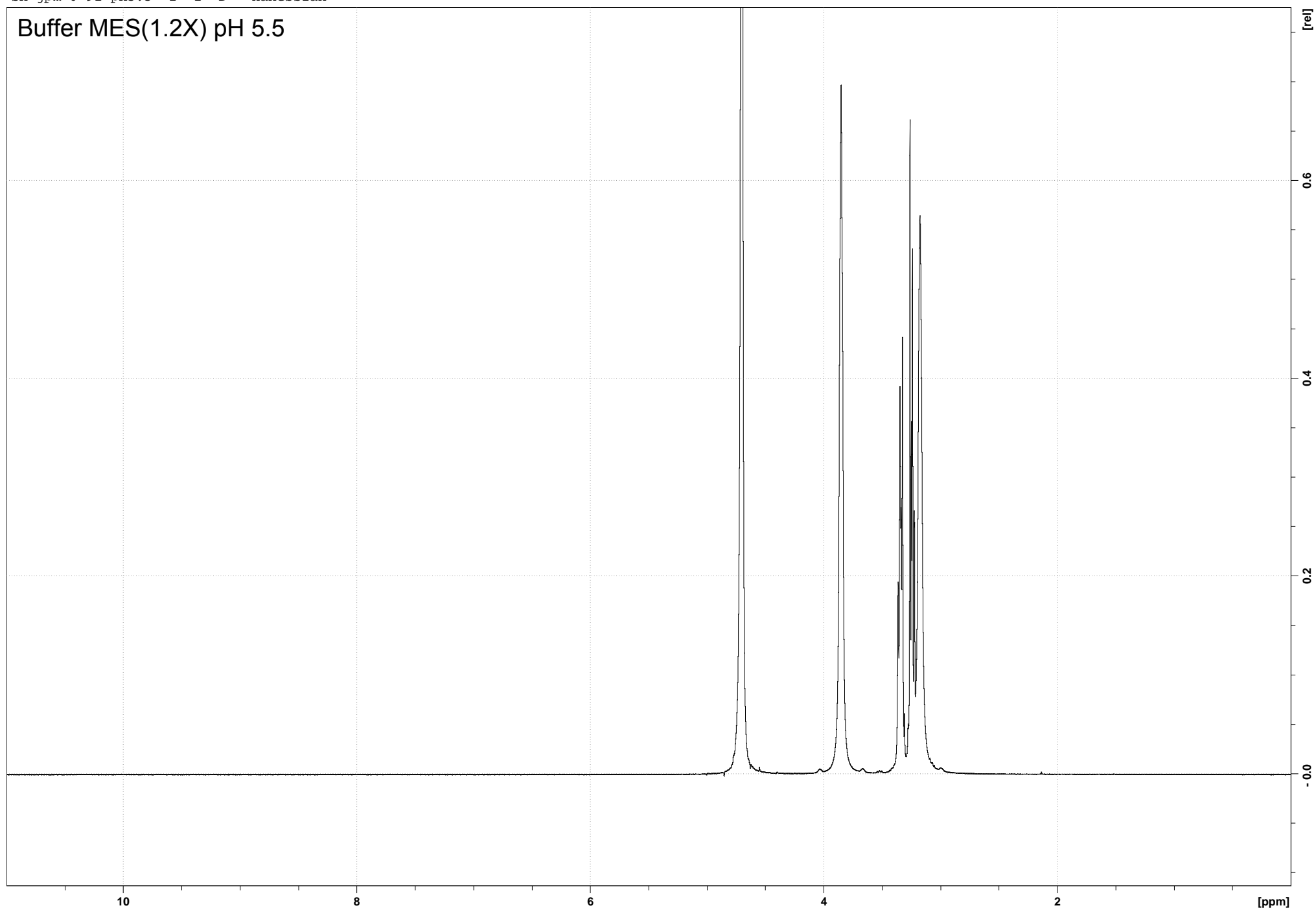


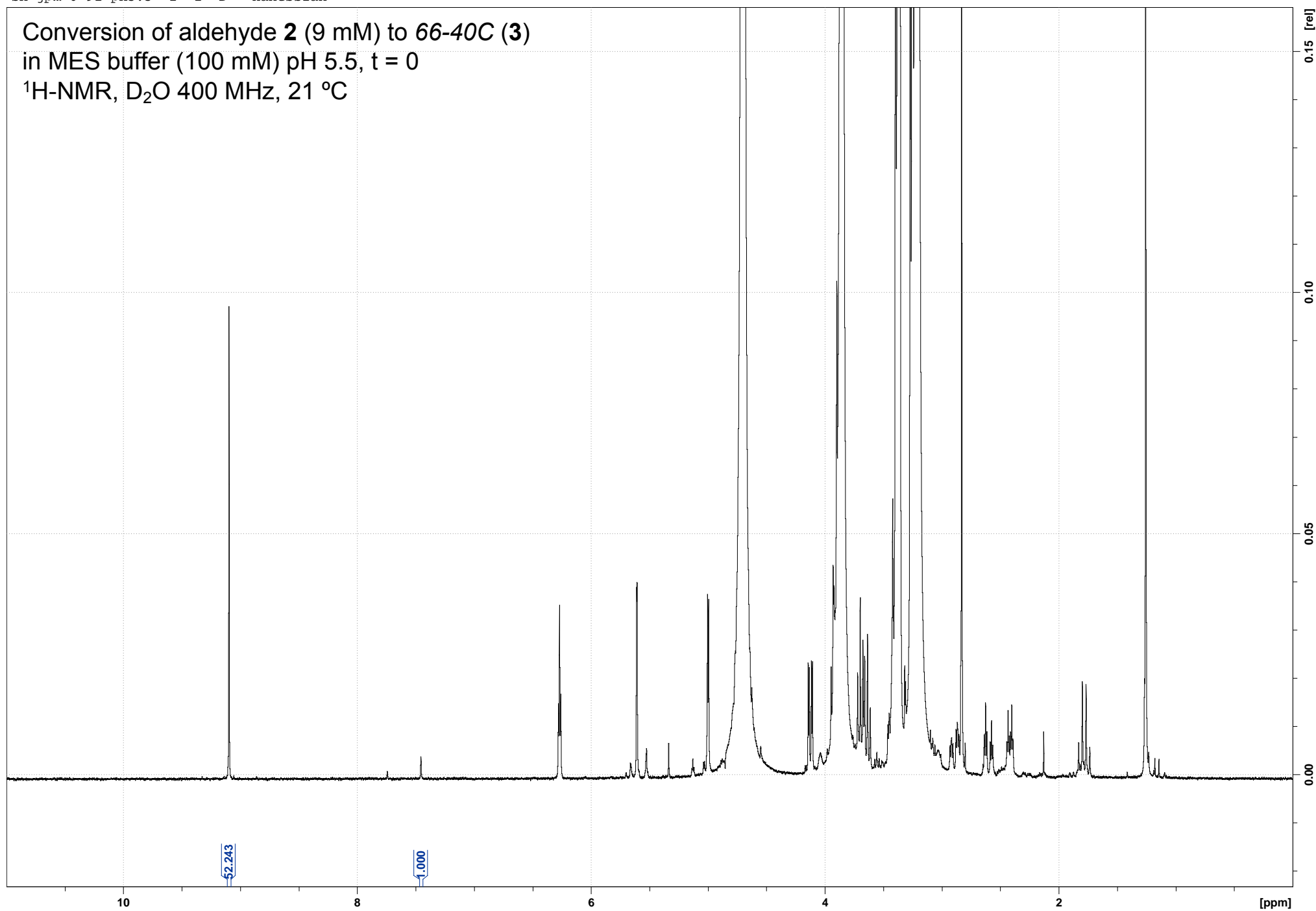
sh-jpm-6-91-ph5.5 1 1 D: Hessian

Buffer MES(1.2X) pH 5.5



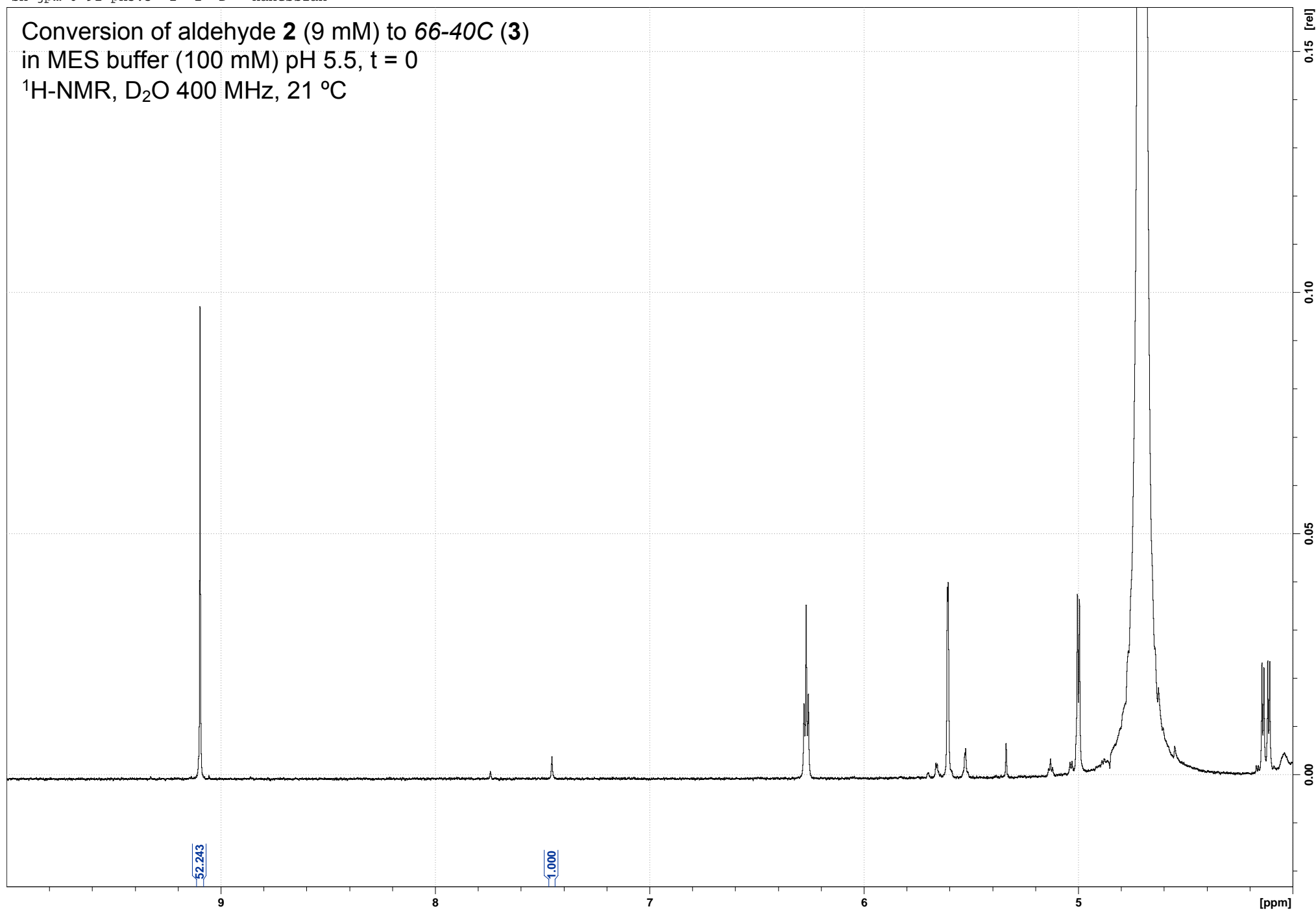
sh-jpm-6-91-ph5.5 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



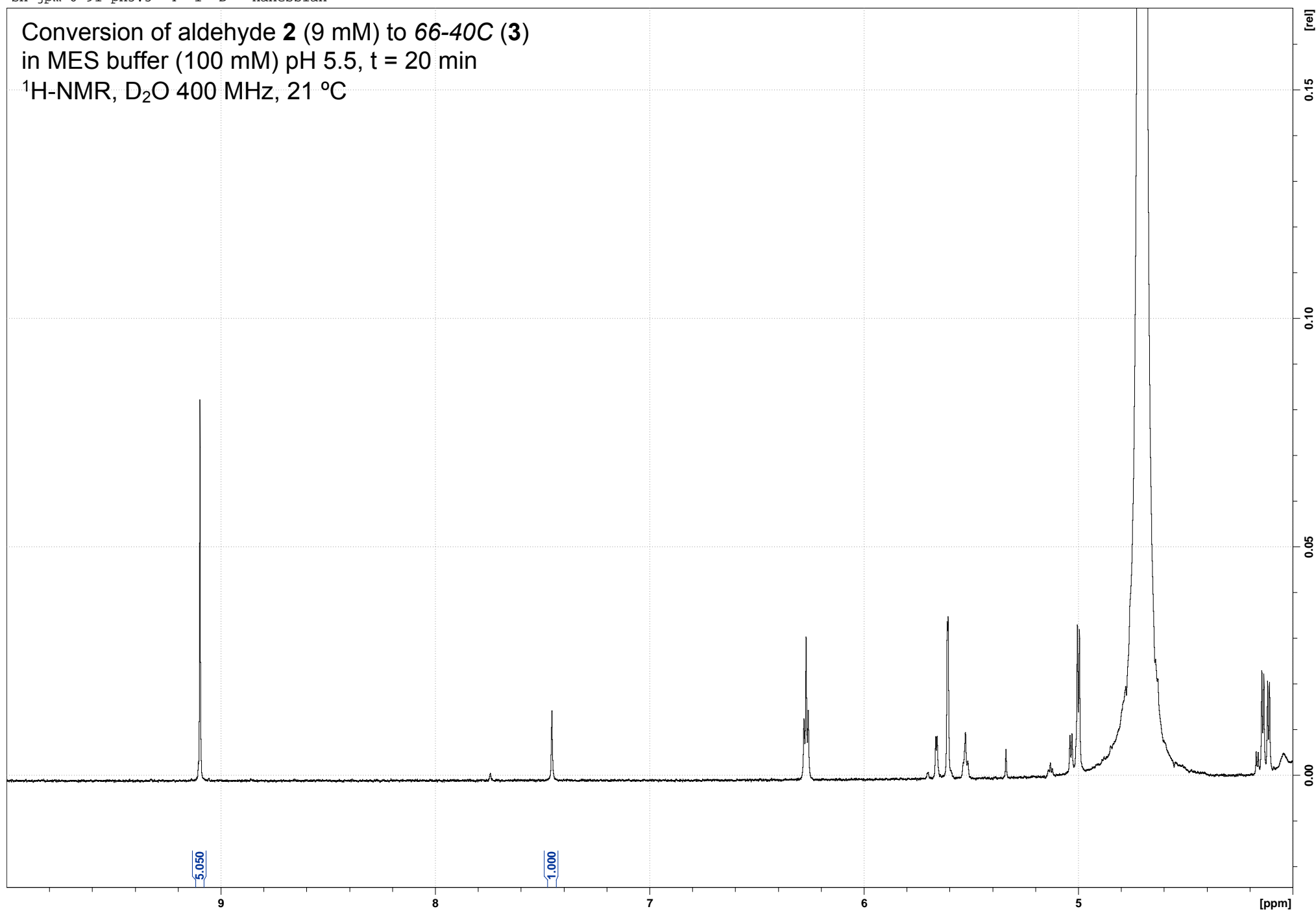
sh-jpm-6-91-ph5.5 2 1 D: Hnessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph5.5 4 1 D: Hanesian

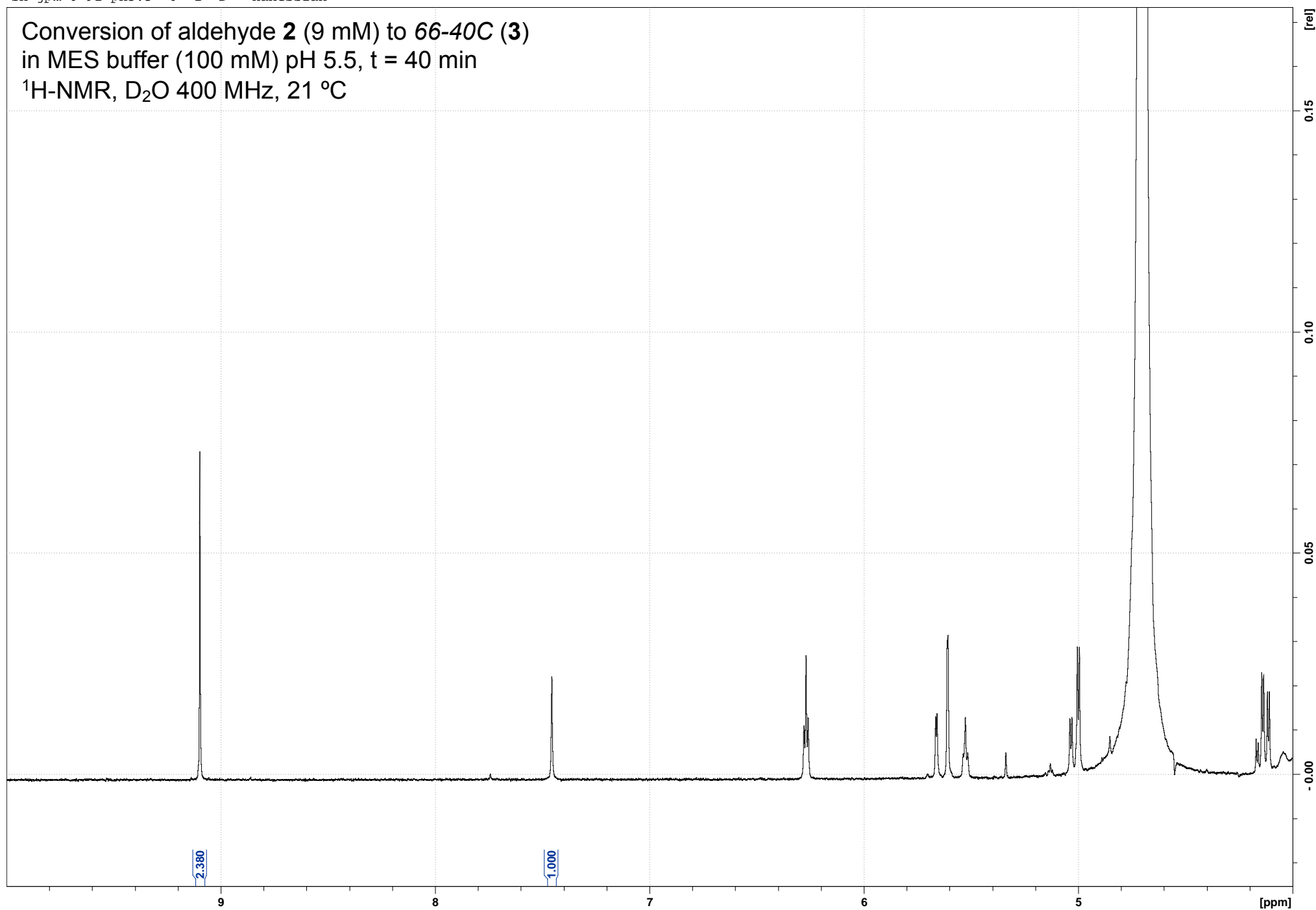
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 20 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





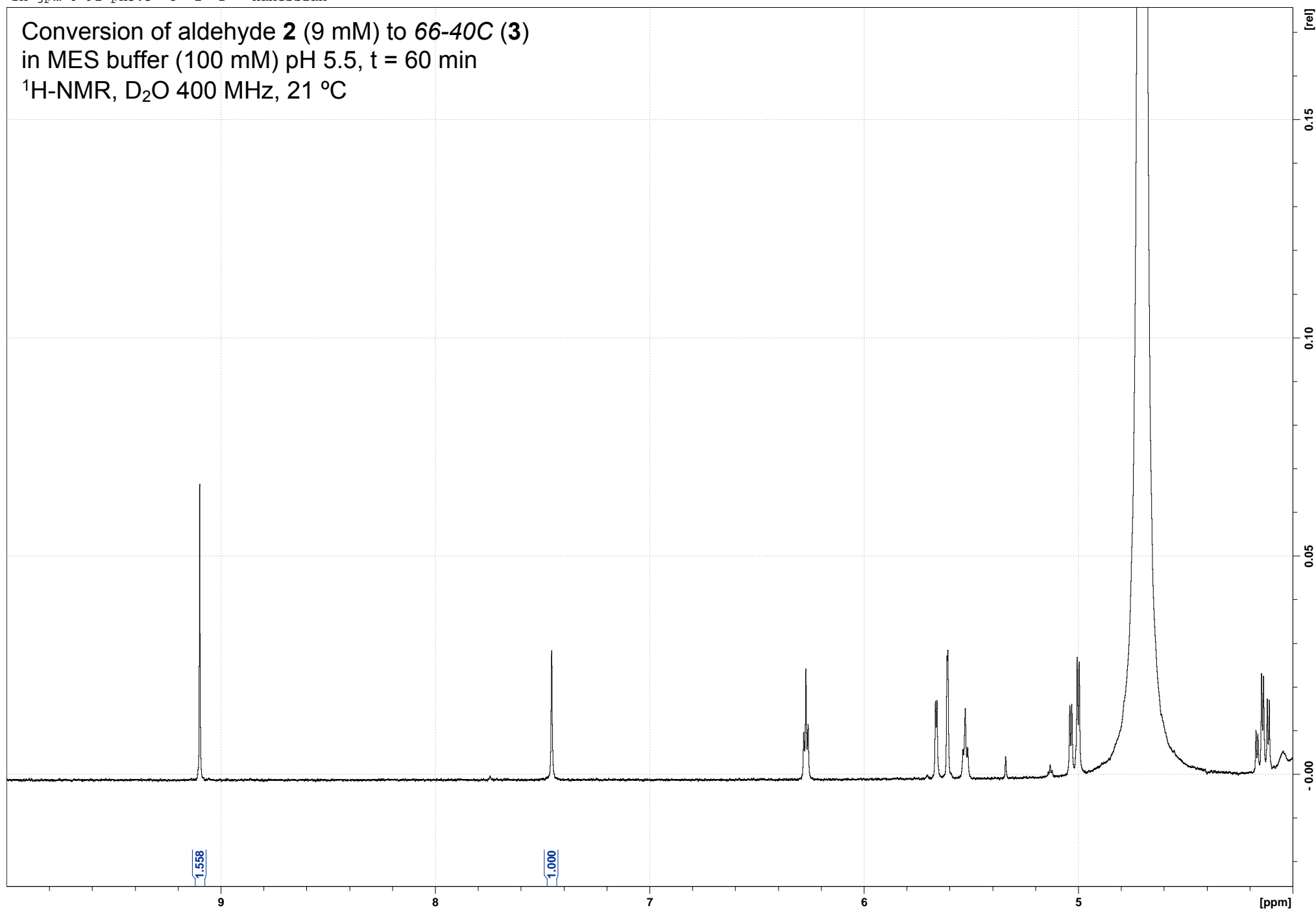
sh-jpm-6-91-ph5.5 6 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 40 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



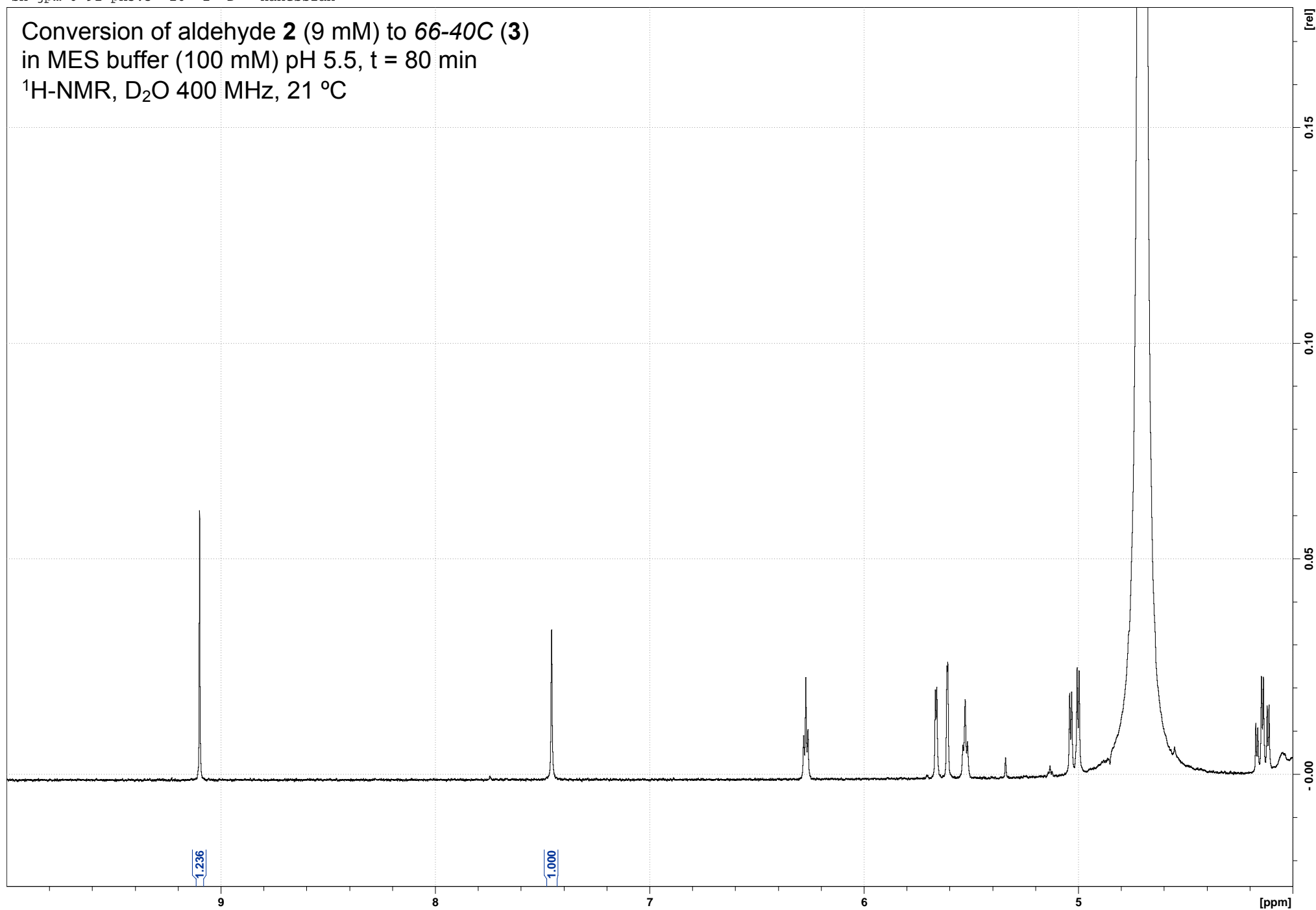
sh-jpm-6-91-ph5.5 8 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 60 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



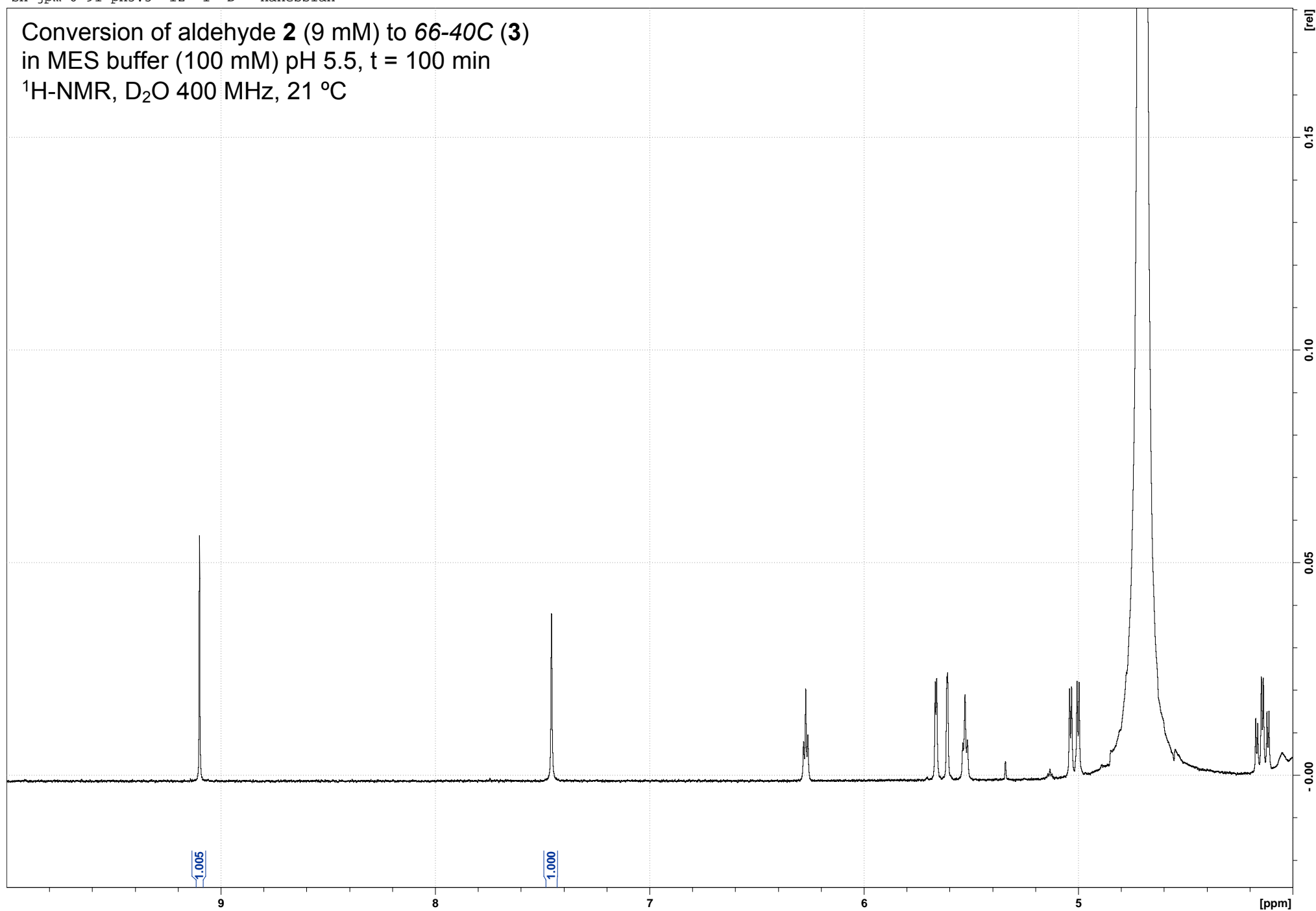
sh-jpm-6-91-ph5.5 10 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 80 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



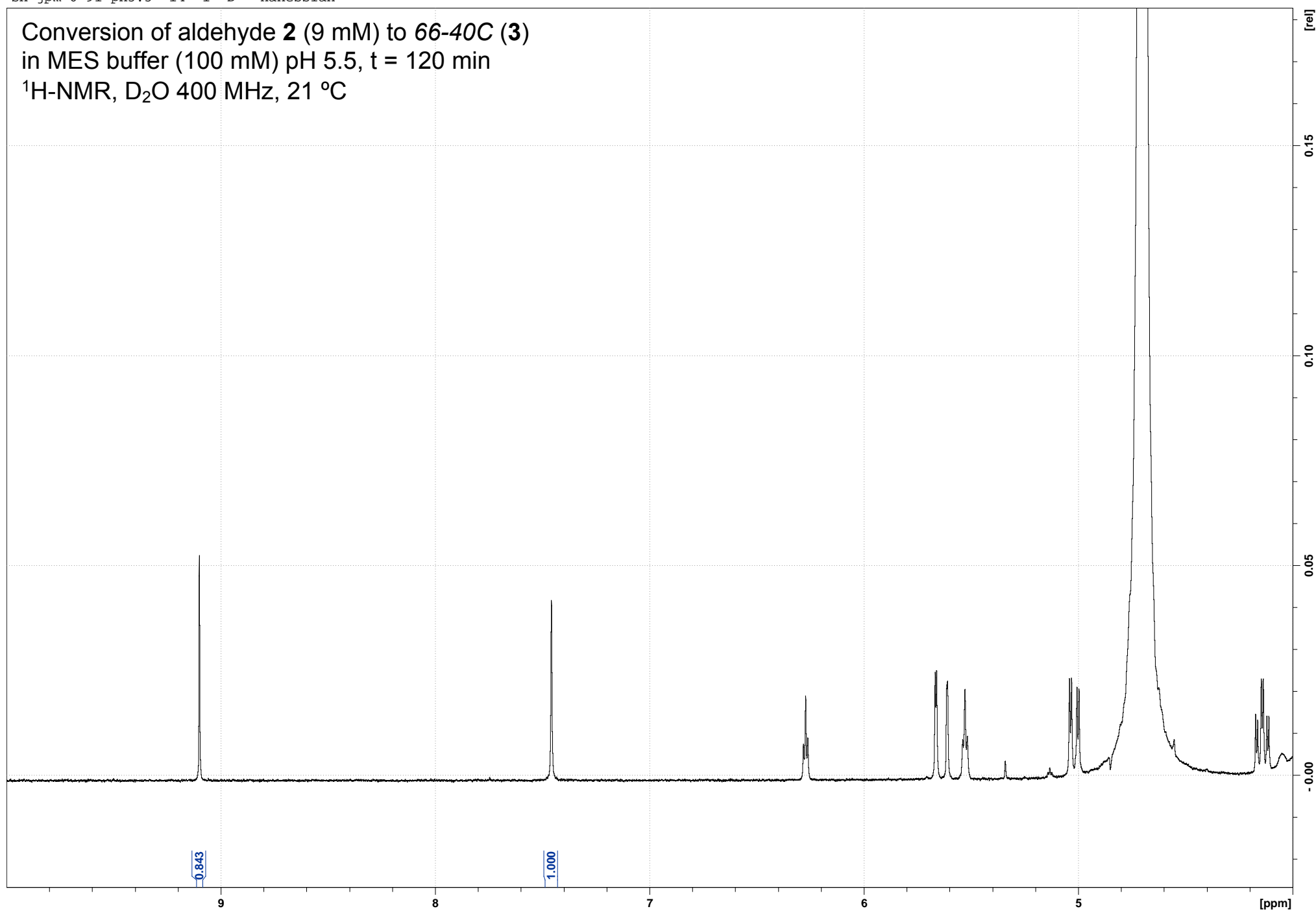
sh-jpm-6-91-ph5.5 12 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 100 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



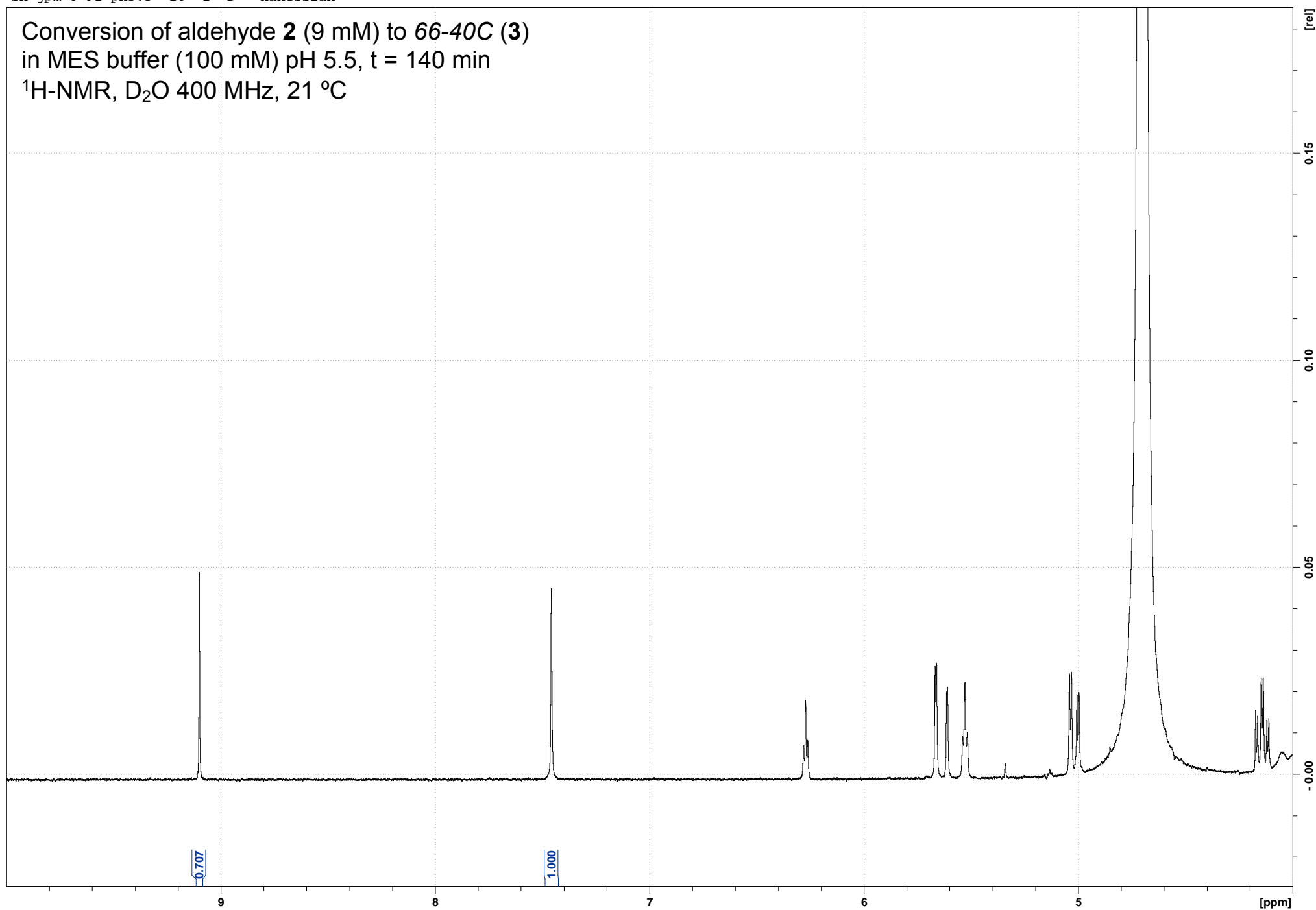
sh-jpm-6-91-ph5.5 14 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 120 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



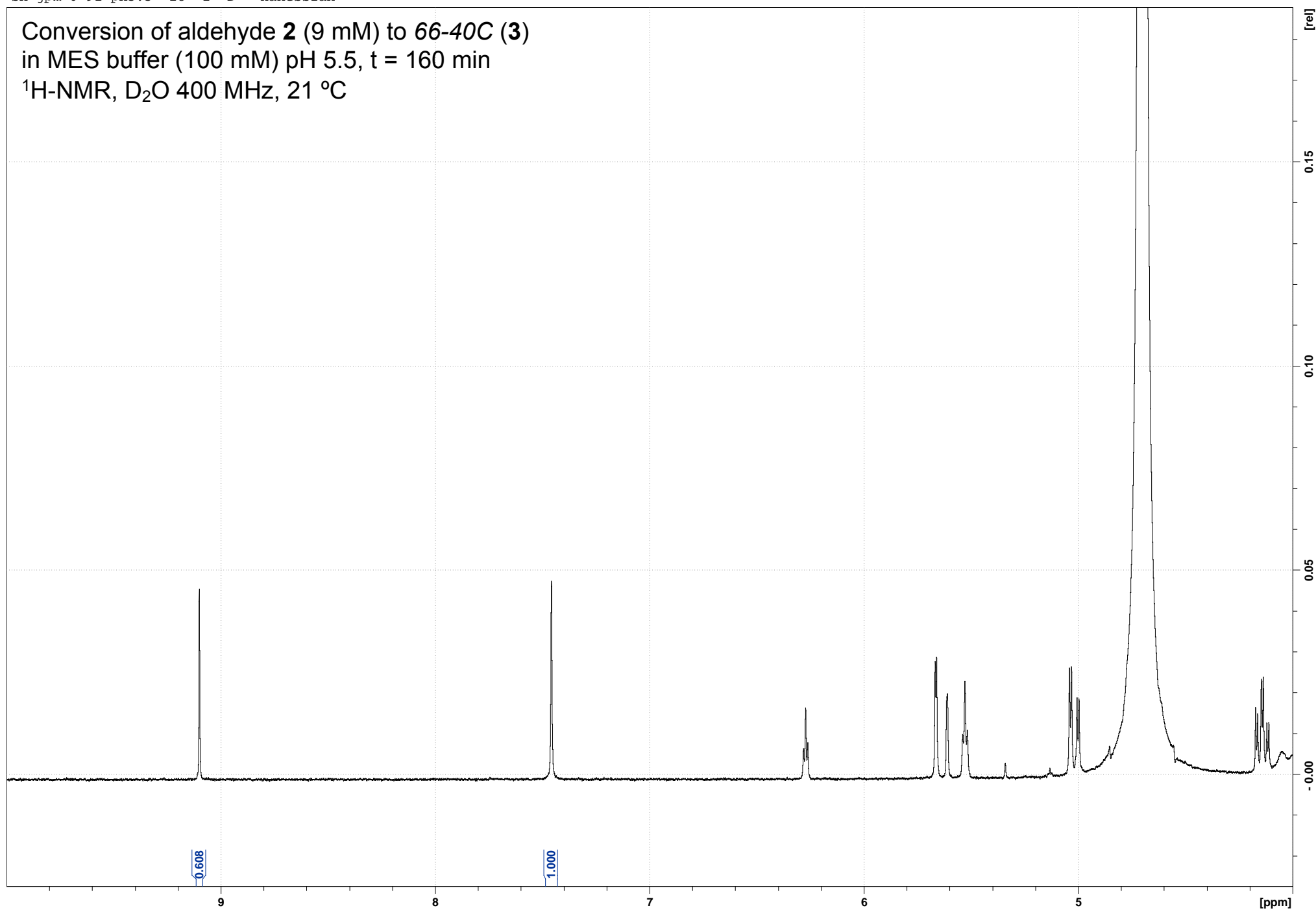
sh-jpm-6-91-ph5.5 16 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 140 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



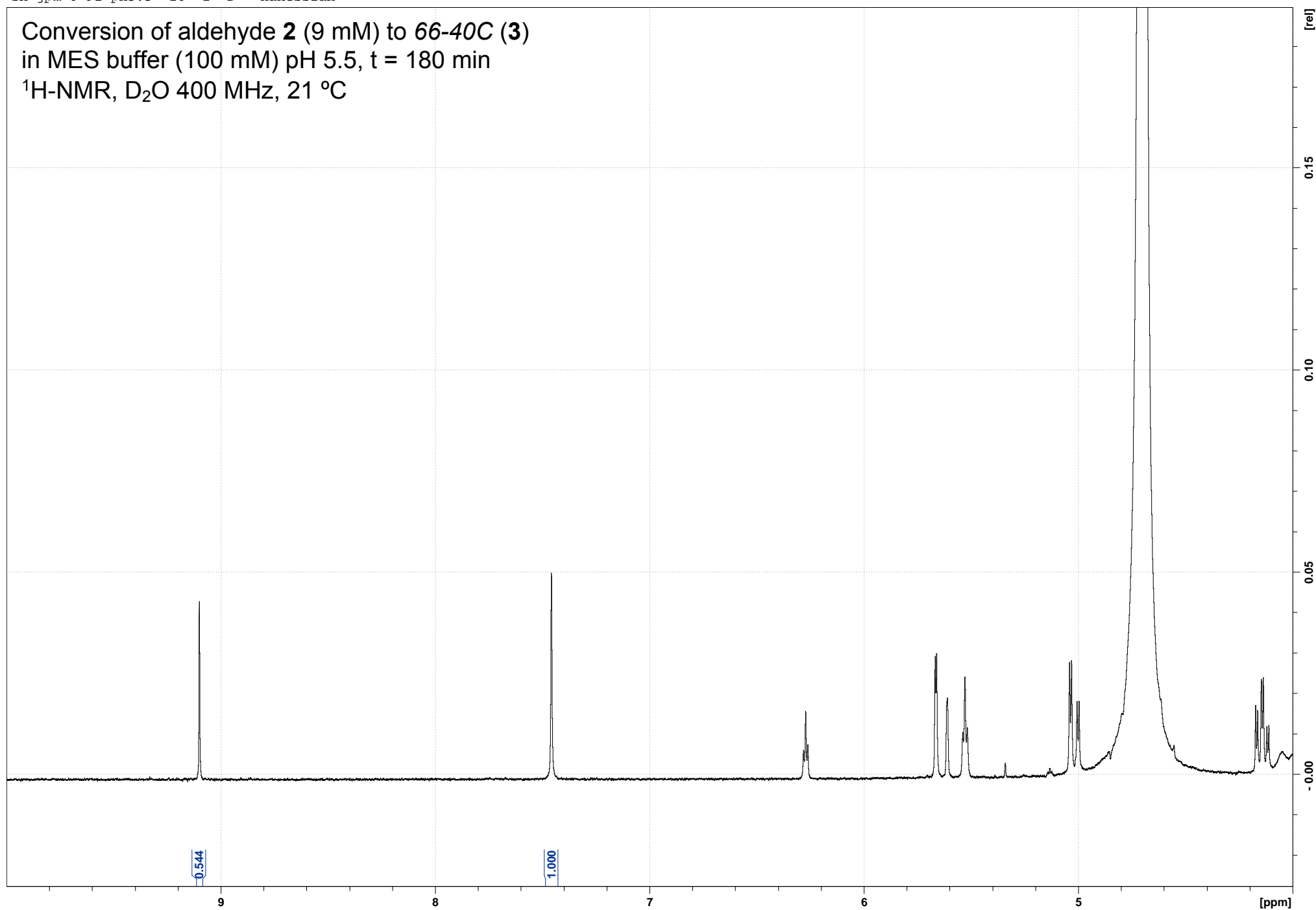
sh-jpm-6-91-ph5.5 18 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 160 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph5.5 20 1 D: Hanessian

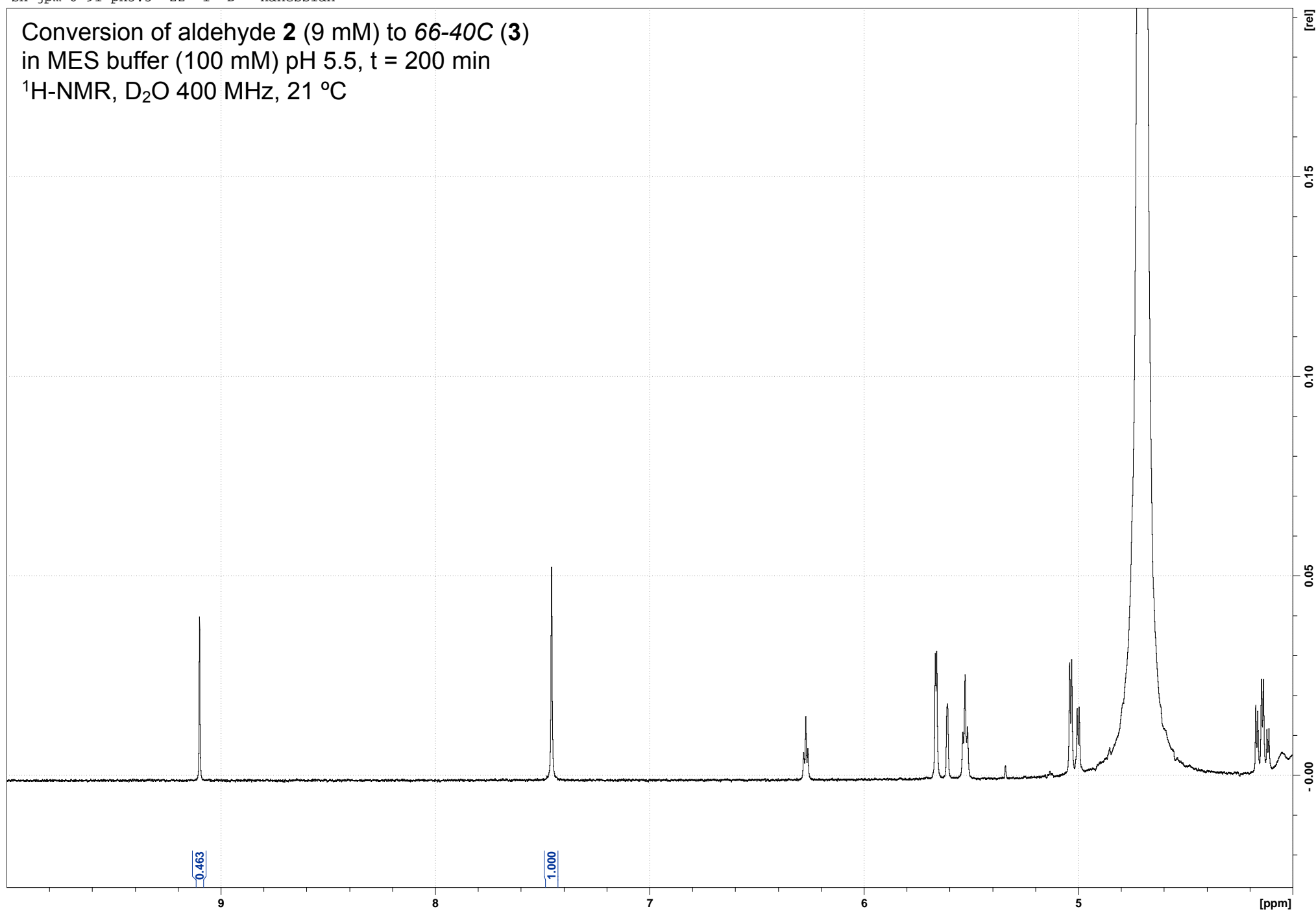
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 180 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





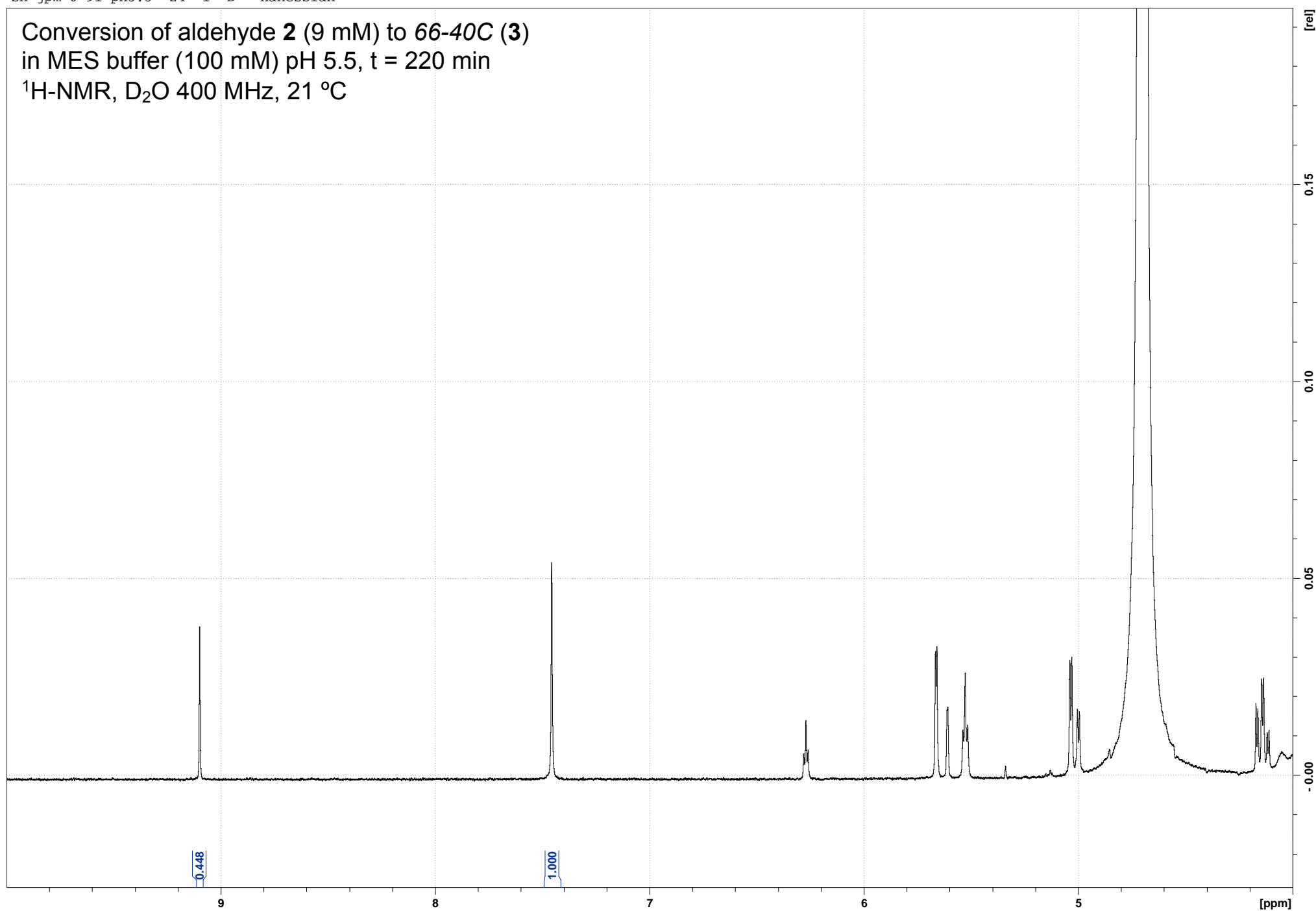
sh-jpm-6-91-ph5.5 22 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 200 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



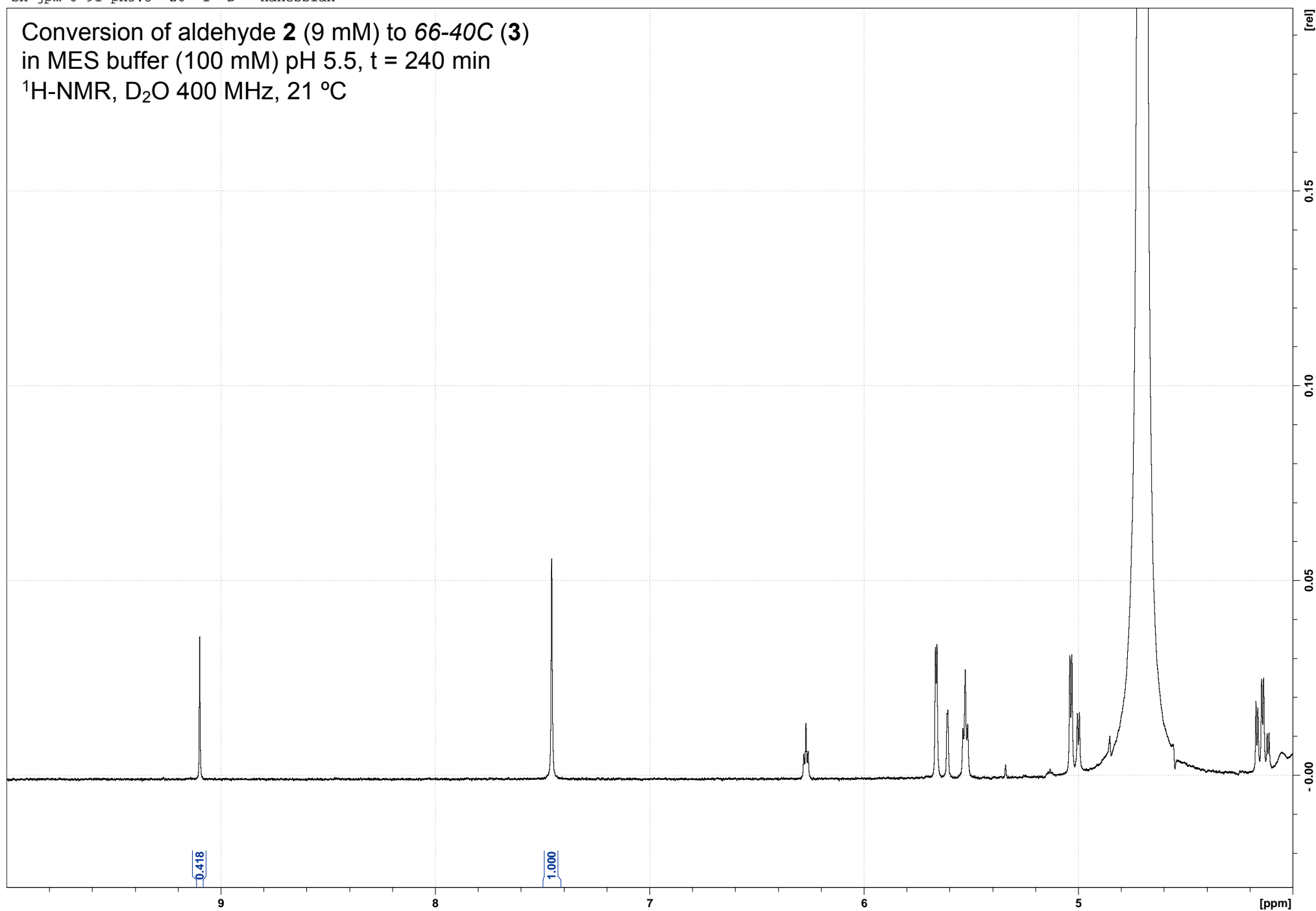
sh-jpm-6-91-ph5.5 24 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 220 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



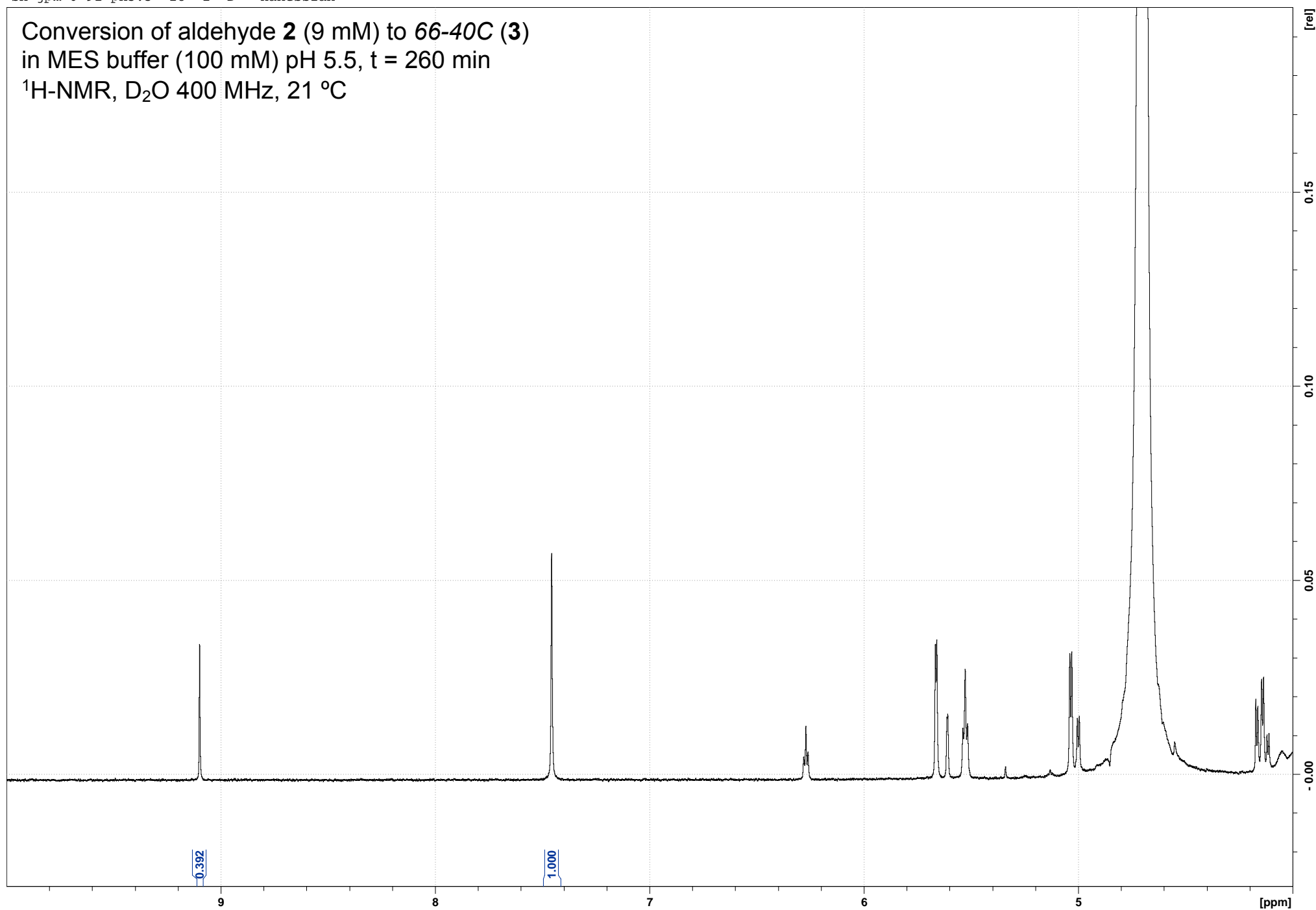
sh-jpm-6-91-ph5.5 26 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 240 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



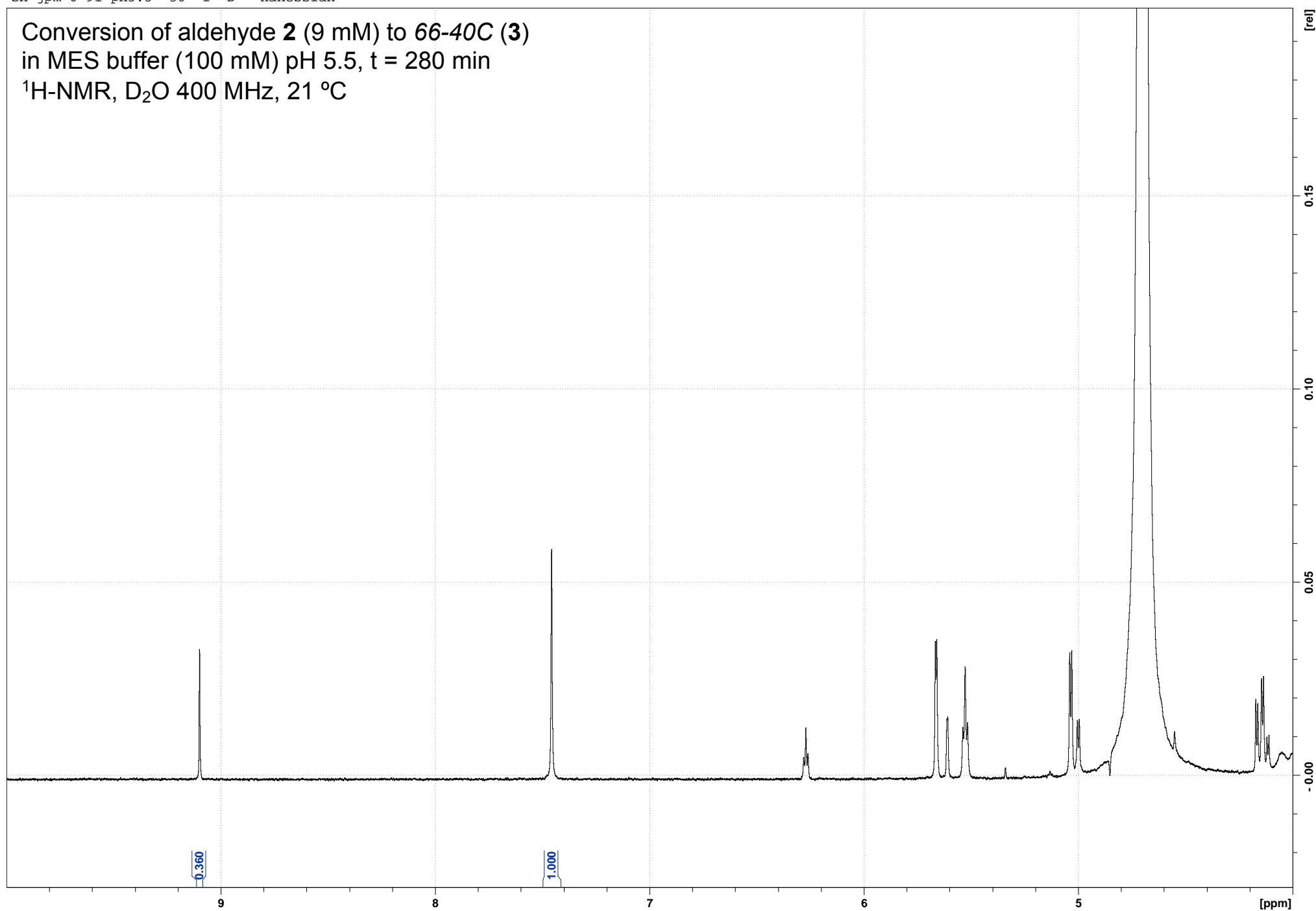
sh-jpm-6-91-ph5.5 28 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 260 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



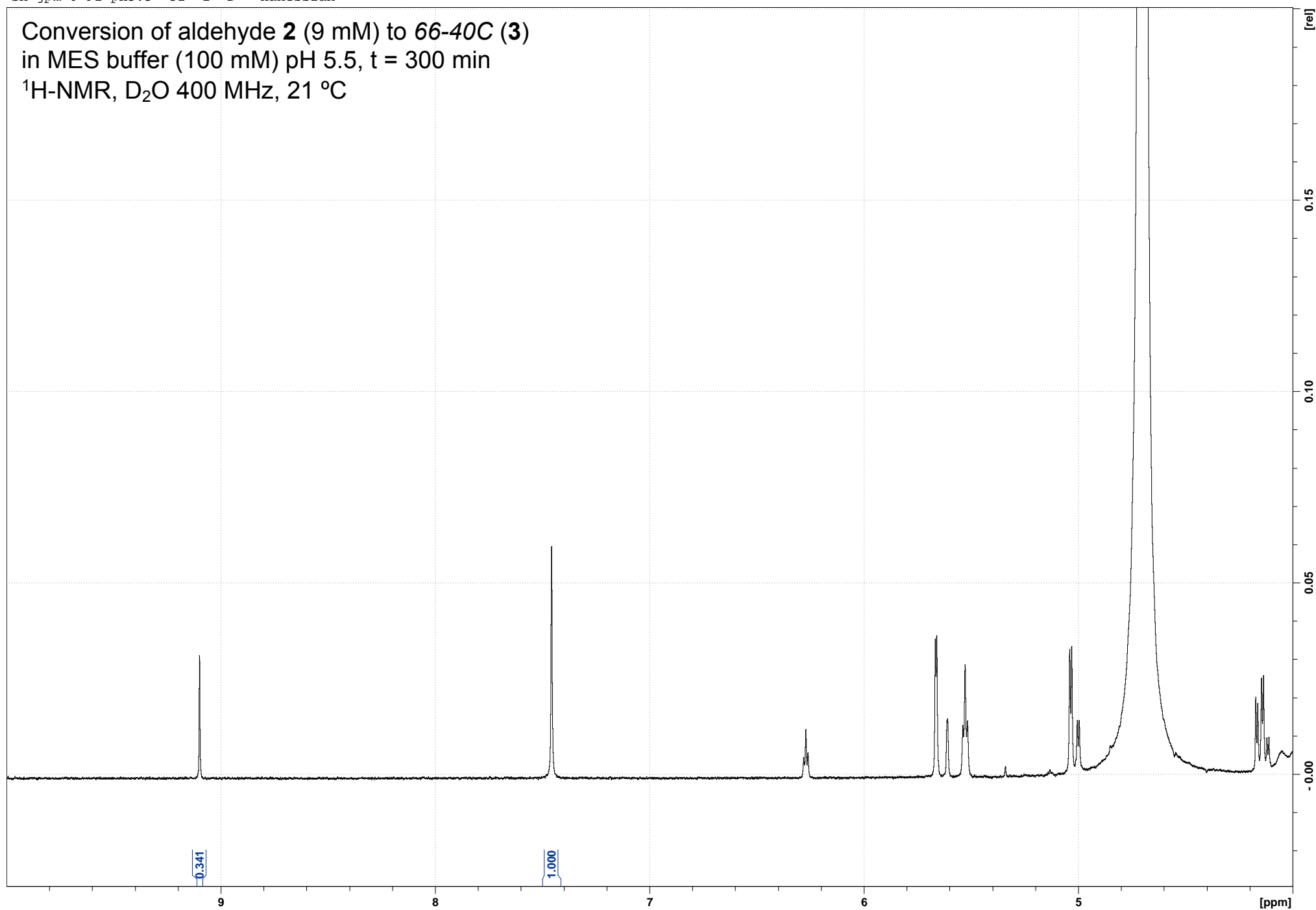
sh-jpm-6-91-ph5.5 30 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 280 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



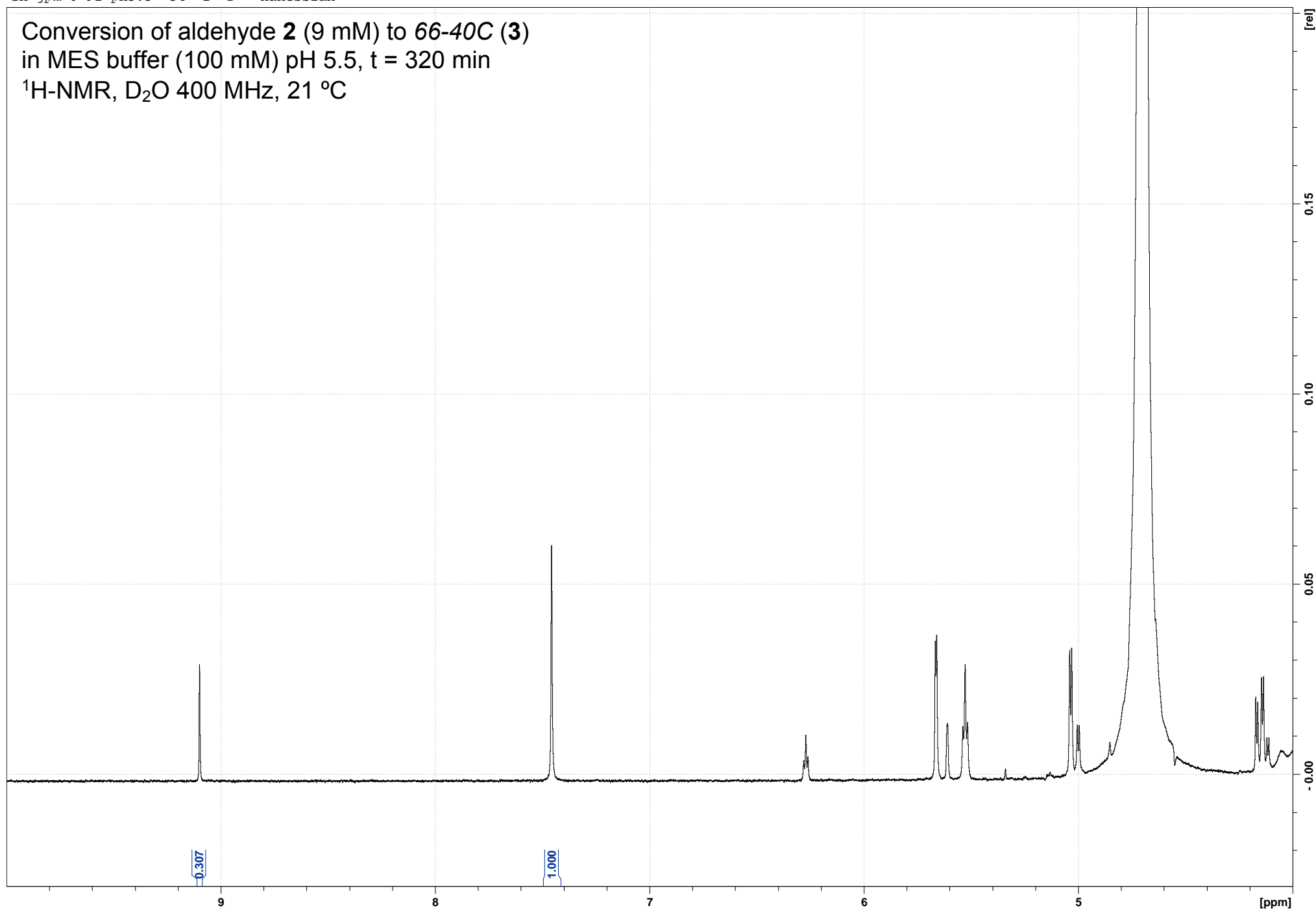
sh-jpm-6-91-ph5.5 32 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 300 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



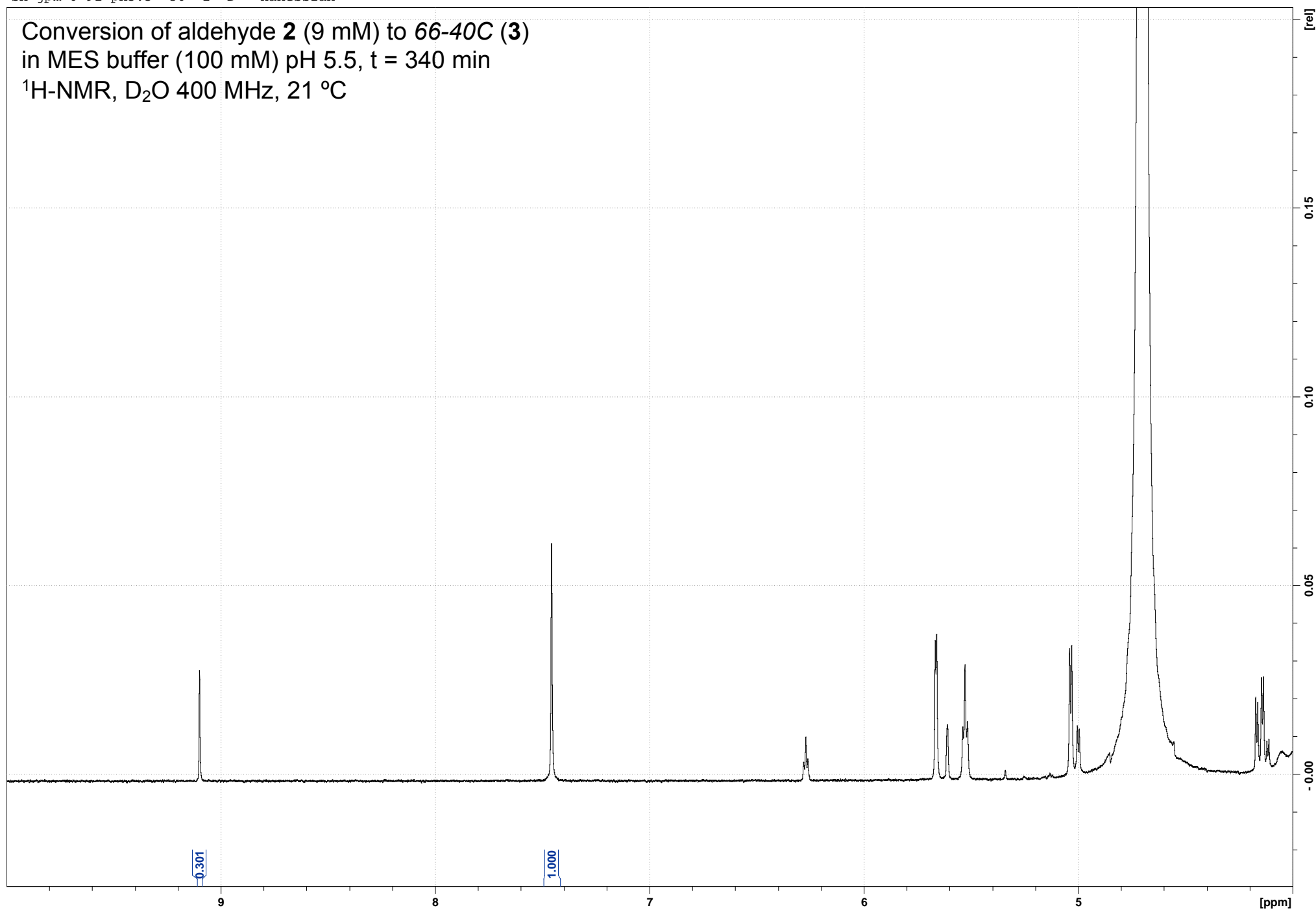
sh-jpm-6-91-ph5.5 34 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 320 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph5.5 36 1 D: Hanessian

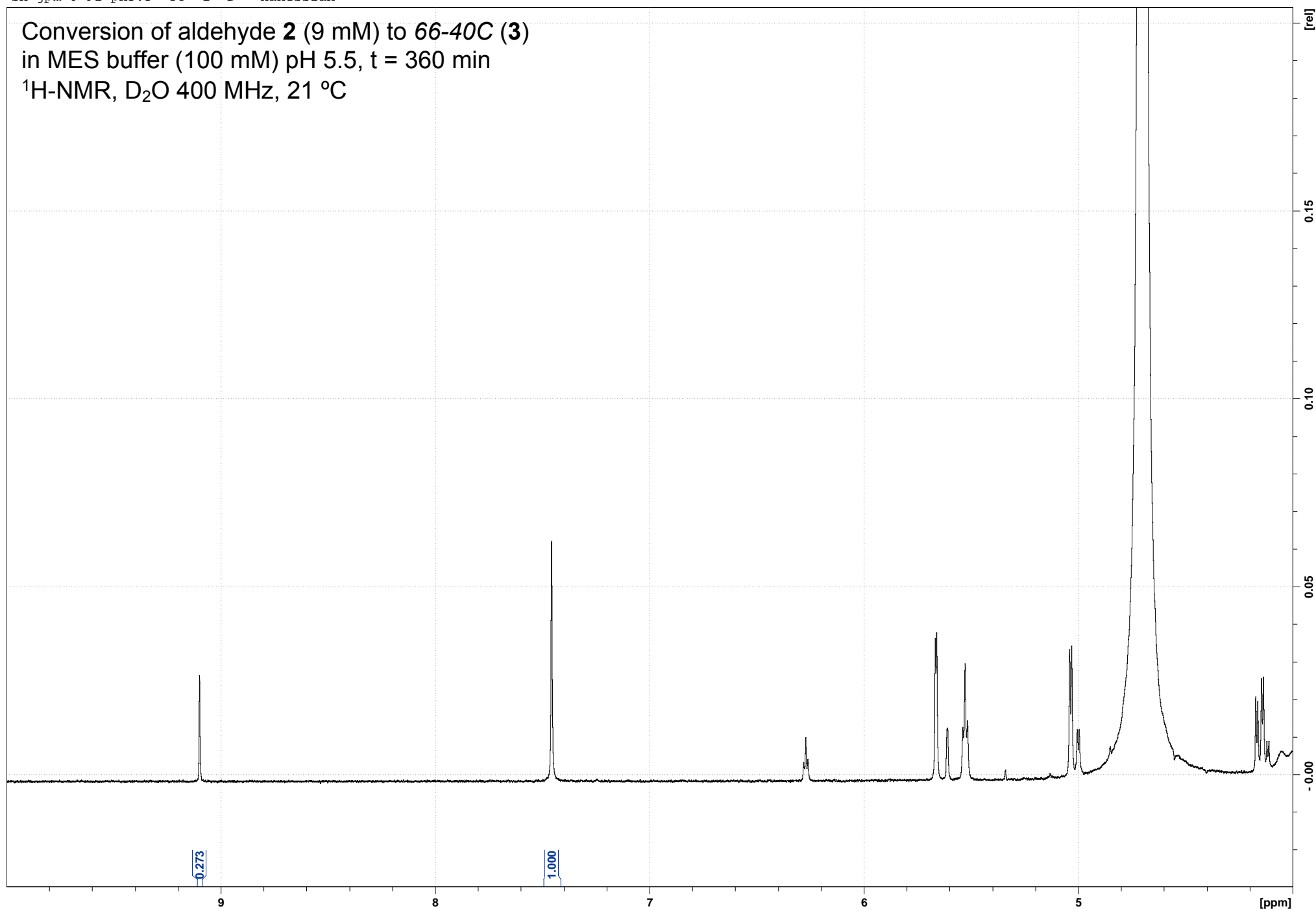
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 340 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





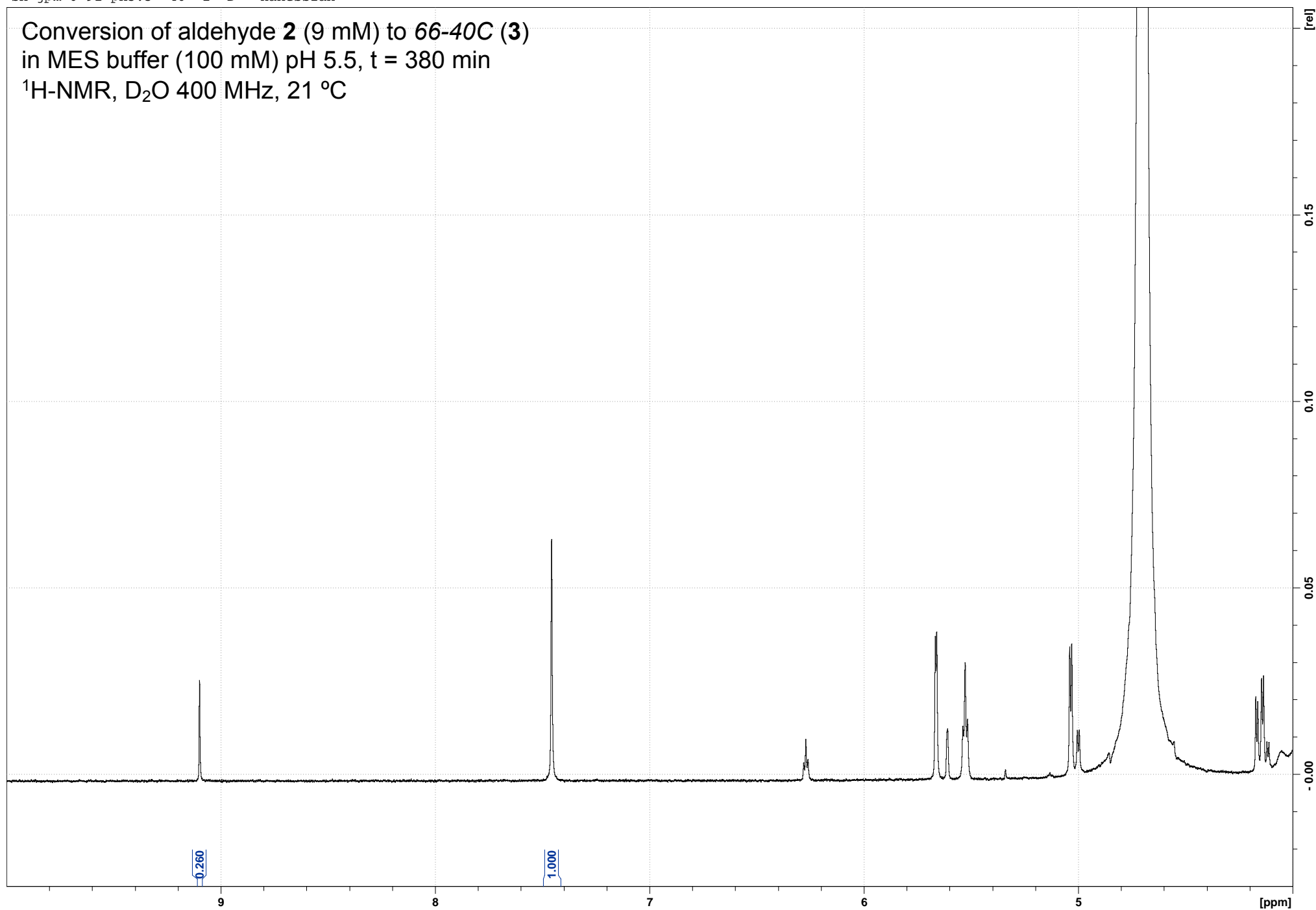
sh-jpm-6-91-ph5.5 38 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 360 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



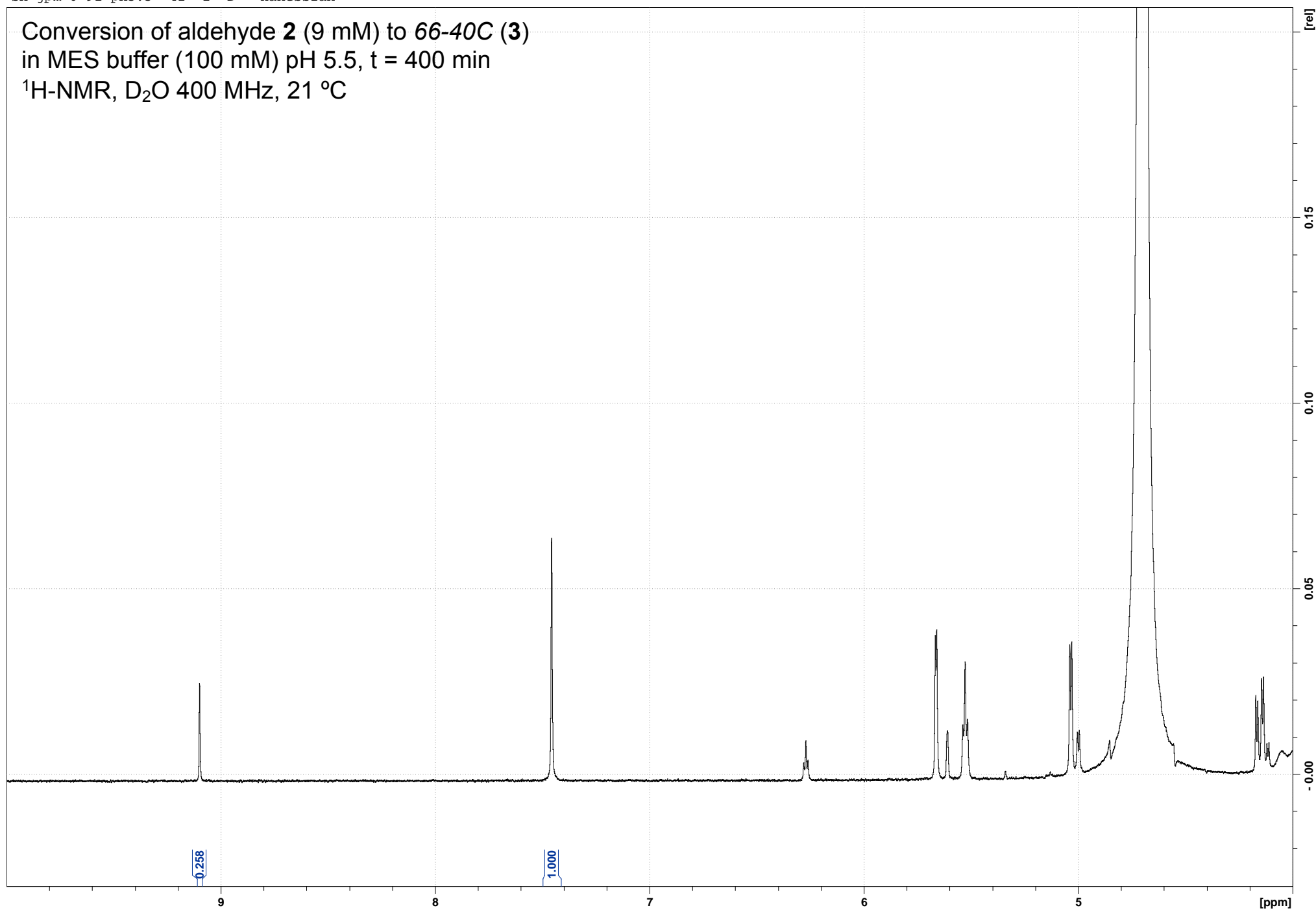
sh-jpm-6-91-ph5.5 40 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 380 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



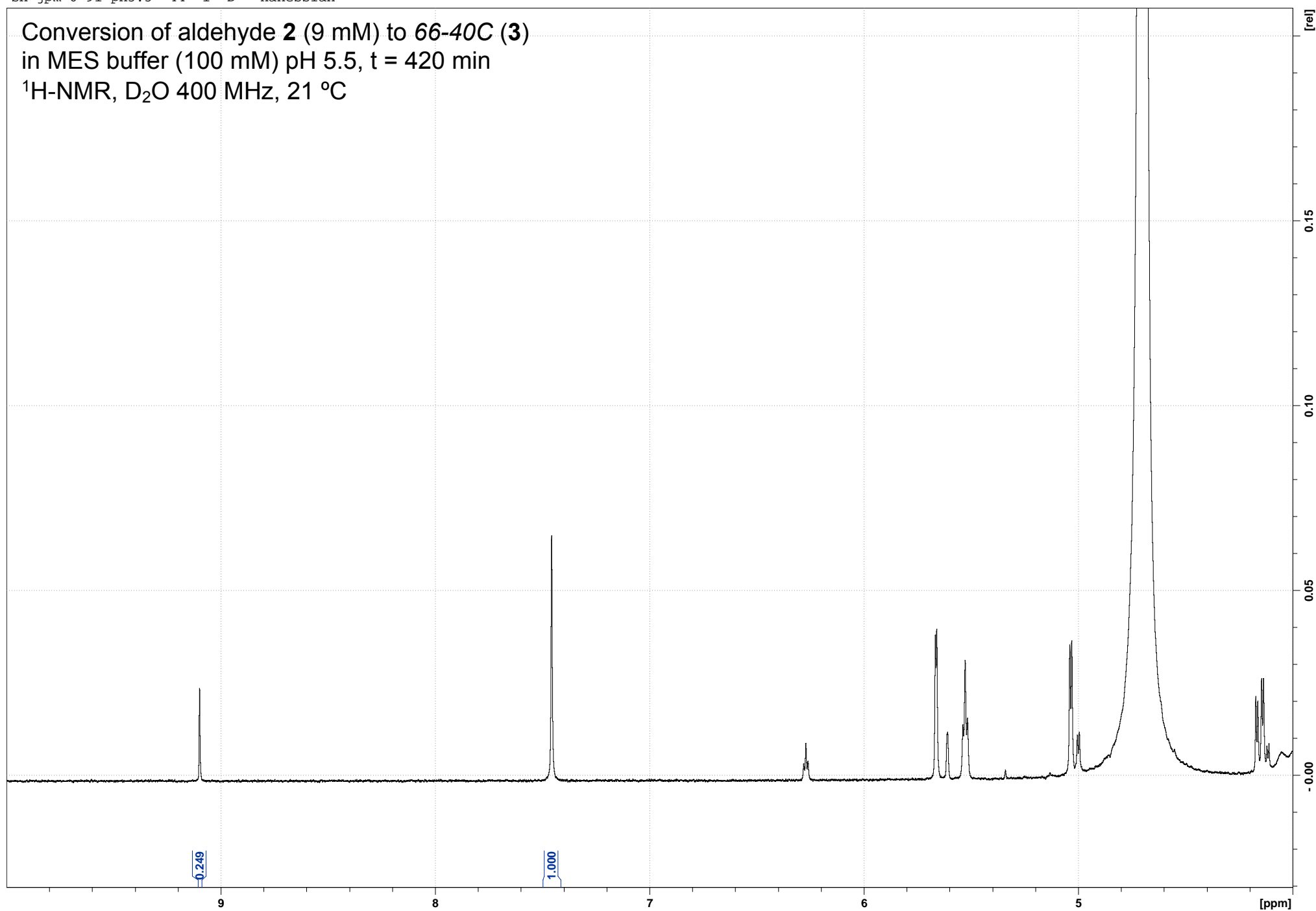
sh-jpm-6-91-ph5.5 42 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 400 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



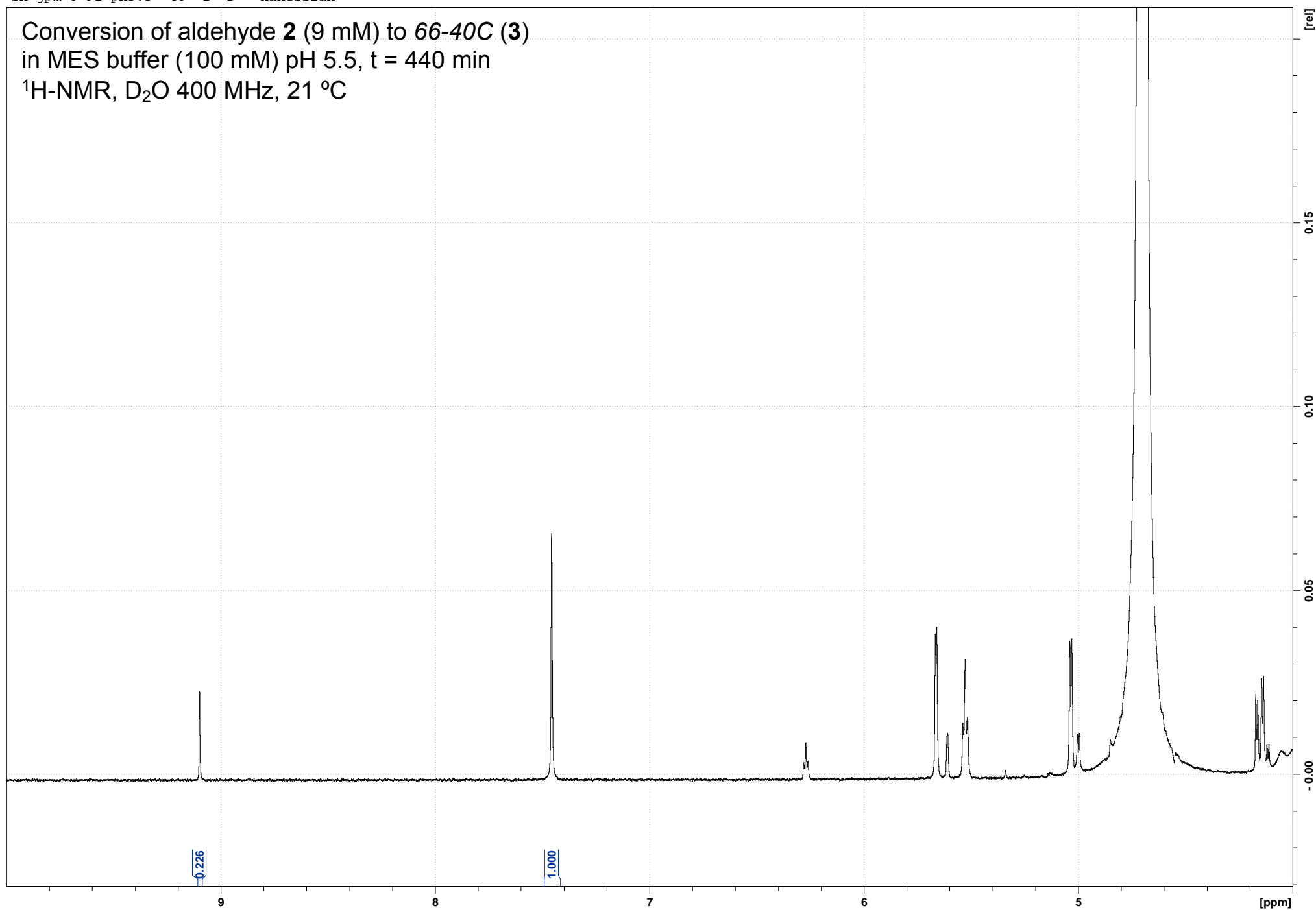
sh-jpm-6-91-ph5.5 44 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 420 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



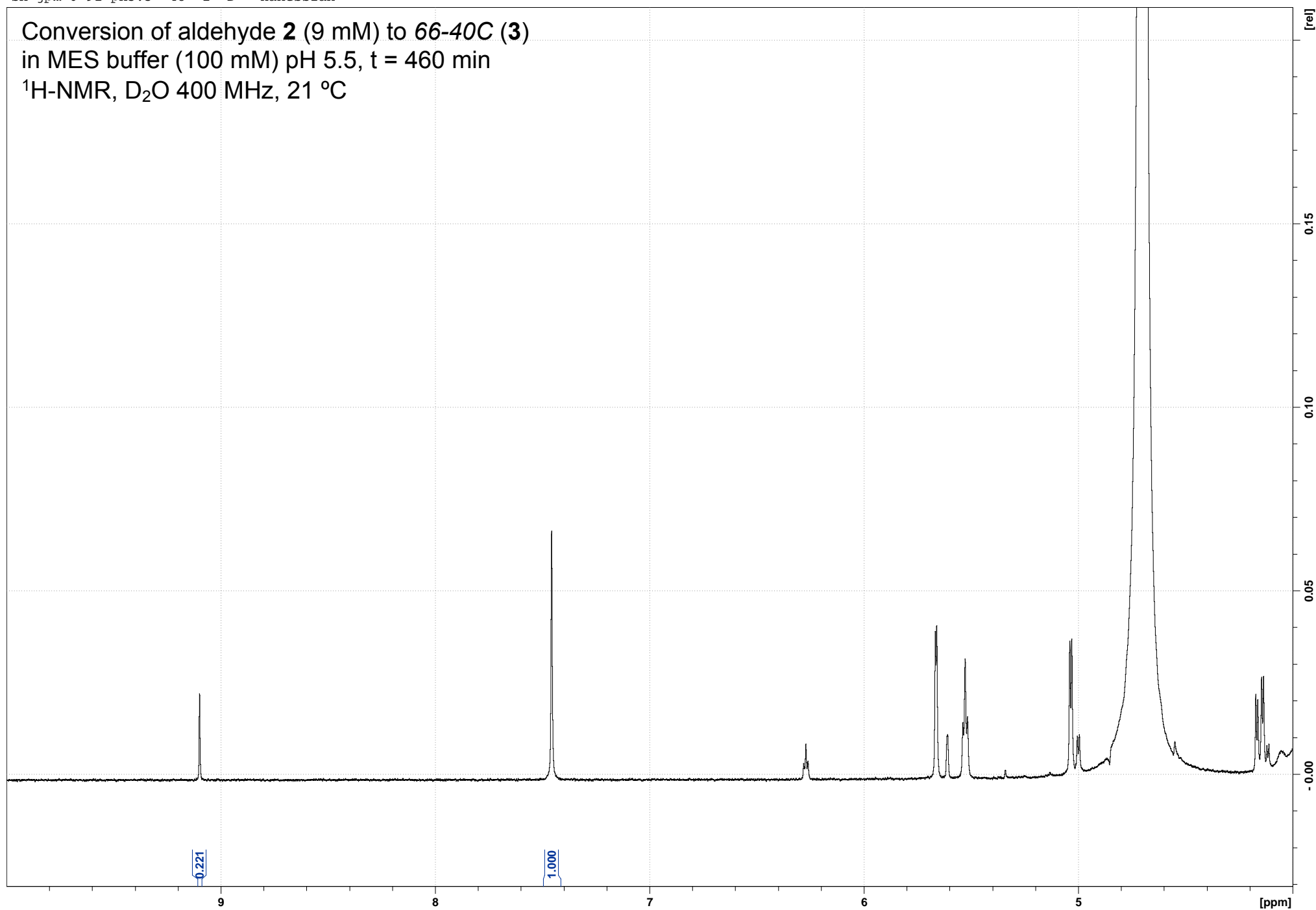
sh-jpm-6-91-ph5.5 46 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 440 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



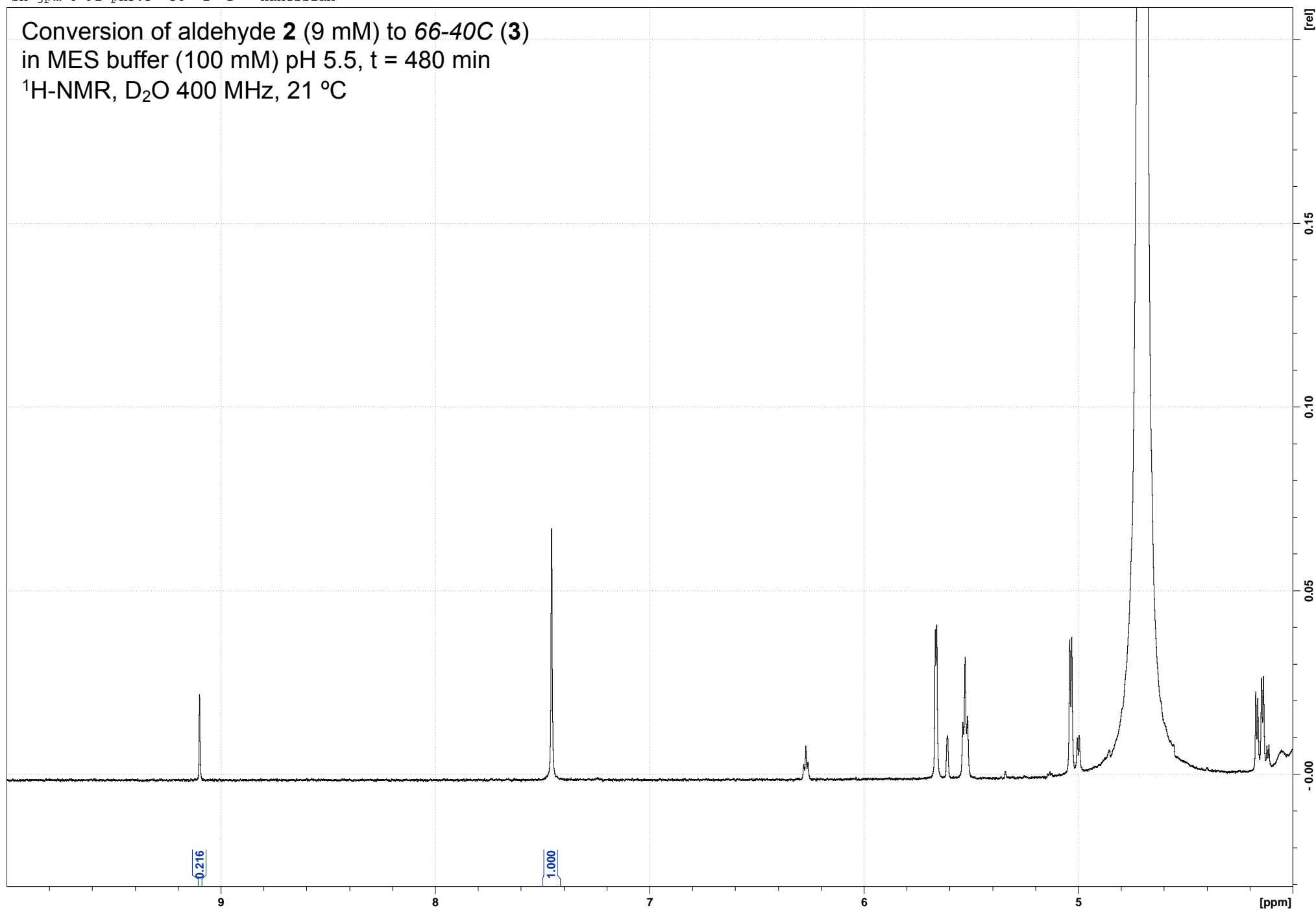
sh-jpm-6-91-ph5.5 48 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 460 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



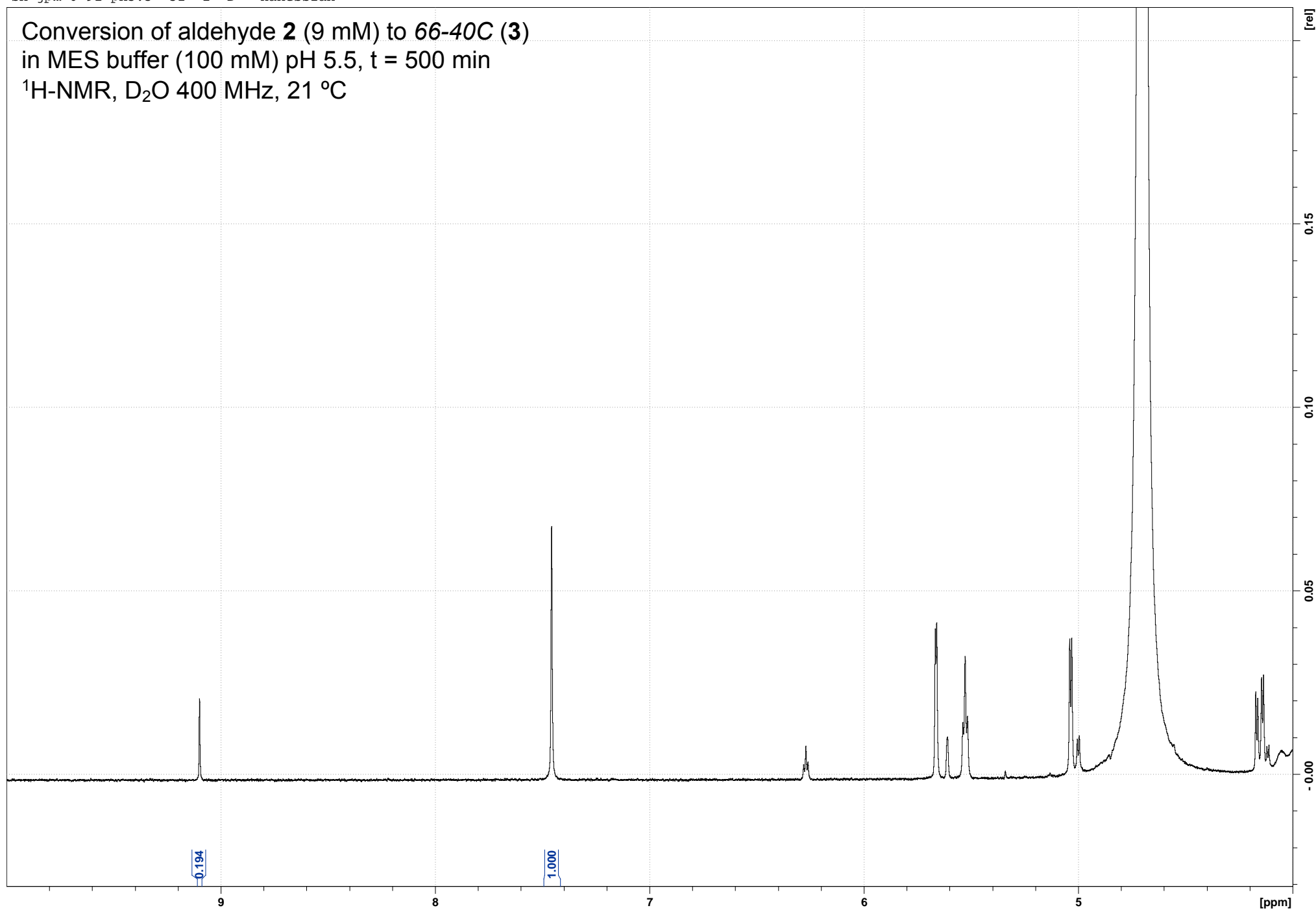
sh-jpm-6-91-ph5.5 50 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 480 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph5.5 52 1 D: Hanessian

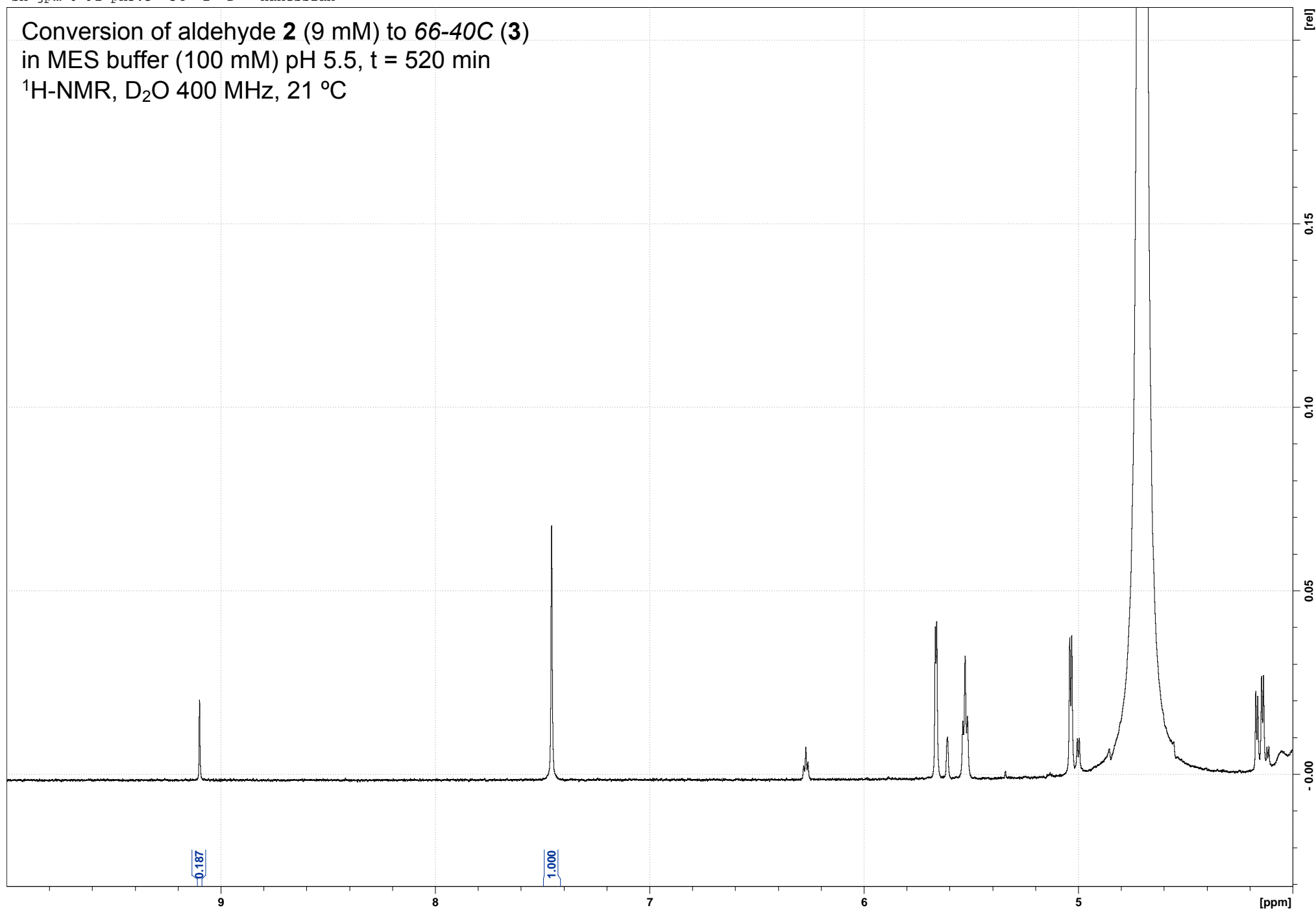
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 500 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





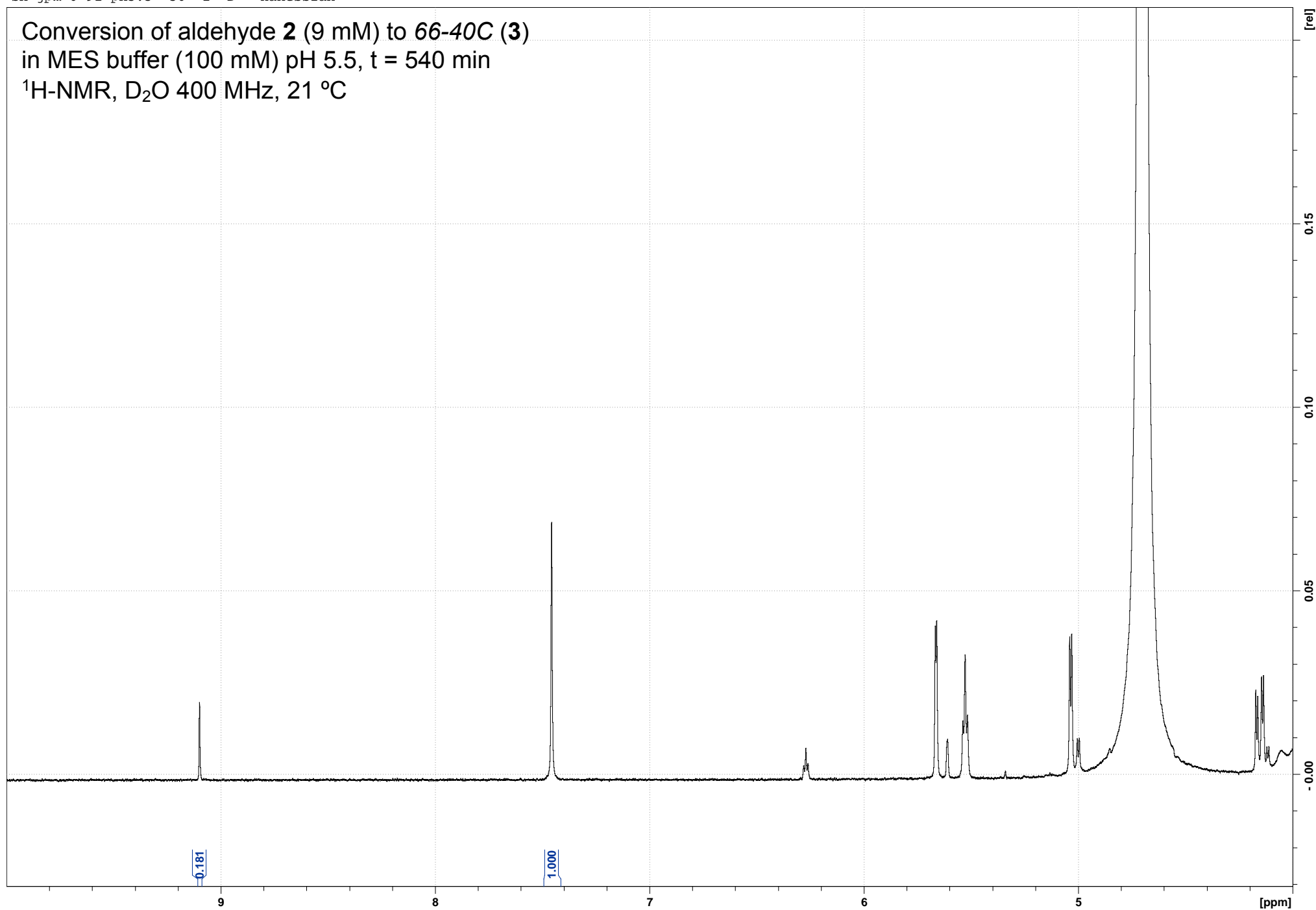
sh-jpm-6-91-ph5.5 54 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 520 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



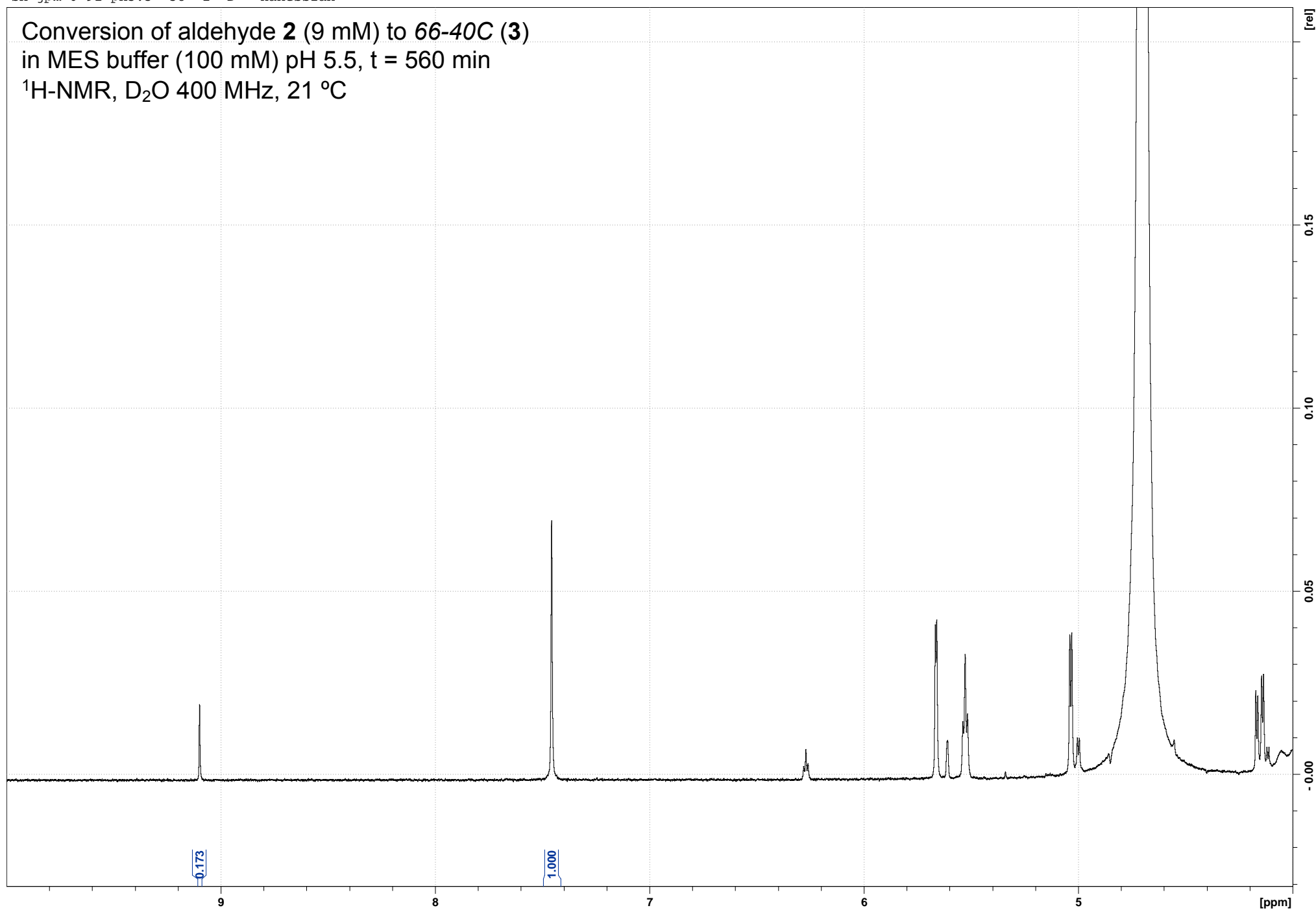
sh-jpm-6-91-ph5.5 56 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 540 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



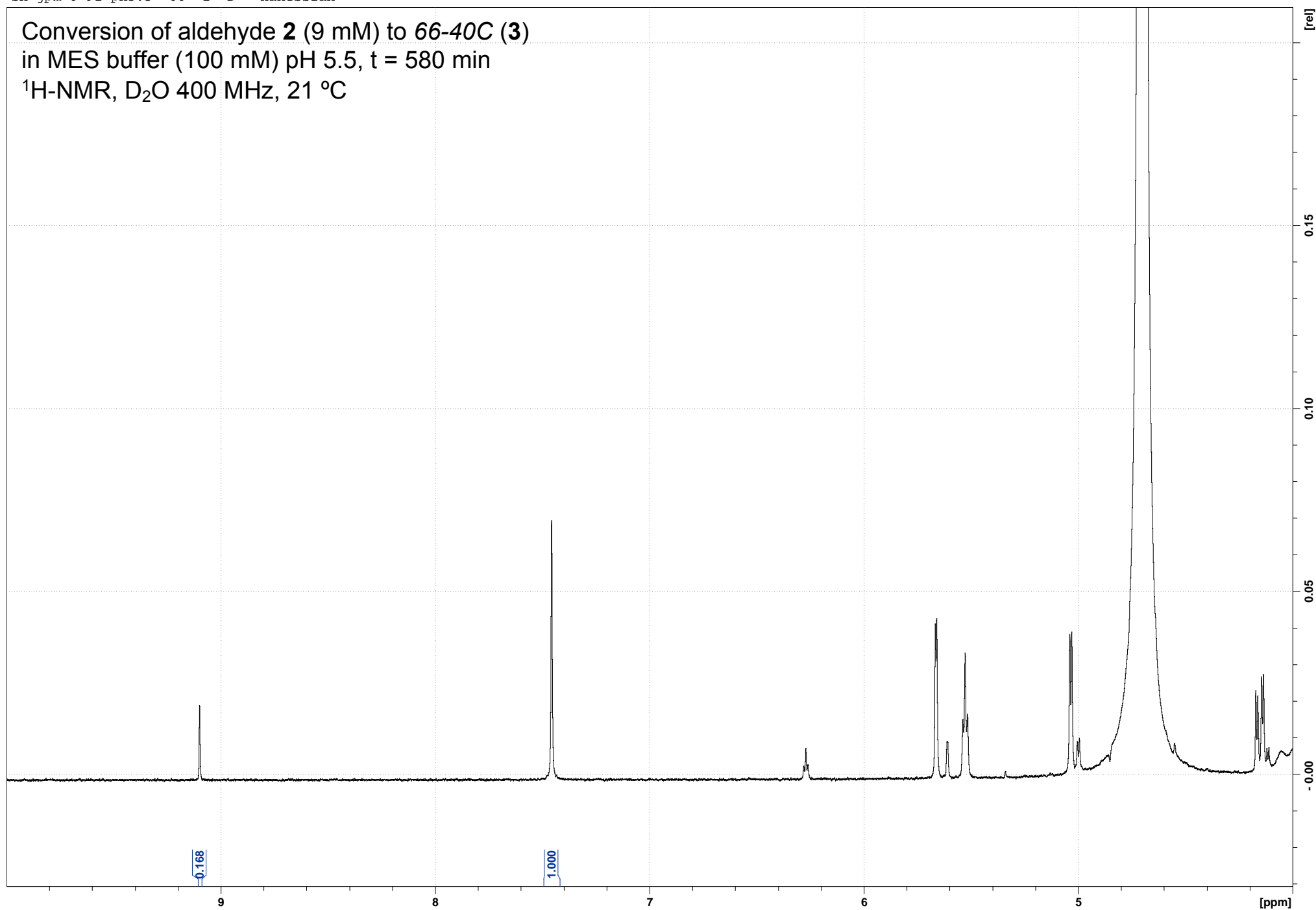
sh-jpm-6-91-ph5.5 58 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 560 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



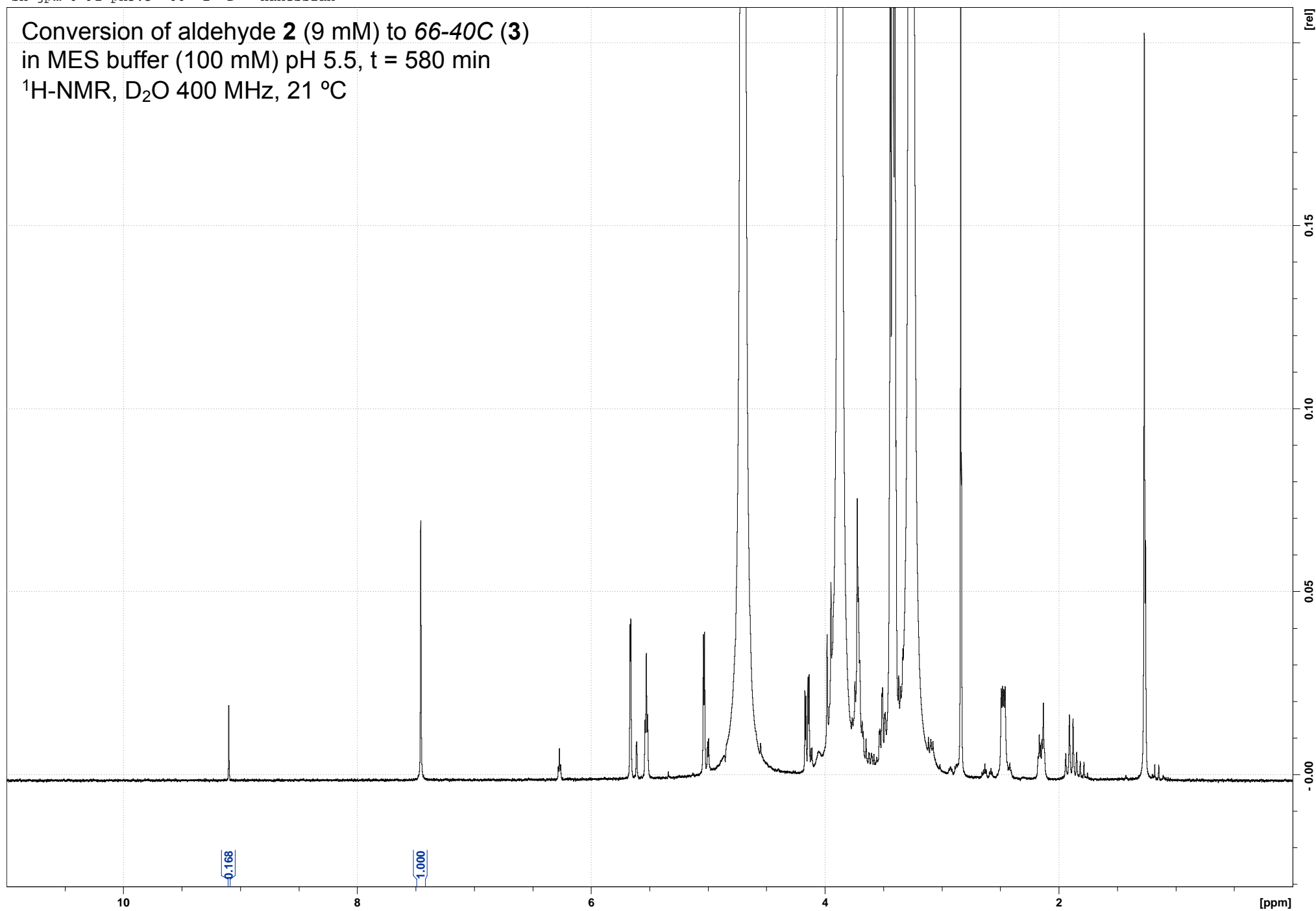
sh-jpm-6-91-ph5.5 60 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 580 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



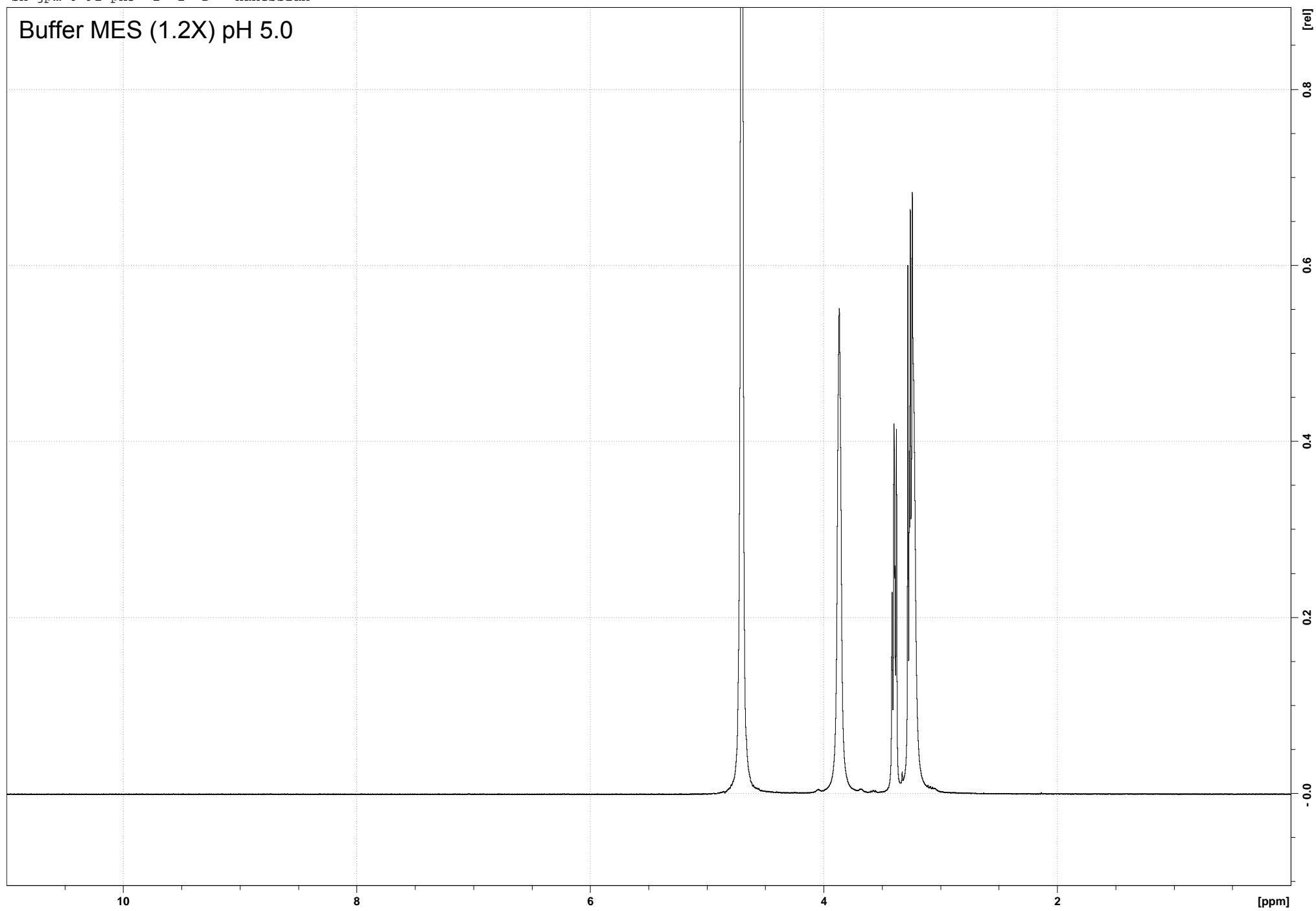
sh-jpm-6-91-ph5.5 60 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.5, t = 580 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



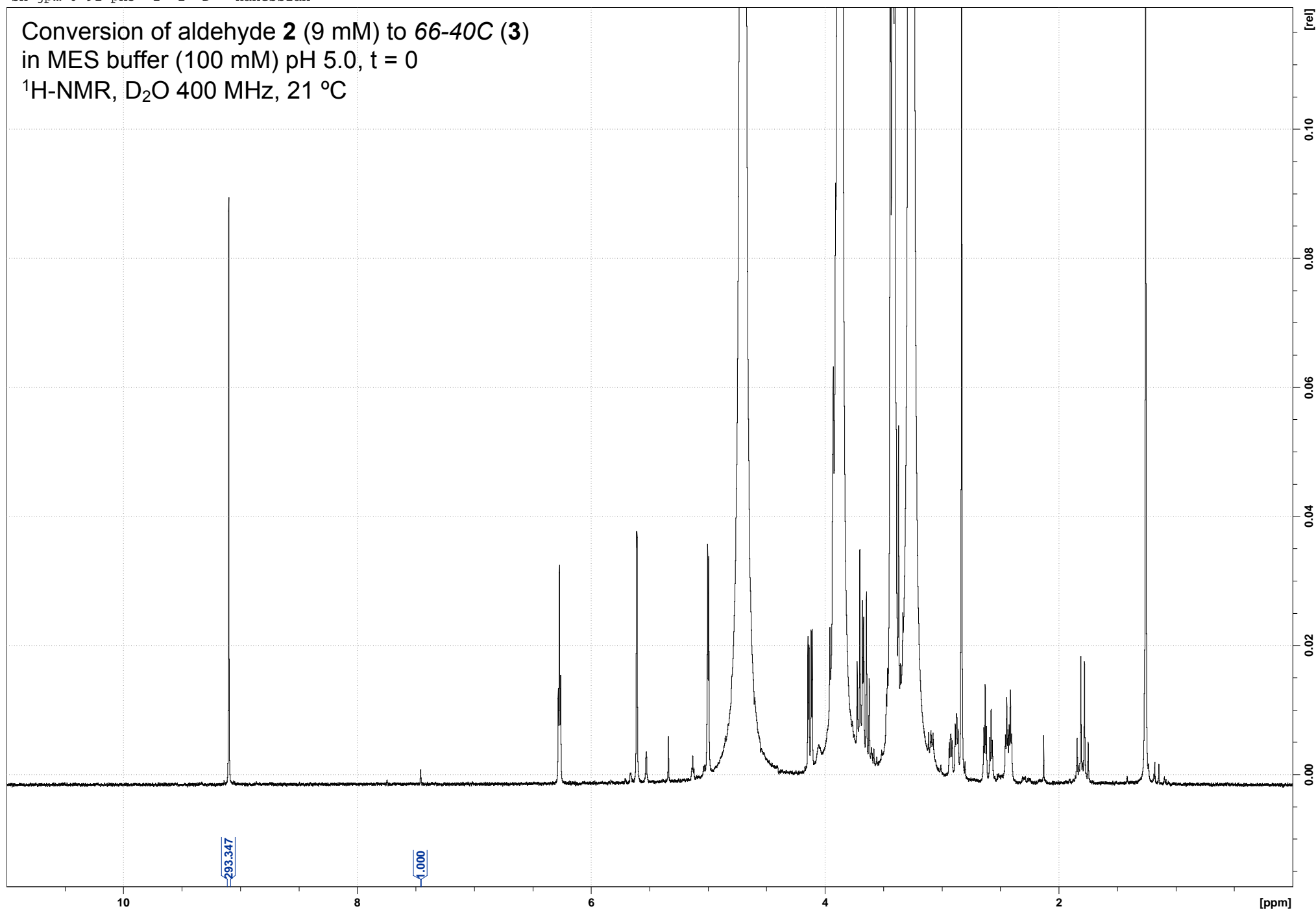
sh-jpm-6-91-ph5 1 1 D: Hanessian

Buffer MES (1.2X) pH 5.0



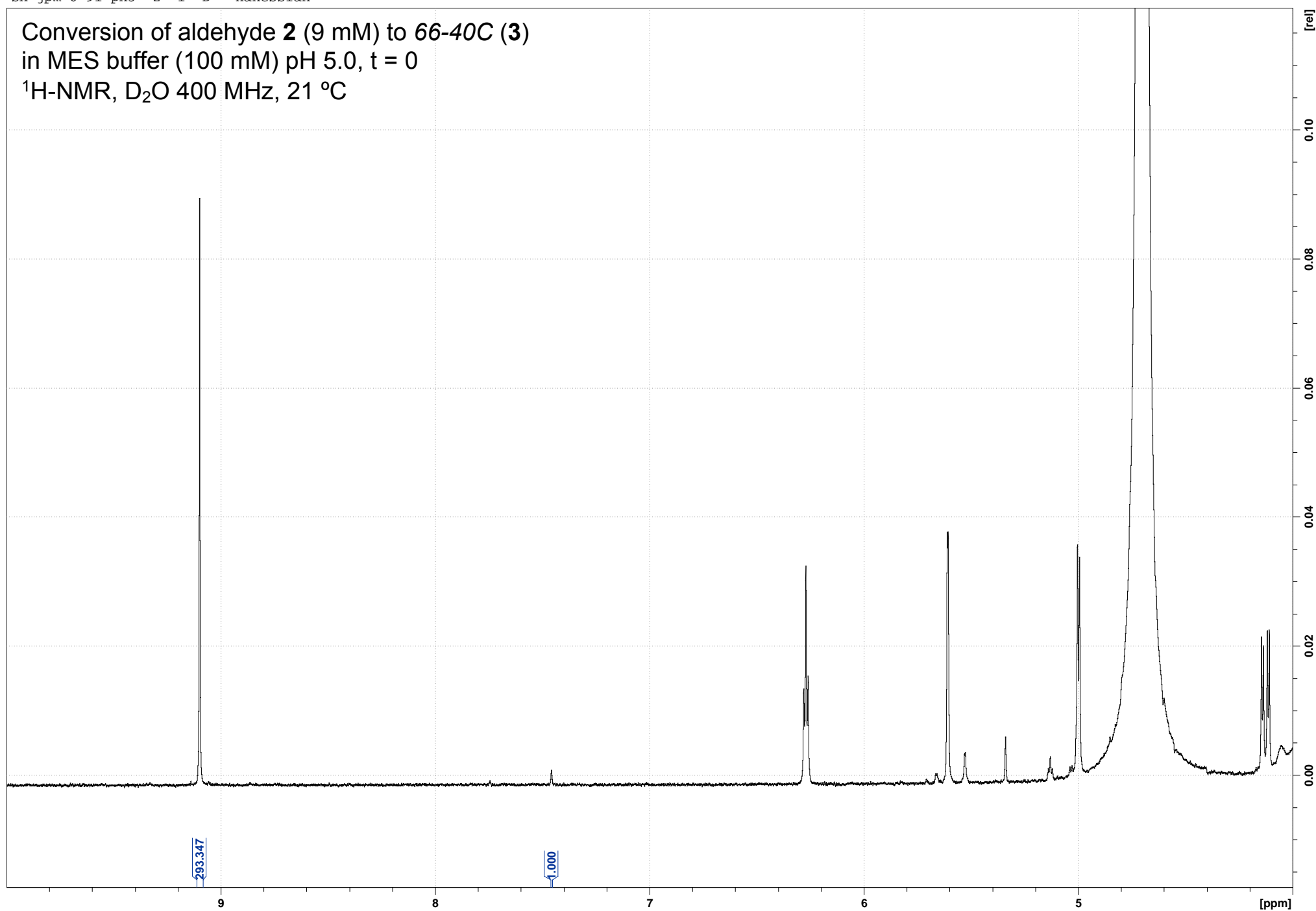
sh-jpm-6-91-ph5 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph5 2 1 D: Hanessian

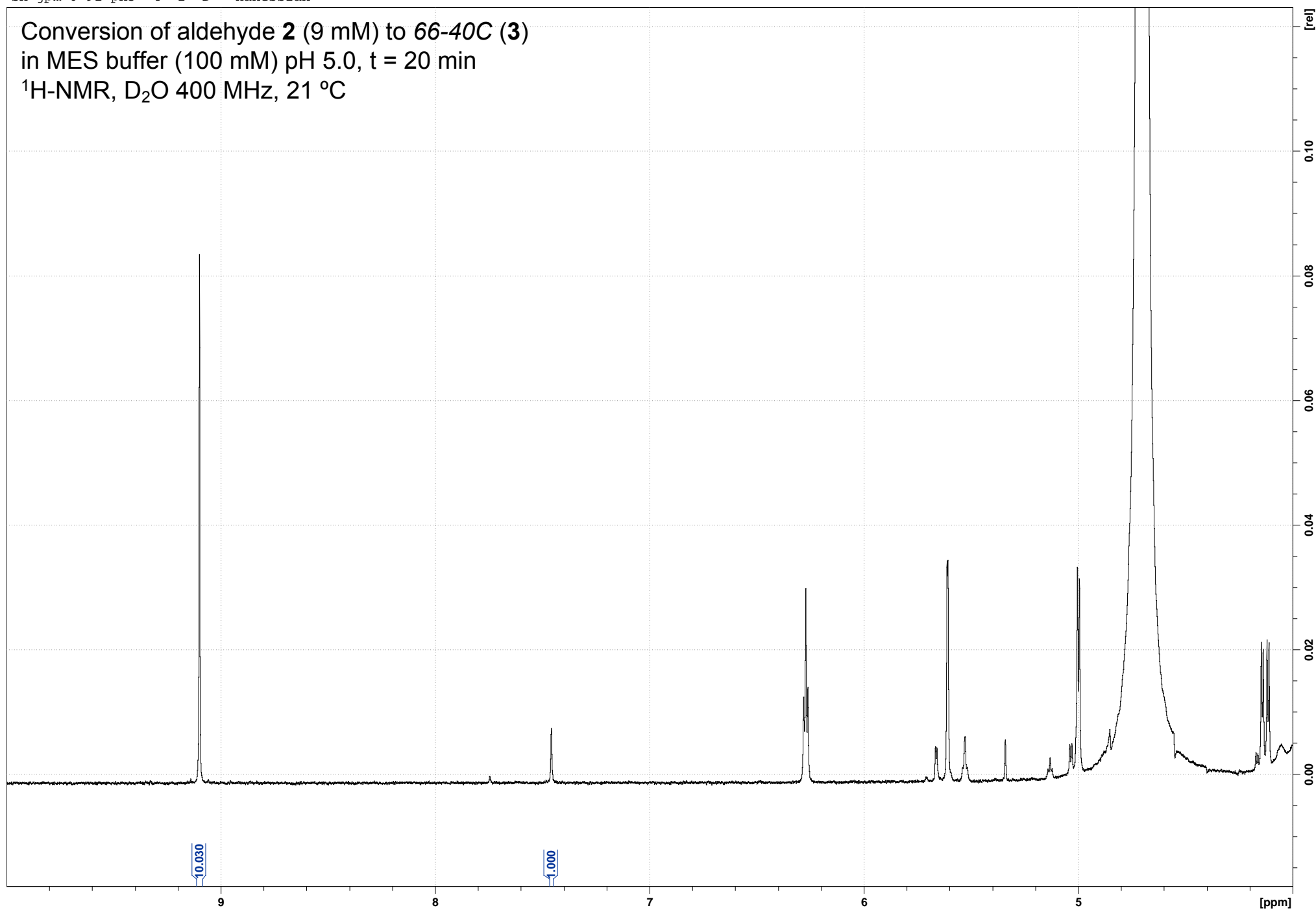
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





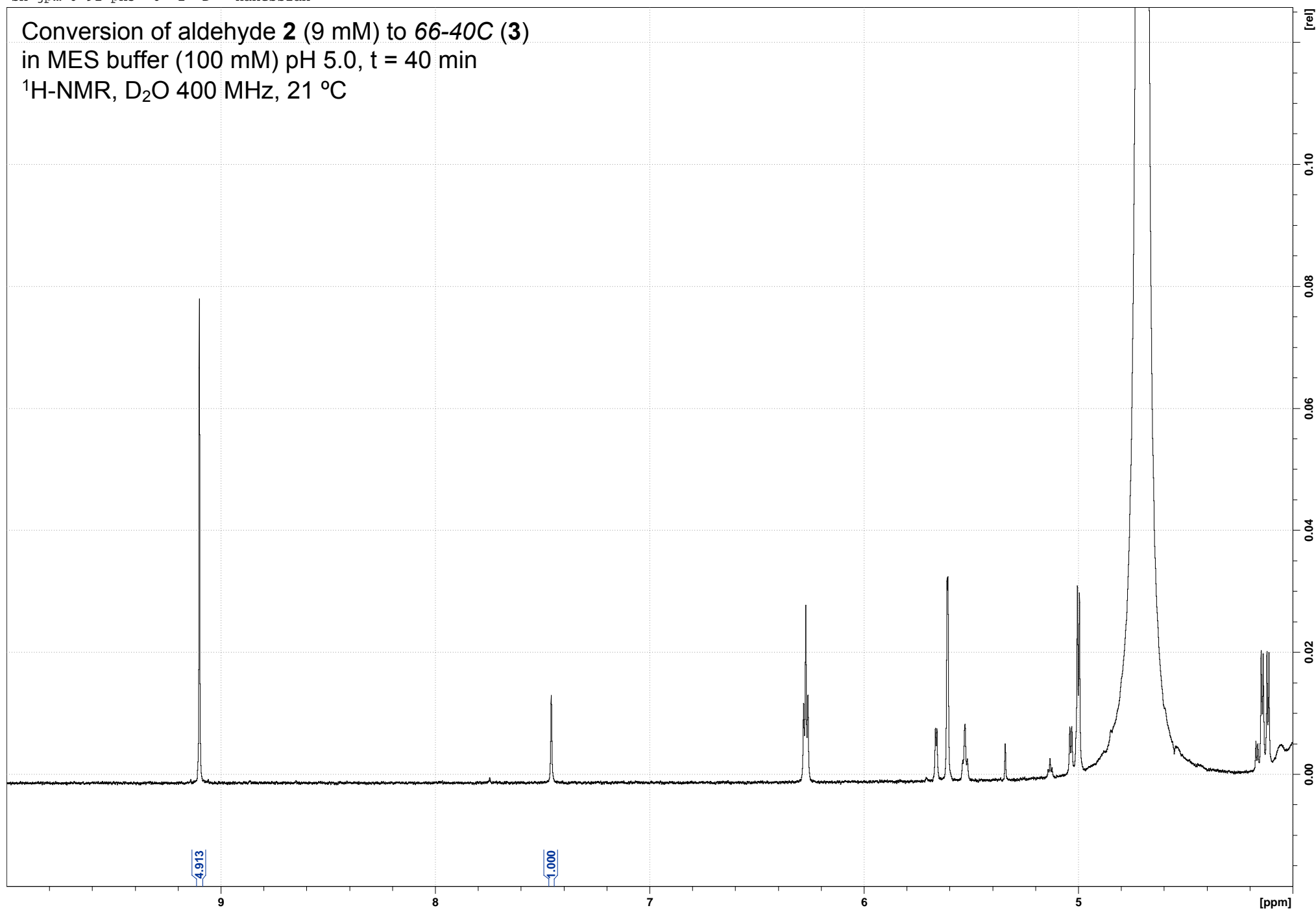
sh-jpm-6-91-ph5 4 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 20 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



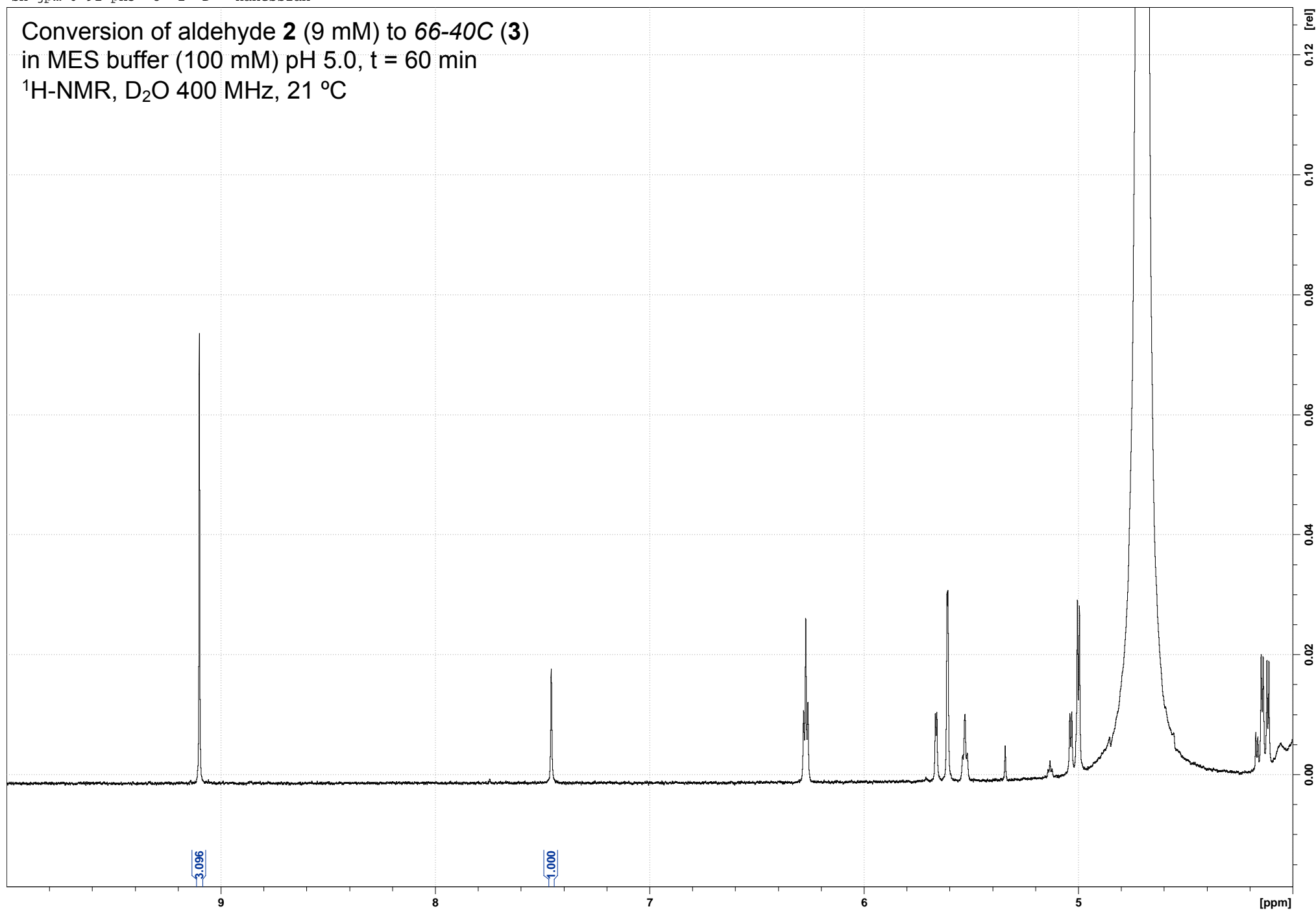
sh-jpm-6-91-ph5 6 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 40 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



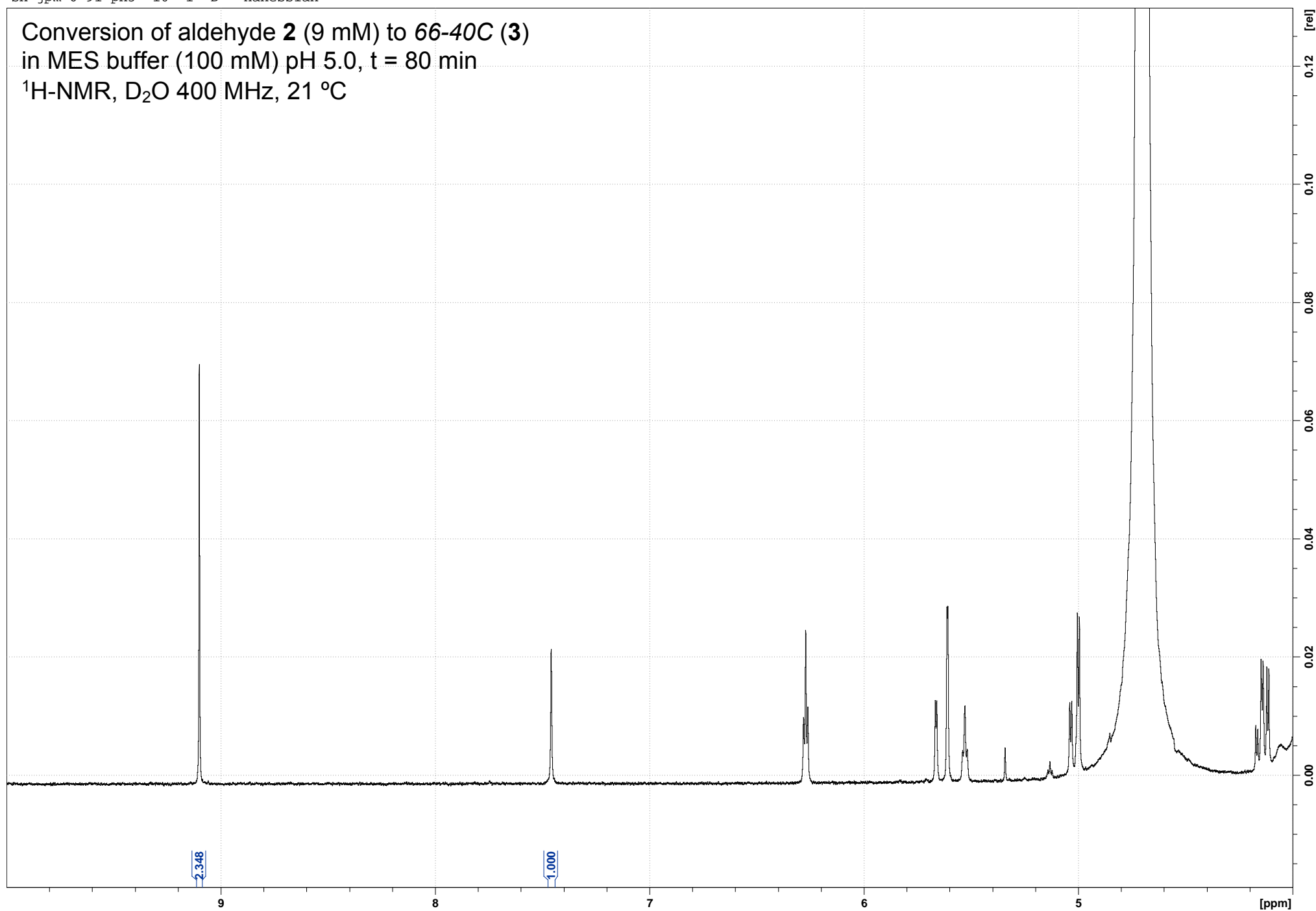
sh-jpm-6-91-ph5 8 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 60 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



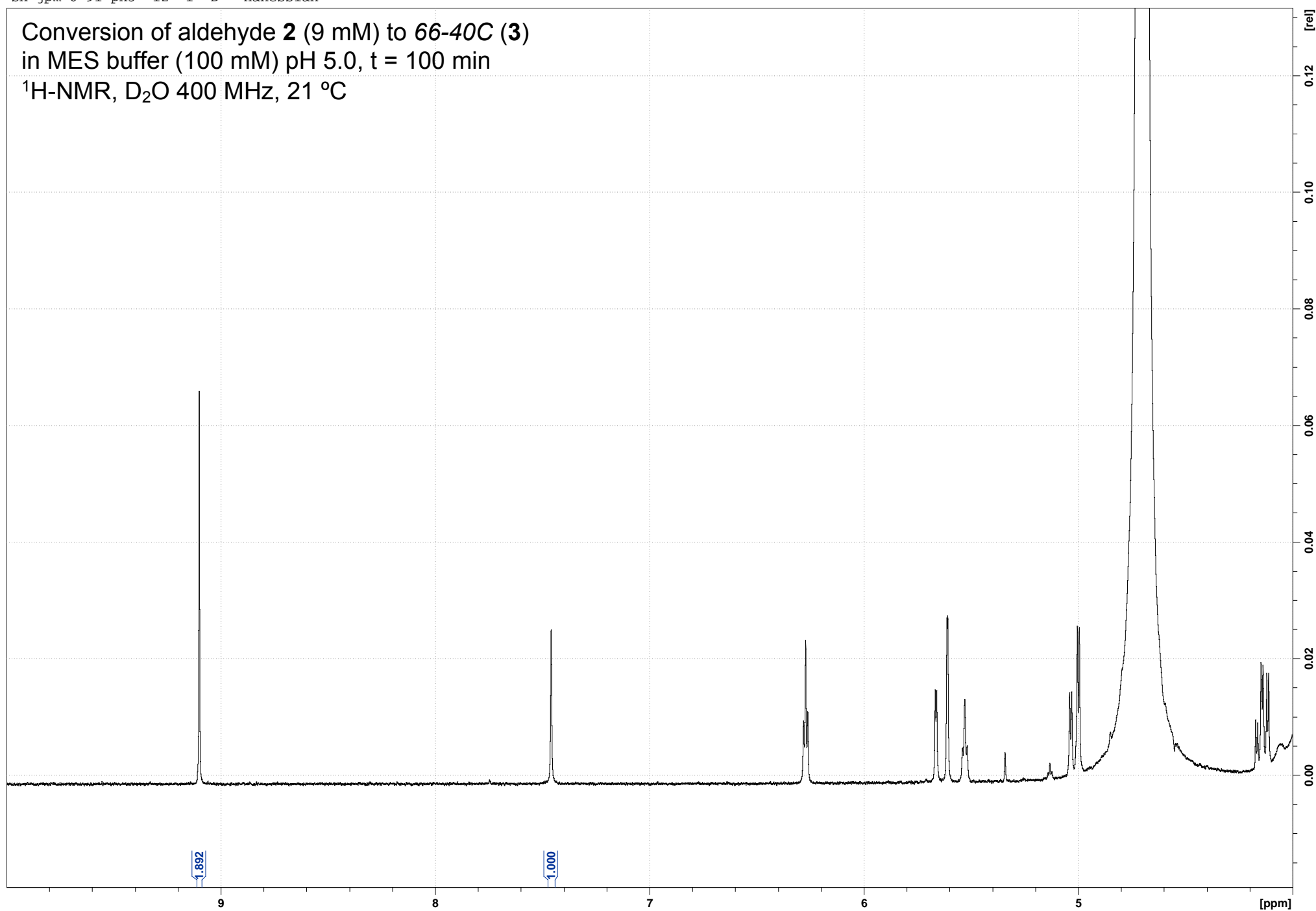
sh-jpm-6-91-ph5 10 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 80 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



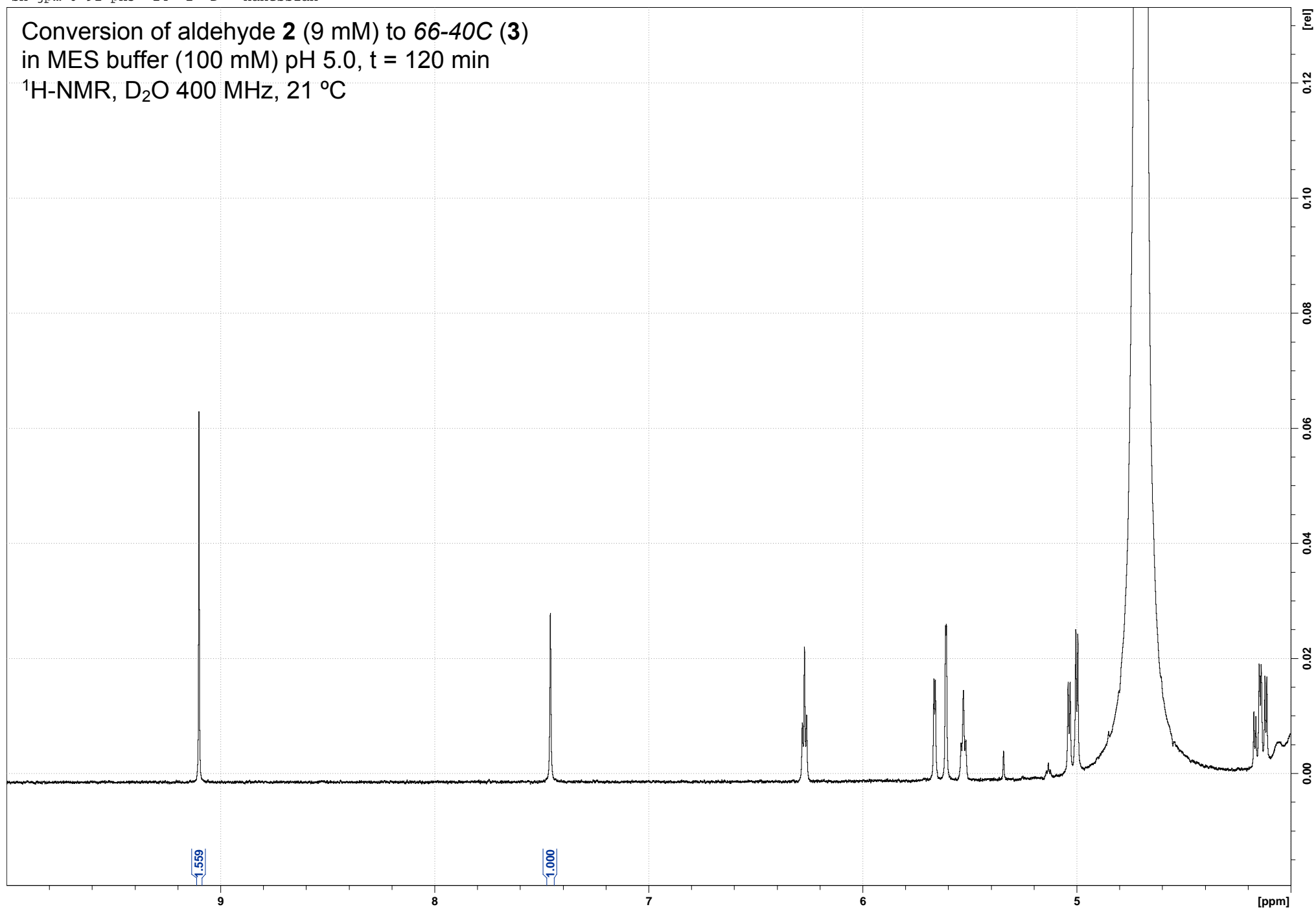
sh-jpm-6-91-ph5 12 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 100 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



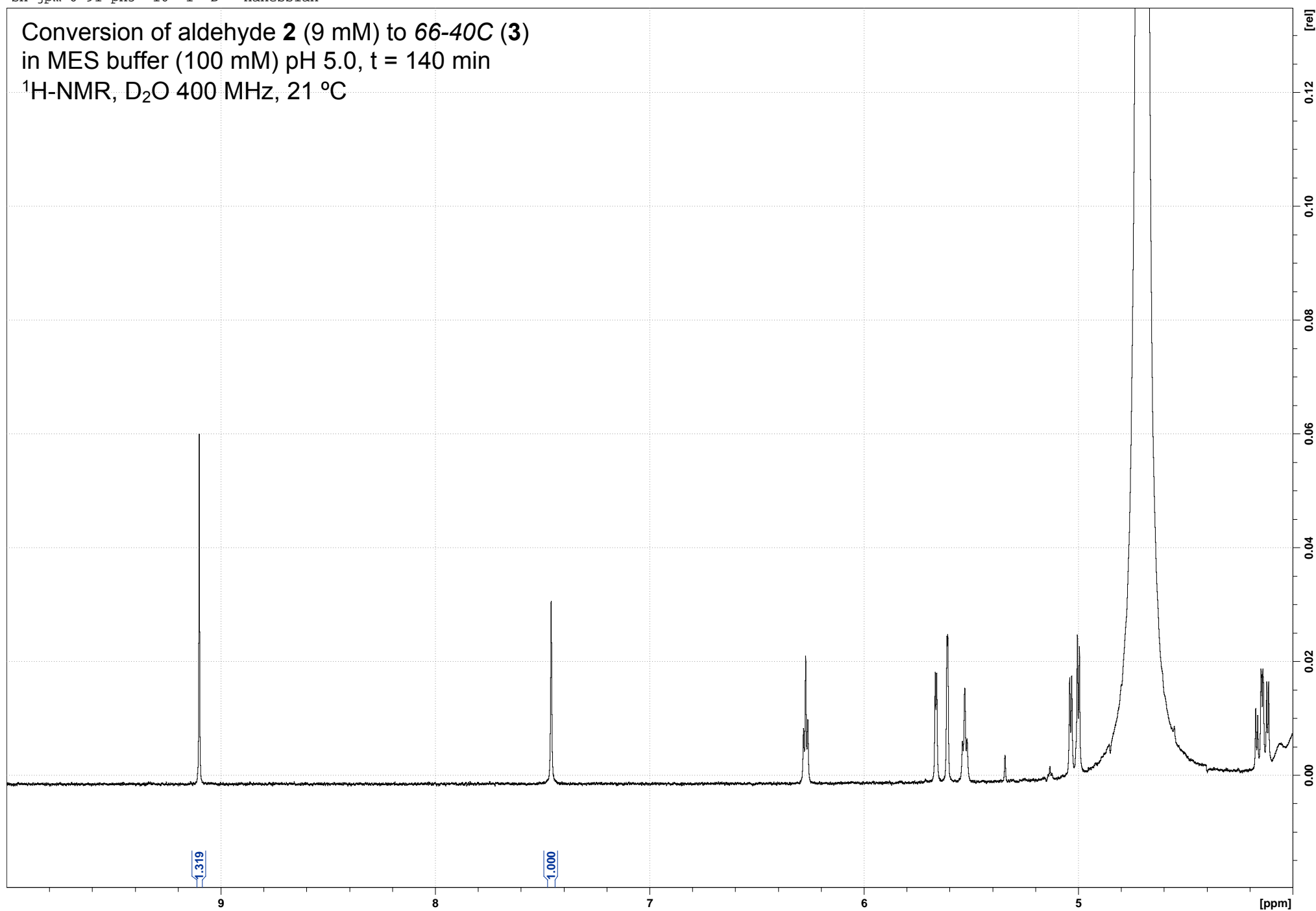
sh-jpm-6-91-ph5 14 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 120 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



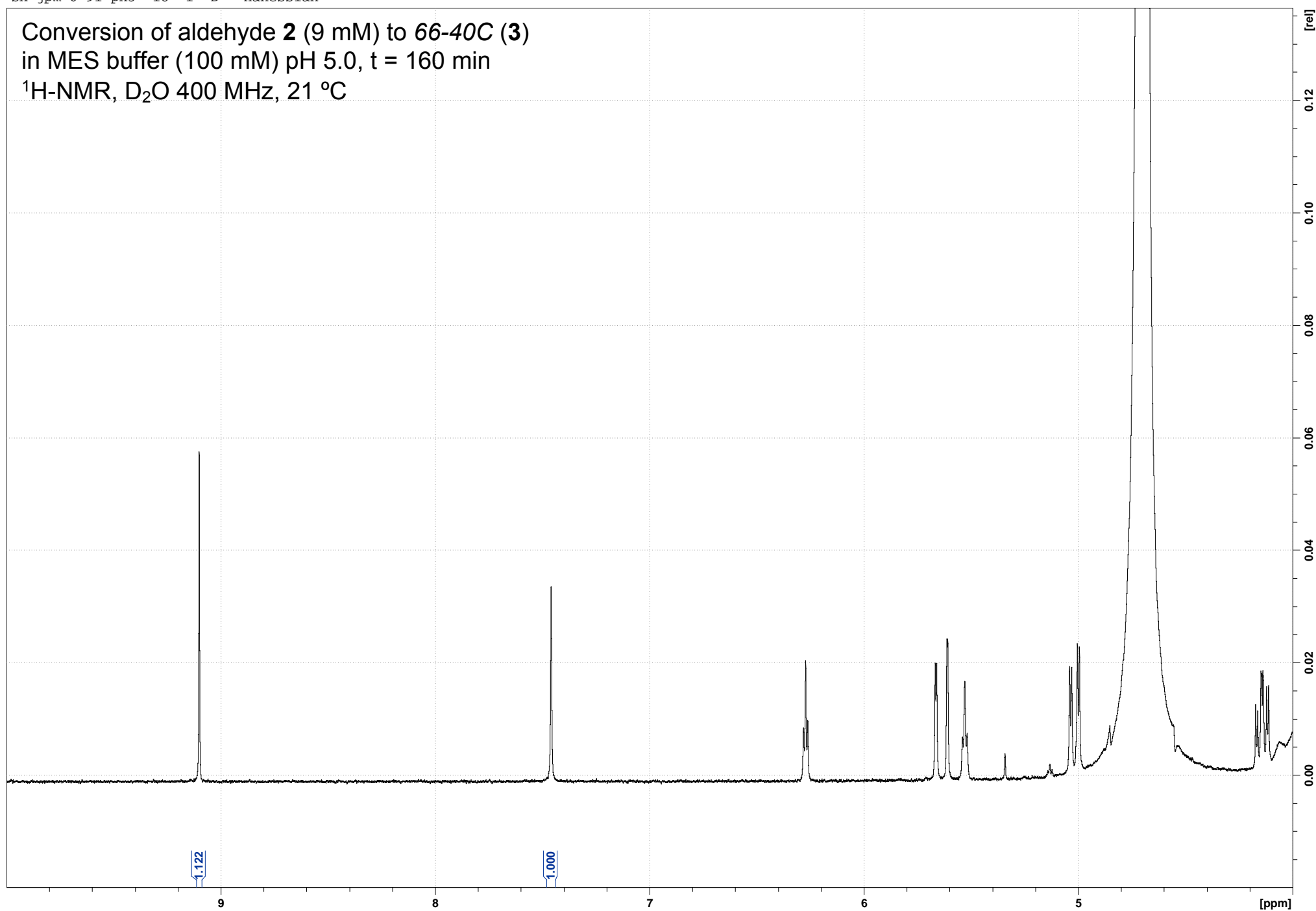
sh-jpm-6-91-ph5 16 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 140 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph5 18 1 D: Hanessian

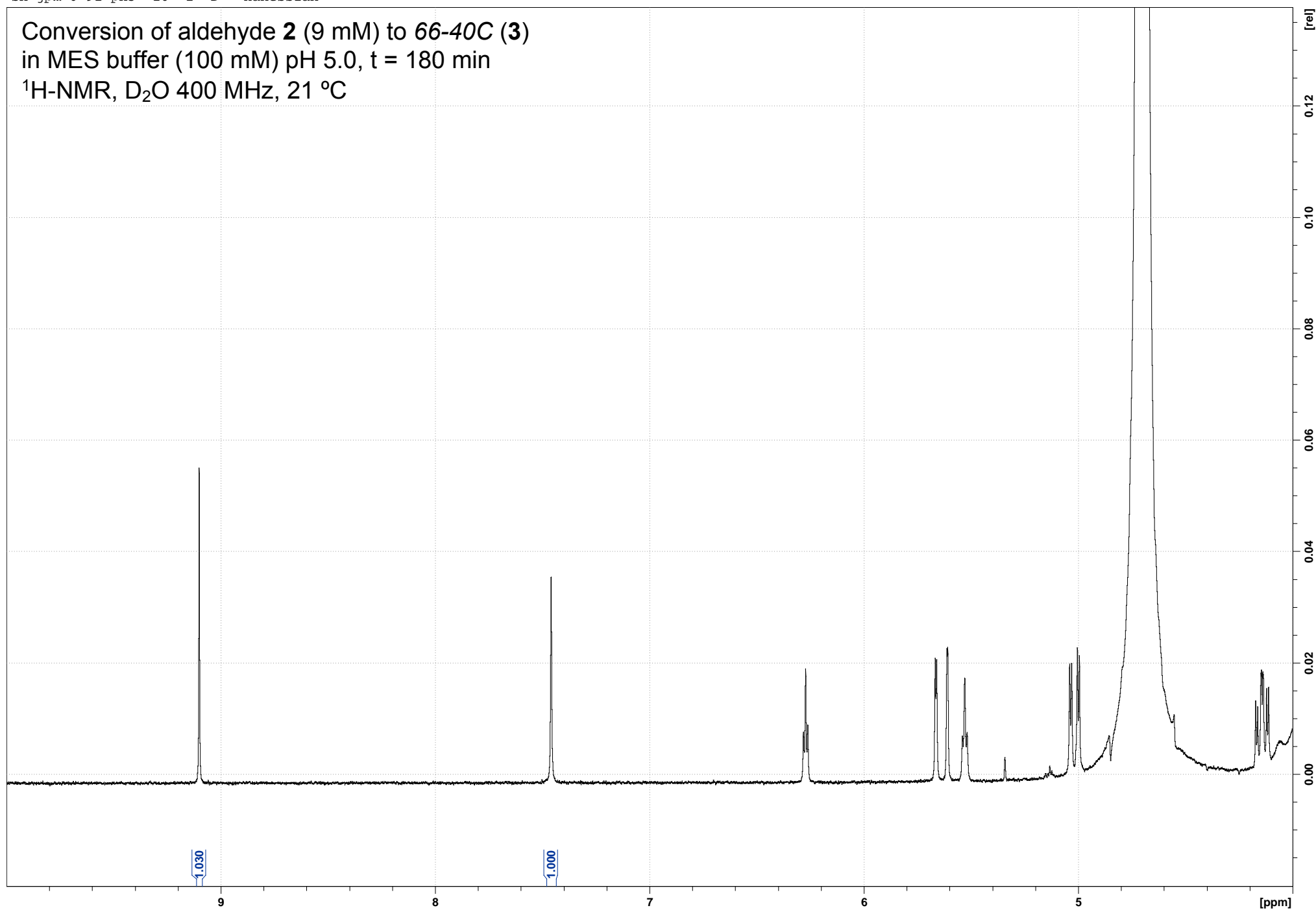
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 160 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





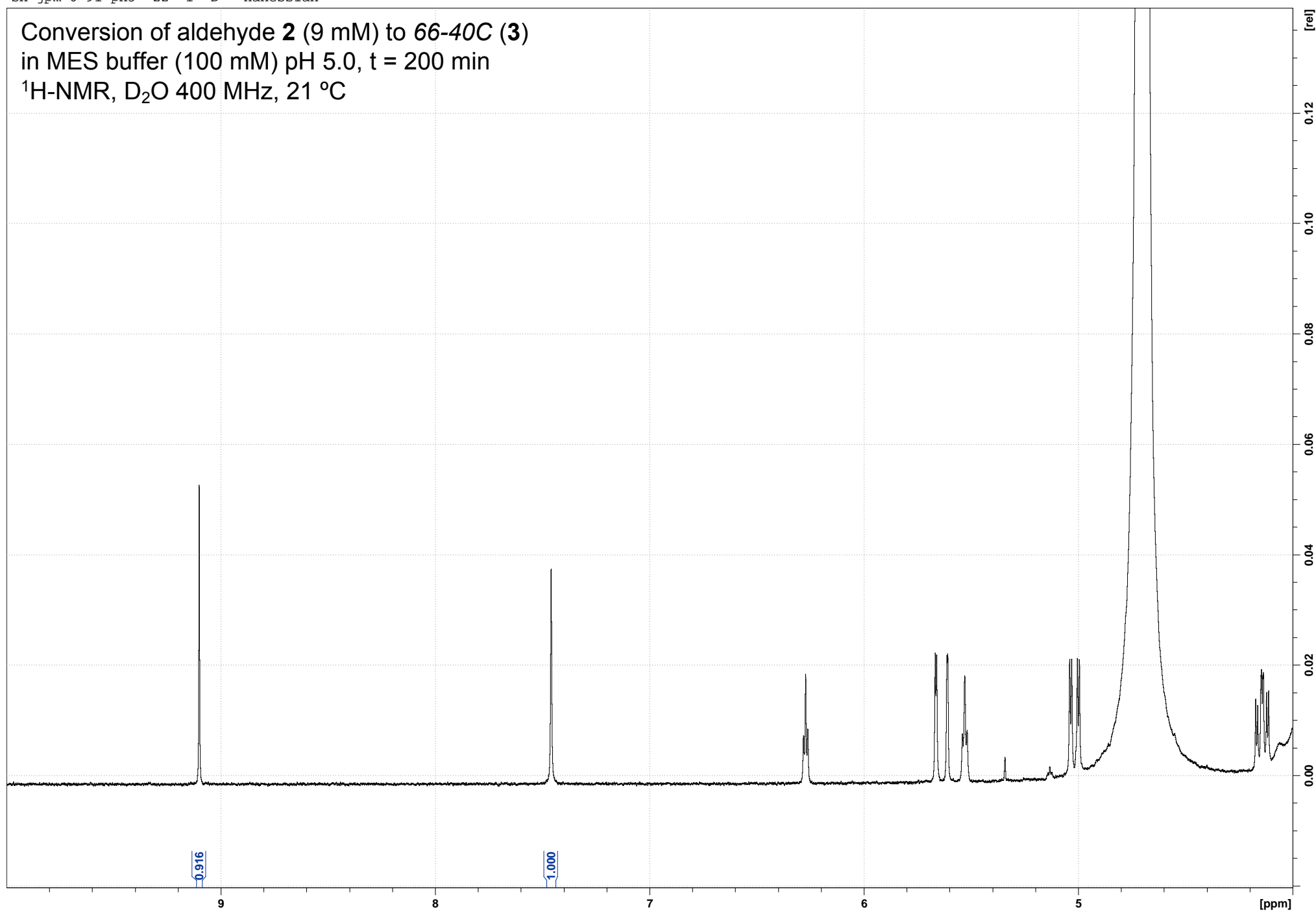
sh-jpm-6-91-ph5 20 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 180 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



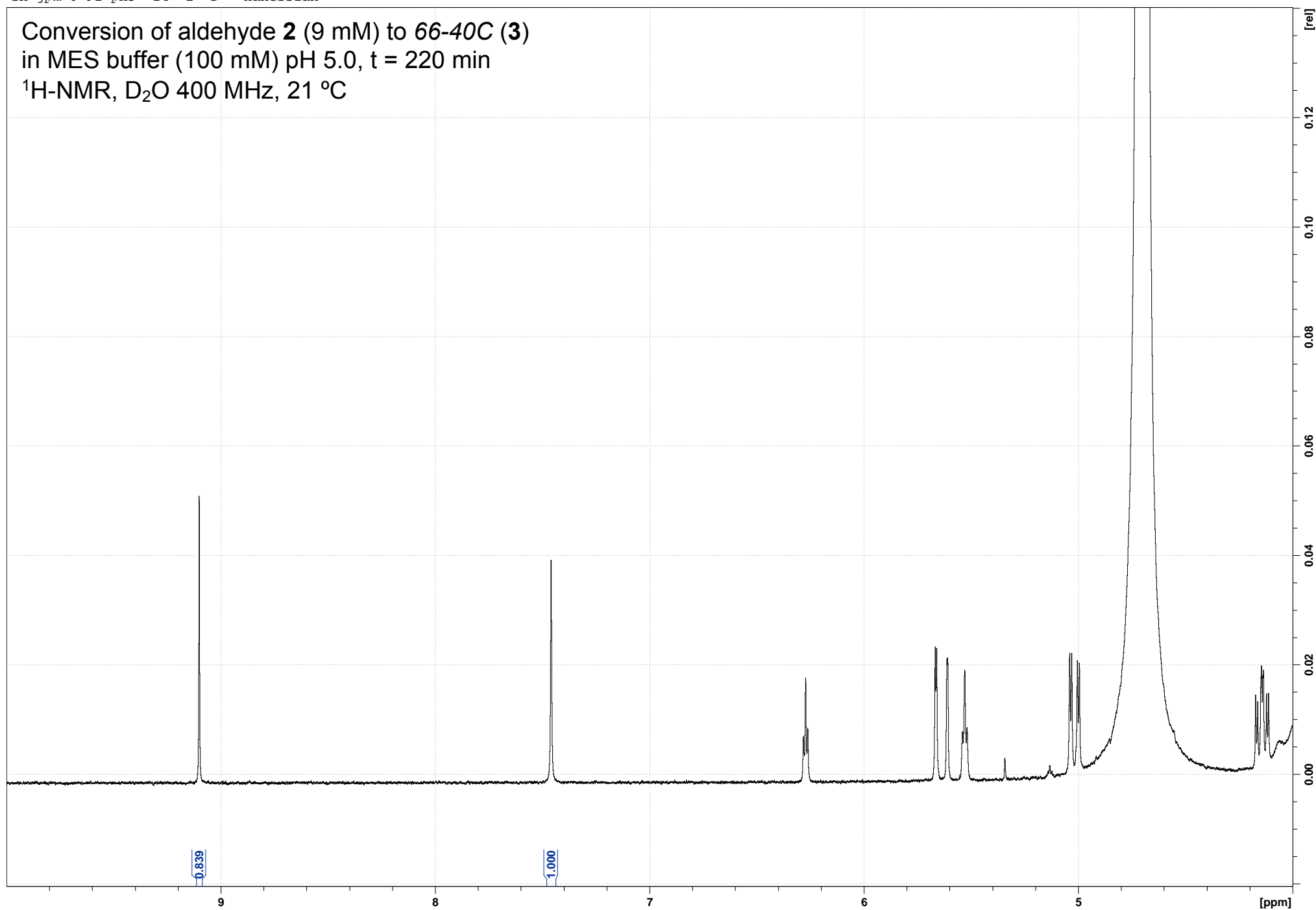
sh-jpm-6-91-ph5 22 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 200 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



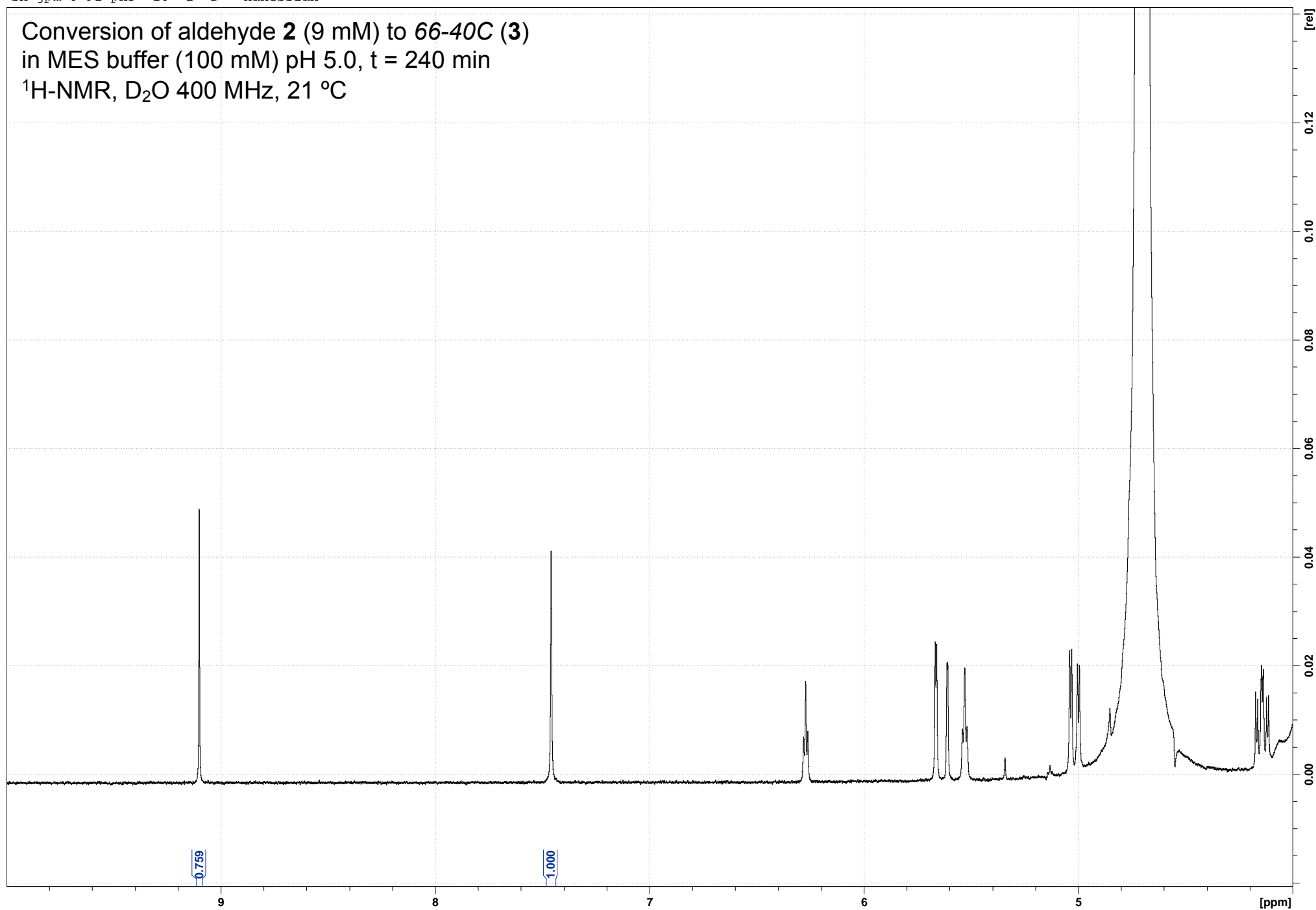
sh-jpm-6-91-ph5 24 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 220 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



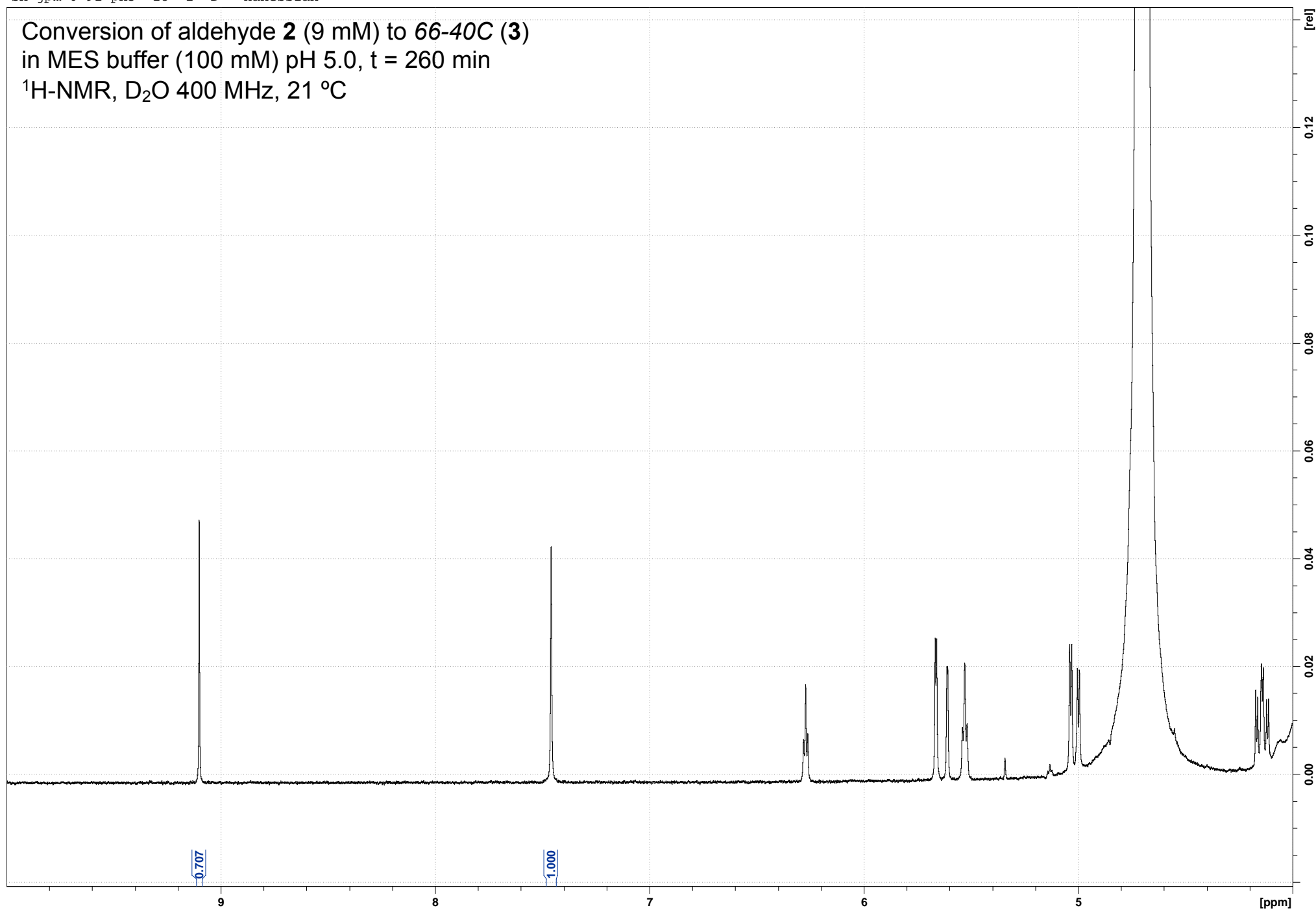
sh-jpm-6-91-ph5 26 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 240 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



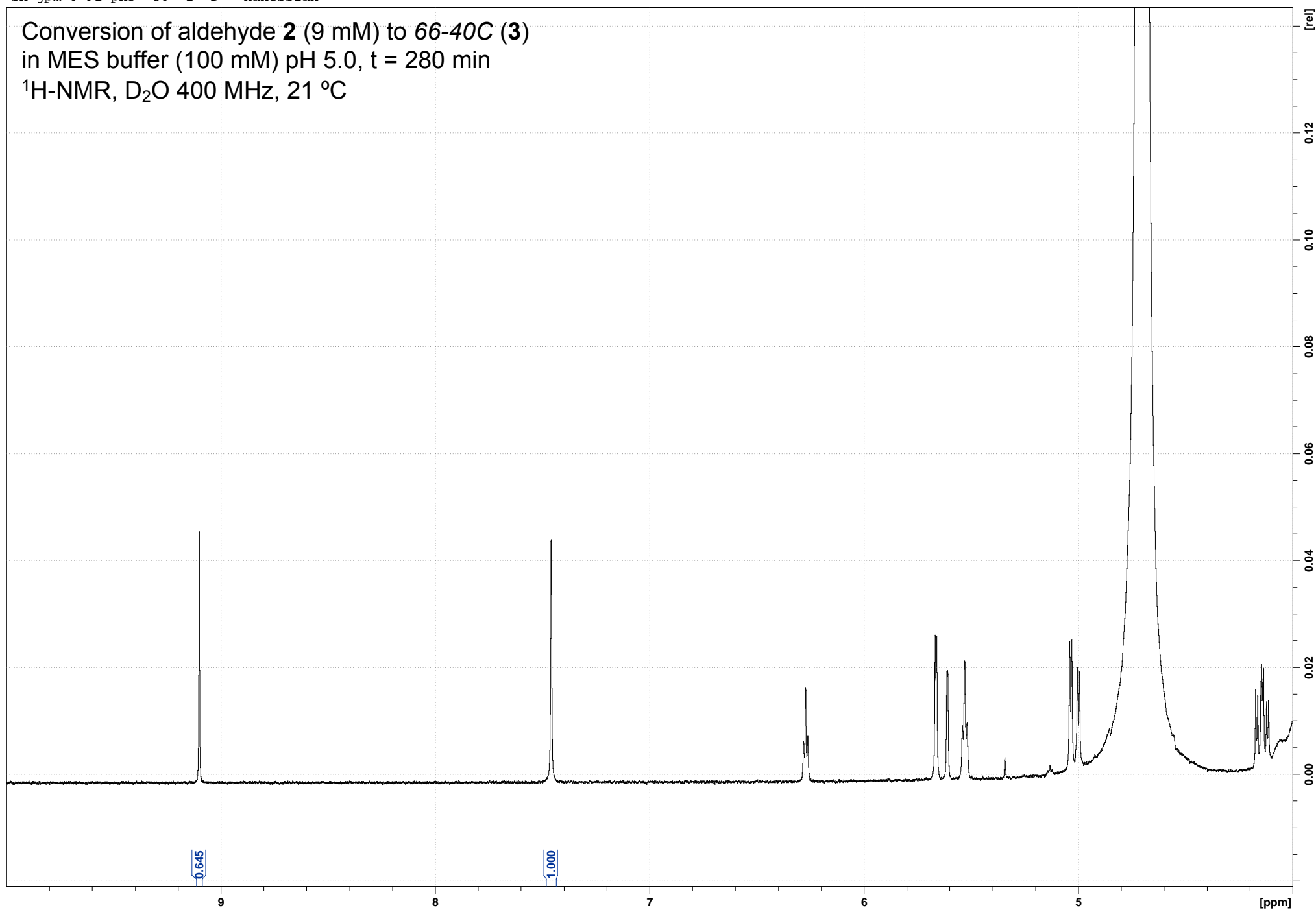
sh-jpm-6-91-ph5 28 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 260 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



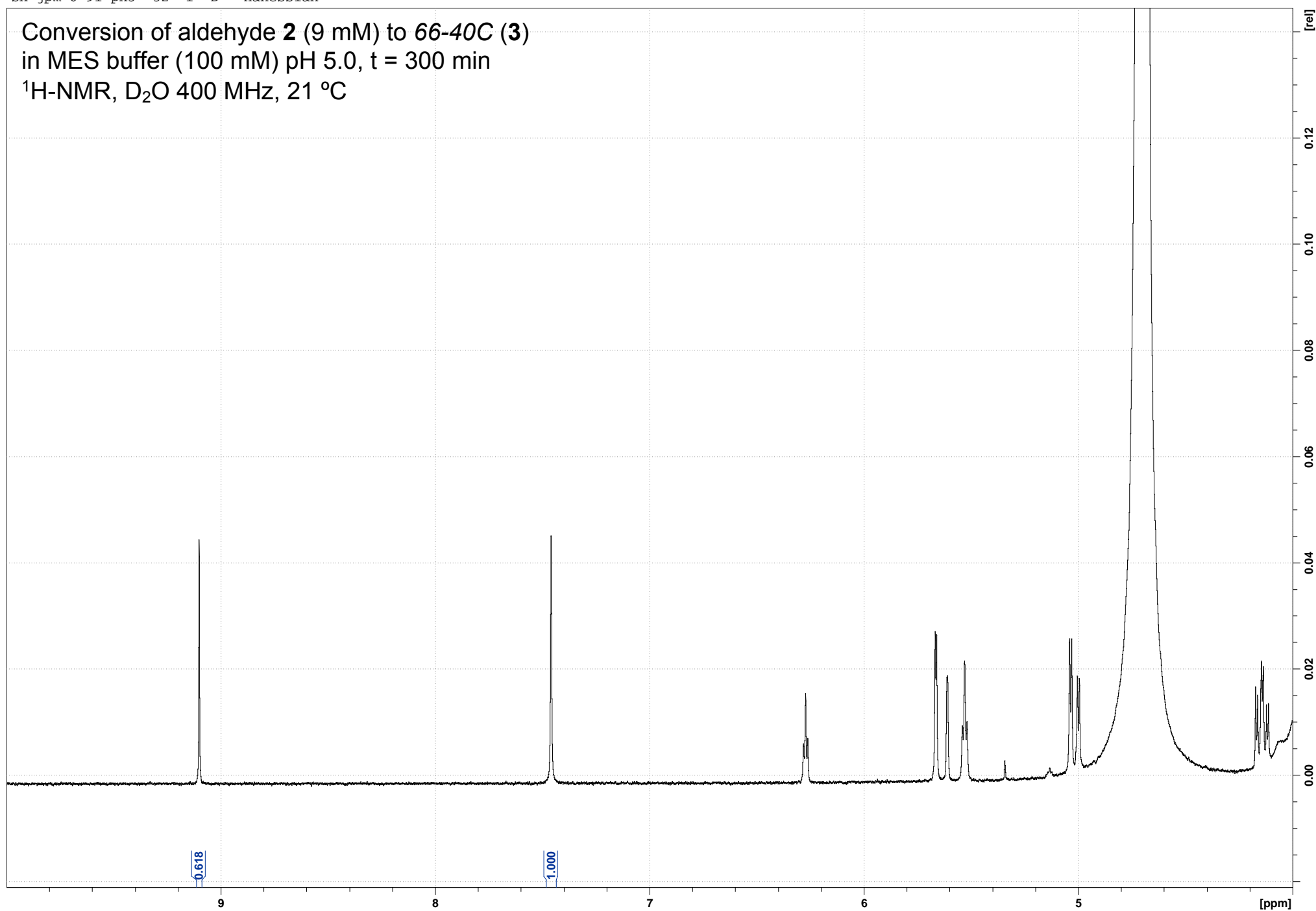
sh-jpm-6-91-ph5 30 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 280 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



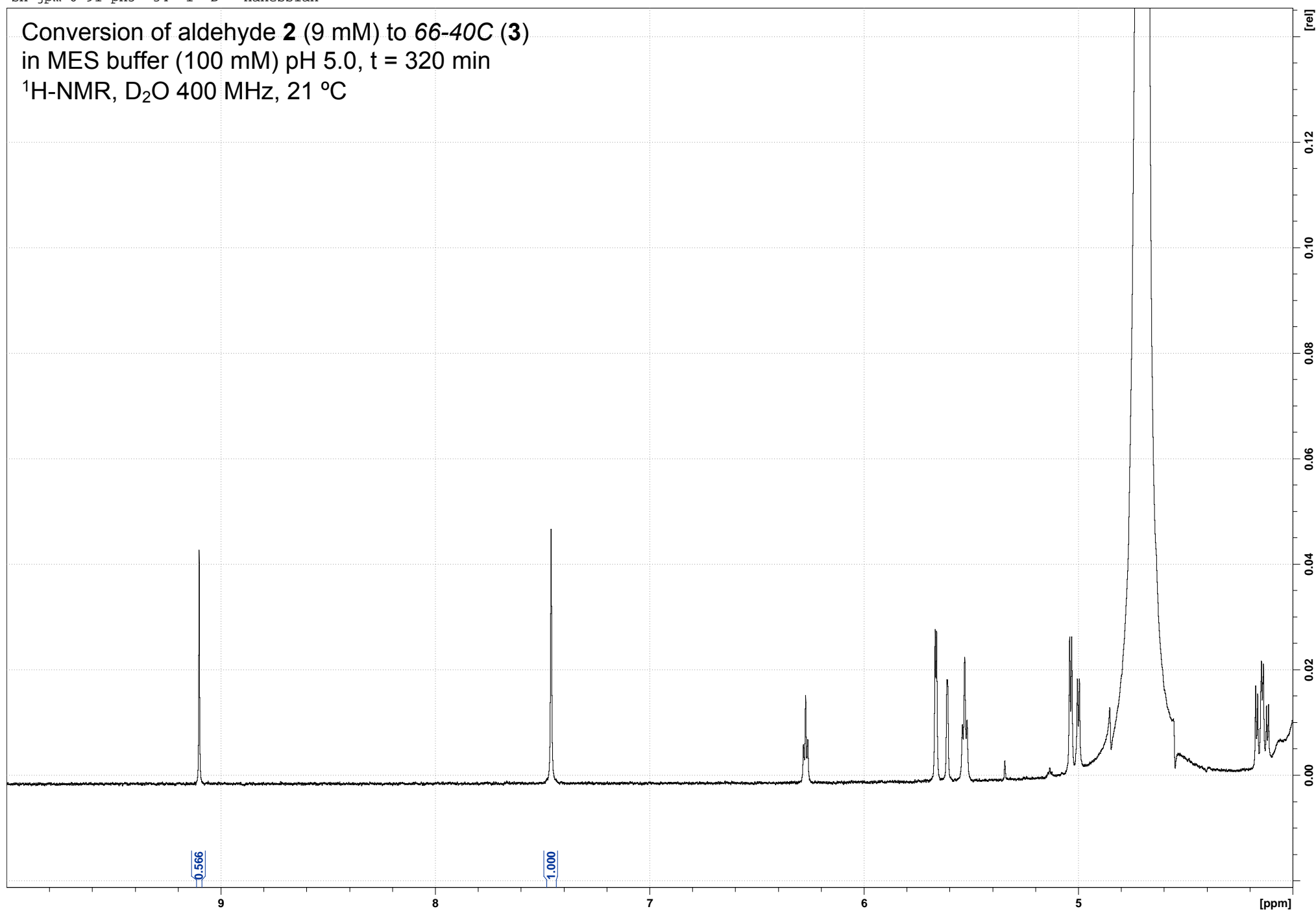
sh-jpm-6-91-ph5 32 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 300 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph5 34 1 D: Hanessian

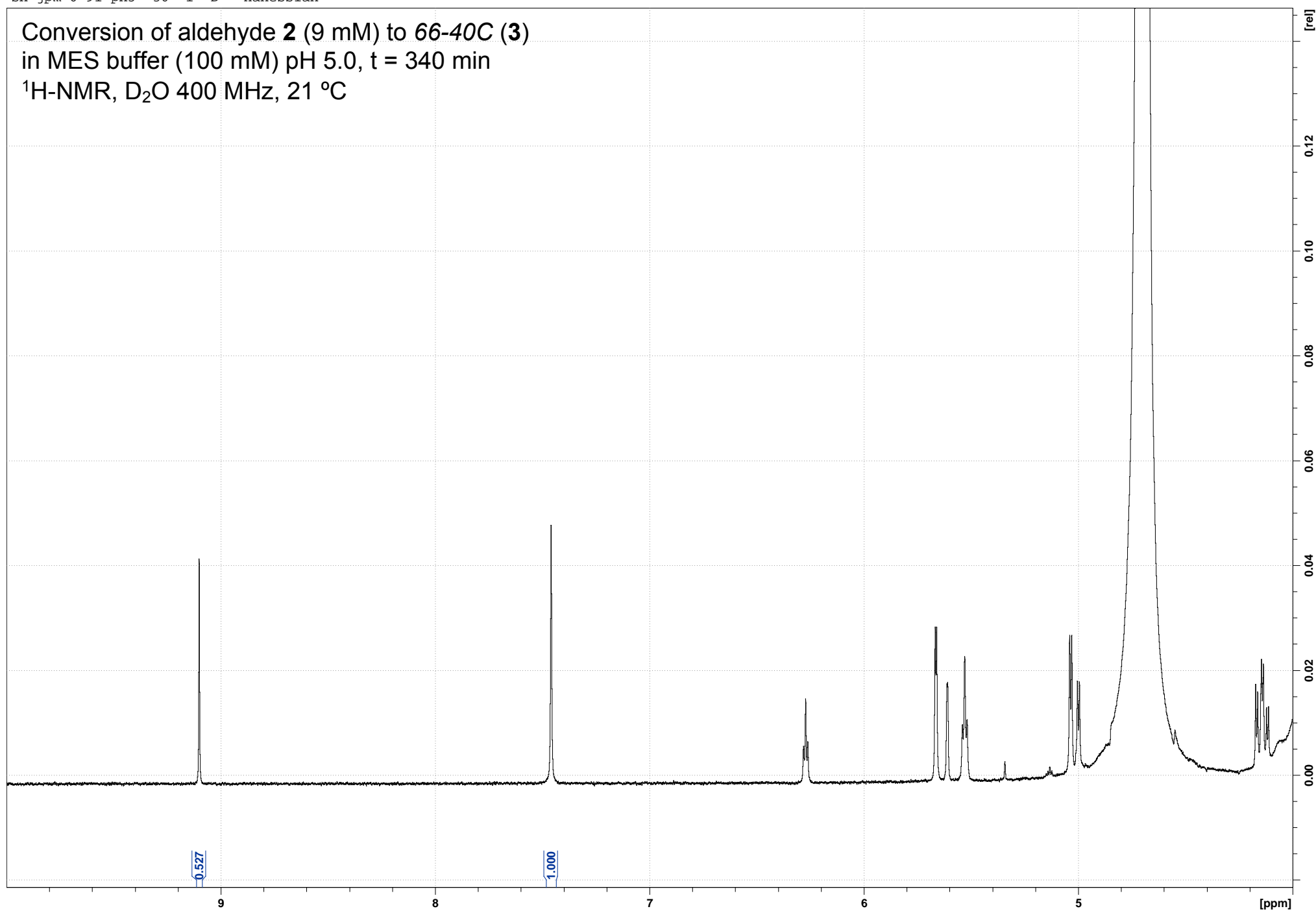
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 320 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





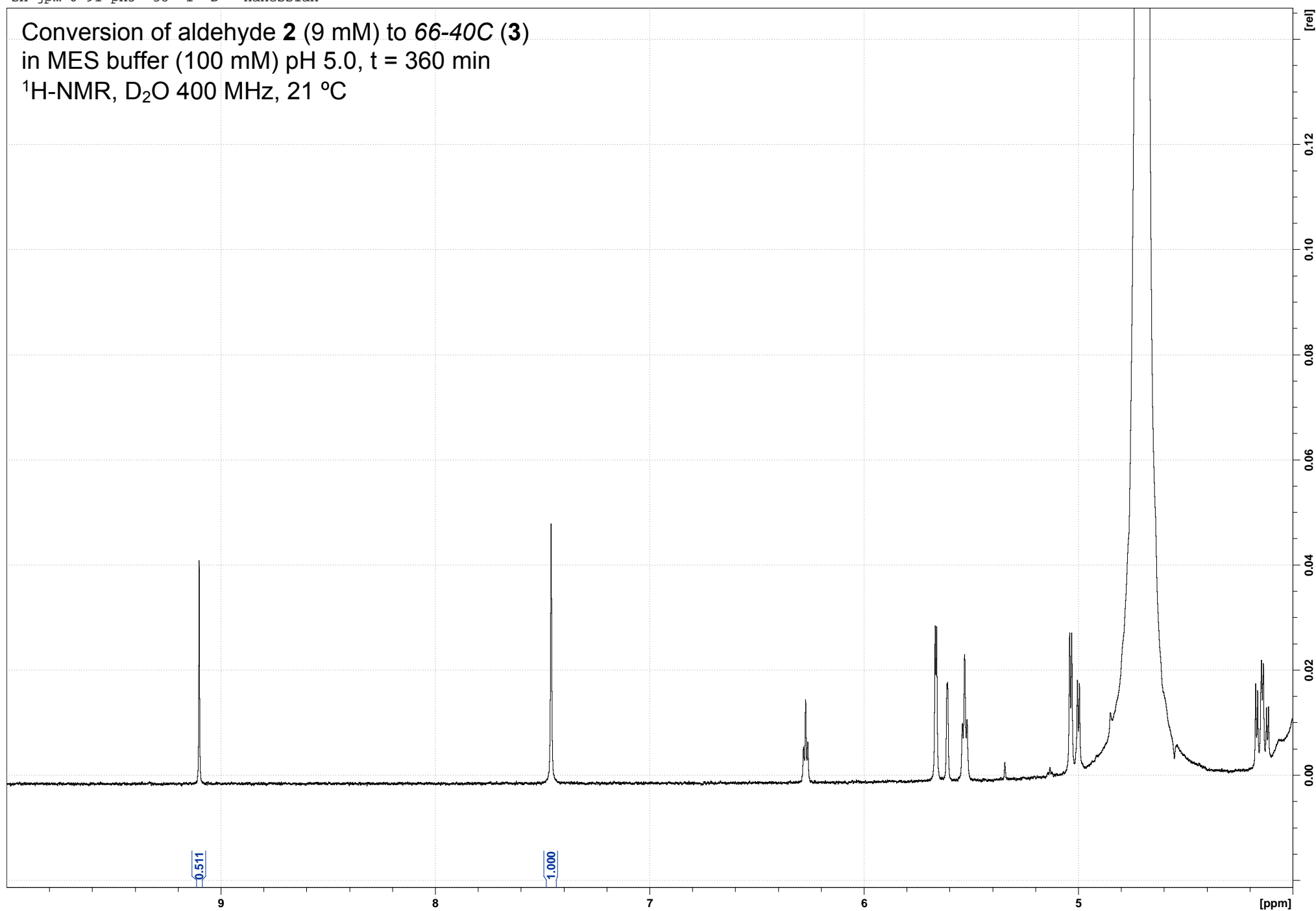
sh-jpm-6-91-ph5 36 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 340 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



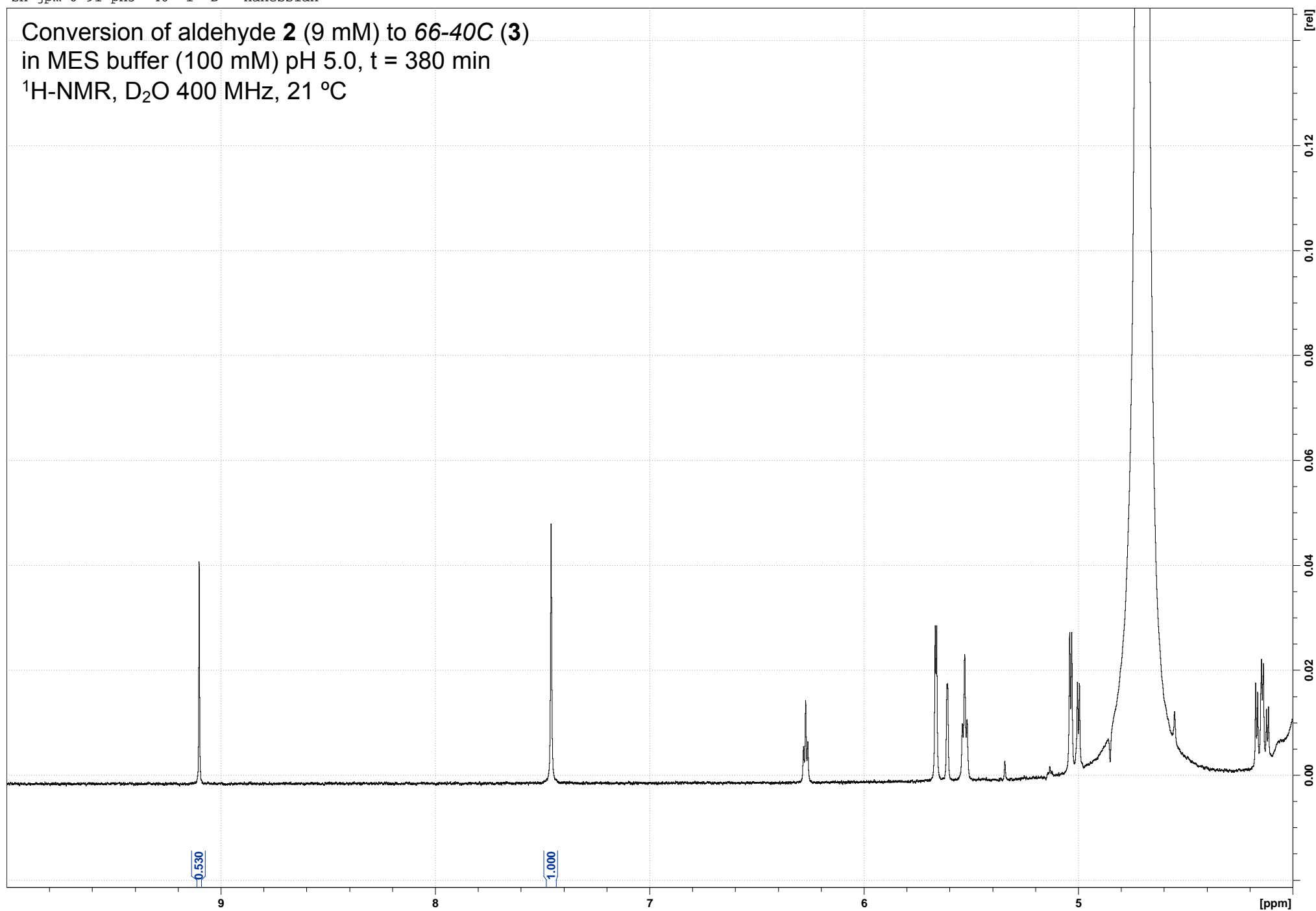
sh-jpm-6-91-ph5 38 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 360 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



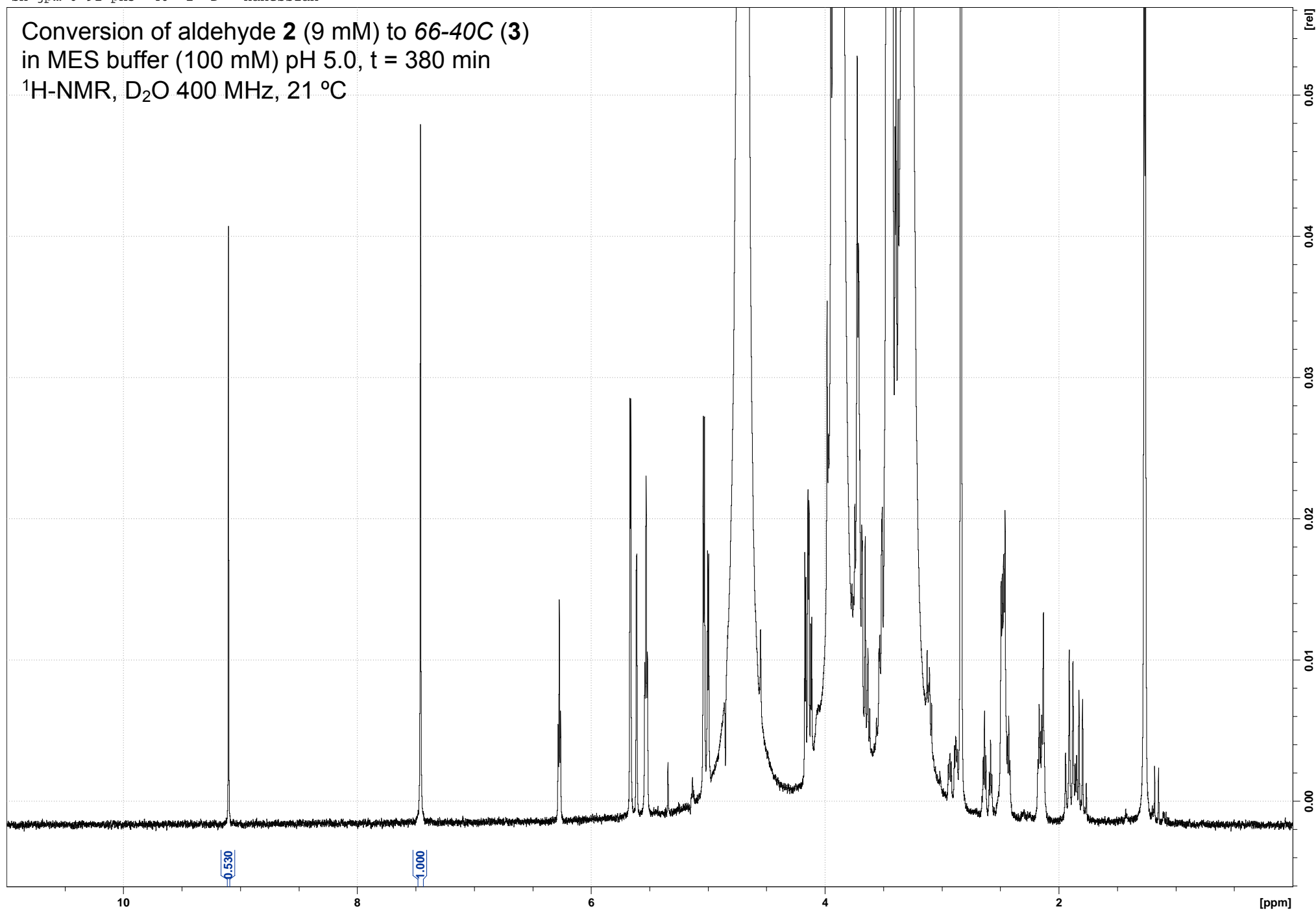
sh-jpm-6-91-ph5 40 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 380 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



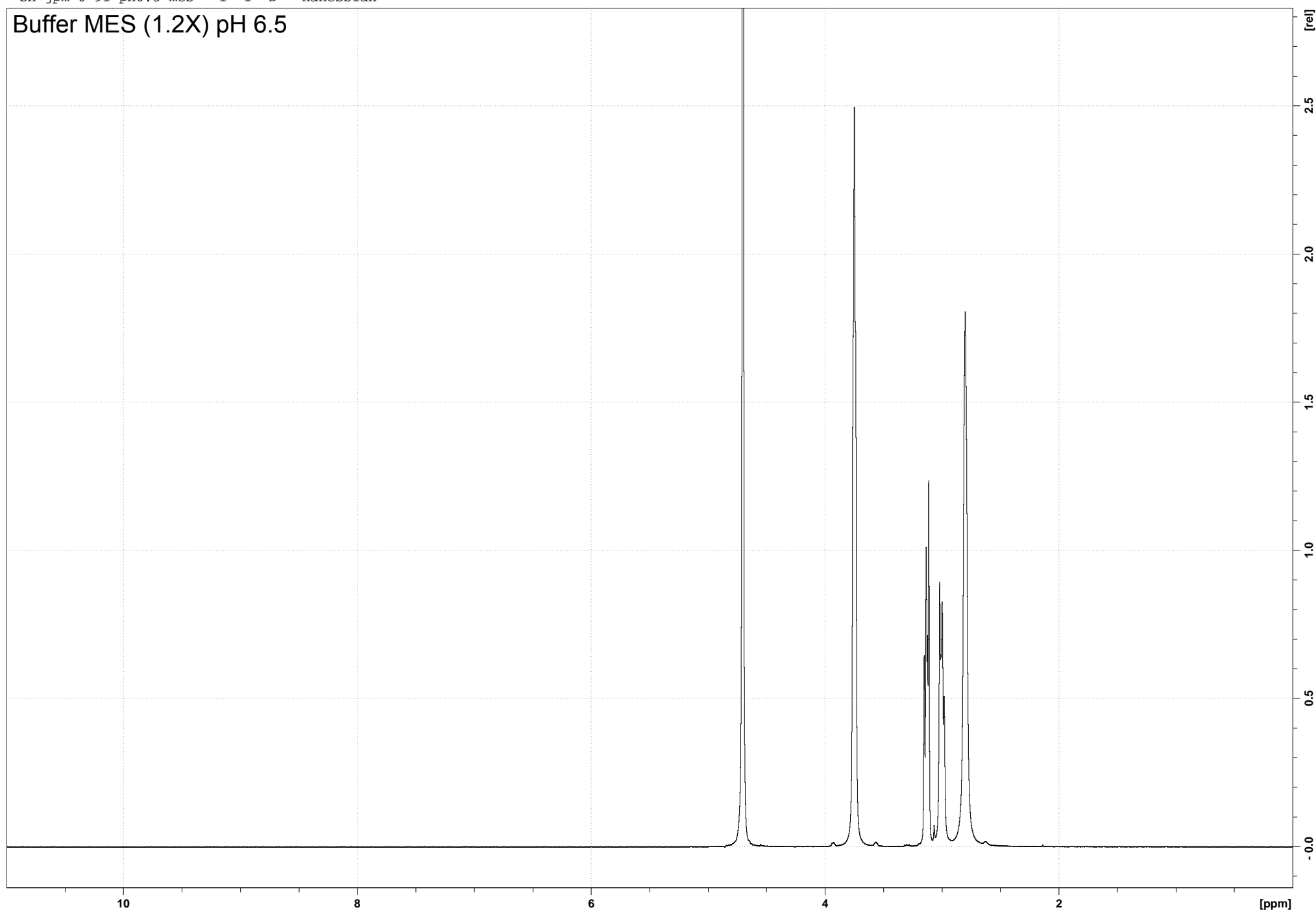
sh-jpm-6-91-ph5 40 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 5.0, t = 380 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



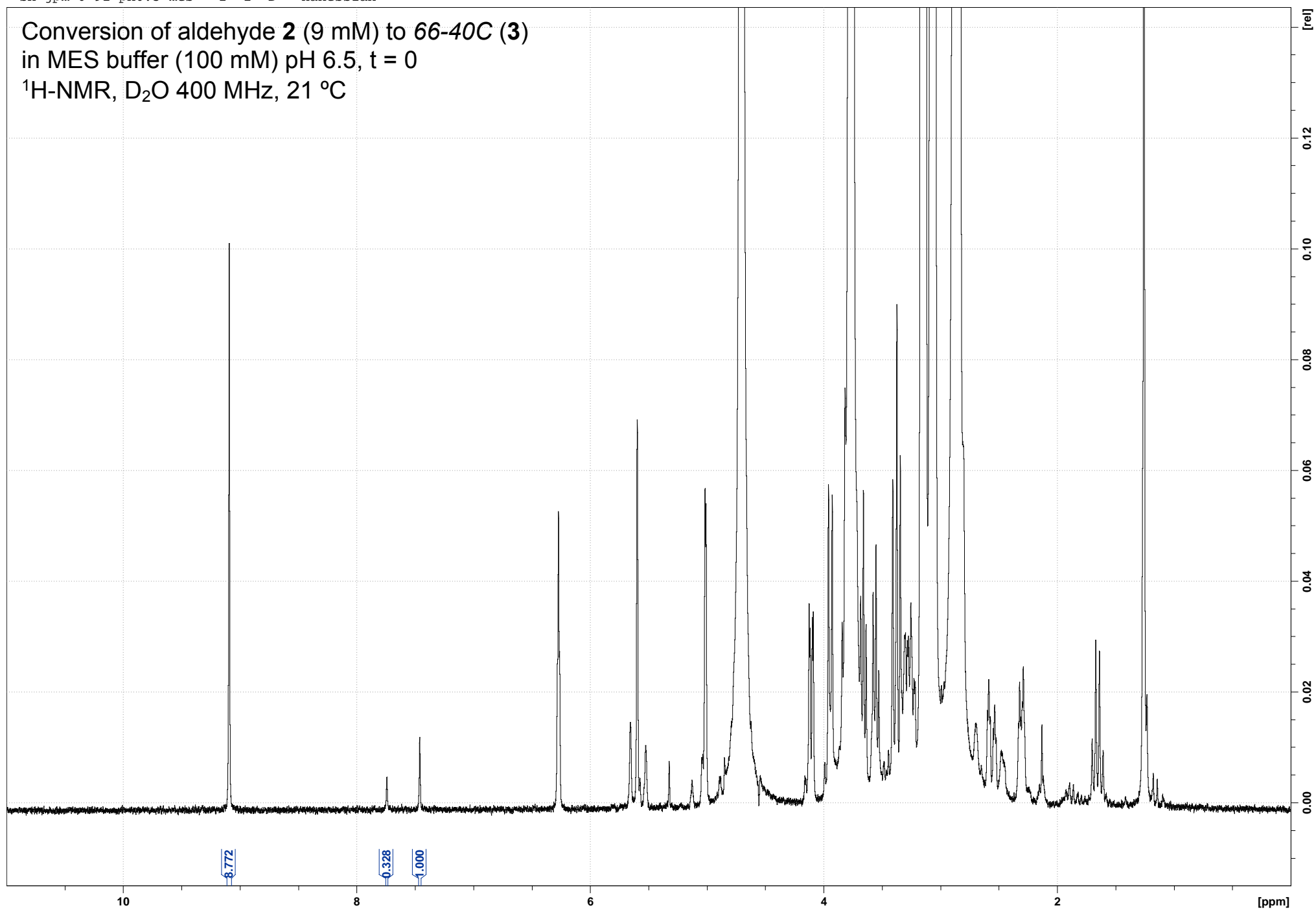
"sh-jpm-6-91-ph6.5 mes" 1 1 D: Hanessian

Buffer MES (1.2X) pH 6.5



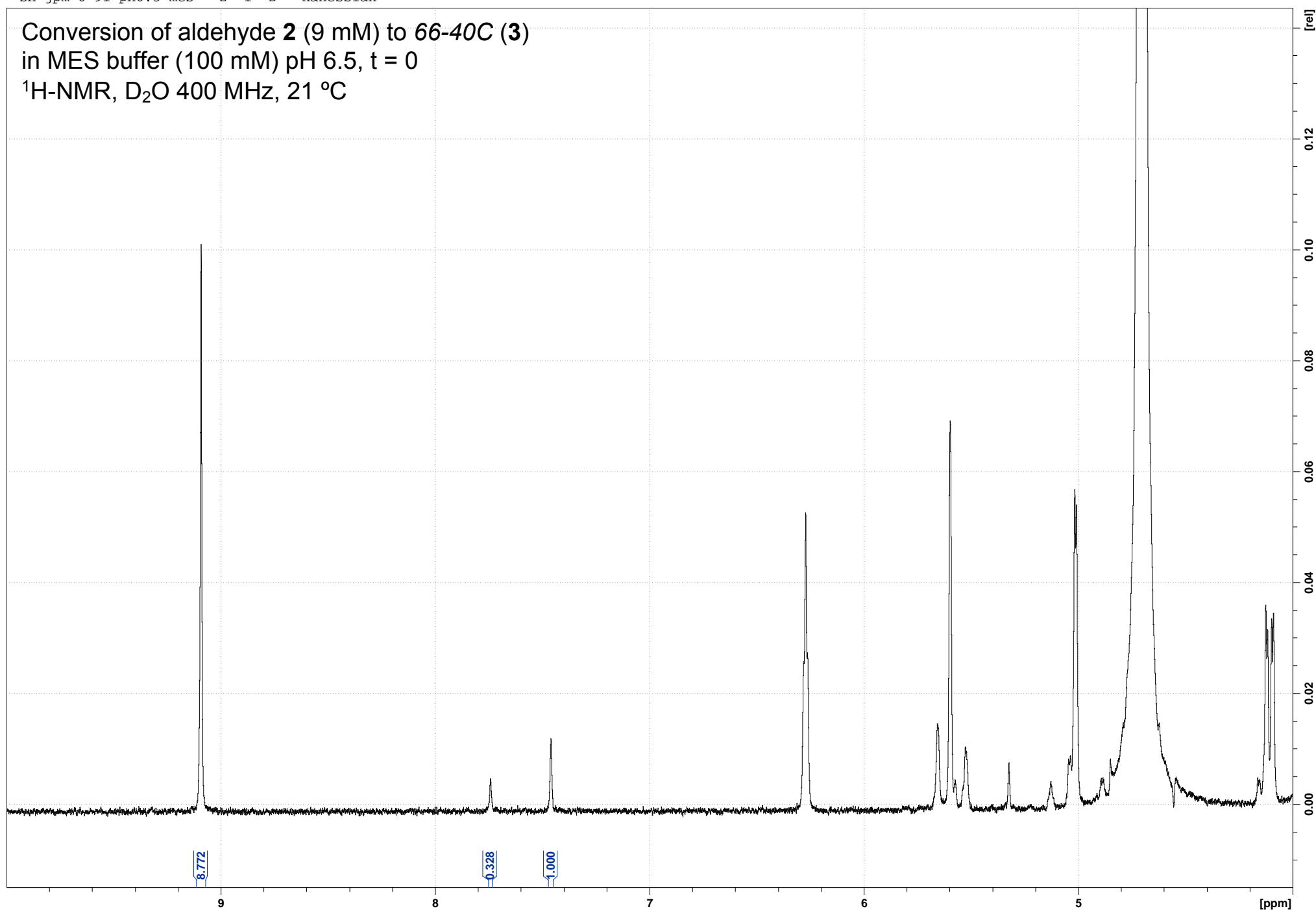
"sh-jpm-6-91-ph6.5 mes" 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



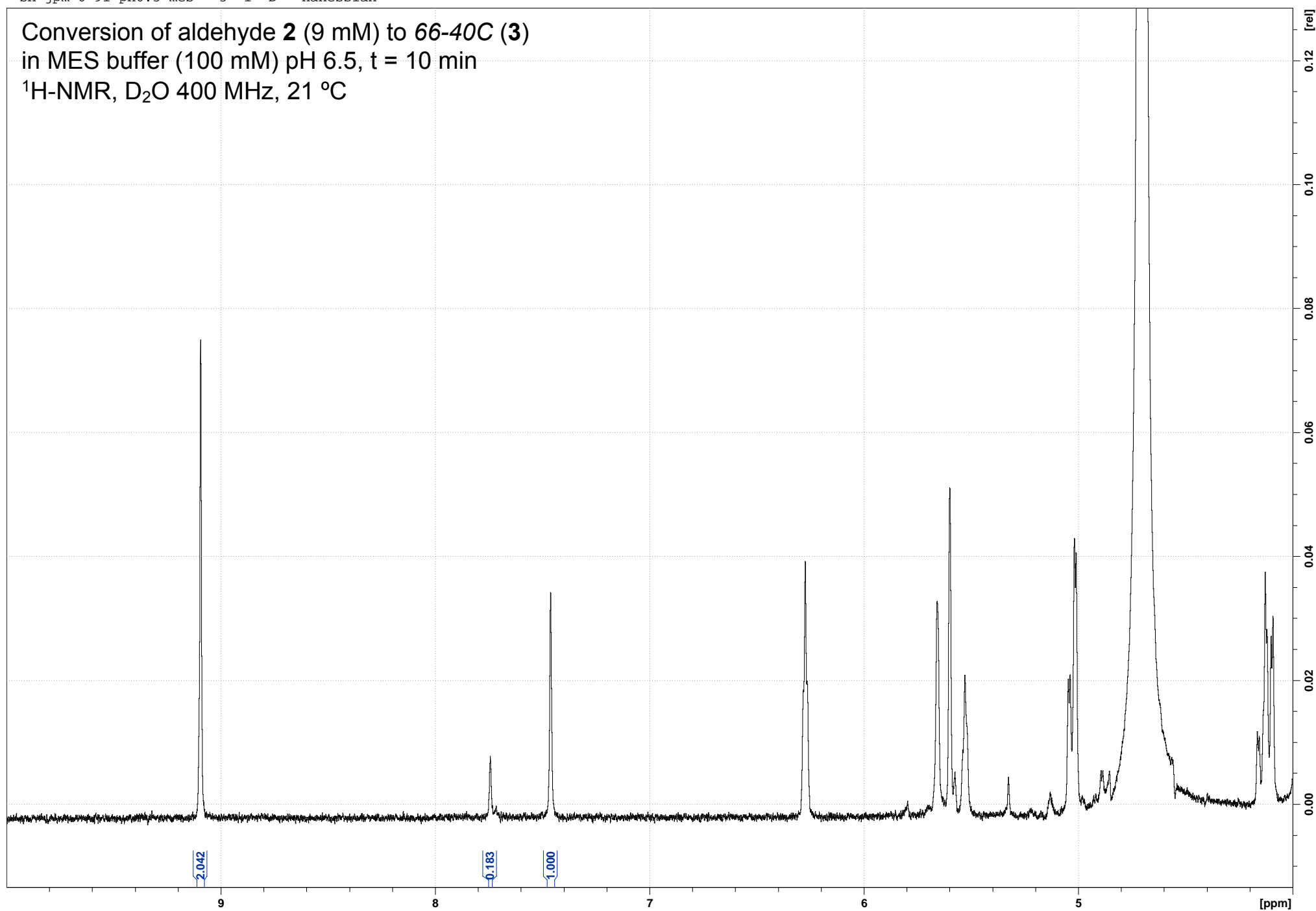
"sh-jpm-6-91-ph6.5 mes" 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



"sh-jpm-6-91-ph6.5 mes" 3 1 D: Hanessian

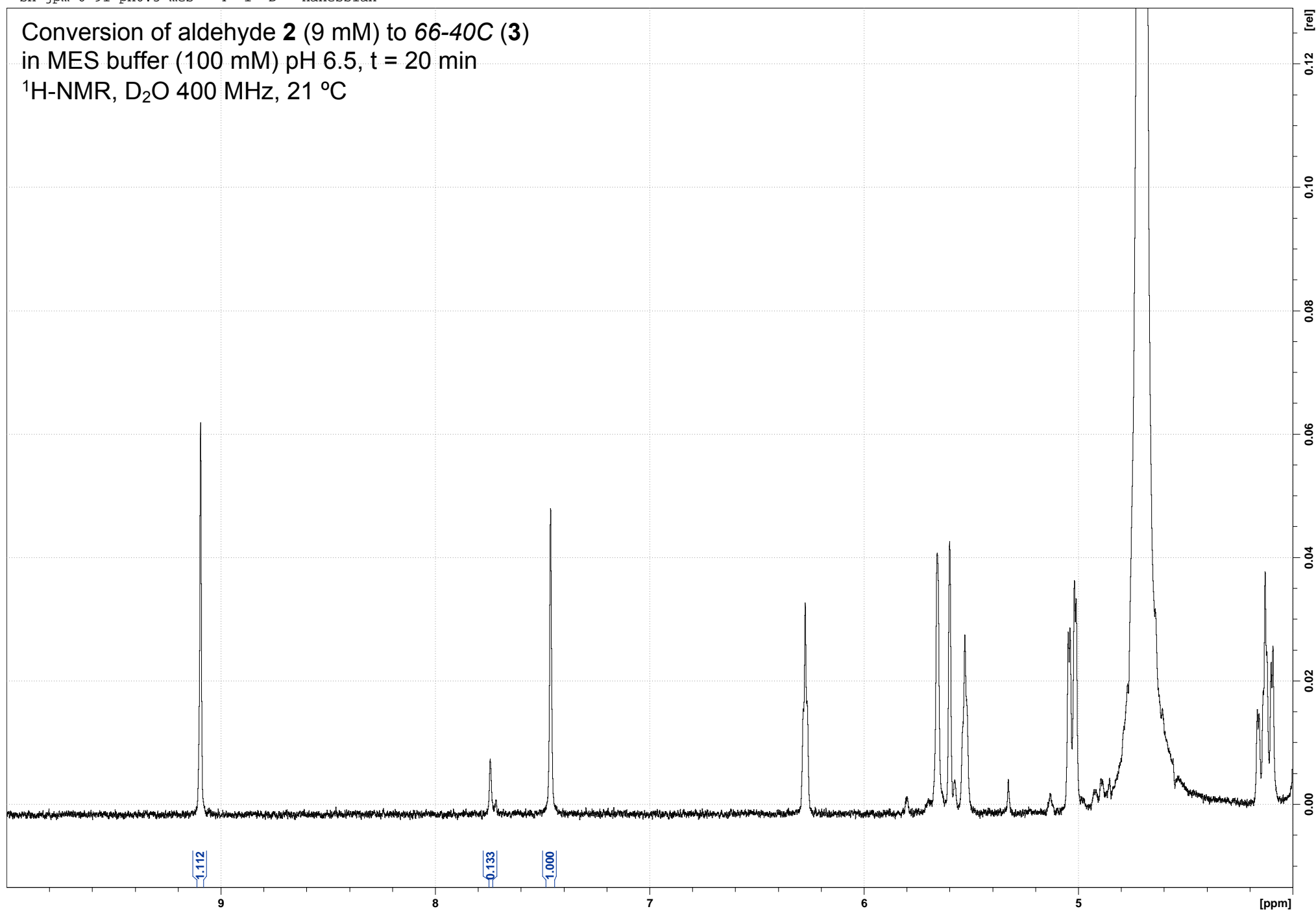
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 10 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





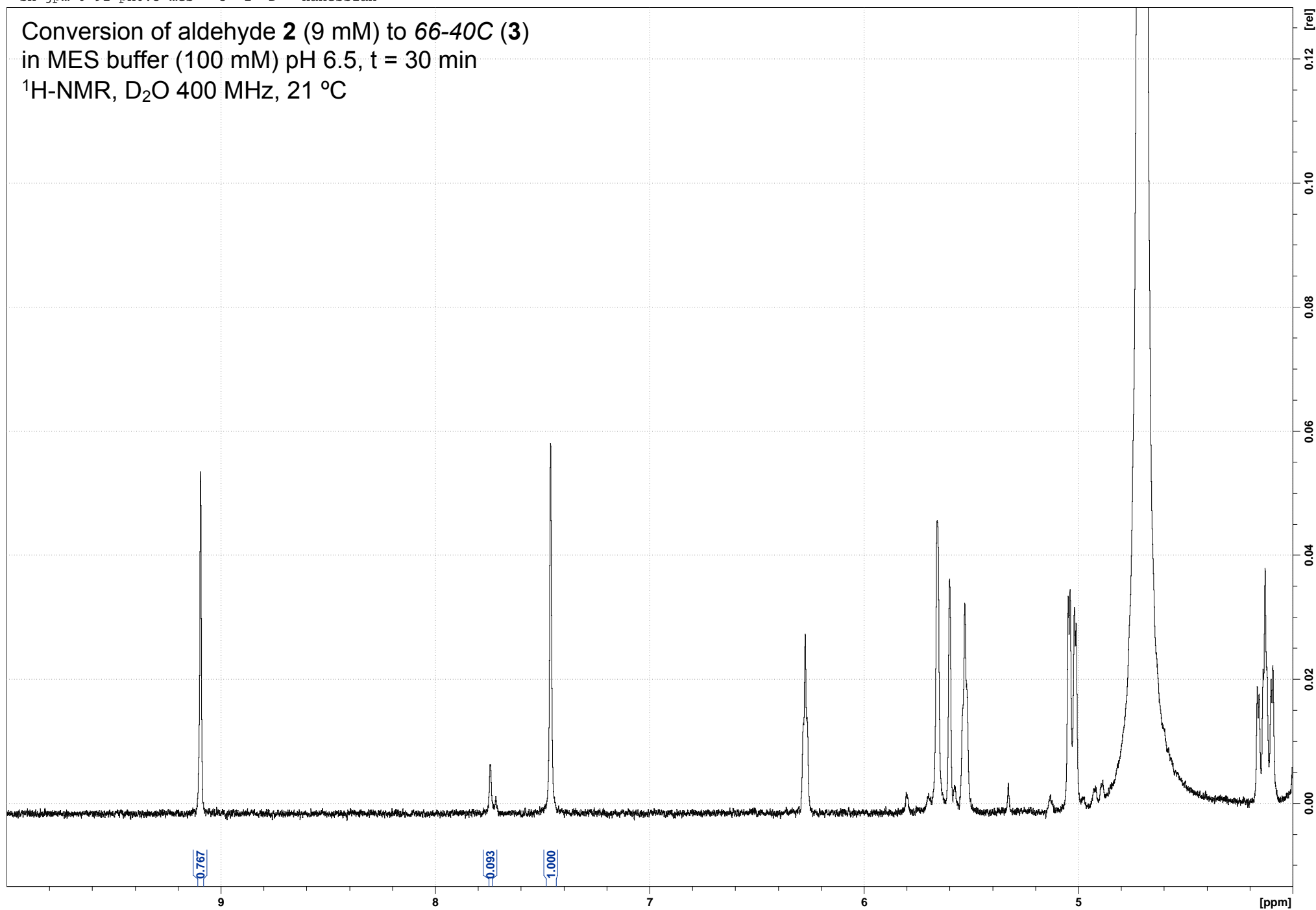
"sh-jpm-6-91-ph6.5 mes" 4 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 20 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



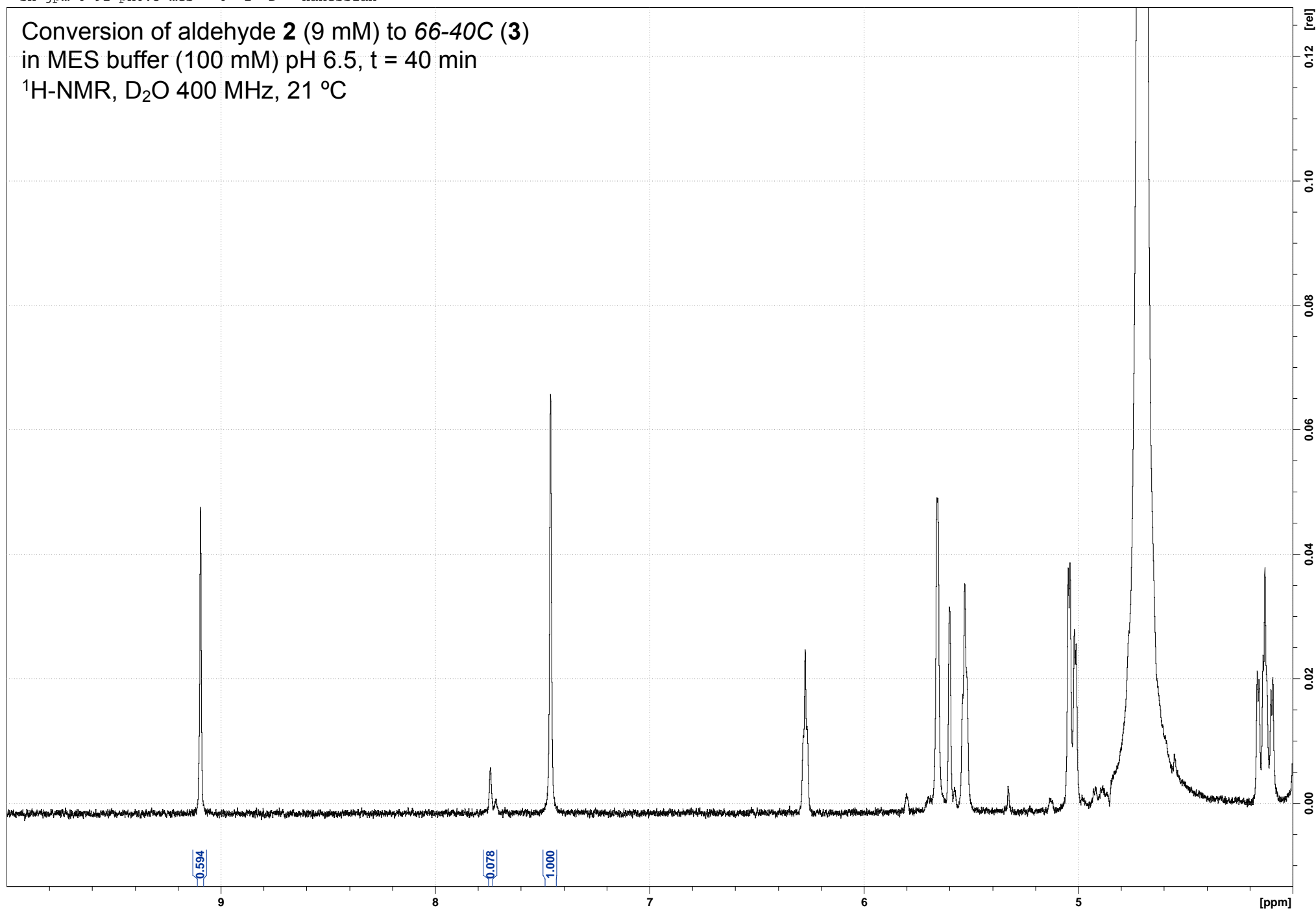
"sh-jpm-6-91-ph6.5 mes" 5 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 30 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



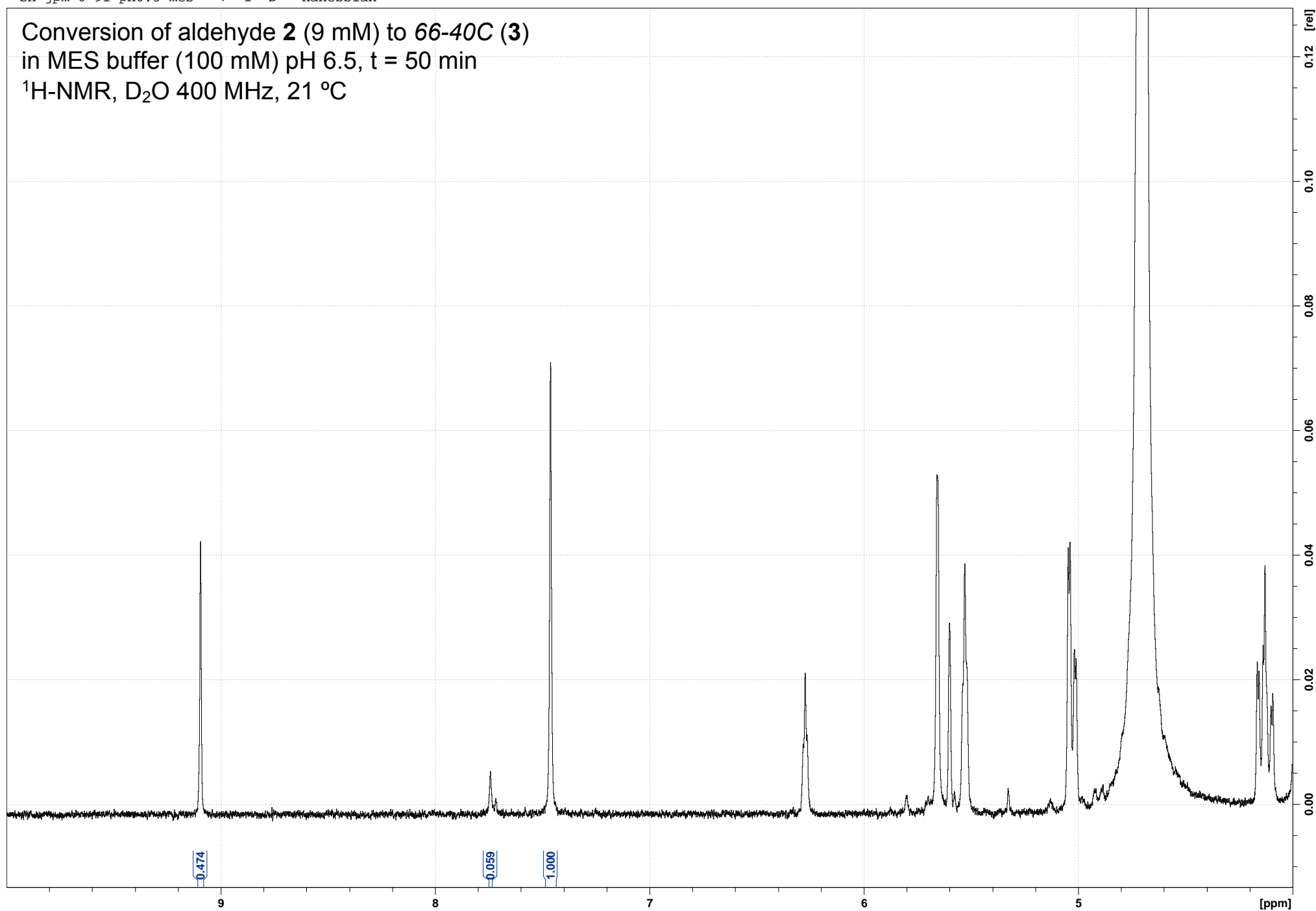
"sh-jpm-6-91-ph6.5 mes" 6 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 40 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



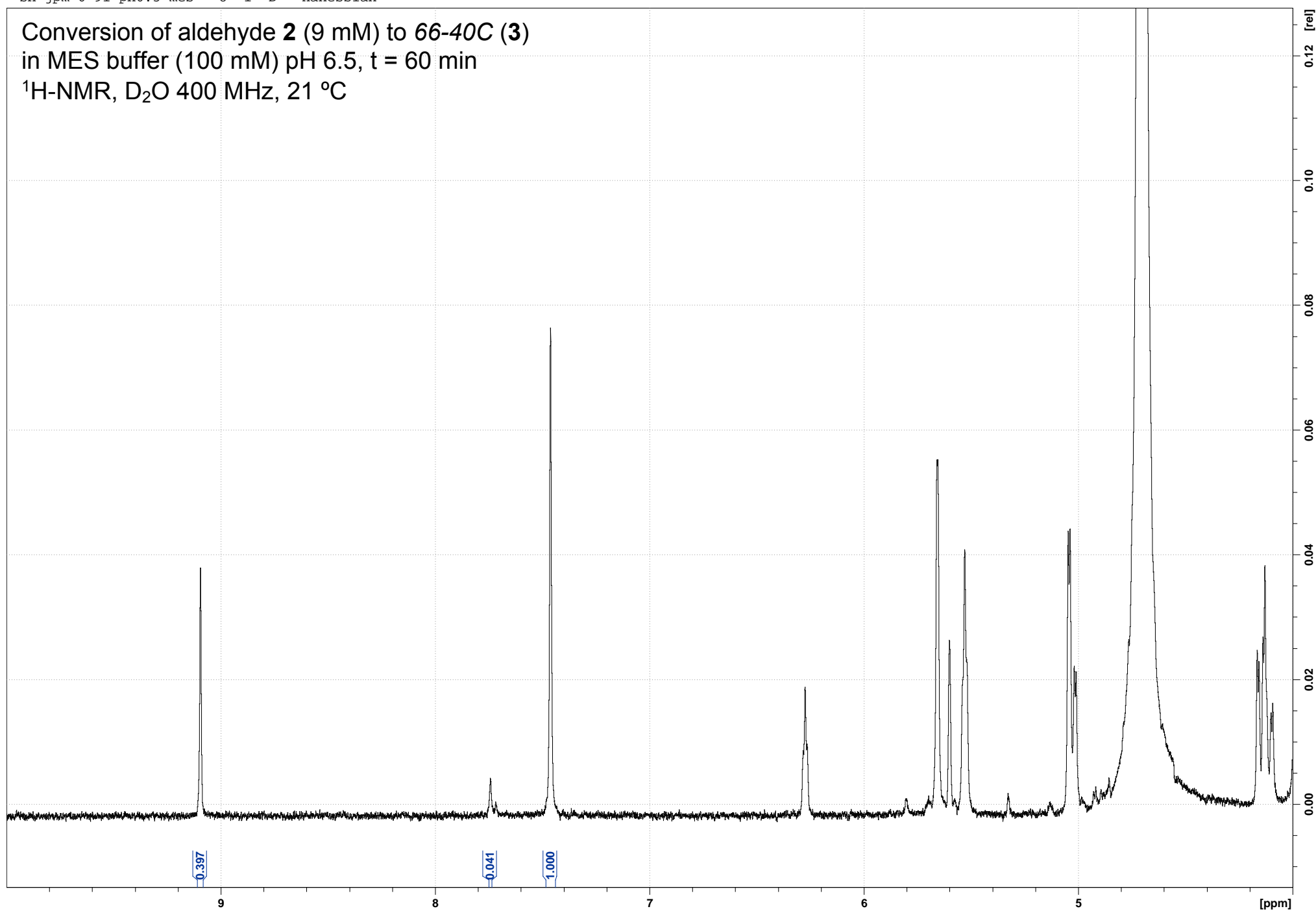
"sh-jpm-6-91-ph6.5 mes" 7 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 50 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



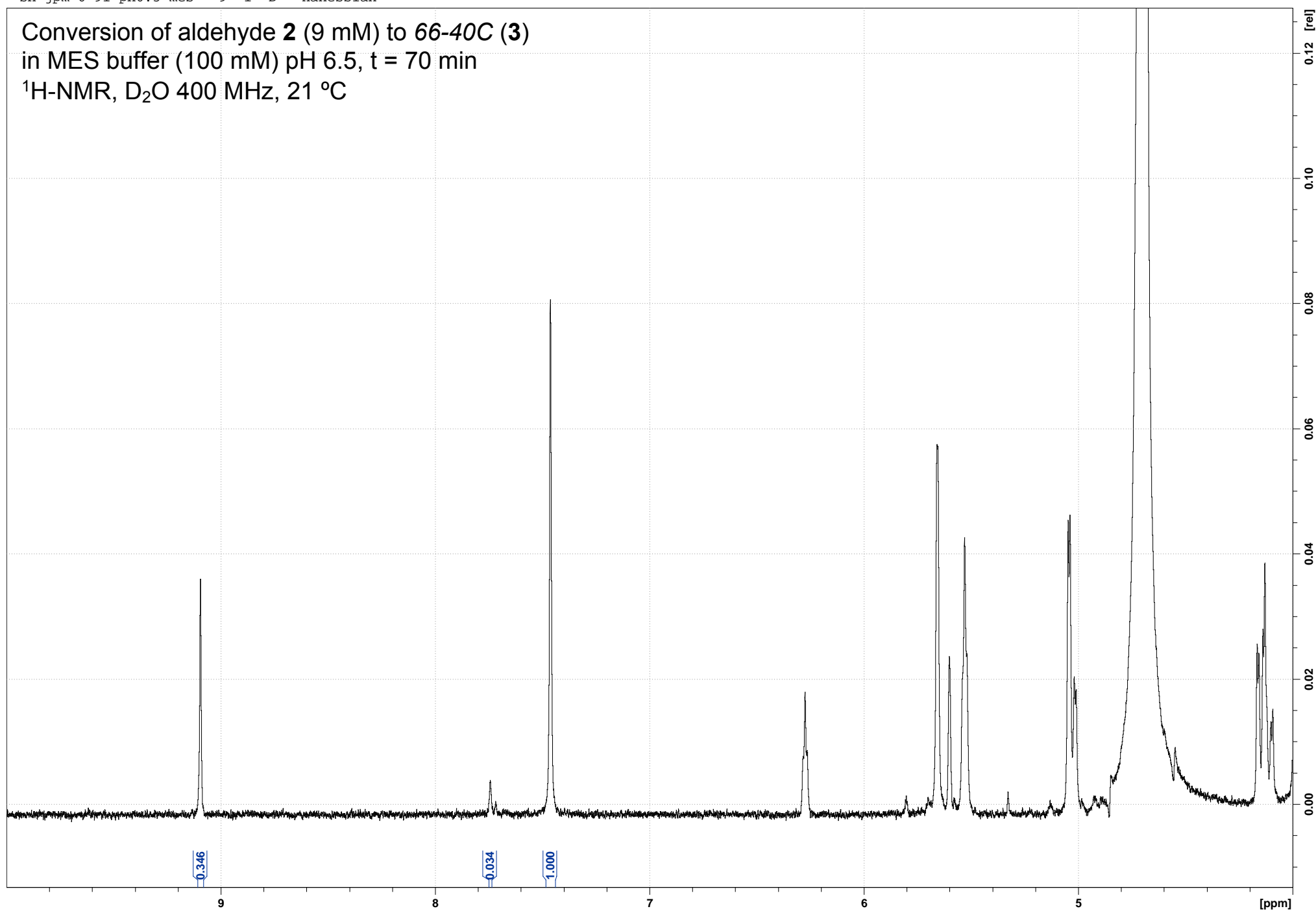
"sh-jpm-6-91-ph6.5 mes" 8 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 60 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



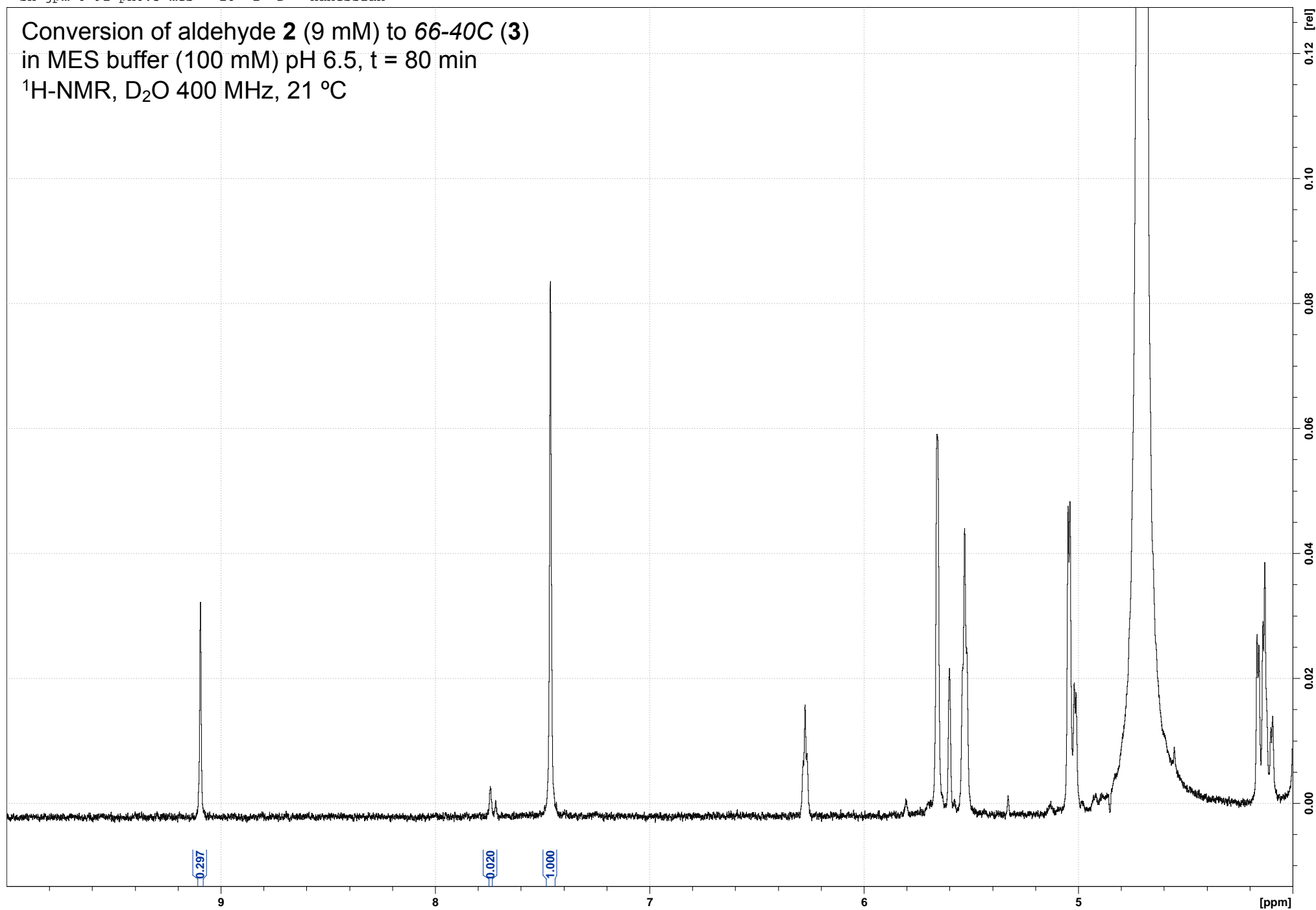
"sh-jpm-6-91-ph6.5 mes" 9 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 70 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



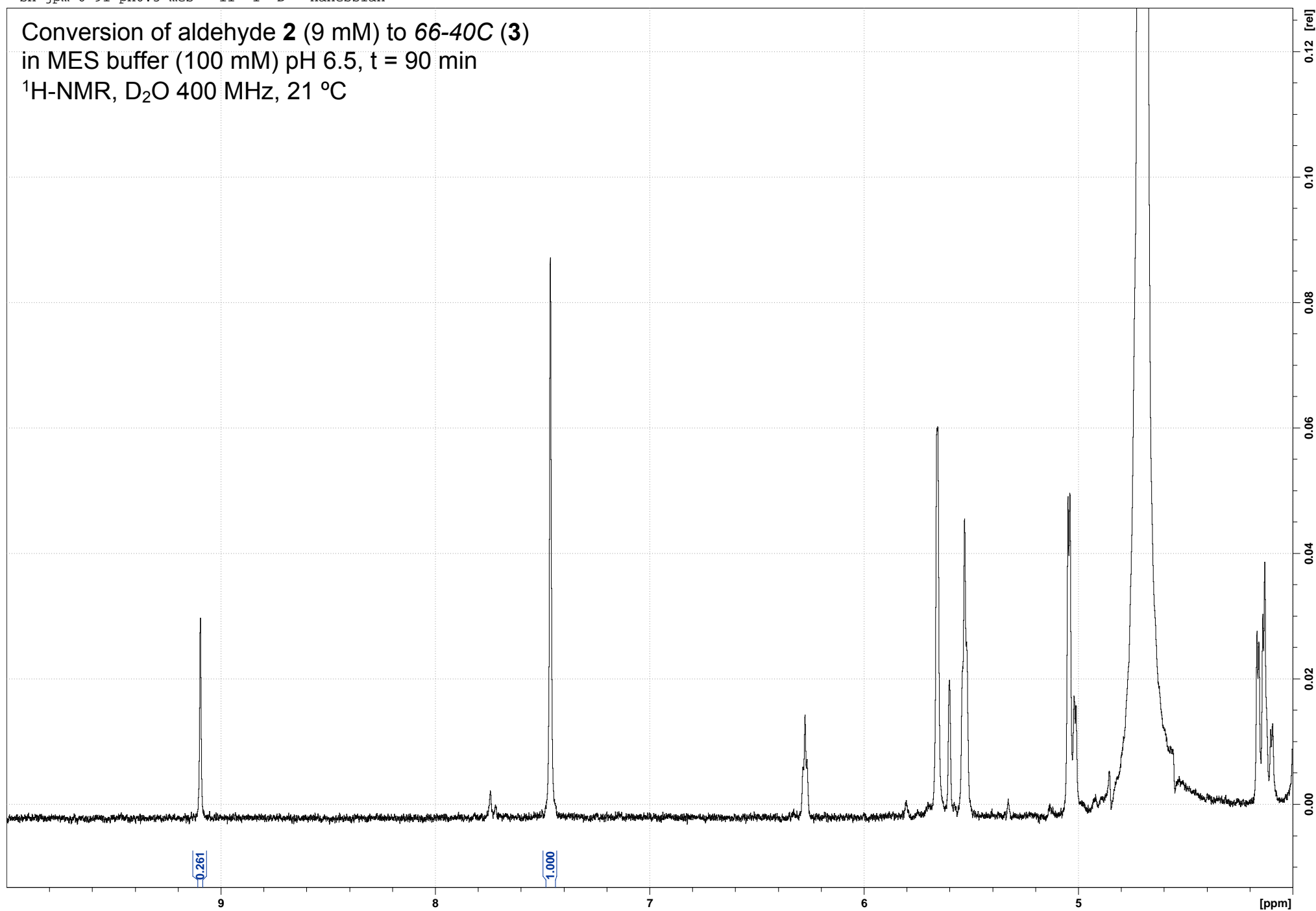
"sh-jpm-6-91-ph6.5 mes" 10 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 80 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



"sh-jpm-6-91-ph6.5 mes" 11 1 D: Hanessian

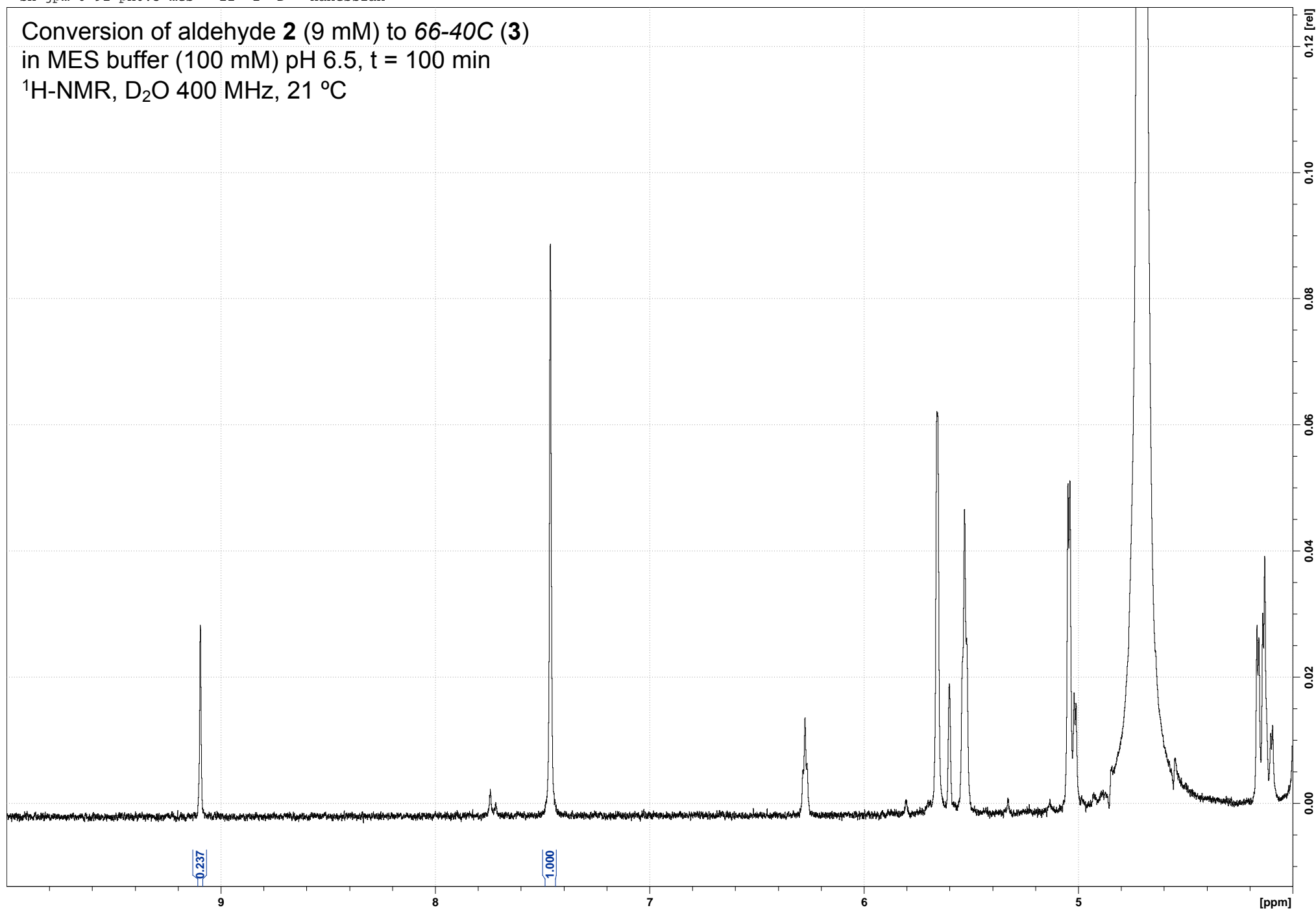
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 90 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





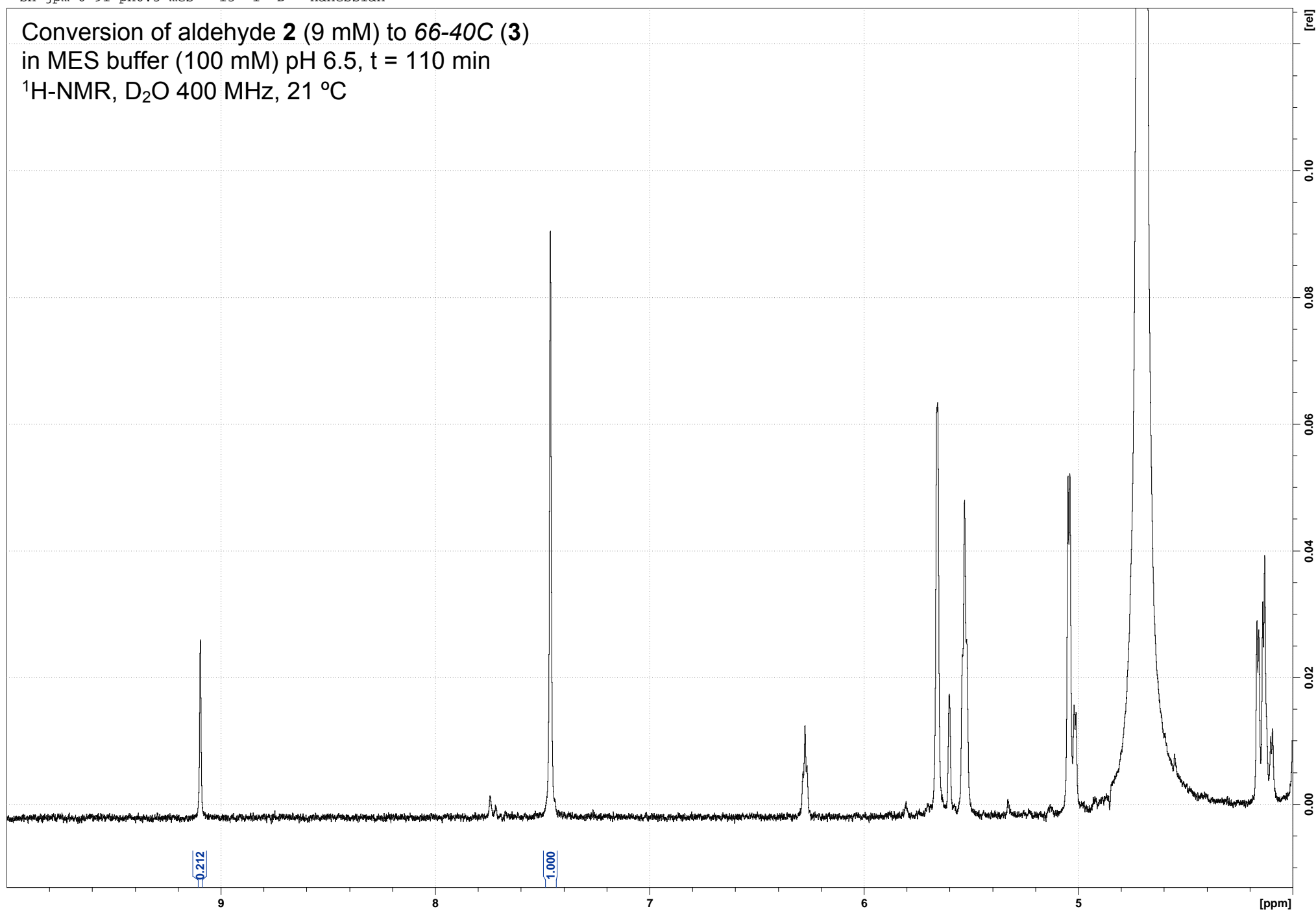
"sh-jpm-6-91-ph6.5 mes" 12 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 100 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



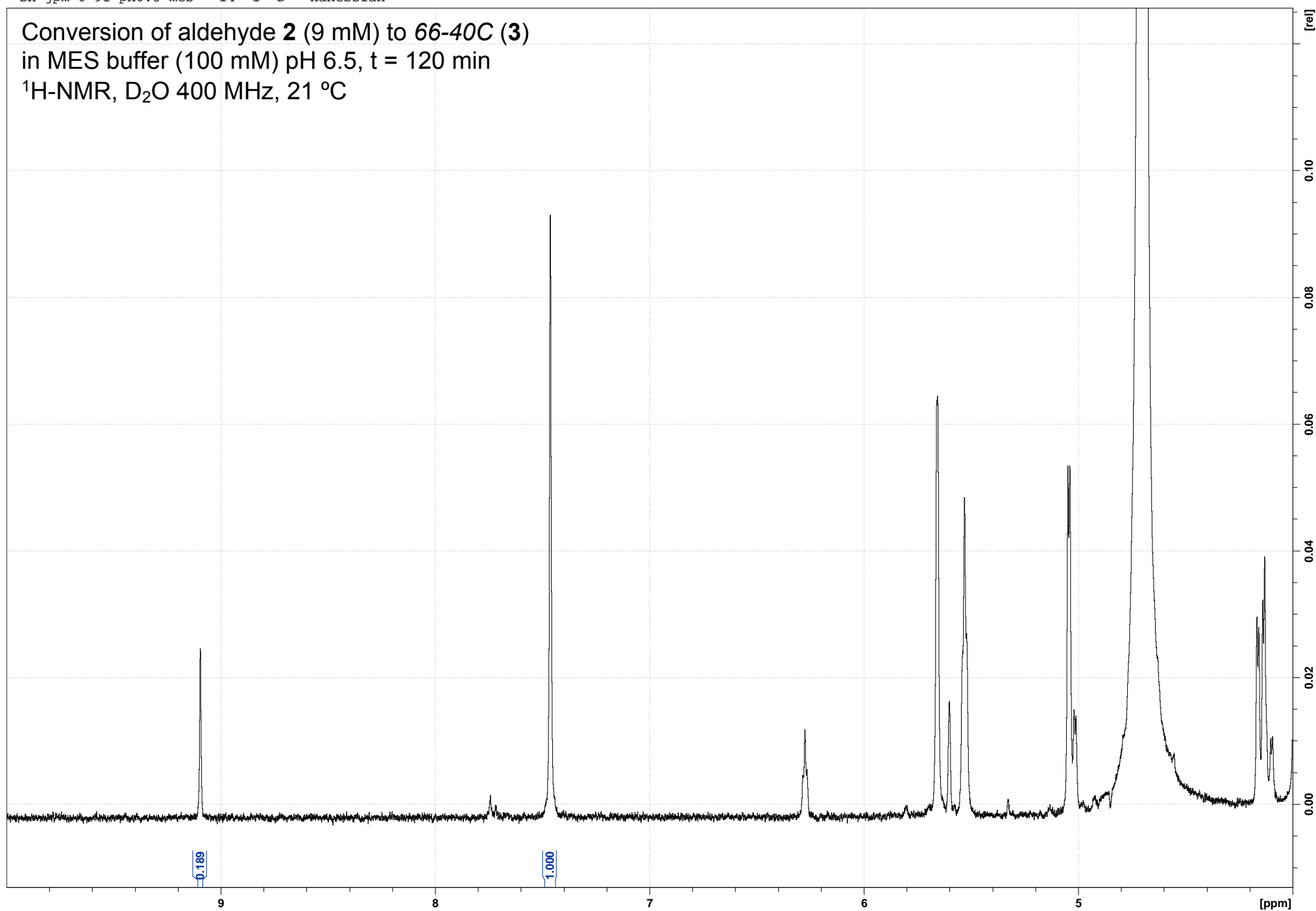
"sh-jpm-6-91-ph6.5 mes" 13 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 110 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



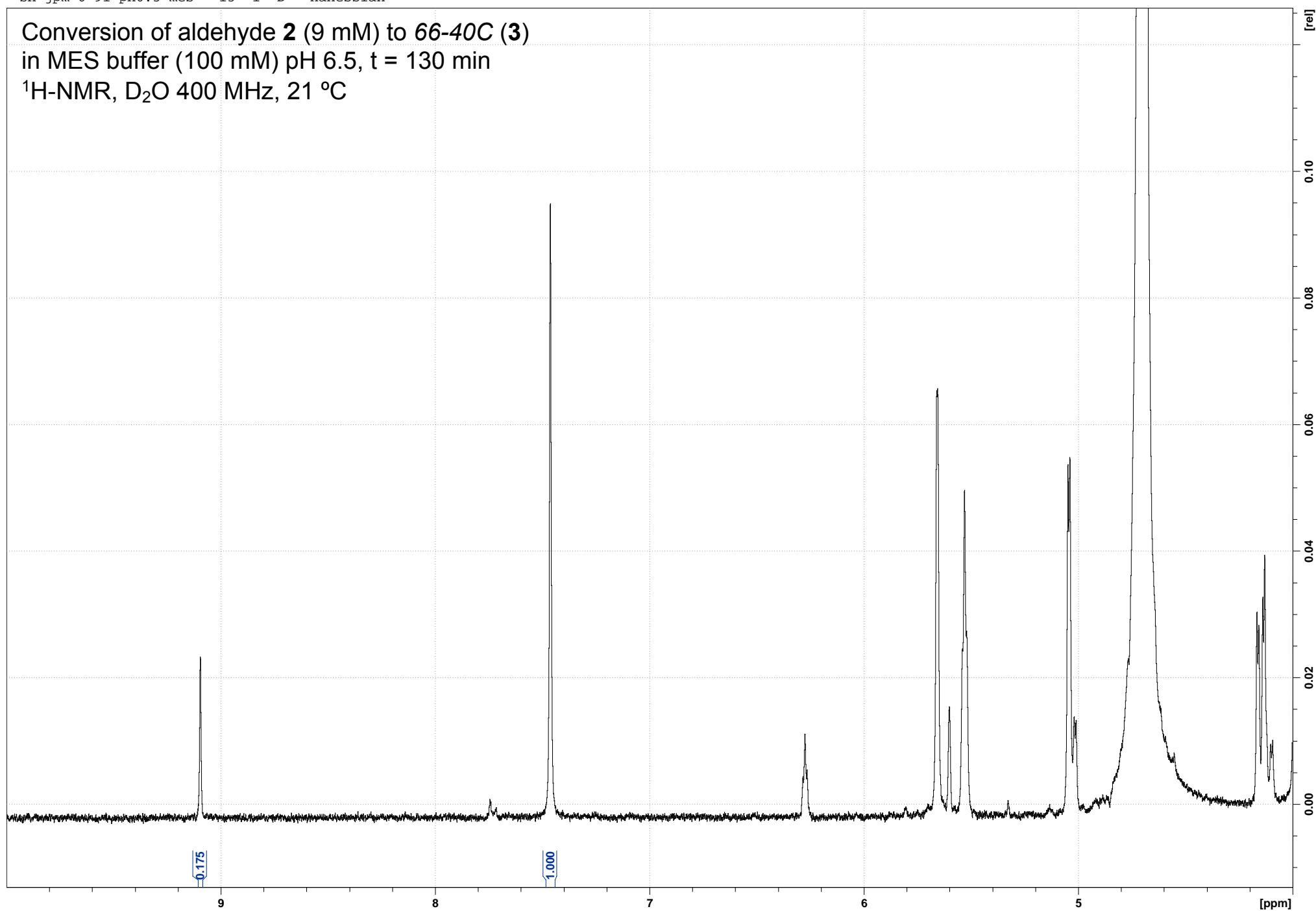
"sh-jpm-6-91-ph6.5 mes" 14 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 120 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



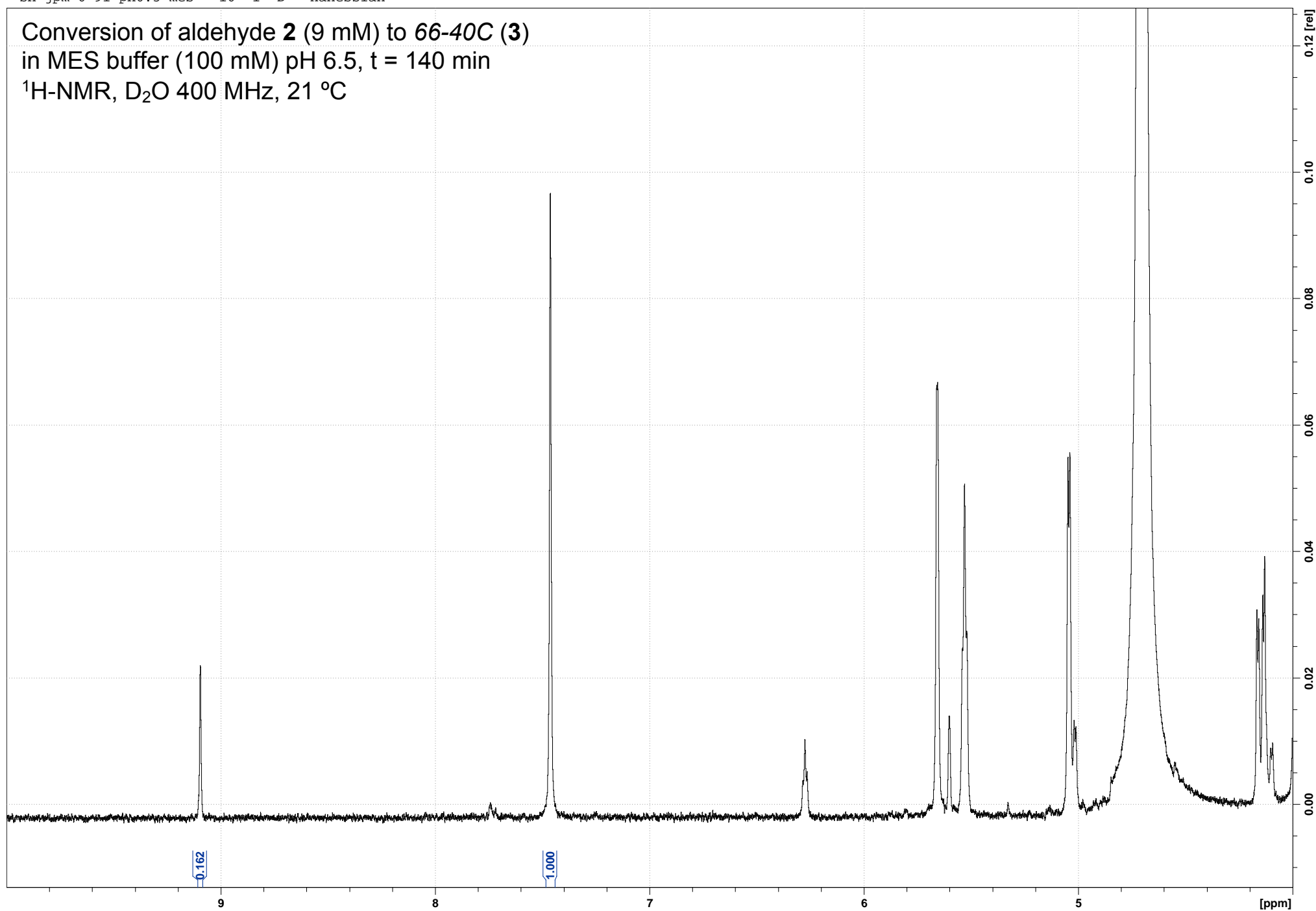
"sh-jpm-6-91-ph6.5 mes" 15 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 130 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



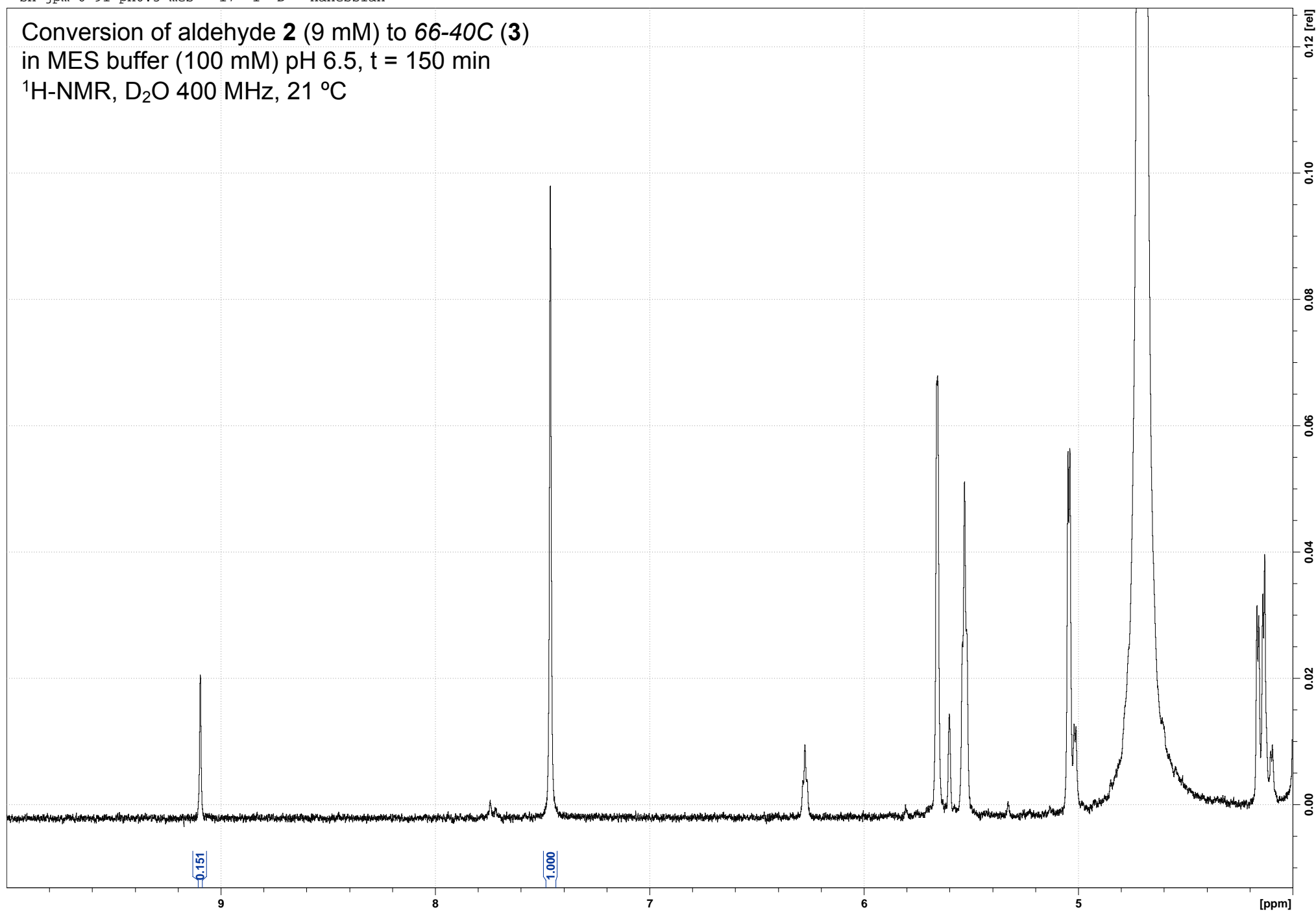
"sh-jpm-6-91-ph6.5 mes" 16 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 140 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



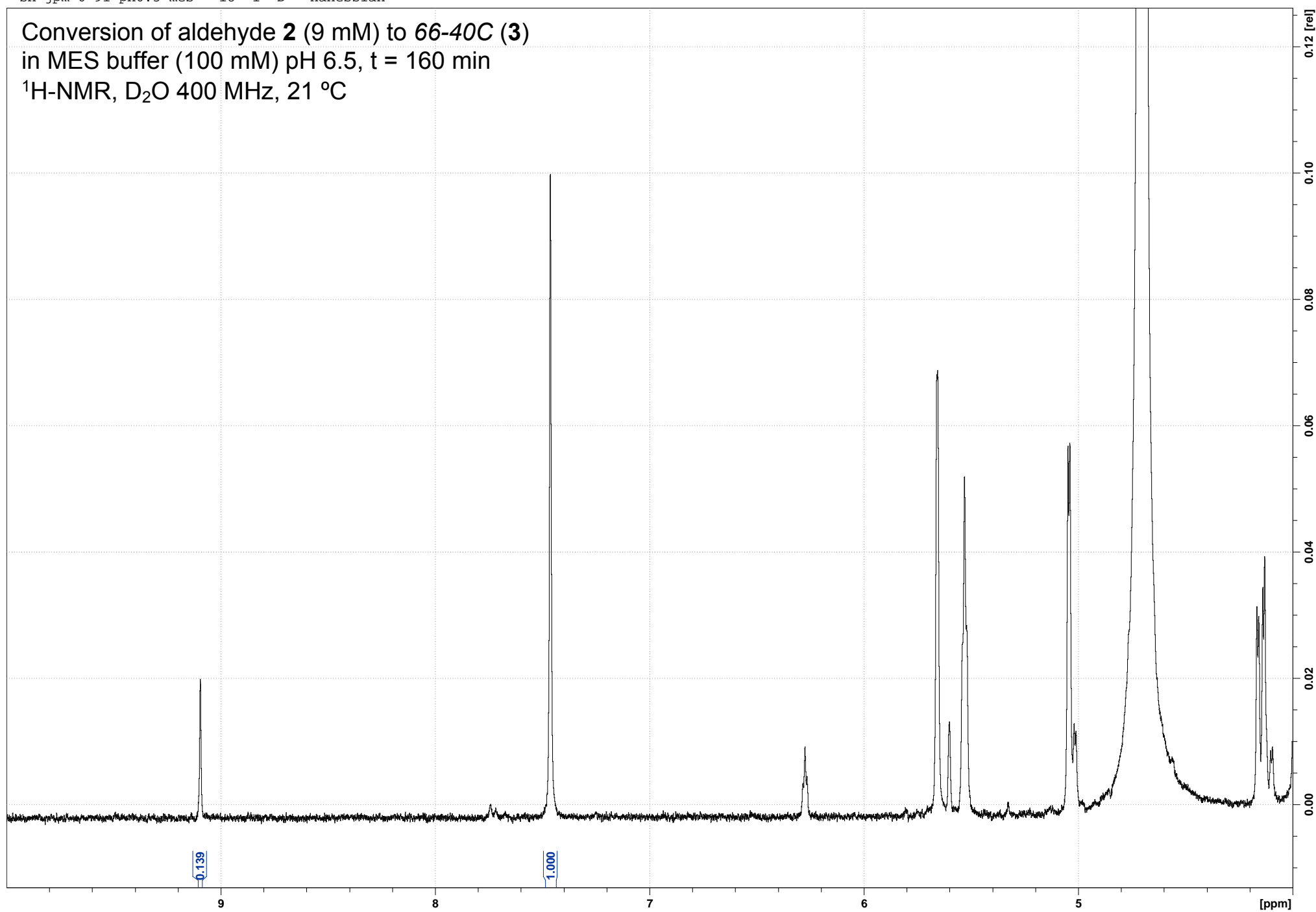
"sh-jpm-6-91-ph6.5 mes" 17 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 150 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



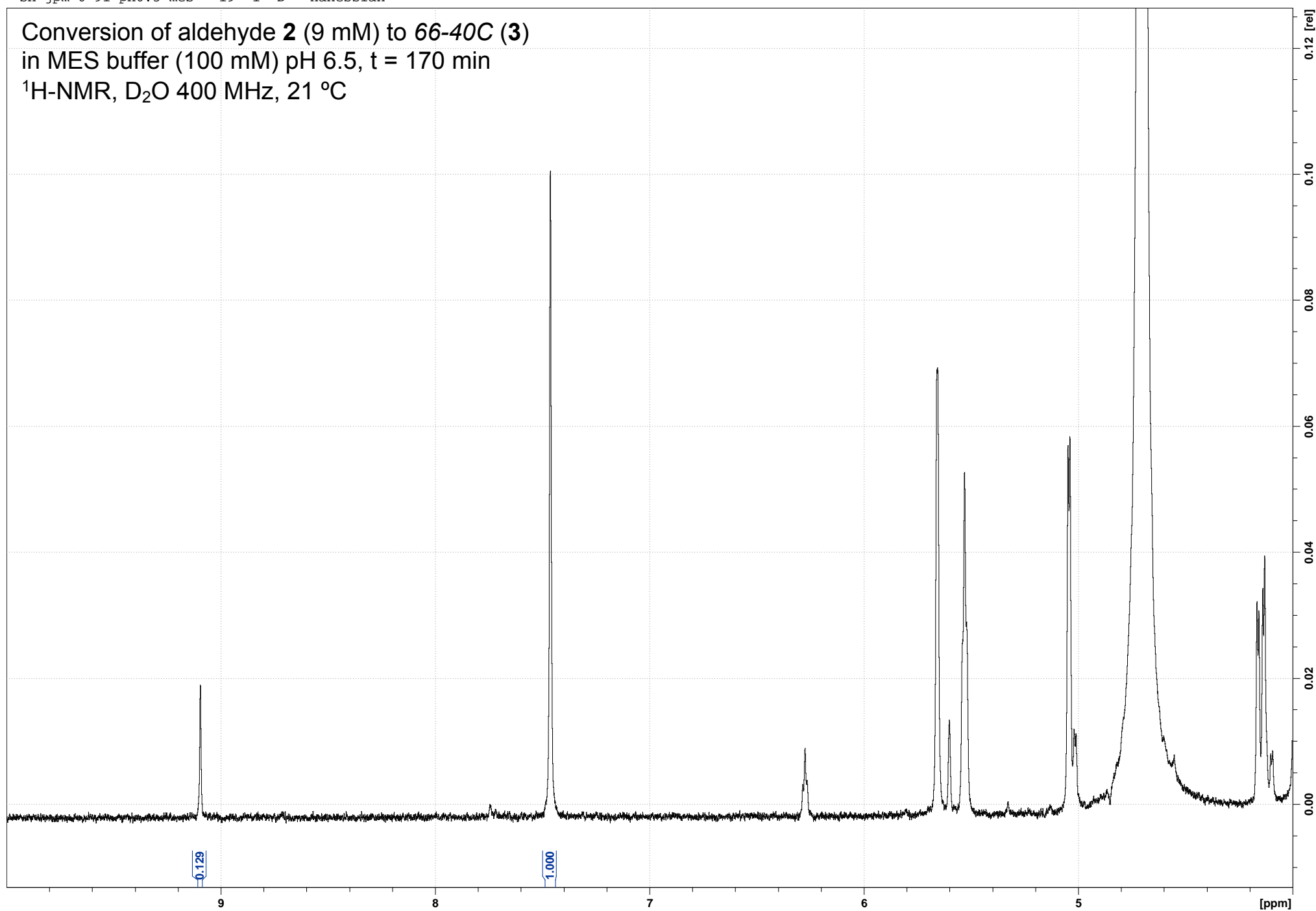
"sh-jpm-6-91-ph6.5 mes" 18 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 160 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



"sh-jpm-6-91-ph6.5 mes" 19 1 D: Hanessian

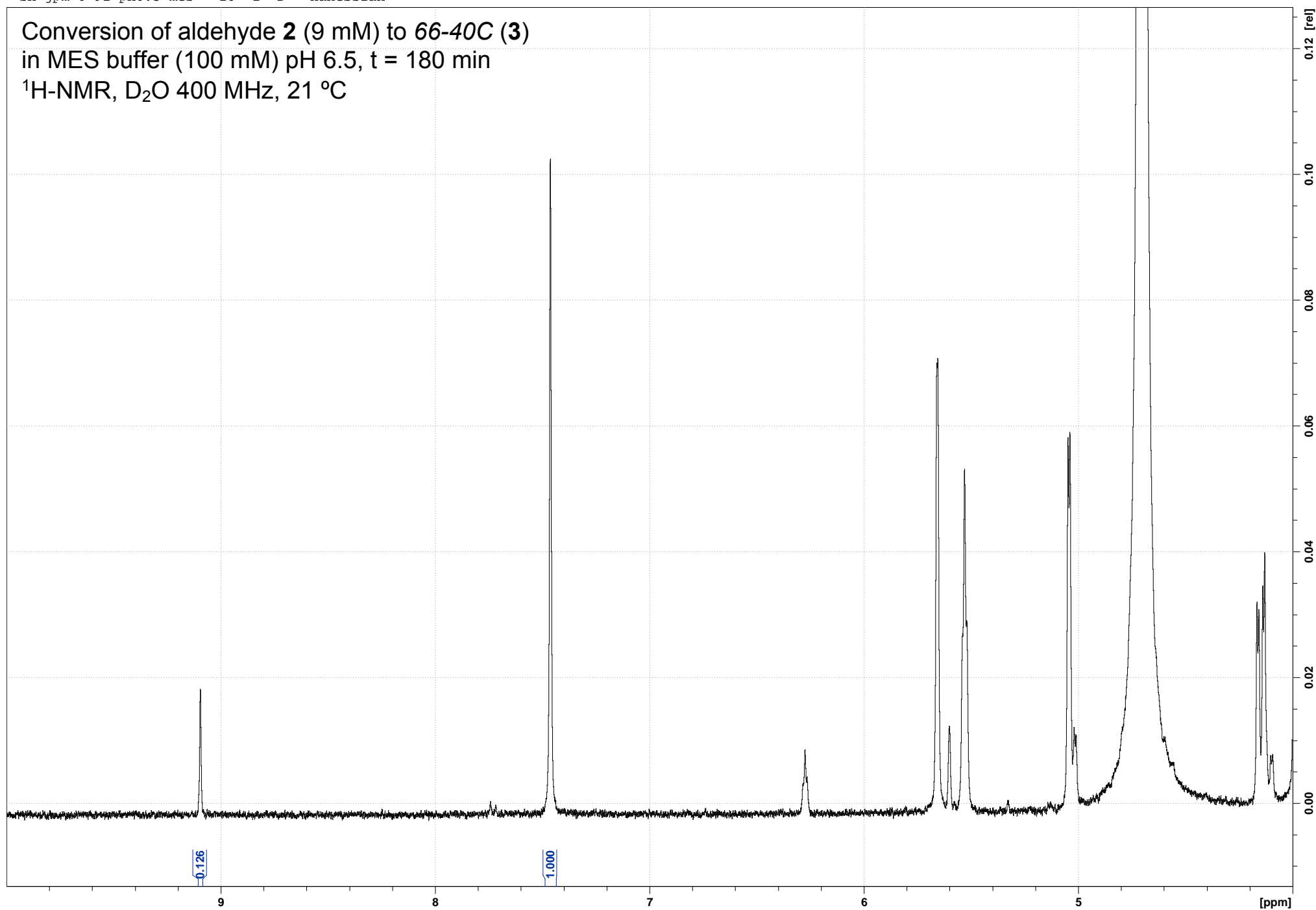
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 170 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





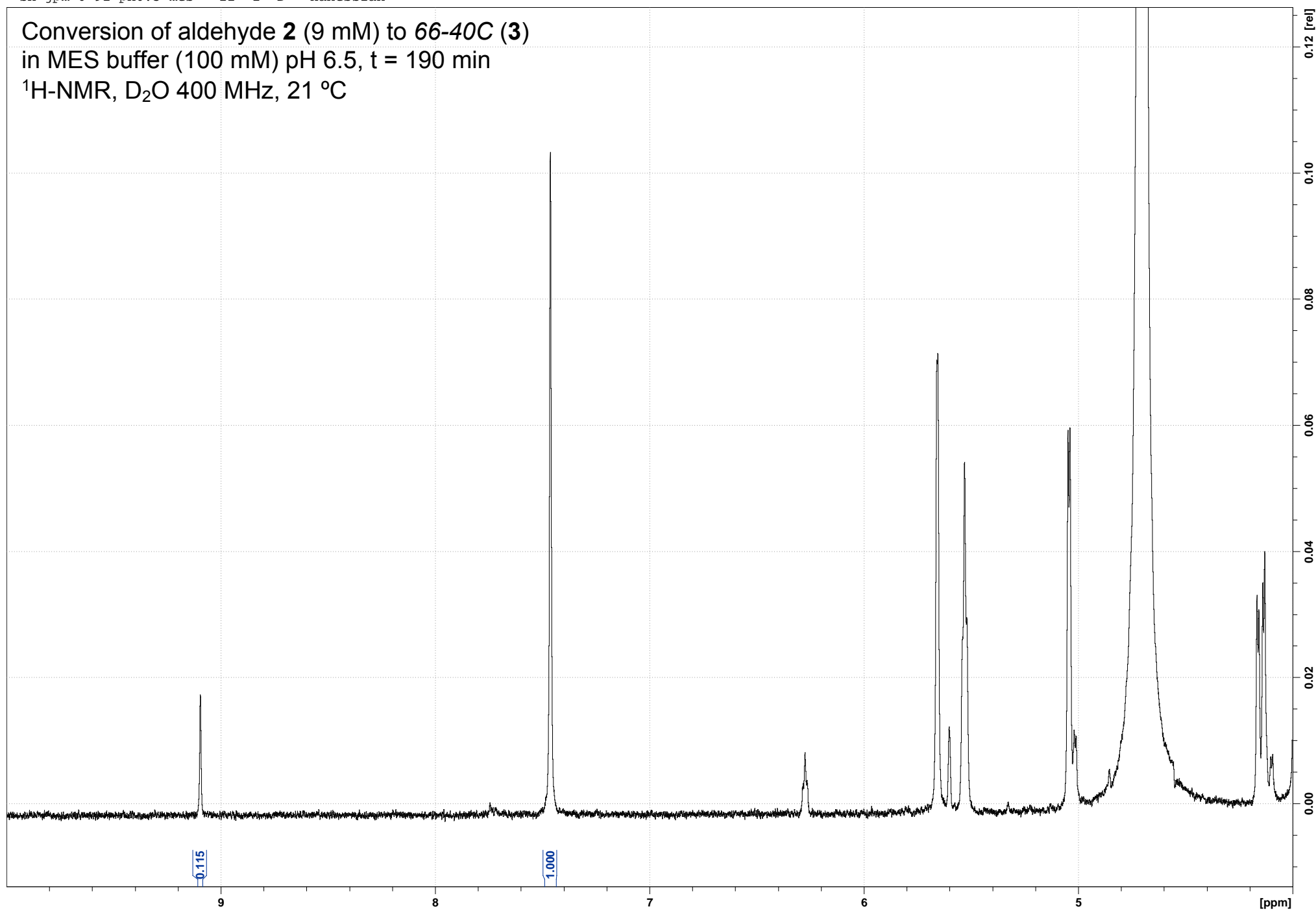
"sh-jpm-6-91-ph6.5 mes" 20 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 180 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



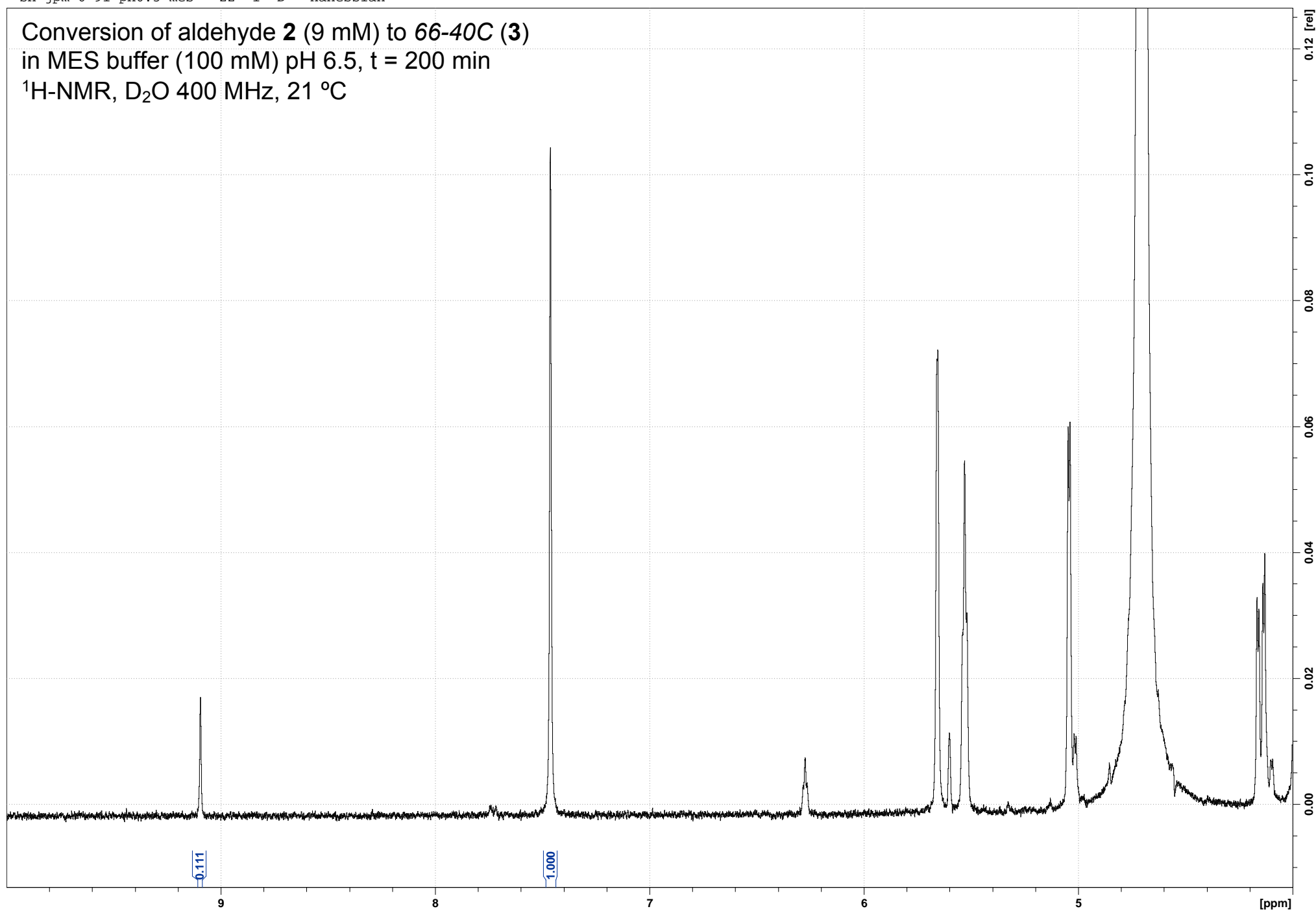
"sh-jpm-6-91-ph6.5 mes" 21 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 190 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



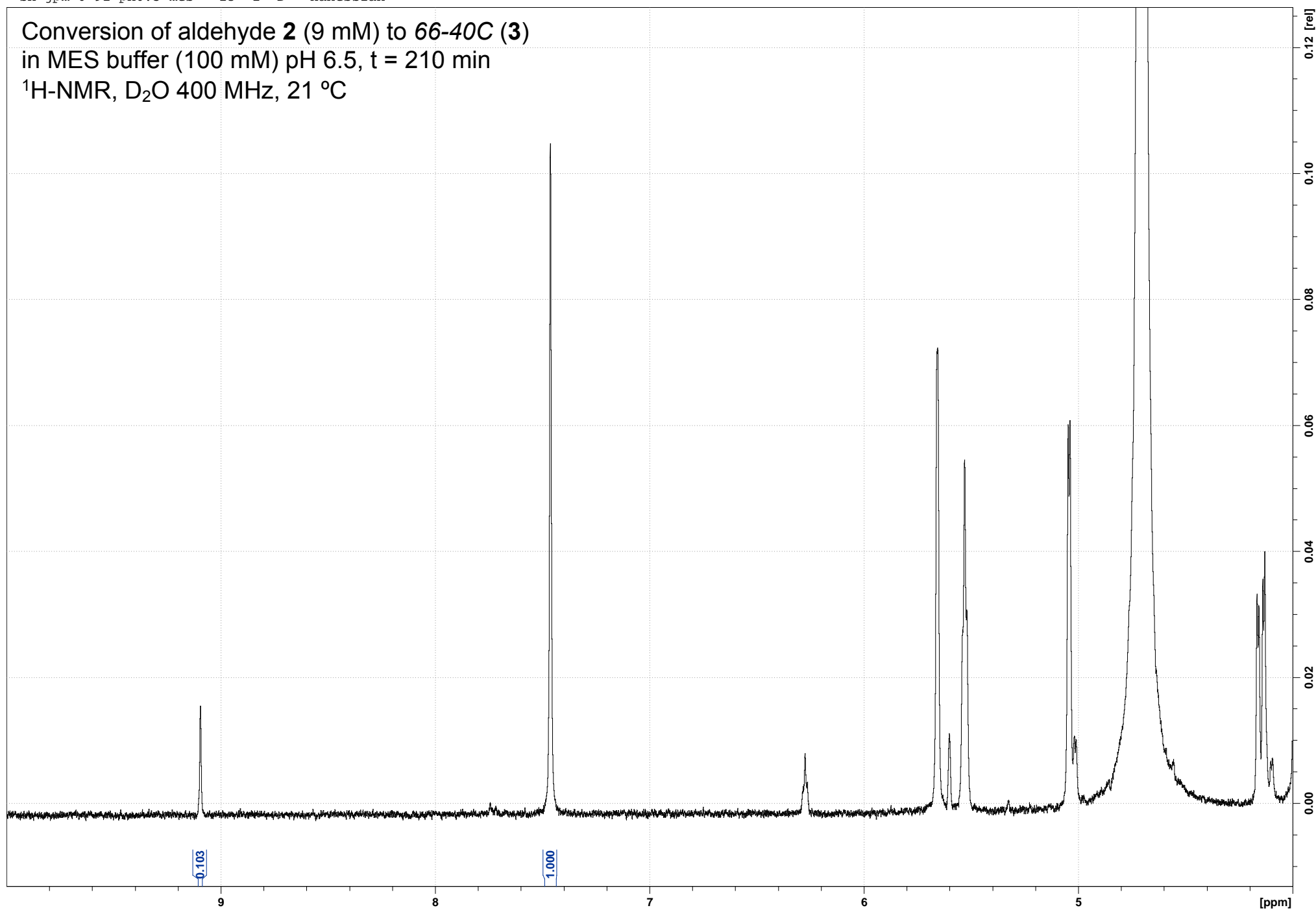
"sh-jpm-6-91-ph6.5 mes" 22 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 200 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



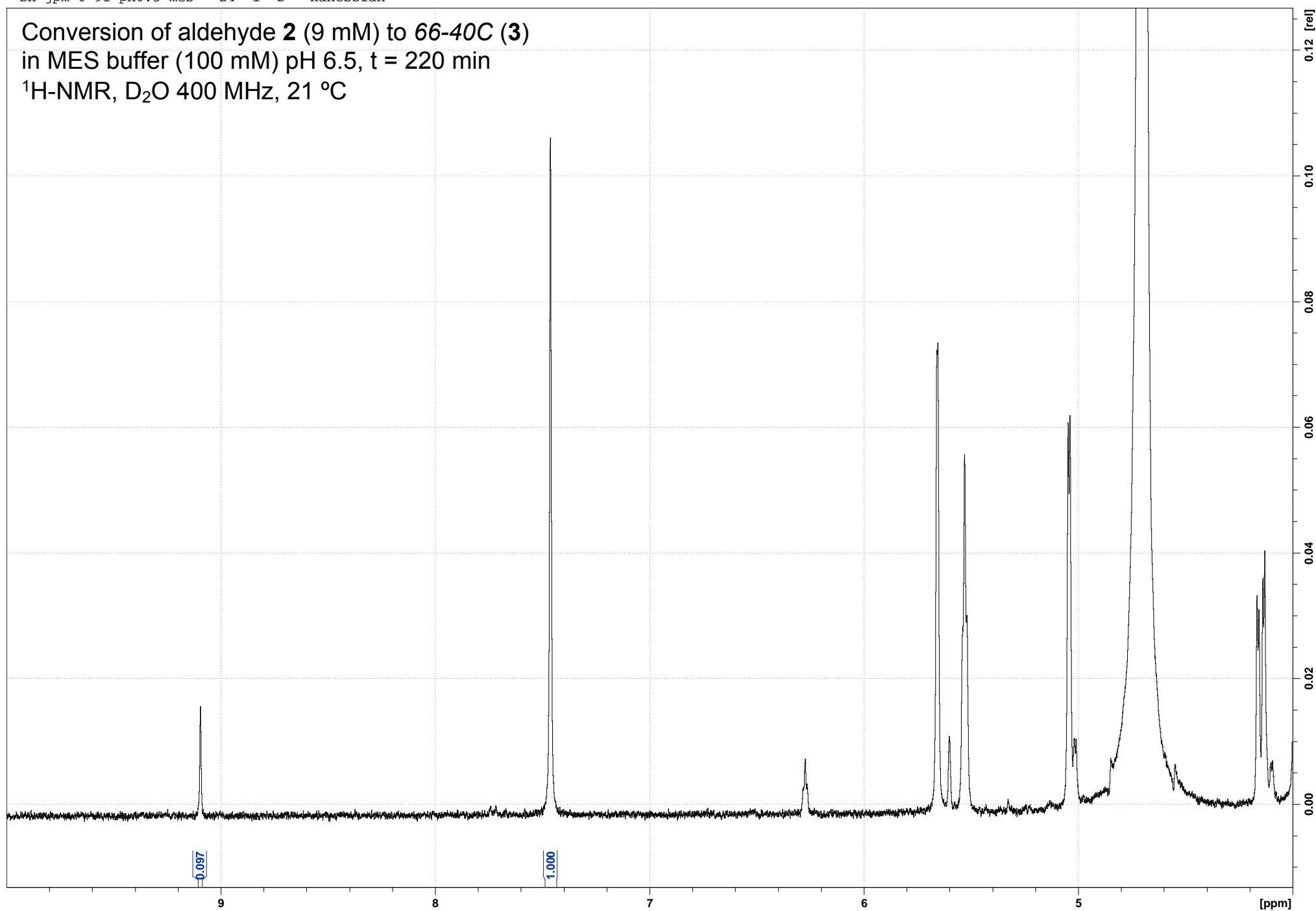
"sh-jpm-6-91-ph6.5 mes" 23 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 210 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



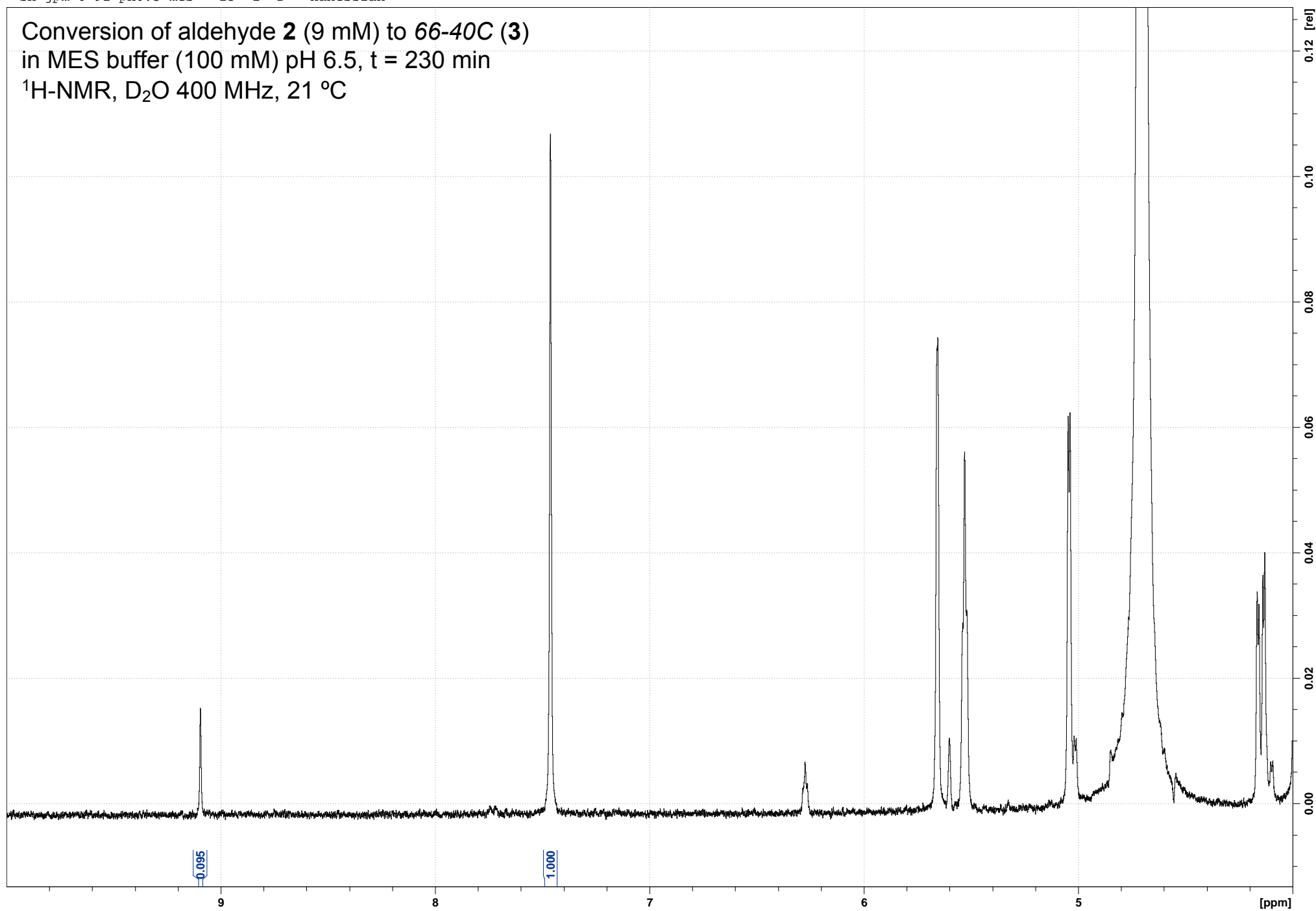
"sh-jpm-6-91-ph6.5 mes" 24 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 220 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



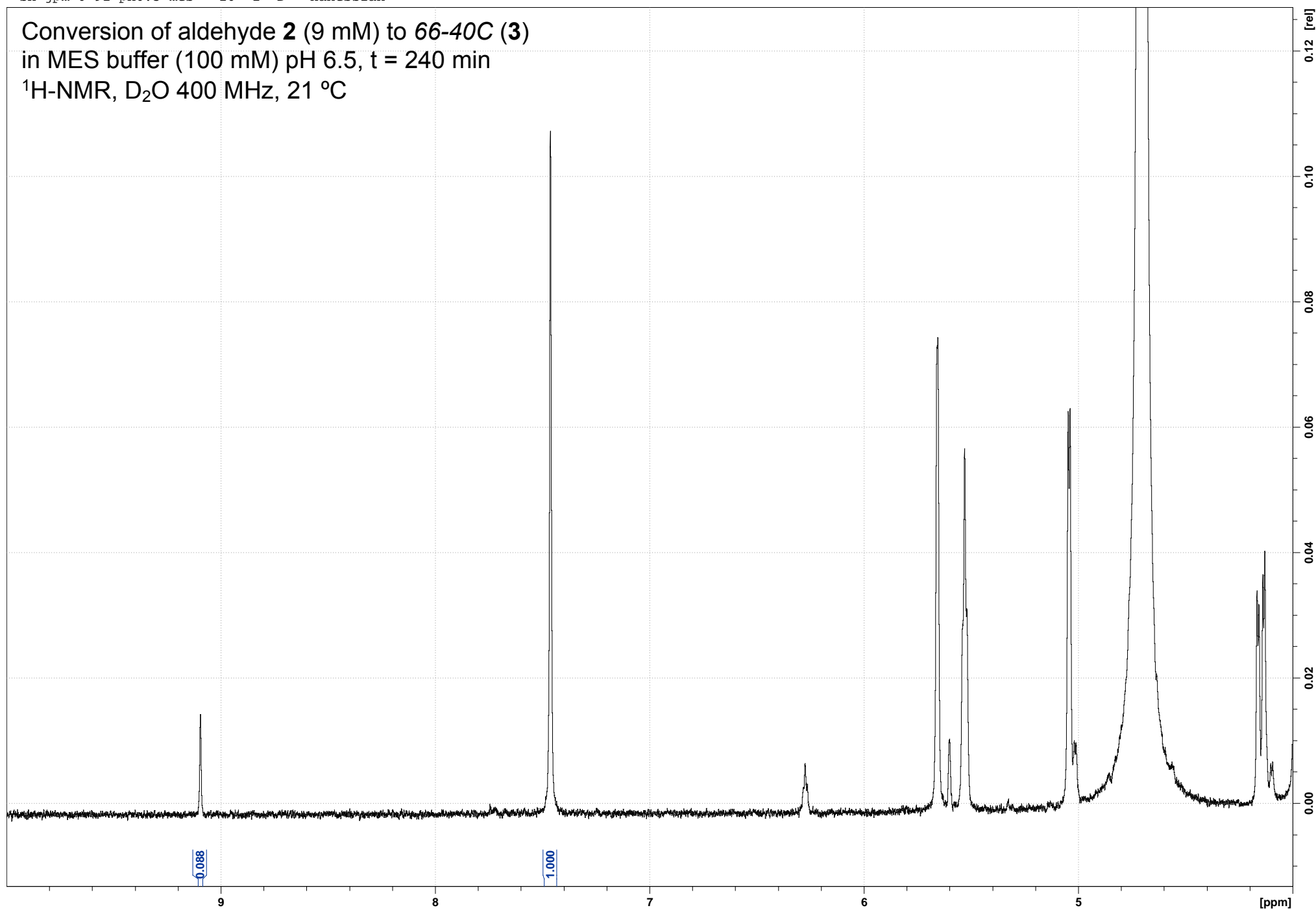
"sh-jpm-6-91-ph6.5 mes" 25 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 230 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



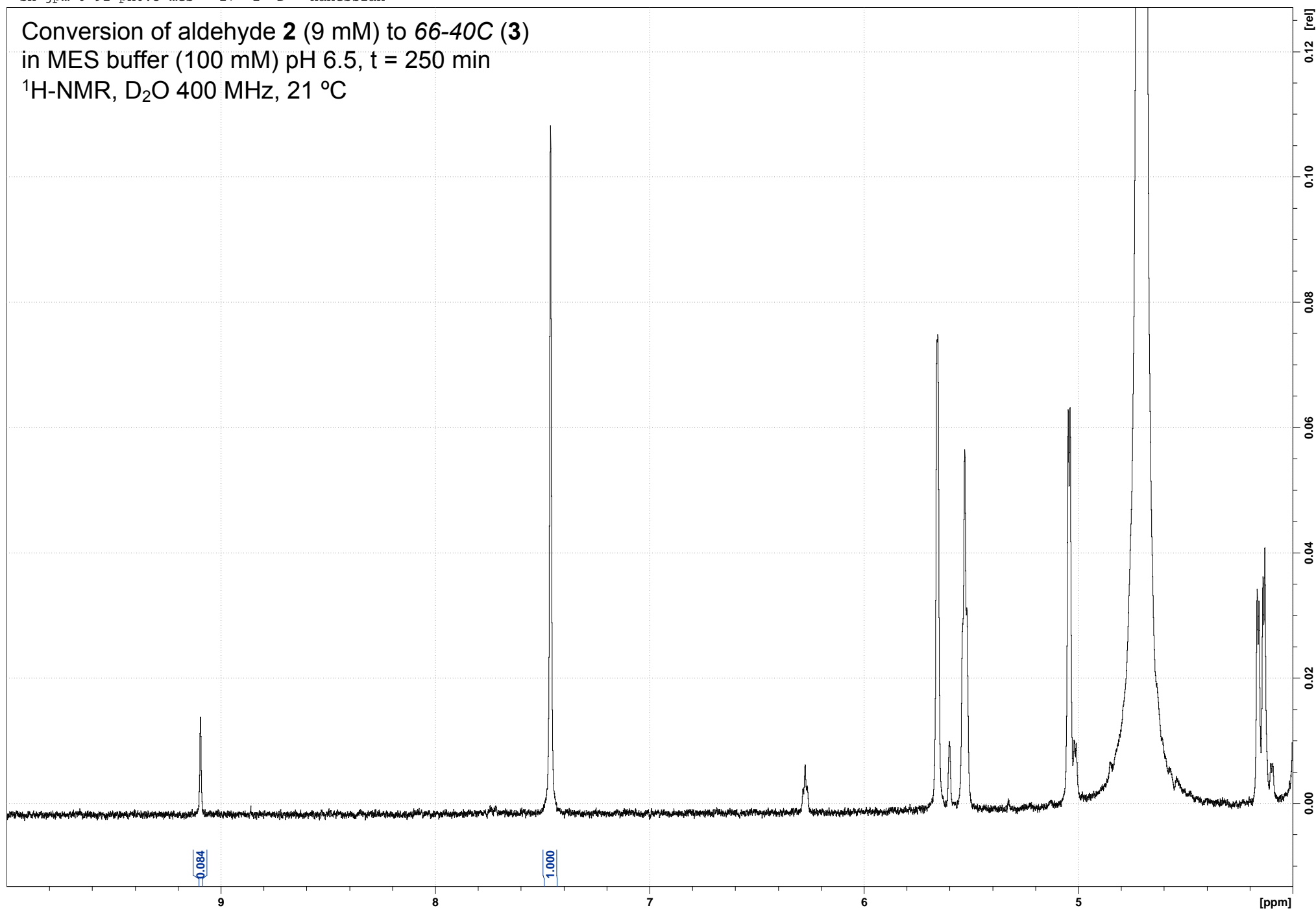
"sh-jpm-6-91-ph6.5 mes" 26 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 240 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



"sh-jpm-6-91-ph6.5 mes" 27 1 D: Hanessian

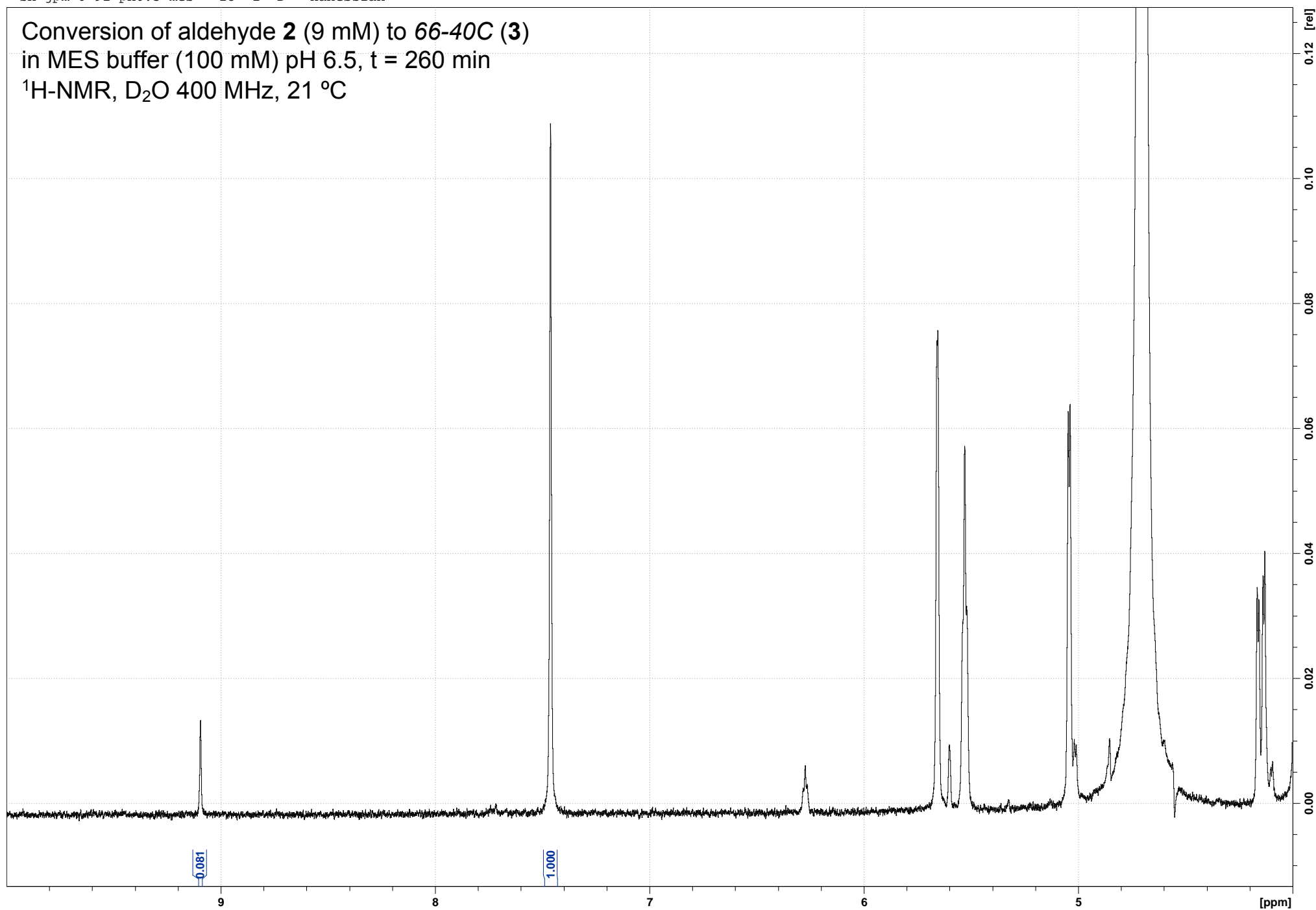
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 250 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





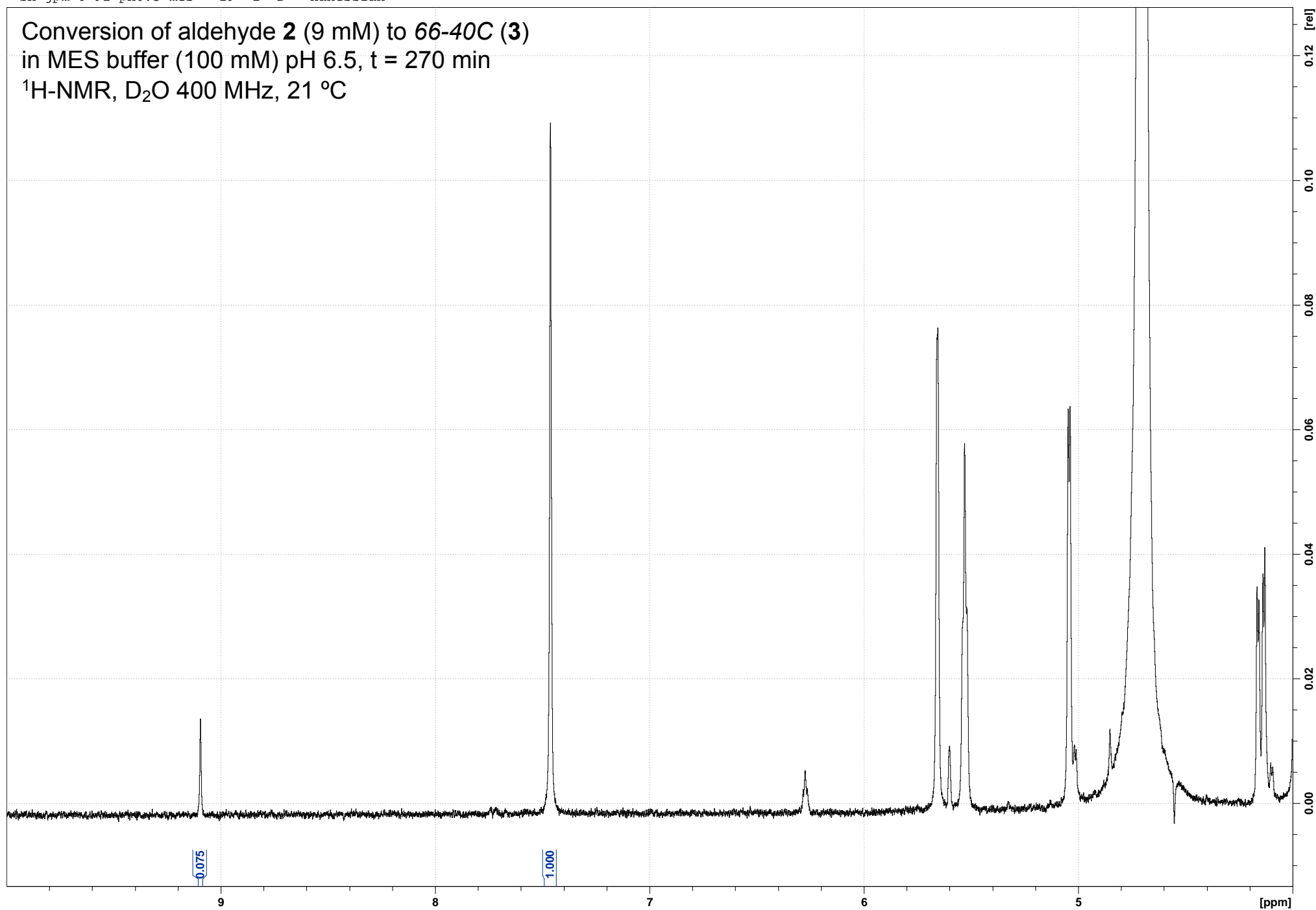
"sh-jpm-6-91-ph6.5 mes" 28 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 260 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



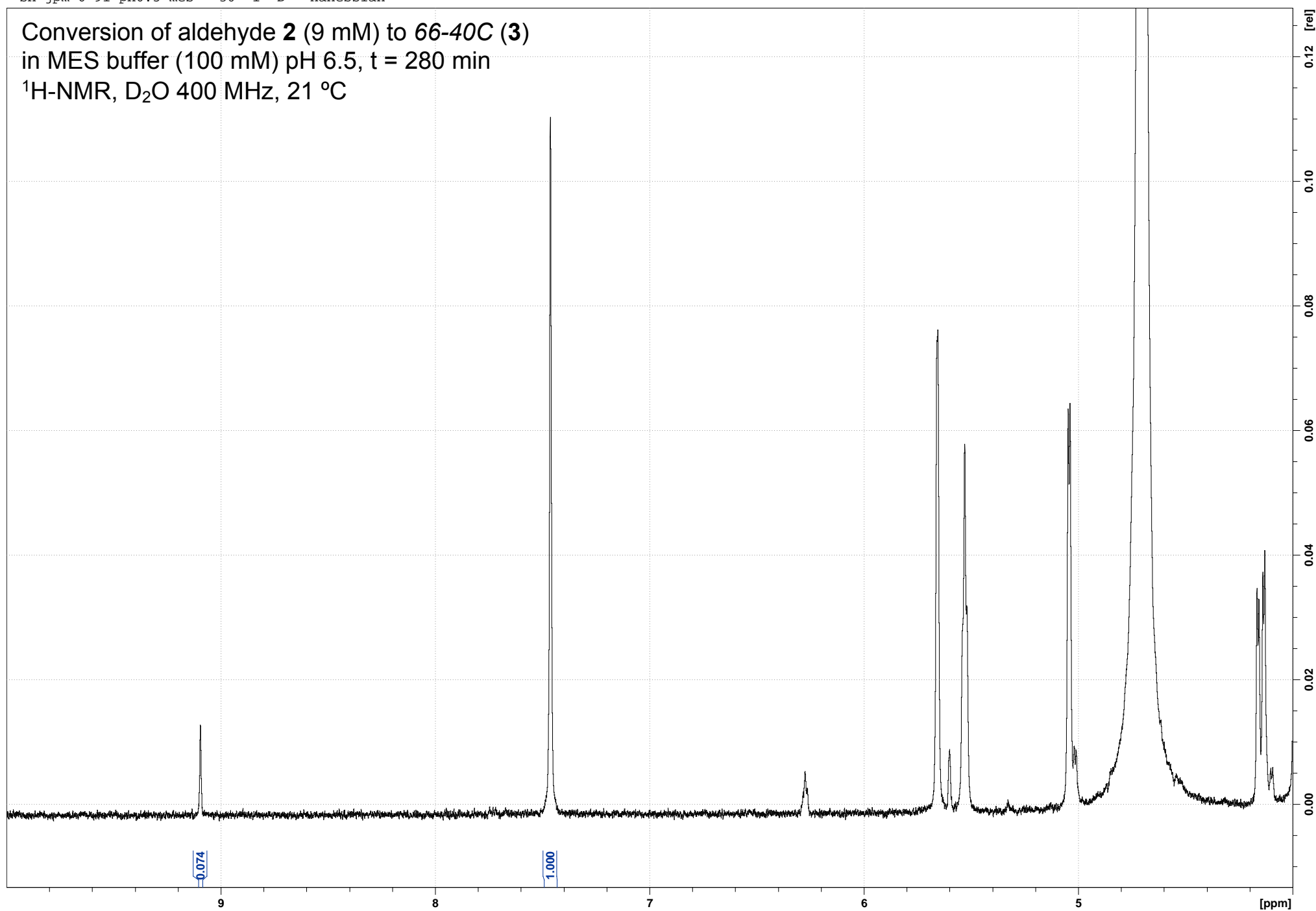
"sh-jpm-6-91-ph6.5 mes" 29 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 270 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



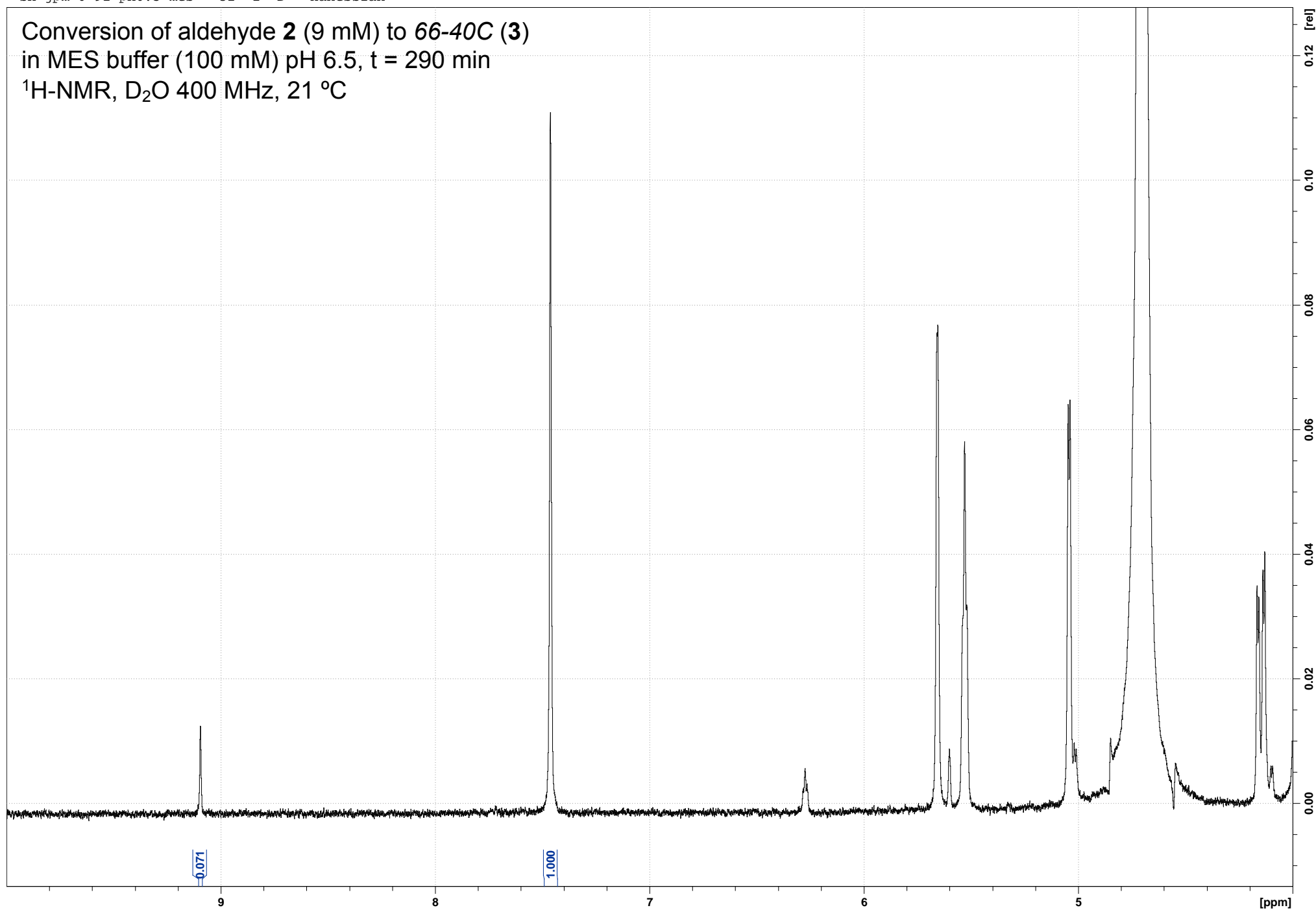
"sh-jpm-6-91-ph6.5 mes" 30 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 280 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



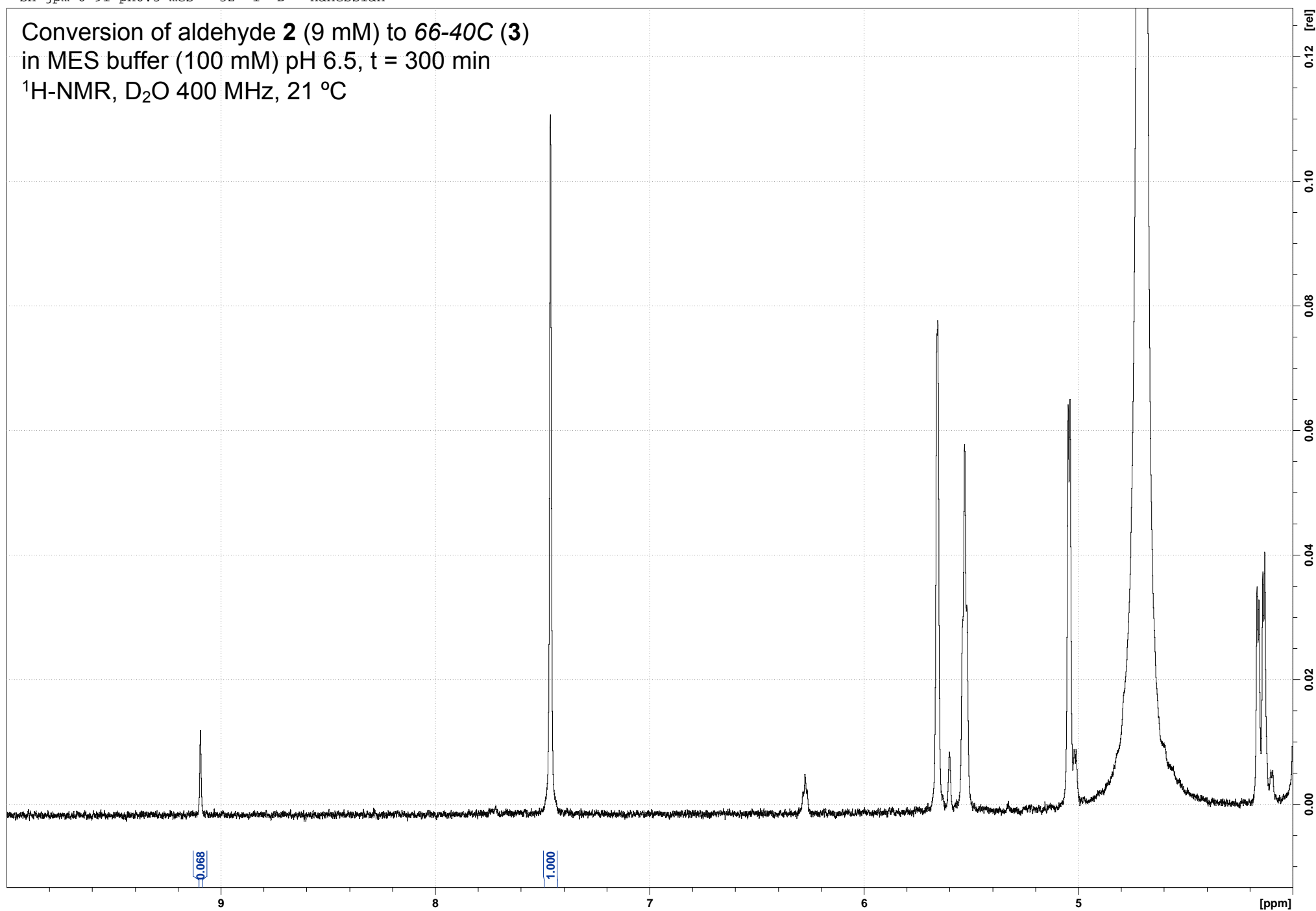
"sh-jpm-6-91-ph6.5 mes" 31 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 290 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



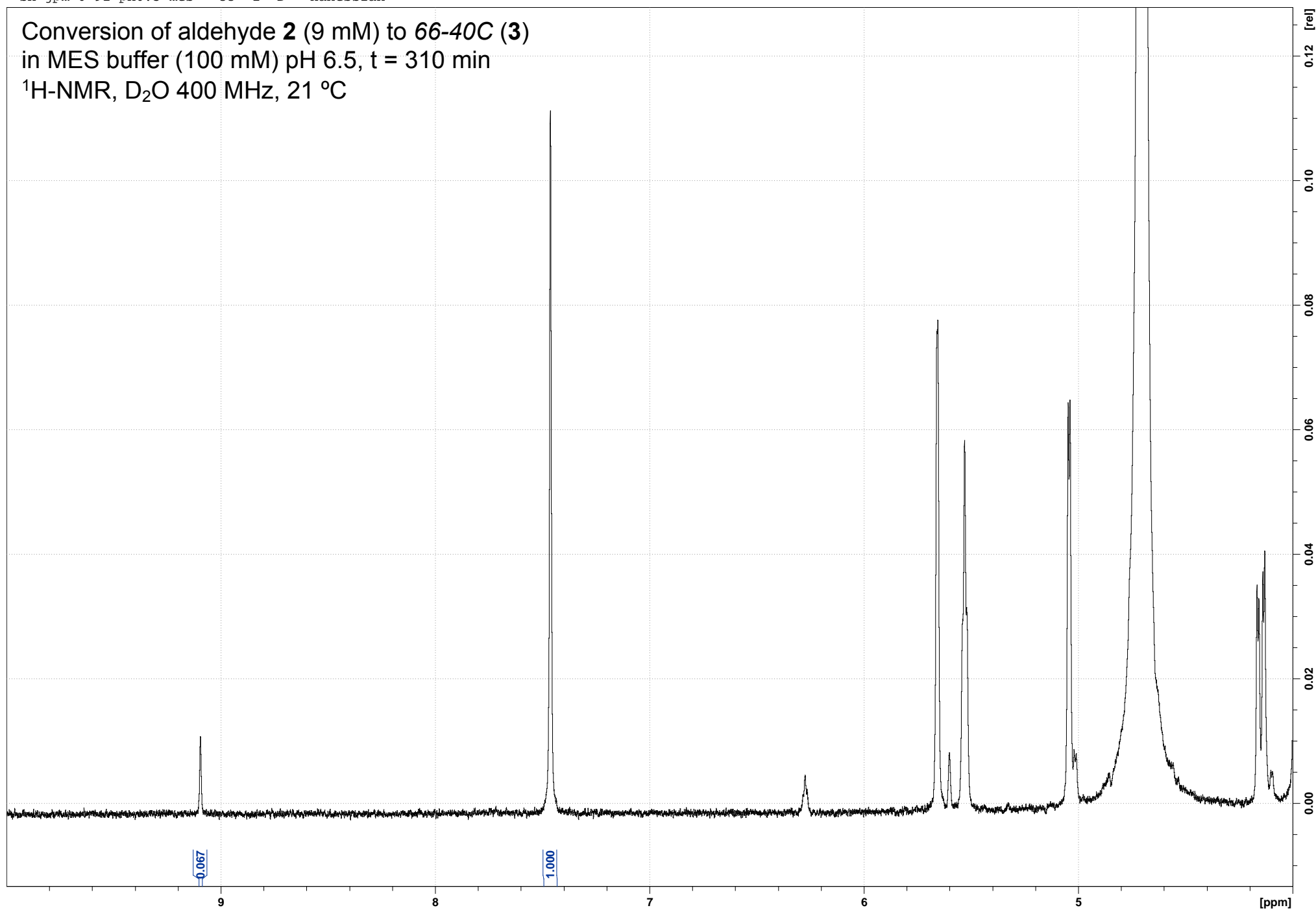
"sh-jpm-6-91-ph6.5 mes" 32 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 300 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



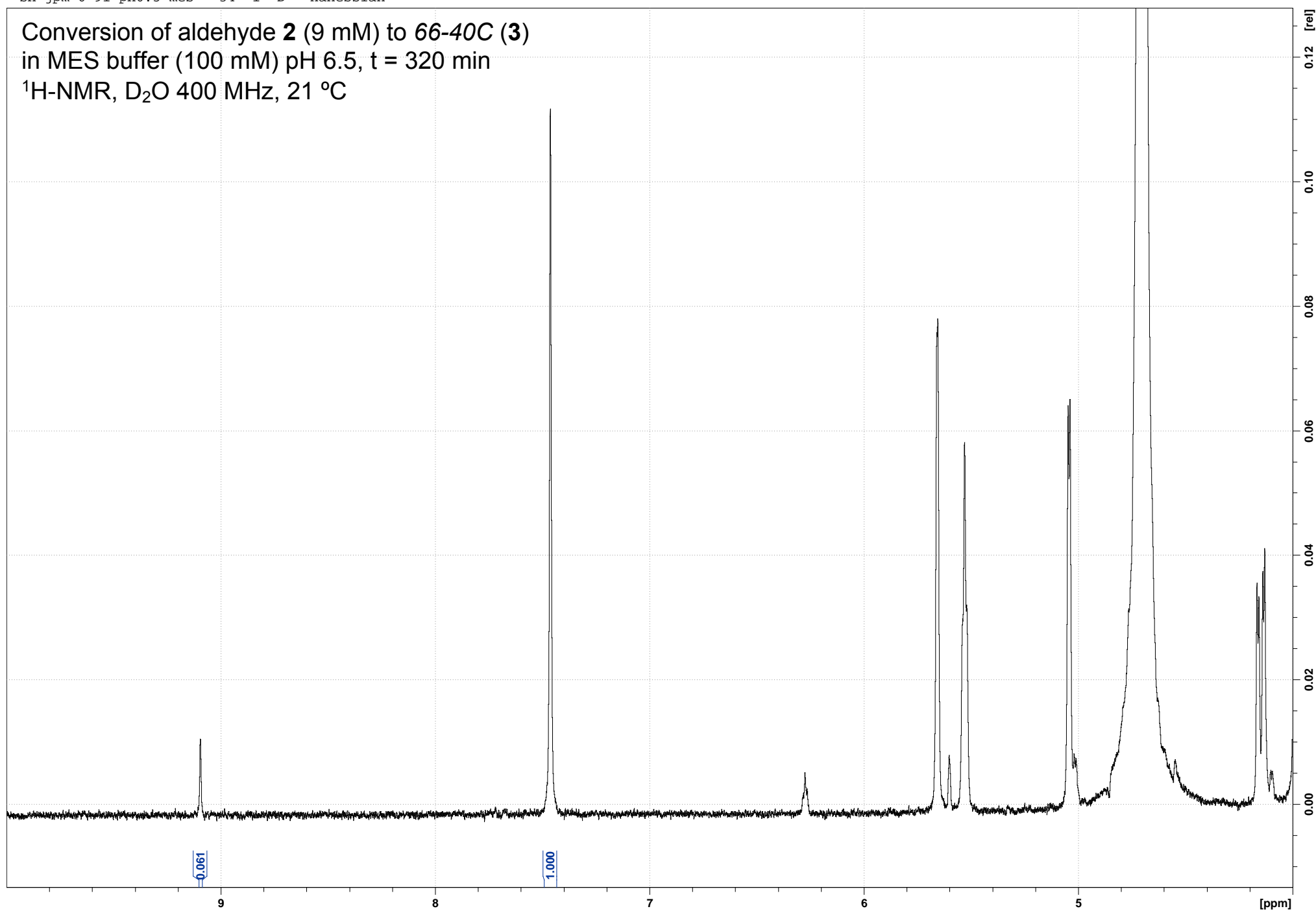
"sh-jpm-6-91-ph6.5 mes" 33 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 310 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



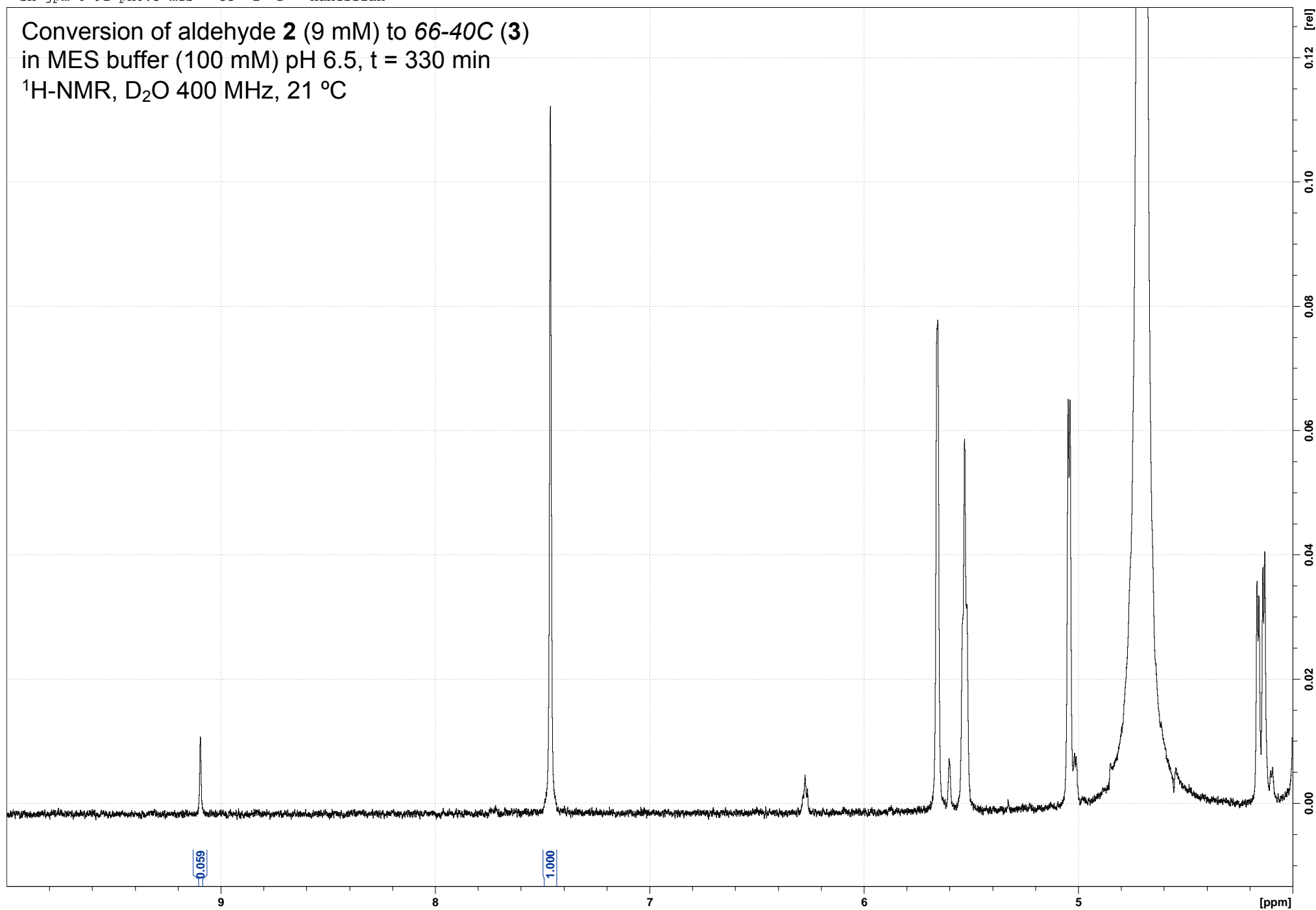
"sh-jpm-6-91-ph6.5 mes" 34 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 320 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



"sh-jpm-6-91-ph6.5 mes" 35 1 D: Hanessian

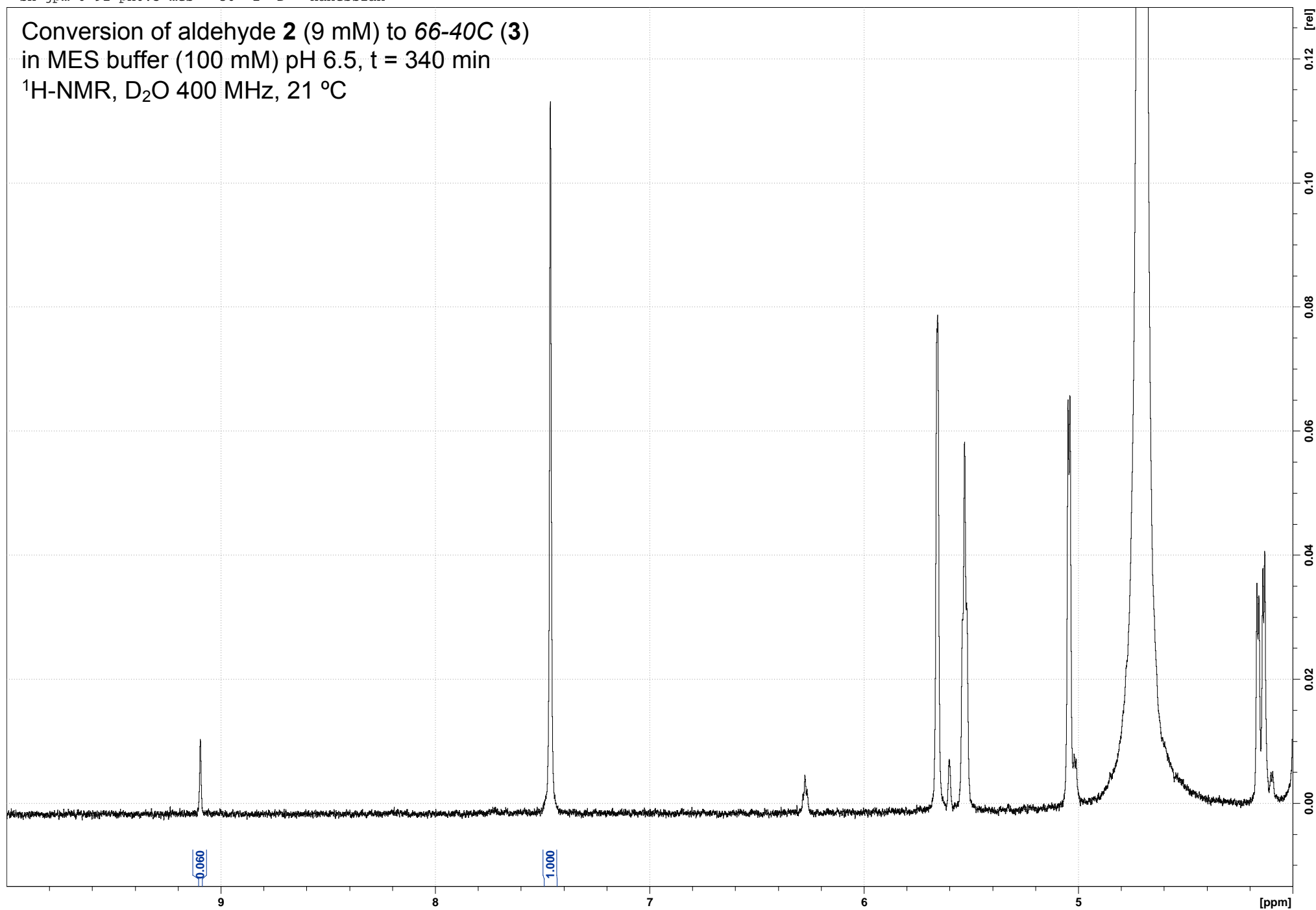
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 330 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





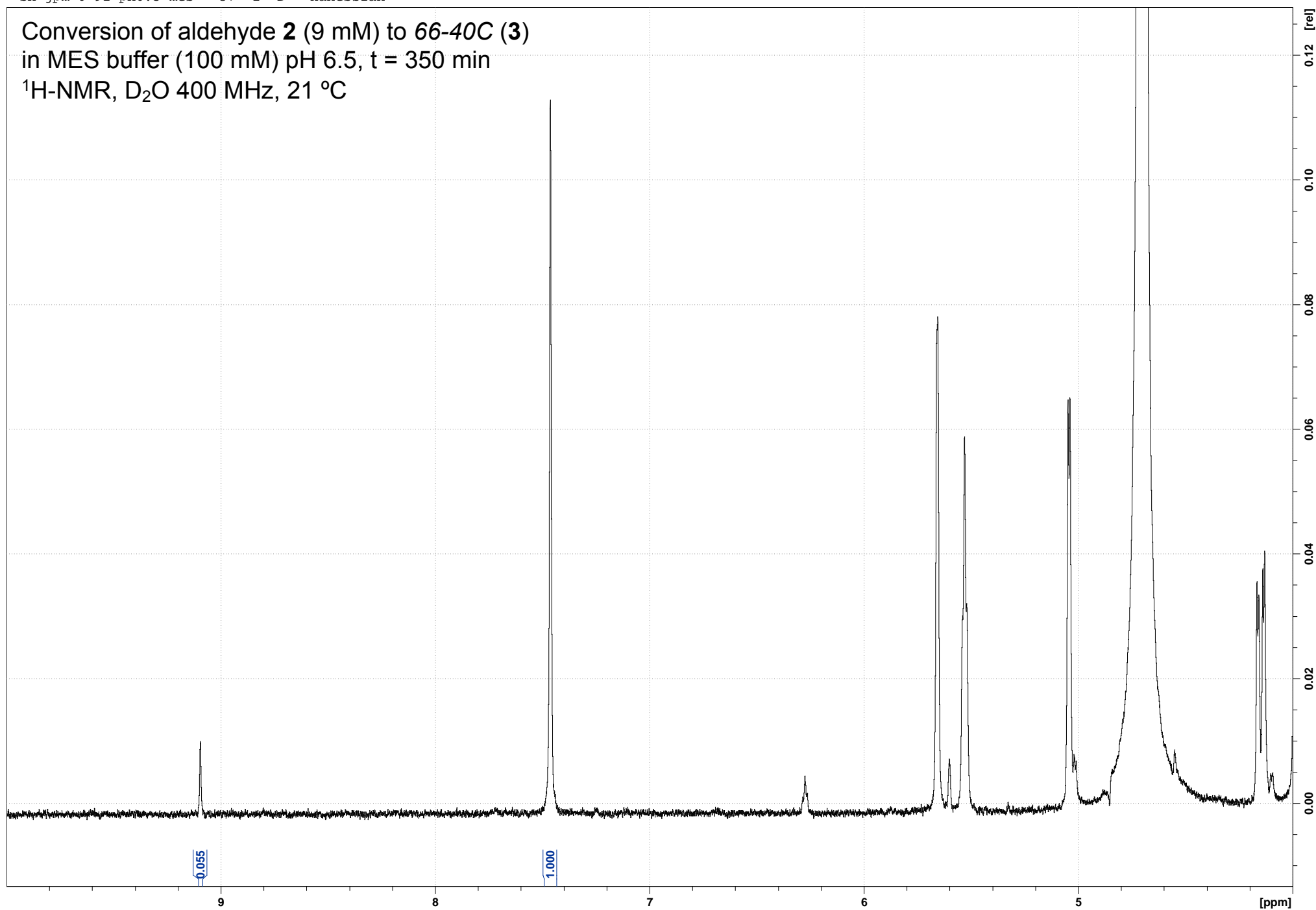
"sh-jpm-6-91-ph6.5 mes" 36 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 340 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



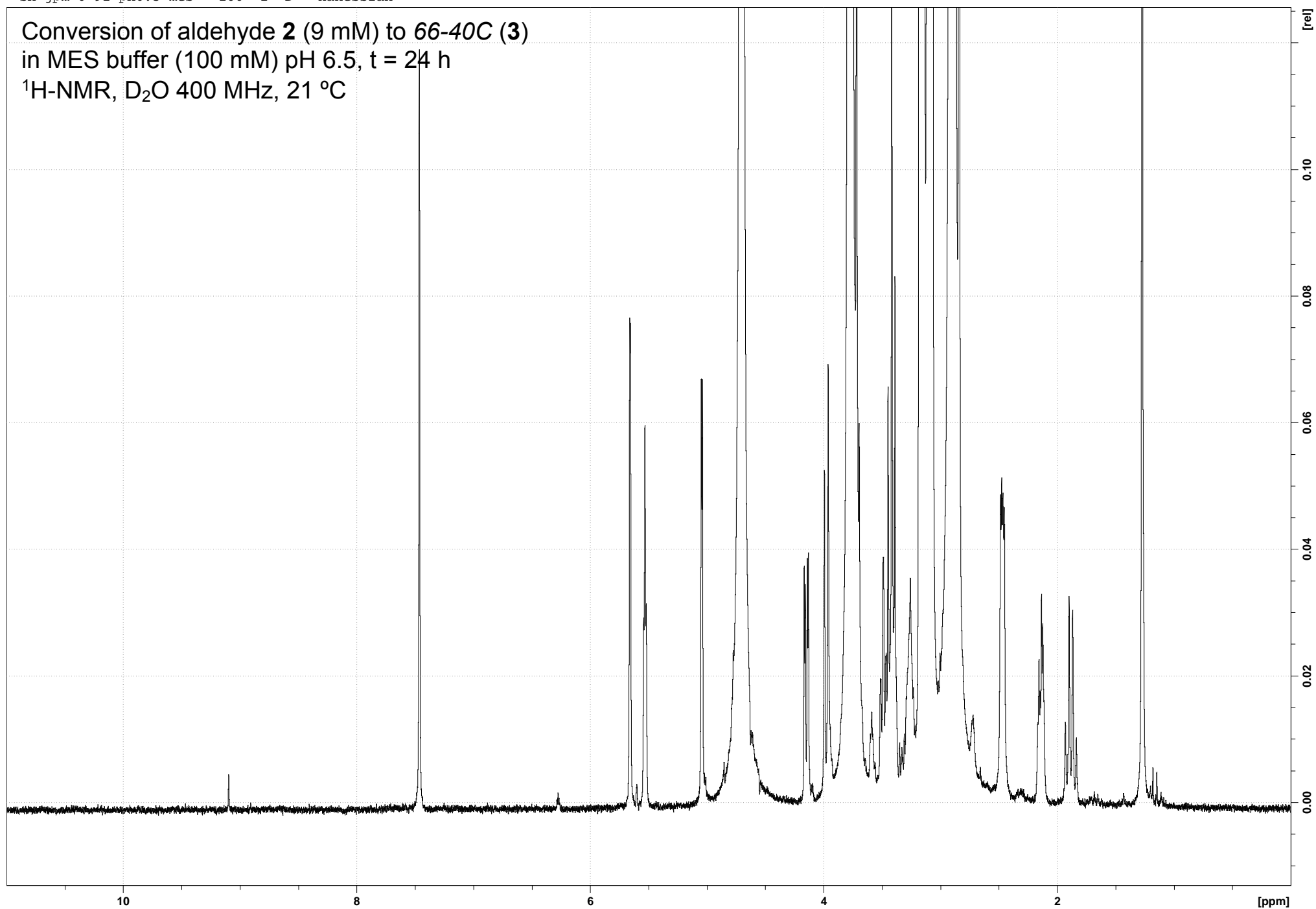
"sh-jpm-6-91-ph6.5 mes" 37 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 350 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



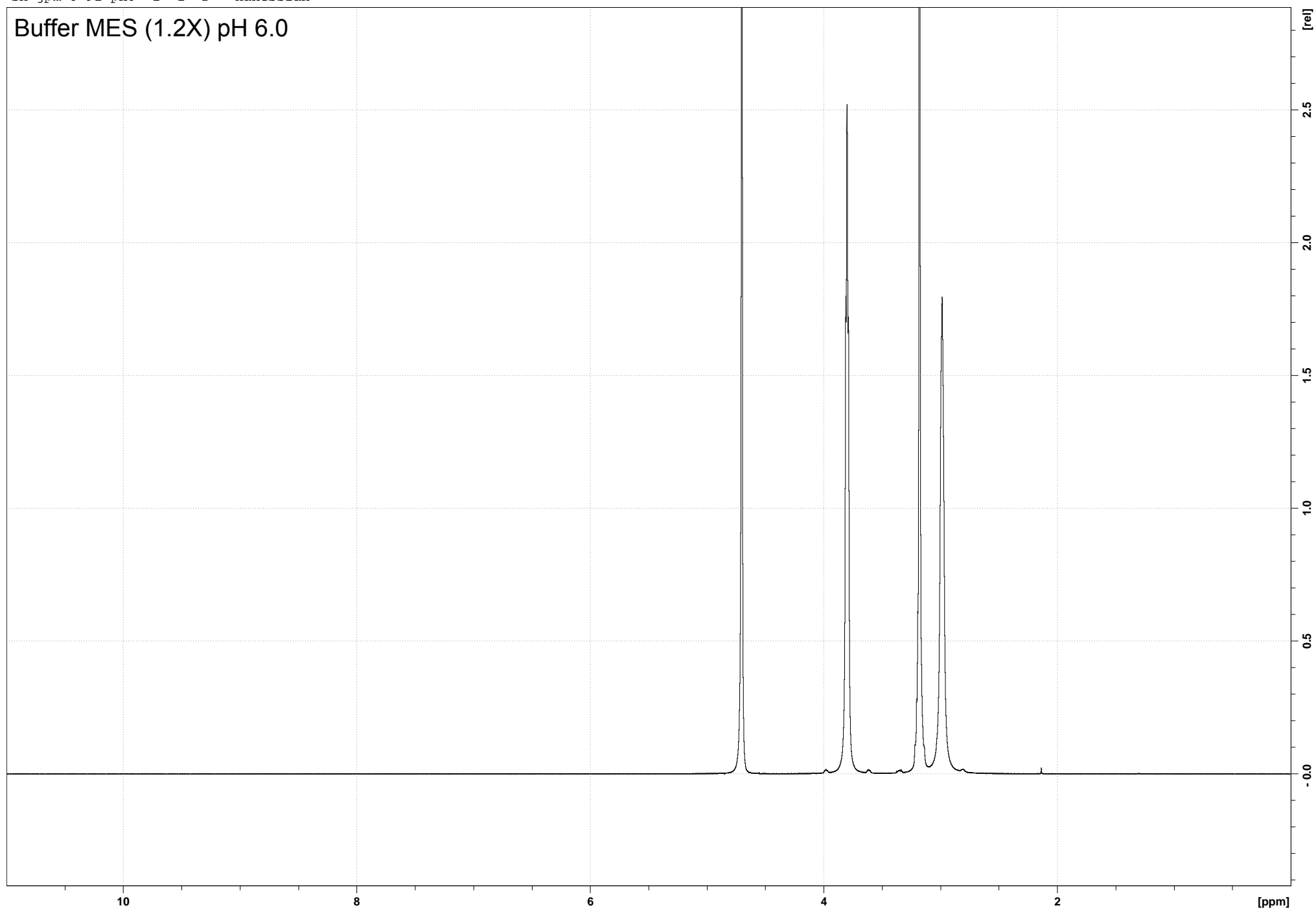
"sh-jpm-6-91-ph6.5 mes" 100 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 24 h  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



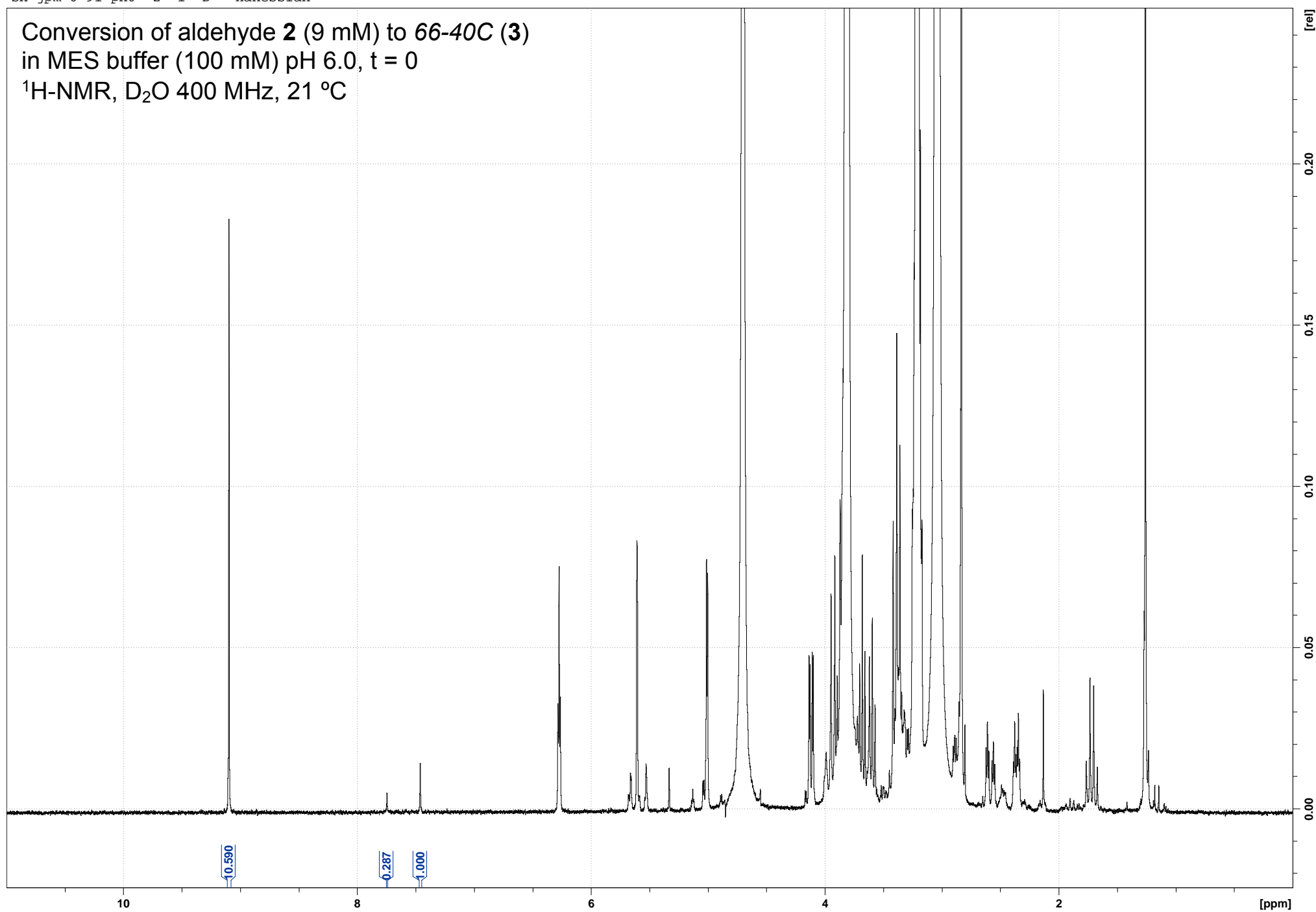
sh-jpm-6-91-ph6 1 1 D: Hanessian

Buffer MES (1.2X) pH 6.0



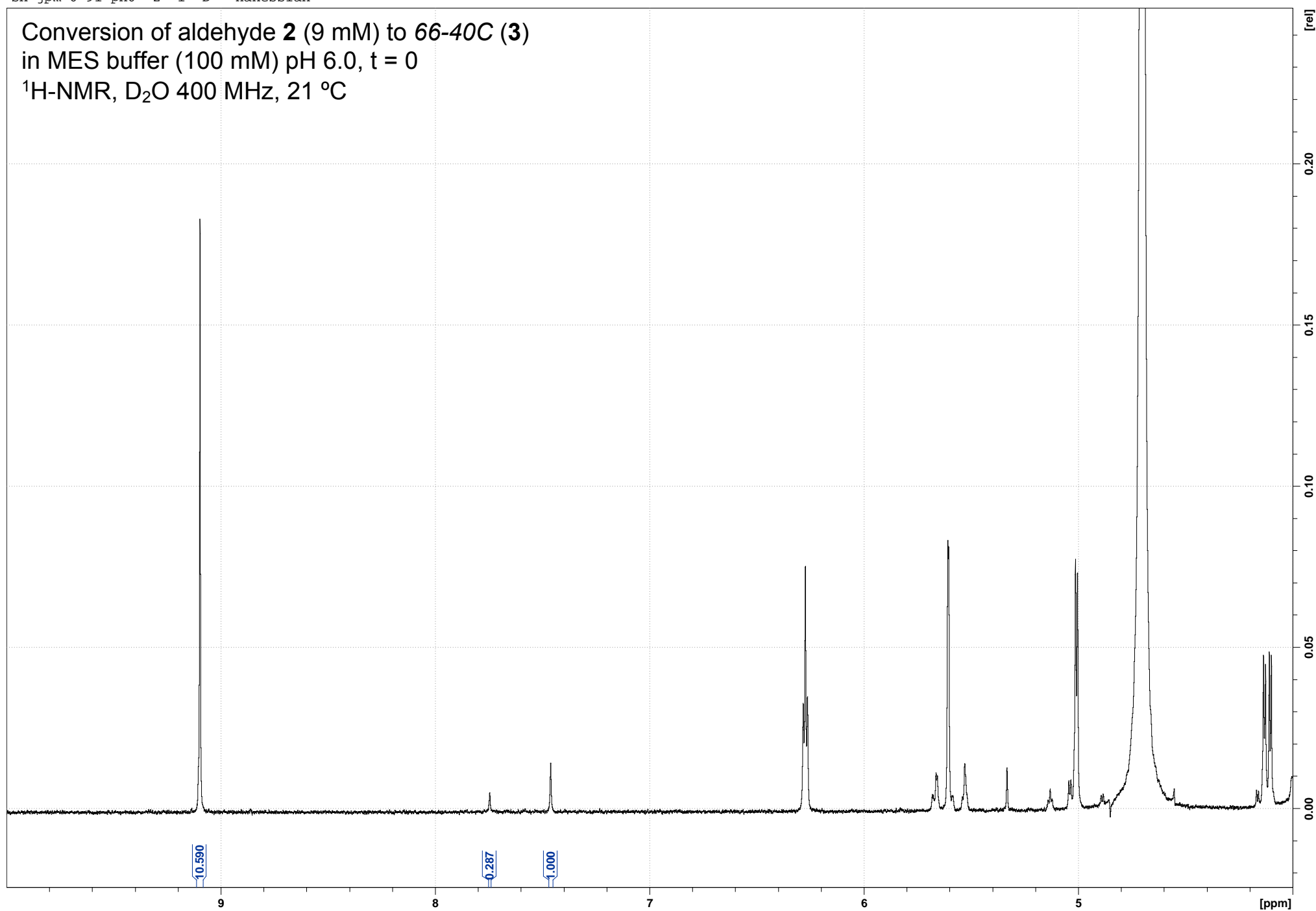
sh-jpm-6-91-ph6 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



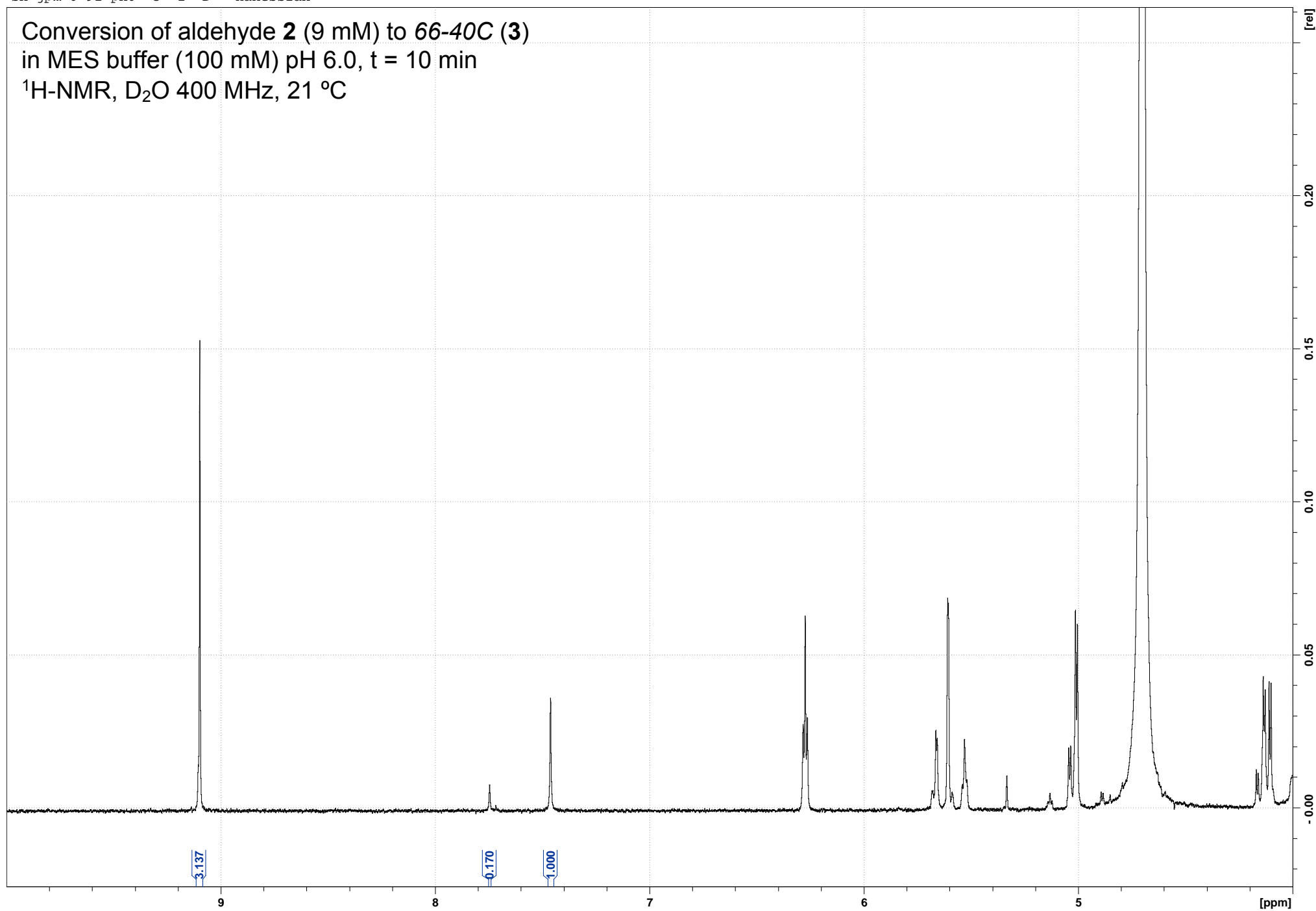
sh-jpm-6-91-ph6 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



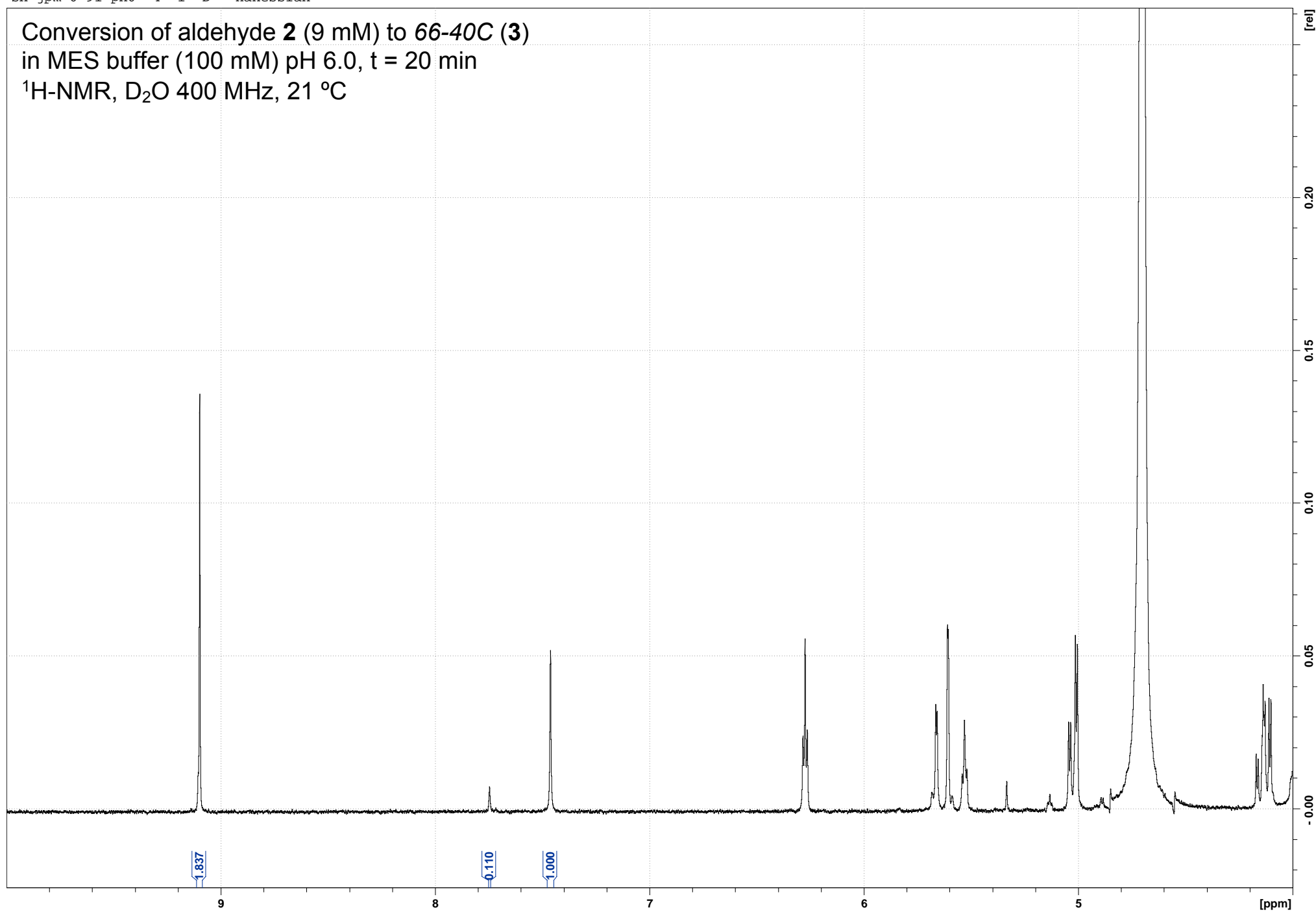
sh-jpm-6-91-ph6 3 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 10 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph6 4 1 D: Hanessian

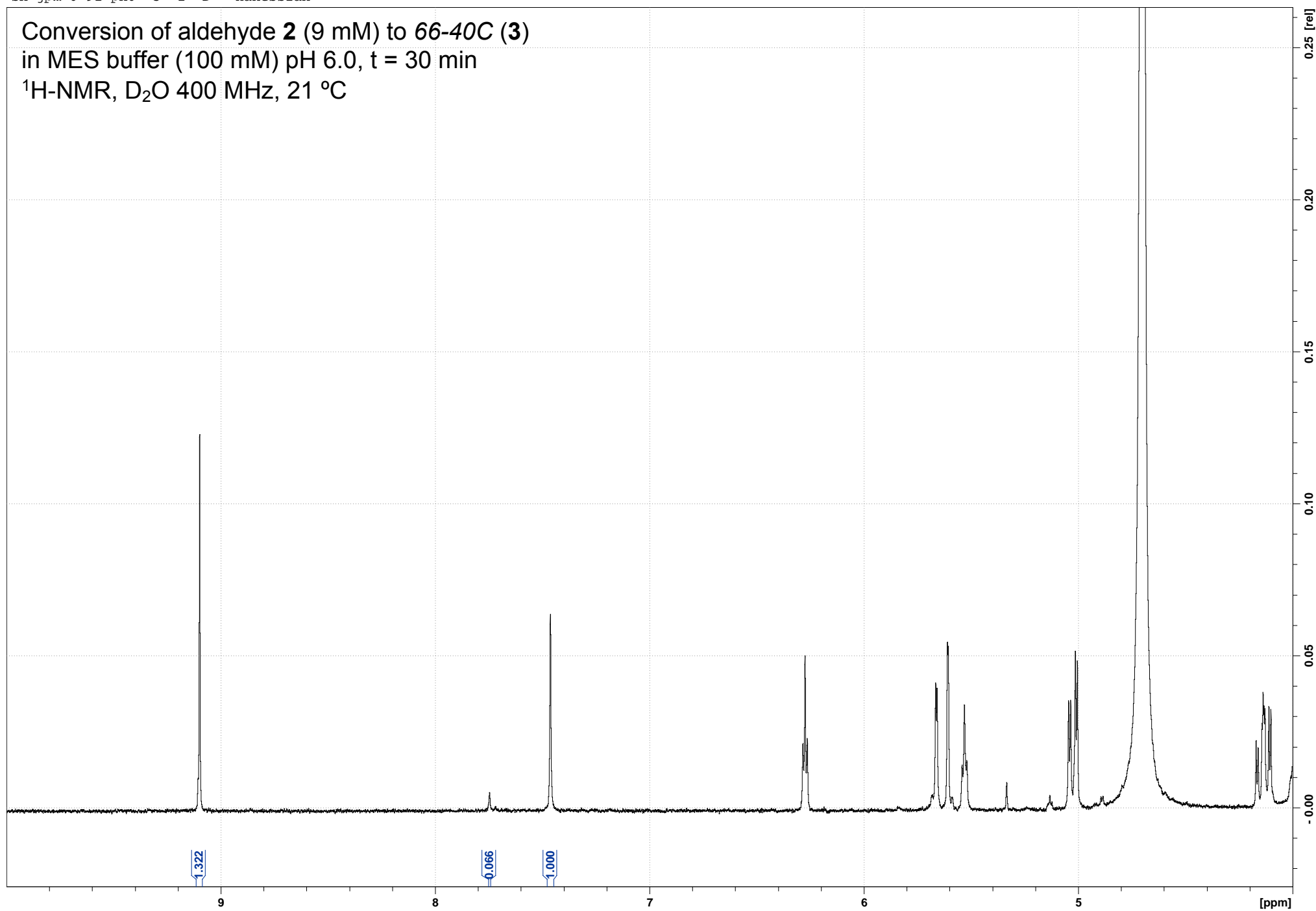
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 20 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





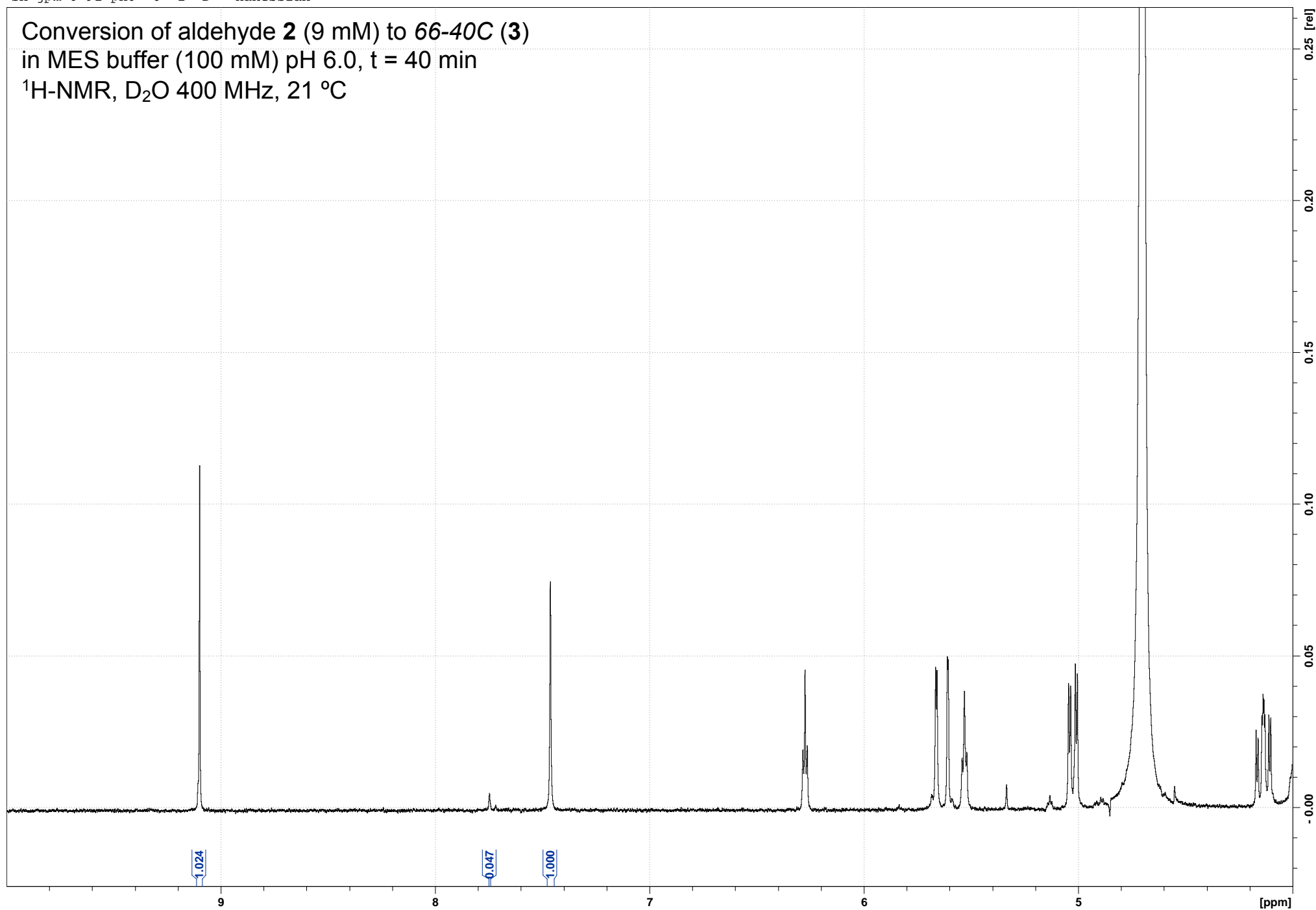
sh-jpm-6-91-ph6 5 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 30 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



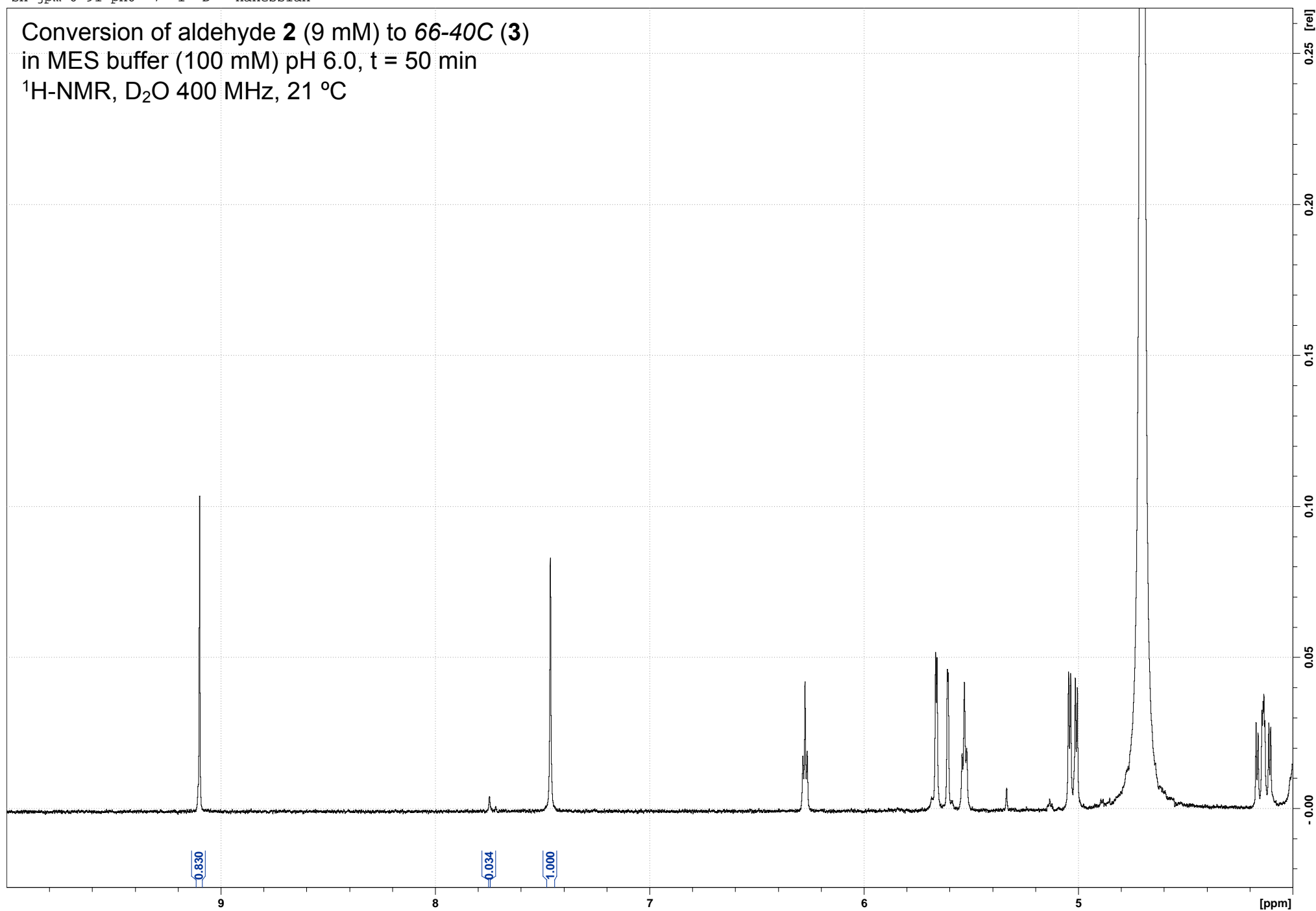
sh-jpm-6-91-ph6 6 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 40 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



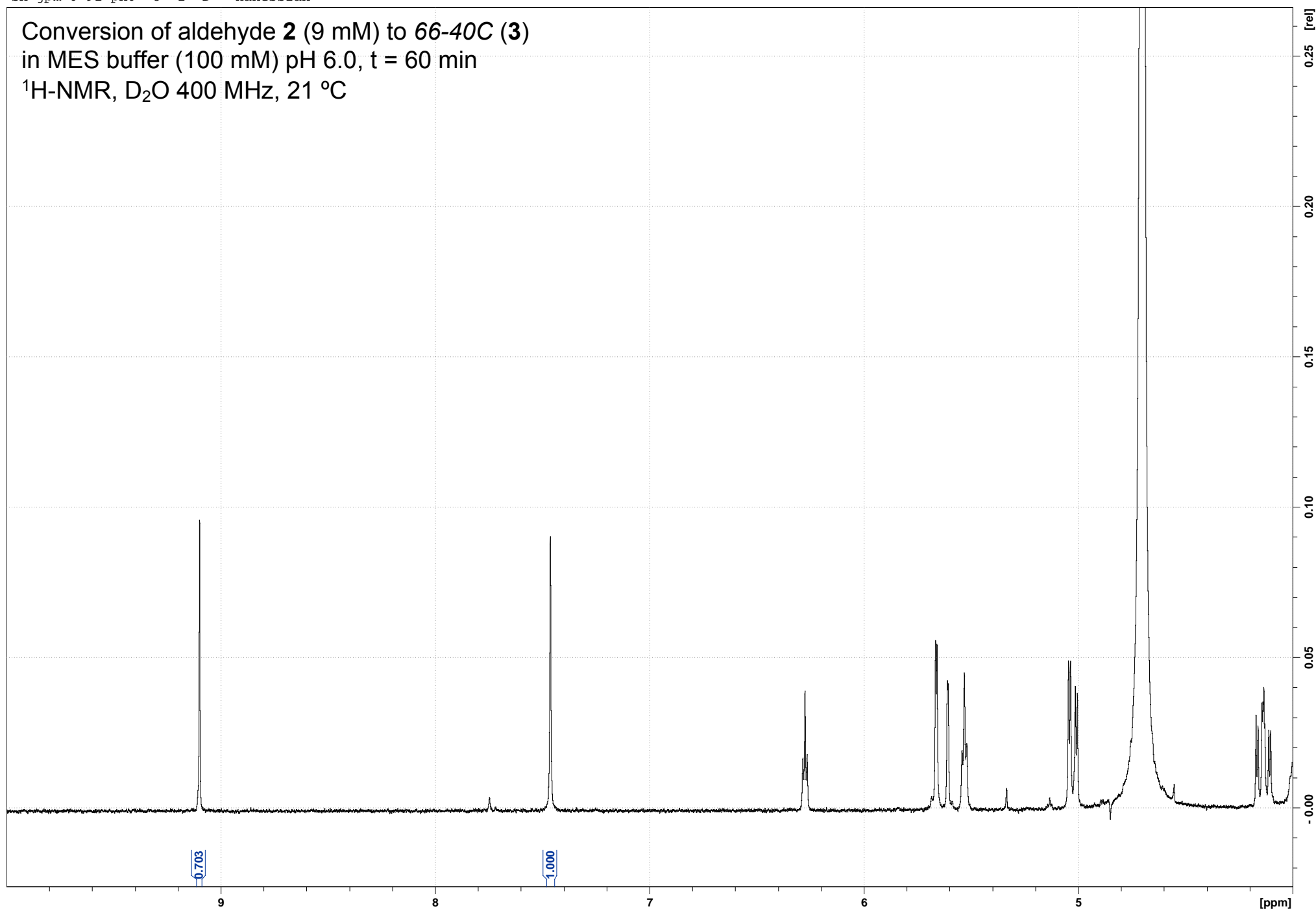
sh-jpm-6-91-ph6 7 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 50 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



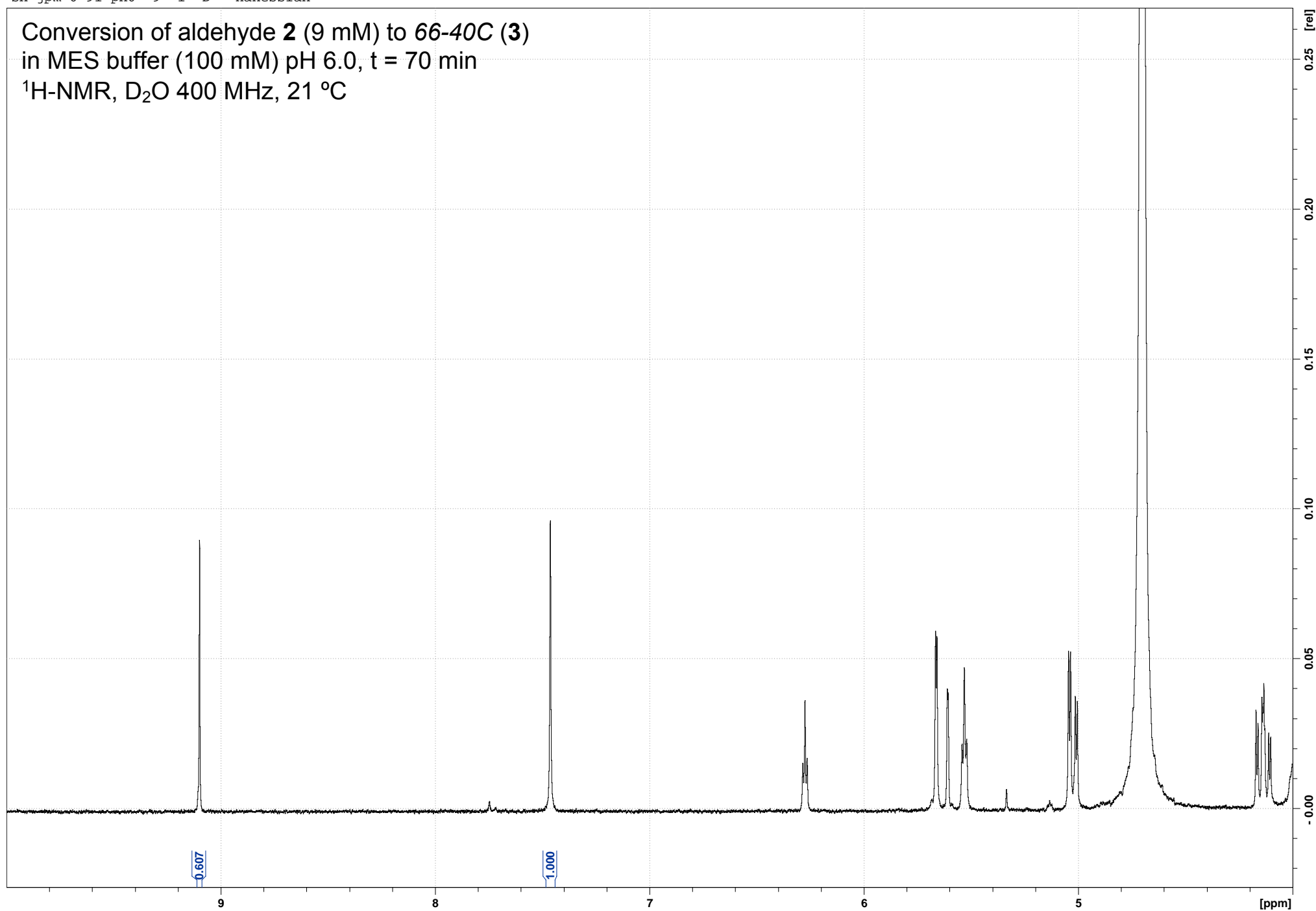
sh-jpm-6-91-ph6 8 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 60 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



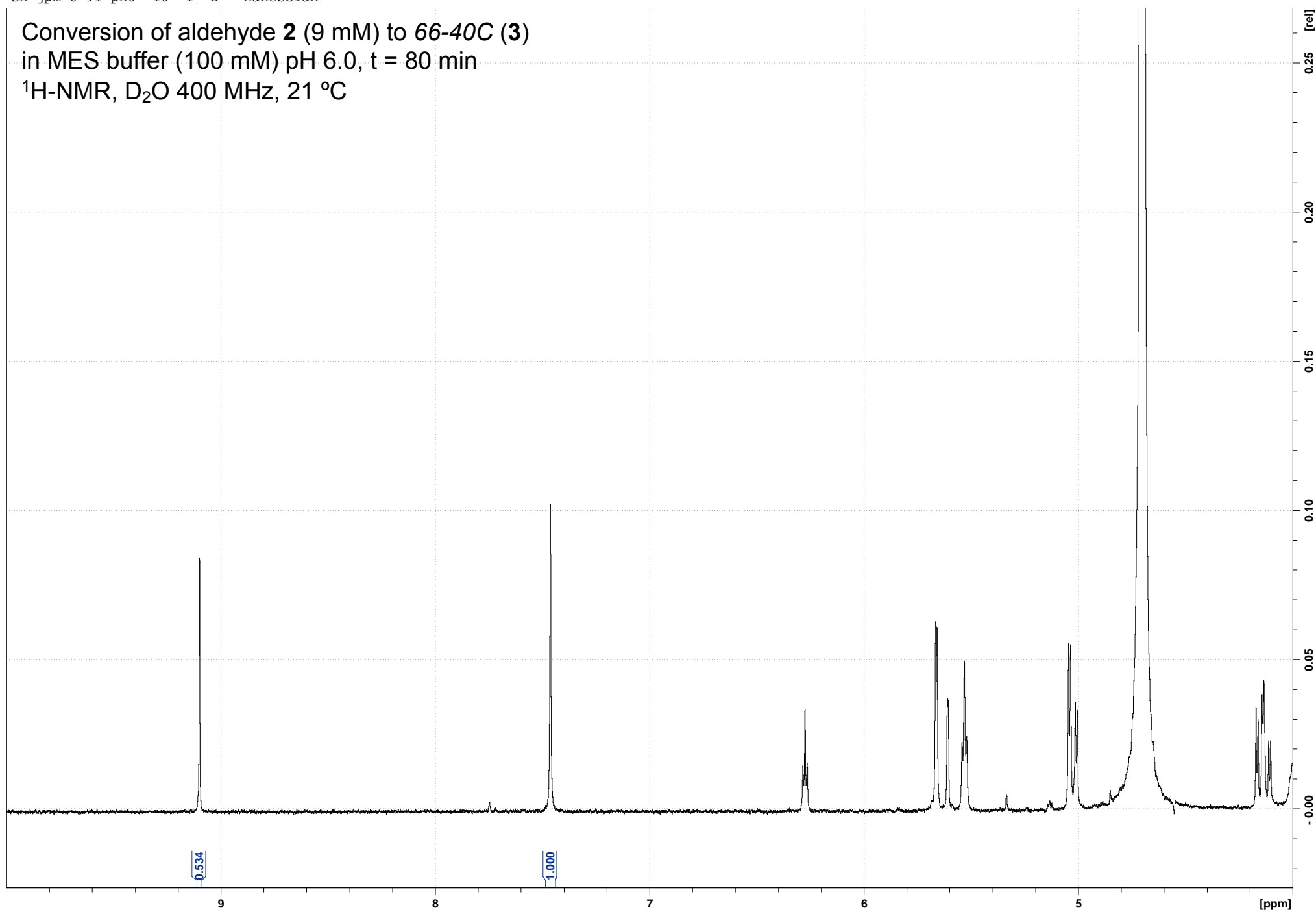
sh-jpm-6-91-ph6 9 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 70 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



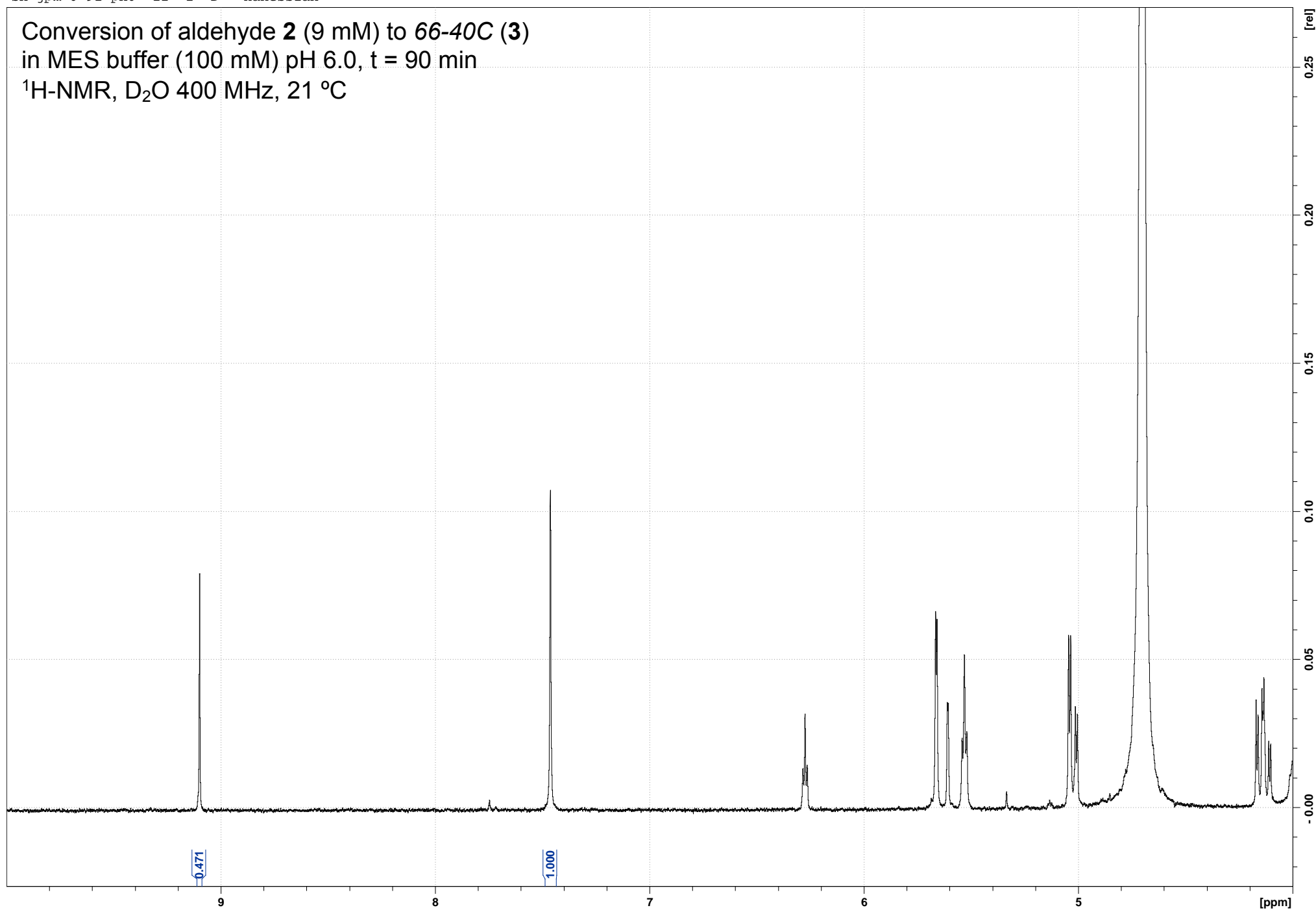
sh-jpm-6-91-ph6 10 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 80 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



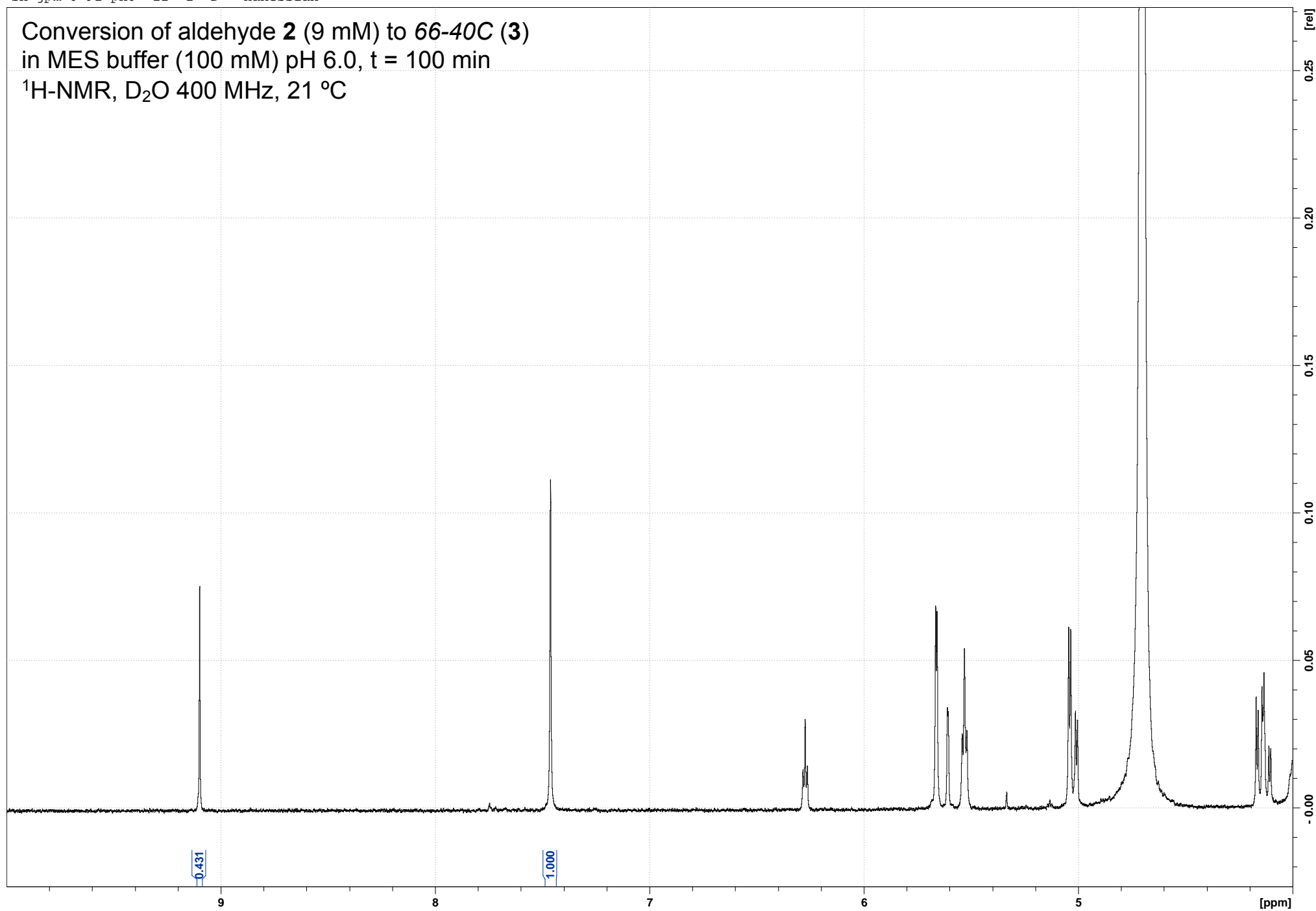
sh-jpm-6-91-ph6 11 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 90 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph6 12 1 D: Hanessian

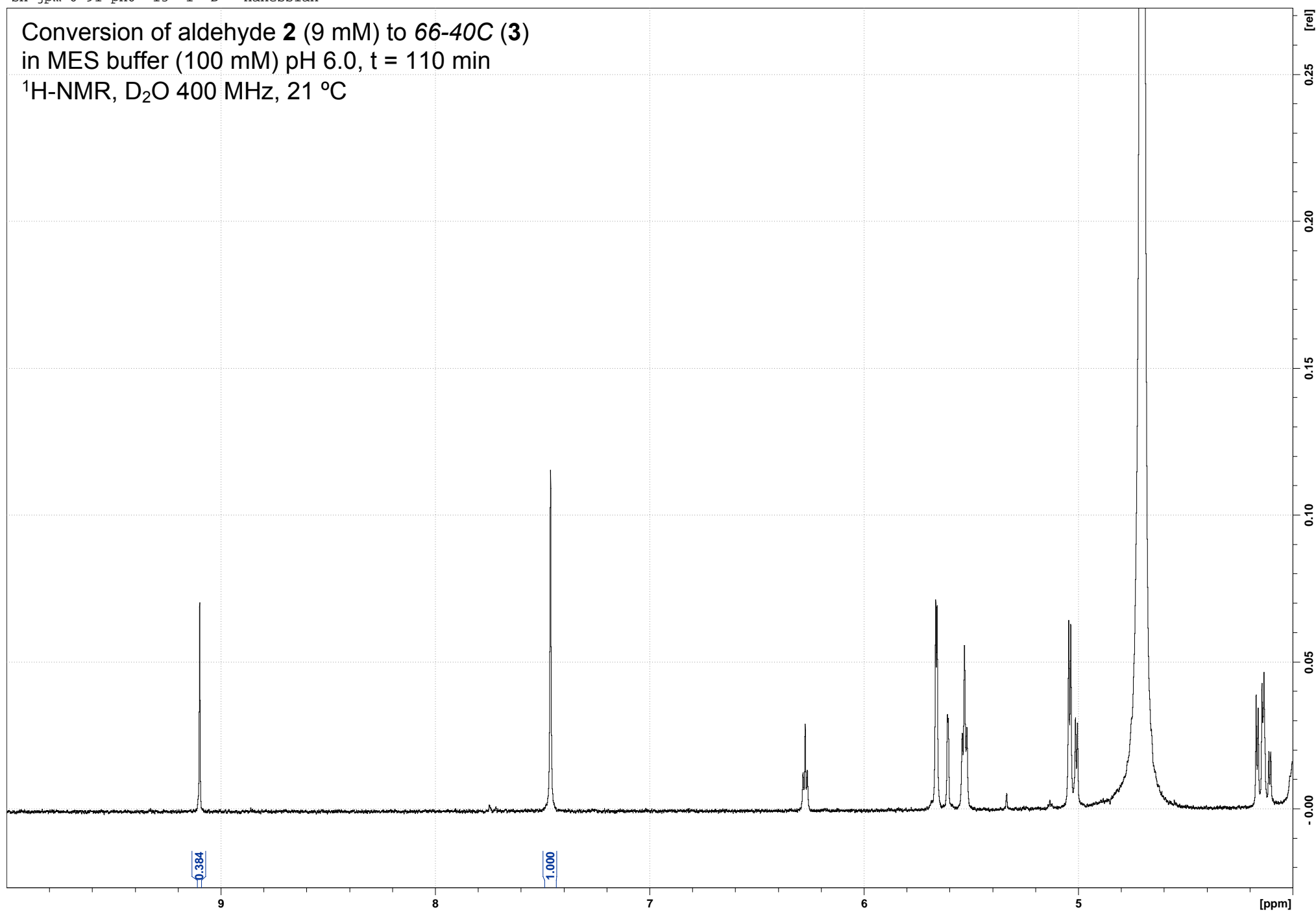
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 100 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





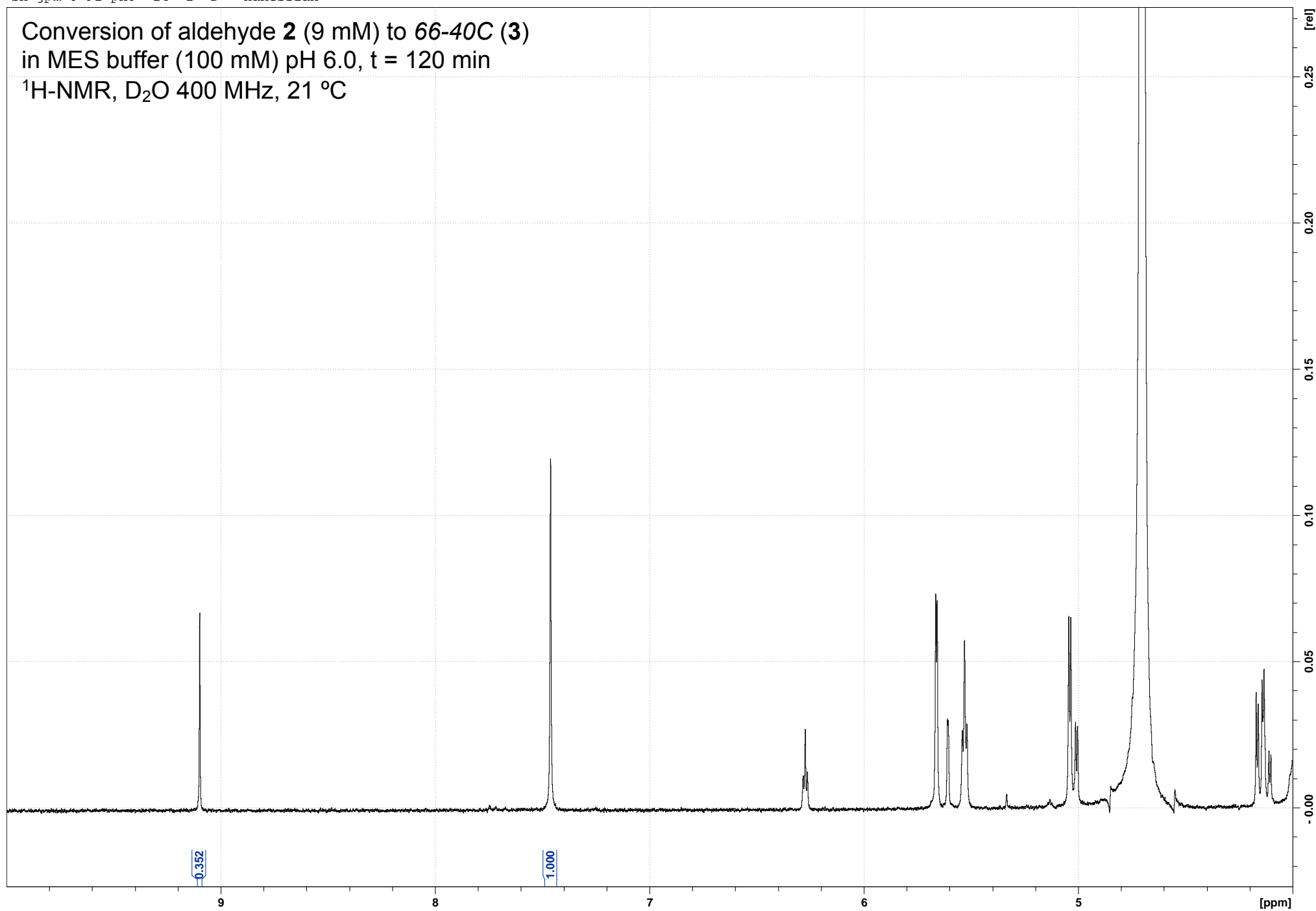
sh-jpm-6-91-ph6 13 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 110 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



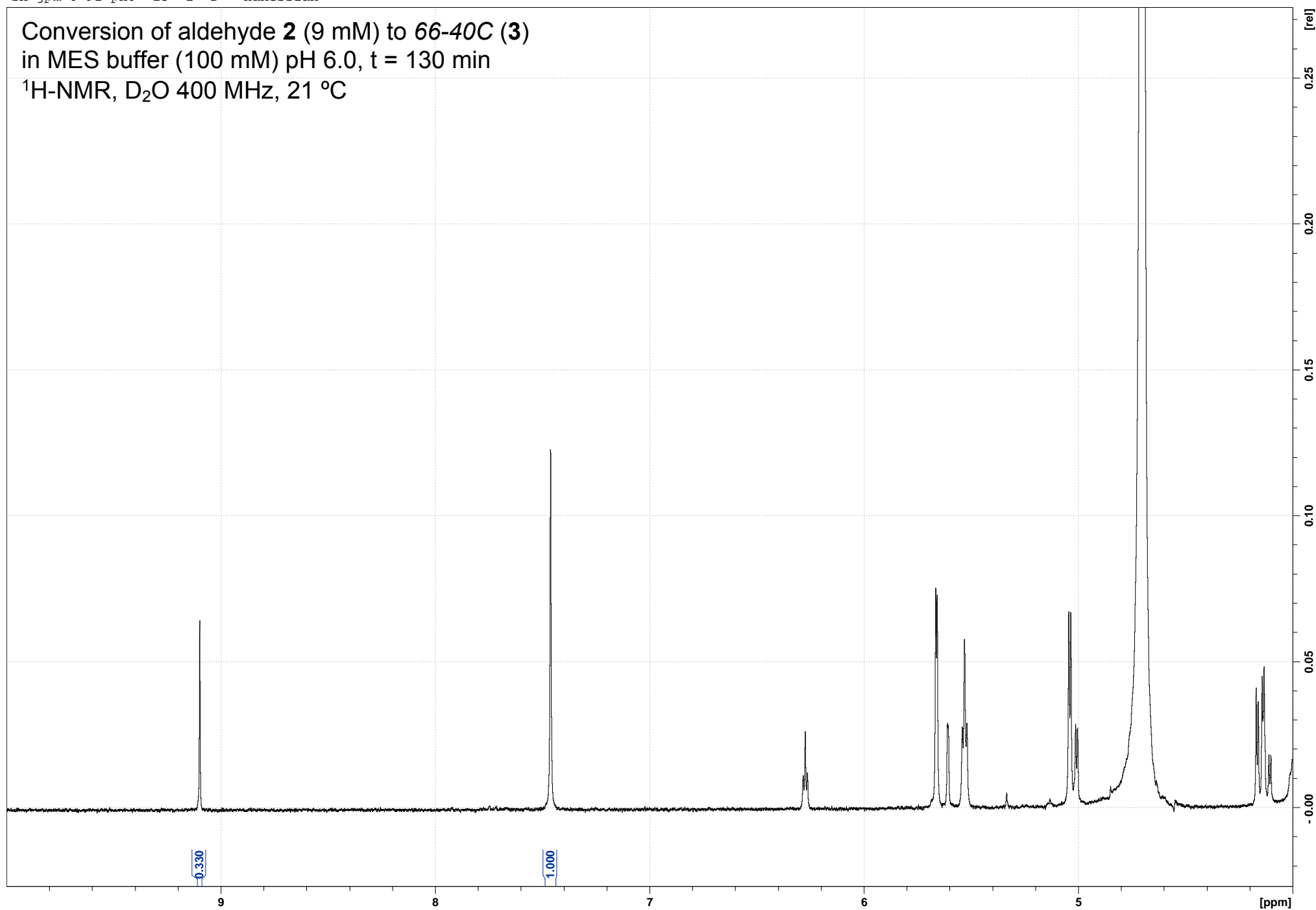
sh-jpm-6-91-ph6 14 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 120 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



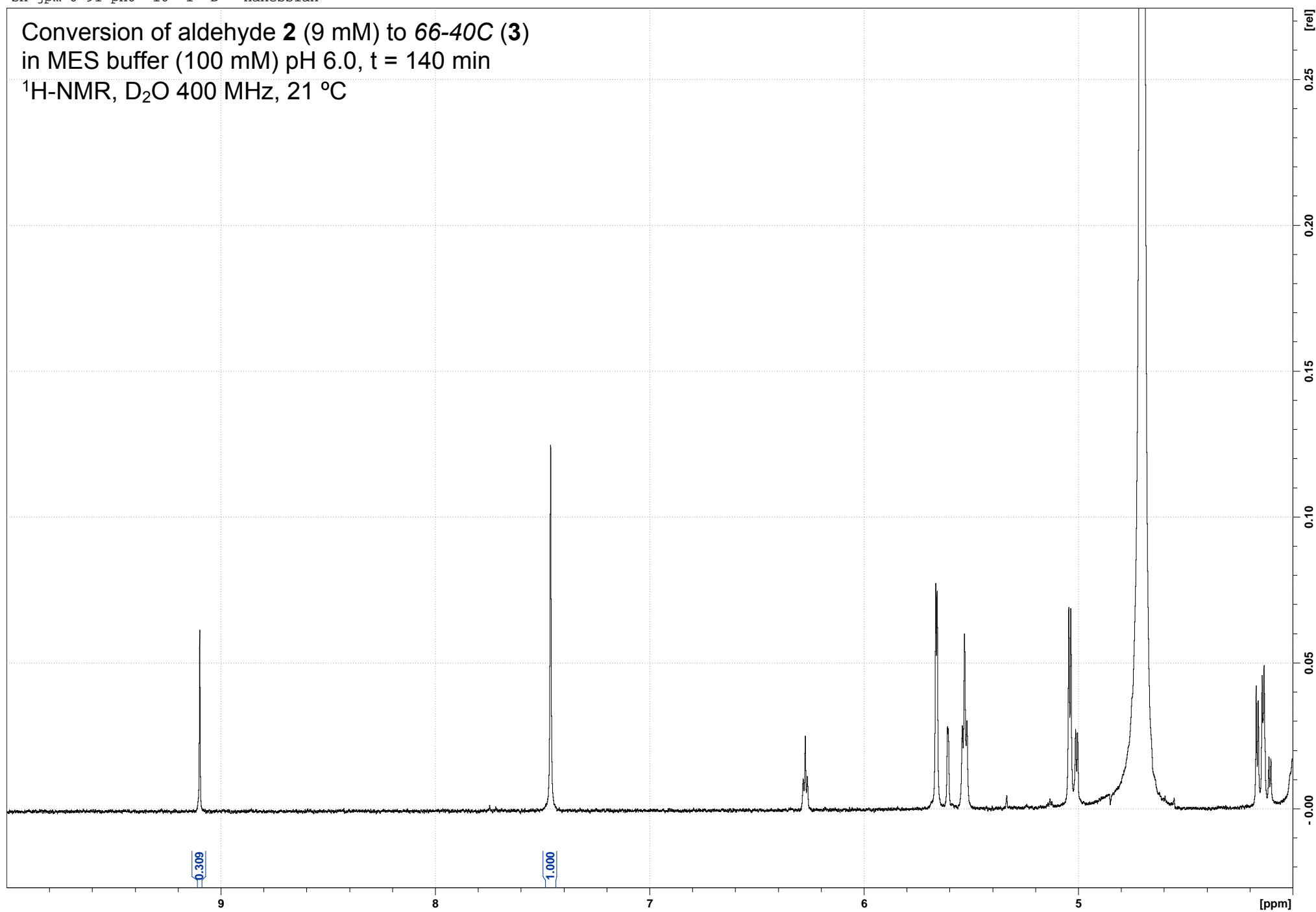
sh-jpm-6-91-ph6 15 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 130 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



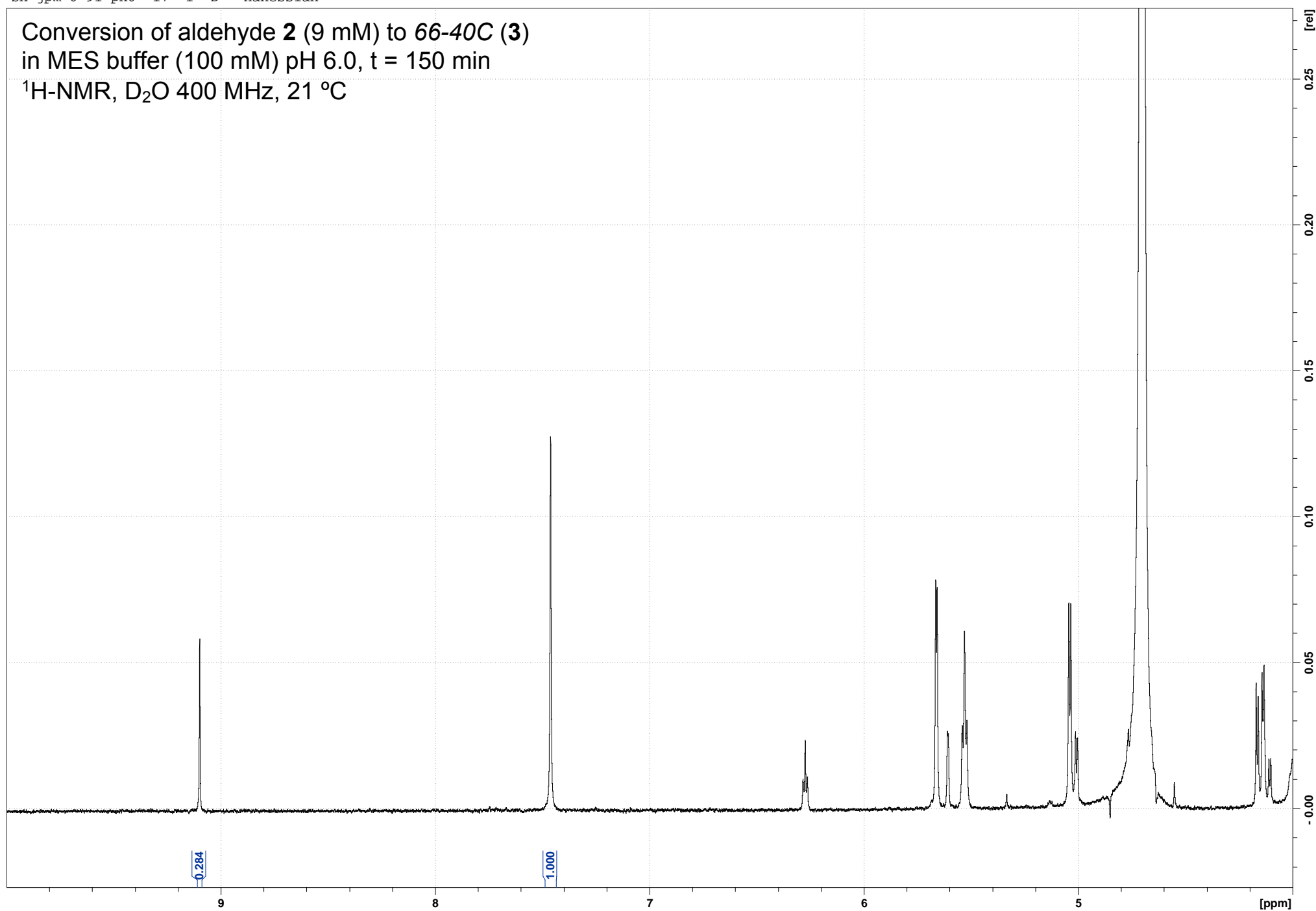
sh-jpm-6-91-ph6 16 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 140 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



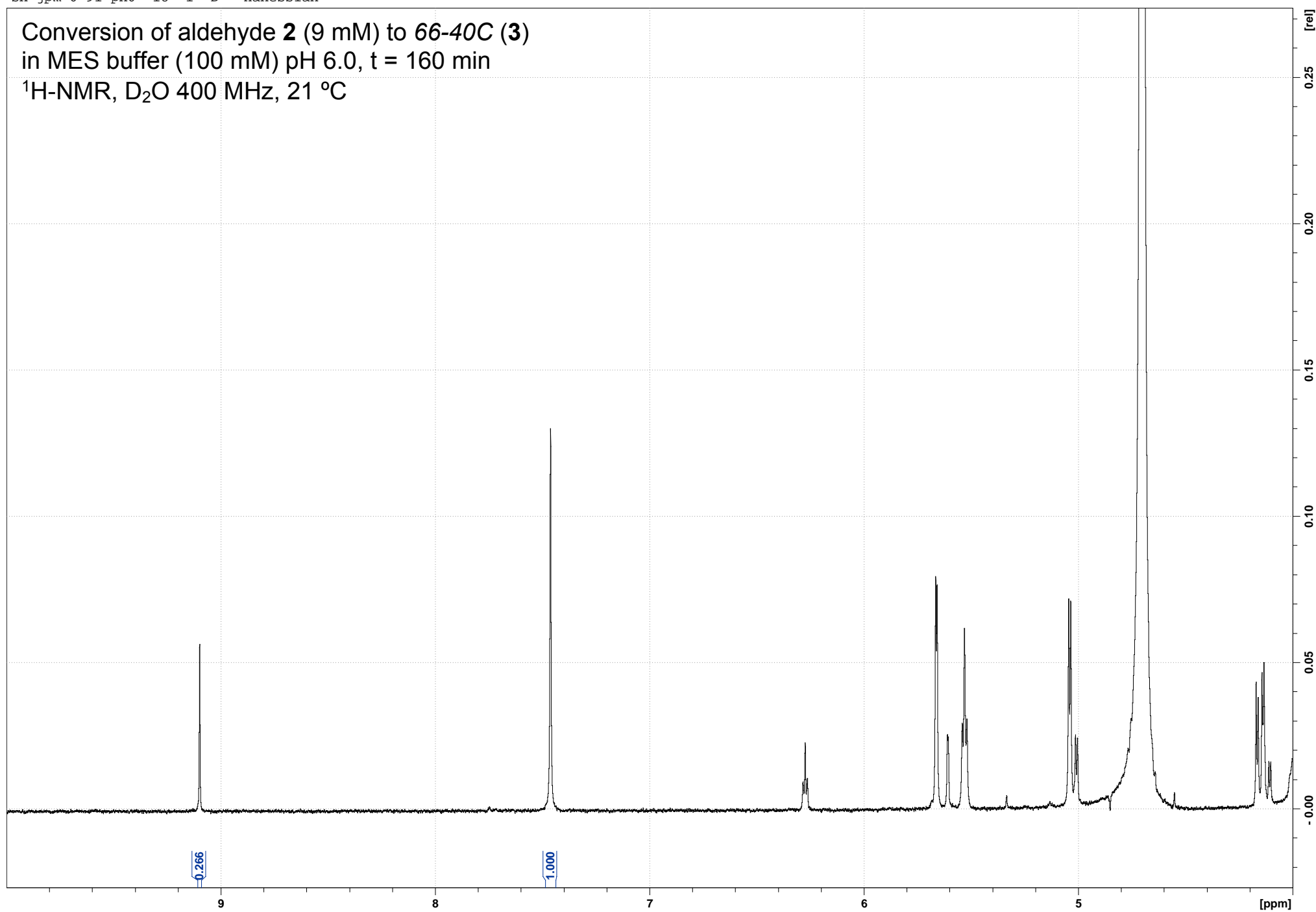
sh-jpm-6-91-ph6 17 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 150 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



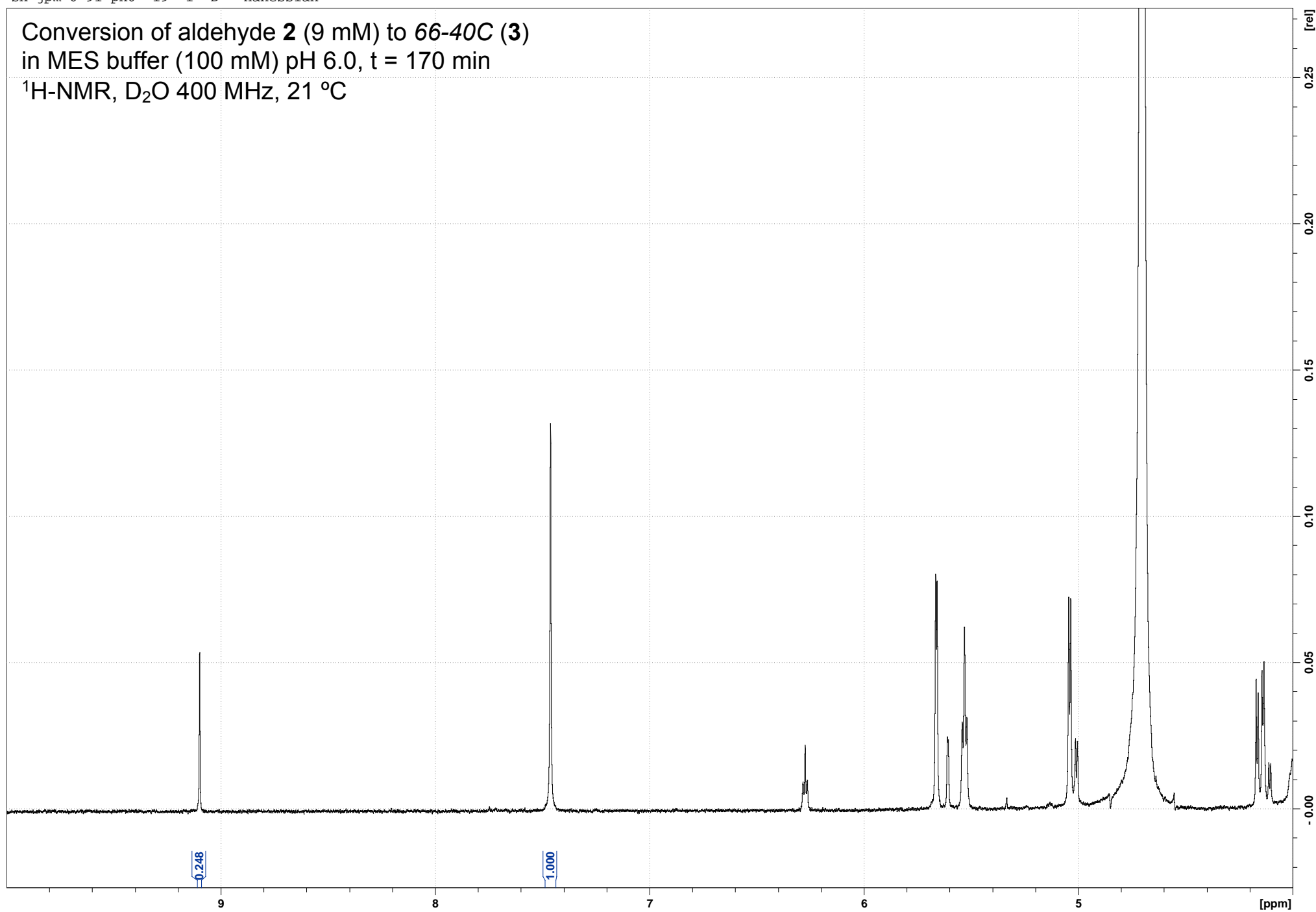
sh-jpm-6-91-ph6 18 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 160 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



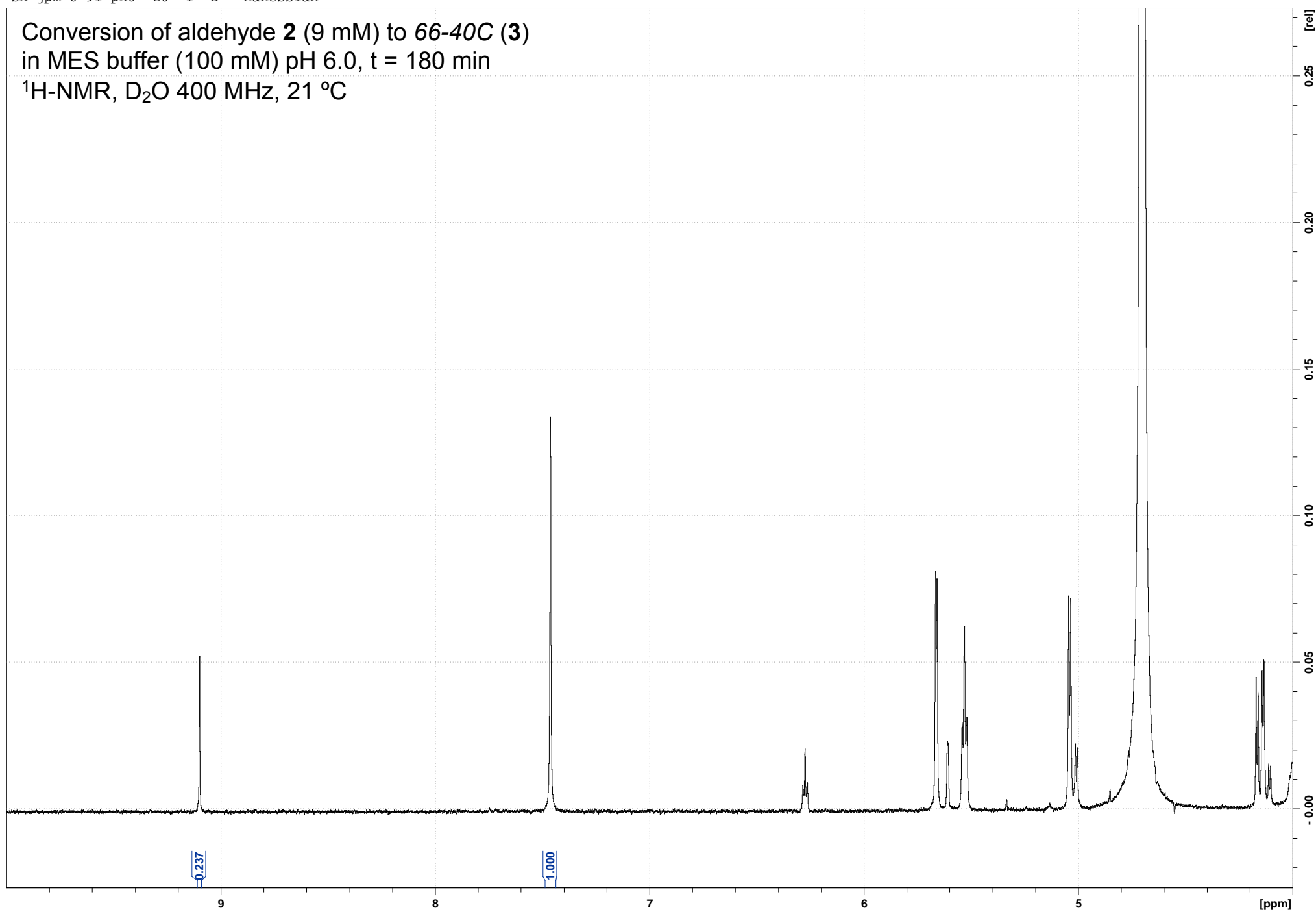
sh-jpm-6-91-ph6 19 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 170 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph6 20 1 D: Hanessian

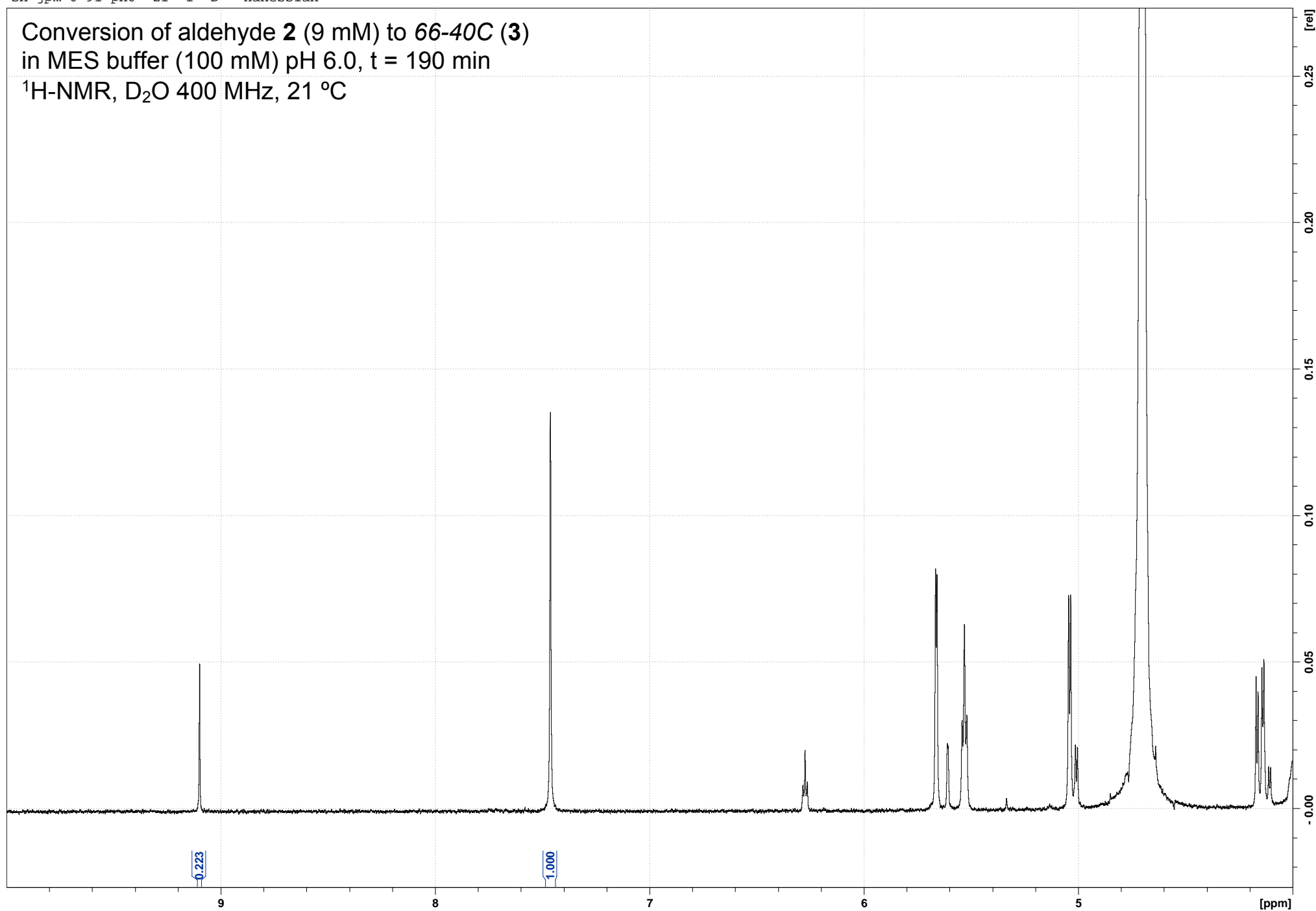
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 180 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





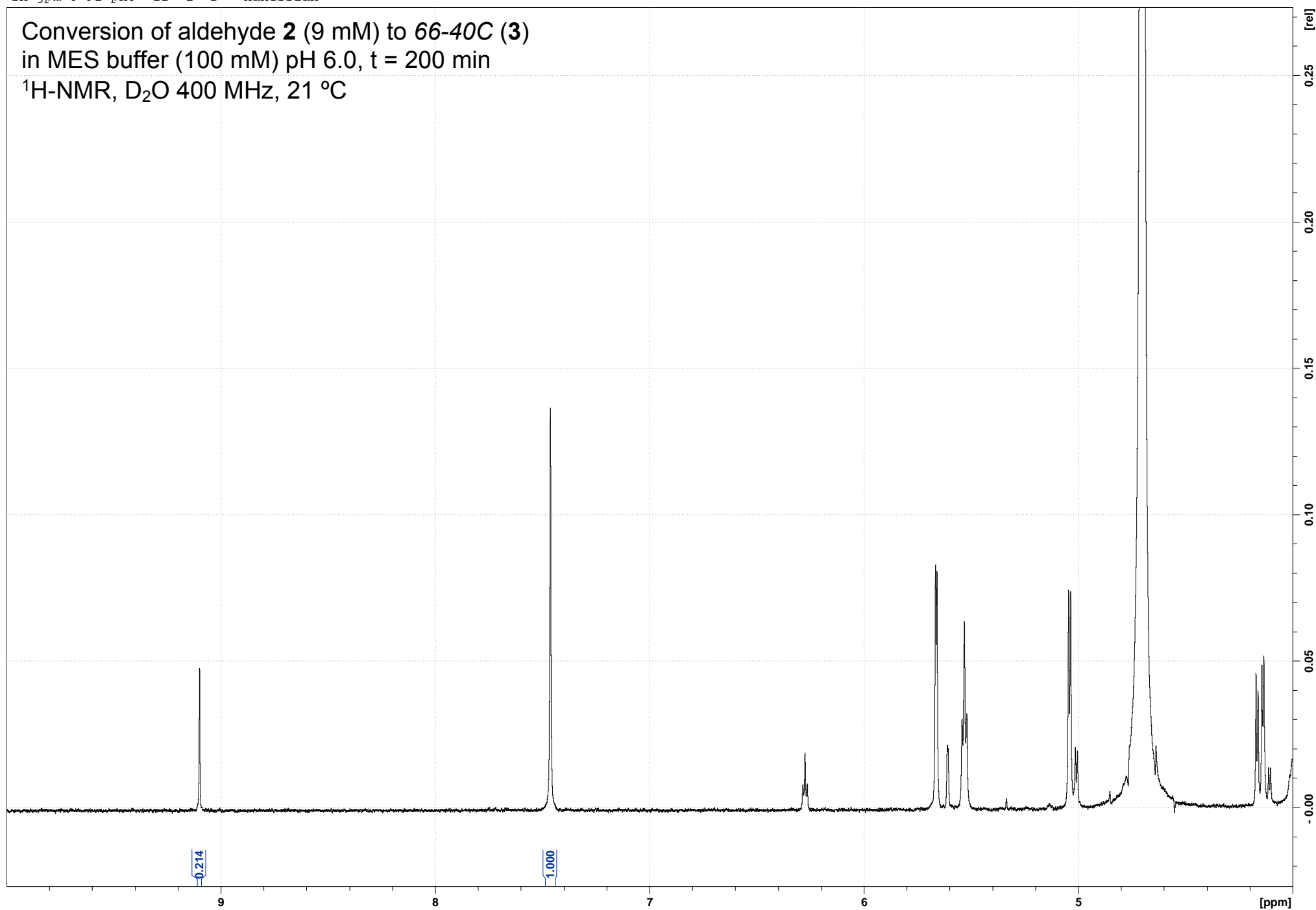
sh-jpm-6-91-ph6 21 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 190 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



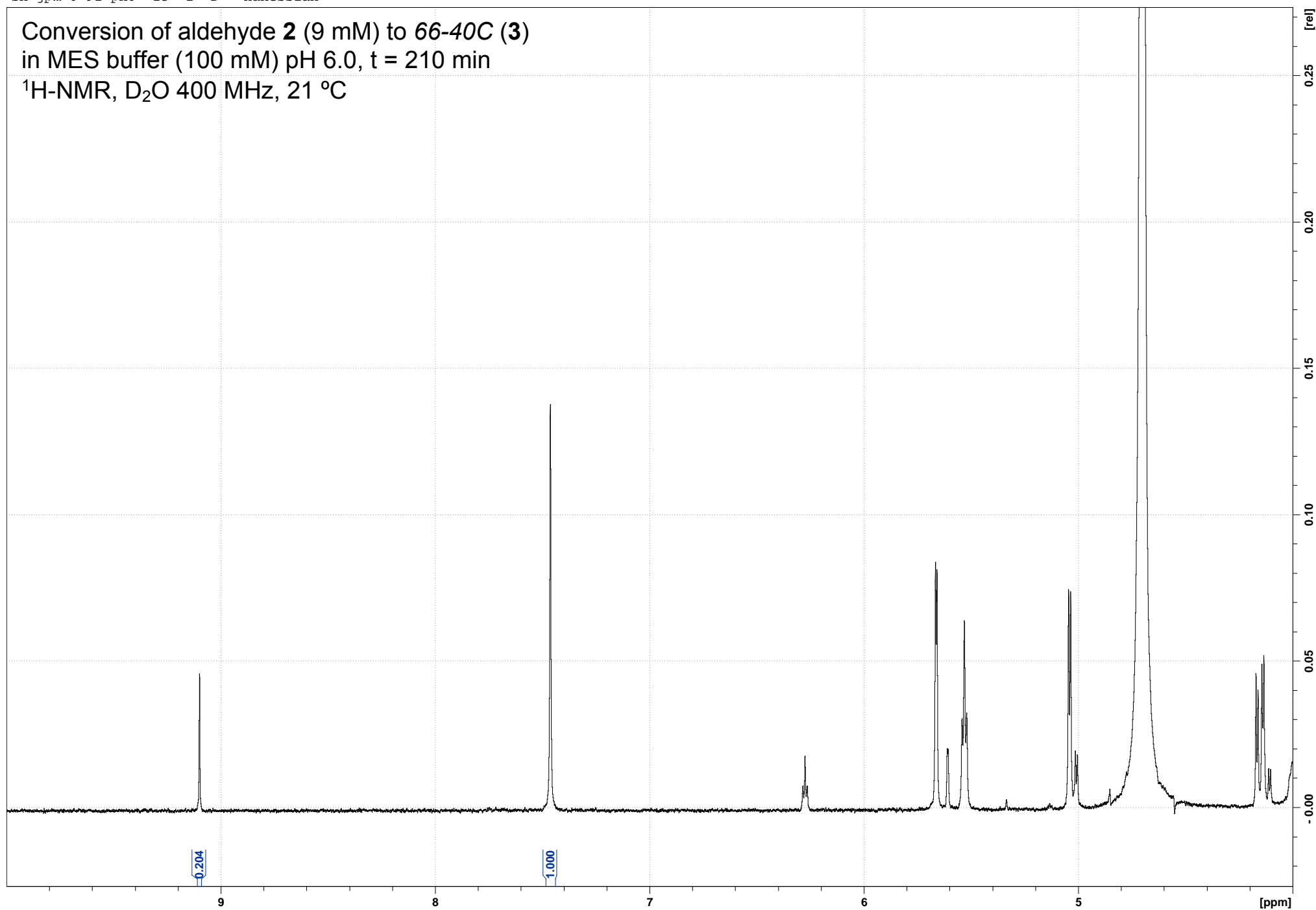
sh-jpm-6-91-ph6 22 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 200 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



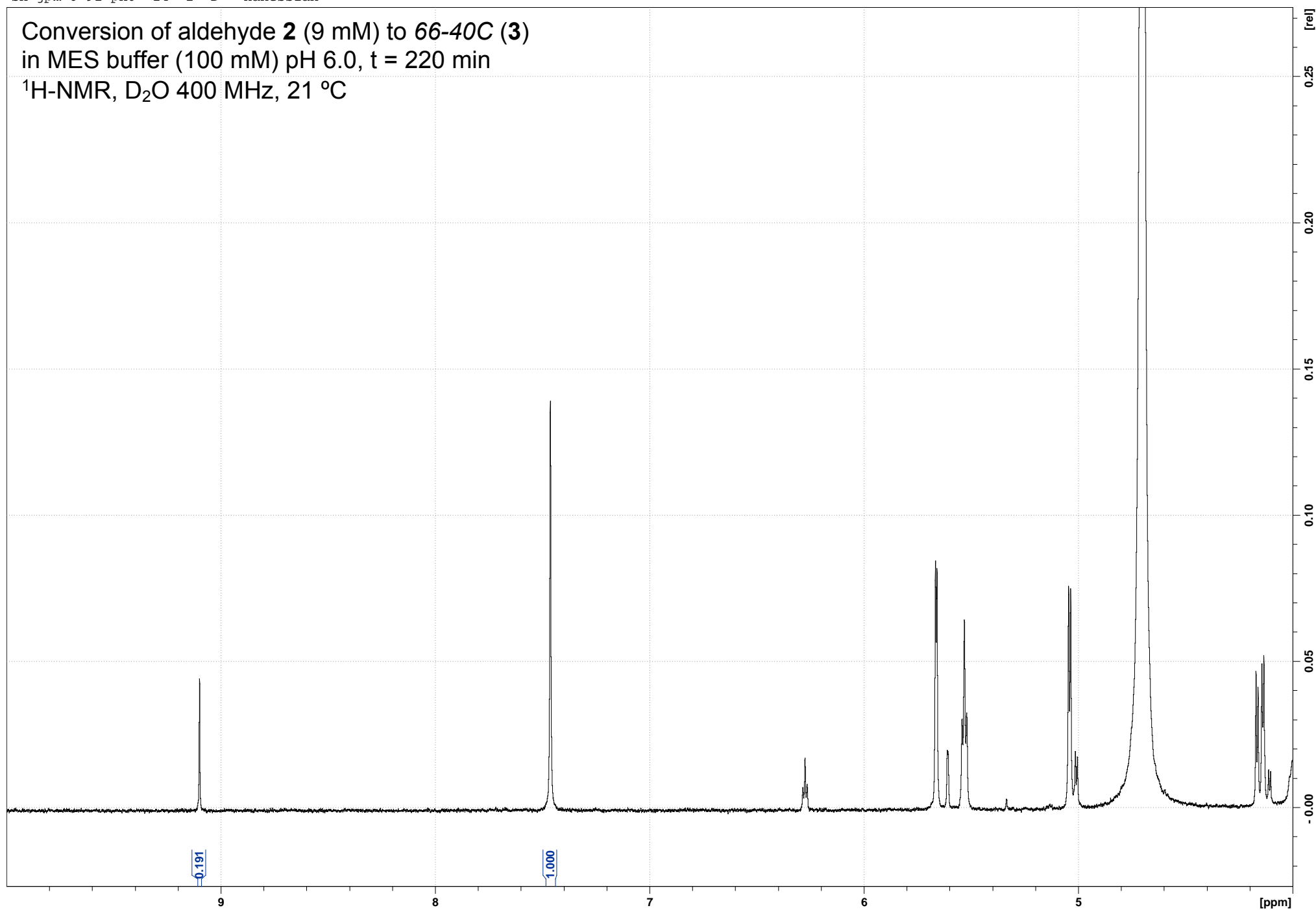
sh-jpm-6-91-ph6 23 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 210 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



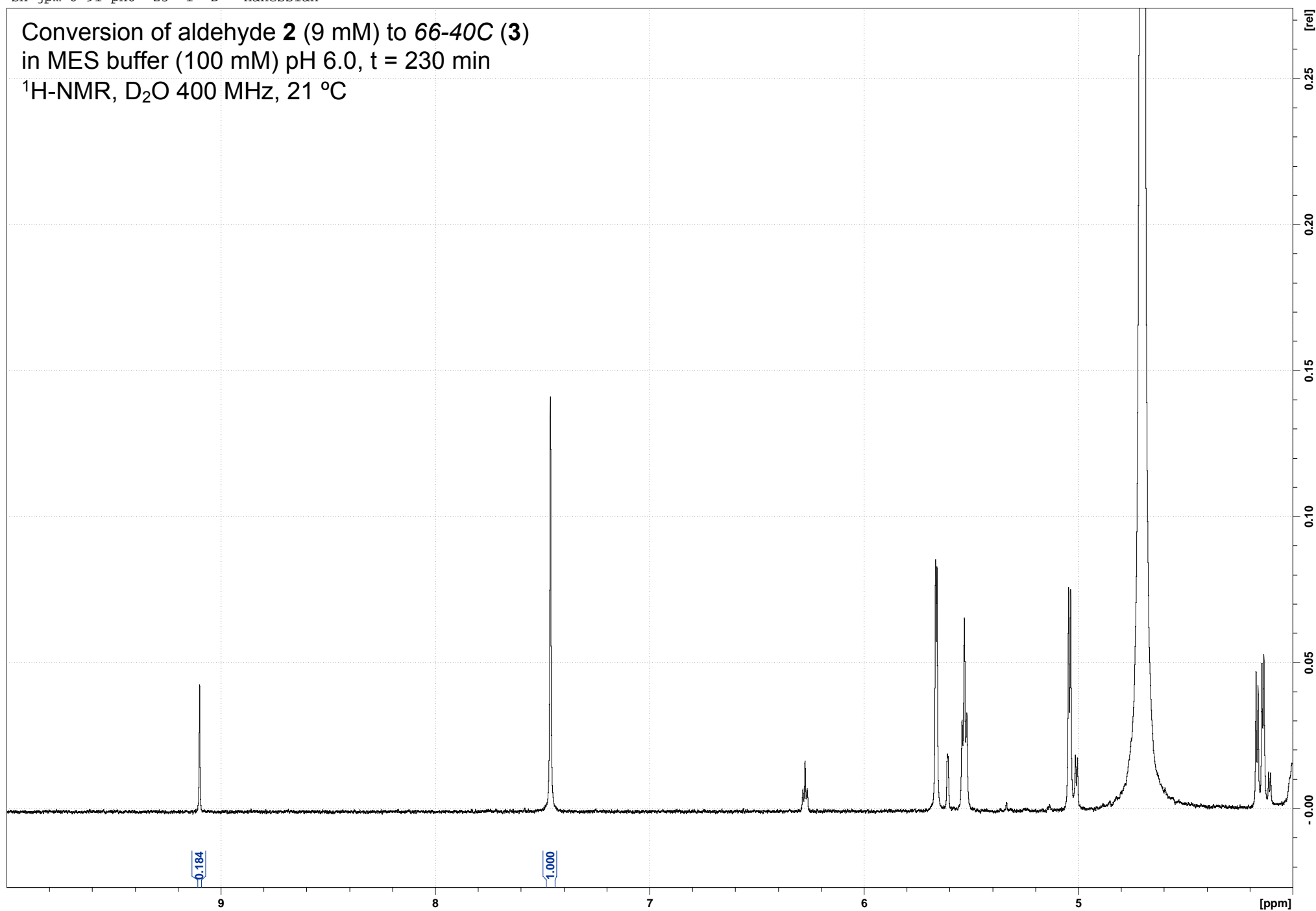
sh-jpm-6-91-ph6 24 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 220 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



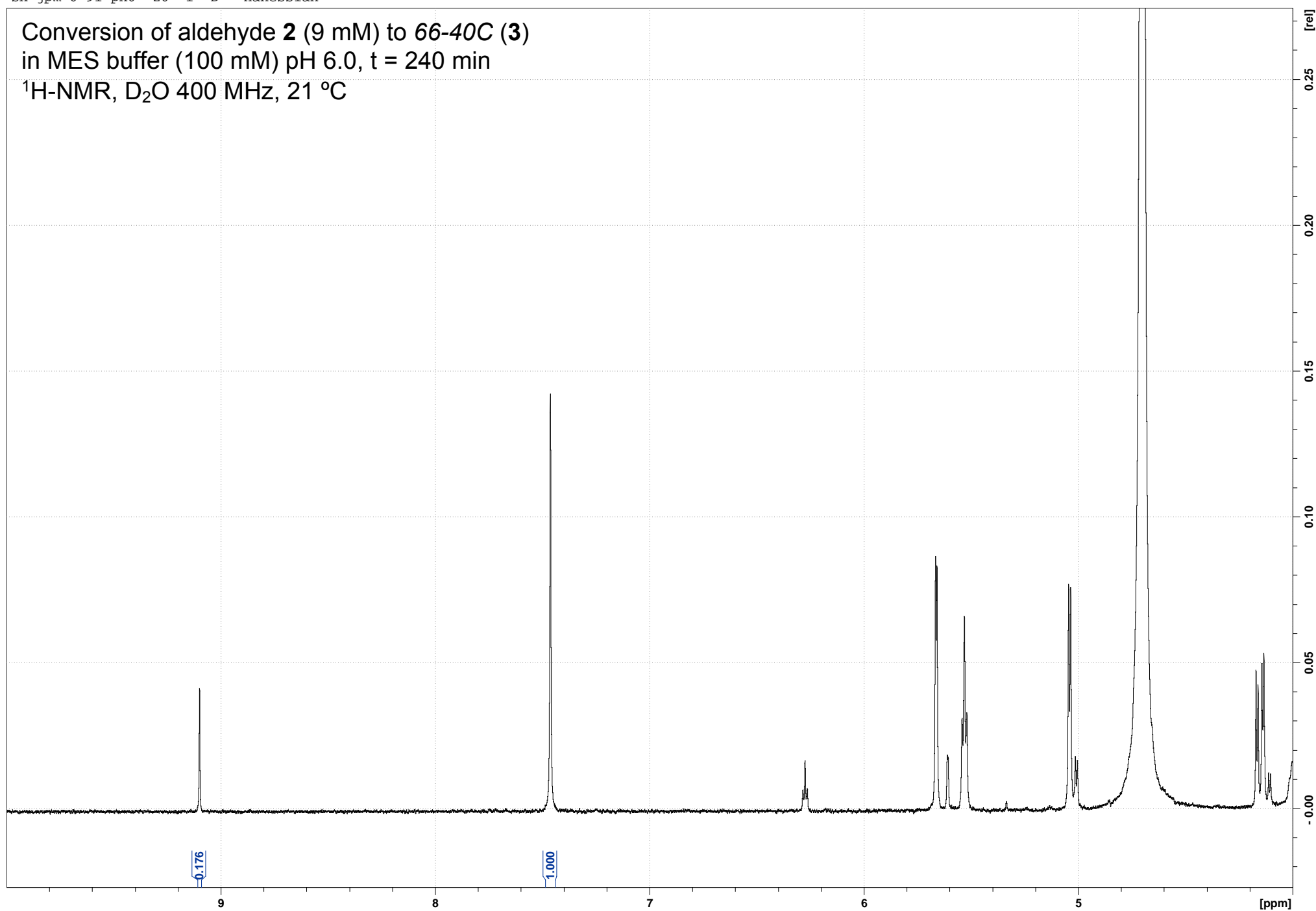
sh-jpm-6-91-ph6 25 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 230 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



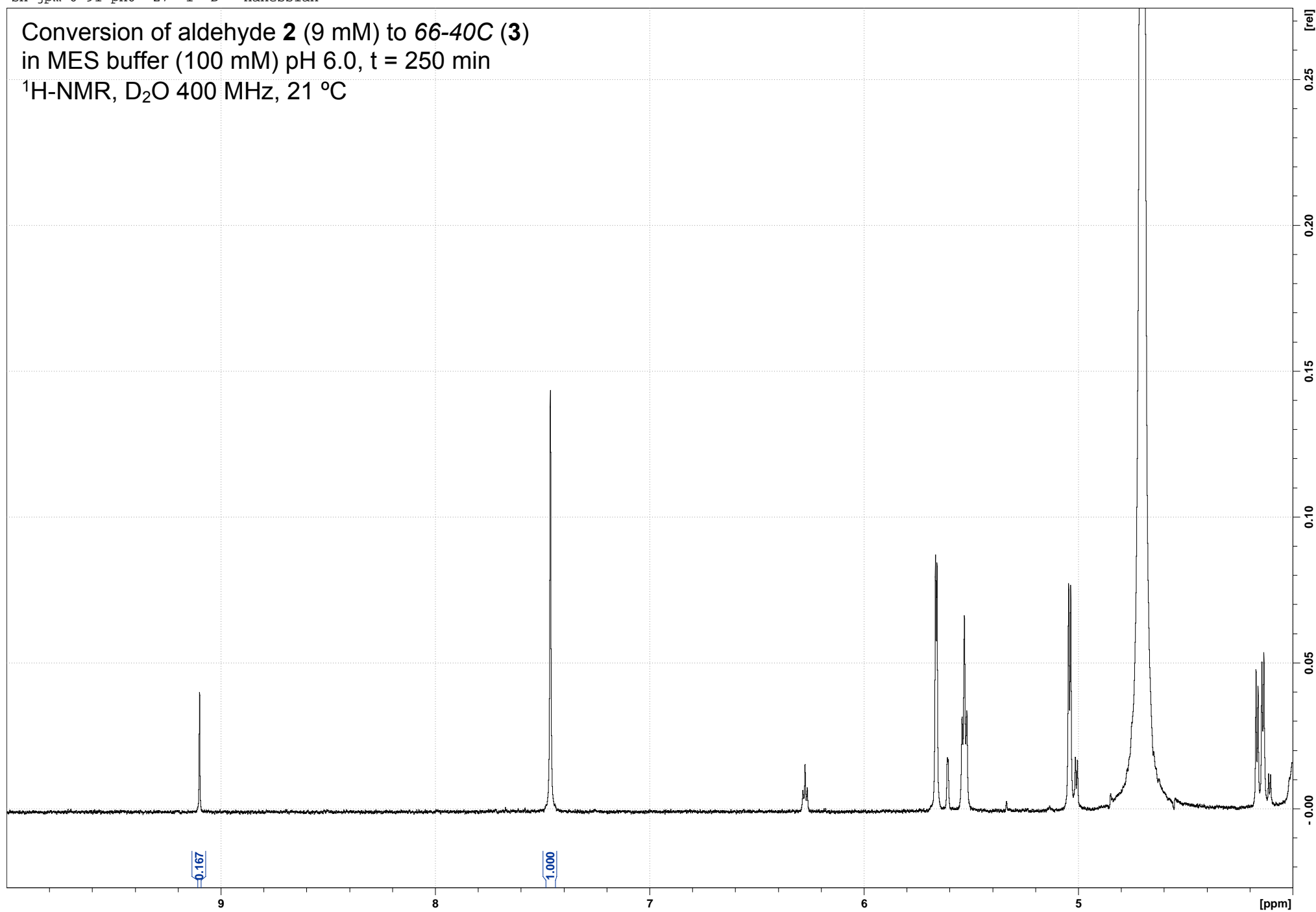
sh-jpm-6-91-ph6 26 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 240 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



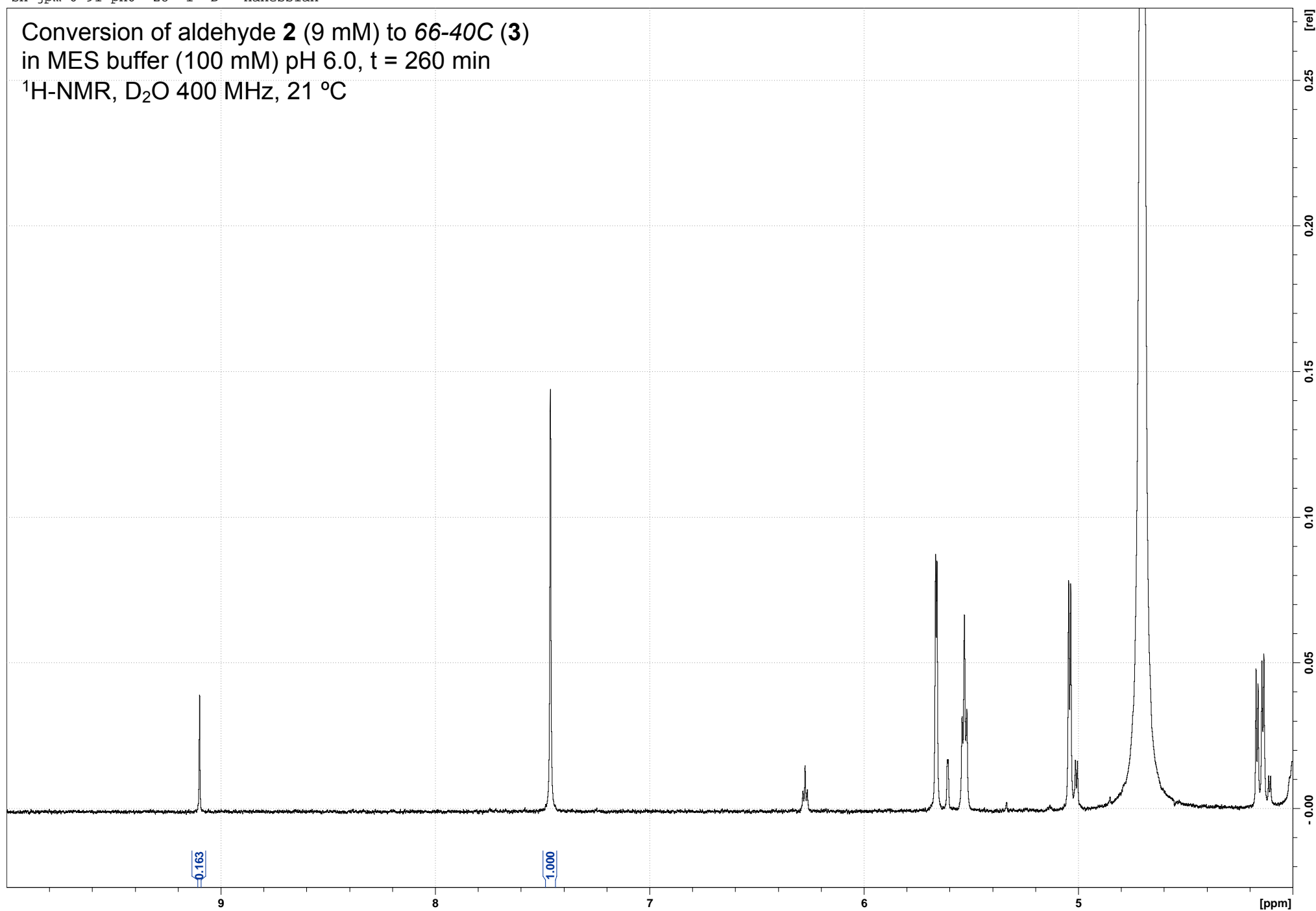
sh-jpm-6-91-ph6 27 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 250 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph6 28 1 D: Hanessian

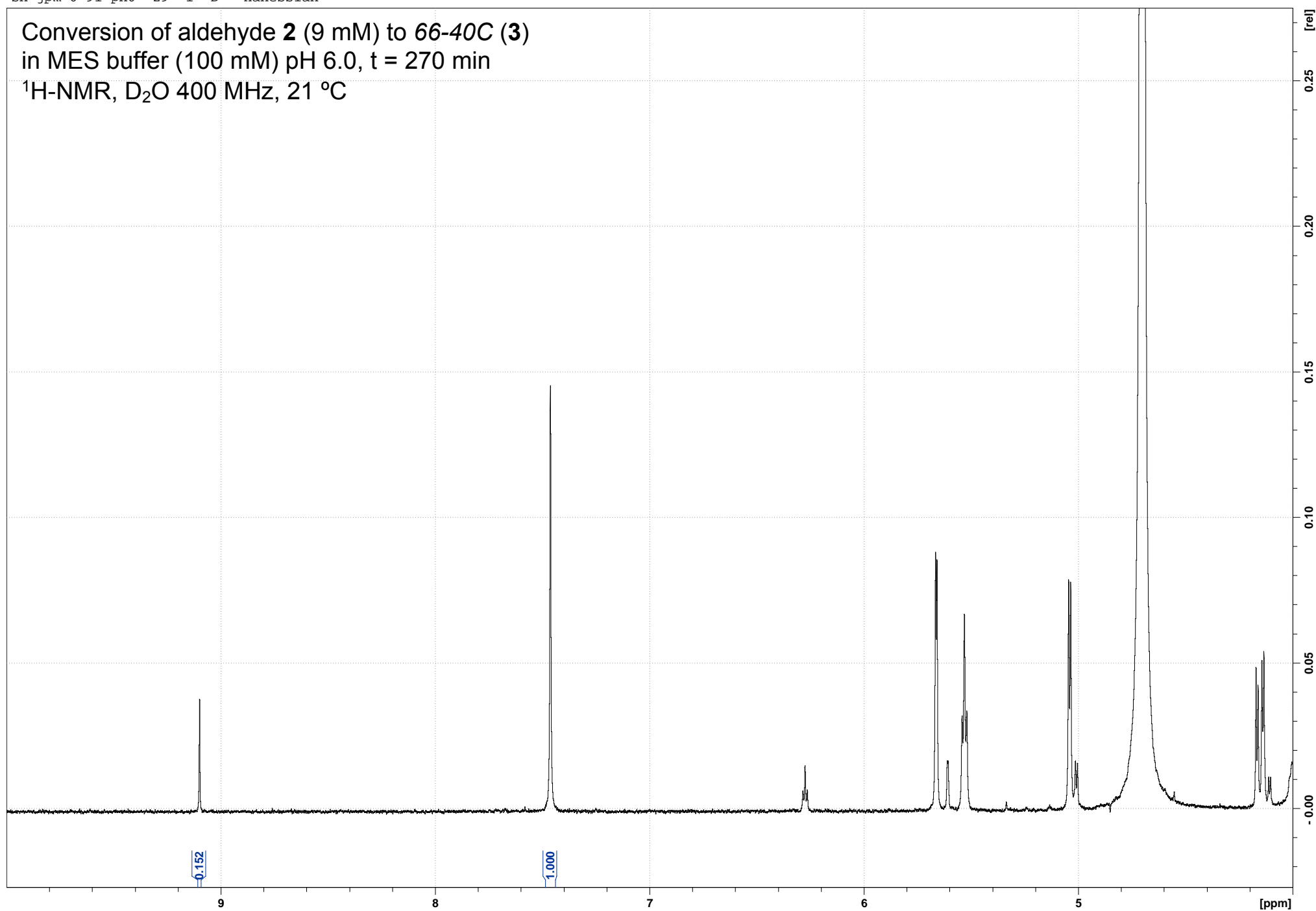
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 260 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





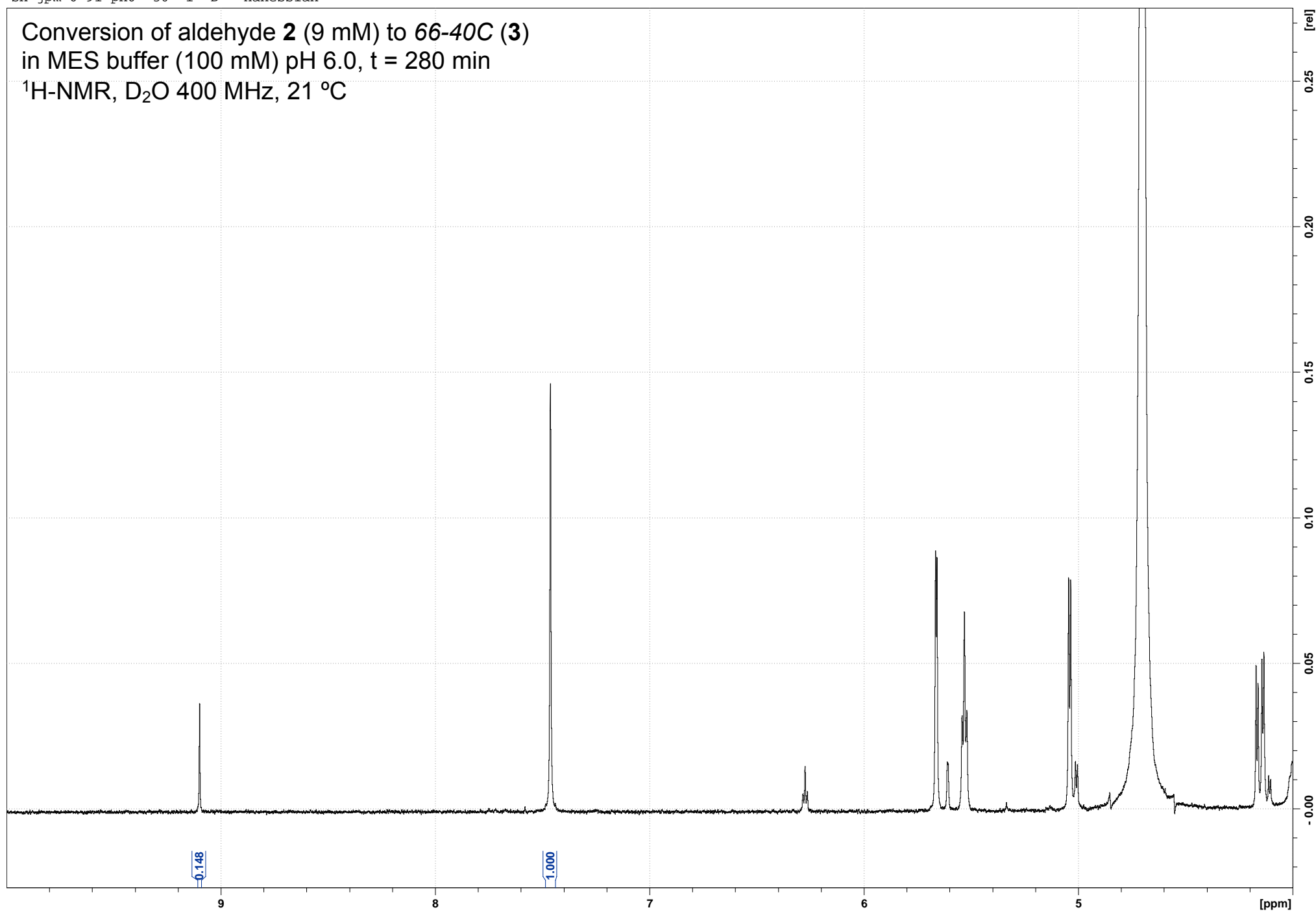
sh-jpm-6-91-ph6 29 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 270 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



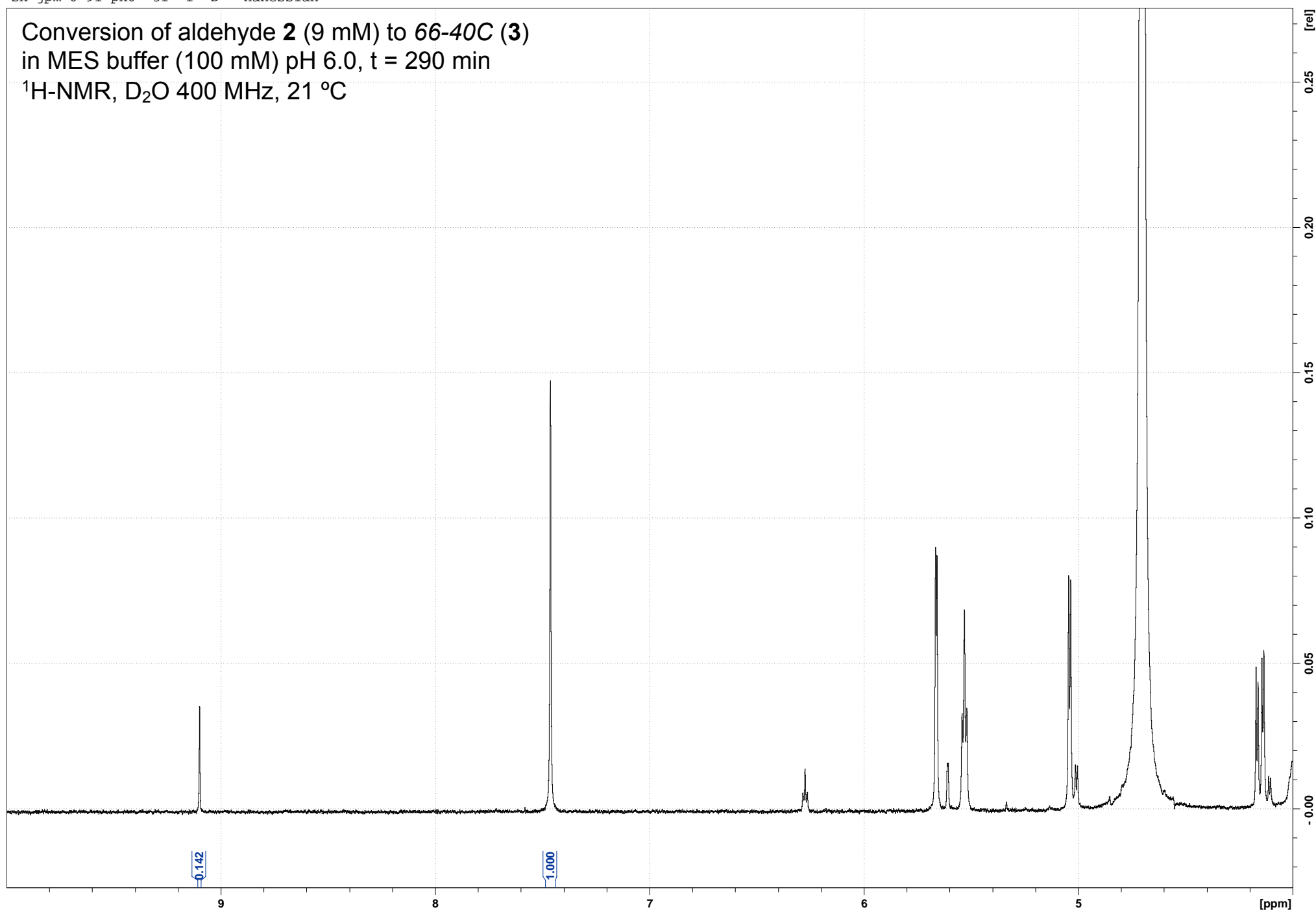
sh-jpm-6-91-ph6 30 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 280 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



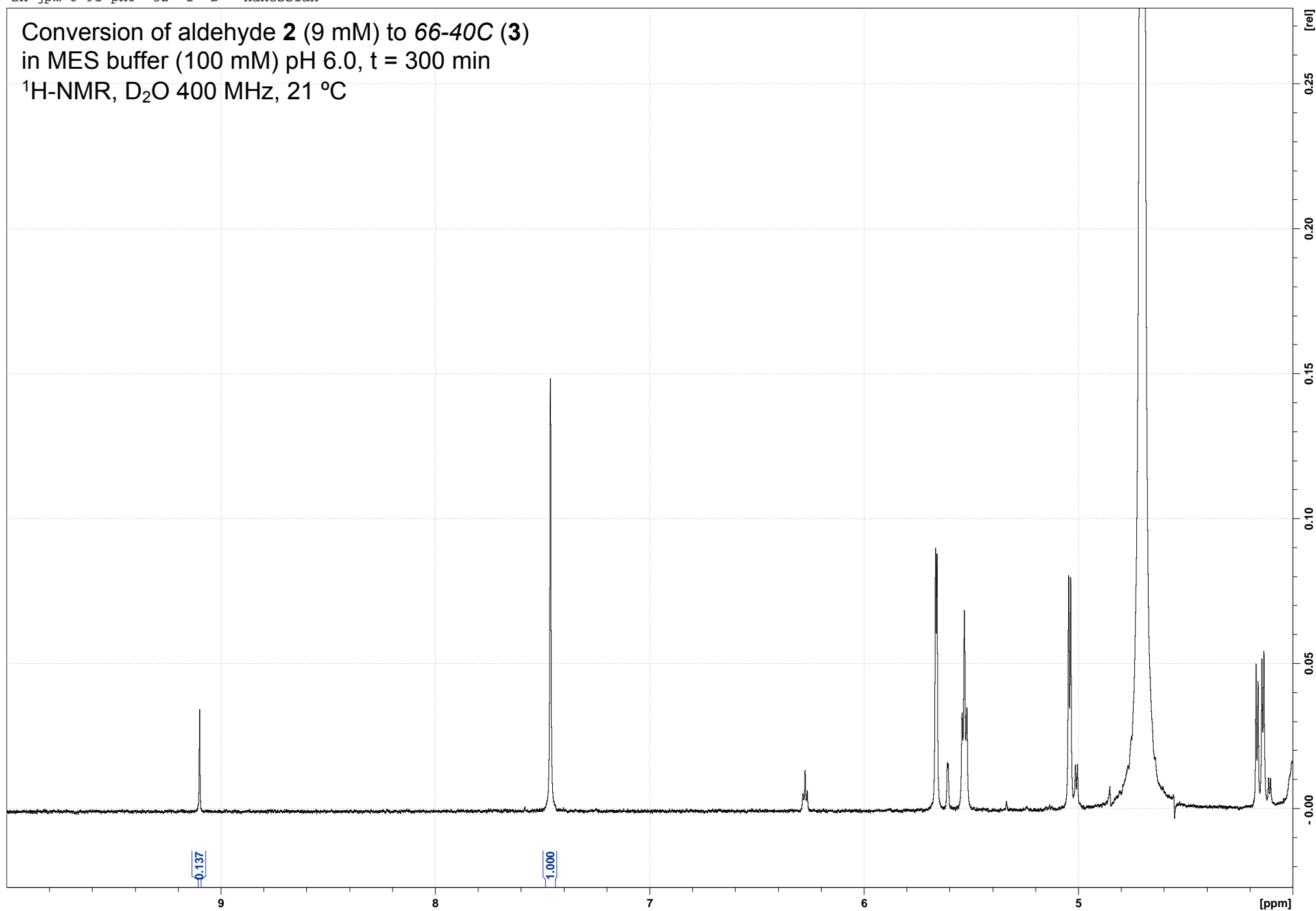
sh-jpm-6-91-ph6 31 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 290 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



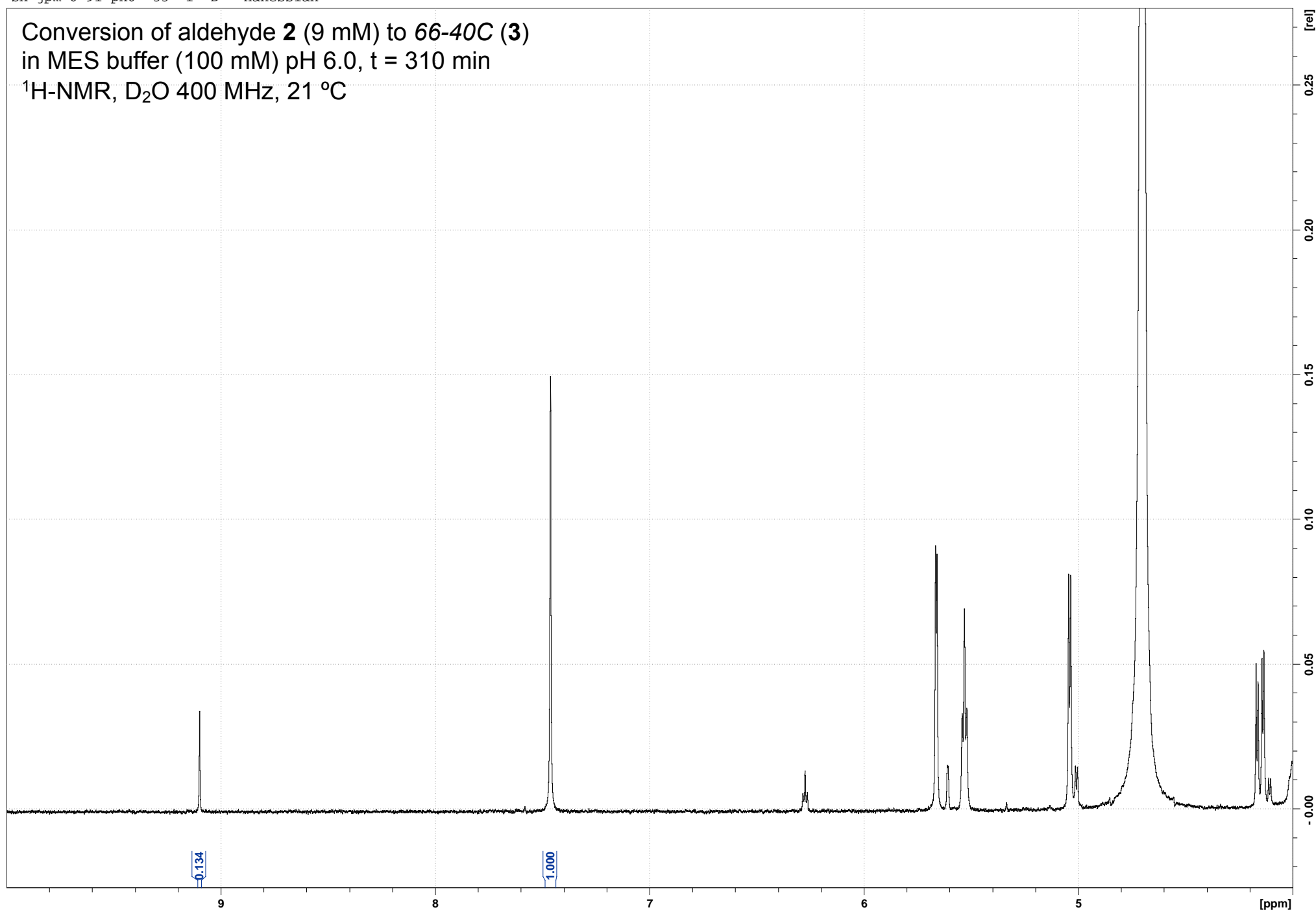
sh-jpm-6-91-ph6 32 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 300 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



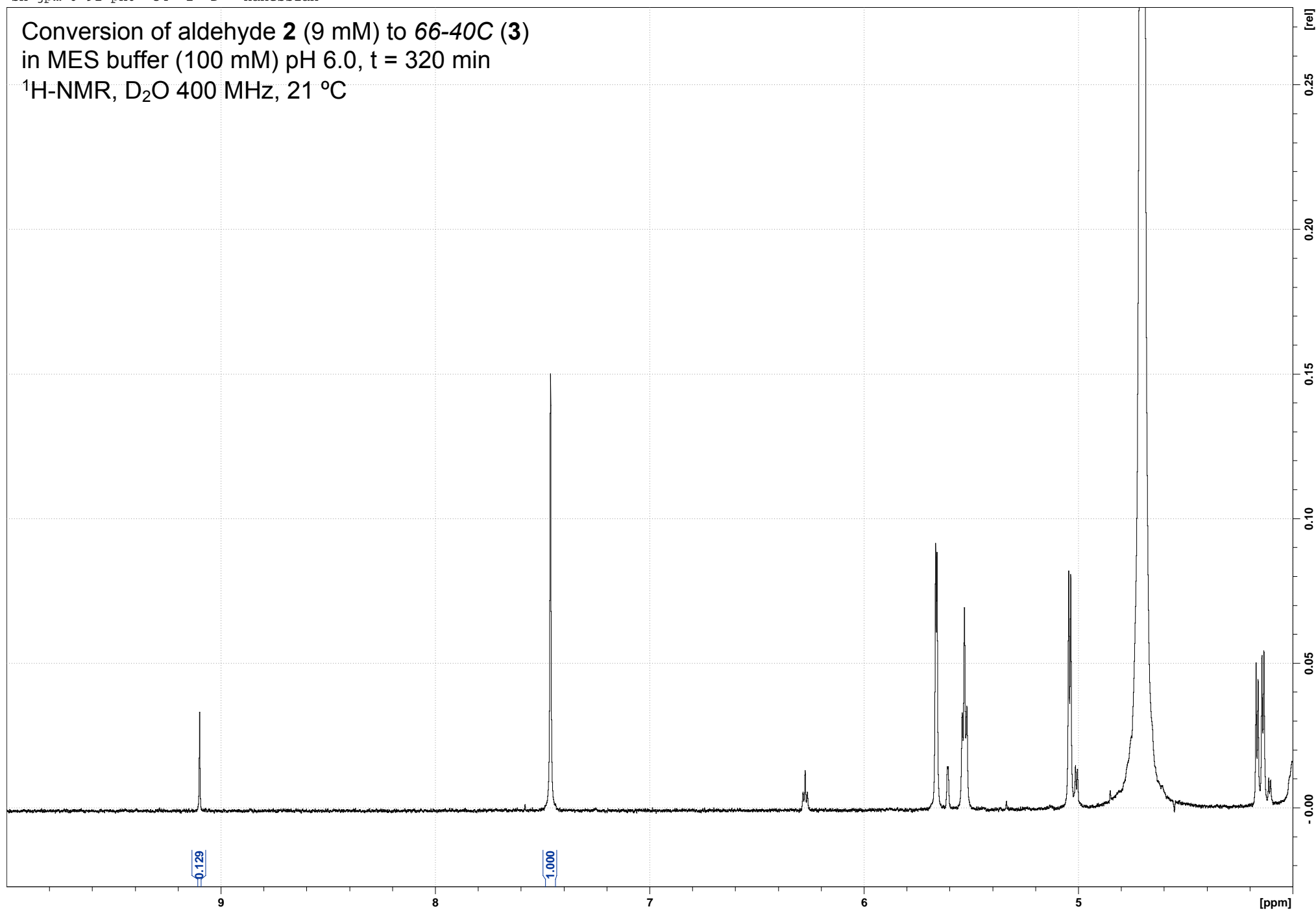
sh-jpm-6-91-ph6 33 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 310 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



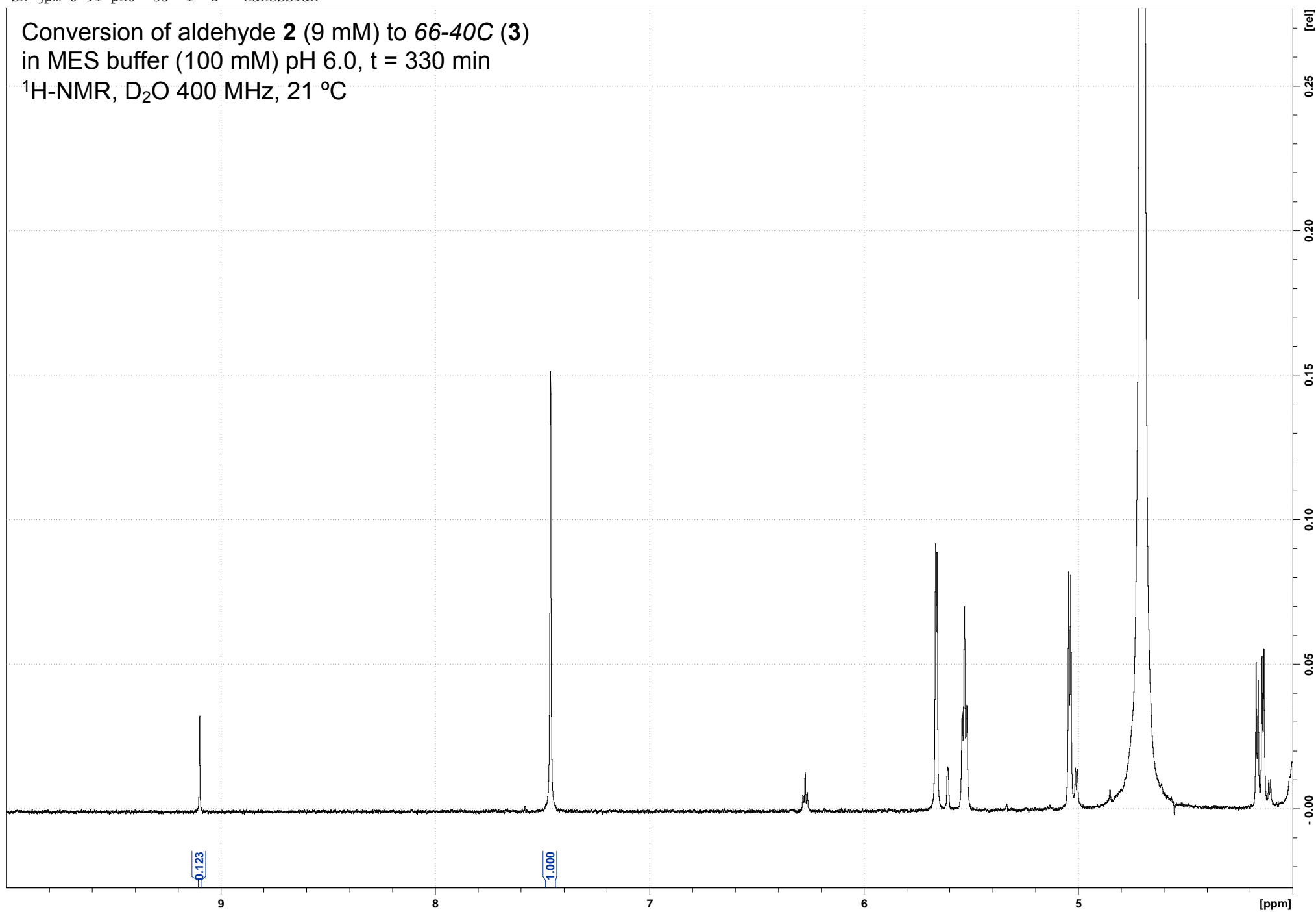
sh-jpm-6-91-ph6 34 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 320 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



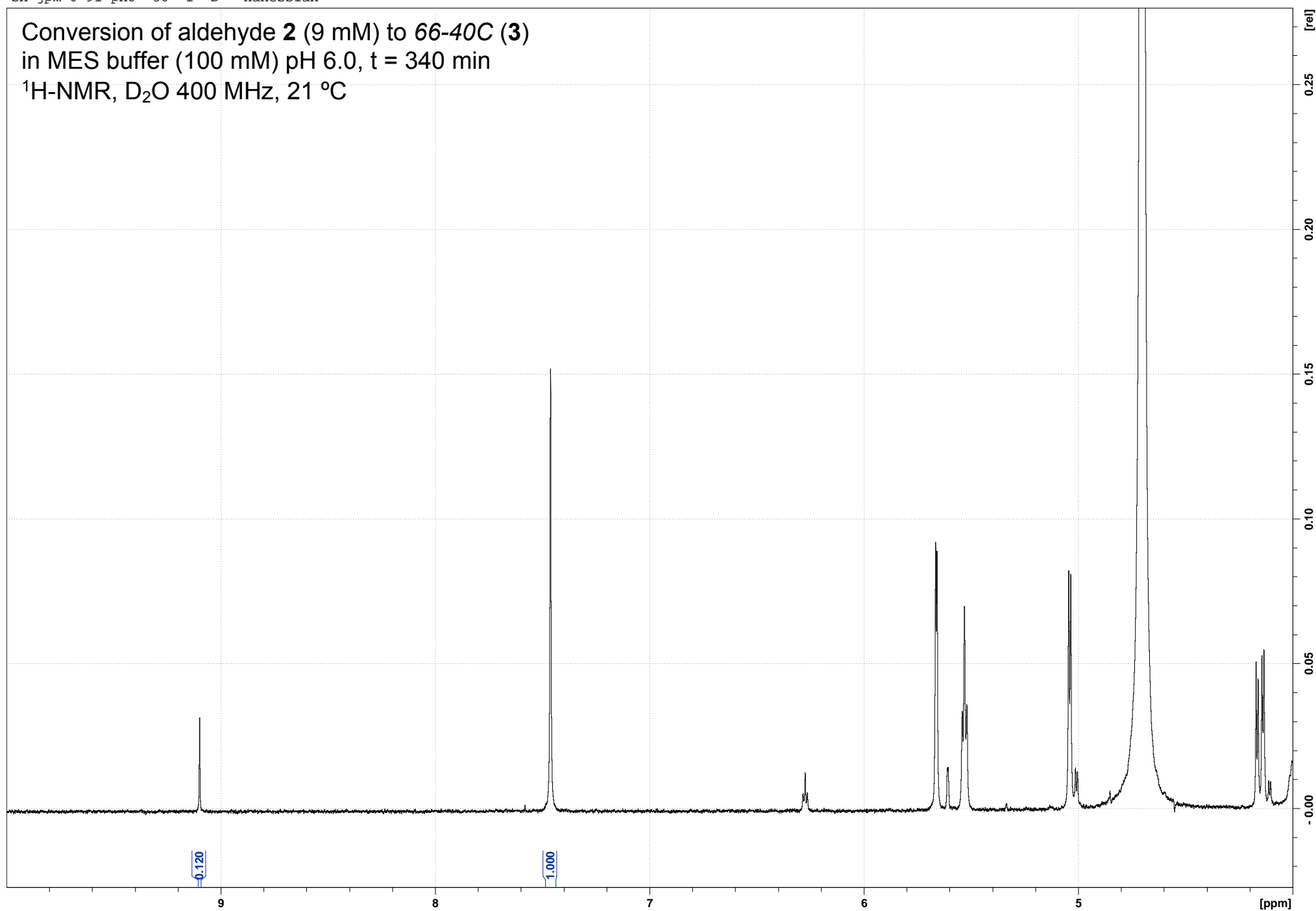
sh-jpm-6-91-ph6 35 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 330 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph6 36 1 D: Hanessian

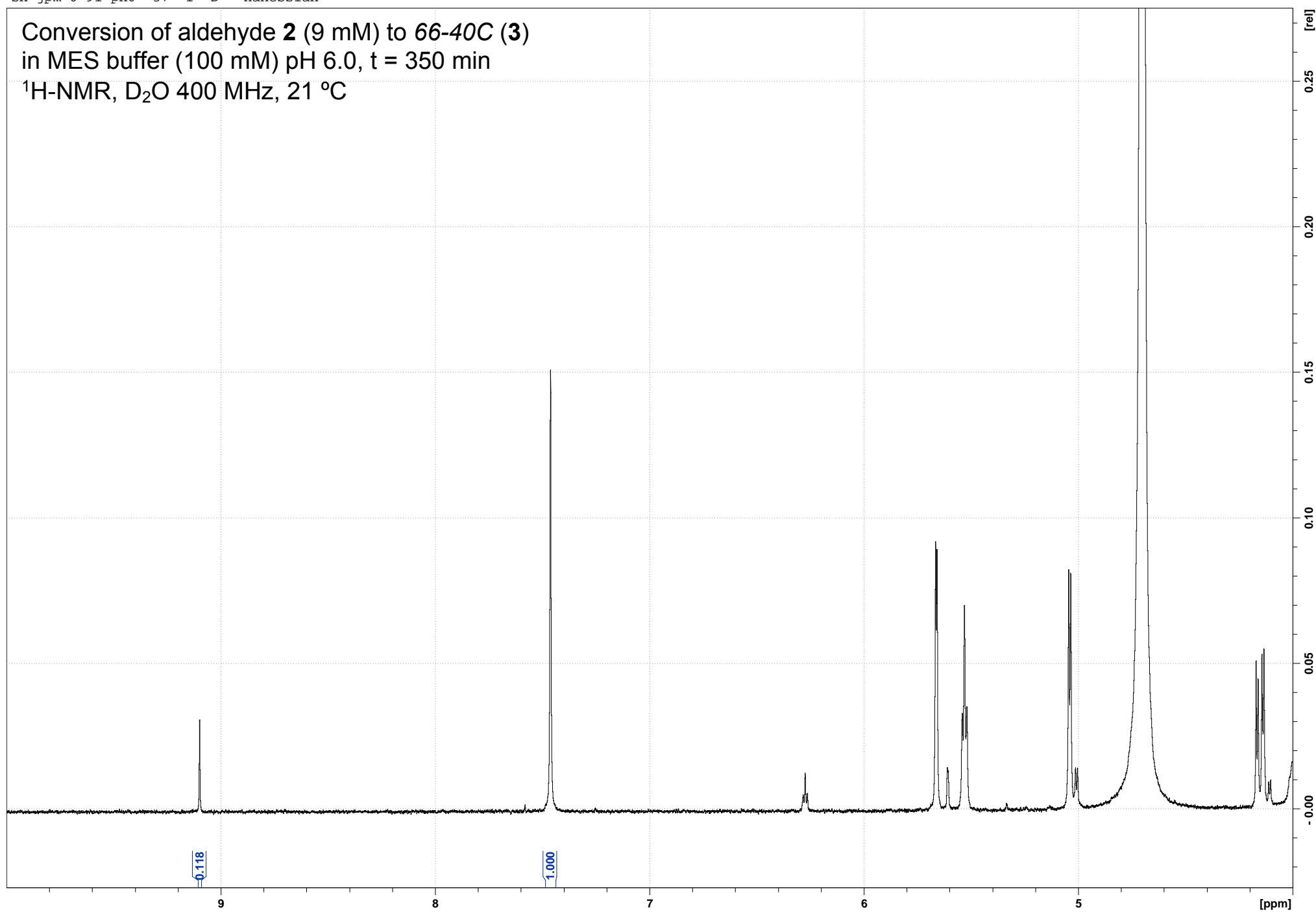
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 340 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





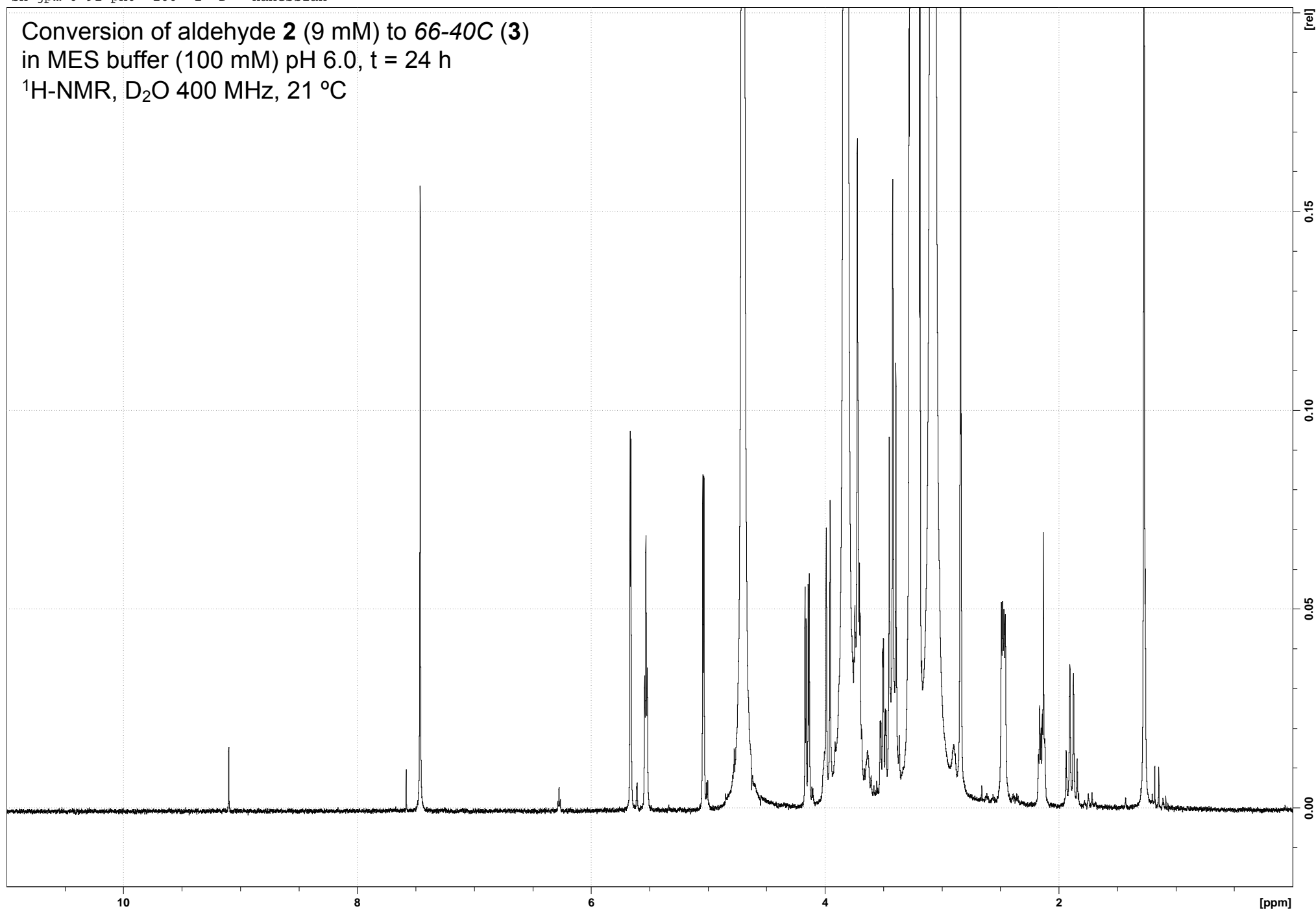
sh-jpm-6-91-ph6 37 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 350 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



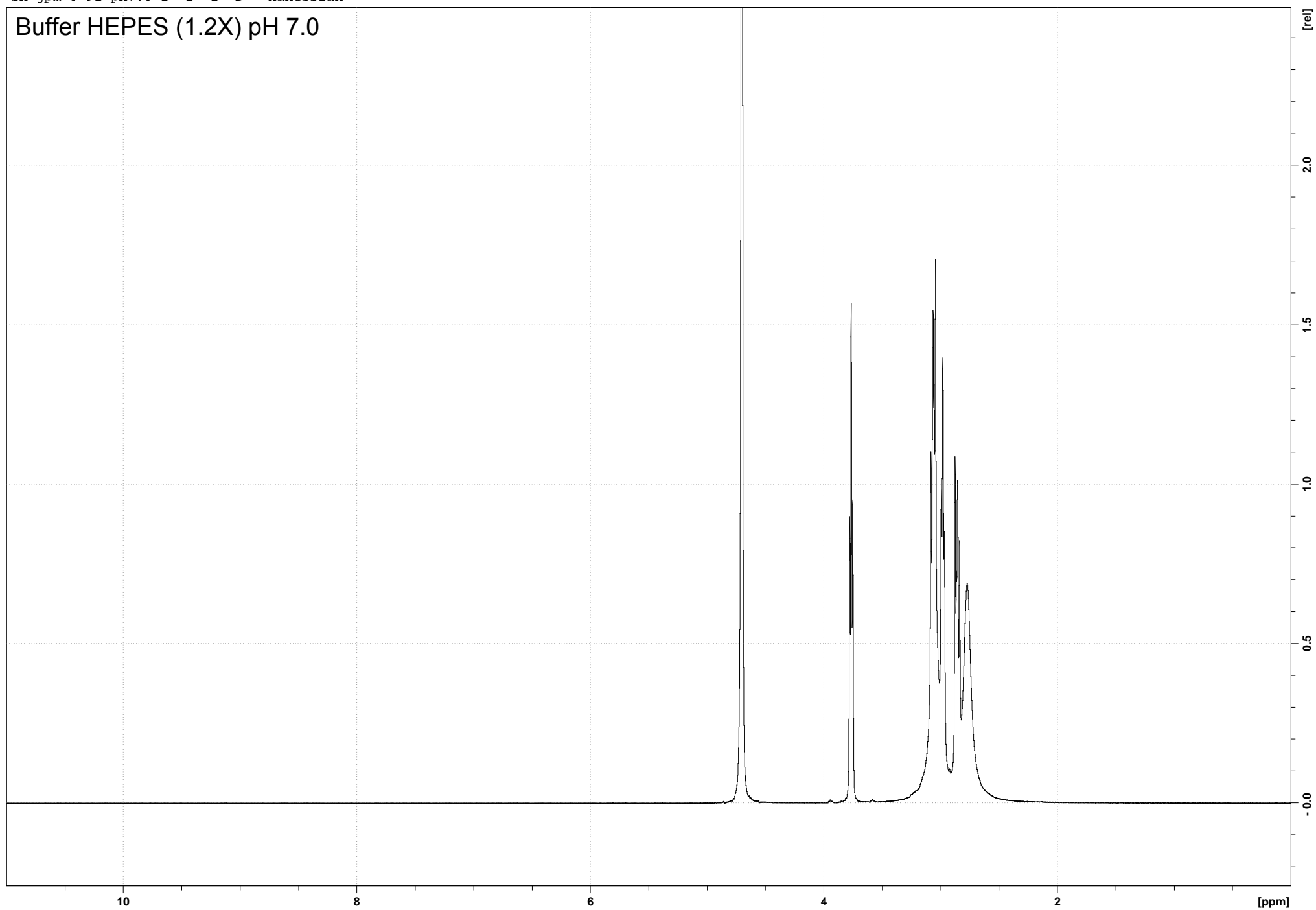
sh-jpm-6-91-ph6 100 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.0, t = 24 h  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



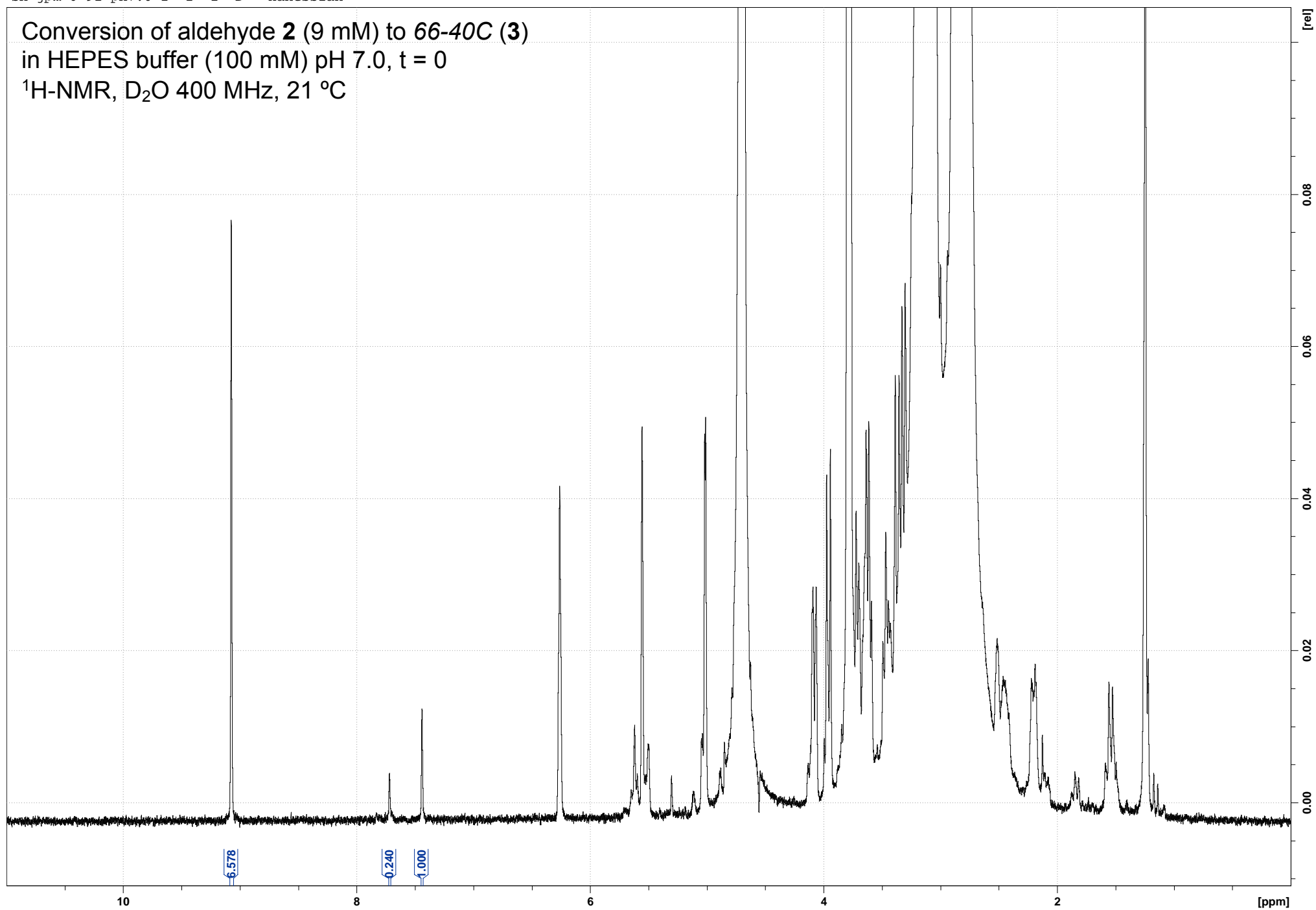
sh-jpm-6-91-ph7.0-2 1 1 D: Hanessian

Buffer HEPES (1.2X) pH 7.0



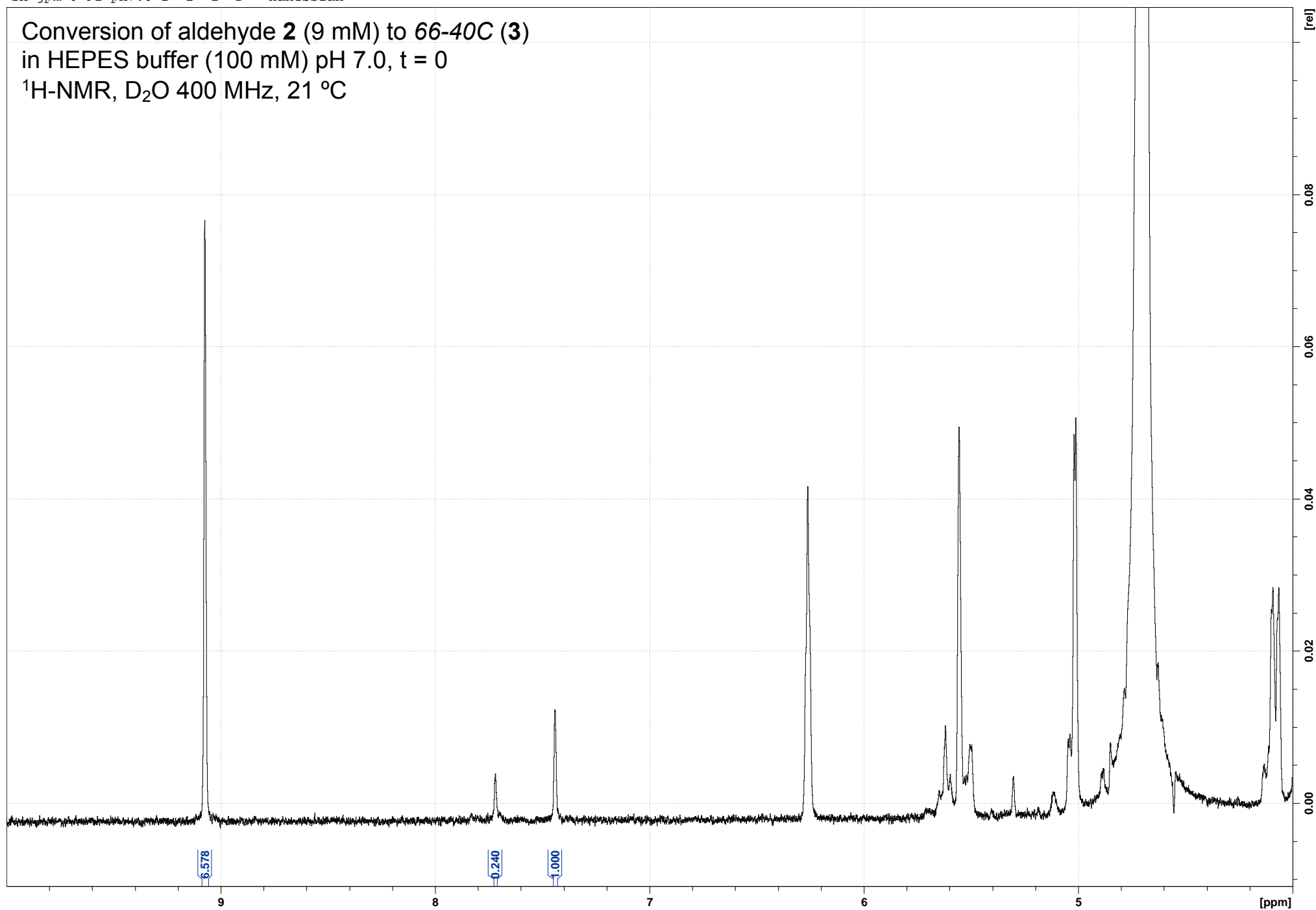
sh-jpm-6-91-ph7.0-2 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



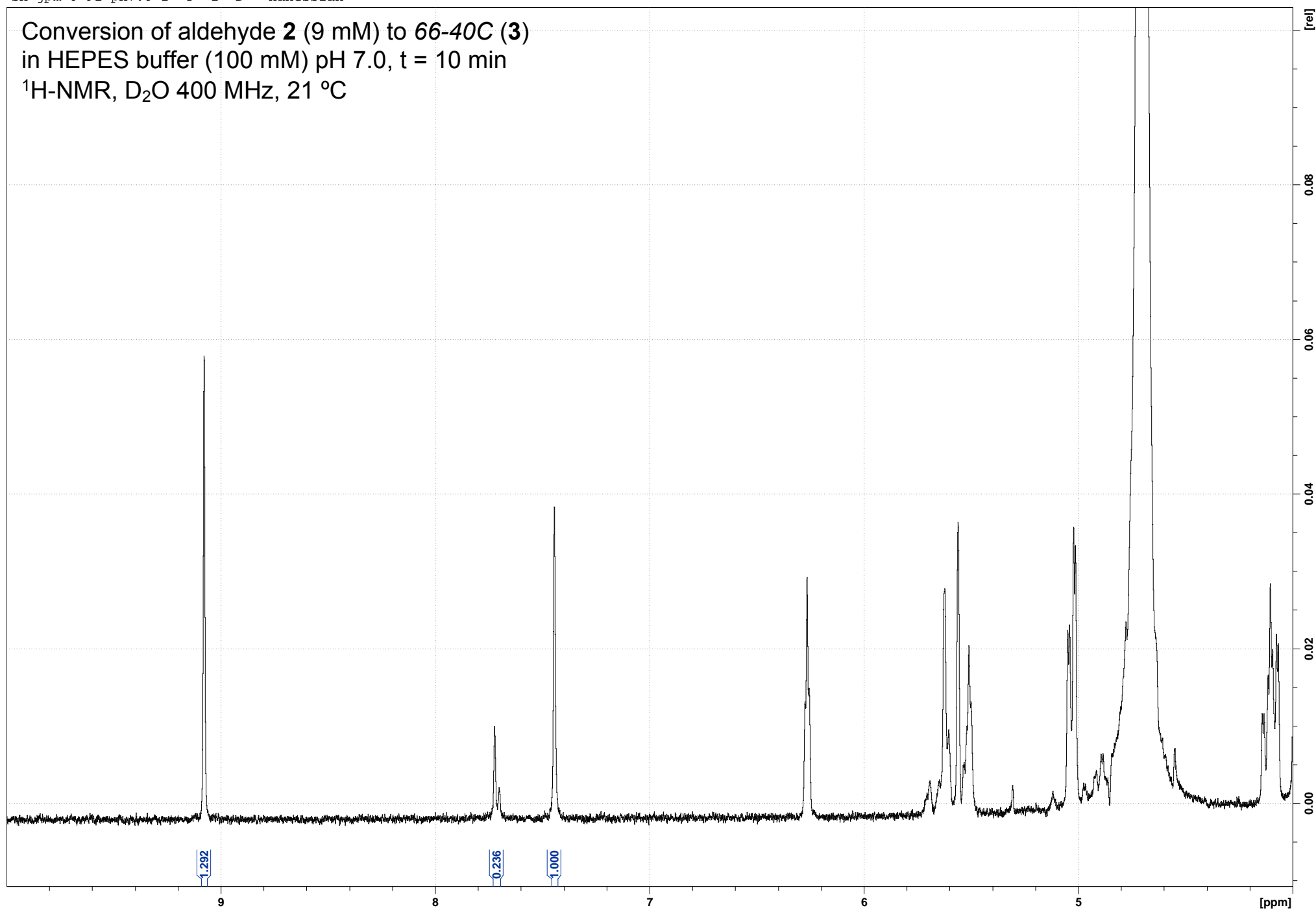
sh-jpm-6-91-ph7.0-2 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



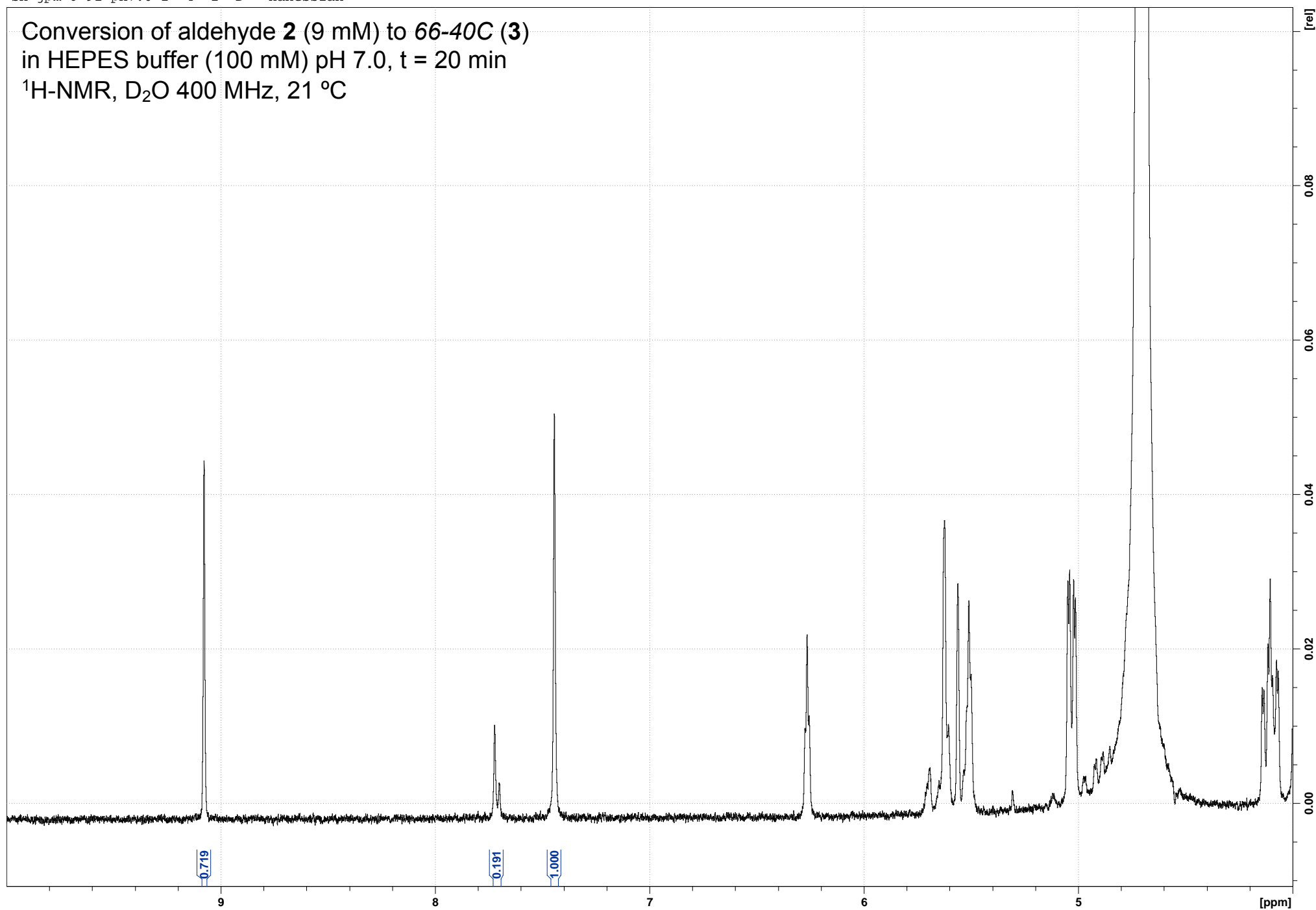
sh-jpm-6-91-ph7.0-2 3 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 10 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



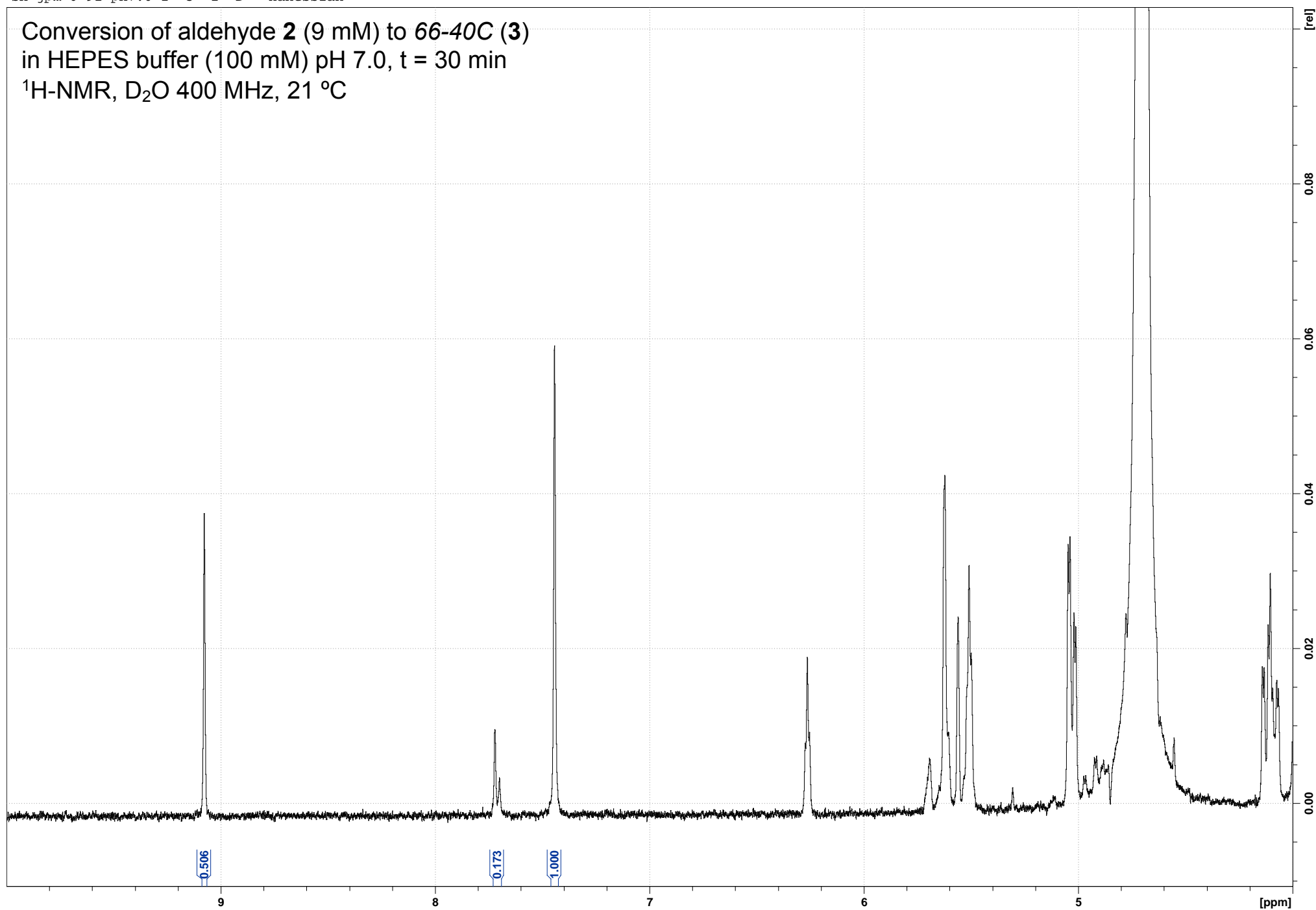
sh-jpm-6-91-ph7.0-2 4 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 20 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph7.0-2 5 1 D: Hanessian

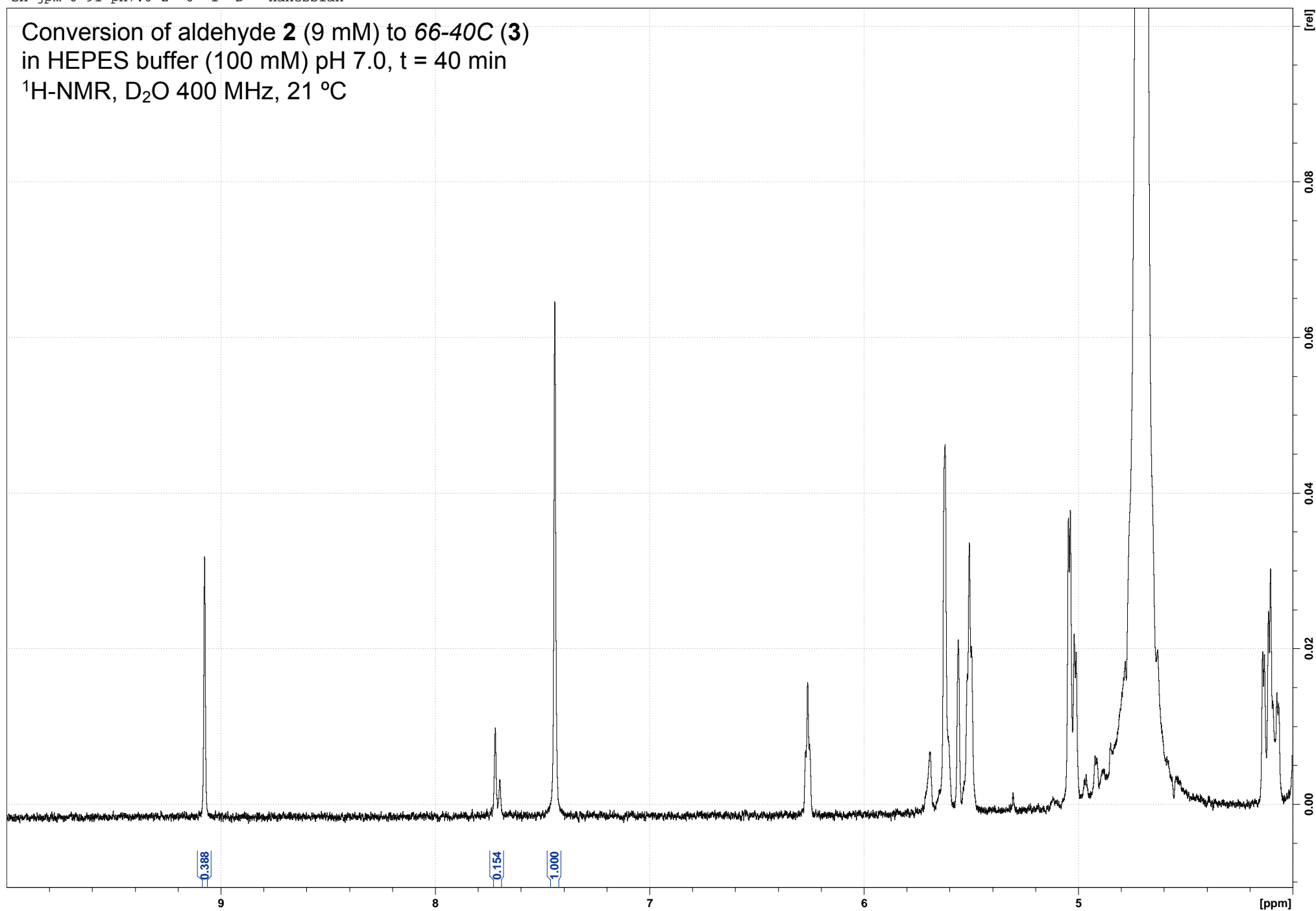
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 30 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





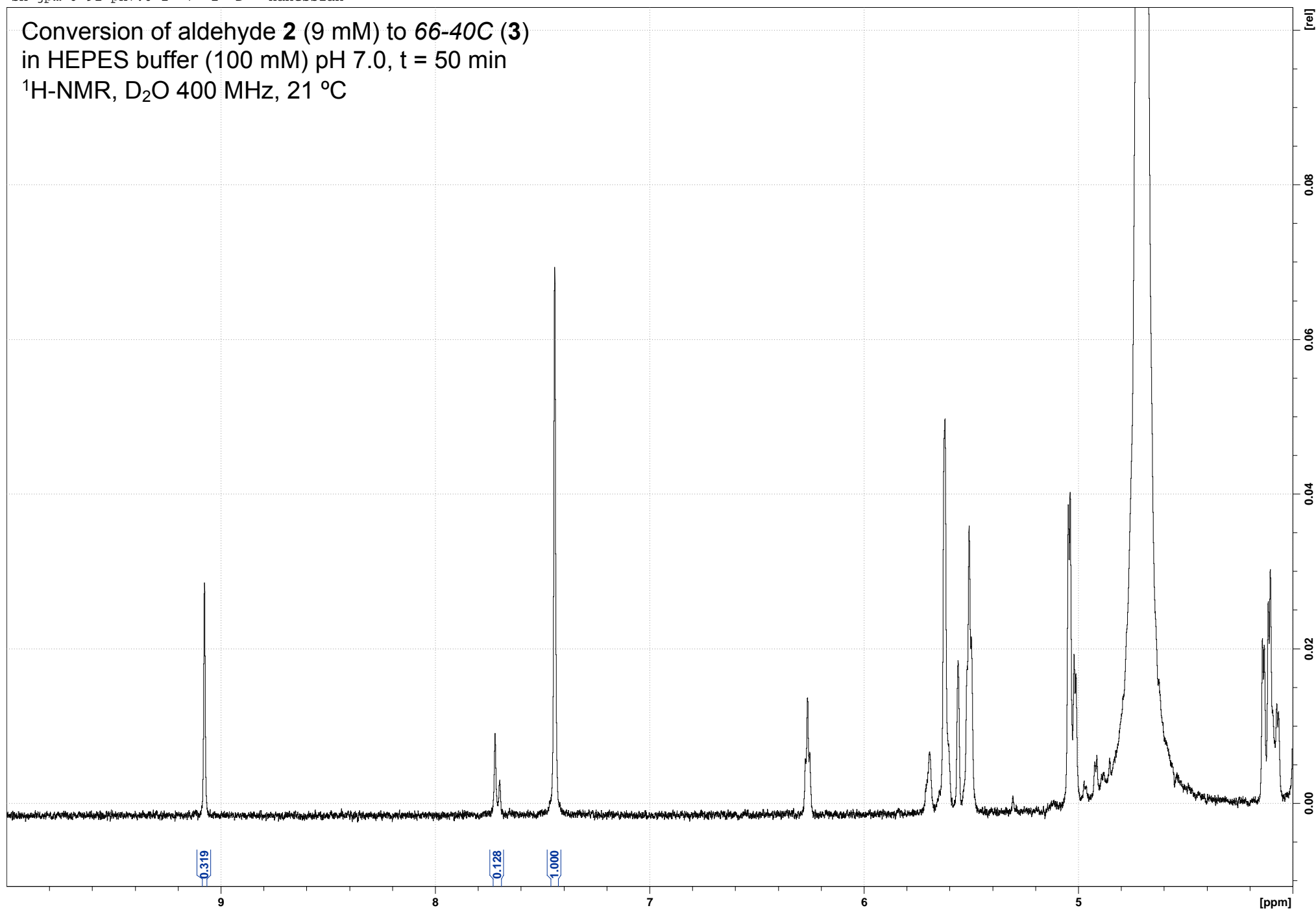
sh-jpm-6-91-ph7.0-2 6 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 40 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



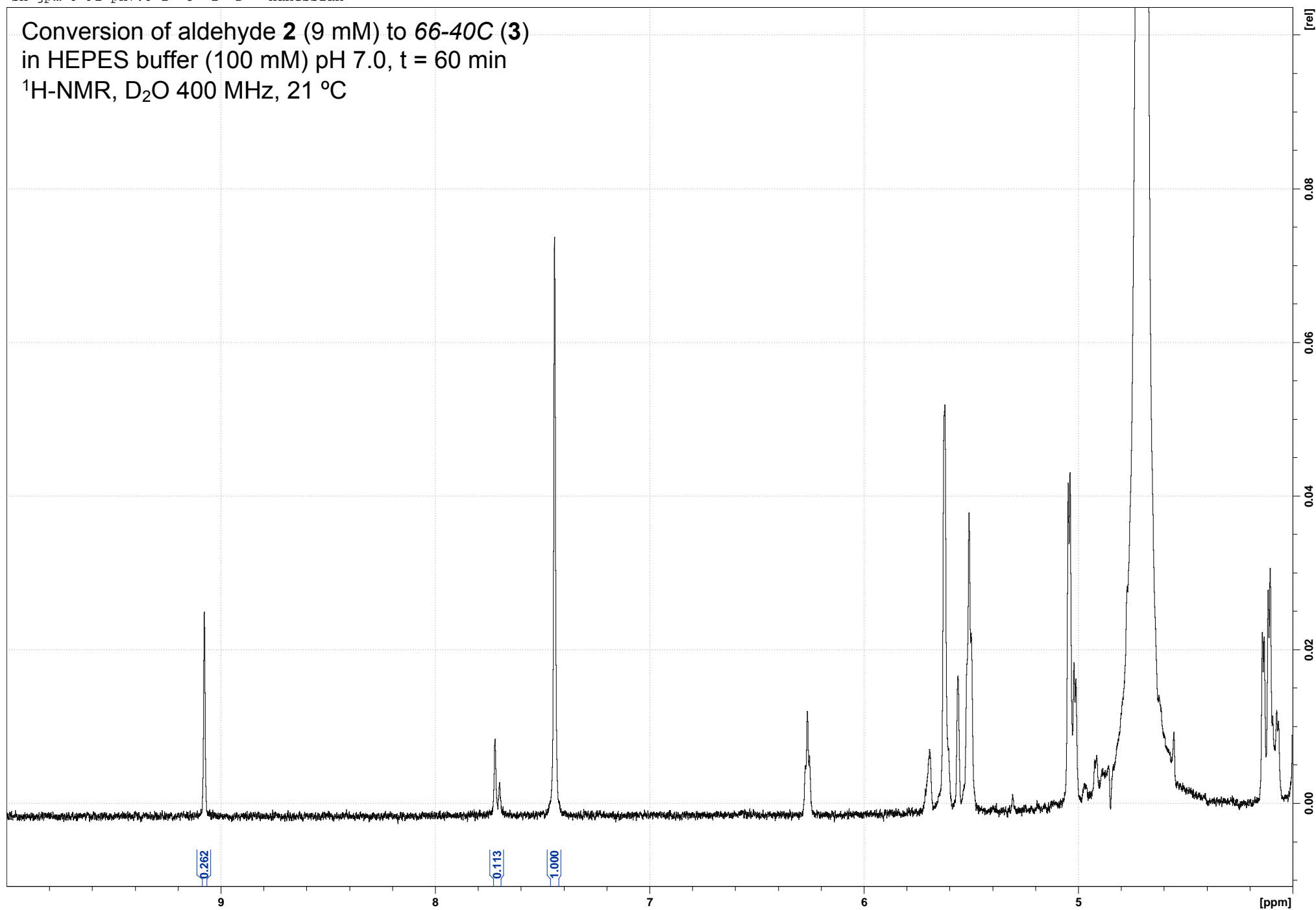
sh-jpm-6-91-ph7.0-2 7 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 50 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



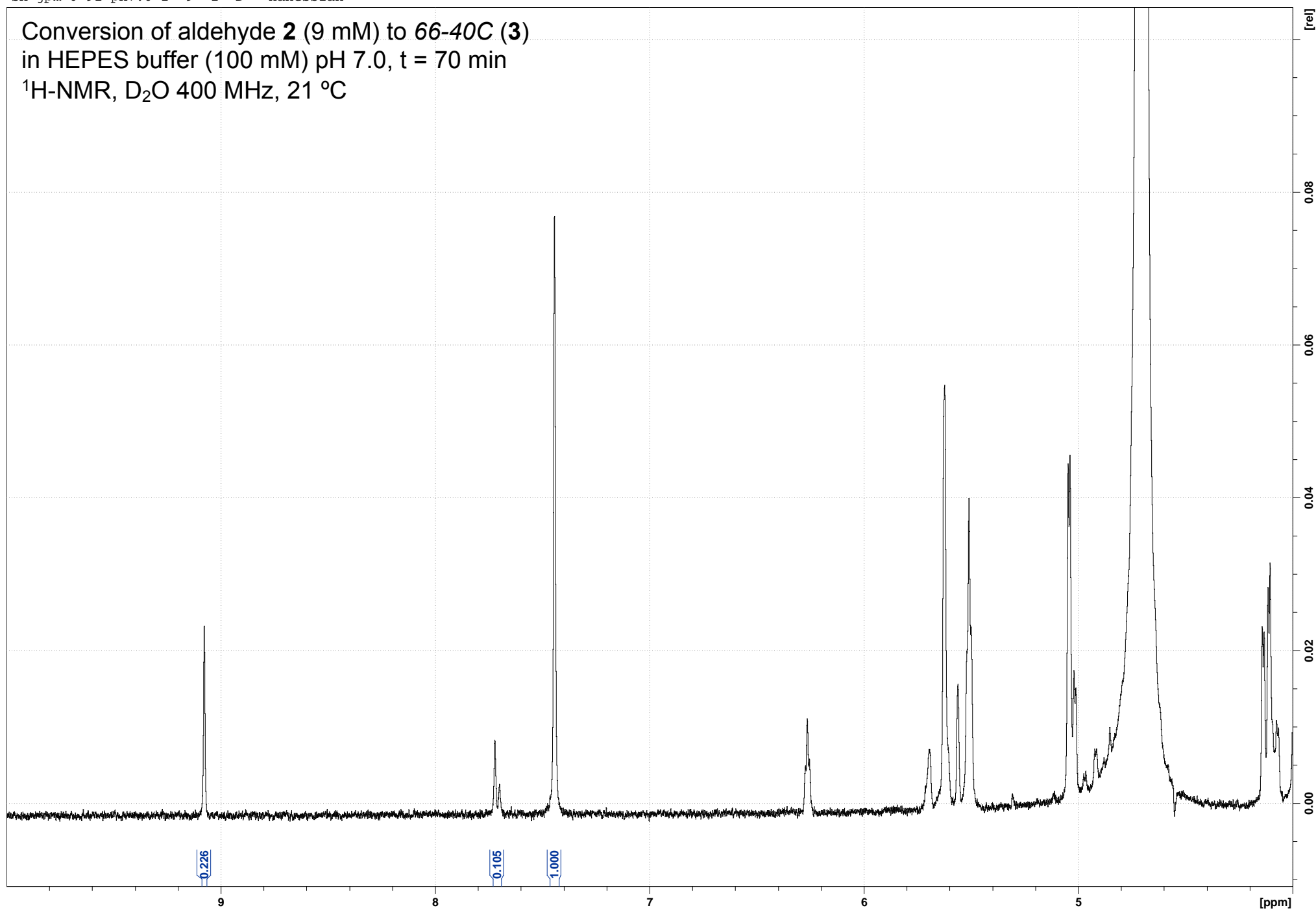
sh-jpm-6-91-ph7.0-2 8 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 60 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



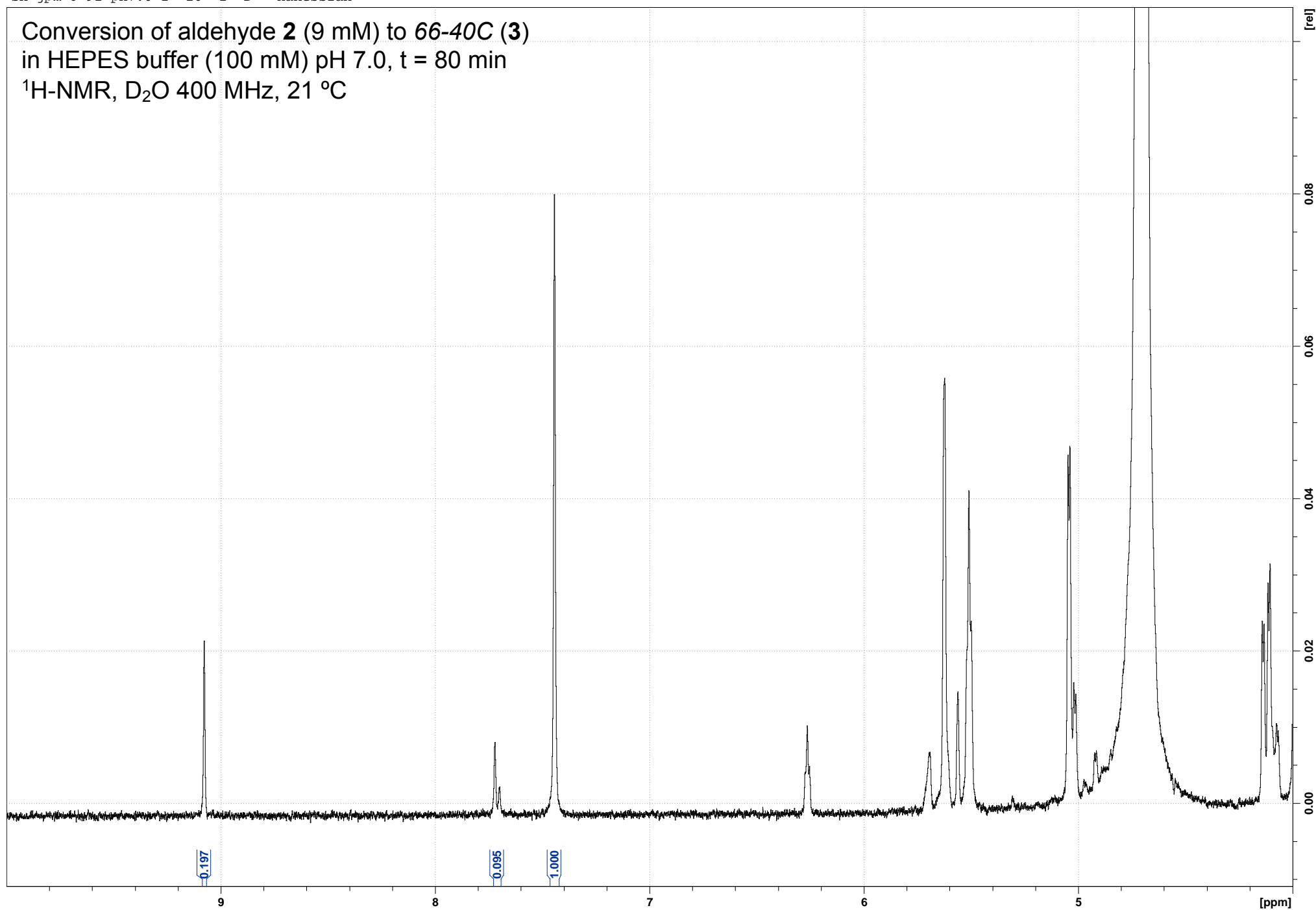
sh-jpm-6-91-ph7.0-2 9 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 70 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



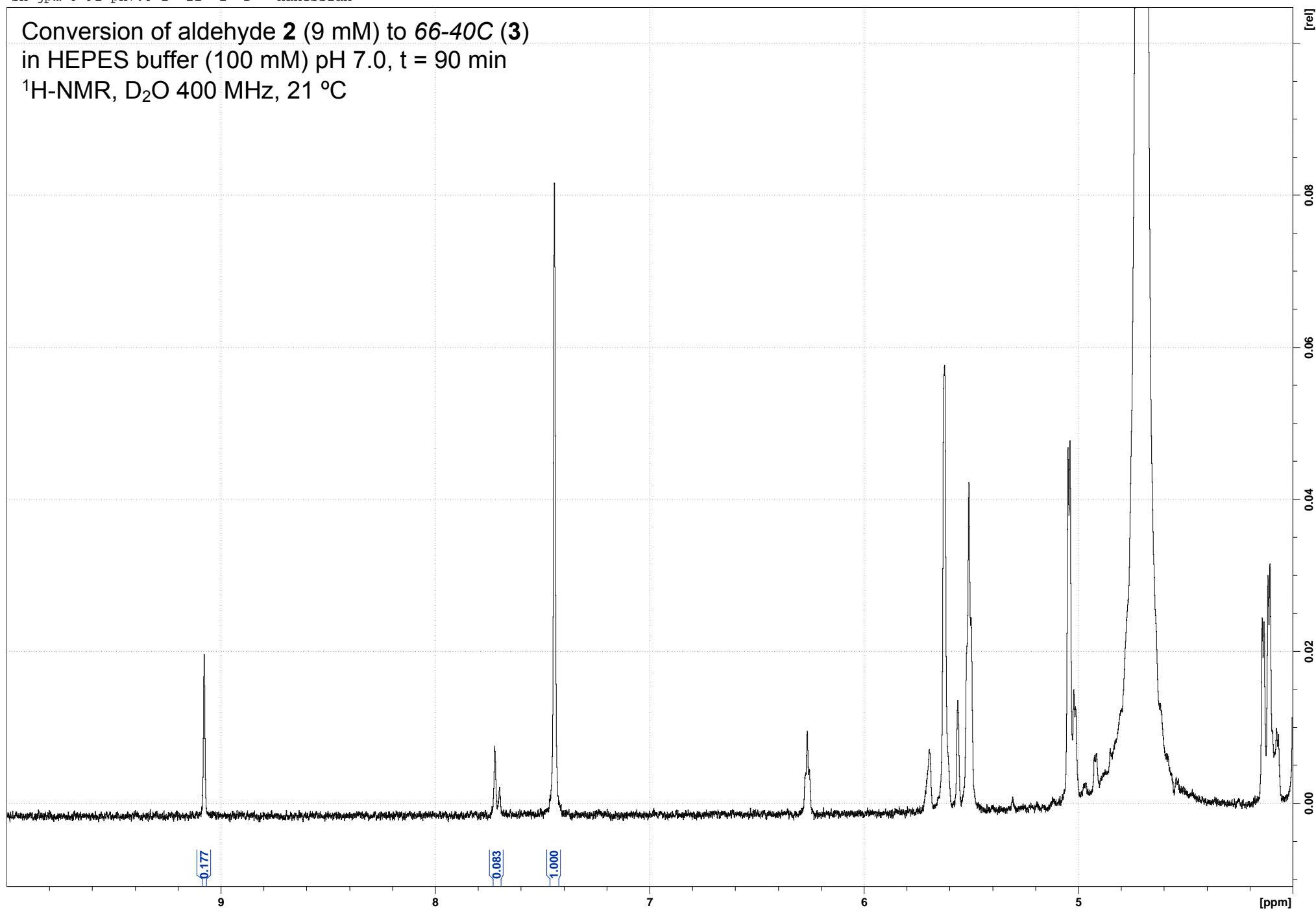
sh-jpm-6-91-ph7.0-2 10 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 80 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



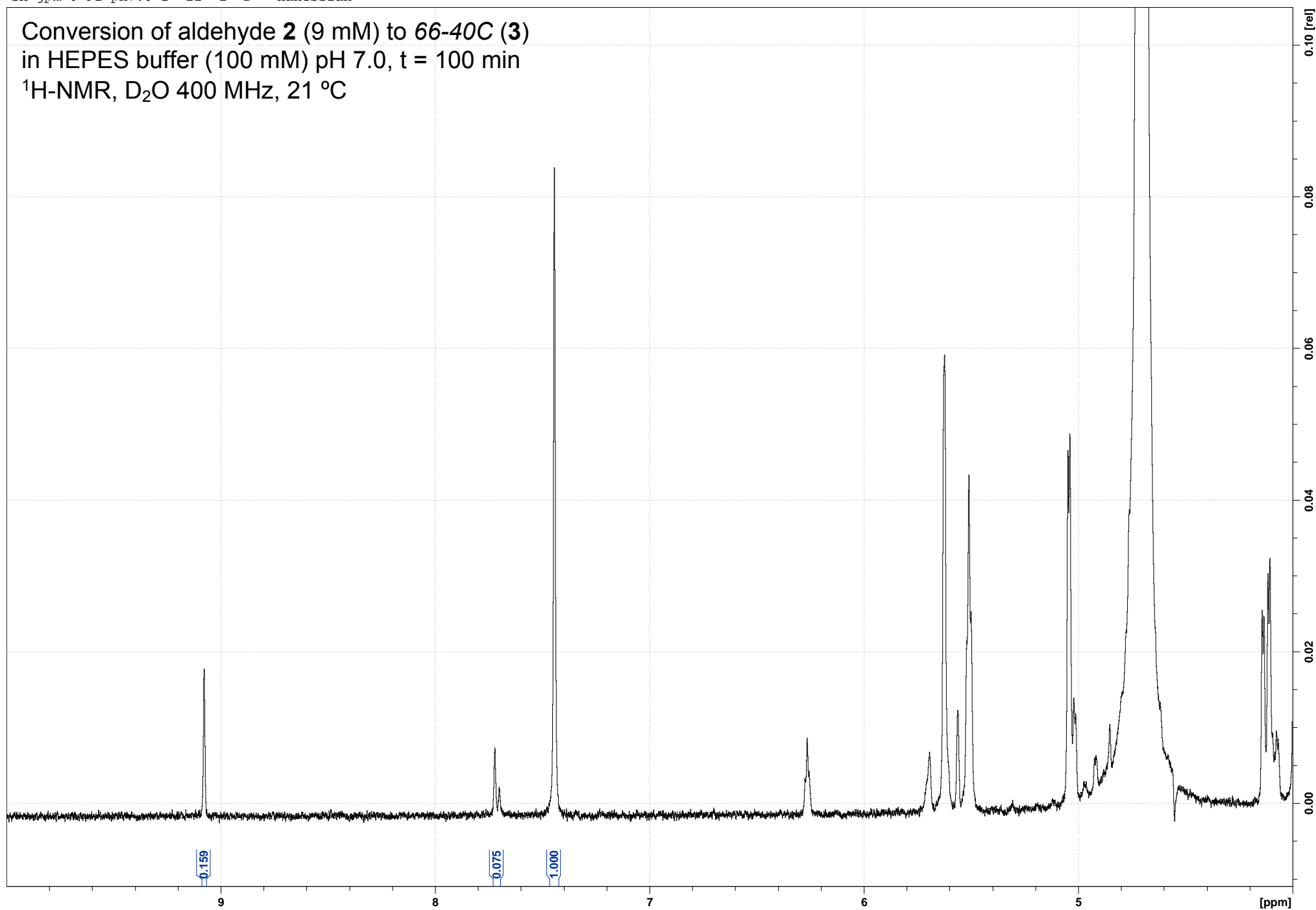
sh-jpm-6-91-ph7.0-2 11 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 90 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



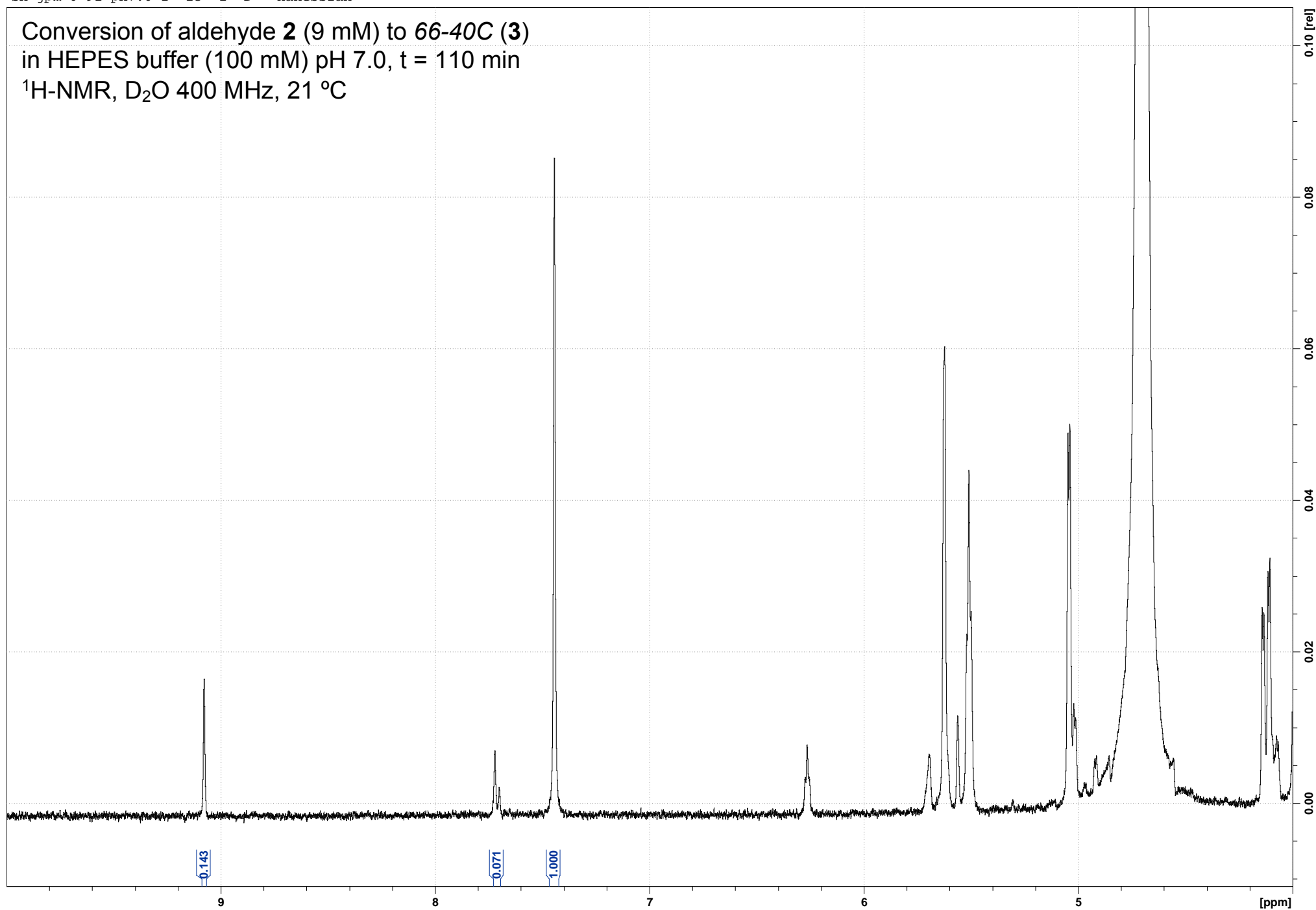
sh-jpm-6-91-ph7.0-2 12 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 100 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph7.0-2 13 1 D: Hanessian

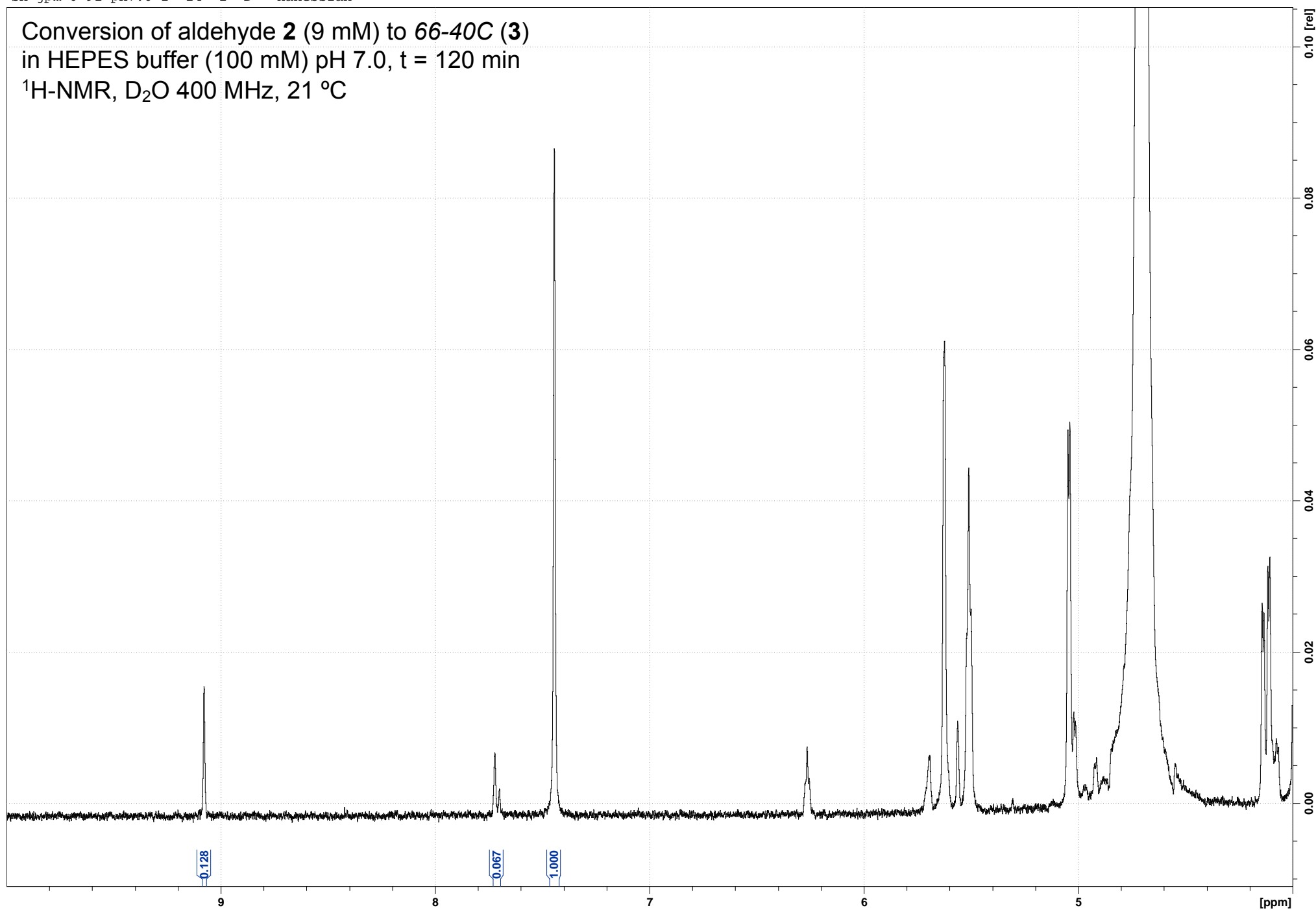
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 110 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C





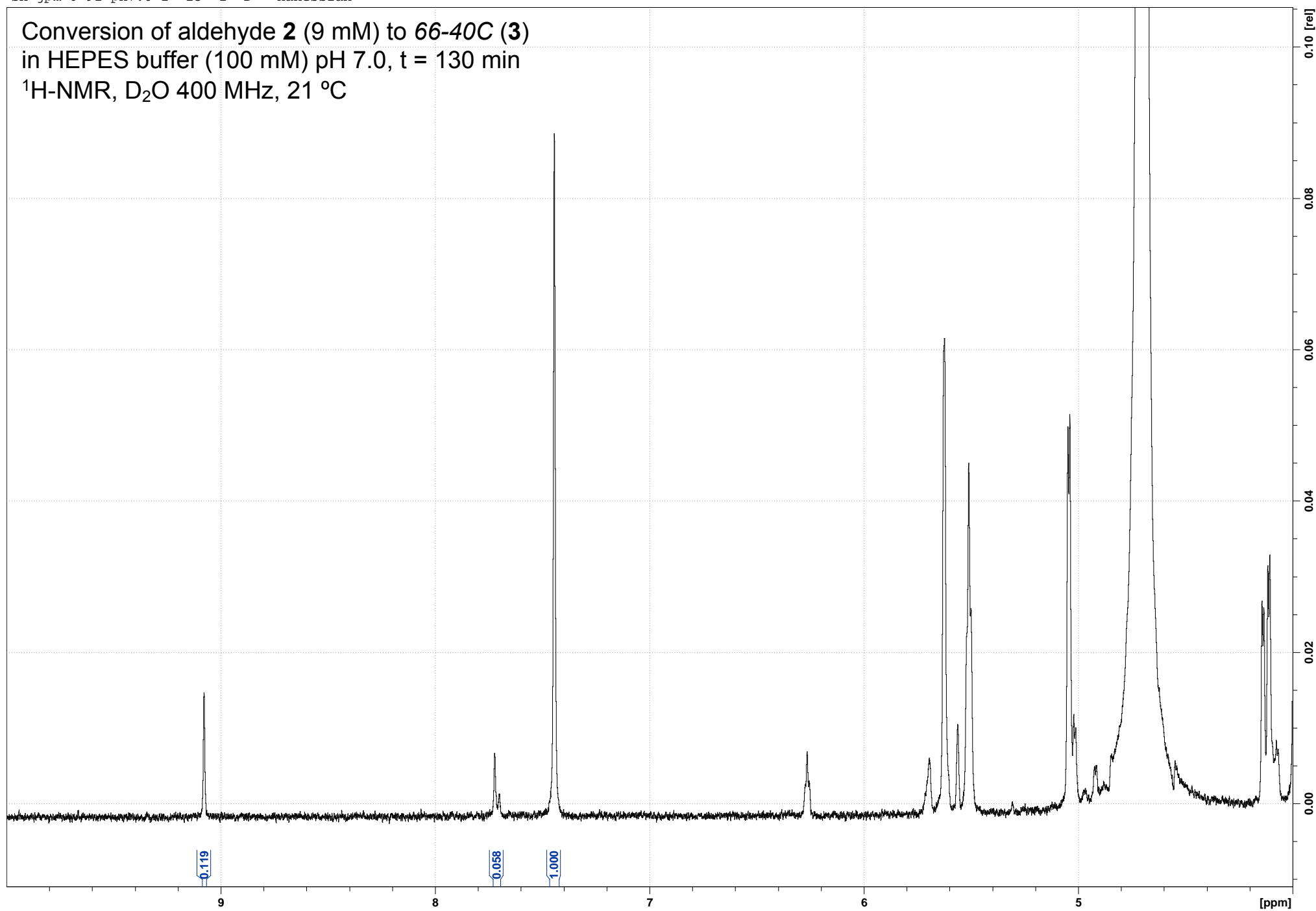
sh-jpm-6-91-ph7.0-2 14 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 120 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



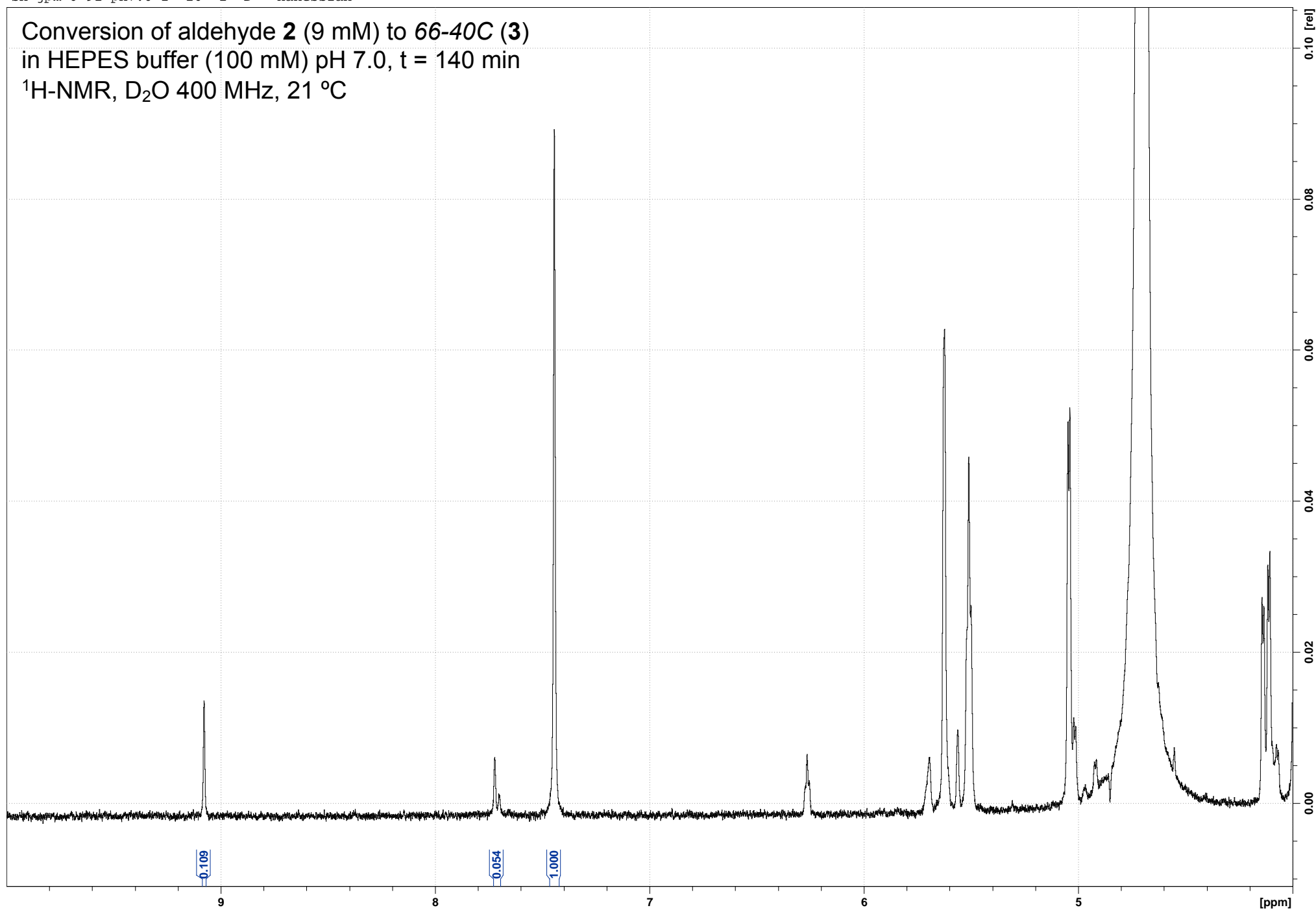
sh-jpm-6-91-ph7.0-2 15 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 130 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



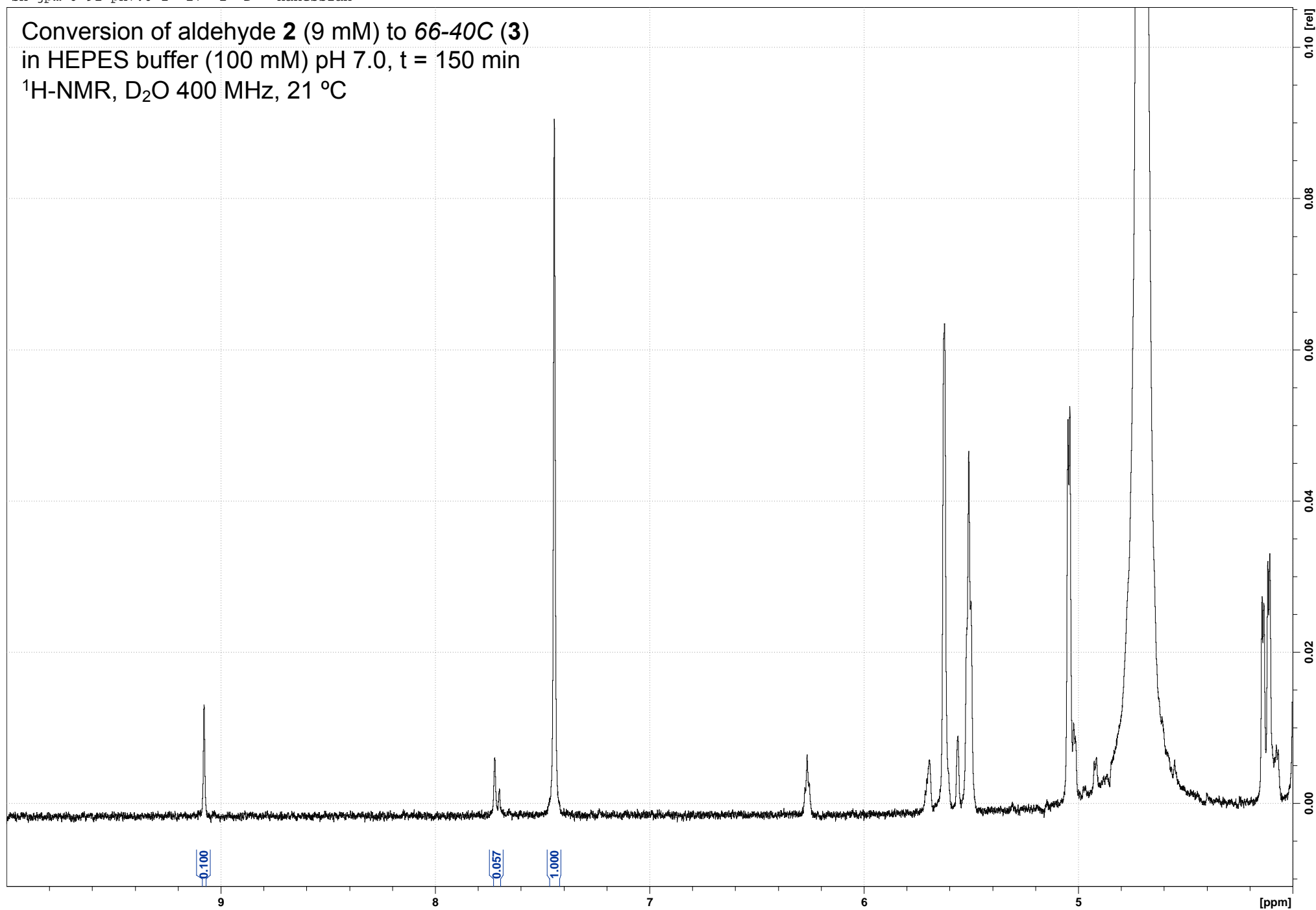
sh-jpm-6-91-ph7.0-2 16 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 140 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



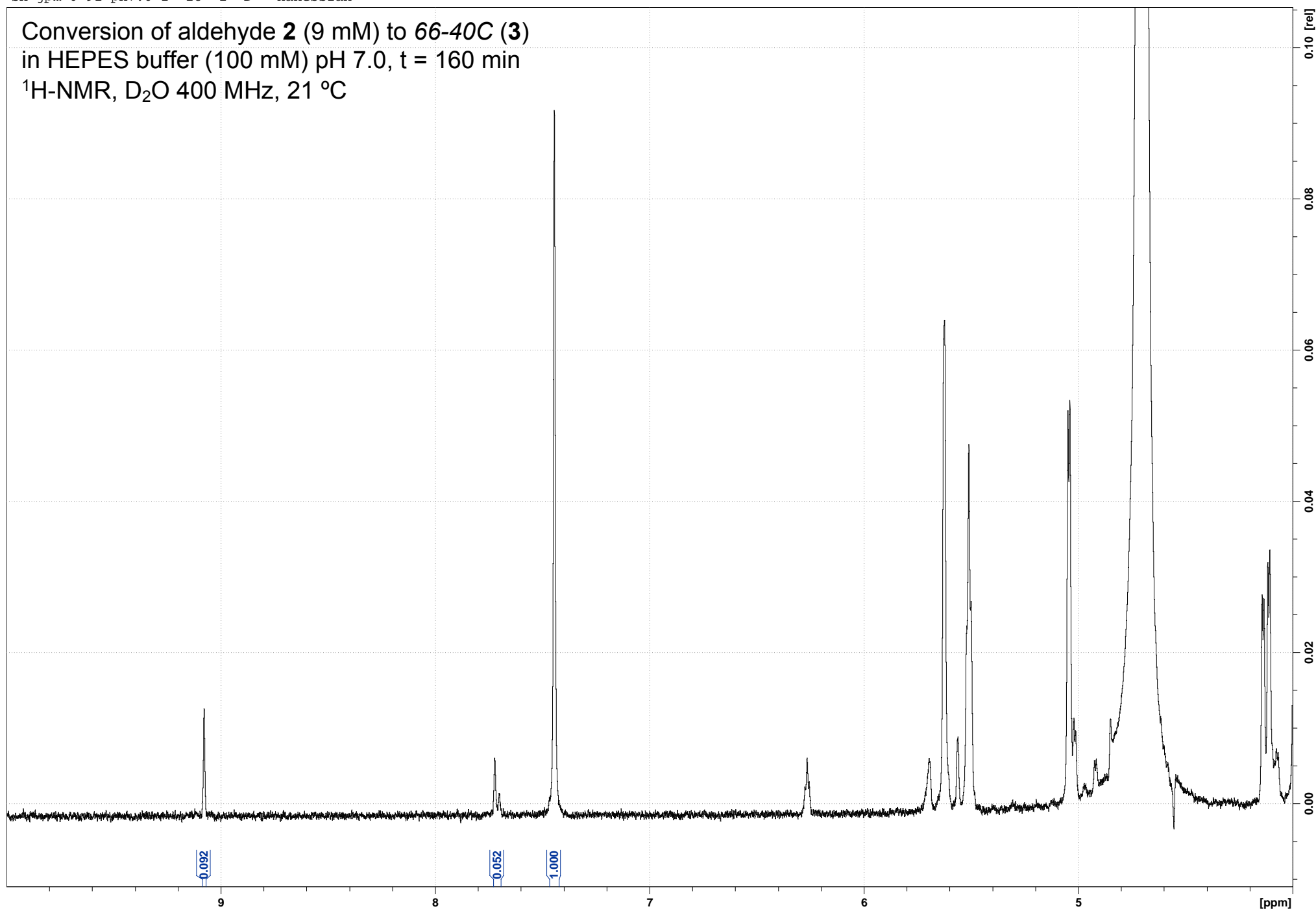
sh-jpm-6-91-ph7.0-2 17 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 150 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



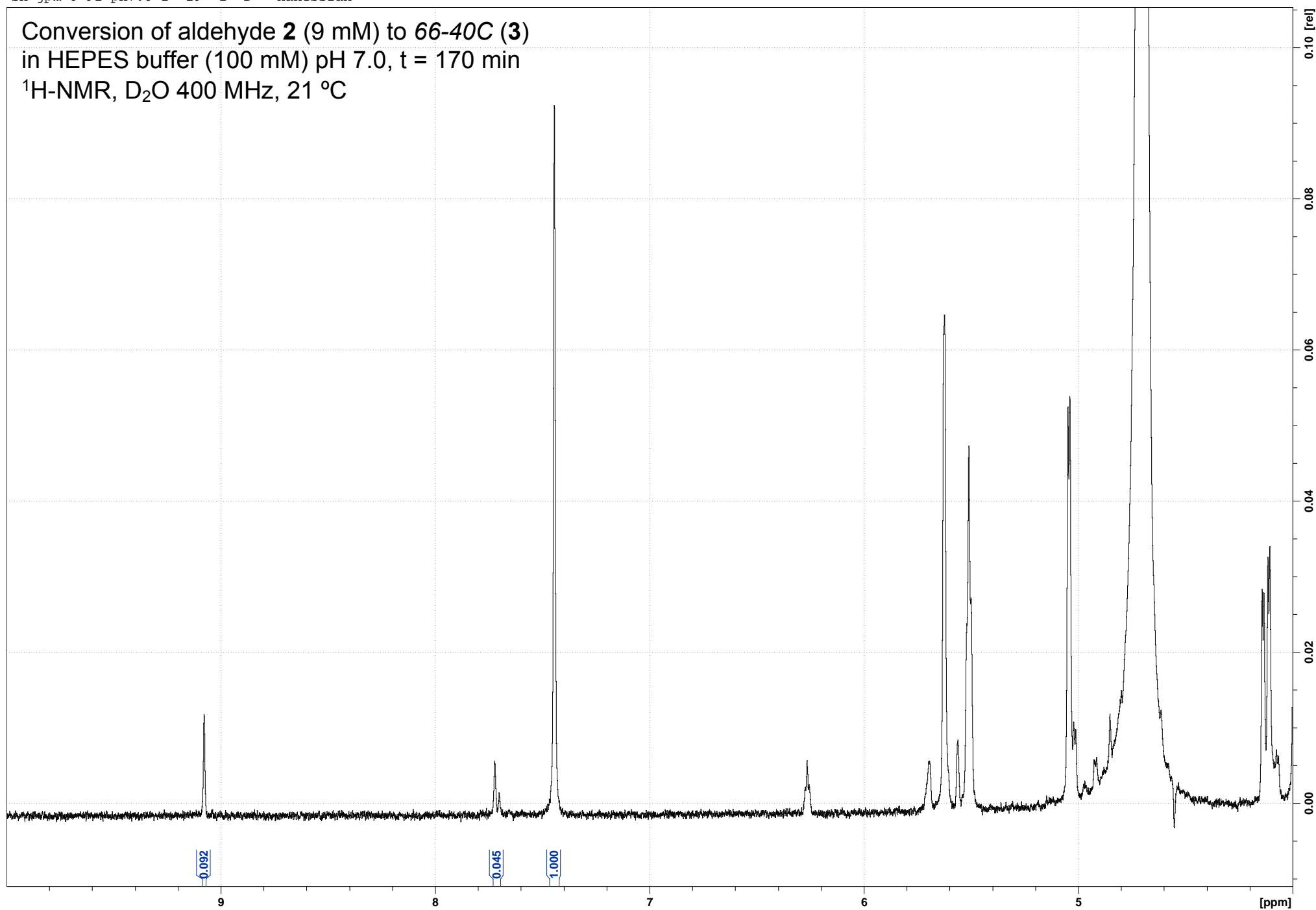
sh-jpm-6-91-ph7.0-2 18 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 160 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



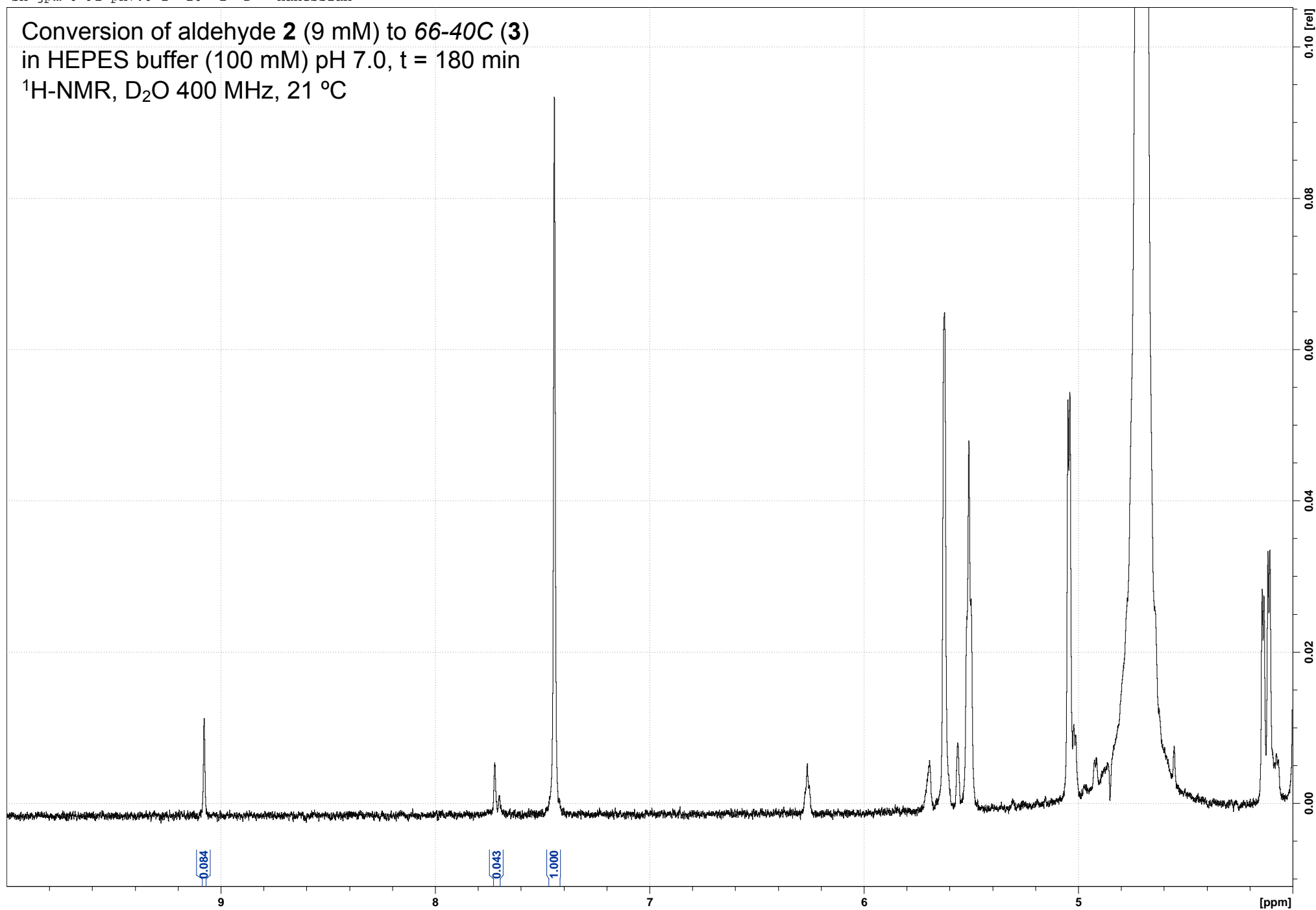
sh-jpm-6-91-ph7.0-2 19 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 170 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



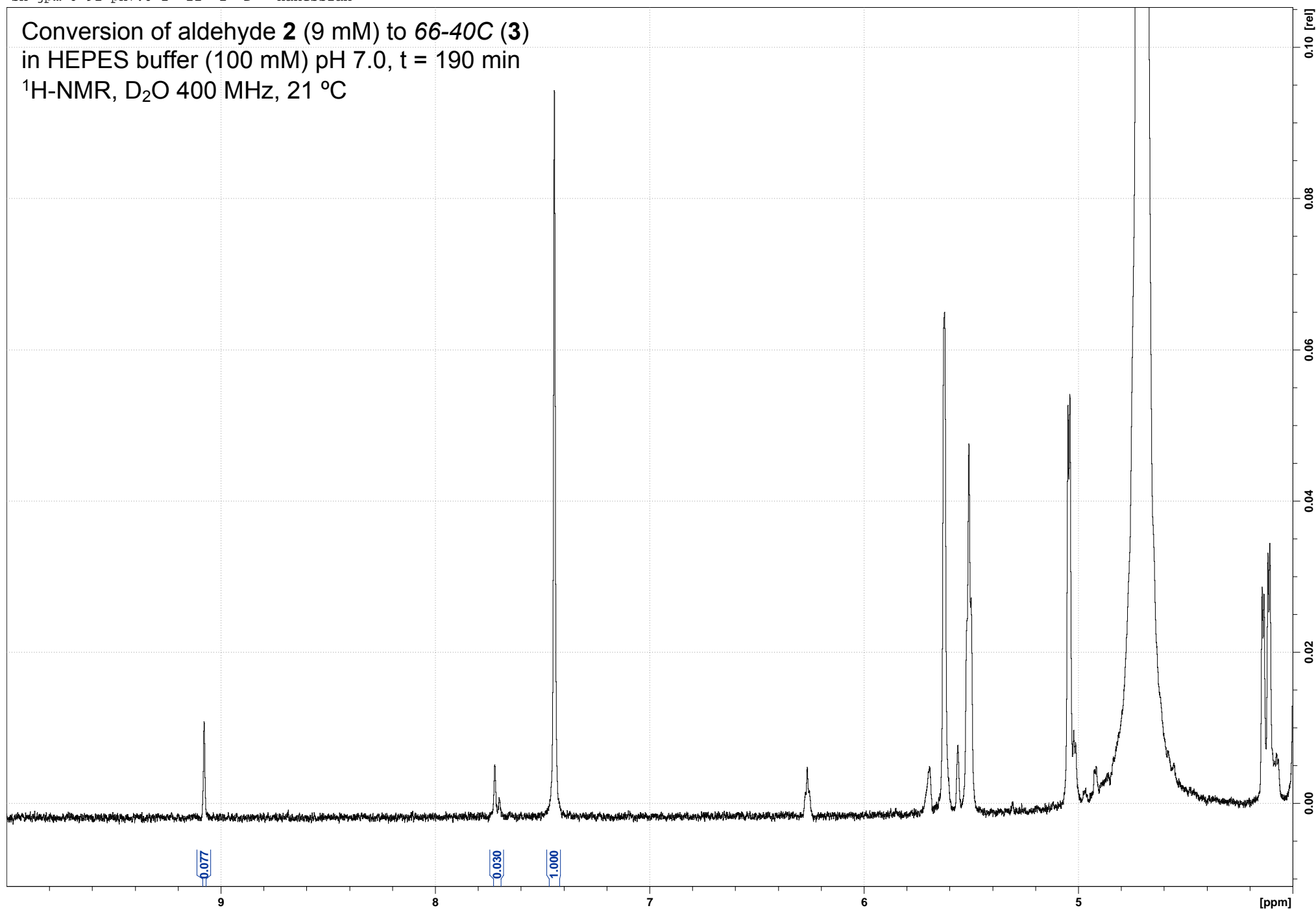
sh-jpm-6-91-ph7.0-2 20 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 180 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph7.0-2 21 1 D: Hanessian

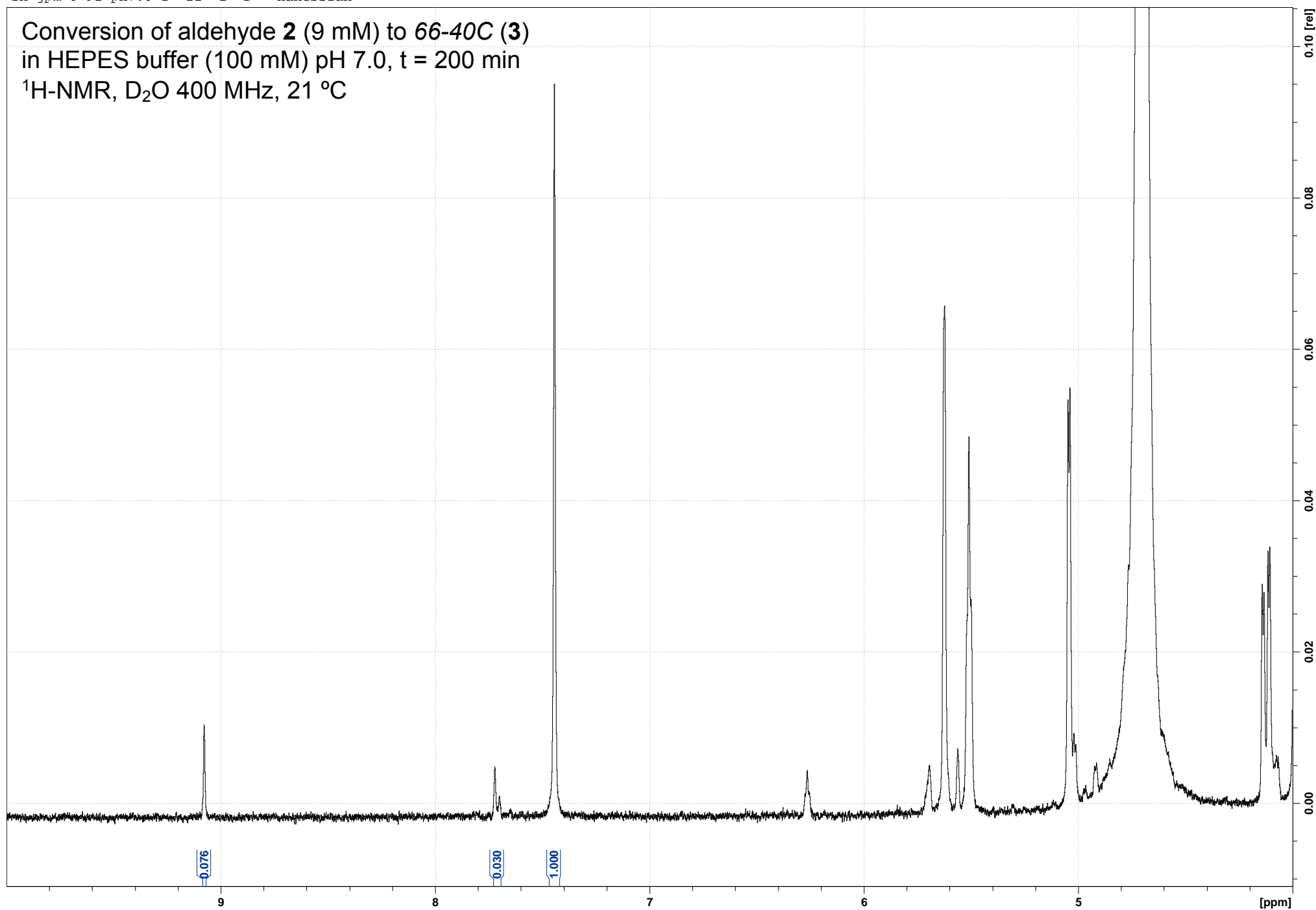
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 190 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





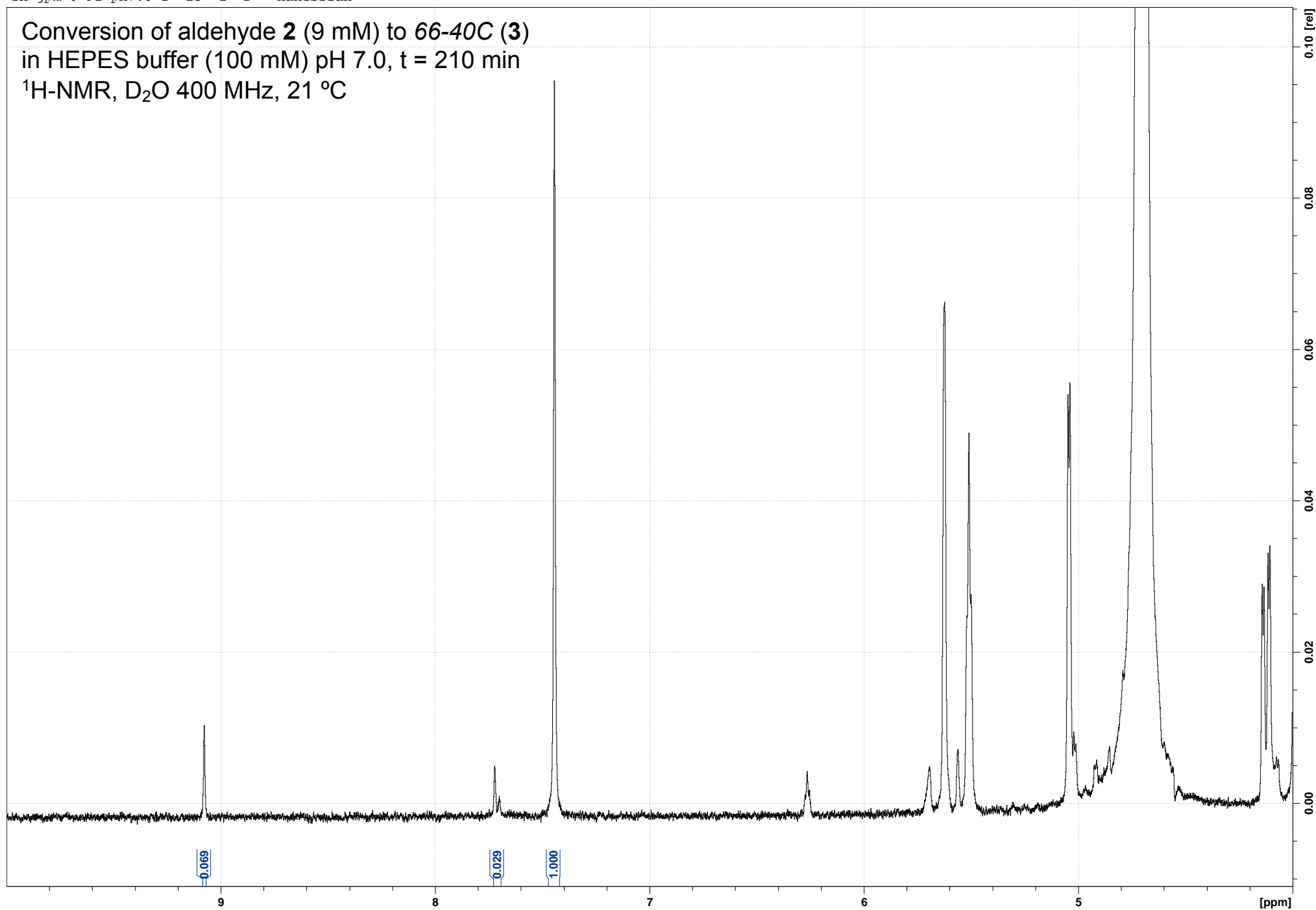
sh-jpm-6-91-ph7.0-2 22 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 200 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



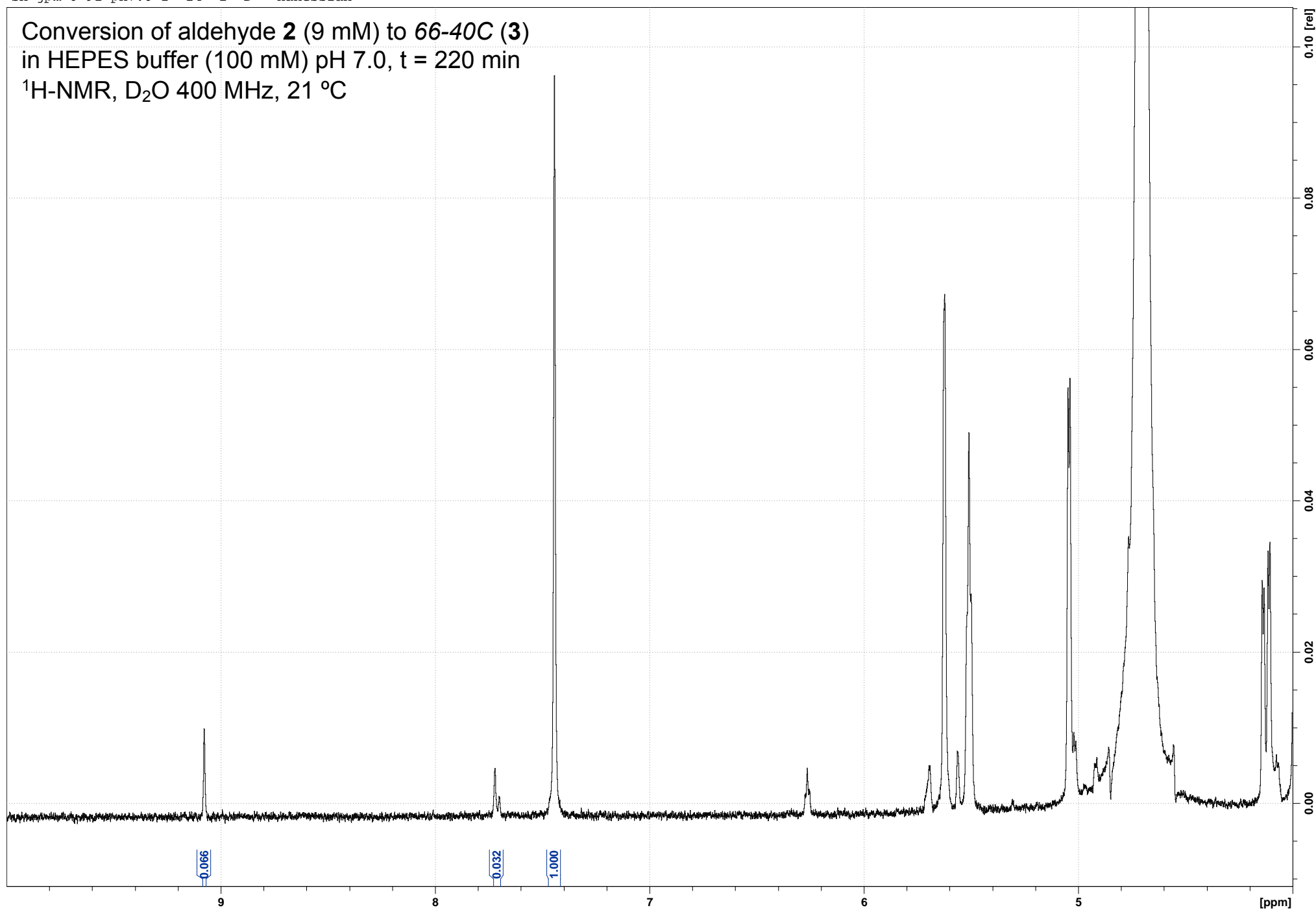
sh-jpm-6-91-ph7.0-2 23 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 210 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



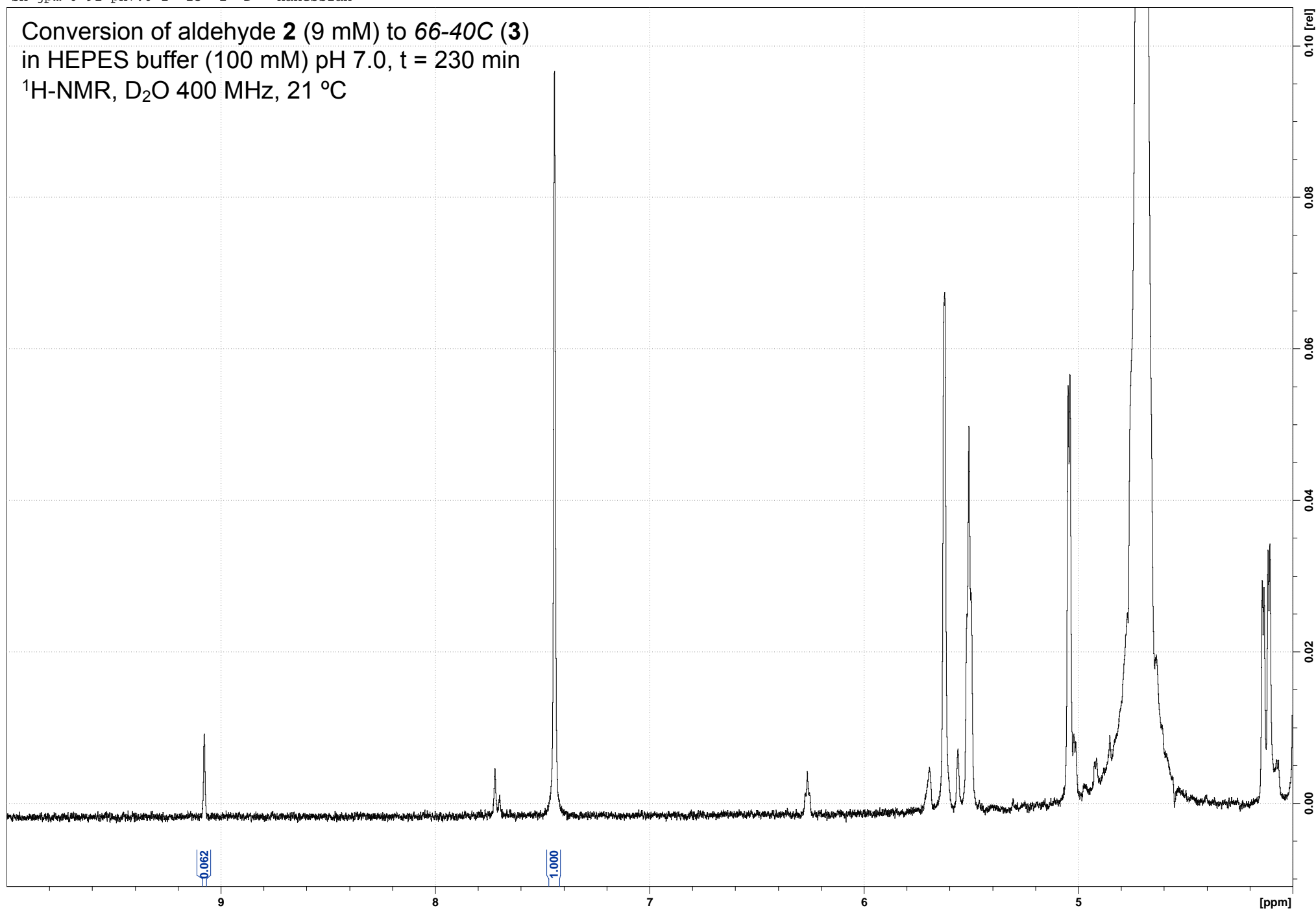
sh-jpm-6-91-ph7.0-2 24 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 220 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



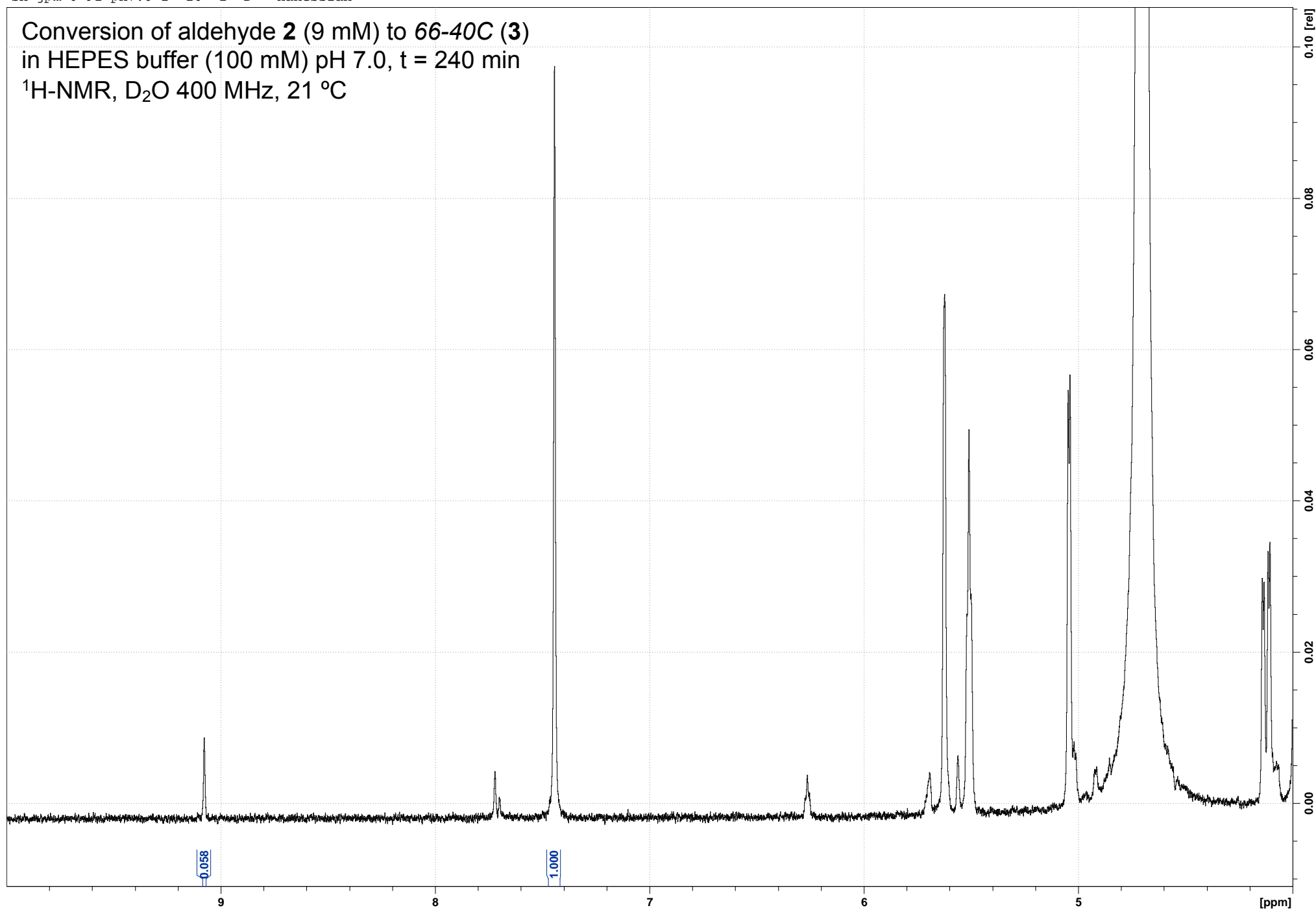
sh-jpm-6-91-ph7.0-2 25 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 230 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



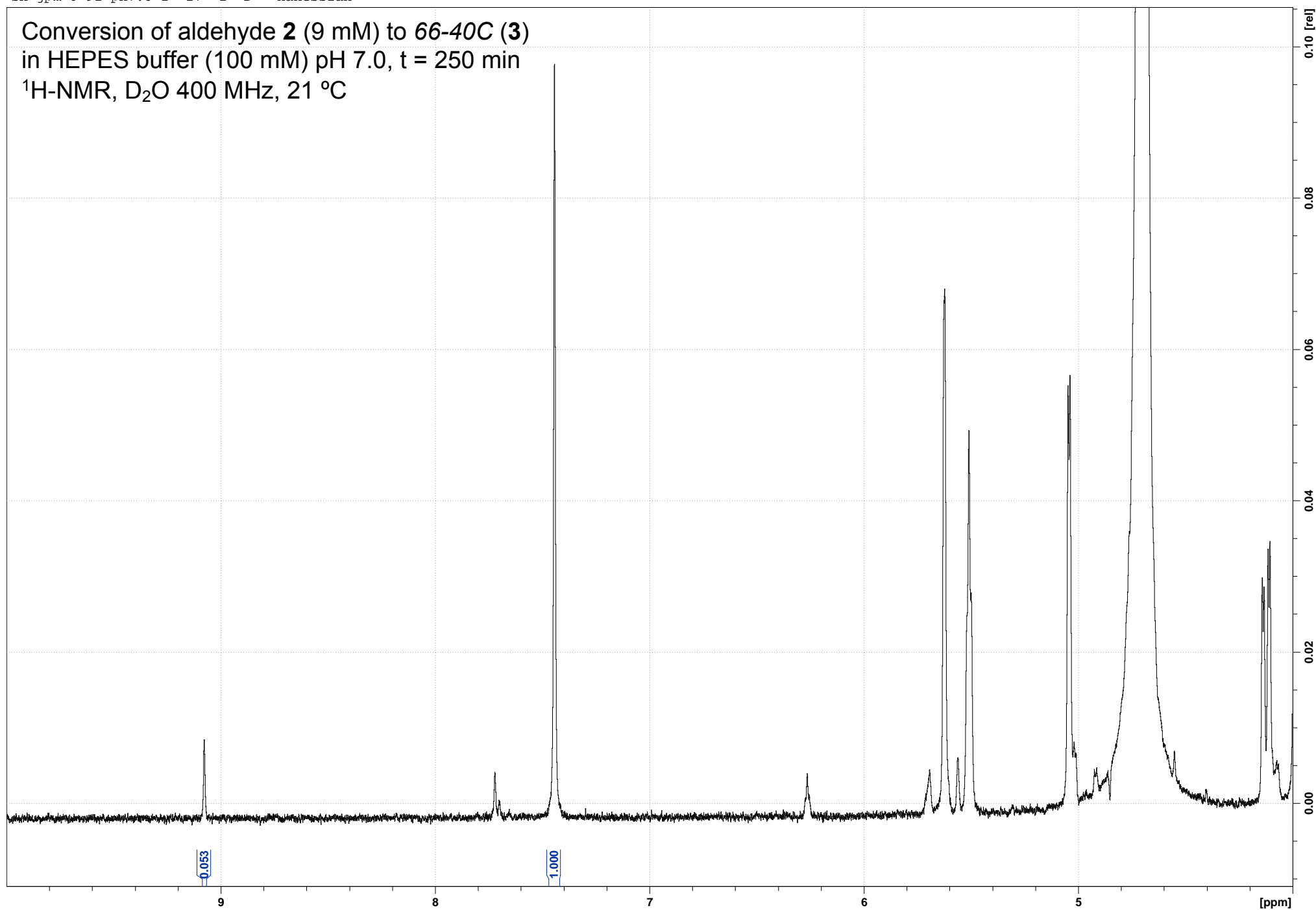
sh-jpm-6-91-ph7.0-2 26 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 240 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



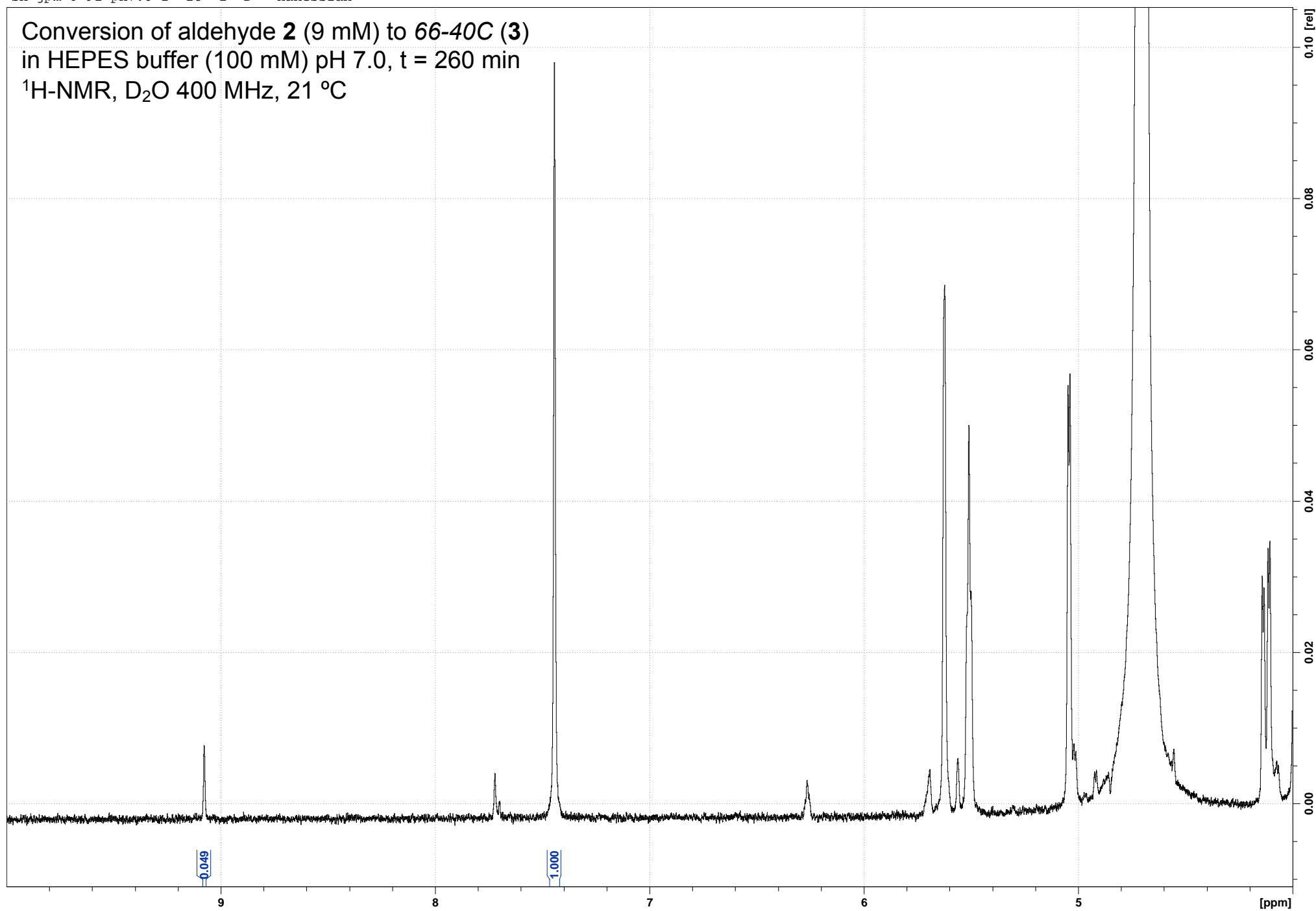
sh-jpm-6-91-ph7.0-2 27 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 250 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



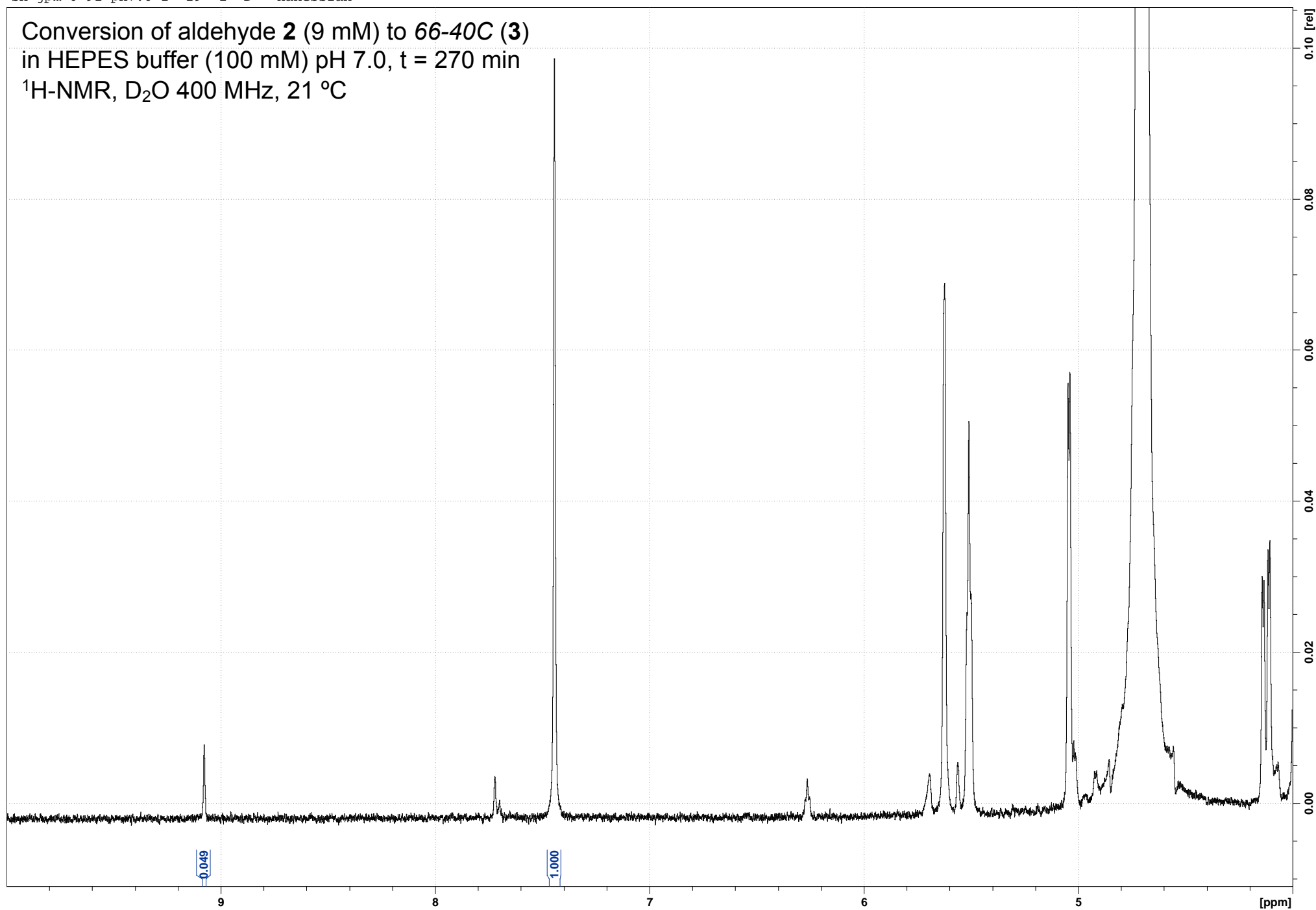
sh-jpm-6-91-ph7.0-2 28 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 260 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph7.0-2 29 1 D: Hanessian

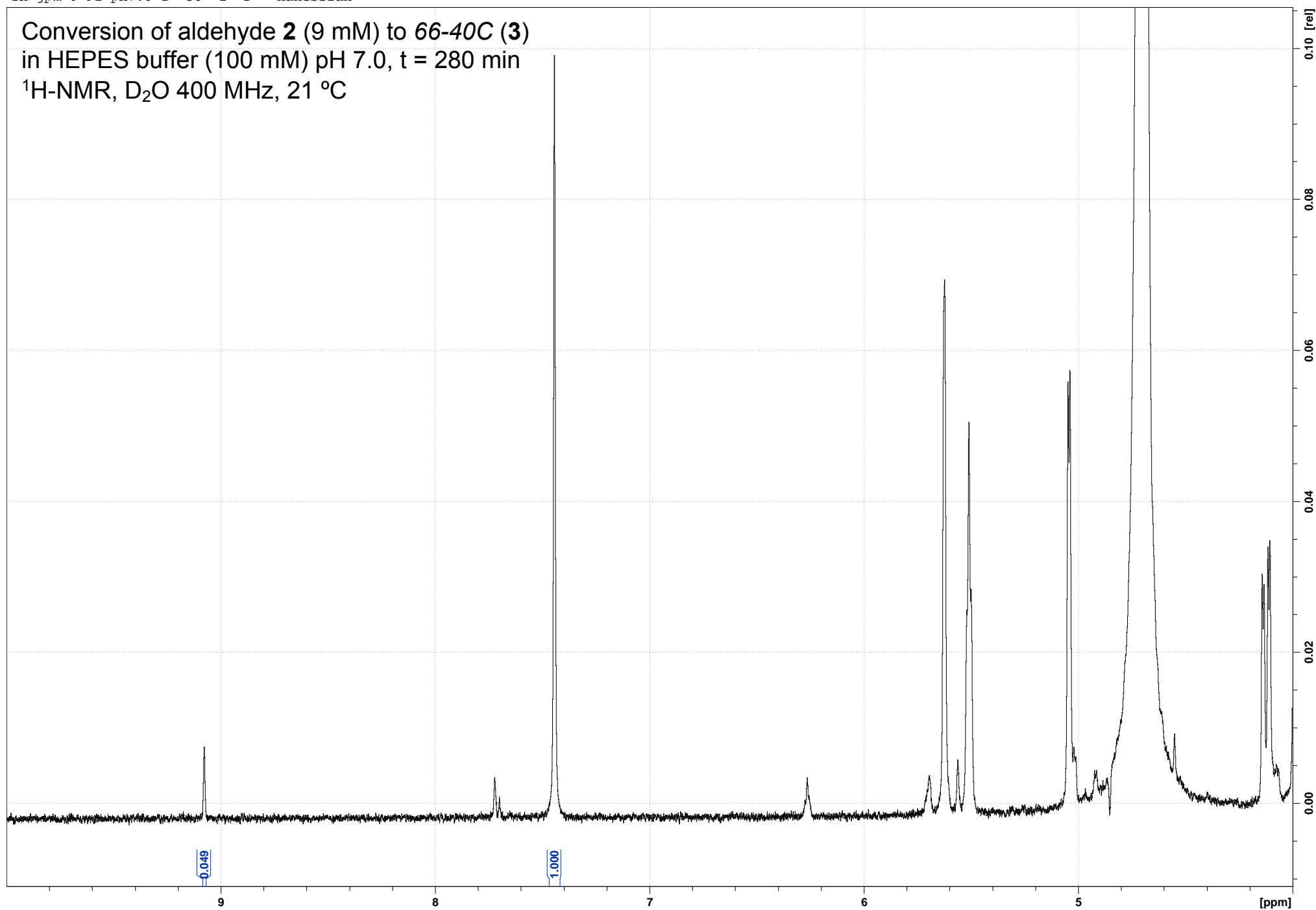
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 270 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





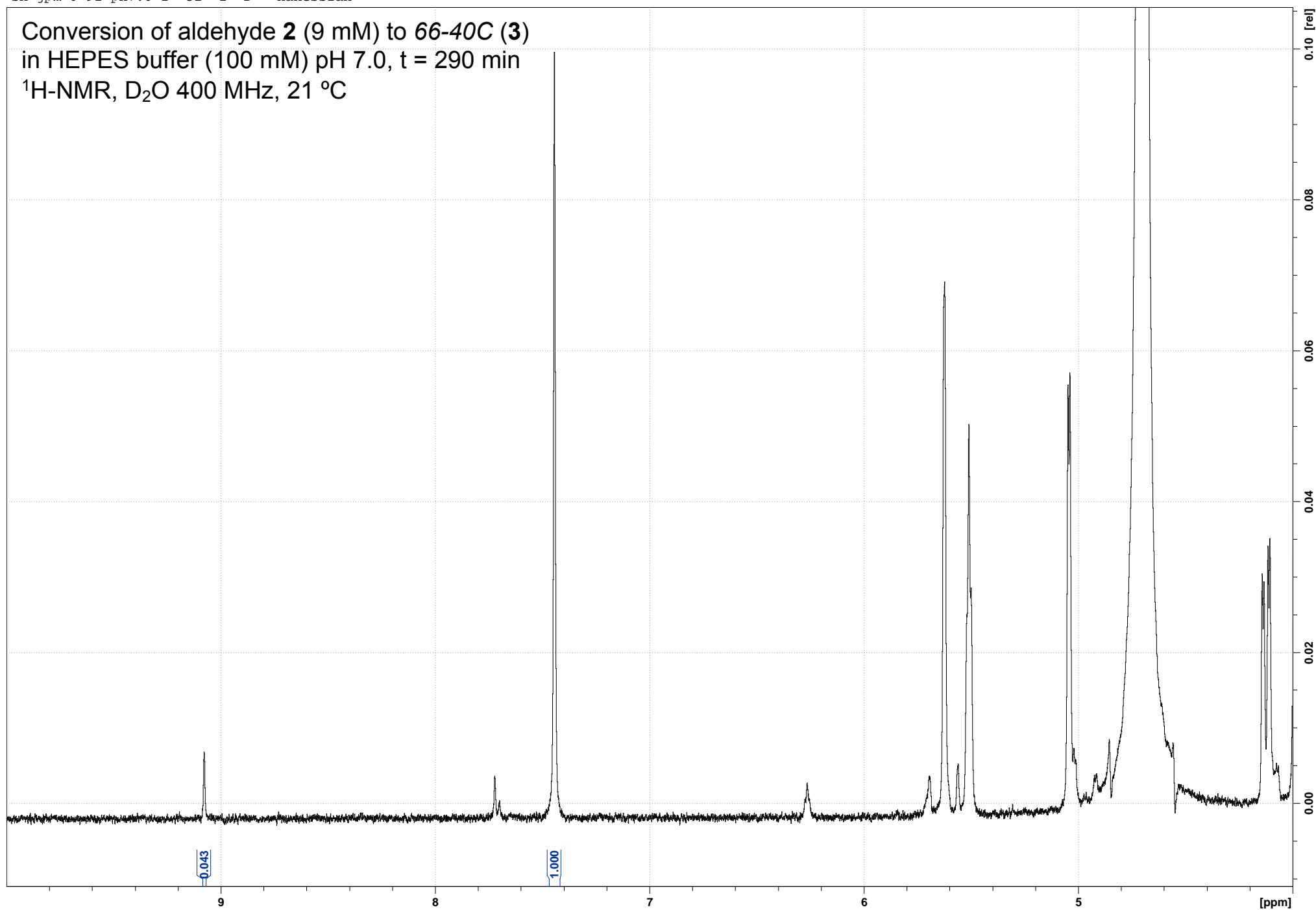
sh-jpm-6-91-ph7.0-2 30 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 280 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



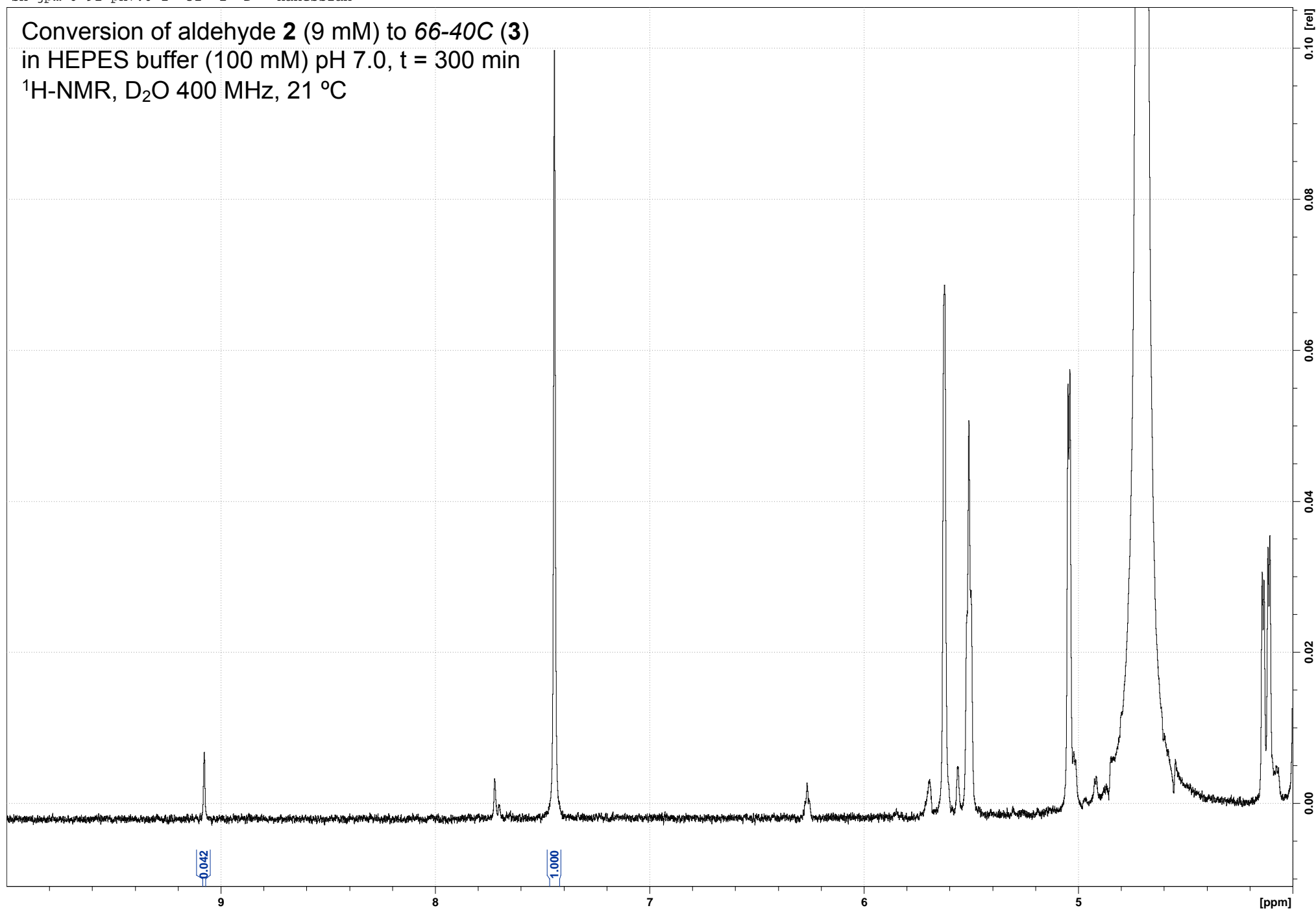
sh-jpm-6-91-ph7.0-2 31 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 290 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



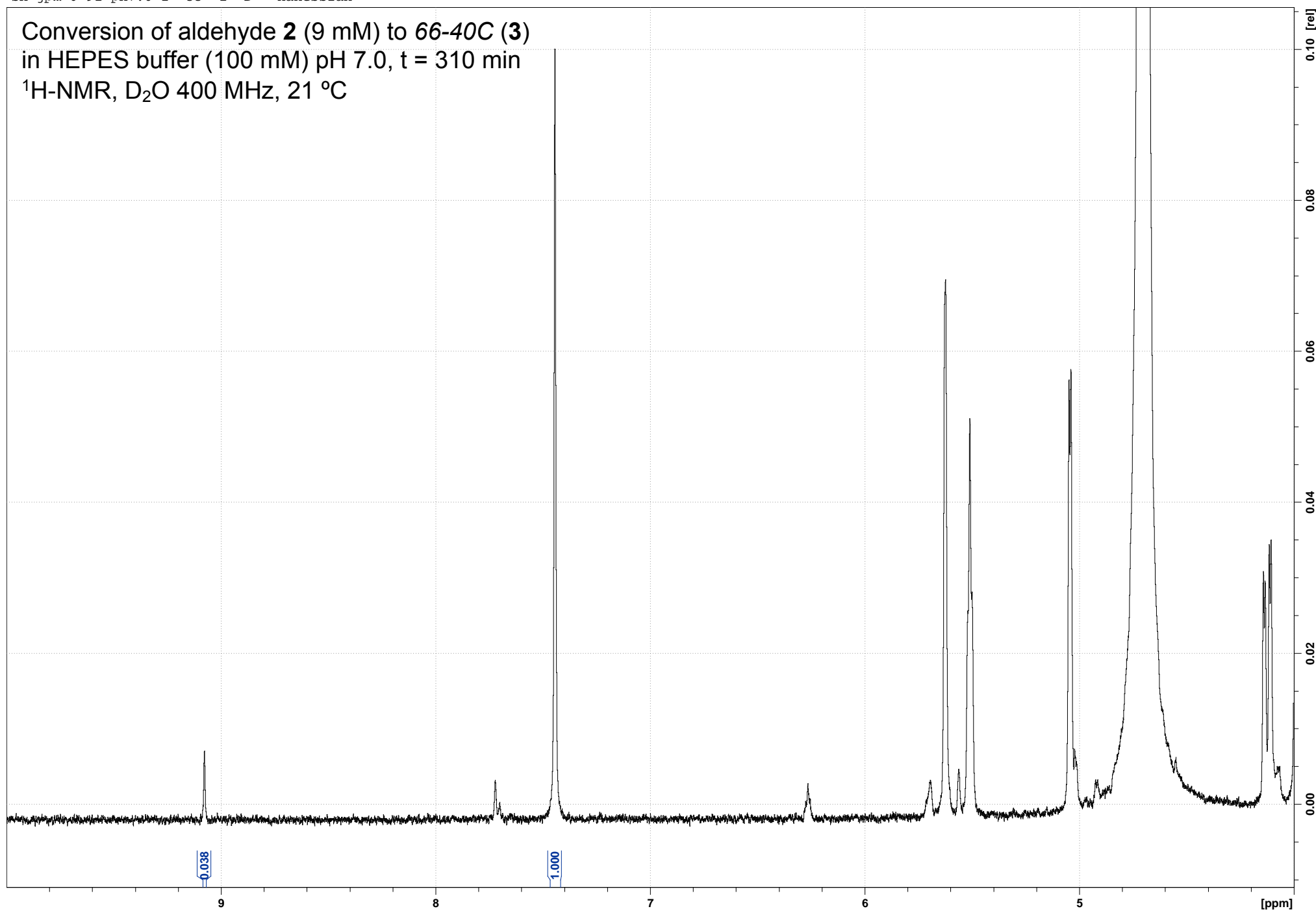
sh-jpm-6-91-ph7.0-2 32 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 300 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



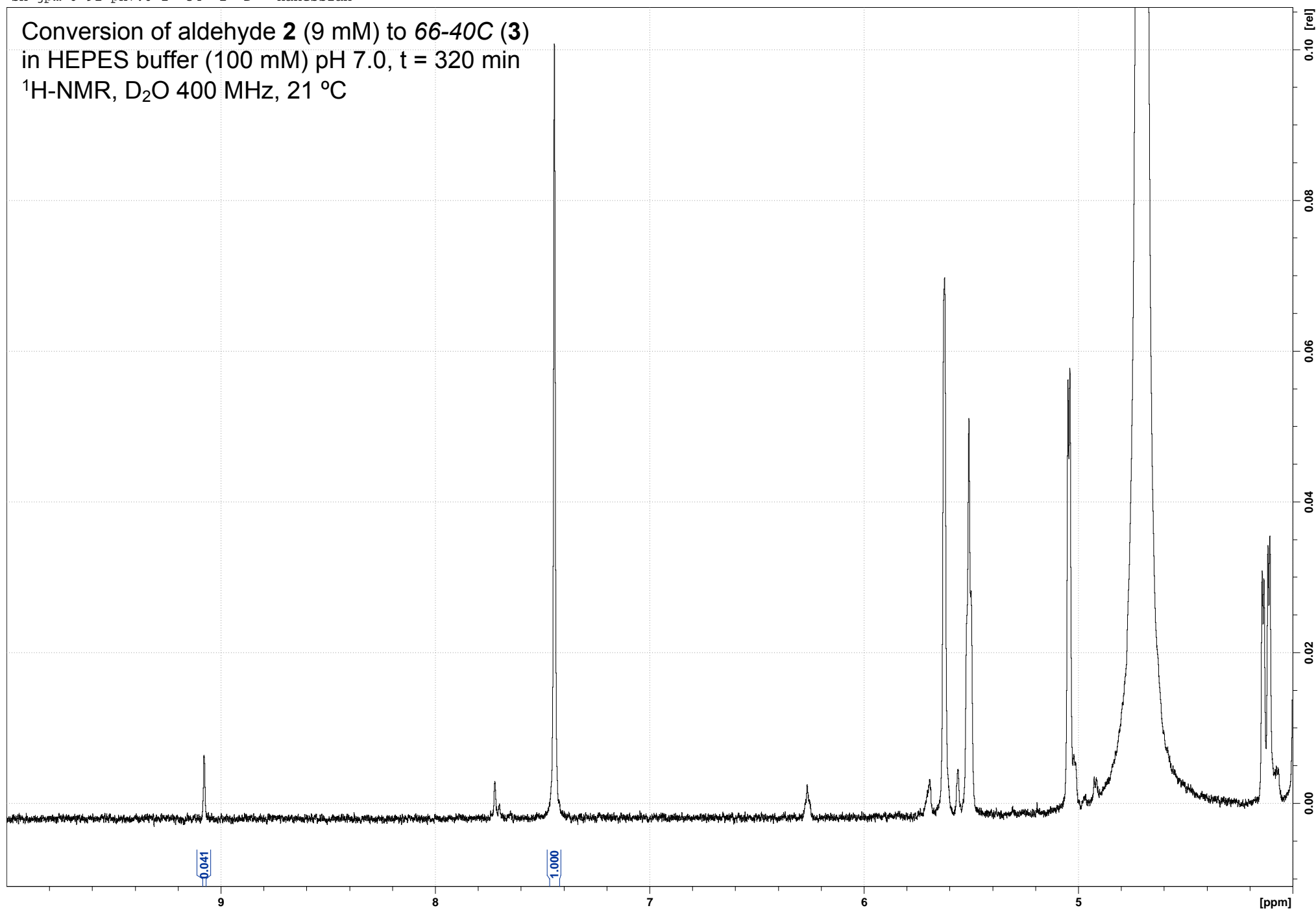
sh-jpm-6-91-ph7.0-2 33 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 310 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



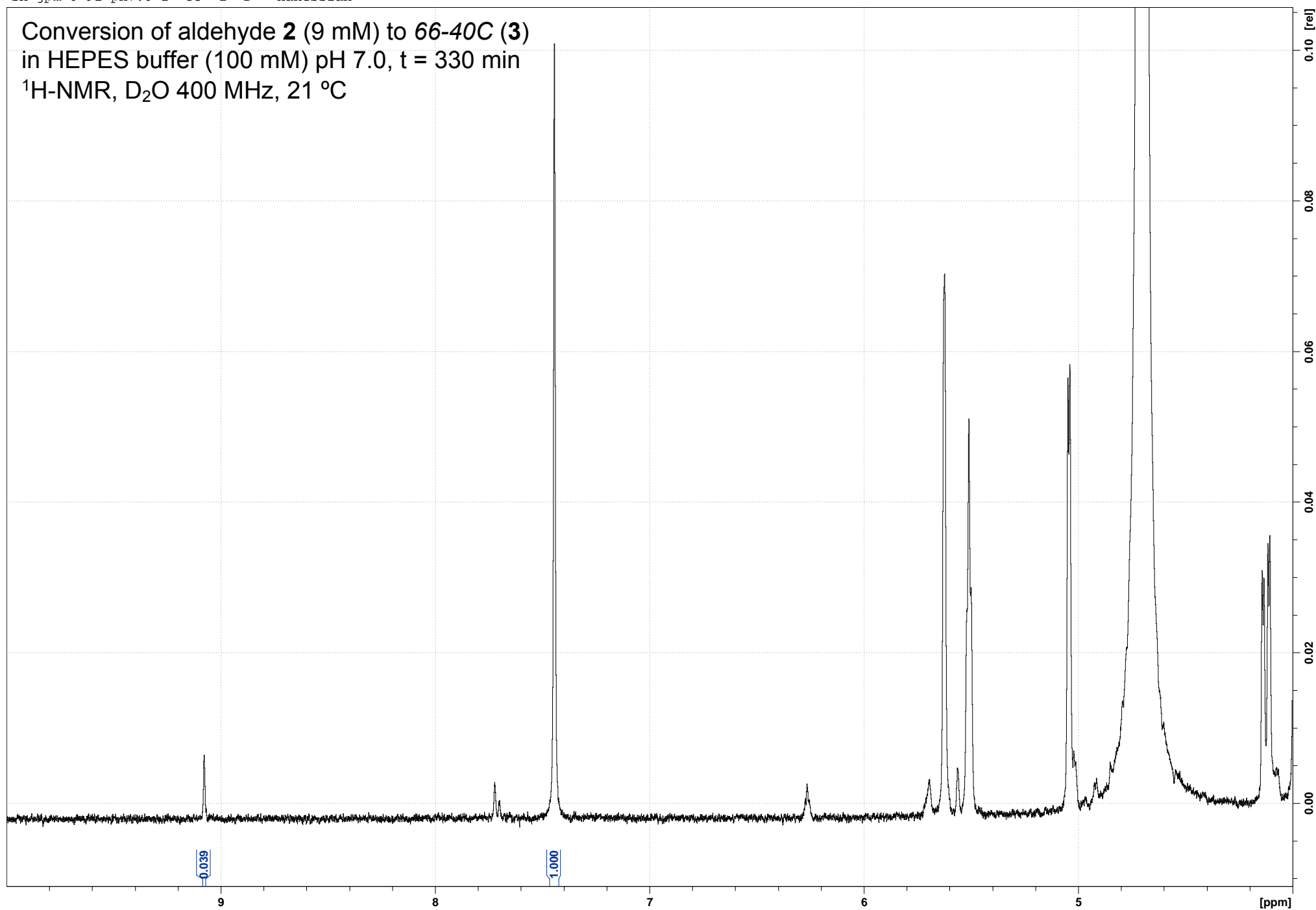
sh-jpm-6-91-ph7.0-2 34 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 320 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



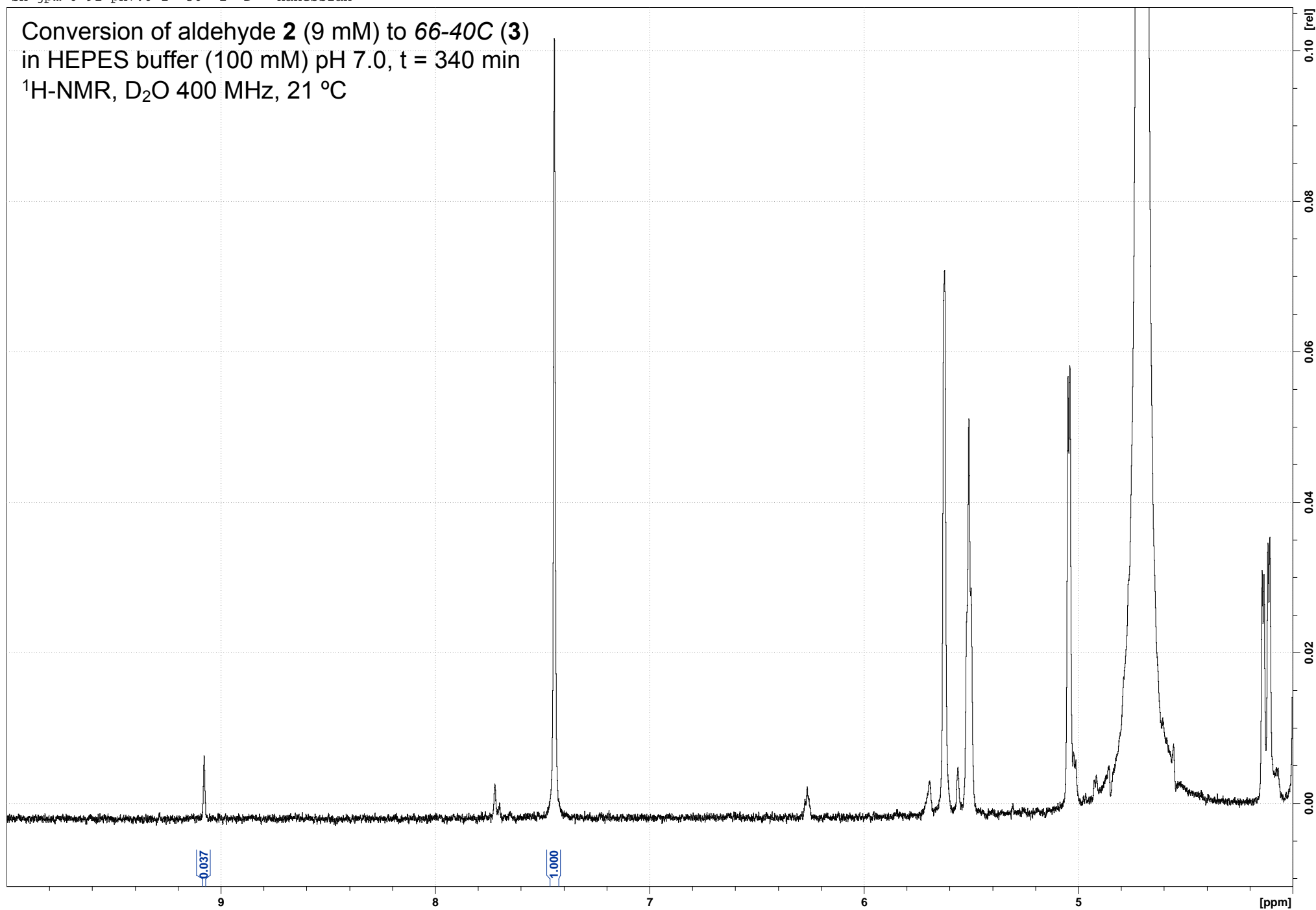
sh-jpm-6-91-ph7.0-2 35 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 330 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



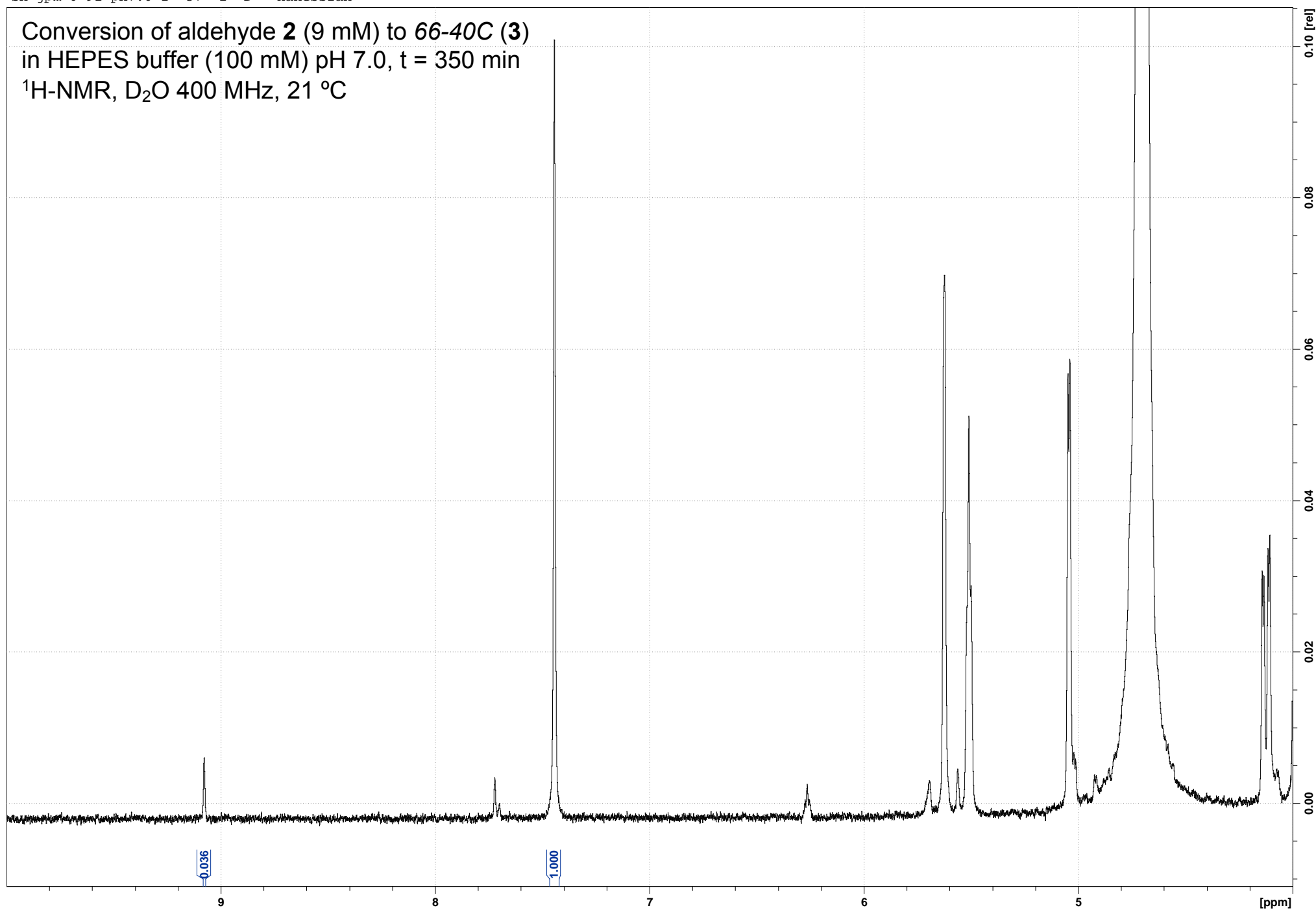
sh-jpm-6-91-ph7.0-2 36 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 340 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph7.0-2 37 1 D: Hanessian

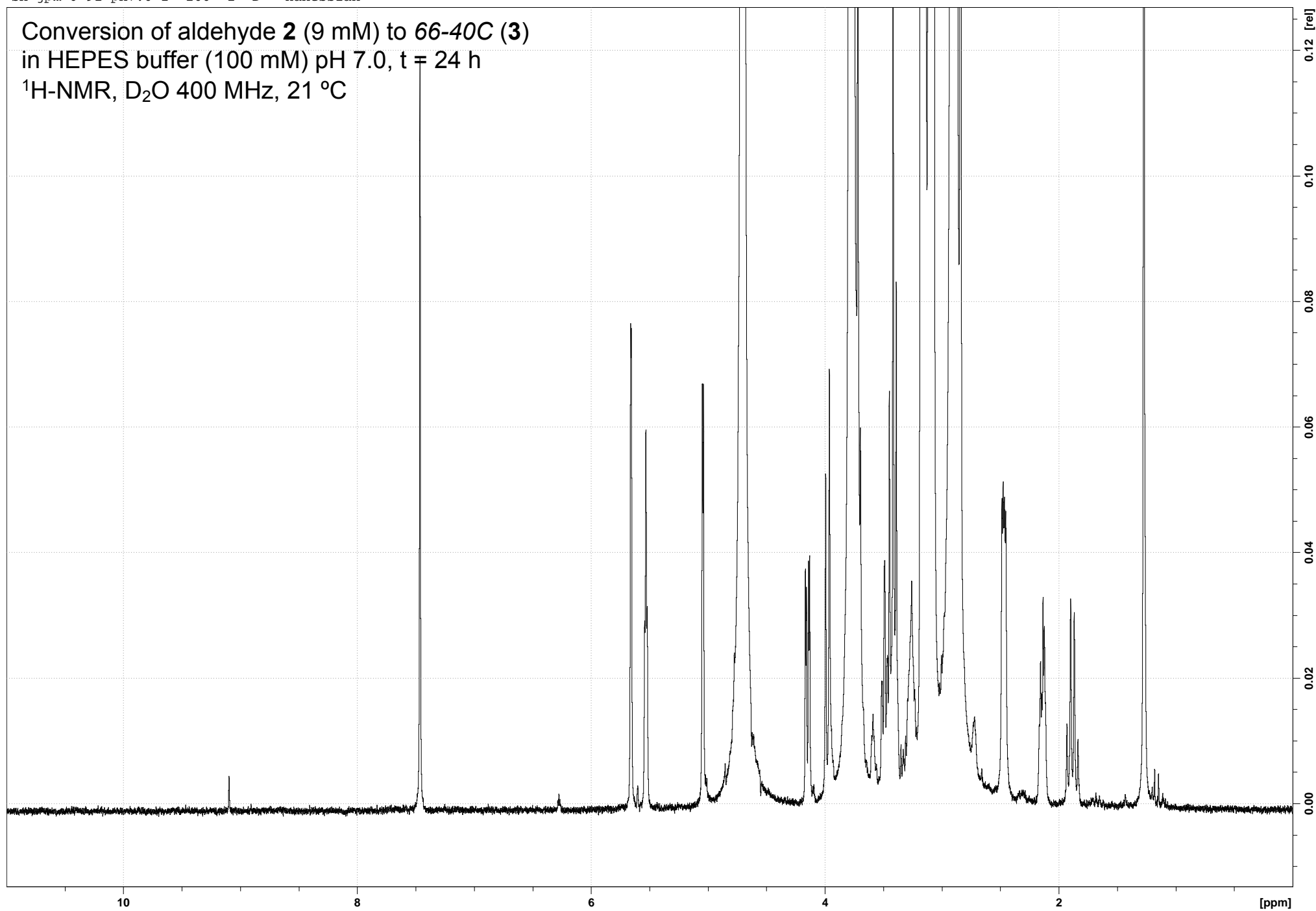
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 350 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





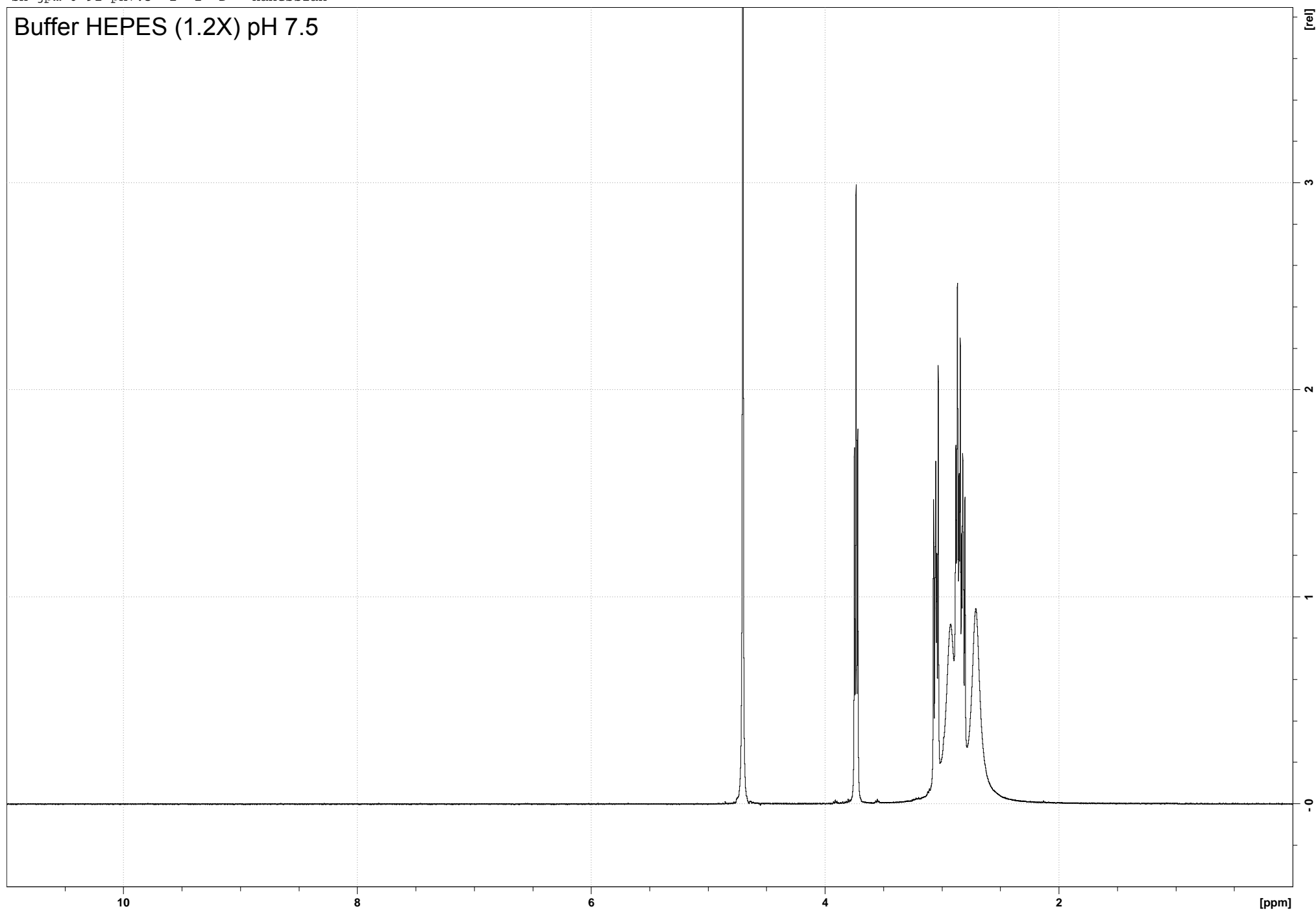
sh-jpm-6-91-ph7.0-2 100 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.0, t = 24 h  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



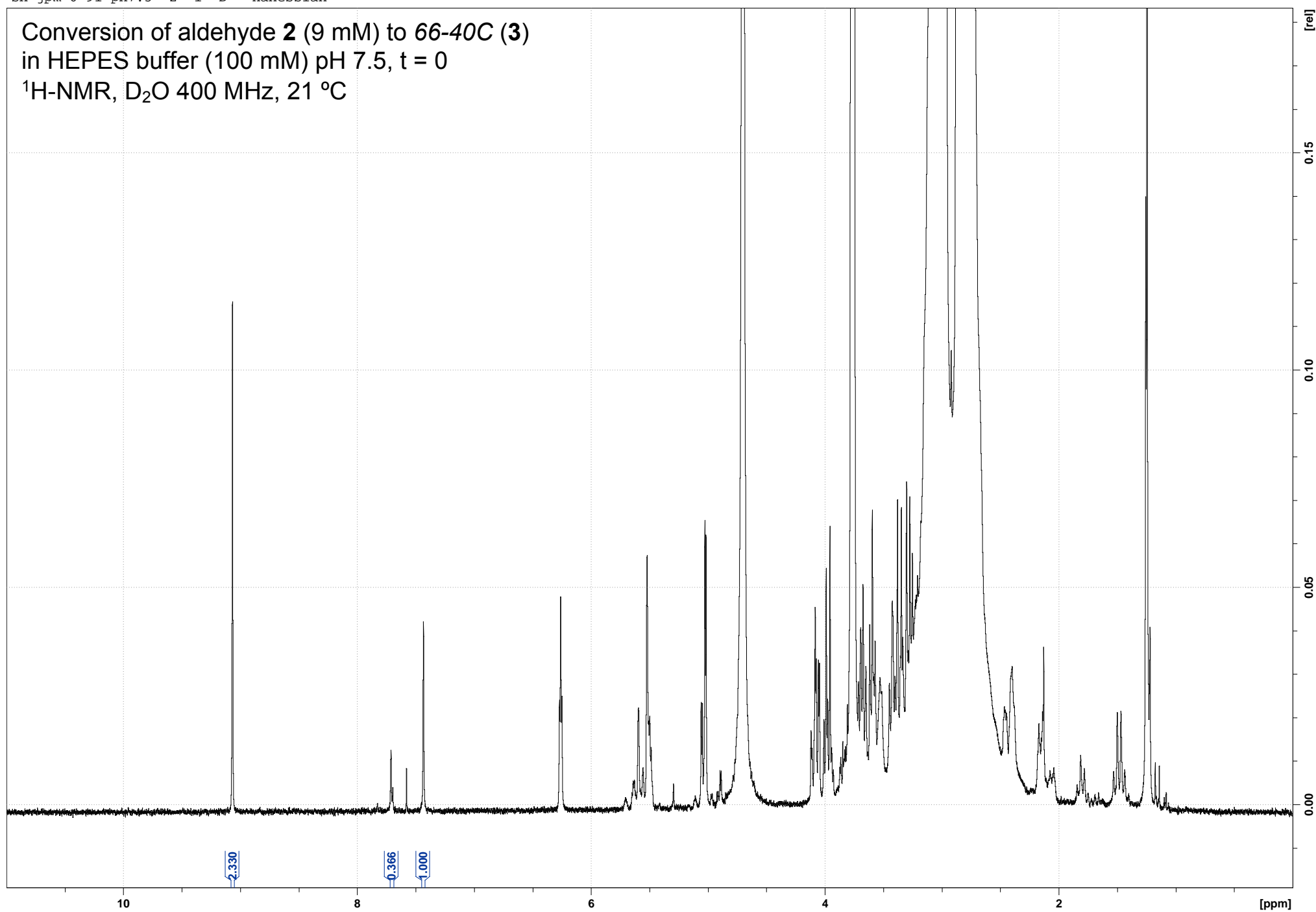
sh-jpm-6-91-ph7.5 1 1 D: Hessian

Buffer HEPES (1.2X) pH 7.5



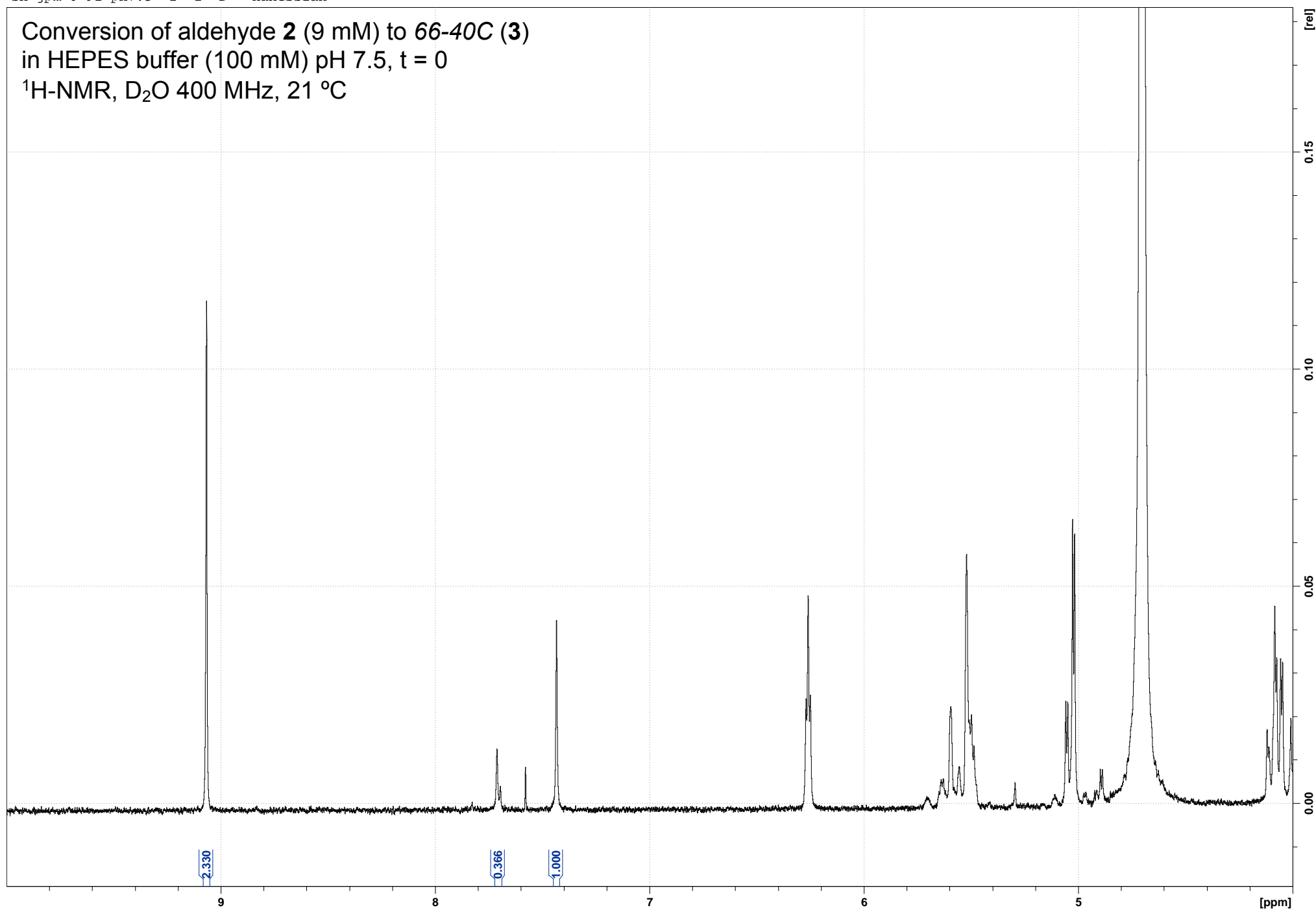
sh-jpm-6-91-ph7.5 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



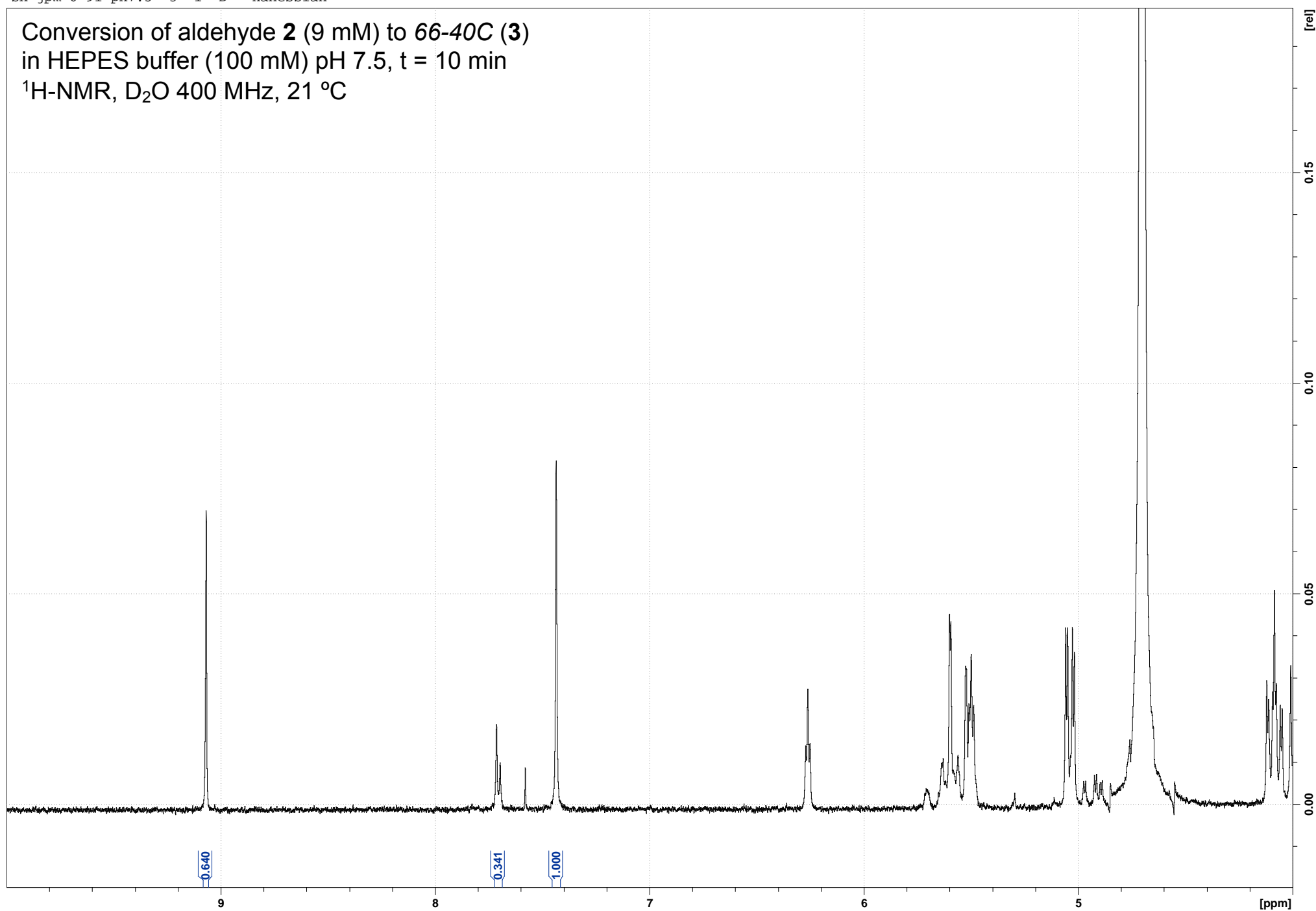
sh-jpm-6-91-ph7.5 2 1 D: Hanesian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



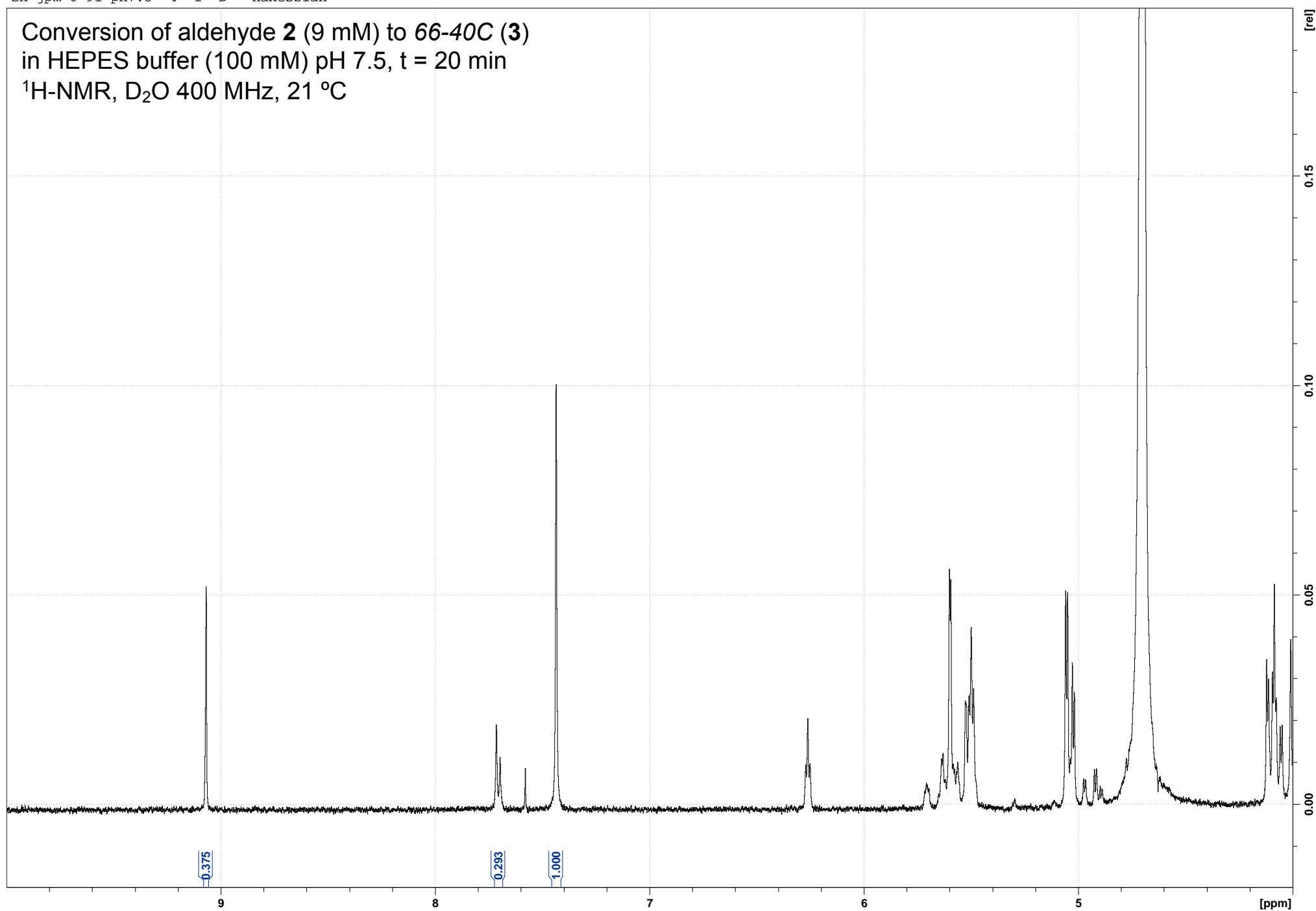
sh-jpm-6-91-ph7.5 3 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 10 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



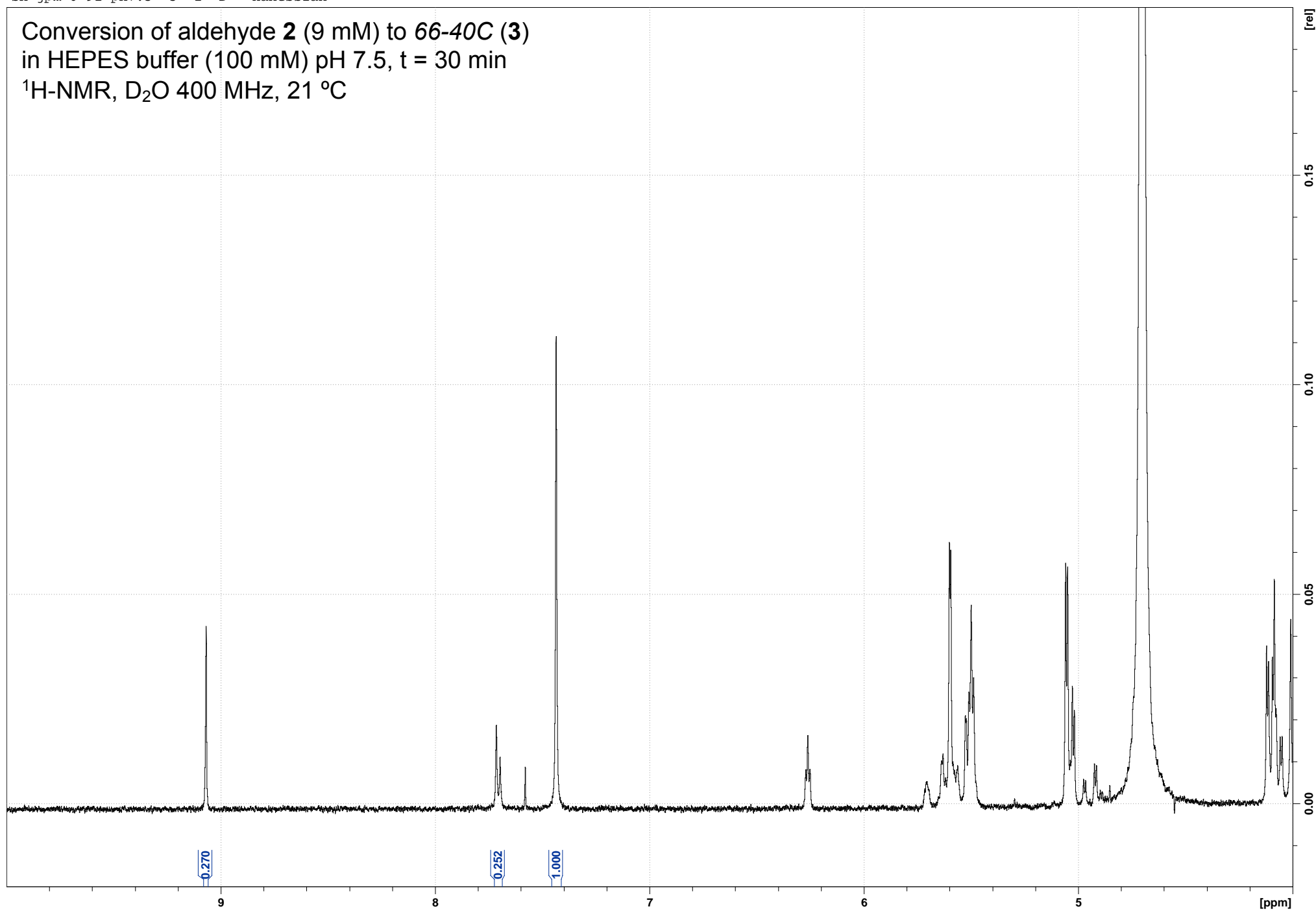
sh-jpm-6-91-ph7.5 4 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 20 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



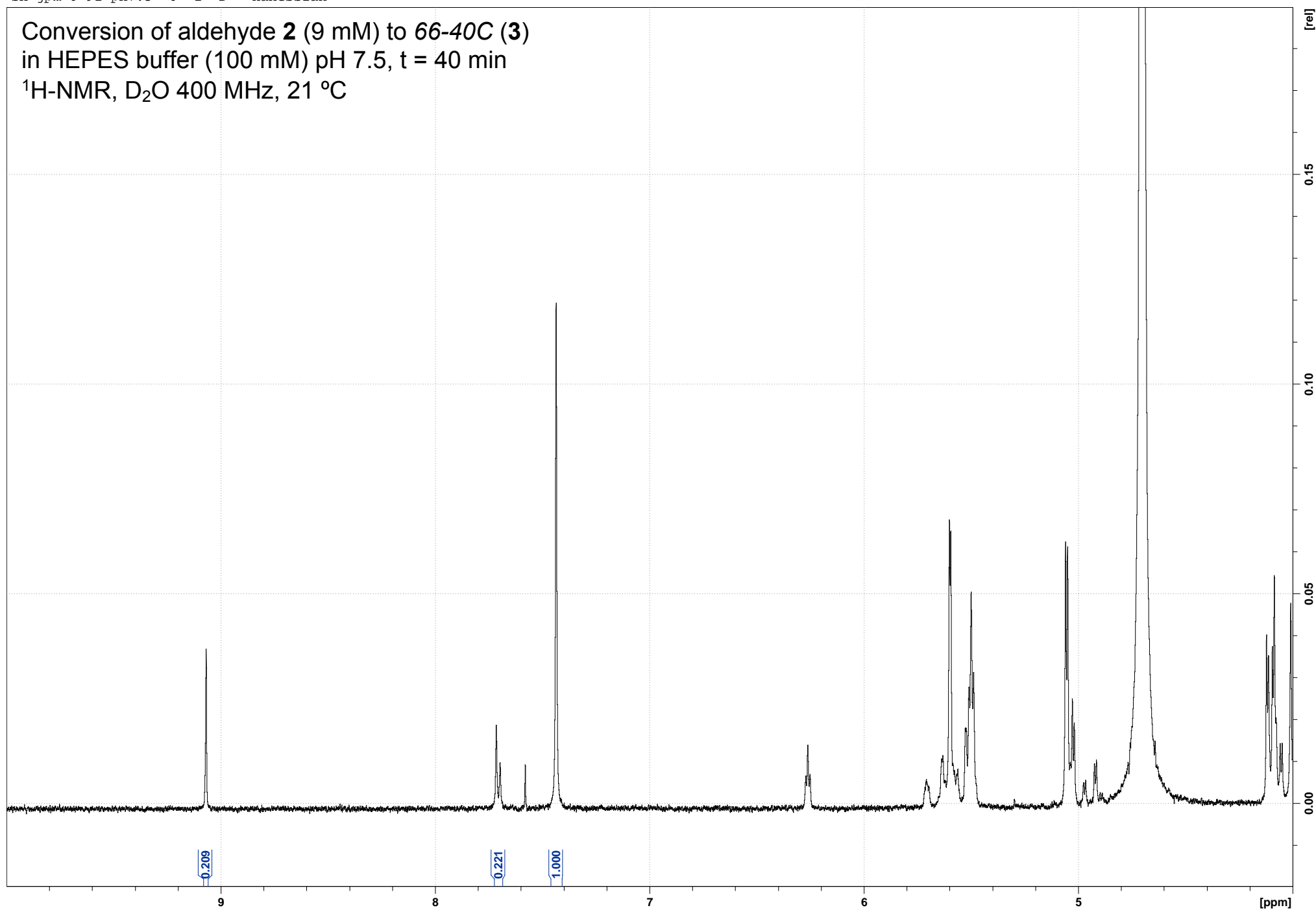
sh-jpm-6-91-ph7.5 5 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 30 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph7.5 6 1 D: Hanessian

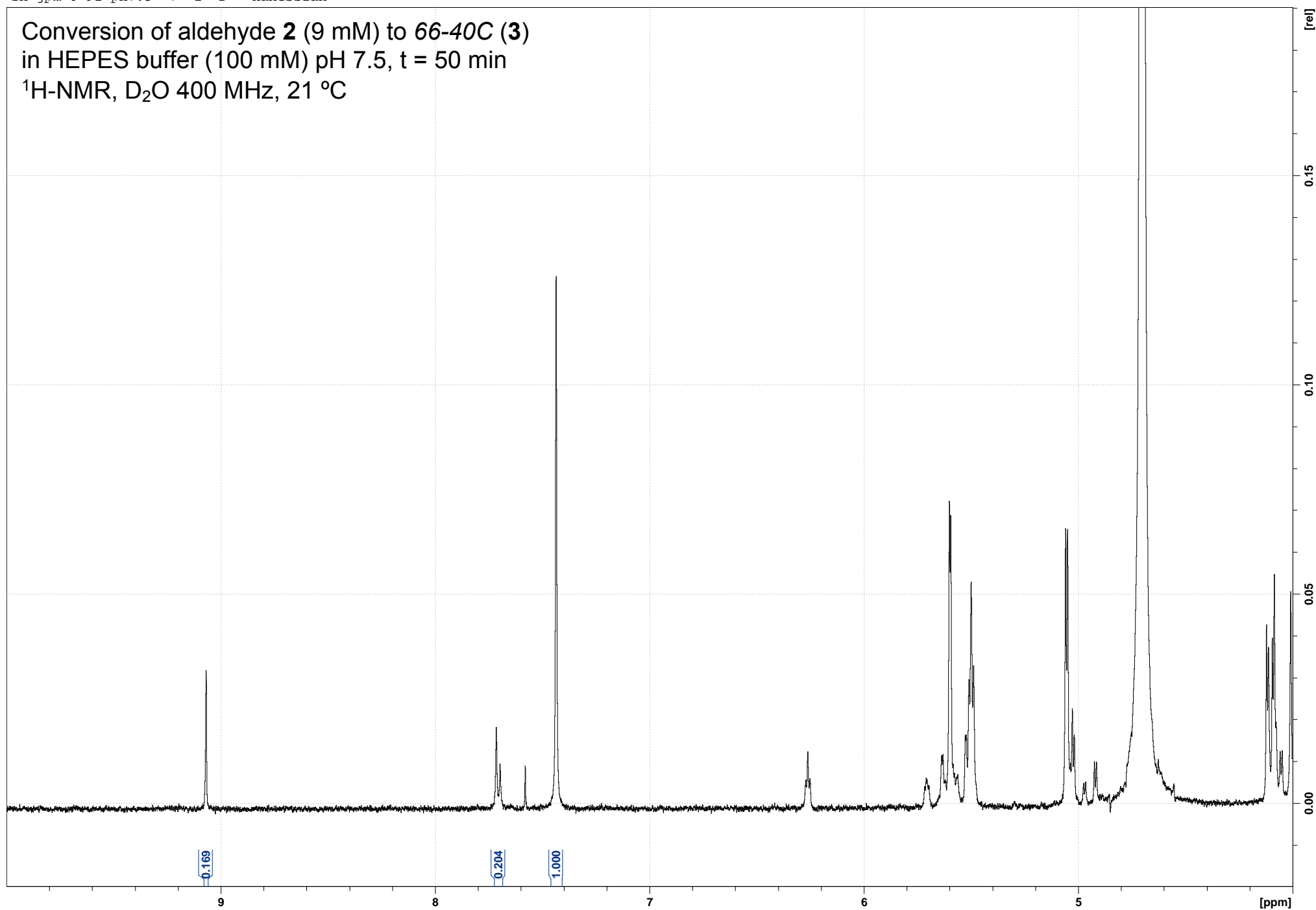
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 40 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





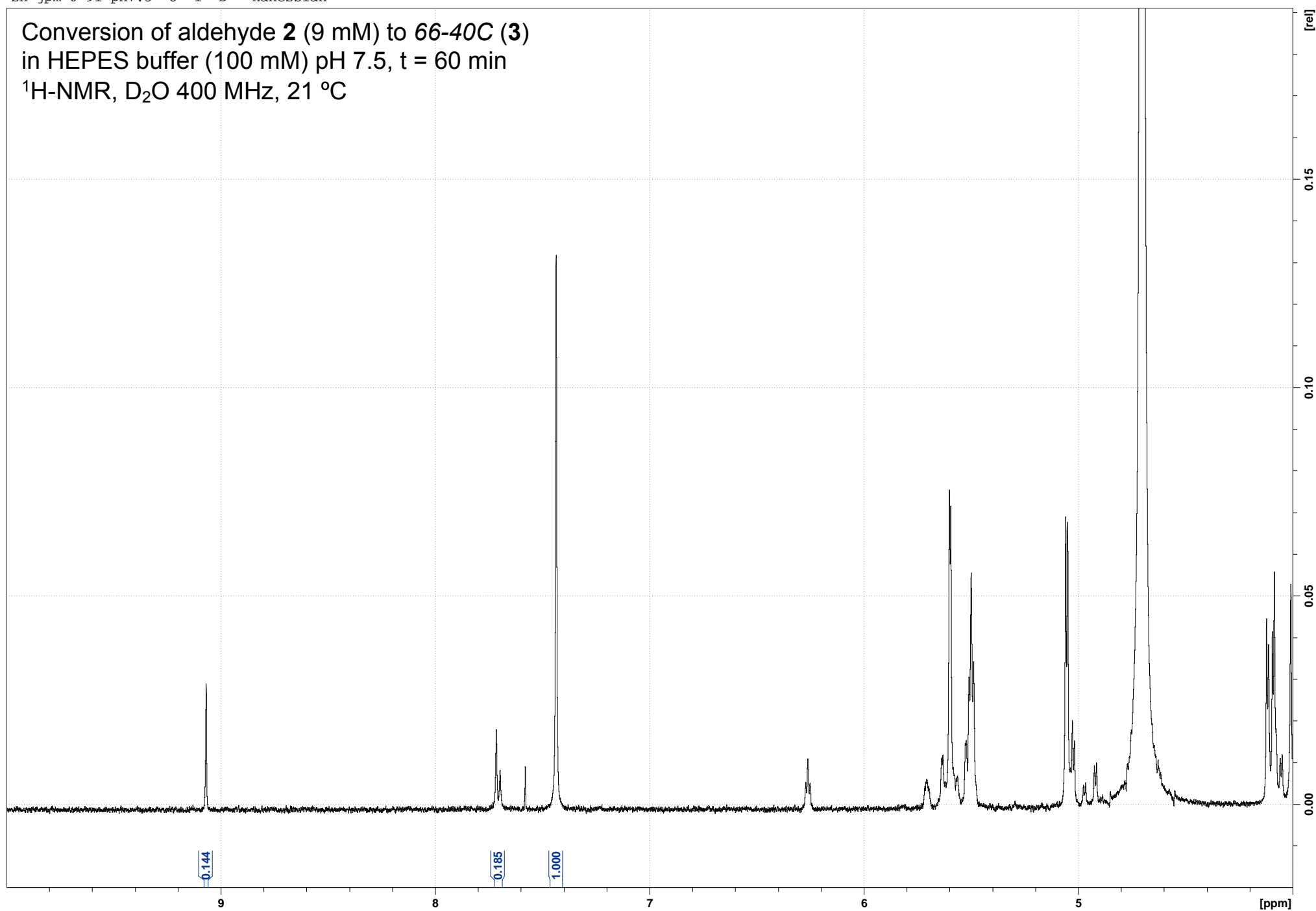
sh-jpm-6-91-ph7.5 7 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 50 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



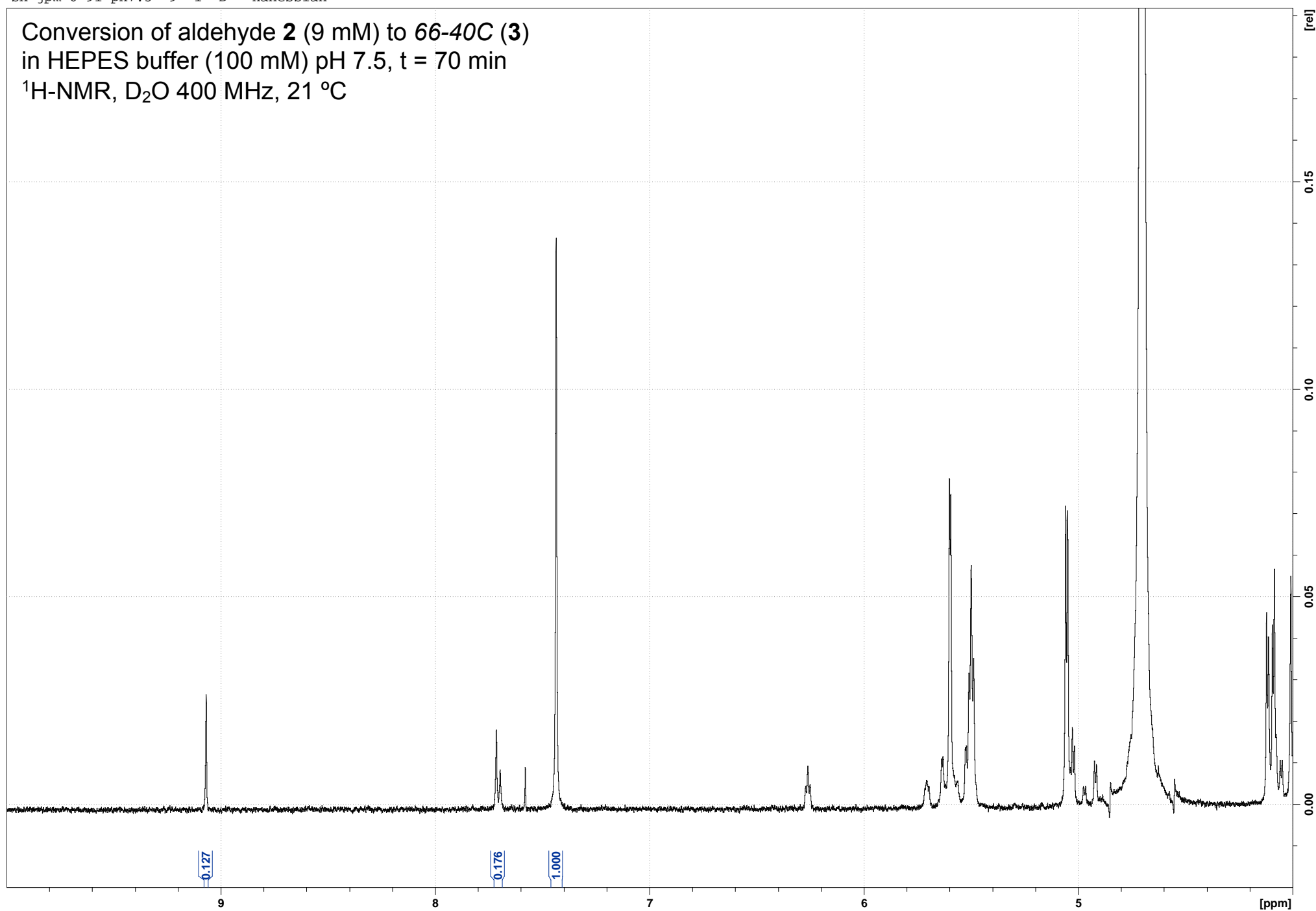
sh-jpm-6-91-ph7.5 8 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 60 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



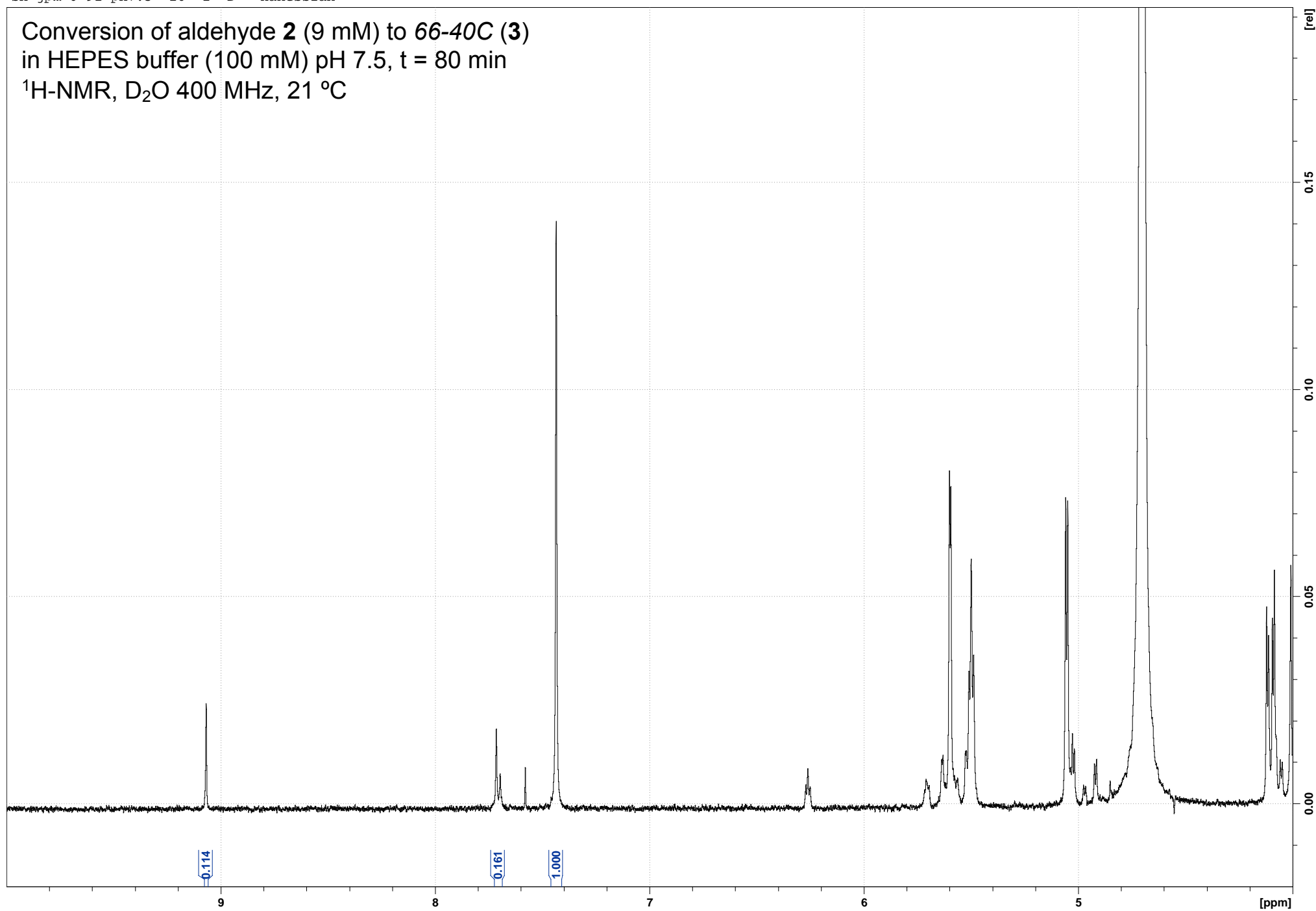
sh-jpm-6-91-ph7.5 9 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 70 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



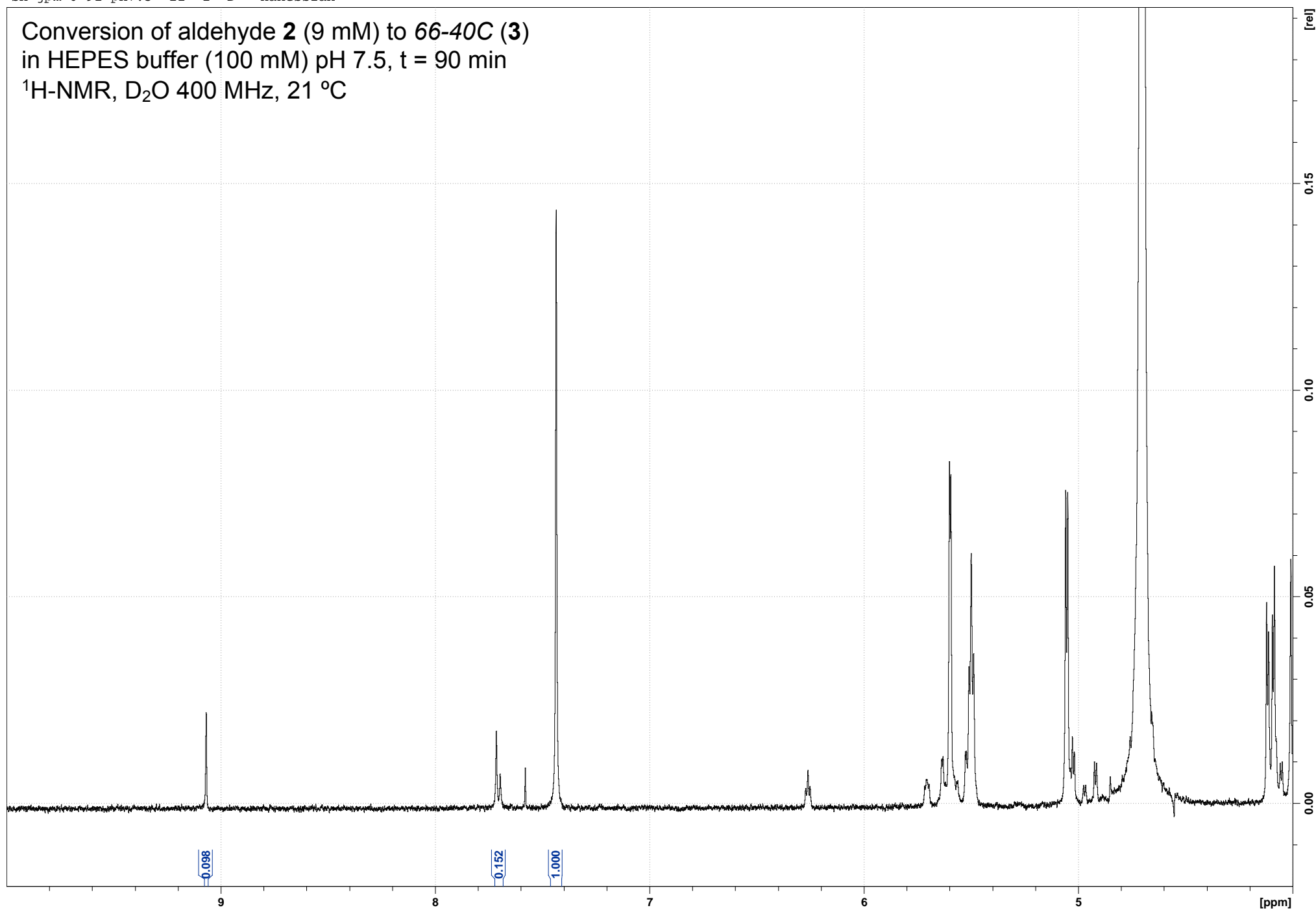
sh-jpm-6-91-ph7.5 10 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 80 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



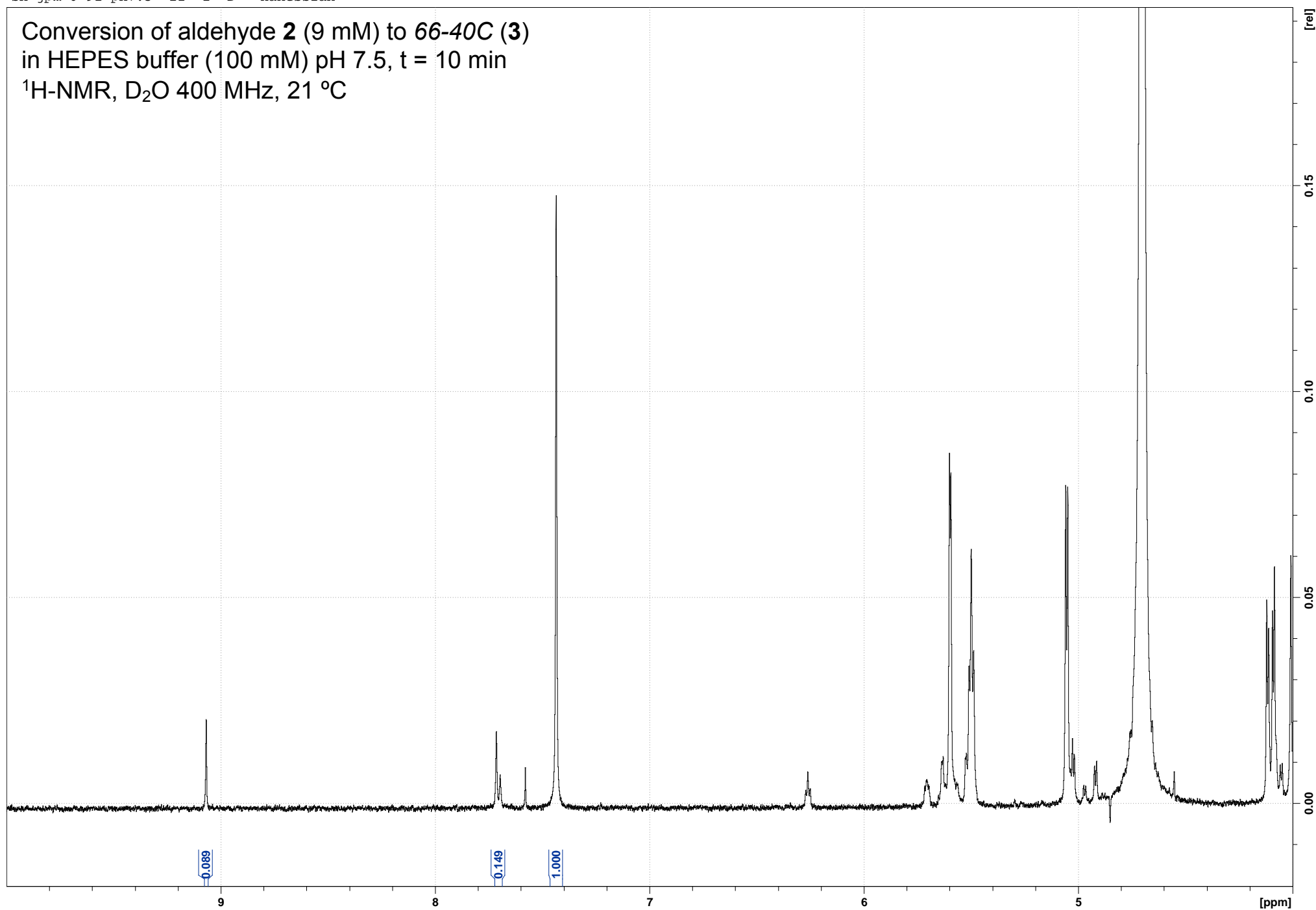
sh-jpm-6-91-ph7.5 11 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 90 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



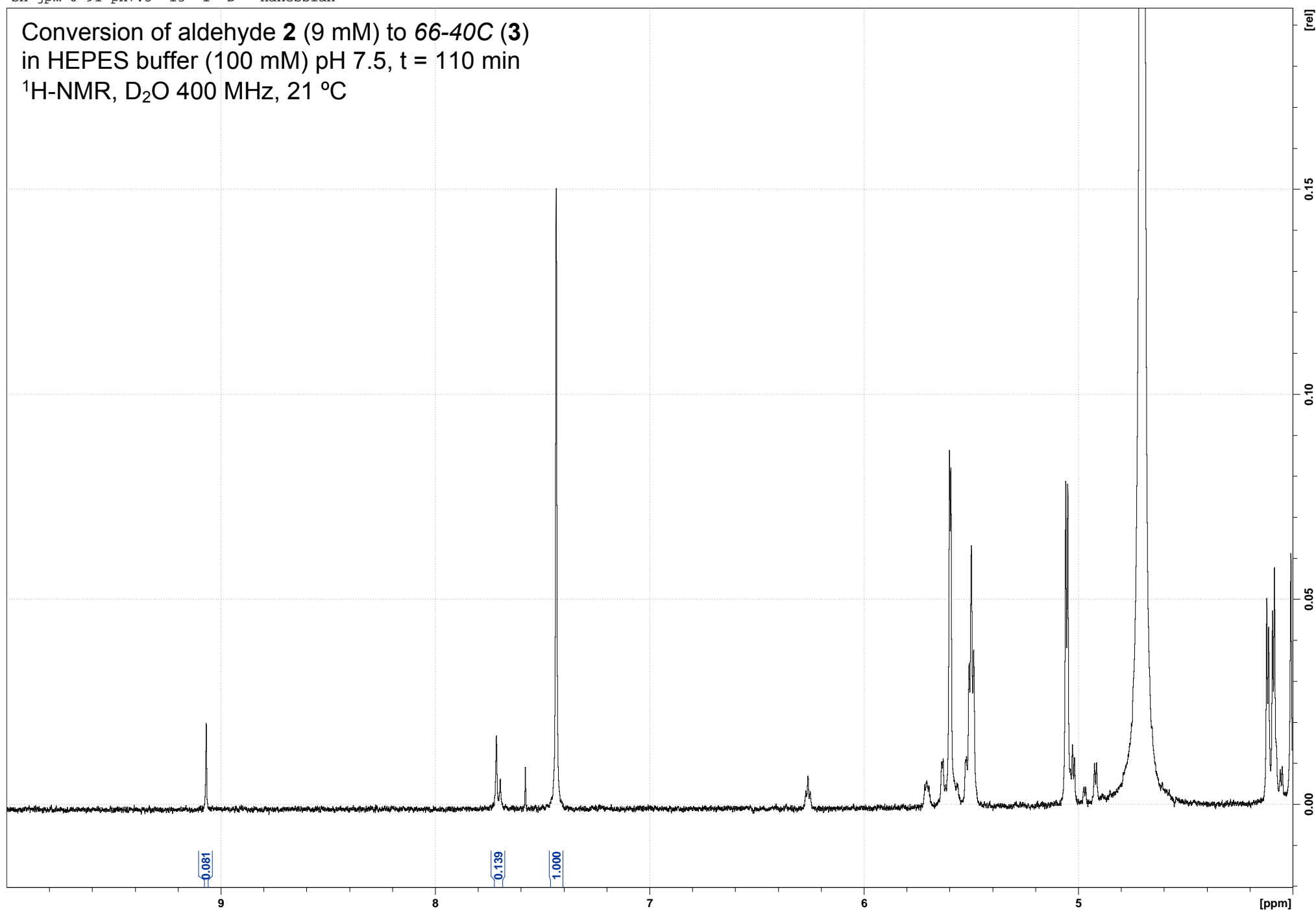
sh-jpm-6-91-ph7.5 12 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 10 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



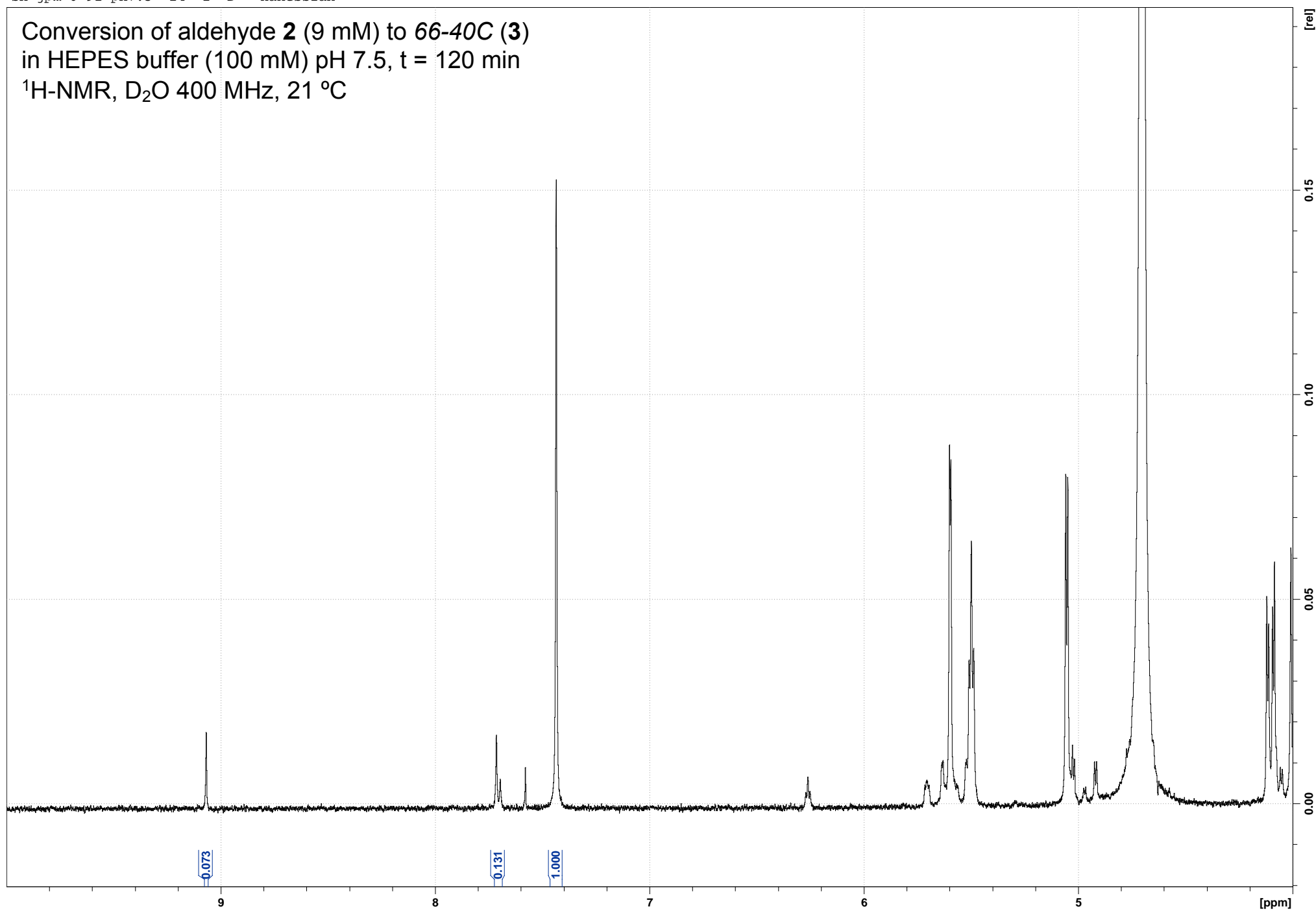
sh-jpm-6-91-ph7.5 13 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 110 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph7.5 14 1 D: Hanessian

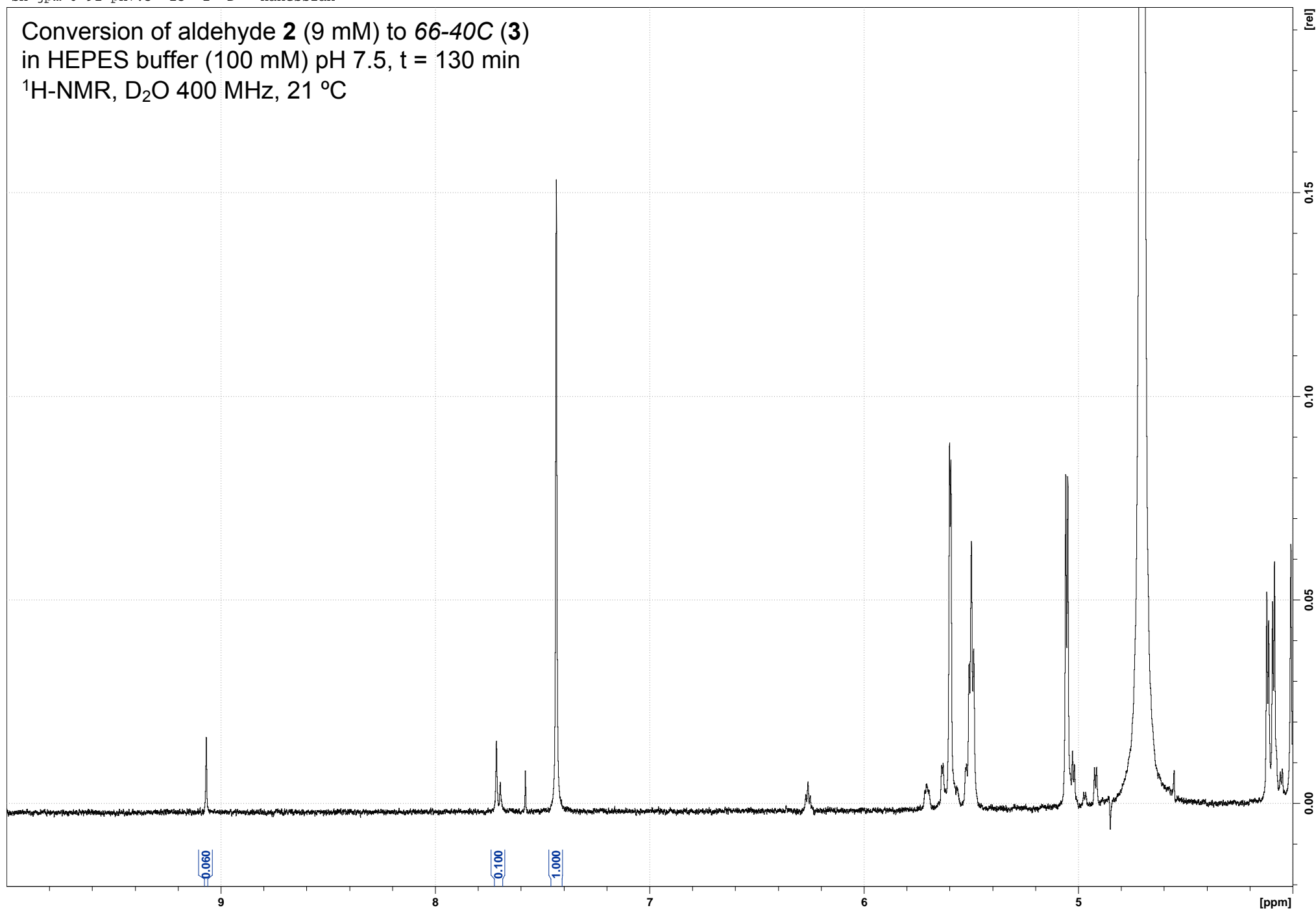
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 120 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





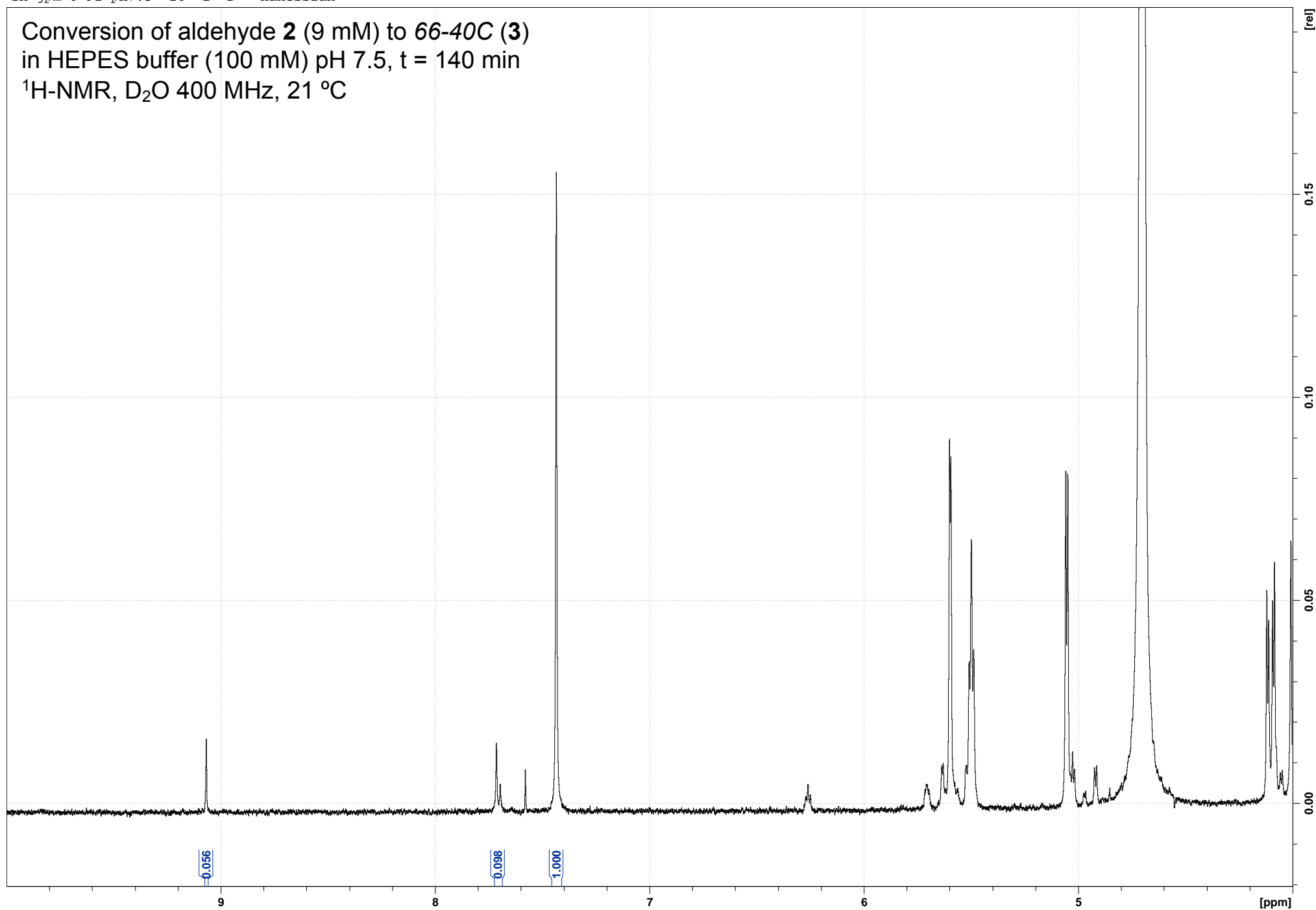
sh-jpm-6-91-ph7.5 15 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 130 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



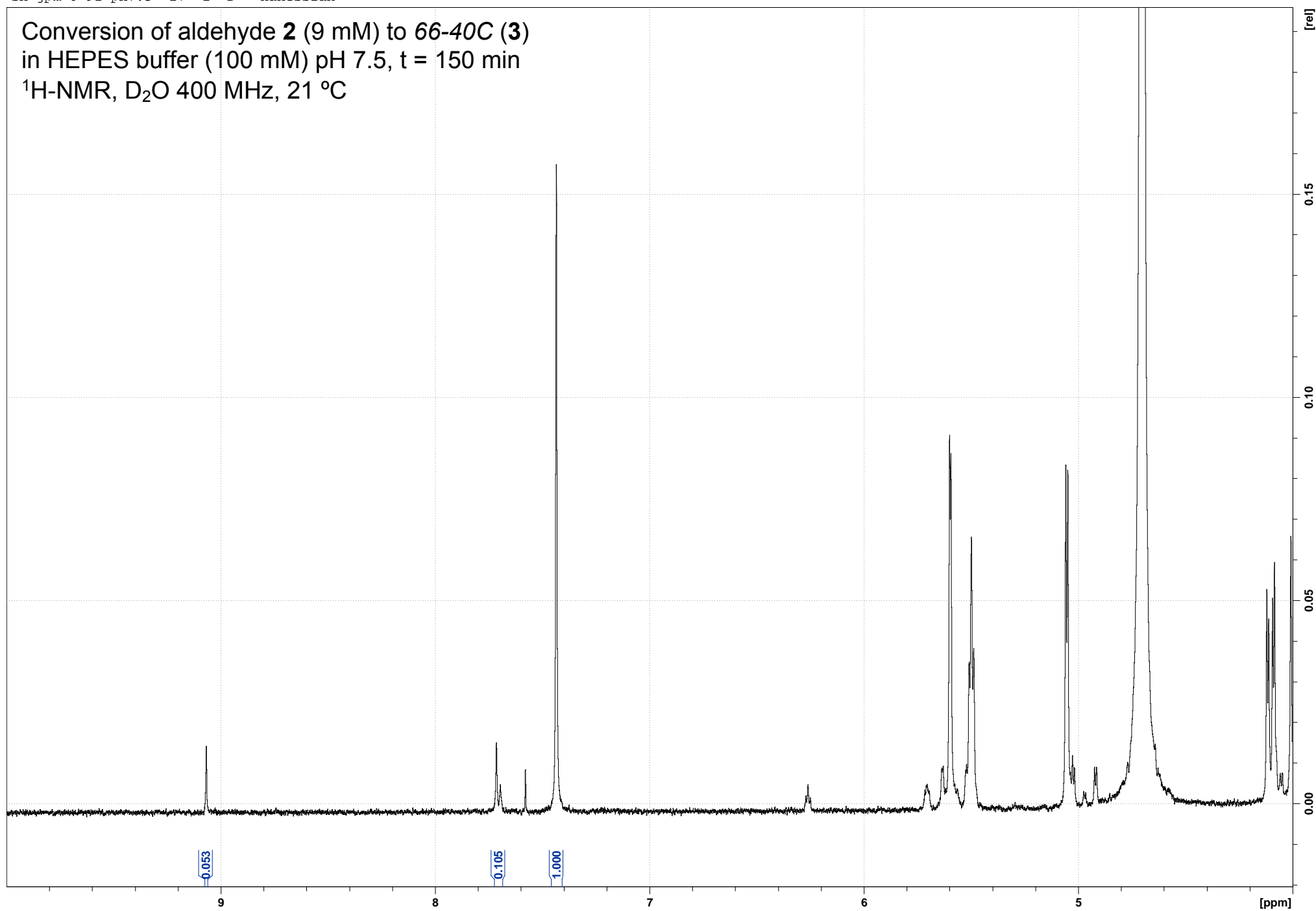
sh-jpm-6-91-ph7.5 16 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 140 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



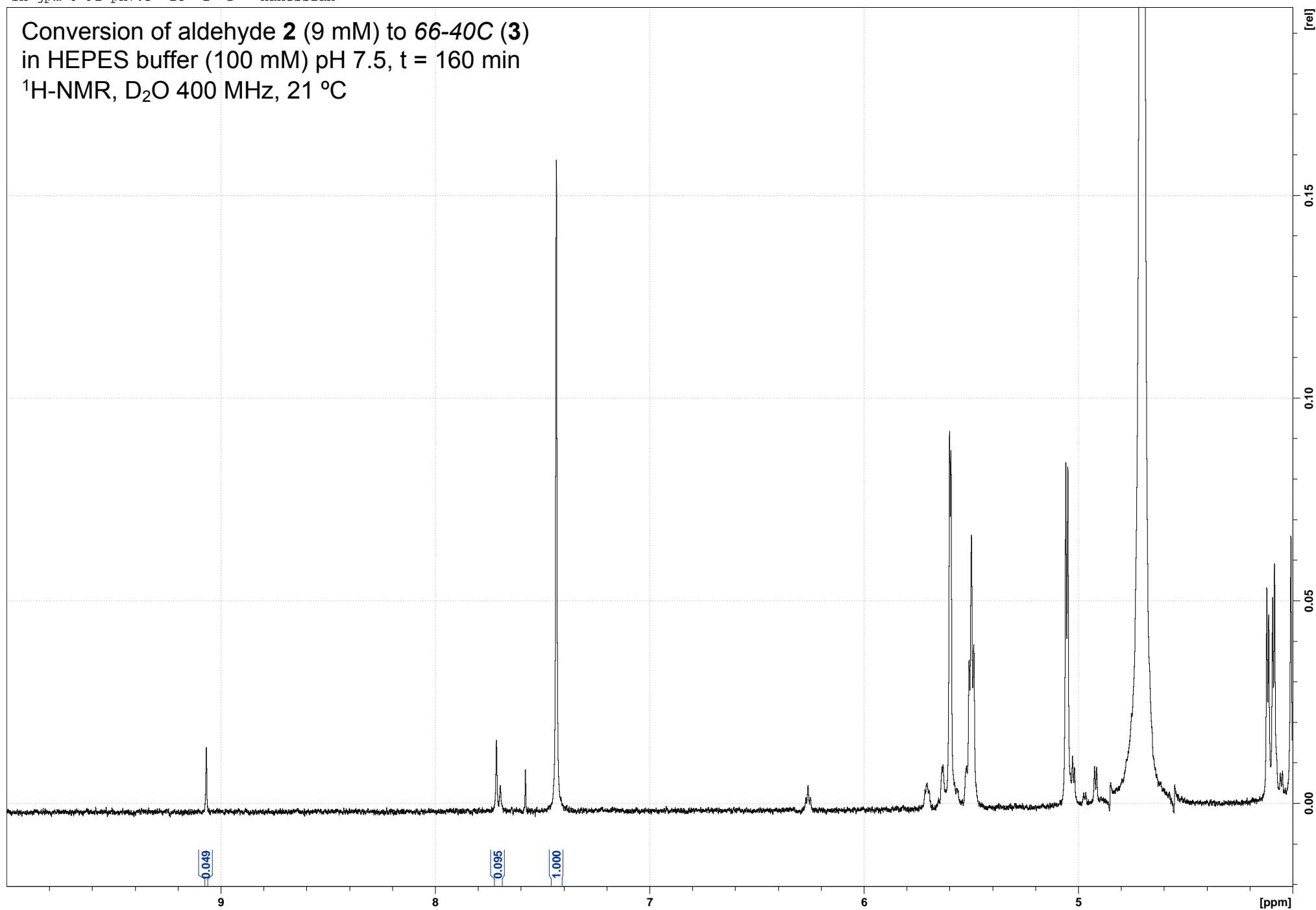
sh-jpm-6-91-ph7.5 17 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 150 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



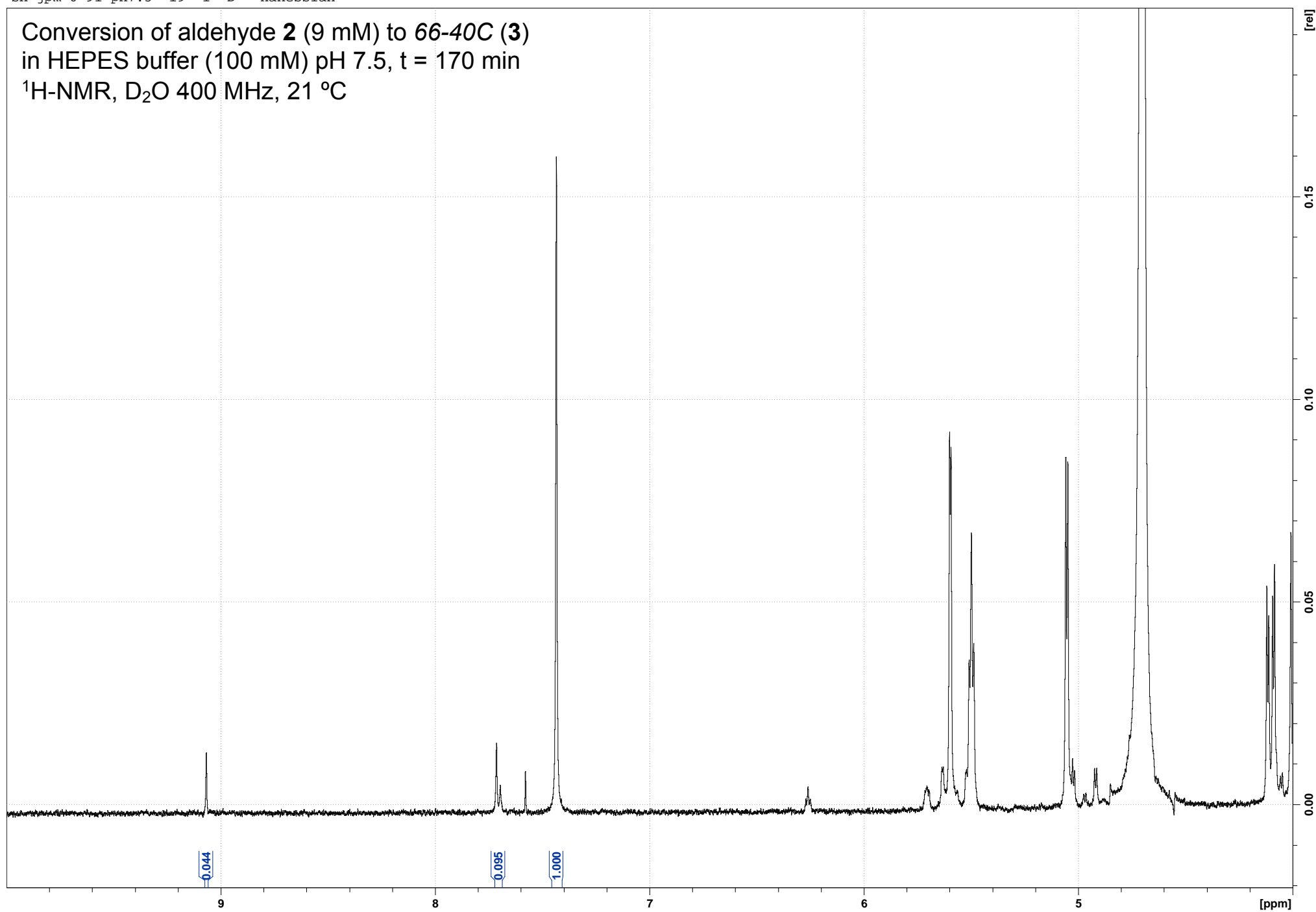
sh-jpm-6-91-ph7.5 18 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 160 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



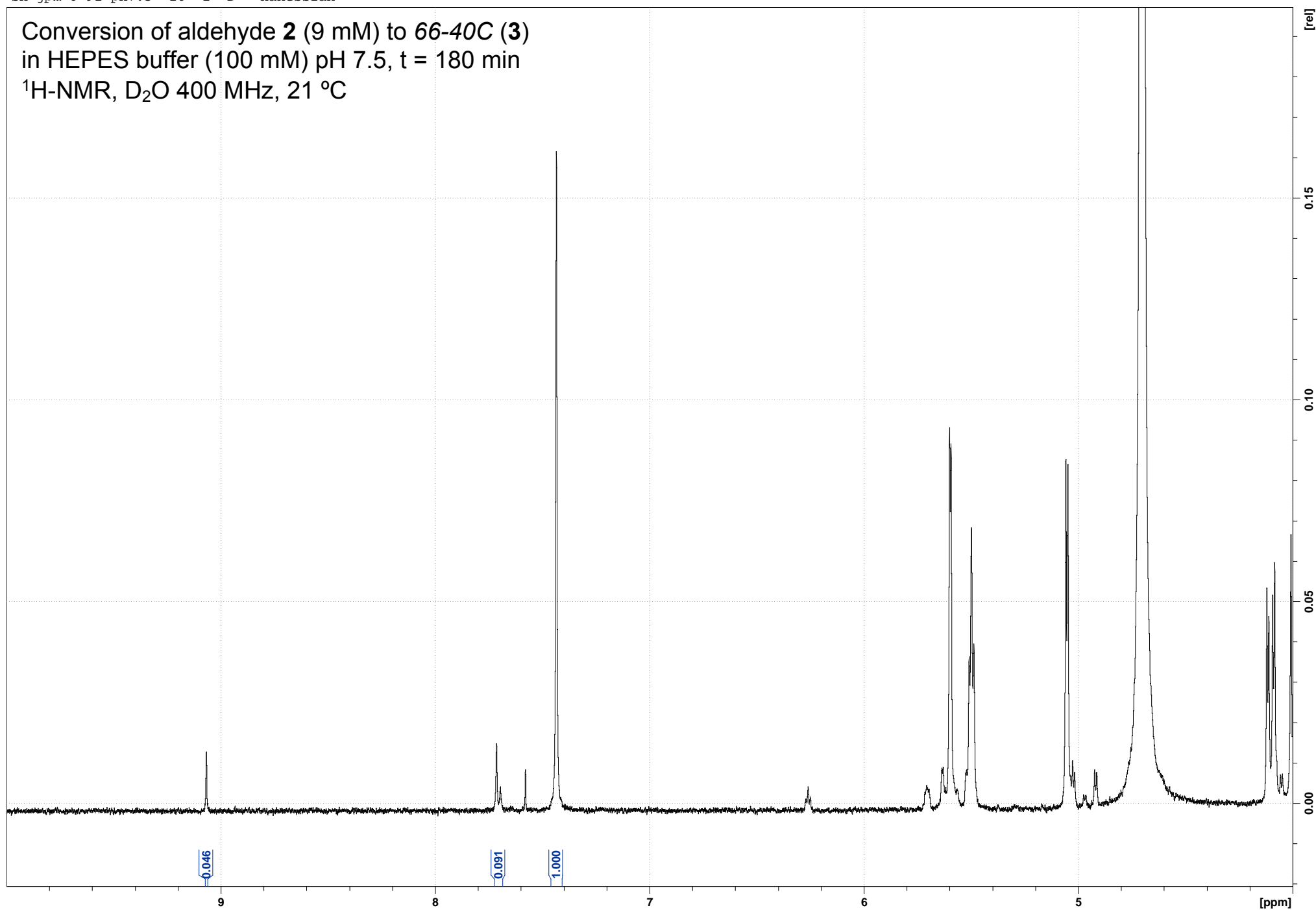
sh-jpm-6-91-ph7.5 19 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 170 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



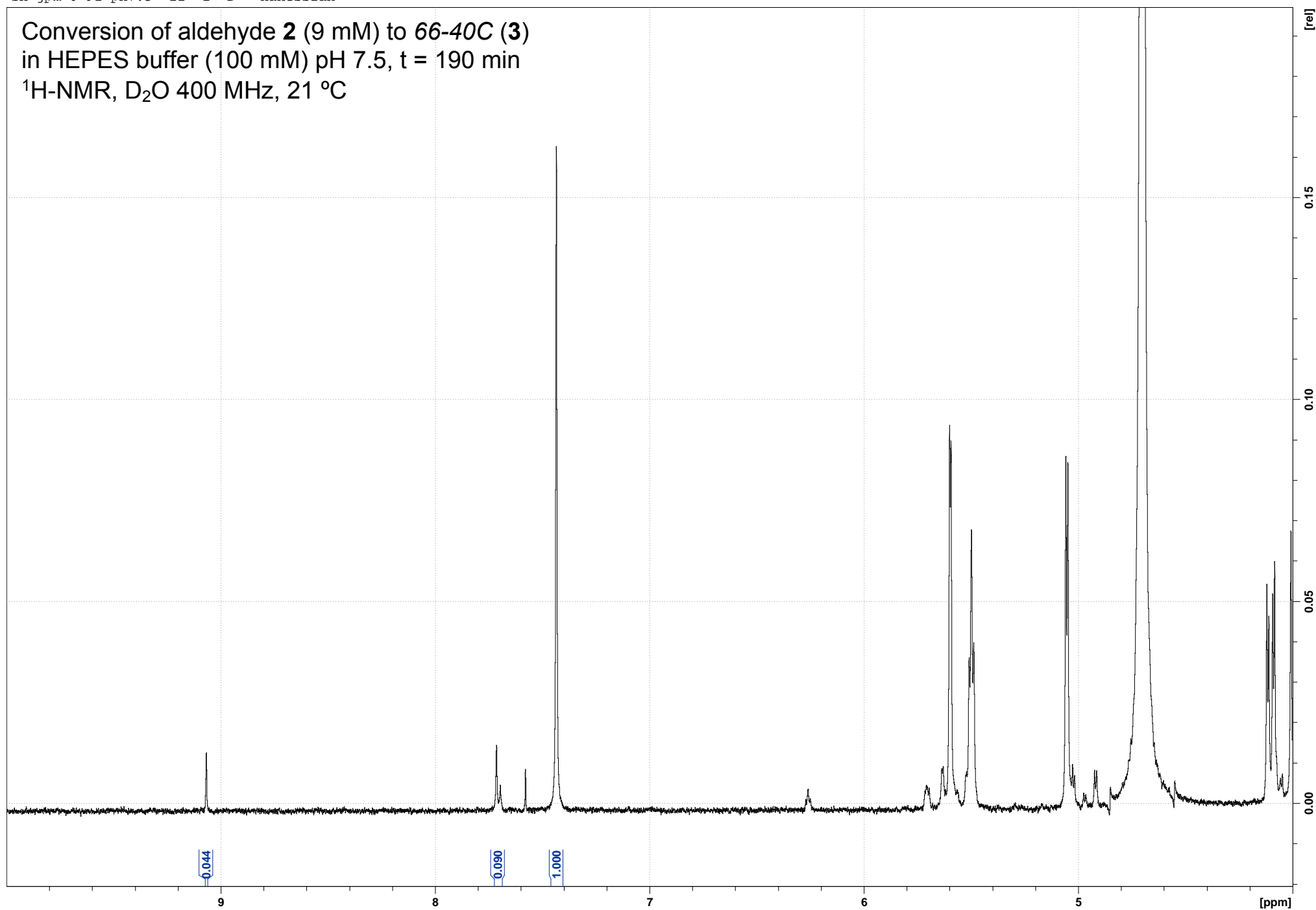
sh-jpm-6-91-ph7.5 20 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 180 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



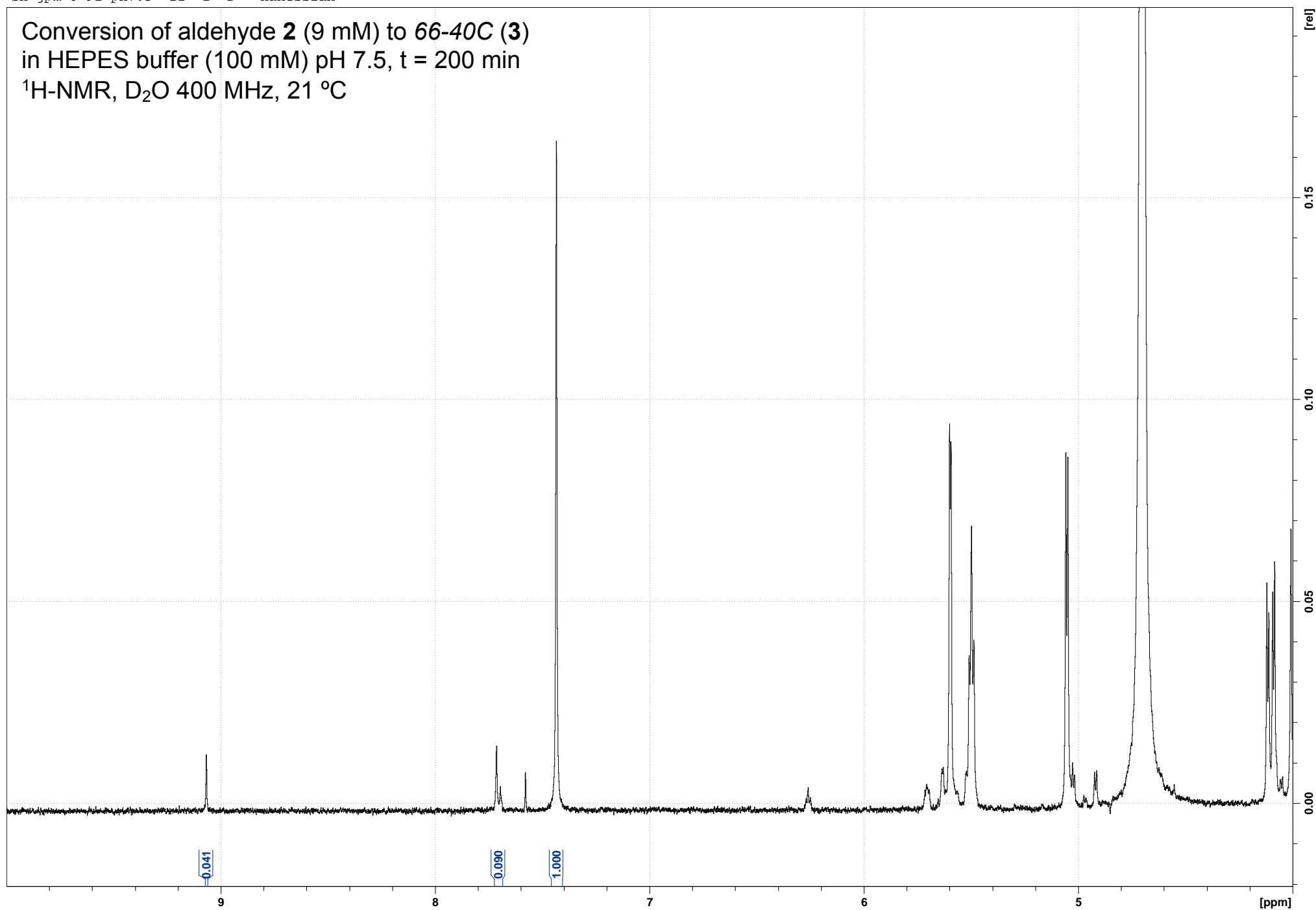
sh-jpm-6-91-ph7.5 21 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 190 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph7.5 22 1 D: Hanessian

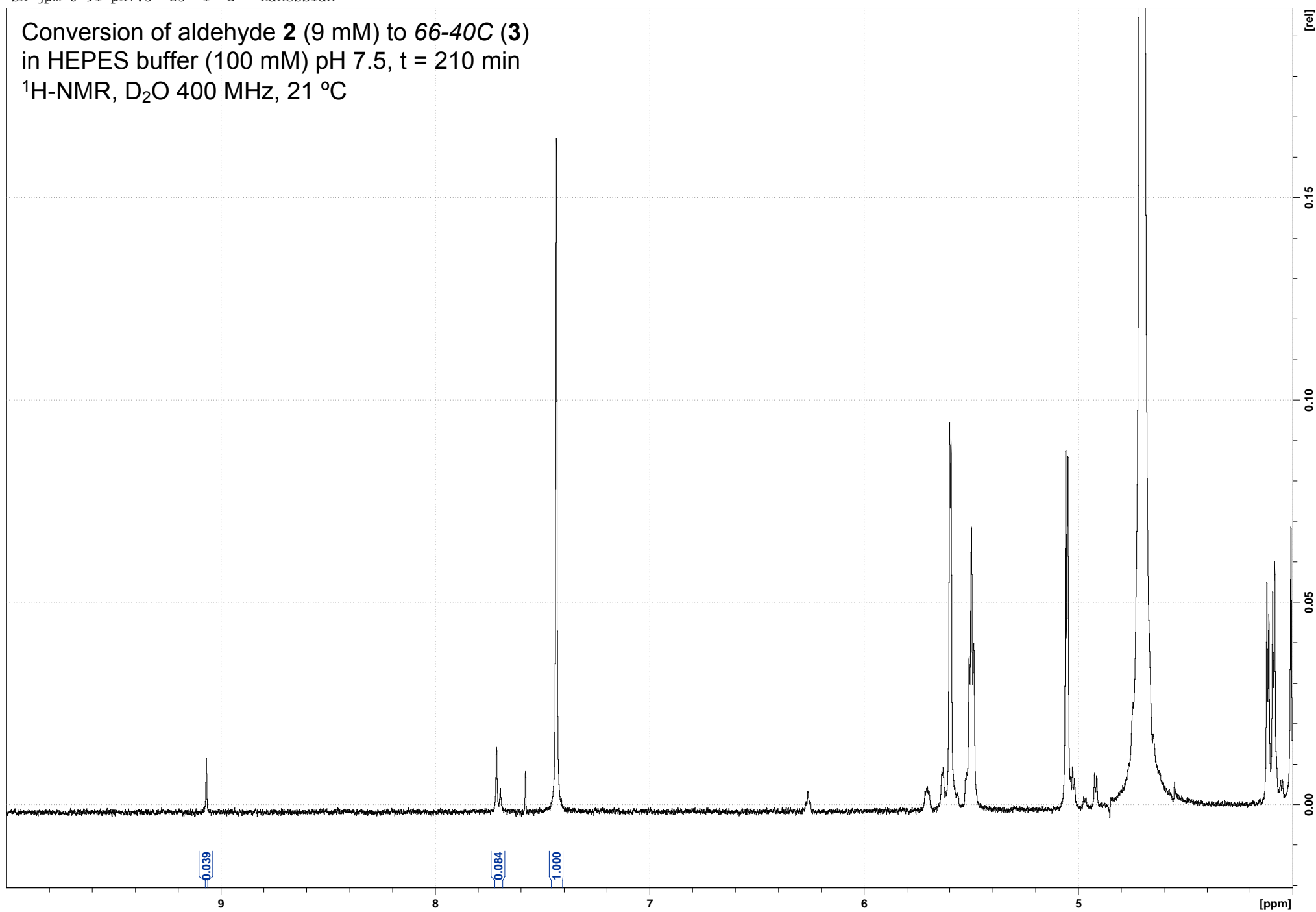
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 200 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





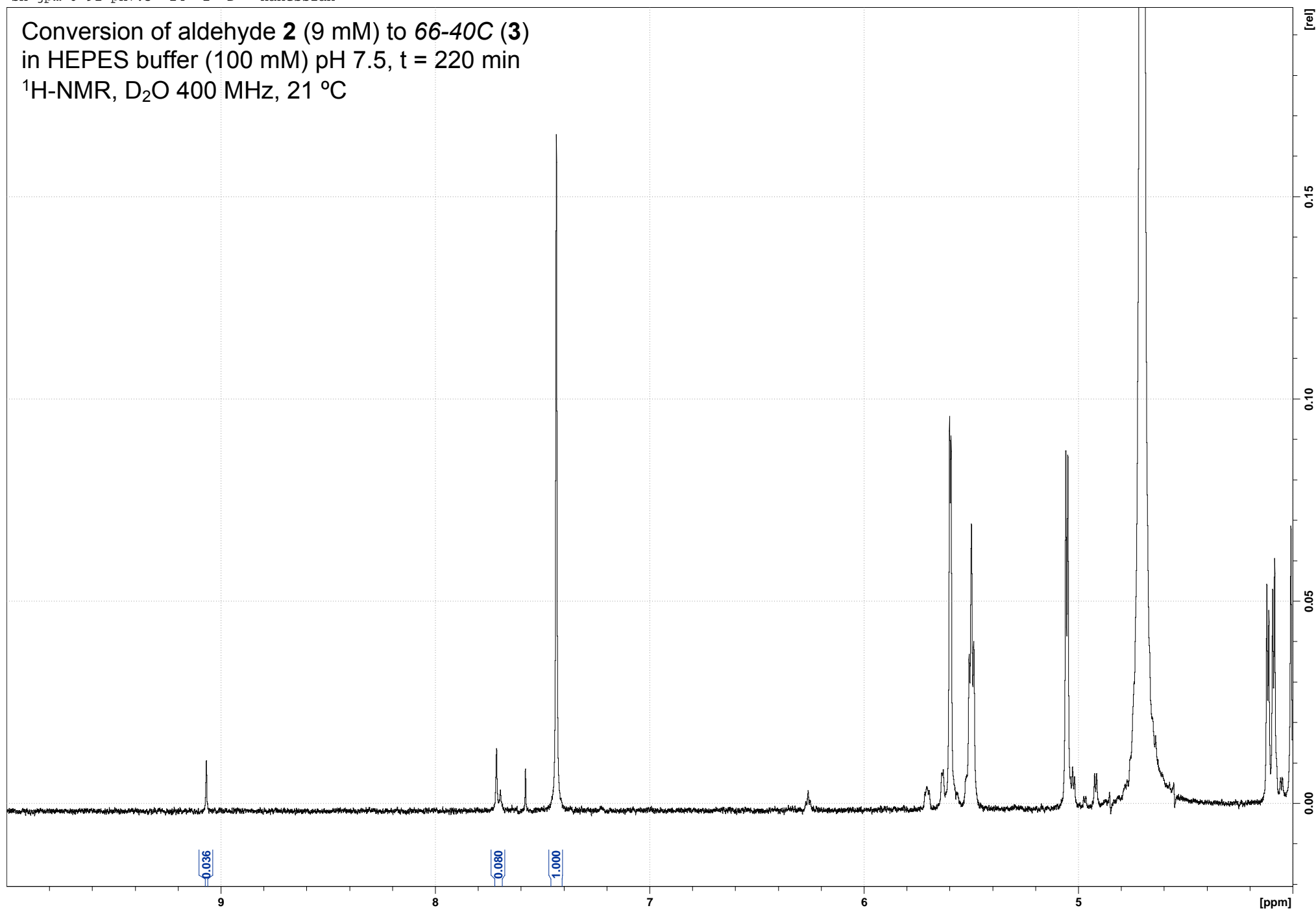
sh-jpm-6-91-ph7.5 23 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 210 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



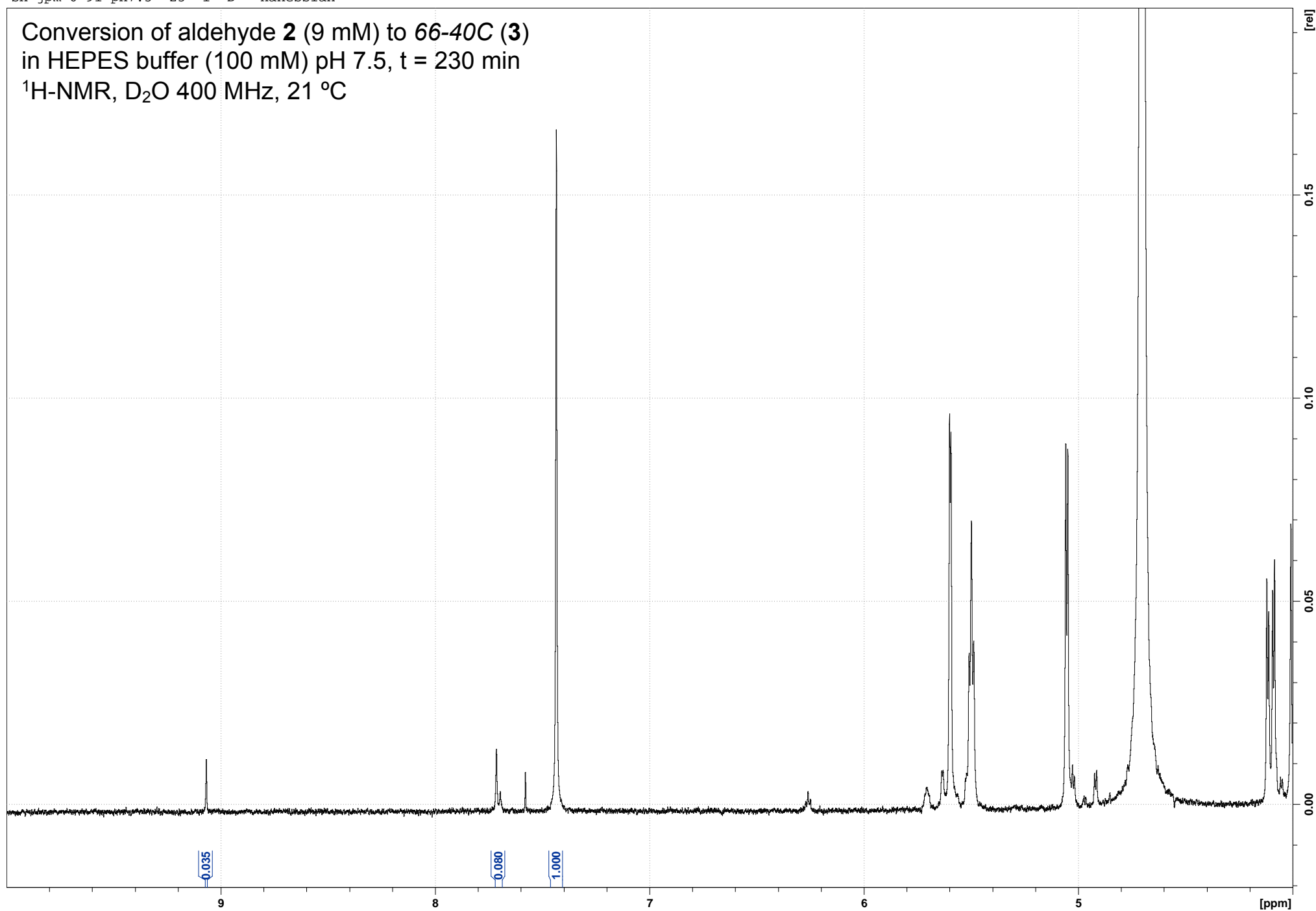
sh-jpm-6-91-ph7.5 24 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 220 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



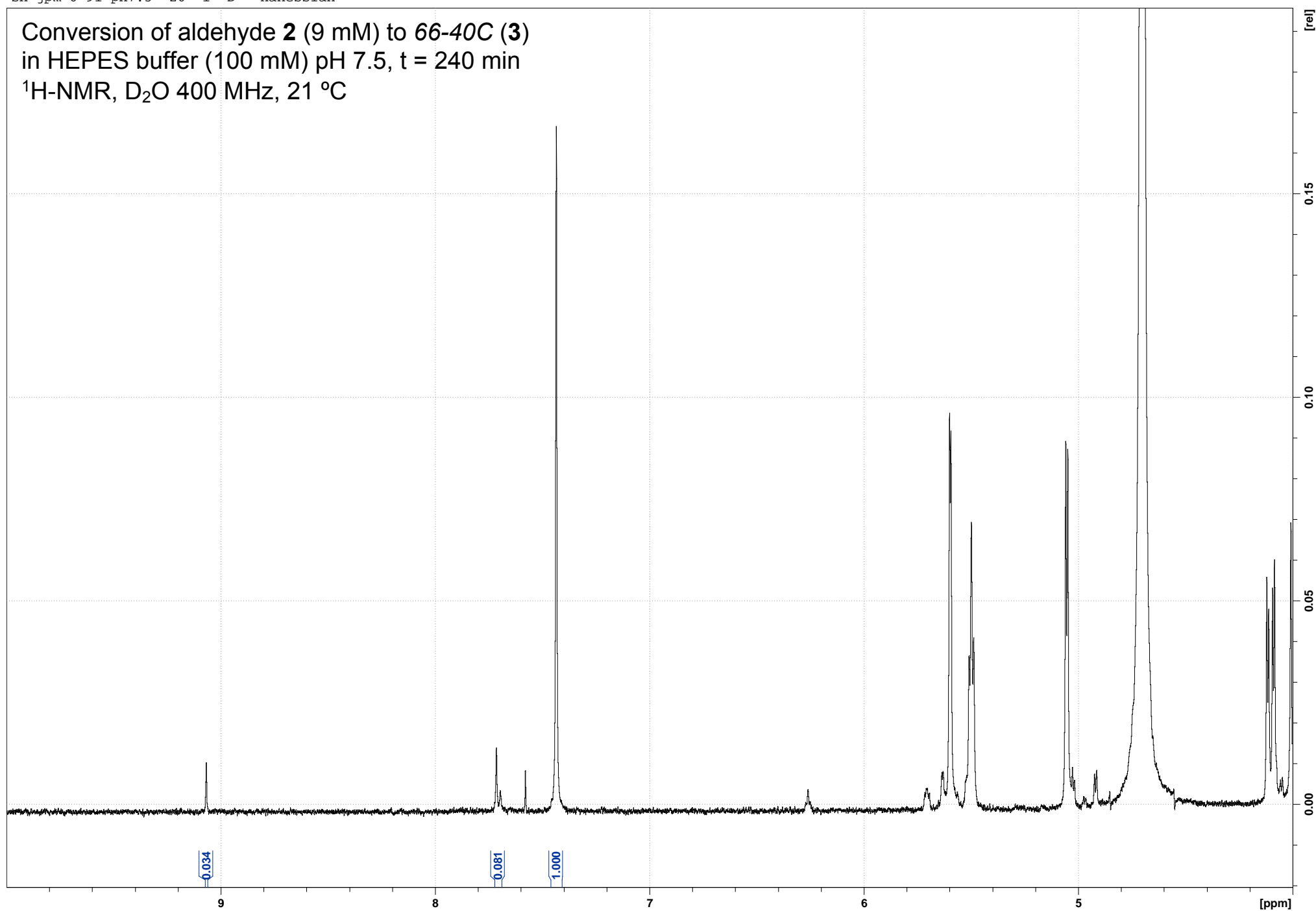
sh-jpm-6-91-ph7.5 25 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 230 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



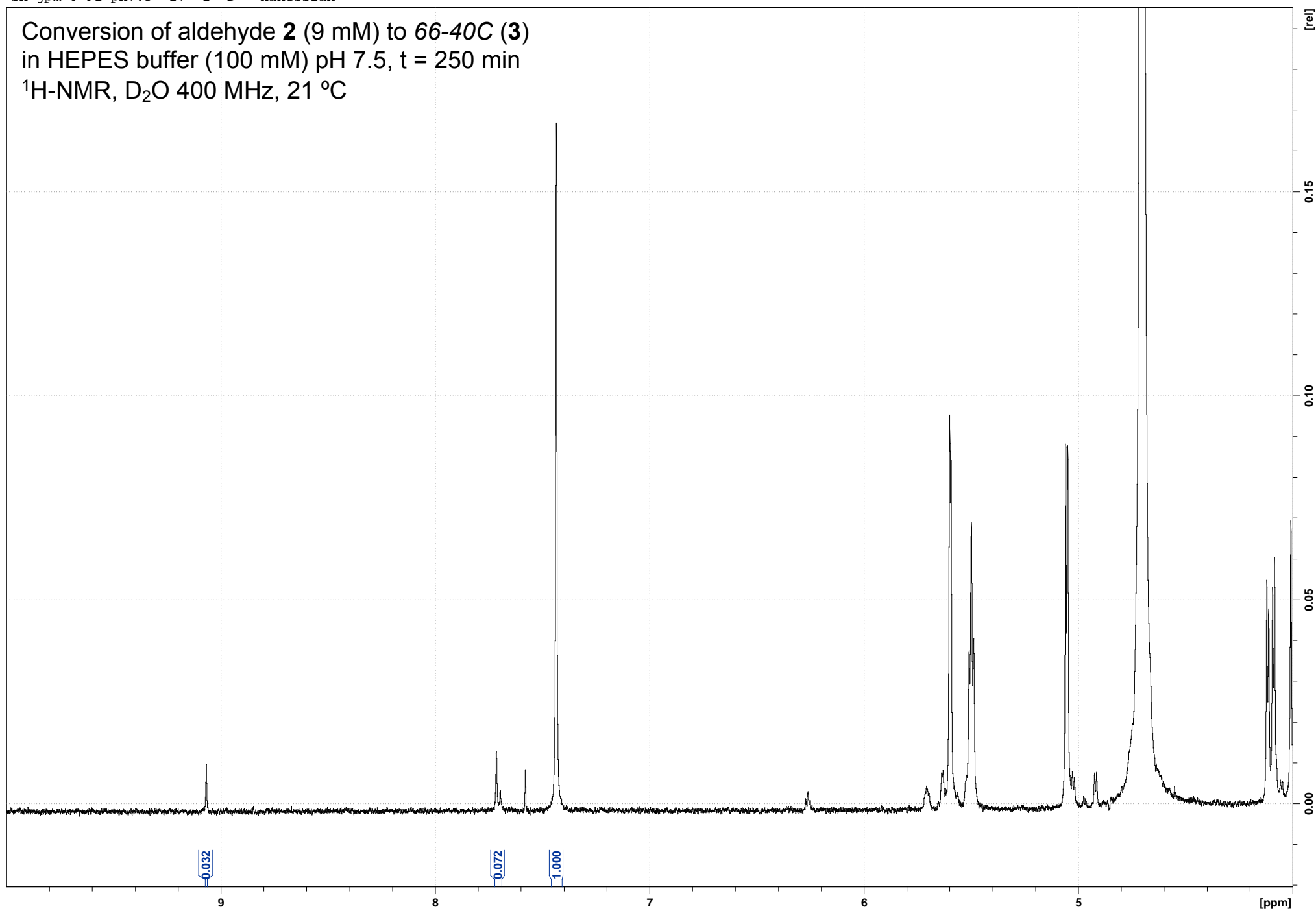
sh-jpm-6-91-ph7.5 26 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 240 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



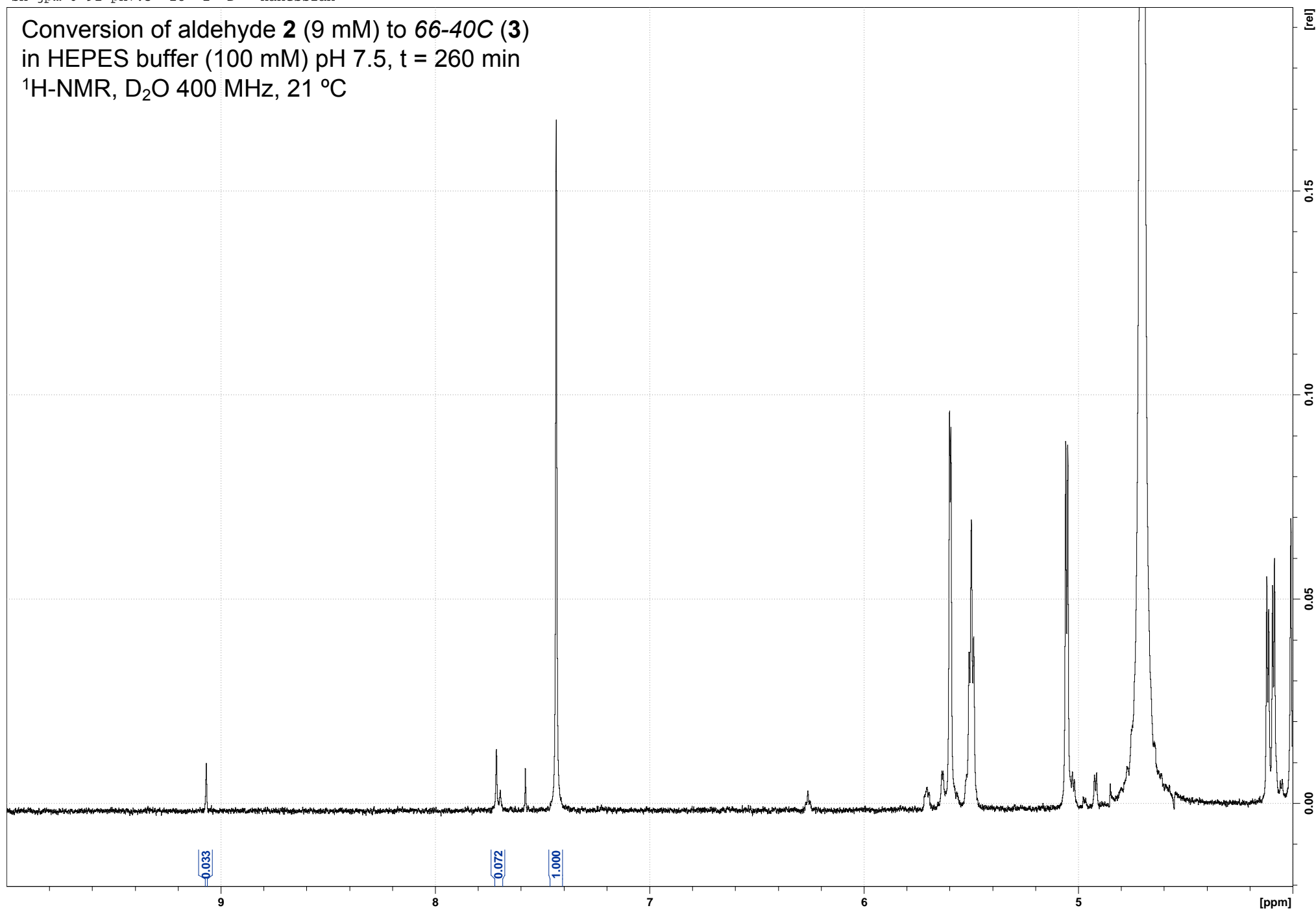
sh-jpm-6-91-ph7.5 27 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 250 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



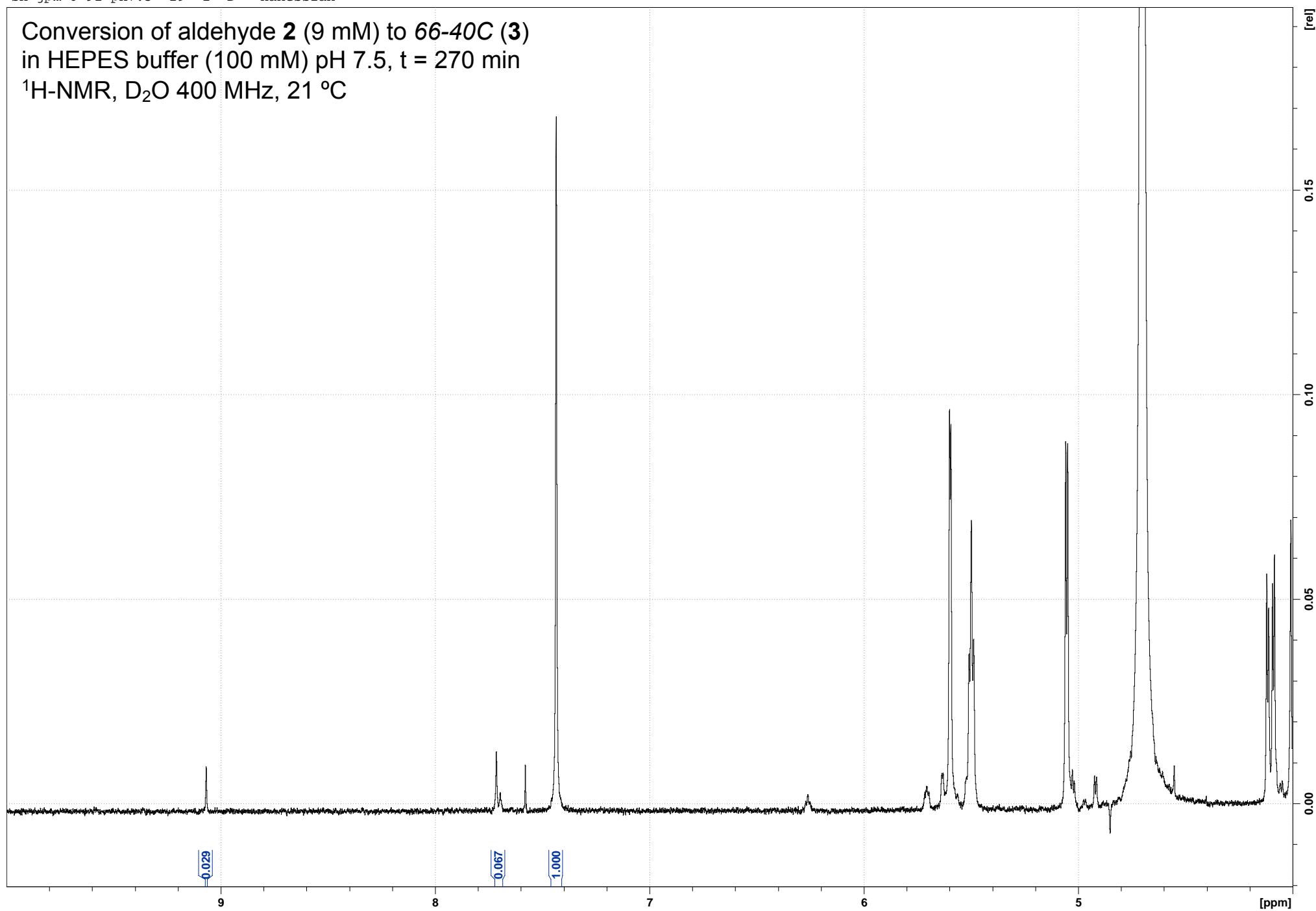
sh-jpm-6-91-ph7.5 28 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 260 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



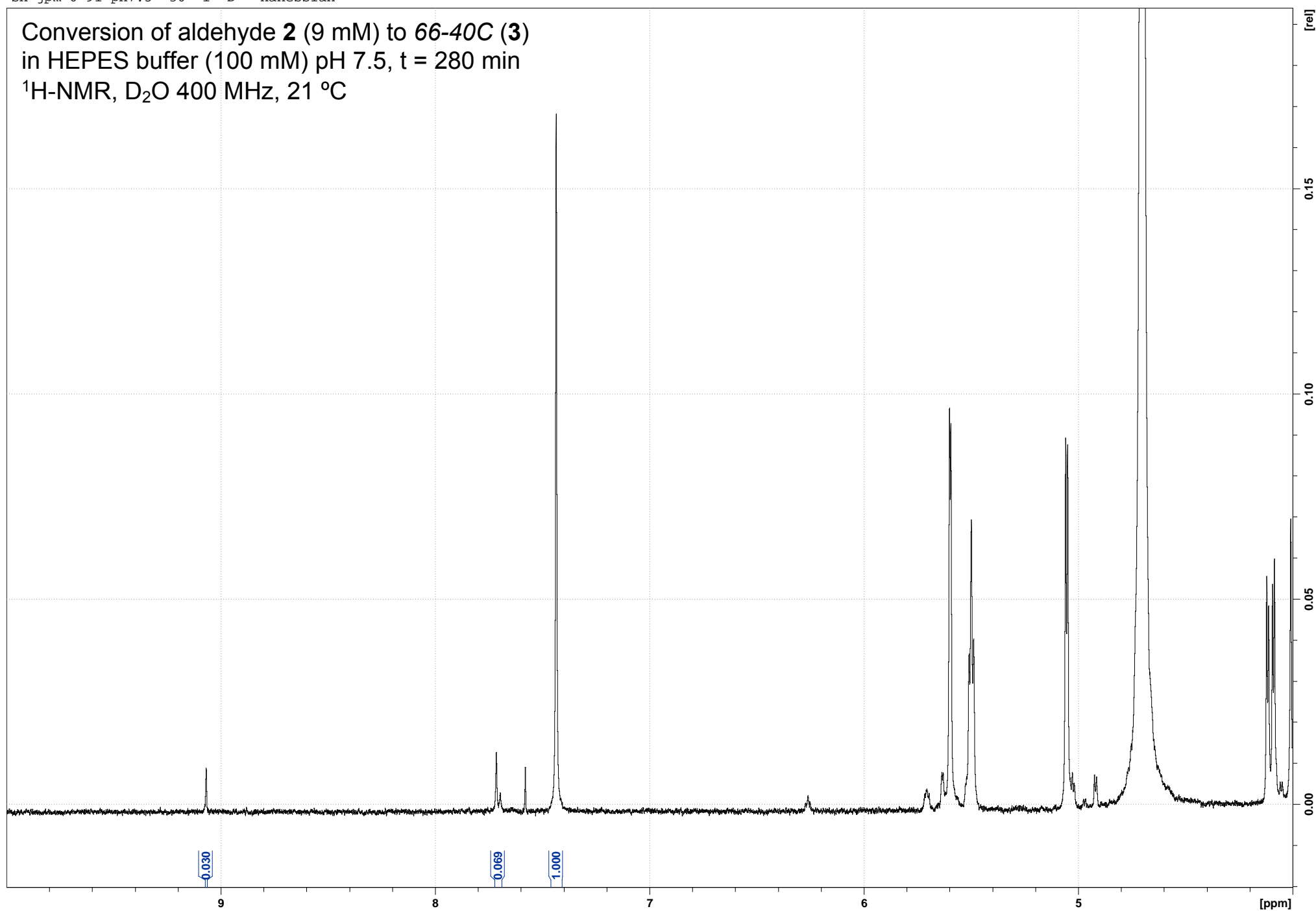
sh-jpm-6-91-ph7.5 29 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 270 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



sh-jpm-6-91-ph7.5 30 1 D: Hanessian

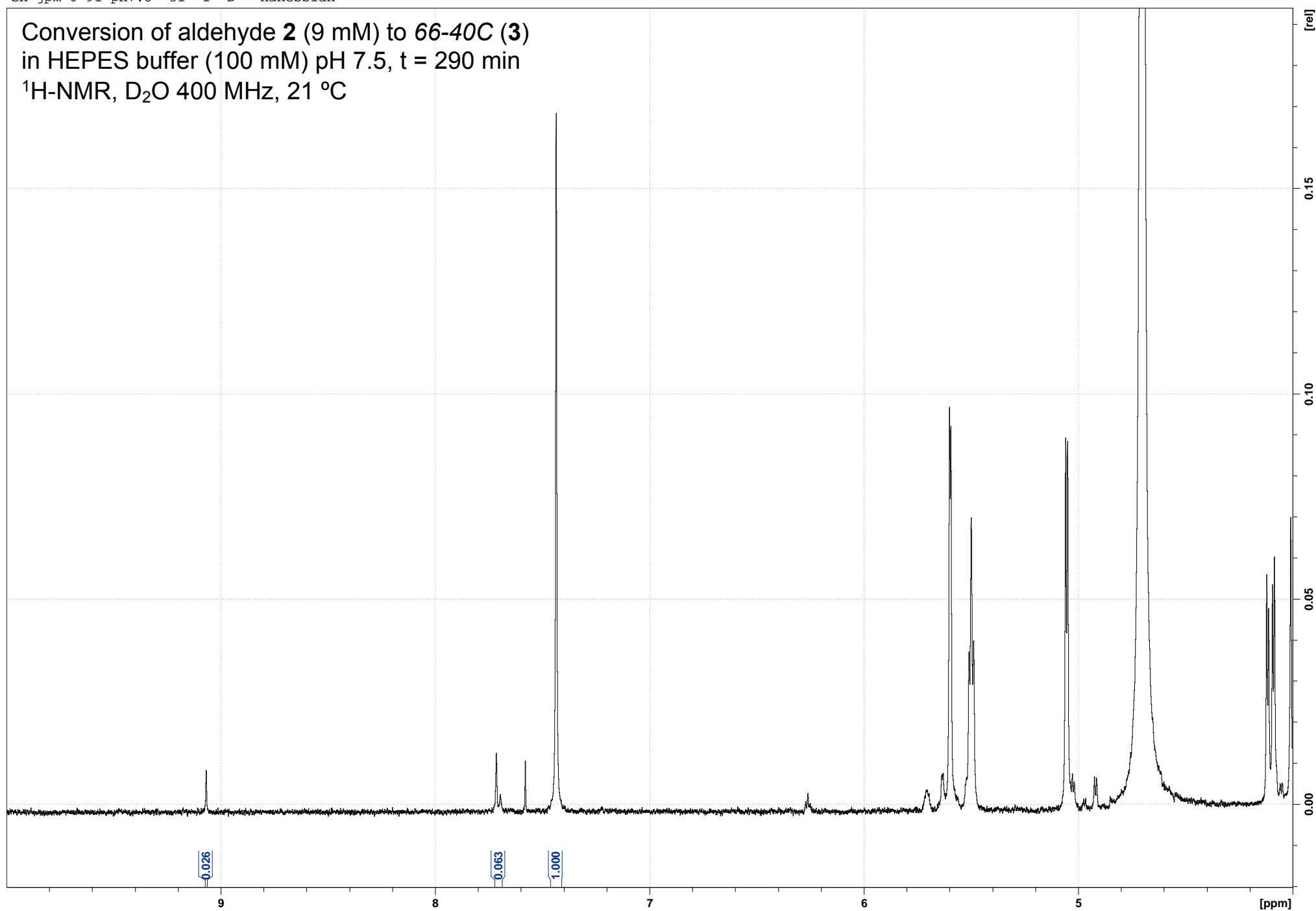
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 280 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C





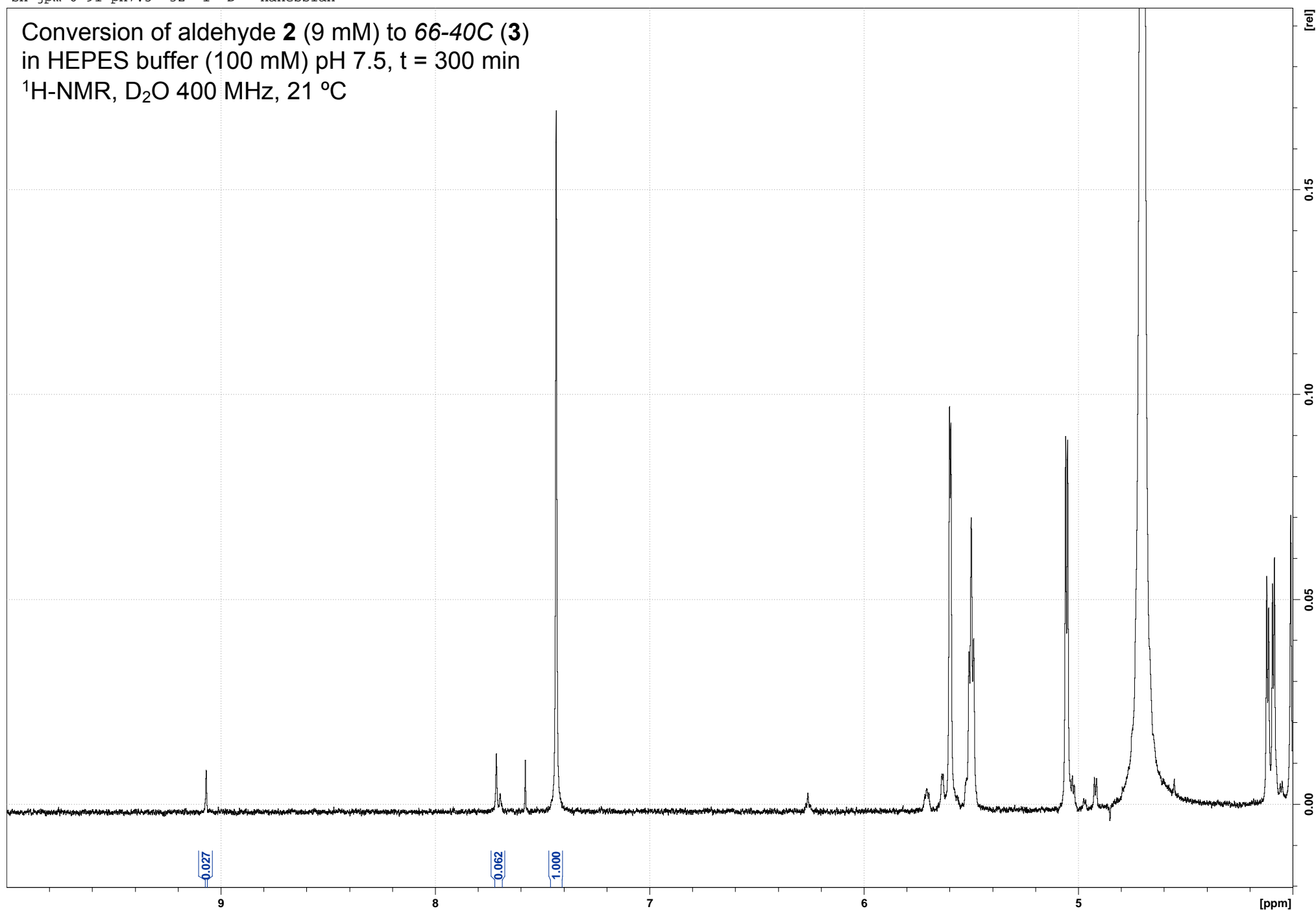
sh-jpm-6-91-ph7.5 31 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 290 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



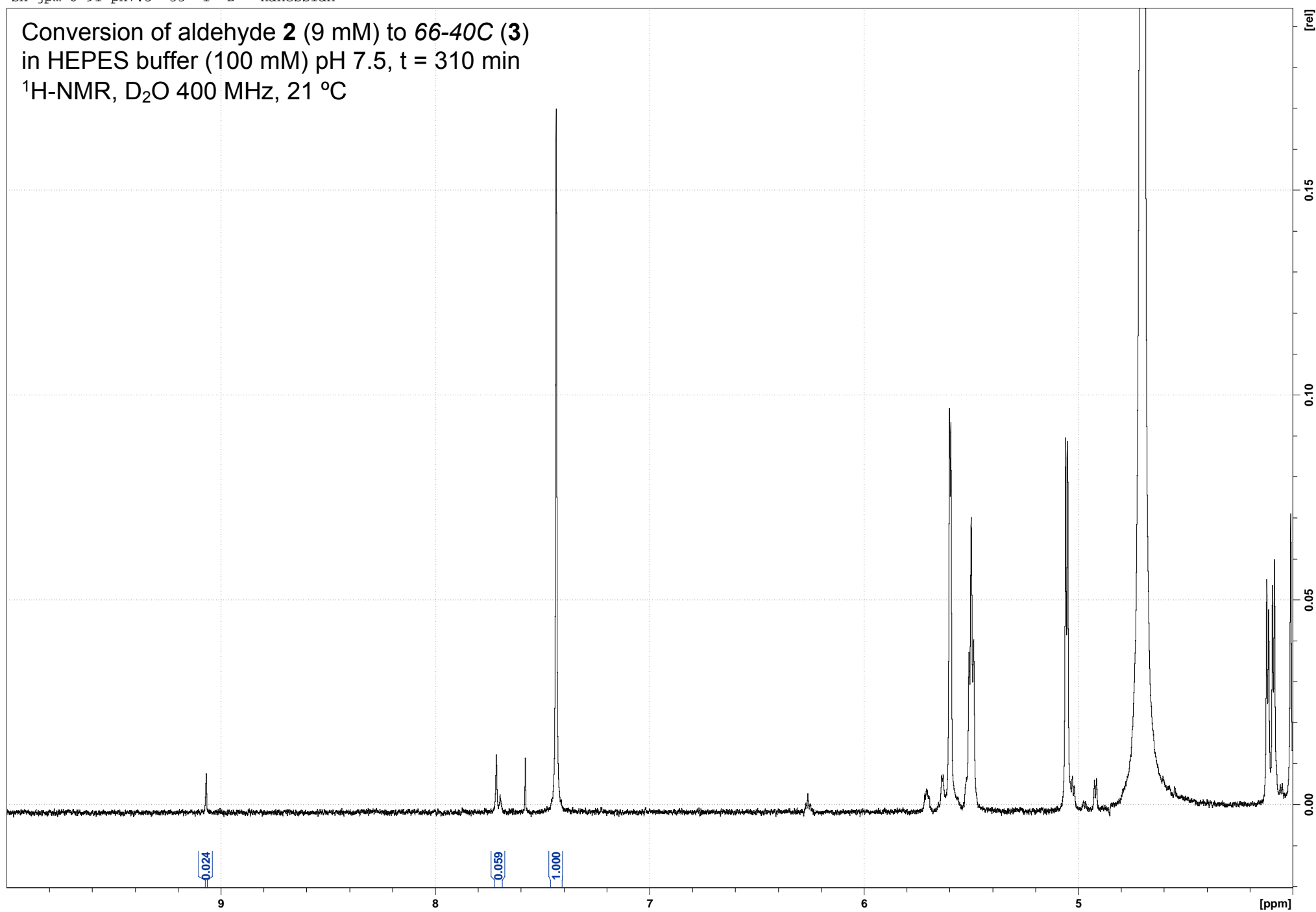
sh-jpm-6-91-ph7.5 32 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 300 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



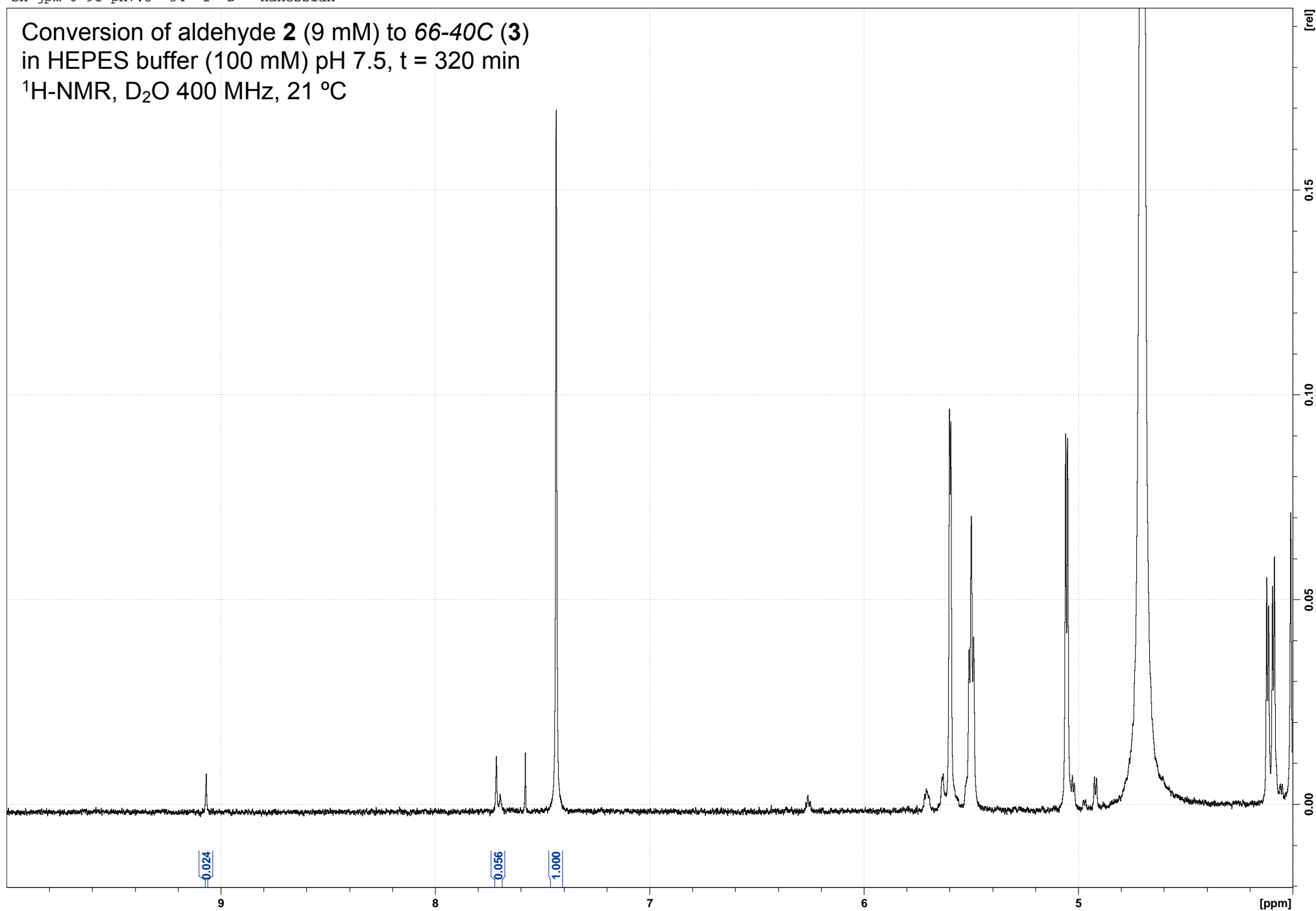
sh-jpm-6-91-ph7.5 33 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 310 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



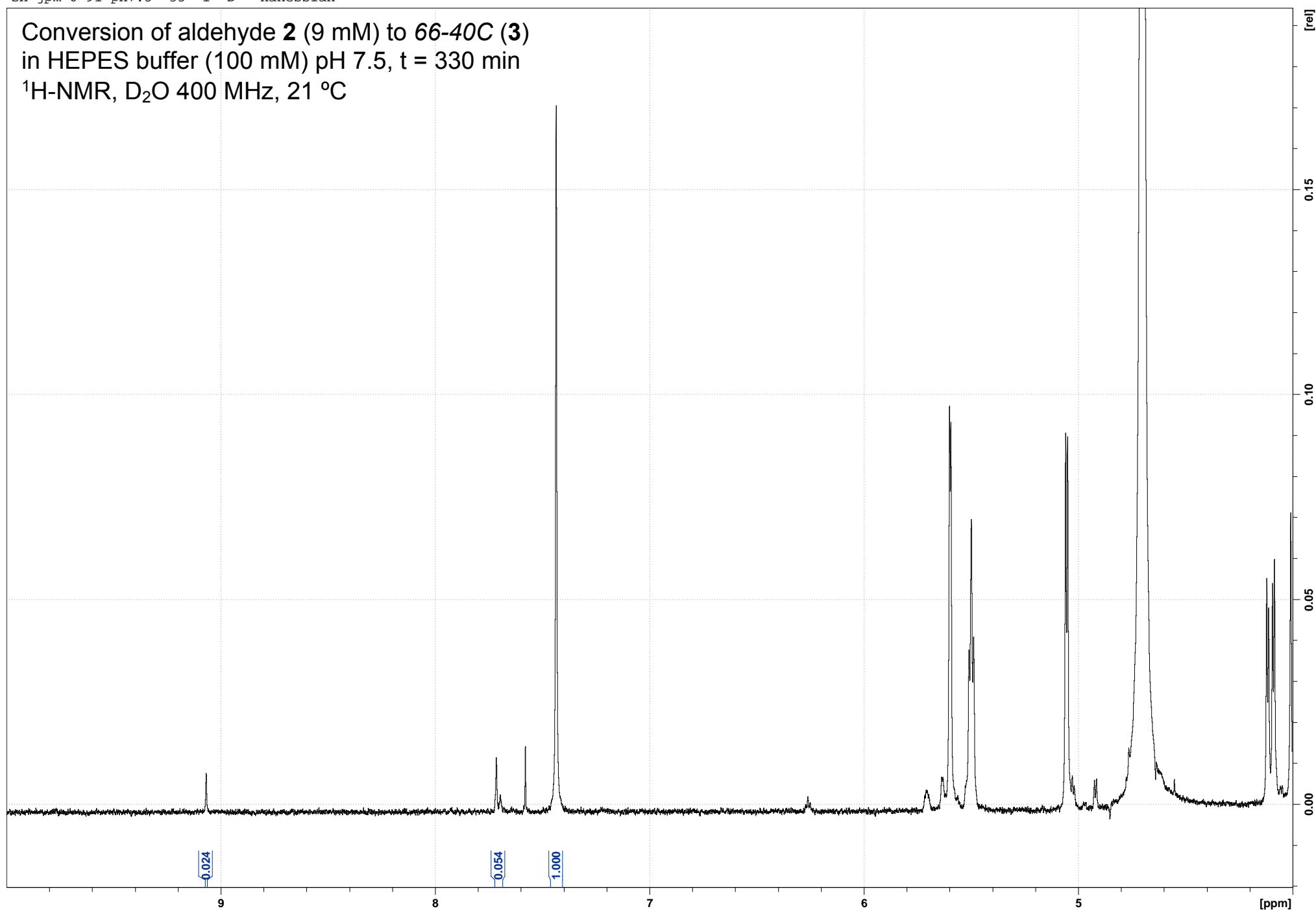
sh-jpm-6-91-ph7.5 34 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 320 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



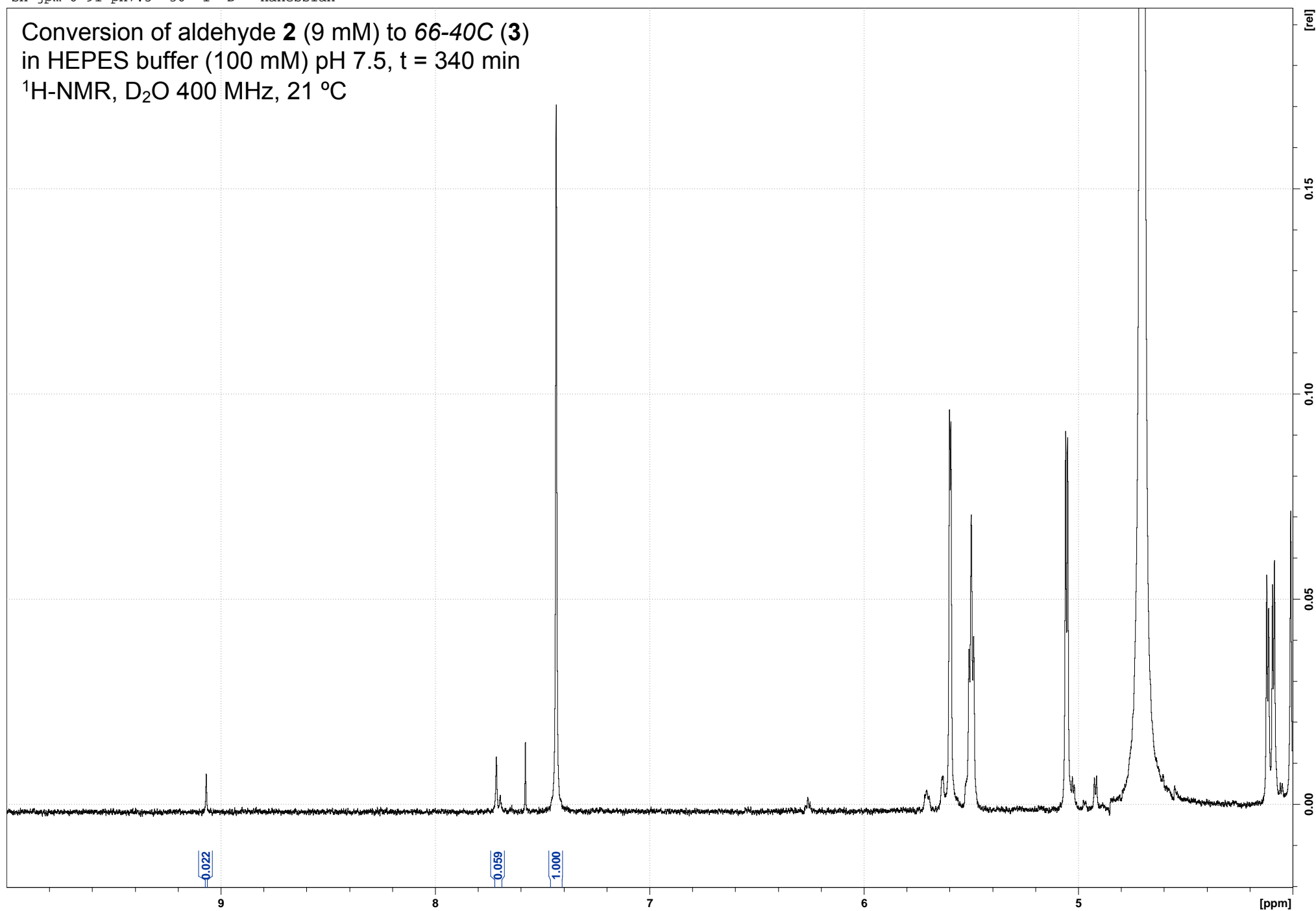
sh-jpm-6-91-ph7.5 35 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 330 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



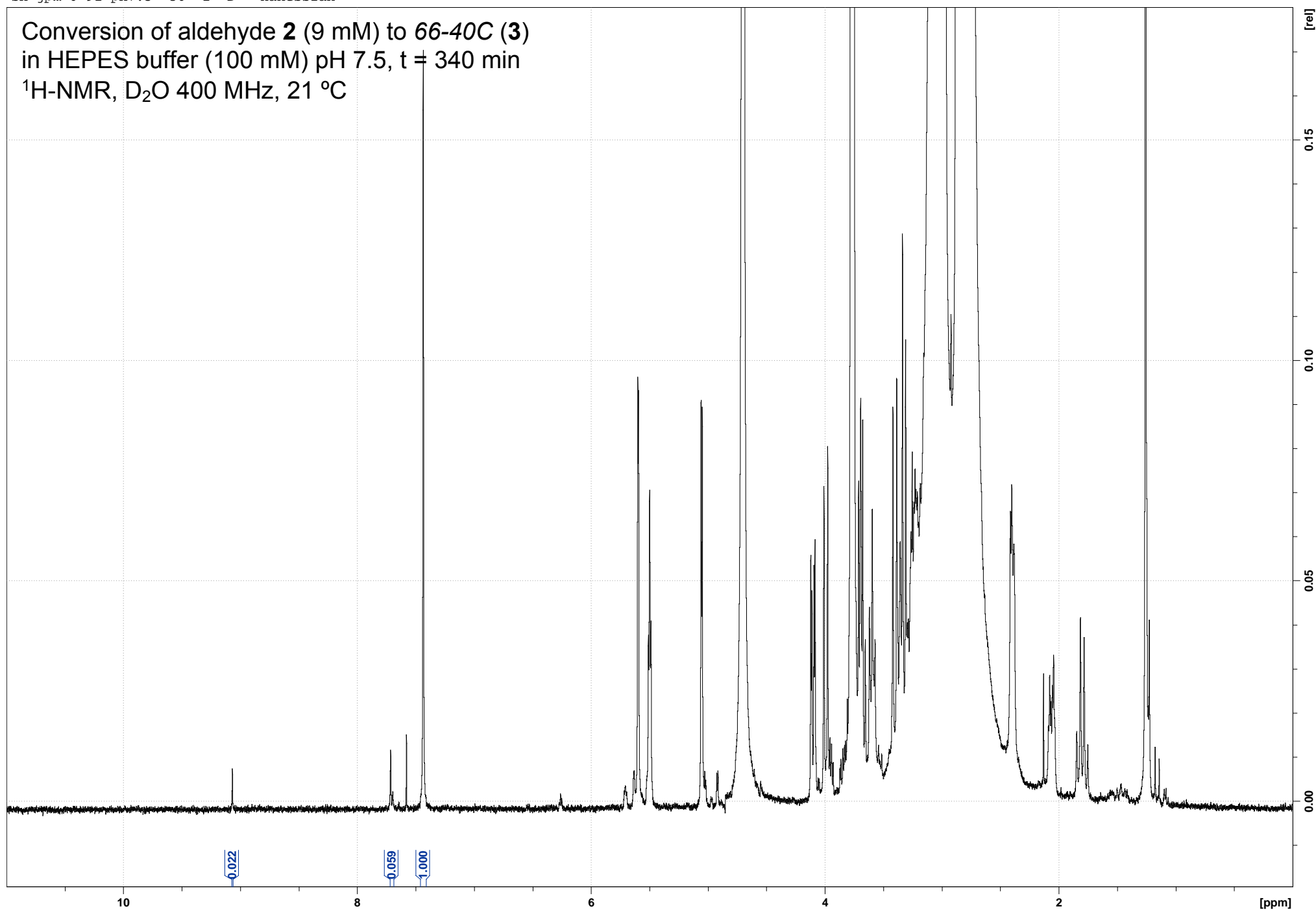
sh-jpm-6-91-ph7.5 36 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 340 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



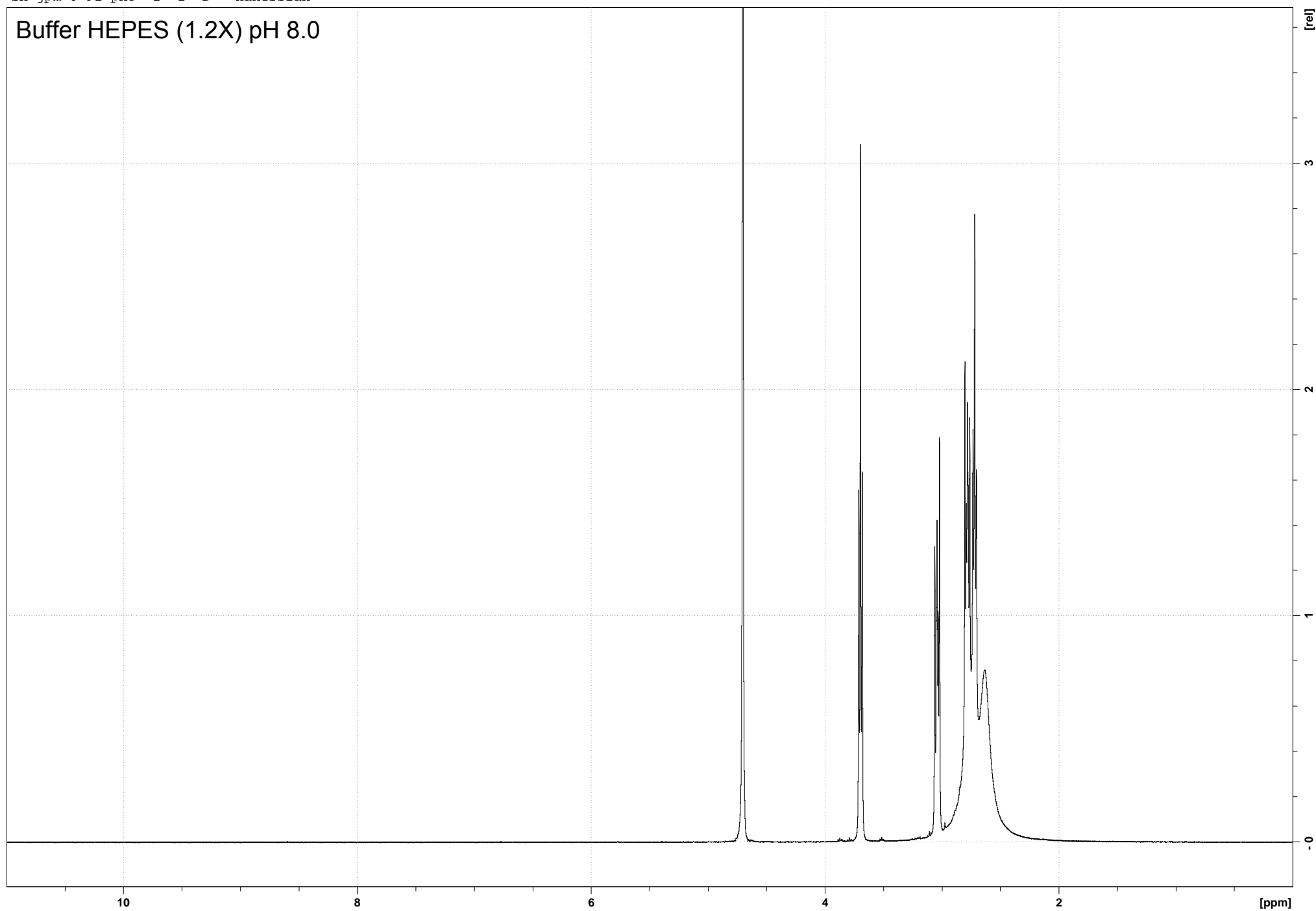
sh-jpm-6-91-ph7.5 36 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 7.5, t = 340 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph8 1 1 D: Hanessian

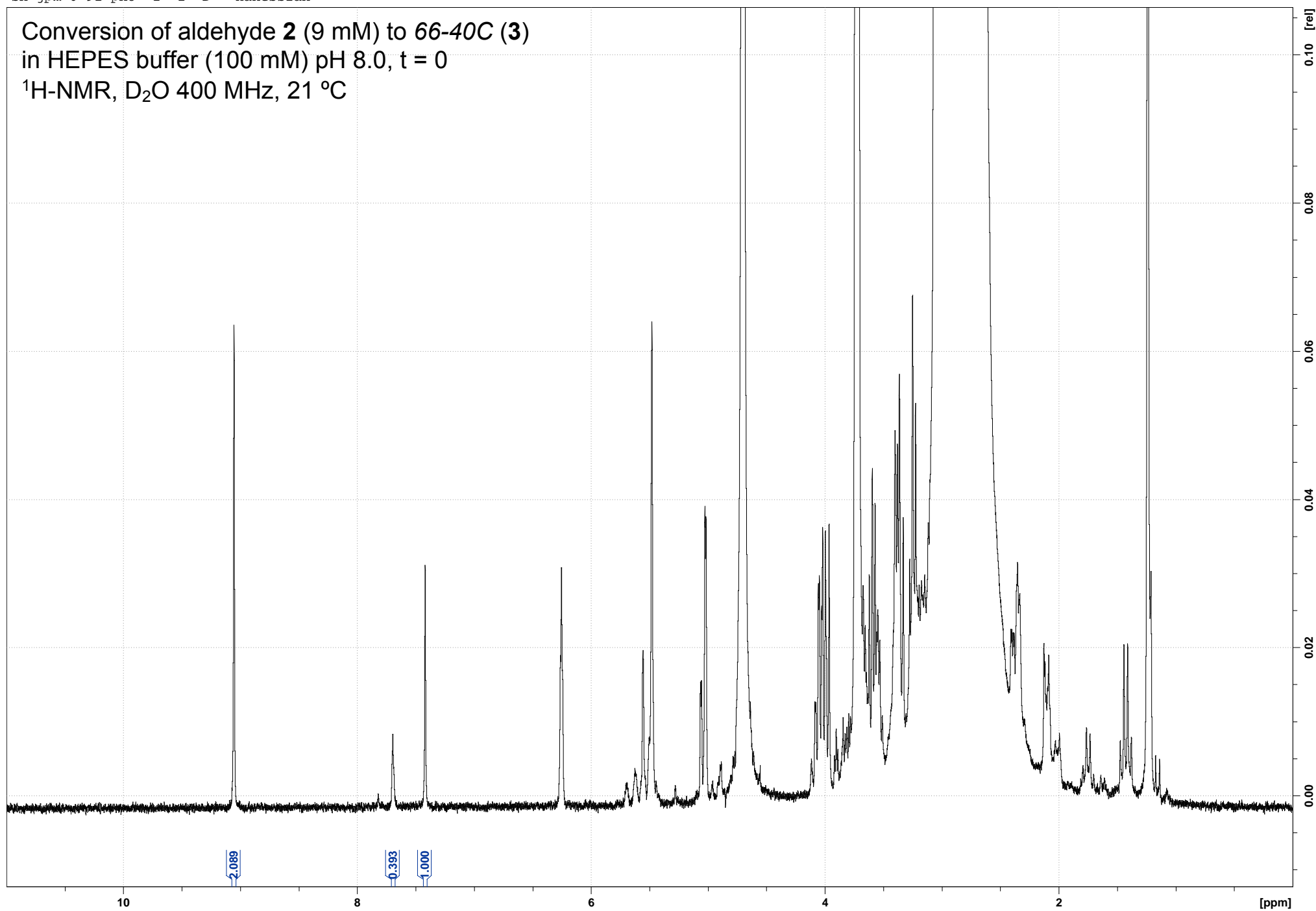
Buffer HEPES (1.2X) pH 8.0





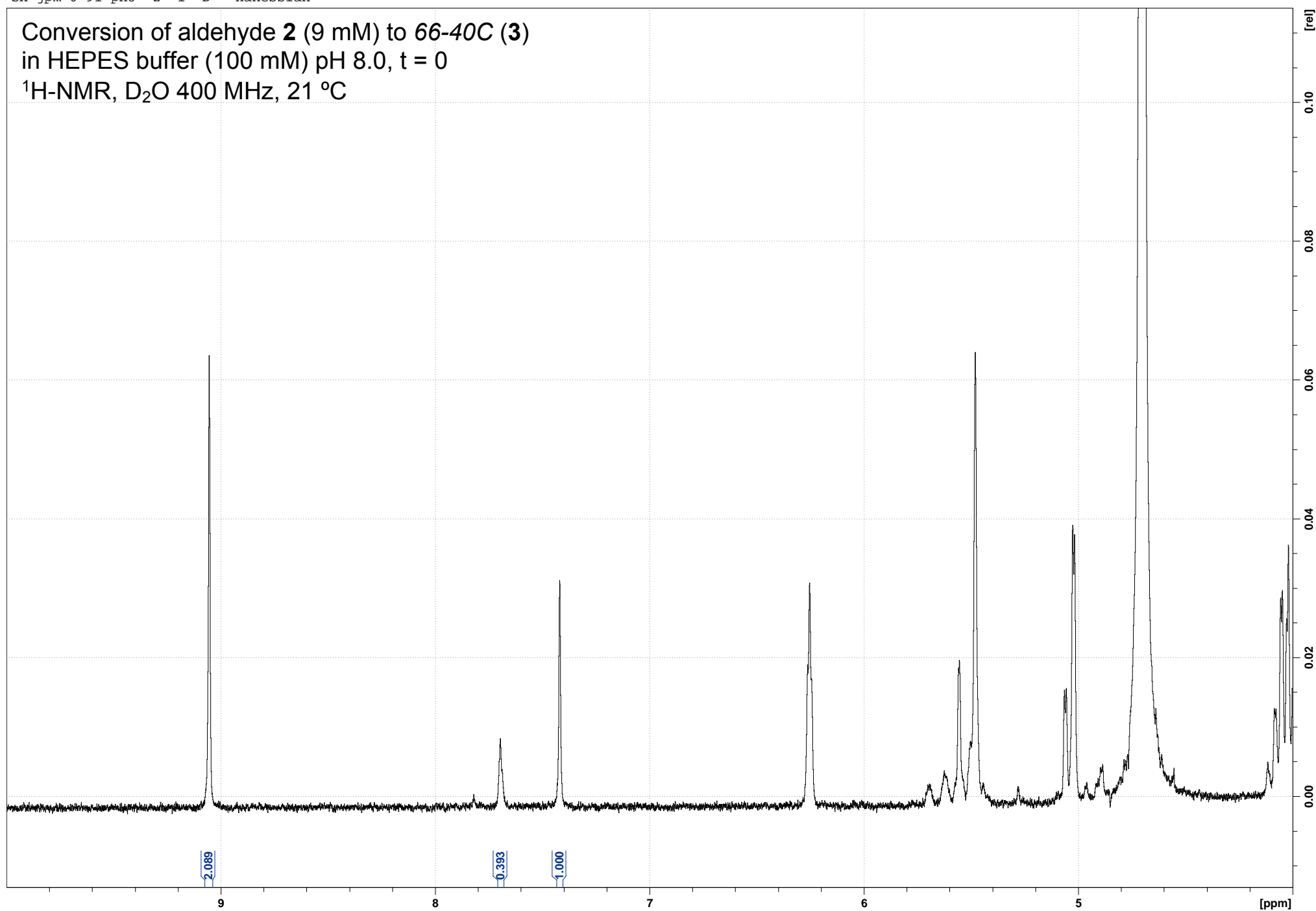
sh-jpm-6-91-ph8 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



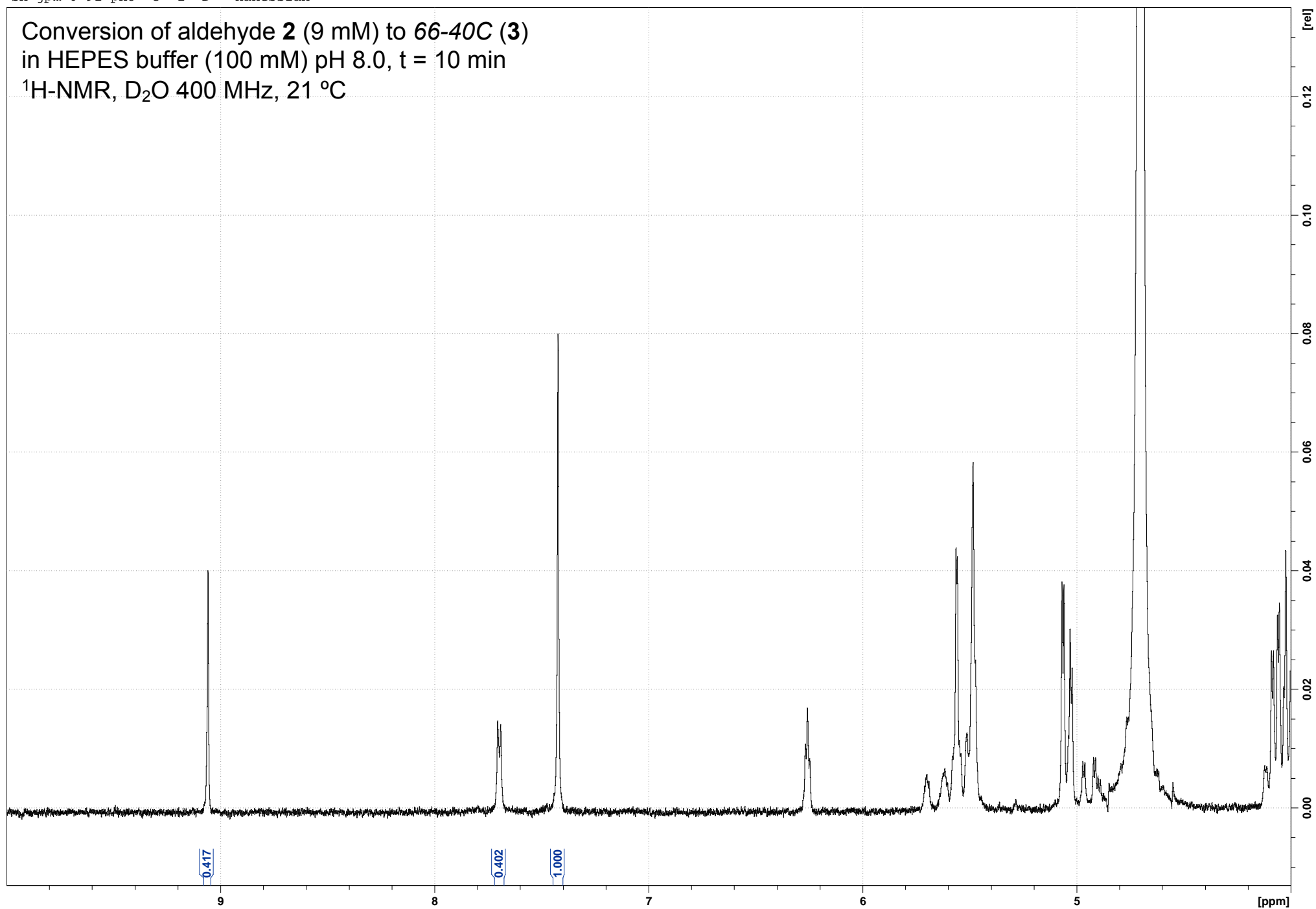
sh-jpm-6-91-ph8 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



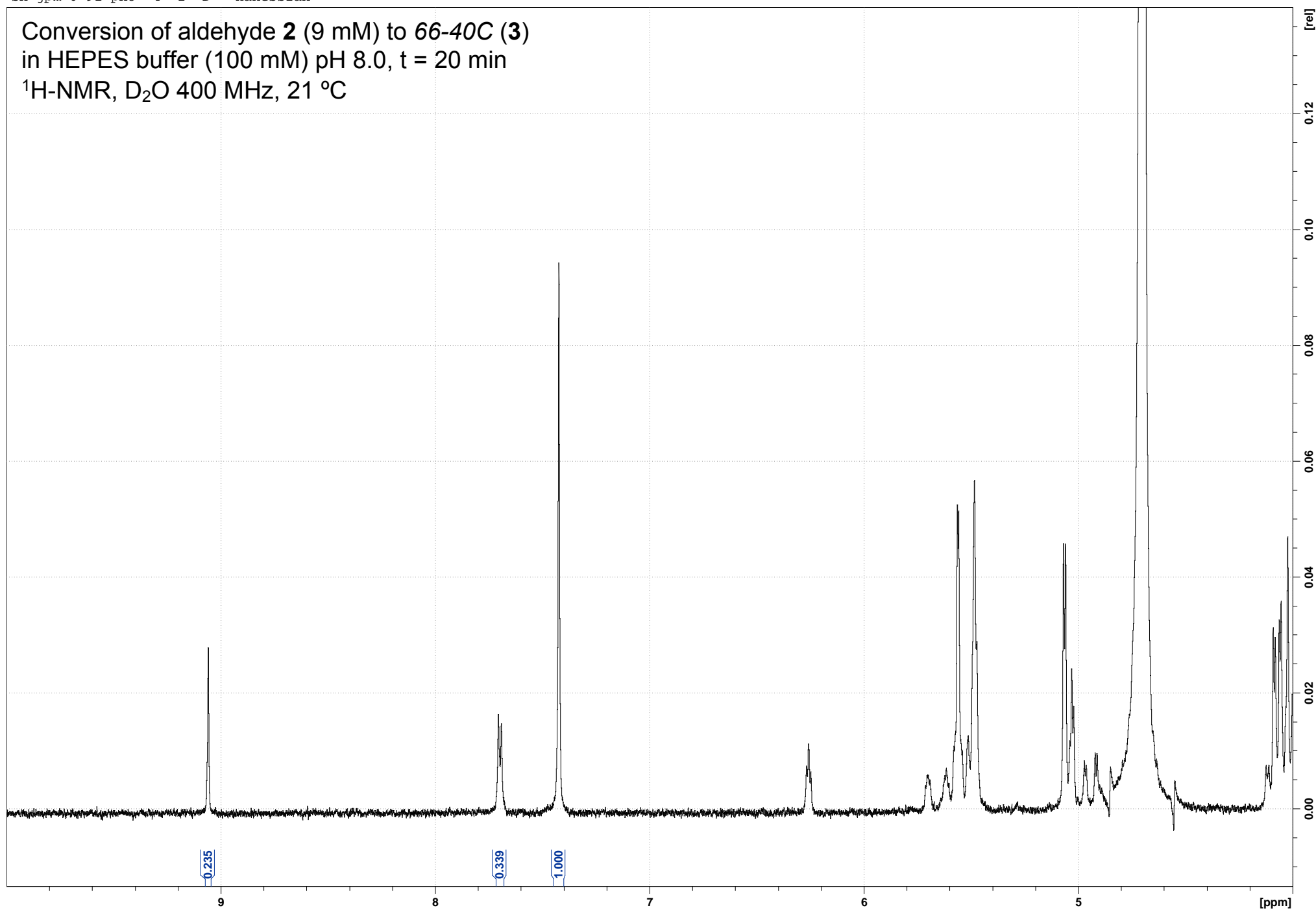
sh-jpm-6-91-ph8 3 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 10 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



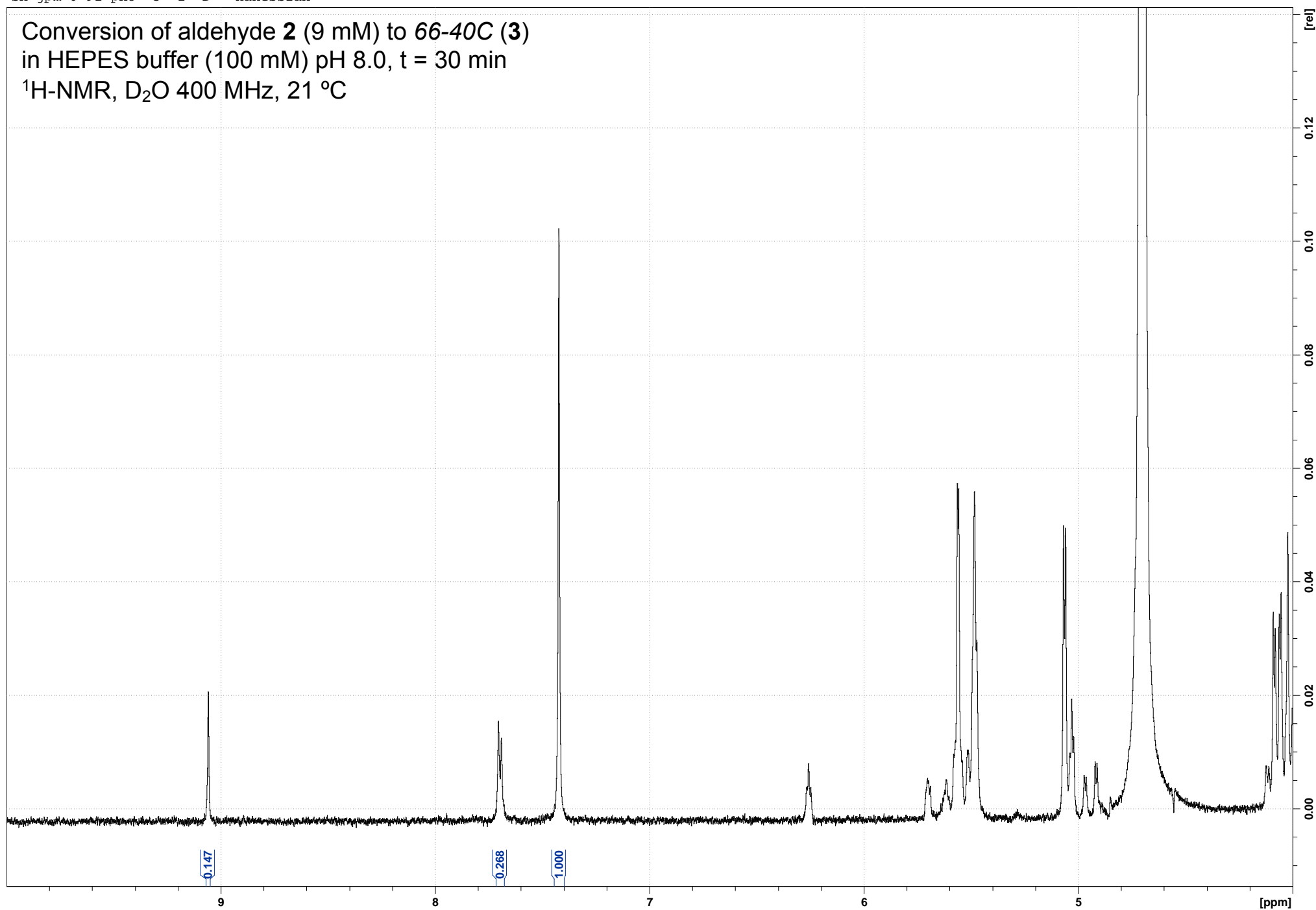
sh-jpm-6-91-ph8 4 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 20 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



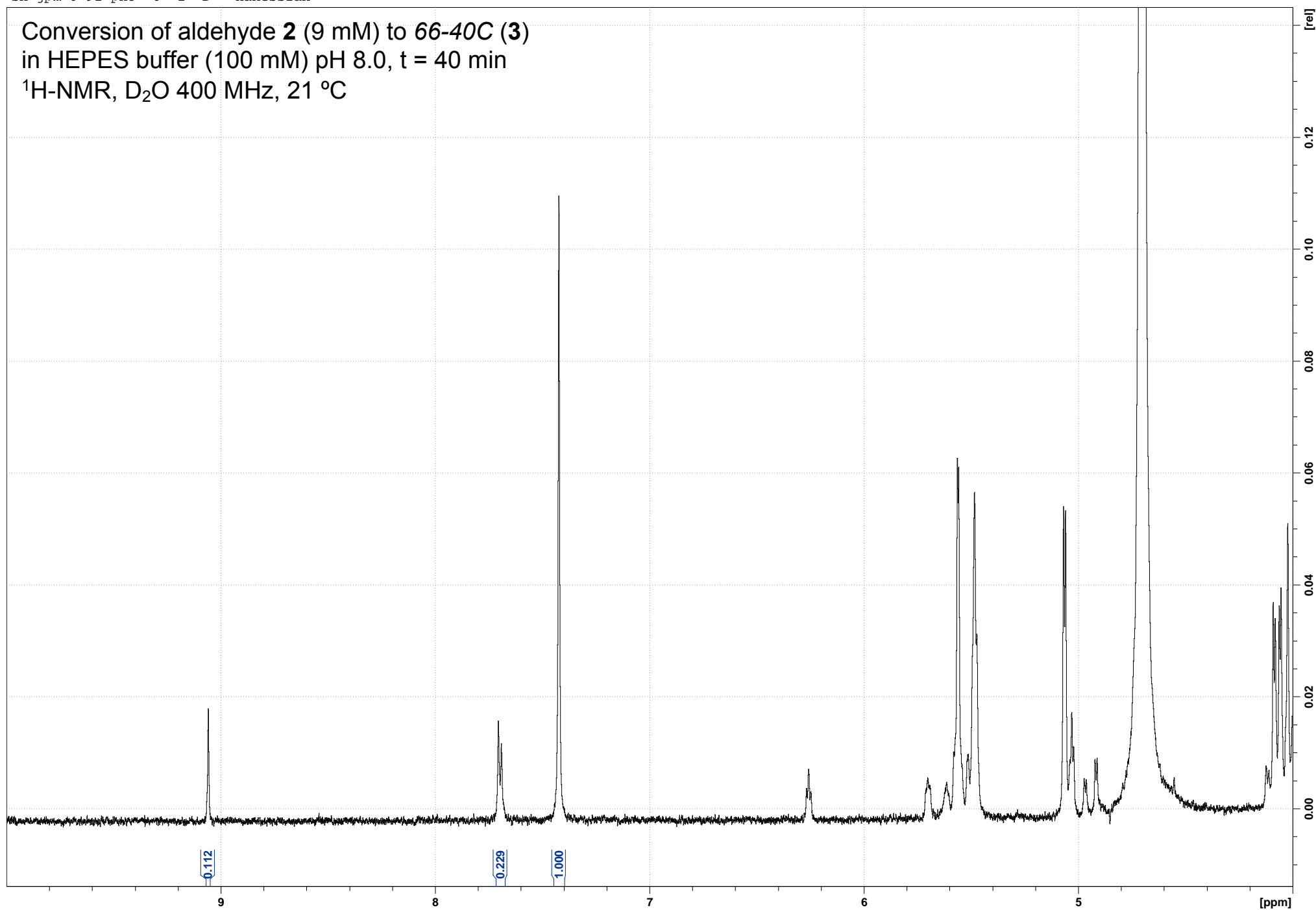
sh-jpm-6-91-ph8 5 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 30 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



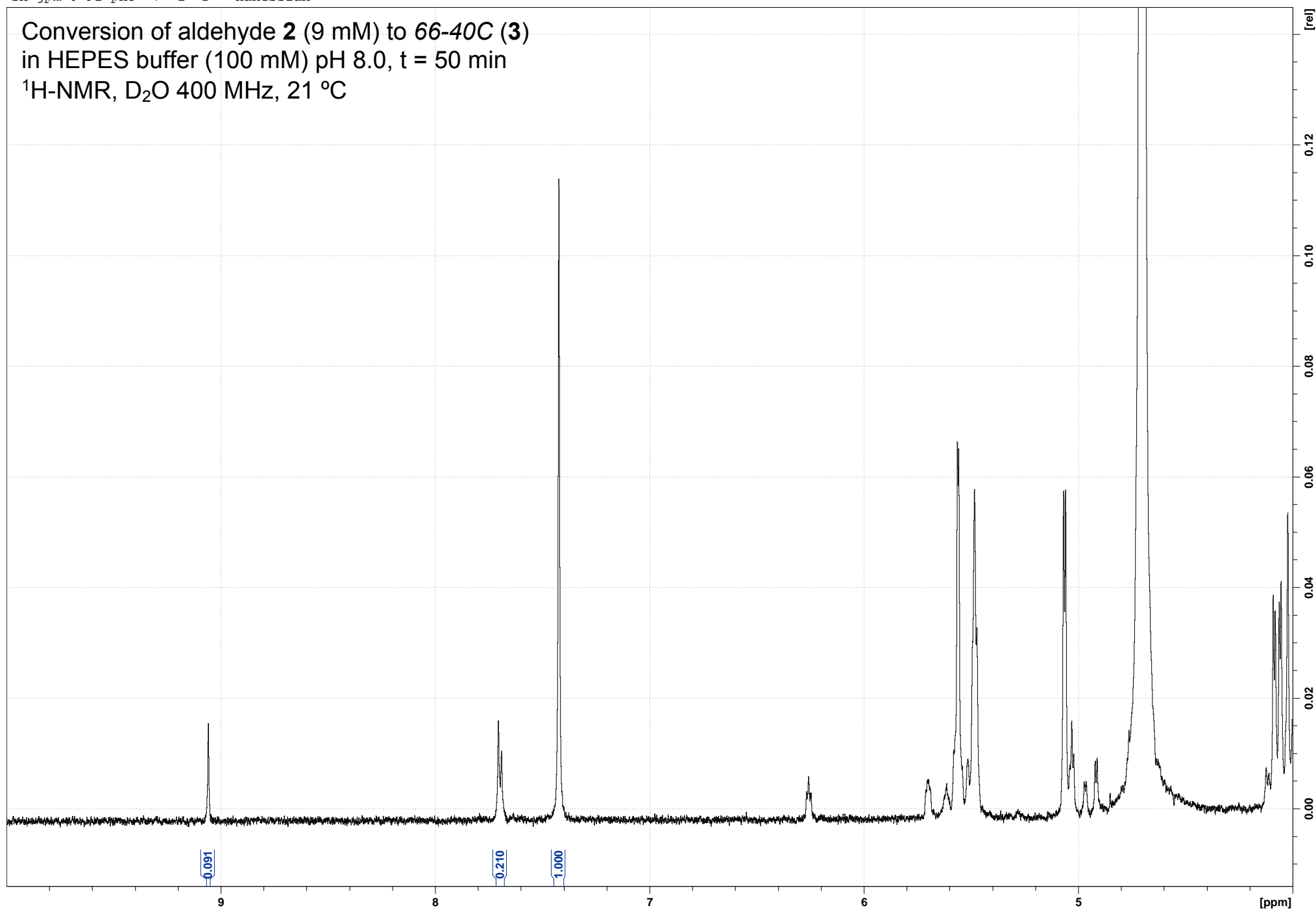
sh-jpm-6-91-ph8 6 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 40 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



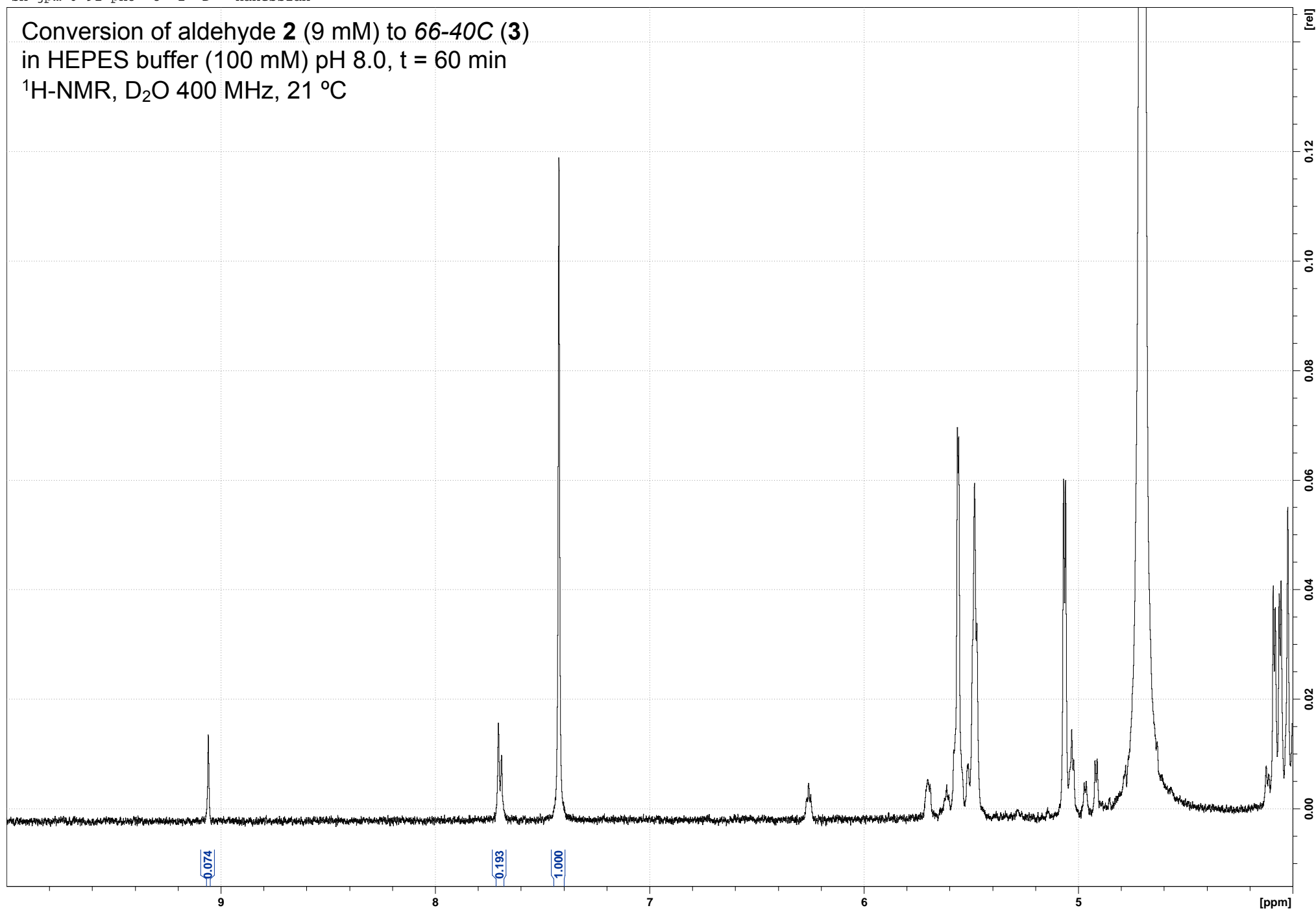
sh-jpm-6-91-ph8 7 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 50 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph8 8 1 D: Hanessian

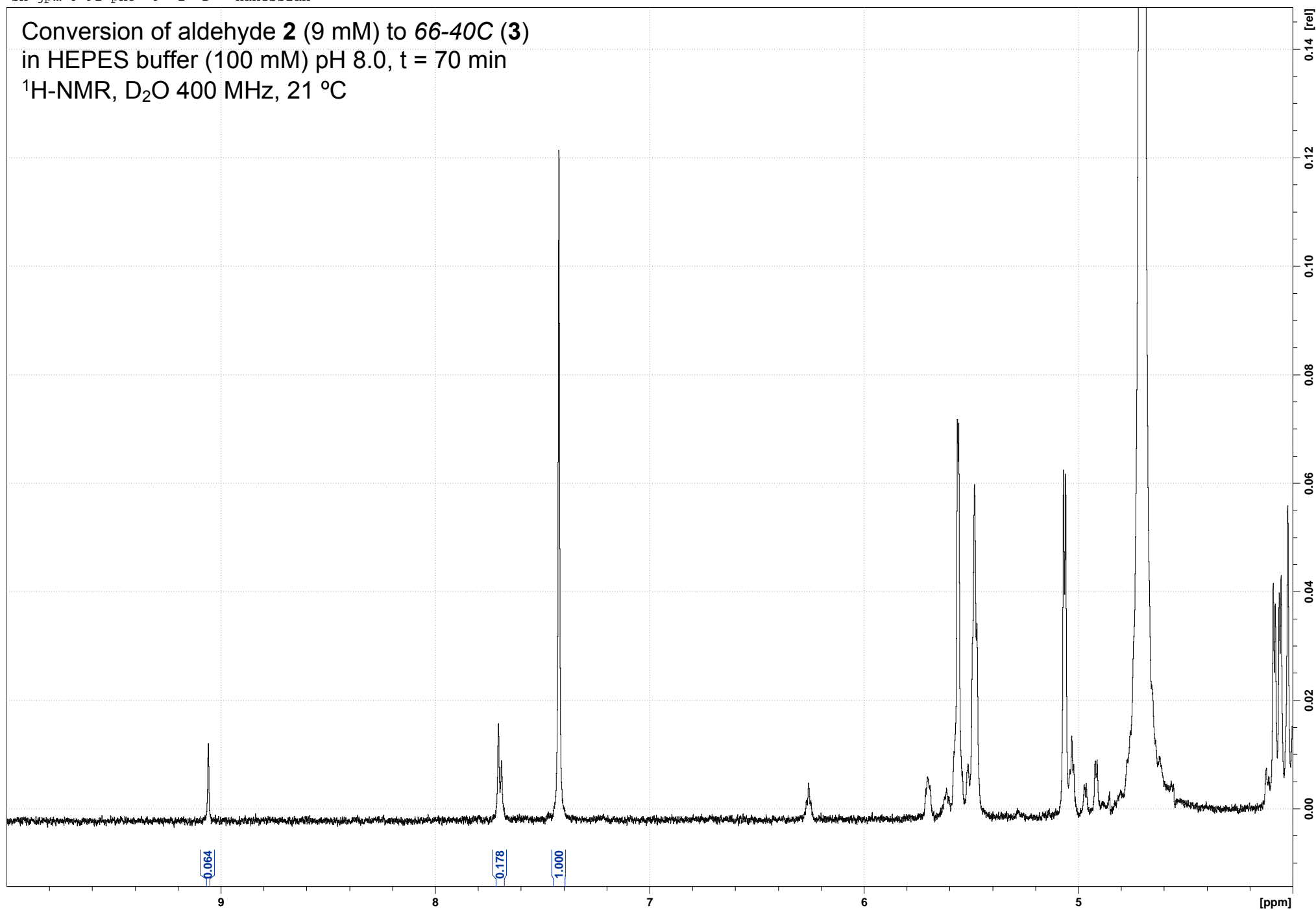
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 60 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





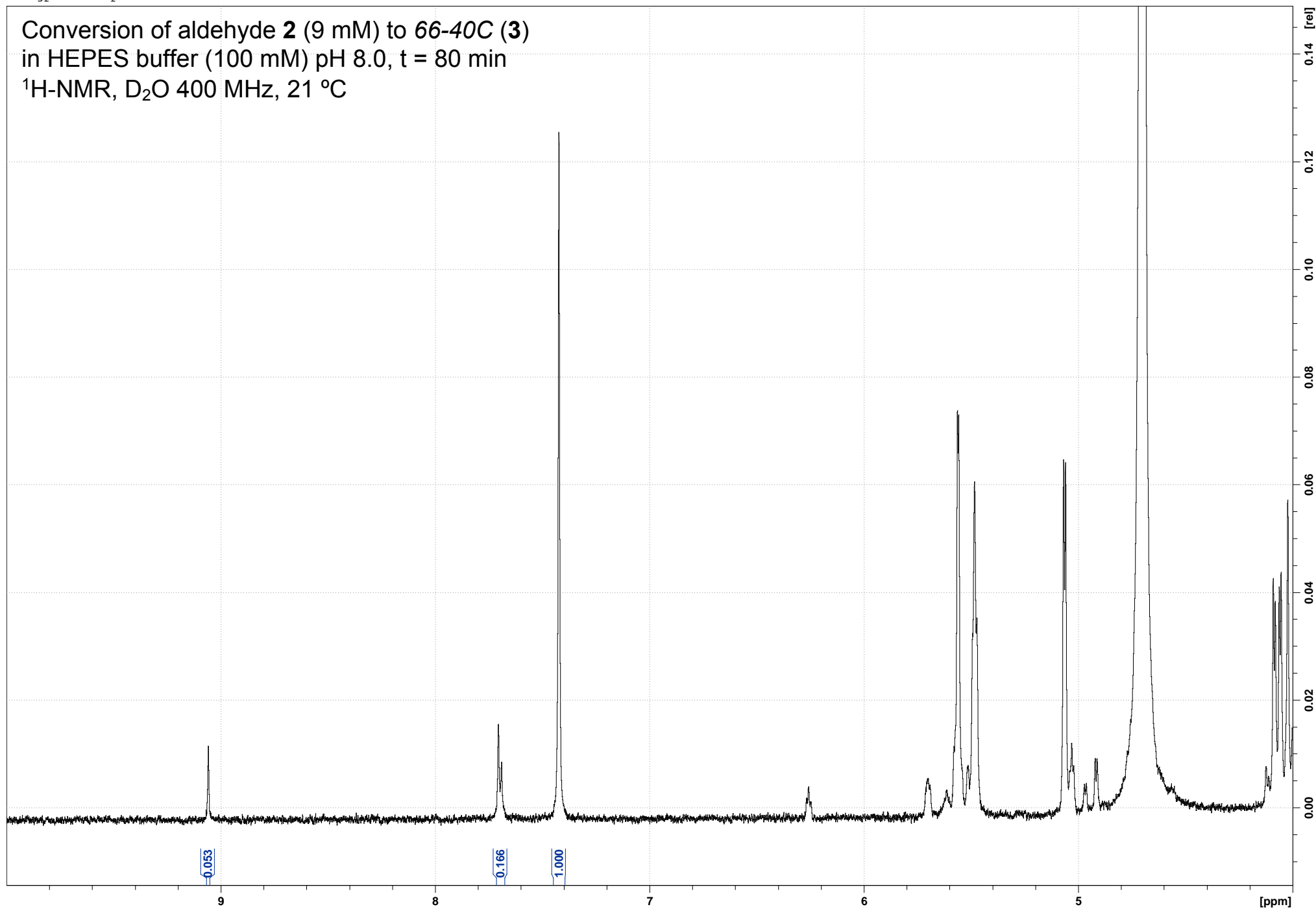
sh-jpm-6-91-ph8 9 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 70 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



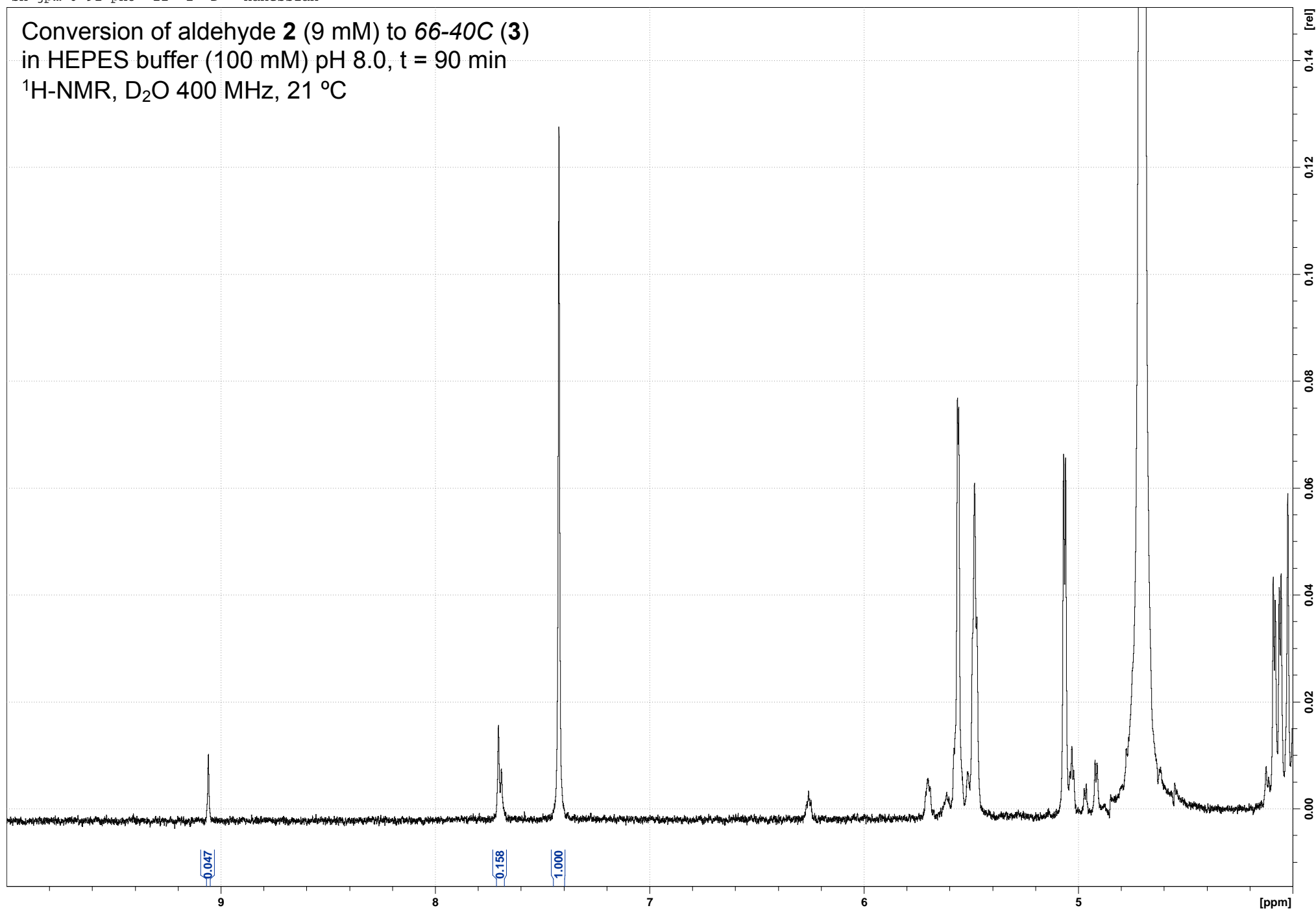
sh-jpm-6-91-ph8 10 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 80 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



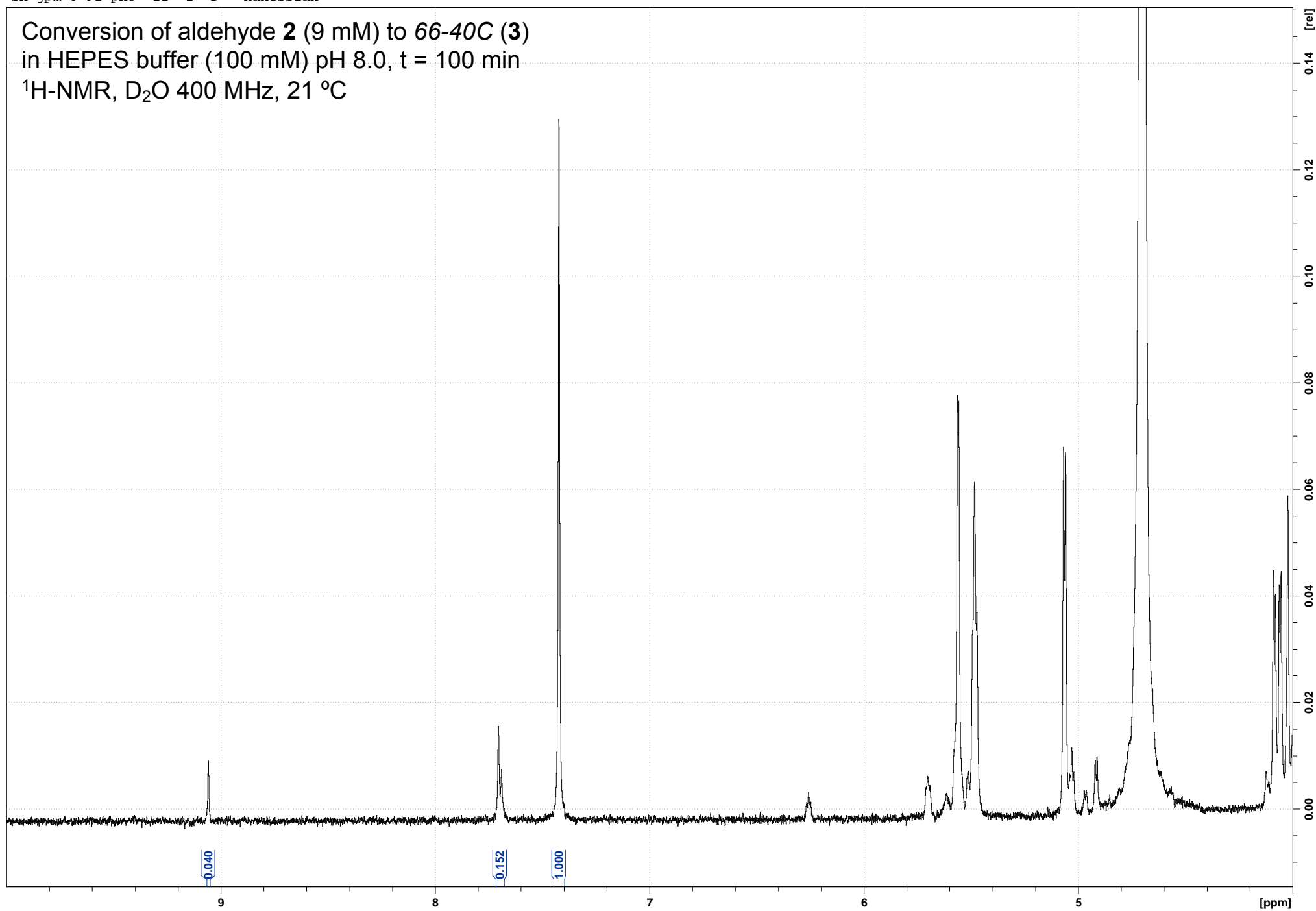
sh-jpm-6-91-ph8 11 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 90 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



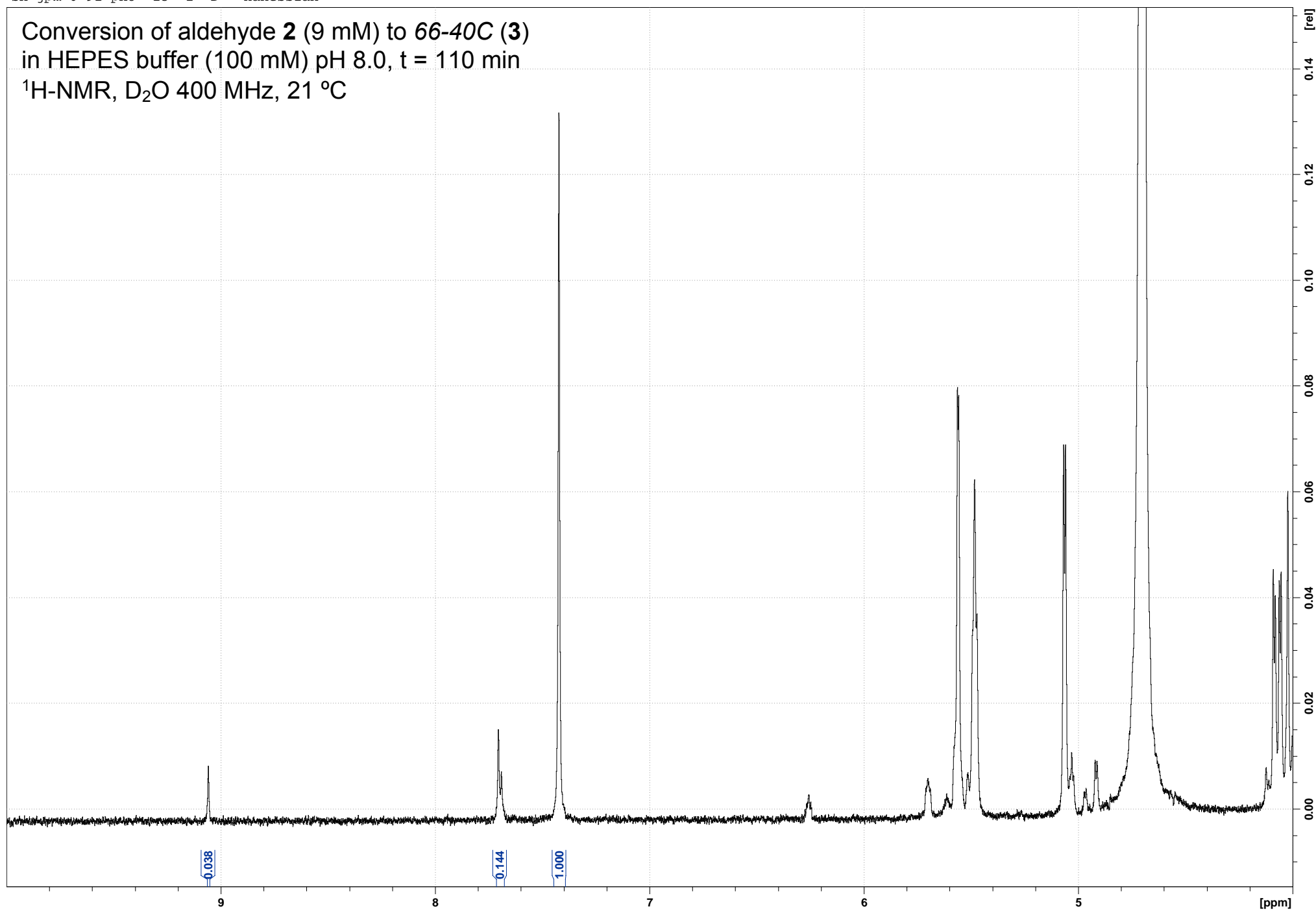
sh-jpm-6-91-ph8 12 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 100 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



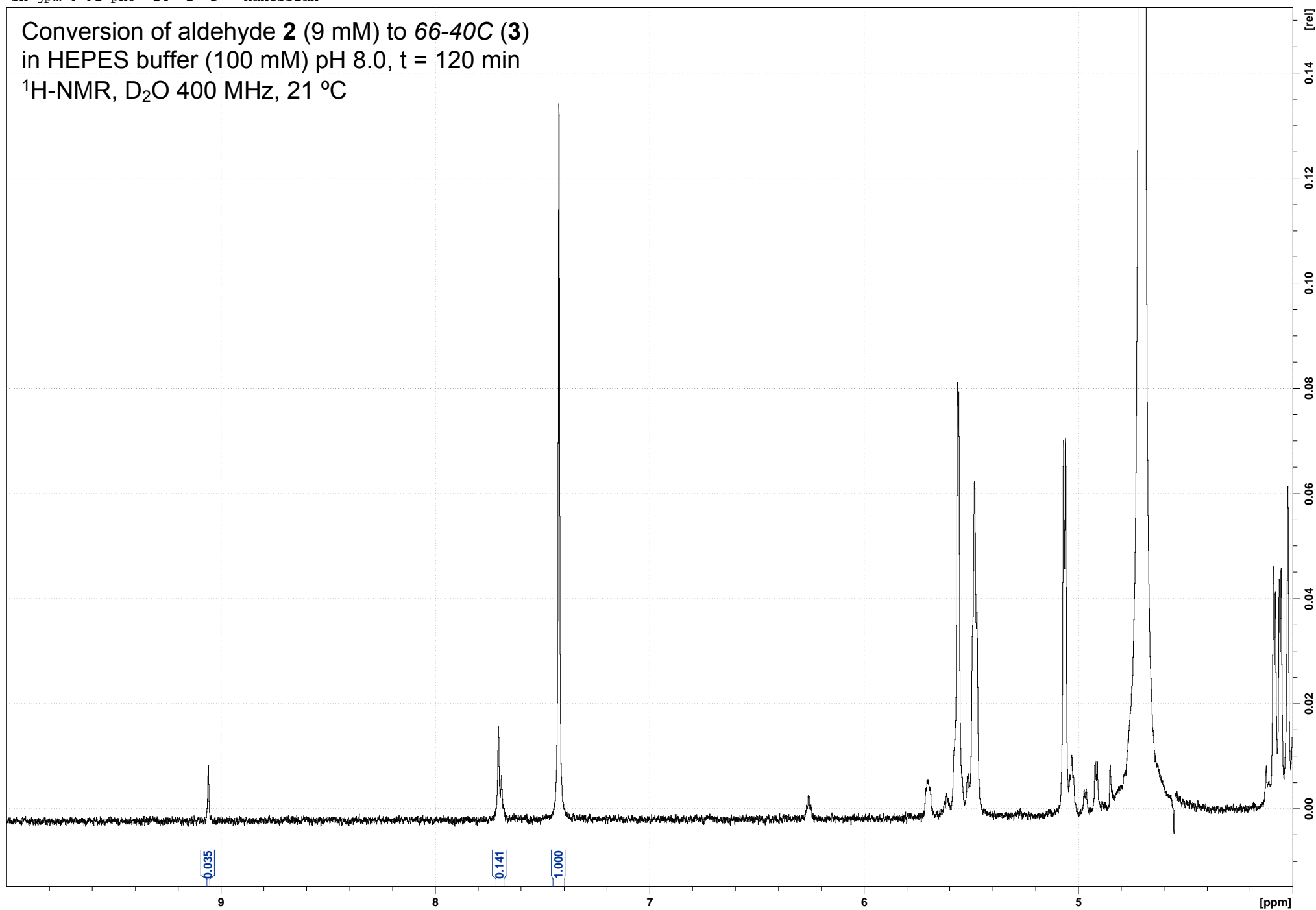
sh-jpm-6-91-ph8 13 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 110 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



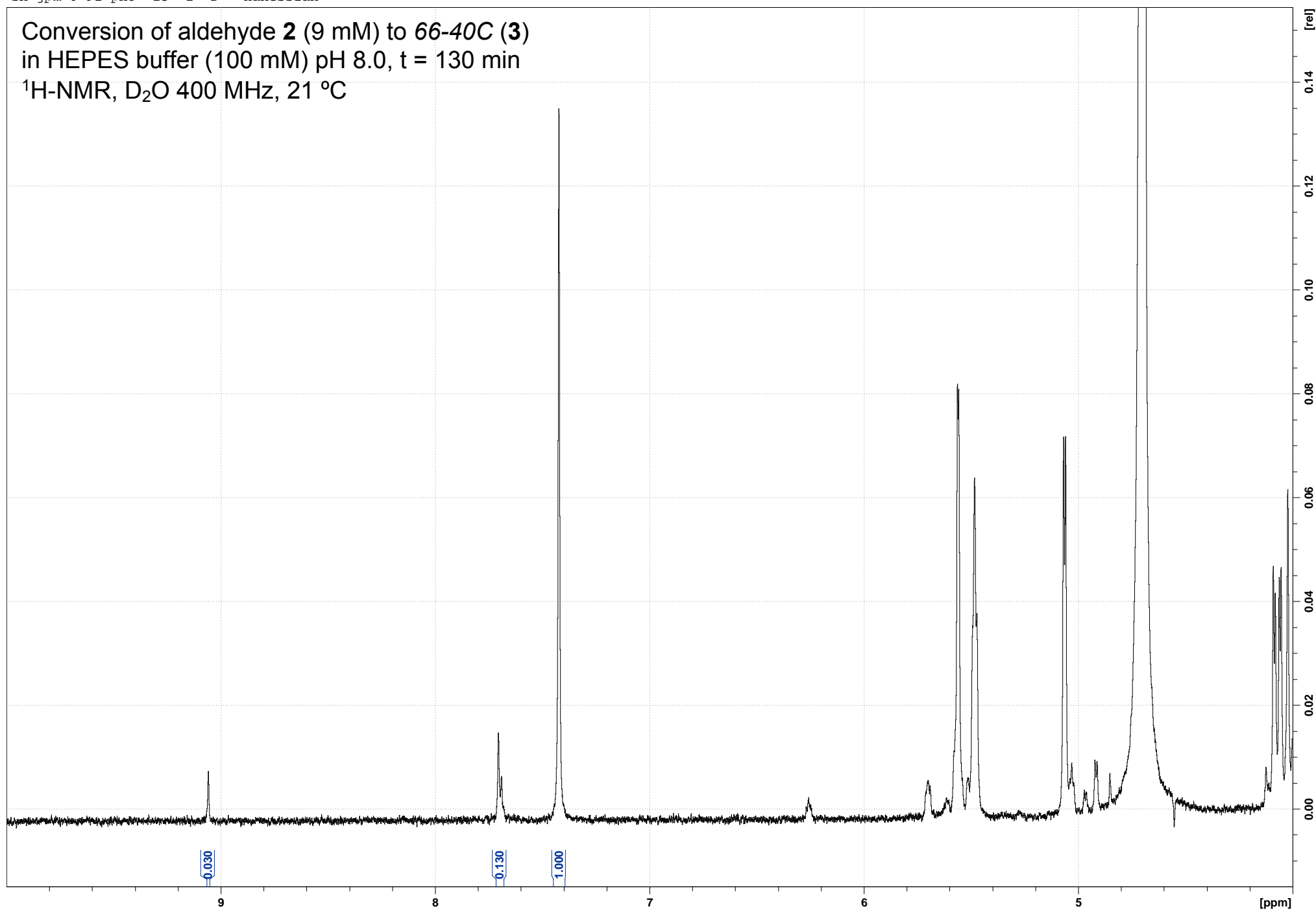
sh-jpm-6-91-ph8 14 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 120 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



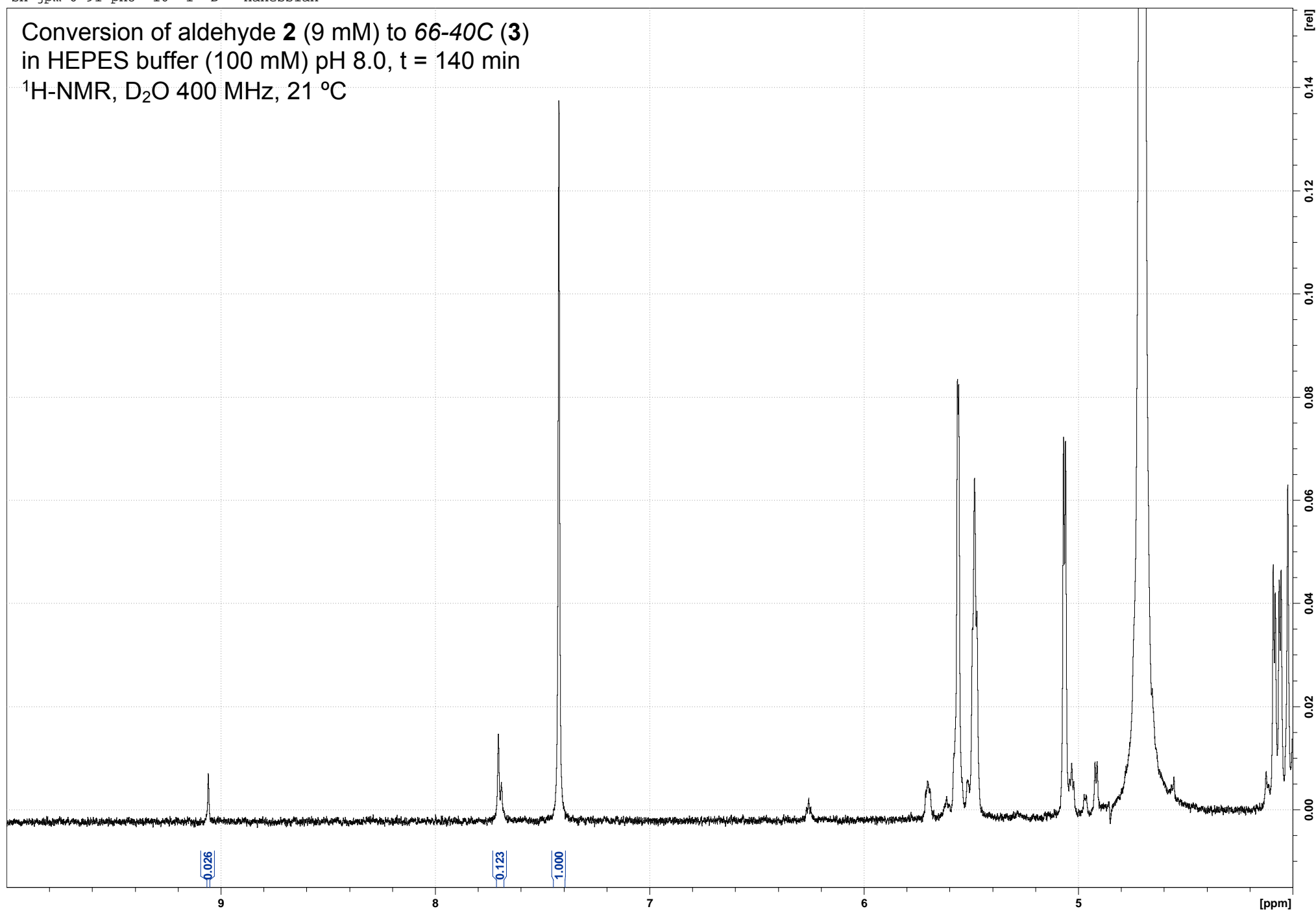
sh-jpm-6-91-ph8 15 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 130 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph8 16 1 D: Hanessian

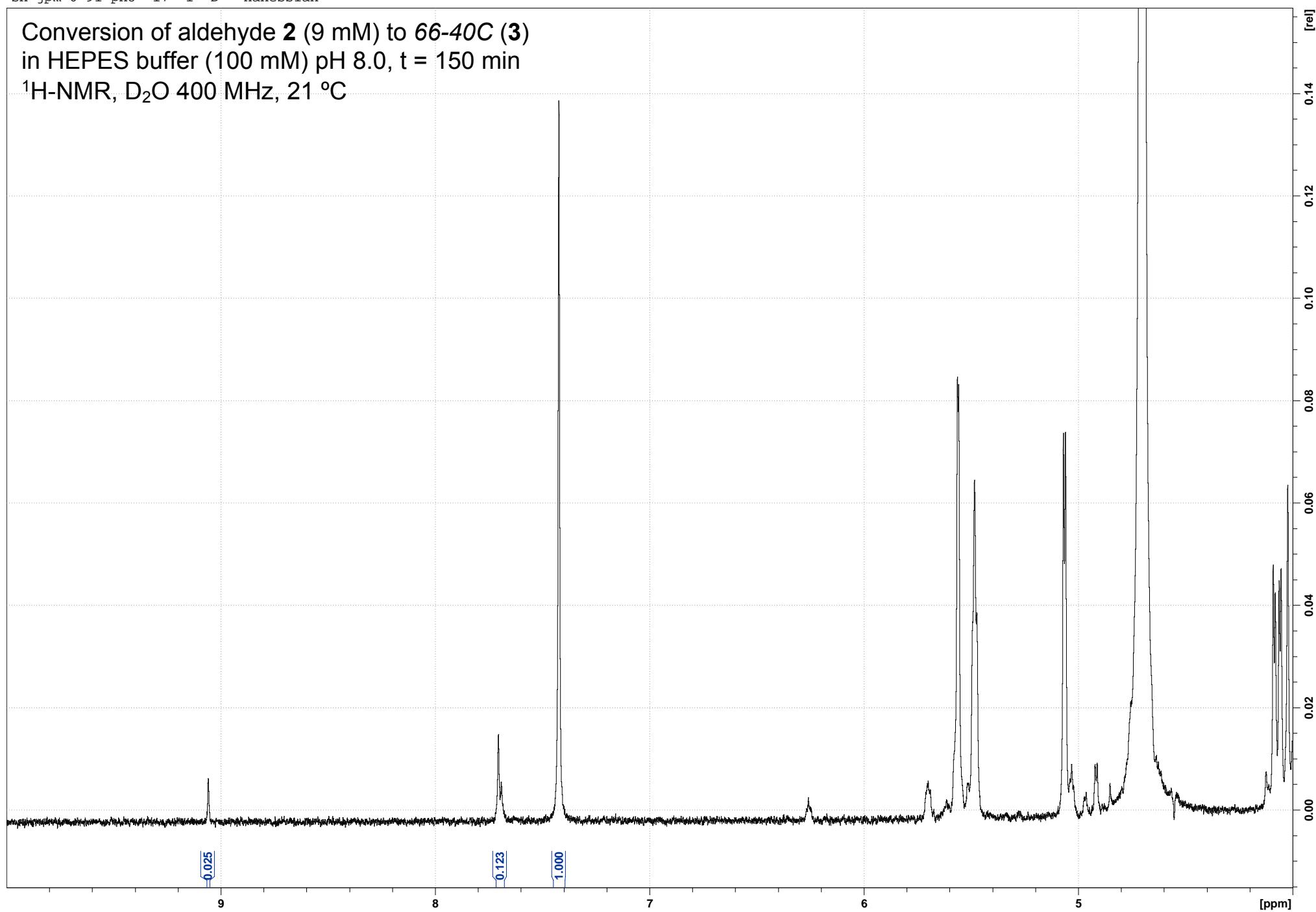
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 140 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





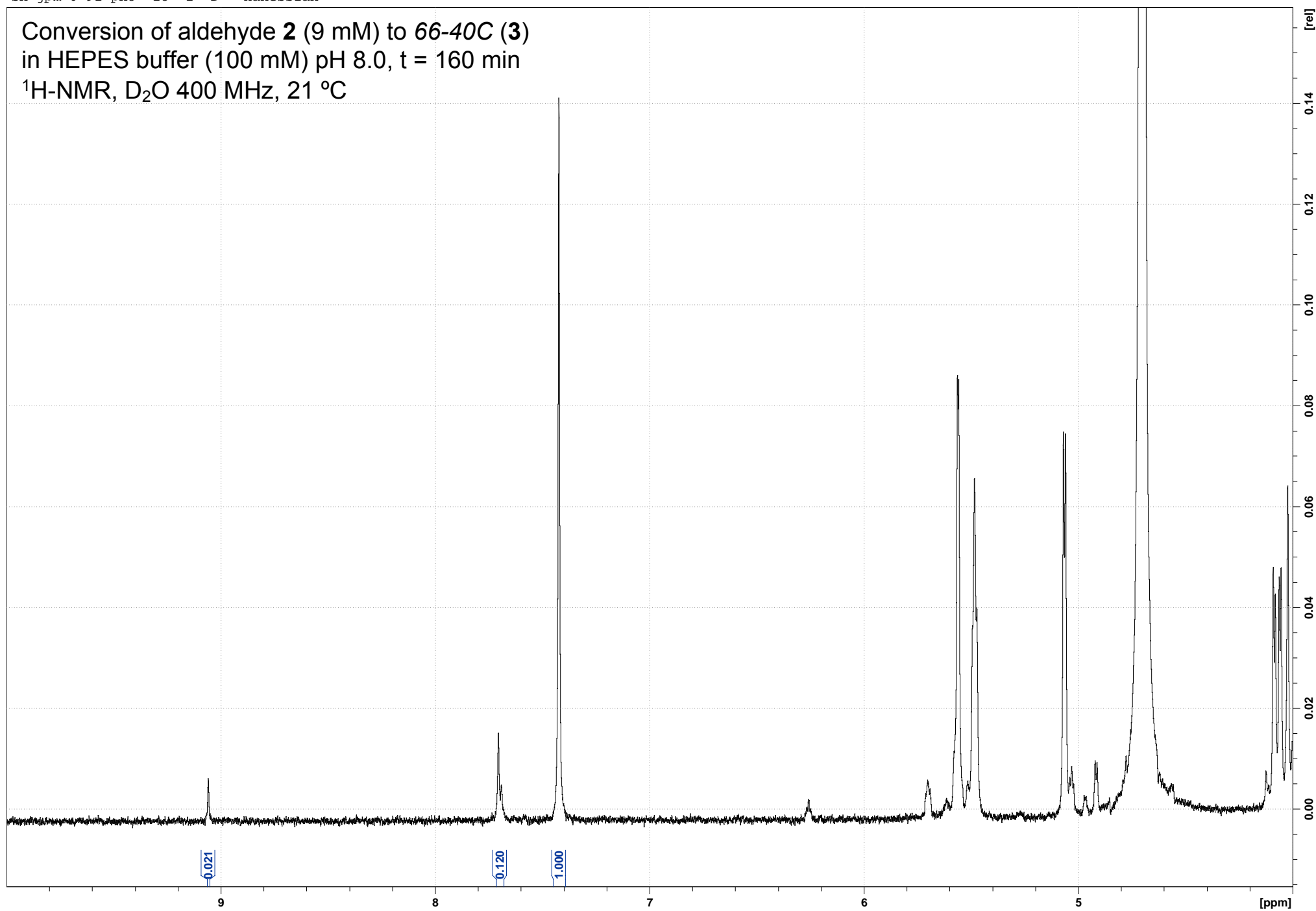
sh-jpm-6-91-ph8 17 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 150 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



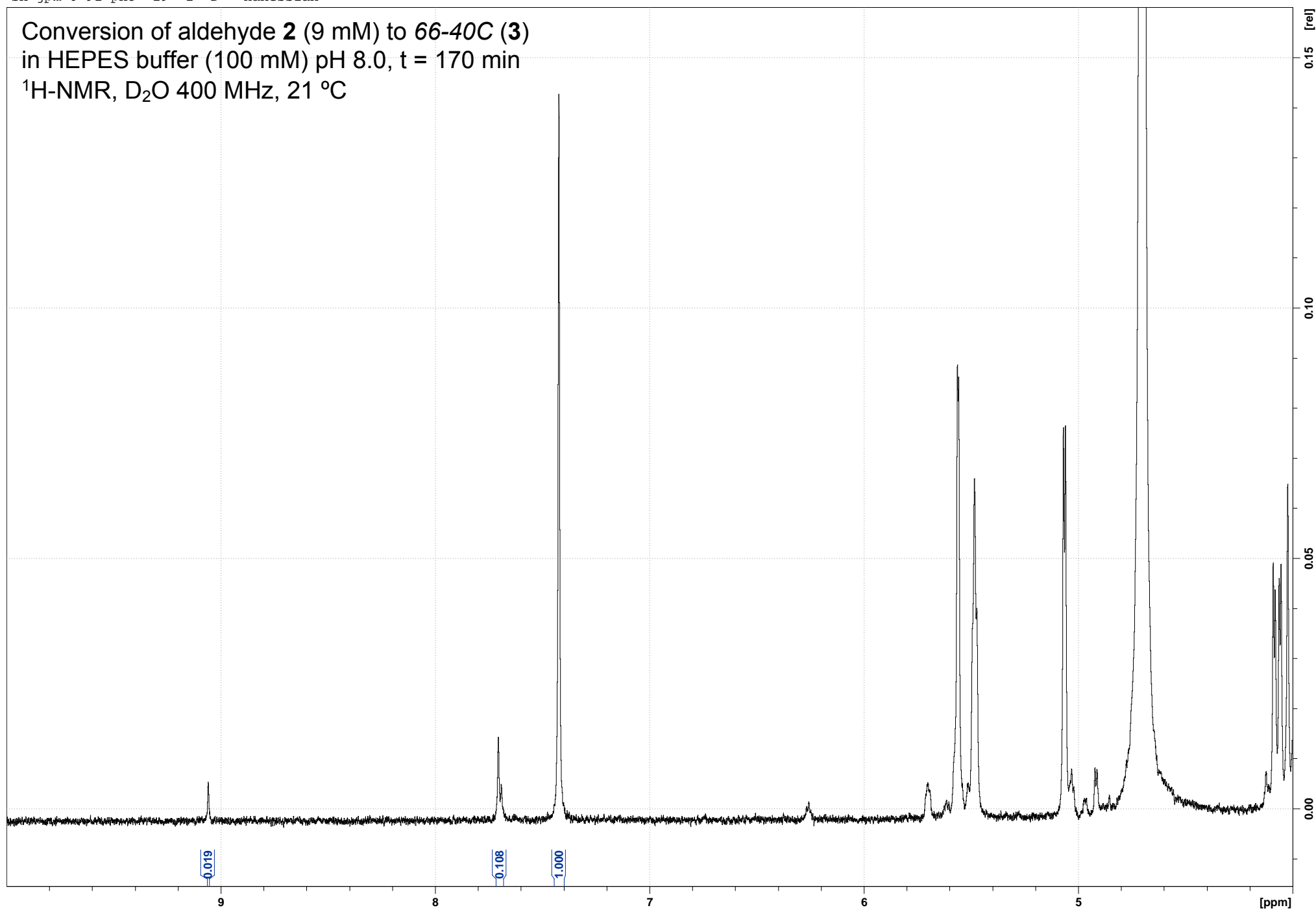
sh-jpm-6-91-ph8 18 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 160 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



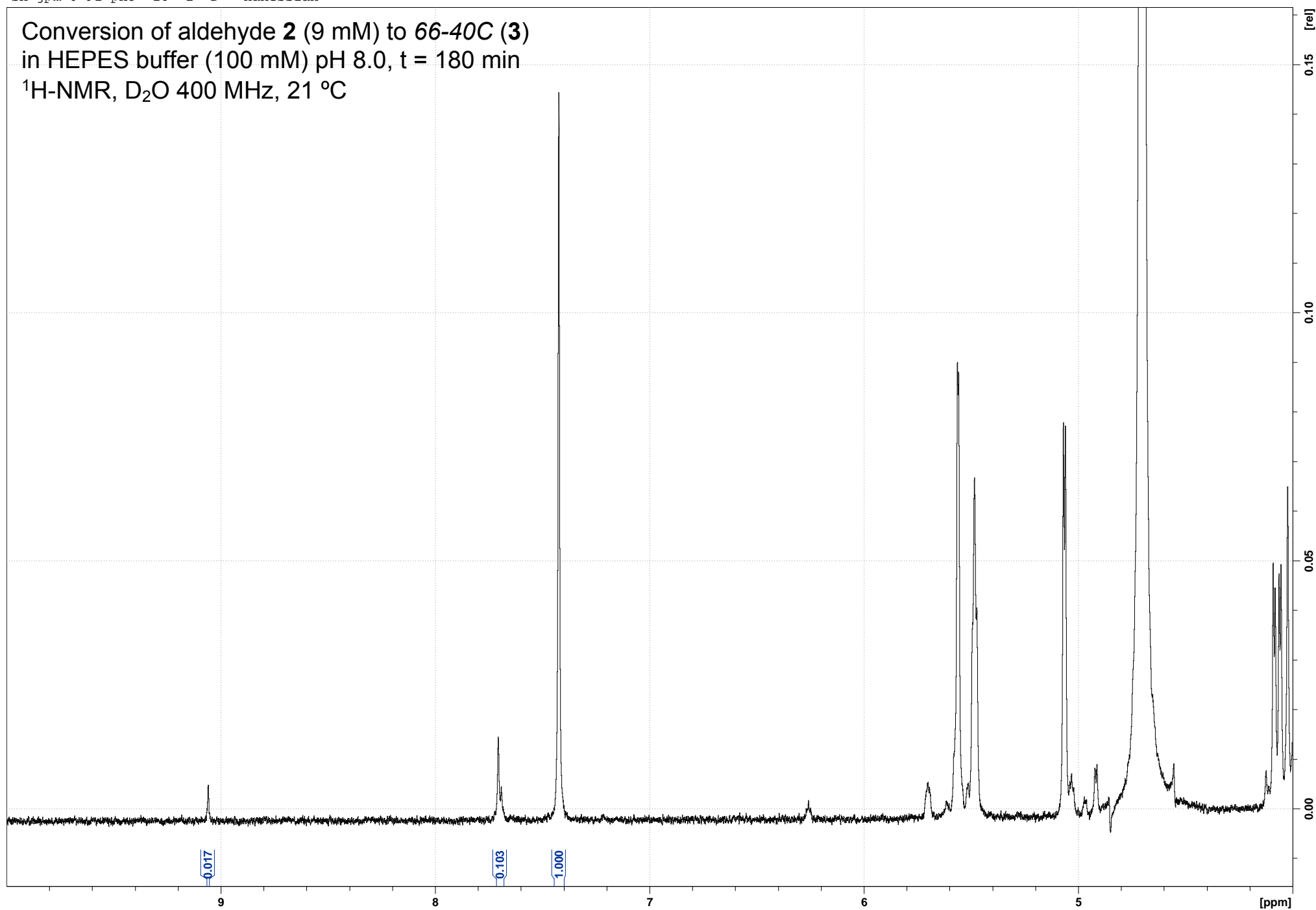
sh-jpm-6-91-ph8 19 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 170 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



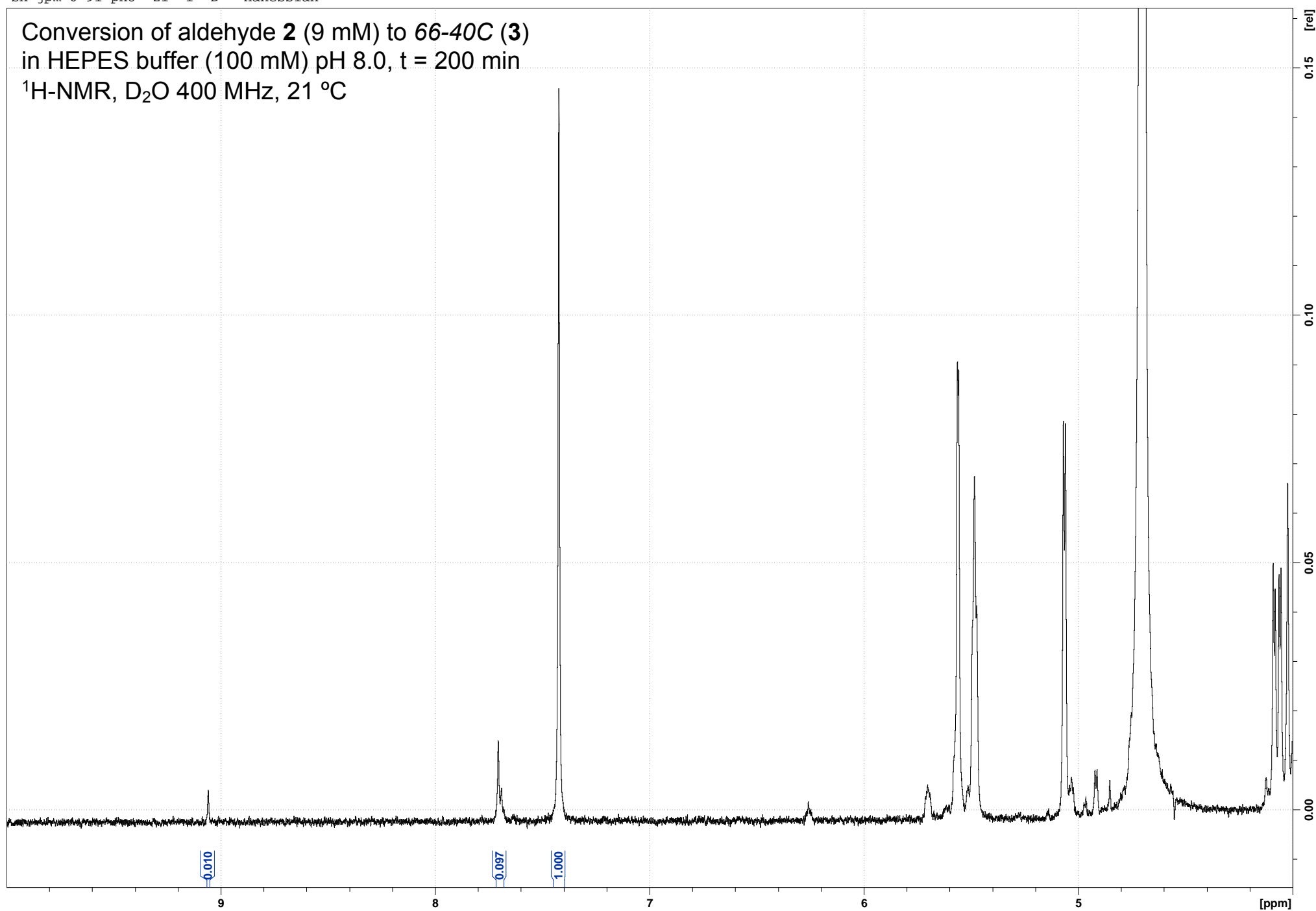
sh-jpm-6-91-ph8 20 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 180 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



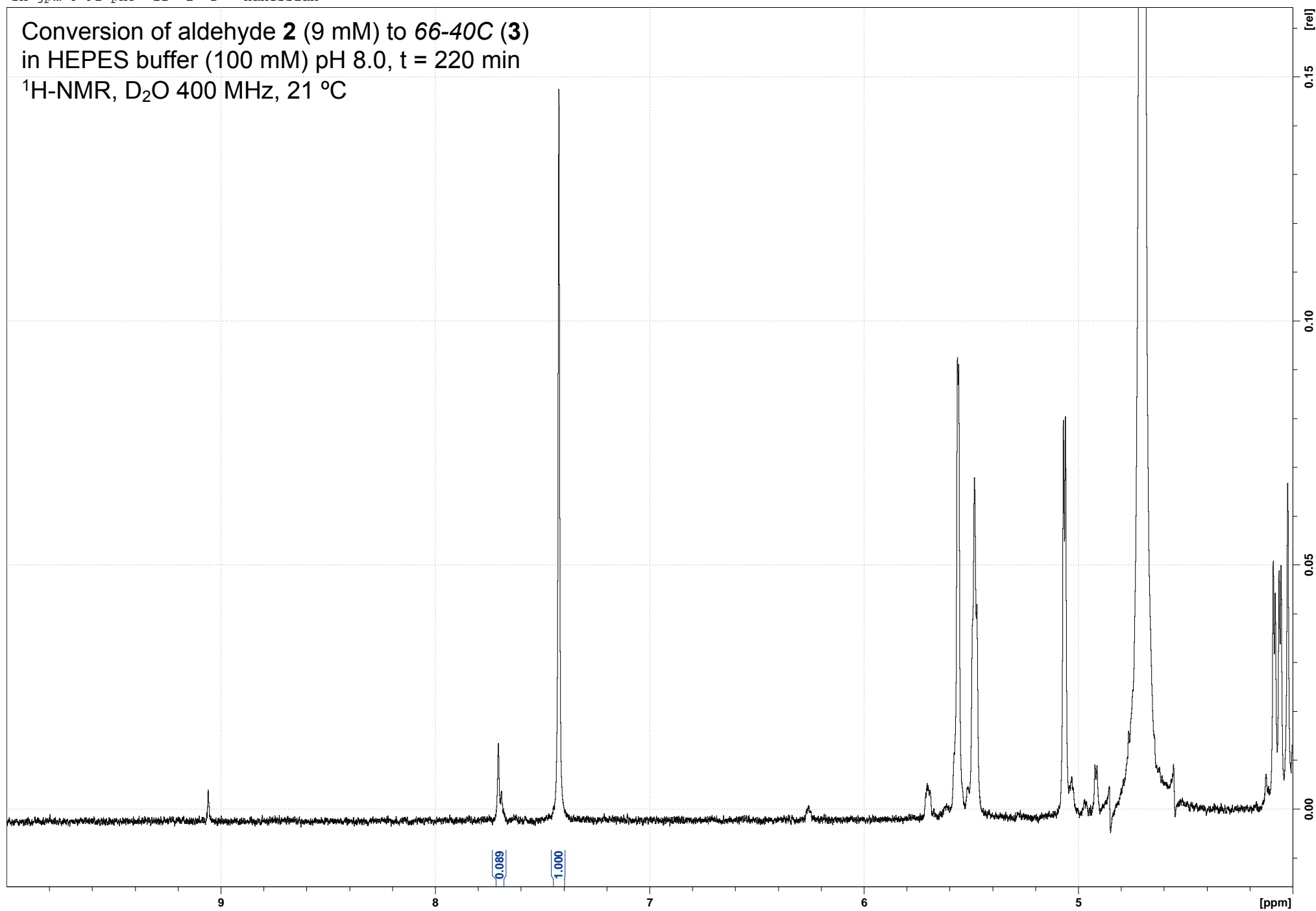
sh-jpm-6-91-ph8 21 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 200 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



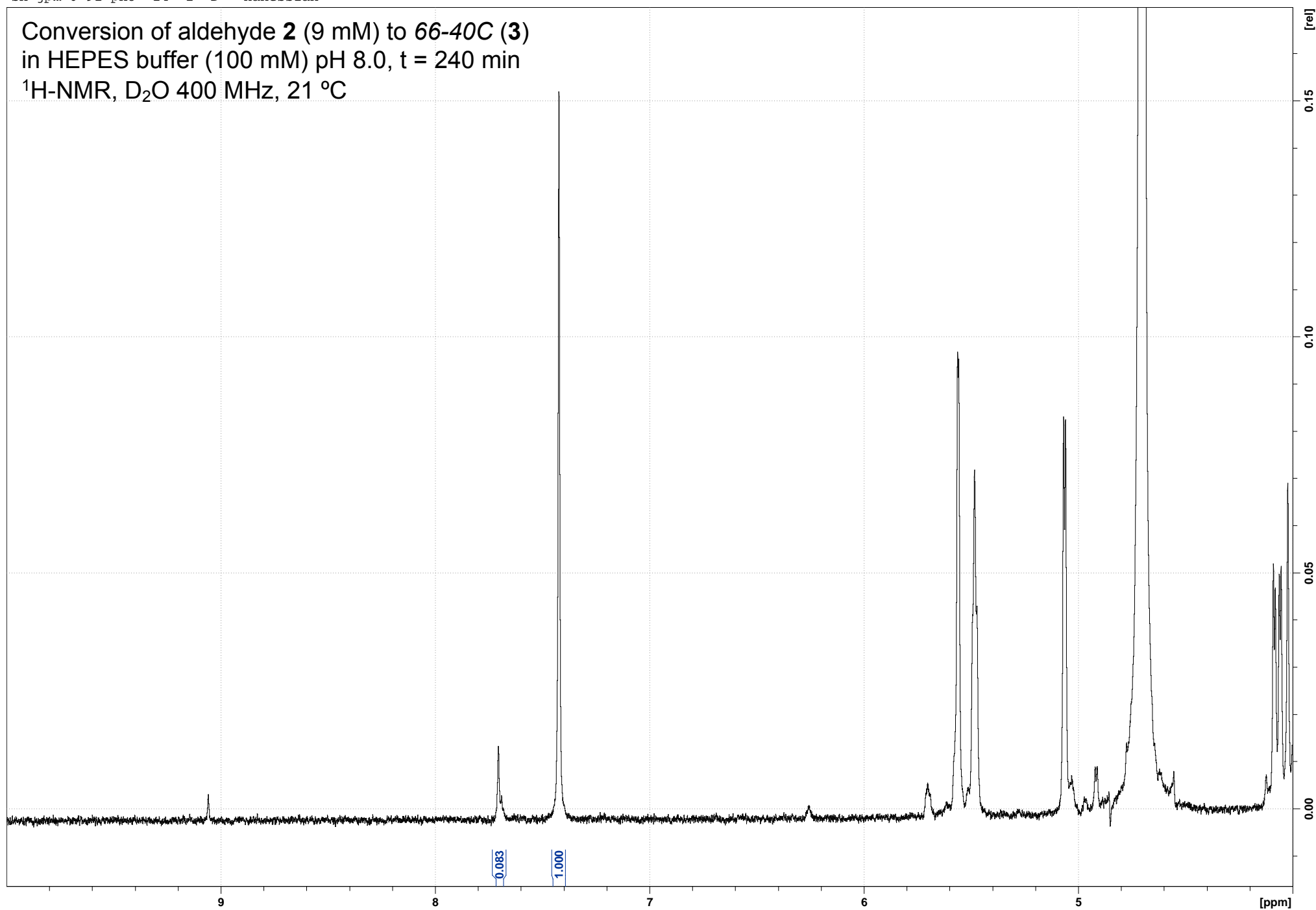
sh-jpm-6-91-ph8 22 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 220 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



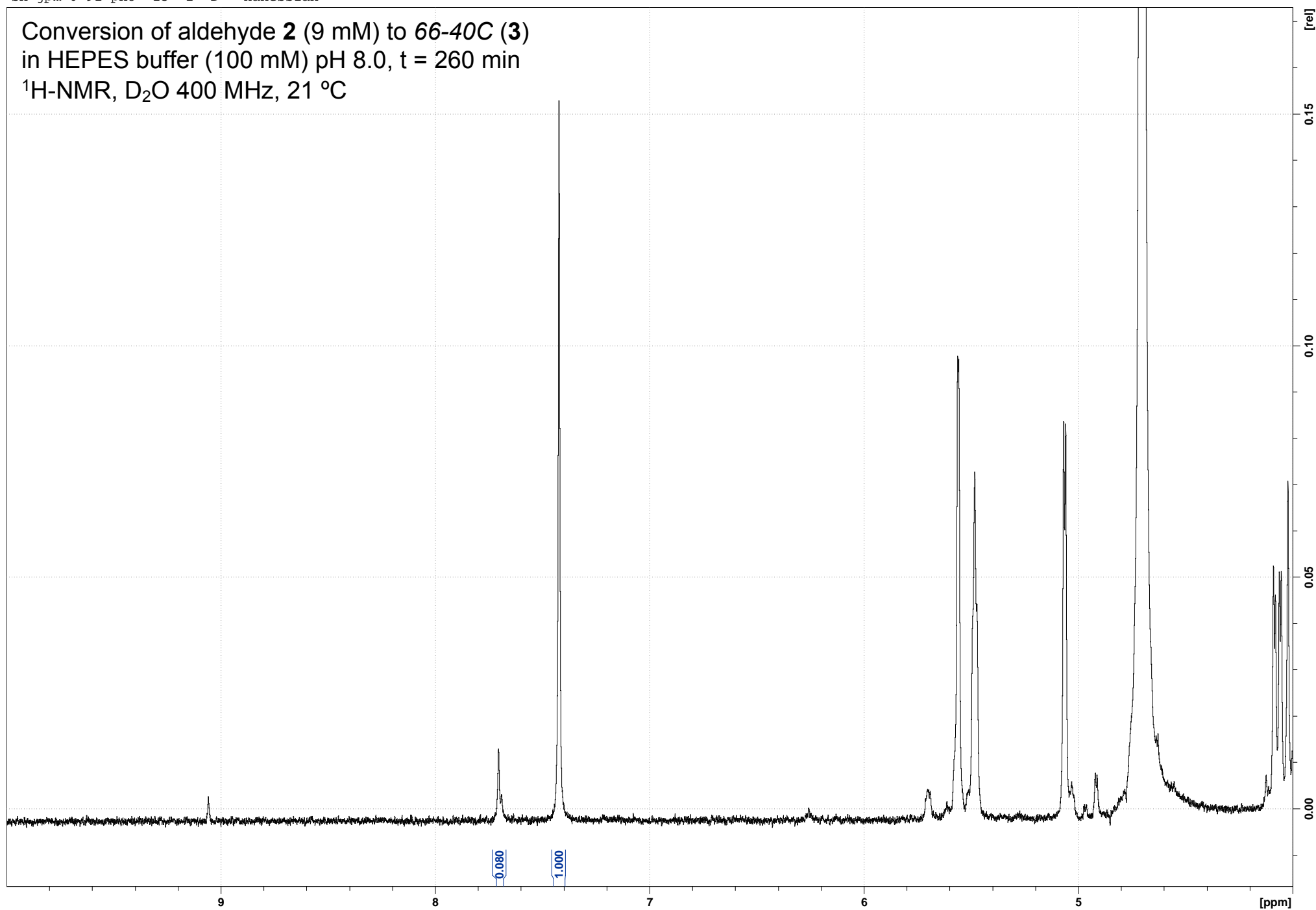
sh-jpm-6-91-ph8 24 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 240 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph8 25 1 D: Hanessian

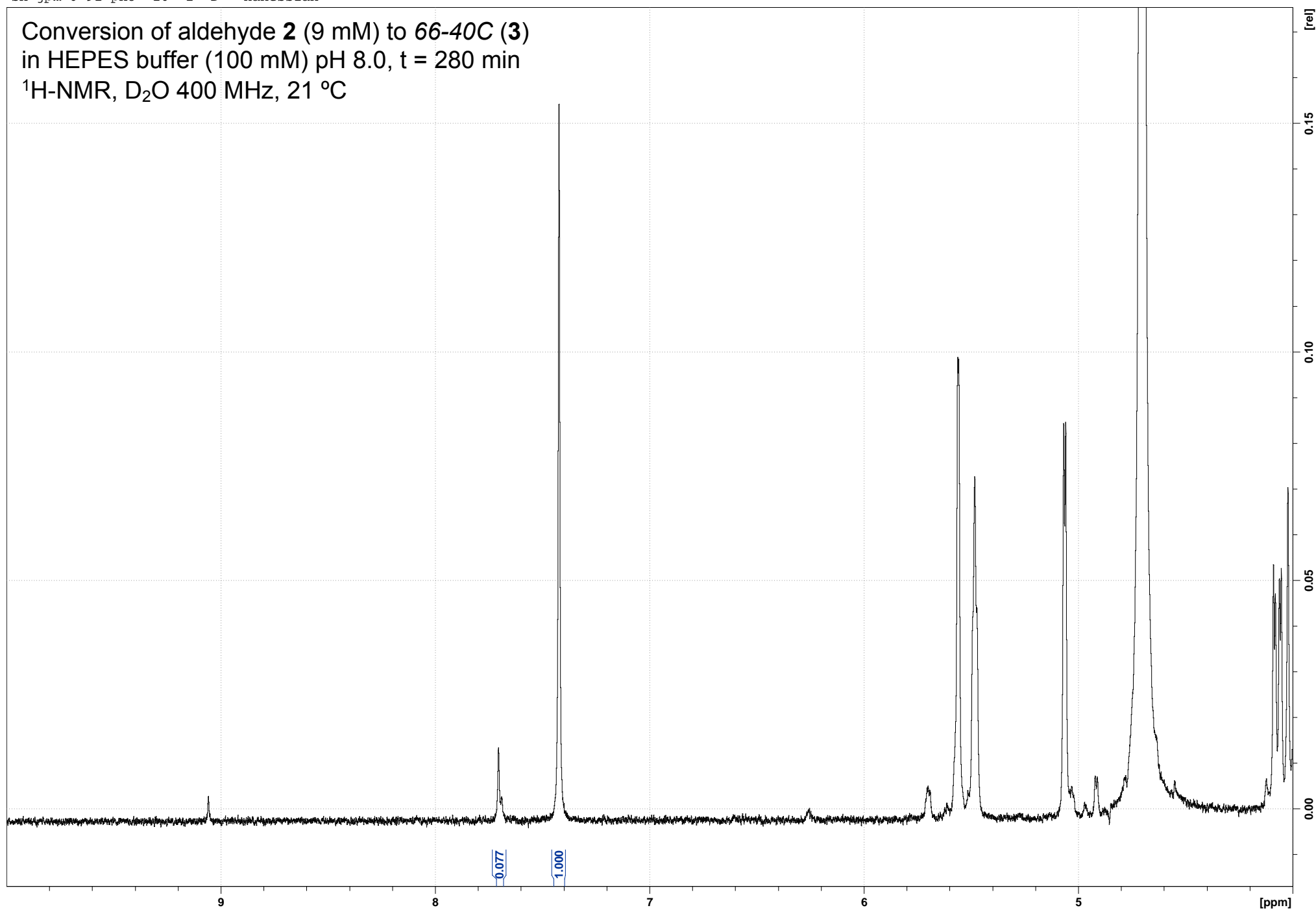
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 260 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





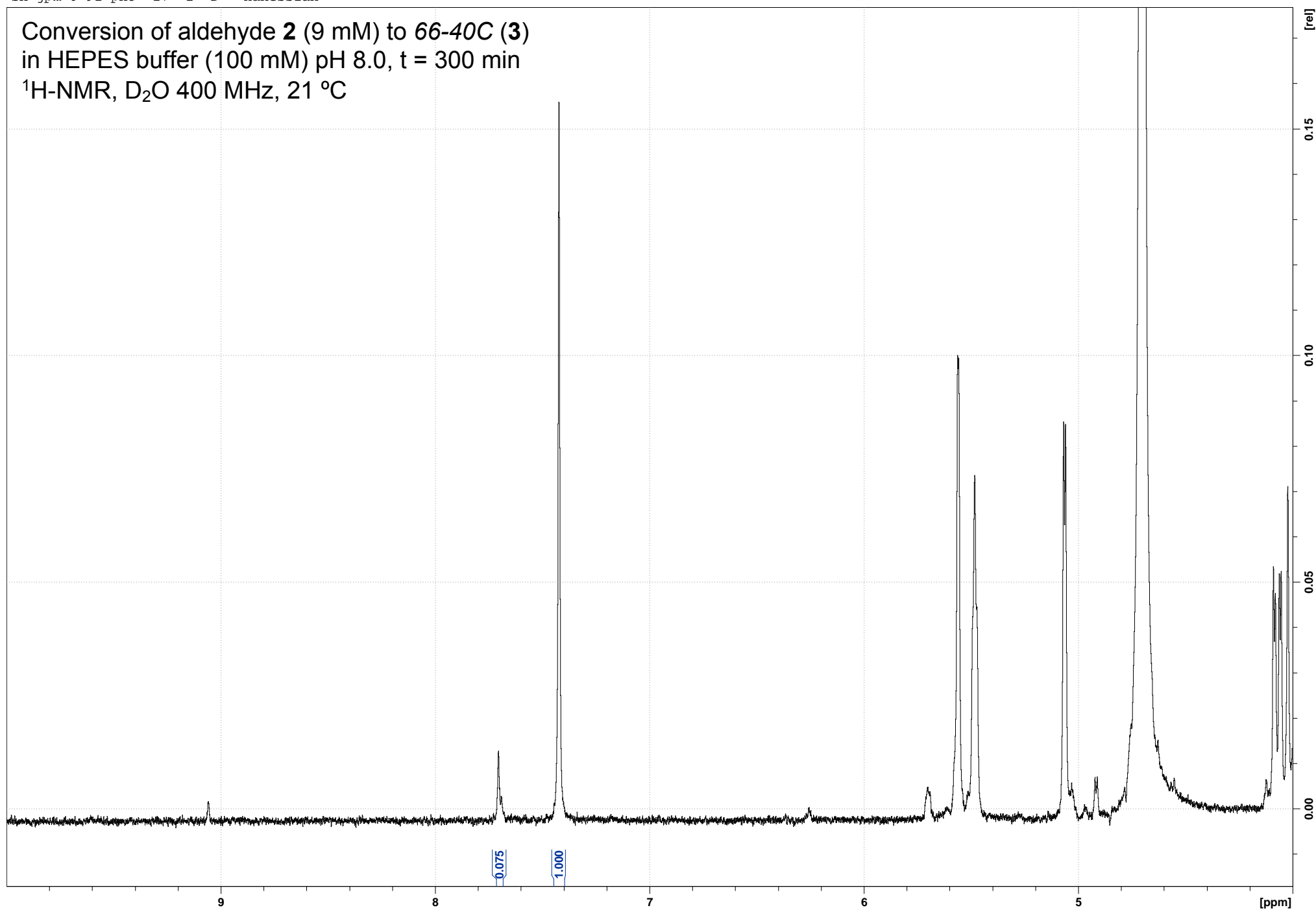
sh-jpm-6-91-ph8 26 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 280 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



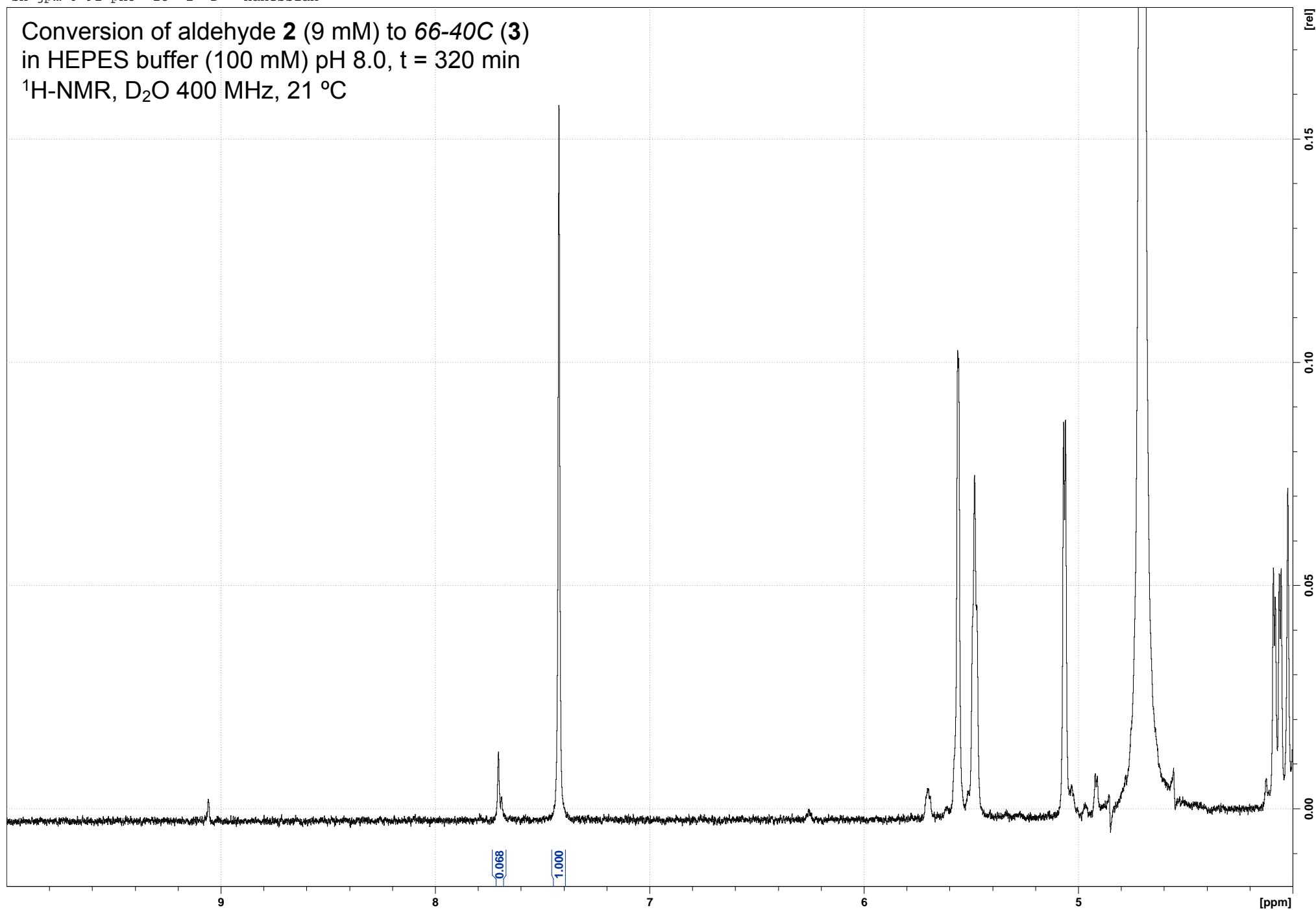
sh-jpm-6-91-ph8 27 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 300 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



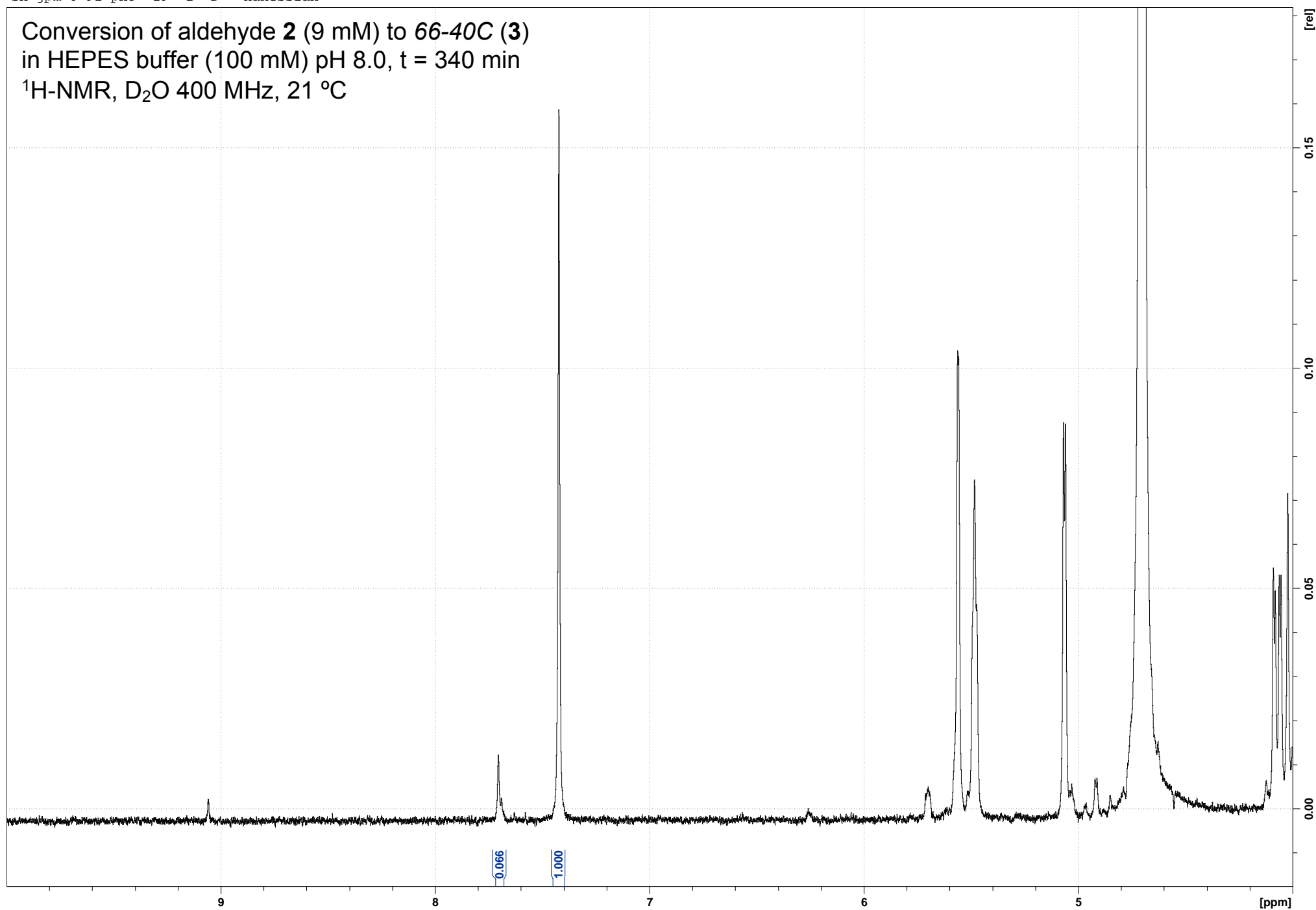
sh-jpm-6-91-ph8 28 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 320 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



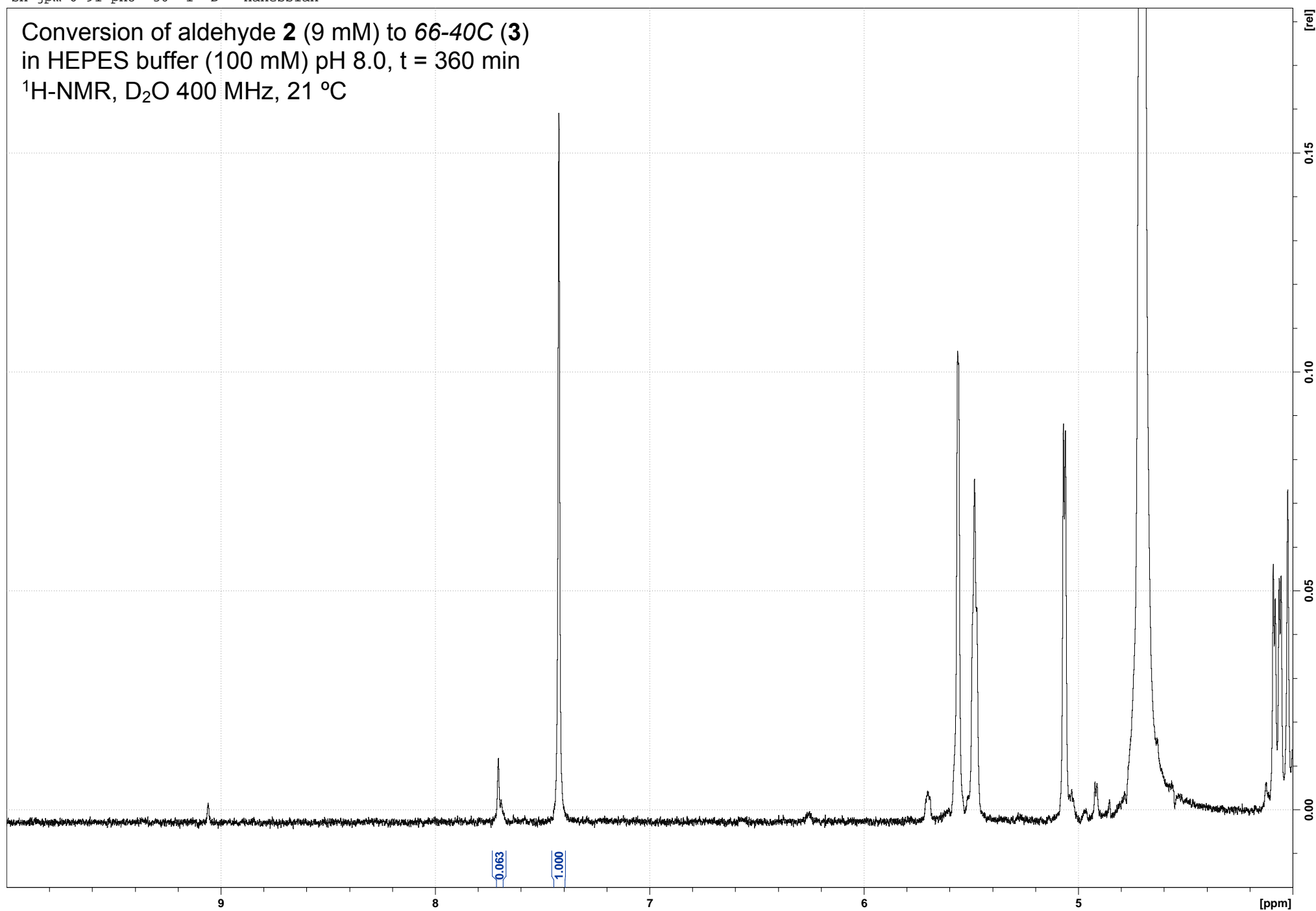
sh-jpm-6-91-ph8 29 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 340 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



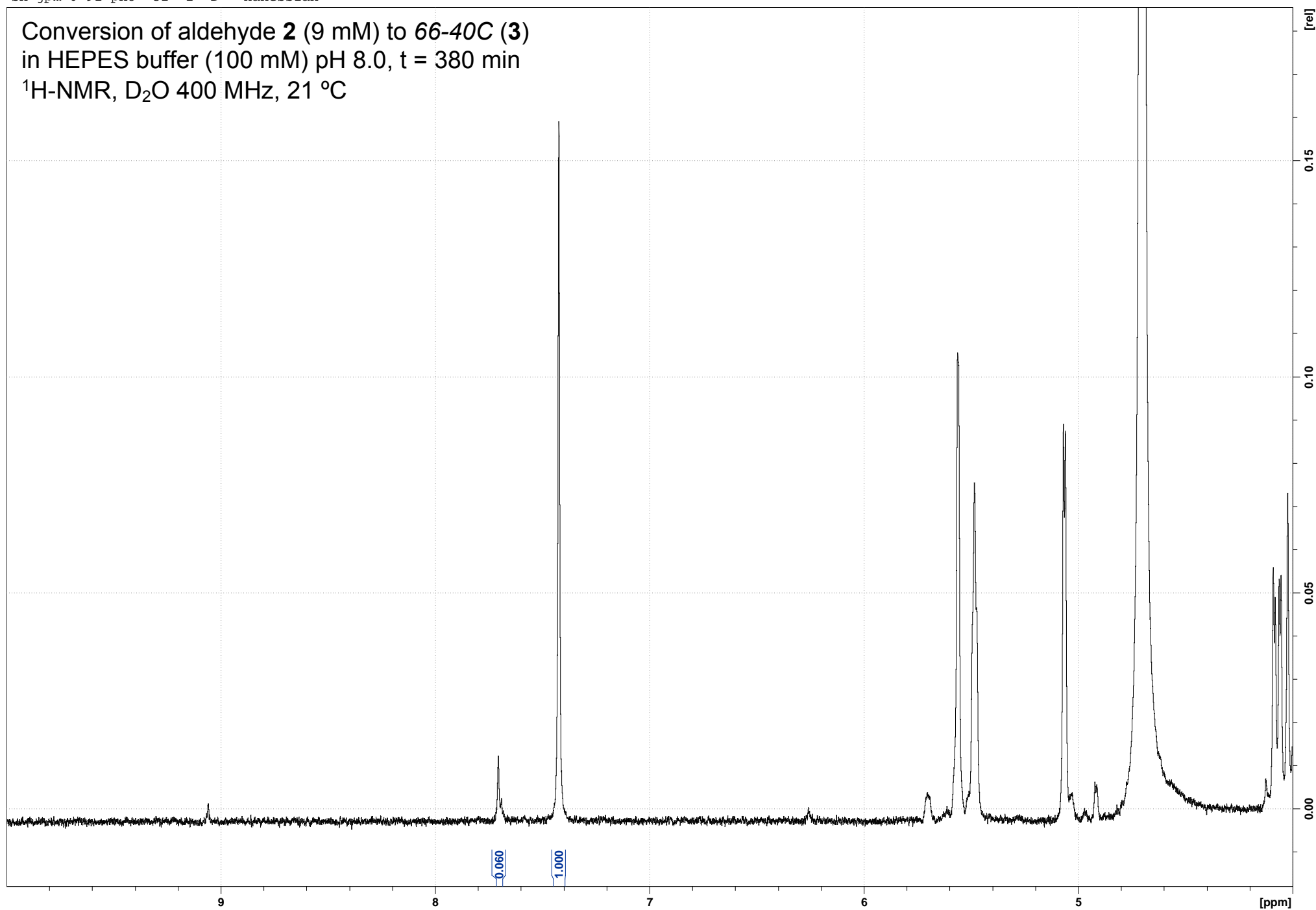
sh-jpm-6-91-ph8 30 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 360 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



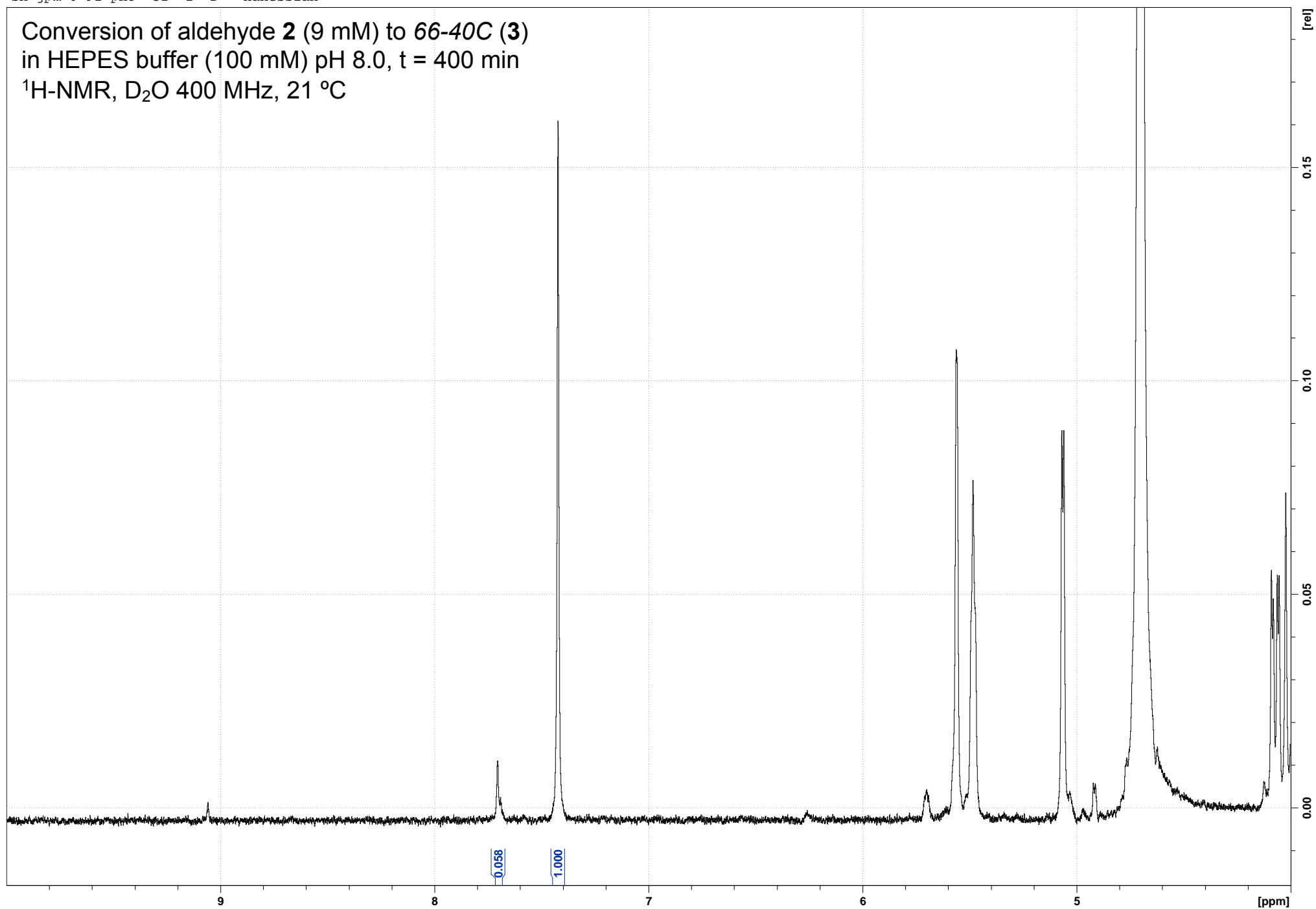
sh-jpm-6-91-ph8 31 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 380 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



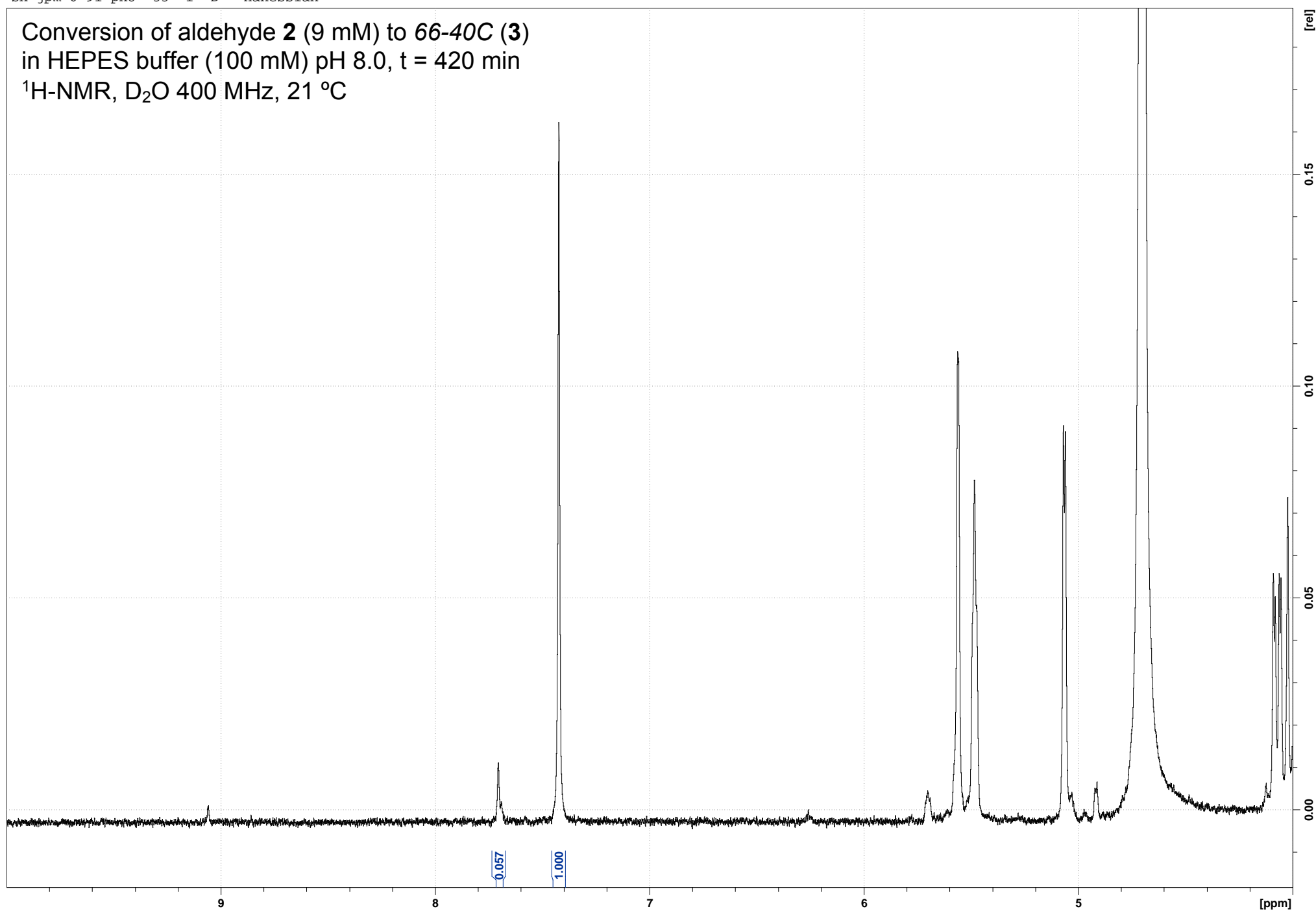
sh-jpm-6-91-ph8 32 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 400 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph8 33 1 D: Hanessian

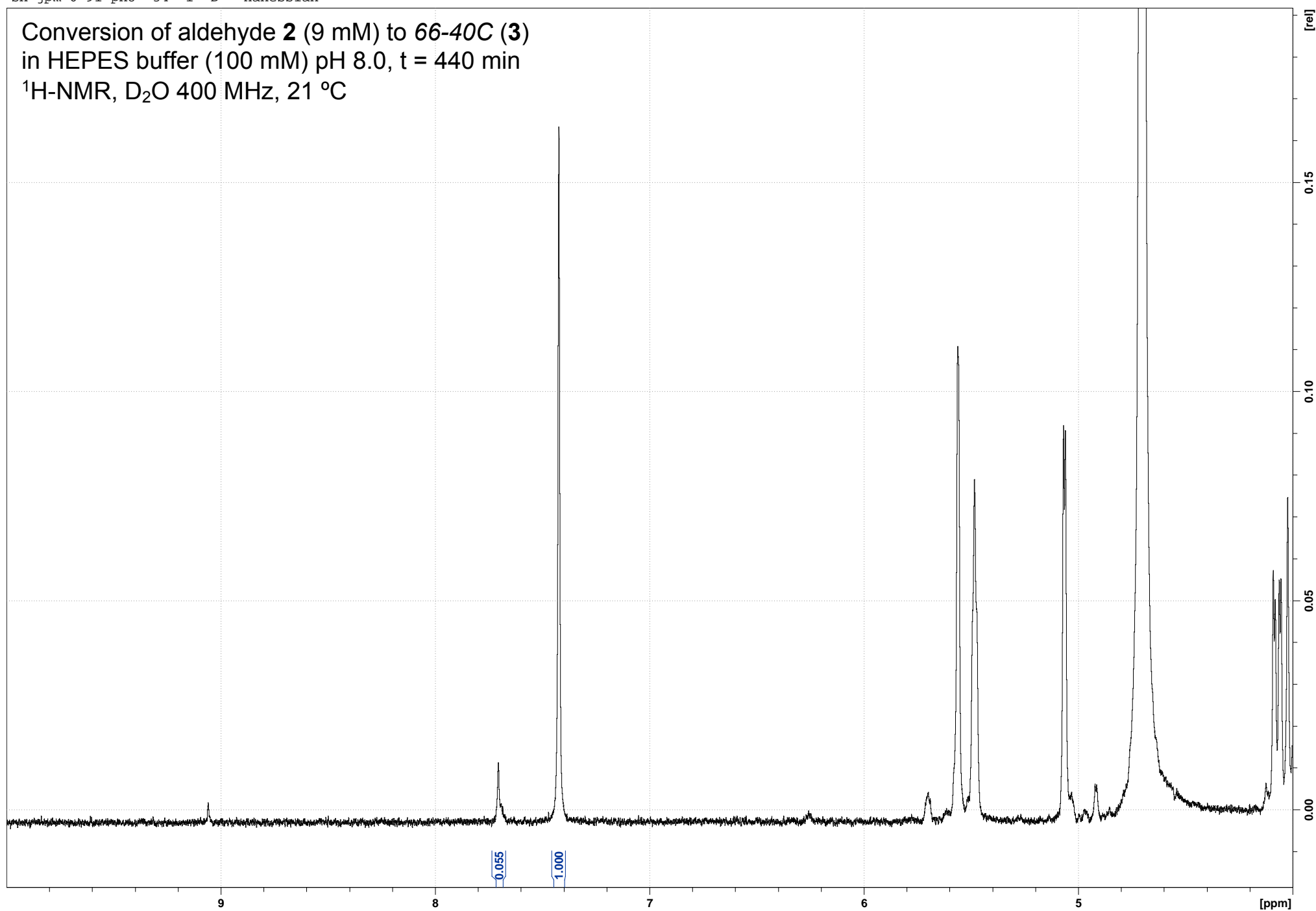
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 420 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





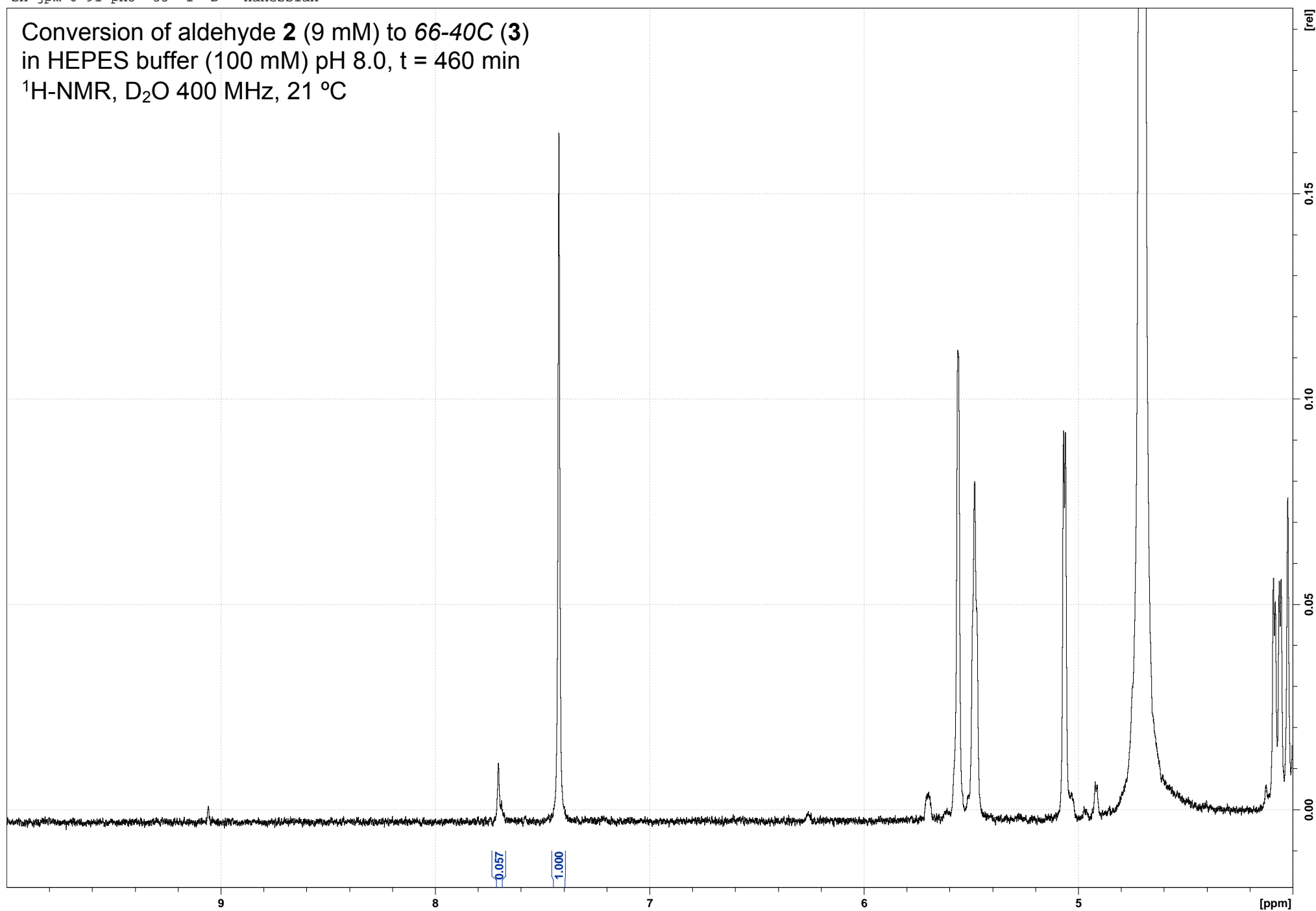
sh-jpm-6-91-ph8 34 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 440 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



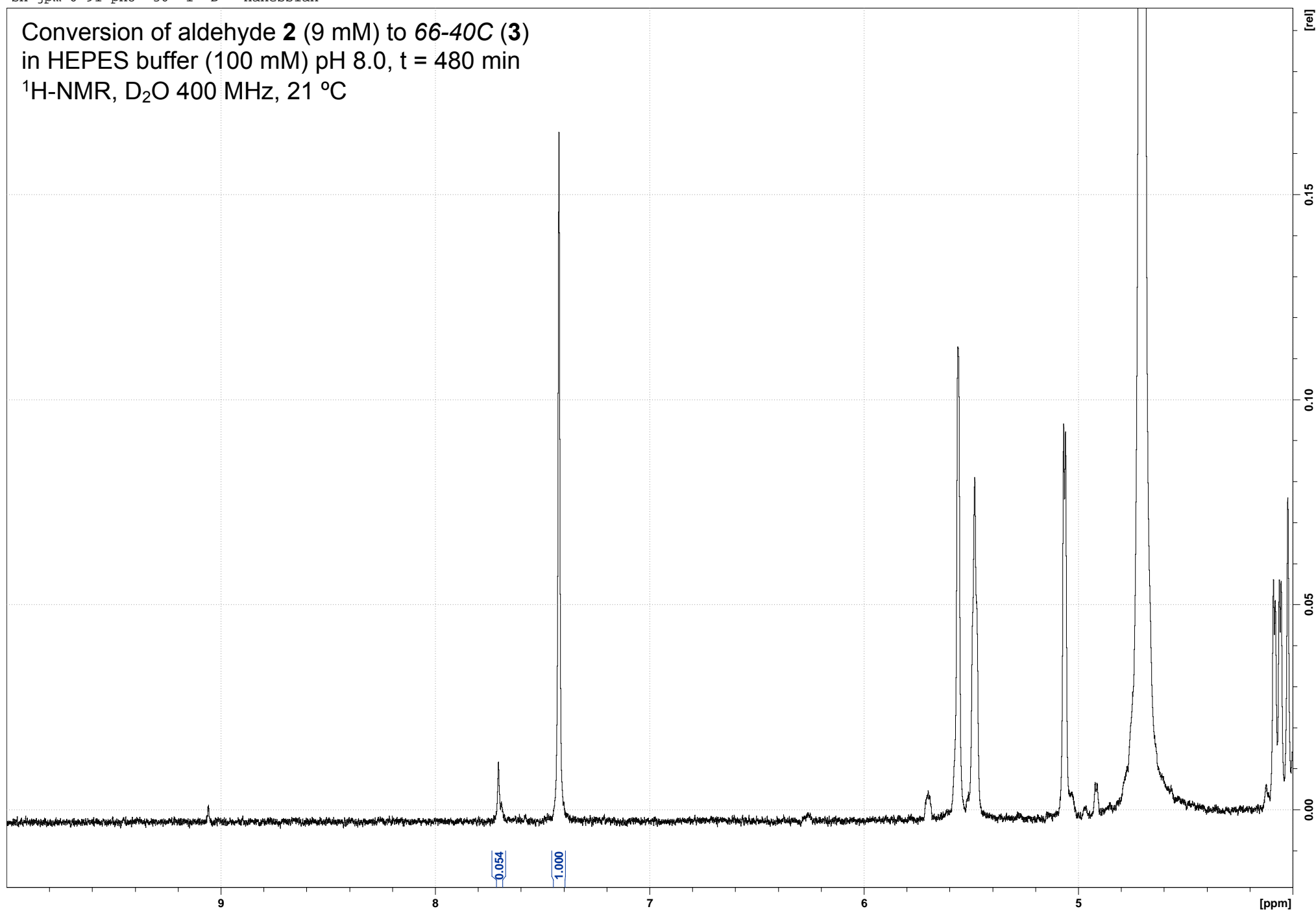
sh-jpm-6-91-ph8 35 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 460 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



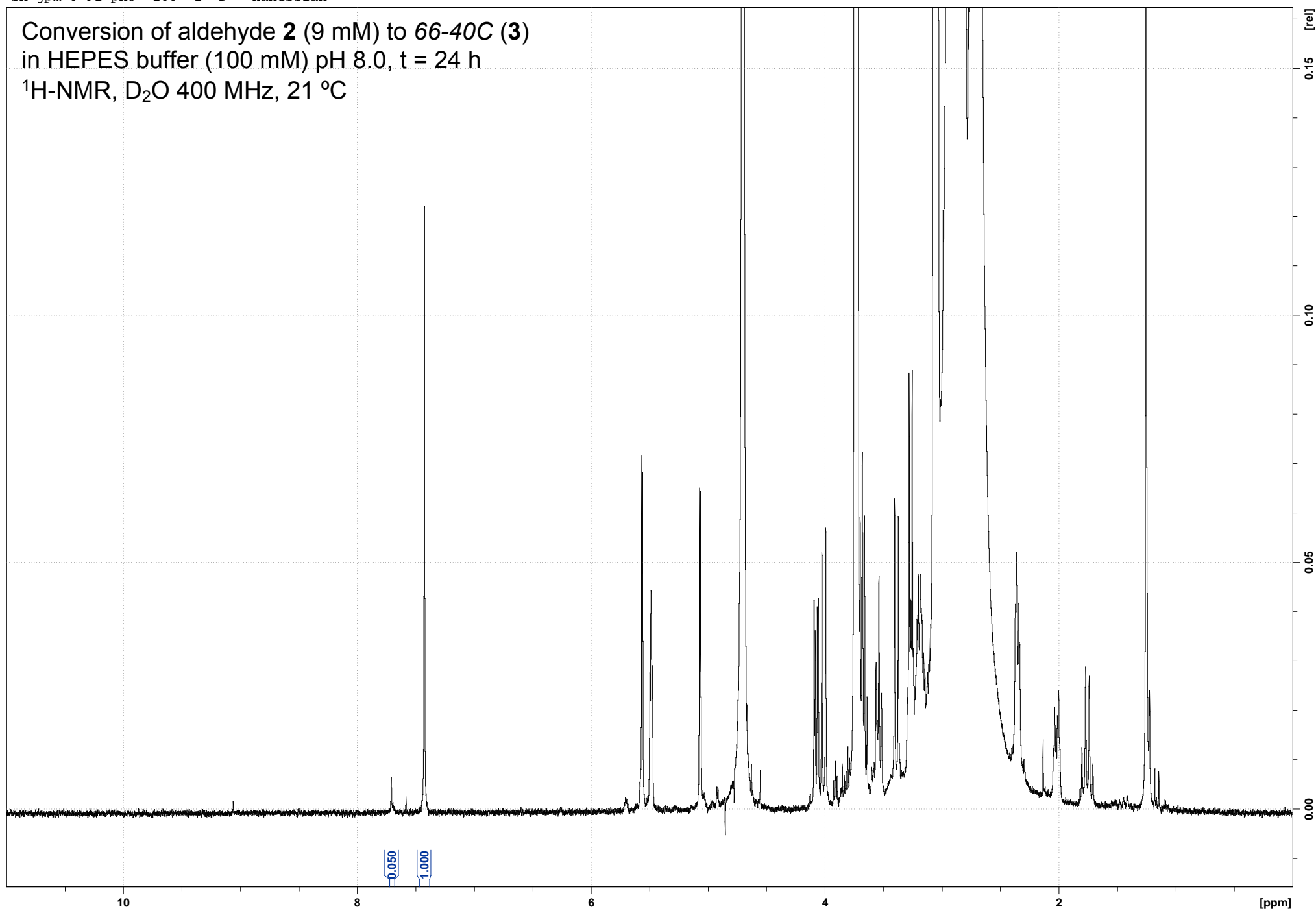
sh-jpm-6-91-ph8 36 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 480 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



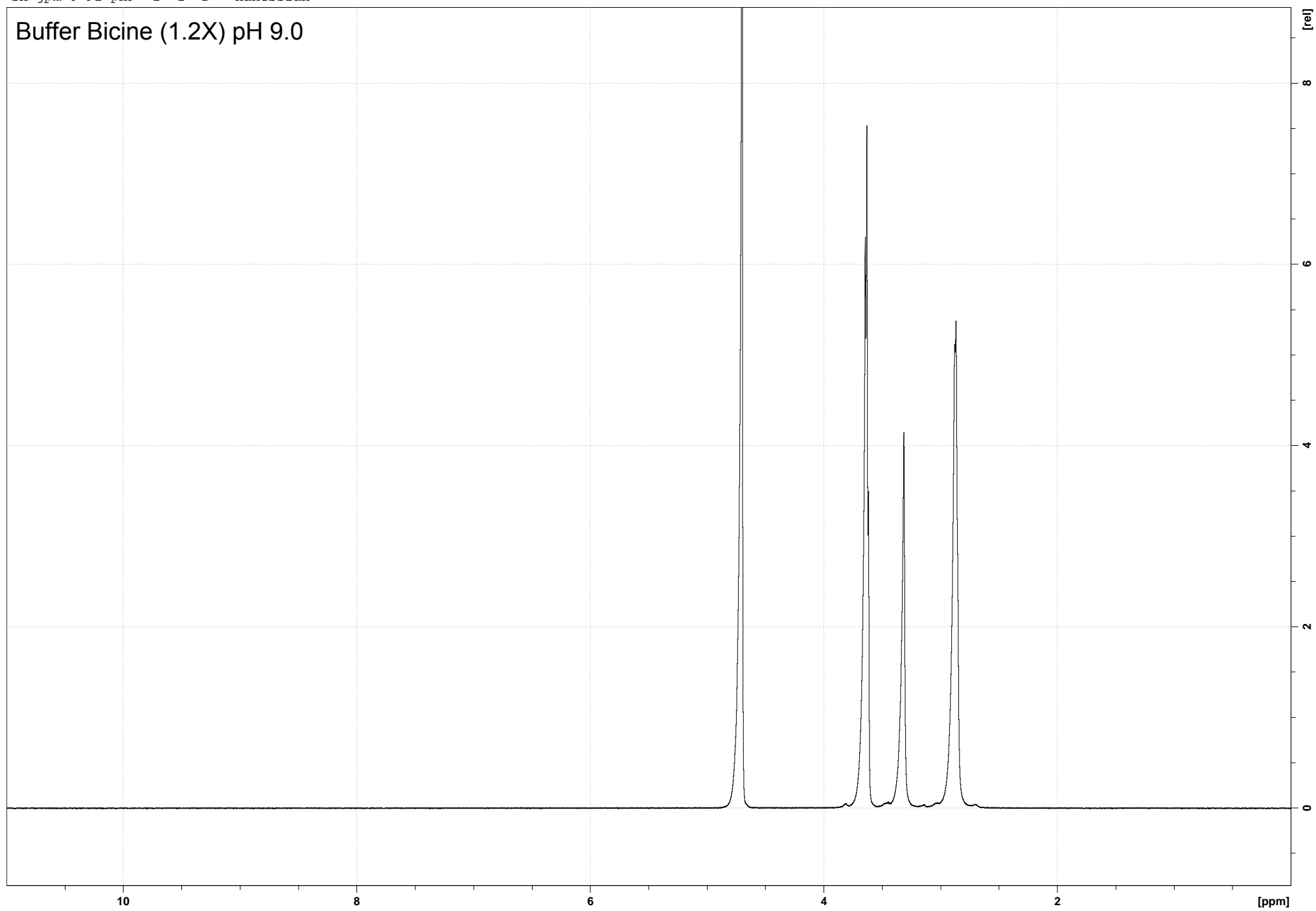
sh-jpm-6-91-ph8 100 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in HEPES buffer (100 mM) pH 8.0, t = 24 h  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



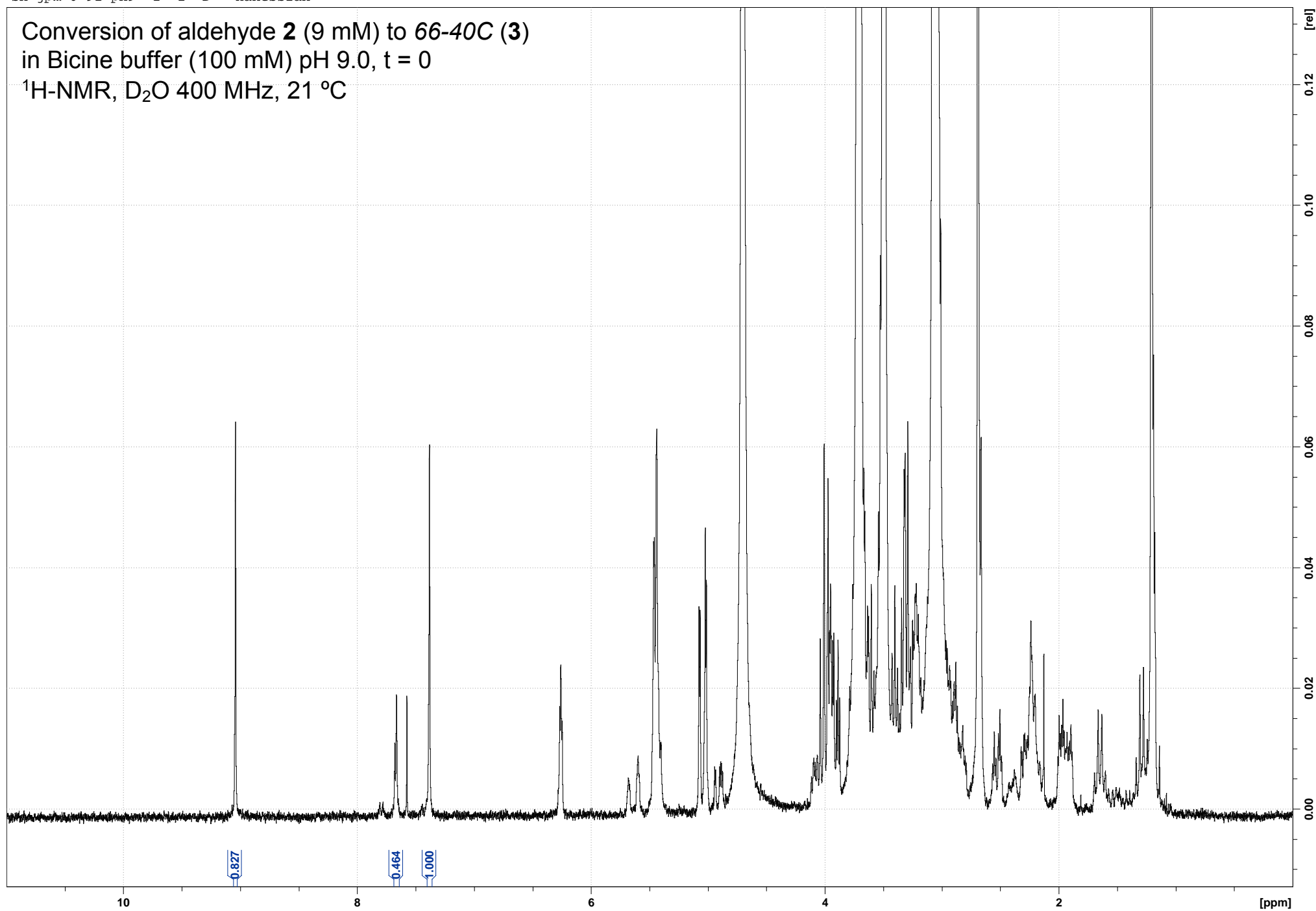
sh-jpm-6-91-ph9 1 1 D: Hanessian

Buffer Bicine (1.2X) pH 9.0



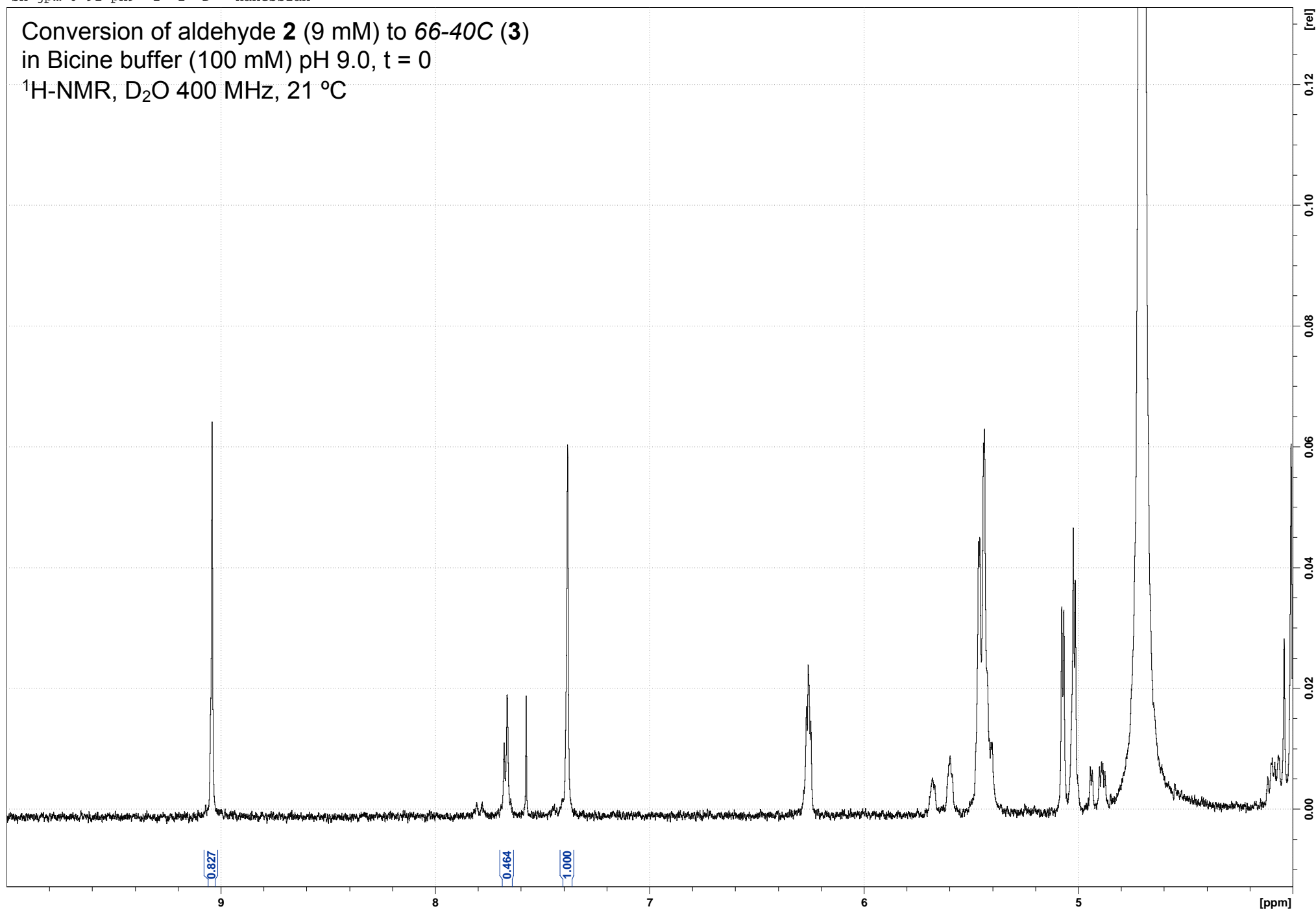
sh-jpm-6-91-ph9 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in Bicine buffer (100 mM) pH 9.0, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



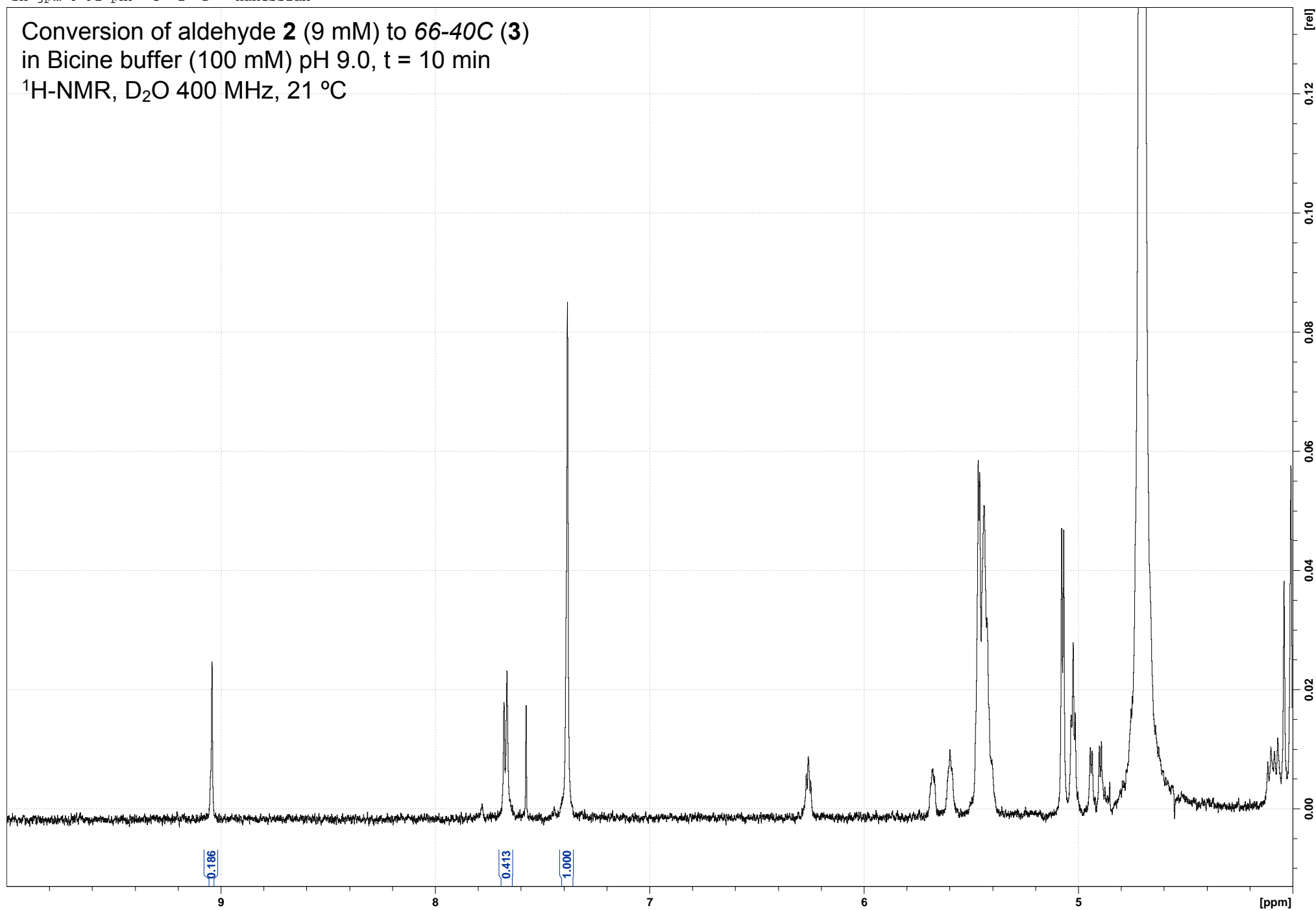
sh-jpm-6-91-ph9 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in Bicine buffer (100 mM) pH 9.0, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph9 3 1 D: Hanessian

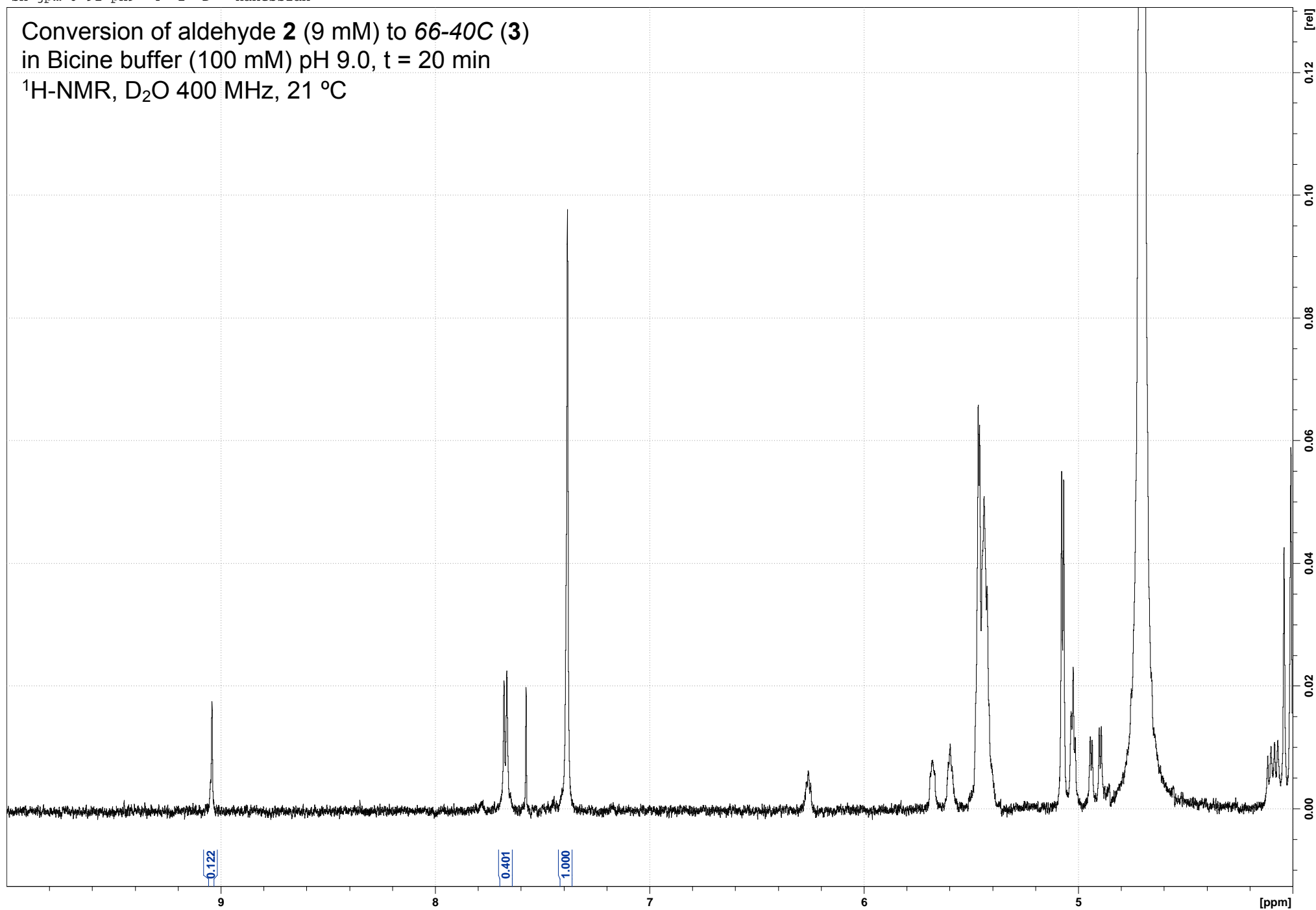
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in Bicine buffer (100 mM) pH 9.0, t = 10 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





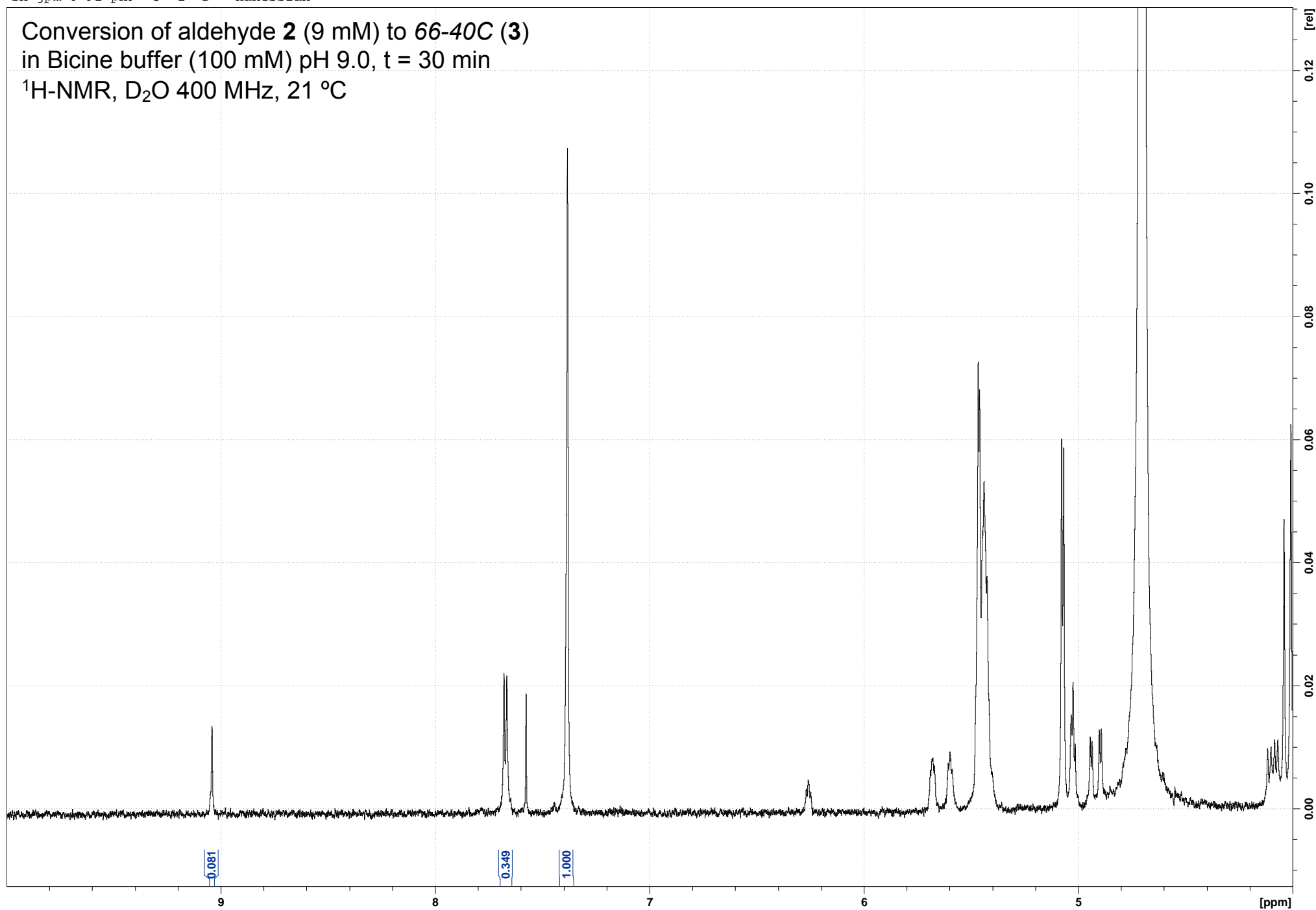
sh-jpm-6-91-ph9 4 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in Bicine buffer (100 mM) pH 9.0, t = 20 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



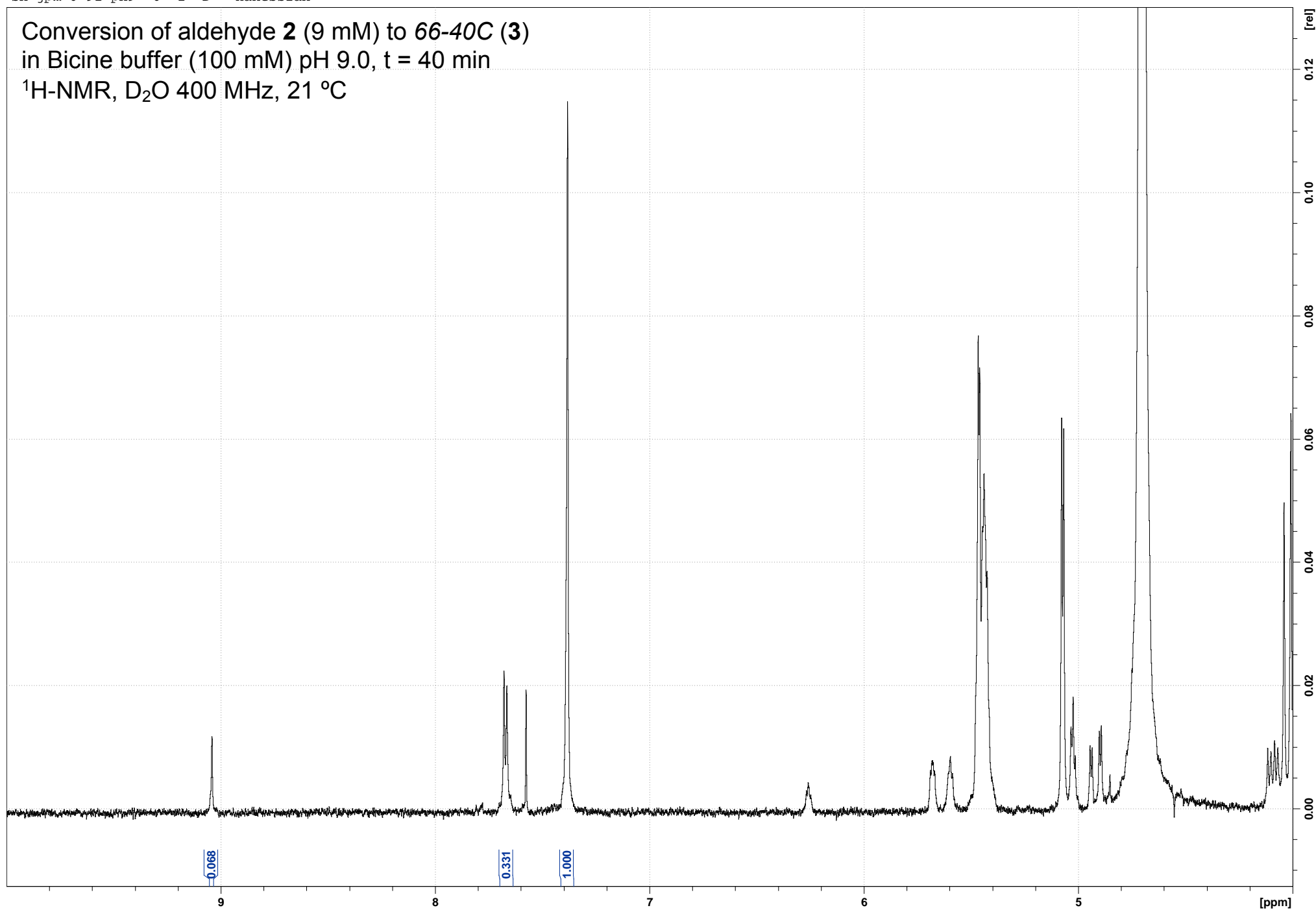
sh-jpm-6-91-ph9 5 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in Bicine buffer (100 mM) pH 9.0, t = 30 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



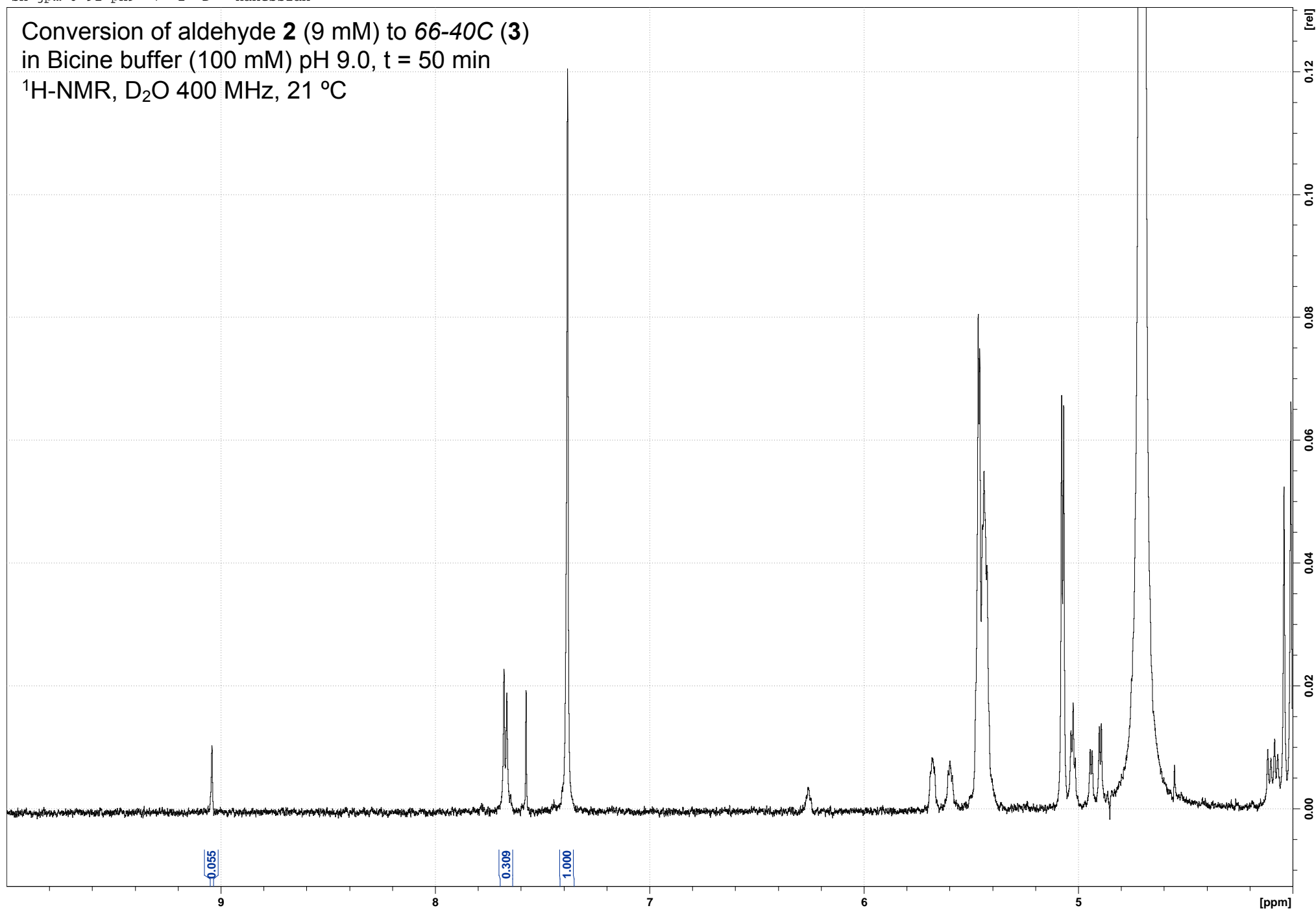
sh-jpm-6-91-ph9 6 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in Bicine buffer (100 mM) pH 9.0, t = 40 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



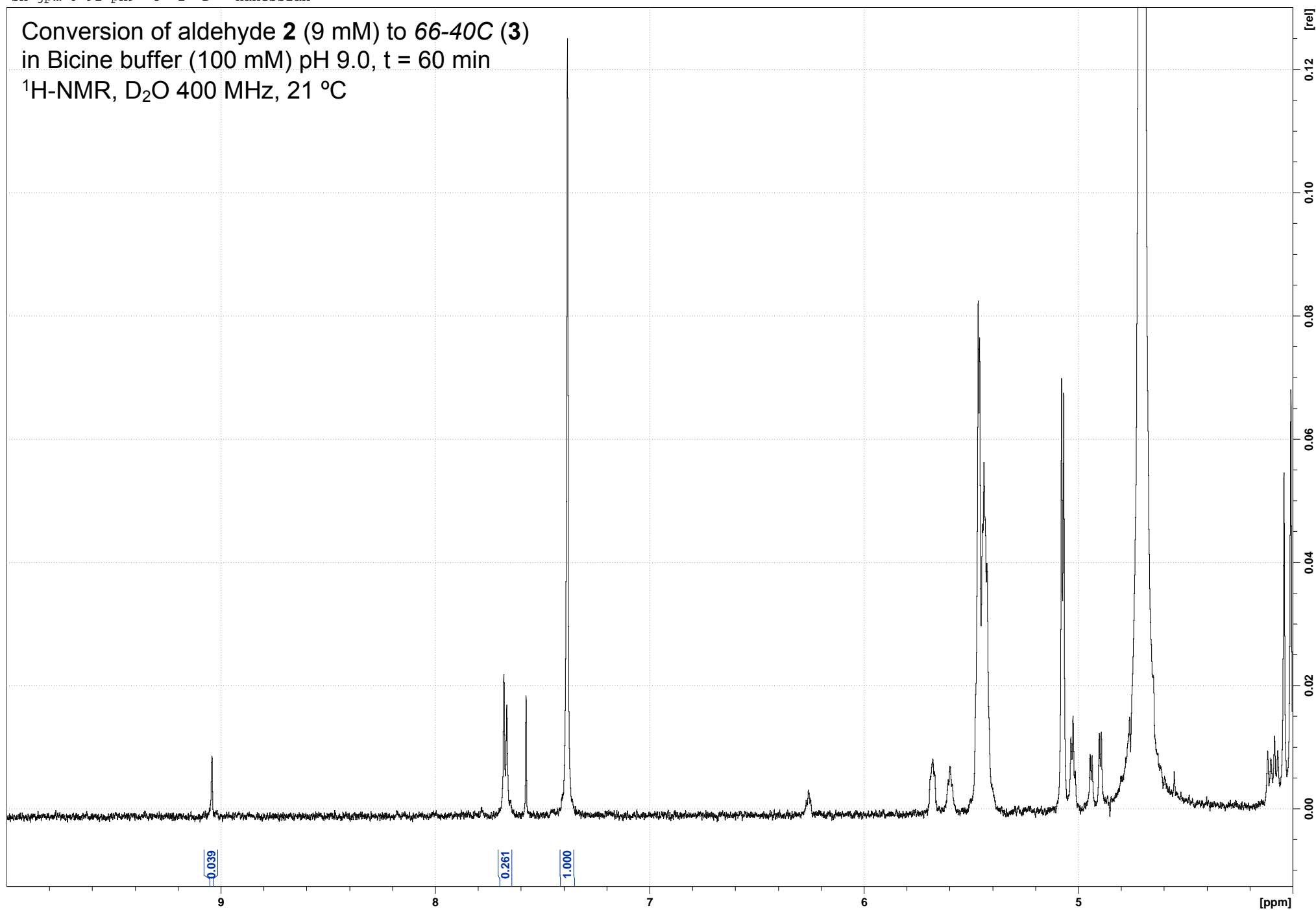
sh-jpm-6-91-ph9 7 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in Bicine buffer (100 mM) pH 9.0, t = 50 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



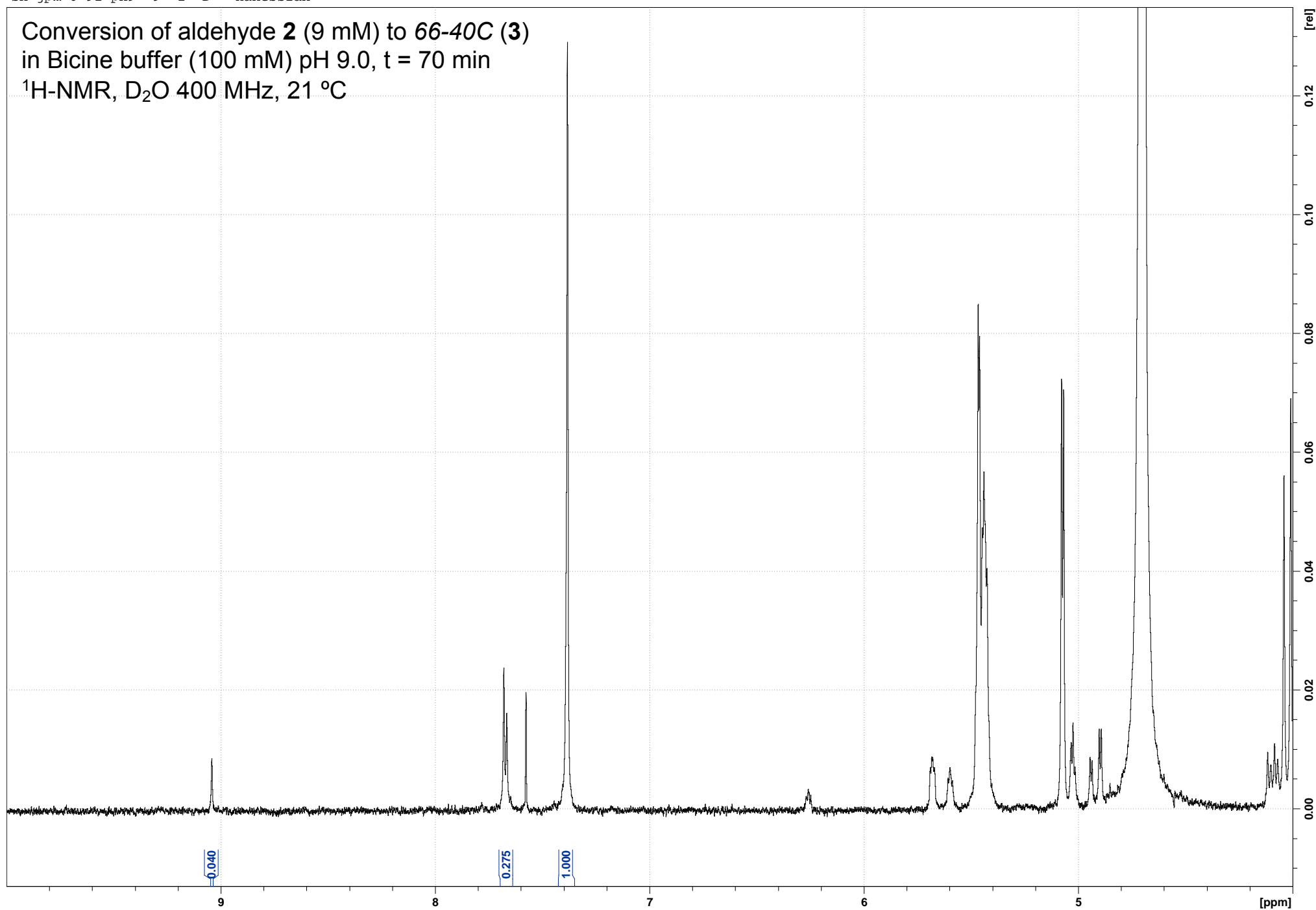
sh-jpm-6-91-ph9 8 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in Bicine buffer (100 mM) pH 9.0, t = 60 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



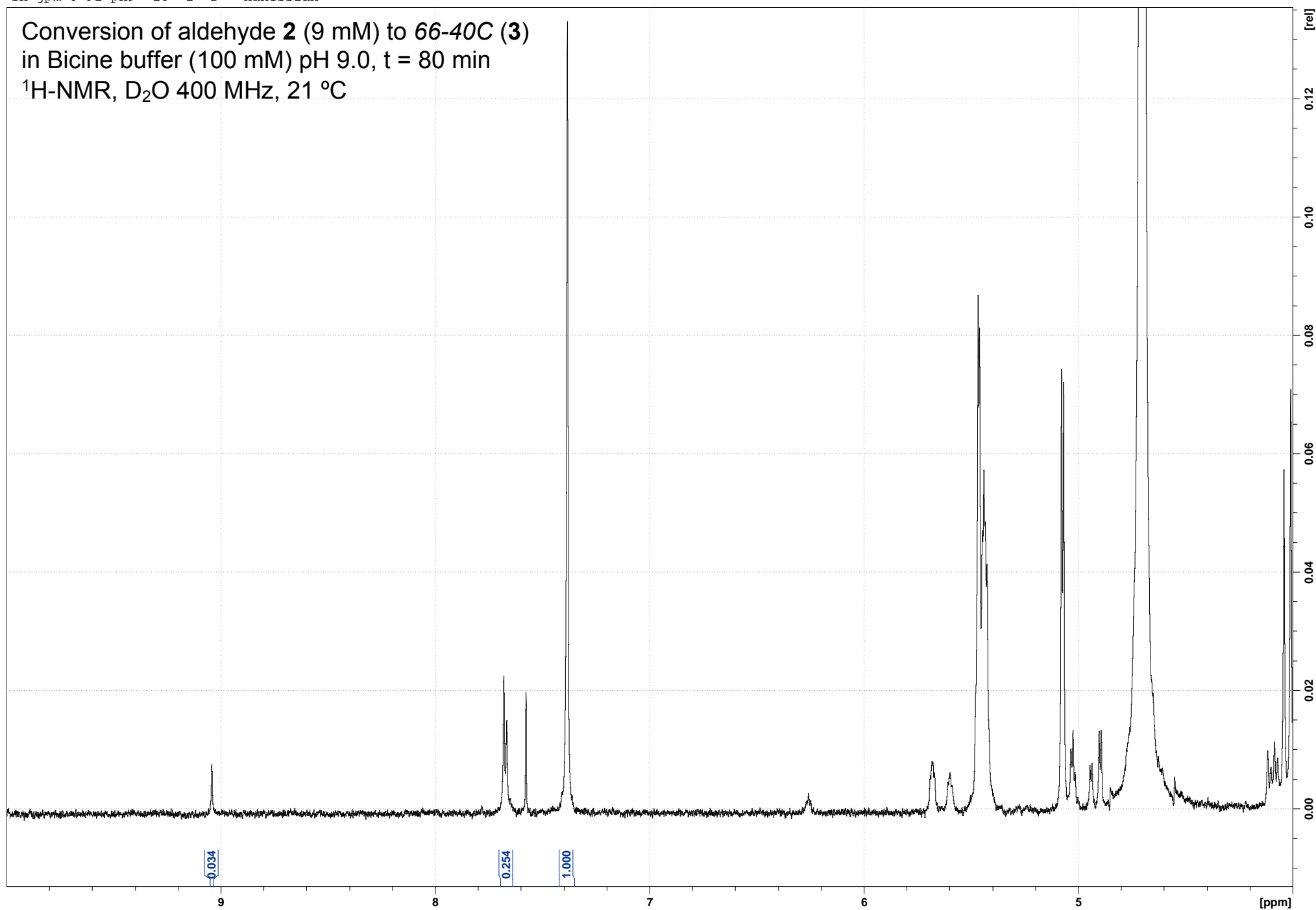
sh-jpm-6-91-ph9 9 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in Bicine buffer (100 mM) pH 9.0, t = 70 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



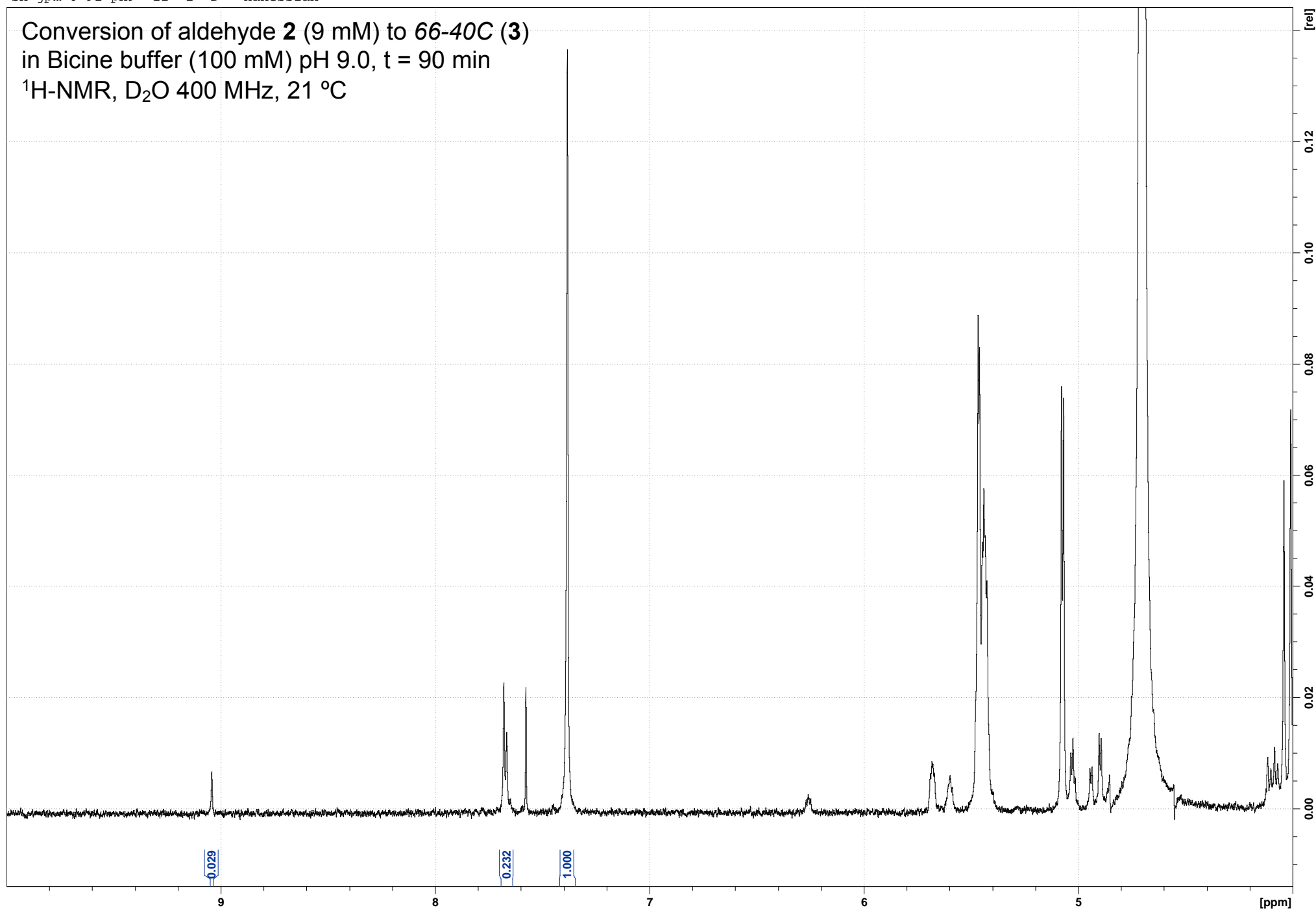
sh-jpm-6-91-ph9 10 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in Bicine buffer (100 mM) pH 9.0, t = 80 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph9 11 1 D: Hanessian

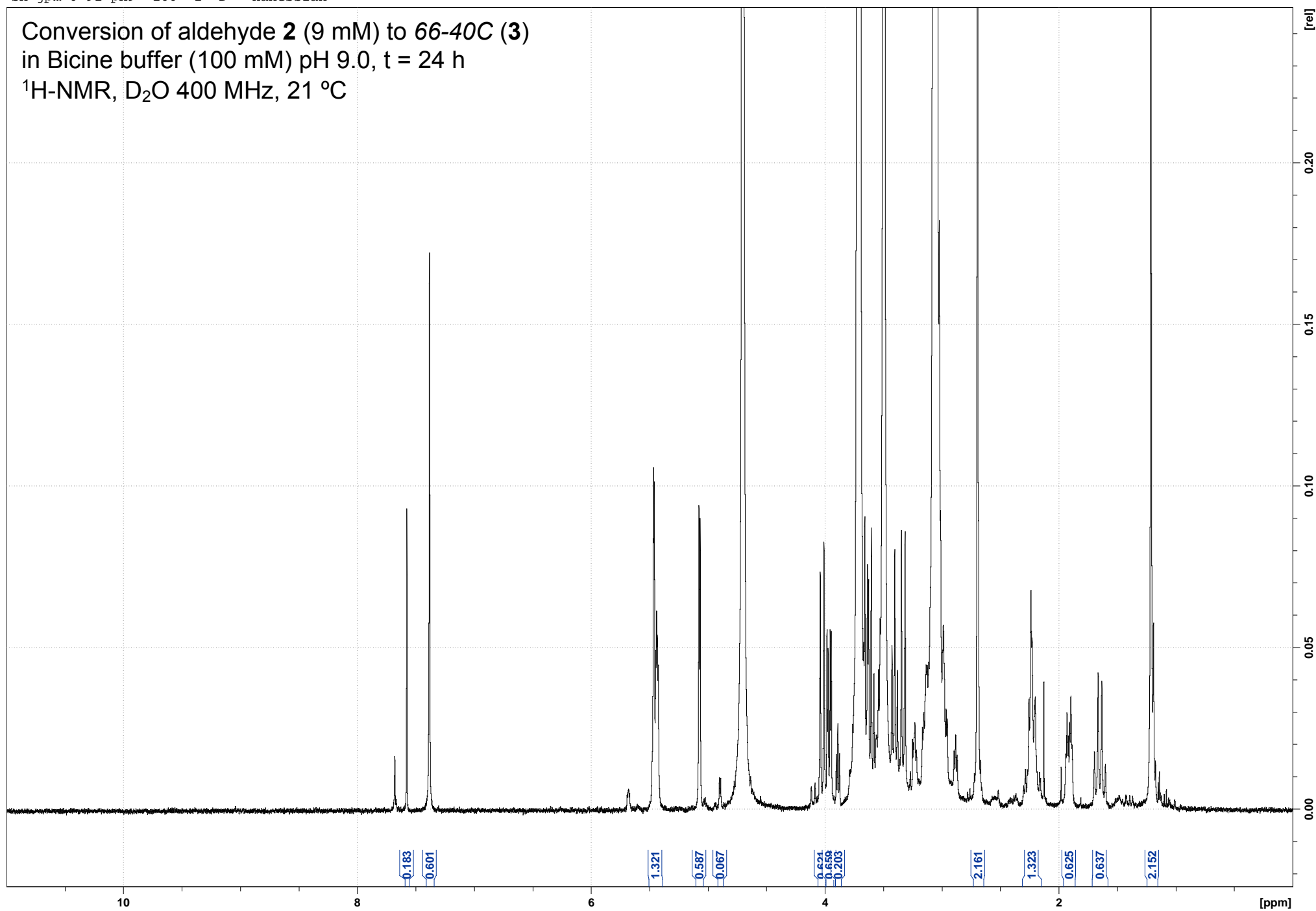
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in Bicine buffer (100 mM) pH 9.0, t = 90 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





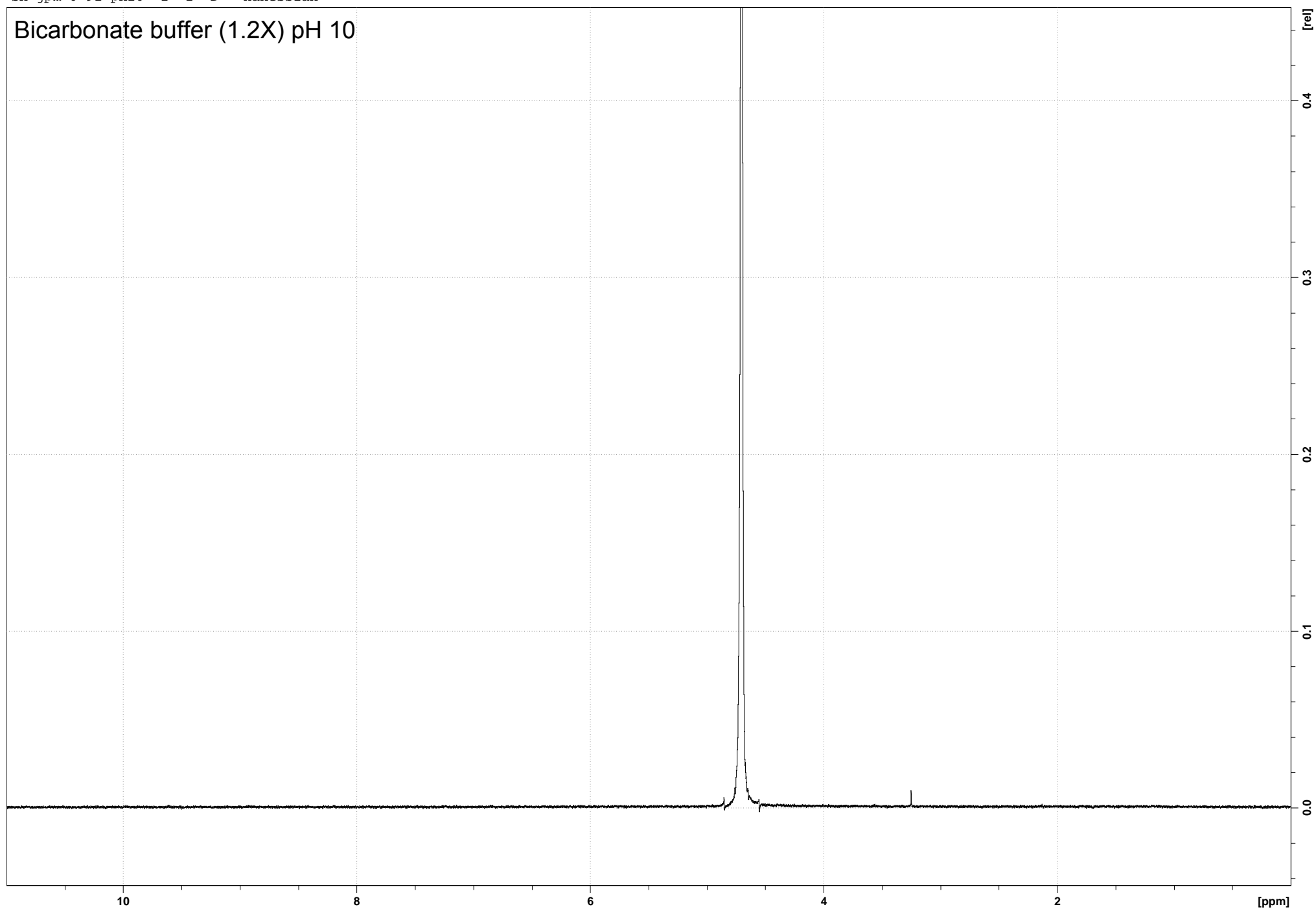
sh-jpm-6-91-ph9 100 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in Bicine buffer (100 mM) pH 9.0, t = 24 h  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



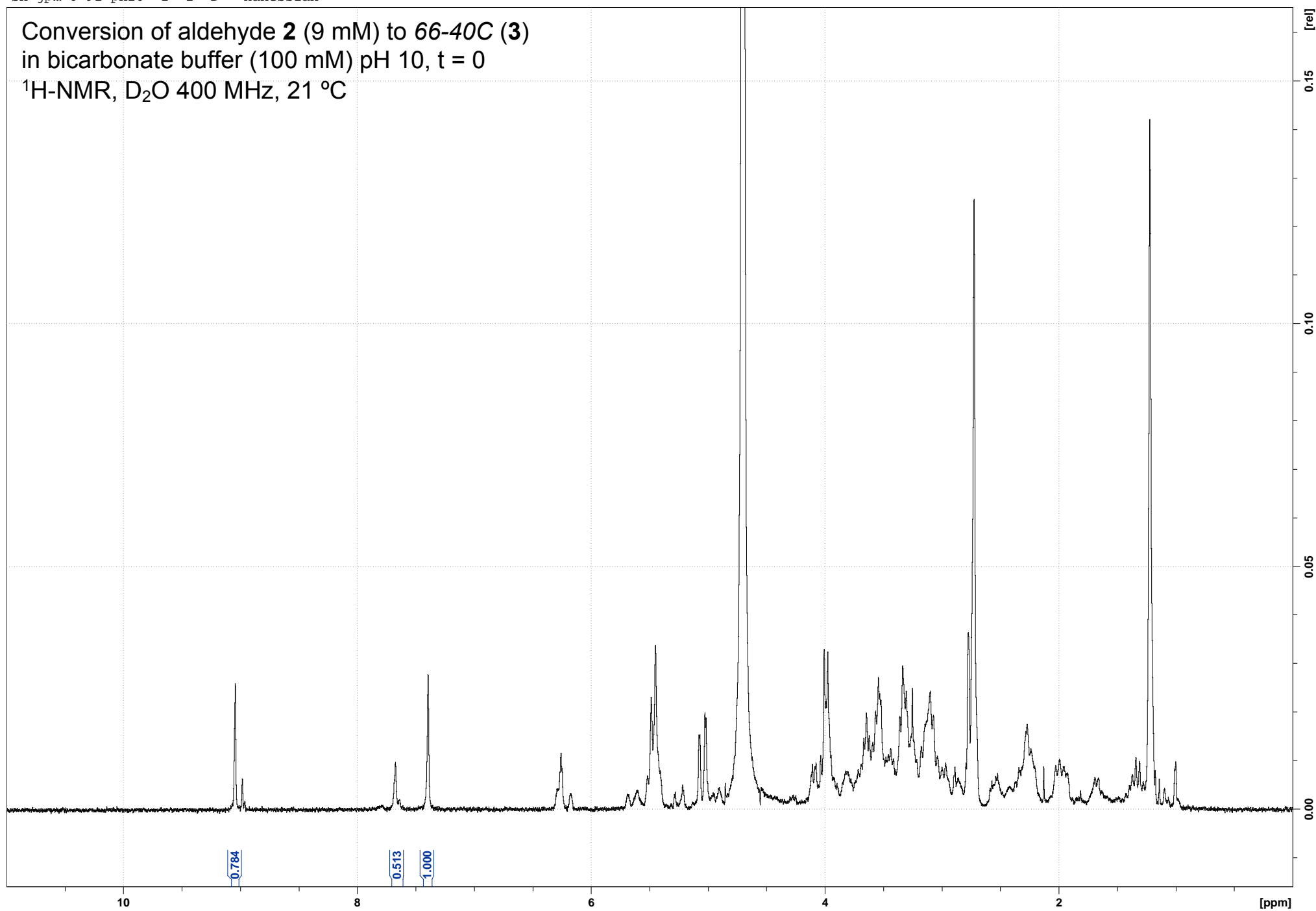
sh-jpm-6-91-ph10 1 1 D: Hanessian

Bicarbonate buffer (1.2X) pH 10



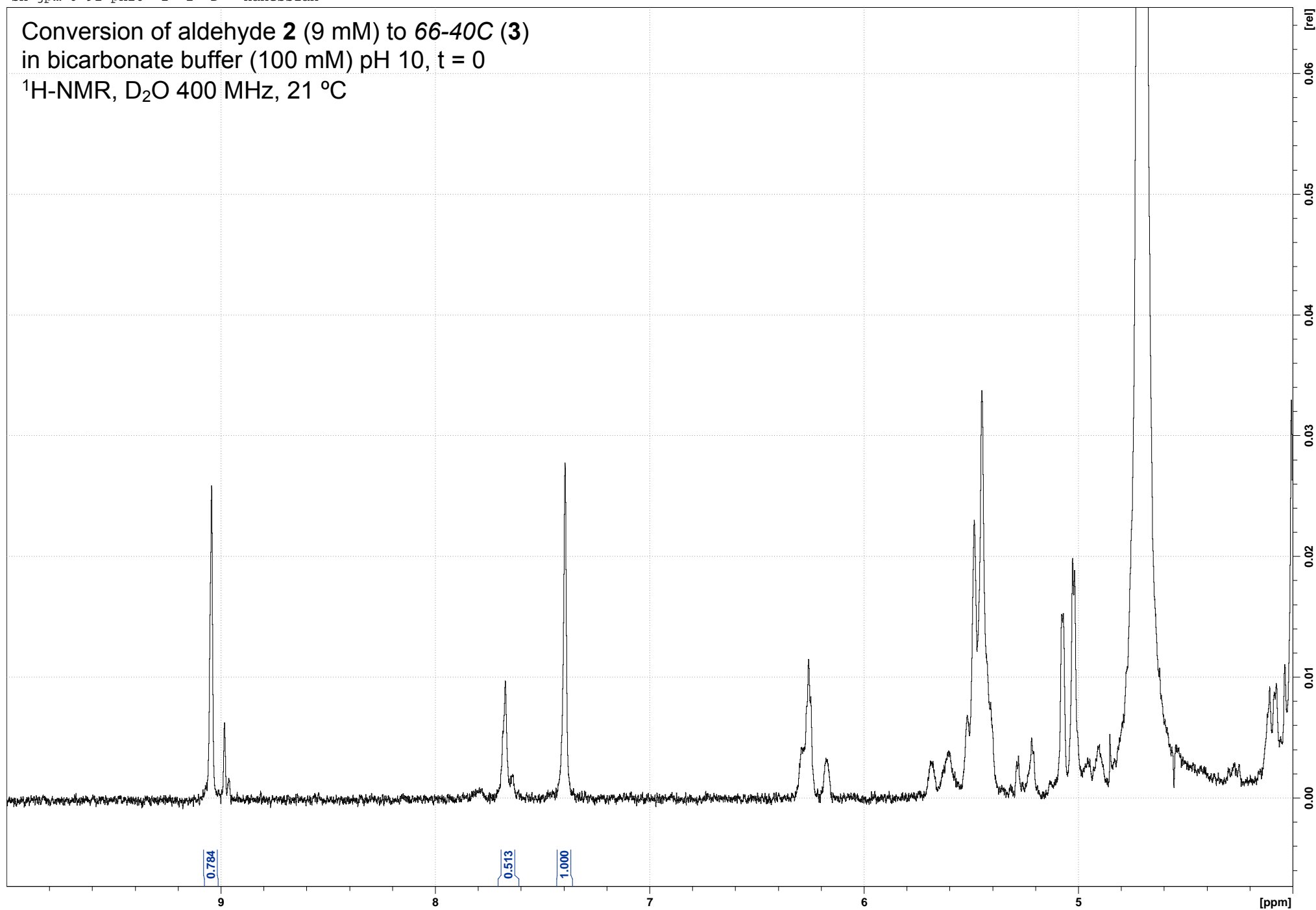
sh-jpm-6-91-ph10 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



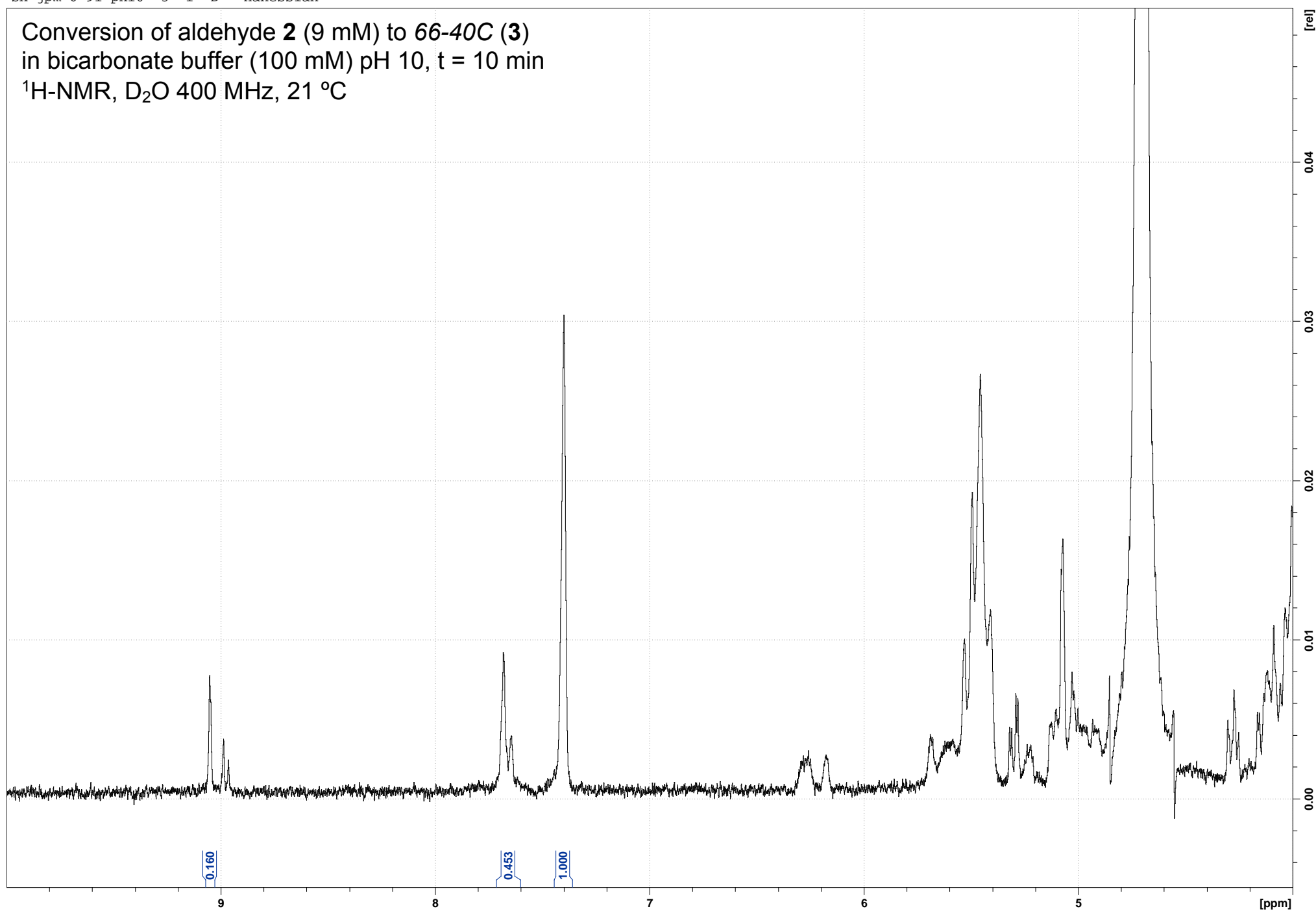
sh-jpm-6-91-ph10 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



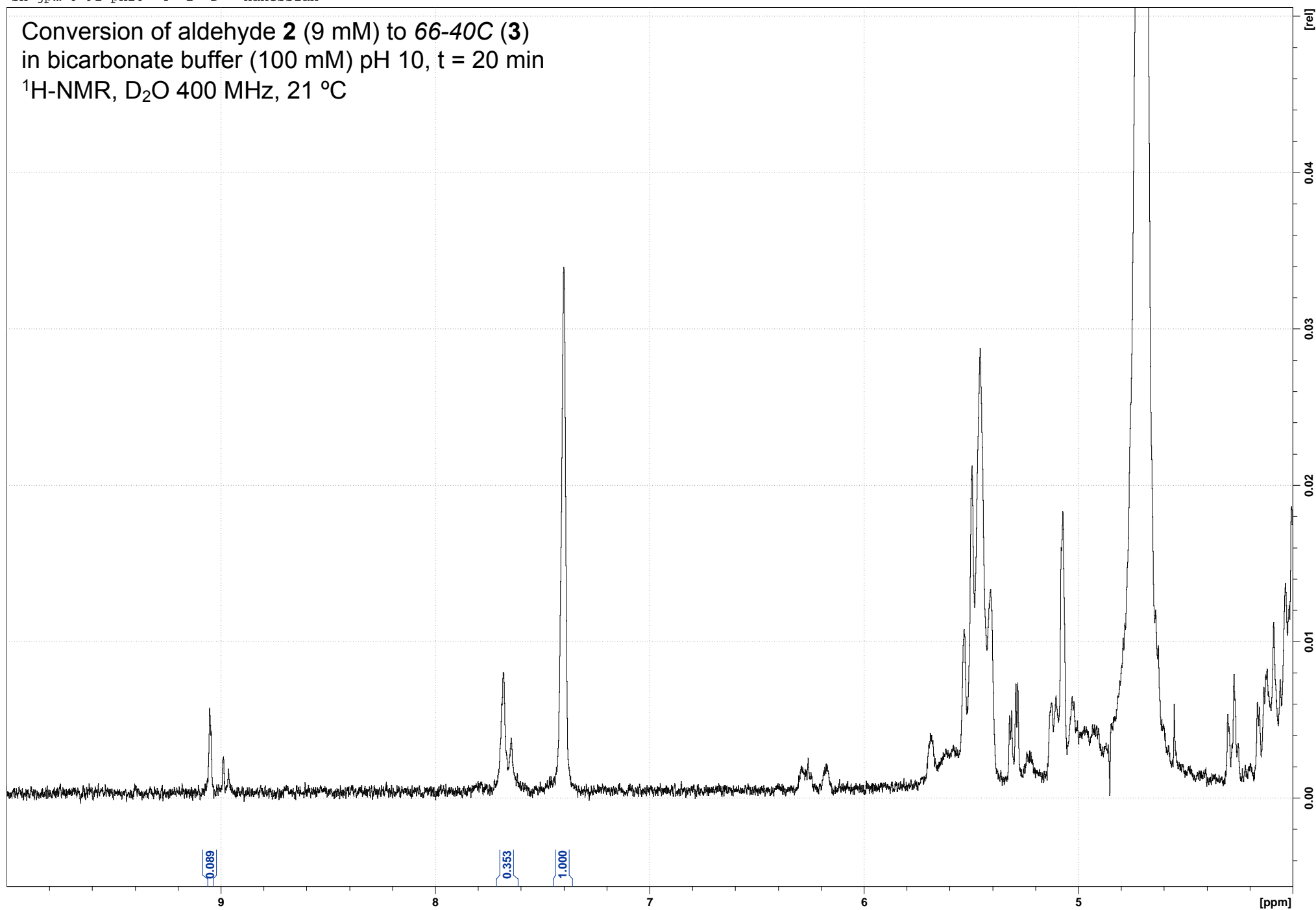
sh-jpm-6-91-ph10 3 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 10 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



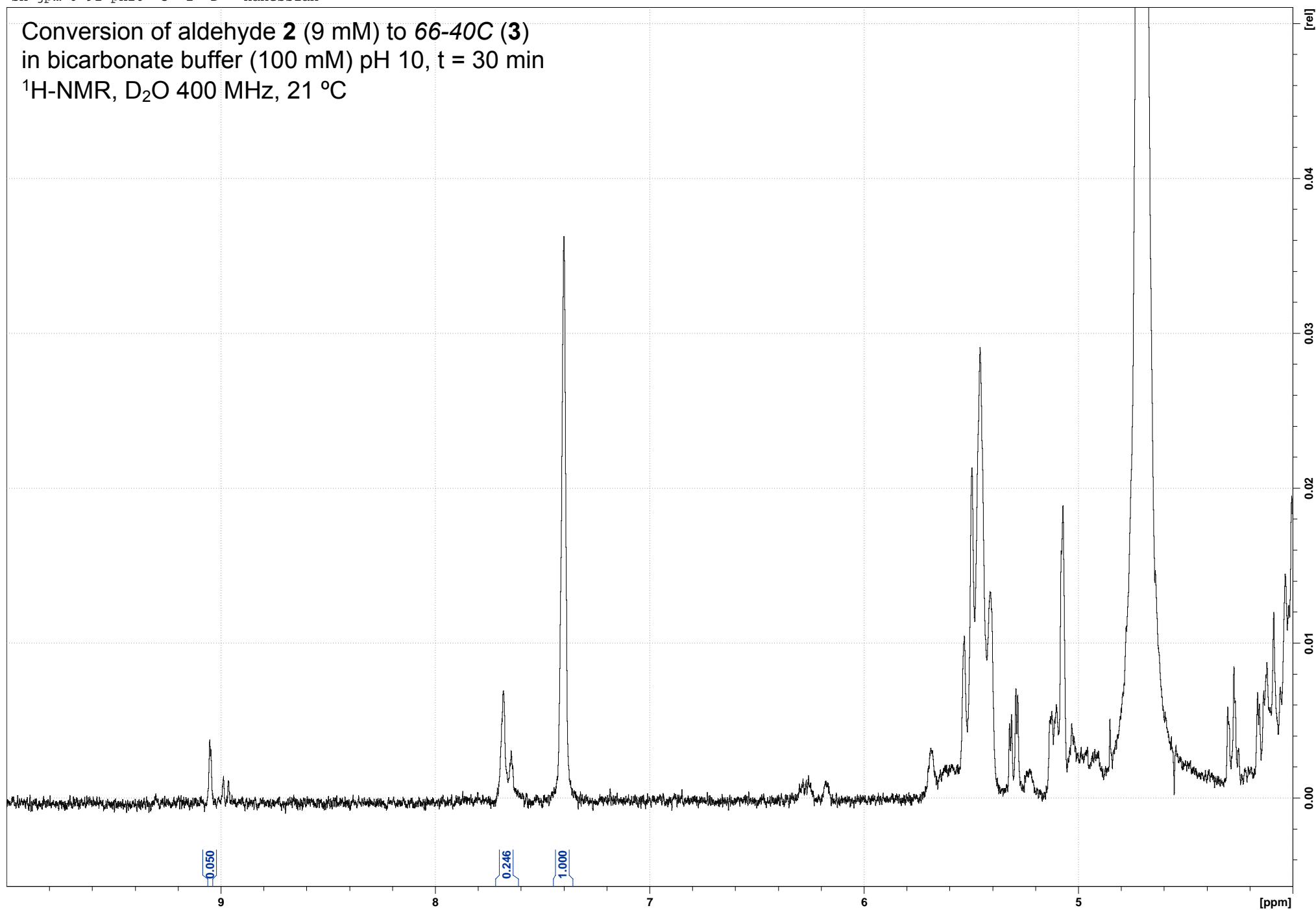
sh-jpm-6-91-ph10 4 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 20 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



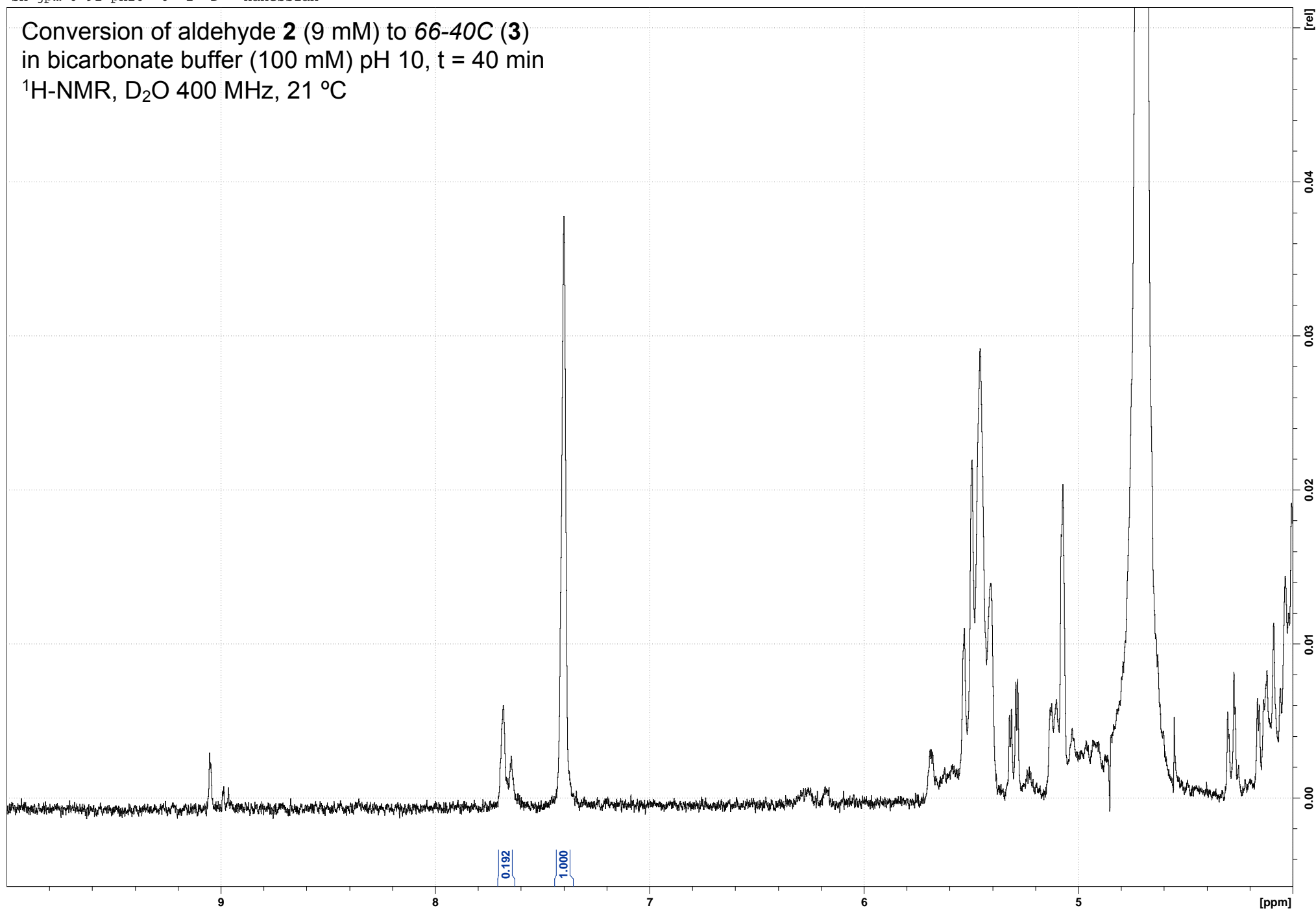
sh-jpm-6-91-ph10 5 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 30 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph10 6 1 D: Hanessian

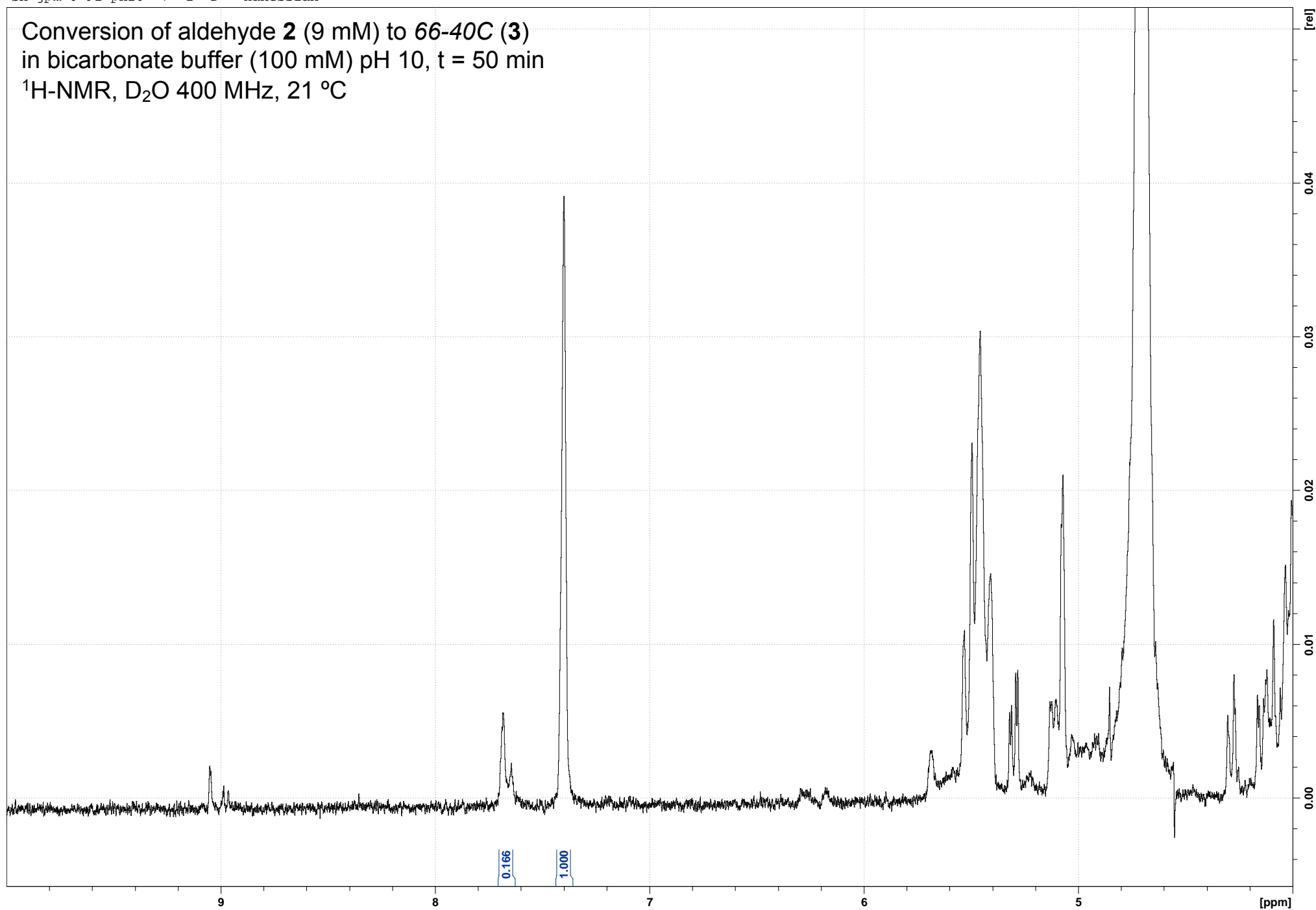
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 40 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





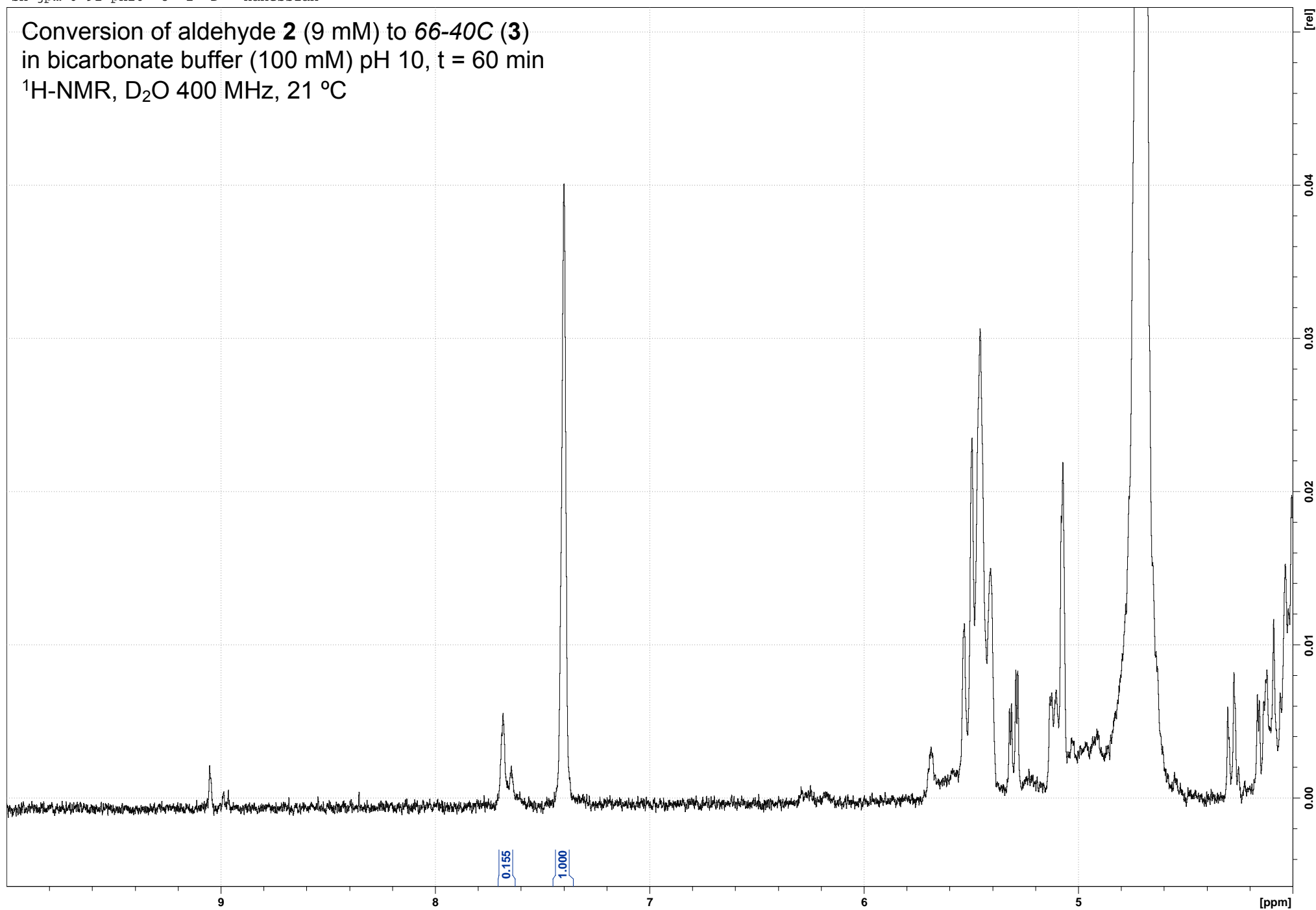
sh-jpm-6-91-ph10 7 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 50 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



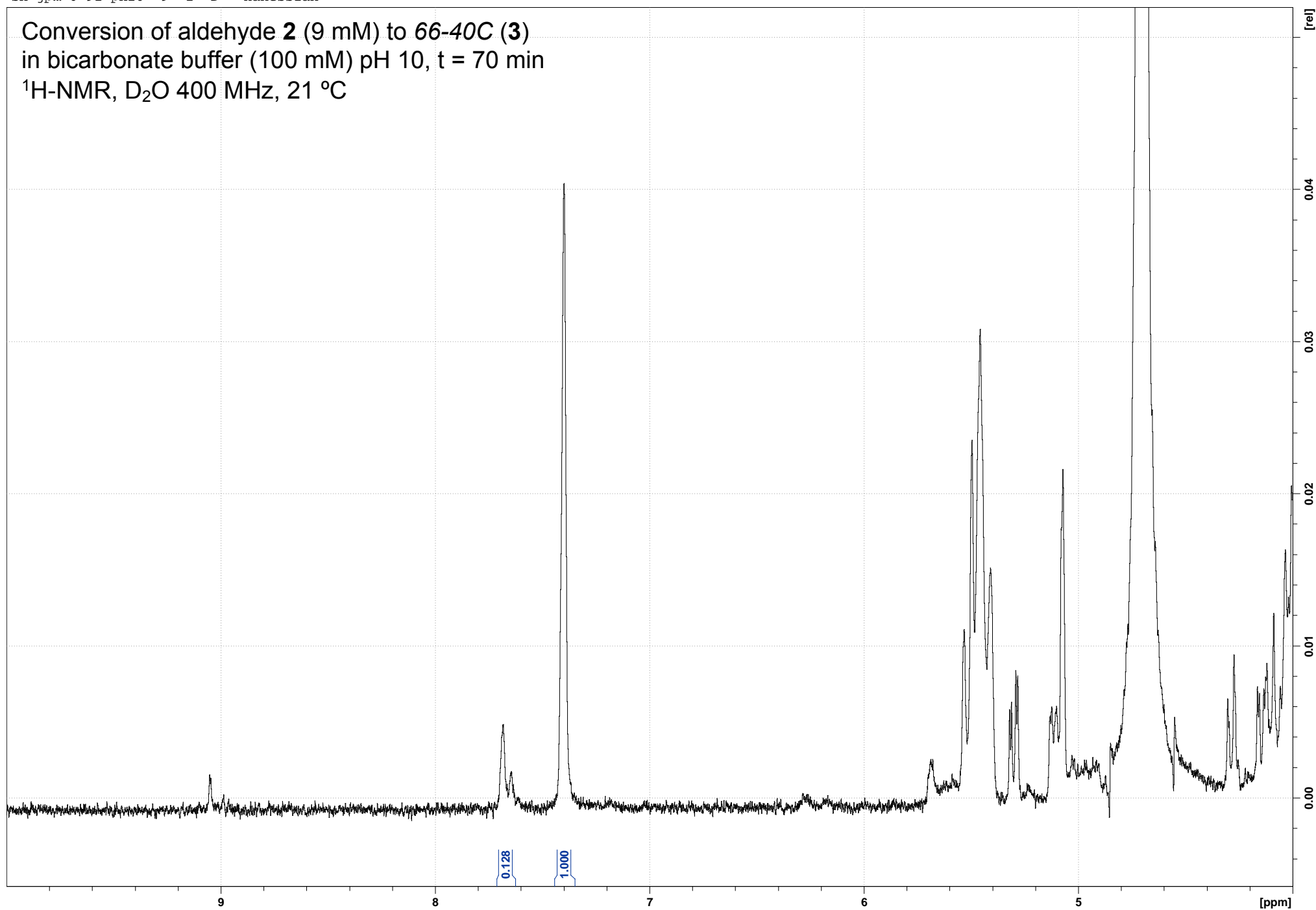
sh-jpm-6-91-ph10 8 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 60 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



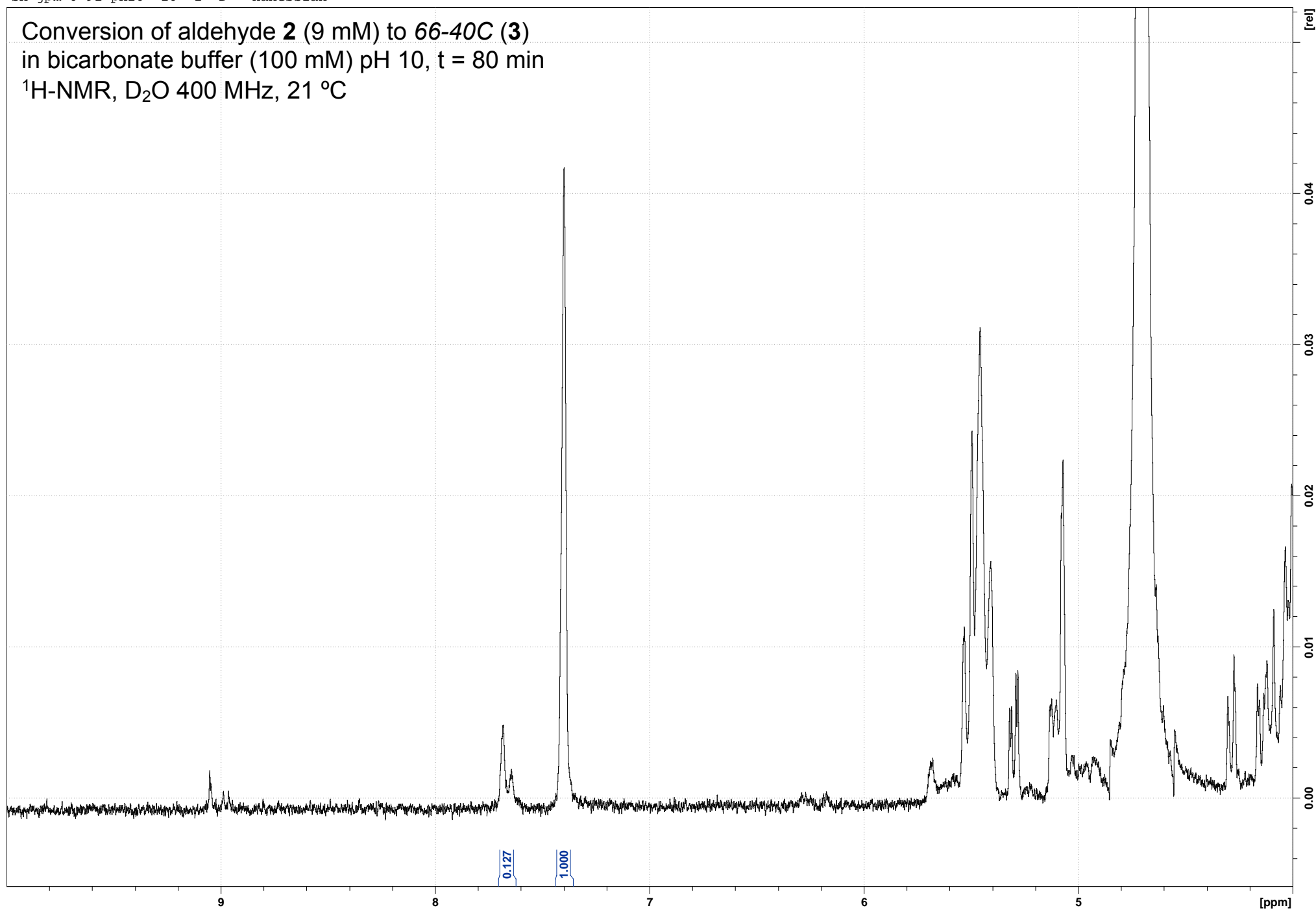
sh-jpm-6-91-ph10 9 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 70 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



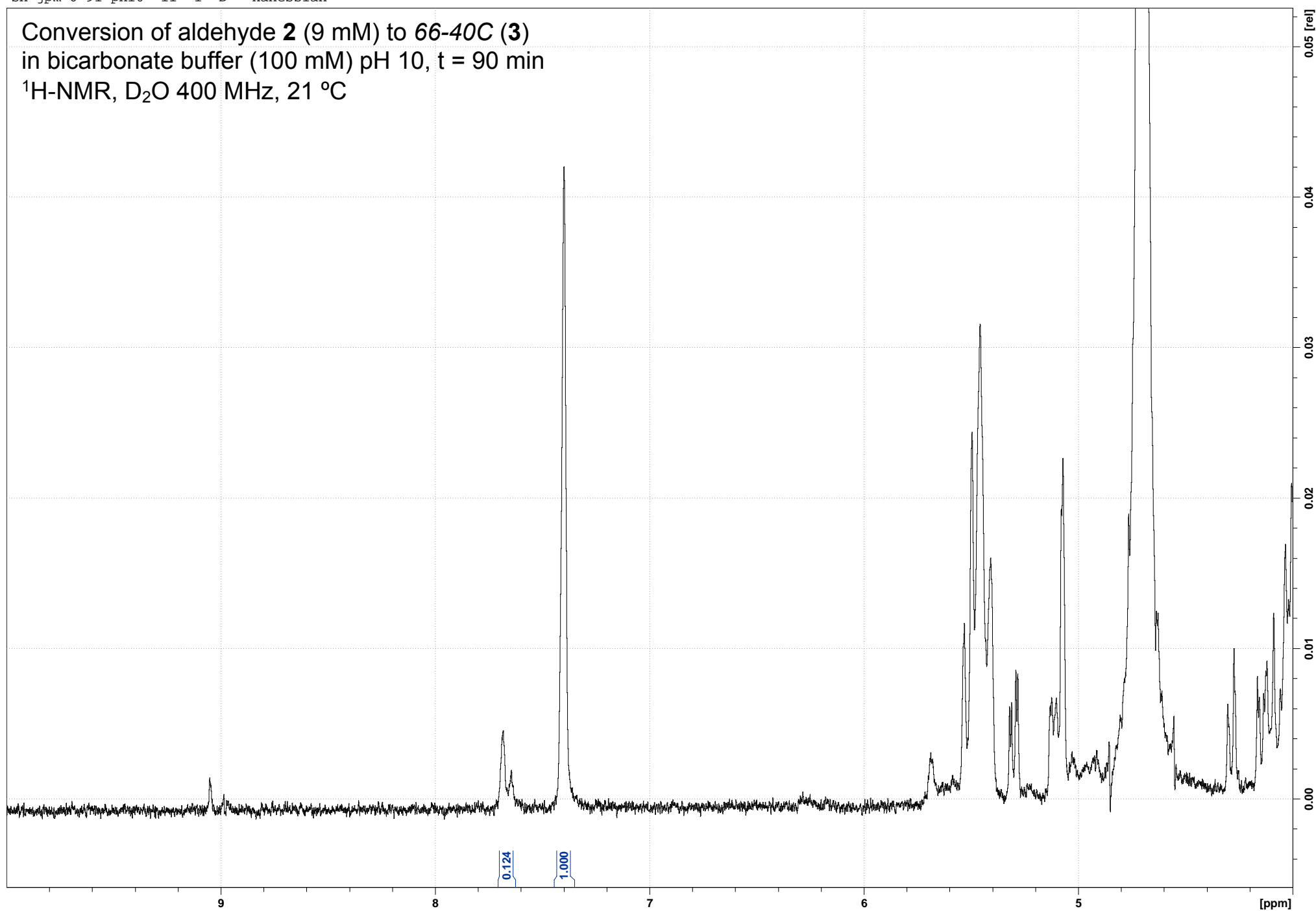
sh-jpm-6-91-ph10 10 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 80 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



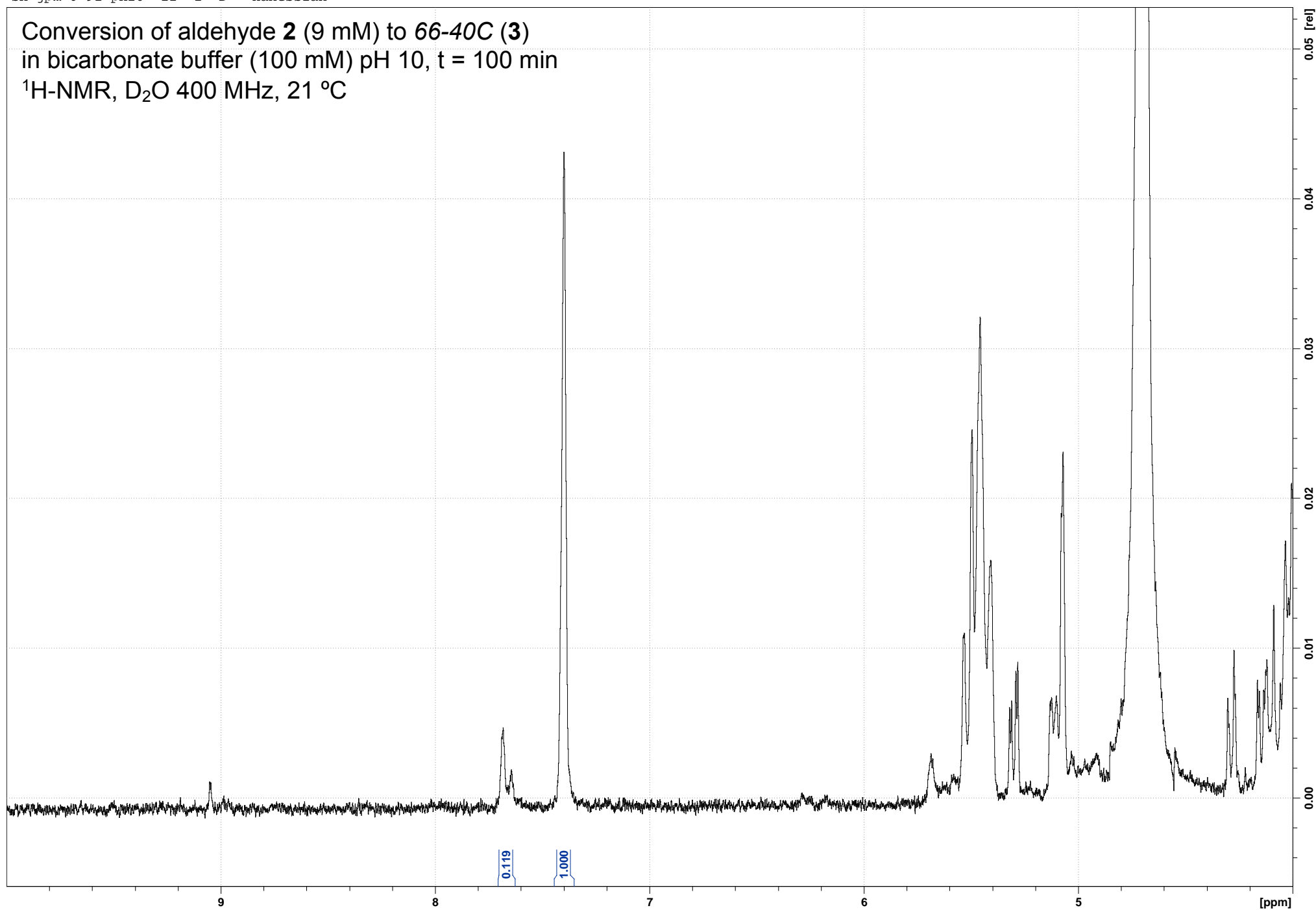
sh-jpm-6-91-ph10 11 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 90 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



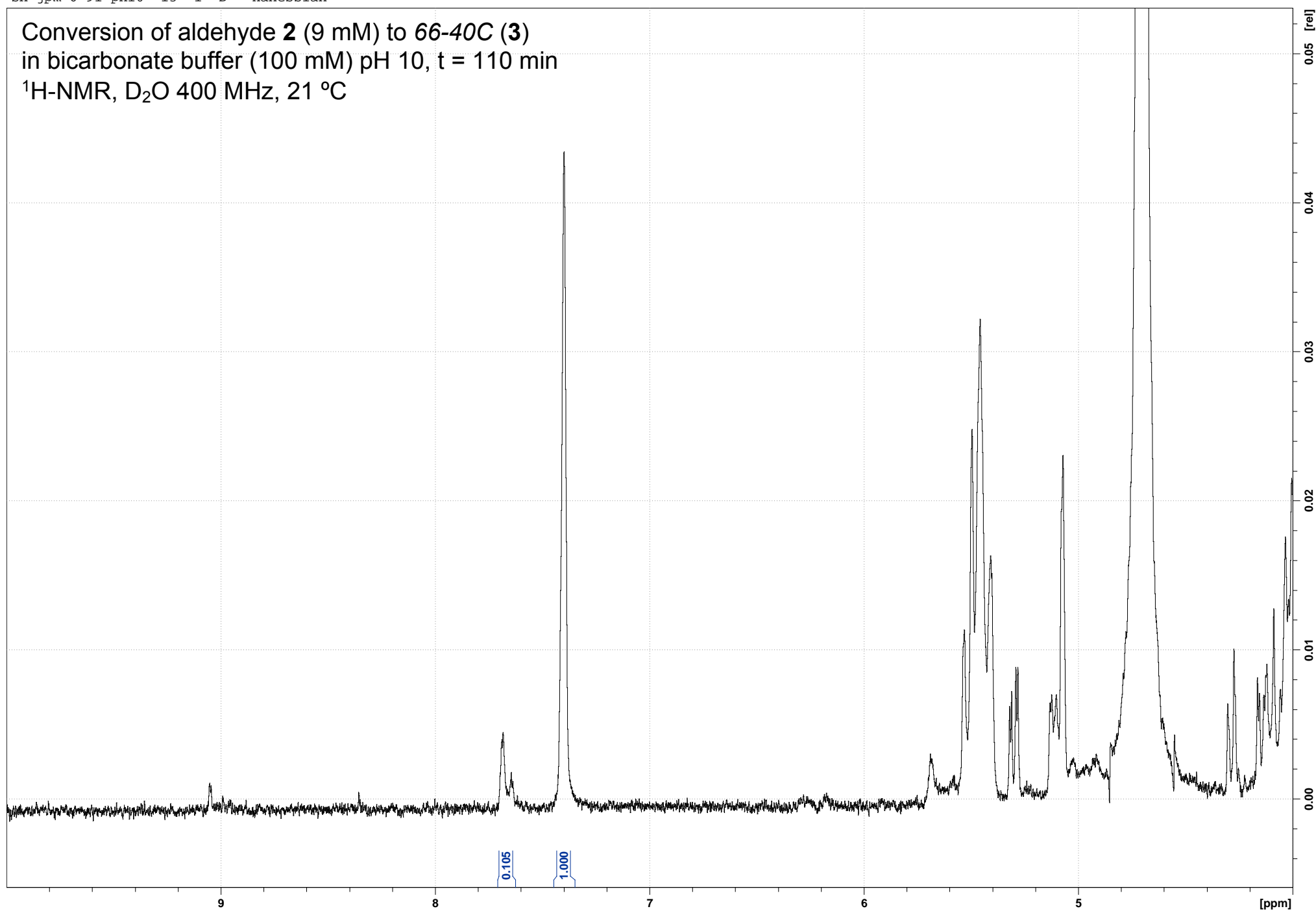
sh-jpm-6-91-ph10 12 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 100 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



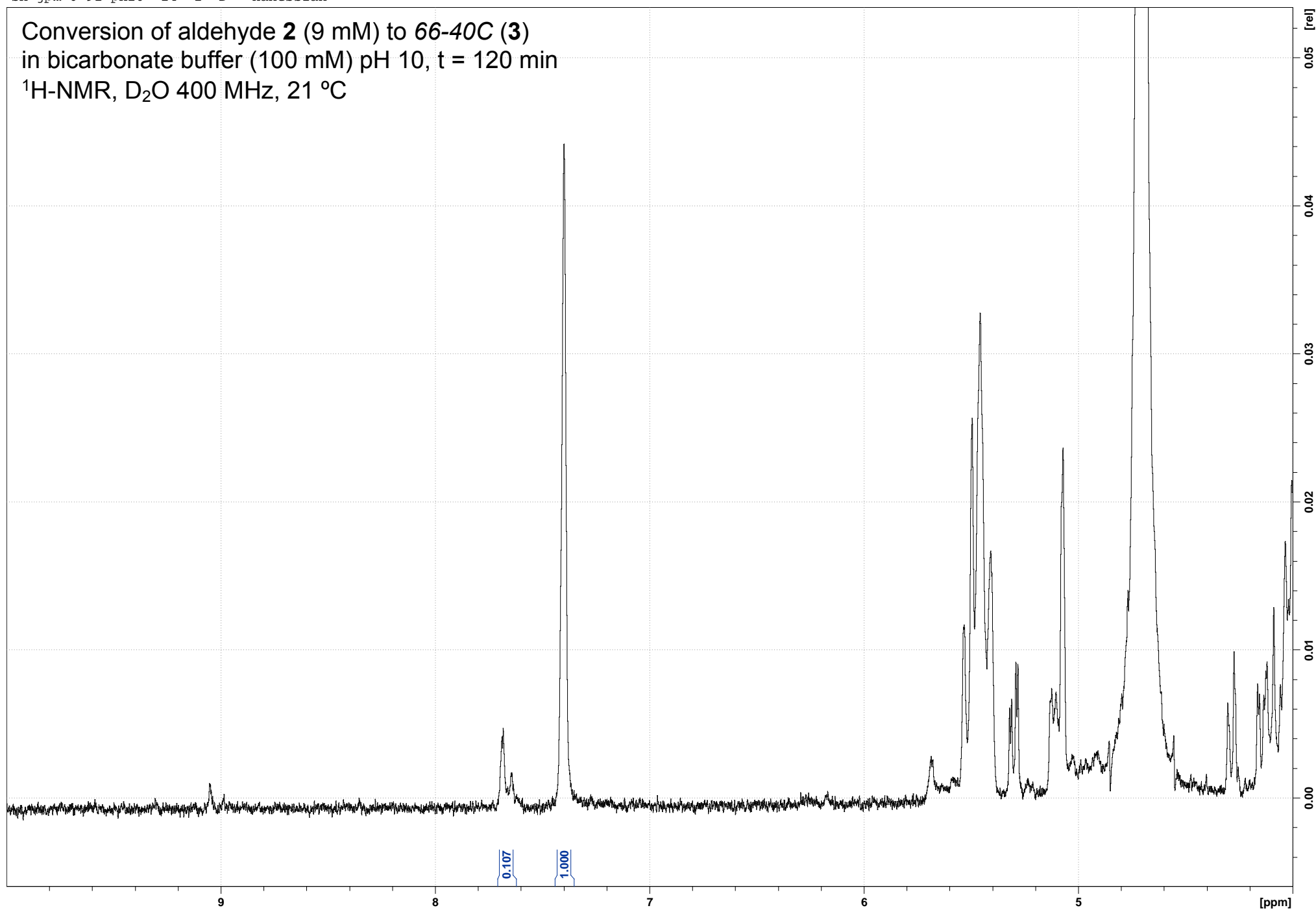
sh-jpm-6-91-ph10 13 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 110 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph10 14 1 D: Hanessian

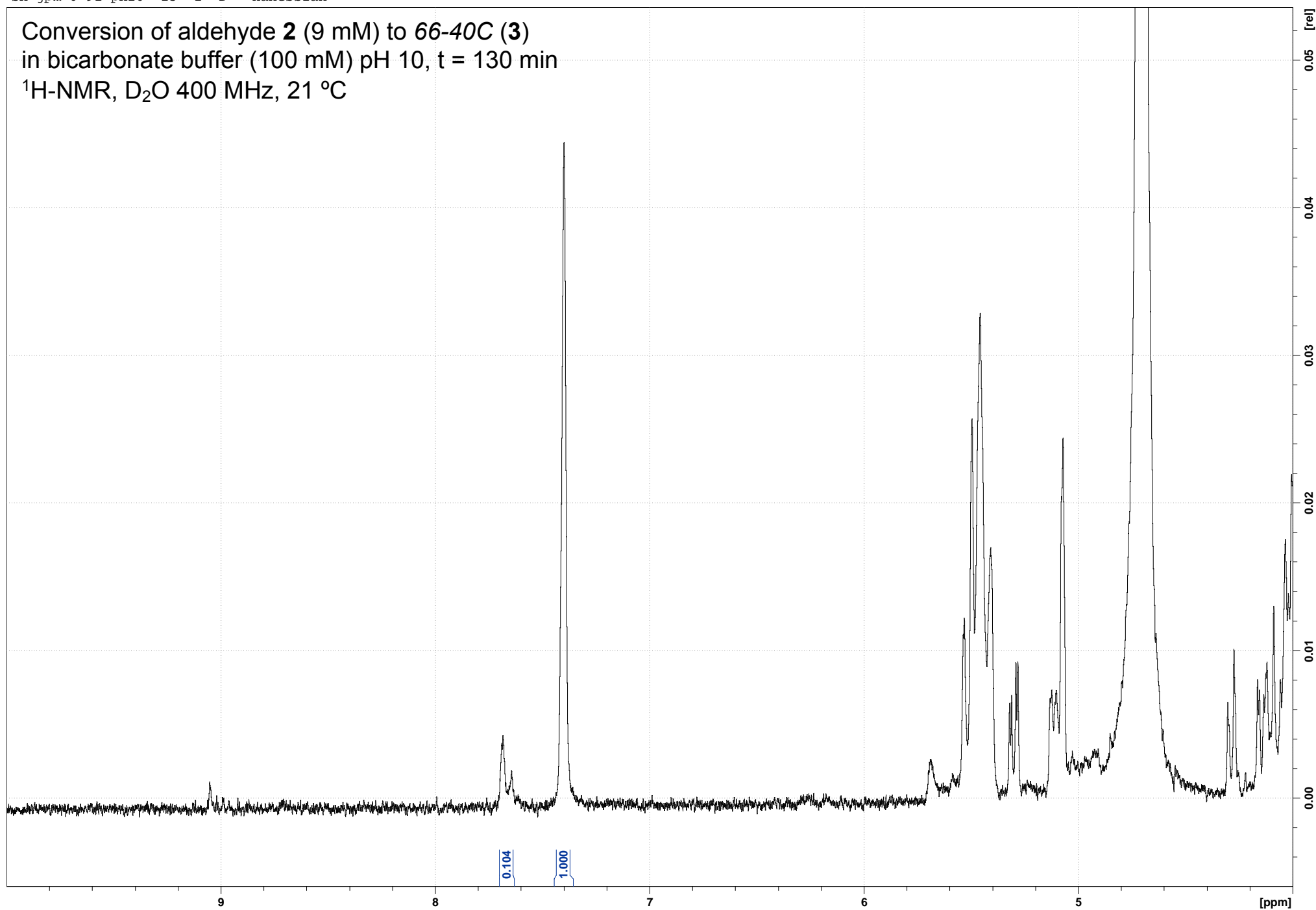
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 120 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





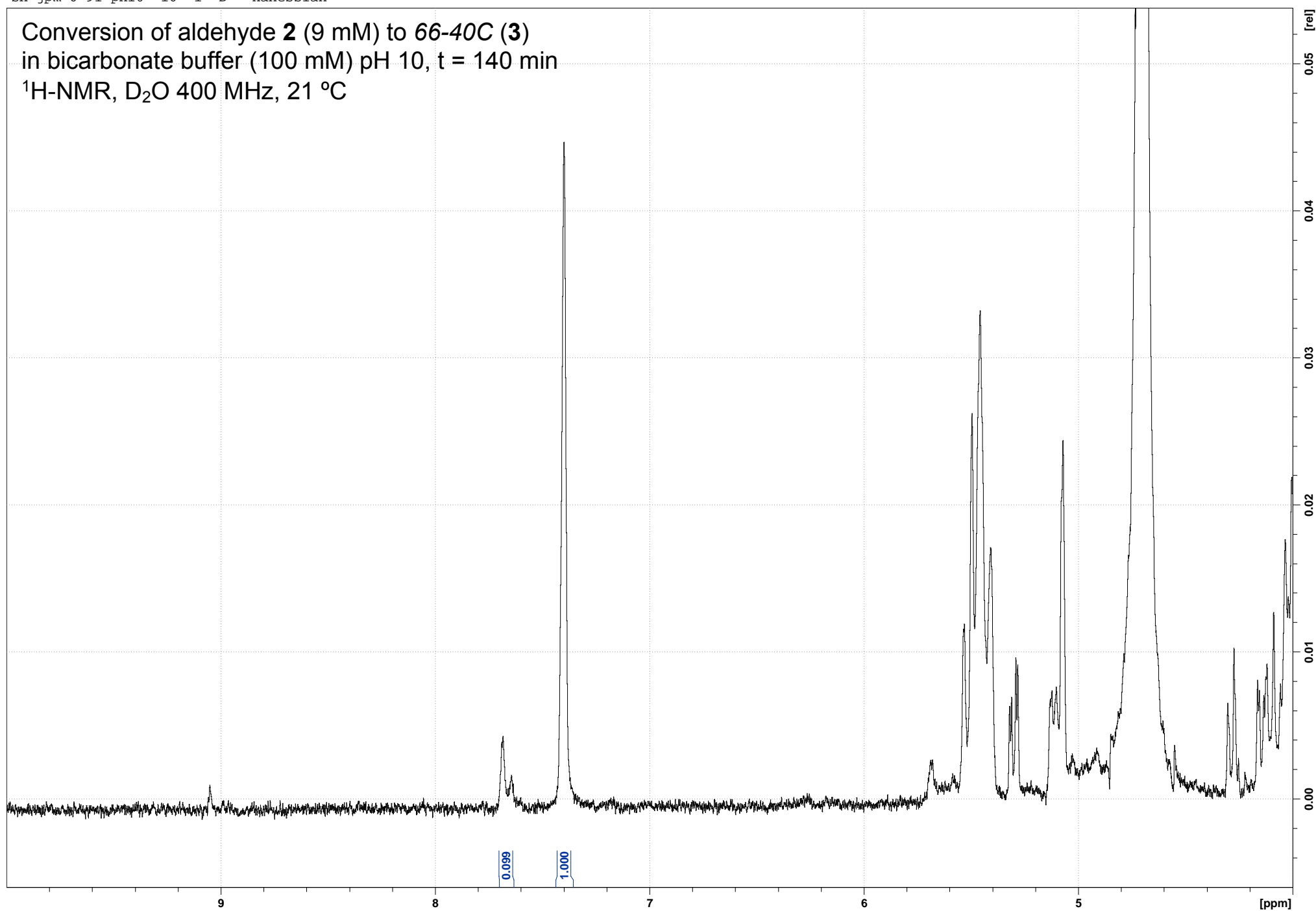
sh-jpm-6-91-ph10 15 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 130 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



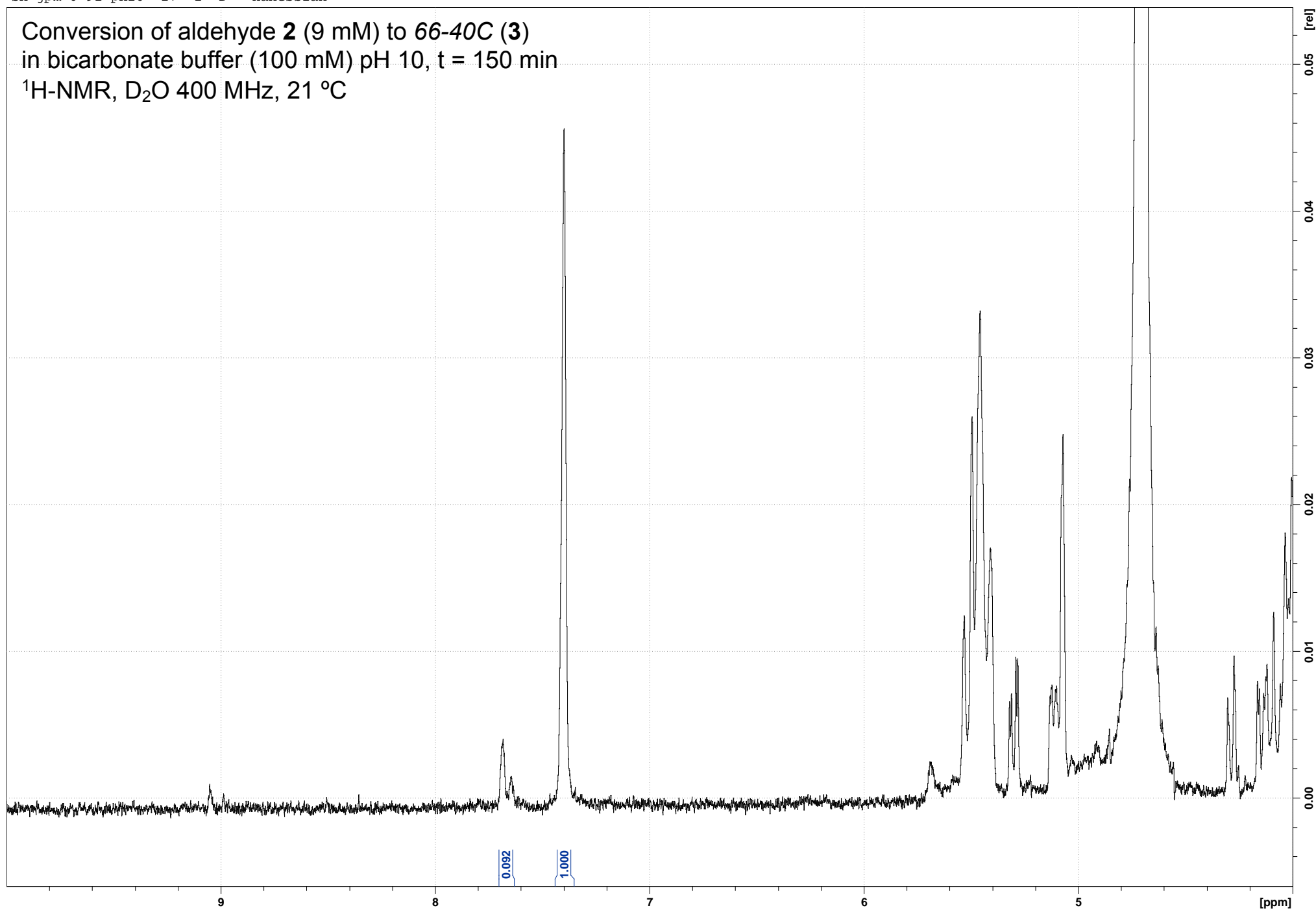
sh-jpm-6-91-ph10 16 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 140 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



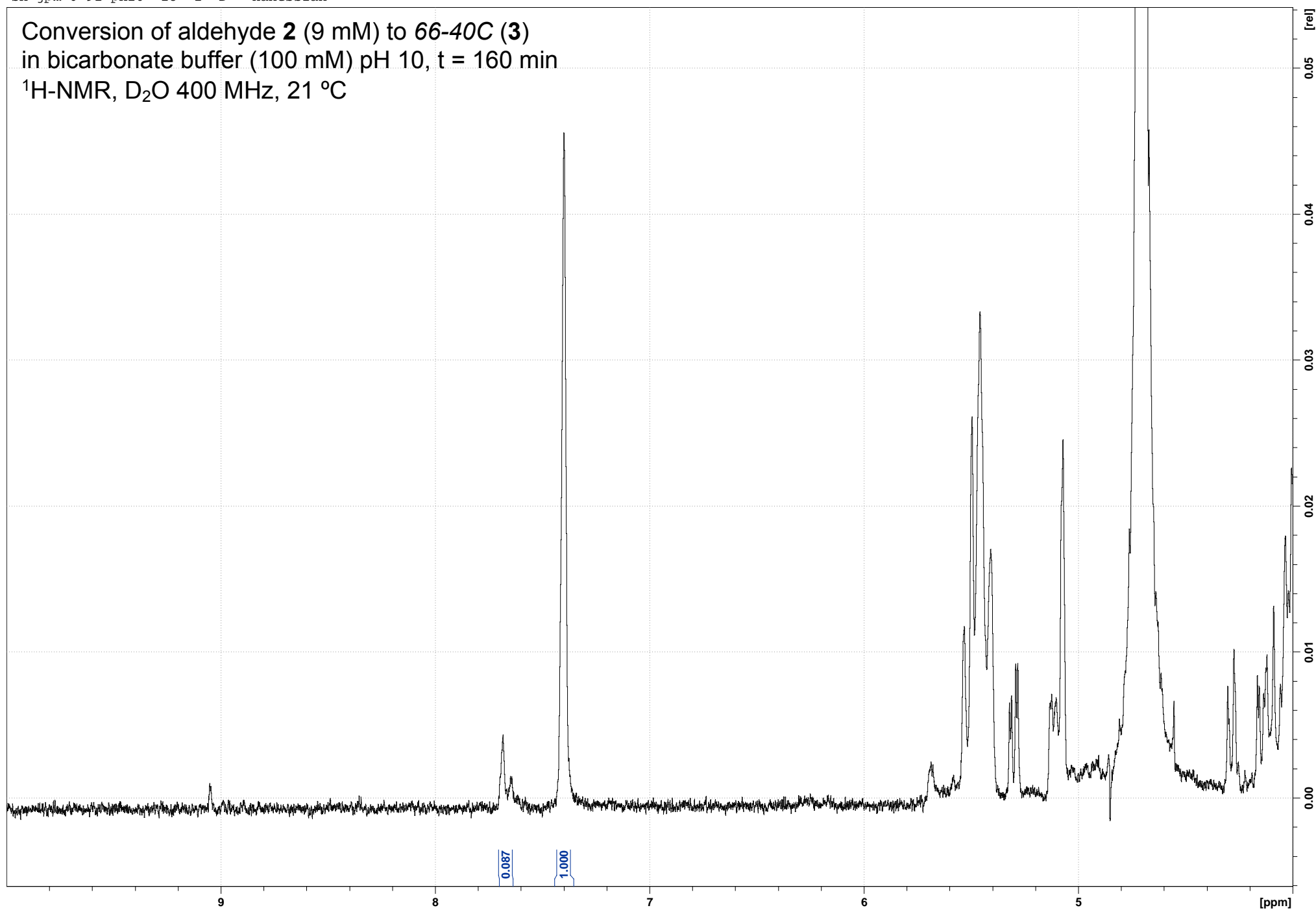
sh-jpm-6-91-ph10 17 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 150 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



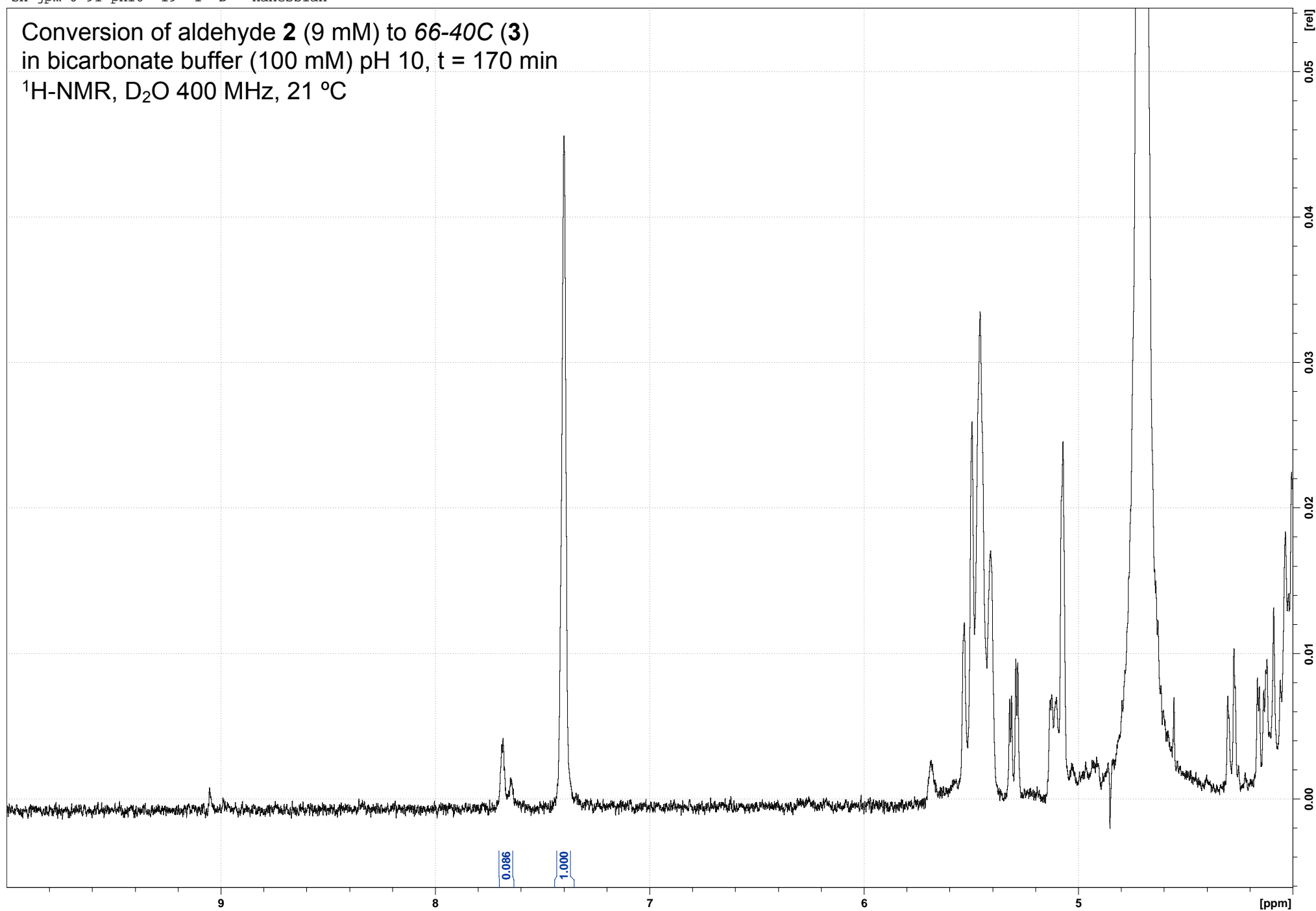
sh-jpm-6-91-ph10 18 1 D: Hanesian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 160 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



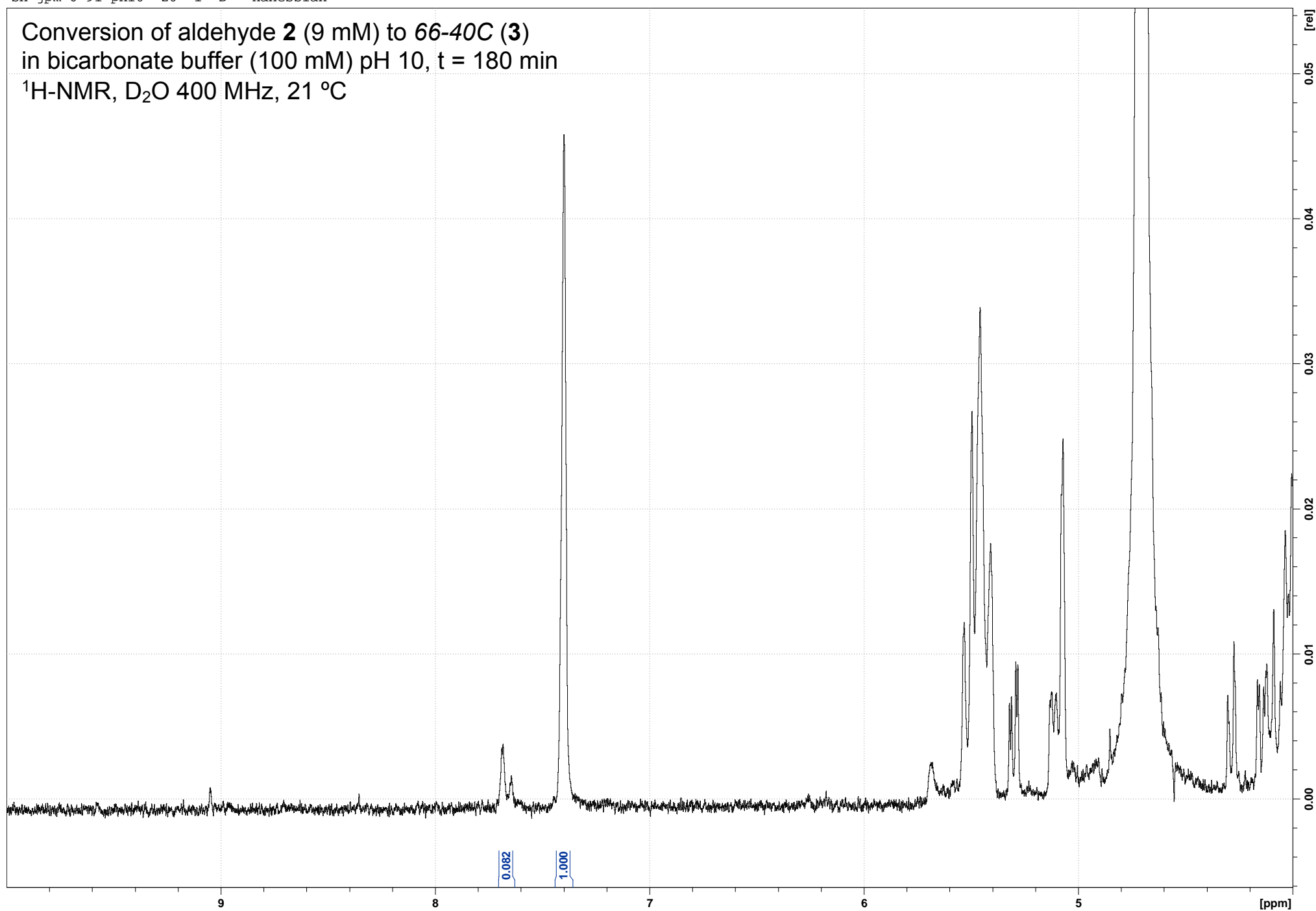
sh-jpm-6-91-ph10 19 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 170 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



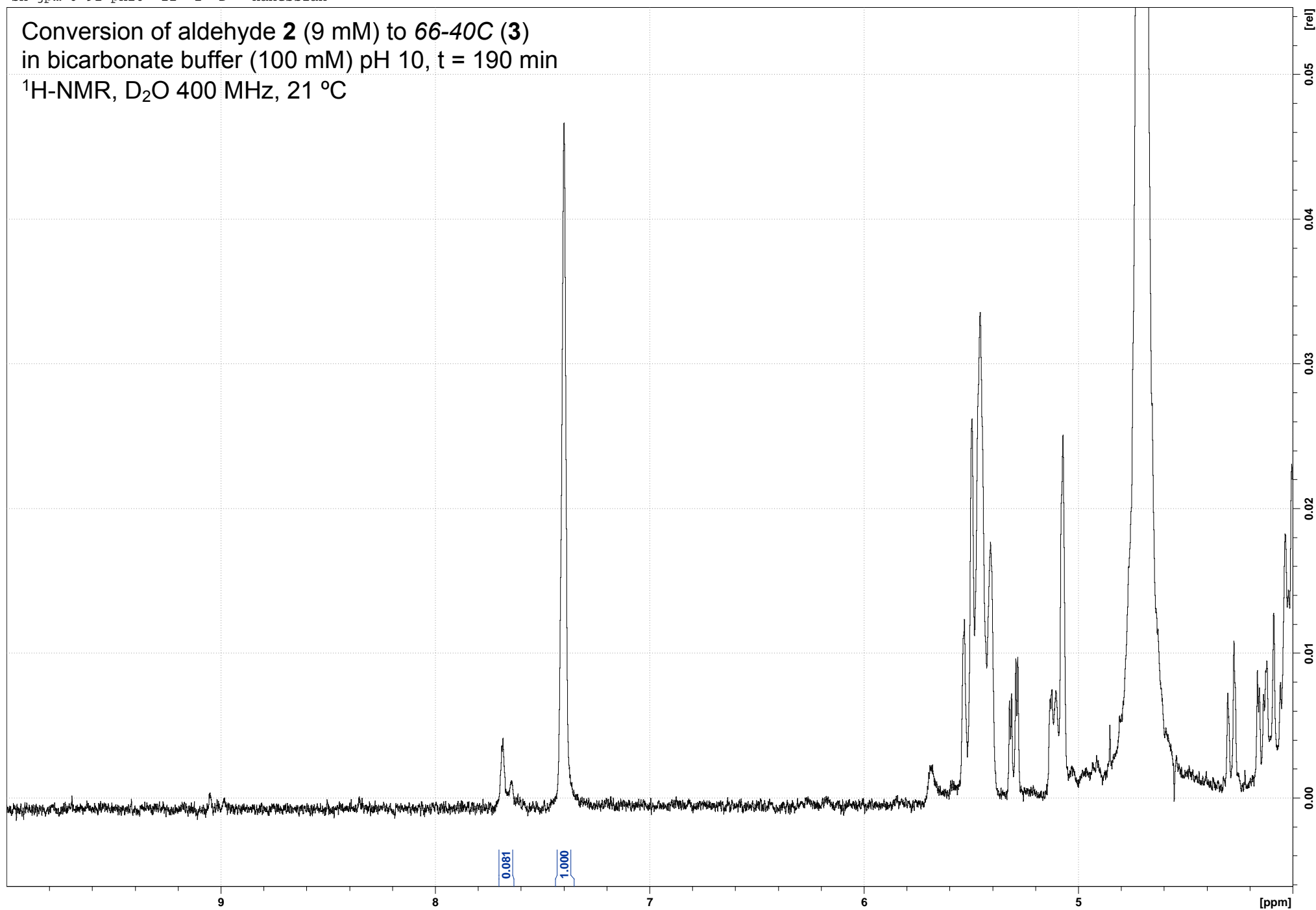
sh-jpm-6-91-ph10 20 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 180 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



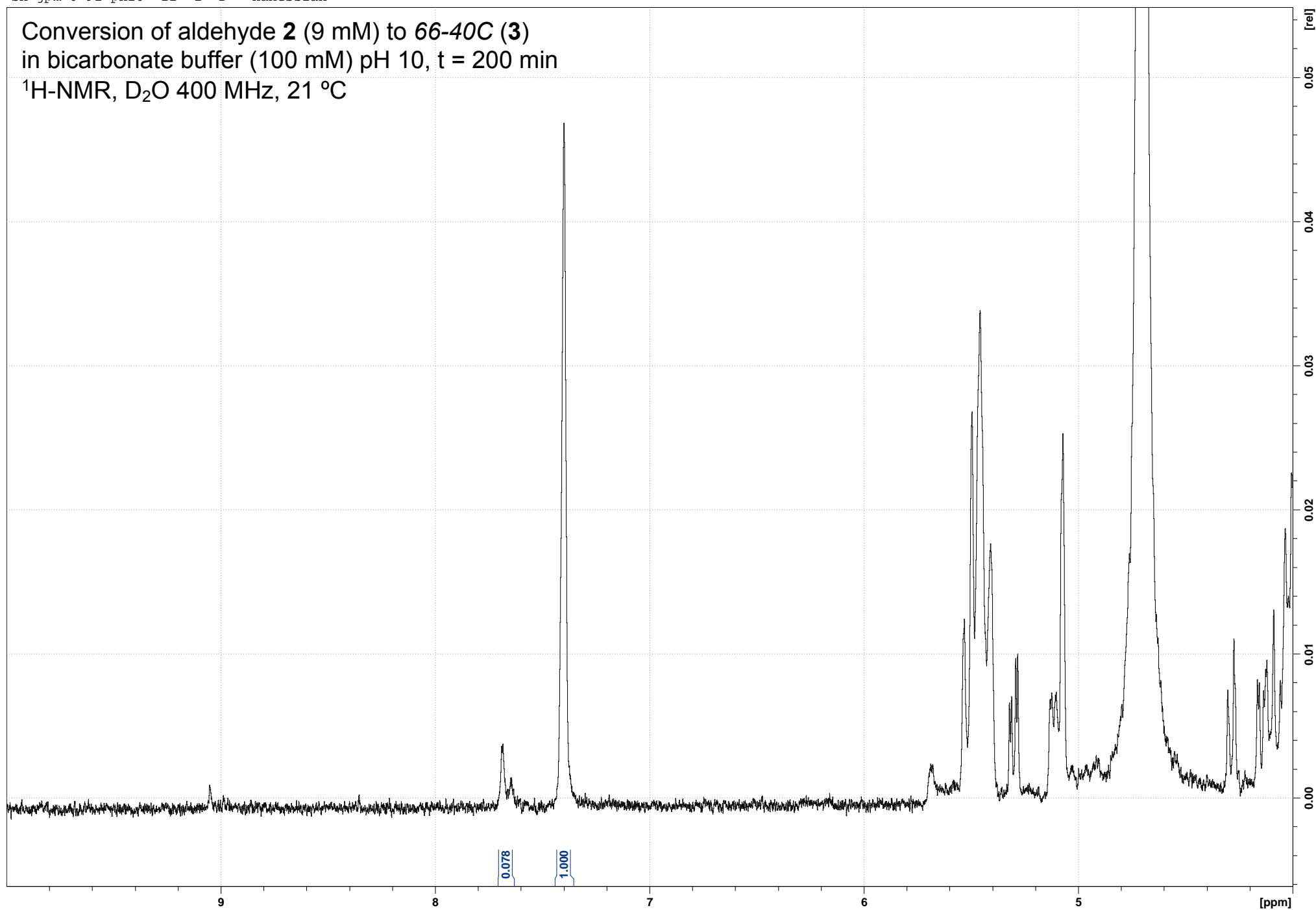
sh-jpm-6-91-ph10 21 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 190 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-ph10 22 1 D: Hanessian

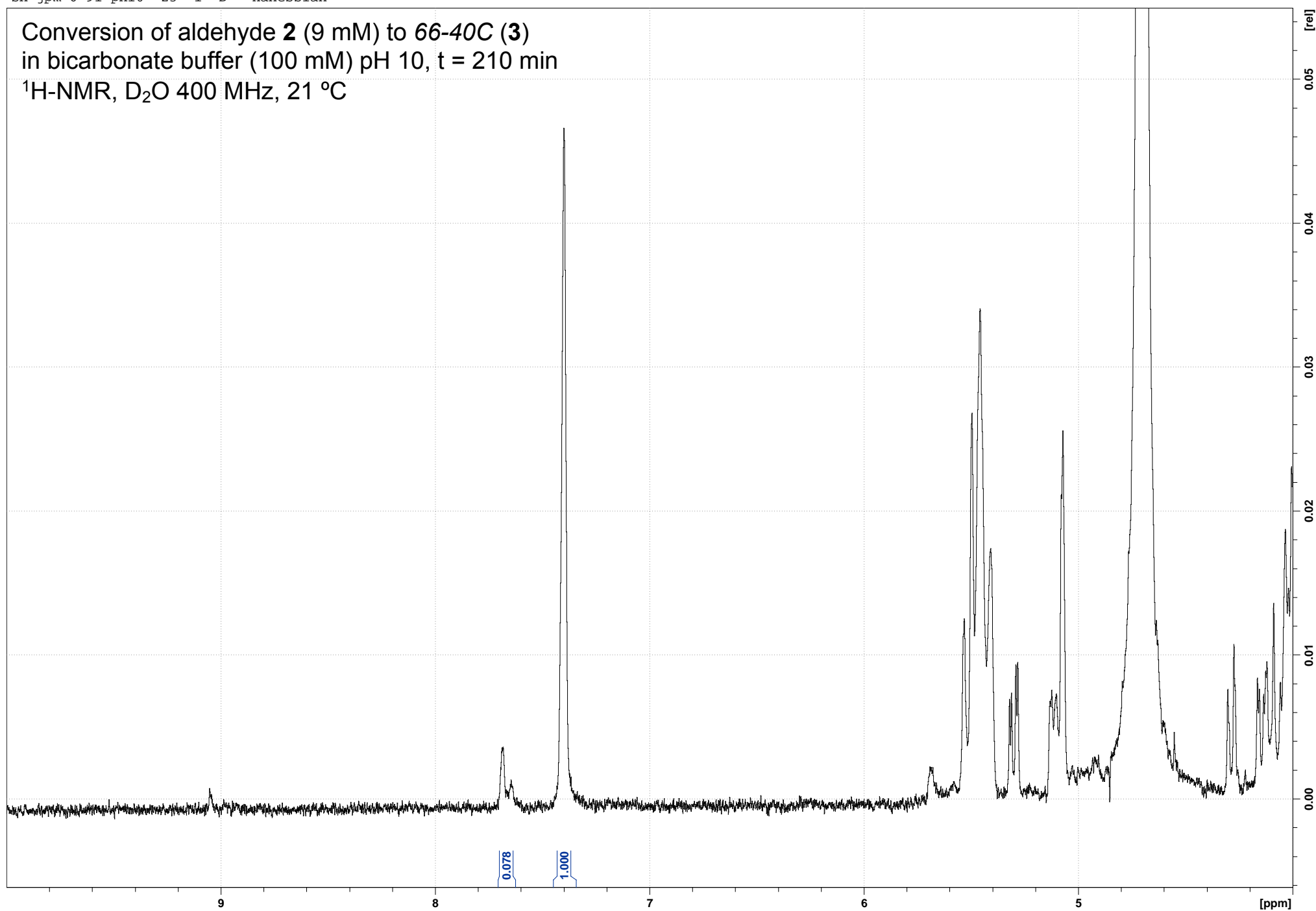
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 200 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





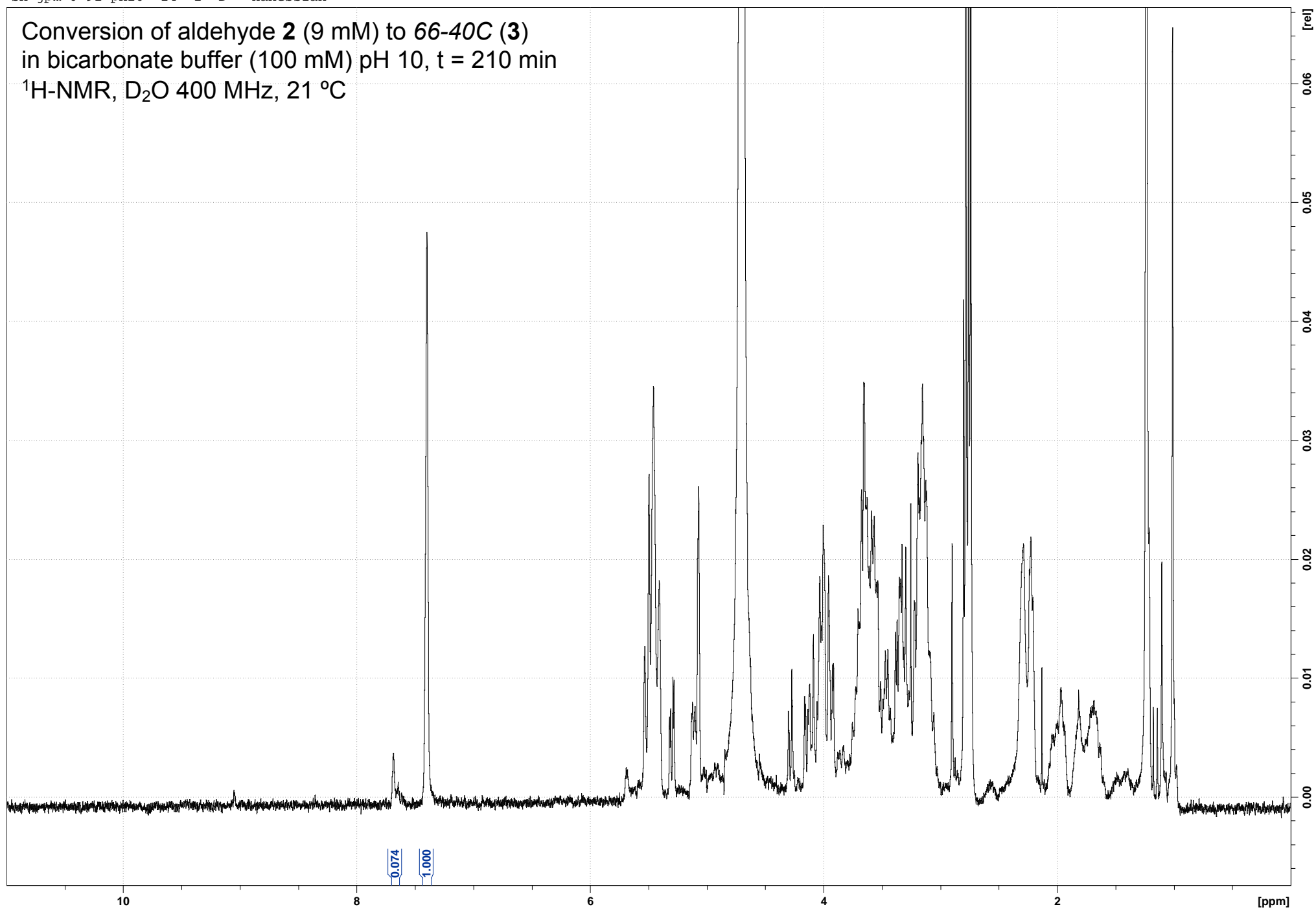
sh-jpm-6-91-ph10 23 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 210 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



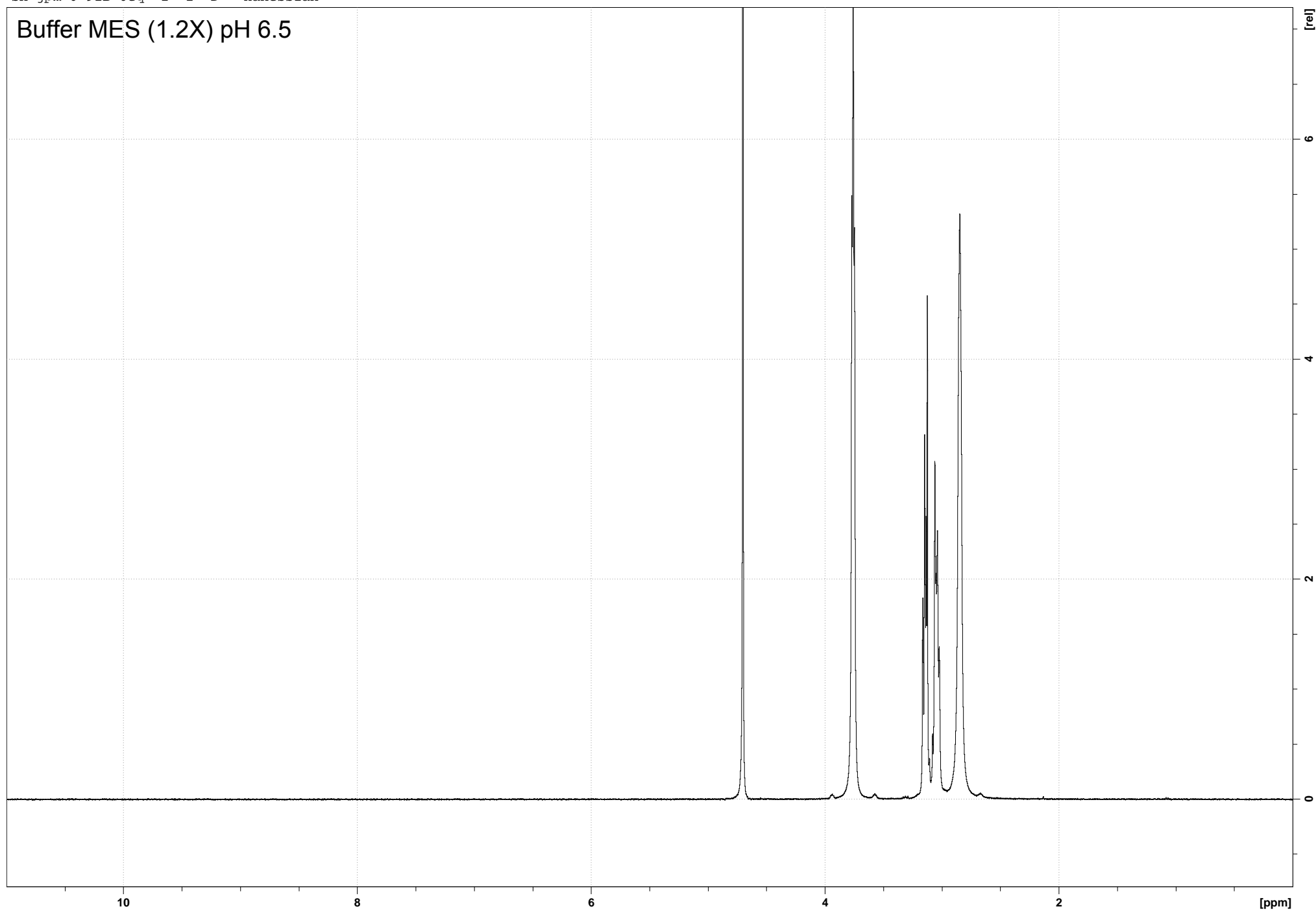
sh-jpm-6-91-ph10 24 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in bicarbonate buffer (100 mM) pH 10, t = 210 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



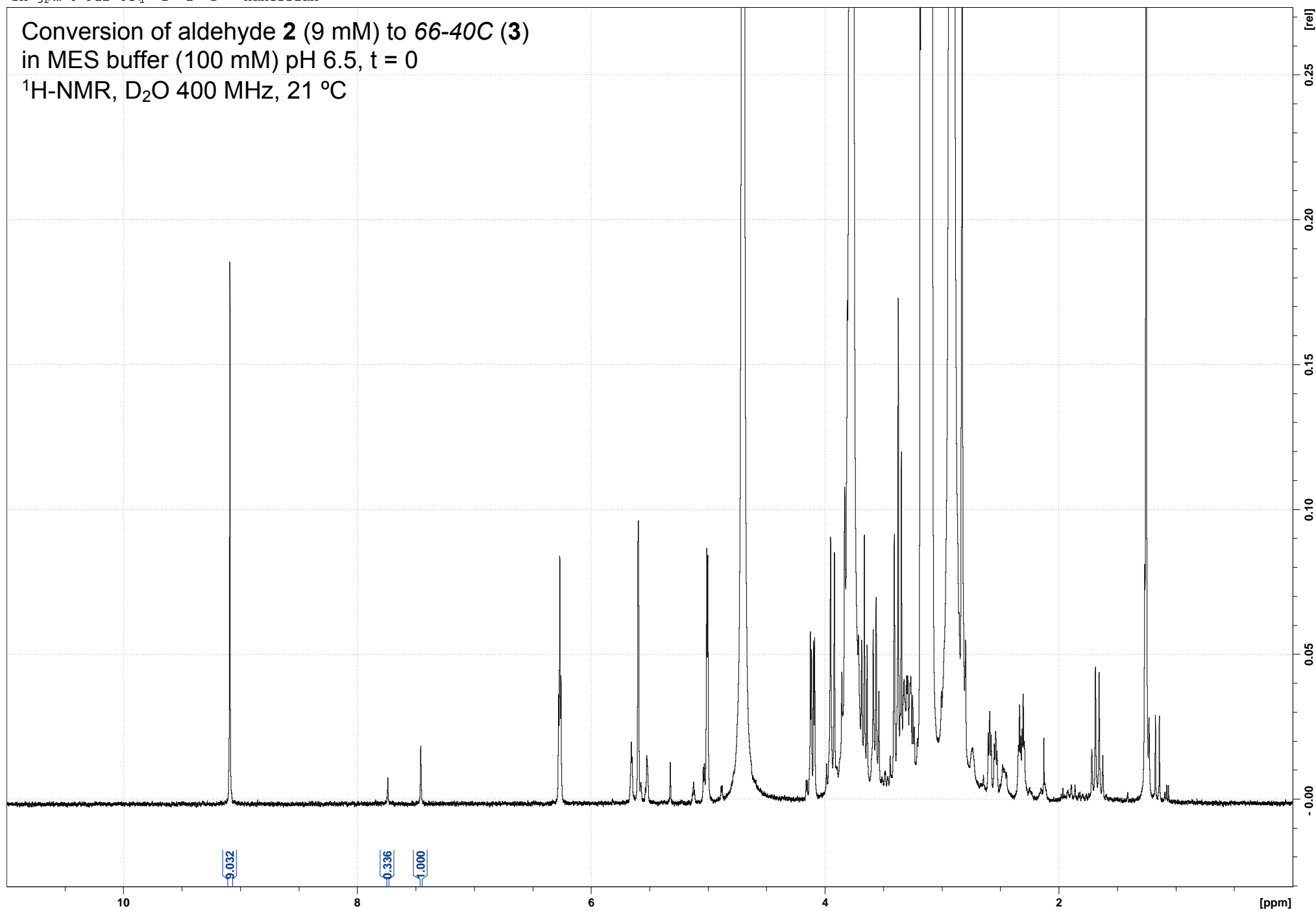
sh-jpm-6-91B-0eq 1 1 D: Hanessian

Buffer MES (1.2X) pH 6.5



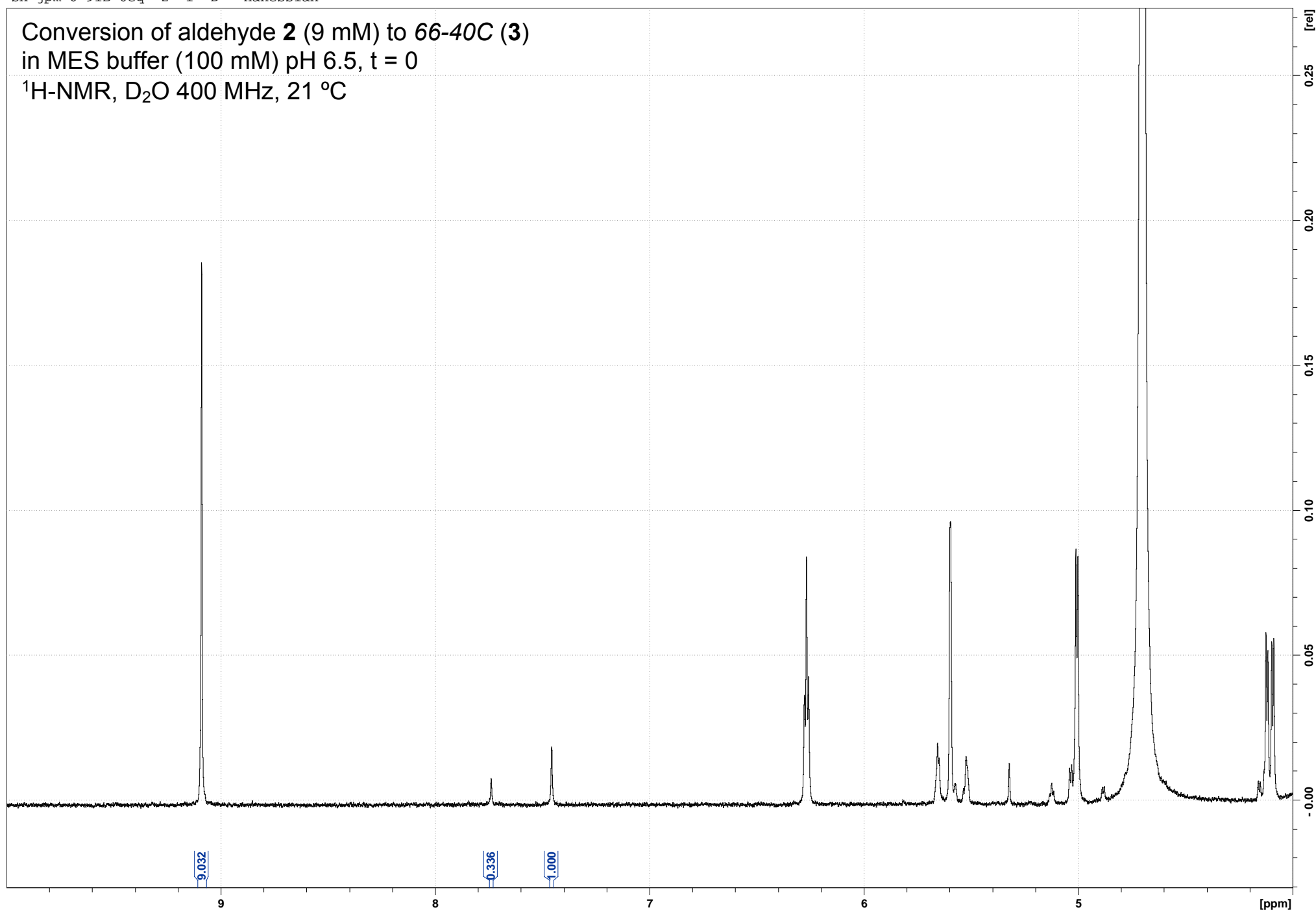
sh-jpm-6-91B-0eq 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



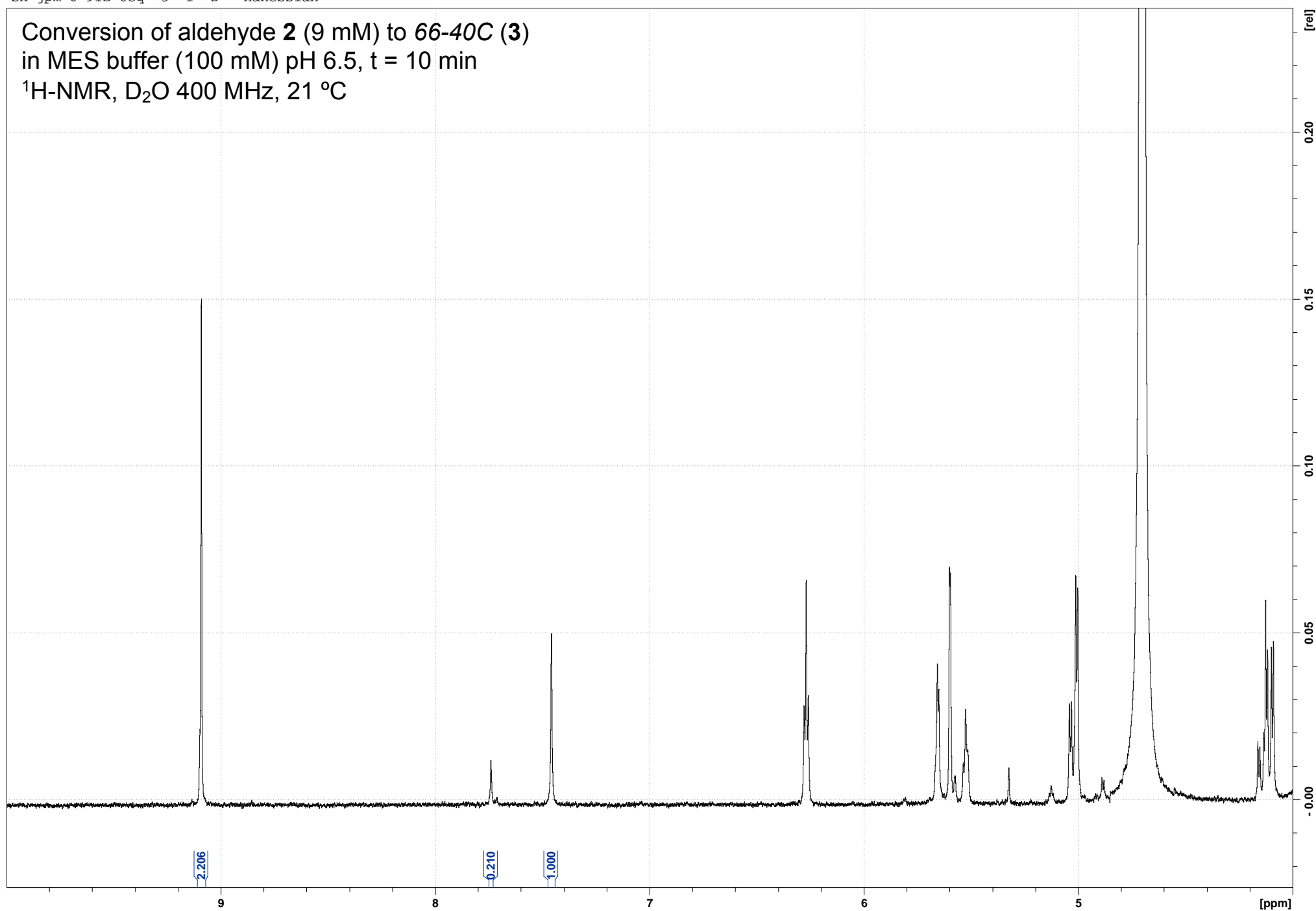
sh-jpm-6-91B-0eq 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



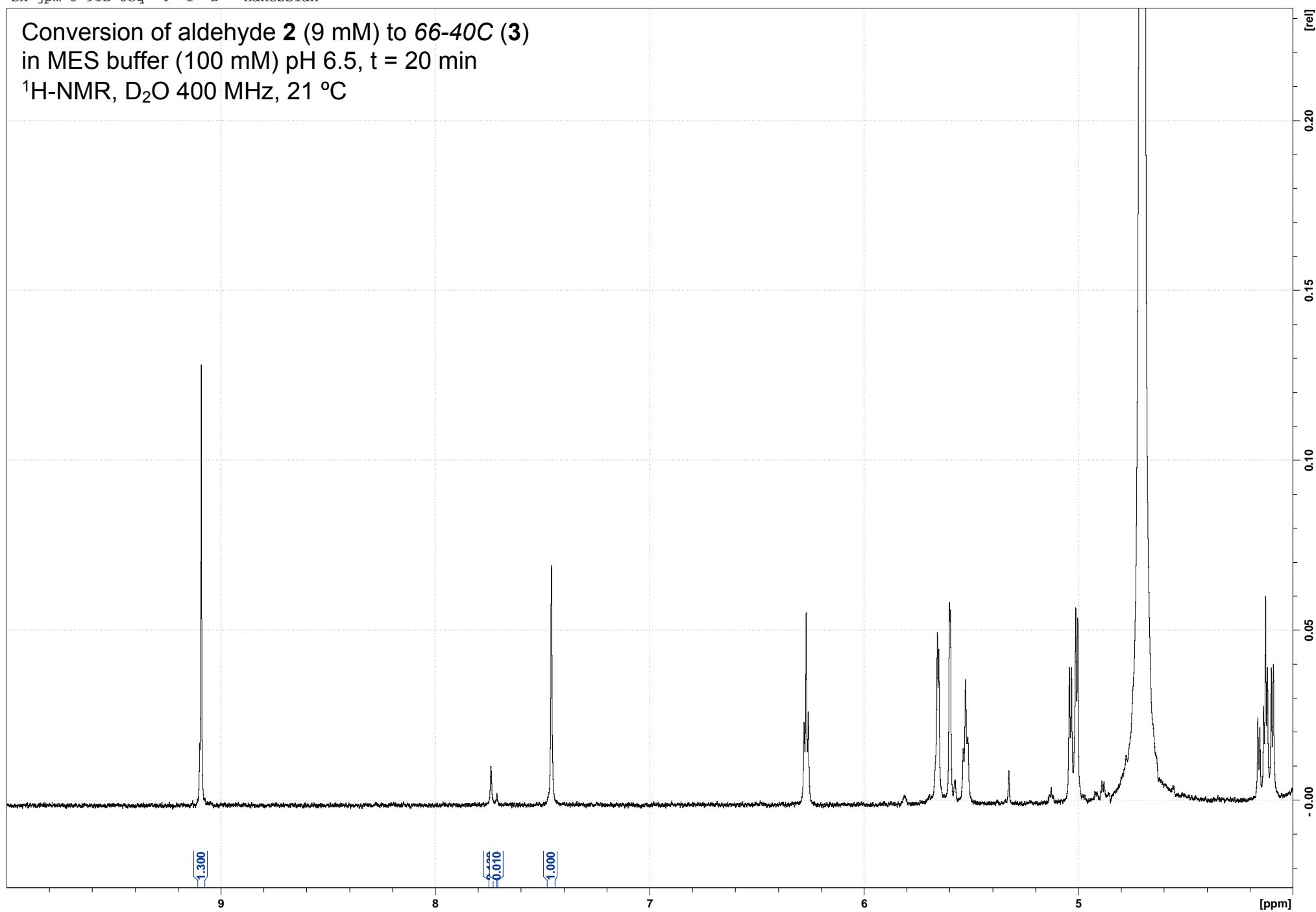
sh-jpm-6-91B-0eq 3 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 10 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



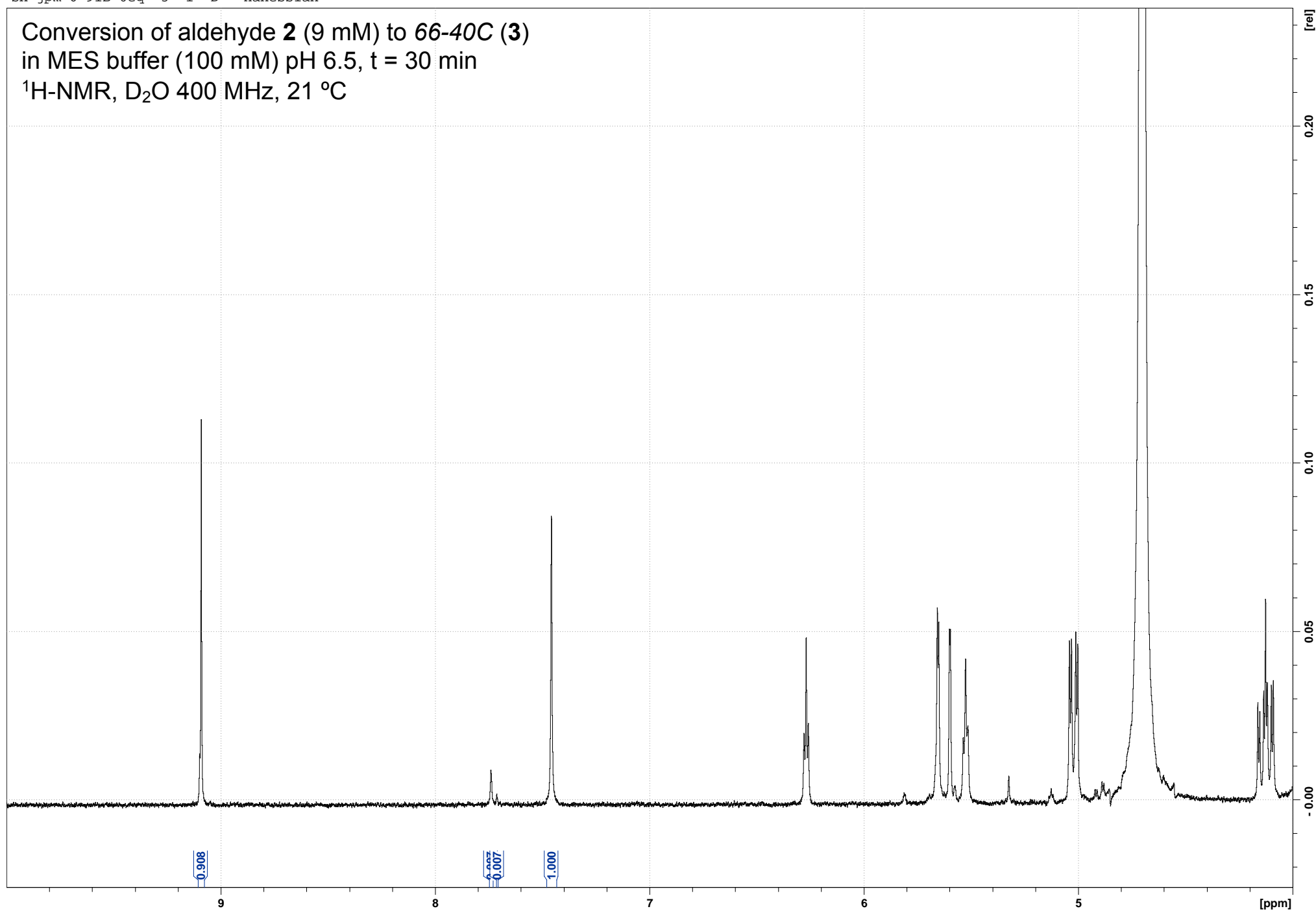
sh-jpm-6-91B-0eq 4 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 20 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91B-0eq 5 1 D: Hanessian

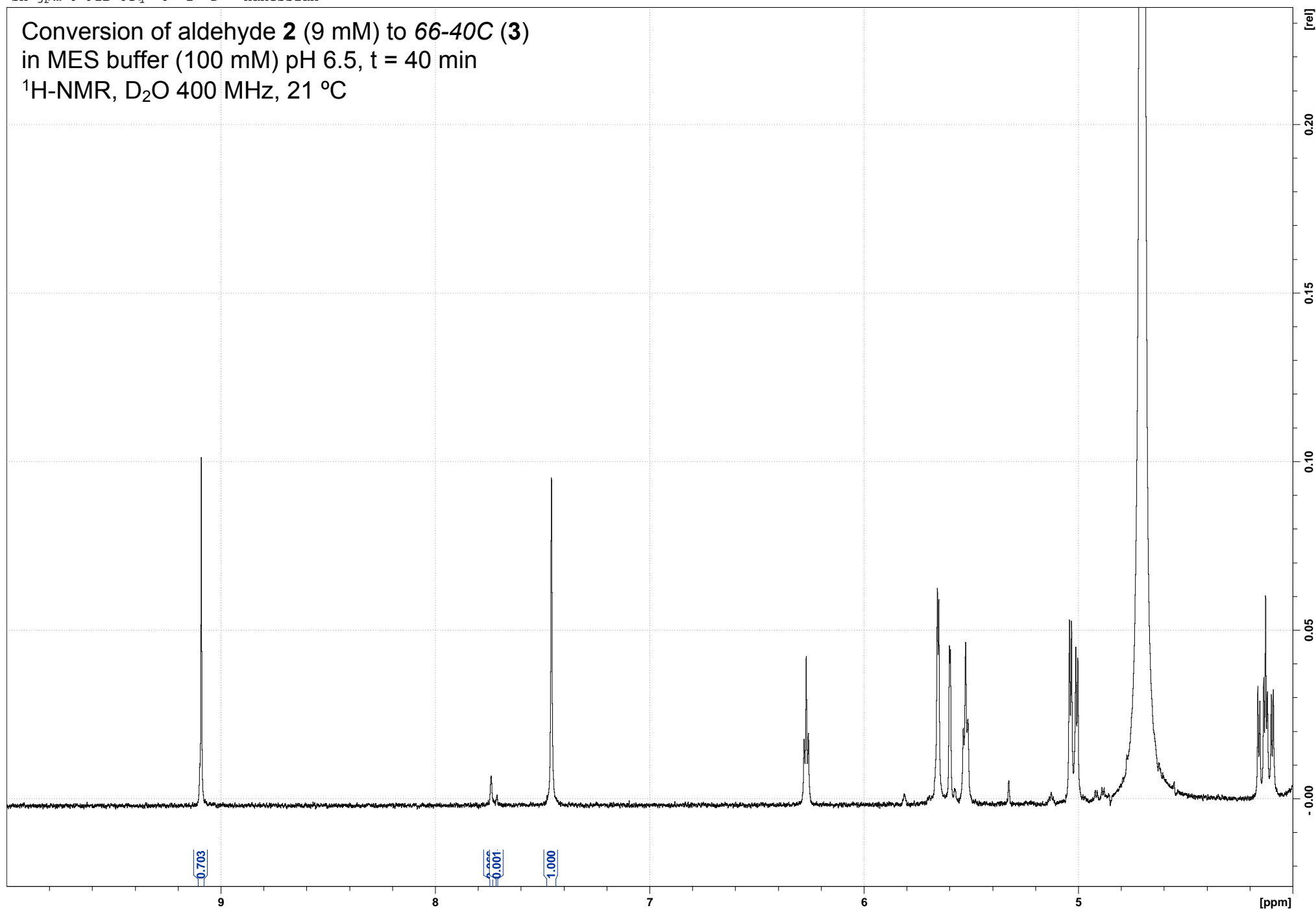
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 30 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





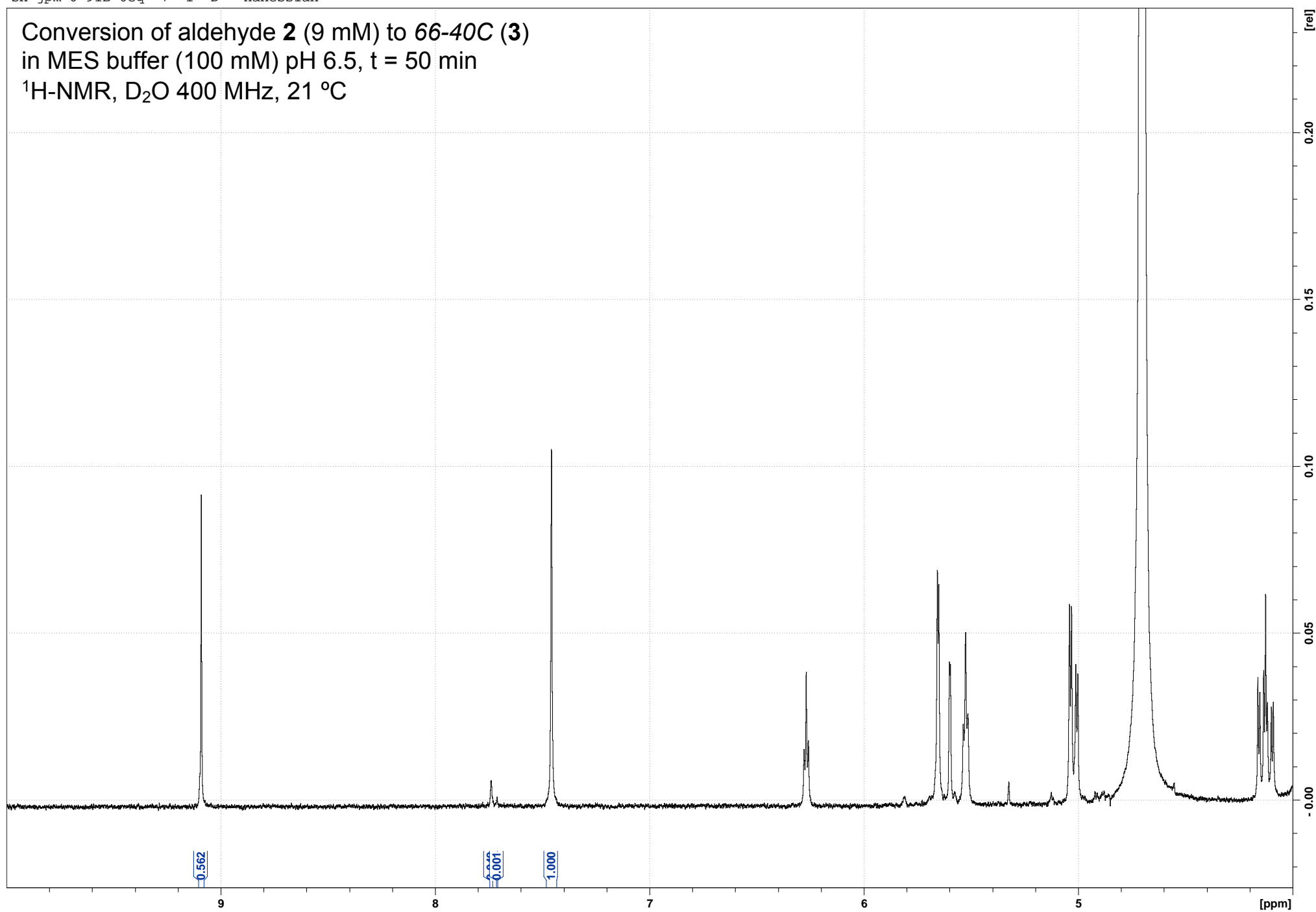
sh-jpm-6-91B-0eq 6 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 40 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



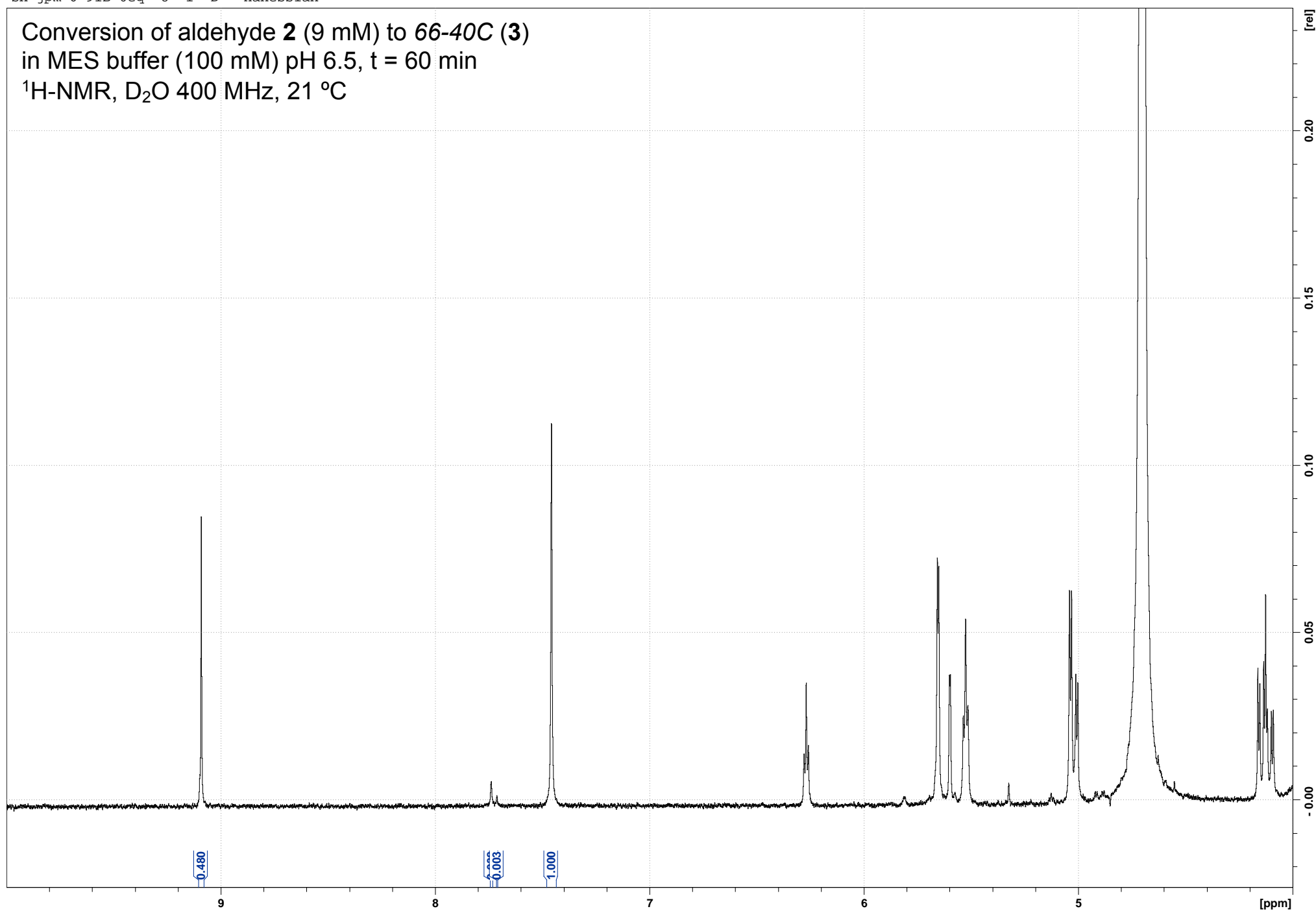
sh-jpm-6-91B-0eq 7 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 50 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



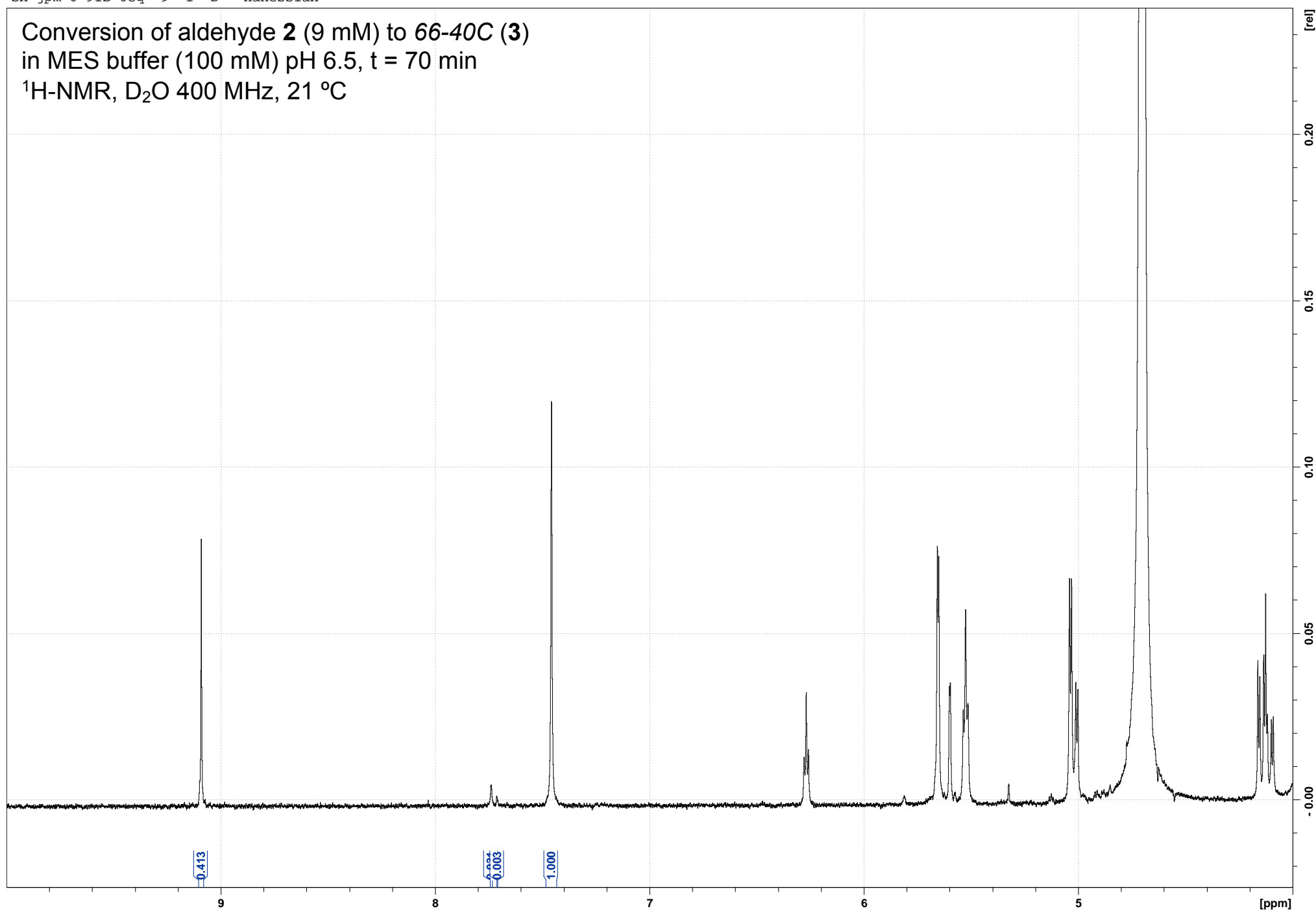
sh-jpm-6-91B-0eq 8 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 60 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



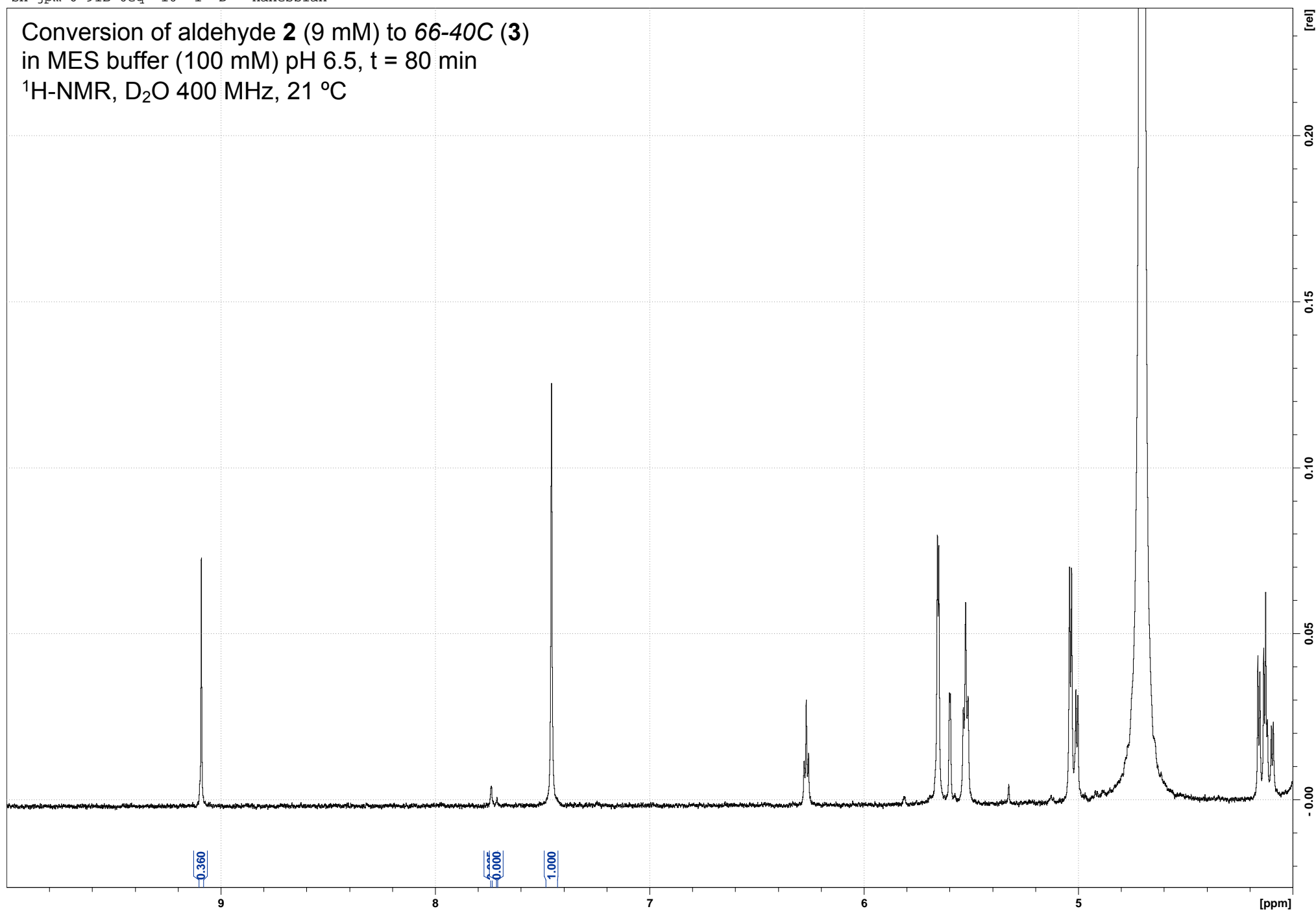
sh-jpm-6-91B-0eq 9 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 70 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



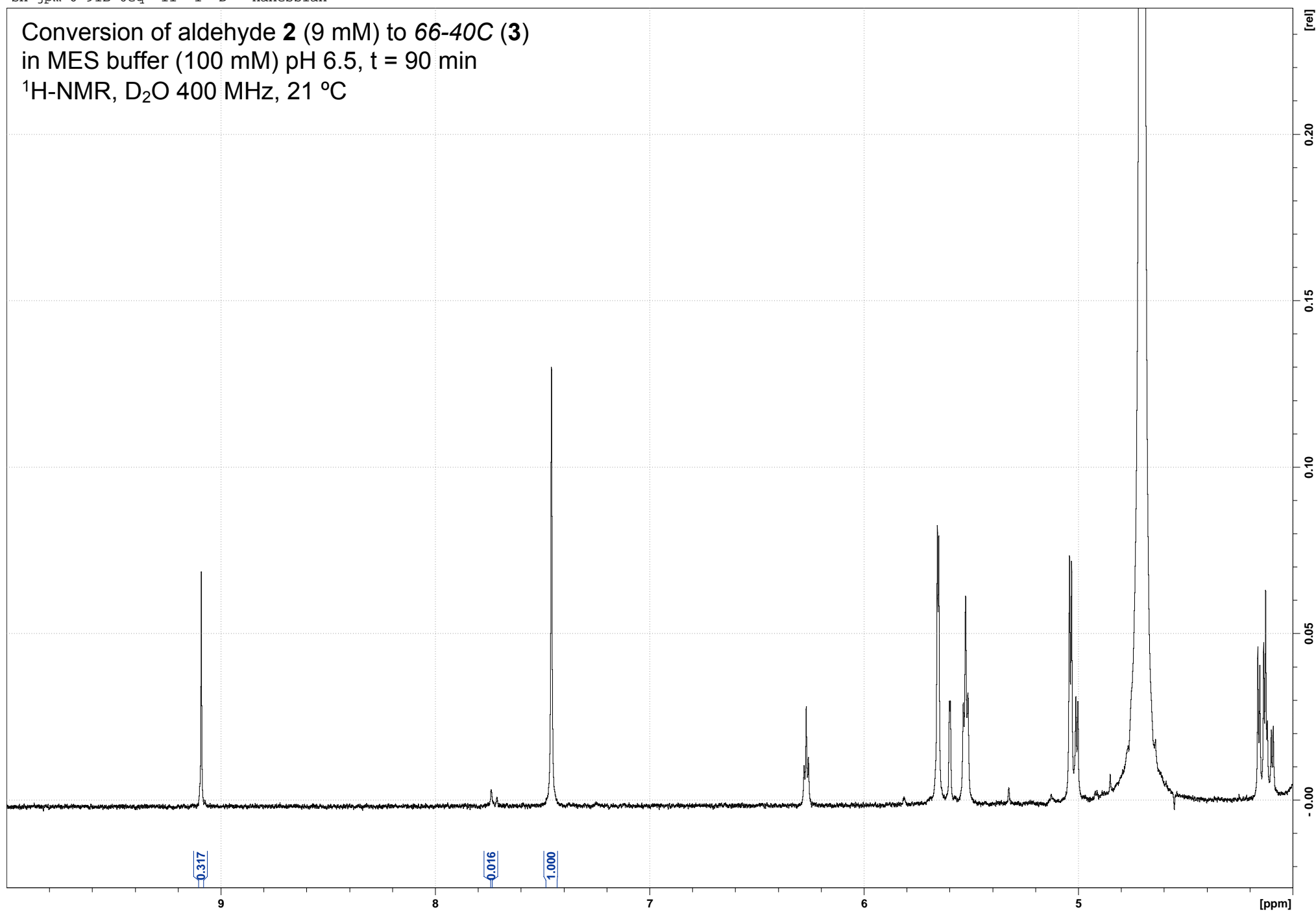
sh-jpm-6-91B-0eq 10 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 80 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



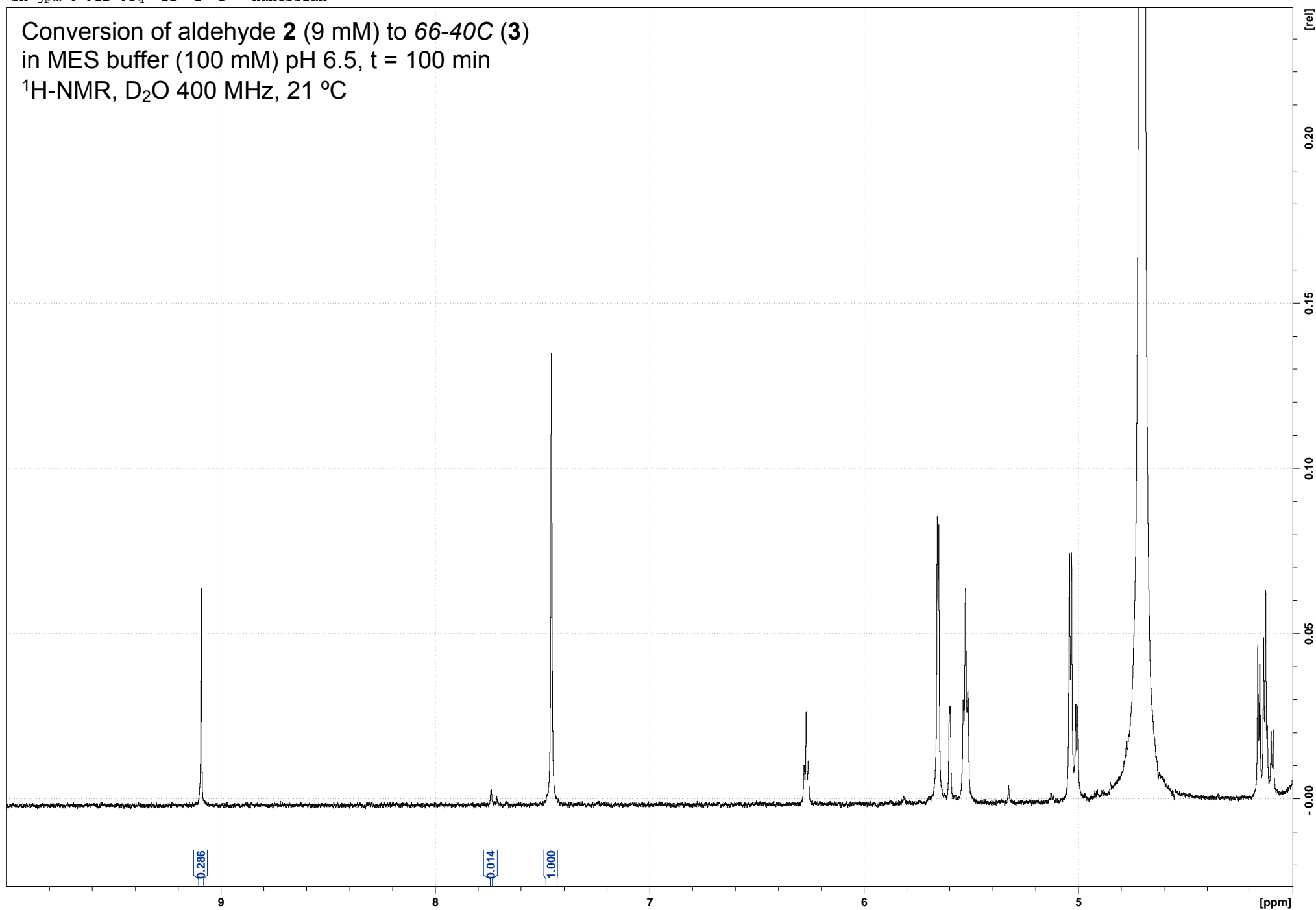
sh-jpm-6-91B-0eq 11 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 90 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



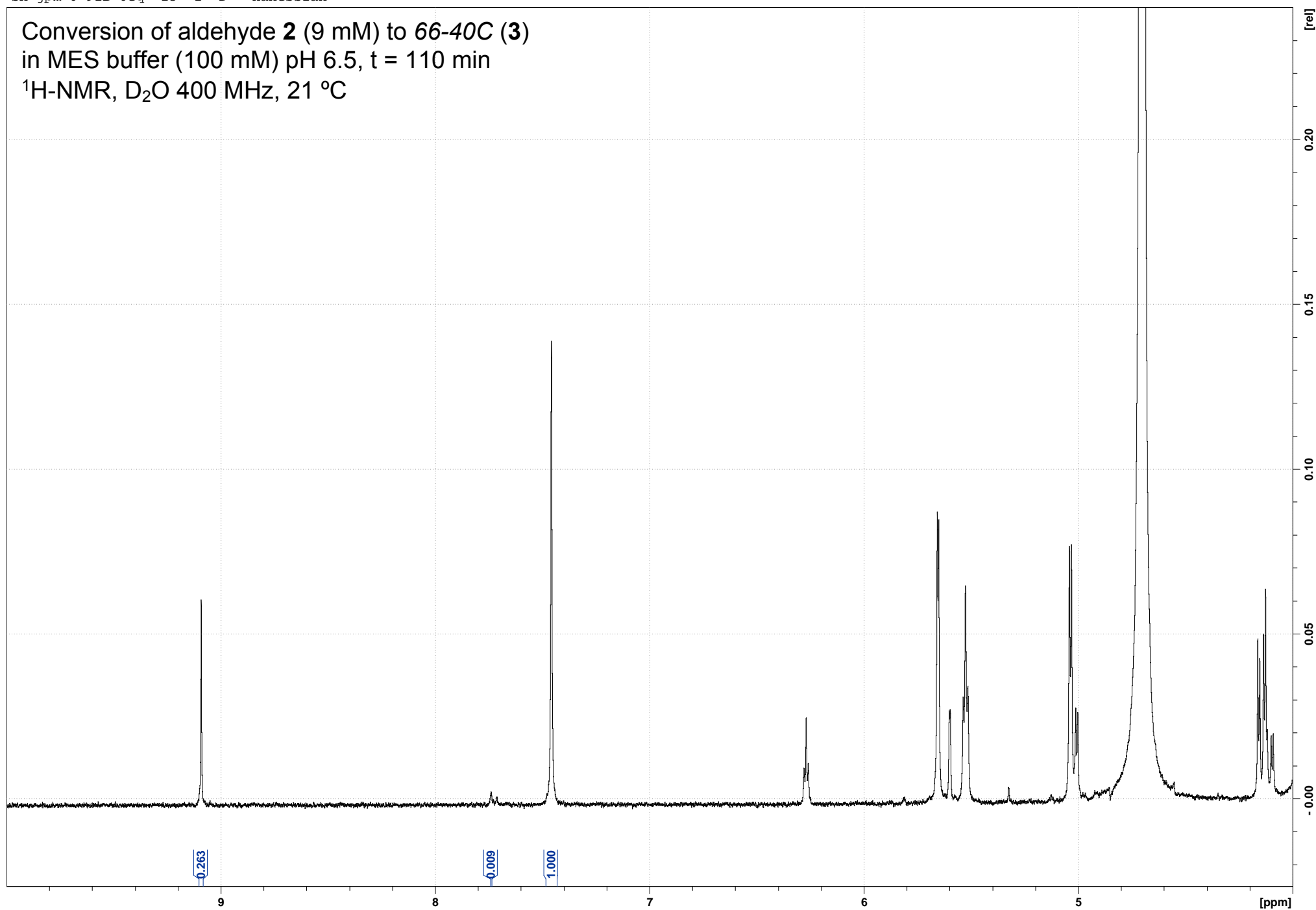
sh-jpm-6-91B-0eq 12 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 100 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



sh-jpm-6-91B-0eq 13 1 D: Hanessian

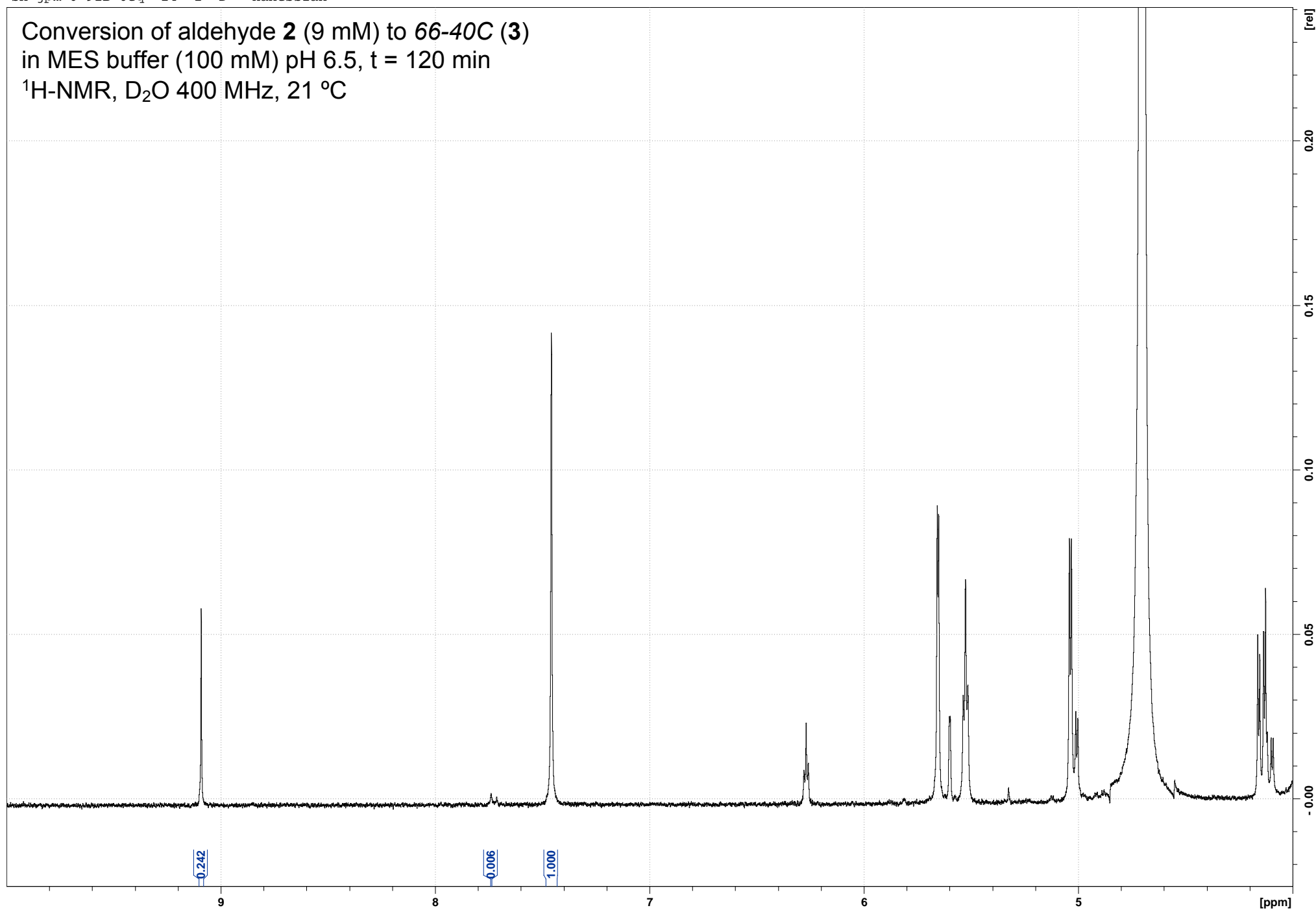
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 110 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





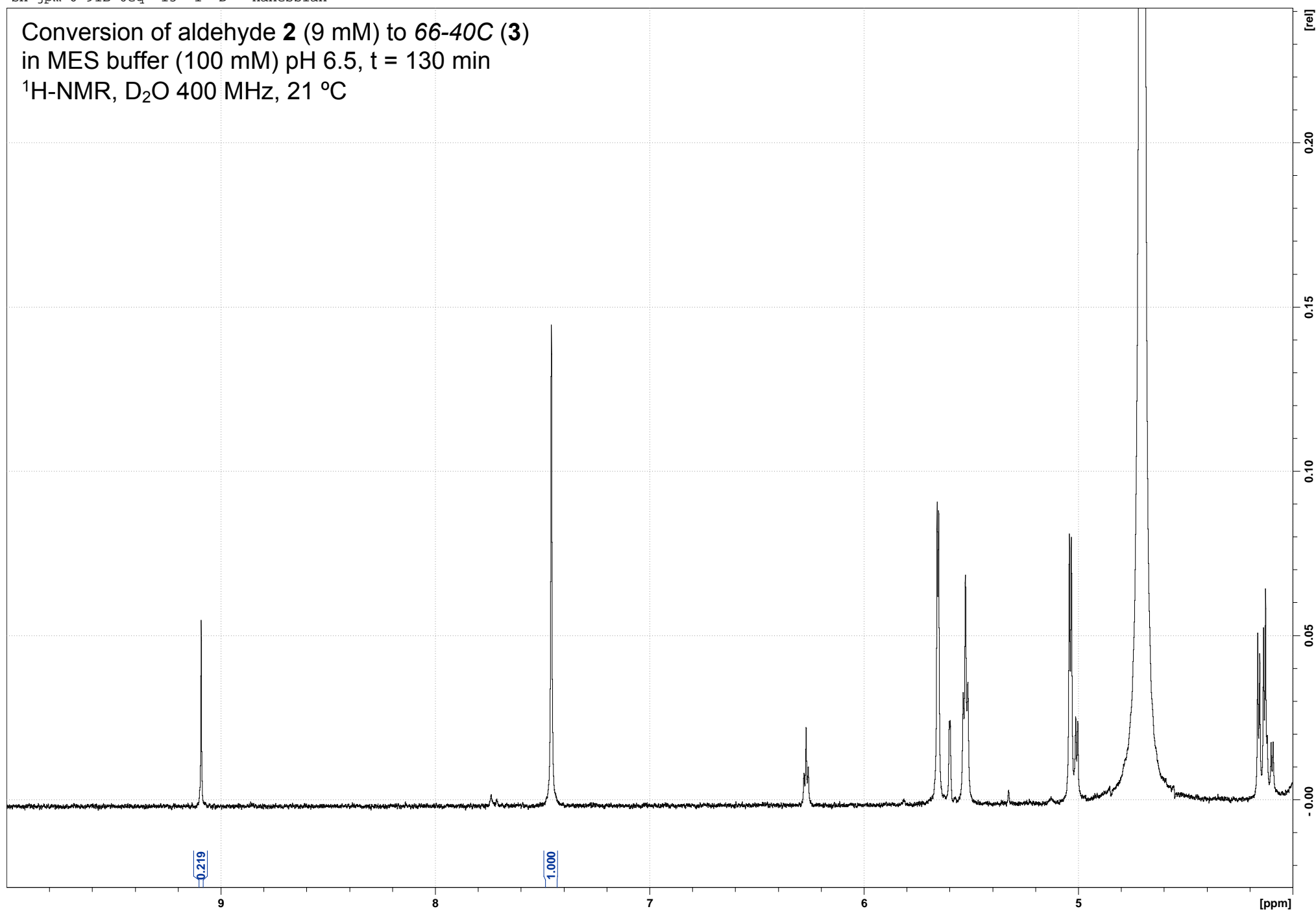
sh-jpm-6-91B-0eq 14 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 120 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



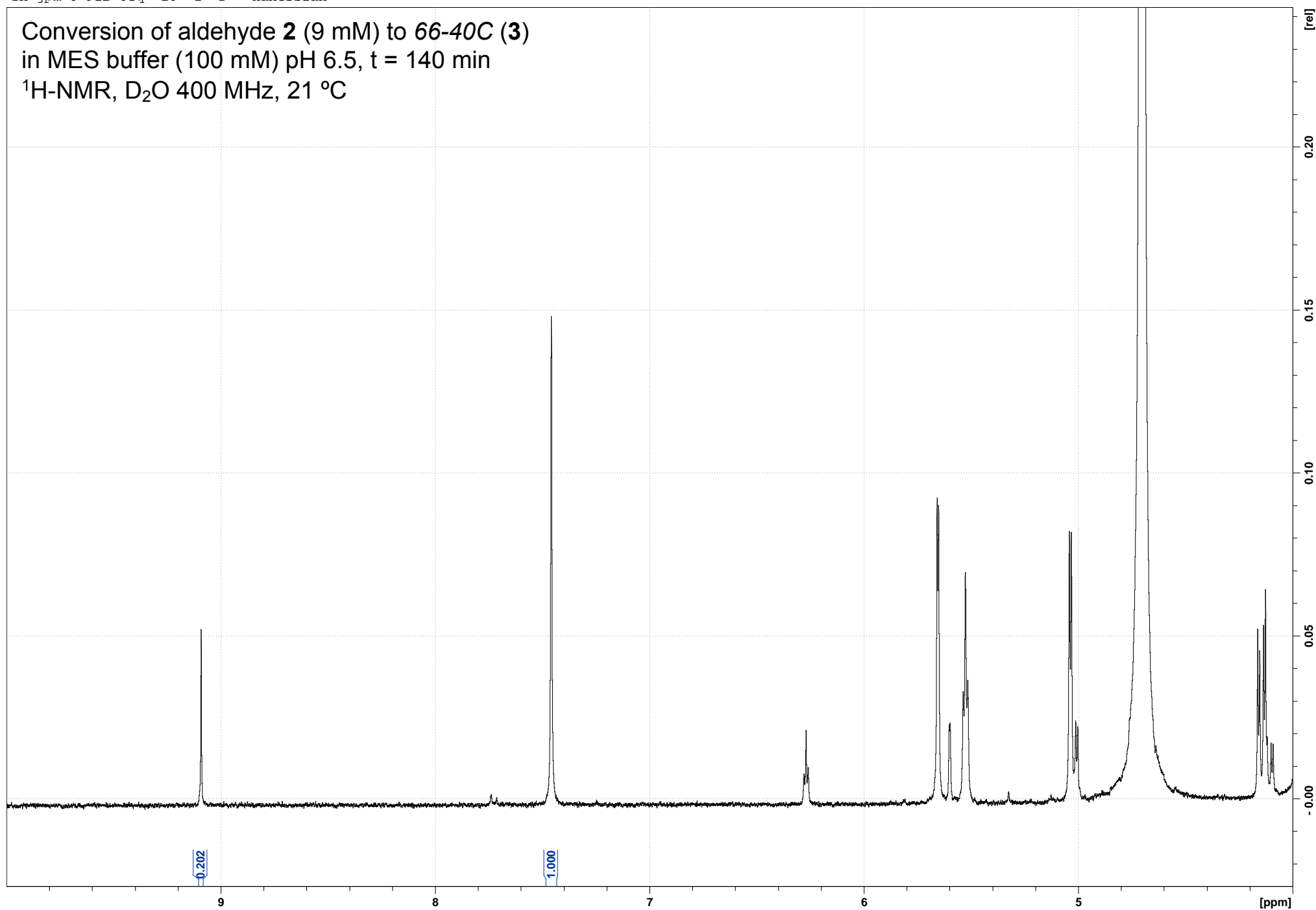
sh-jpm-6-91B-0eq 15 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 130 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



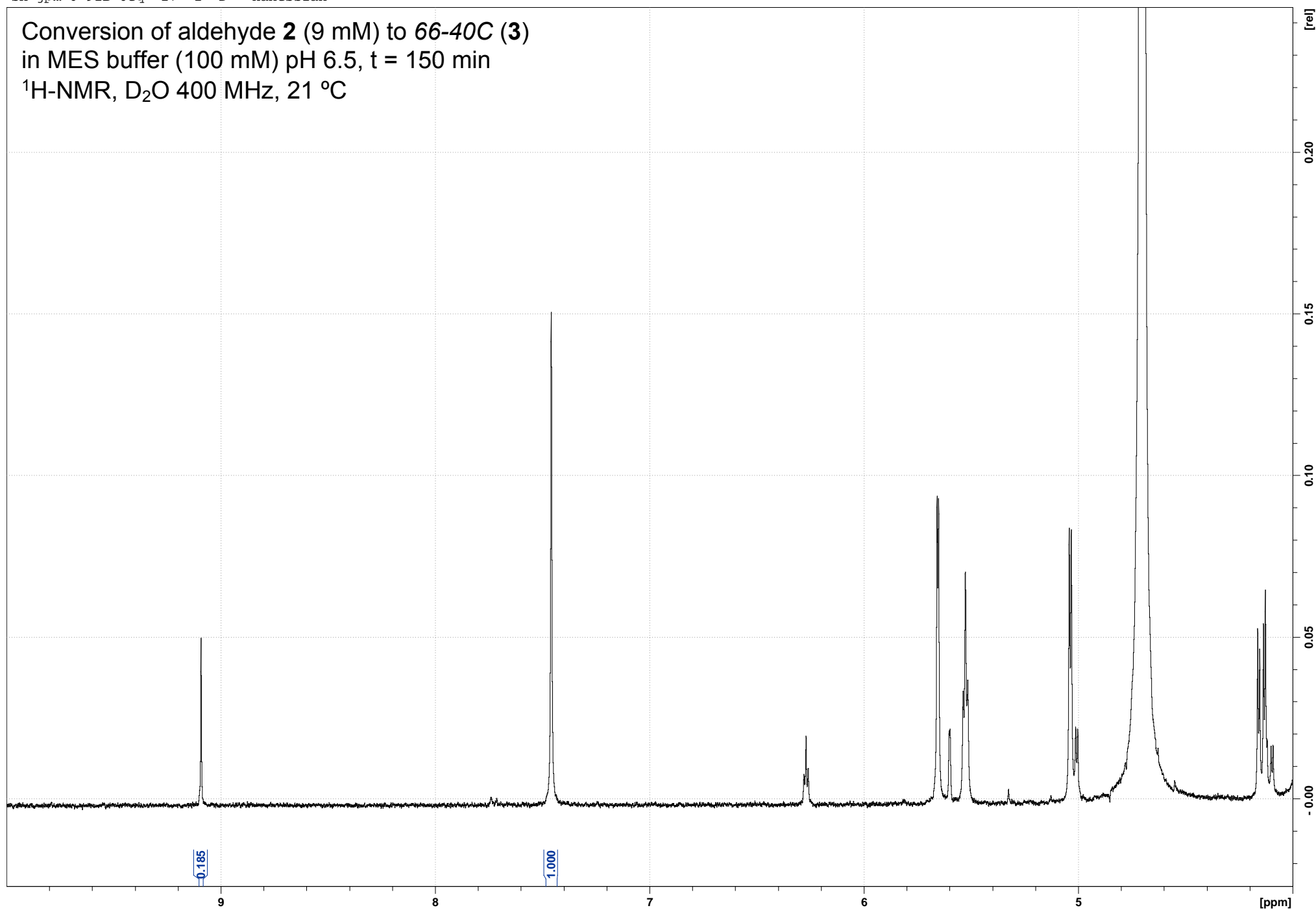
sh-jpm-6-91B-0eq 16 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 140 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



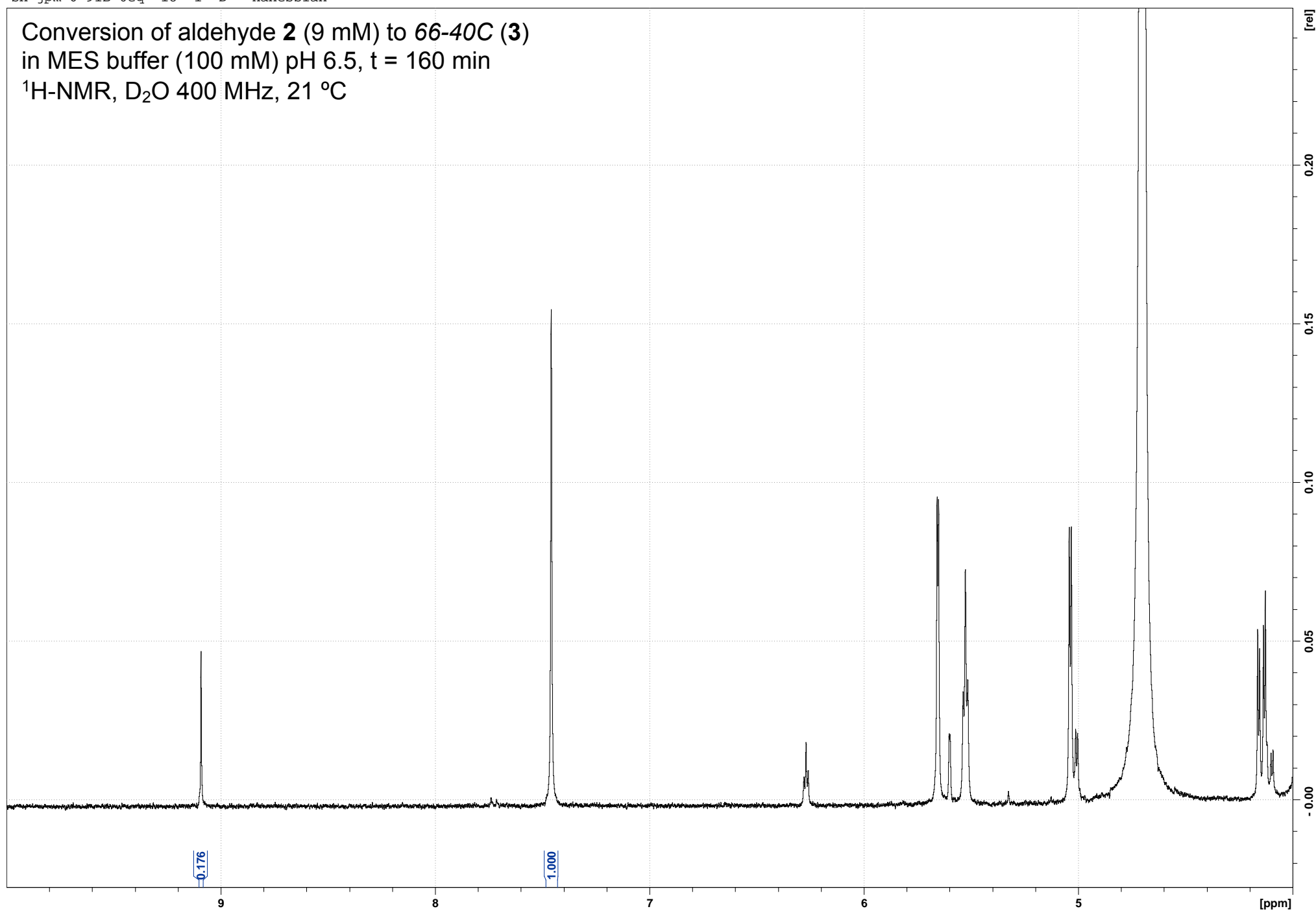
sh-jpm-6-91B-0eq 17 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 150 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



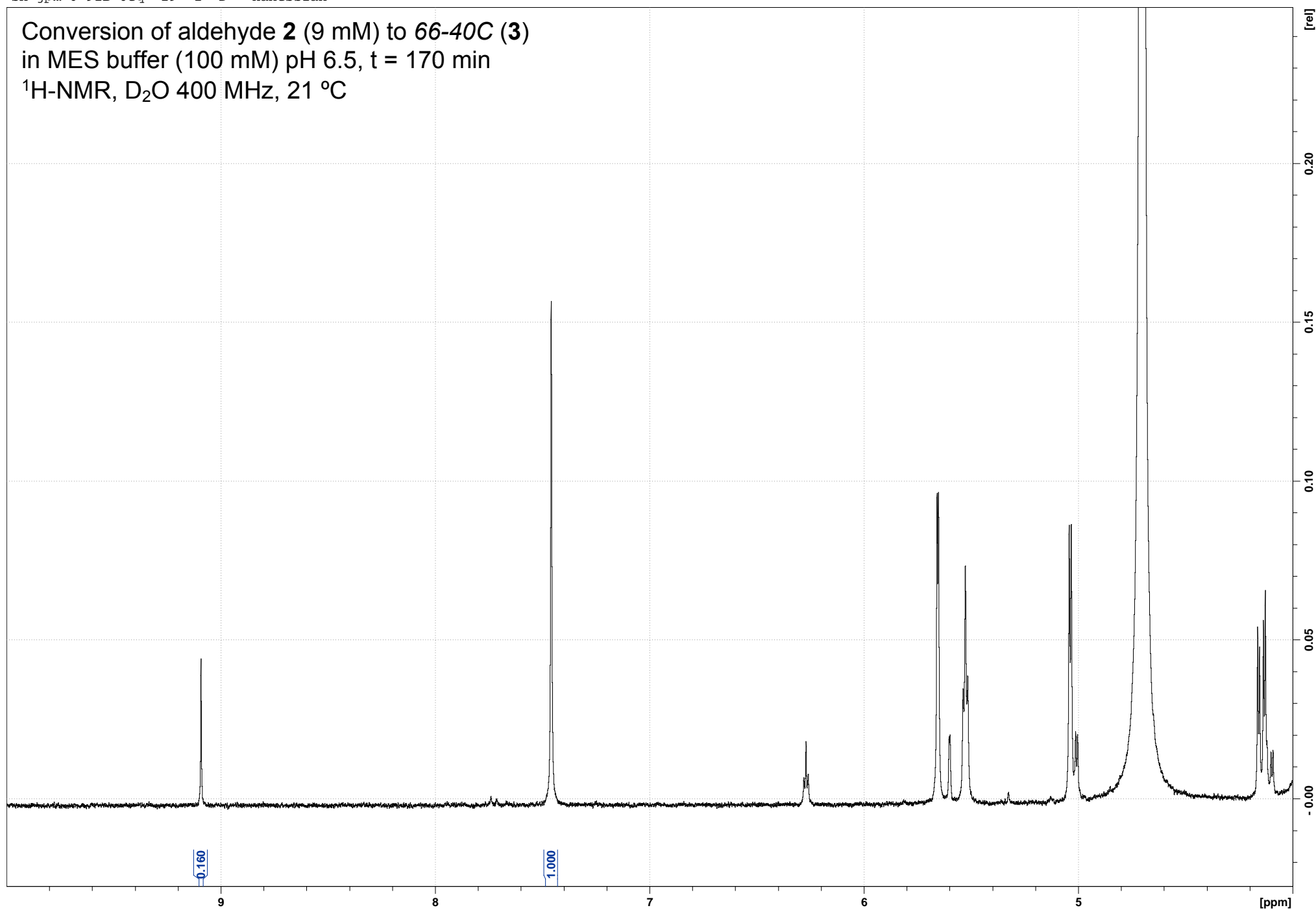
sh-jpm-6-91B-0eq 18 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 160 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



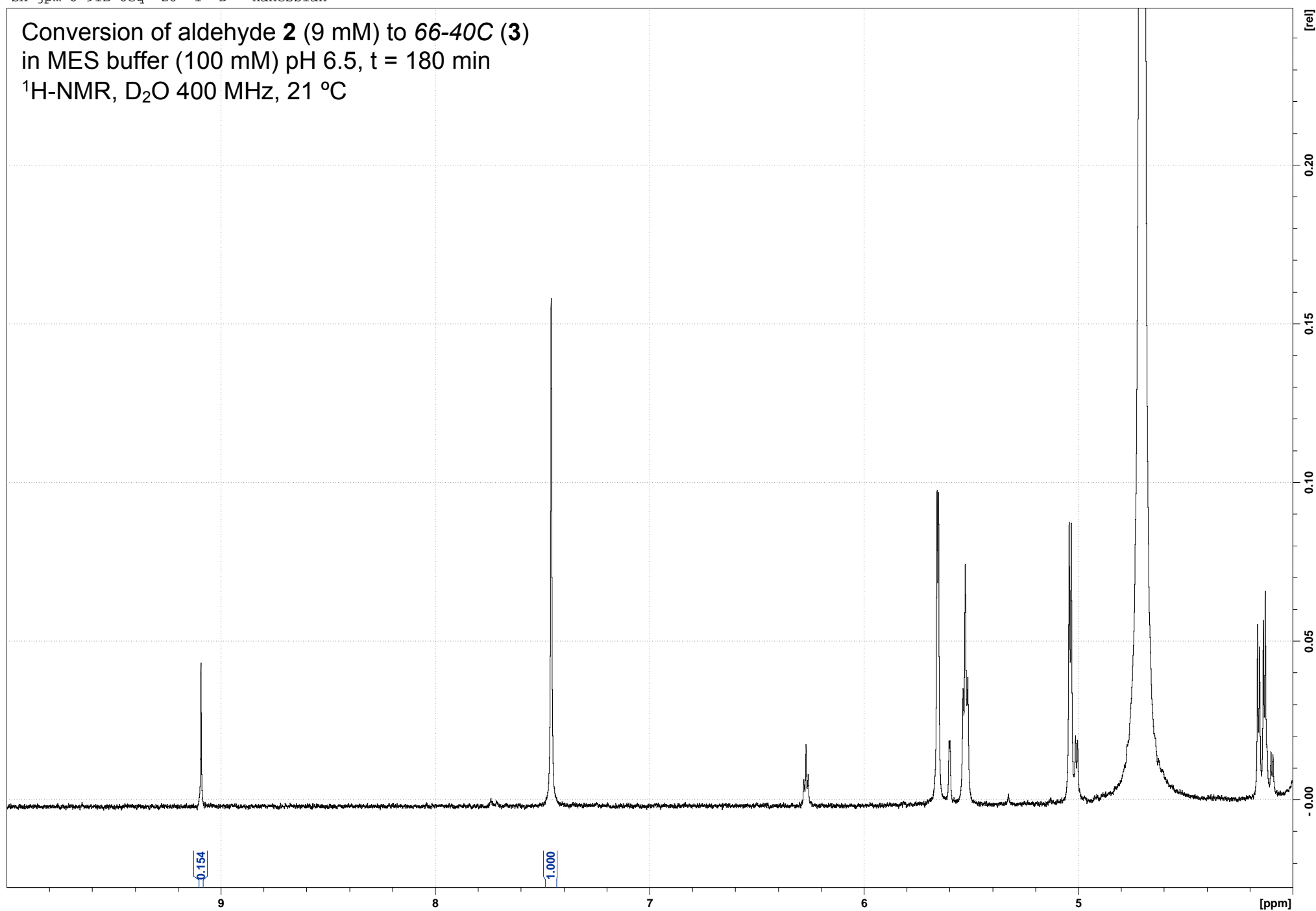
sh-jpm-6-91B-0eq 19 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 170 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



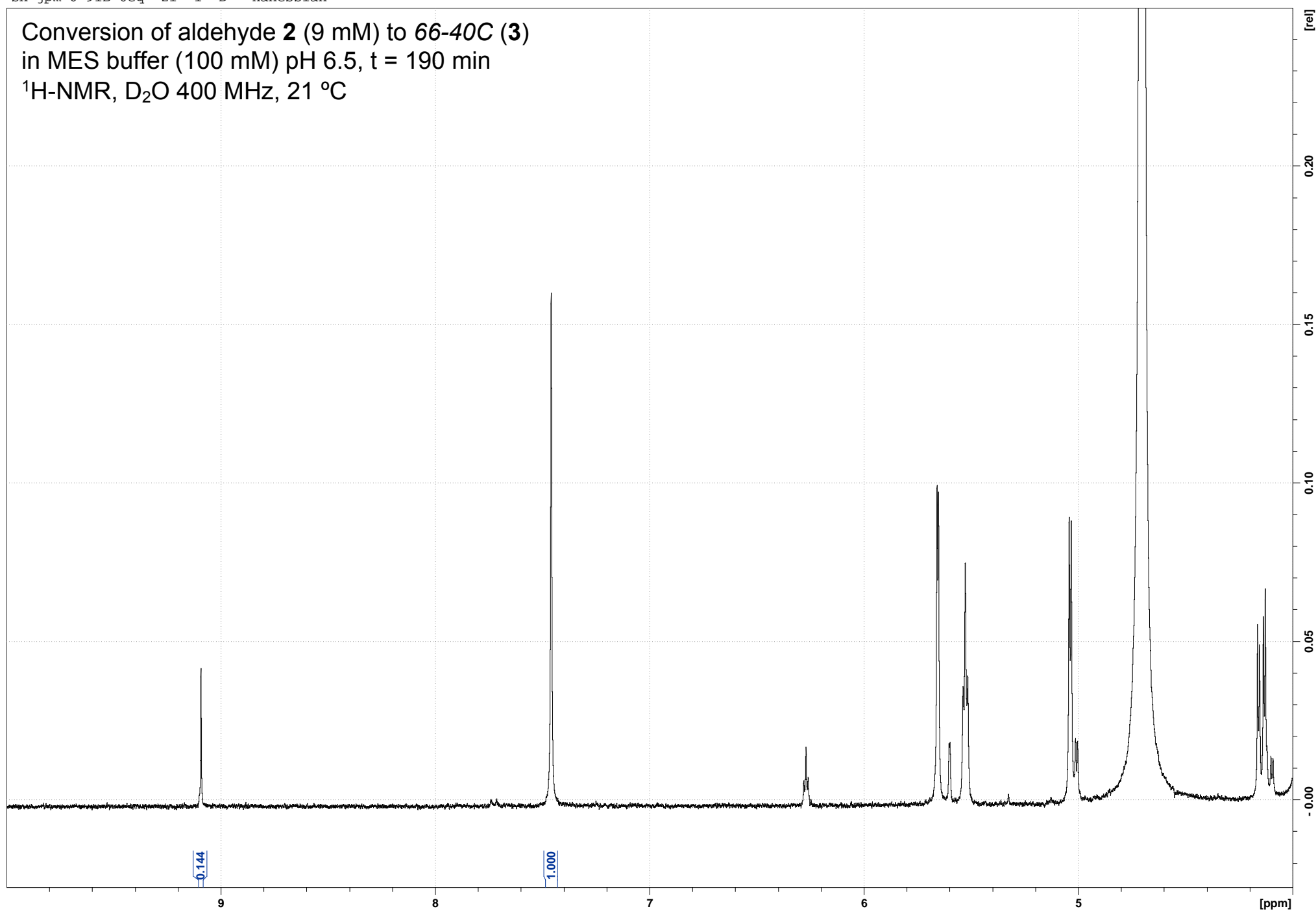
sh-jpm-6-91B-0eq 20 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 180 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91B-0eq 21 1 D: Hanessian

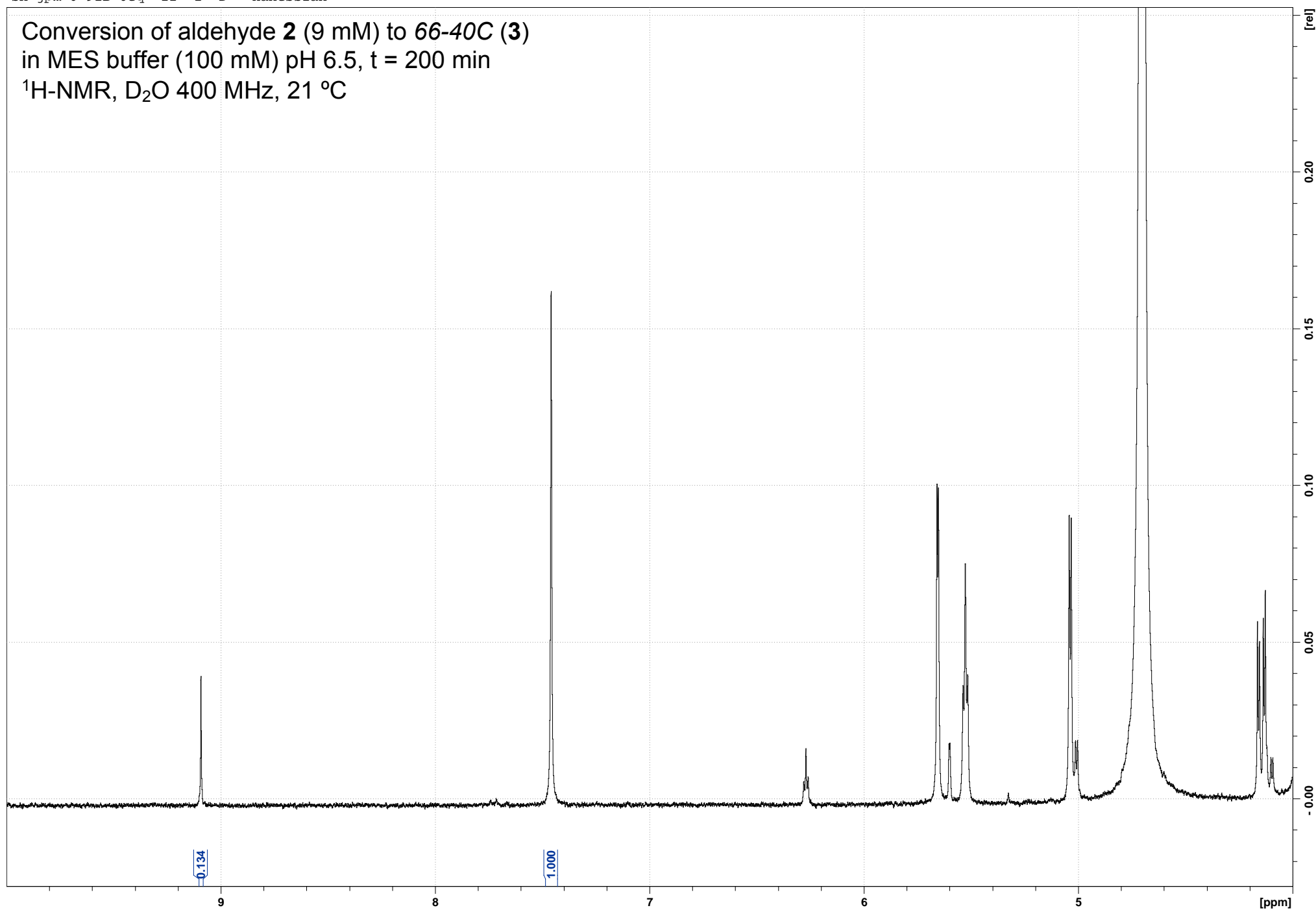
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 190 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





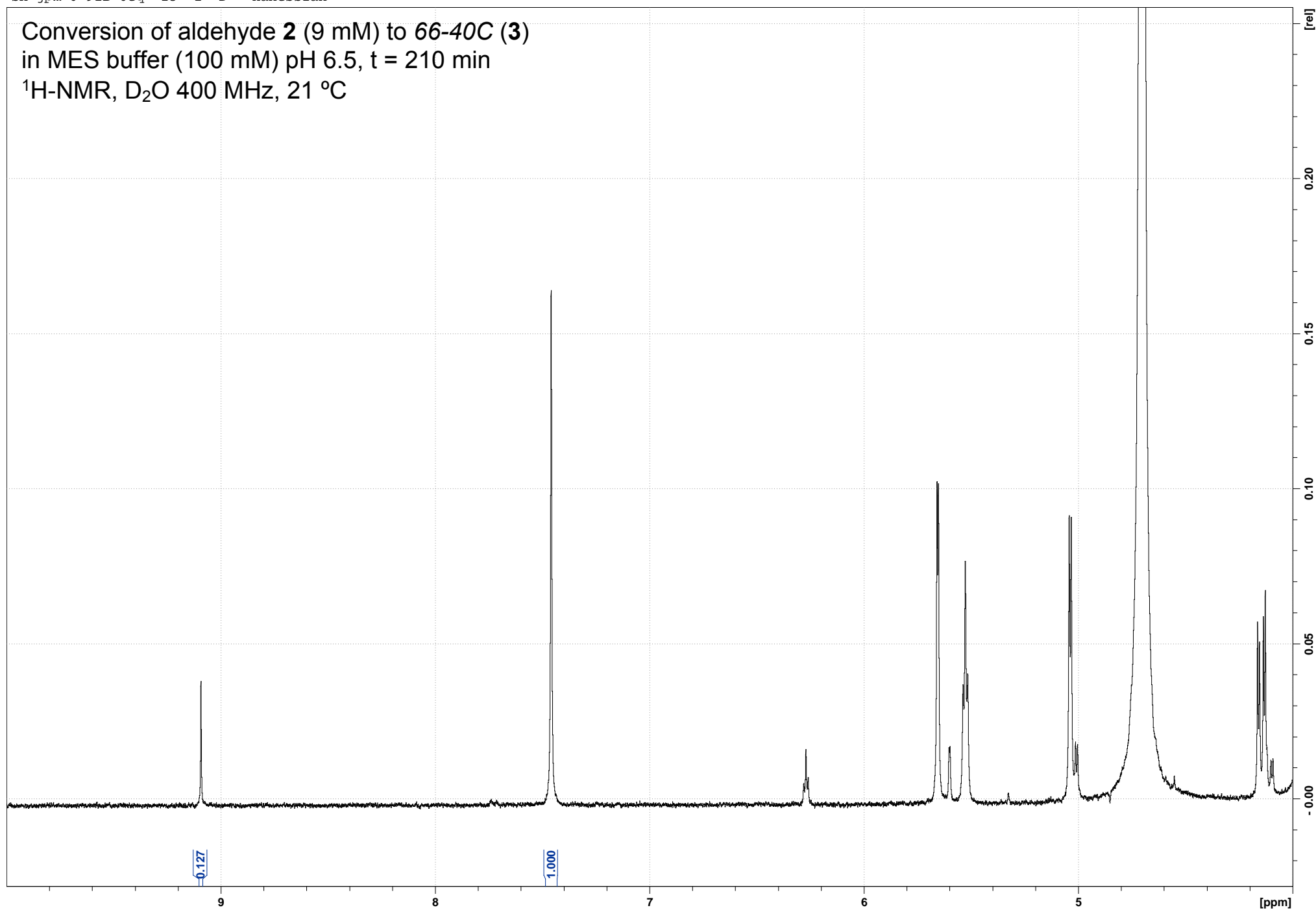
sh-jpm-6-91B-0eq 22 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 200 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



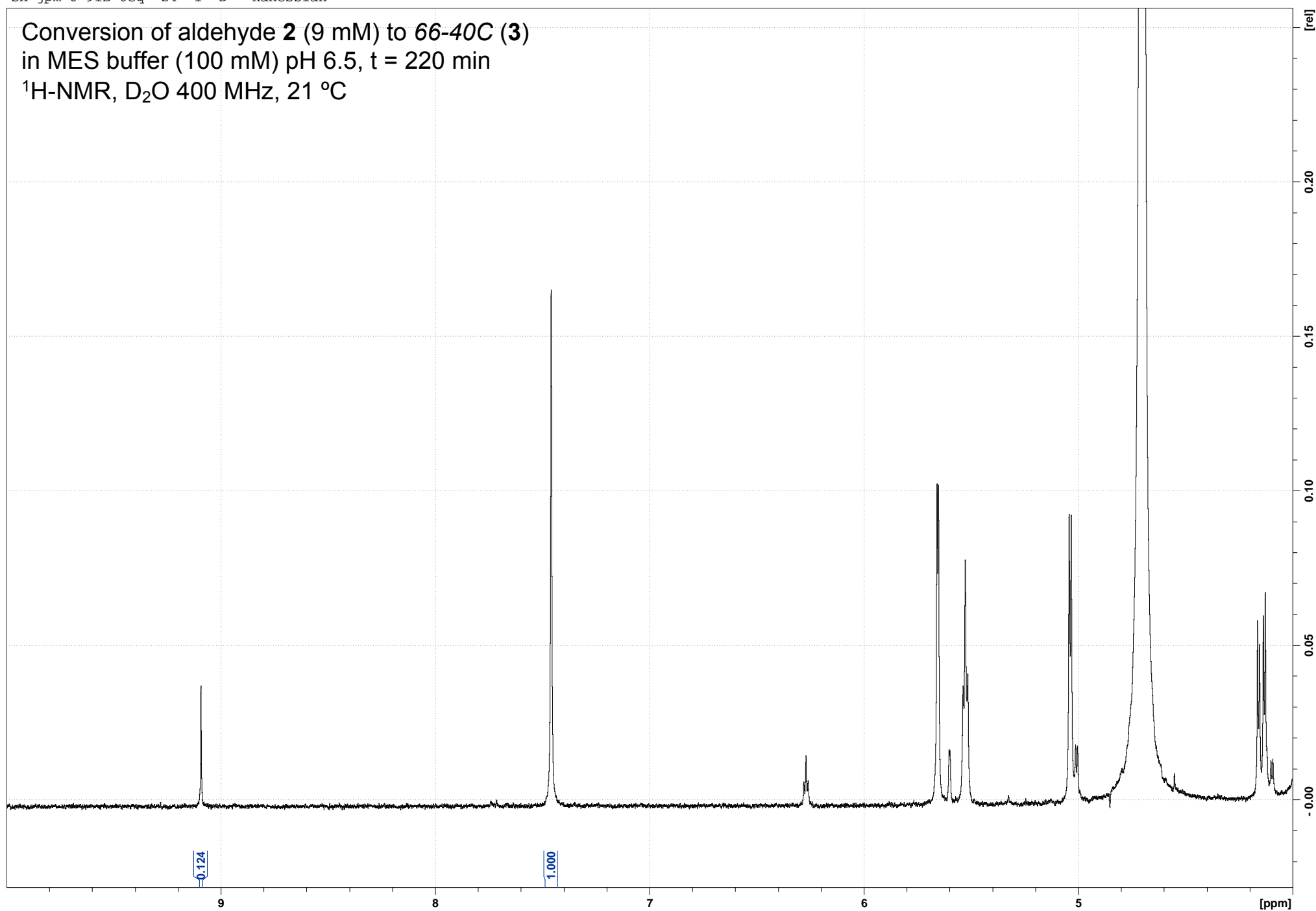
sh-jpm-6-91B-0eq 23 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 210 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



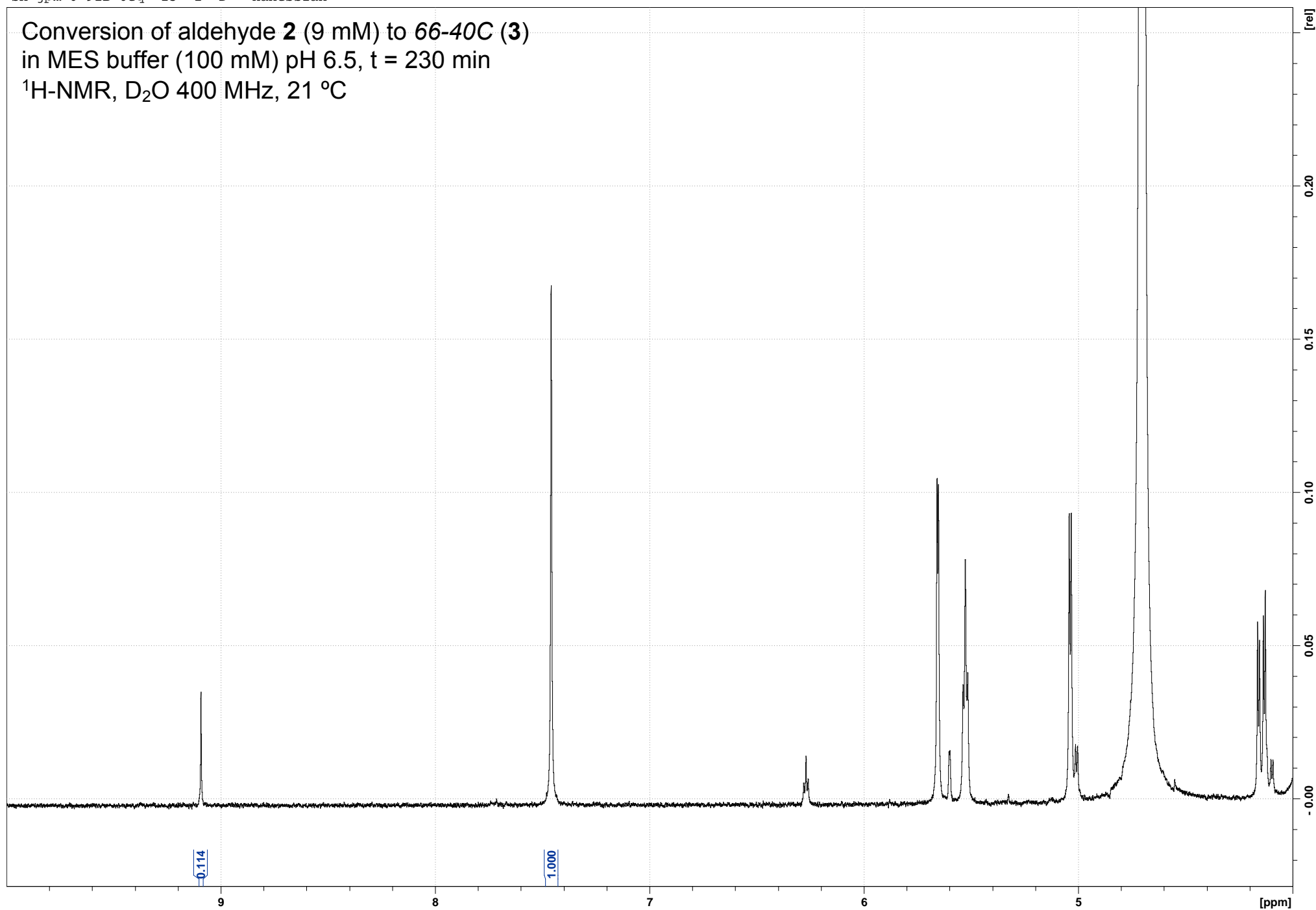
sh-jpm-6-91B-0eq 24 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 220 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



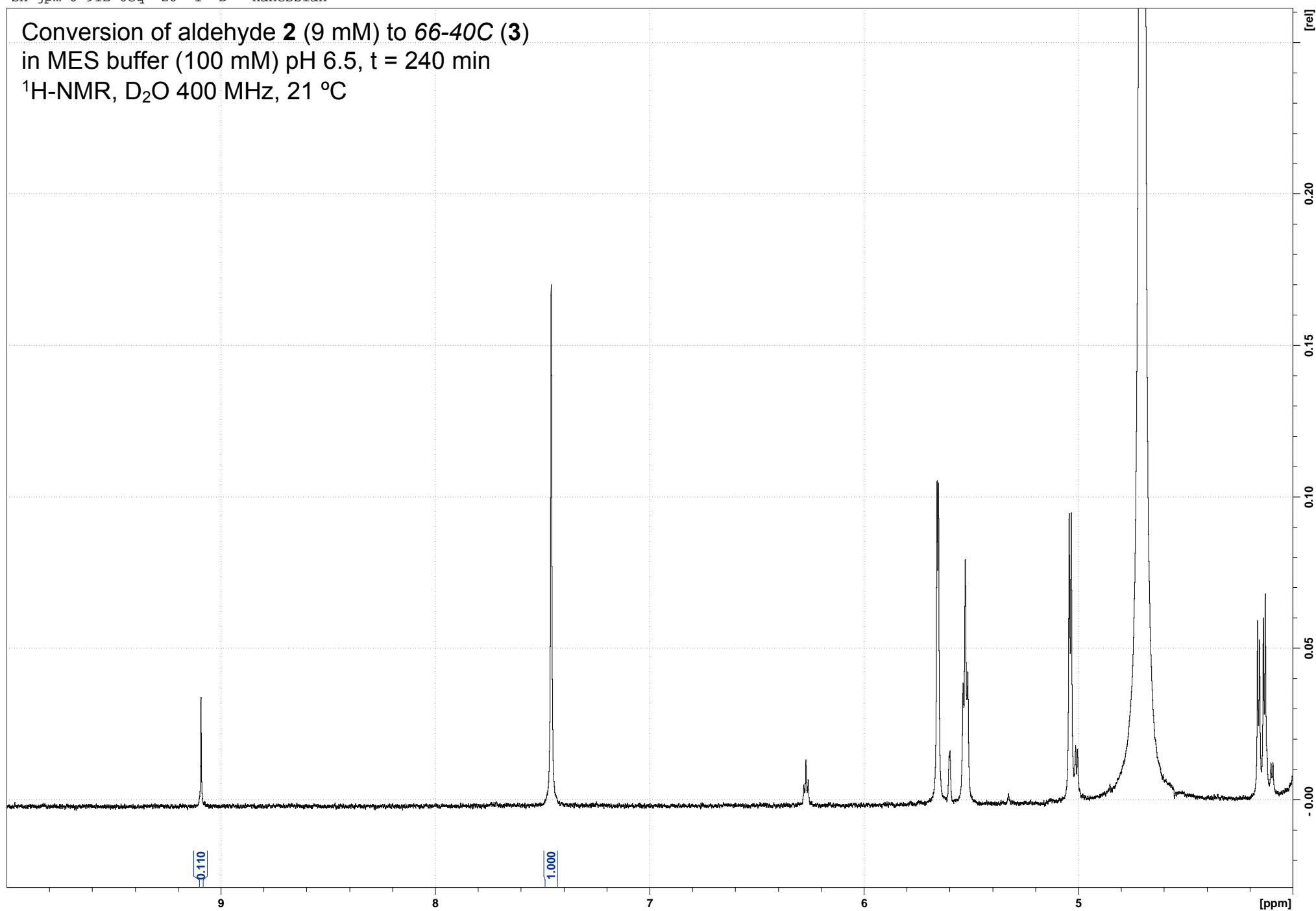
sh-jpm-6-91B-0eq 25 1 D: Hnessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 230 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



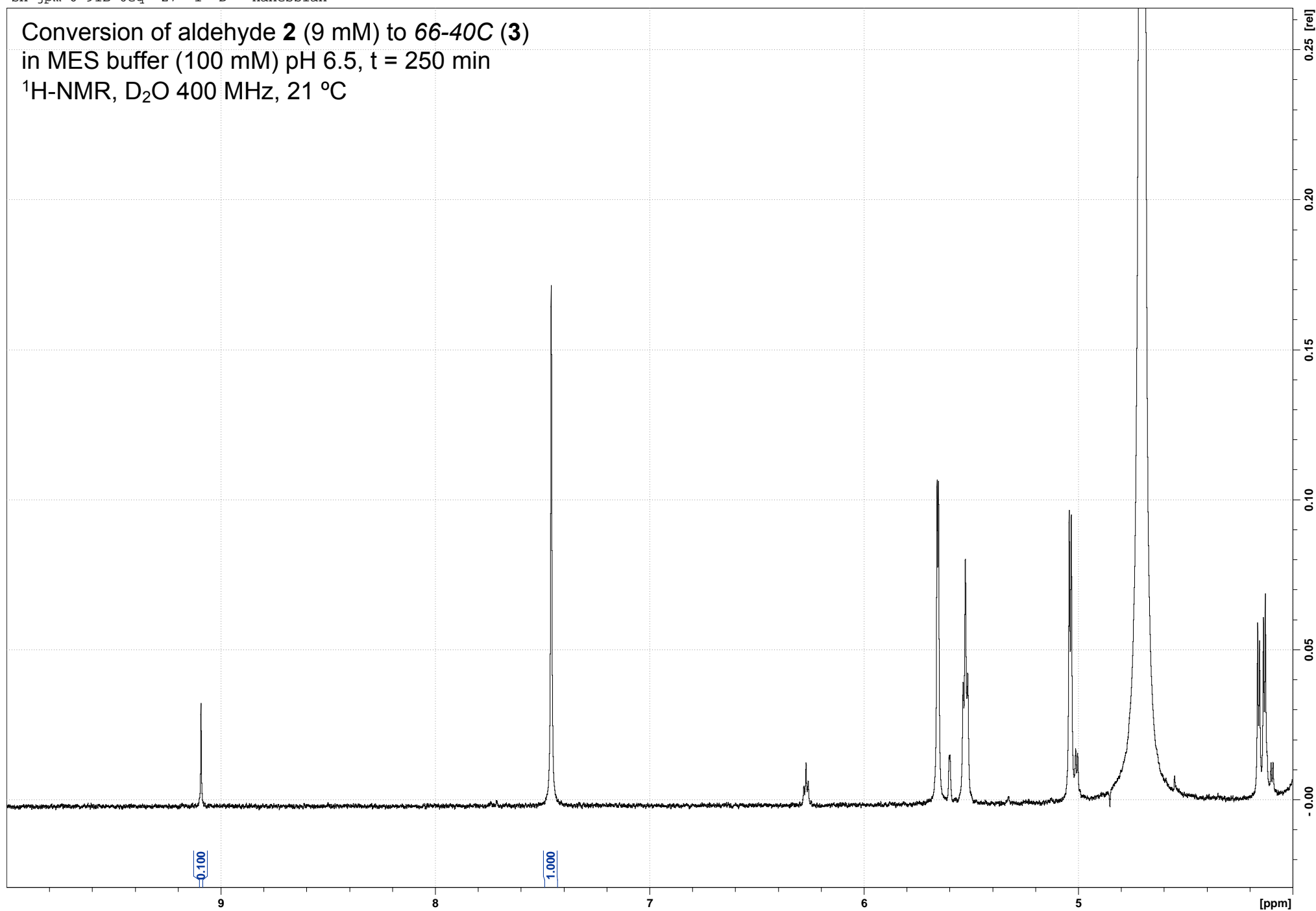
sh-jpm-6-91B-0eq 26 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 240 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



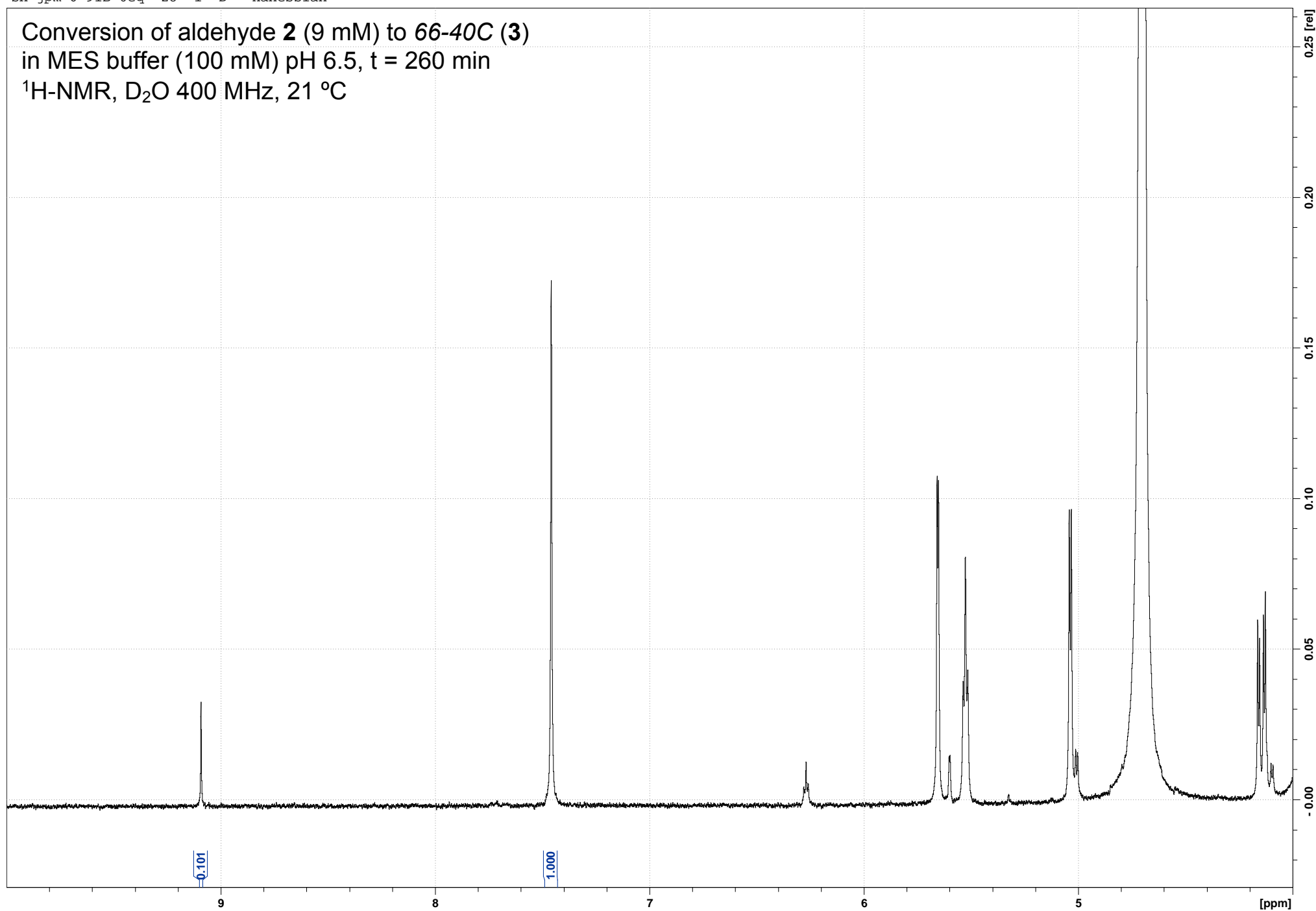
sh-jpm-6-91B-0eq 27 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 250 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



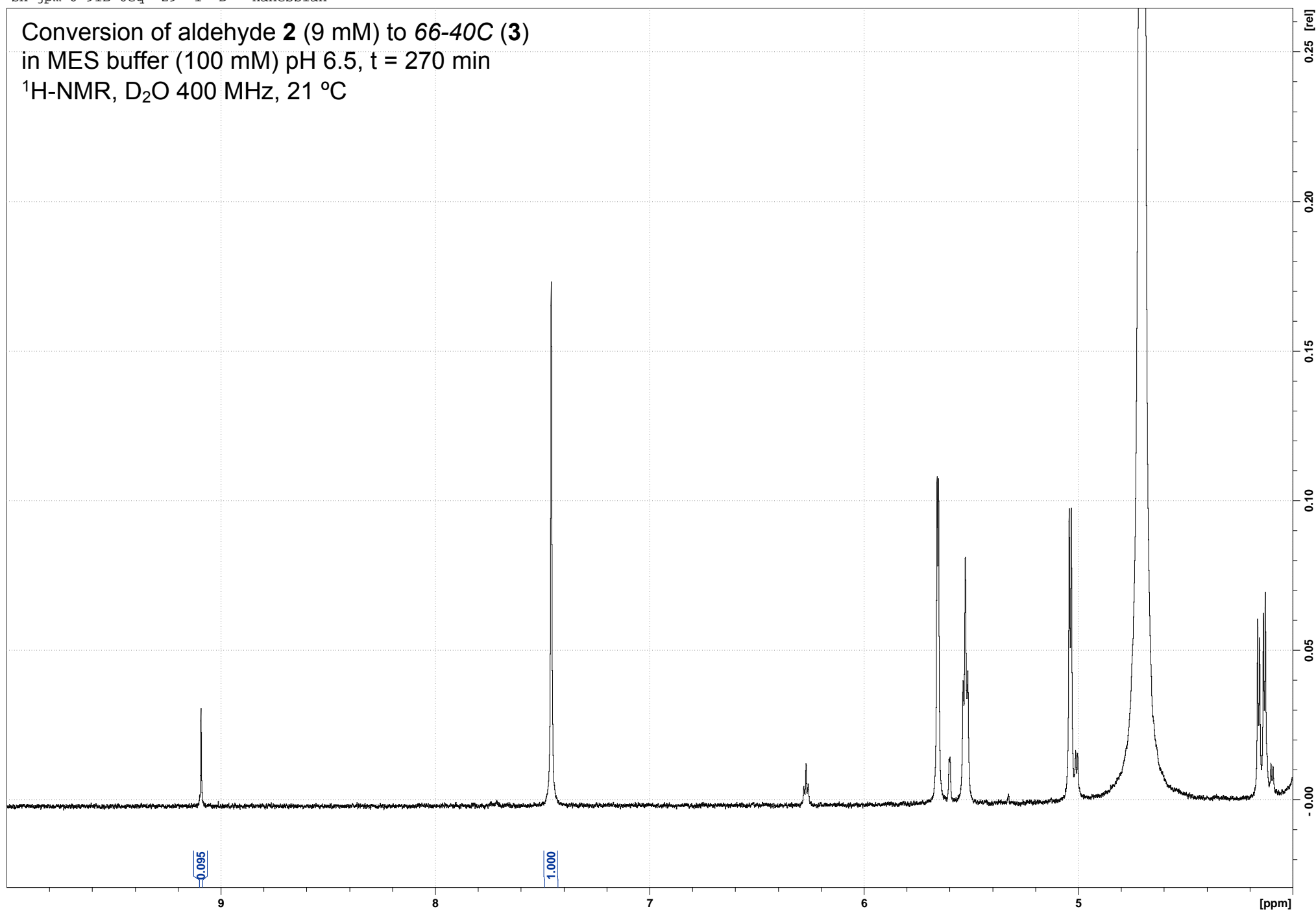
sh-jpm-6-91B-0eq 28 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 260 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91B-0eq 29 1 D: Hanessian

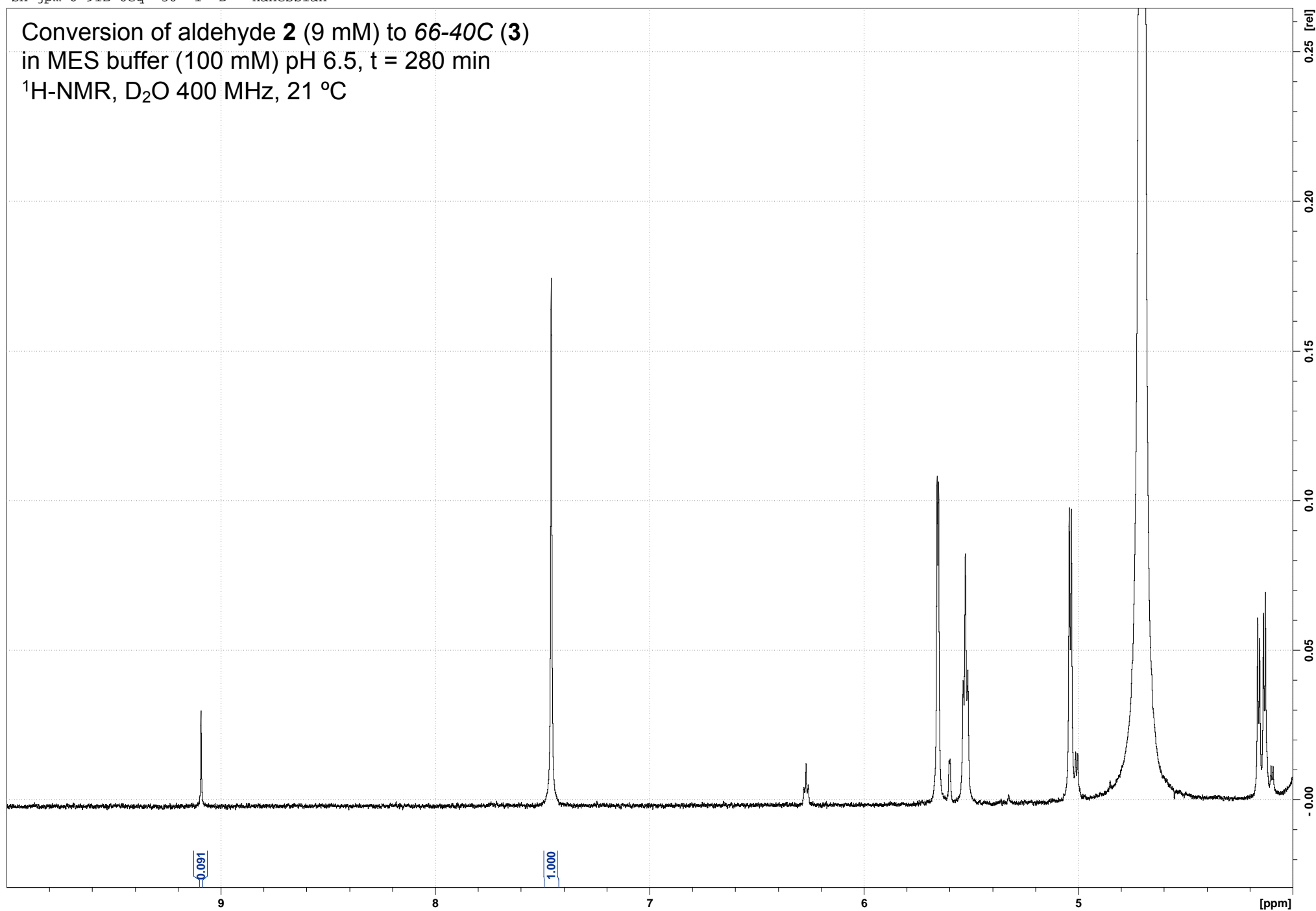
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 270 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





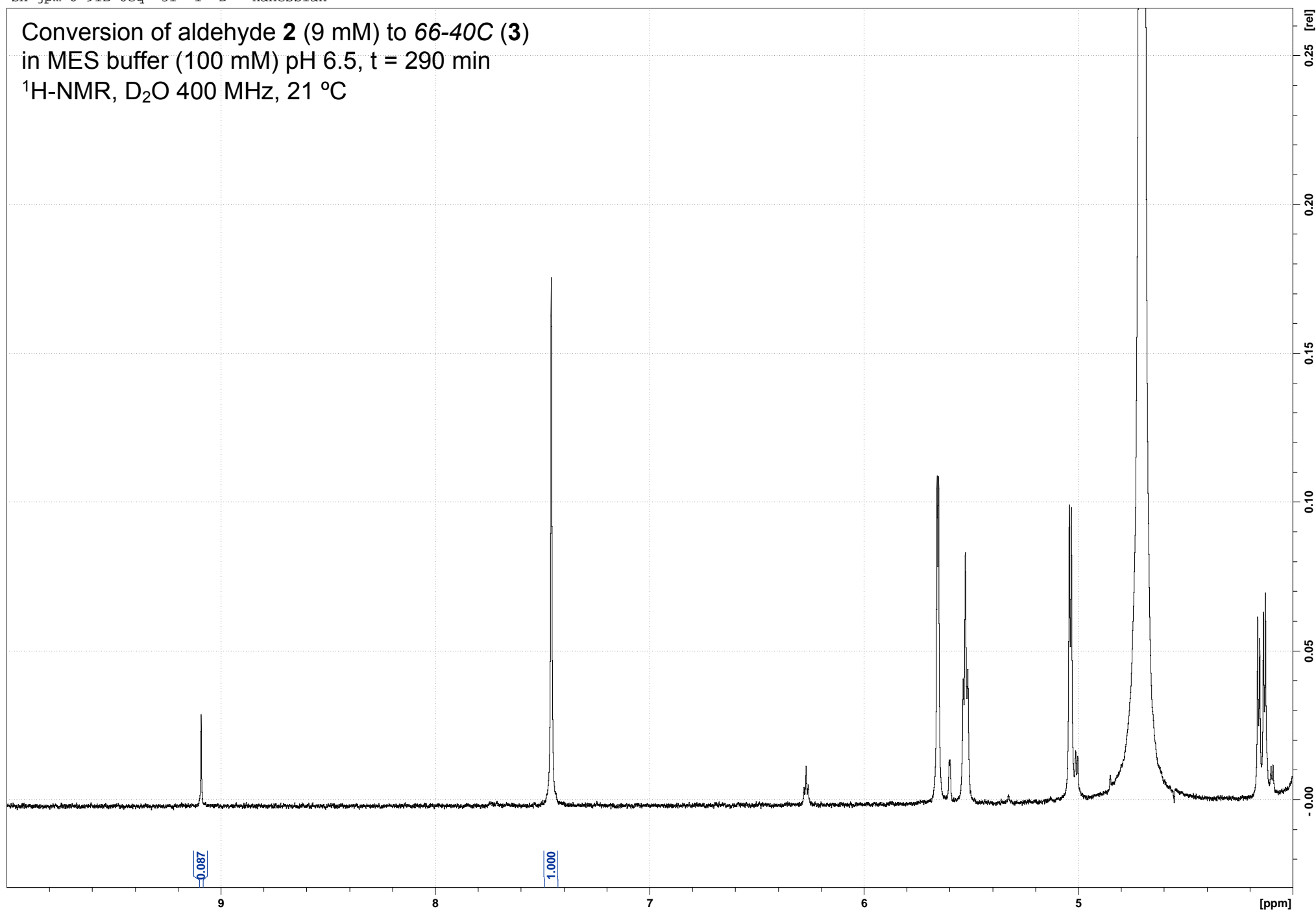
sh-jpm-6-91B-0eq 30 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 280 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



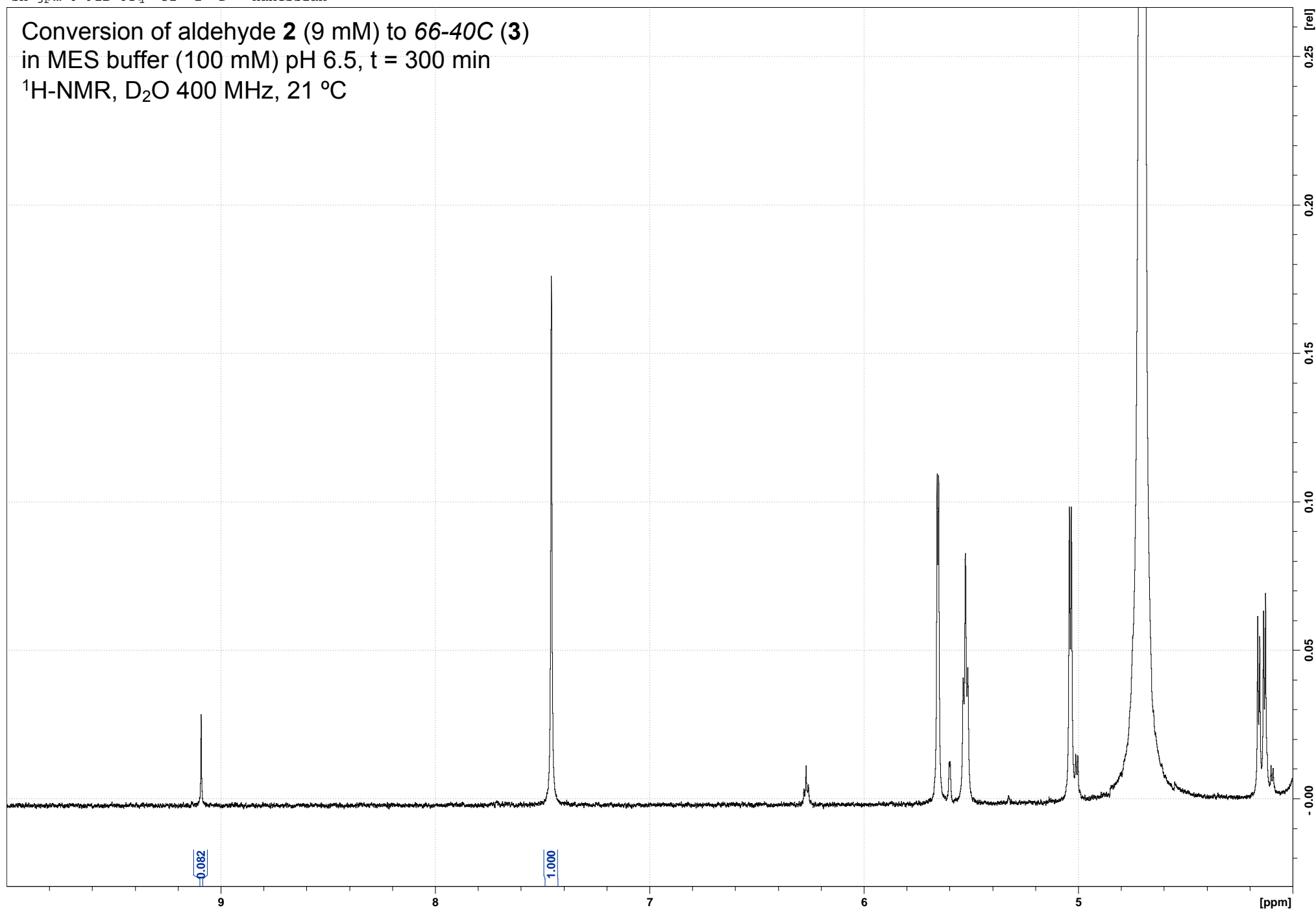
sh-jpm-6-91B-0eq 31 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 290 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



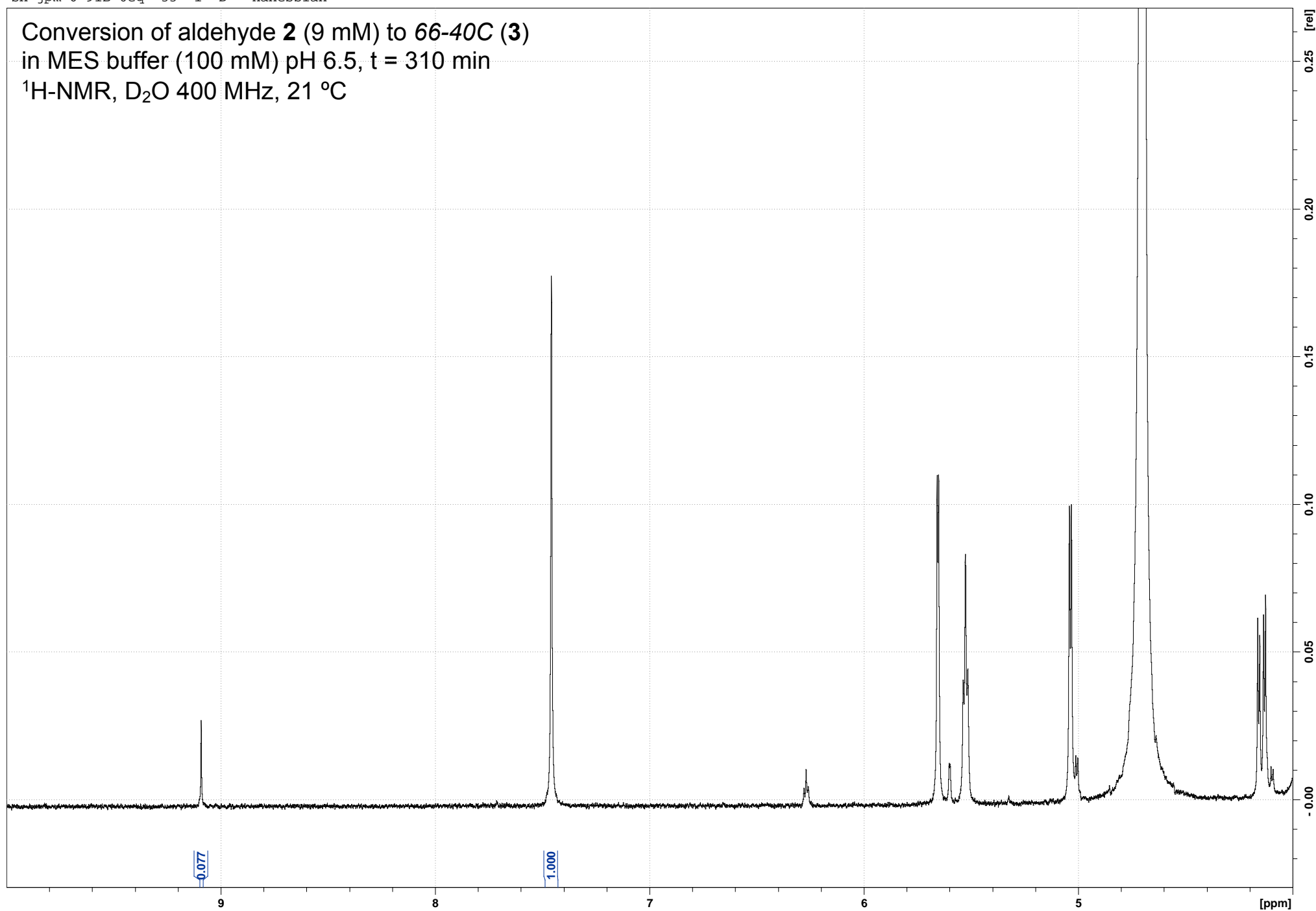
sh-jpm-6-91B-0eq 32 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 300 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



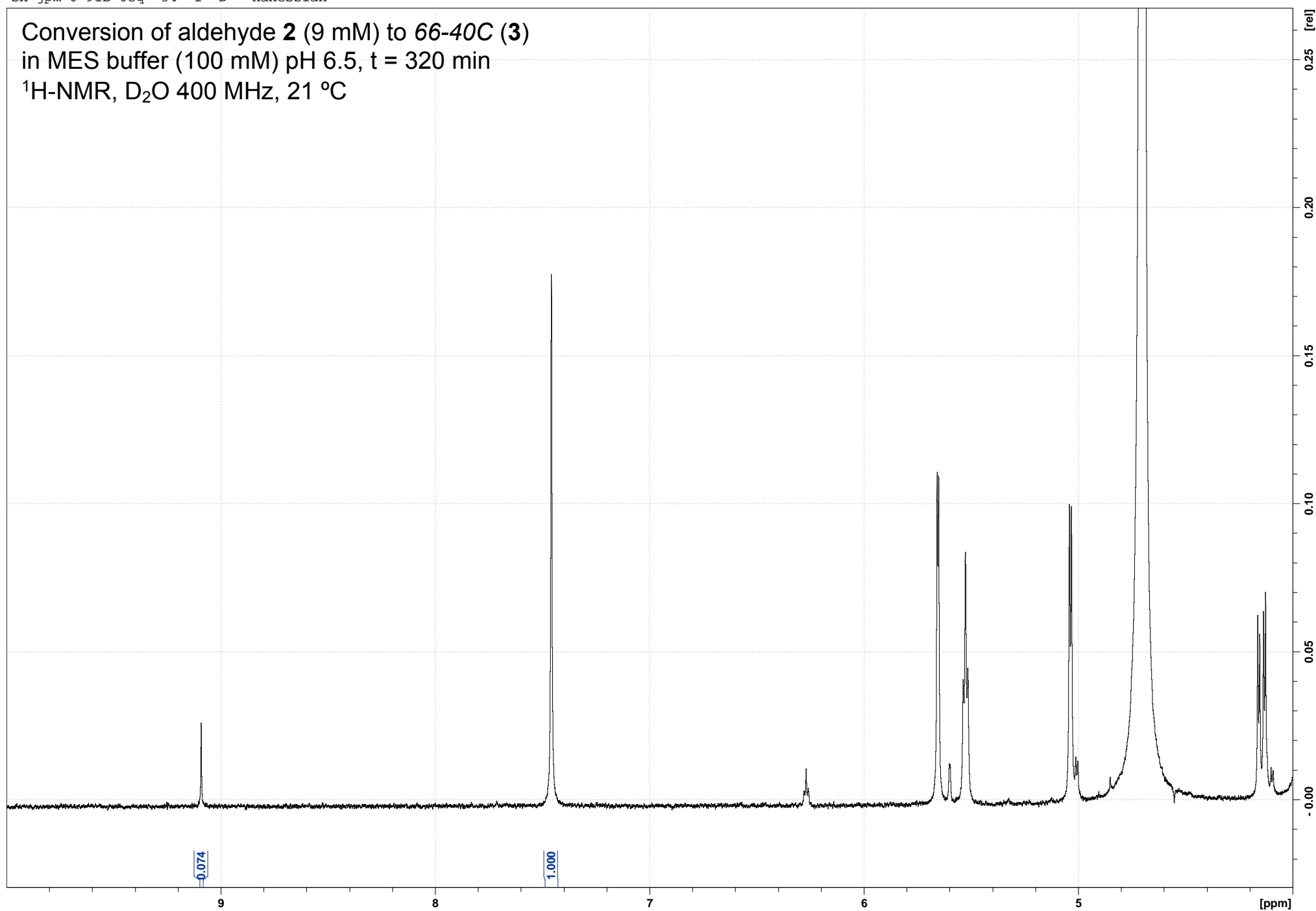
sh-jpm-6-91B-0eq 33 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 310 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



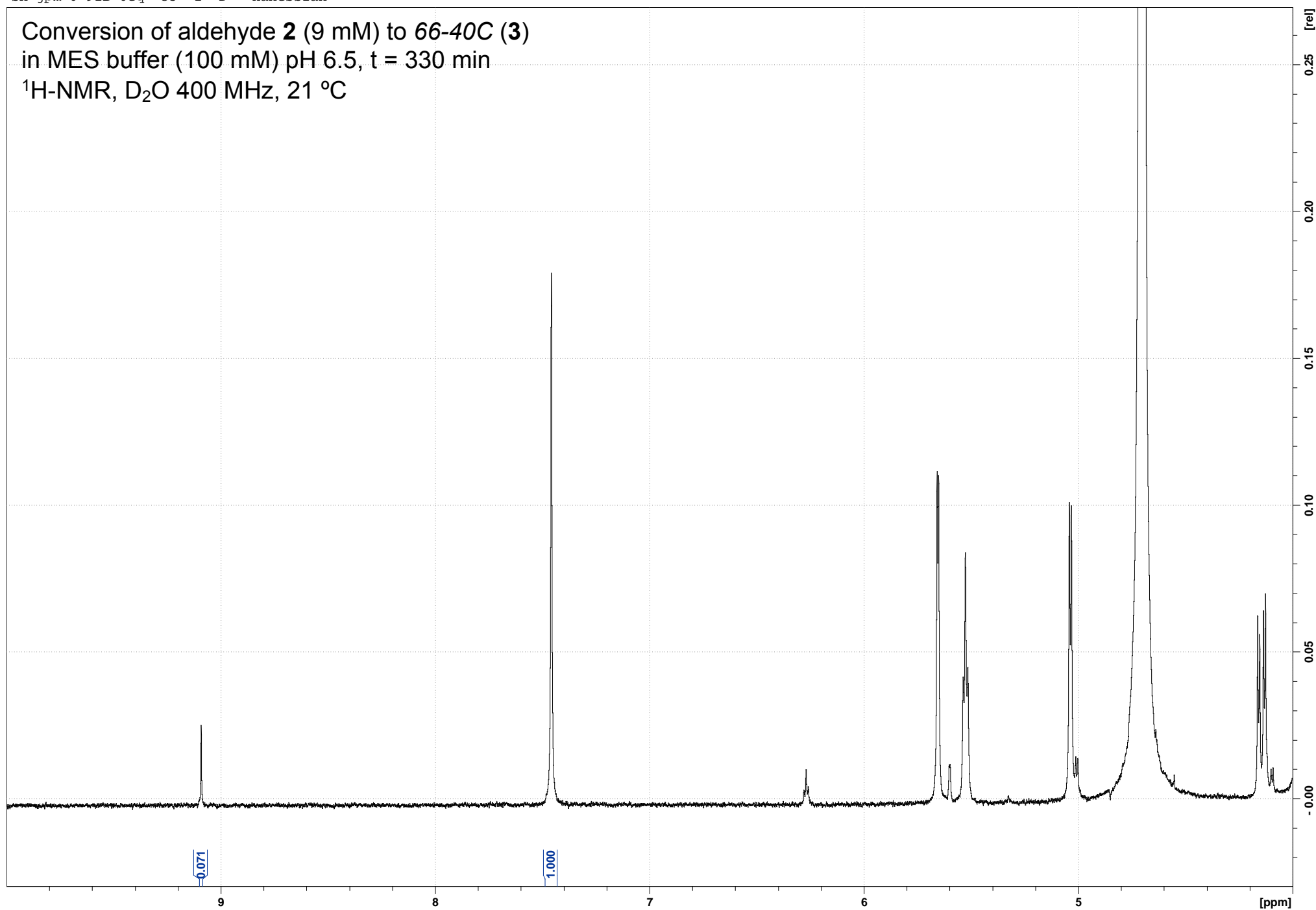
sh-jpm-6-91B-0eq 34 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 320 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



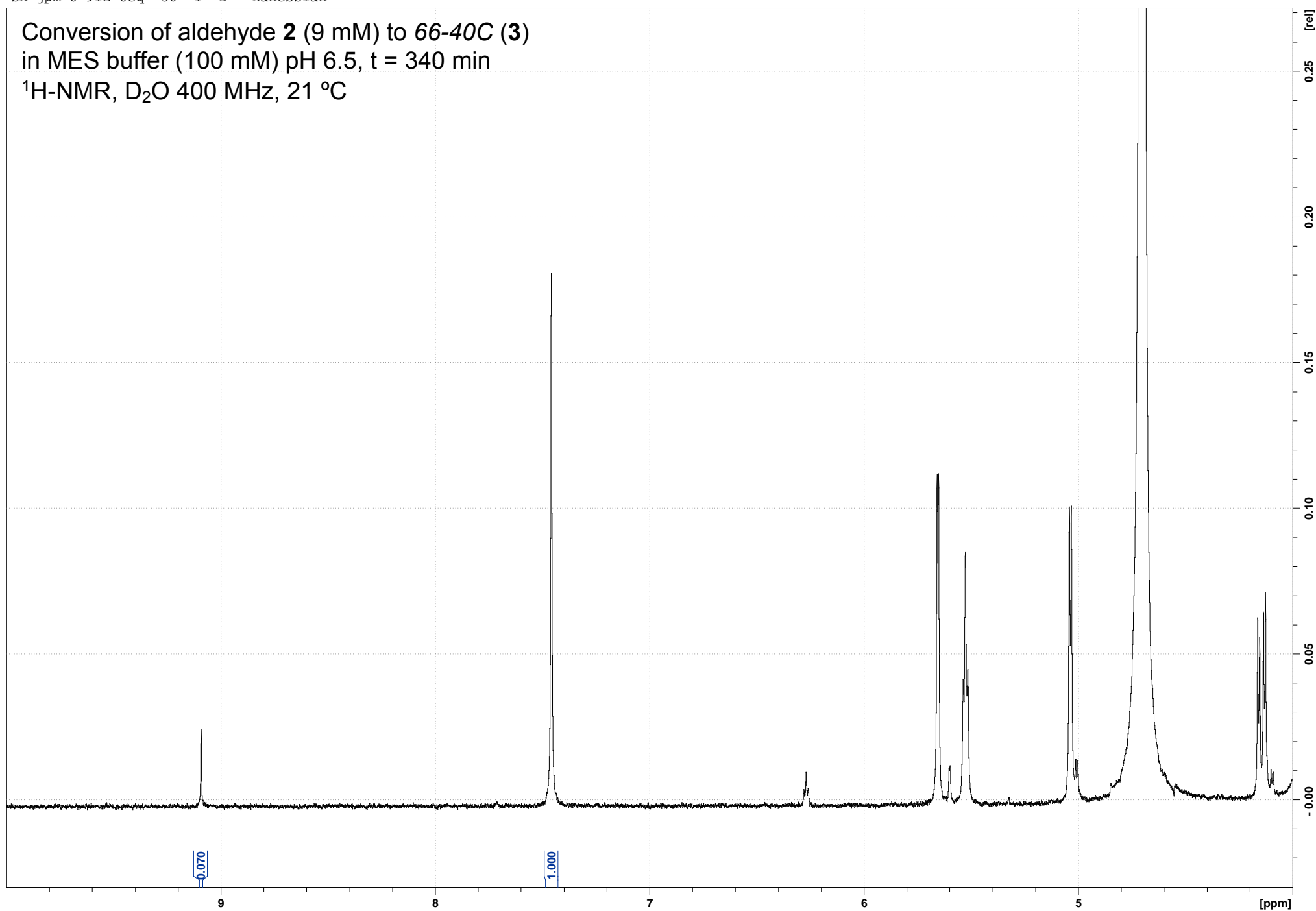
sh-jpm-6-91B-0eq 35 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 330 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



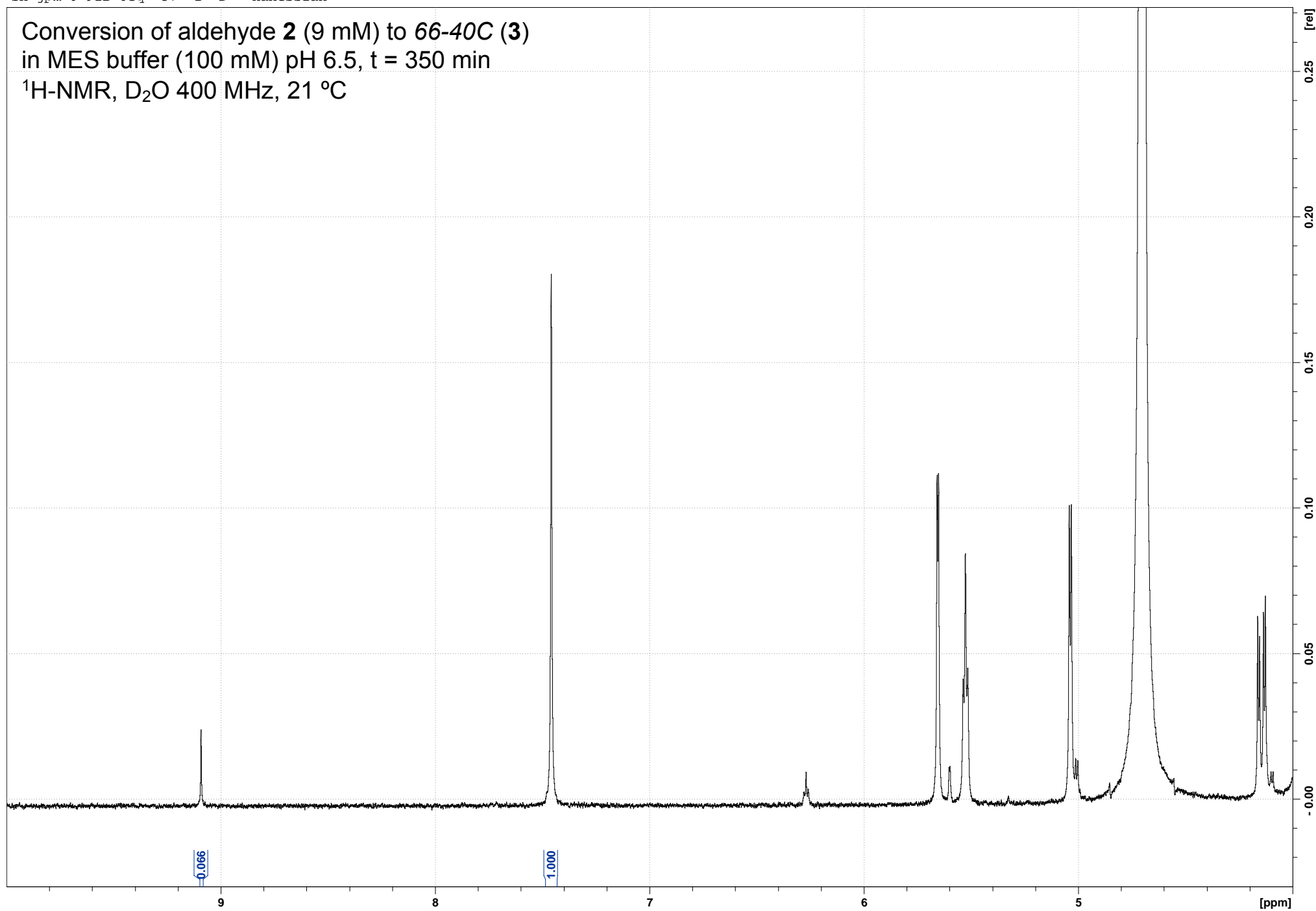
sh-jpm-6-91B-0eq 36 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 340 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91B-0eq 37 1 D: Hanessian

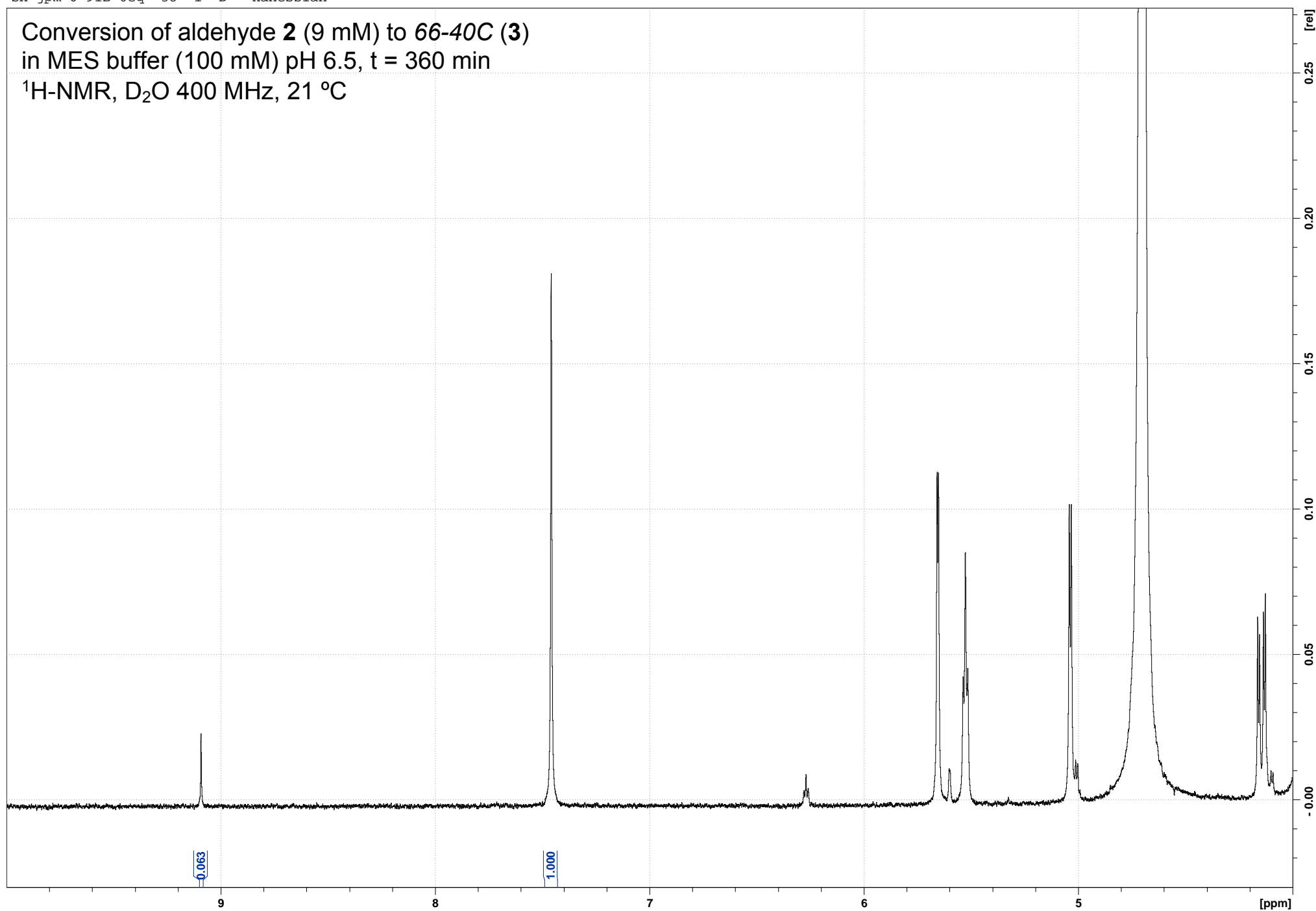
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 350 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





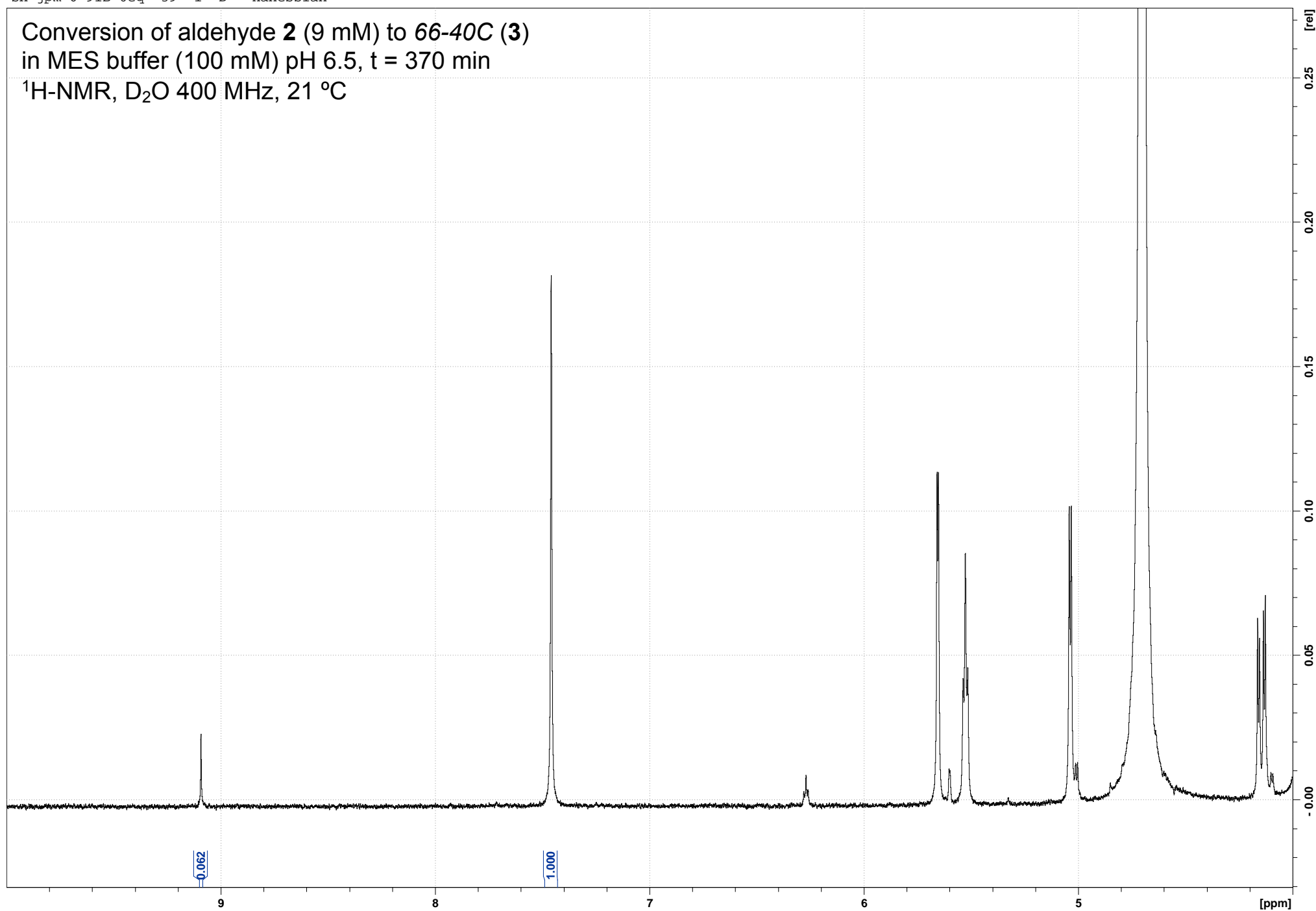
sh-jpm-6-91B-0eq 38 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 360 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



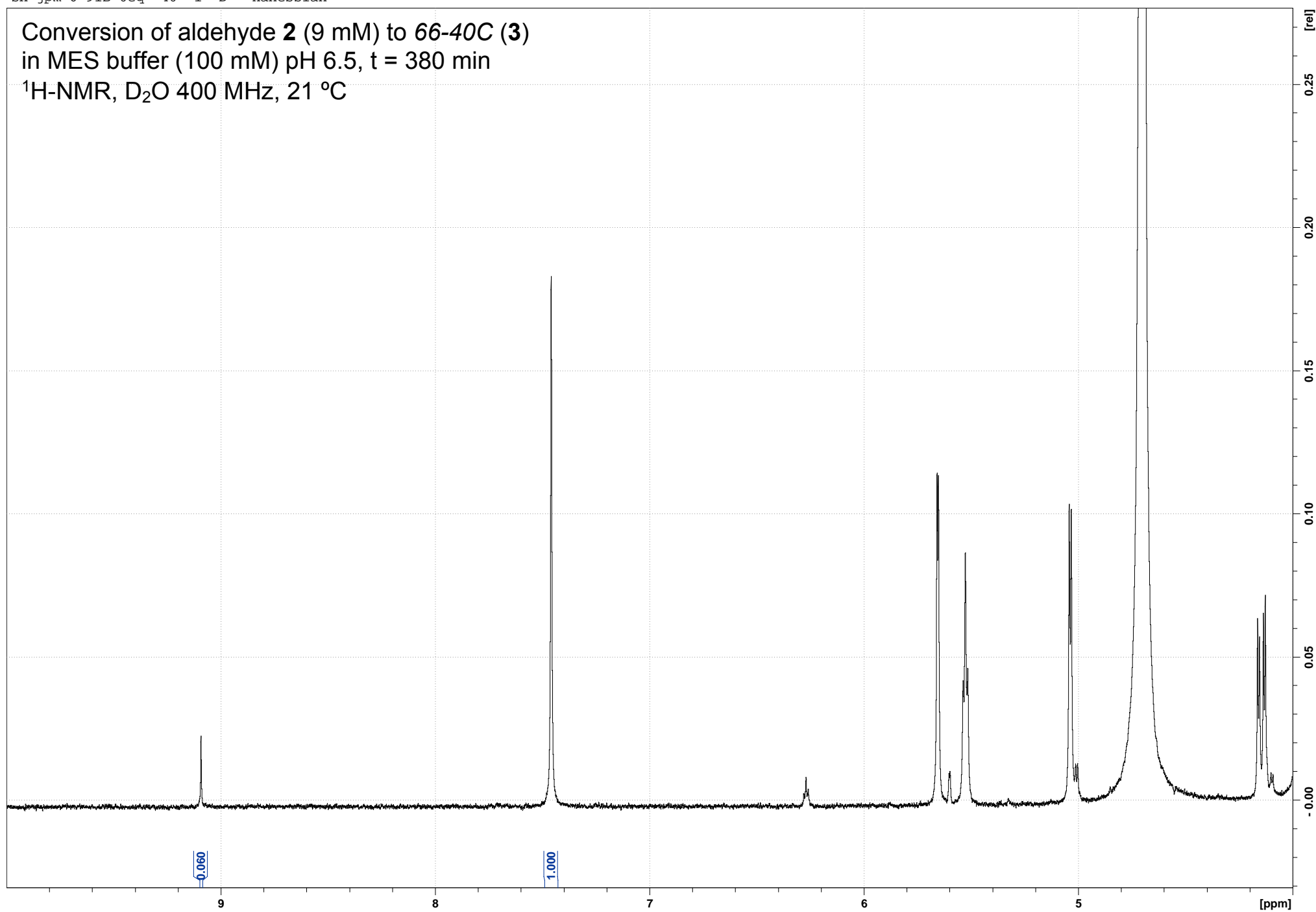
sh-jpm-6-91B-0eq 39 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 370 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



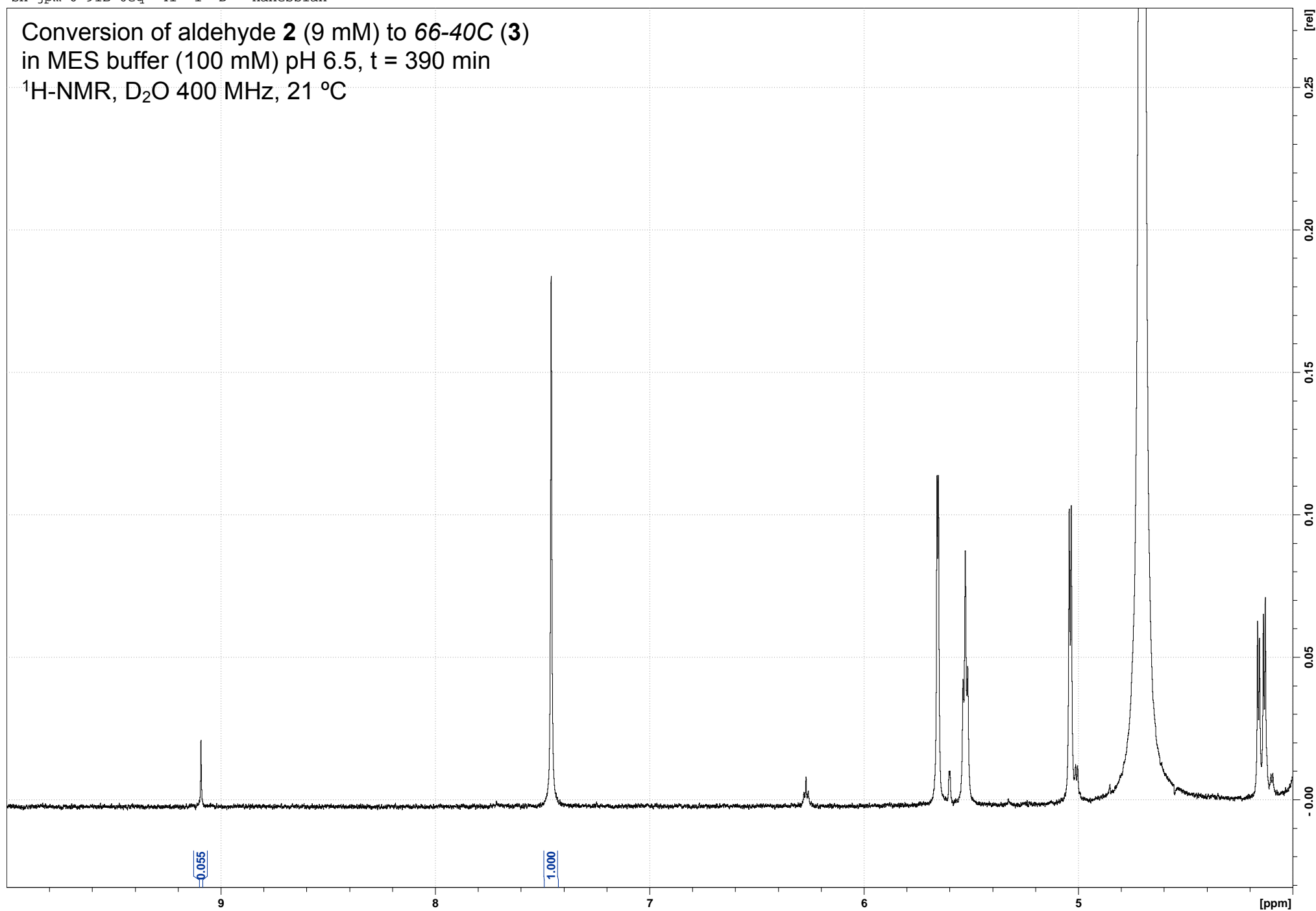
sh-jpm-6-91B-0eq 40 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 380 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



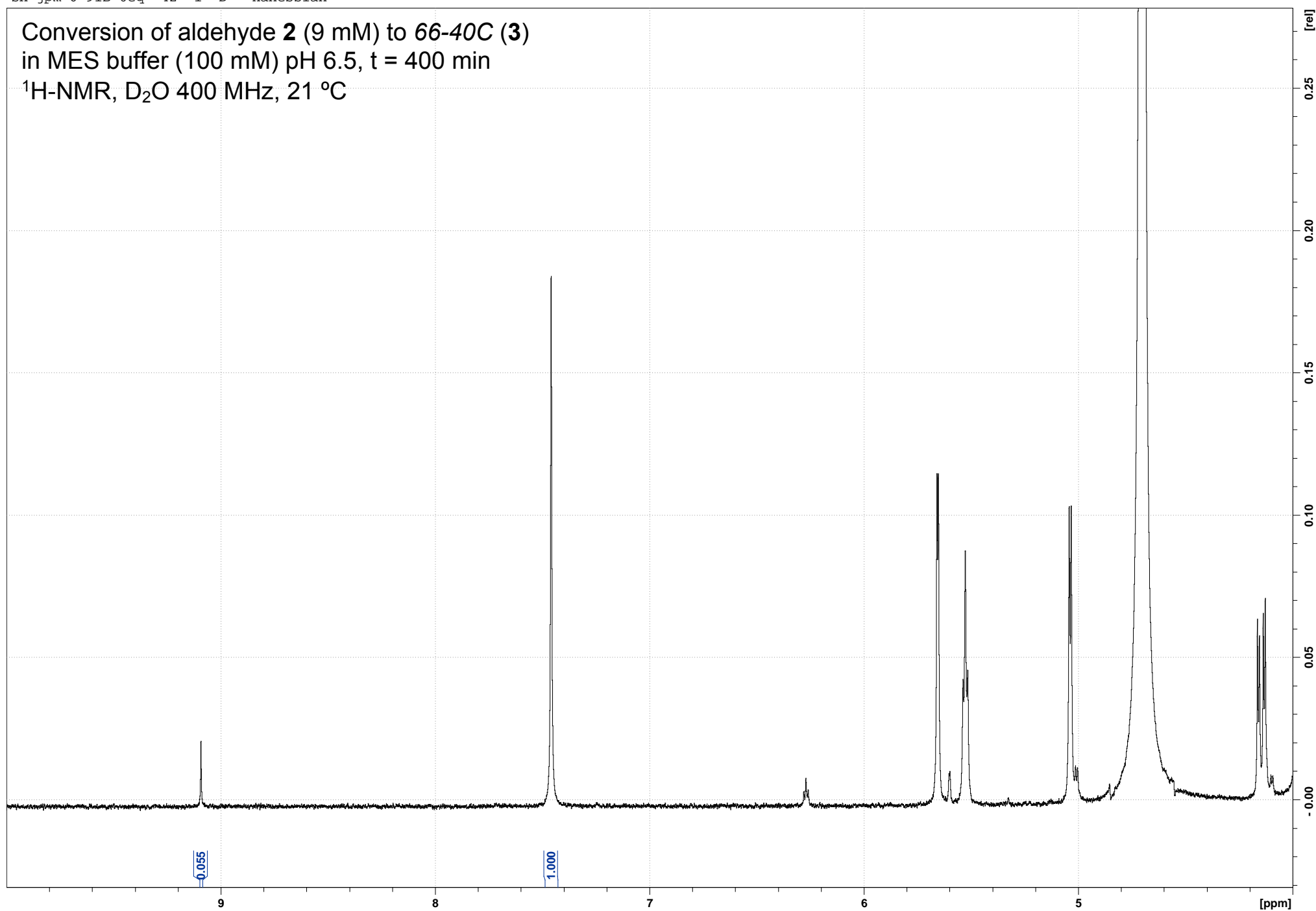
sh-jpm-6-91B-0eq 41 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 390 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



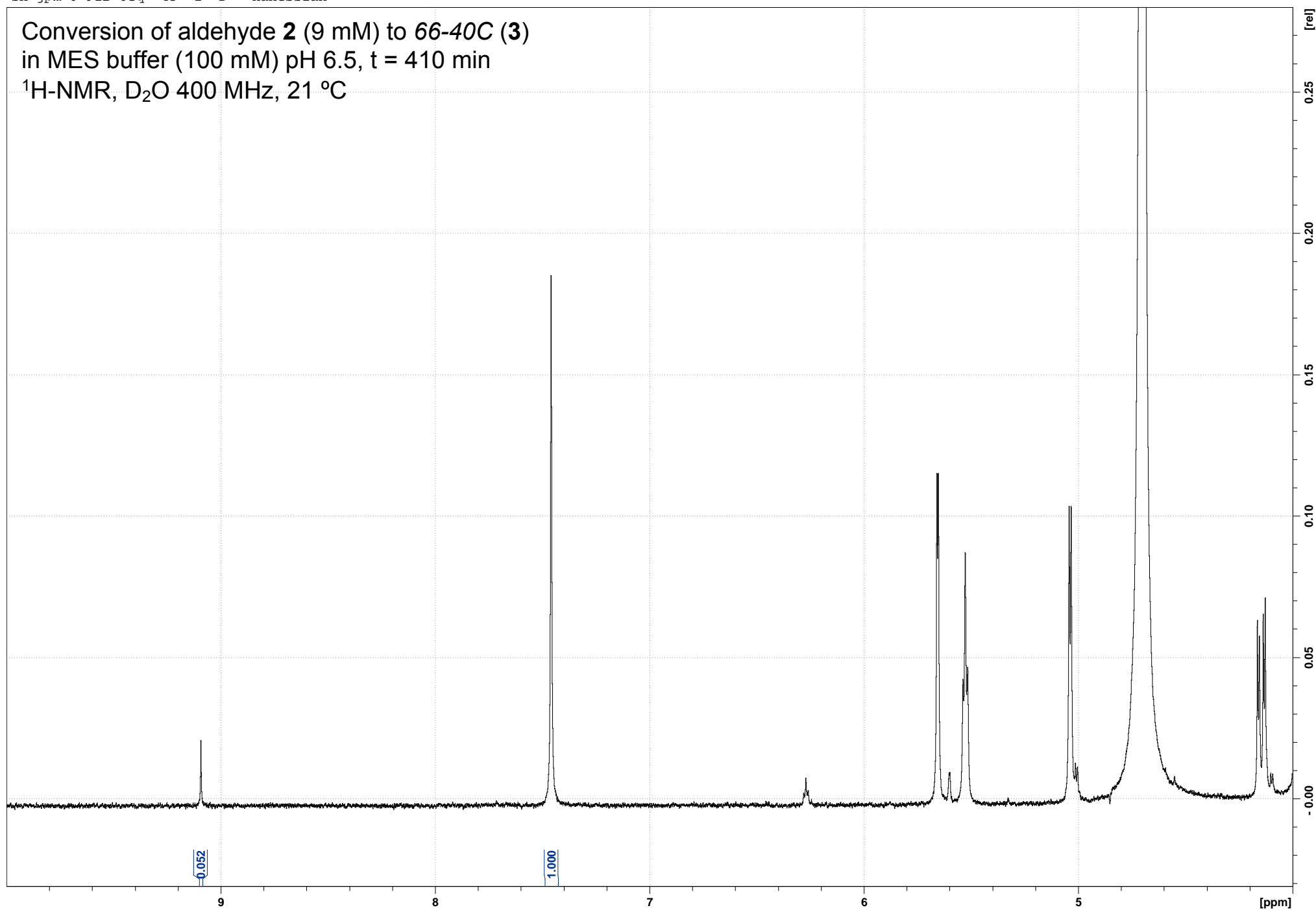
sh-jpm-6-91B-0eq 42 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 400 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



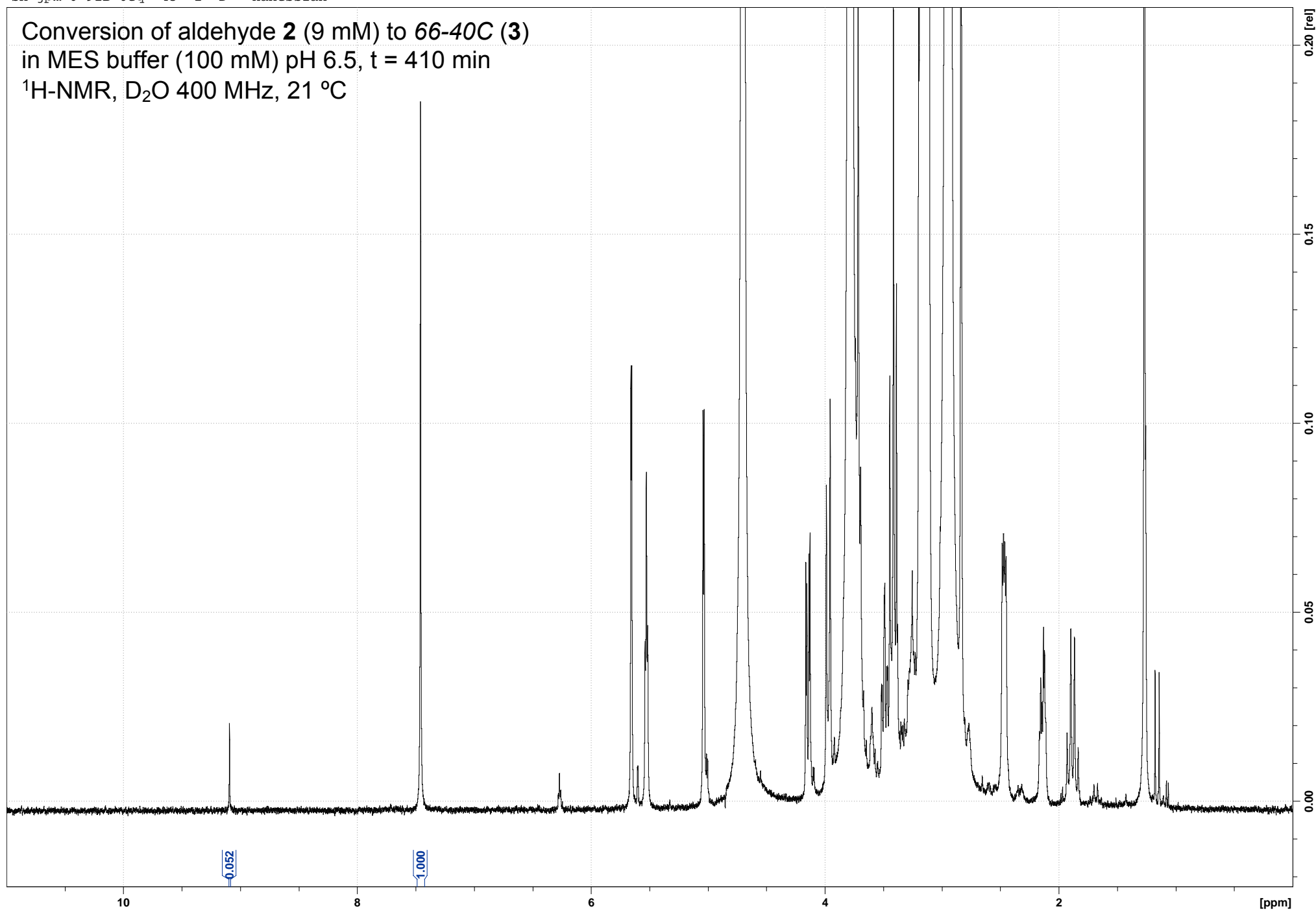
sh-jpm-6-91B-0eq 43 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 410 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



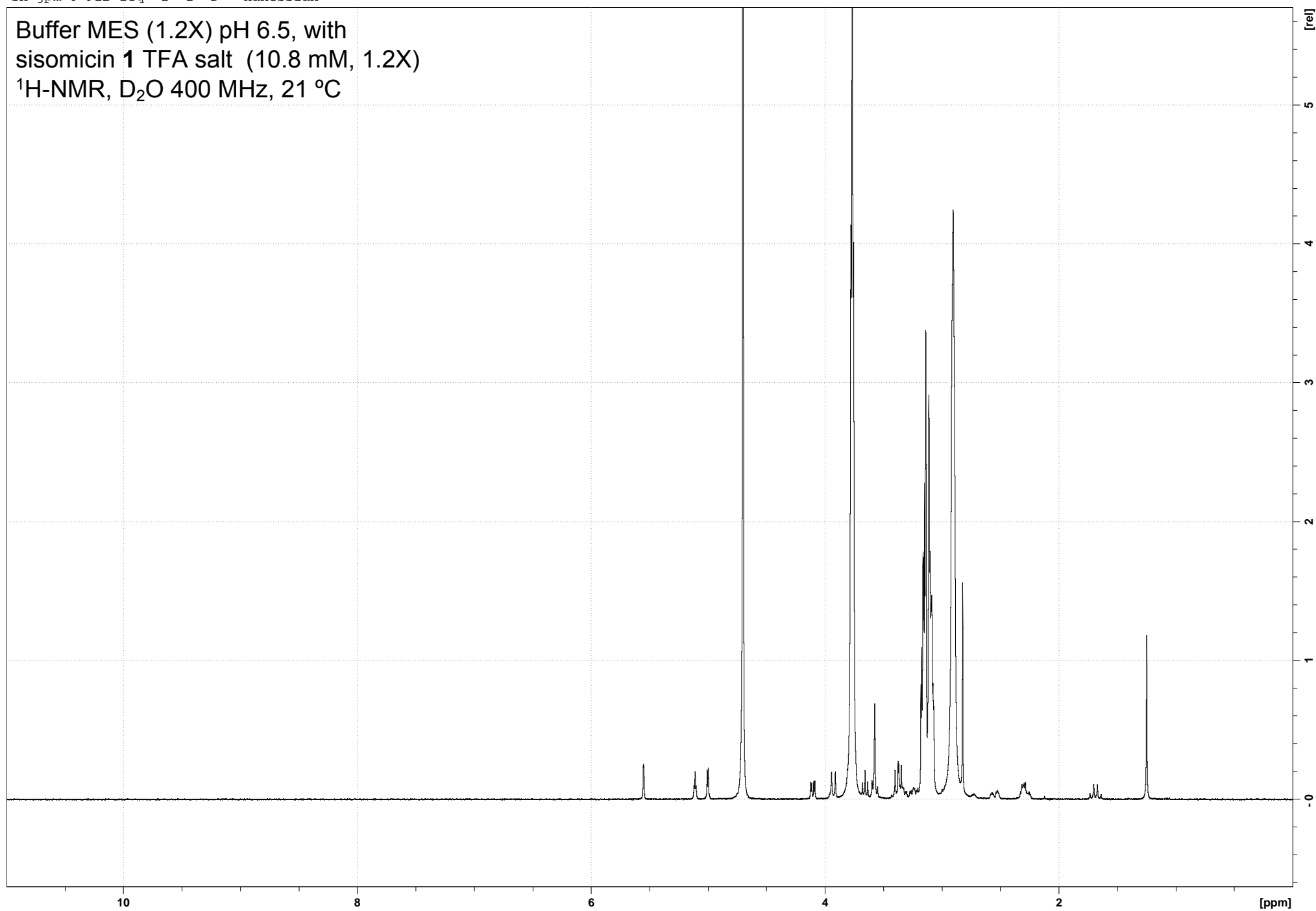
sh-jpm-6-91B-0eq 43 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 410 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91B-1eq 1 1 D: Hanessian

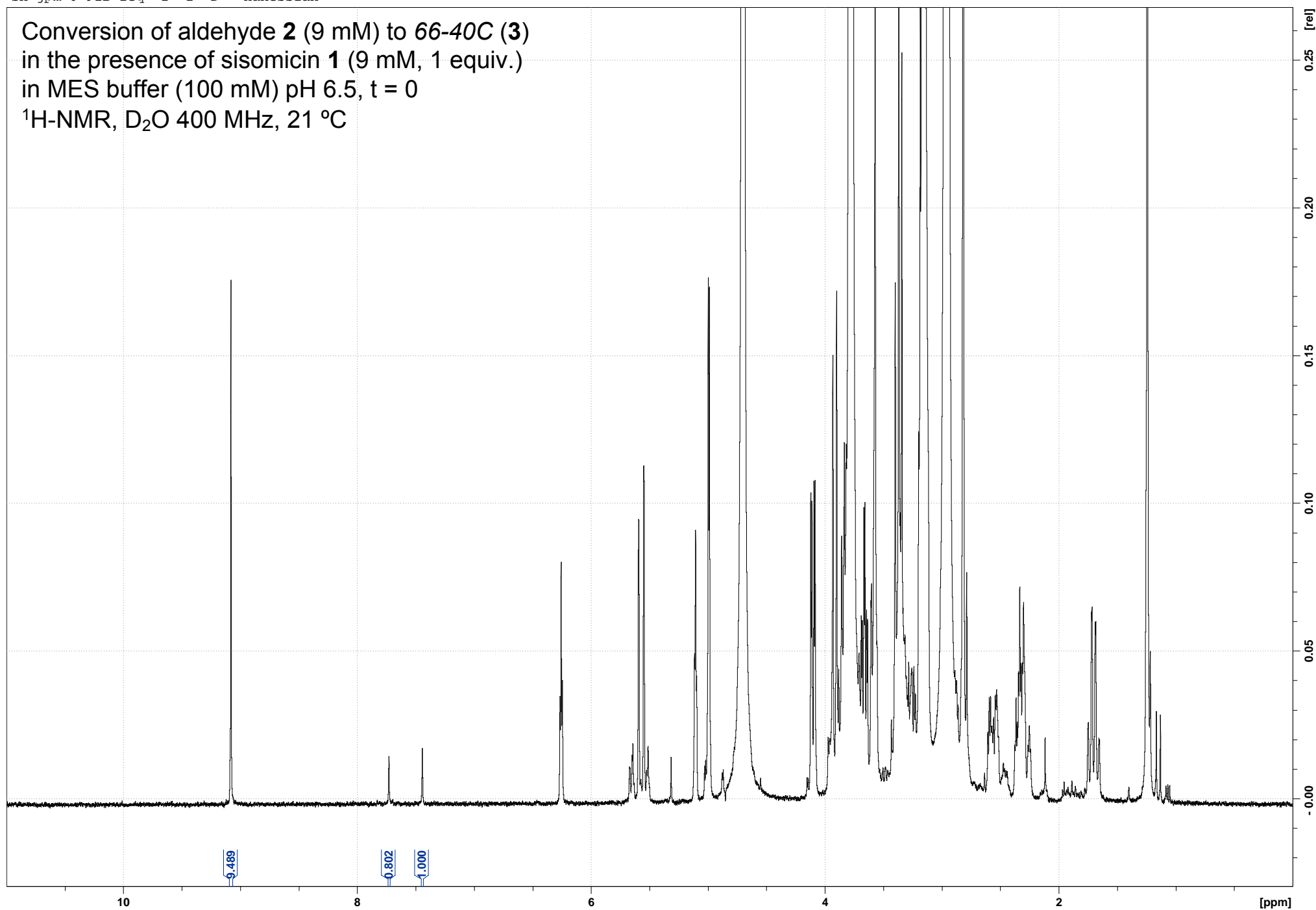
Buffer MES (1.2X) pH 6.5, with  
sisomicin **1** TFA salt (10.8 mM, 1.2X)  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





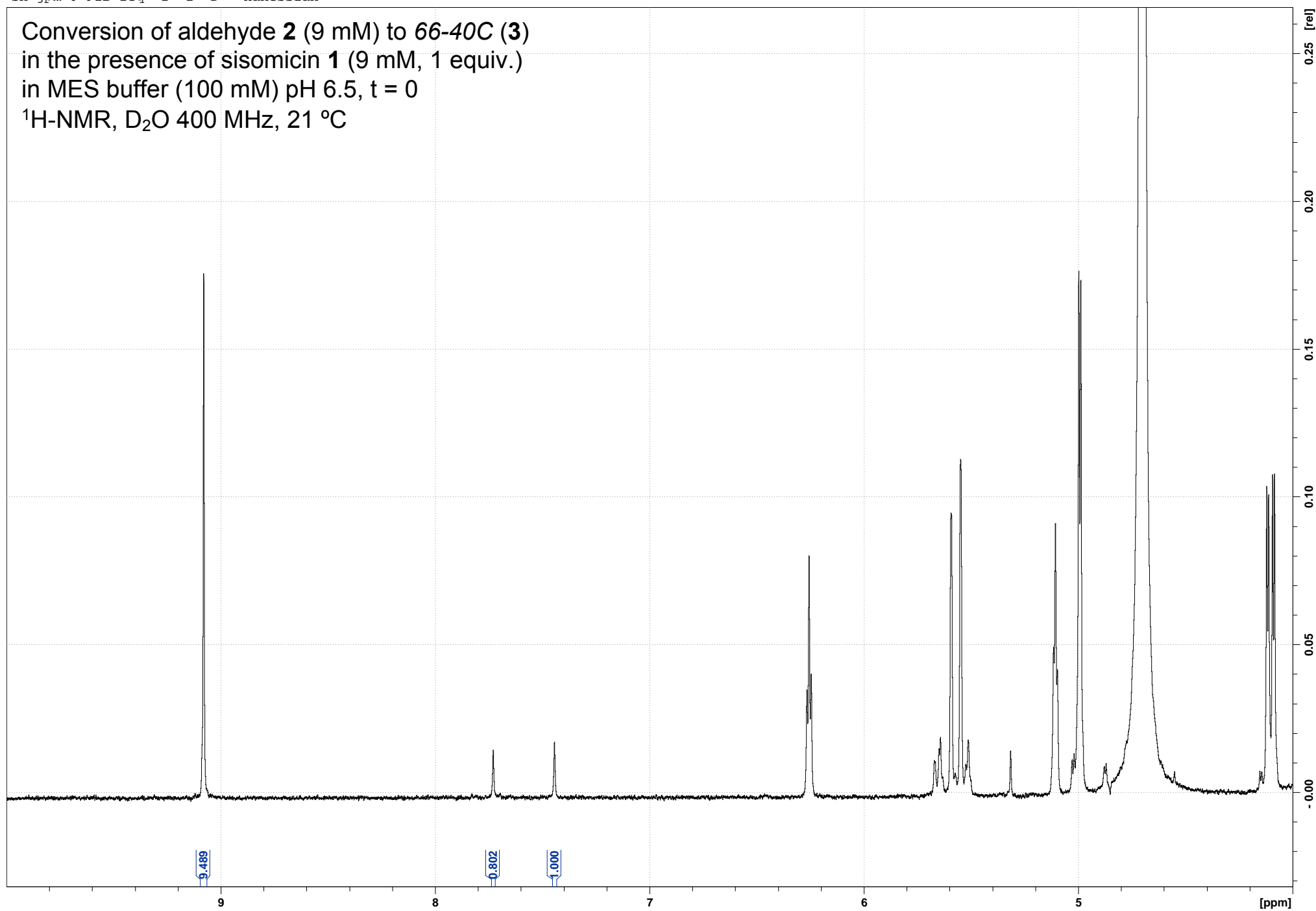
sh-jpm-6-91B-1eq 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



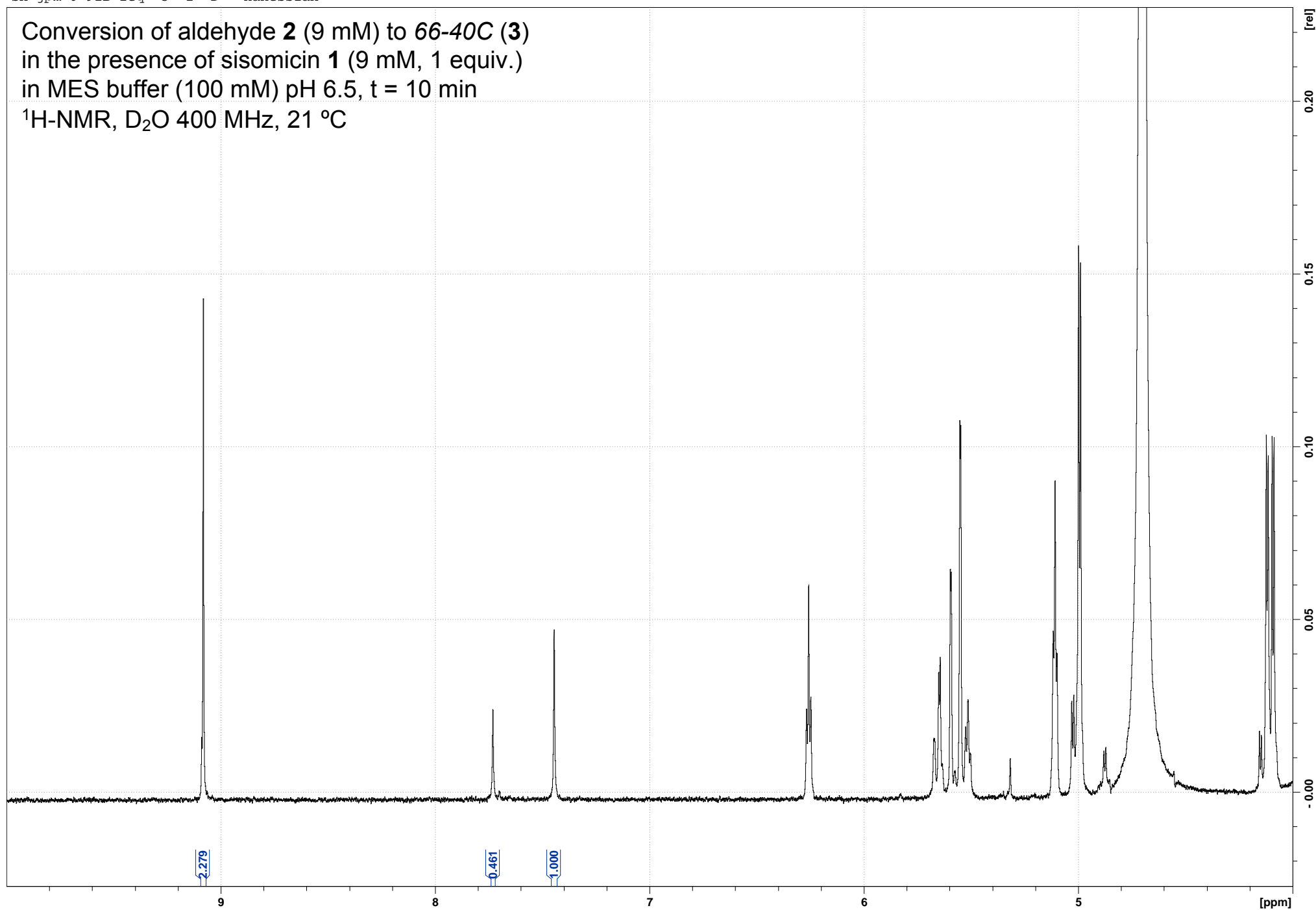
sh-jpm-6-91B-1eq 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



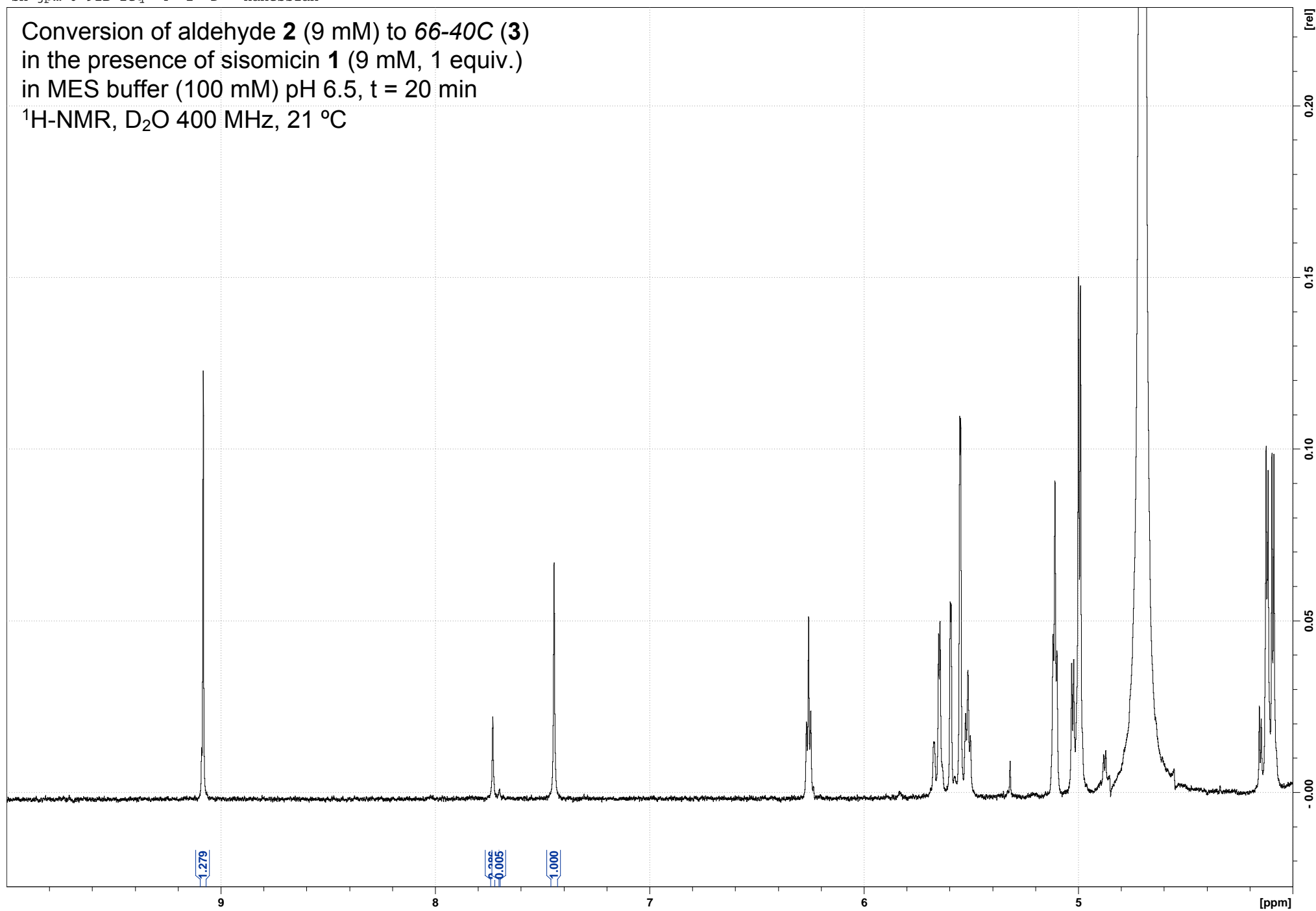
sh-jpm-6-91B-1eq 3 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 10 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



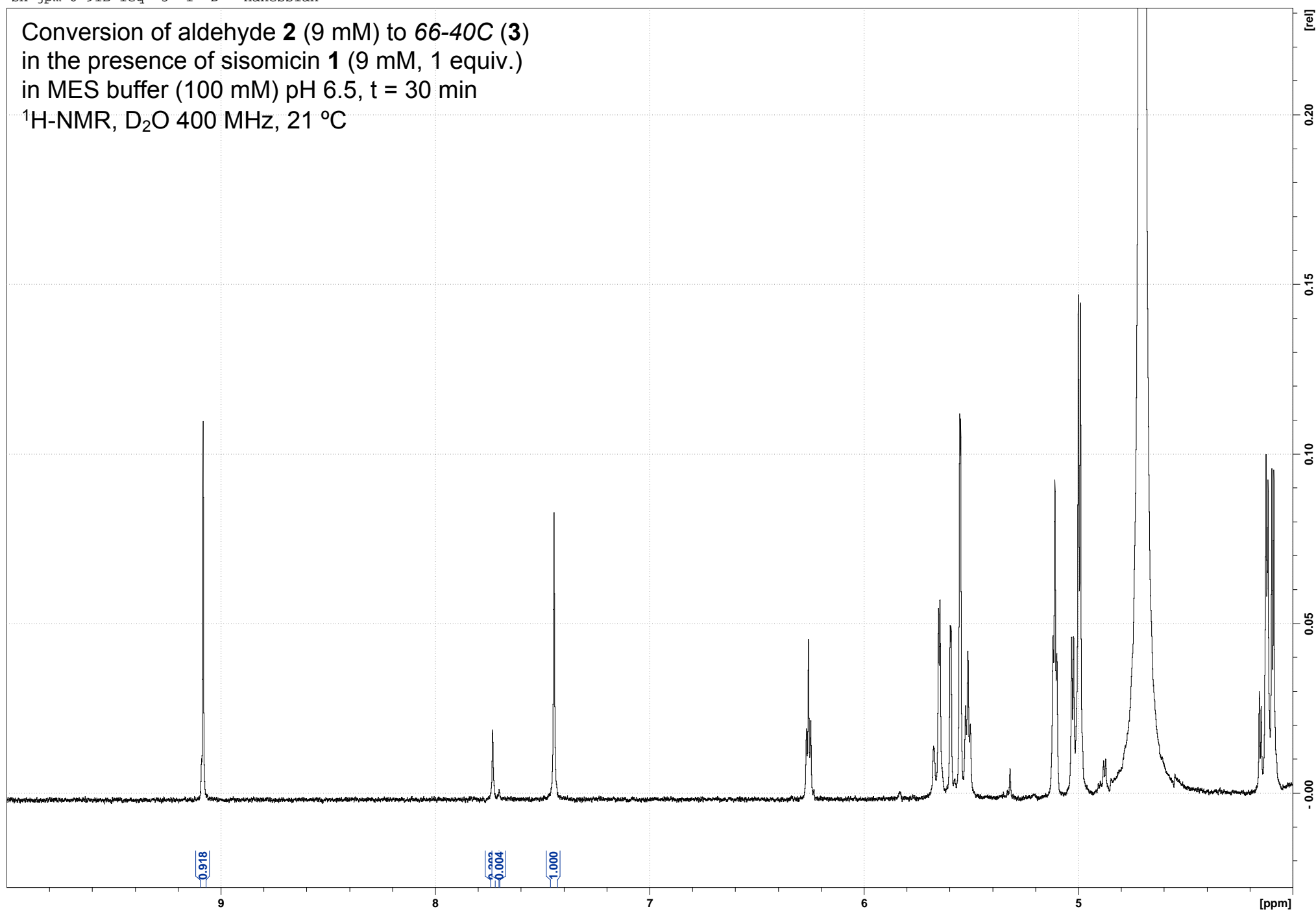
sh-jpm-6-91B-1eq 4 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 20 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



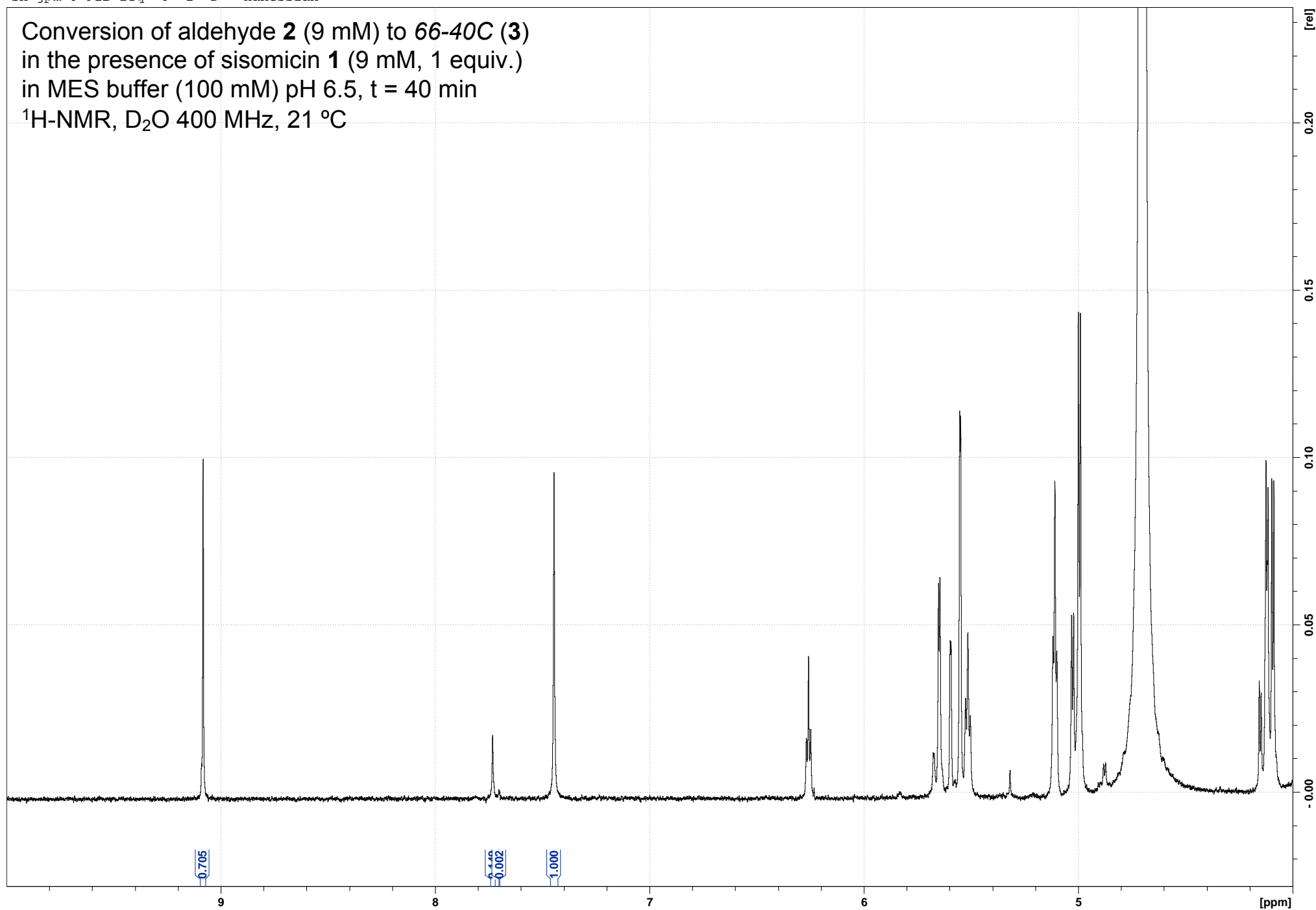
sh-jpm-6-91B-1eq 5 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 30 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



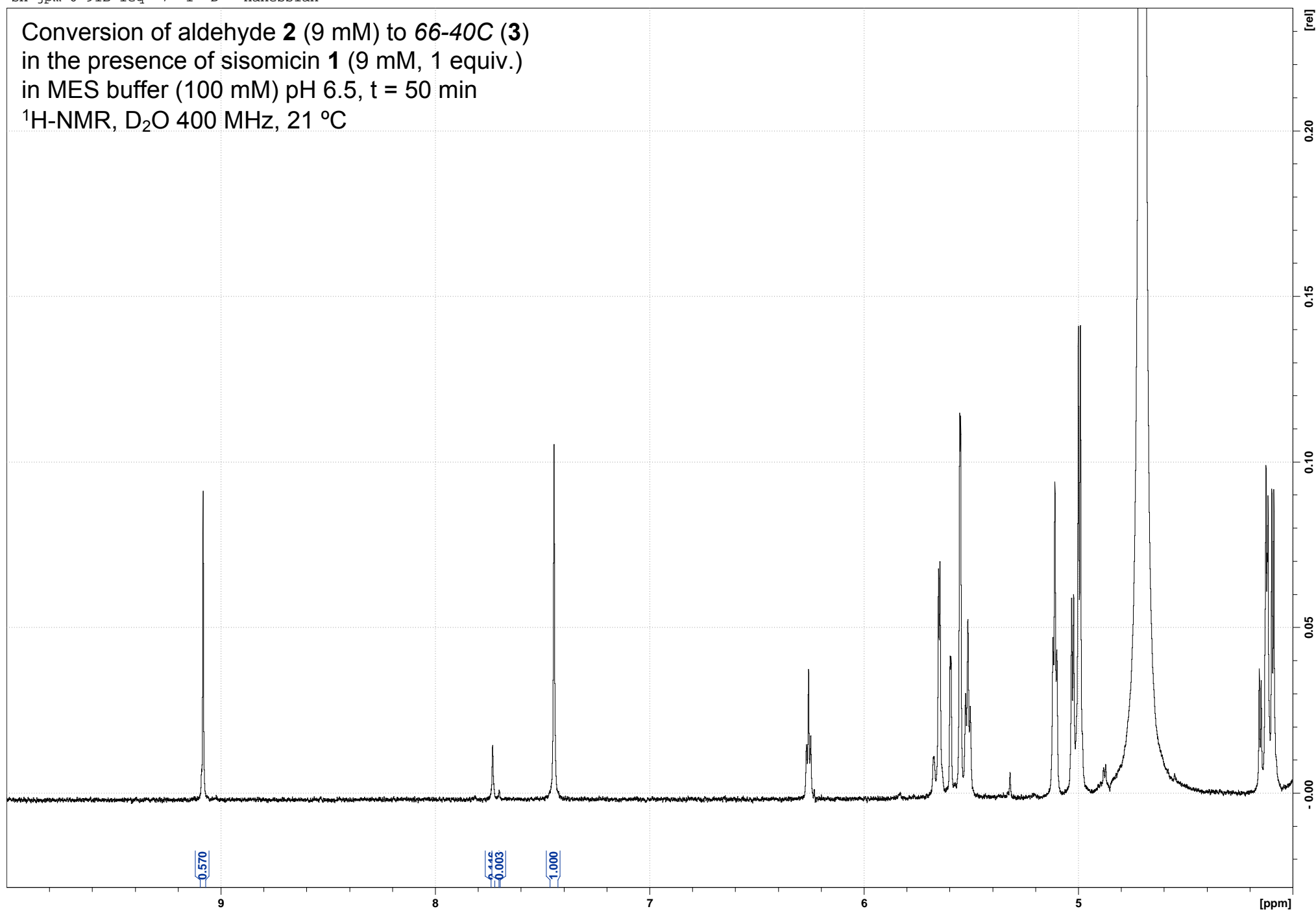
sh-jpm-6-91B-1eq 6 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 40 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



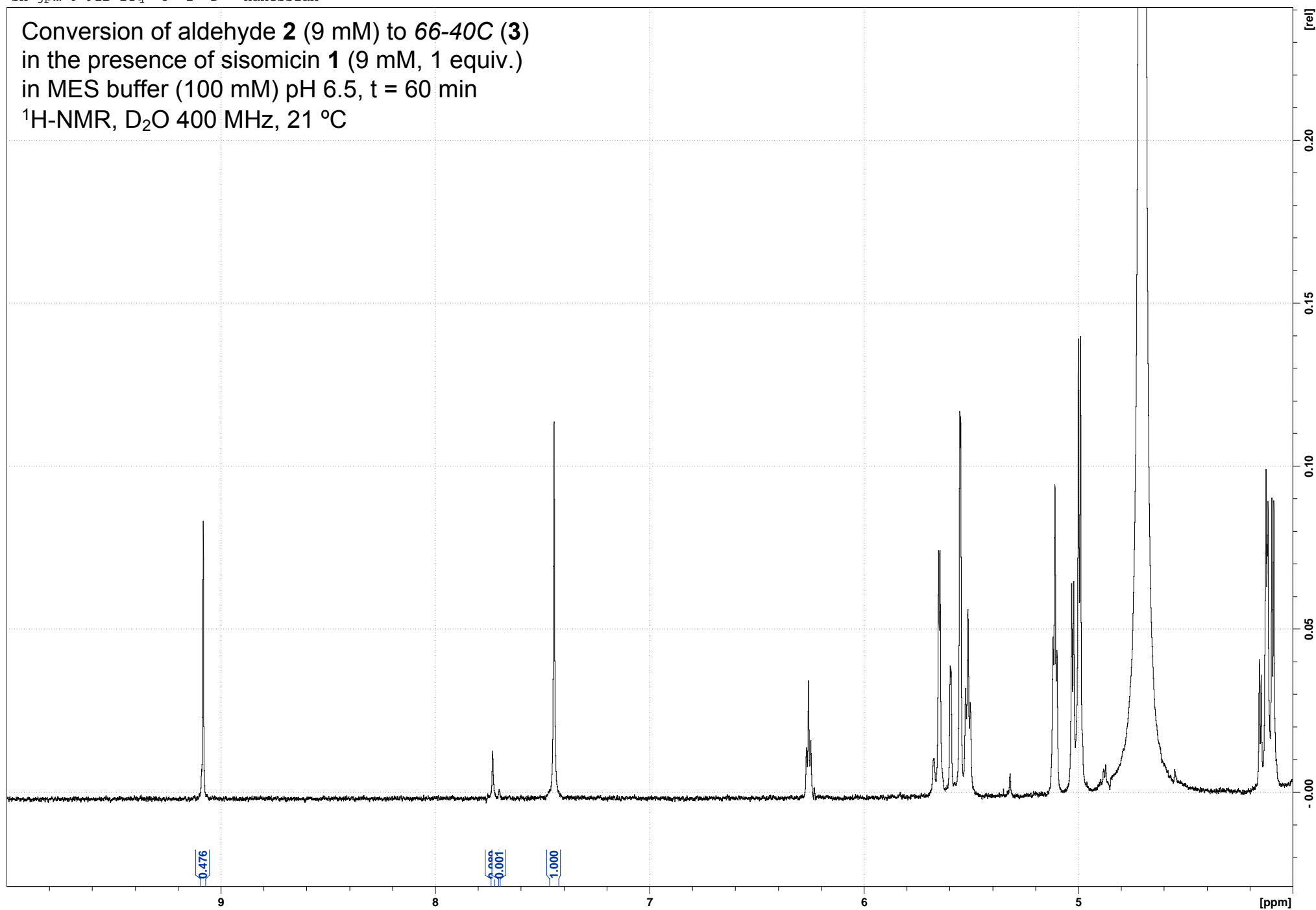
sh-jpm-6-91B-1eq 7 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 50 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91B-1eq 8 1 D: Hanessian

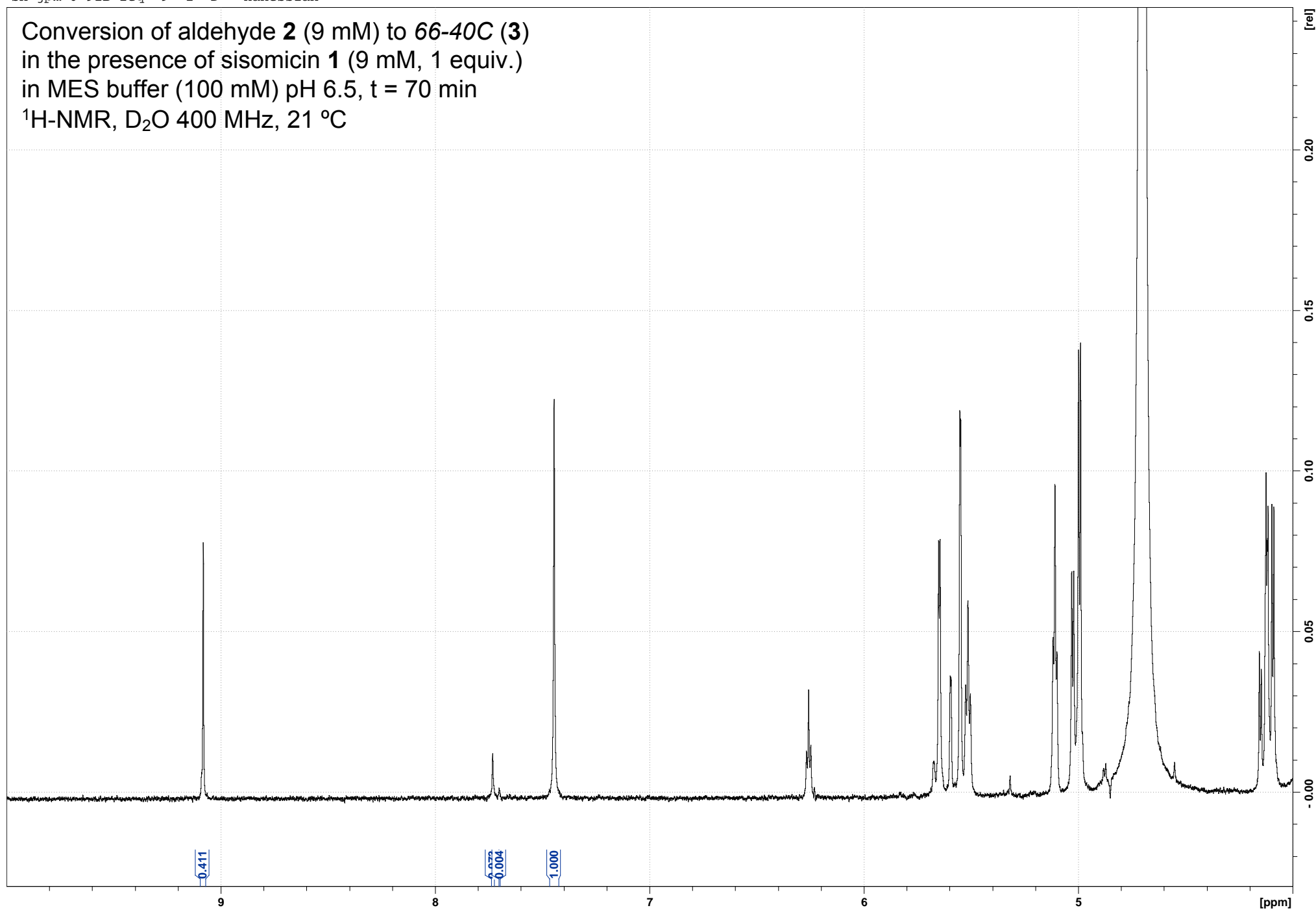
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 60 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C





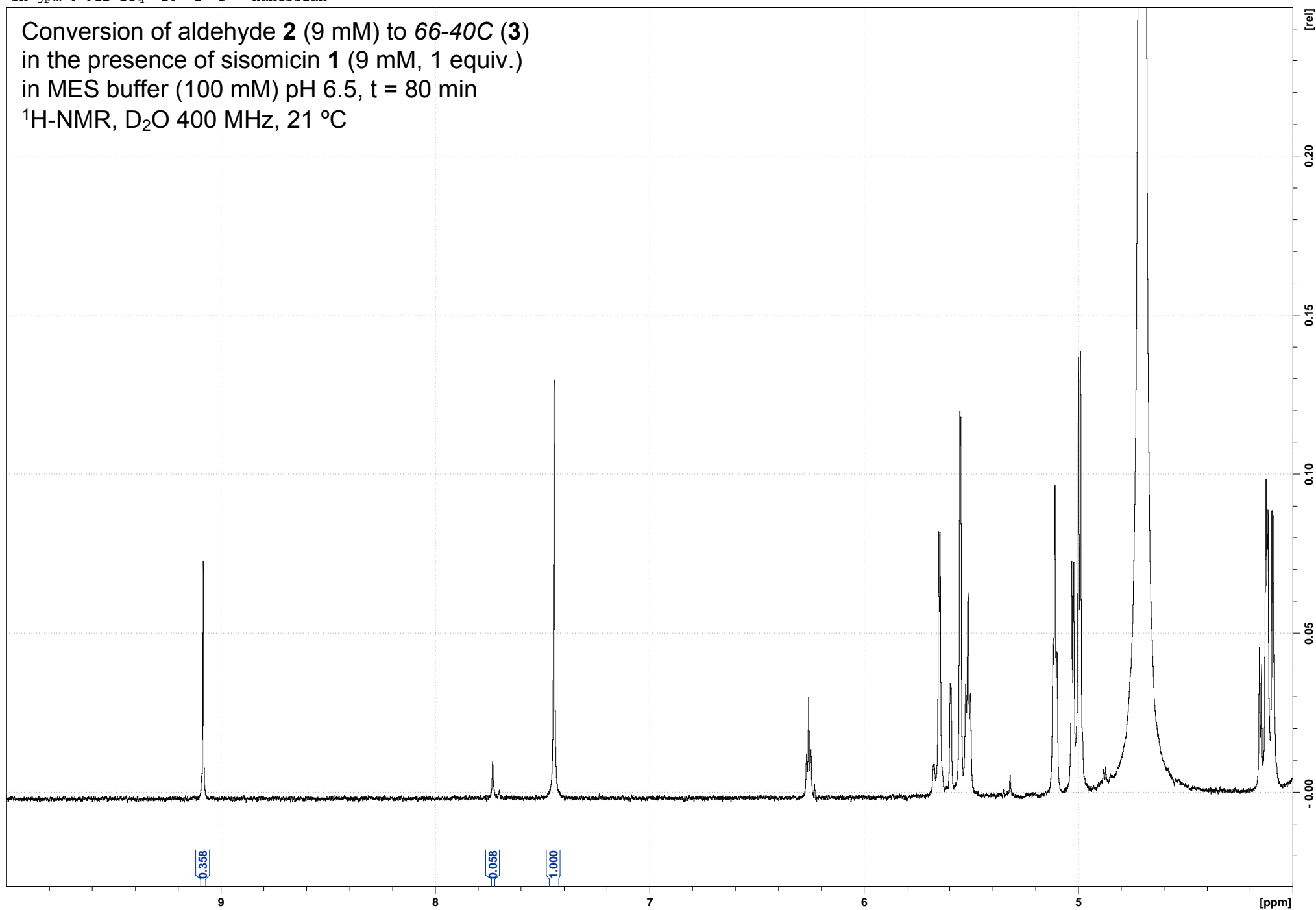
sh-jpm-6-91B-1eq 9 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 70 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



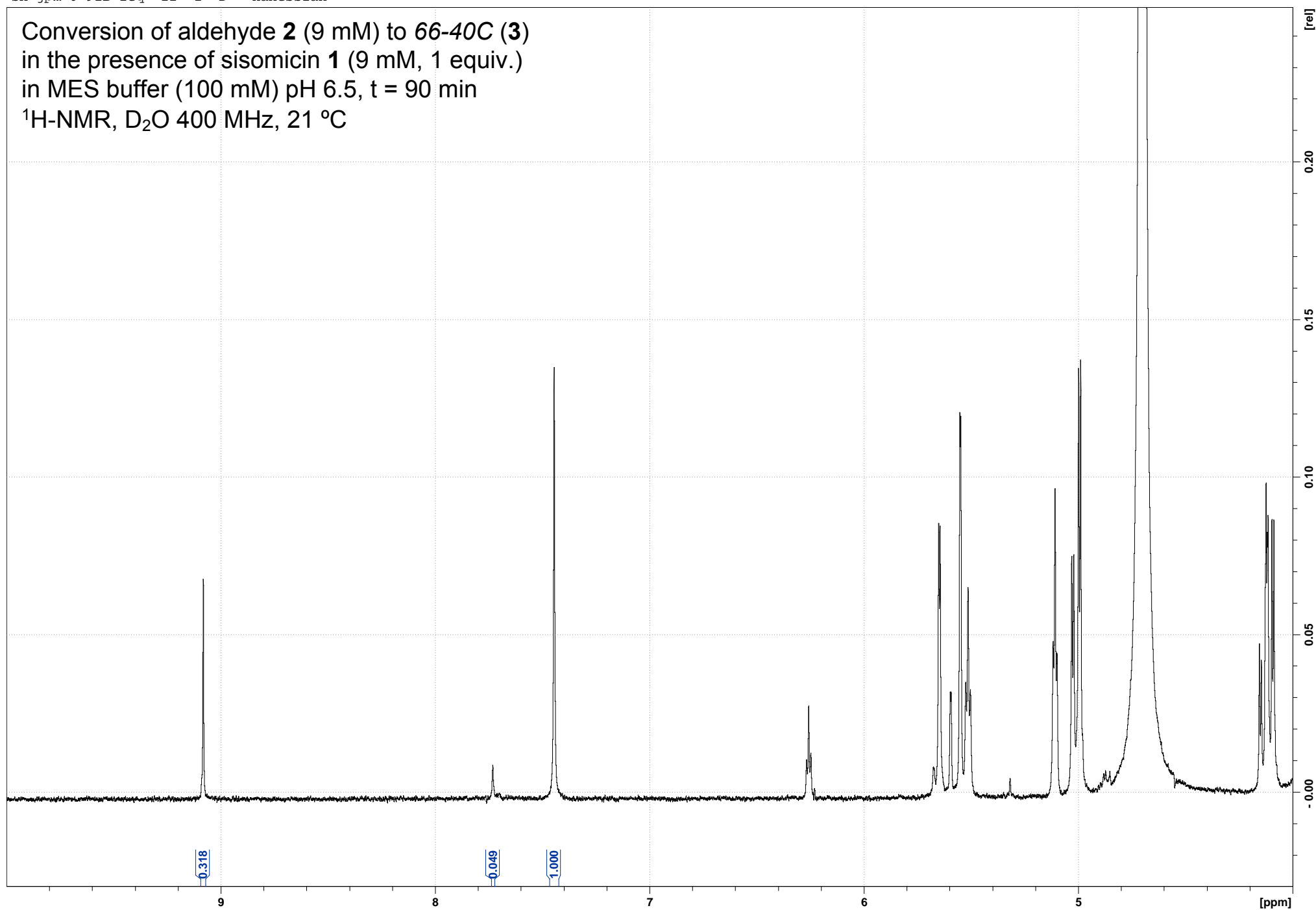
sh-jpm-6-91B-1eq 10 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 80 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



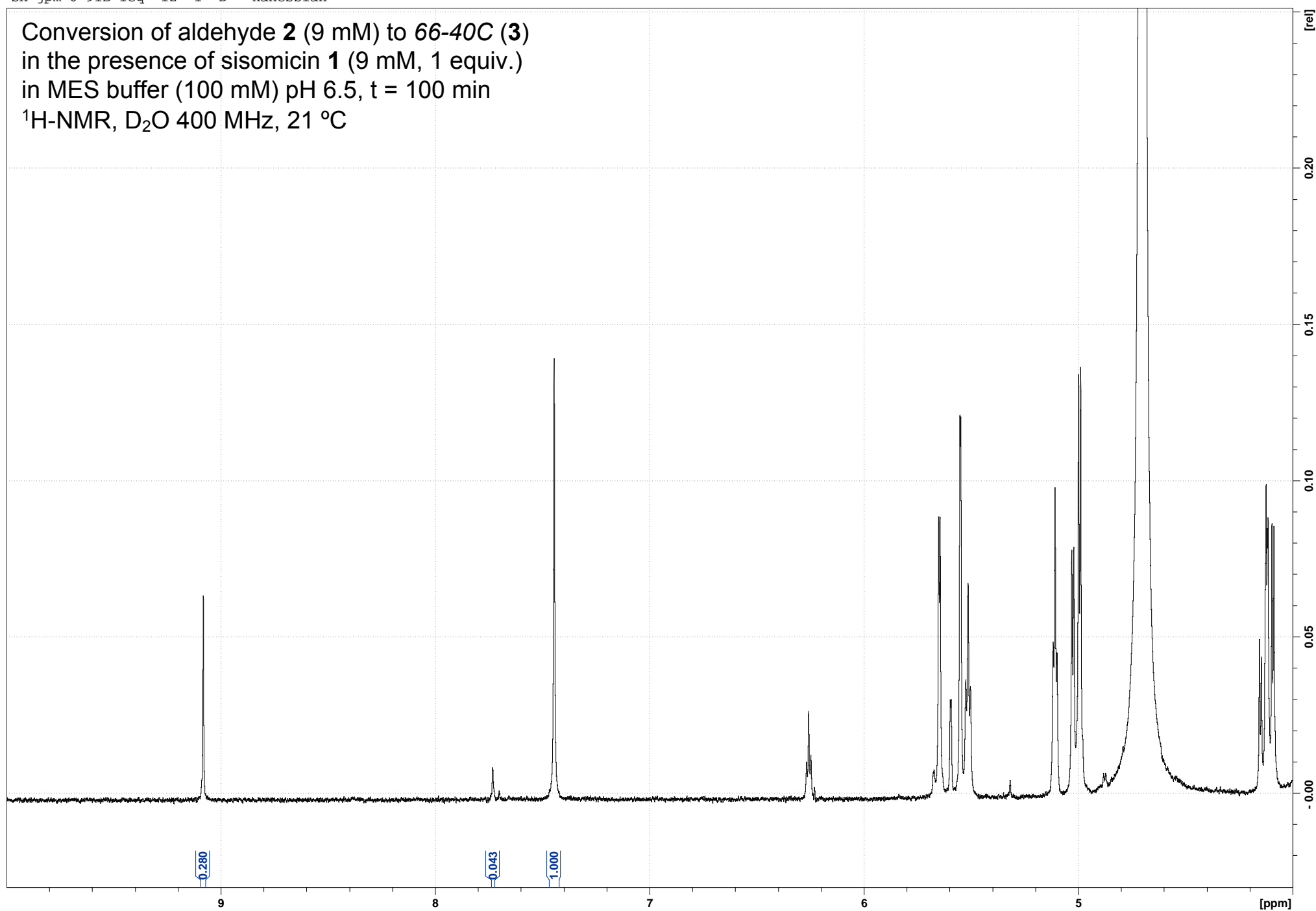
sh-jpm-6-91B-1eq 11 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 90 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



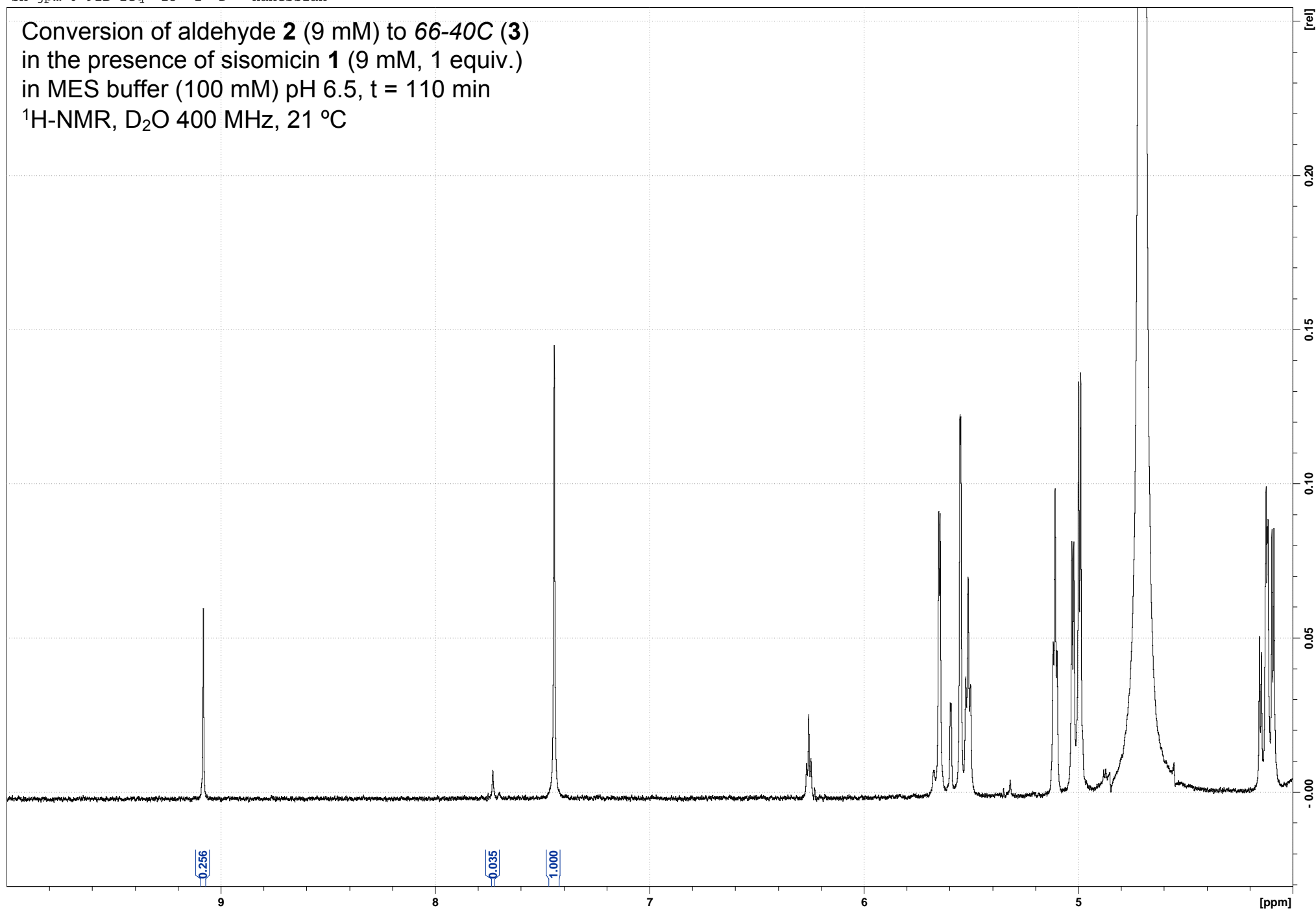
sh-jpm-6-91B-1eq 12 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 100 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



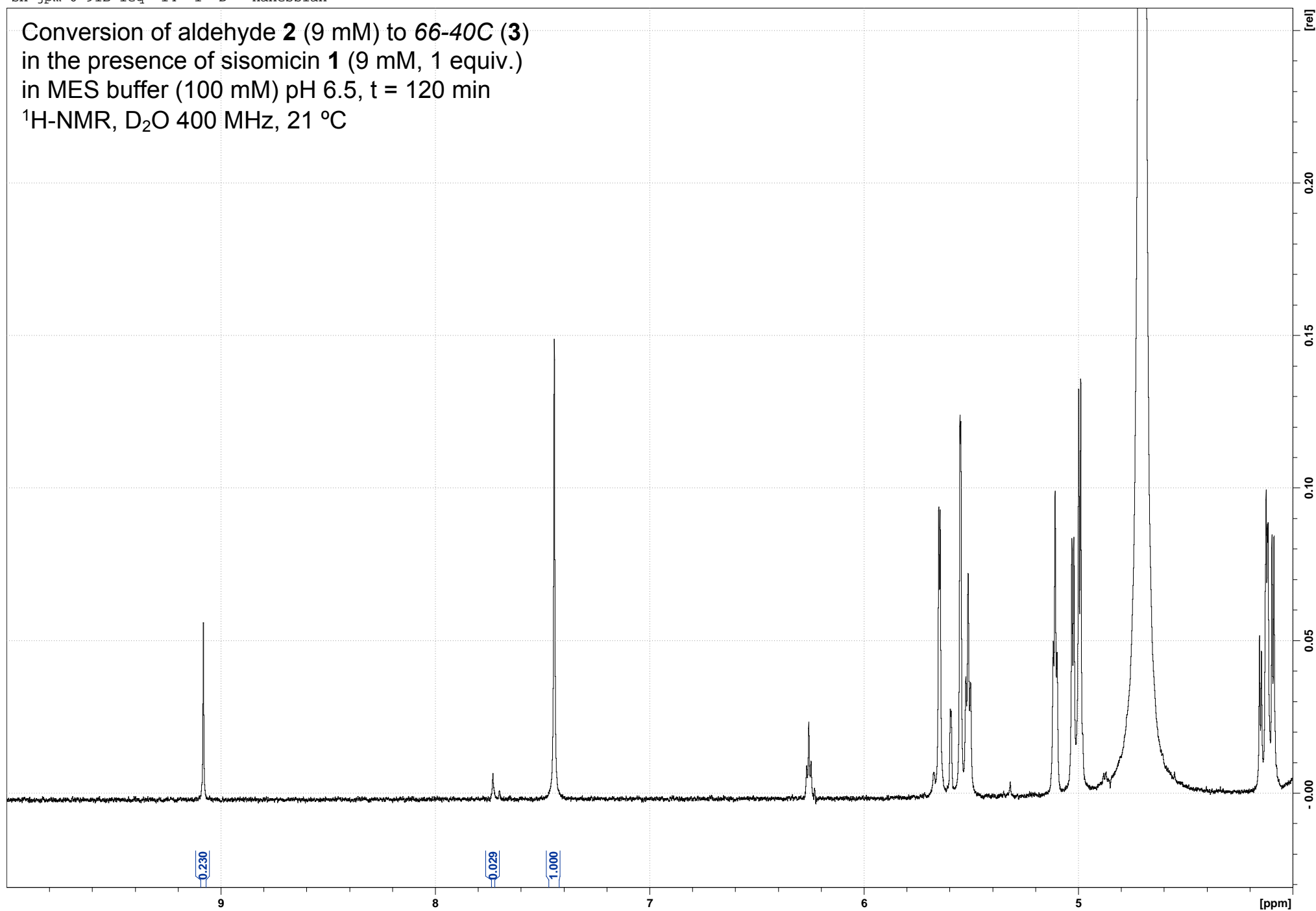
sh-jpm-6-91B-1eq 13 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 110 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



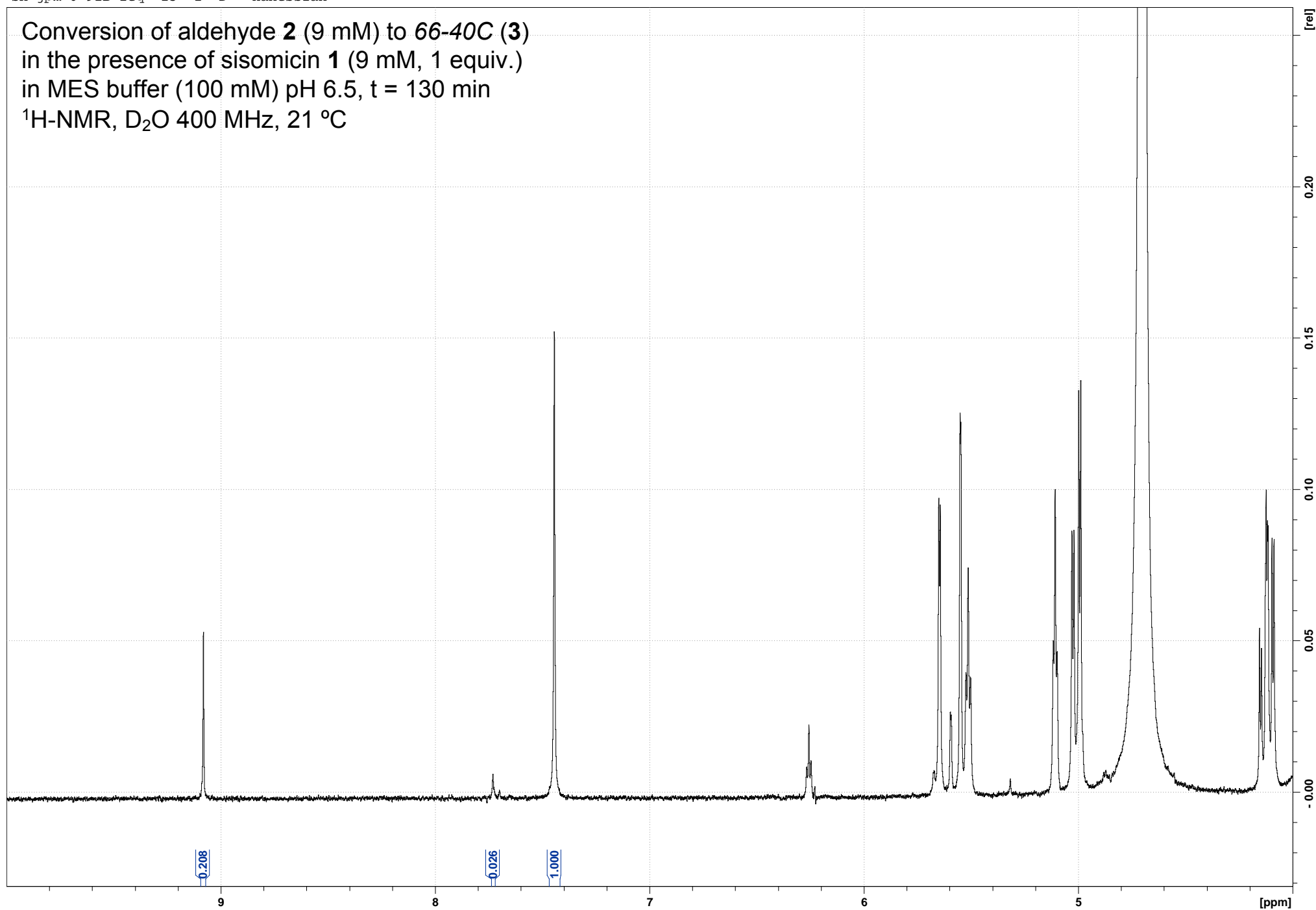
sh-jpm-6-91B-1eq 14 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 120 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



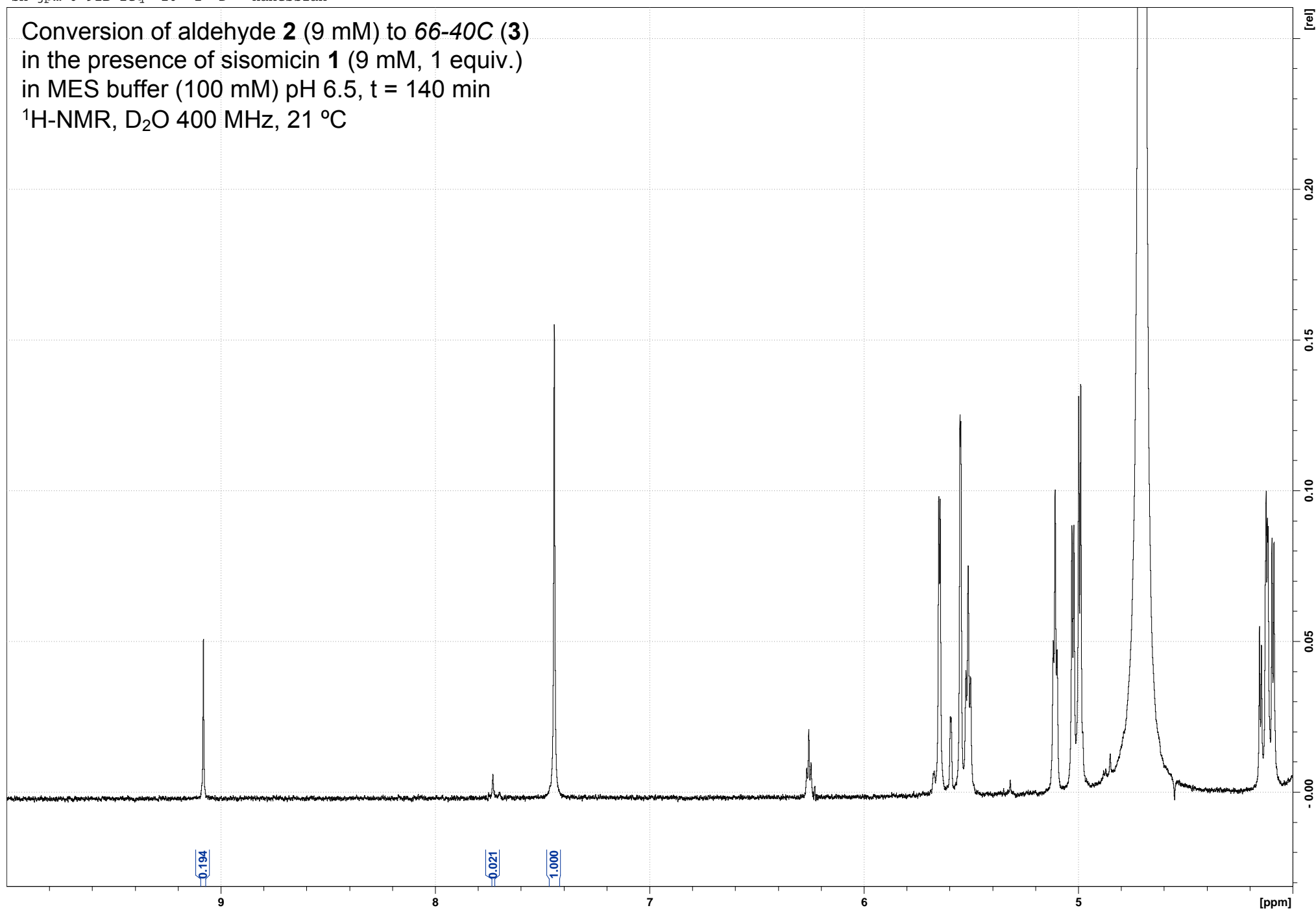
sh-jpm-6-91B-1eq 15 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 130 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91B-1eq 16 1 D: Hanessian

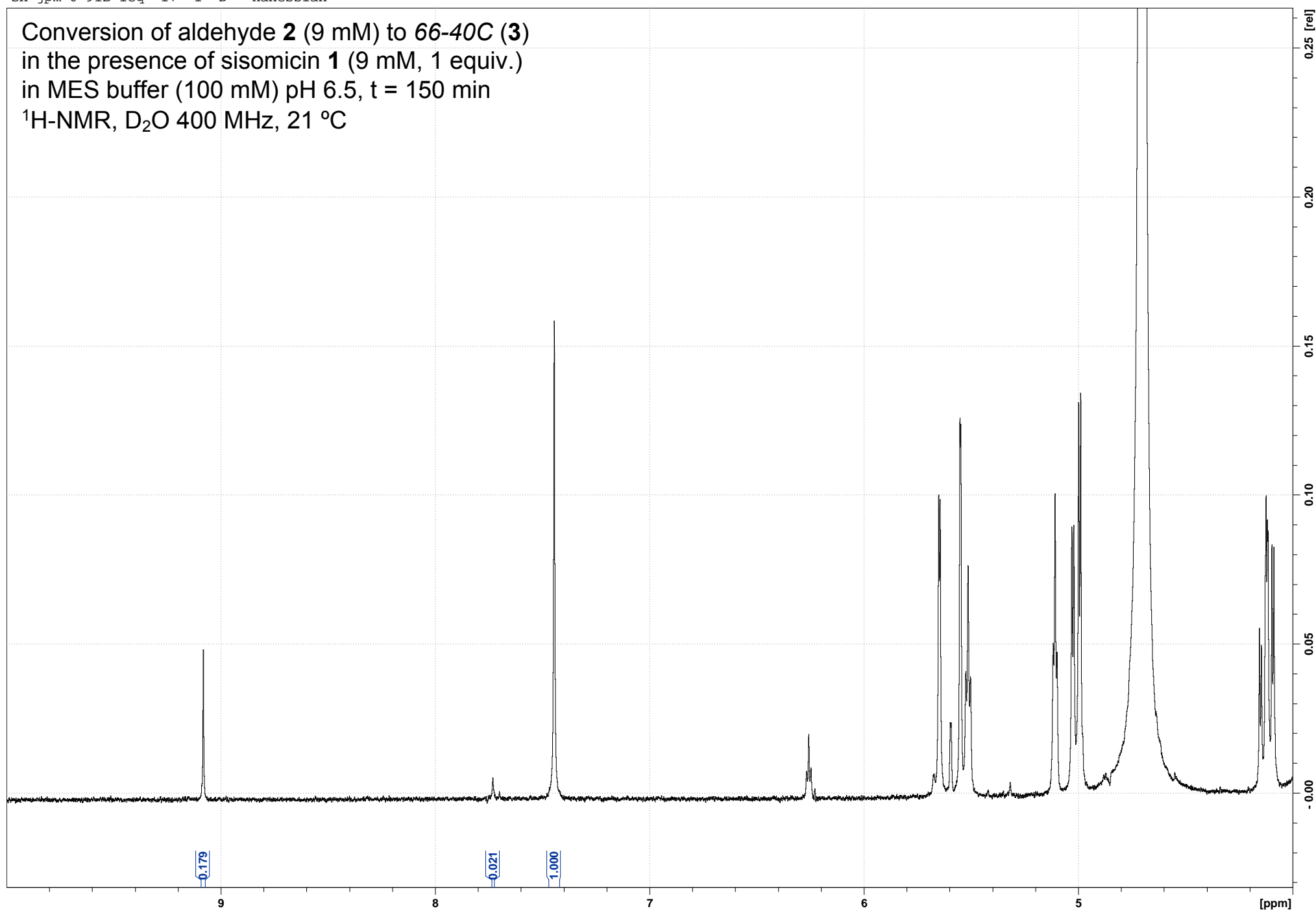
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 140 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





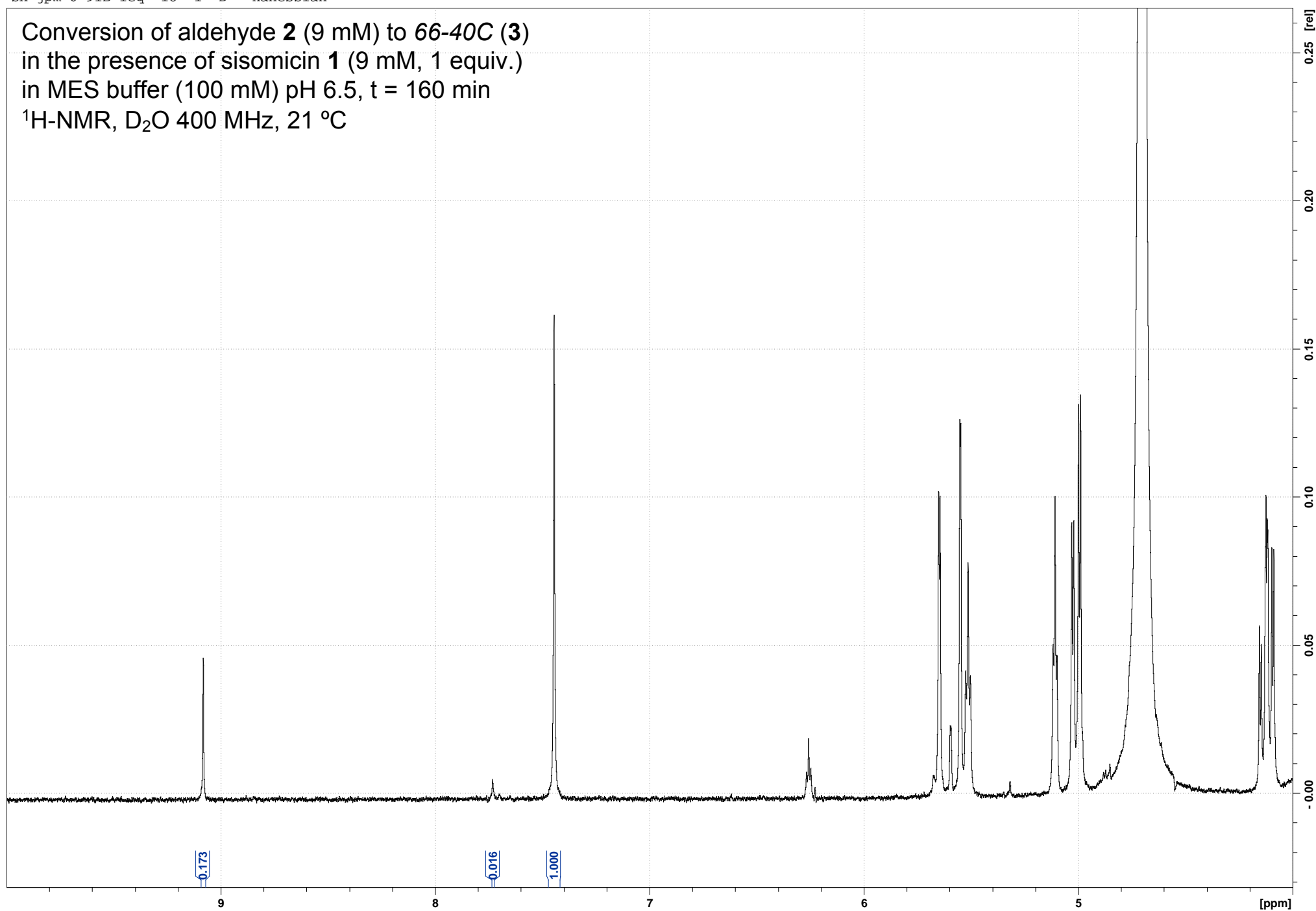
sh-jpm-6-91B-1eq 17 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 150 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



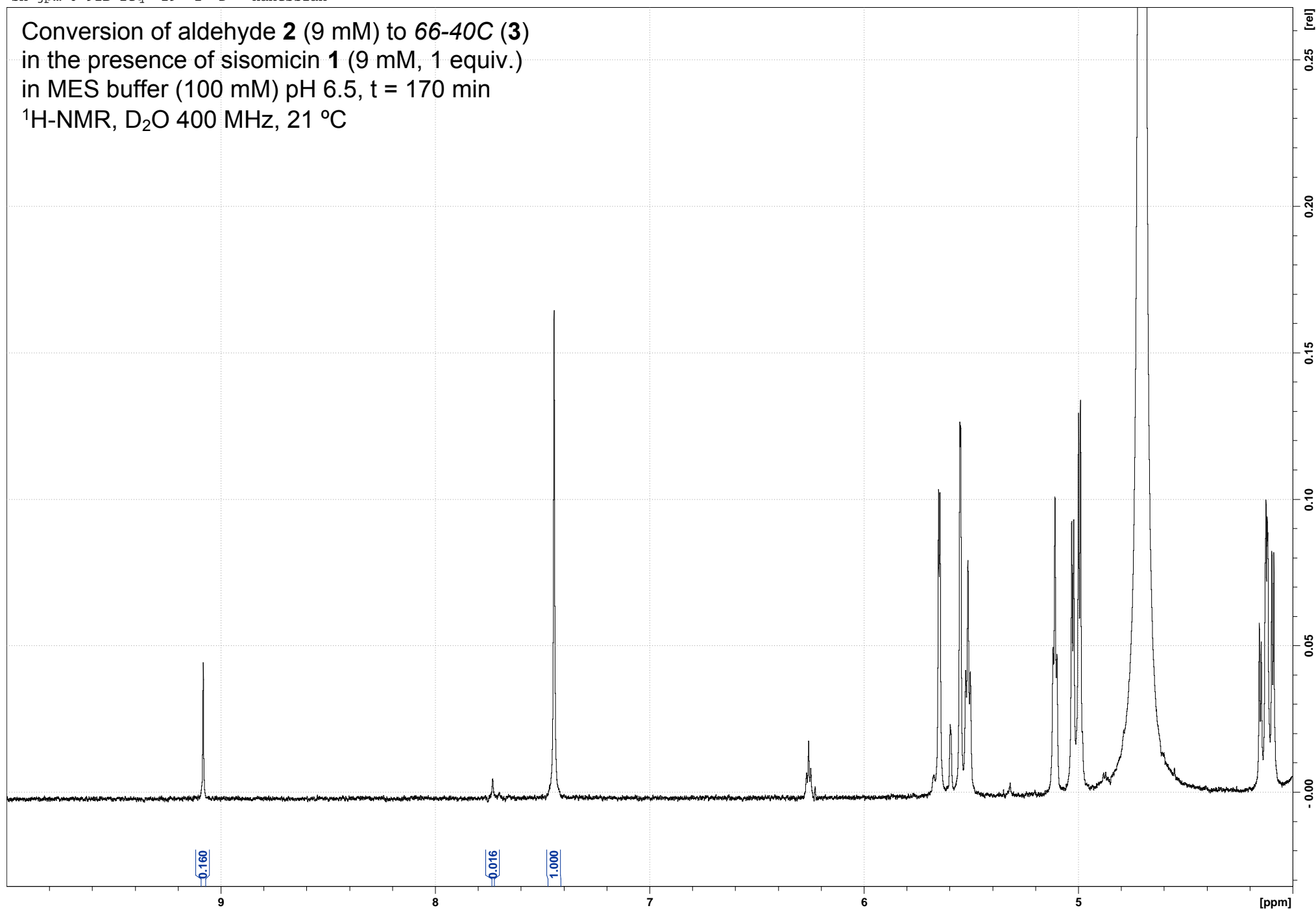
sh-jpm-6-91B-1eq 18 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 160 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



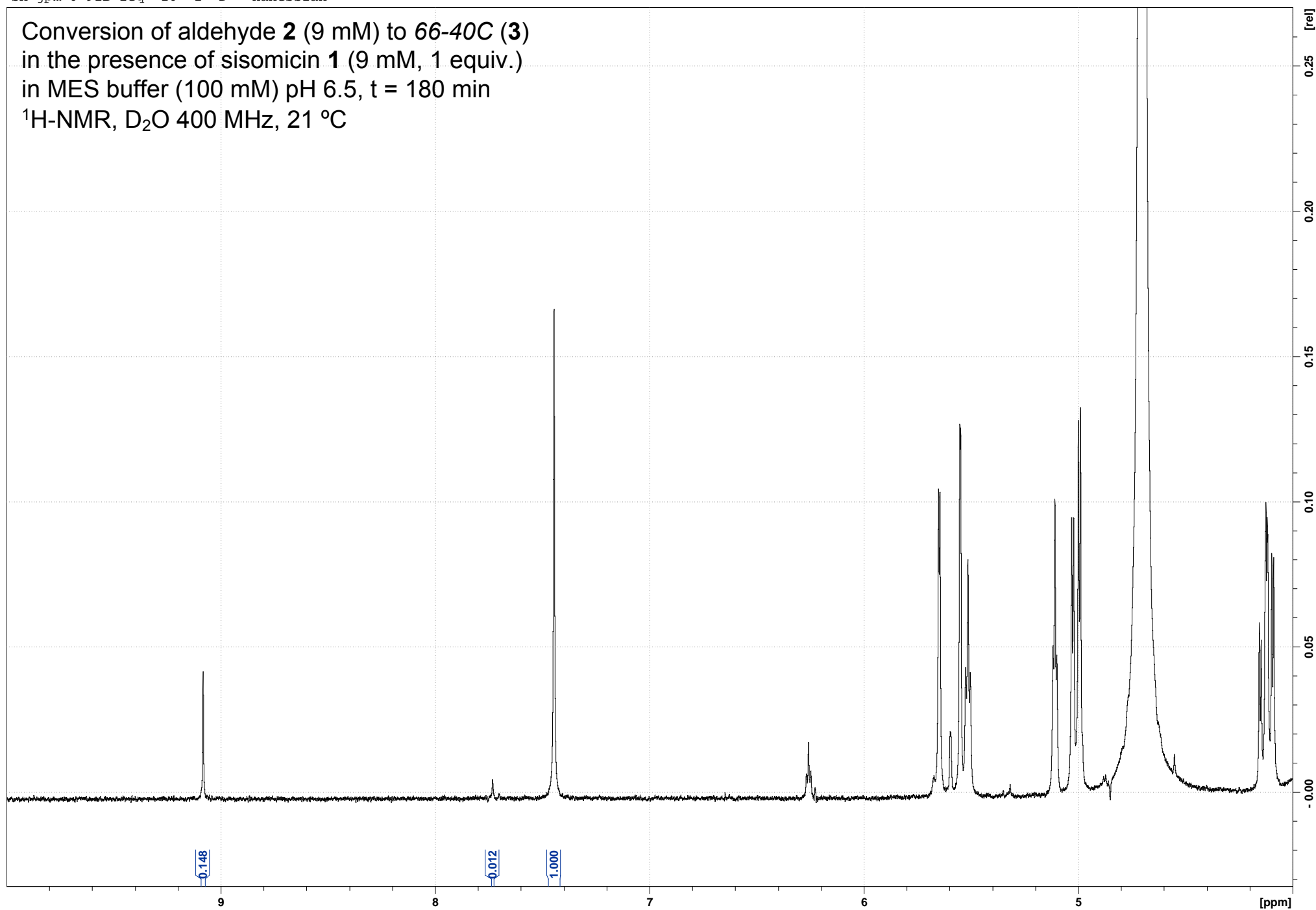
sh-jpm-6-91B-1eq 19 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 170 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



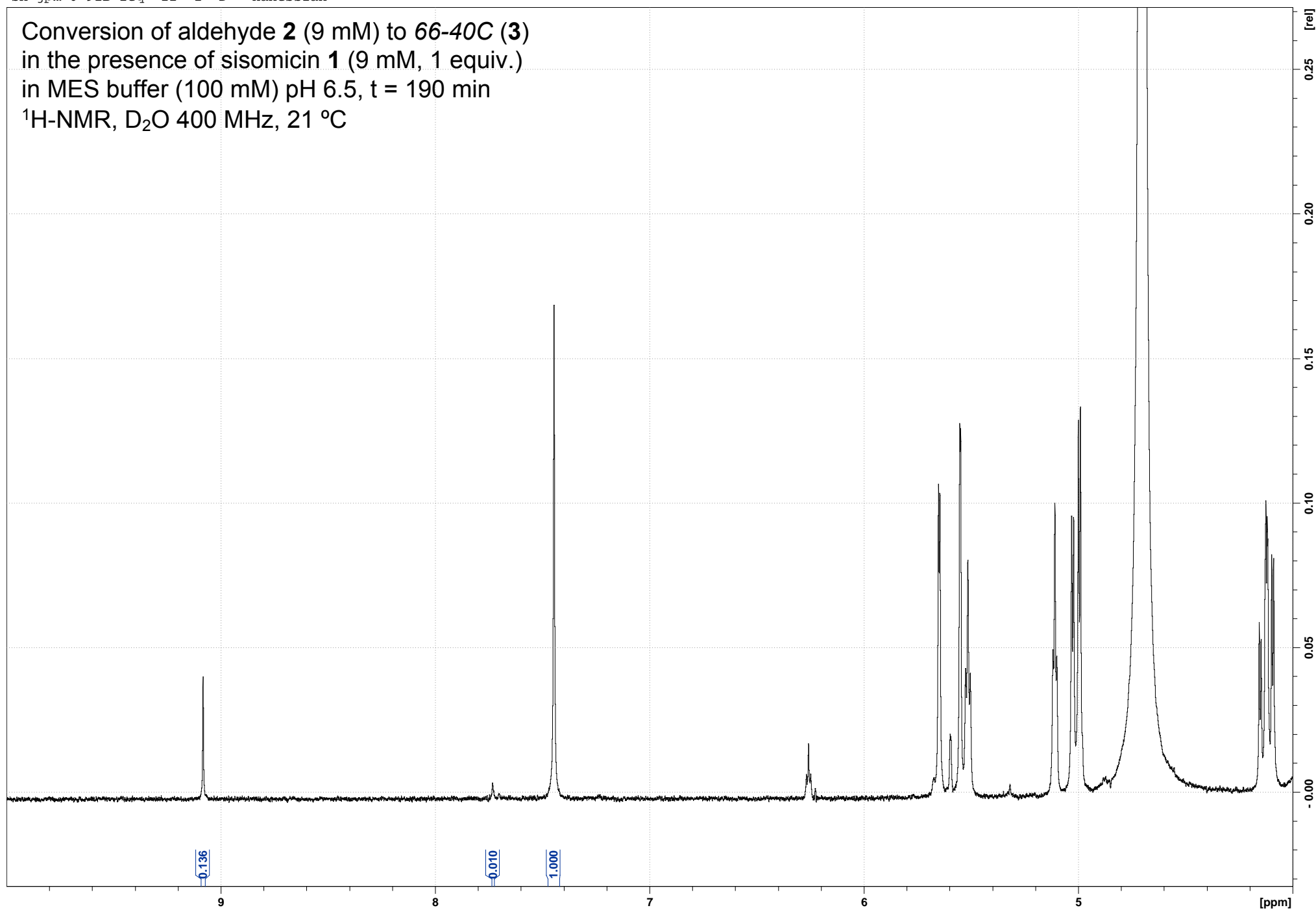
sh-jpm-6-91B-1eq 20 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 180 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



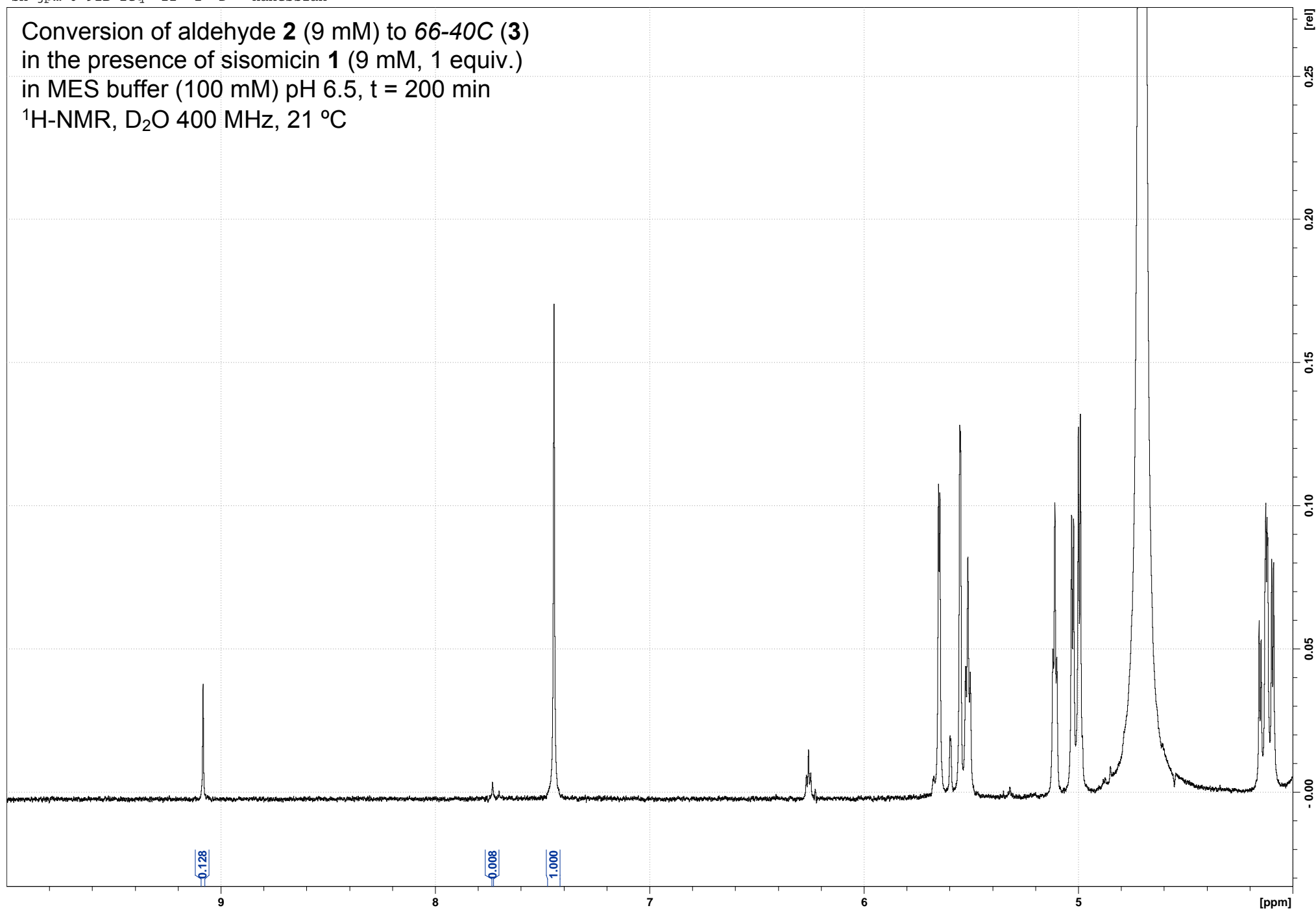
sh-jpm-6-91B-1eq 21 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 190 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



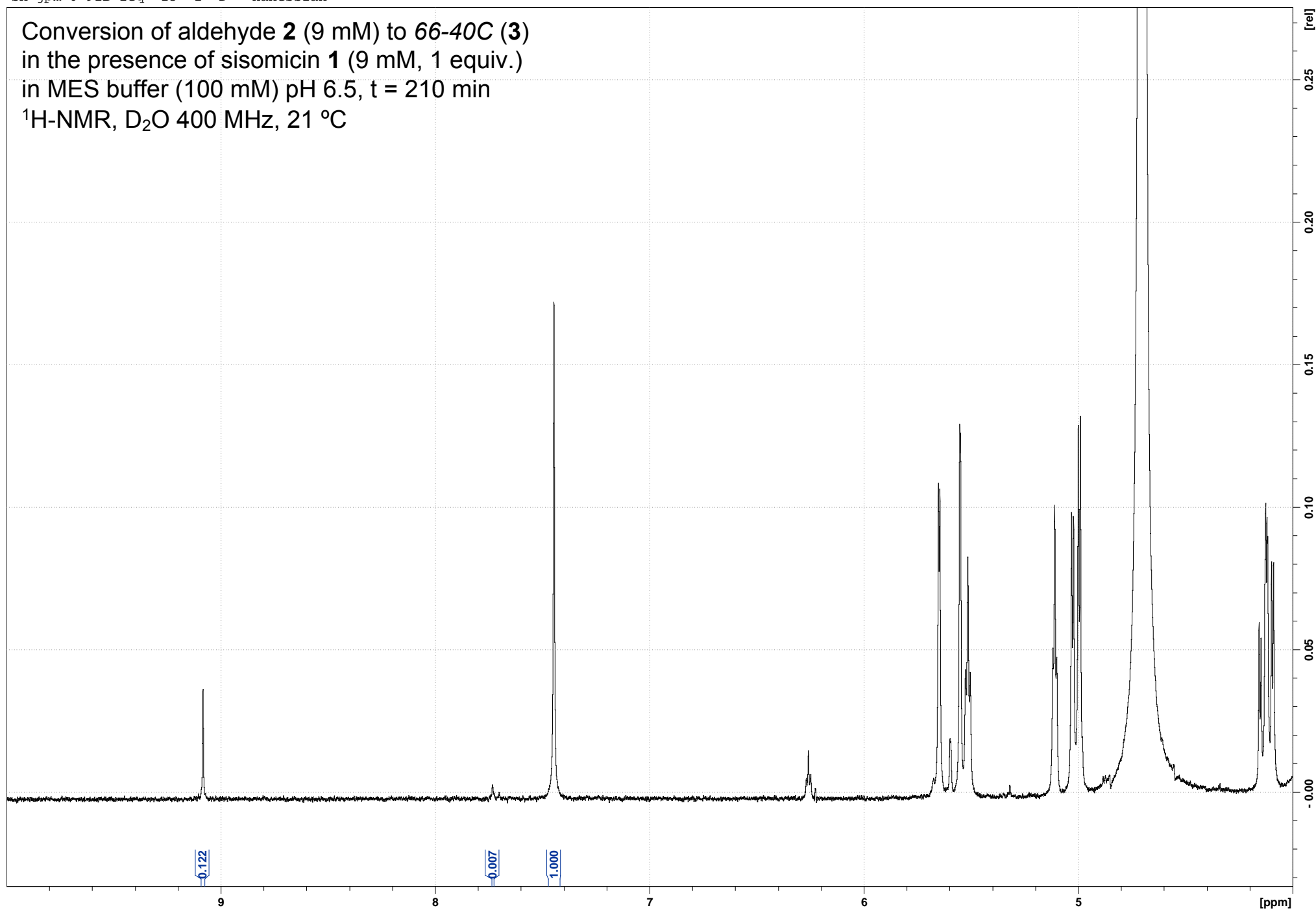
sh-jpm-6-91B-1eq 22 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 200 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



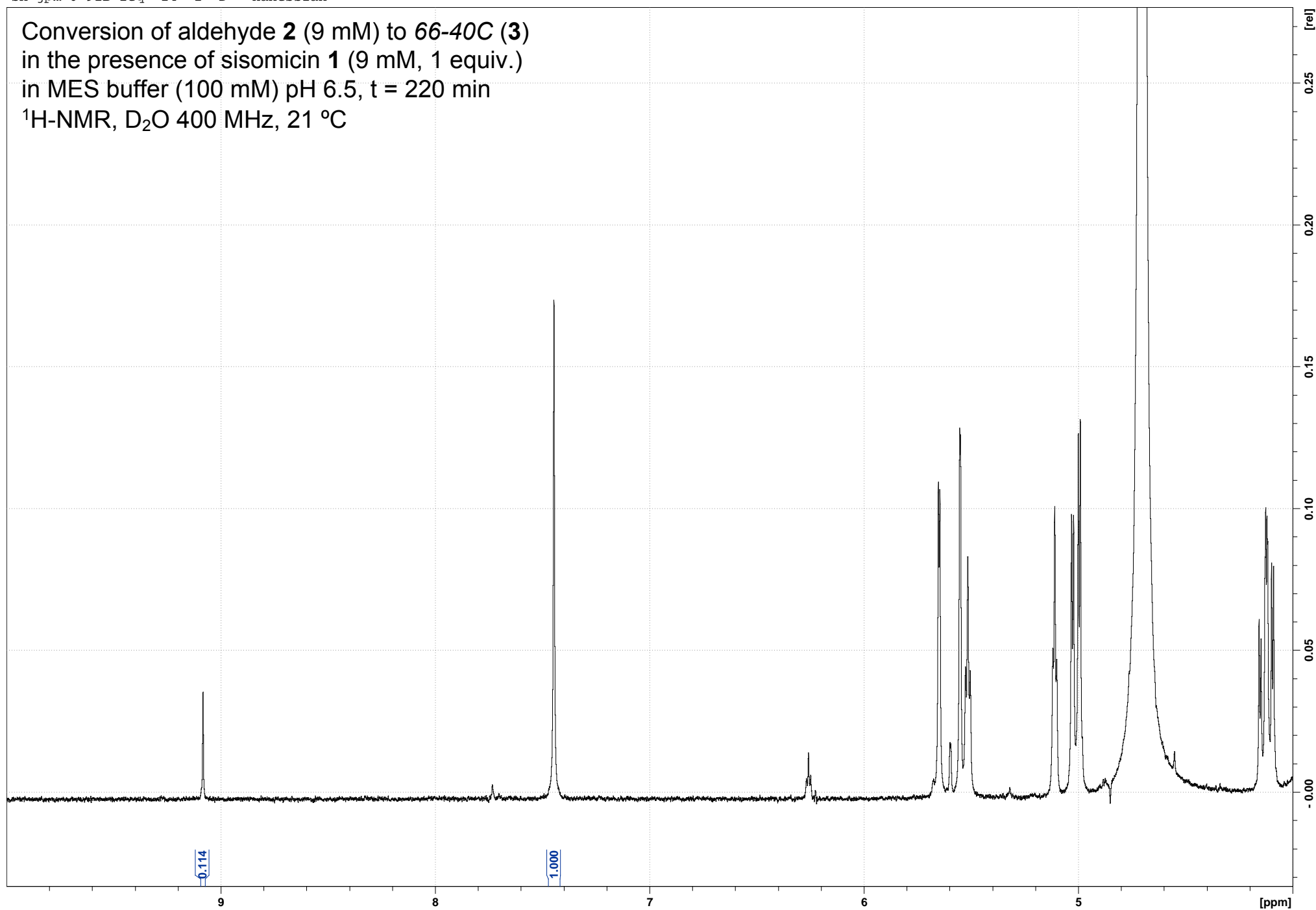
sh-jpm-6-91B-1eq 23 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 210 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91B-1eq 24 1 D: Hanessian

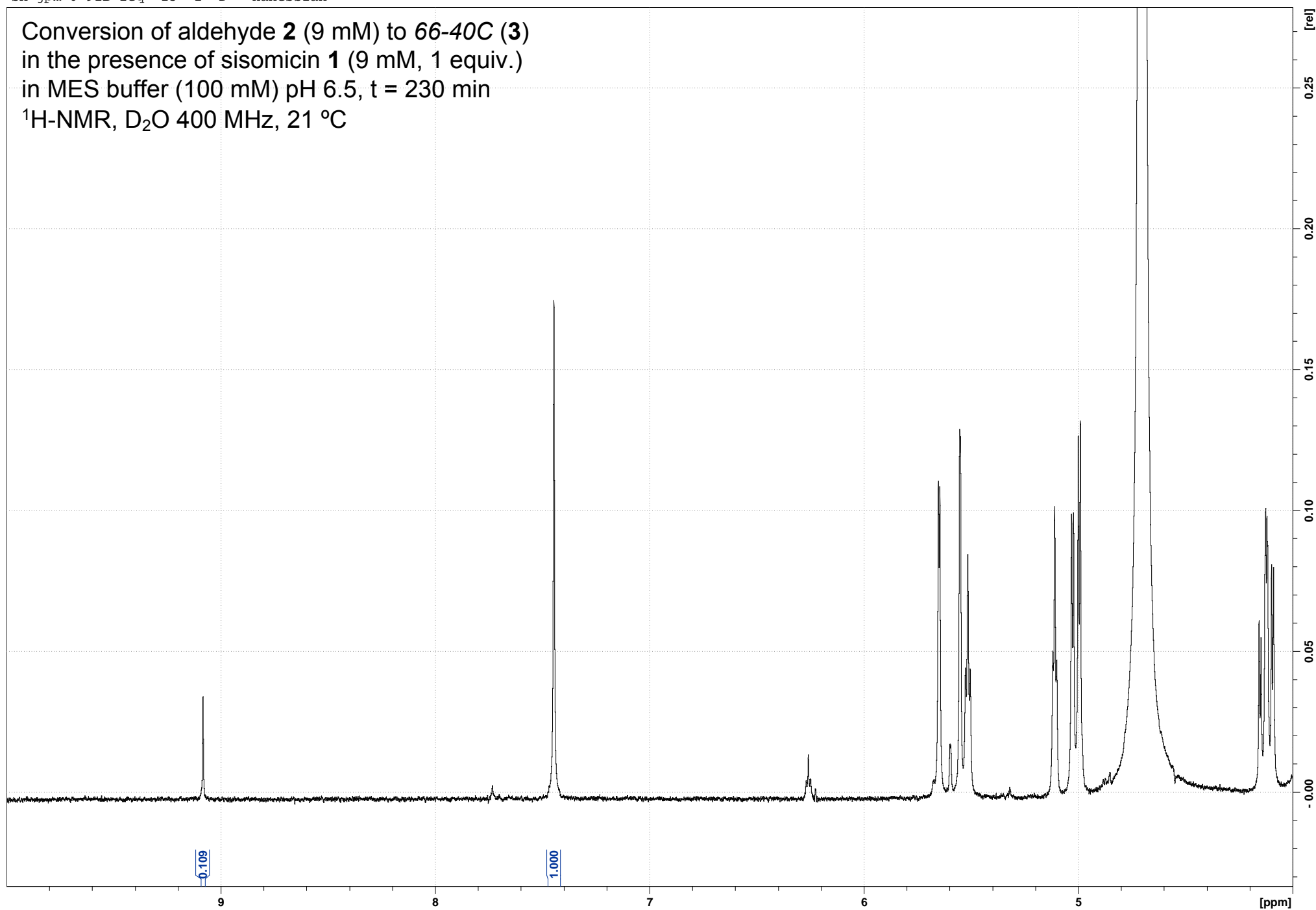
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 220 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





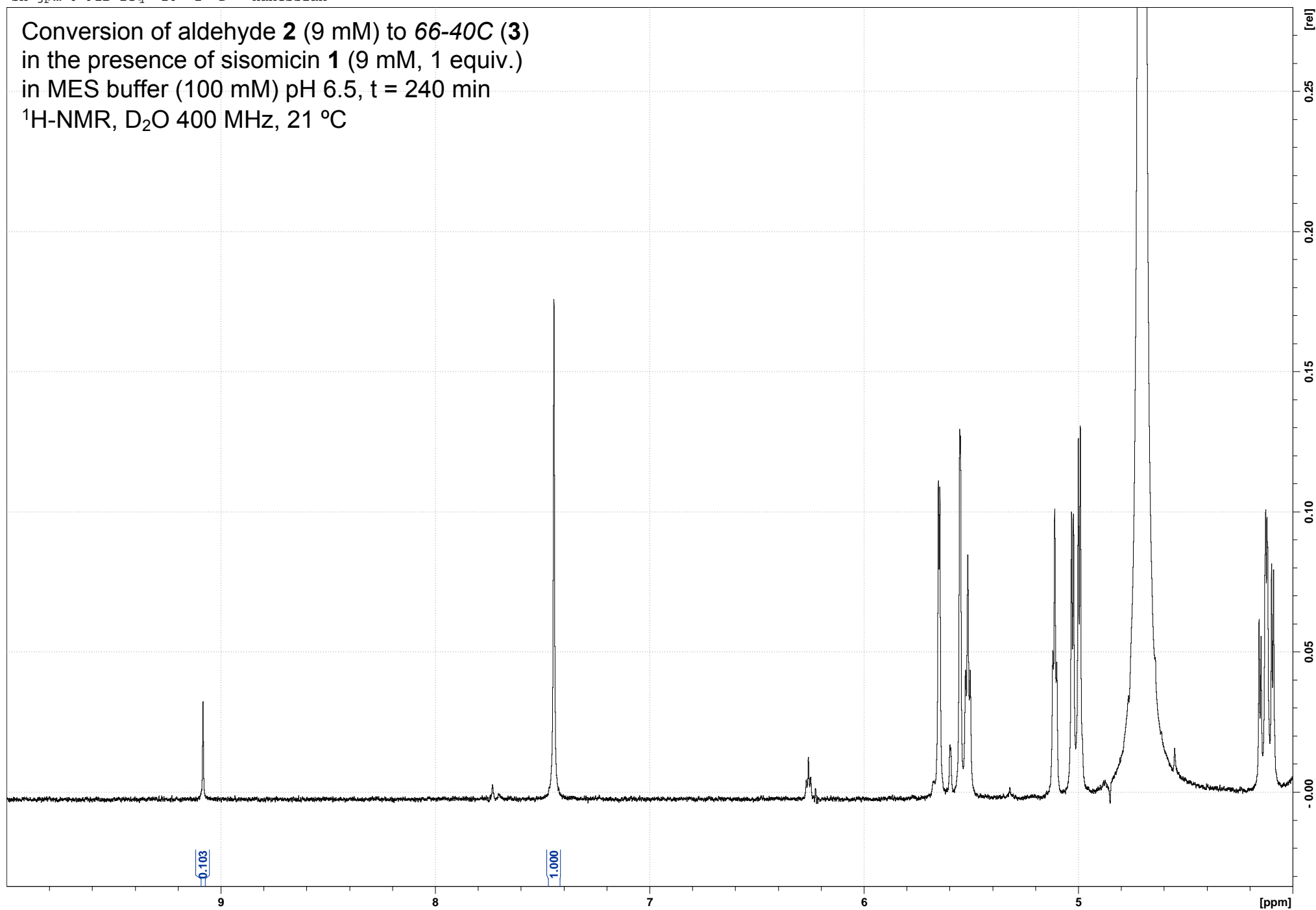
sh-jpm-6-91B-1eq 25 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 230 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



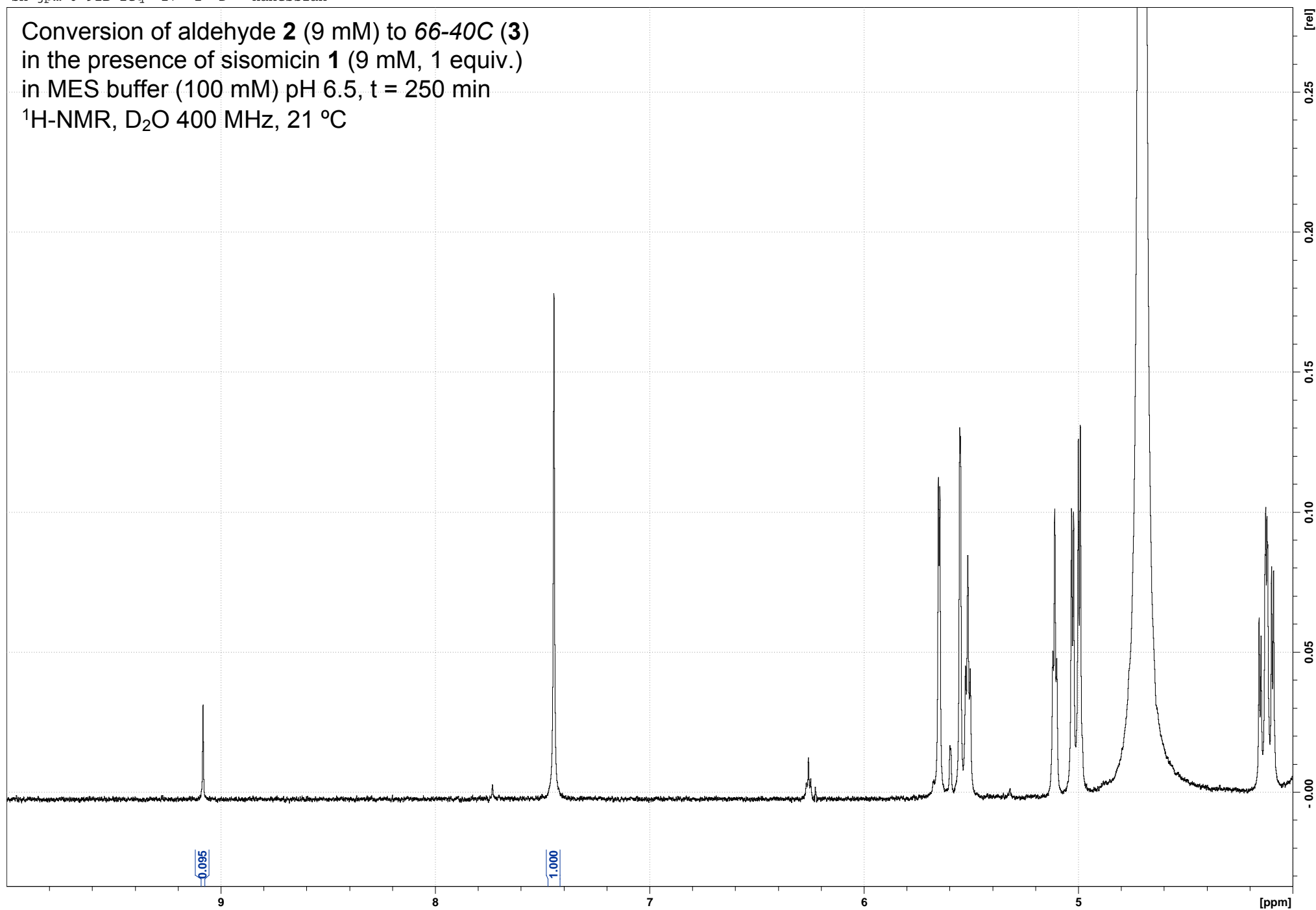
sh-jpm-6-91B-1eq 26 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 240 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



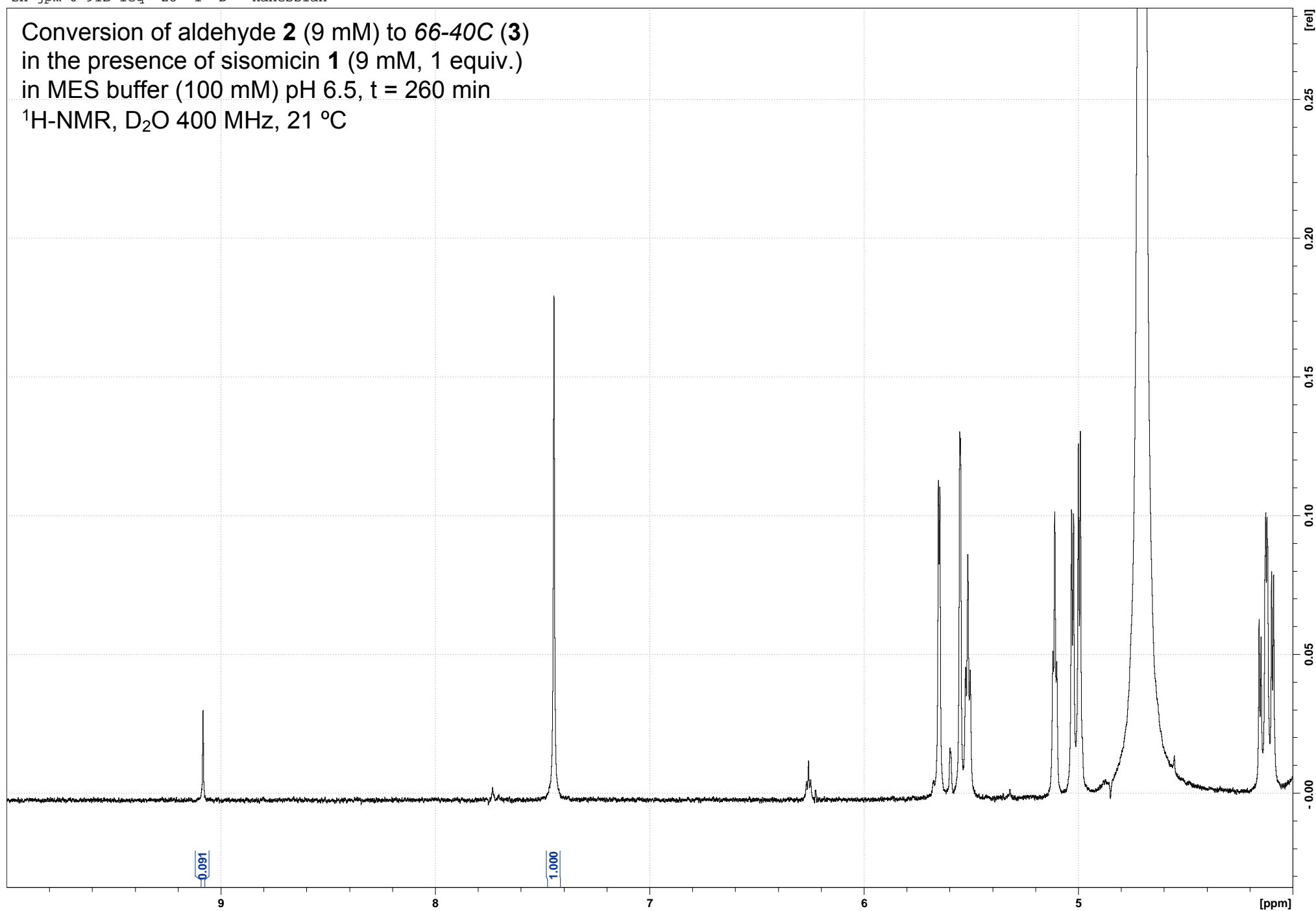
sh-jpm-6-91B-1eq 27 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 250 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



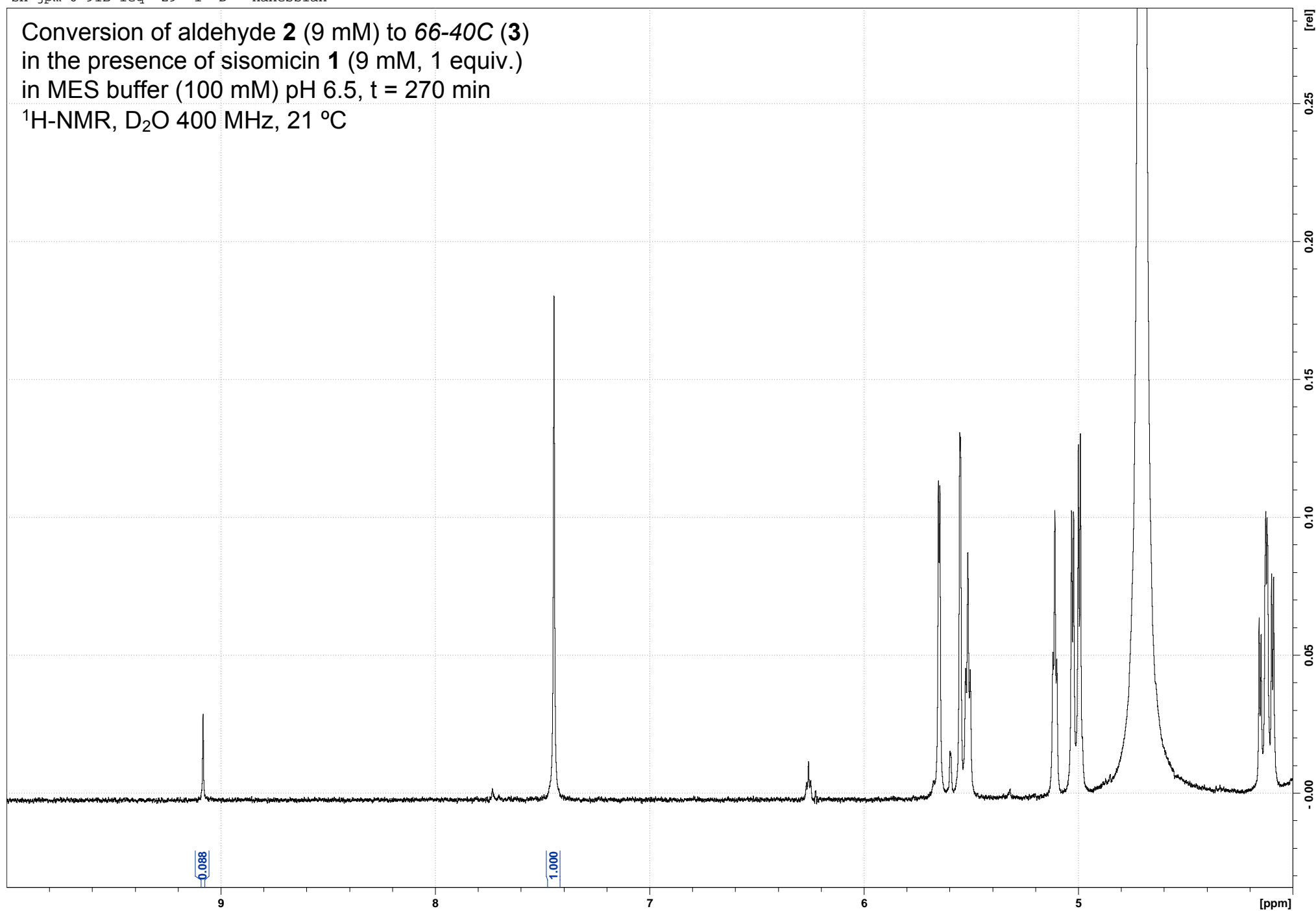
sh-jpm-6-91B-1eq 28 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 260 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



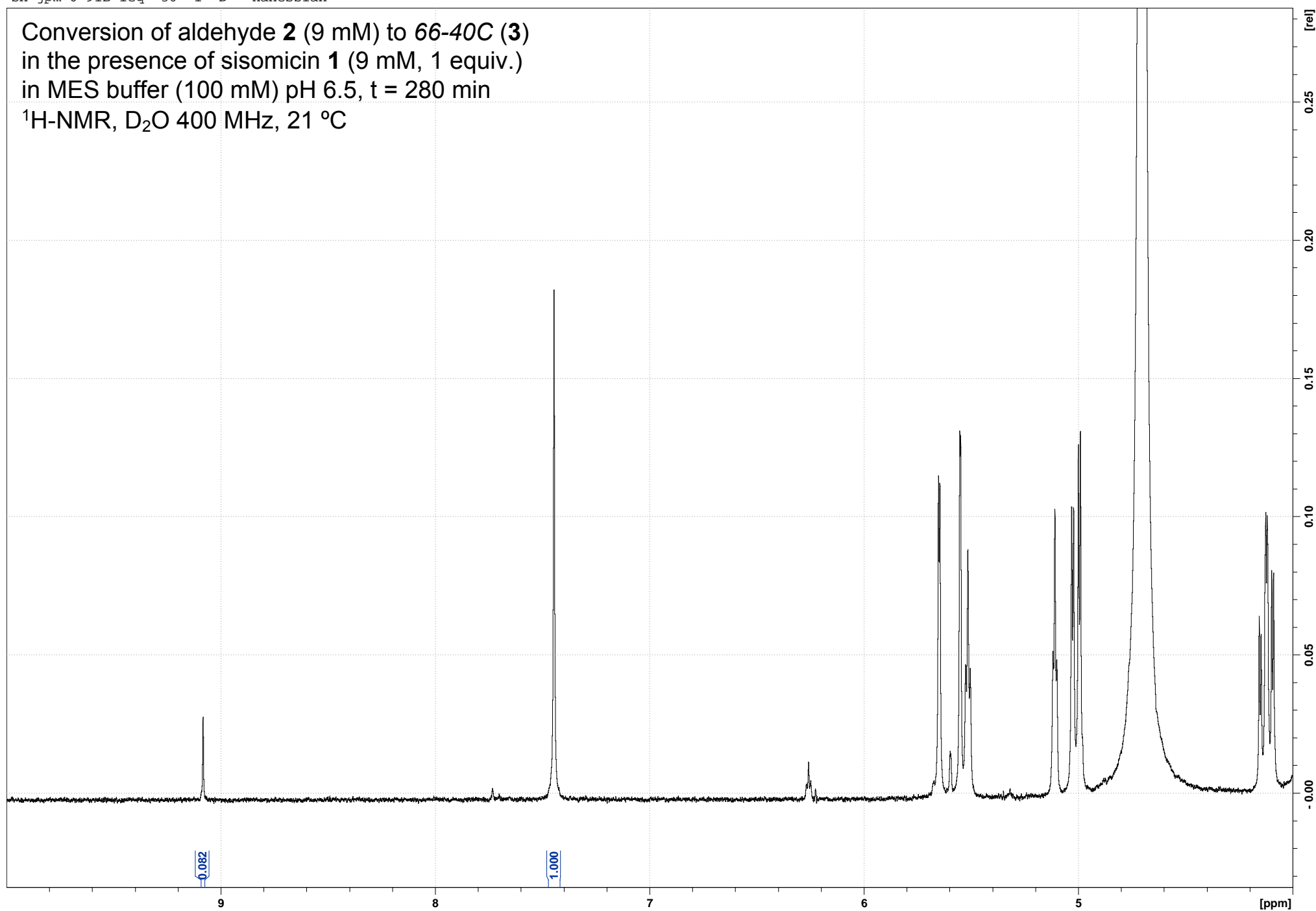
sh-jpm-6-91B-1eq 29 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 270 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



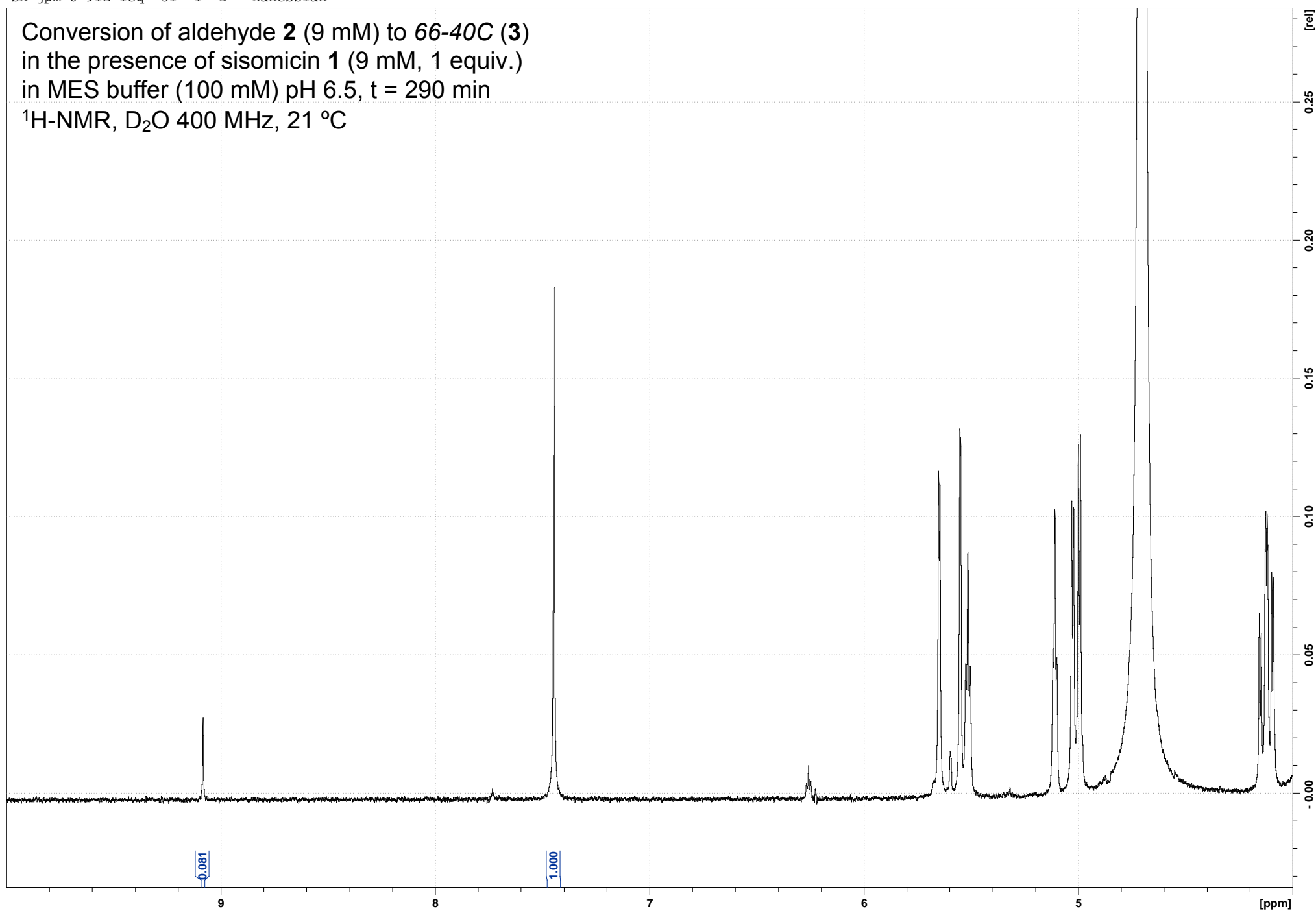
sh-jpm-6-91B-1eq 30 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 280 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



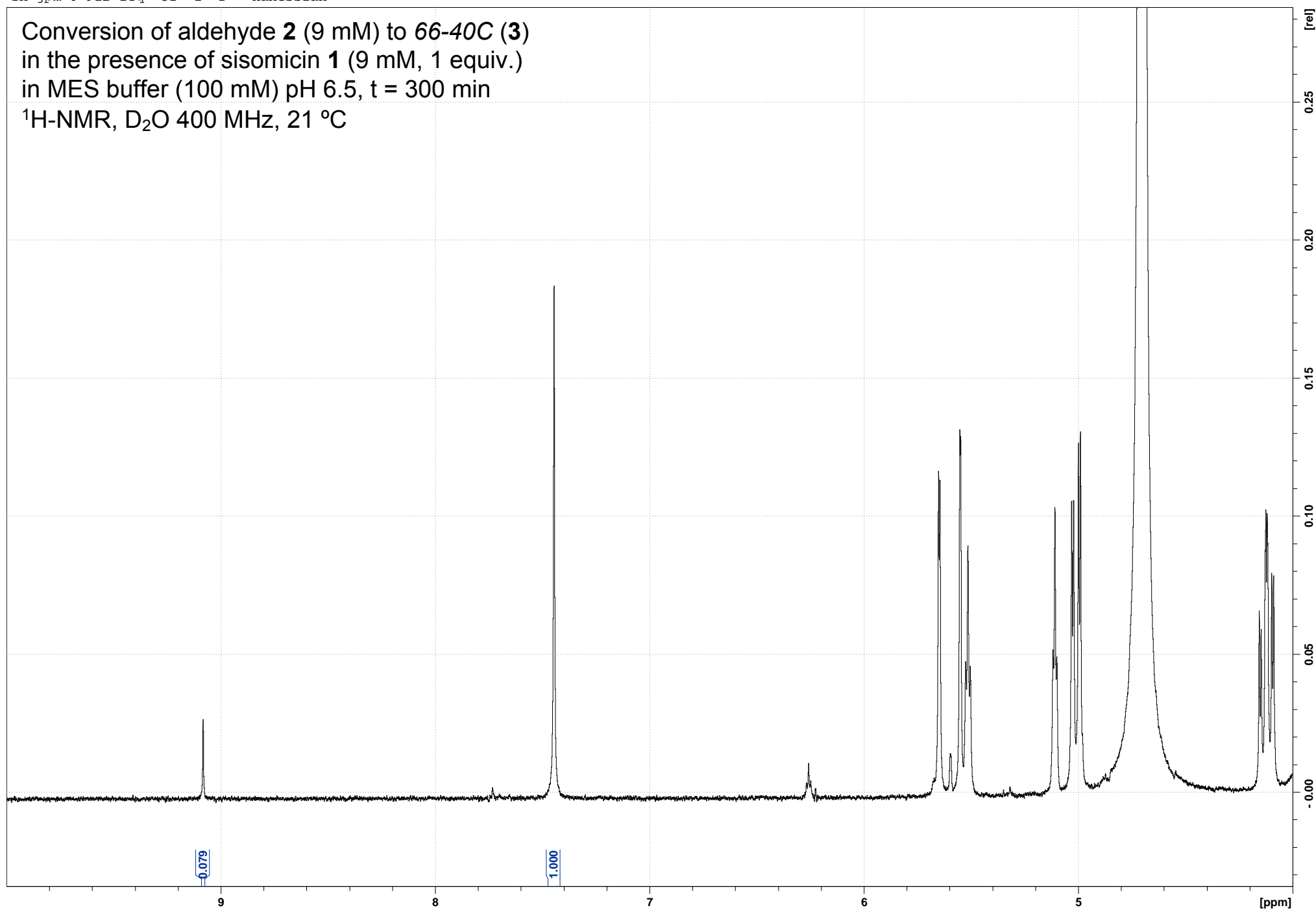
sh-jpm-6-91B-1eq 31 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 290 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91B-1eq 32 1 D: Hanessian

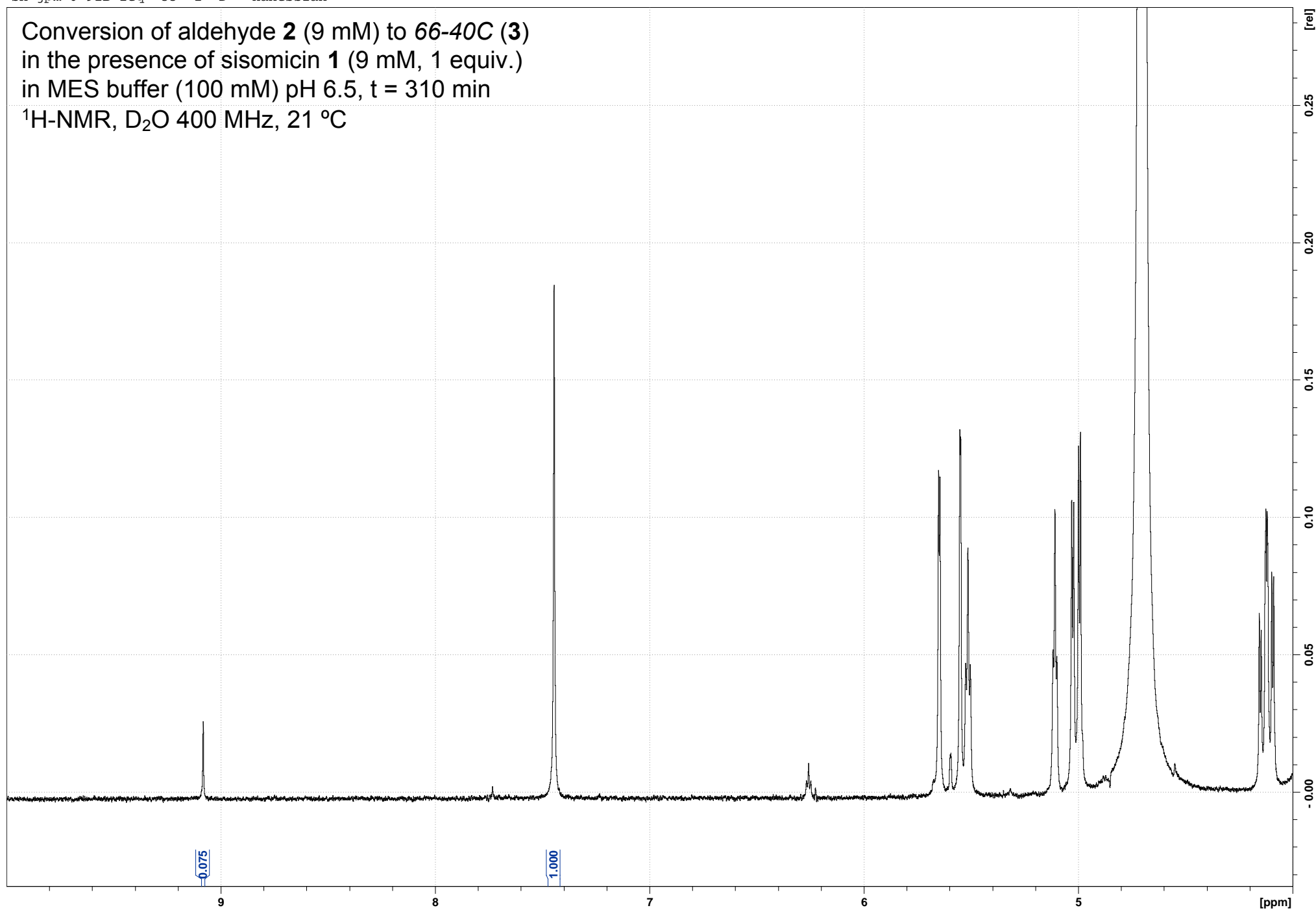
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 300 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





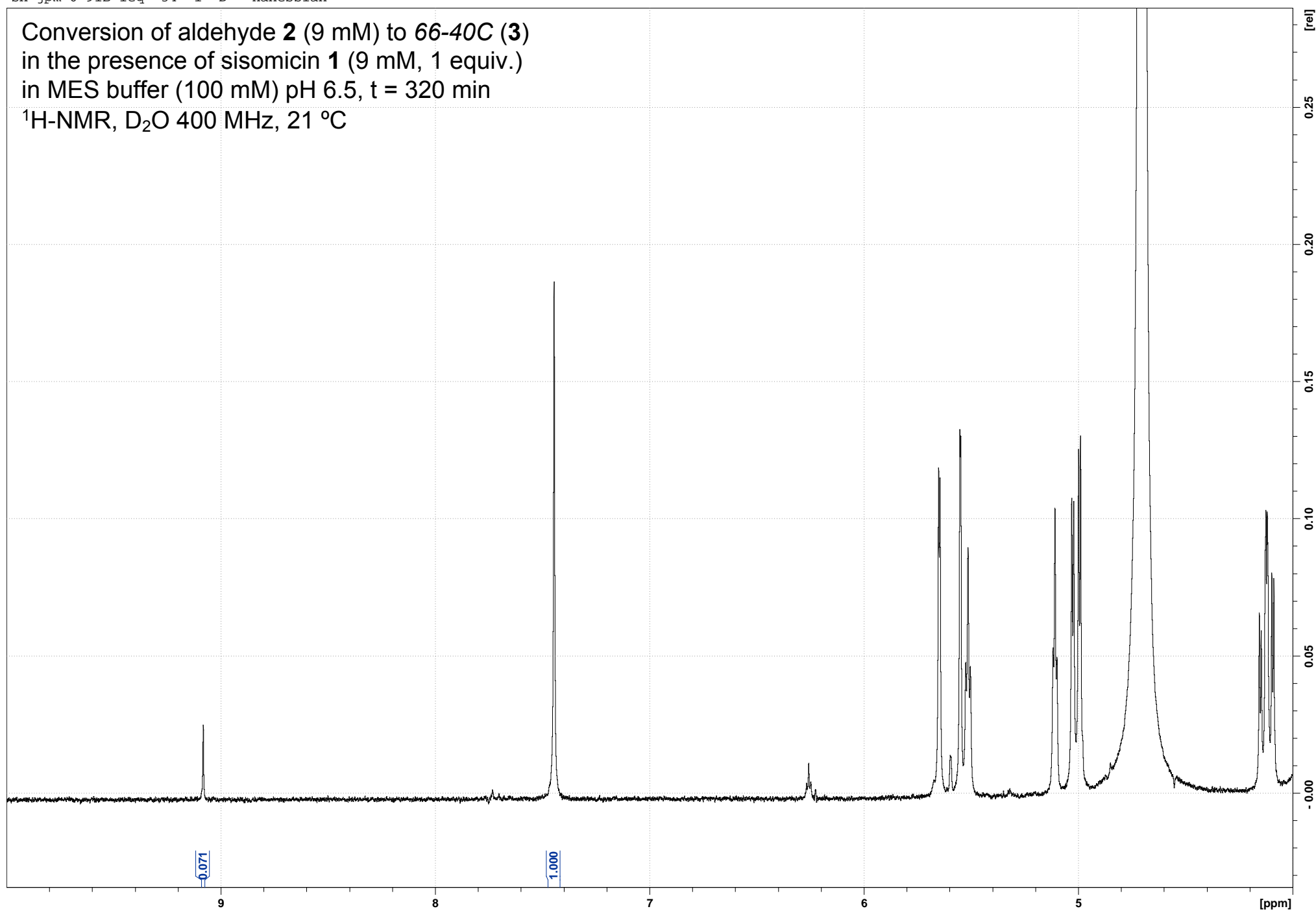
sh-jpm-6-91B-1eq 33 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 310 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



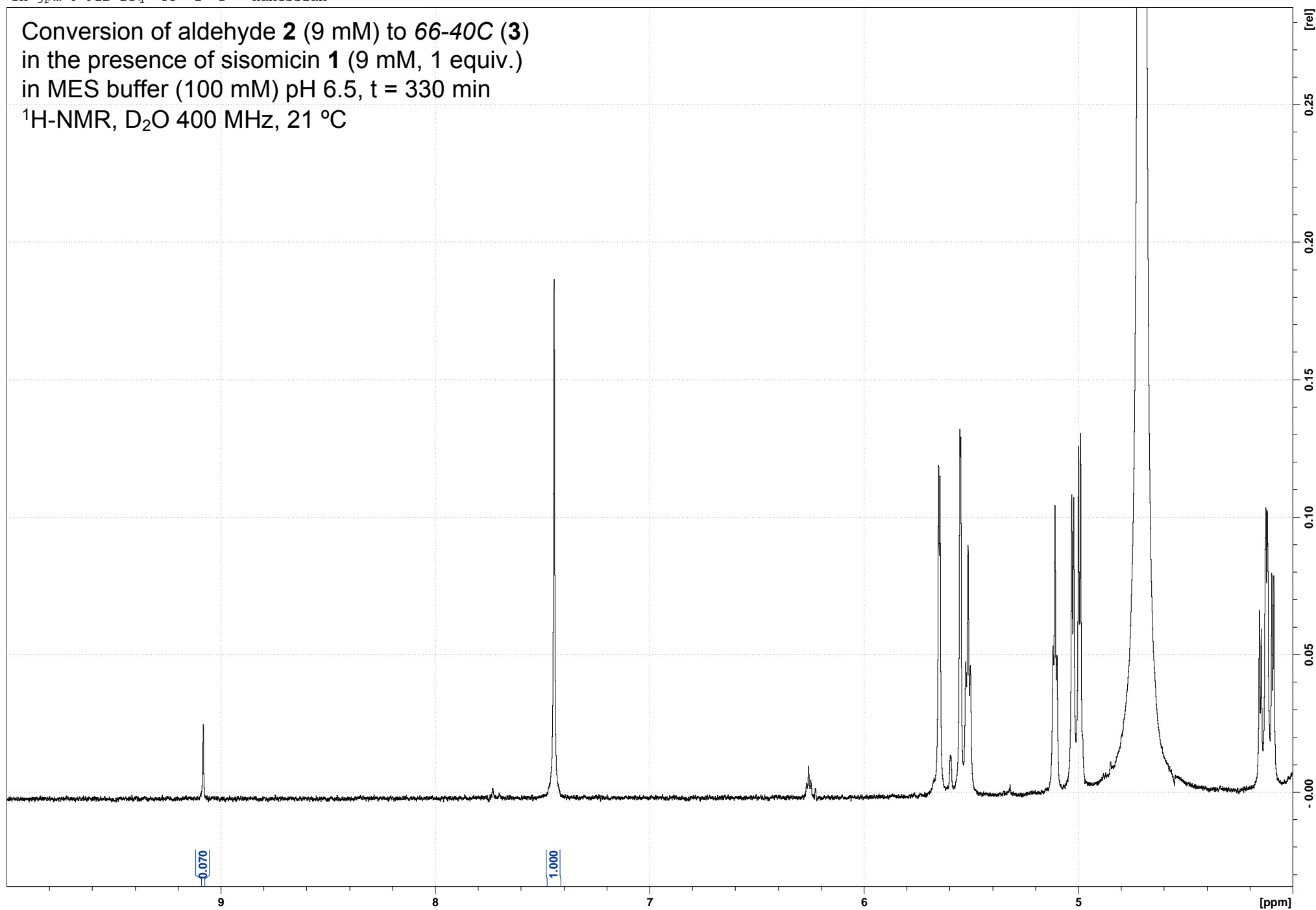
sh-jpm-6-91B-1eq 34 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 320 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



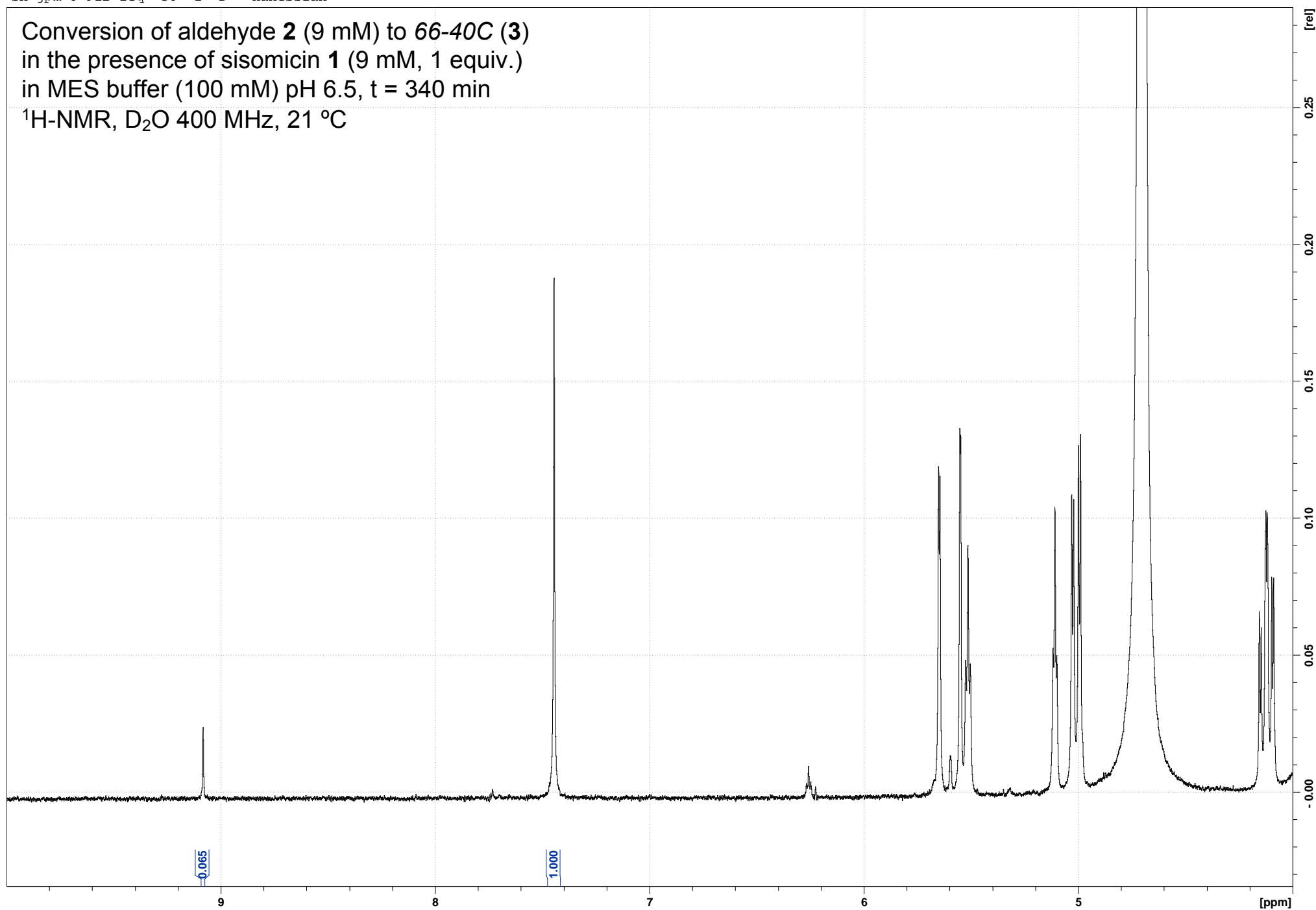
sh-jpm-6-91B-1eq 35 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 330 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



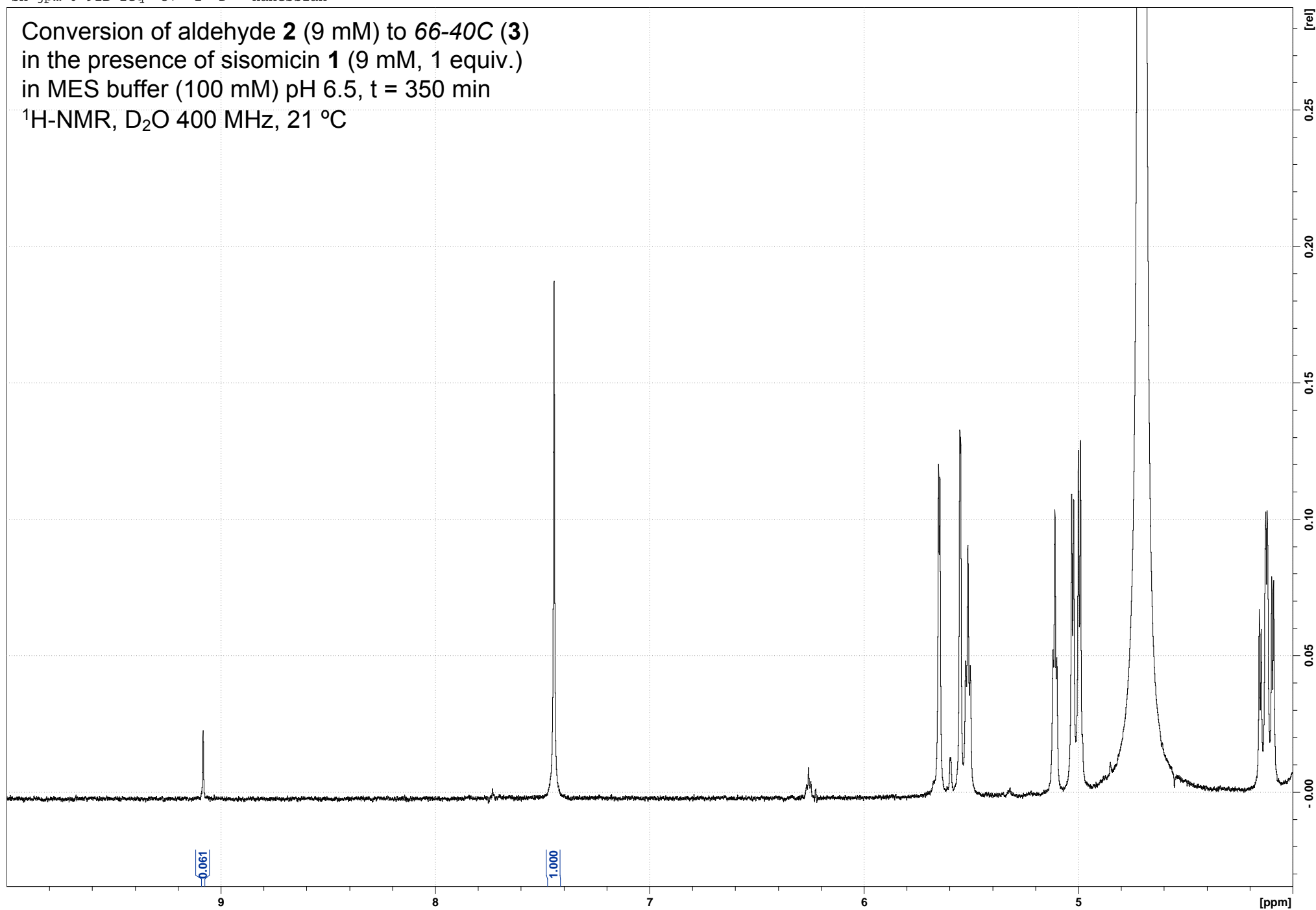
sh-jpm-6-91B-1eq 36 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 340 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



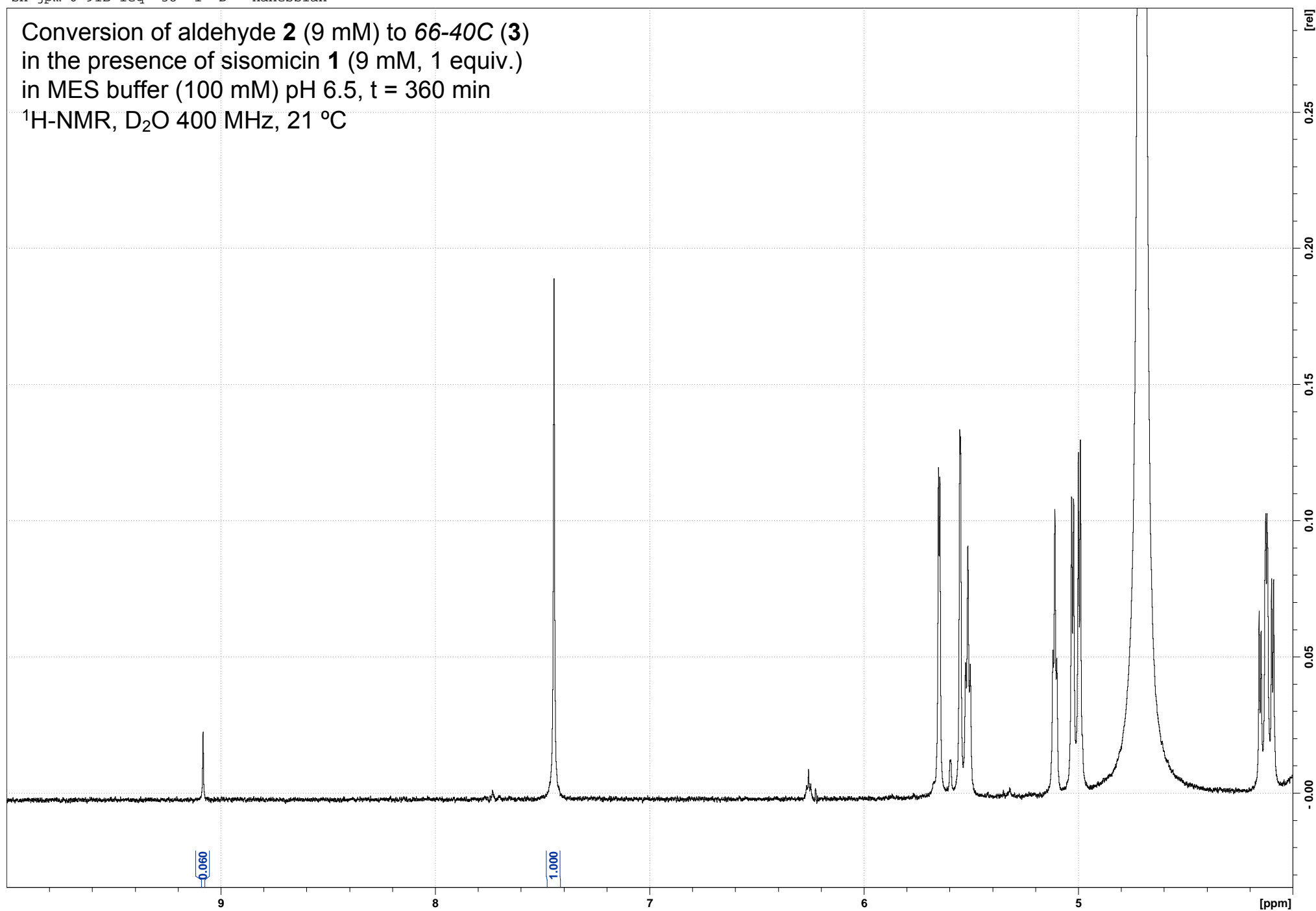
sh-jpm-6-91B-1eq 37 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 350 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



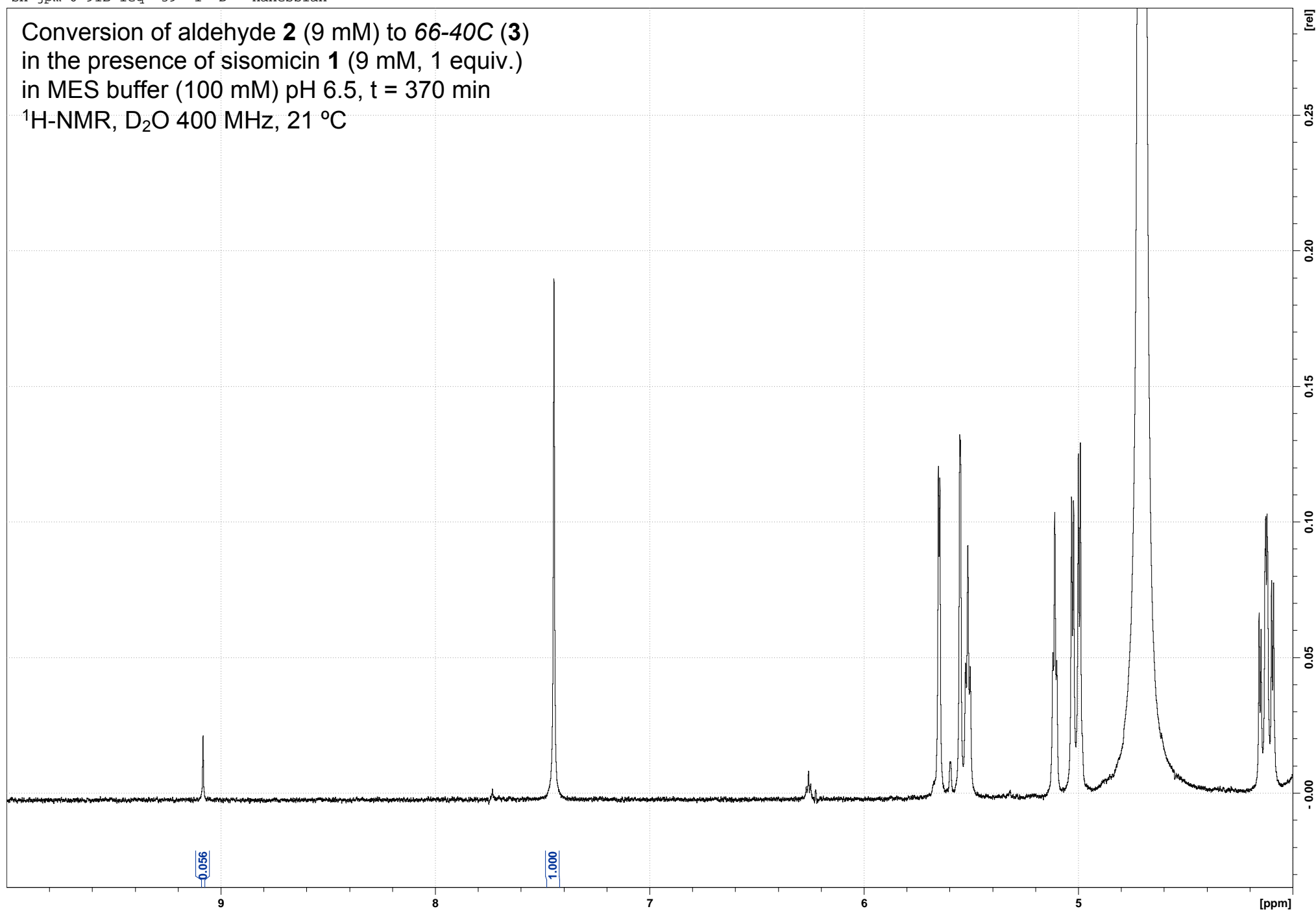
sh-jpm-6-91B-1eq 38 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 360 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



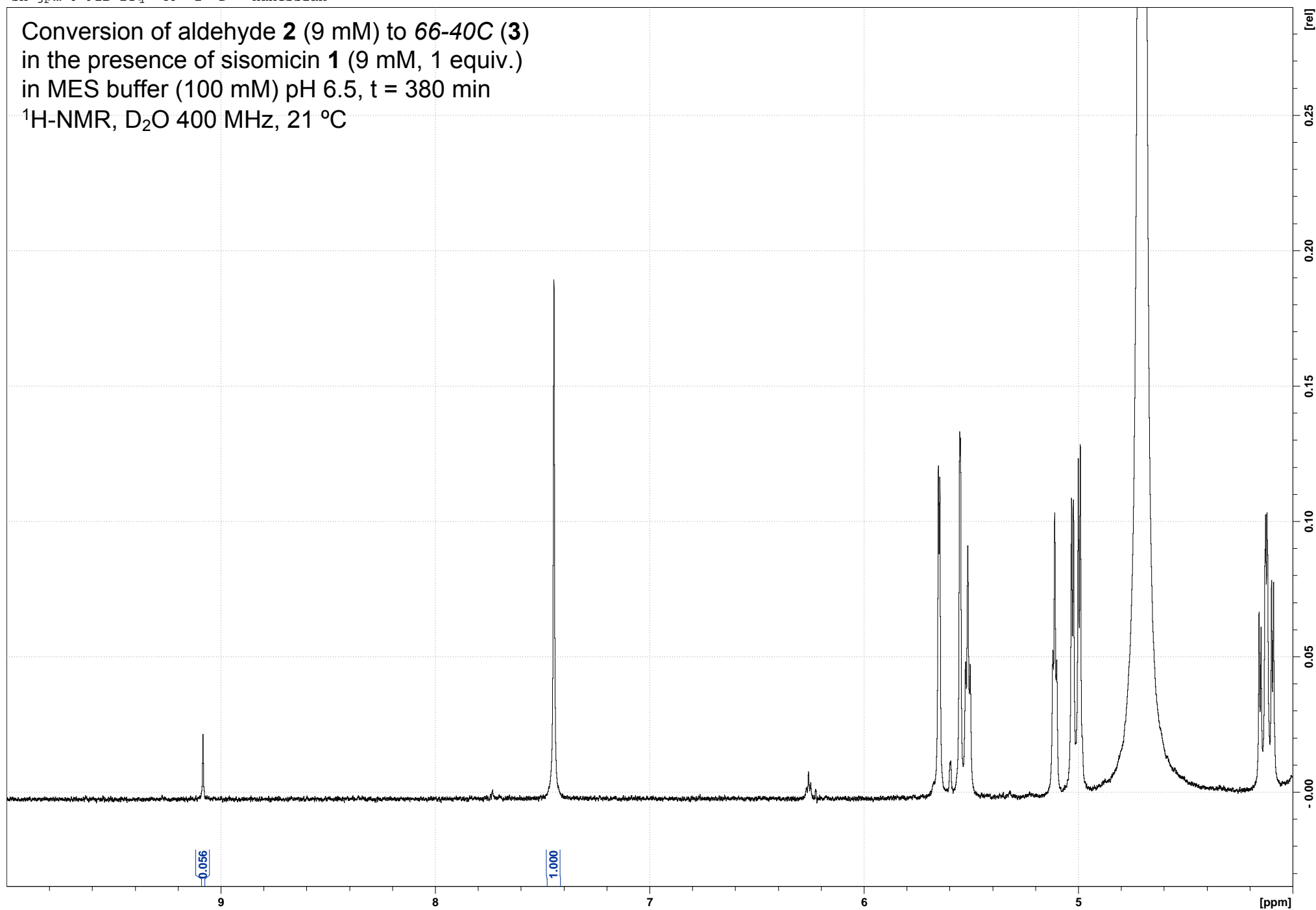
sh-jpm-6-91B-1eq 39 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 370 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91B-1eq 40 1 D: Hanessian

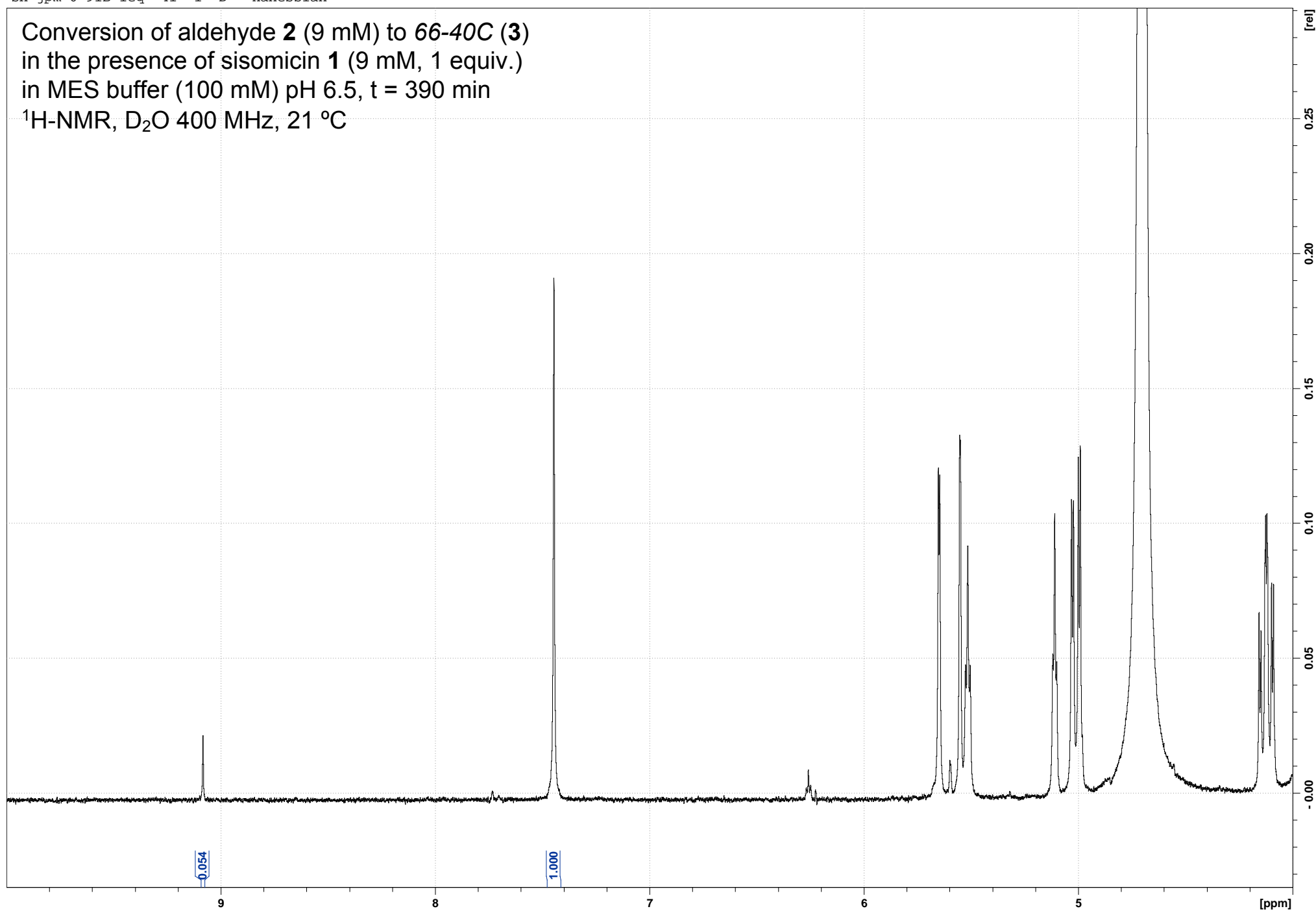
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 380 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





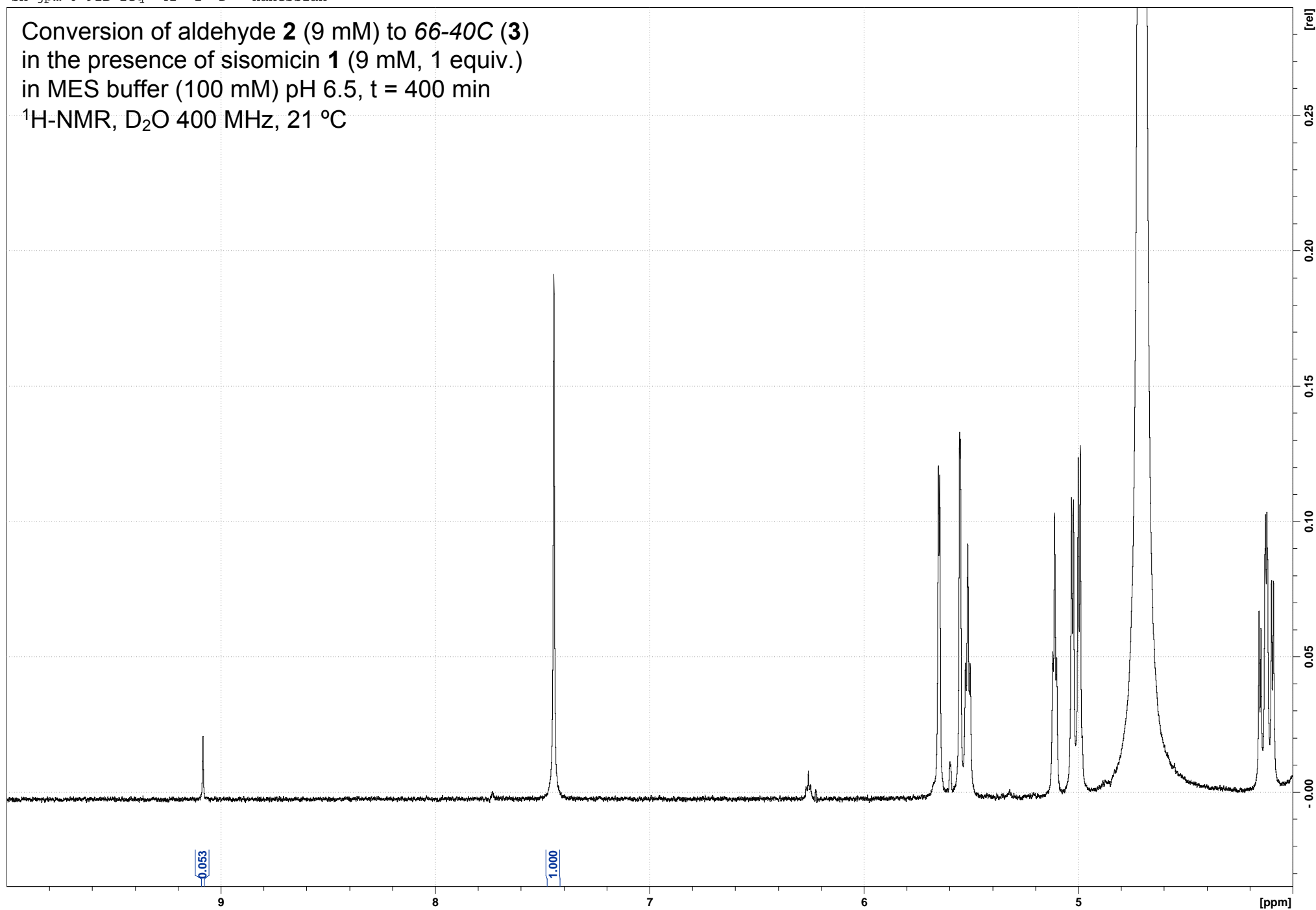
sh-jpm-6-91B-1eq 41 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 390 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



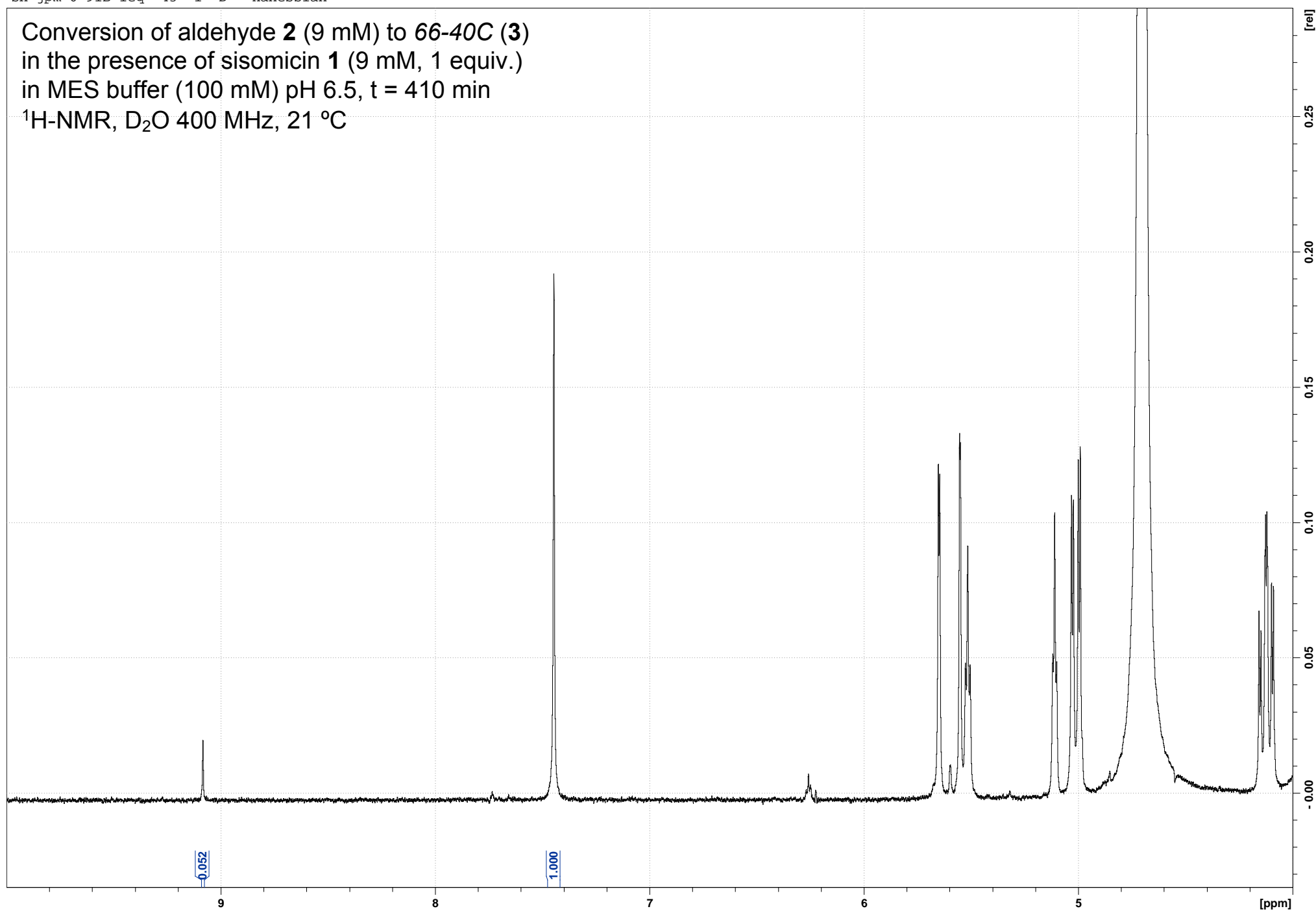
sh-jpm-6-91B-1eq 42 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 400 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



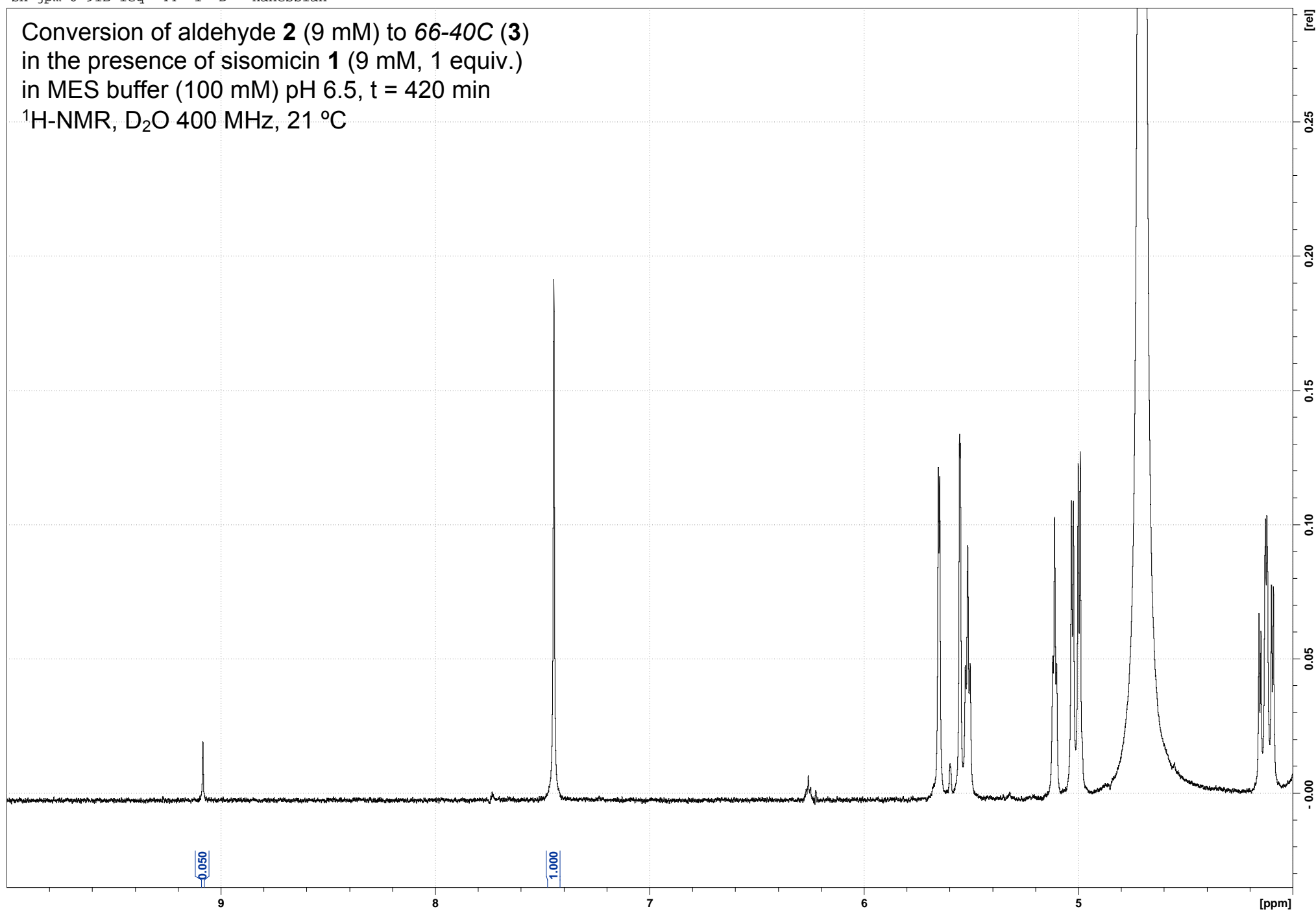
sh-jpm-6-91B-1eq 43 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 410 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



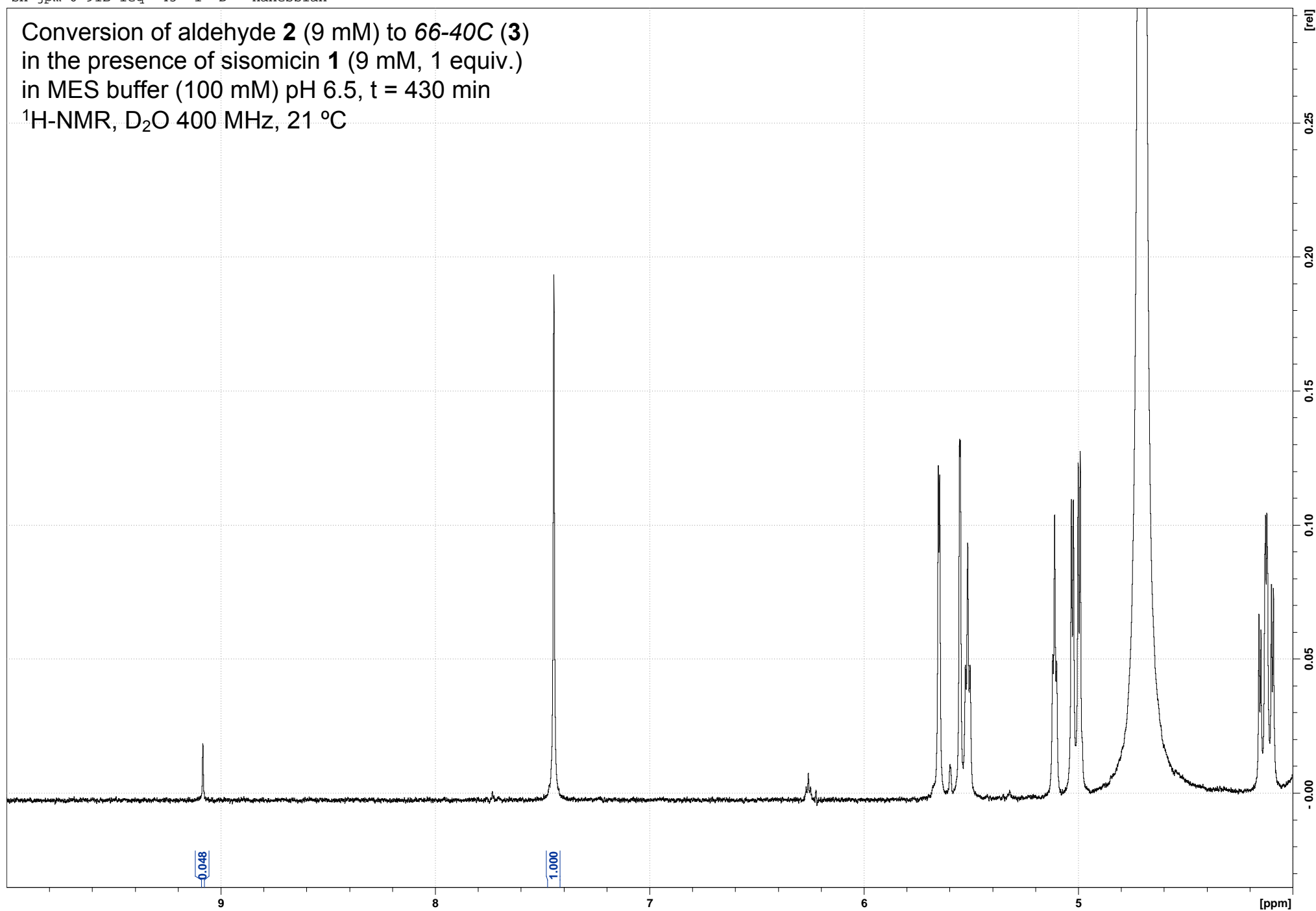
sh-jpm-6-91B-1eq 44 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 420 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



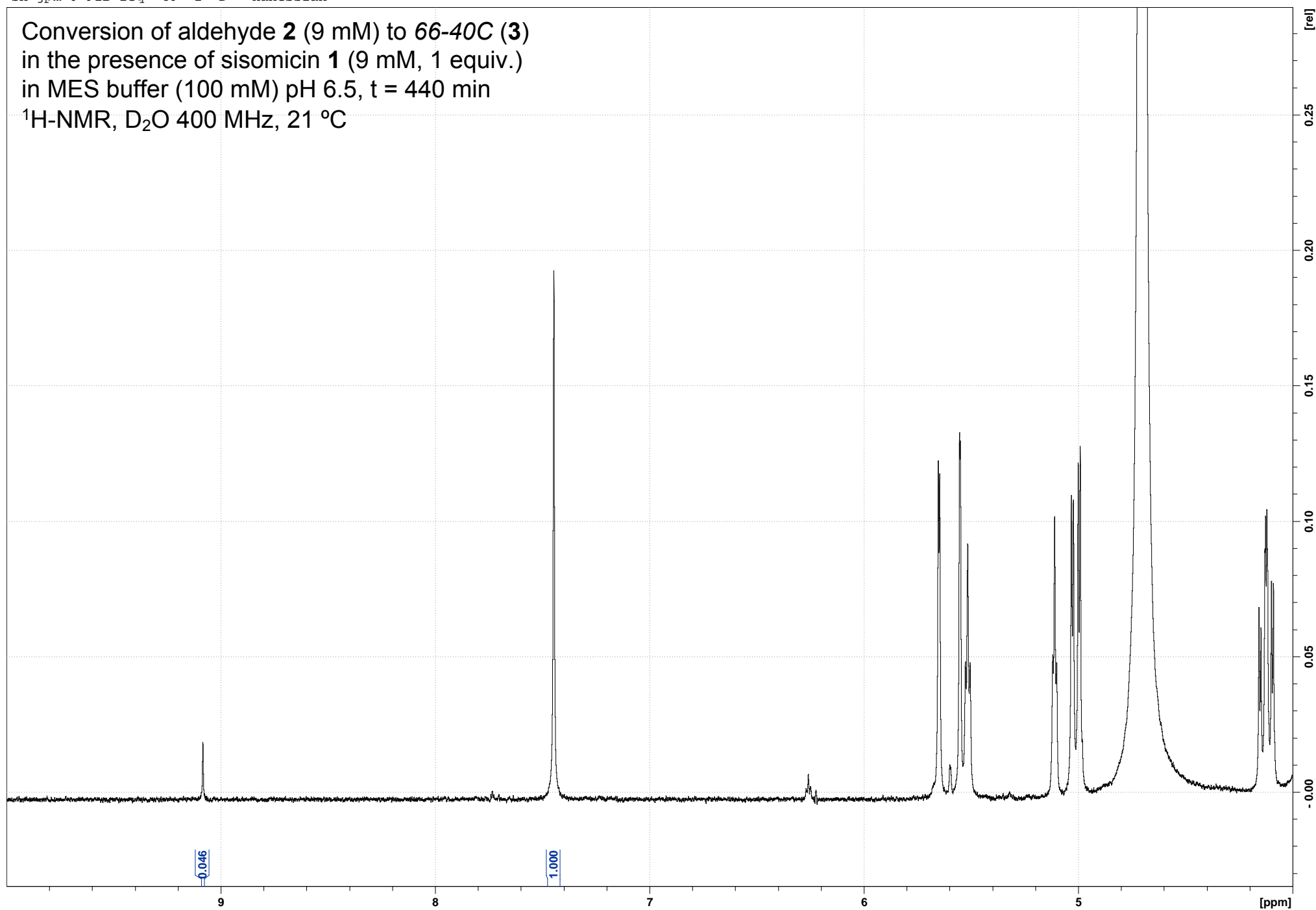
sh-jpm-6-91B-1eq 45 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 430 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



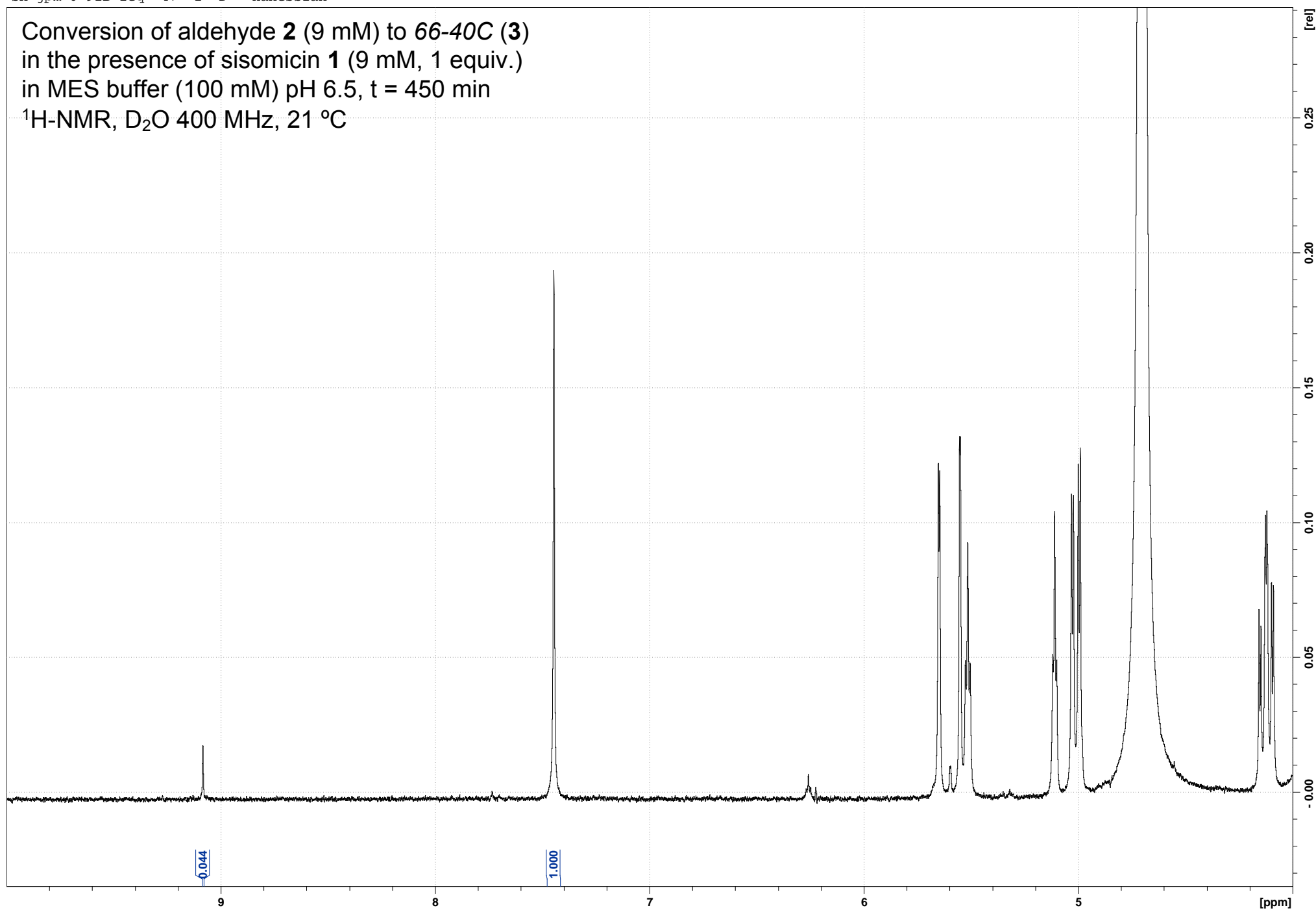
sh-jpm-6-91B-1eq 46 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 440 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



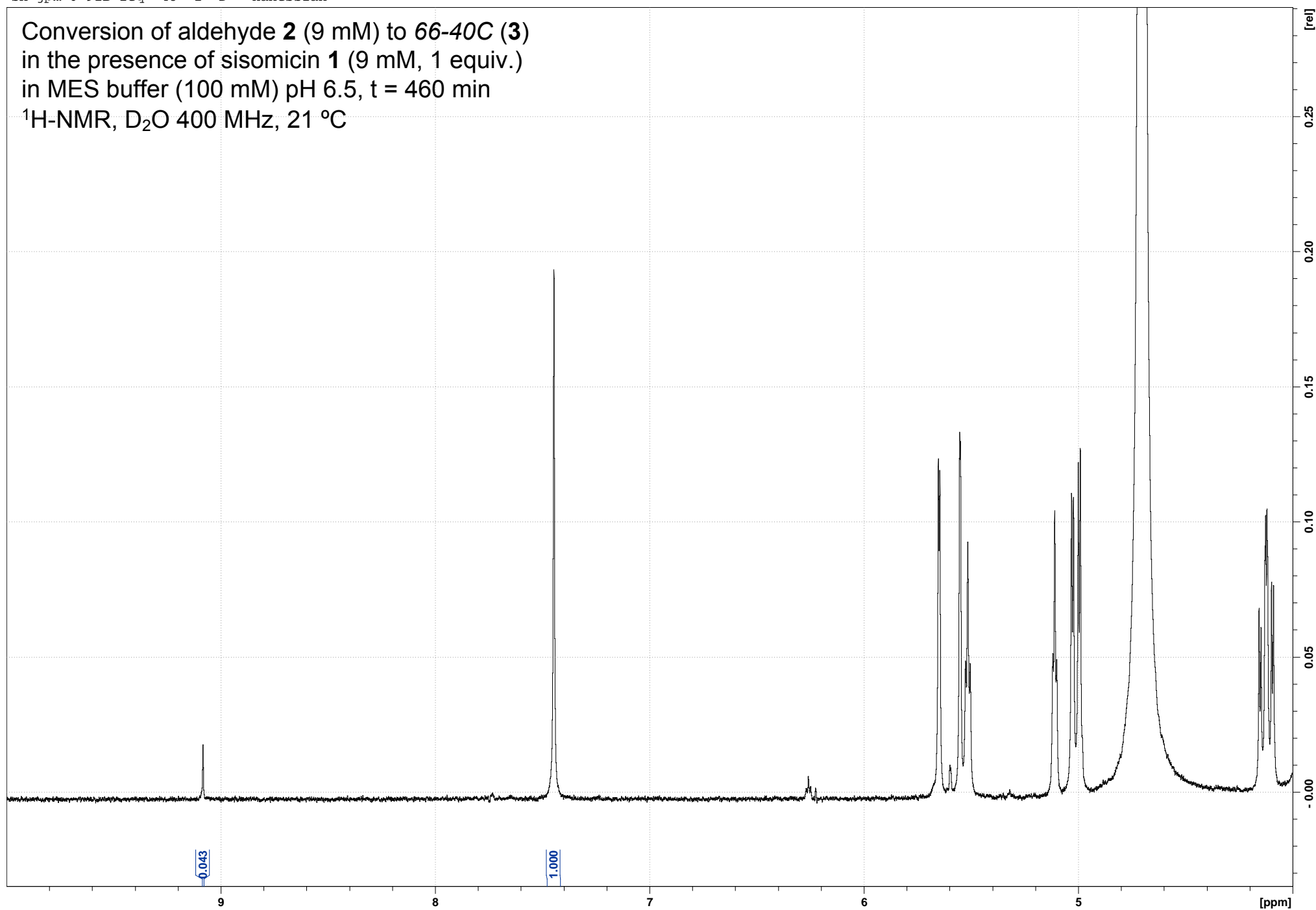
sh-jpm-6-91B-1eq 47 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 450 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91B-1eq 48 1 D: Hanessian

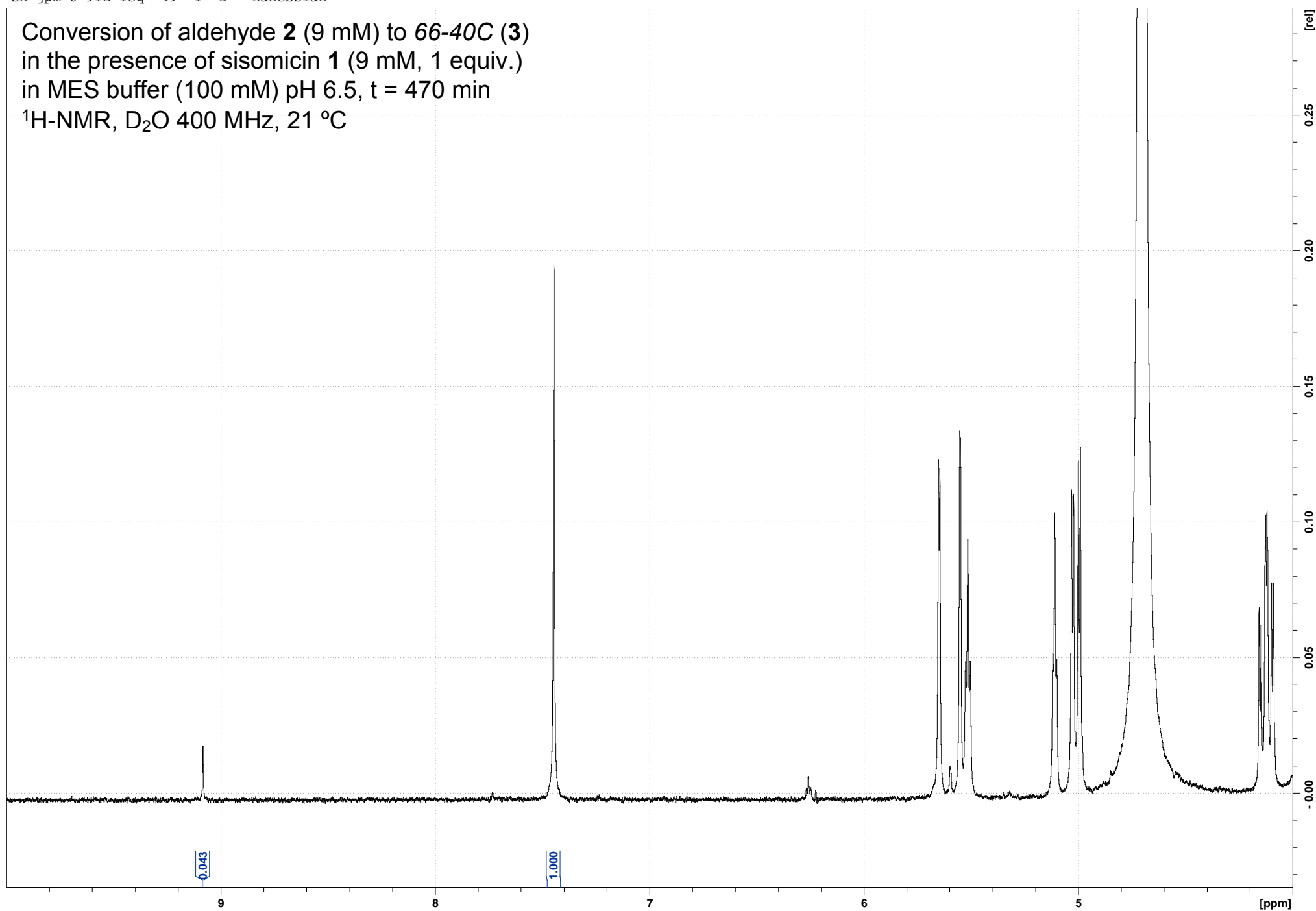
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 460 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





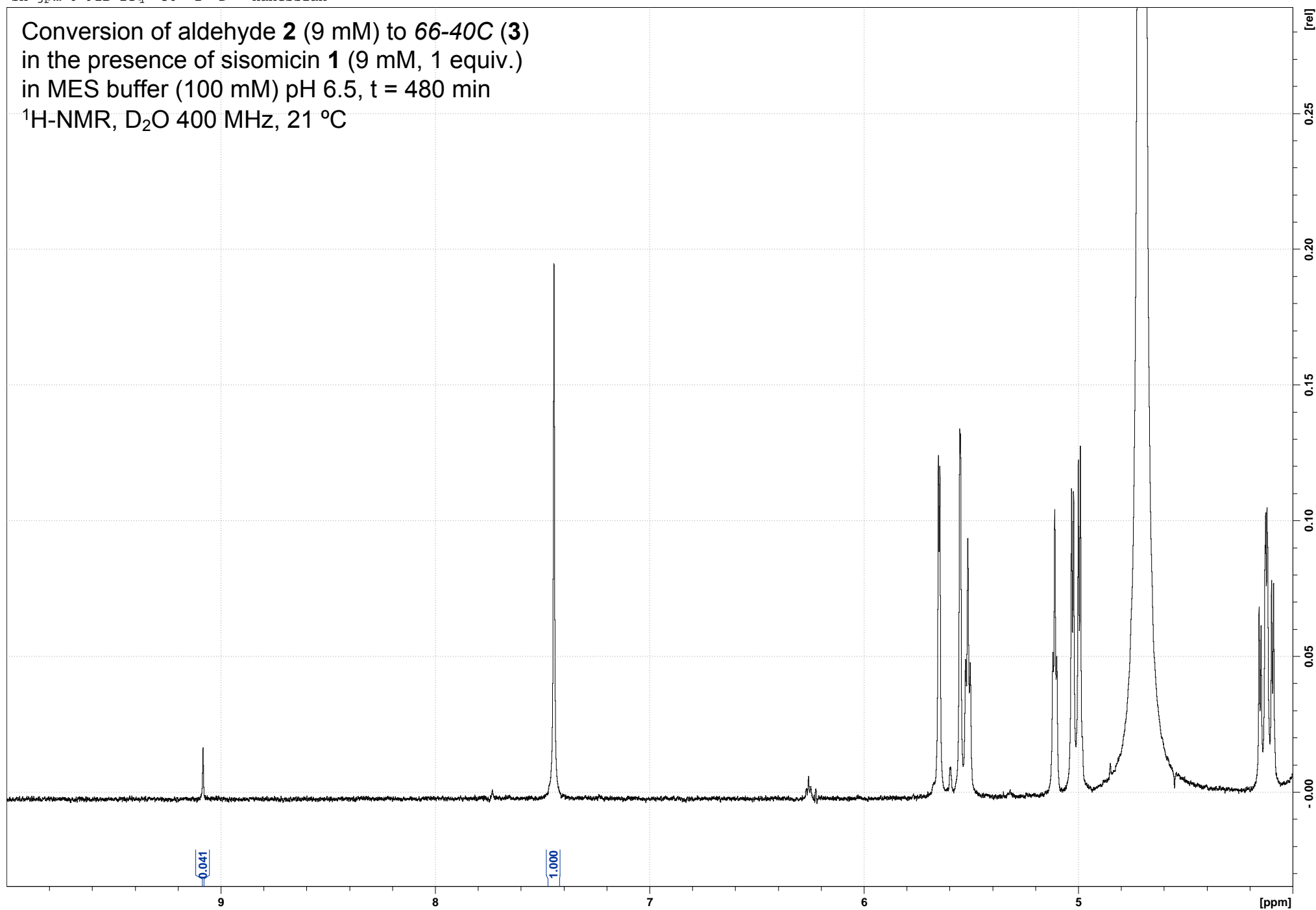
sh-jpm-6-91B-1eq 49 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 470 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



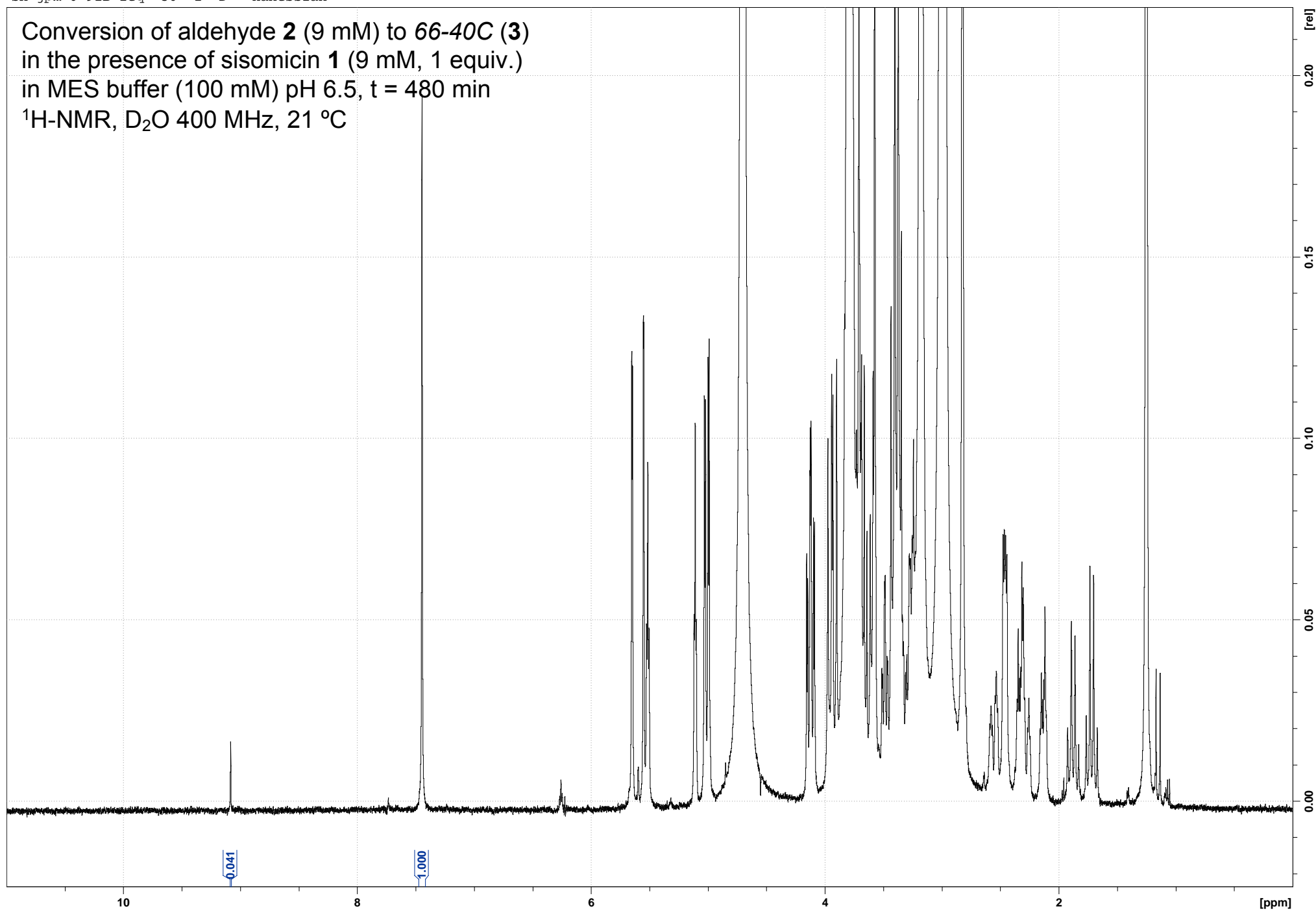
sh-jpm-6-91B-1eq 50 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 480 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



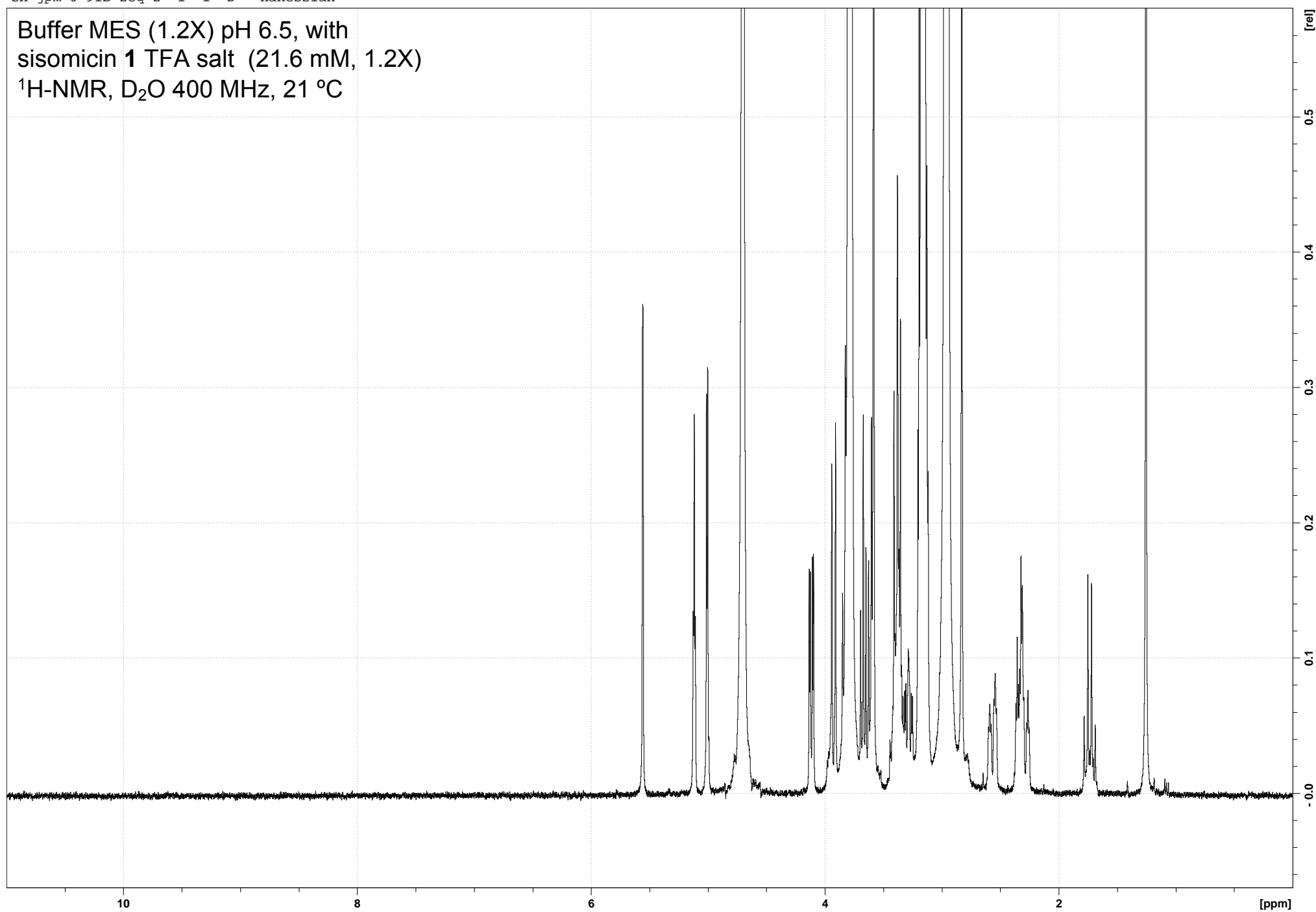
sh-jpm-6-91B-1eq 50 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (9 mM, 1 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 480 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



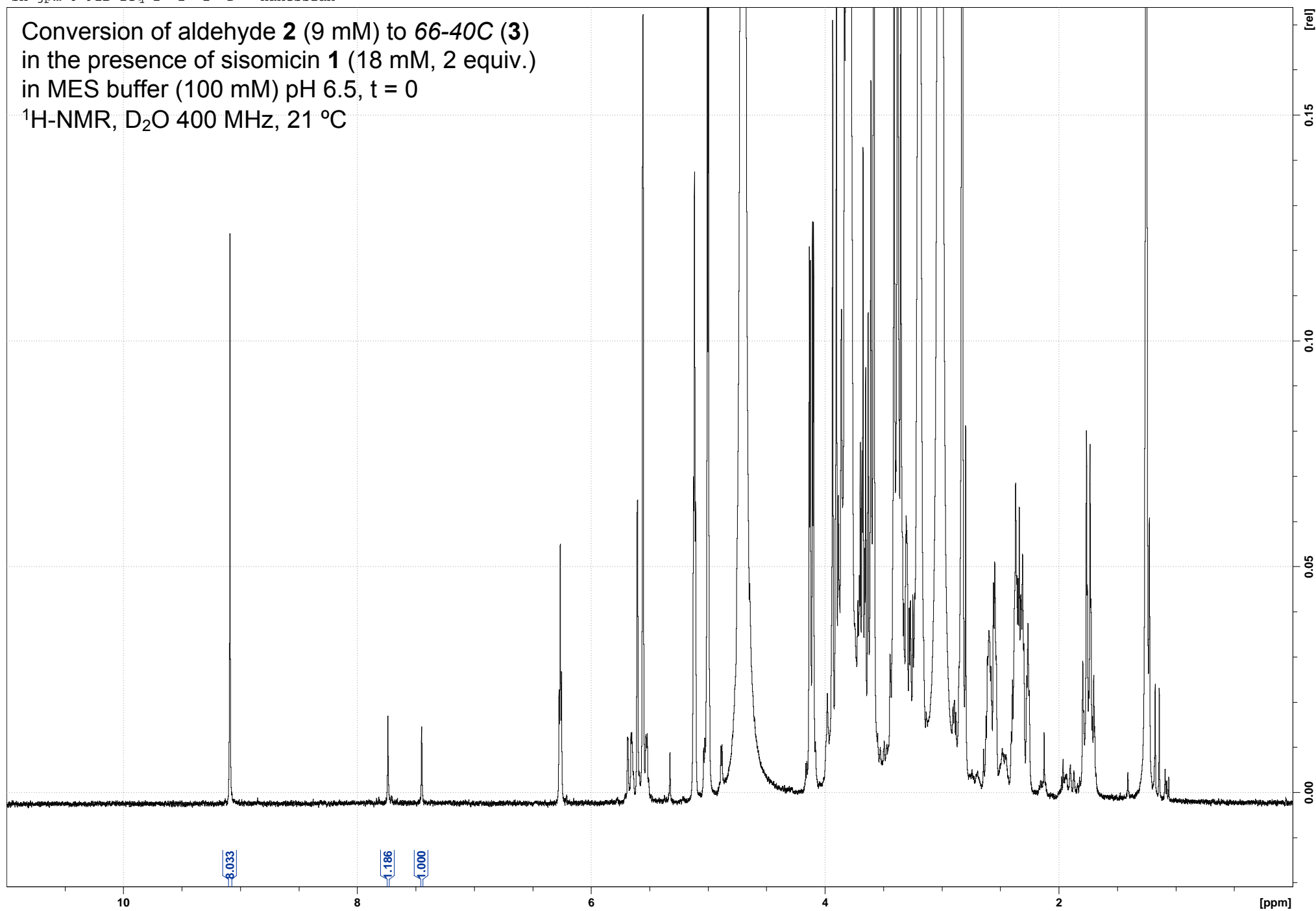
sh-jpm-6-91B-2eq-2 1 1 D: Hanessian

Buffer MES (1.2X) pH 6.5, with  
sisomicin **1** TFA salt (21.6 mM, 1.2X)  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



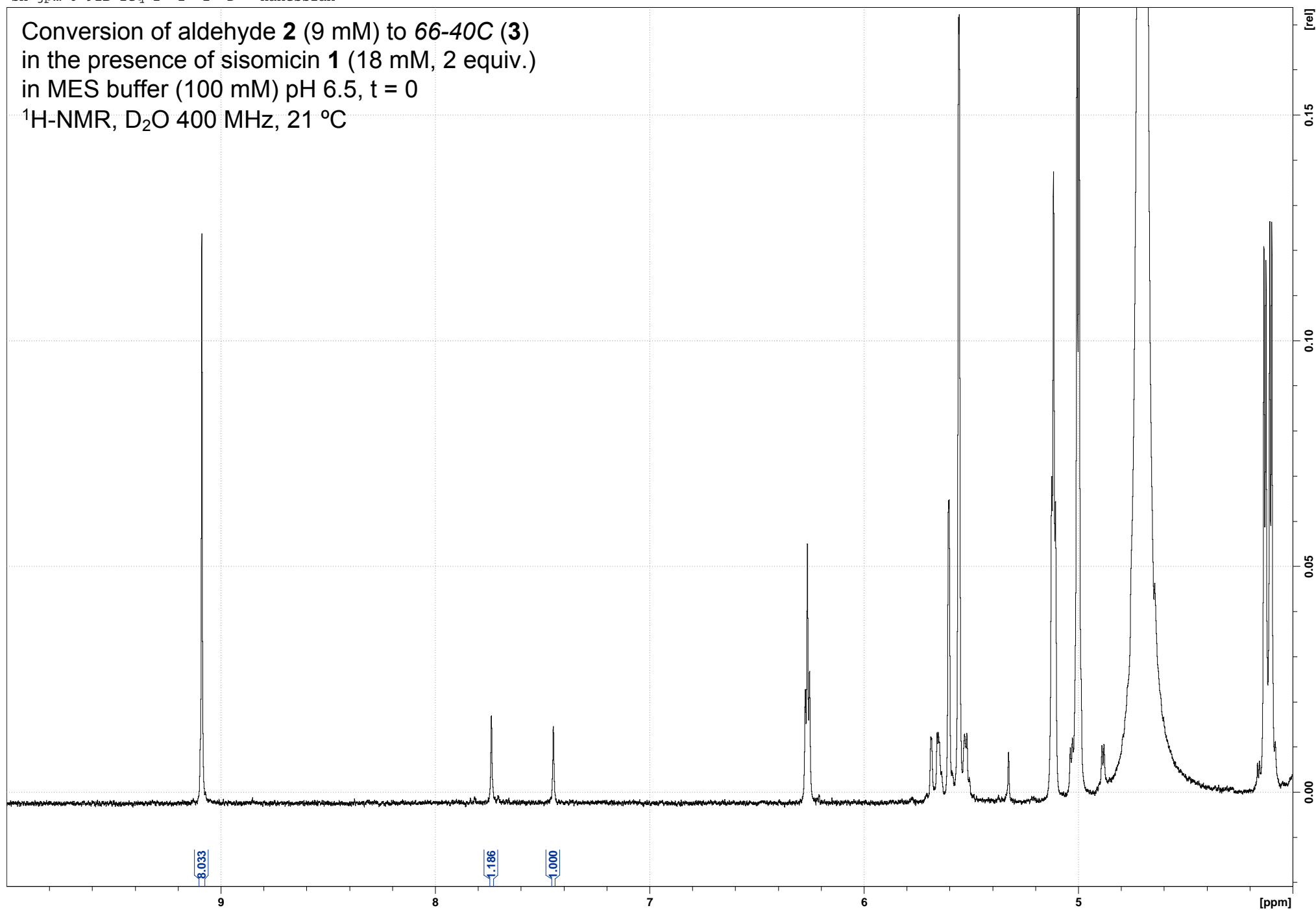
sh-jpm-6-91B-2eq-2 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



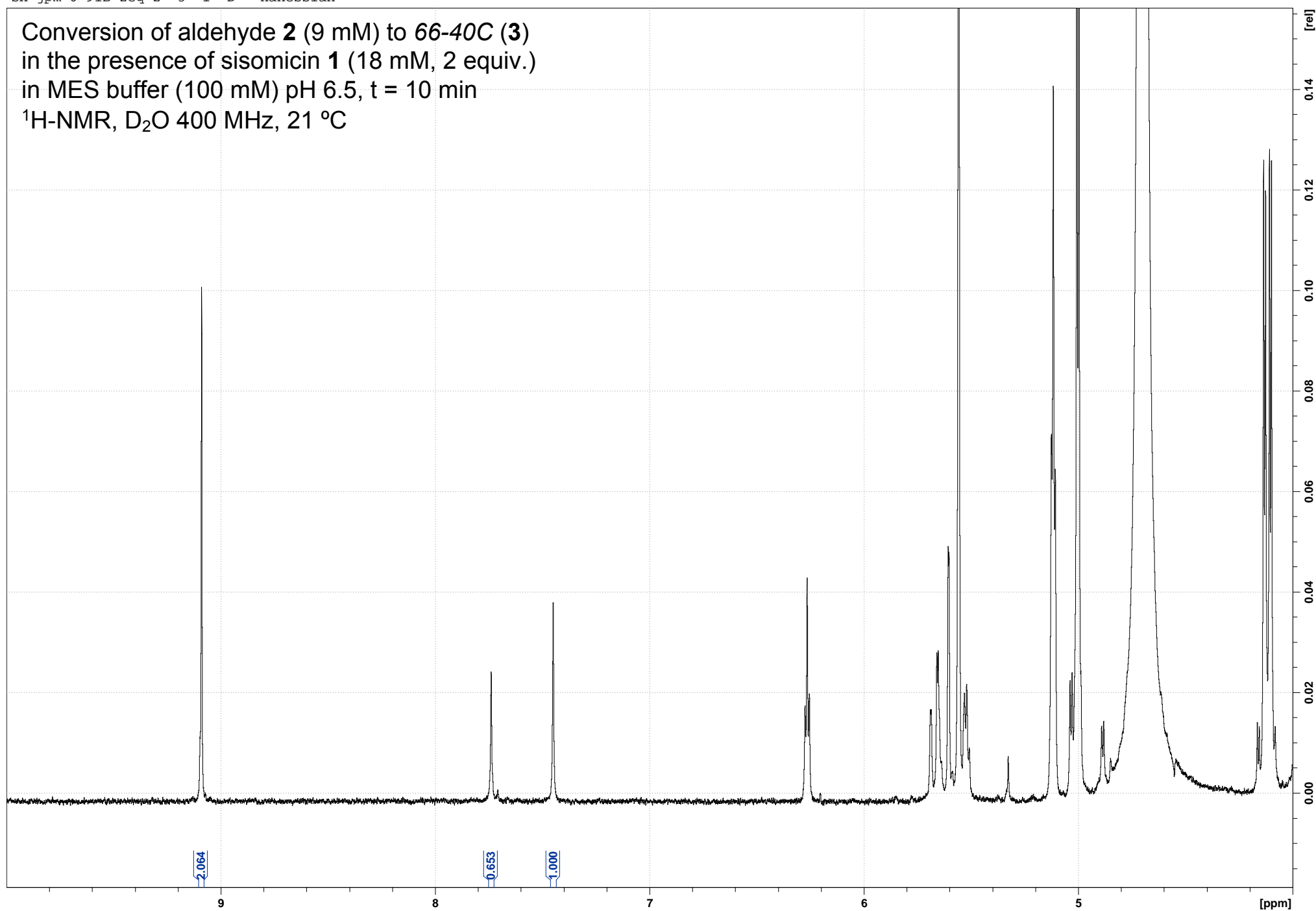
sh-jpm-6-91B-2eq-2 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



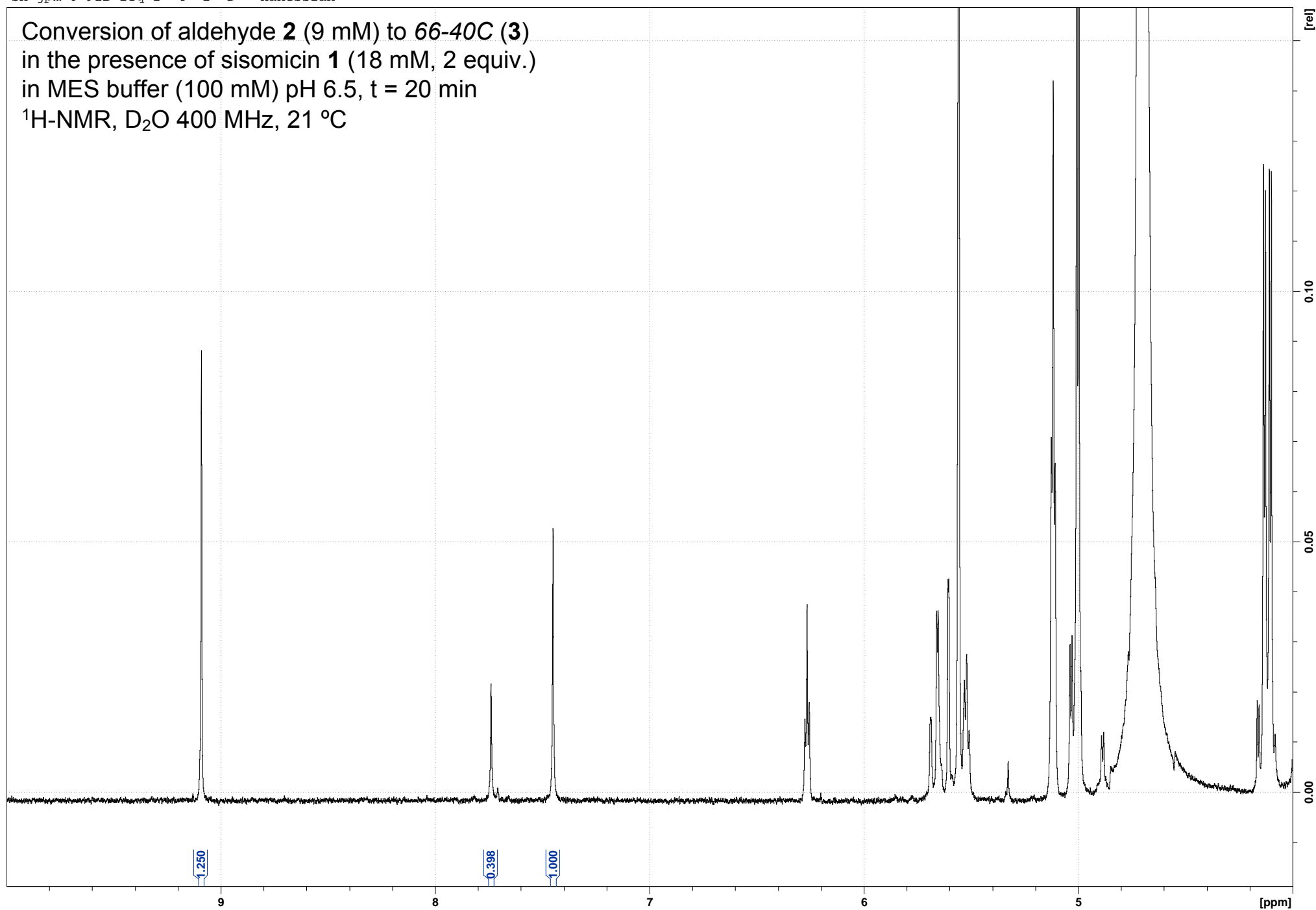
sh-jpm-6-91B-2eq-2 3 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 10 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91B-2eq-2 4 1 D: Hanessian

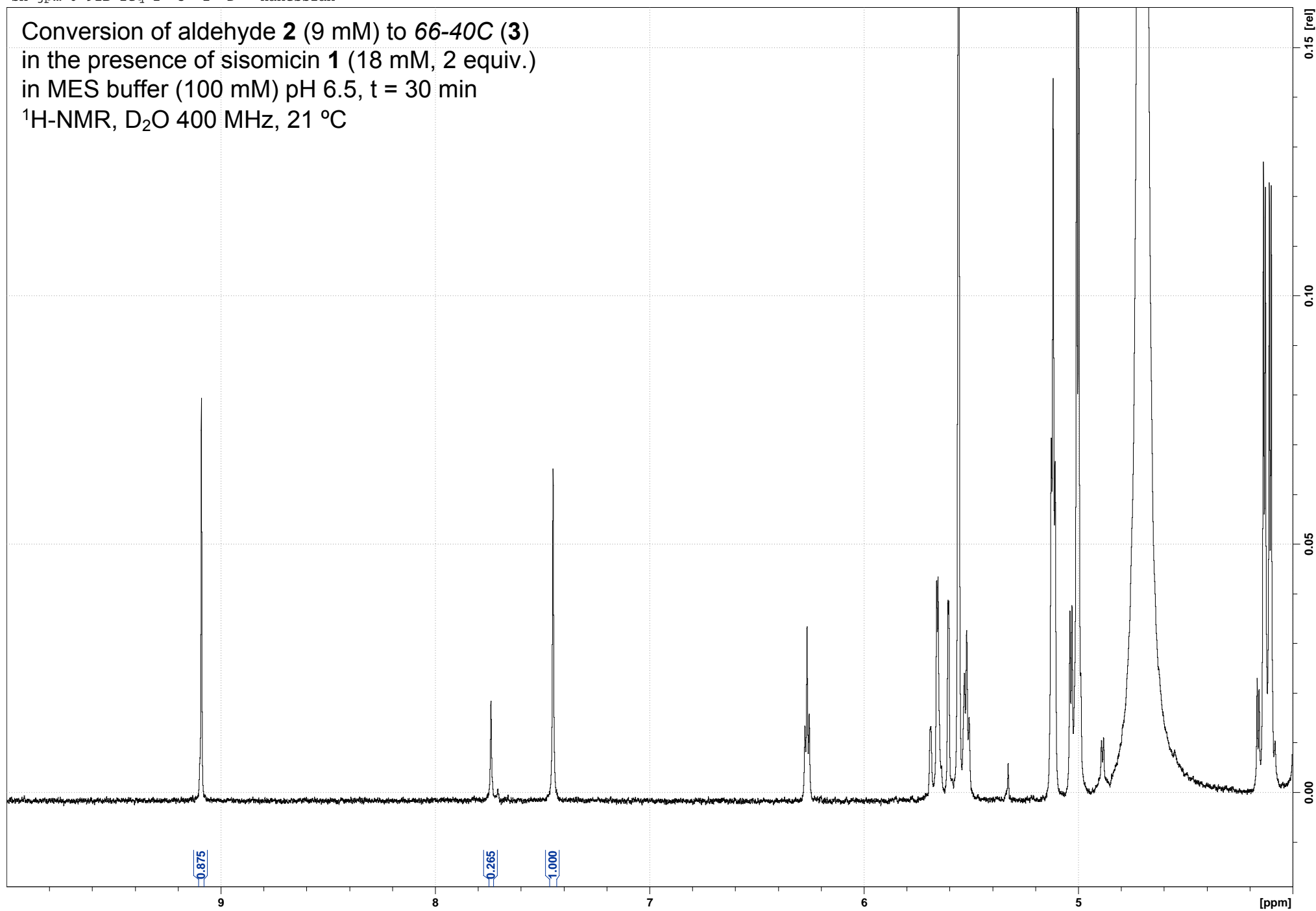
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 20 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





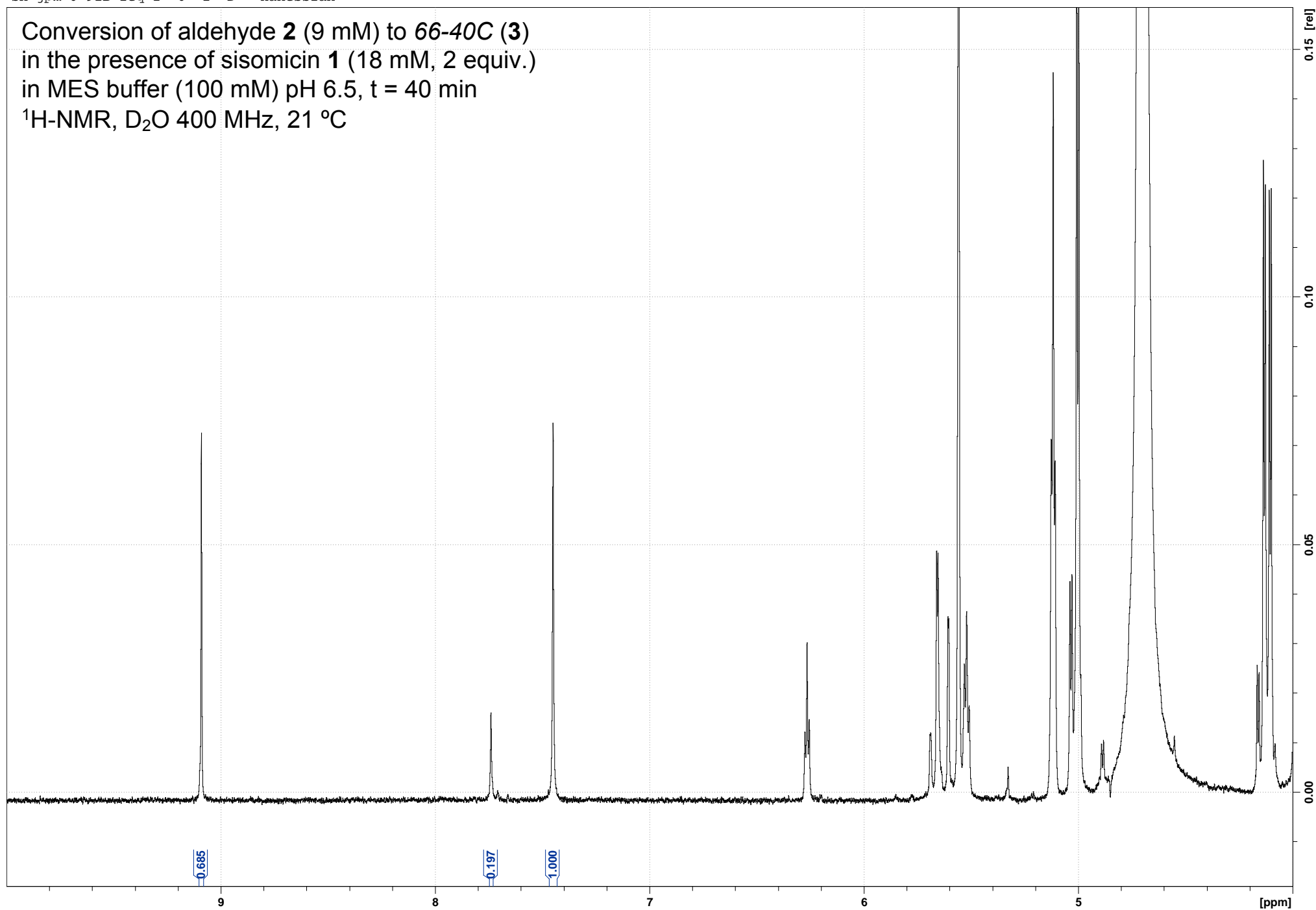
sh-jpm-6-91B-2eq-2 5 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 30 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



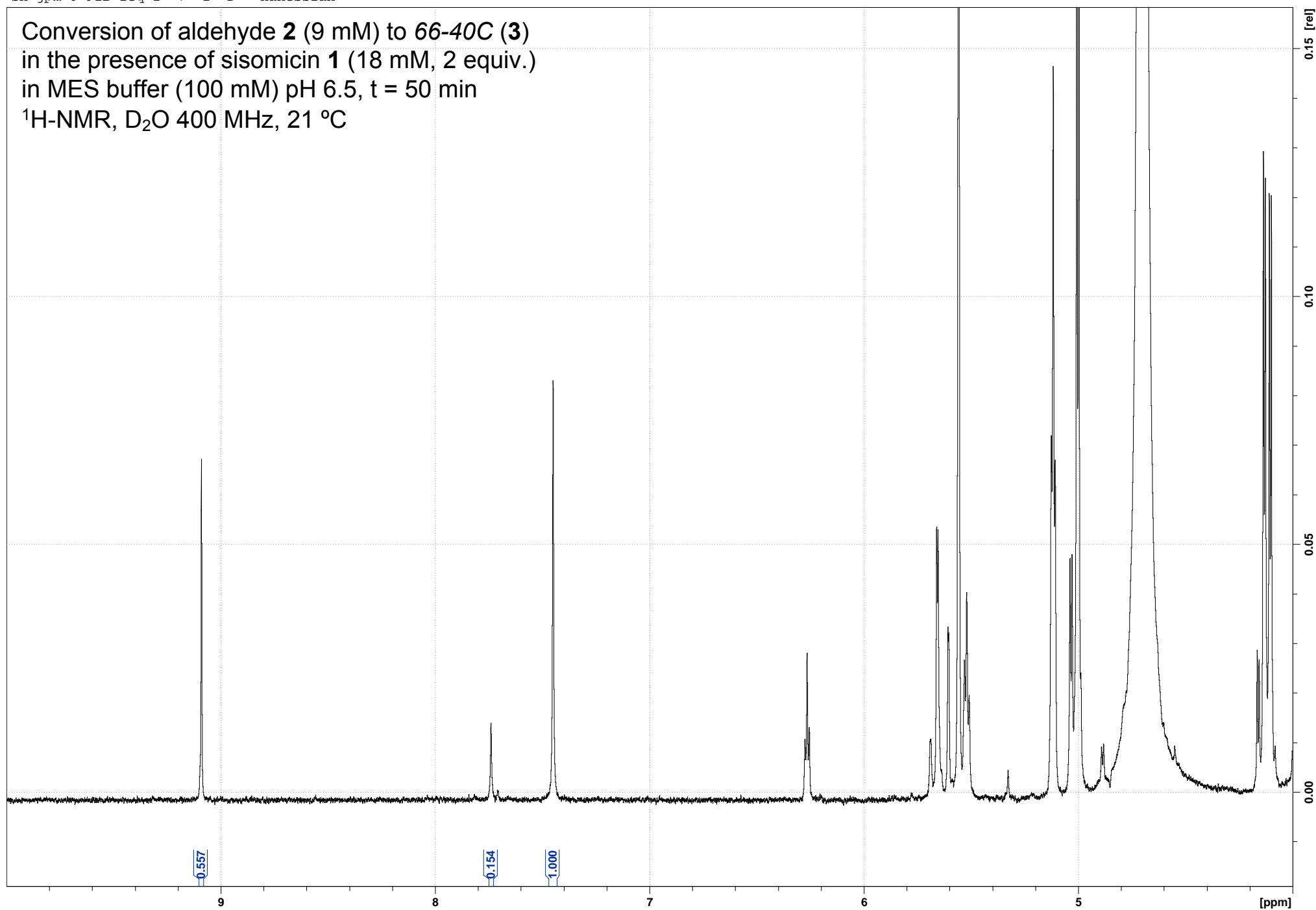
sh-jpm-6-91B-2eq-2 6 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 40 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



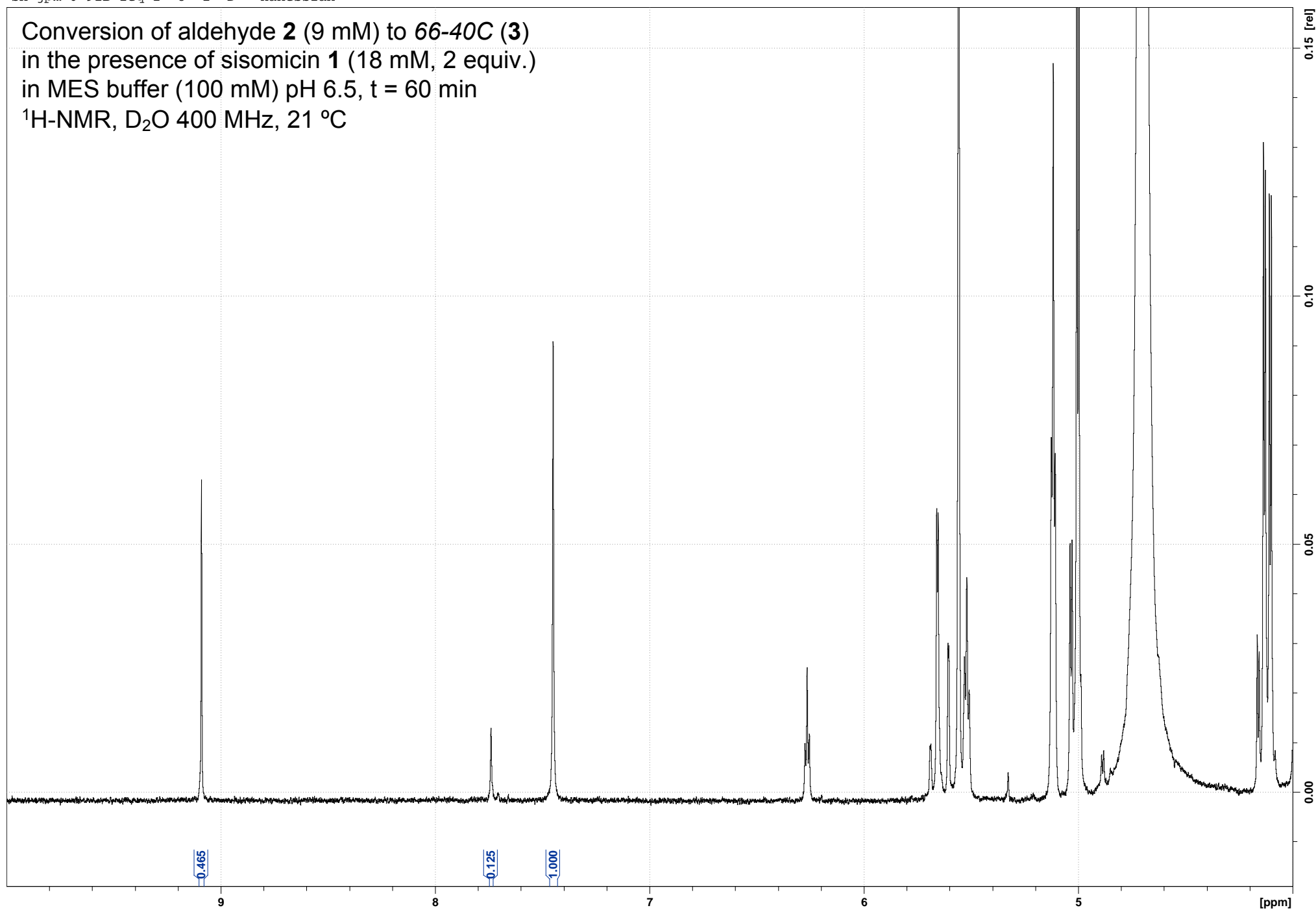
sh-jpm-6-91B-2eq-2 7 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 50 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



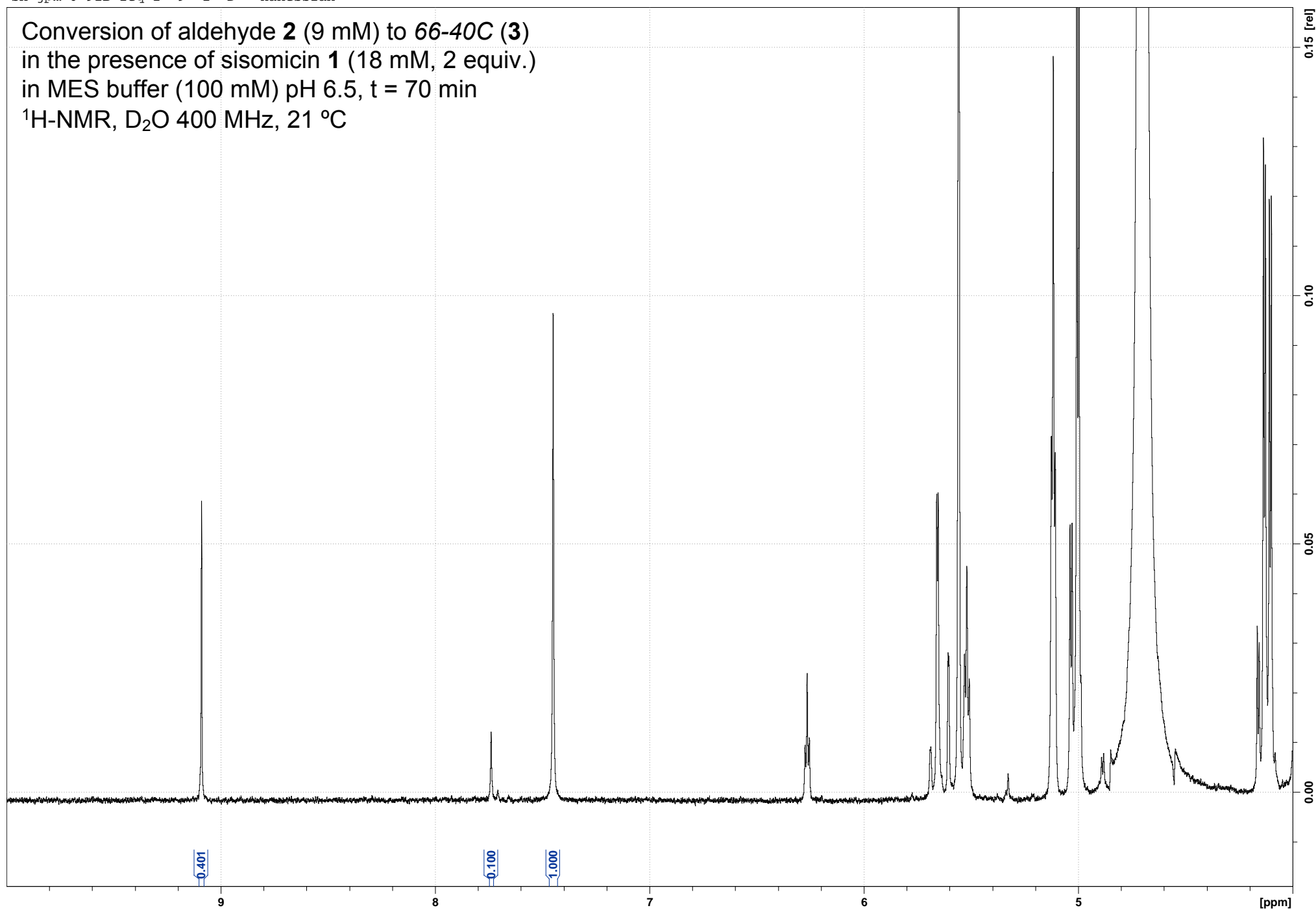
sh-jpm-6-91B-2eq-2 8 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 60 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



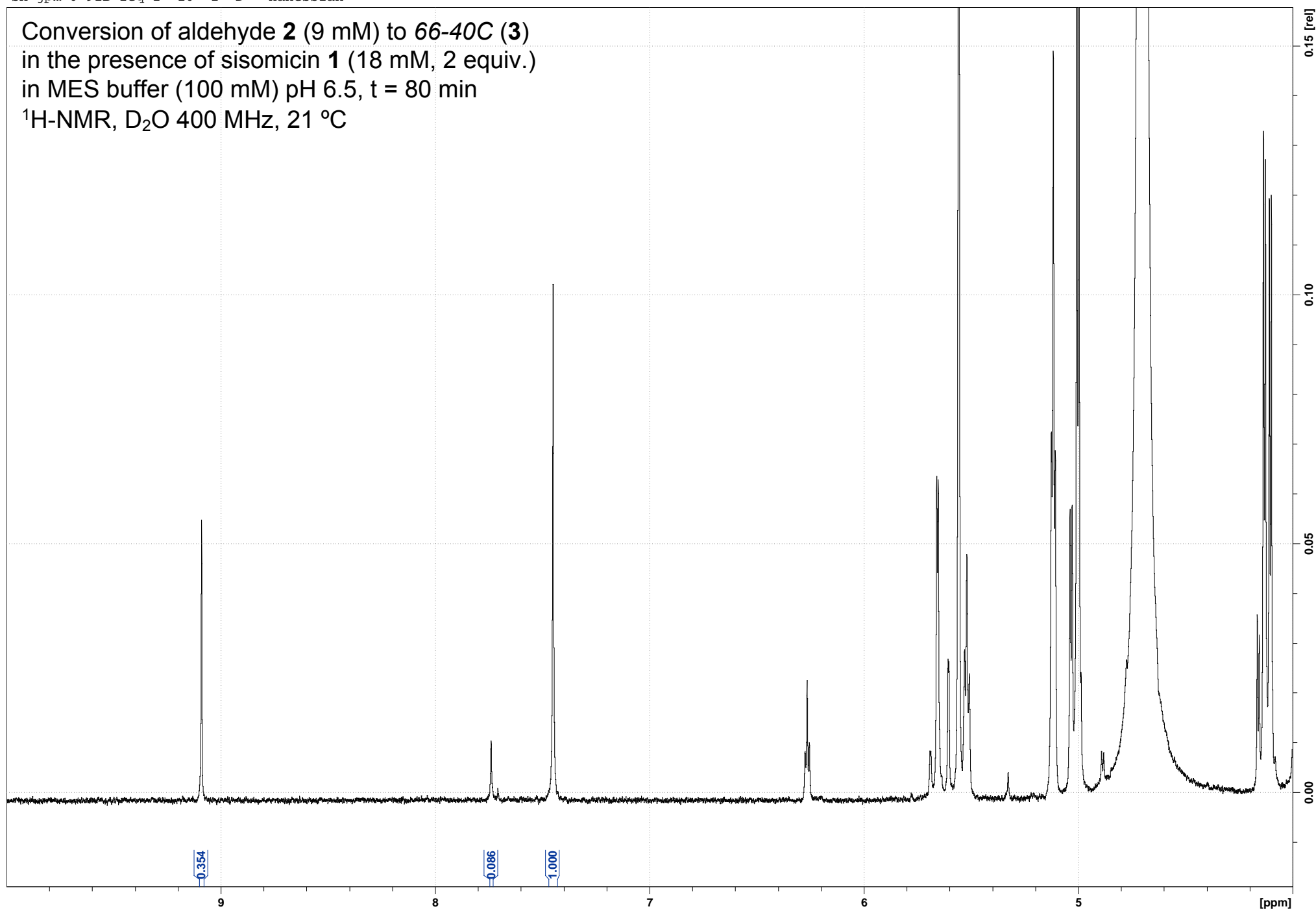
sh-jpm-6-91B-2eq-2 9 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 70 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



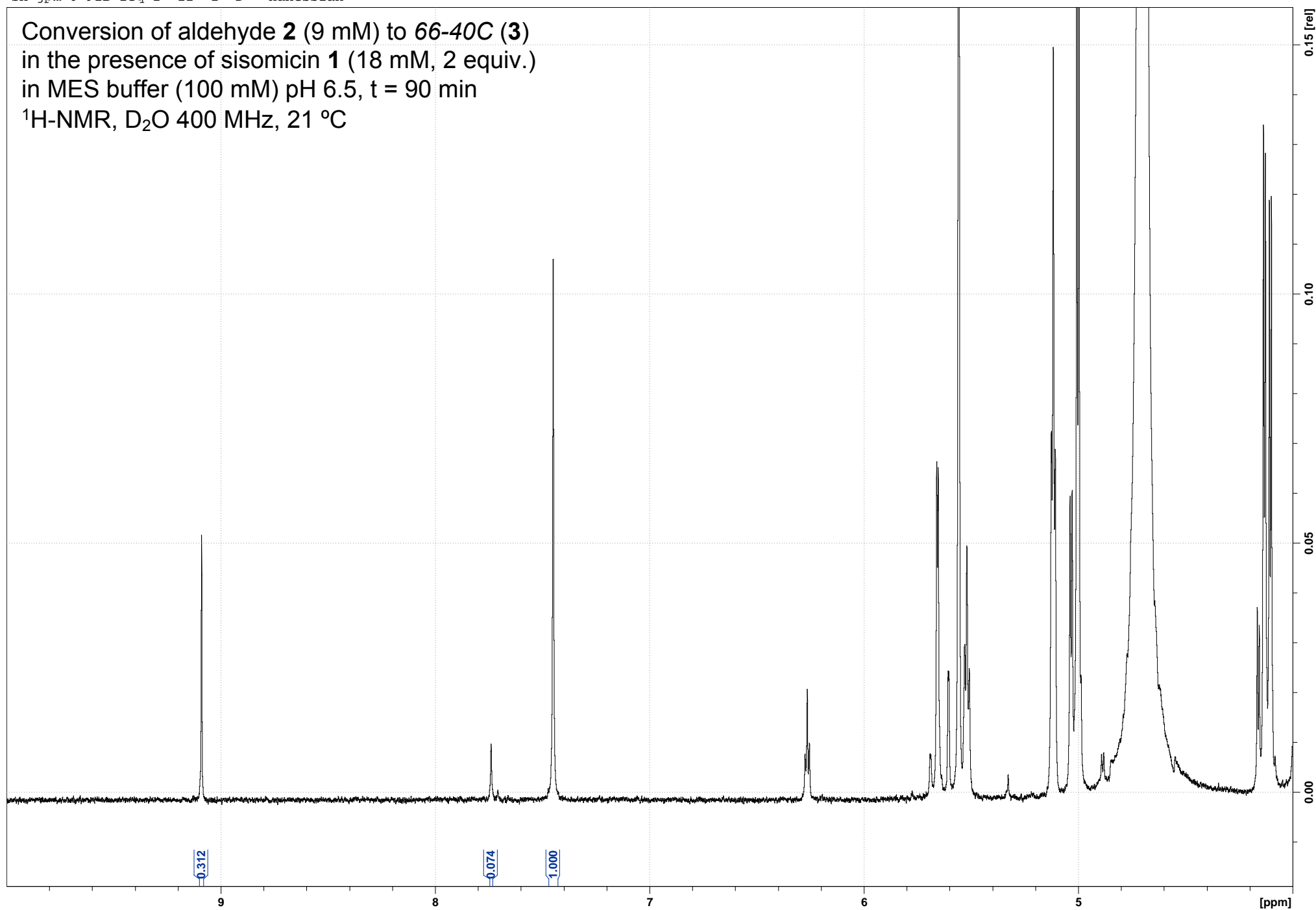
sh-jpm-6-91B-2eq-2 10 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 80 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



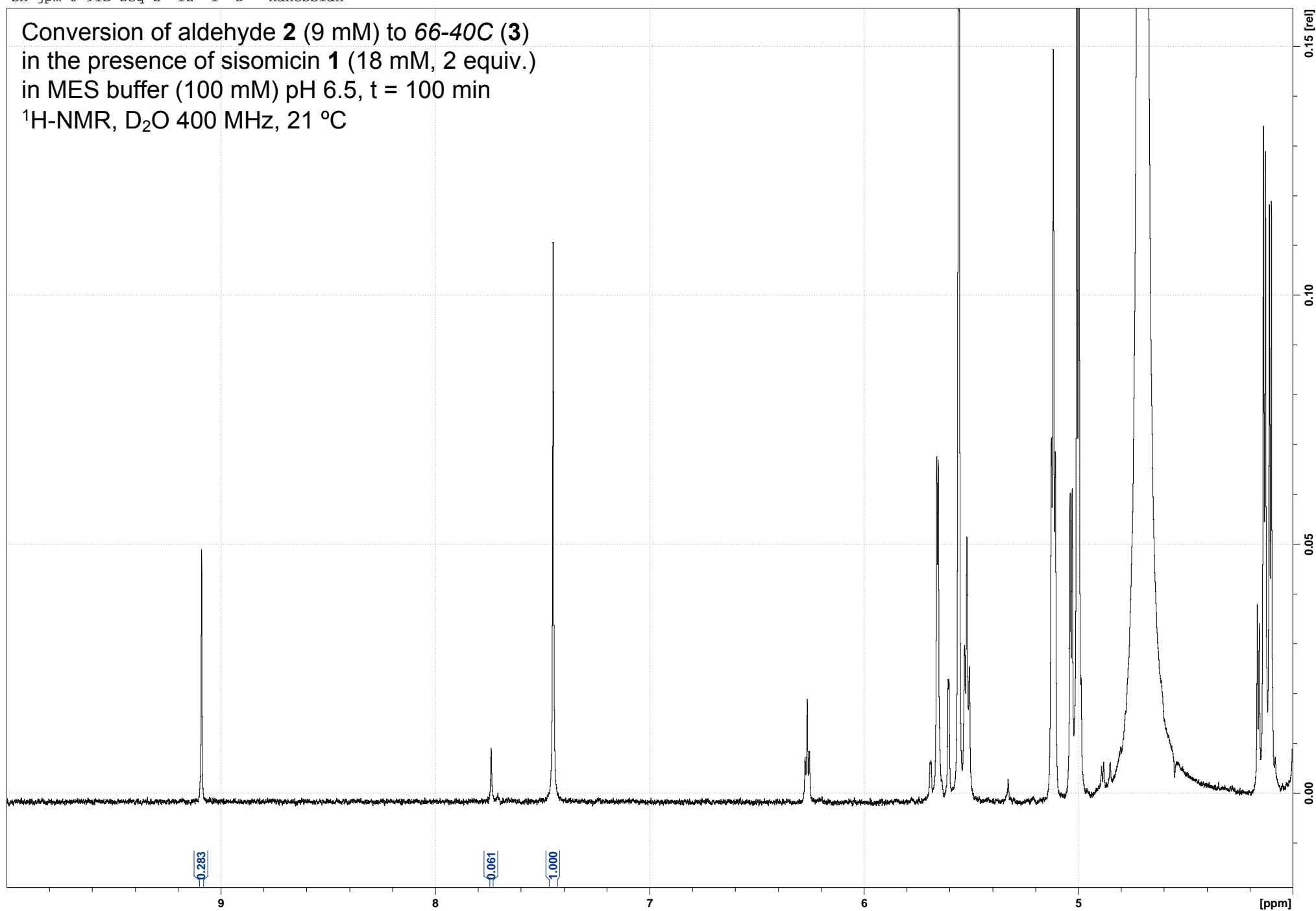
sh-jpm-6-91B-2eq-2 11 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 90 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91B-2eq-2 12 1 D: Hanessian

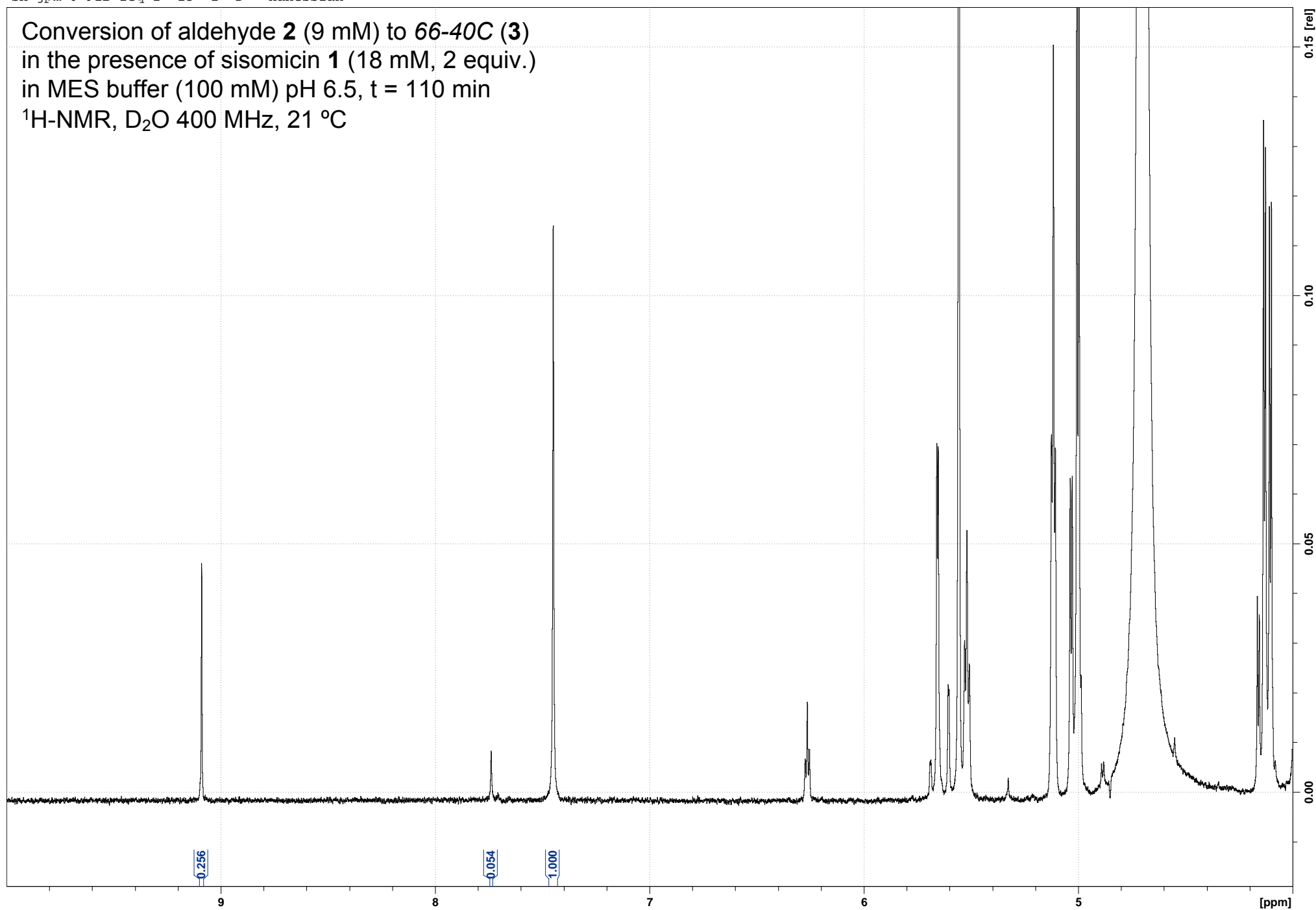
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 100 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C





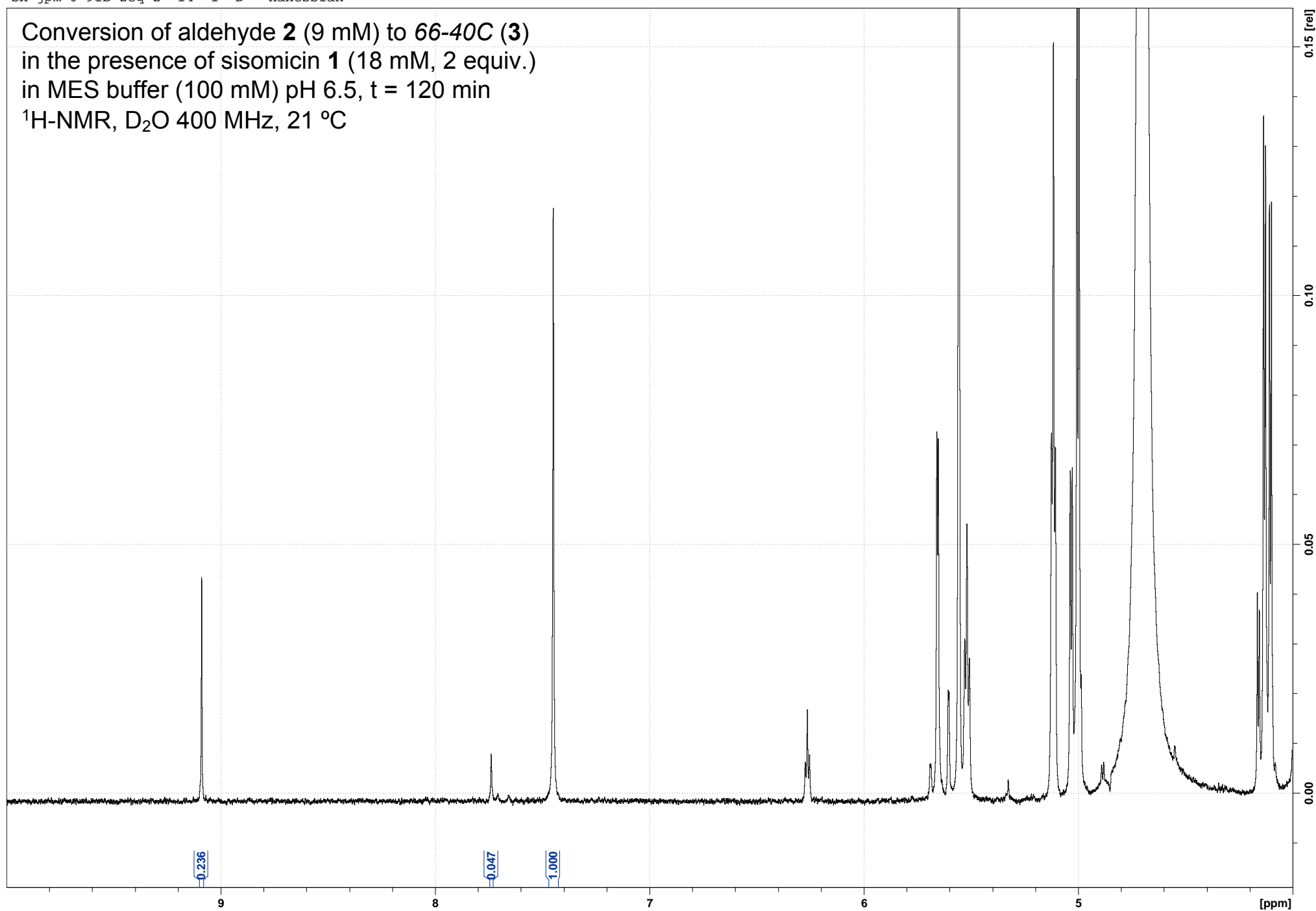
sh-jpm-6-91B-2eq-2 13 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 110 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



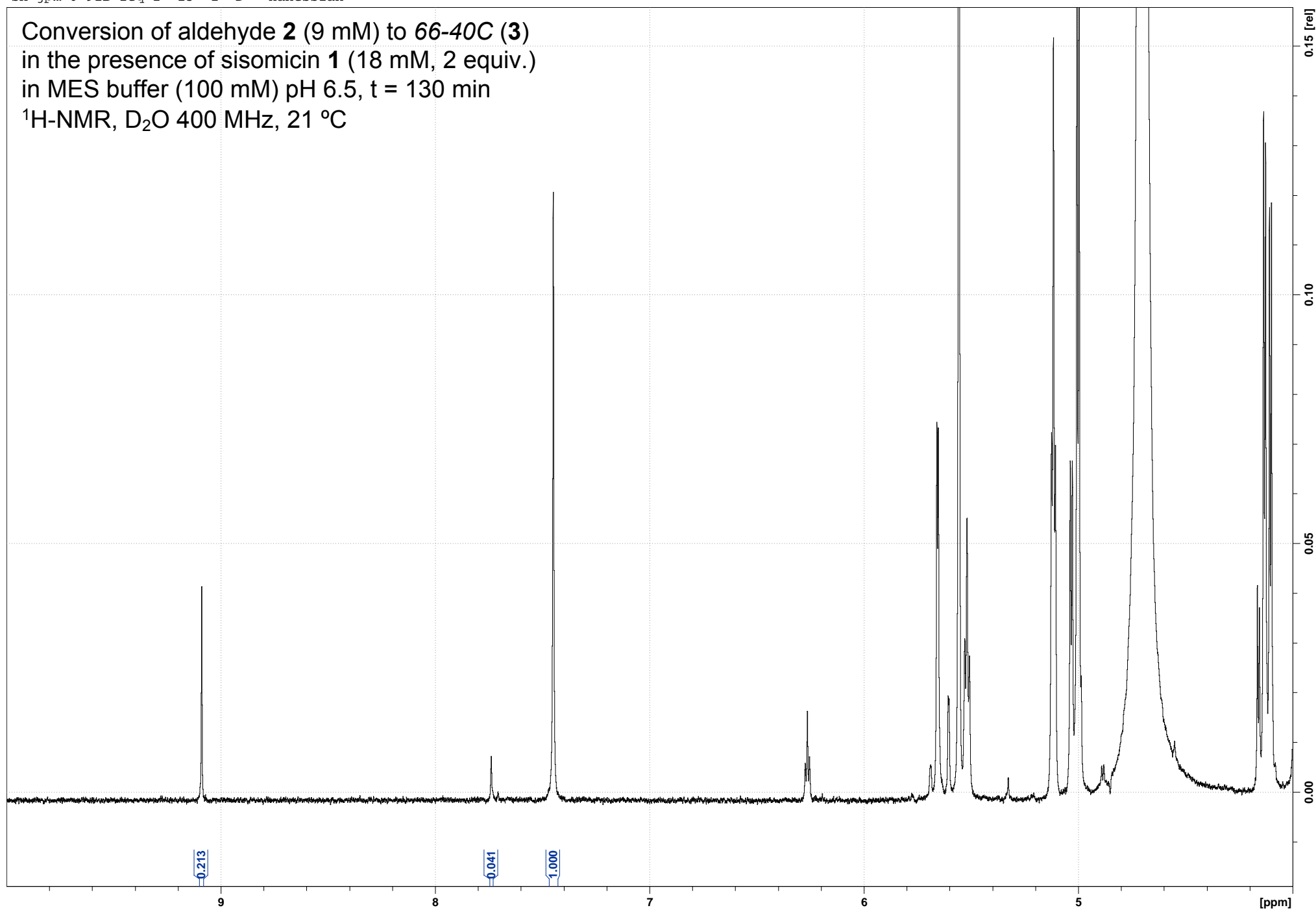
sh-jpm-6-91B-2eq-2 14 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 120 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



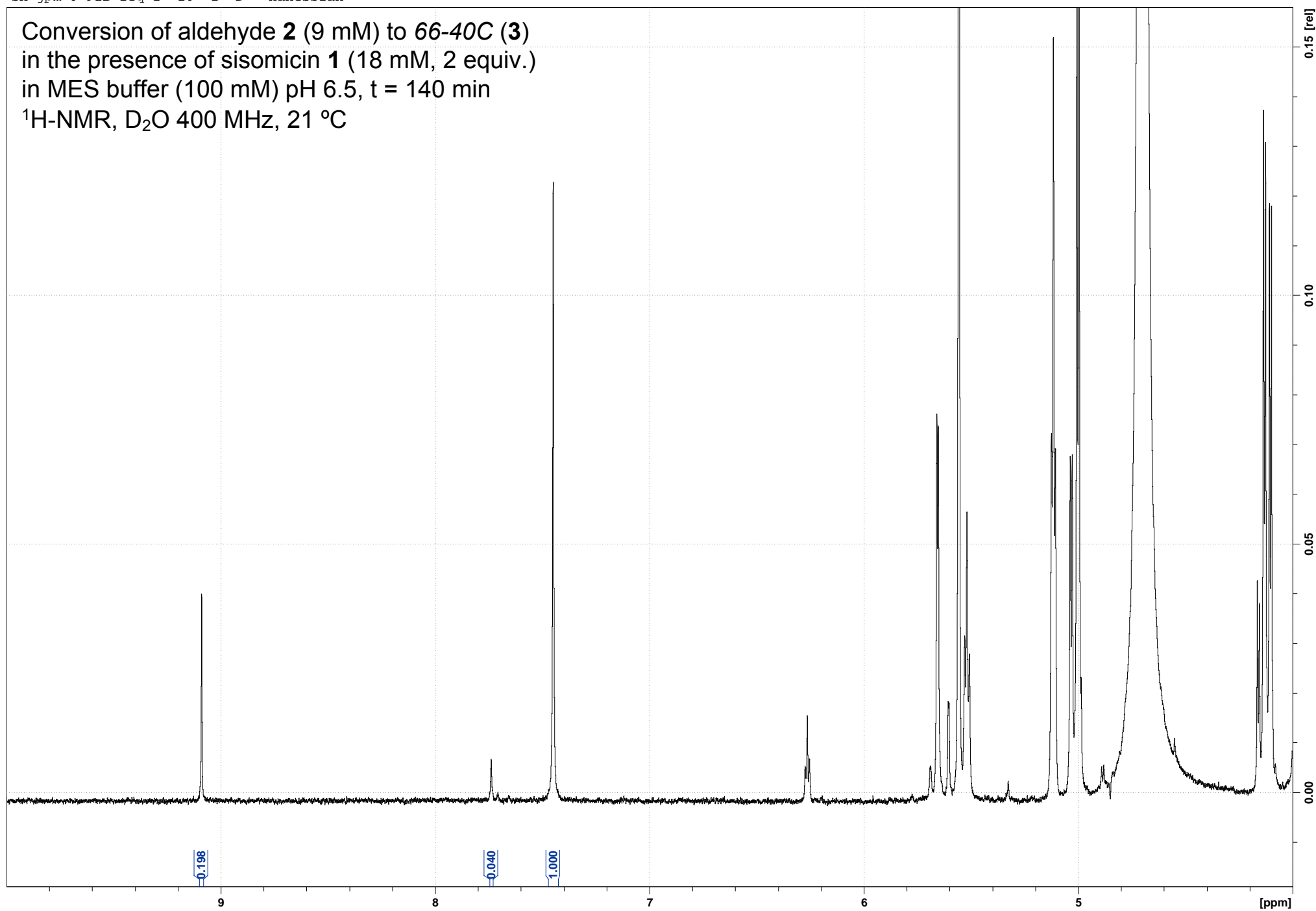
sh-jpm-6-91B-2eq-2 15 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 130 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



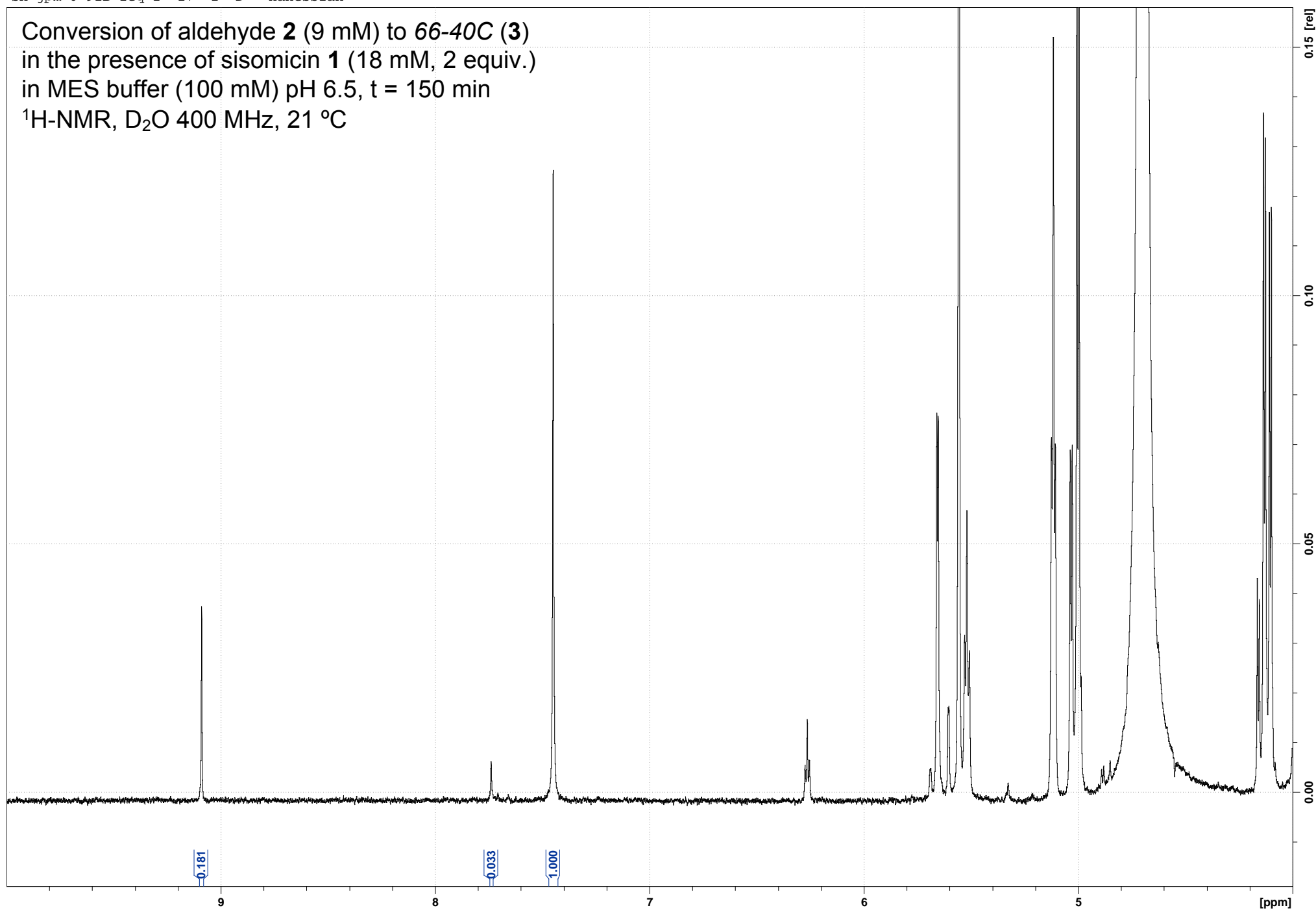
sh-jpm-6-91B-2eq-2 16 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 140 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



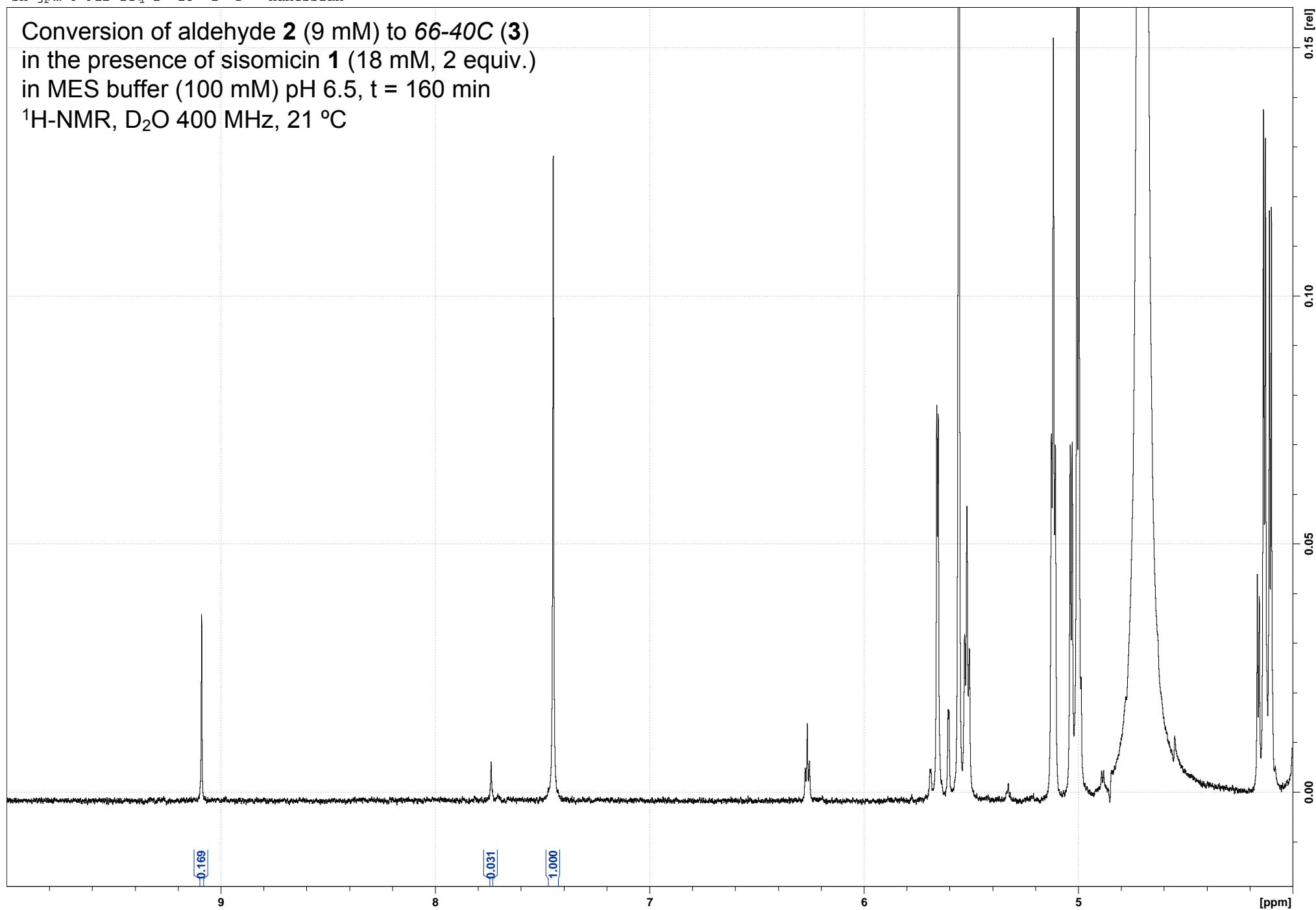
sh-jpm-6-91B-2eq-2 17 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 150 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



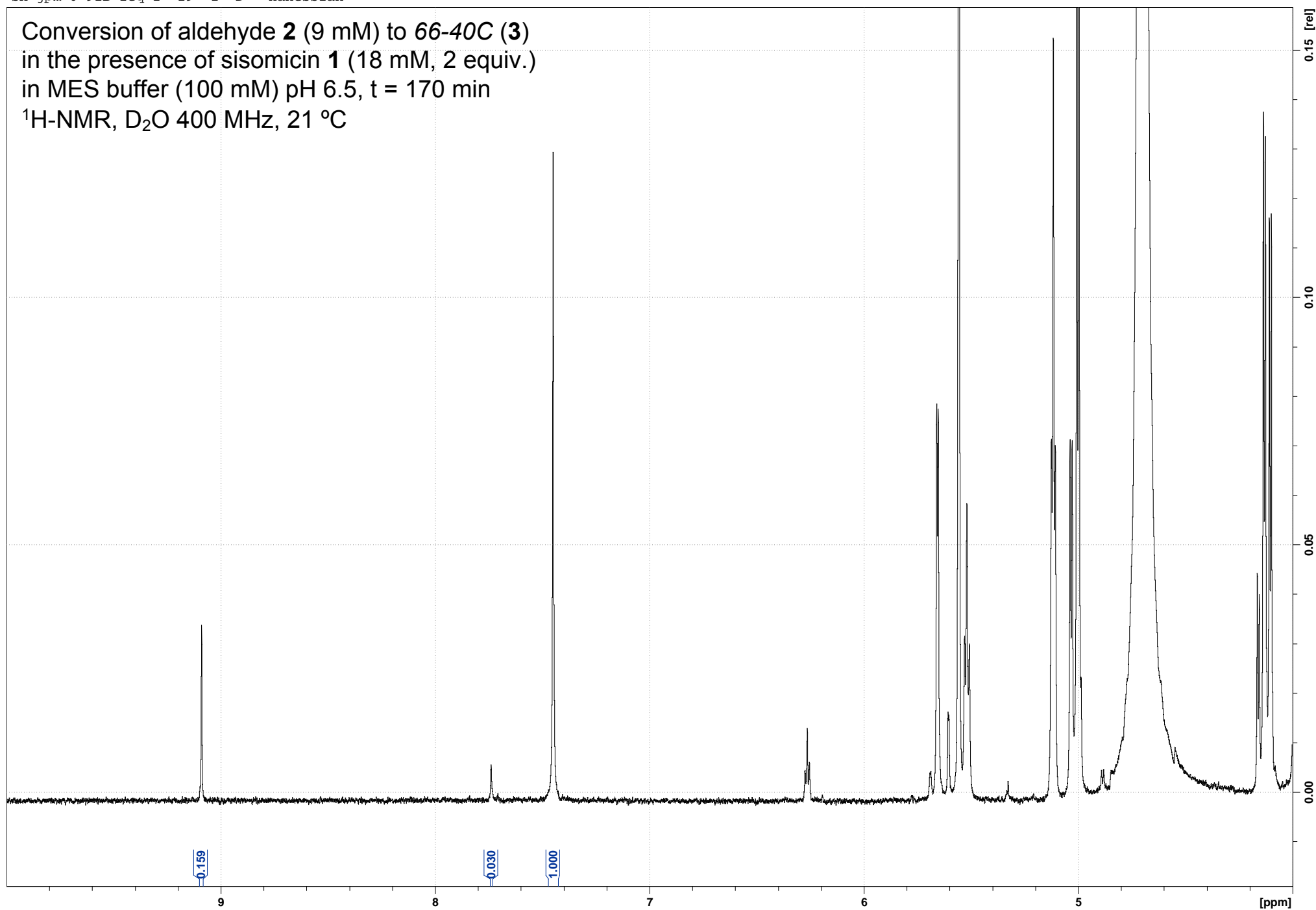
sh-jpm-6-91B-2eq-2 18 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 160 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



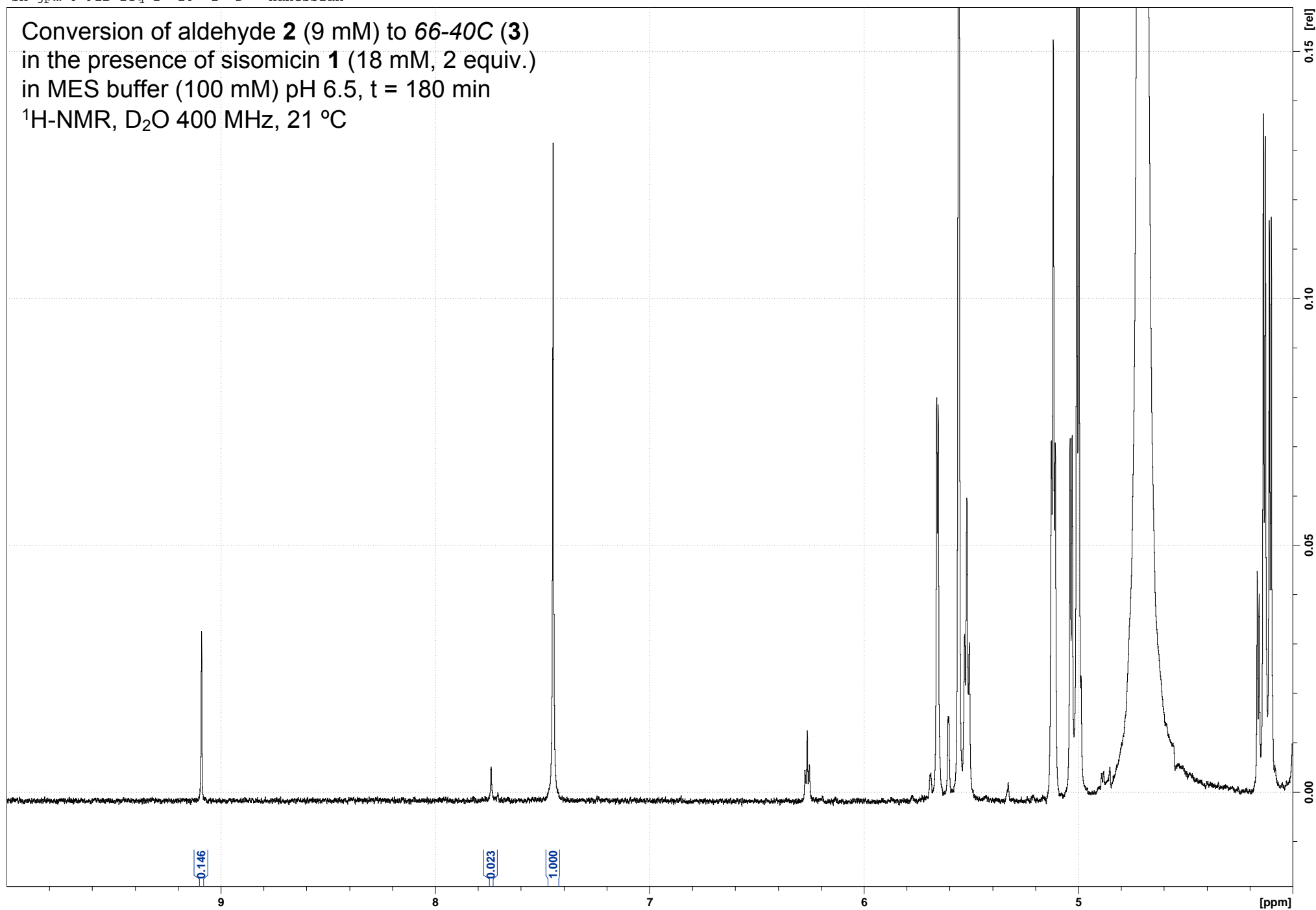
sh-jpm-6-91B-2eq-2 19 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 170 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91B-2eq-2 20 1 D: Hanessian

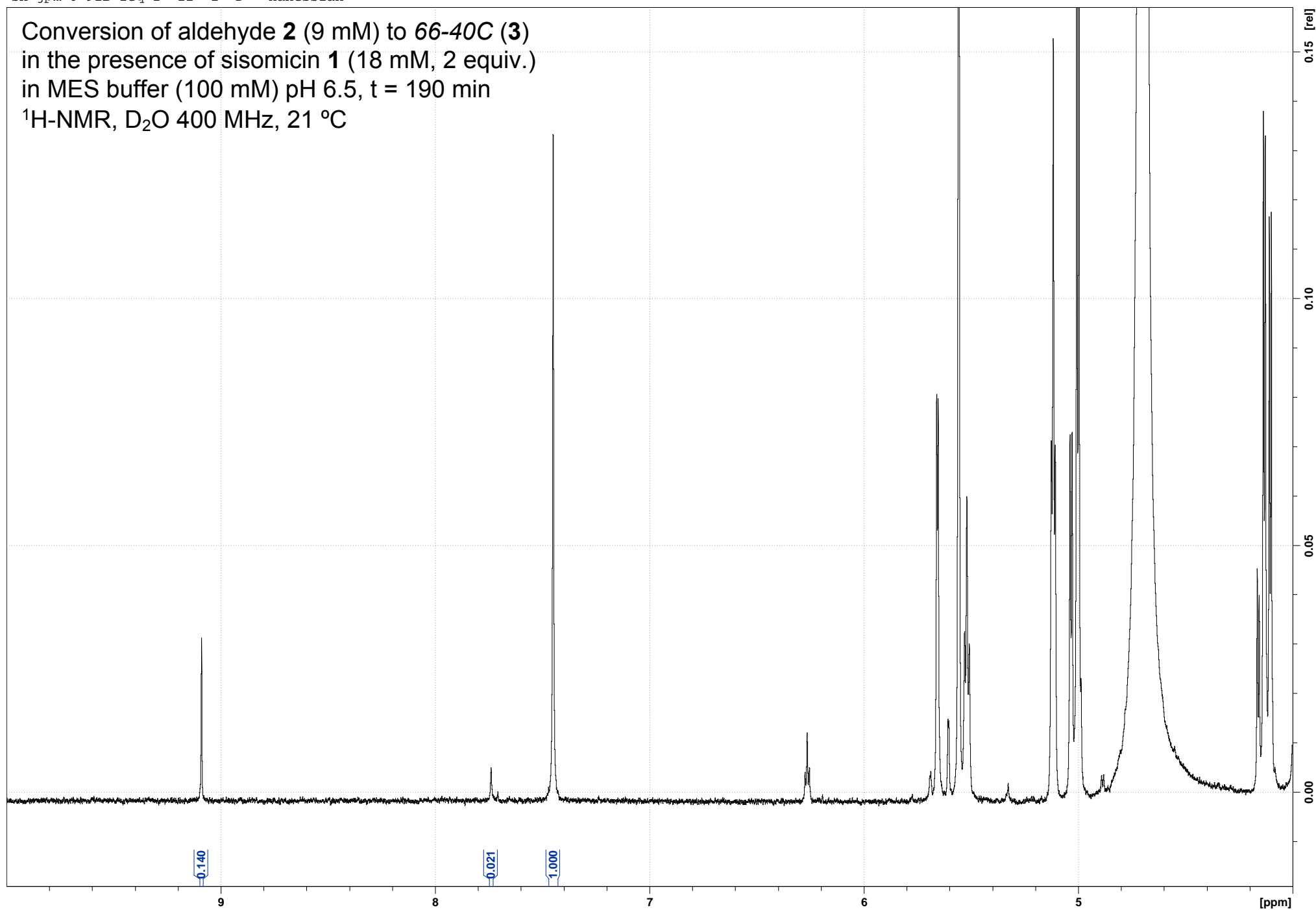
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 180 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





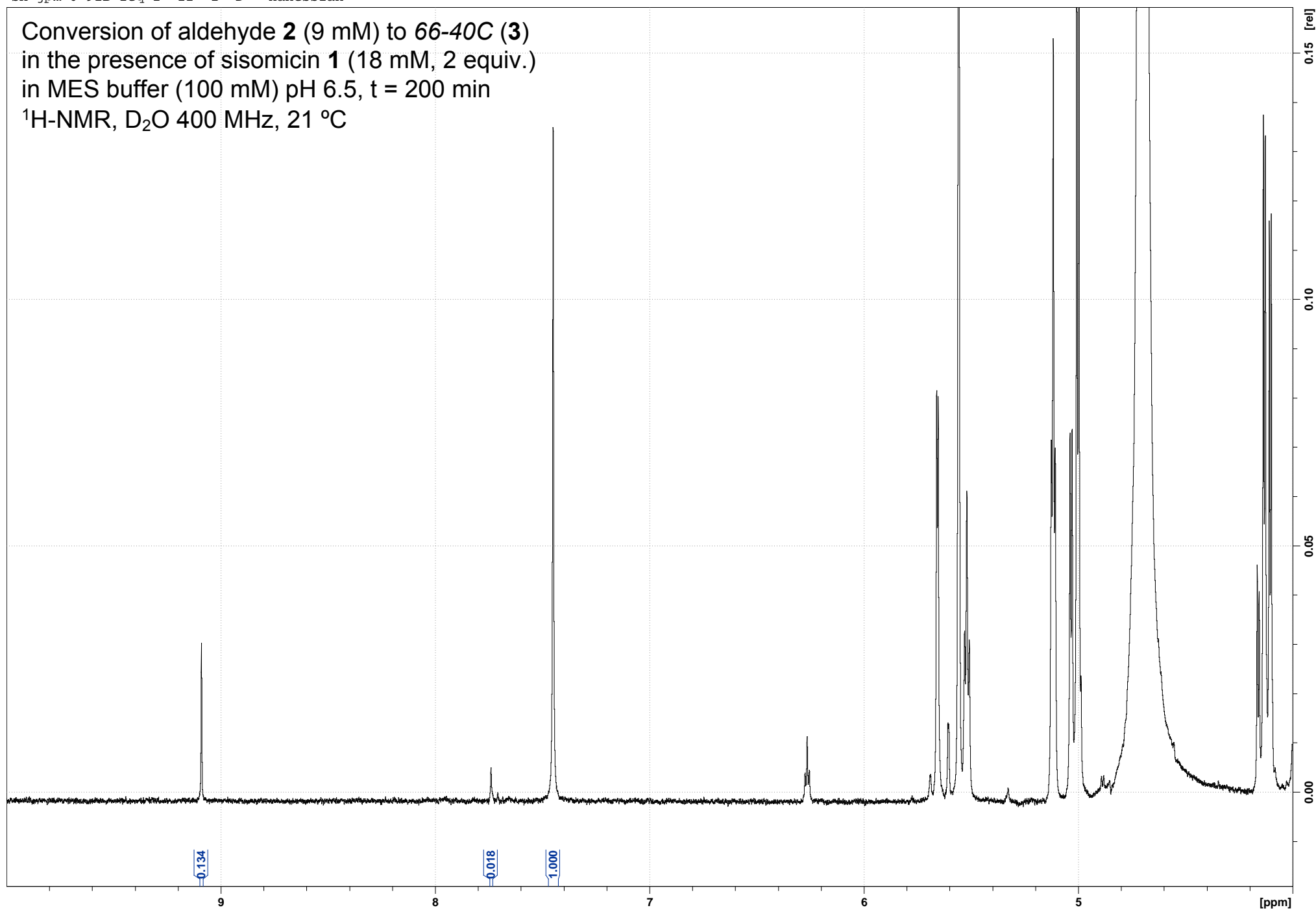
sh-jpm-6-91B-2eq-2 21 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 190 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



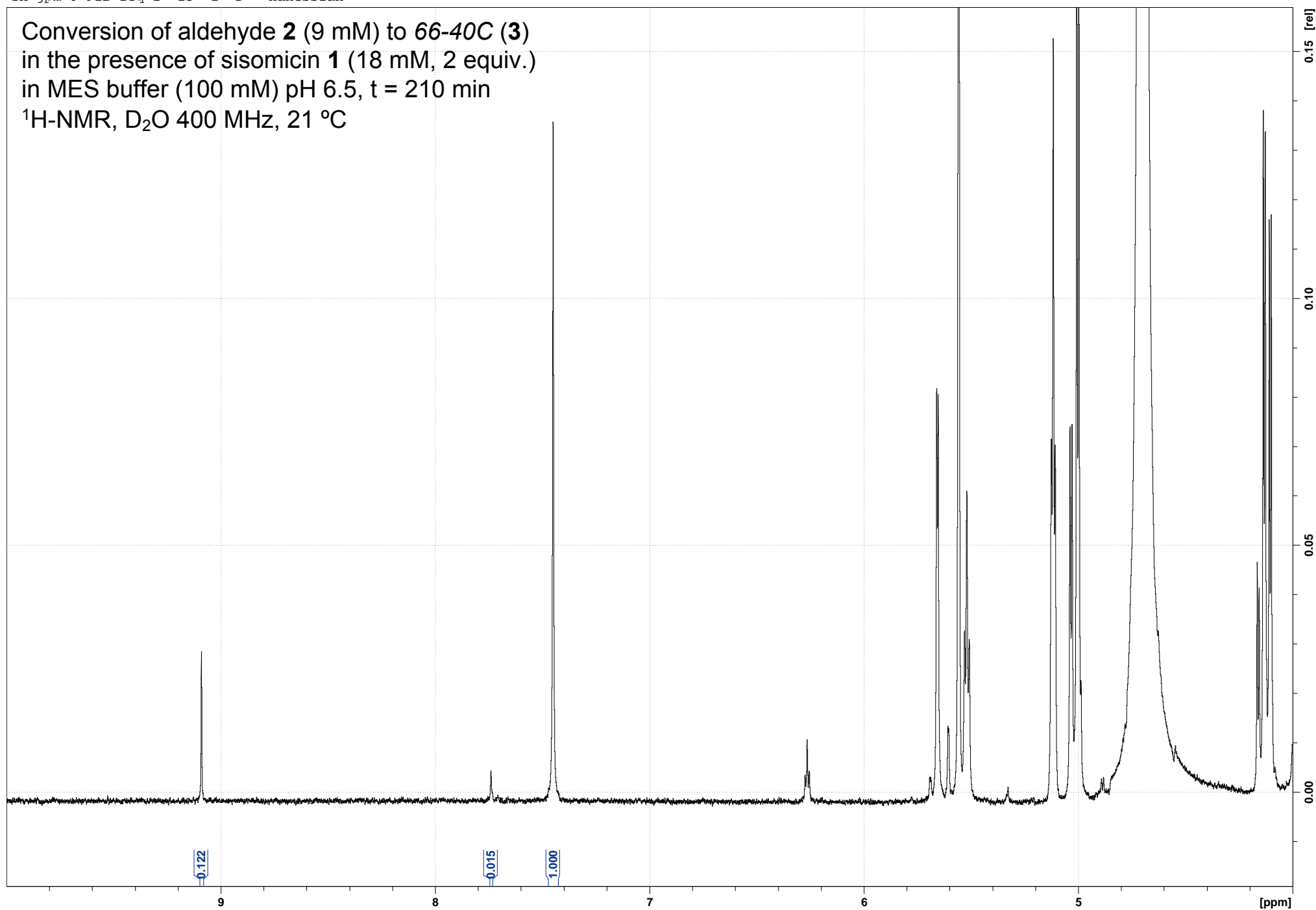
sh-jpm-6-91B-2eq-2 22 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 200 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



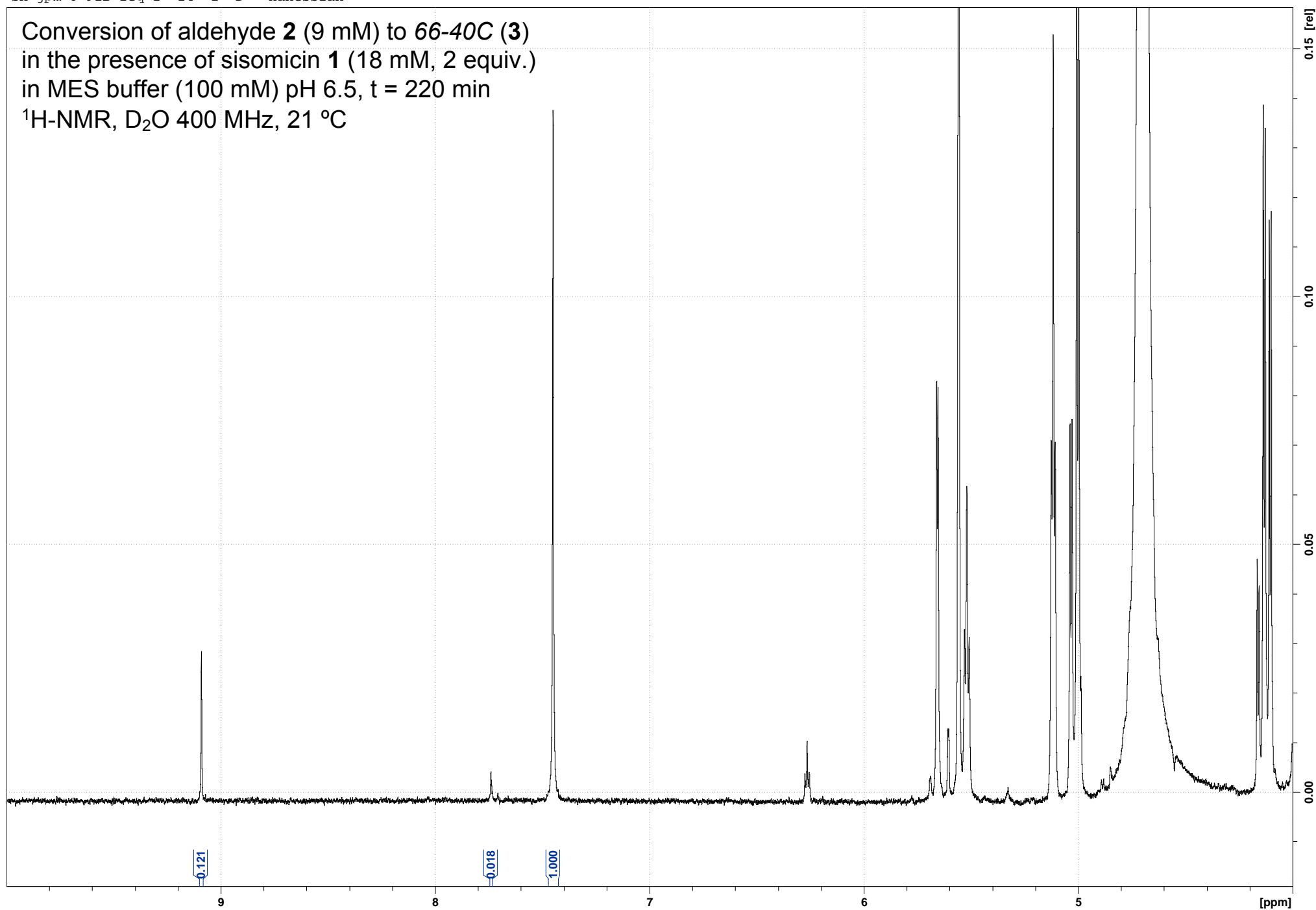
sh-jpm-6-91B-2eq-2 23 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 210 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



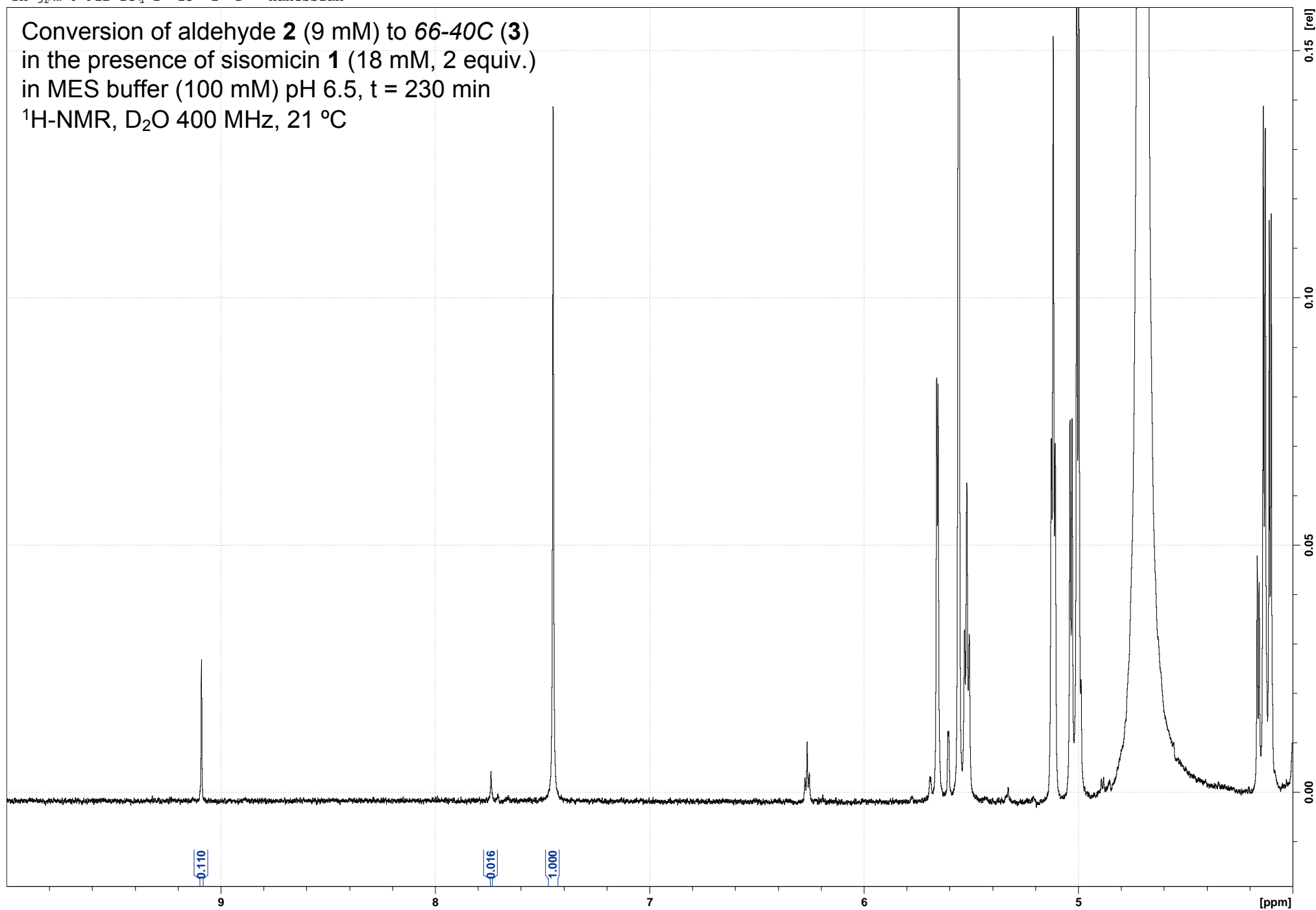
sh-jpm-6-91B-2eq-2 24 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 220 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



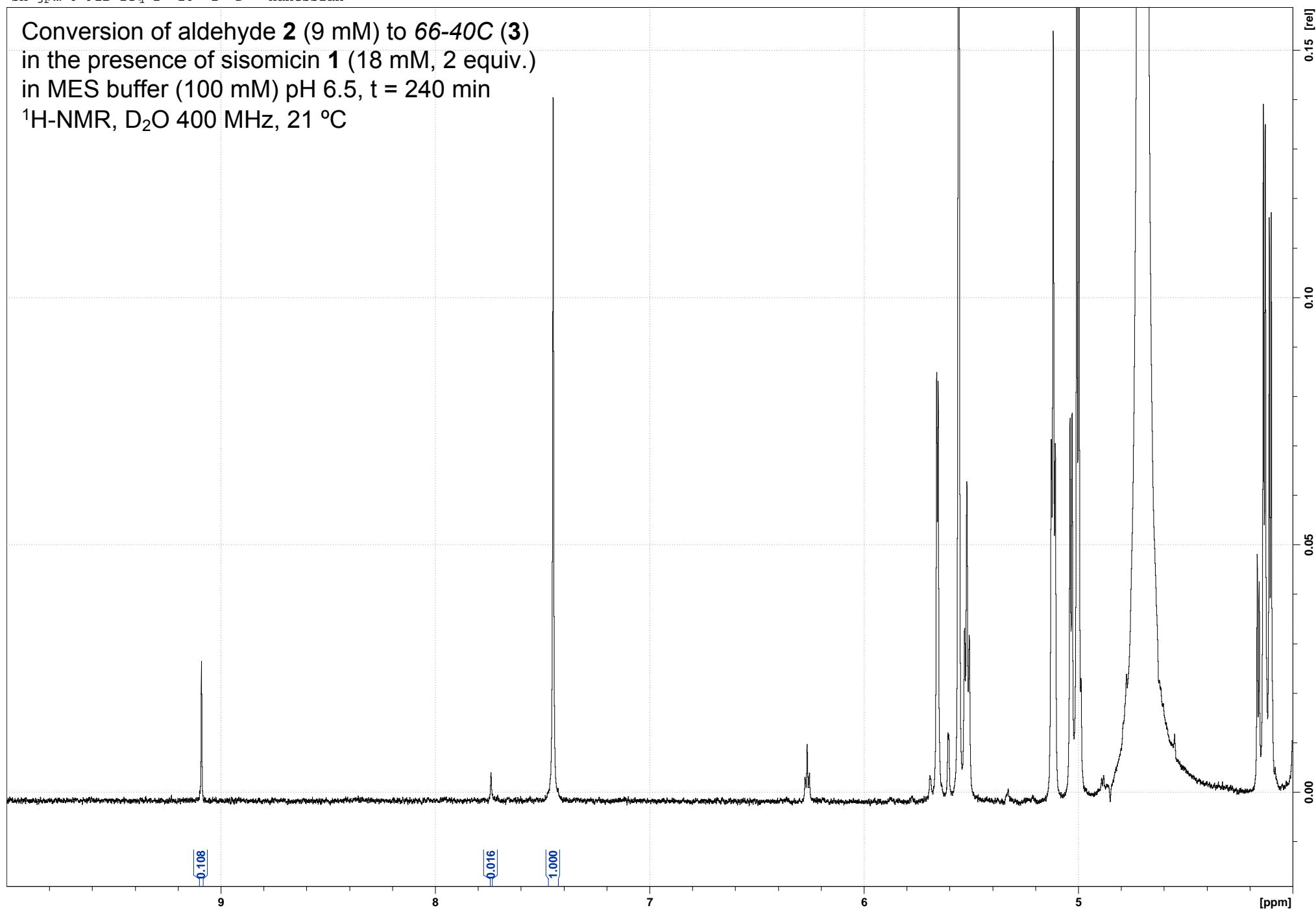
sh-jpm-6-91B-2eq-2 25 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 230 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



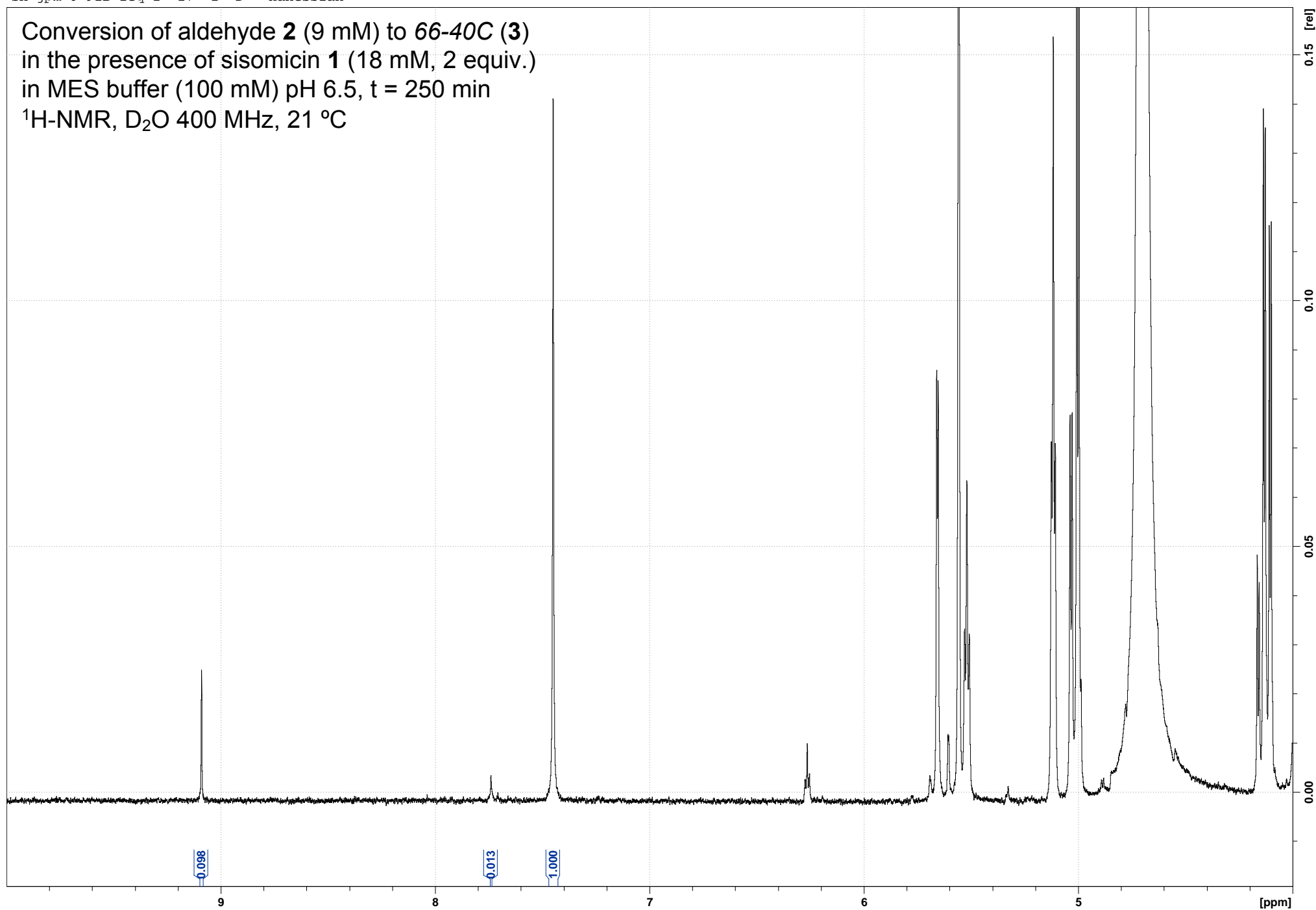
sh-jpm-6-91B-2eq-2 26 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 240 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



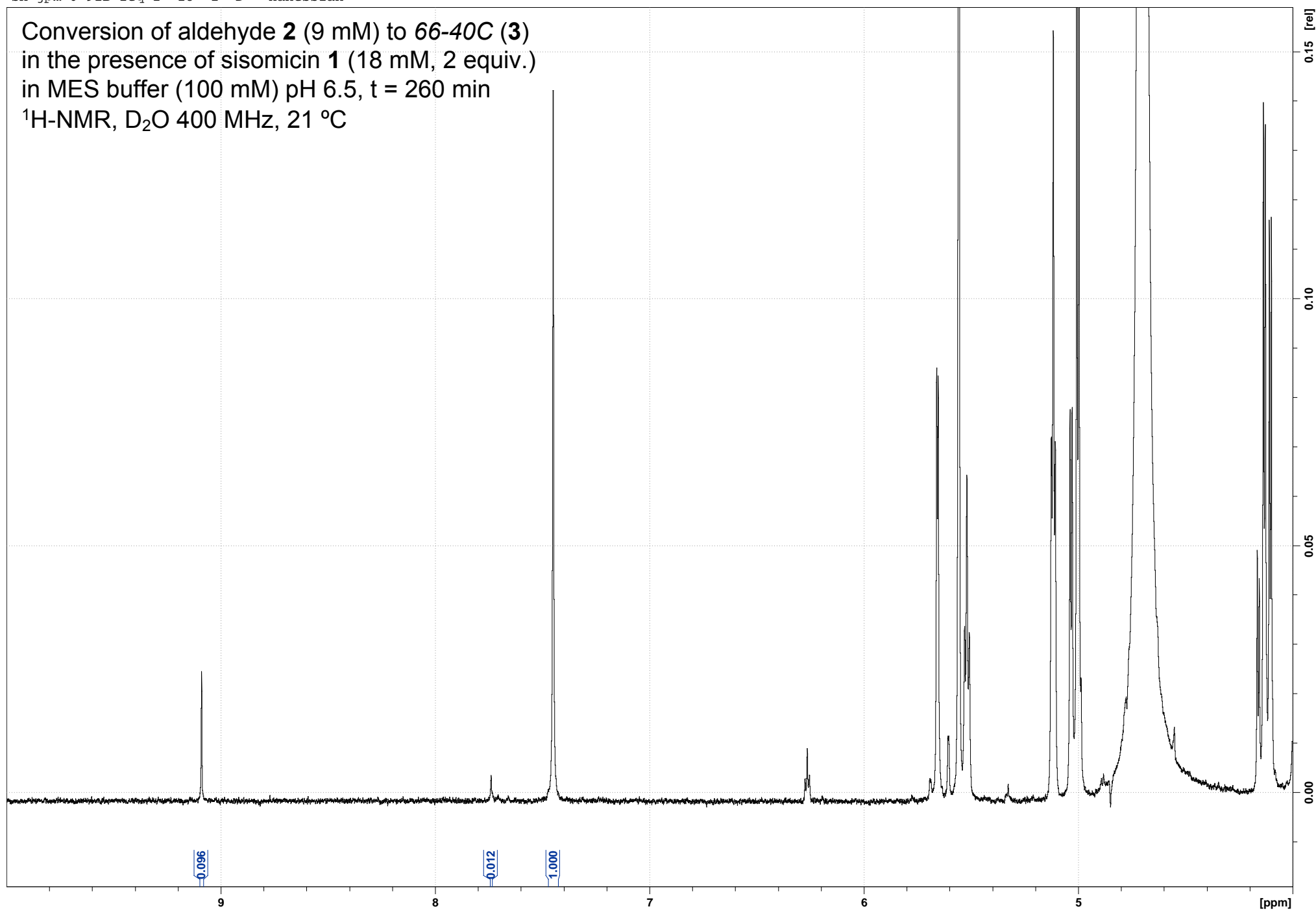
sh-jpm-6-91B-2eq-2 27 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 250 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91B-2eq-2 28 1 D: Hanessian

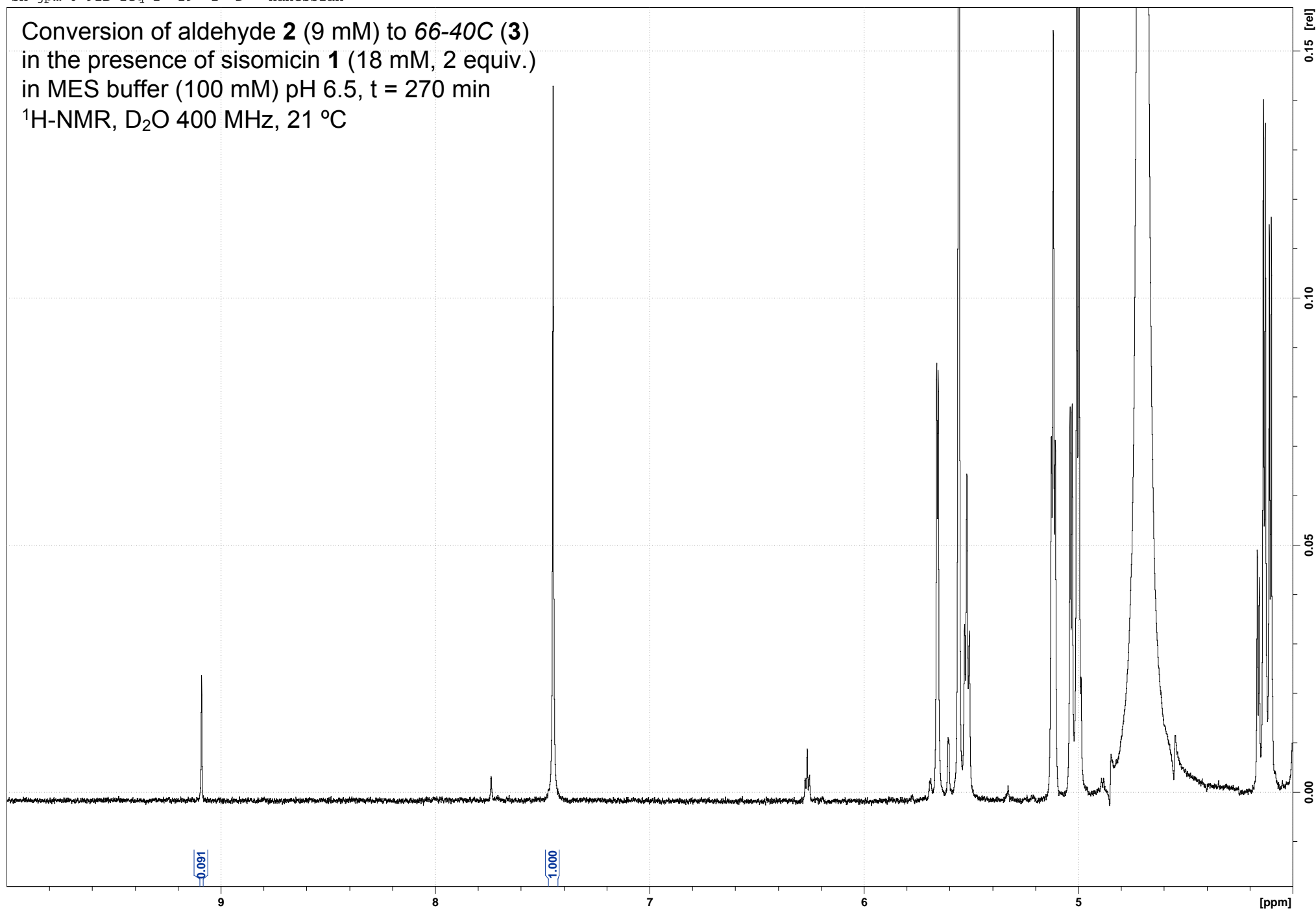
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 260 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





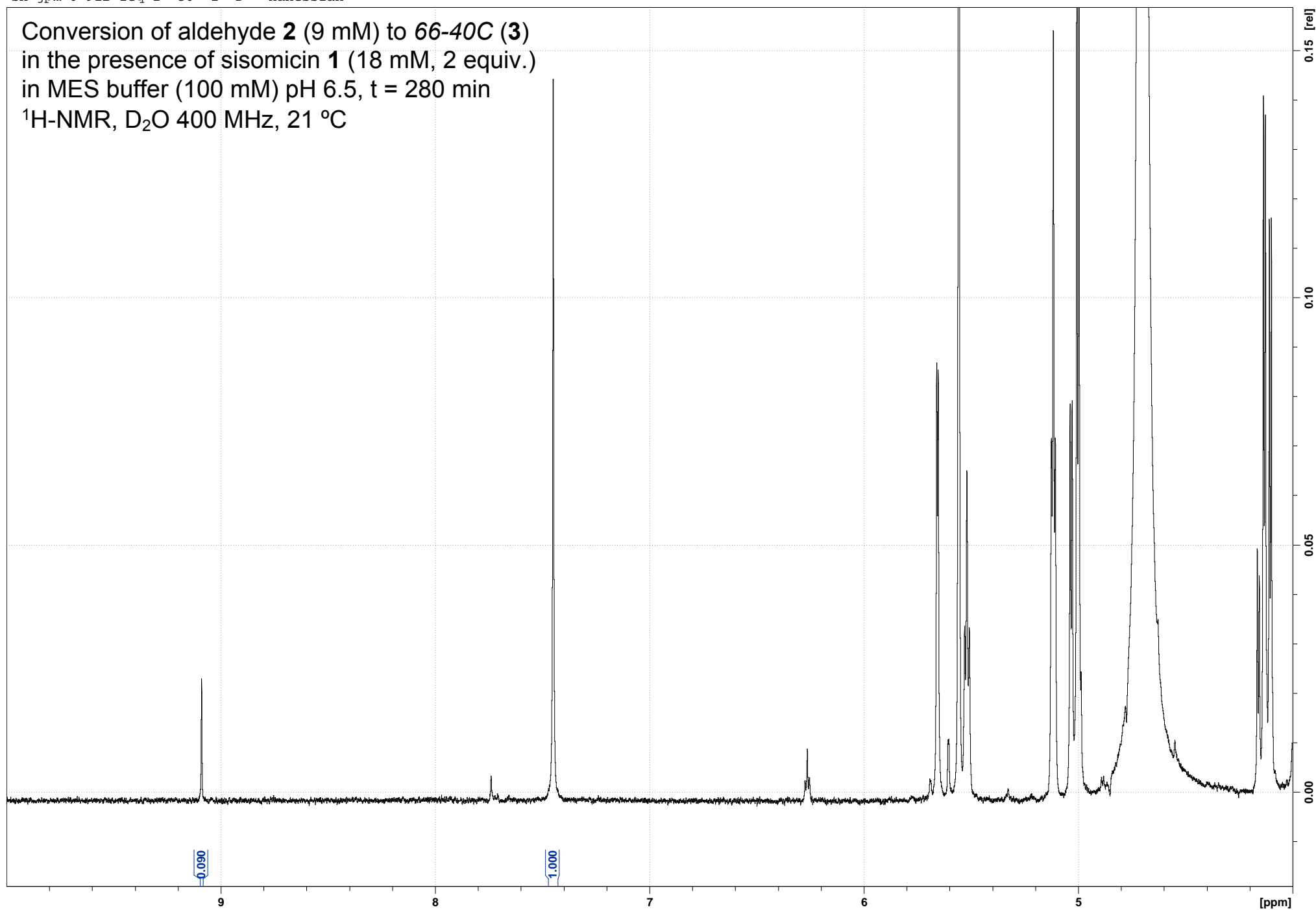
sh-jpm-6-91B-2eq-2 29 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 270 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



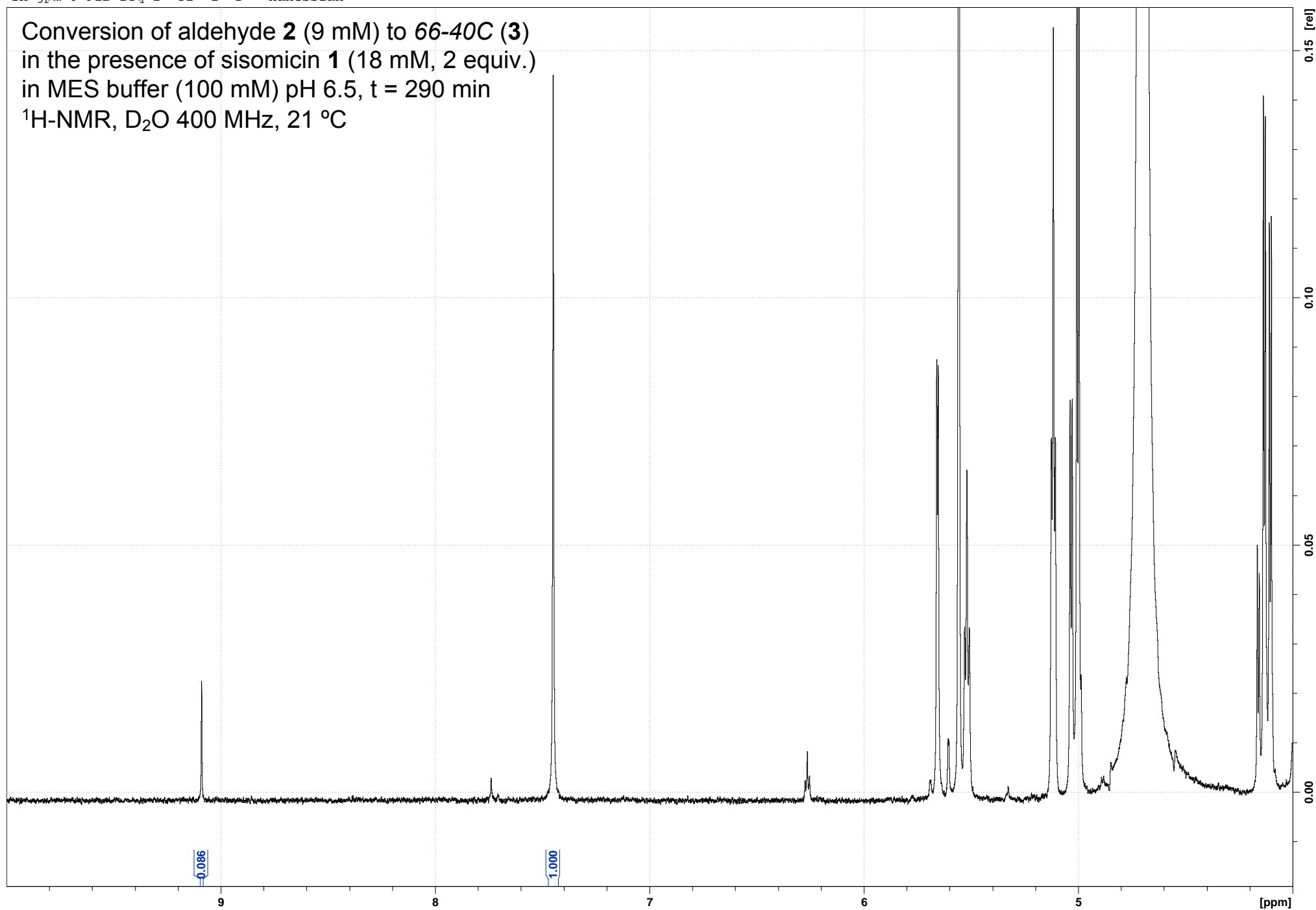
sh-jpm-6-91B-2eq-2 30 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 280 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



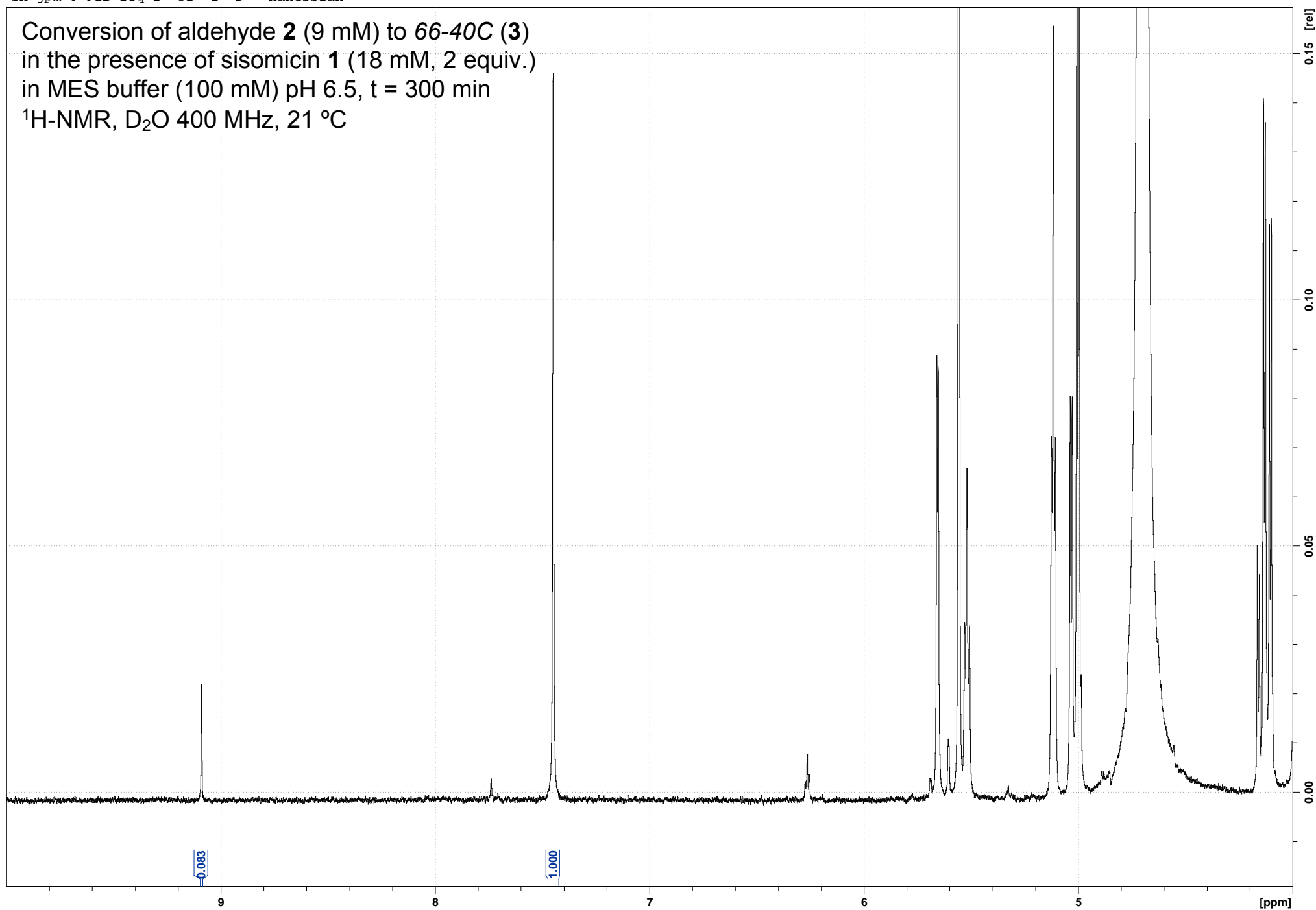
sh-jpm-6-91B-2eq-2 31 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 290 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



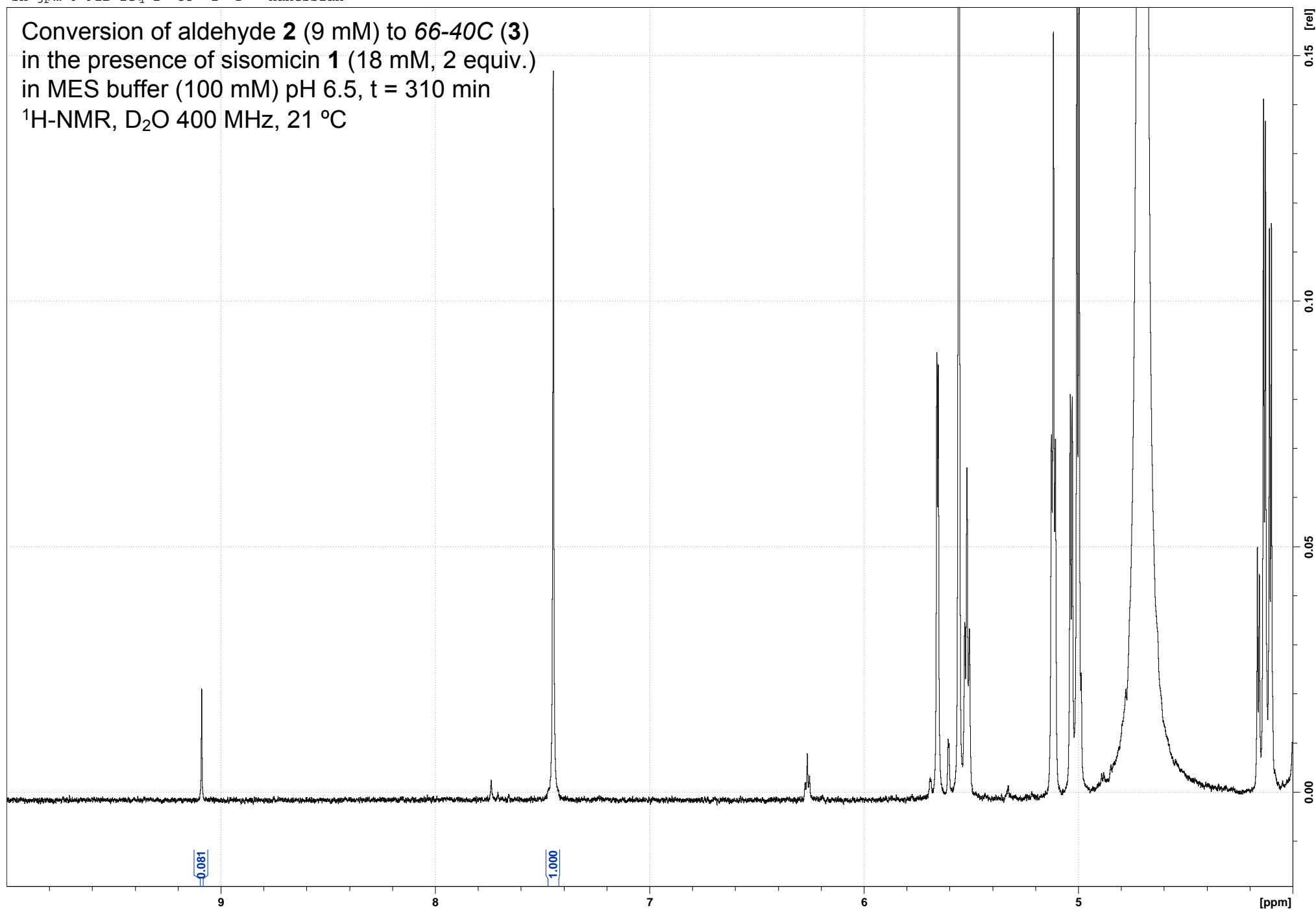
sh-jpm-6-91B-2eq-2 32 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 300 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



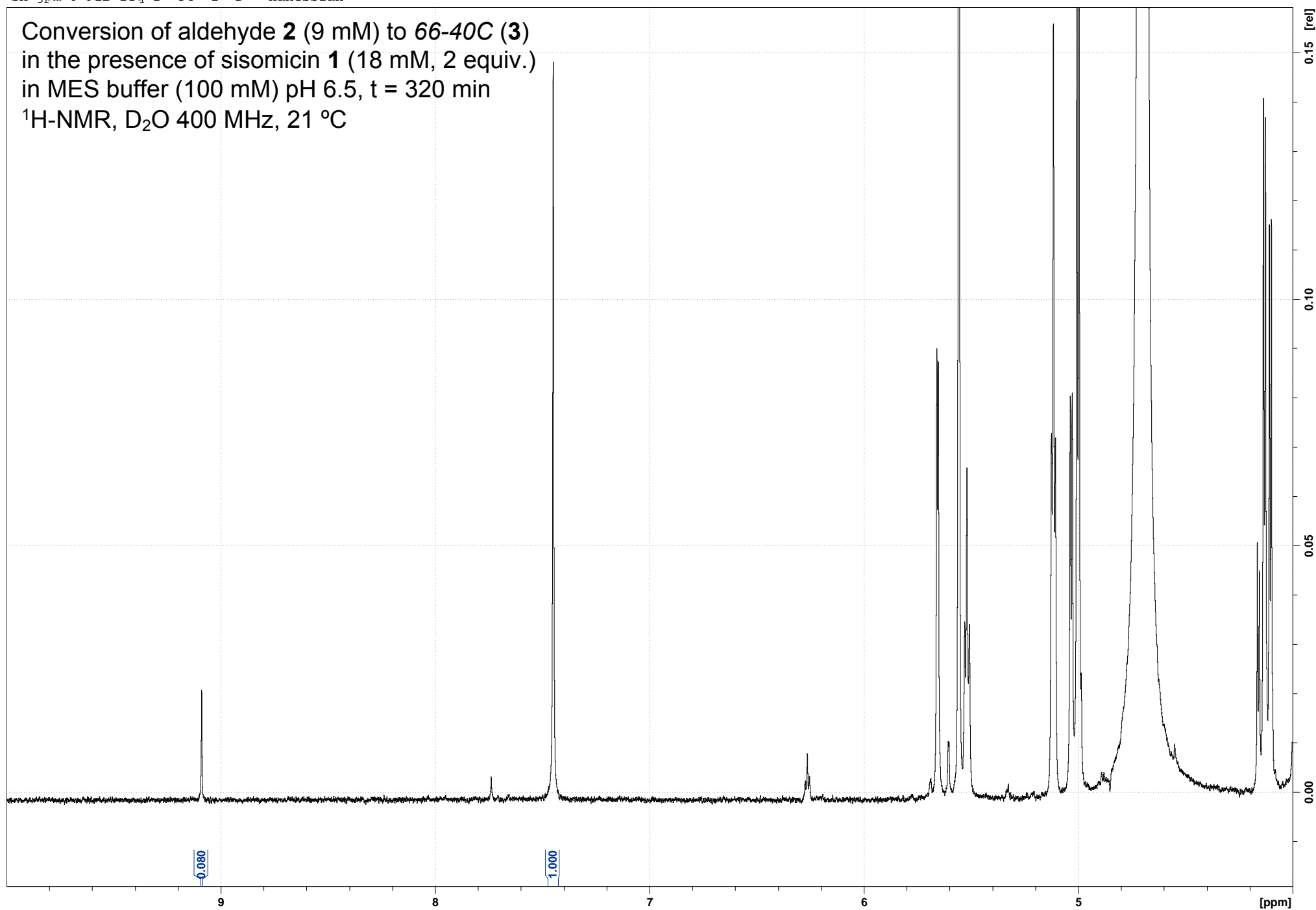
sh-jpm-6-91B-2eq-2 33 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 310 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



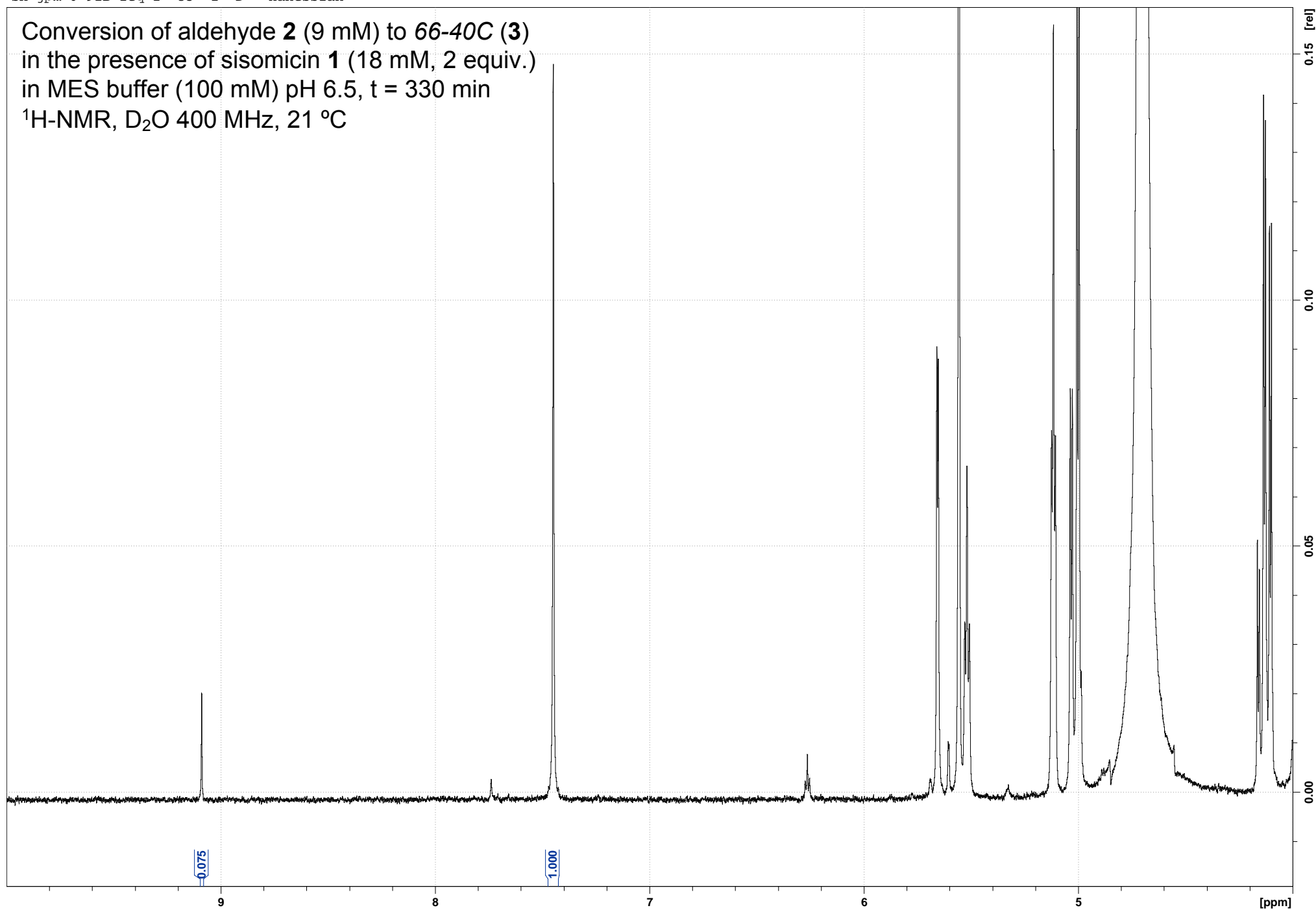
sh-jpm-6-91B-2eq-2 34 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 320 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



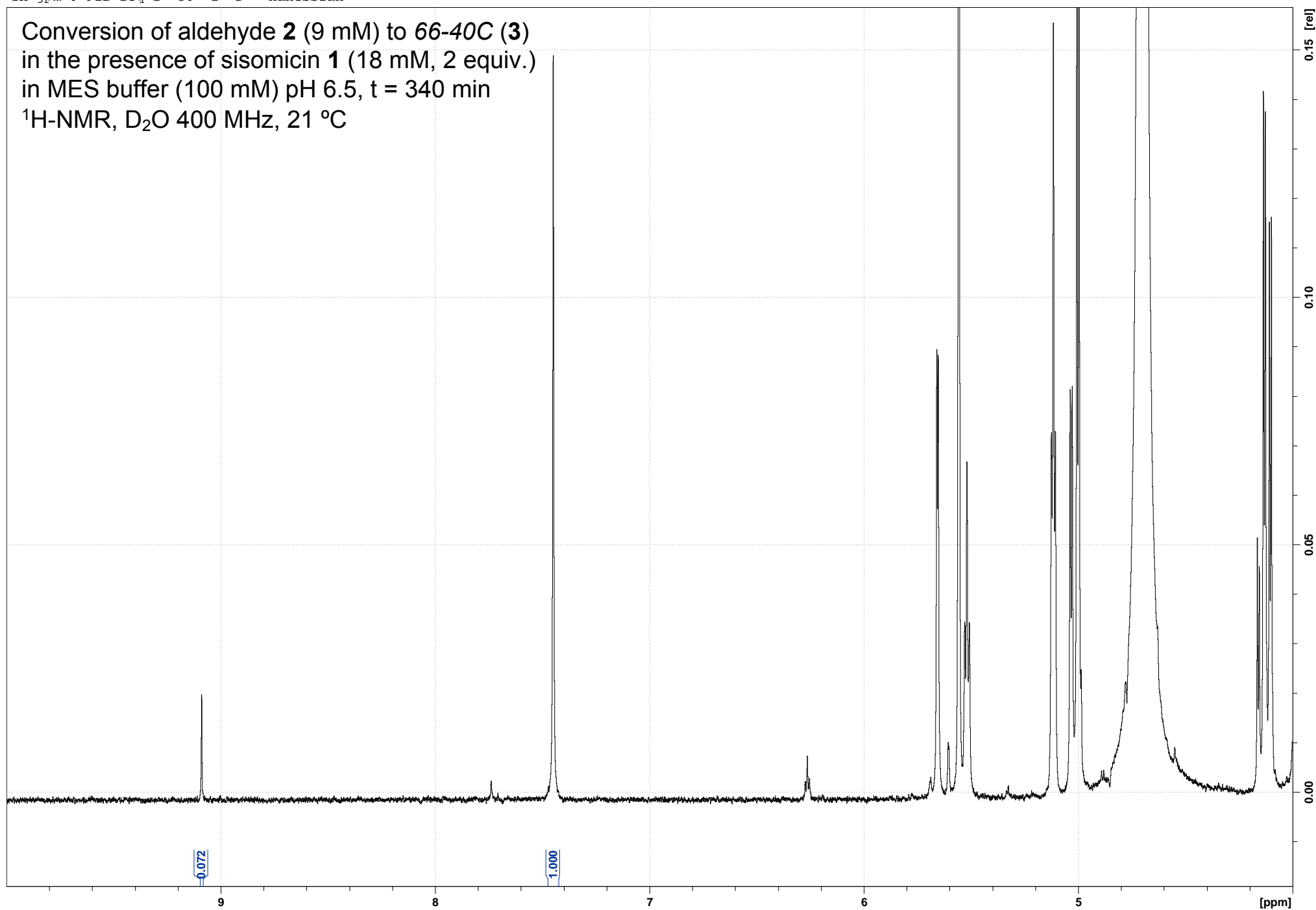
sh-jpm-6-91B-2eq-2 35 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 330 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



sh-jpm-6-91B-2eq-2 36 1 D: Hanessian

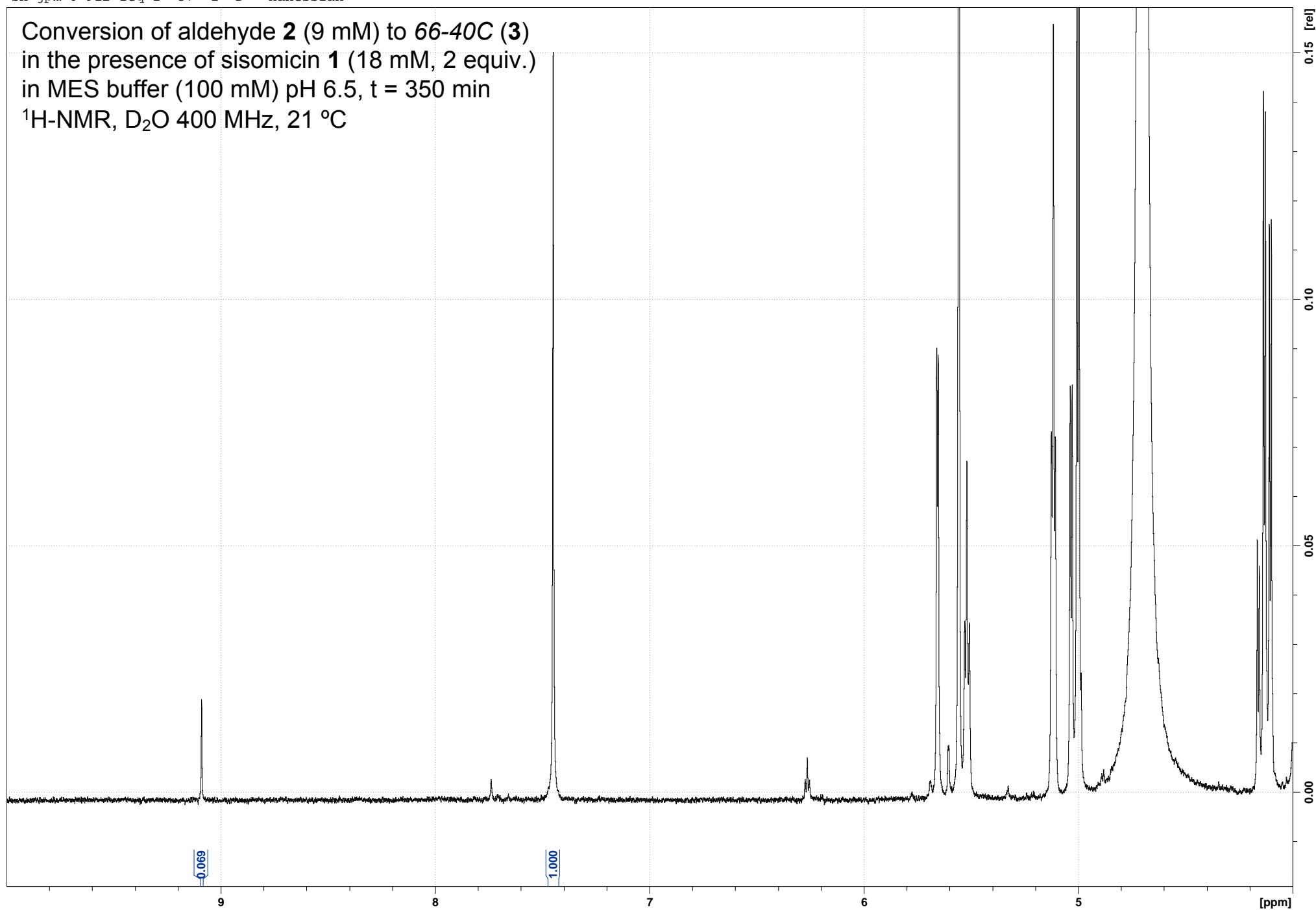
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 340 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





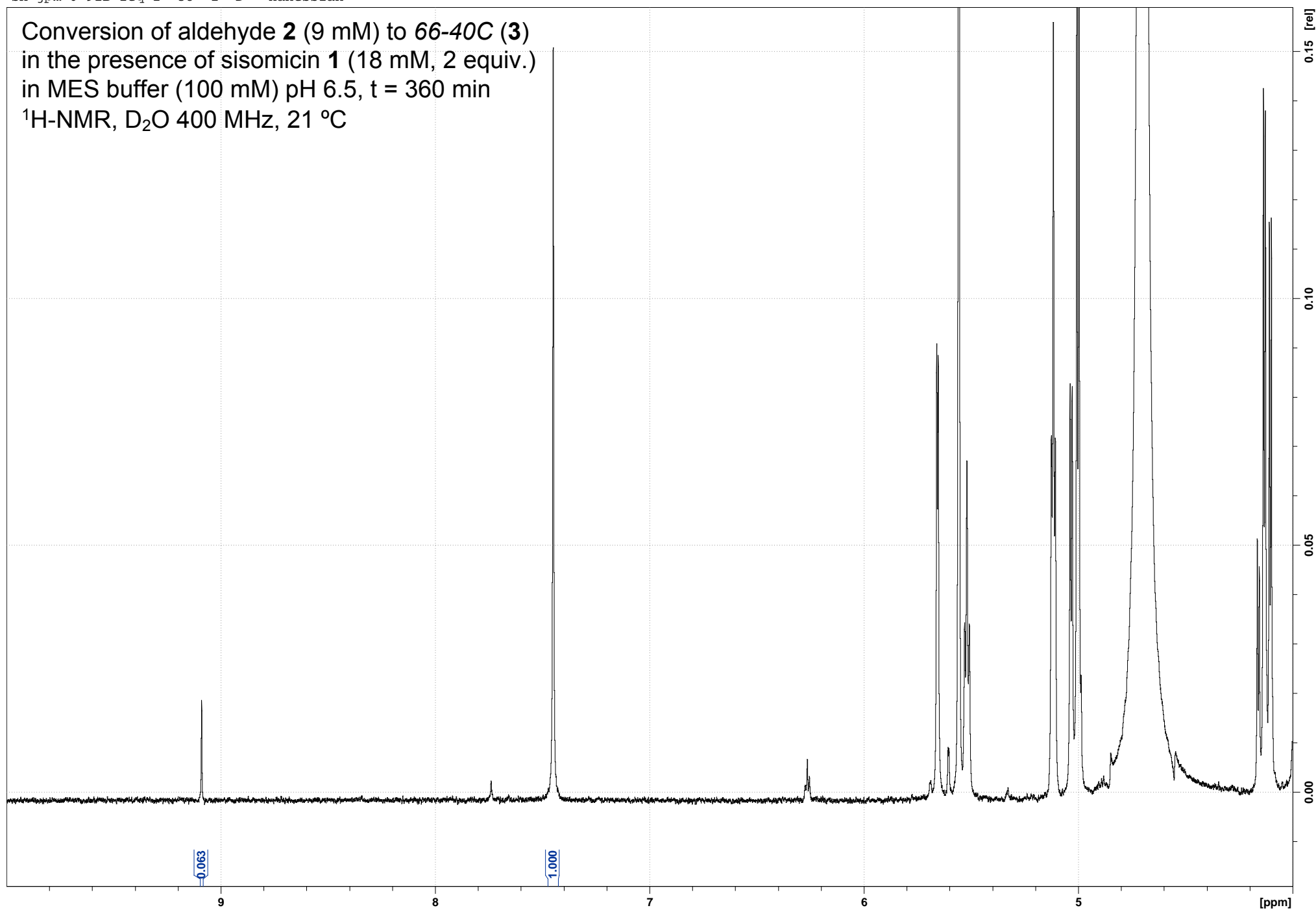
sh-jpm-6-91B-2eq-2 37 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 350 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



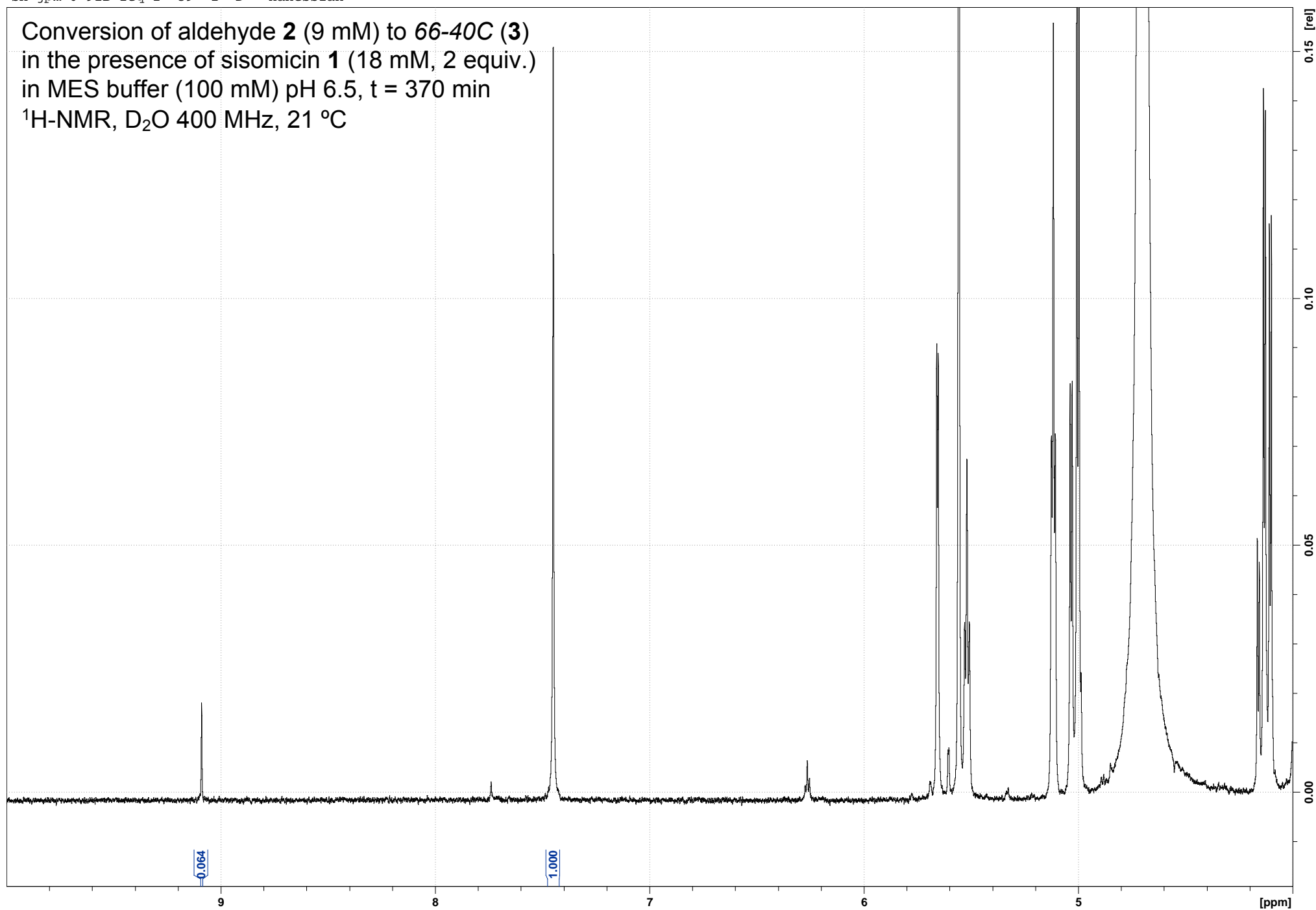
sh-jpm-6-91B-2eq-2 38 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 360 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



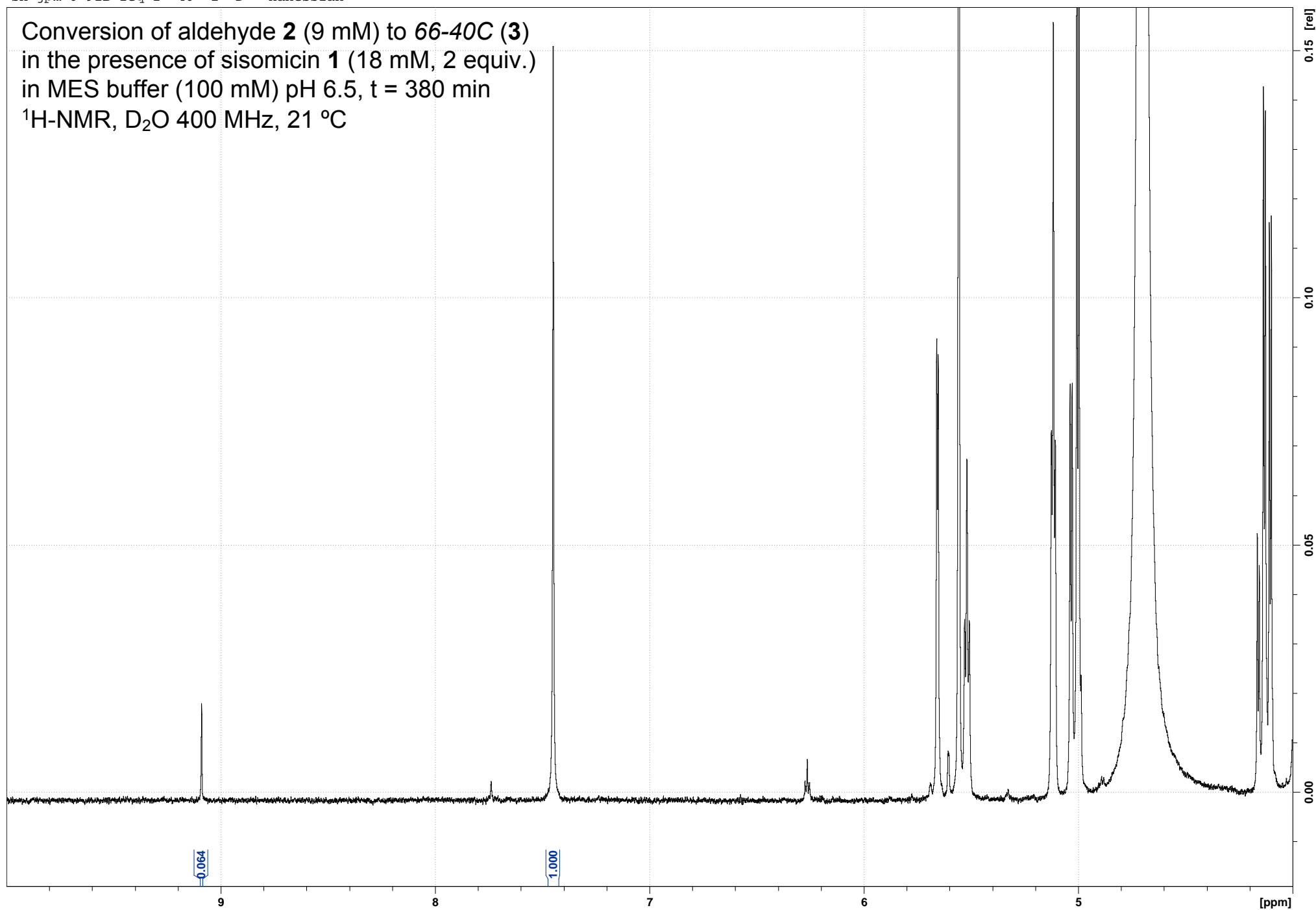
sh-jpm-6-91B-2eq-2 39 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 370 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



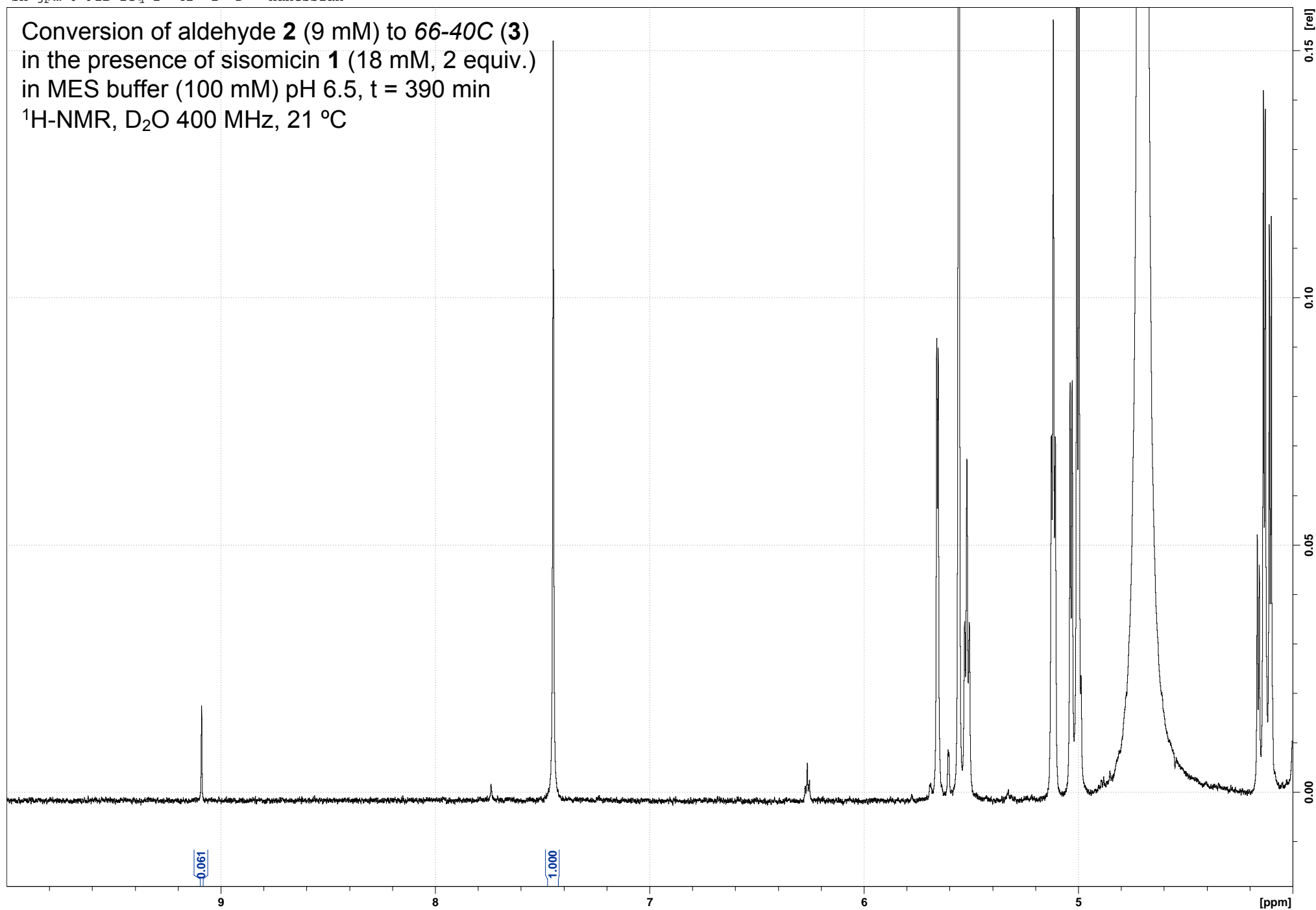
sh-jpm-6-91B-2eq-2 40 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 380 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



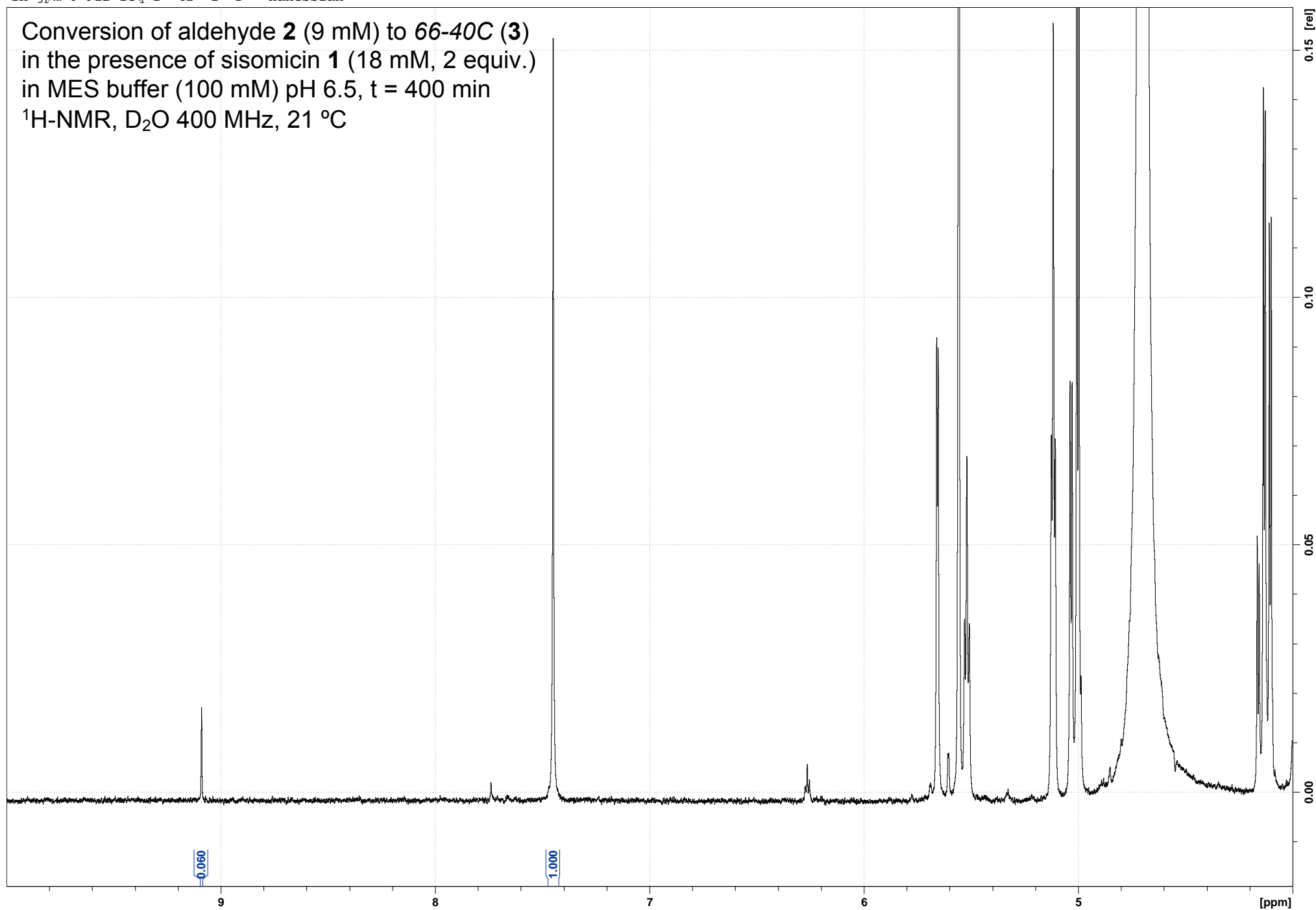
sh-jpm-6-91B-2eq-2 41 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 390 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



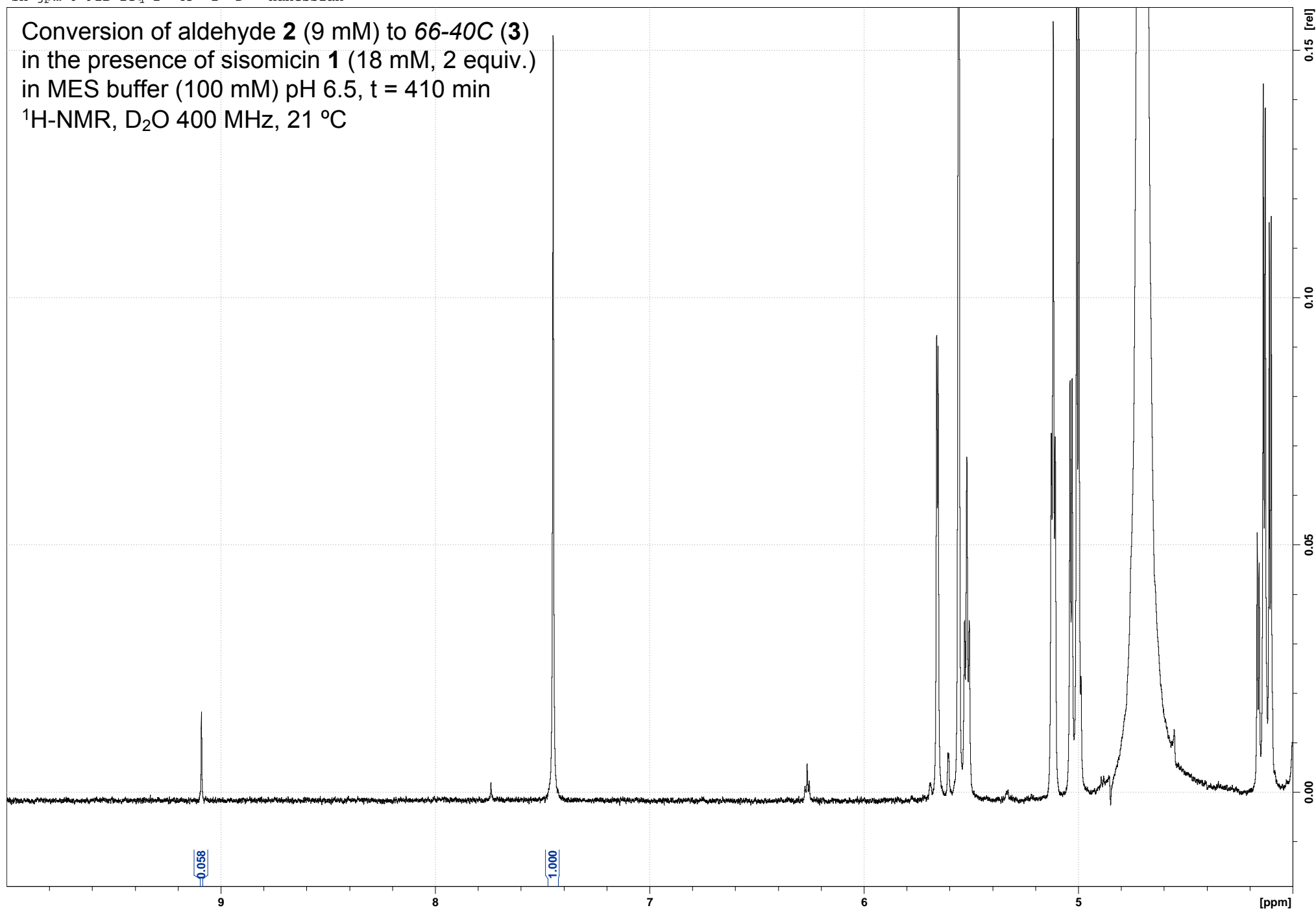
sh-jpm-6-91B-2eq-2 42 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 400 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



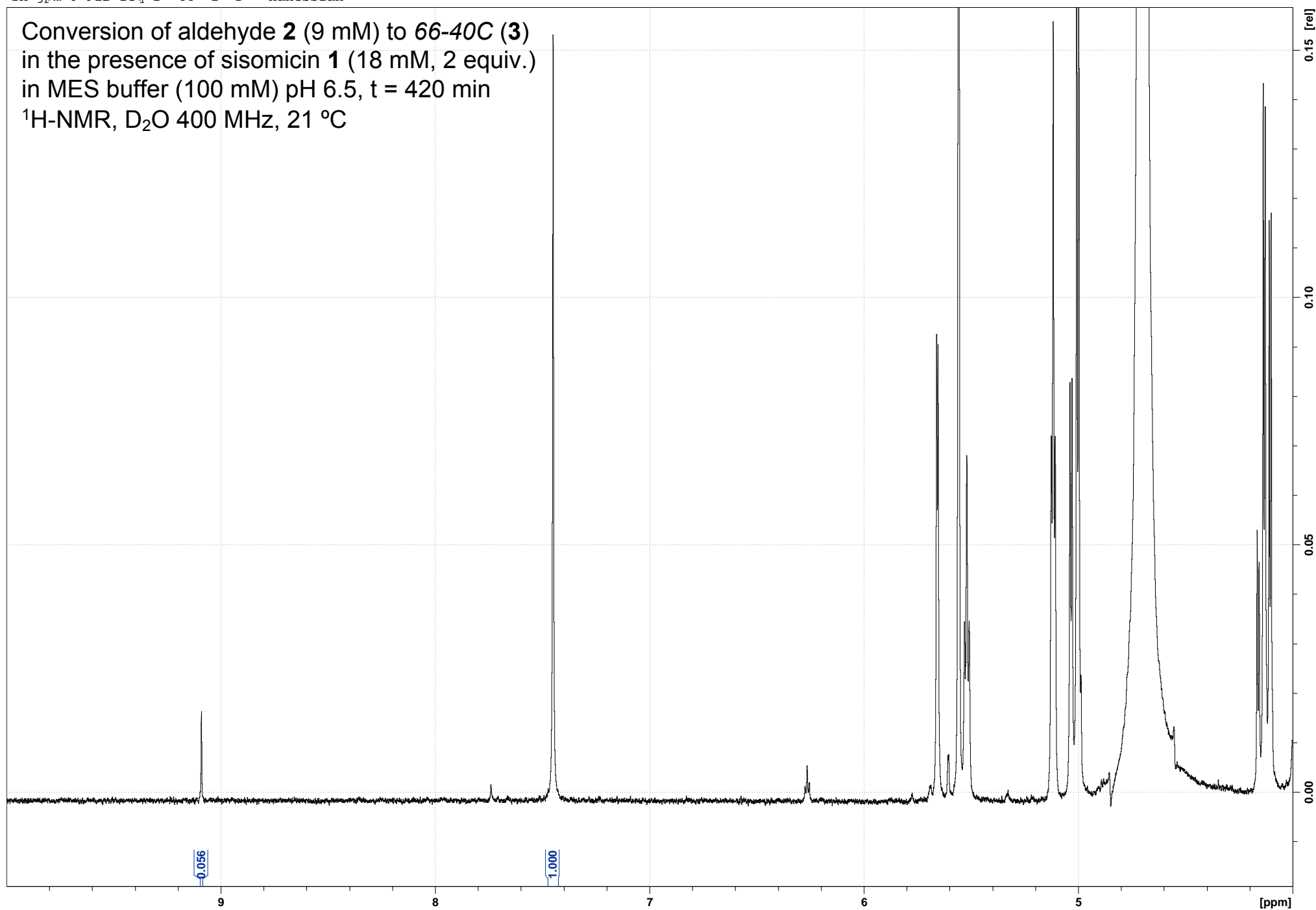
sh-jpm-6-91B-2eq-2 43 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 410 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



sh-jpm-6-91B-2eq-2 44 1 D: Hanessian

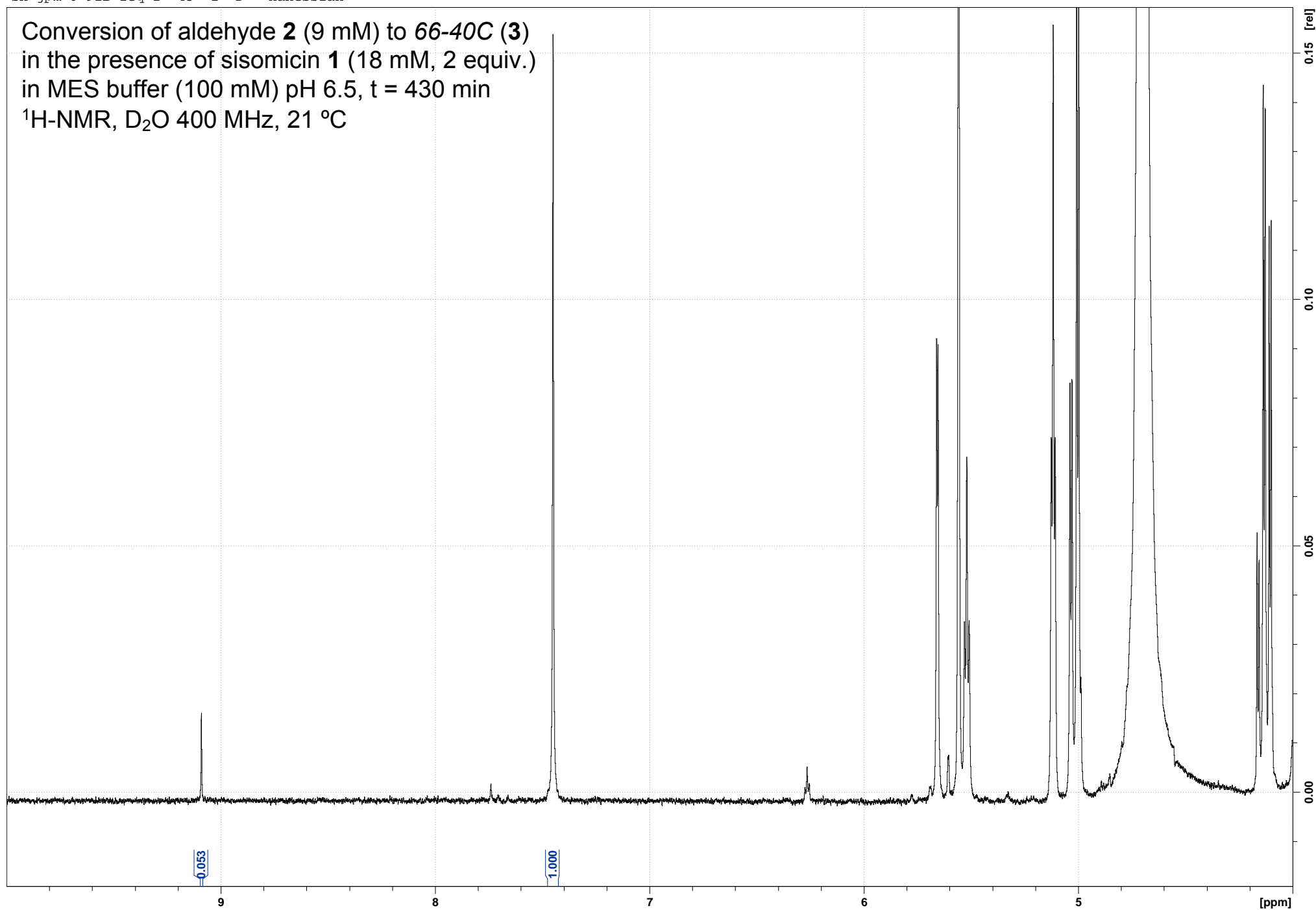
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 420 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





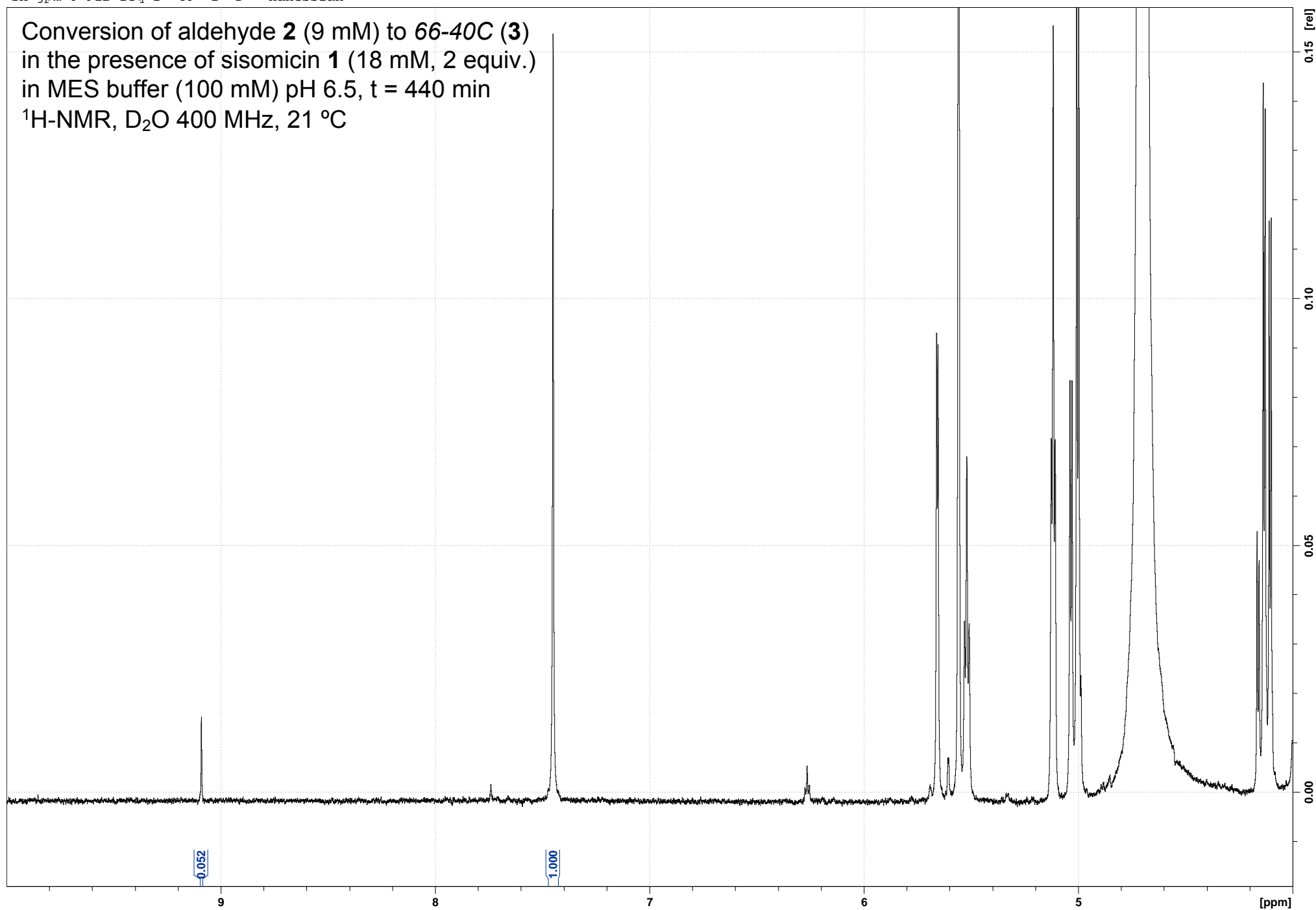
sh-jpm-6-91B-2eq-2 45 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 430 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



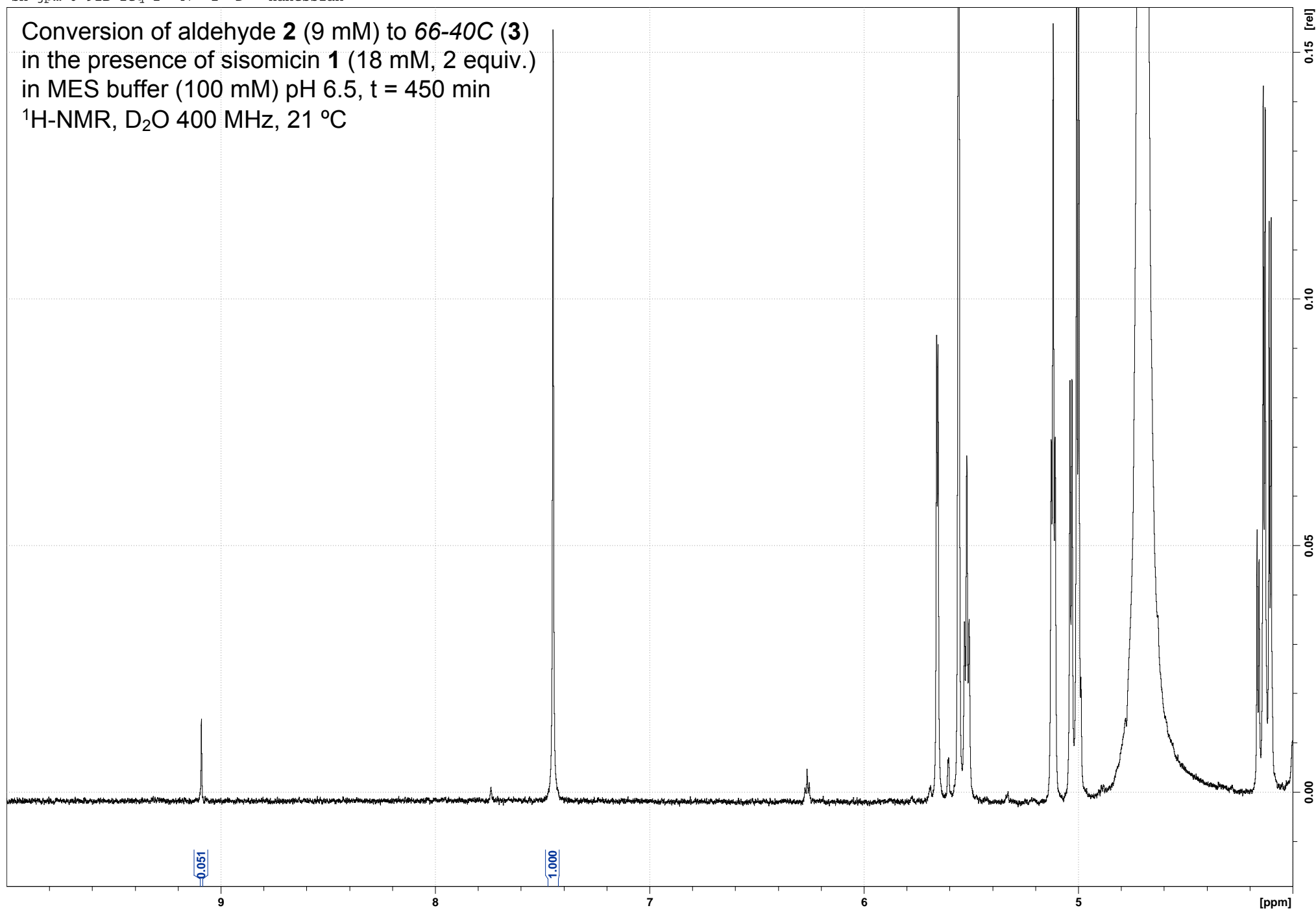
sh-jpm-6-91B-2eq-2 46 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 440 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



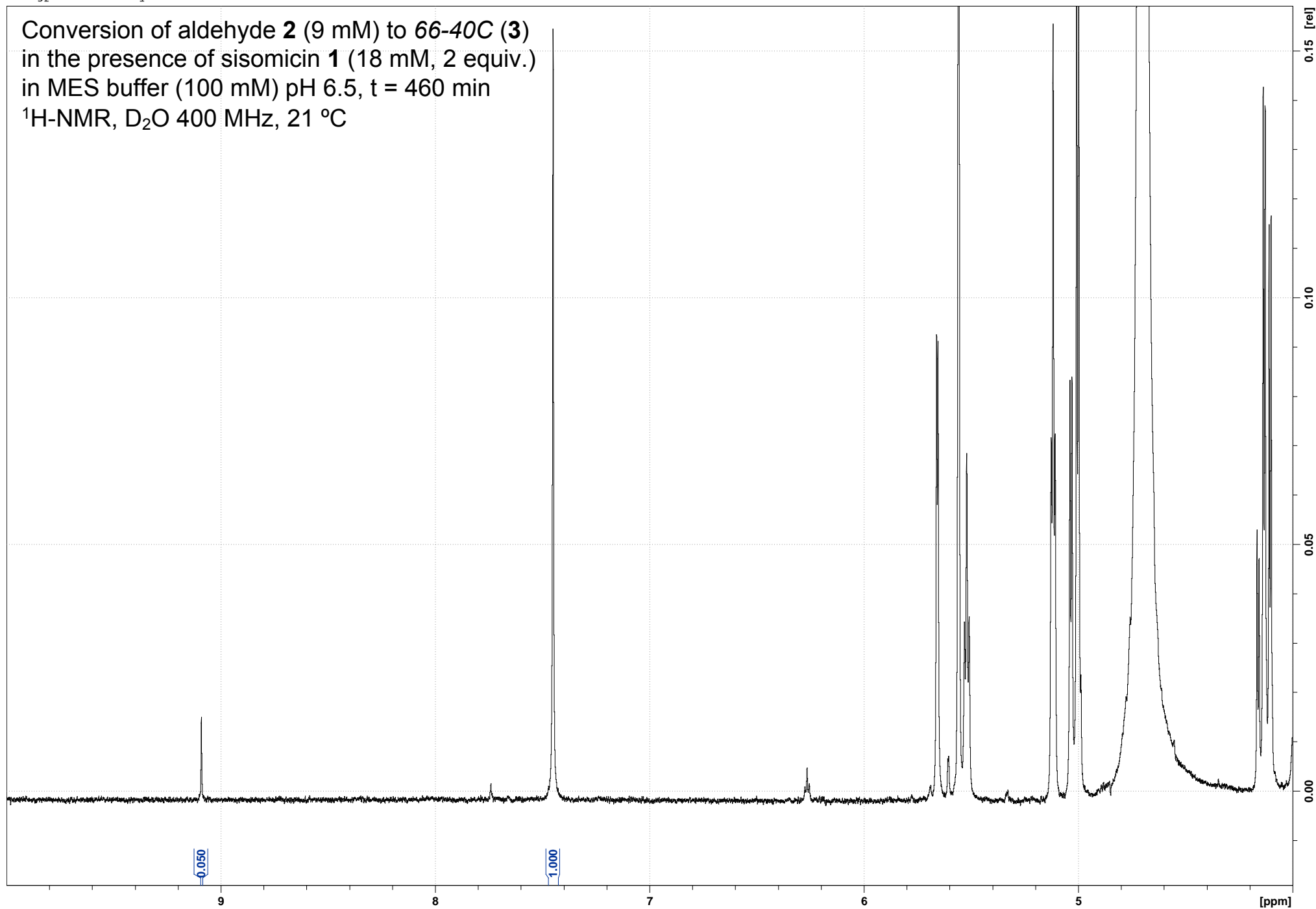
sh-jpm-6-91B-2eq-2 47 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 450 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



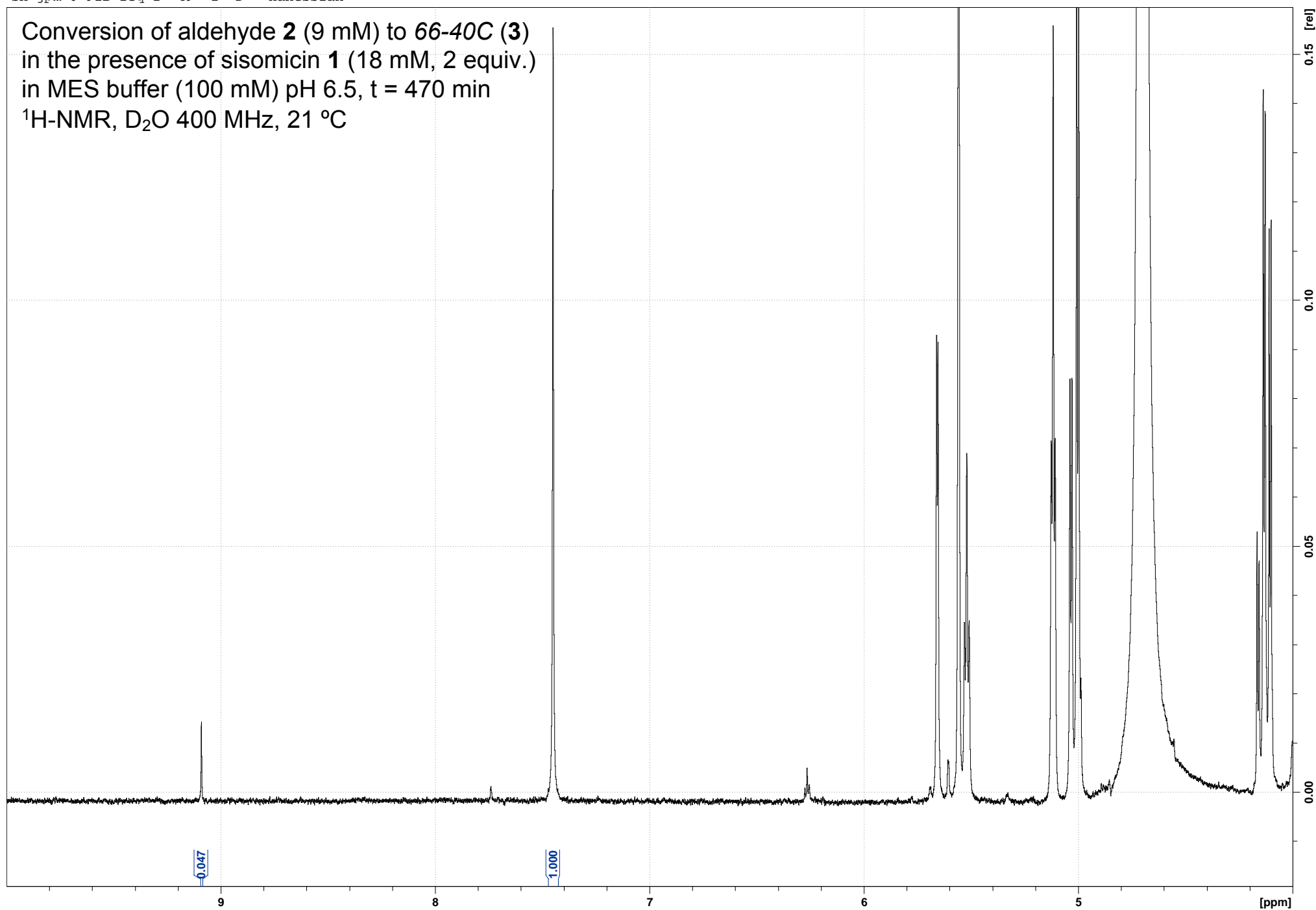
sh-jpm-6-91B-2eq-2 48 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 460 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



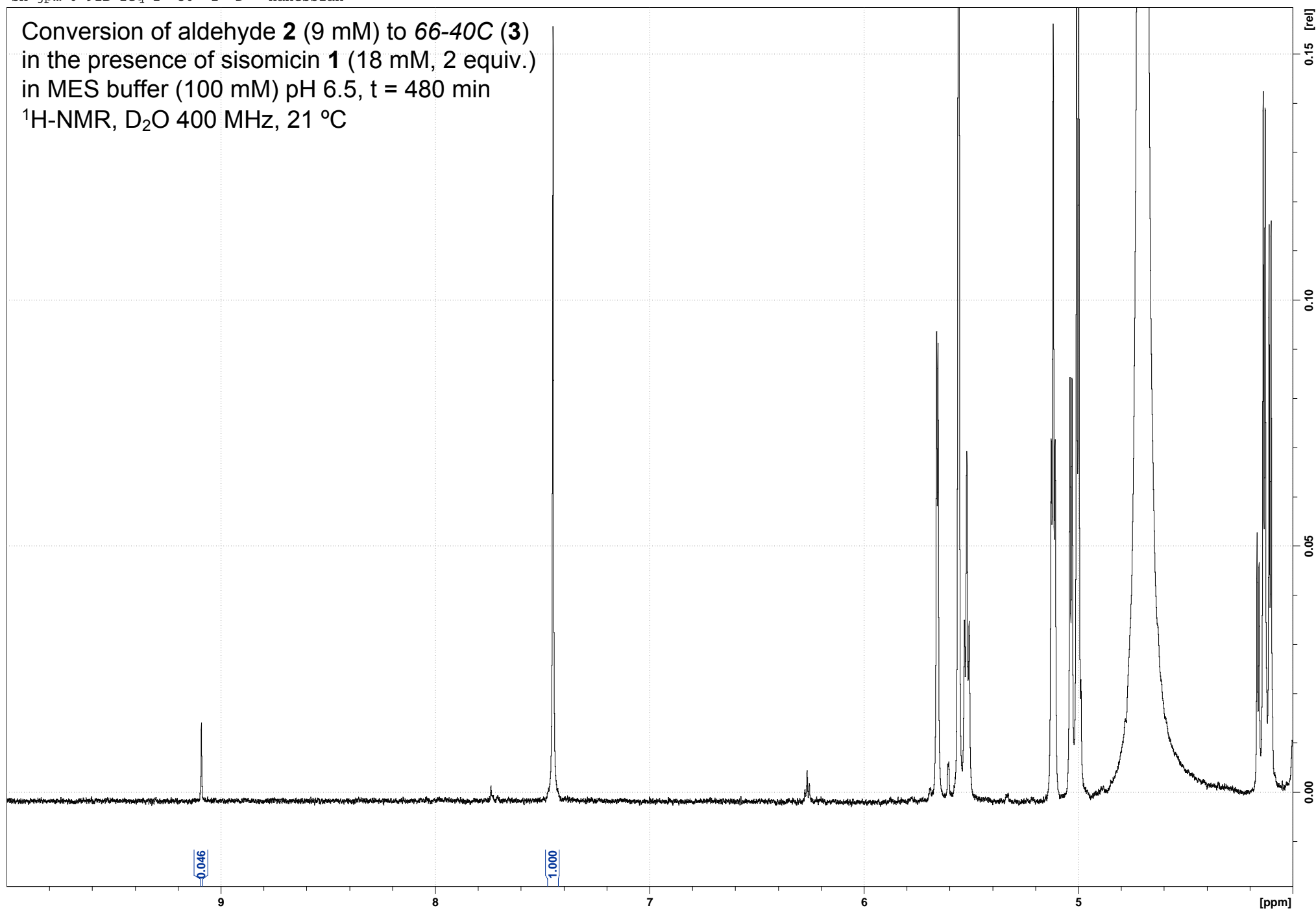
sh-jpm-6-91B-2eq-2 49 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 470 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



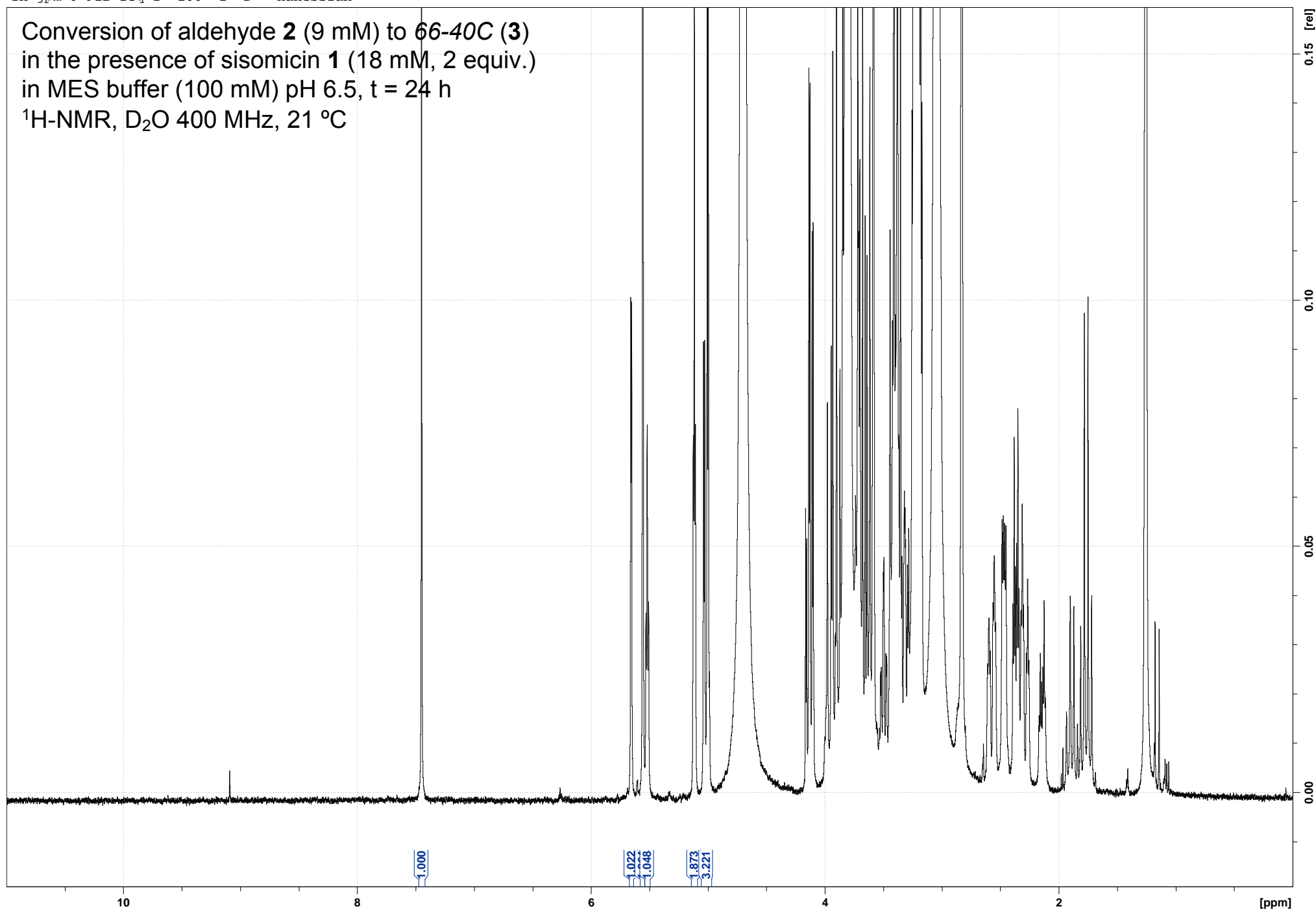
sh-jpm-6-91B-2eq-2 50 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 480 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



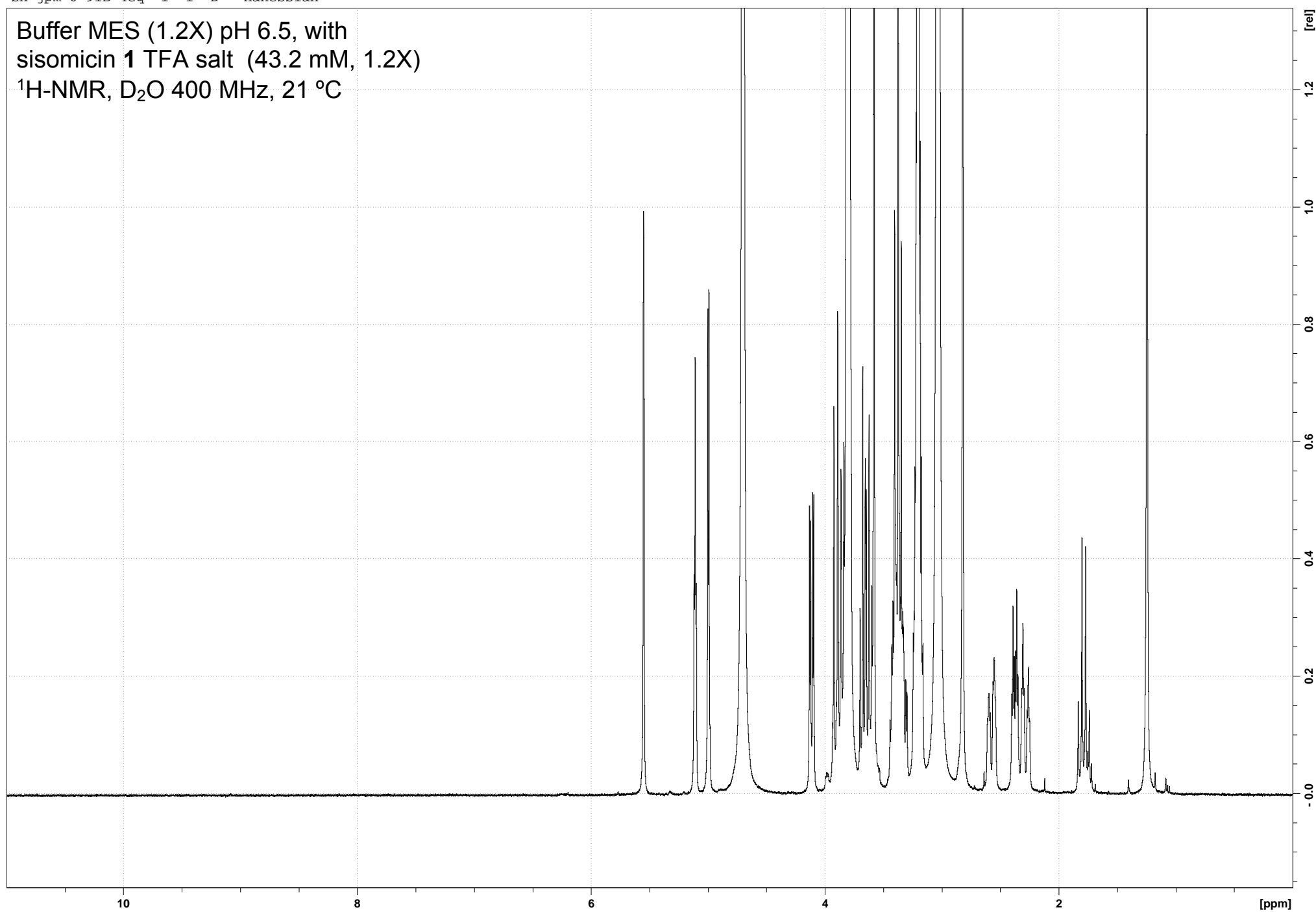
sh-jpm-6-91B-2eq-2 100 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (18 mM, 2 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 24 h  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91B-4eq 1 1 D: Hanessian

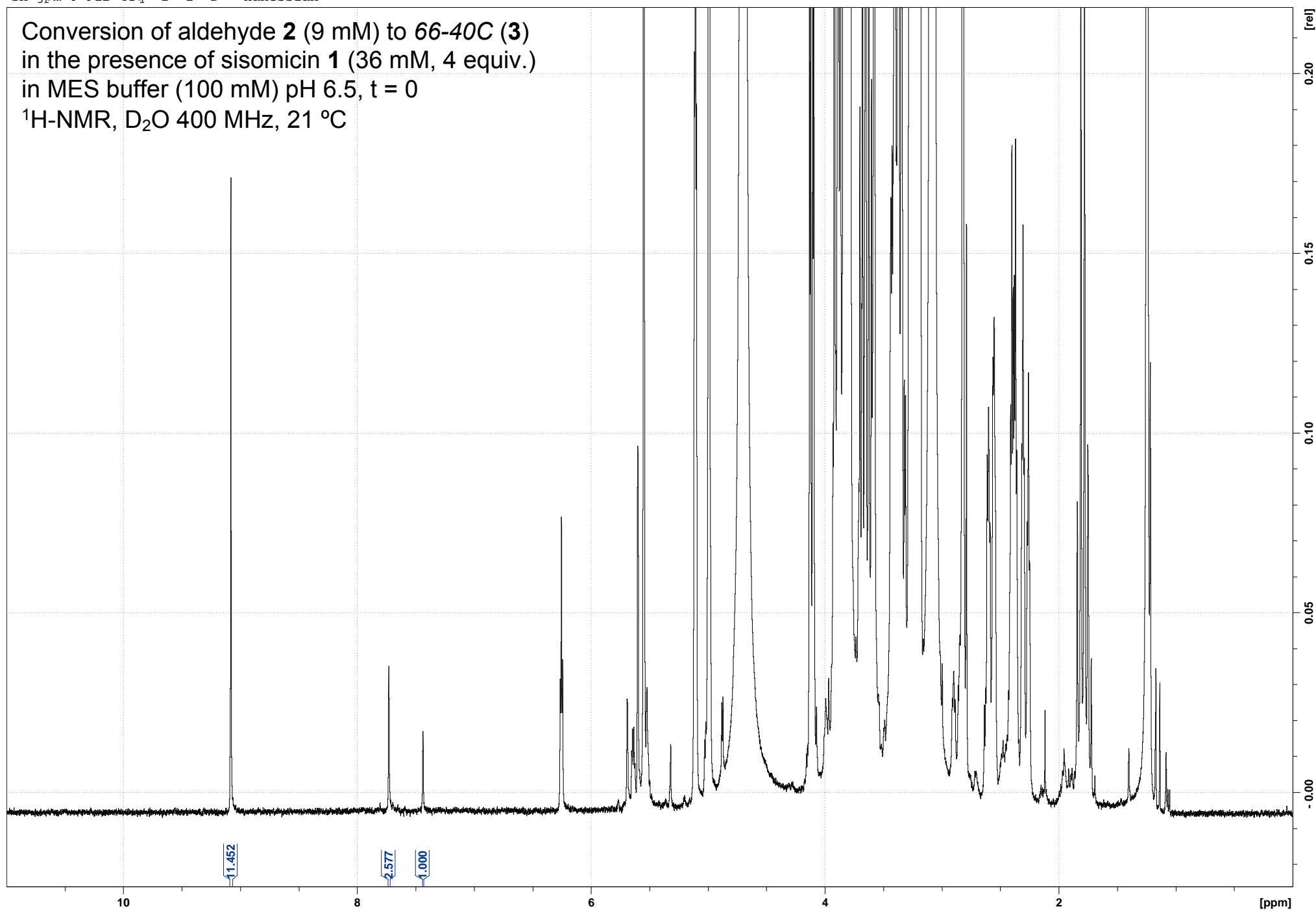
Buffer MES (1.2X) pH 6.5, with  
sisomicin 1 TFA salt (43.2 mM, 1.2X)  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





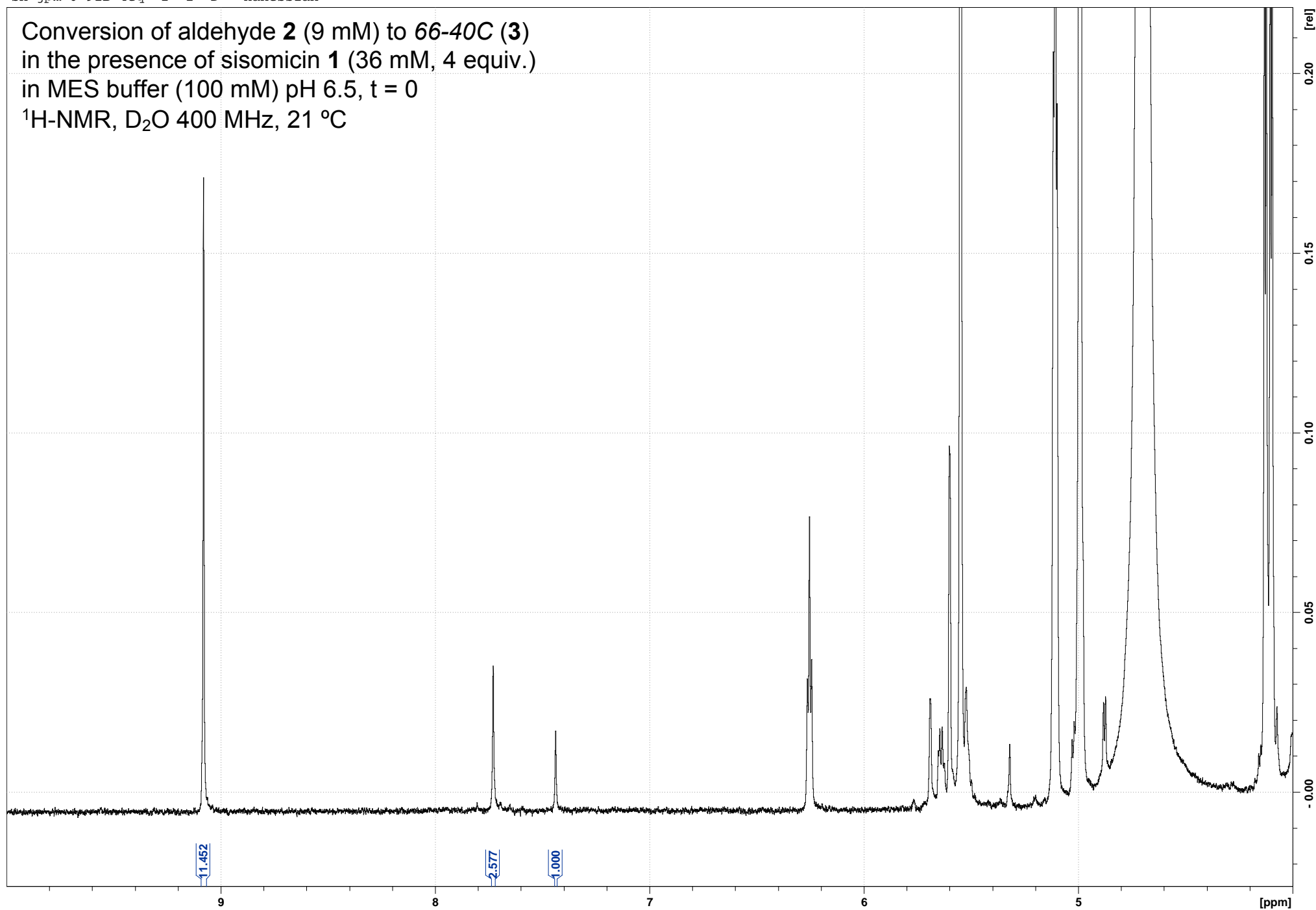
sh-jpm-6-91B-4eq 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



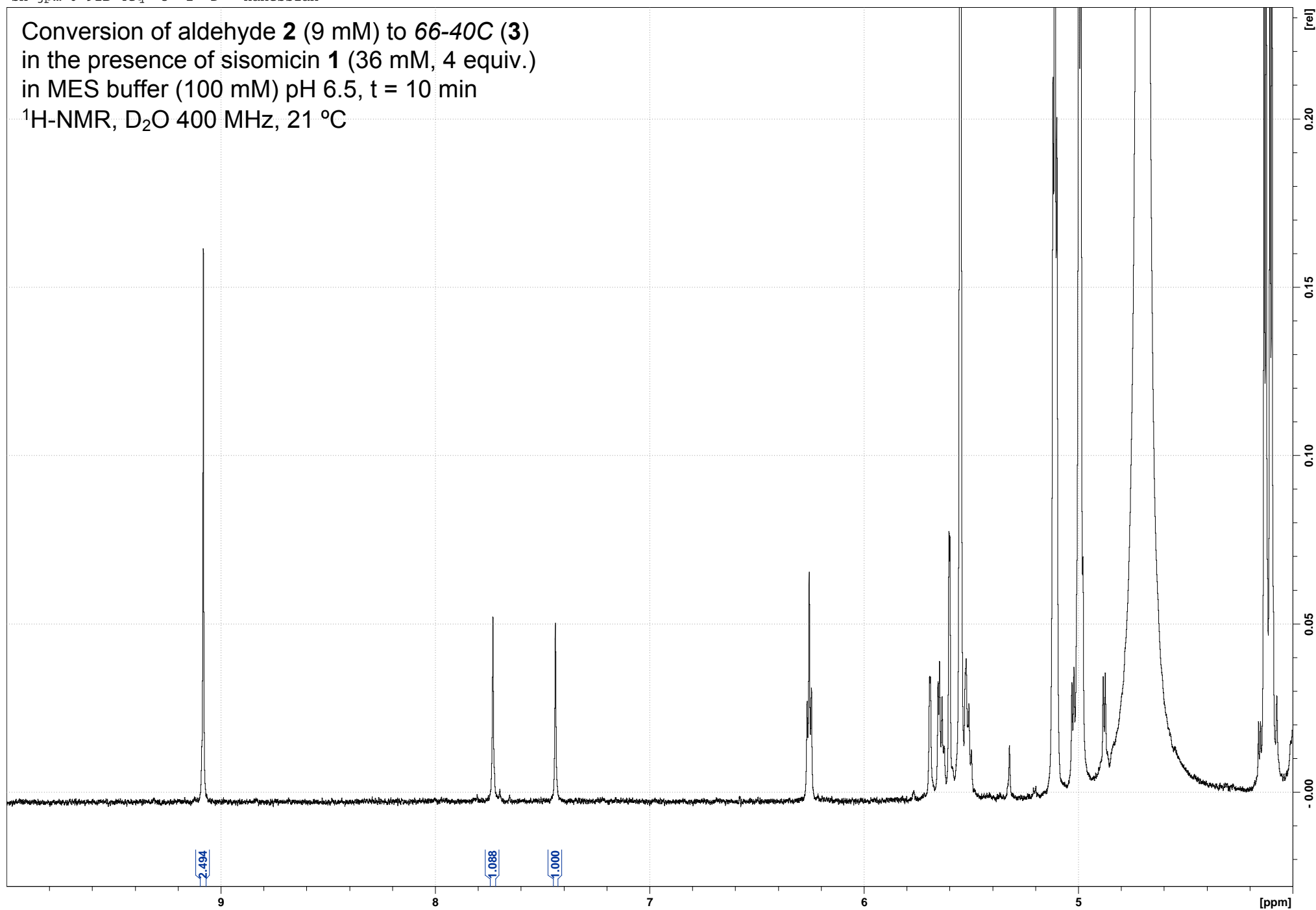
sh-jpm-6-91B-4eq 2 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



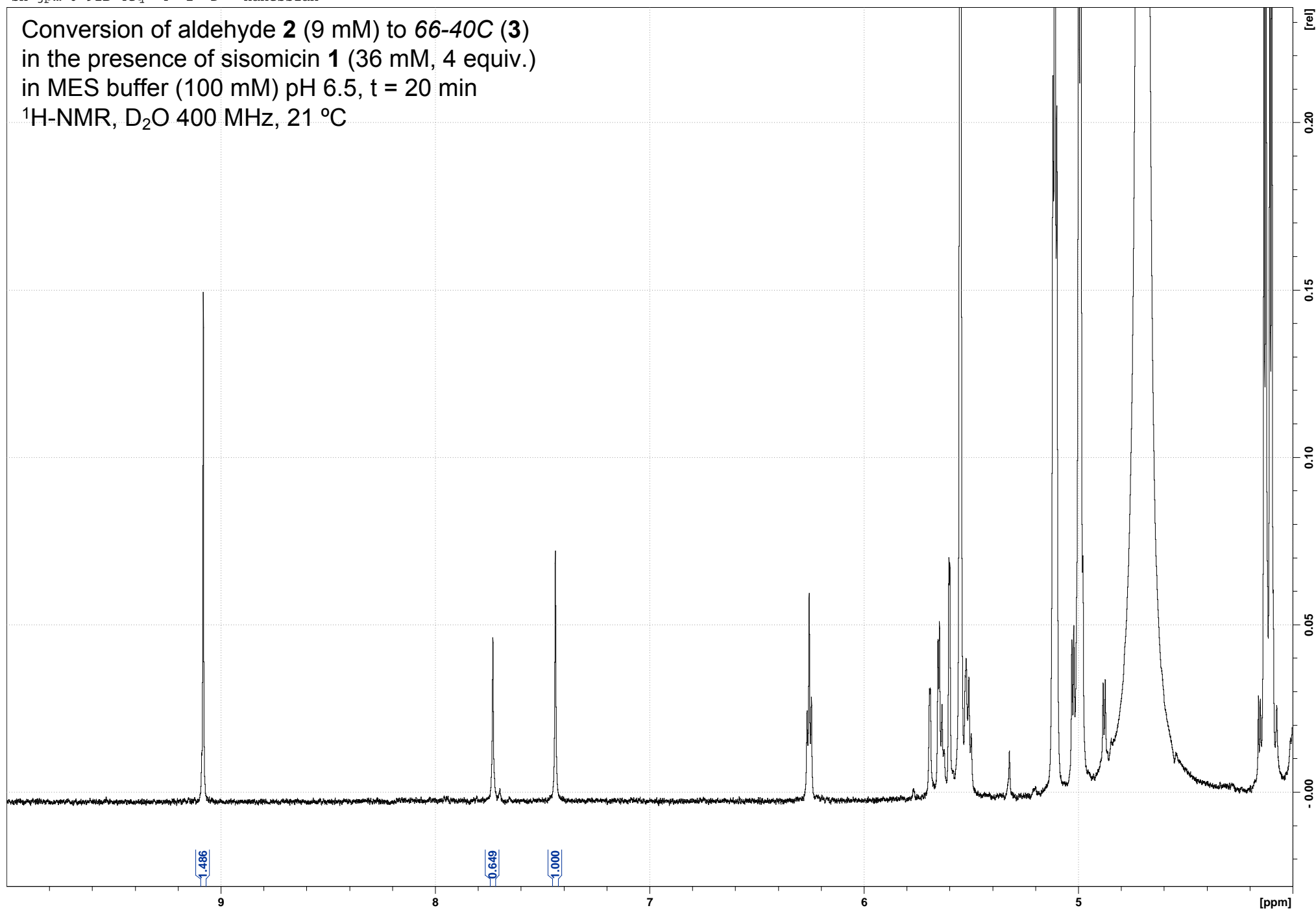
sh-jpm-6-91B-4eq 3 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 10 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



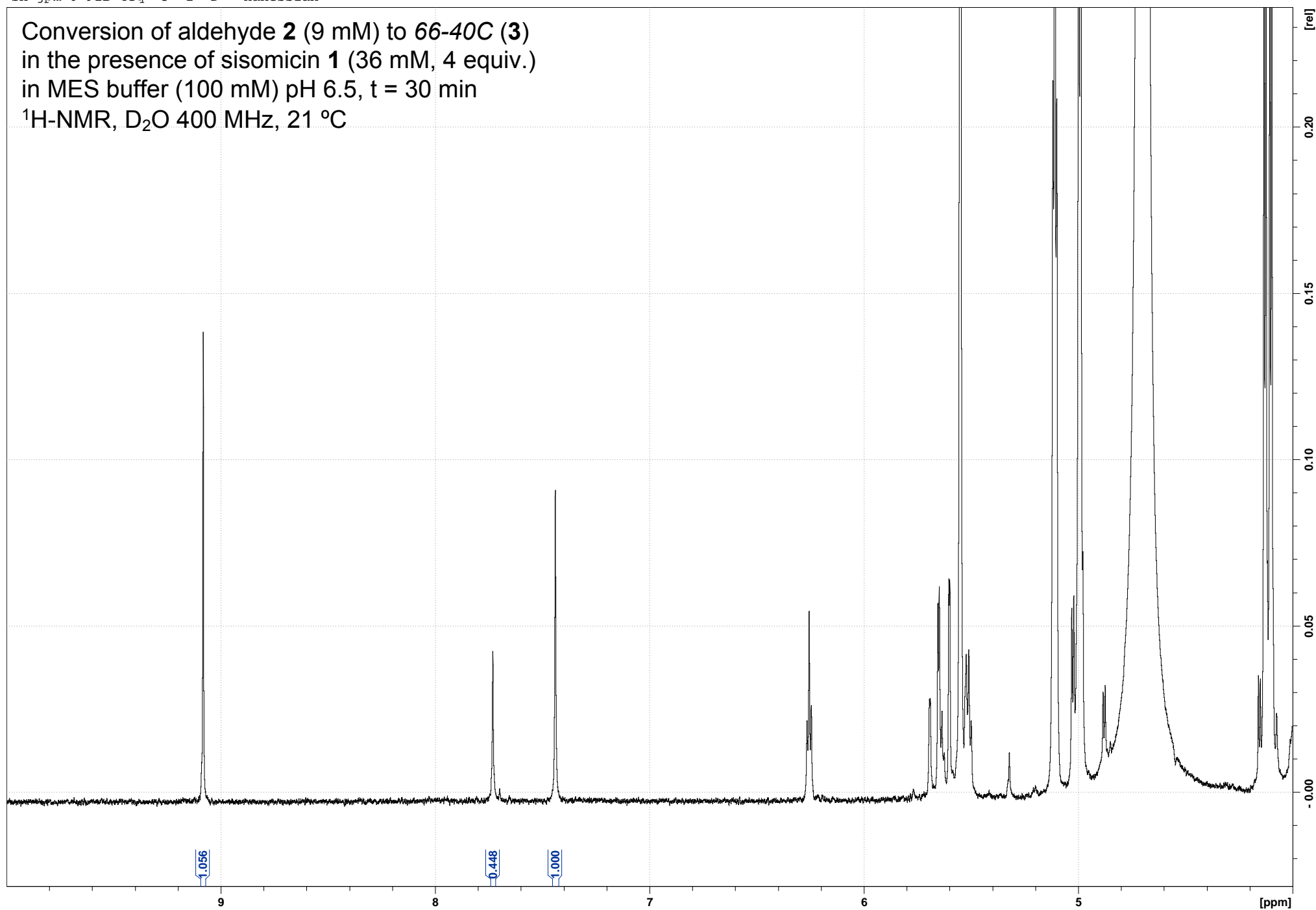
sh-jpm-6-91B-4eq 4 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 20 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



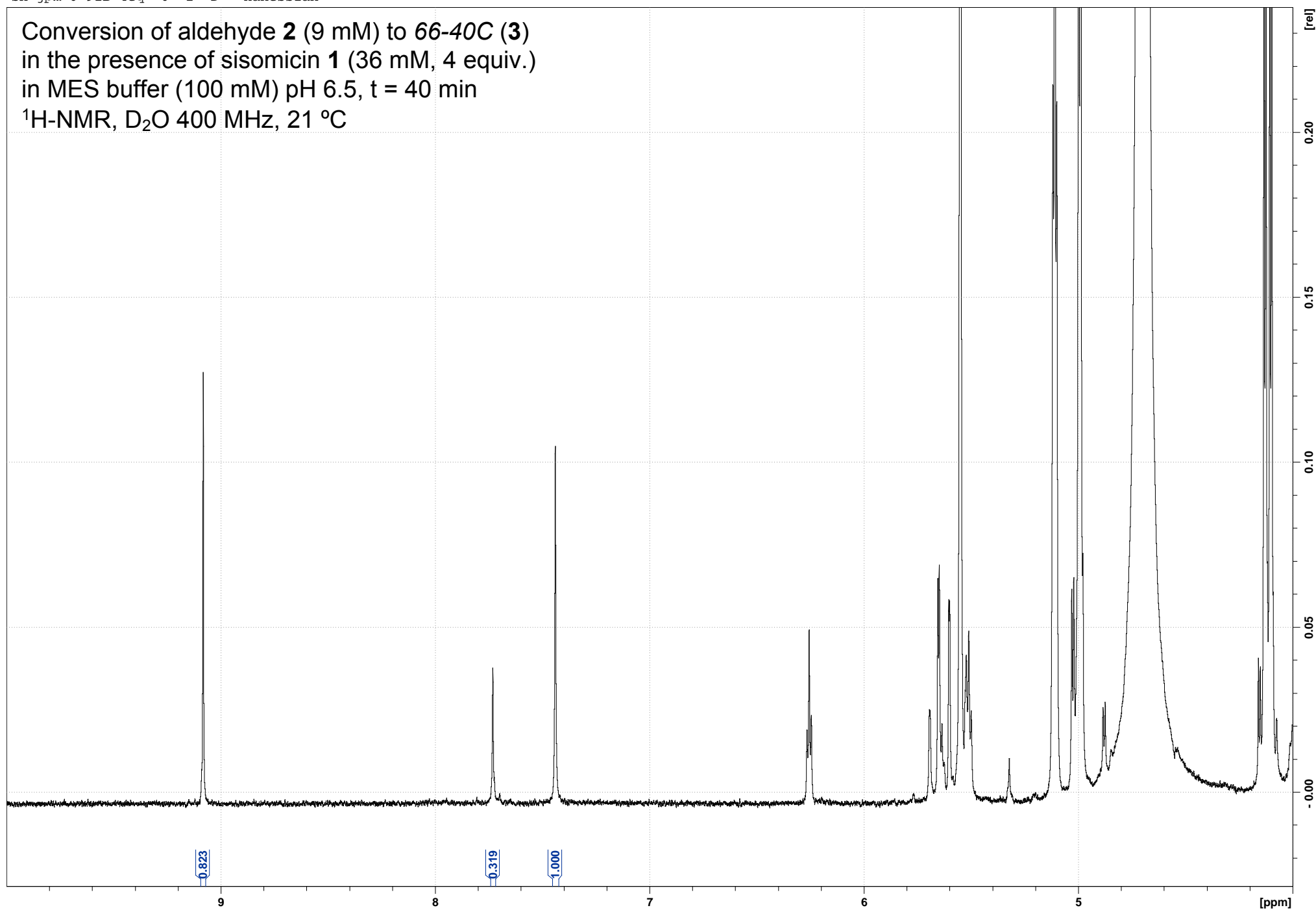
sh-jpm-6-91B-4eq 5 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 30 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



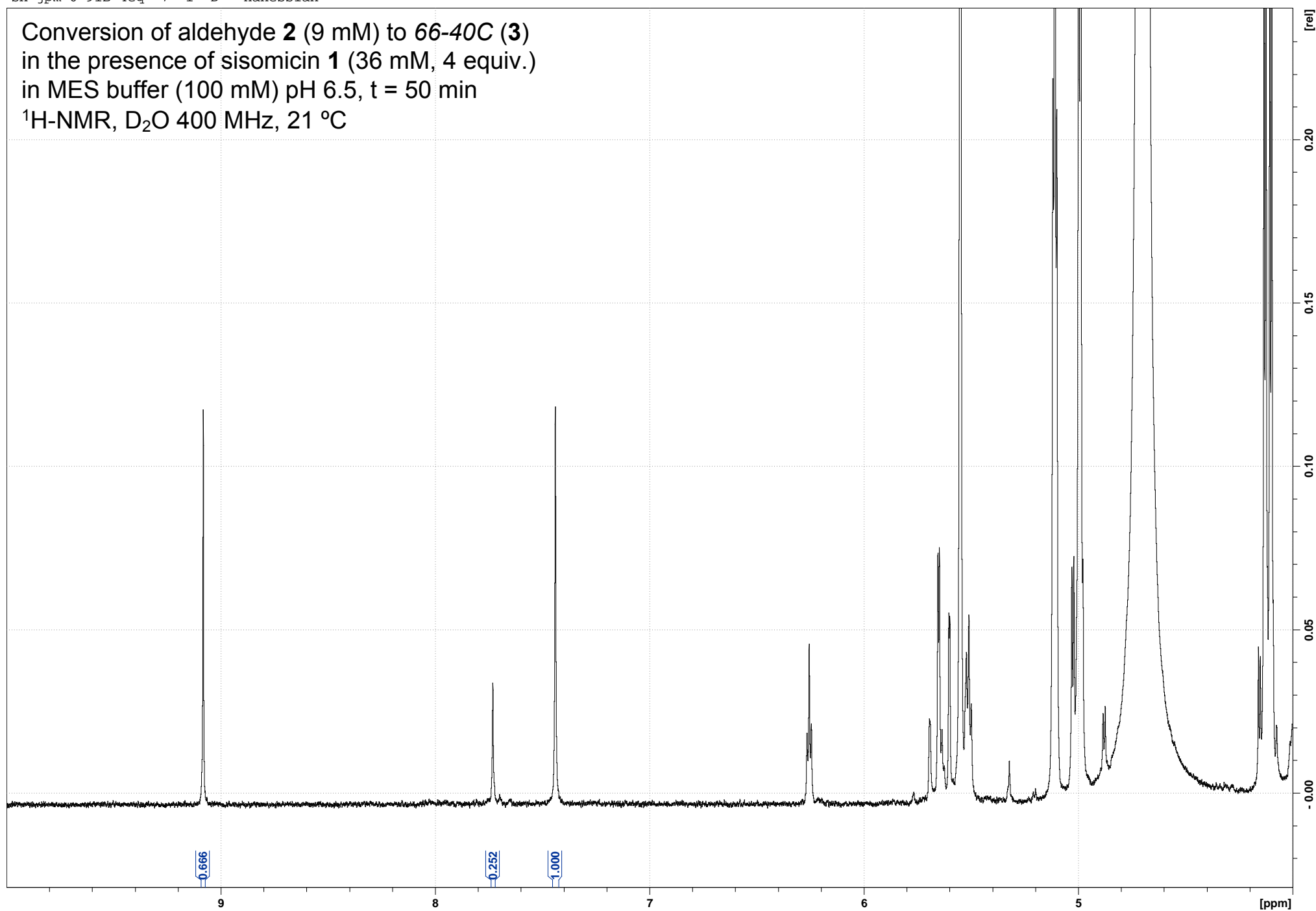
sh-jpm-6-91B-4eq 6 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 40 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



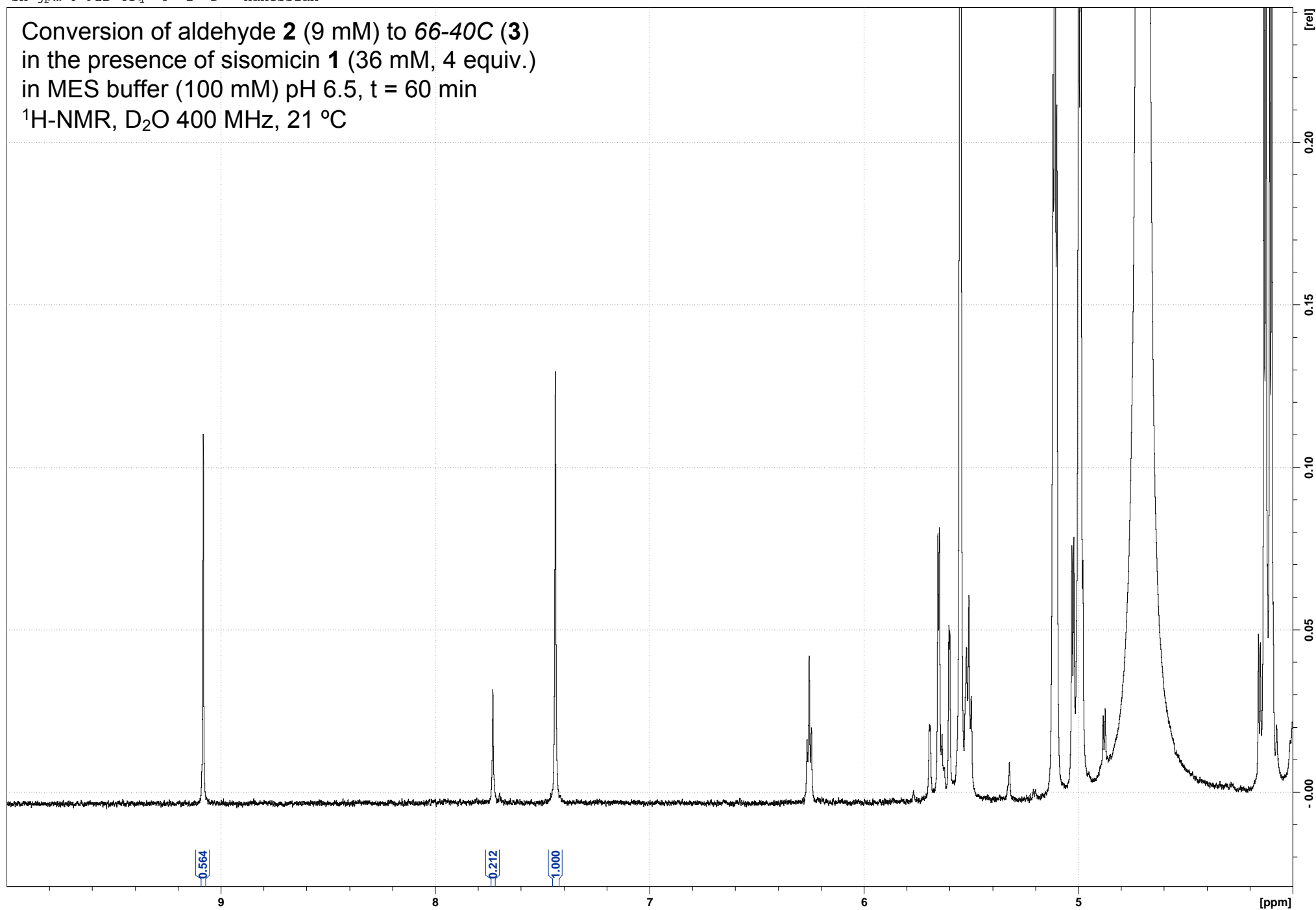
sh-jpm-6-91B-4eq 7 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 50 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91B-4eq 8 1 D: Hanessian

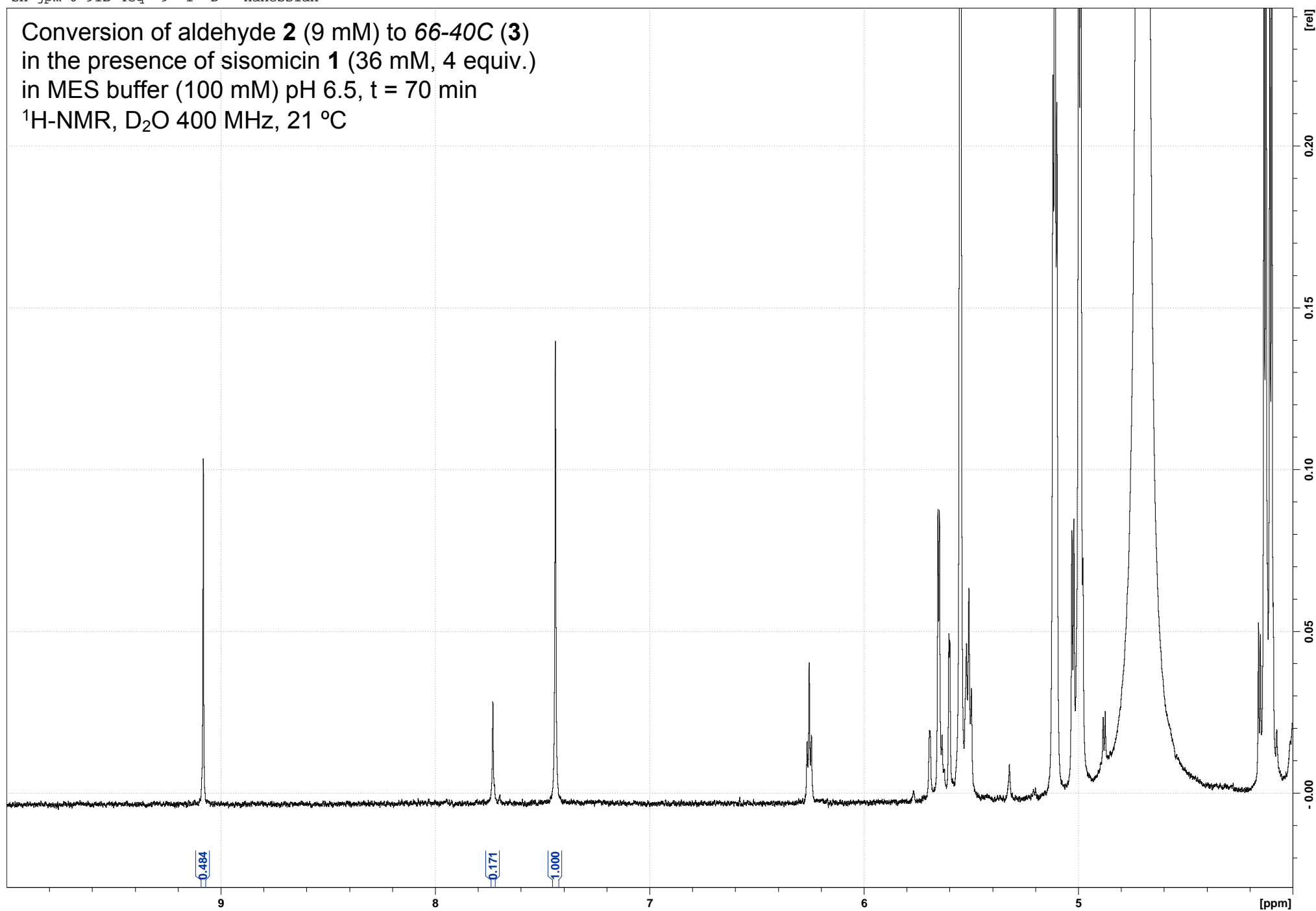
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 60 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





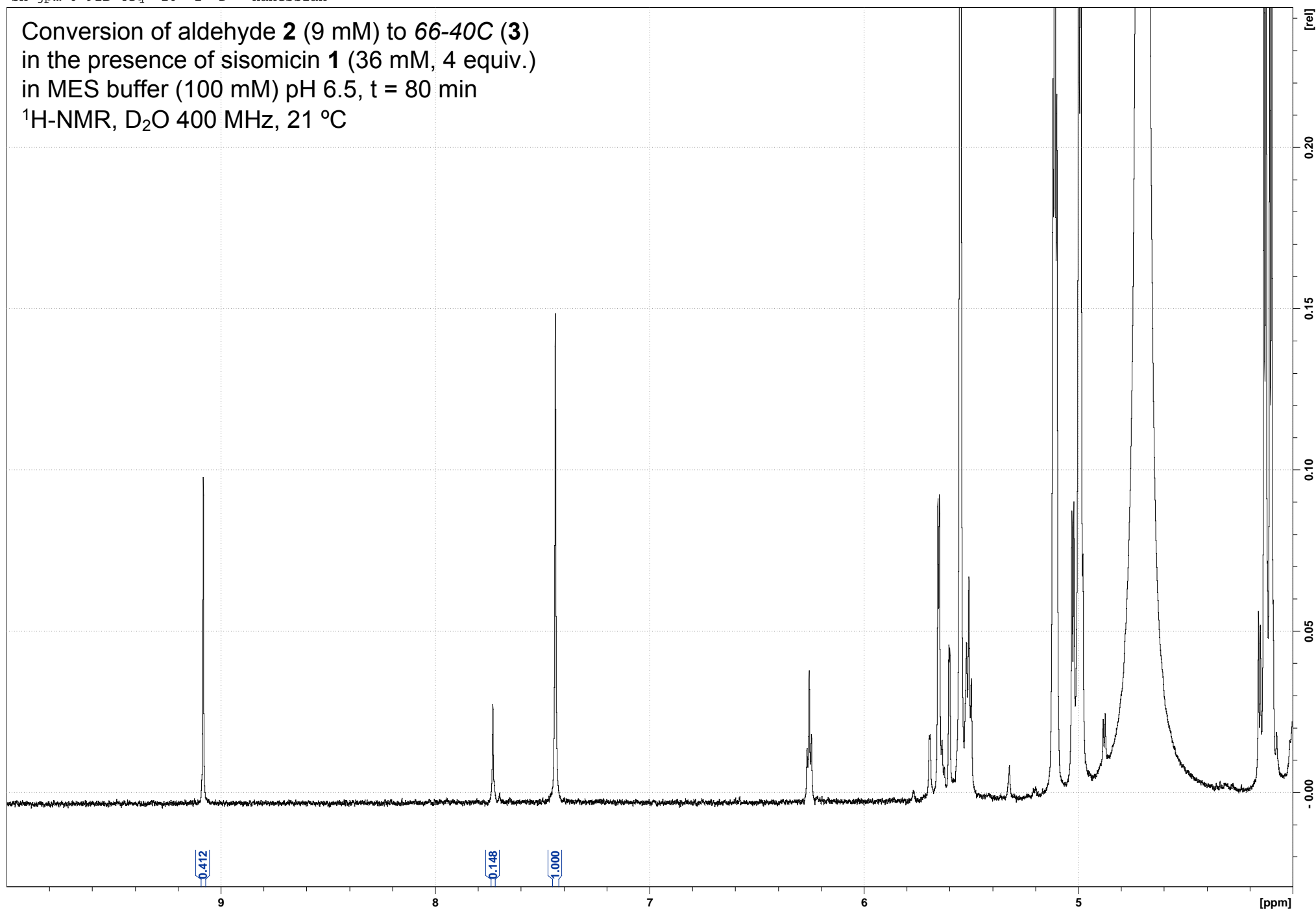
sh-jpm-6-91B-4eq 9 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 70 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



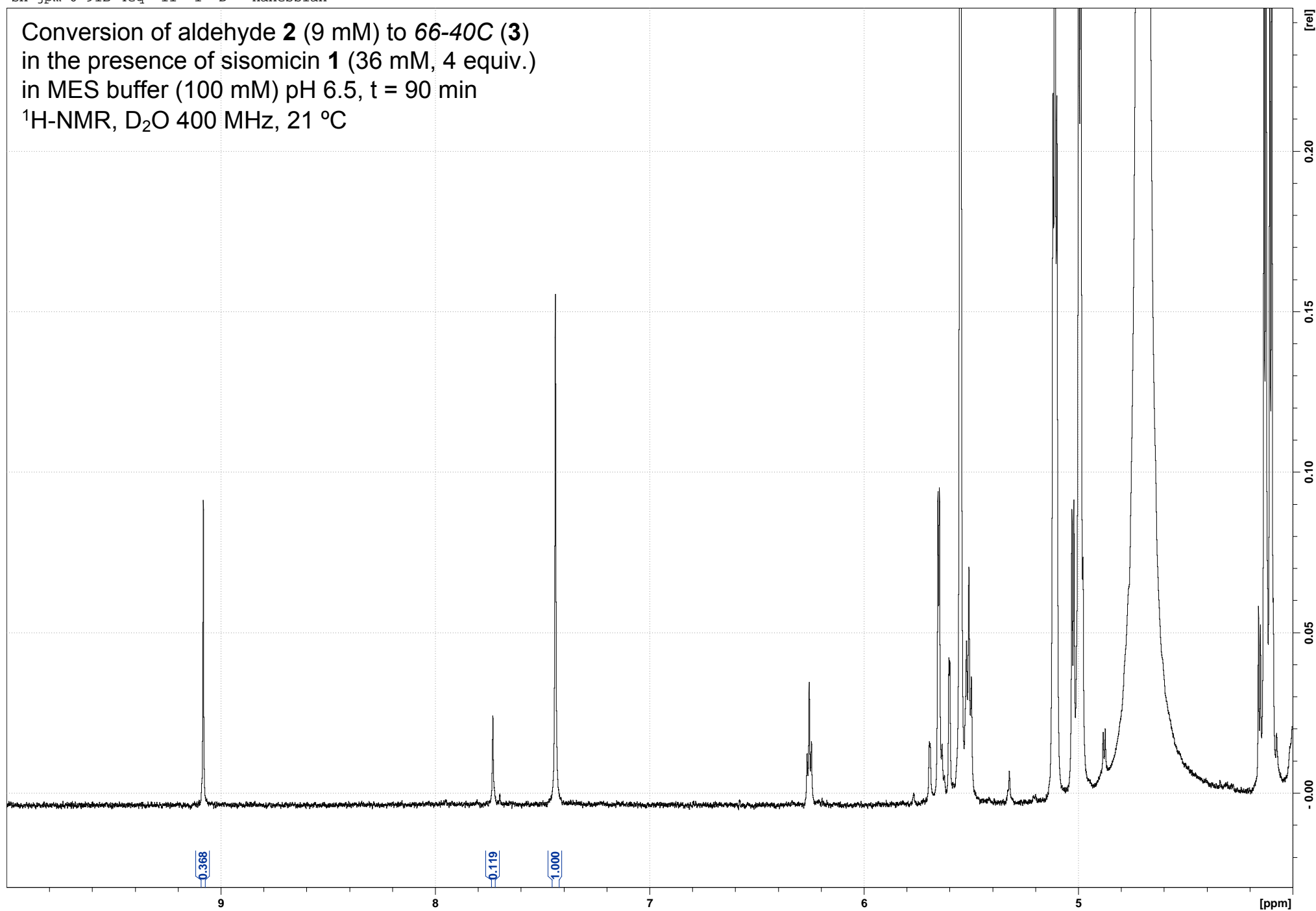
sh-jpm-6-91B-4eq 10 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 80 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



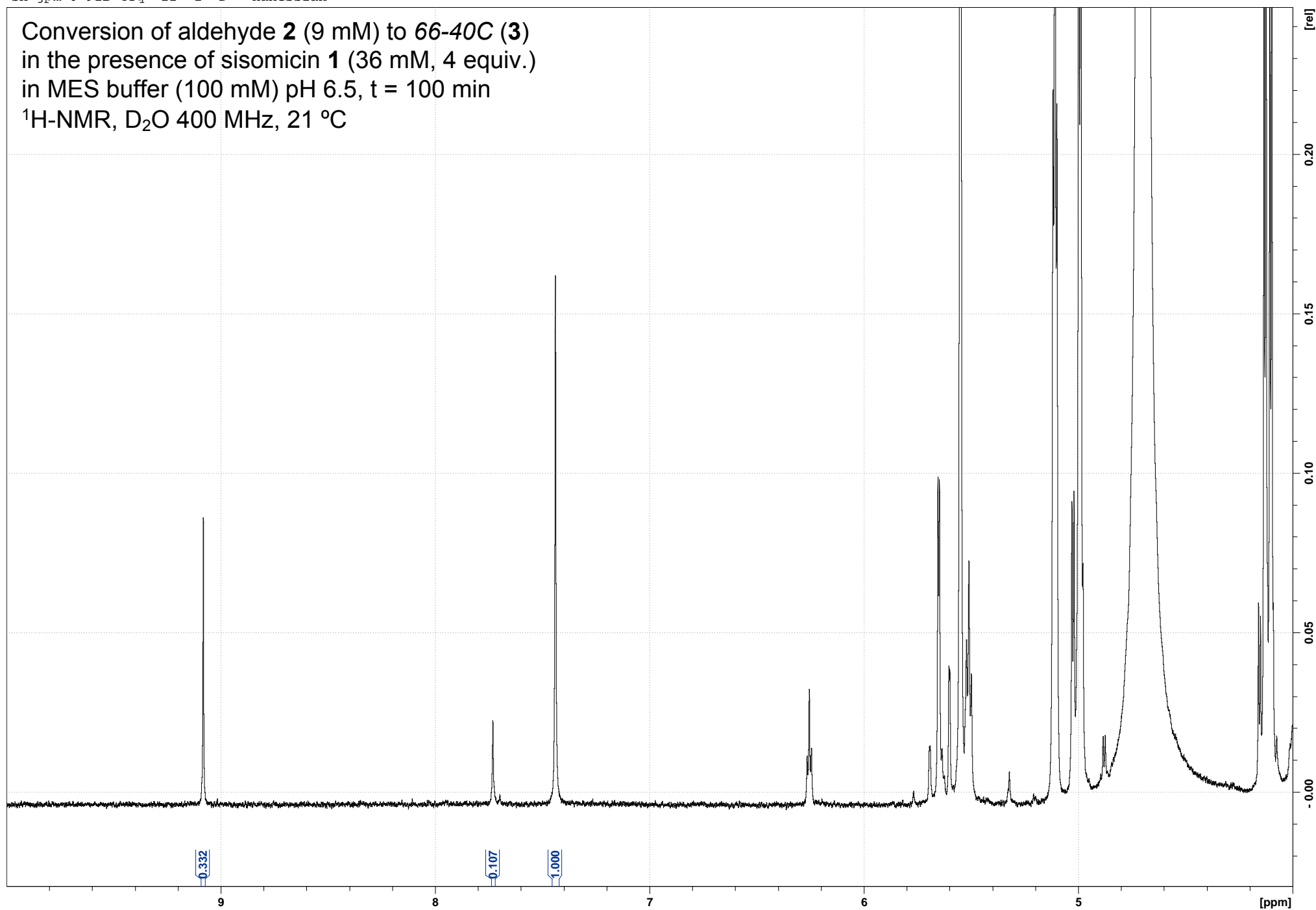
sh-jpm-6-91B-4eq 11 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 90 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



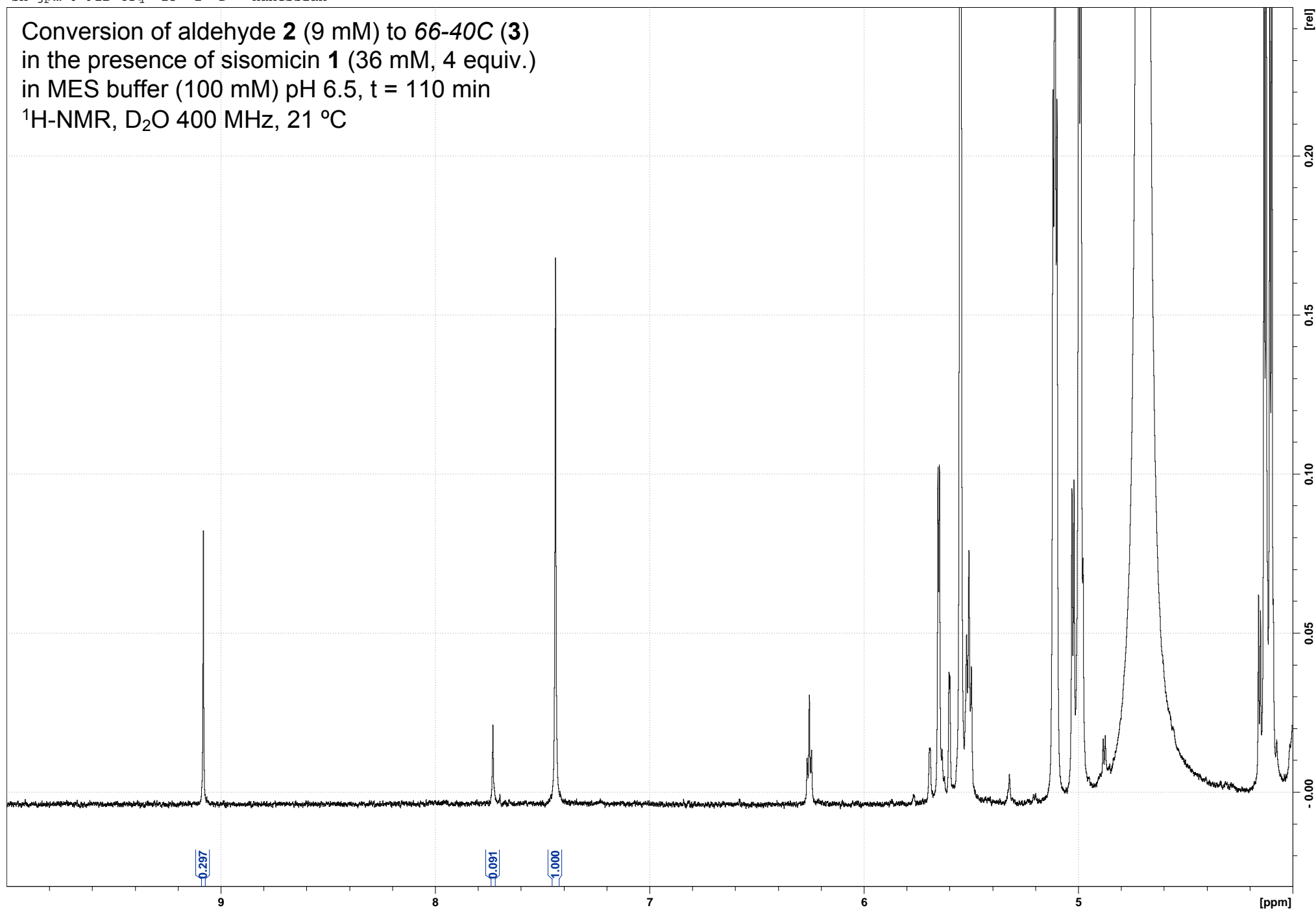
sh-jpm-6-91B-4eq 12 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 100 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



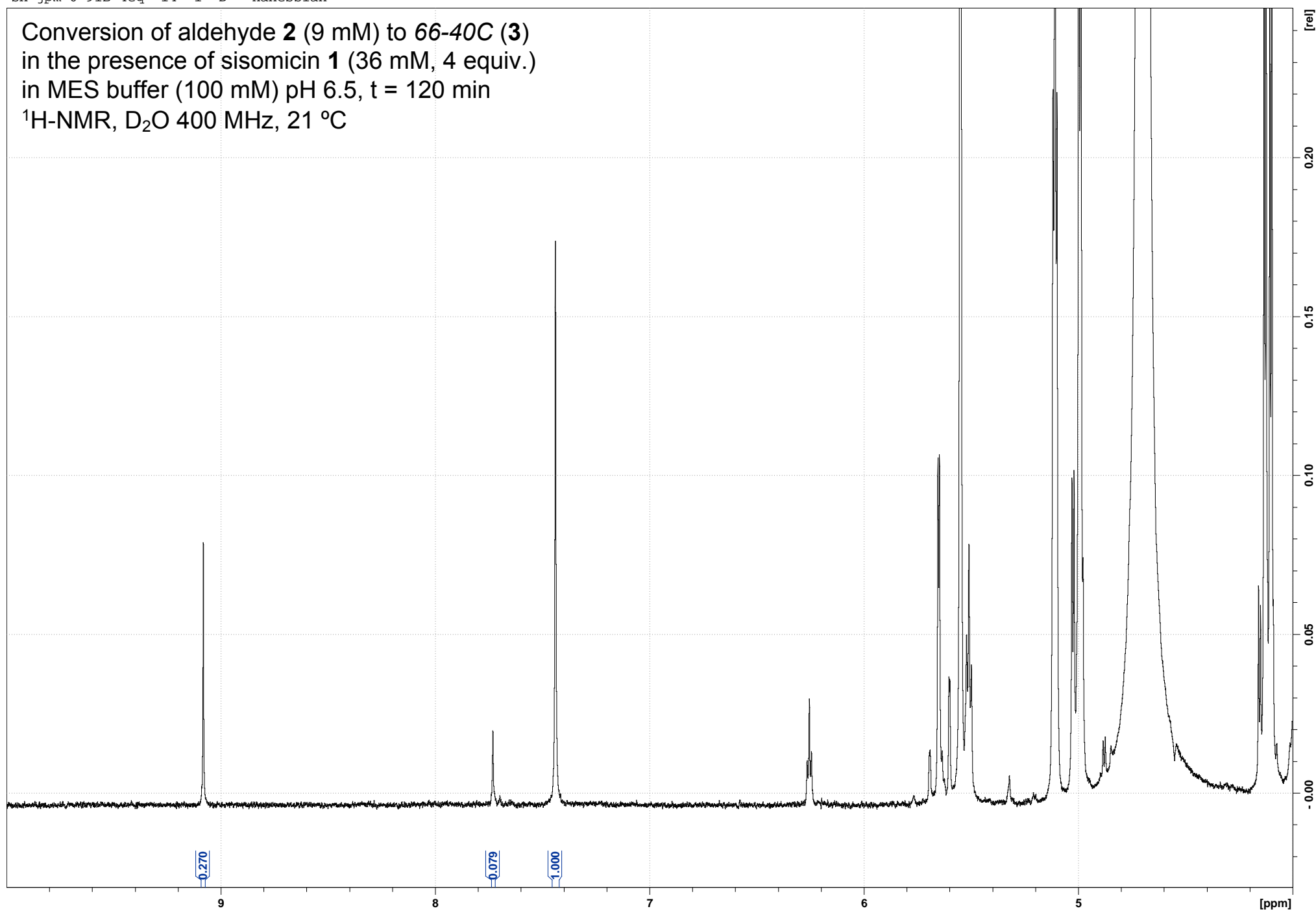
sh-jpm-6-91B-4eq 13 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 110 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



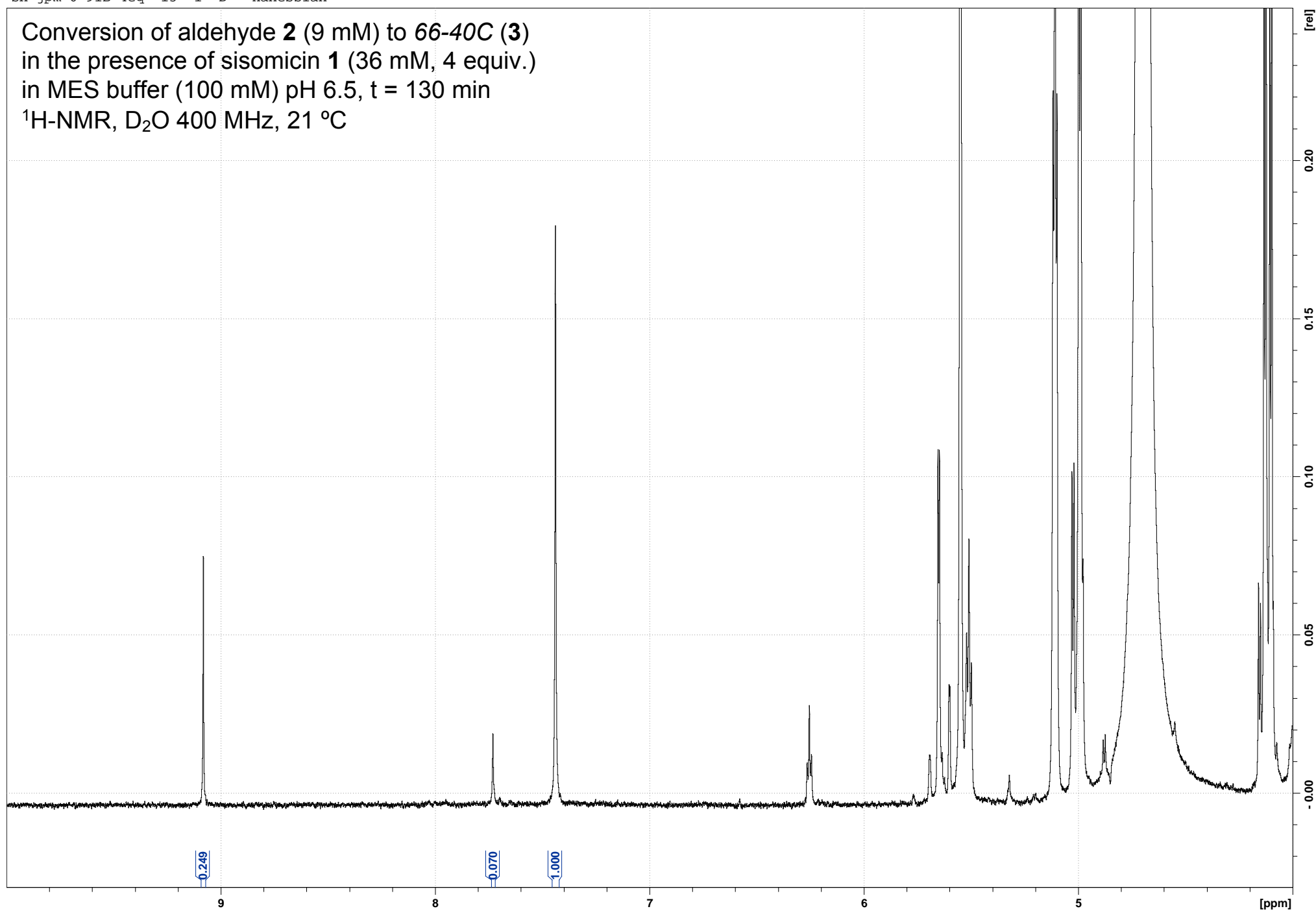
sh-jpm-6-91B-4eq 14 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 120 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



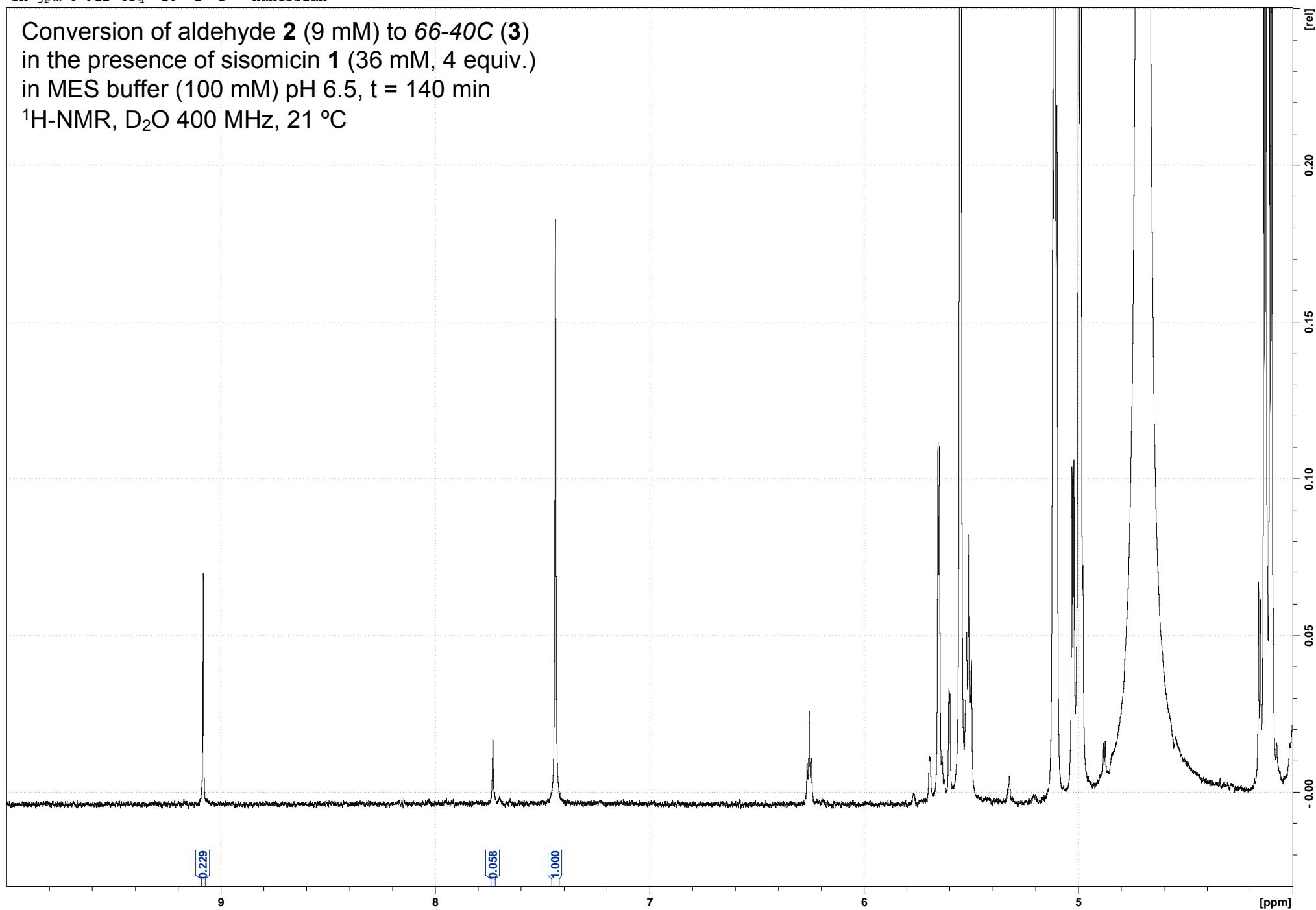
sh-jpm-6-91B-4eq 15 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 130 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91B-4eq 16 1 D: Hanessian

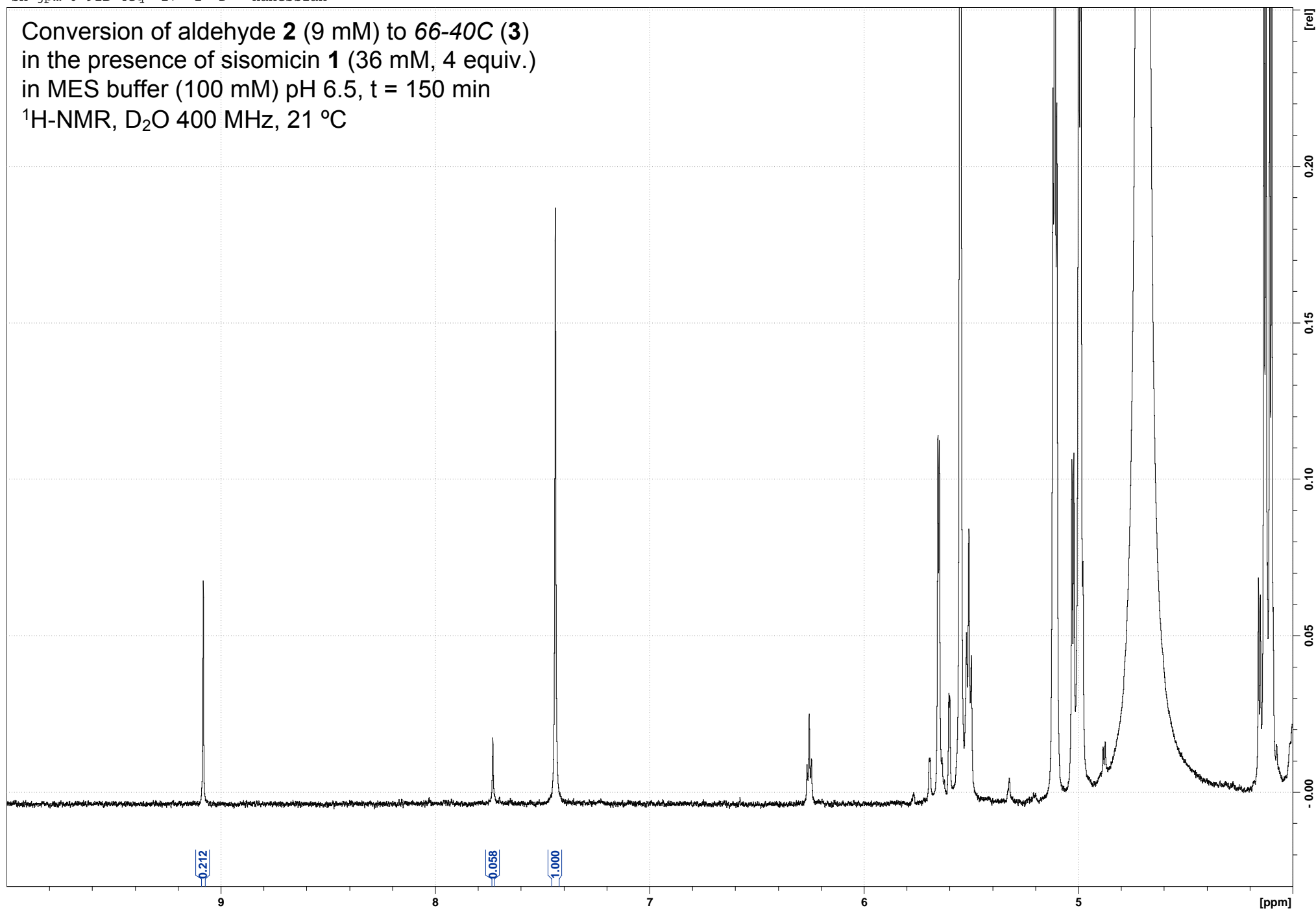
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 140 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





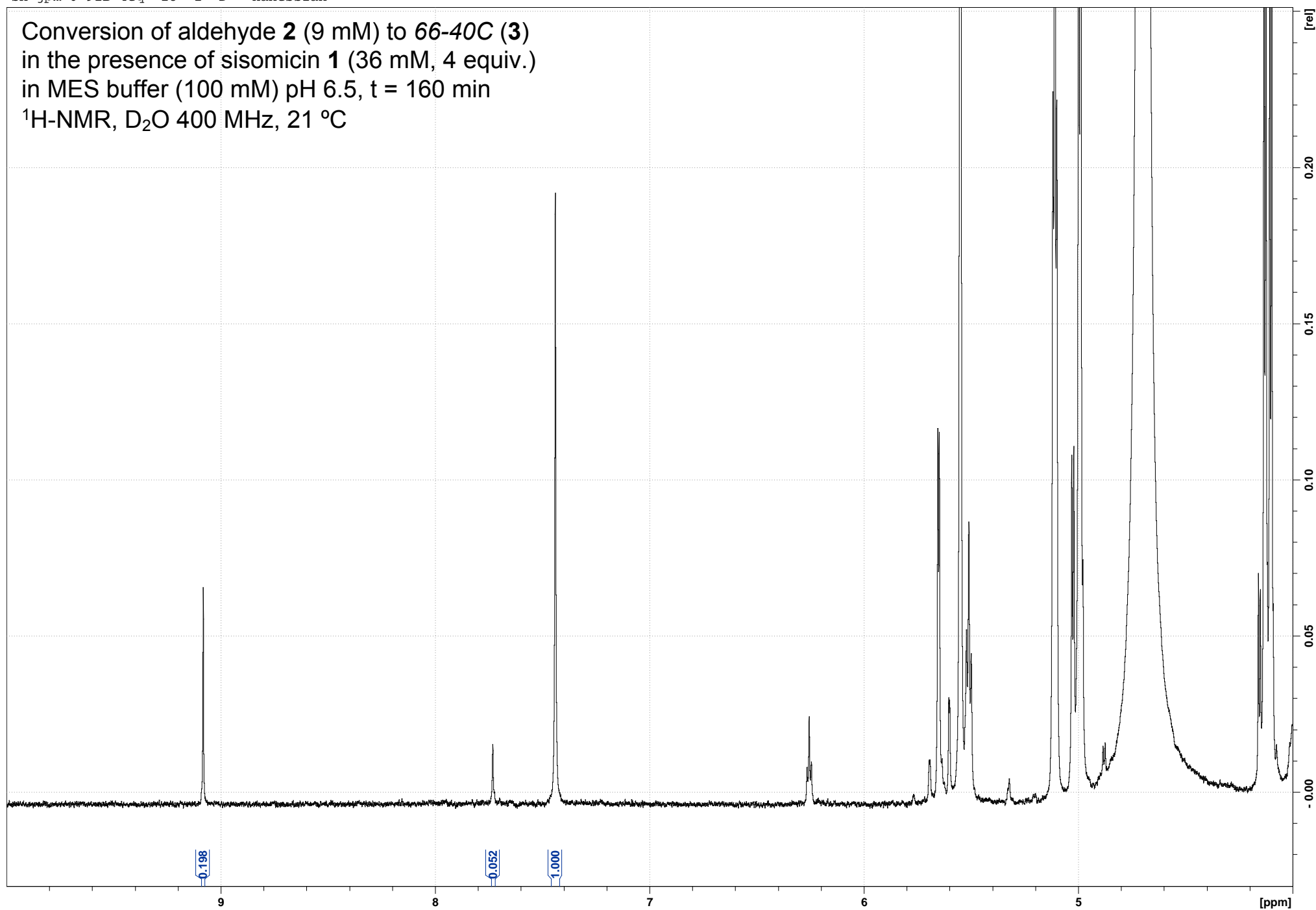
sh-jpm-6-91B-4eq 17 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 150 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



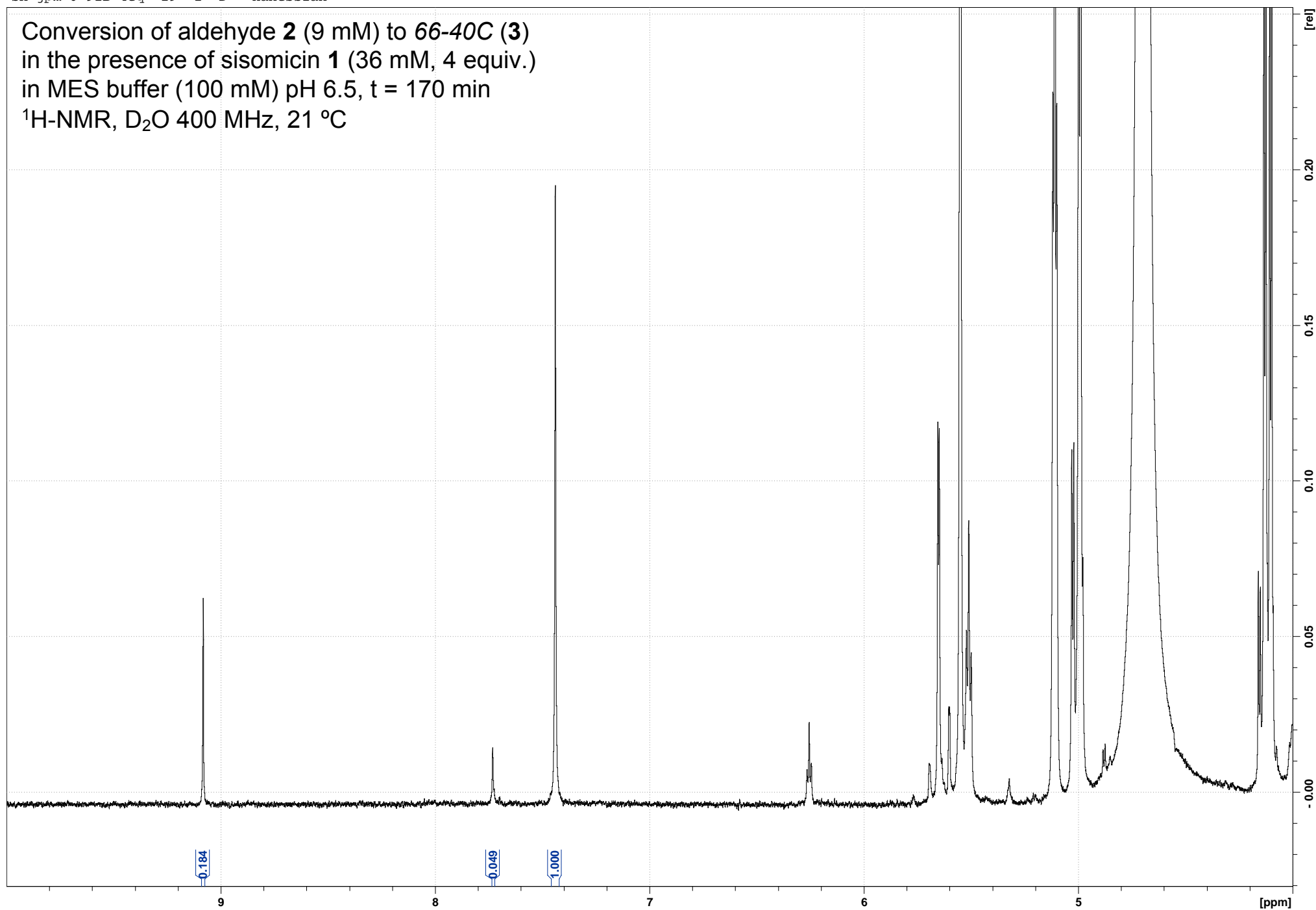
sh-jpm-6-91B-4eq 18 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 160 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



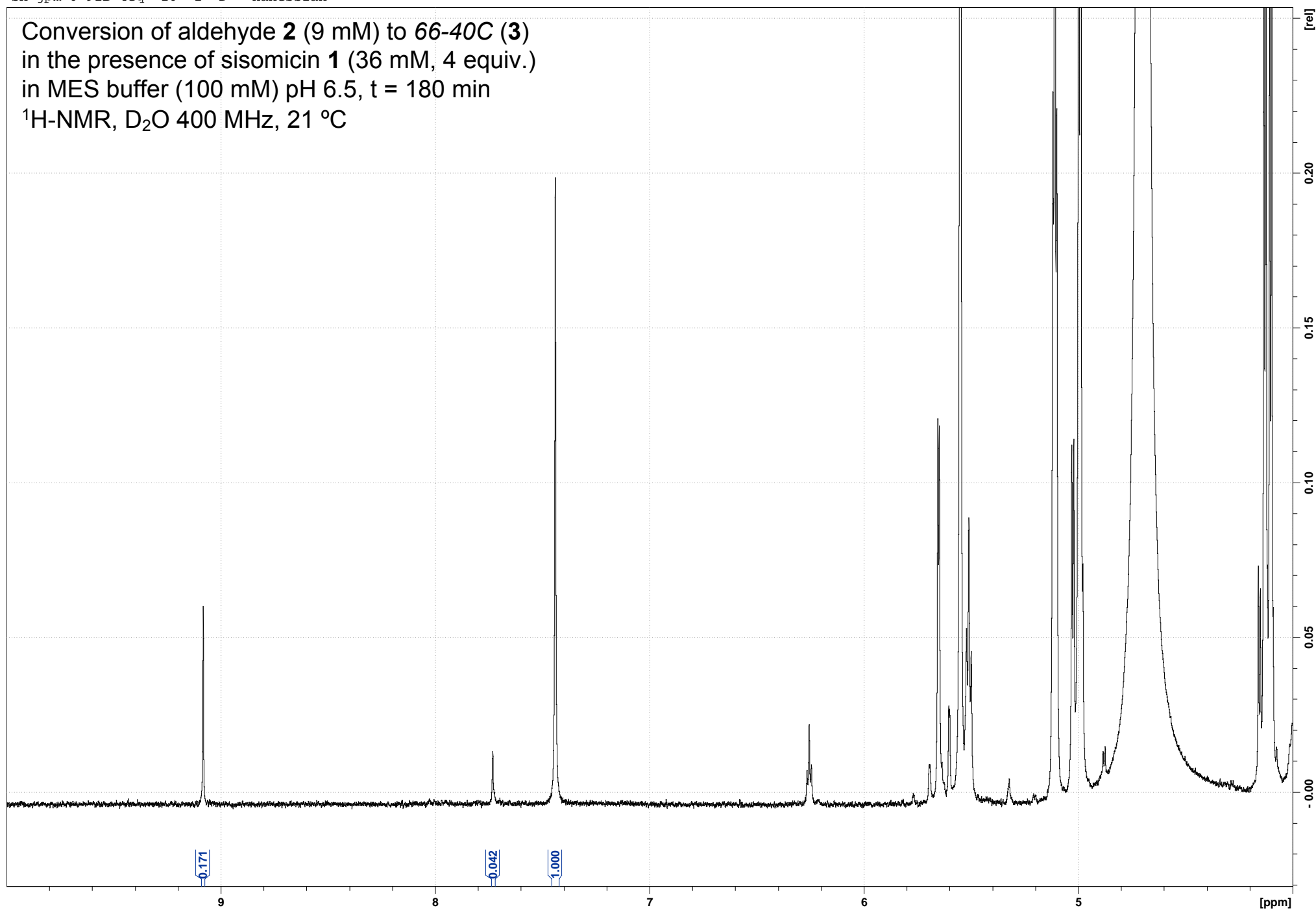
sh-jpm-6-91B-4eq 19 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 170 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



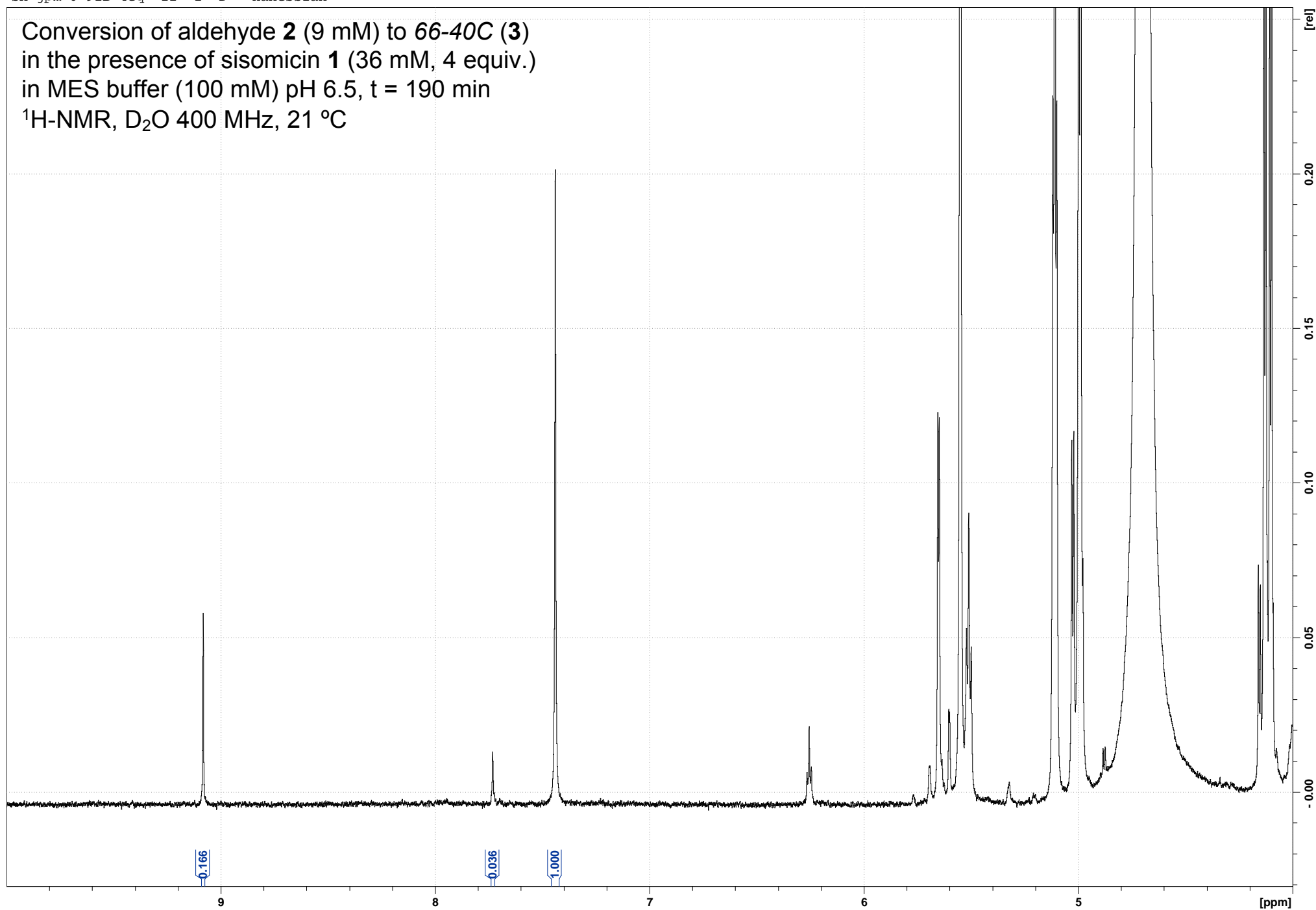
sh-jpm-6-91B-4eq 20 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 180 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



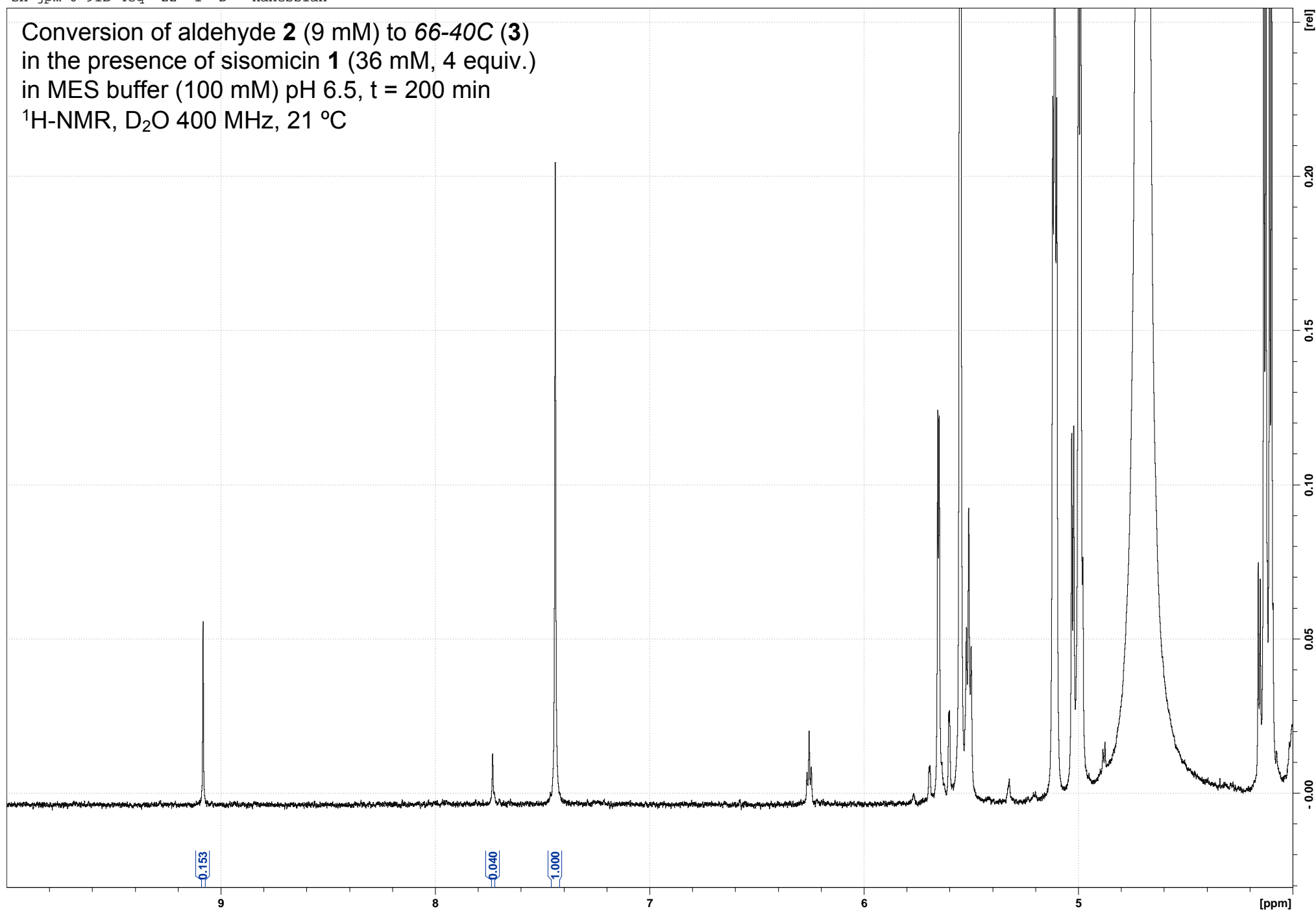
sh-jpm-6-91B-4eq 21 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 190 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



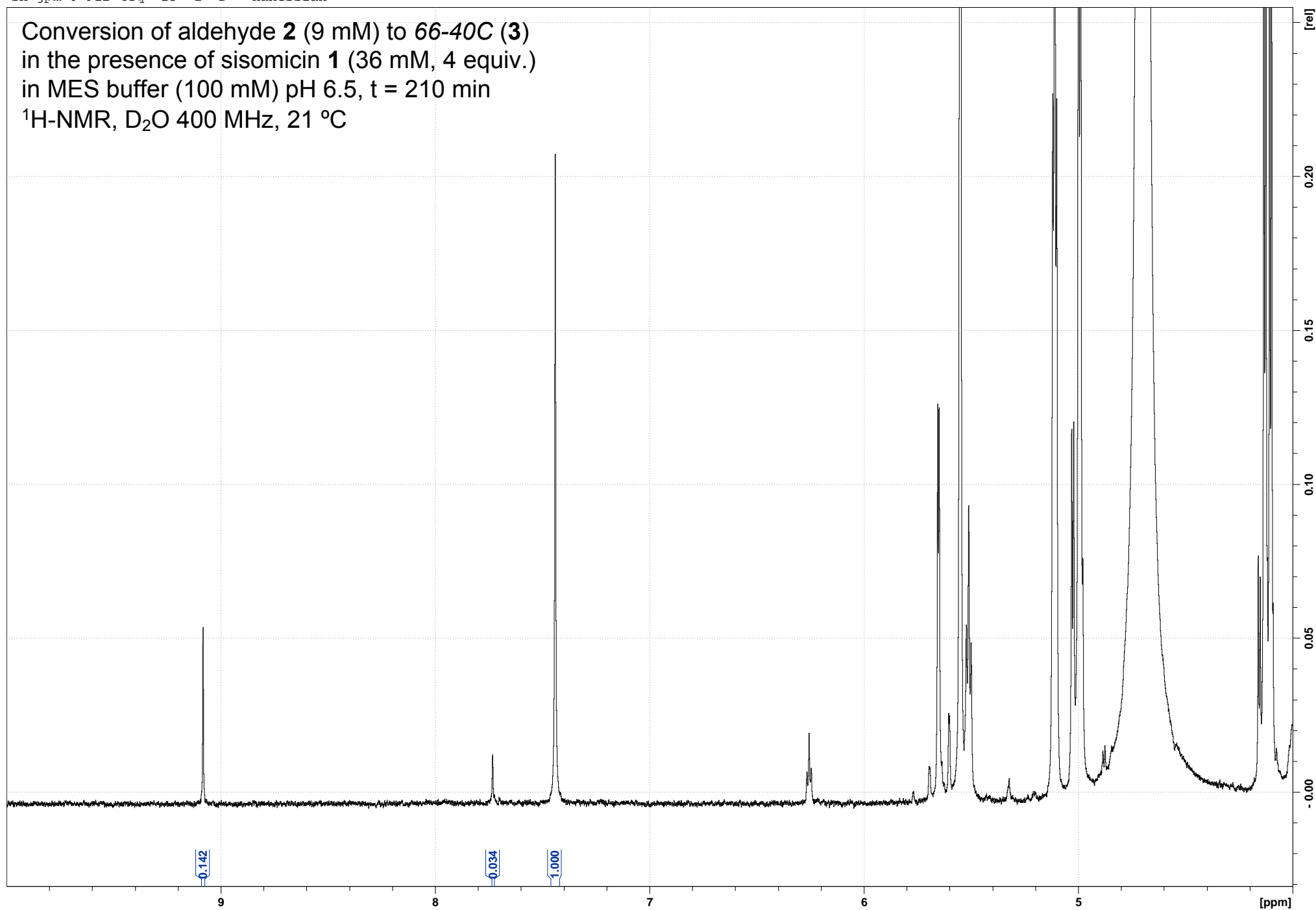
sh-jpm-6-91B-4eq 22 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 200 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



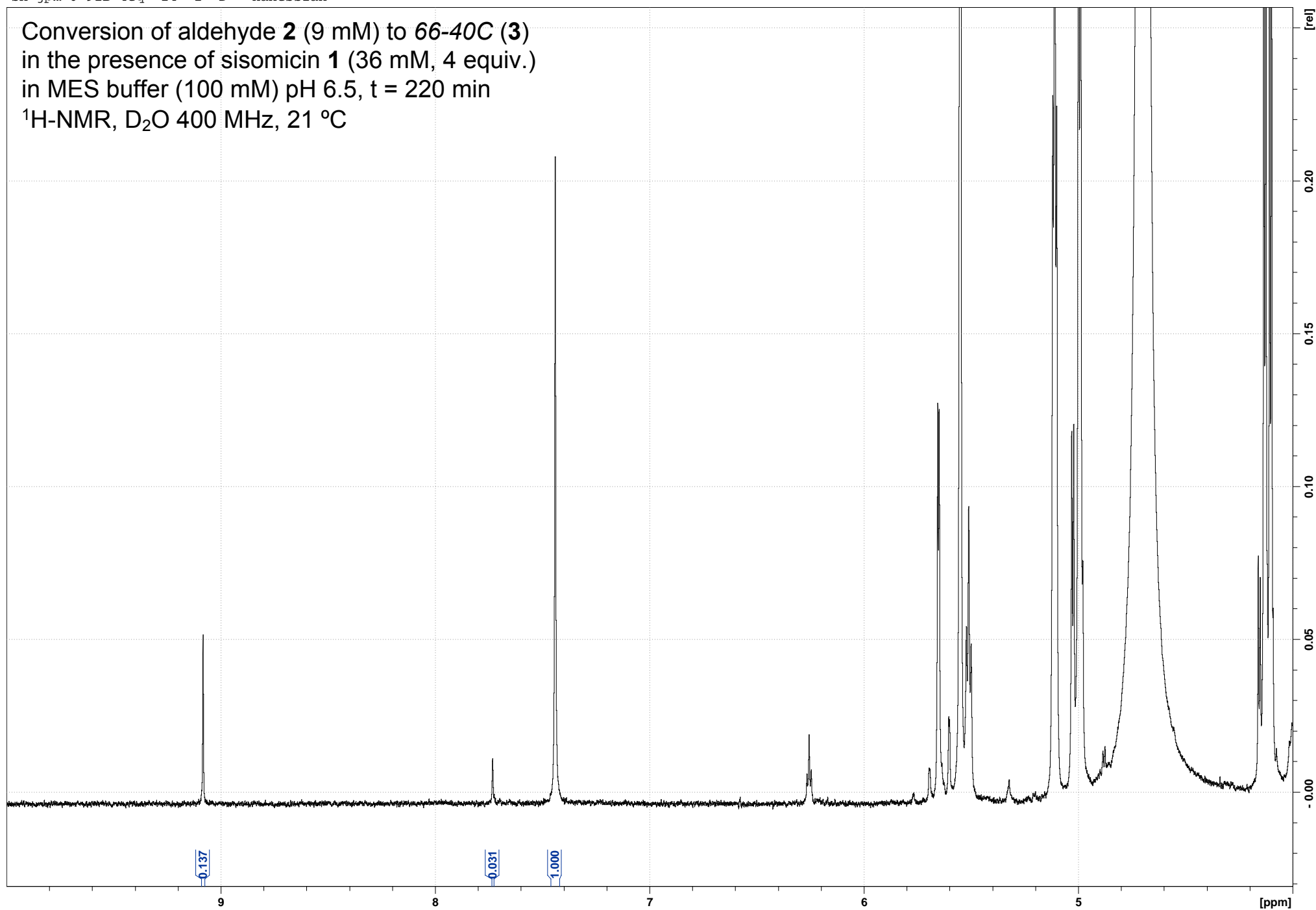
sh-jpm-6-91B-4eq 23 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 210 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91B-4eq 24 1 D: Hanessian

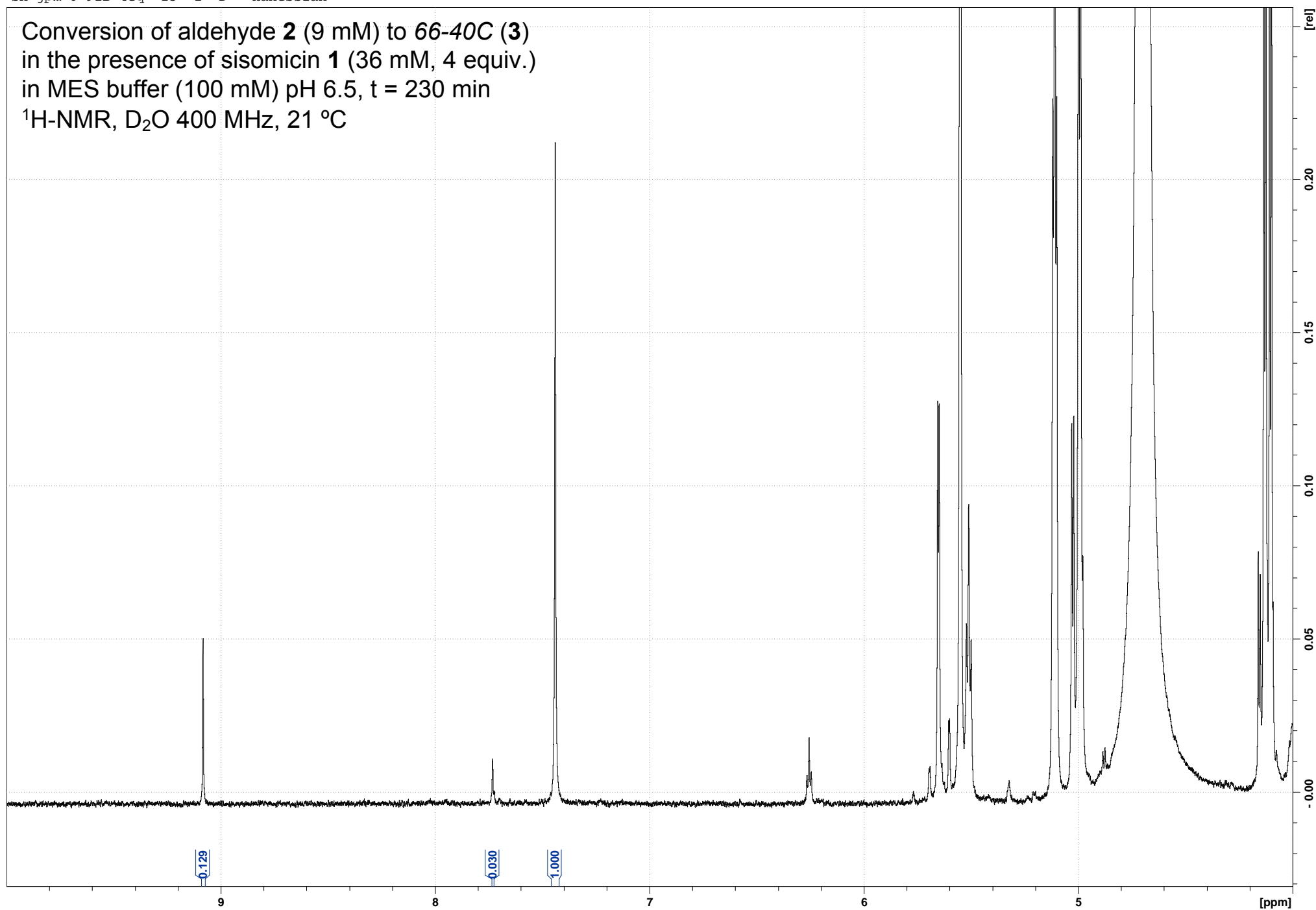
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 220 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





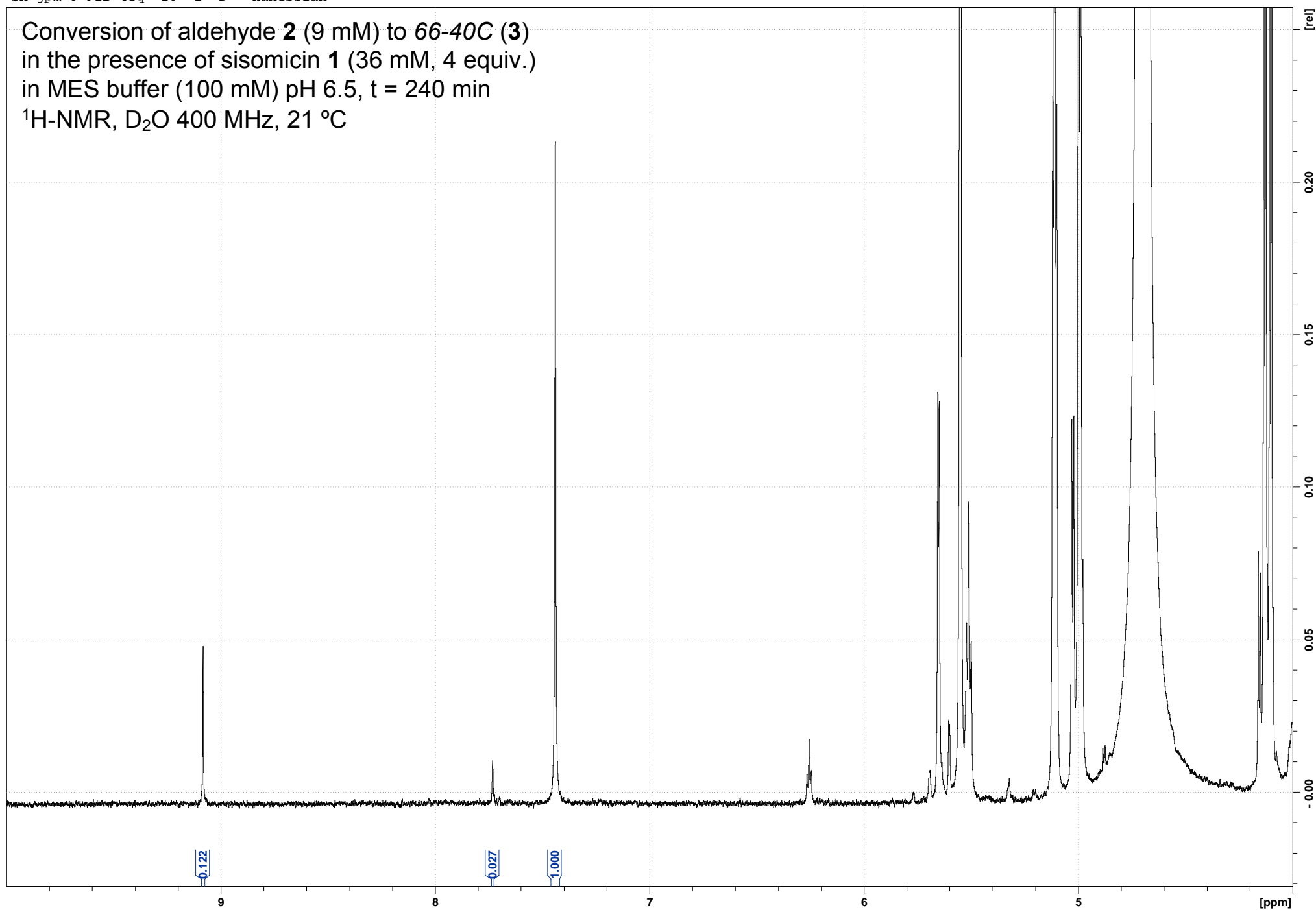
sh-jpm-6-91B-4eq 25 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 230 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



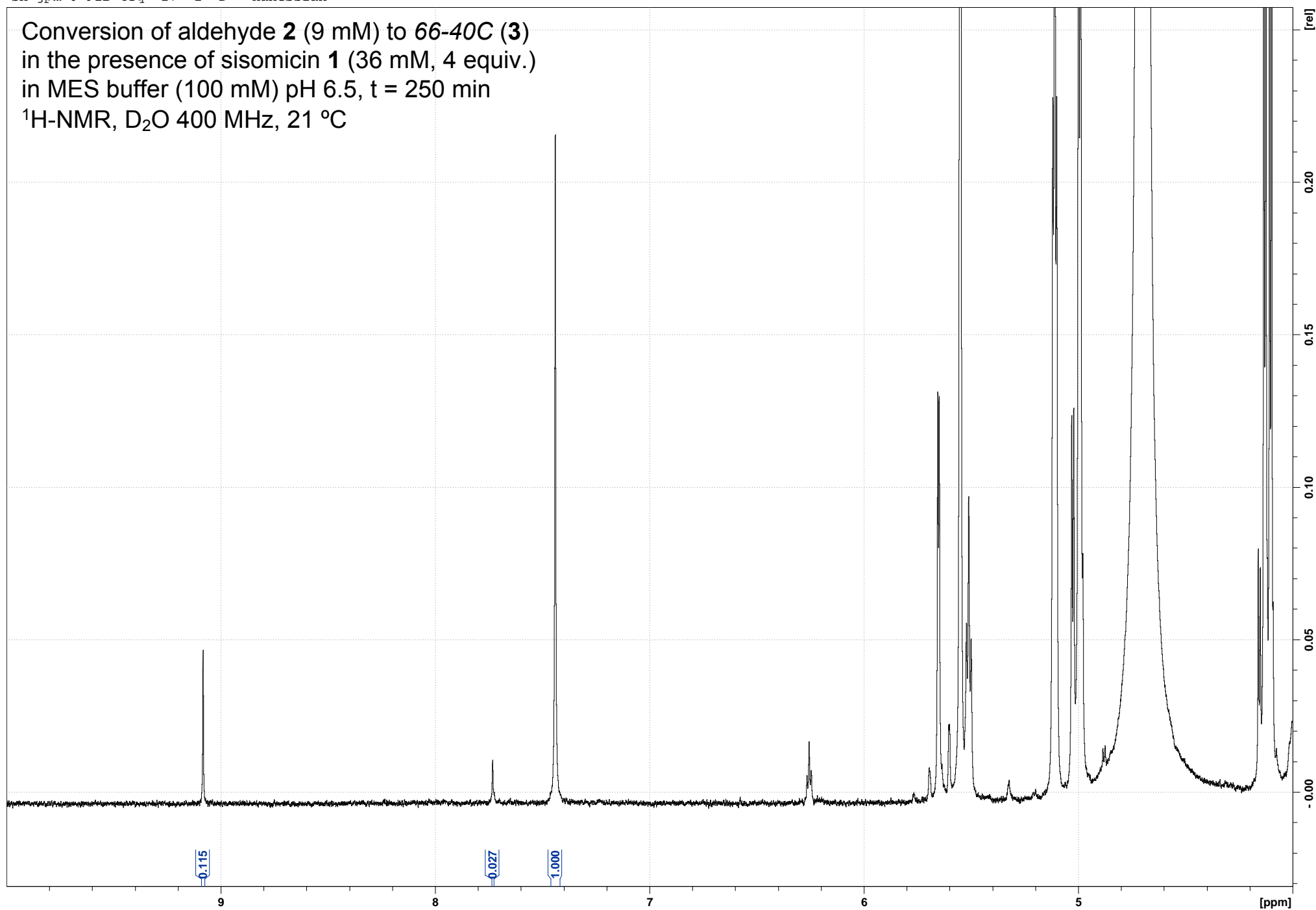
sh-jpm-6-91B-4eq 26 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 240 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



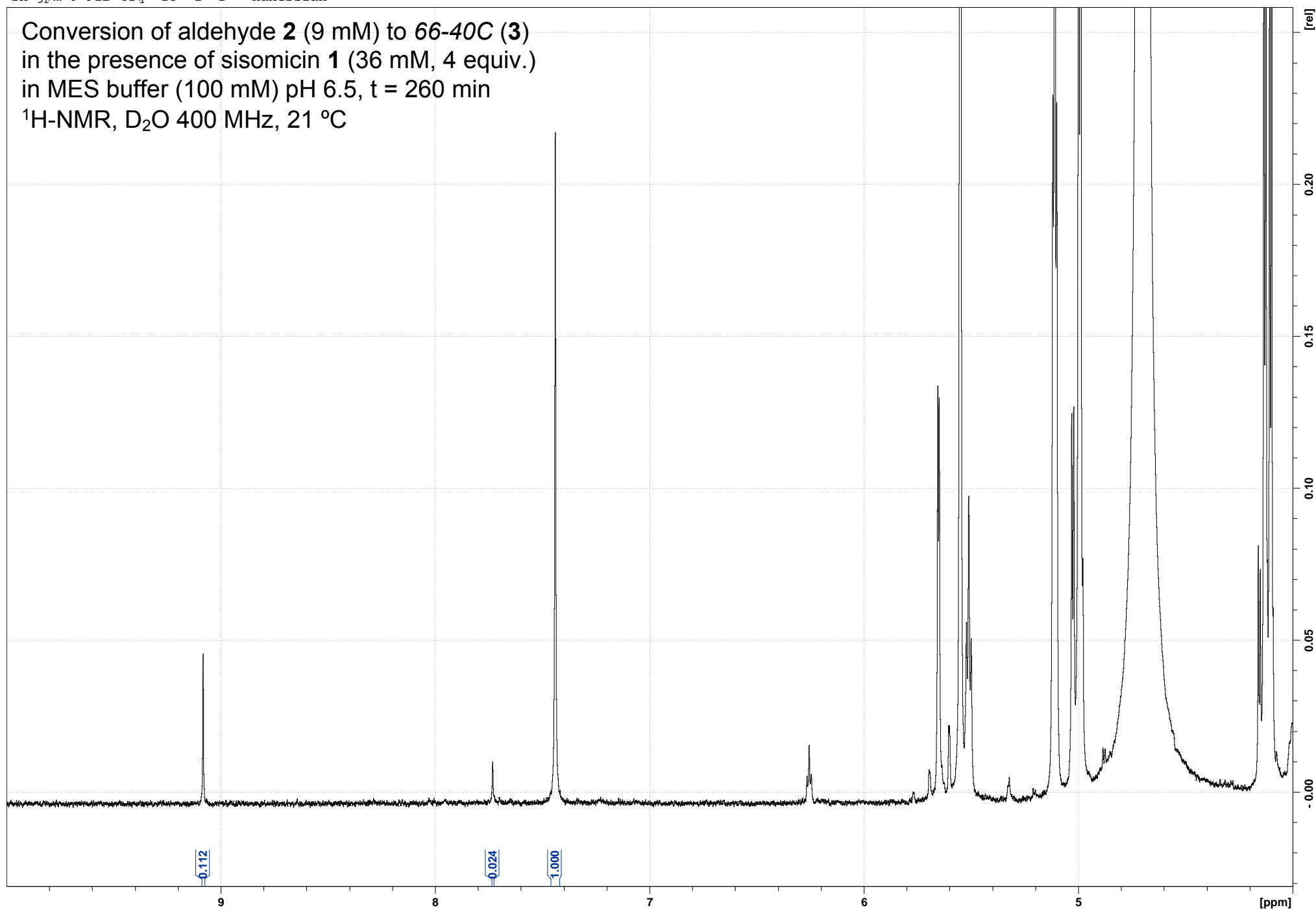
sh-jpm-6-91B-4eq 27 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 250 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



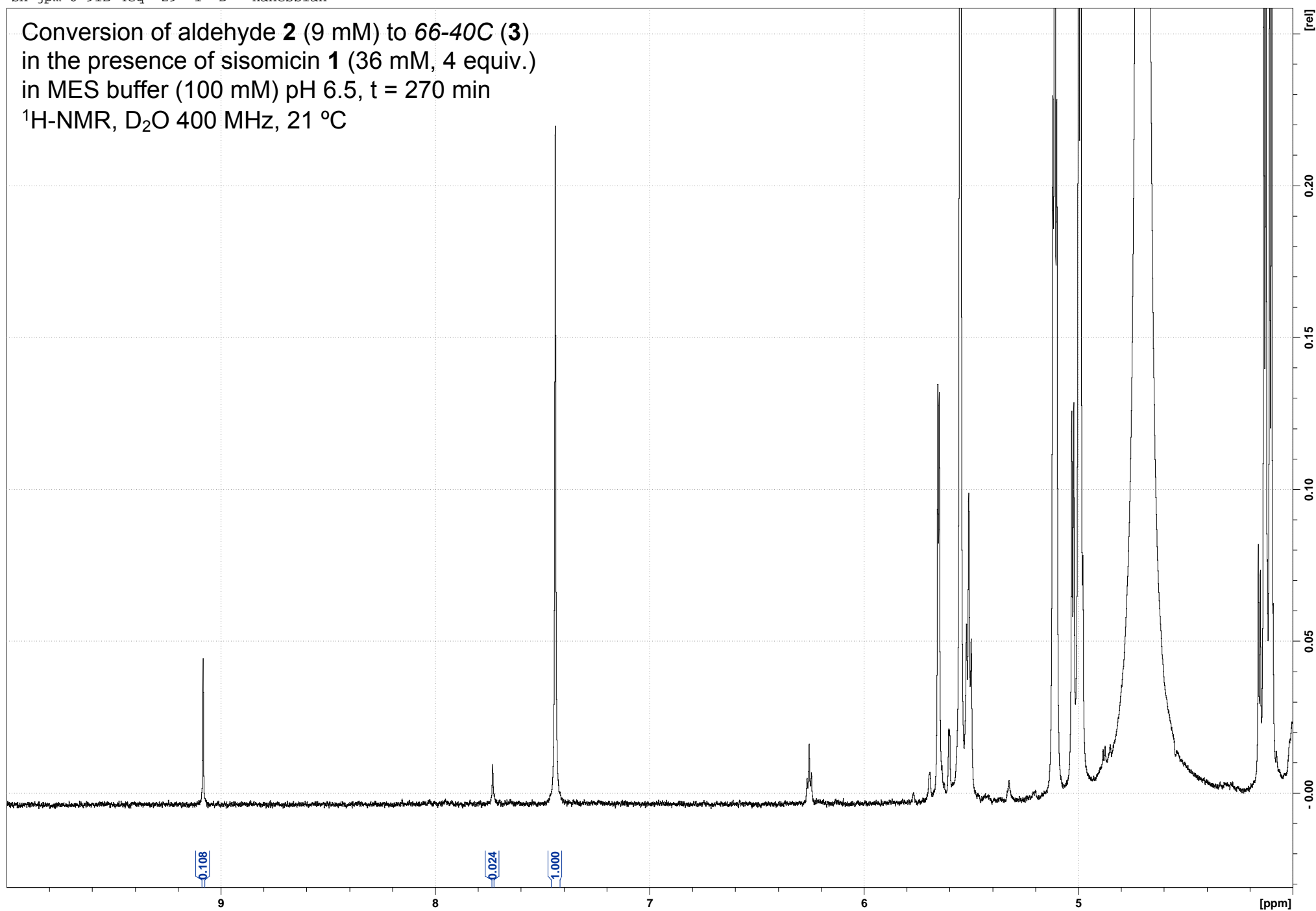
sh-jpm-6-91B-4eq 28 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 260 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



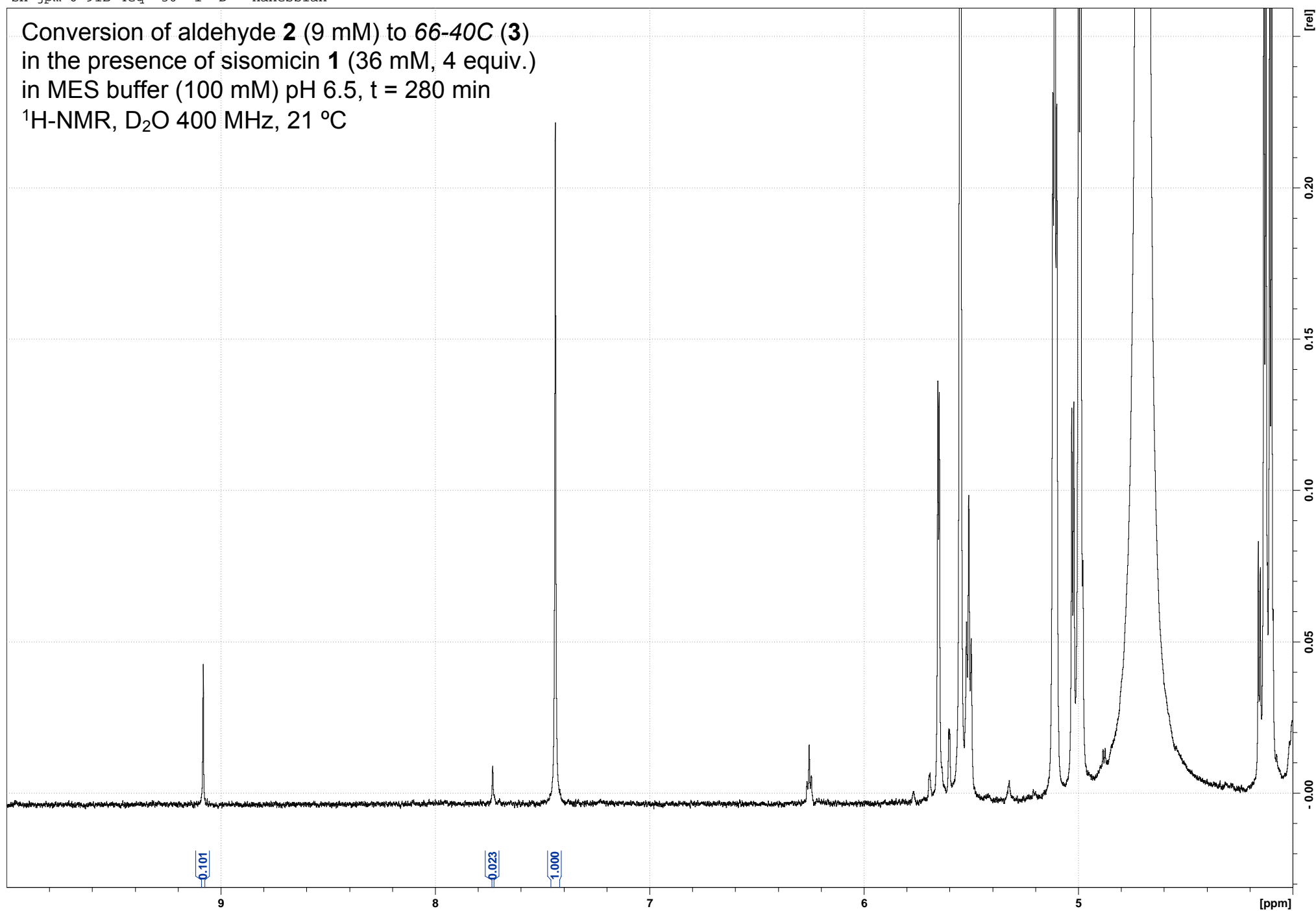
sh-jpm-6-91B-4eq 29 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 270 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



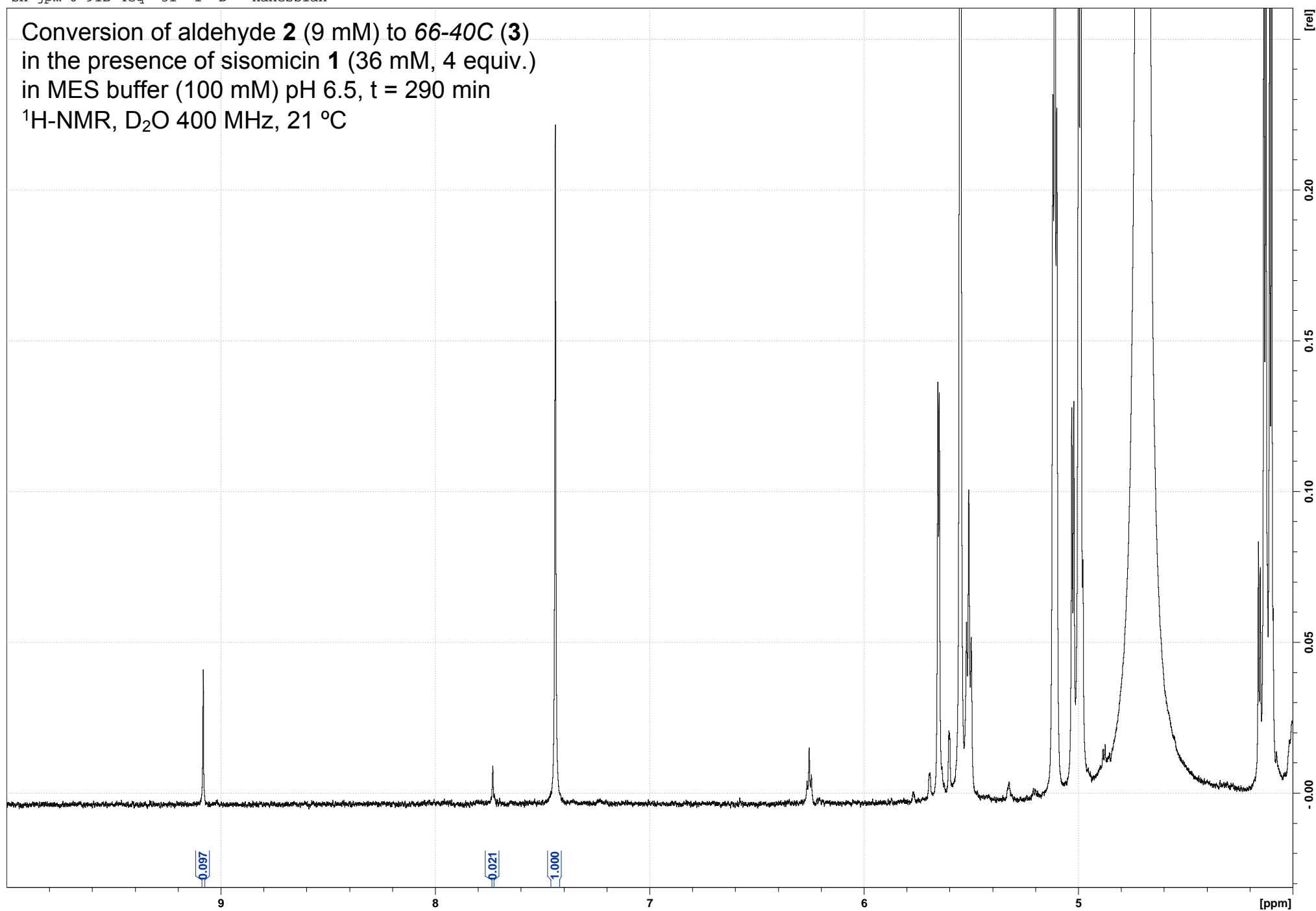
sh-jpm-6-91B-4eq 30 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 280 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



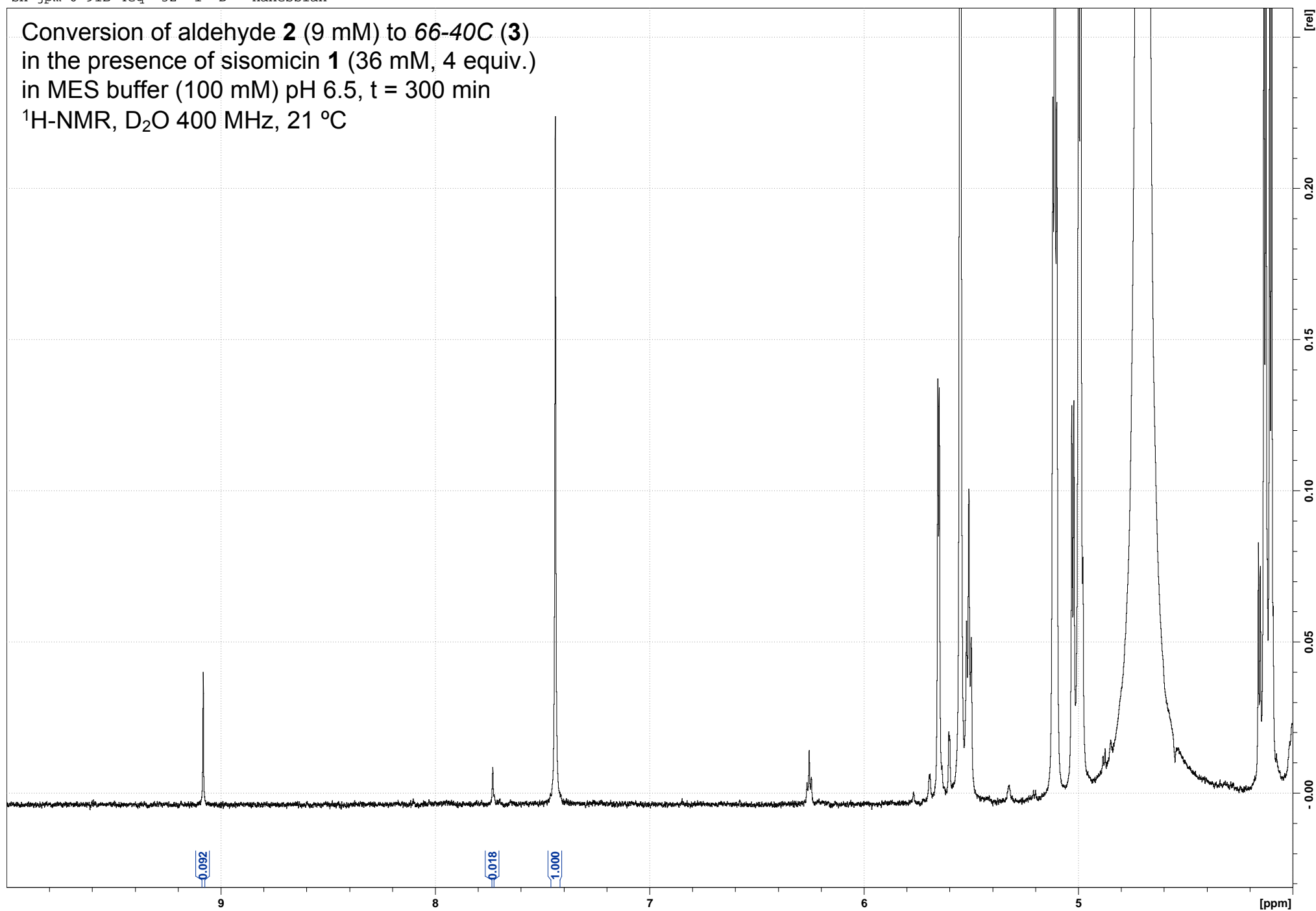
sh-jpm-6-91B-4eq 31 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 290 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91B-4eq 32 1 D: Hanessian

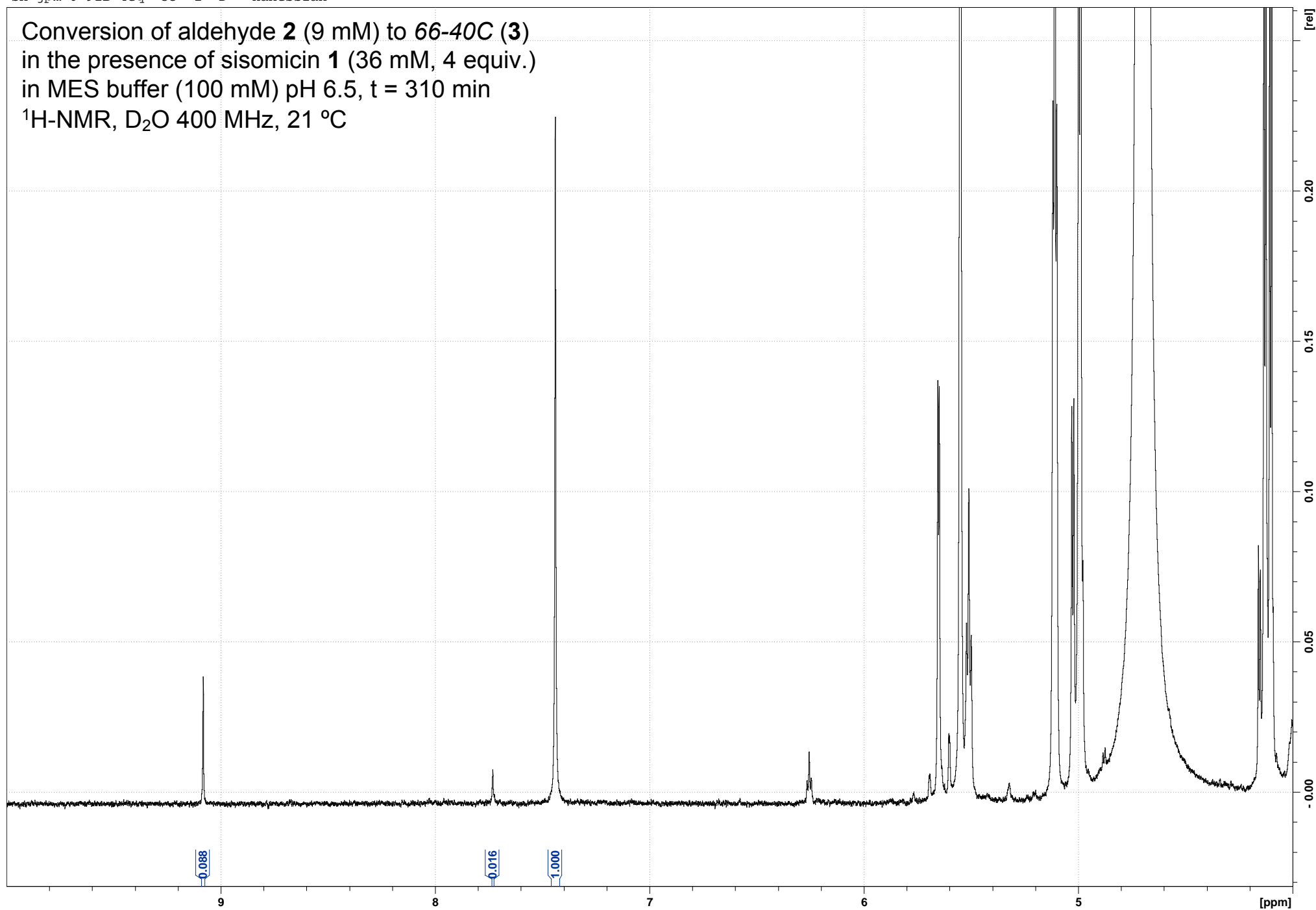
Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 300 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C





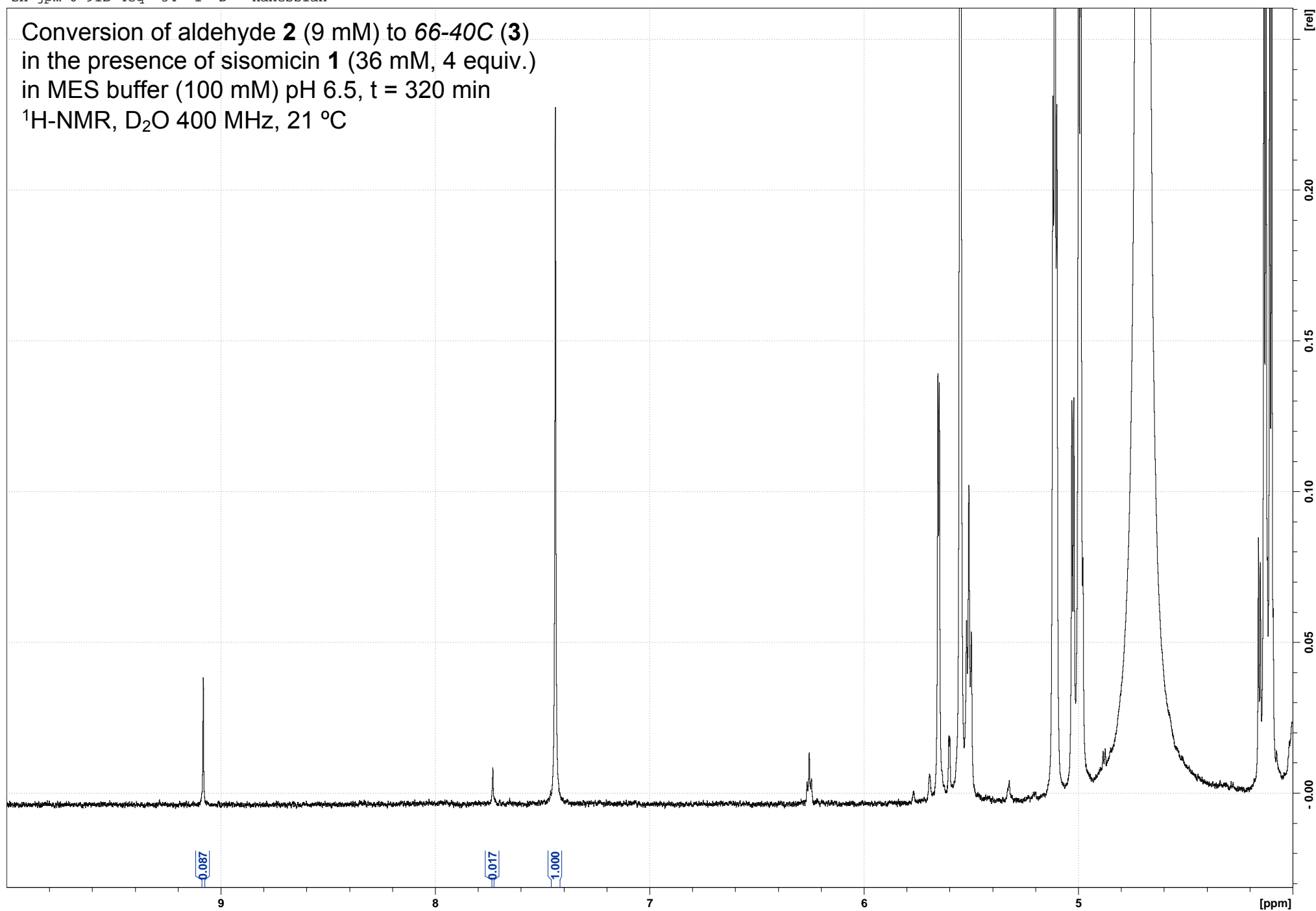
sh-jpm-6-91B-4eq 33 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 310 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



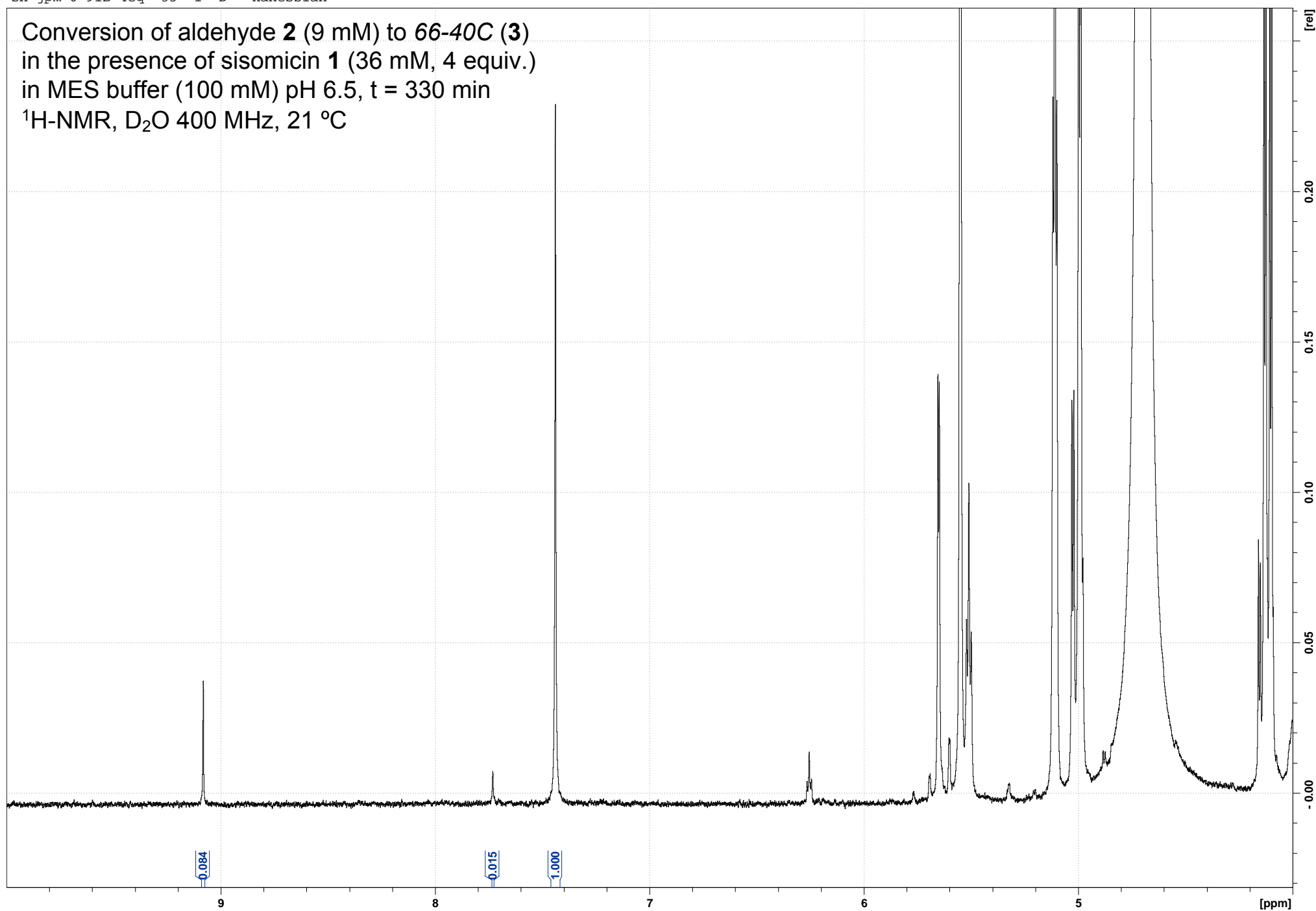
sh-jpm-6-91B-4eq 34 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 320 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



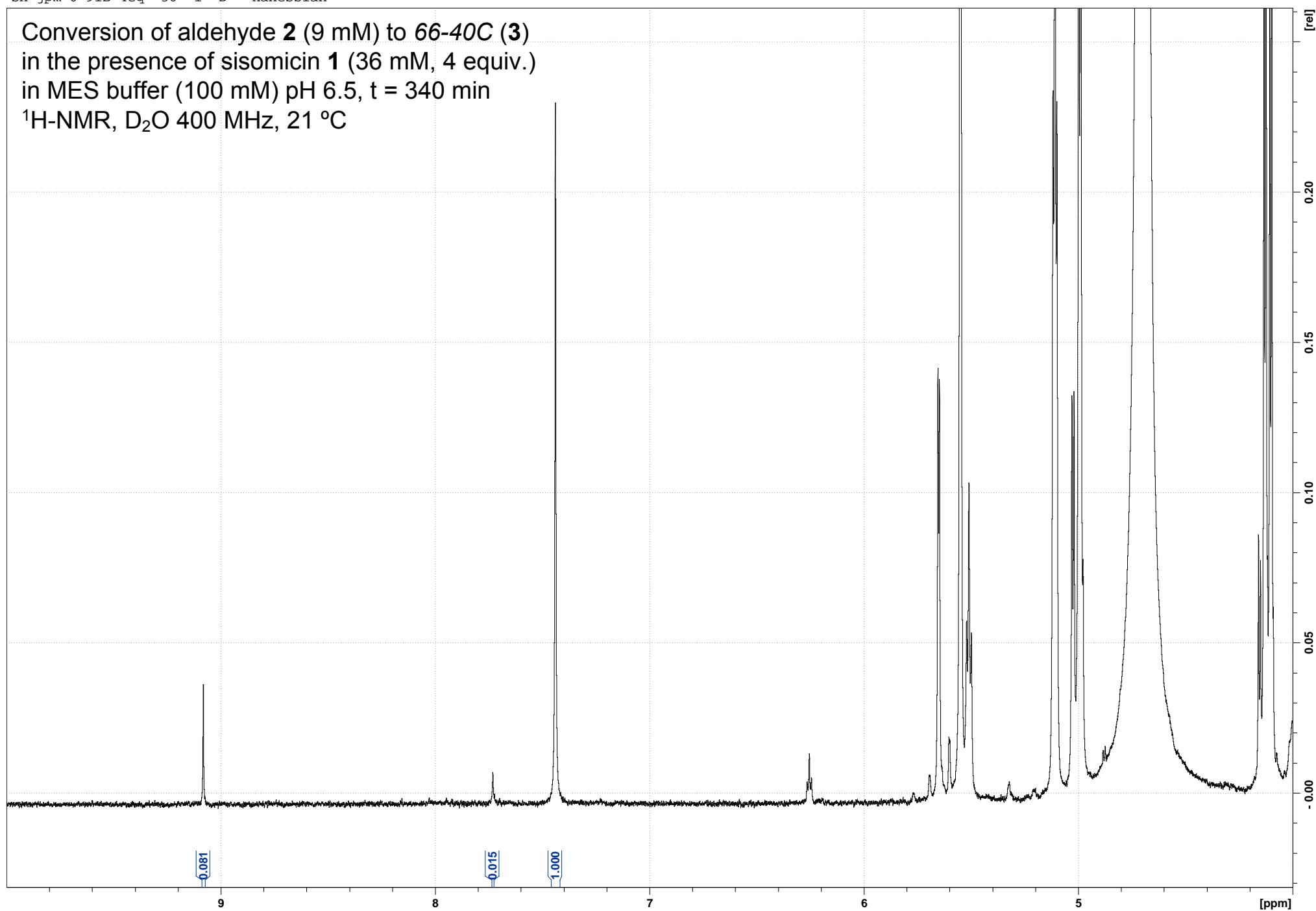
sh-jpm-6-91B-4eq 35 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 330 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



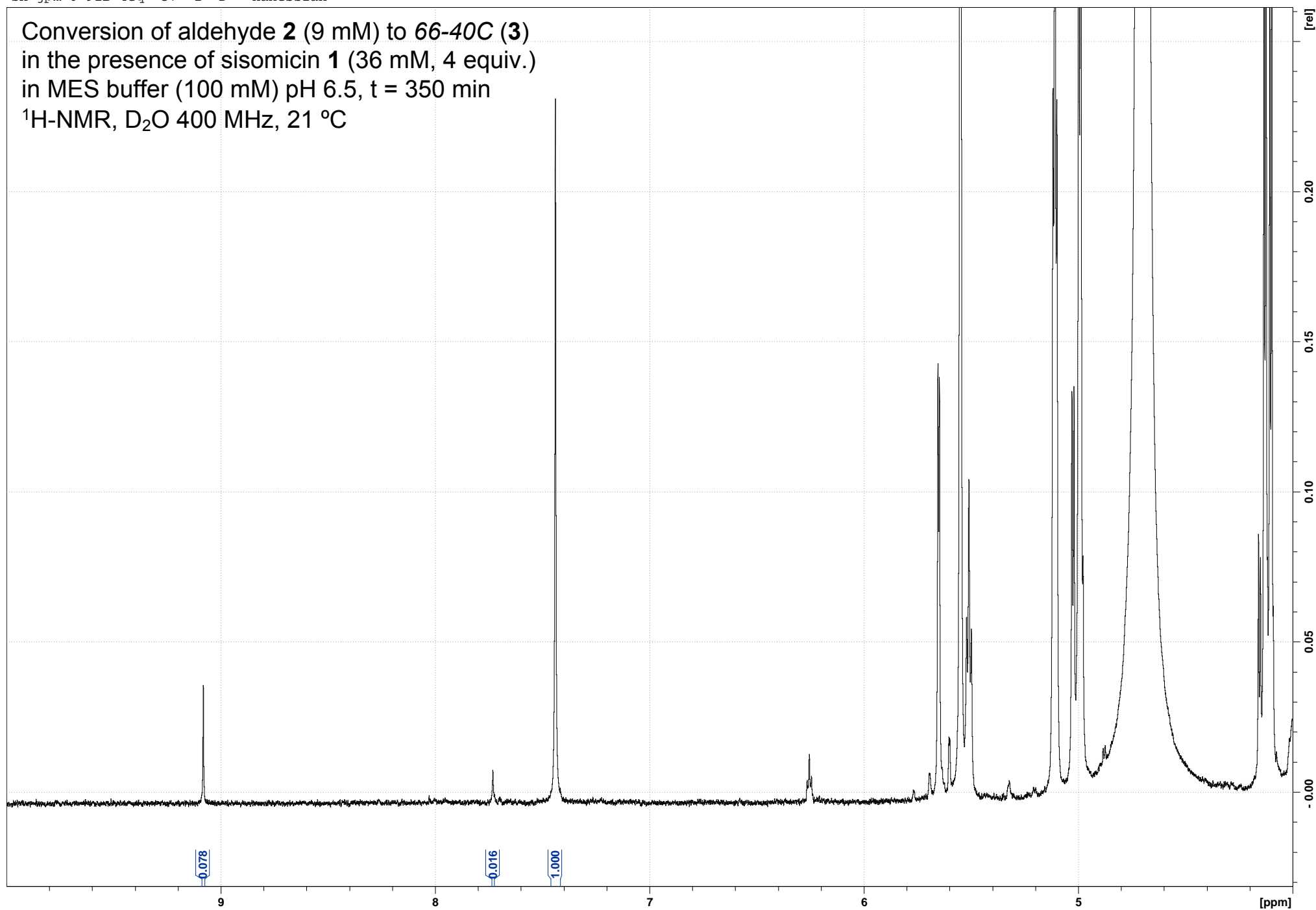
sh-jpm-6-91B-4eq 36 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 340 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



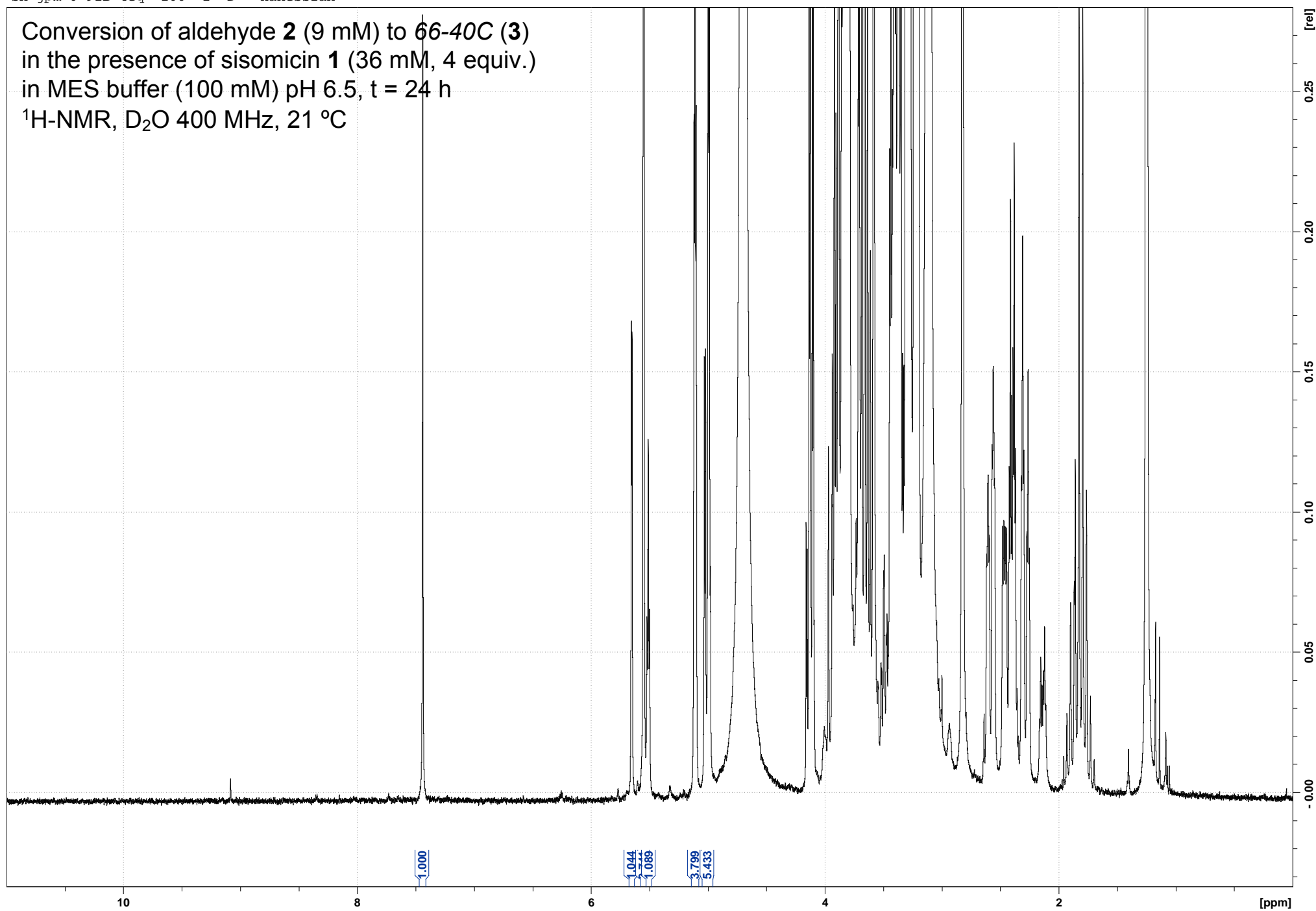
sh-jpm-6-91B-4eq 37 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 350 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C

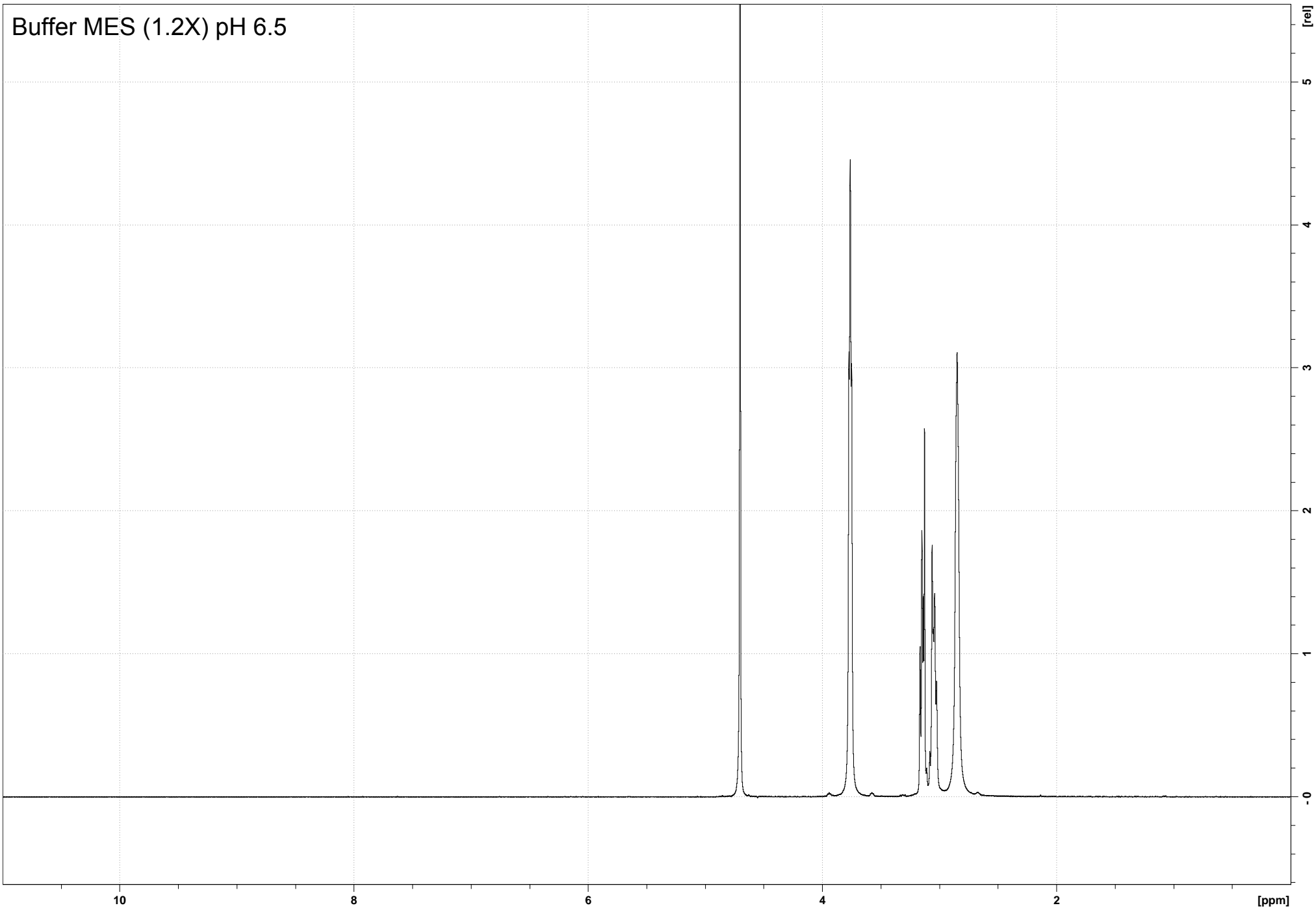


sh-jpm-6-91B-4eq 100 1 D: Hanessian

Conversion of aldehyde **2** (9 mM) to **66-40C** (**3**)  
in the presence of sisomicin **1** (36 mM, 4 equiv.)  
in MES buffer (100 mM) pH 6.5, t = 24 h  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C

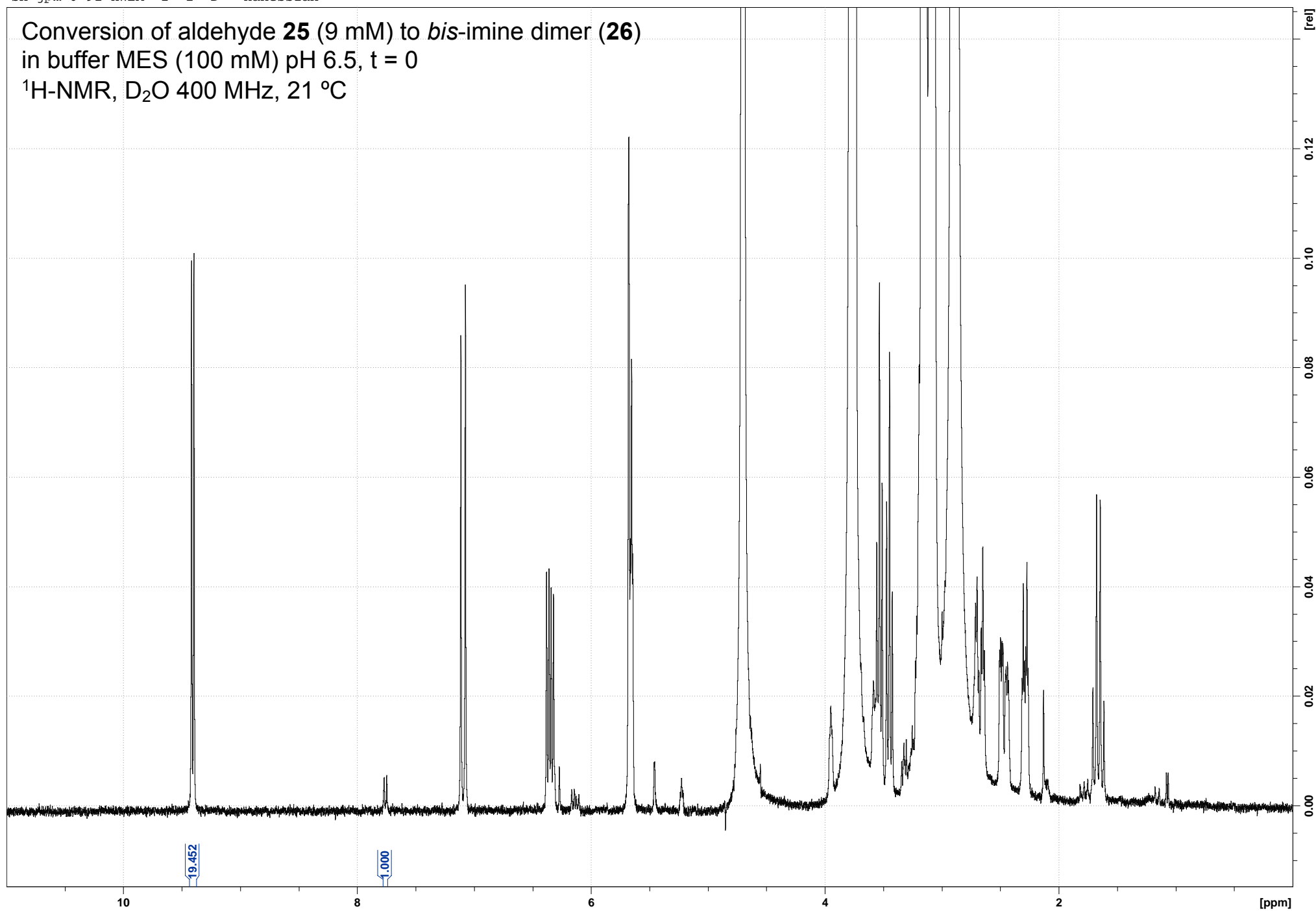


sh-jpm-6-91-HWEA 1 1 D: Hanessian



sh-jpm-6-91-HWEA 2 1 D: Hanessian

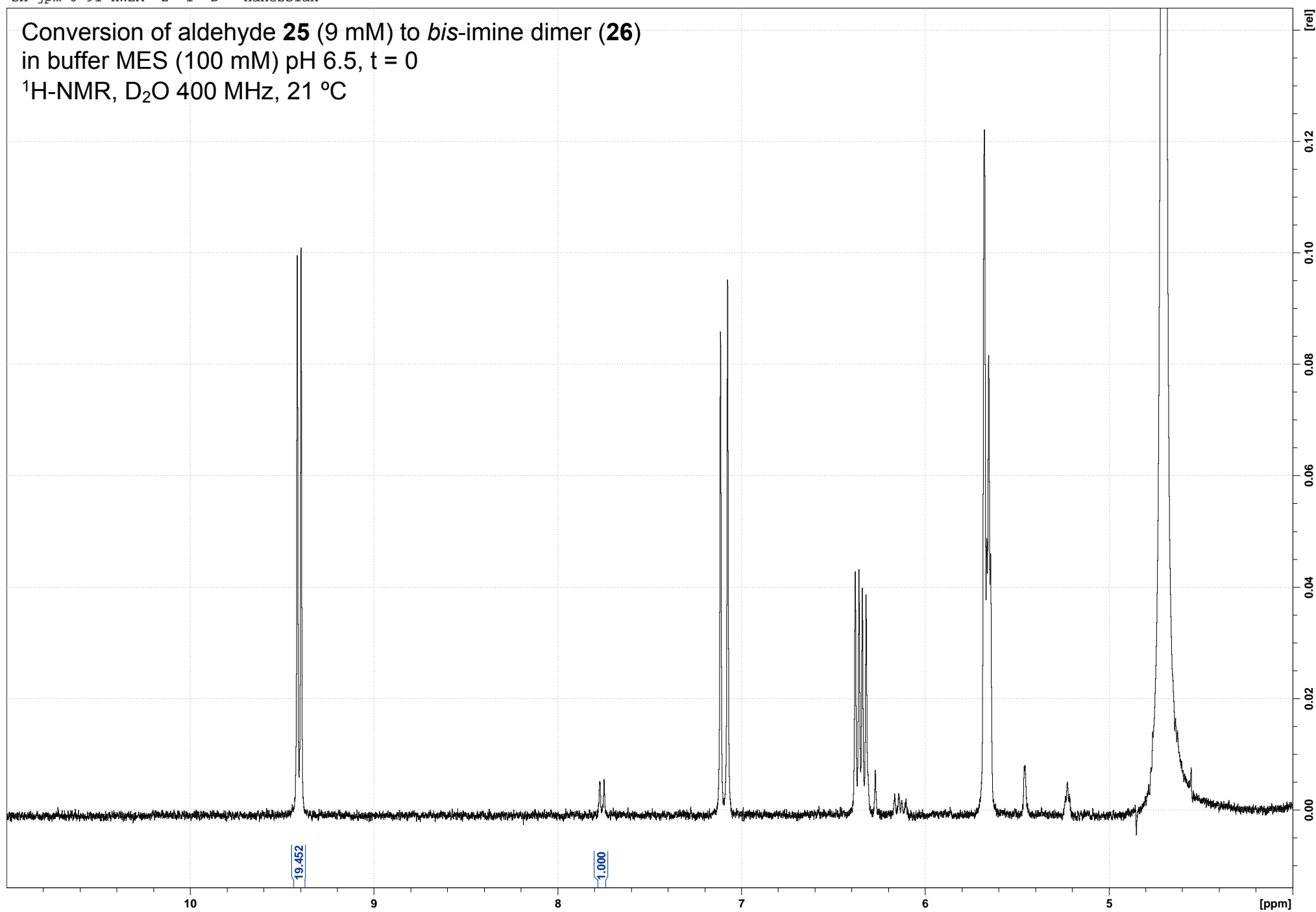
Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





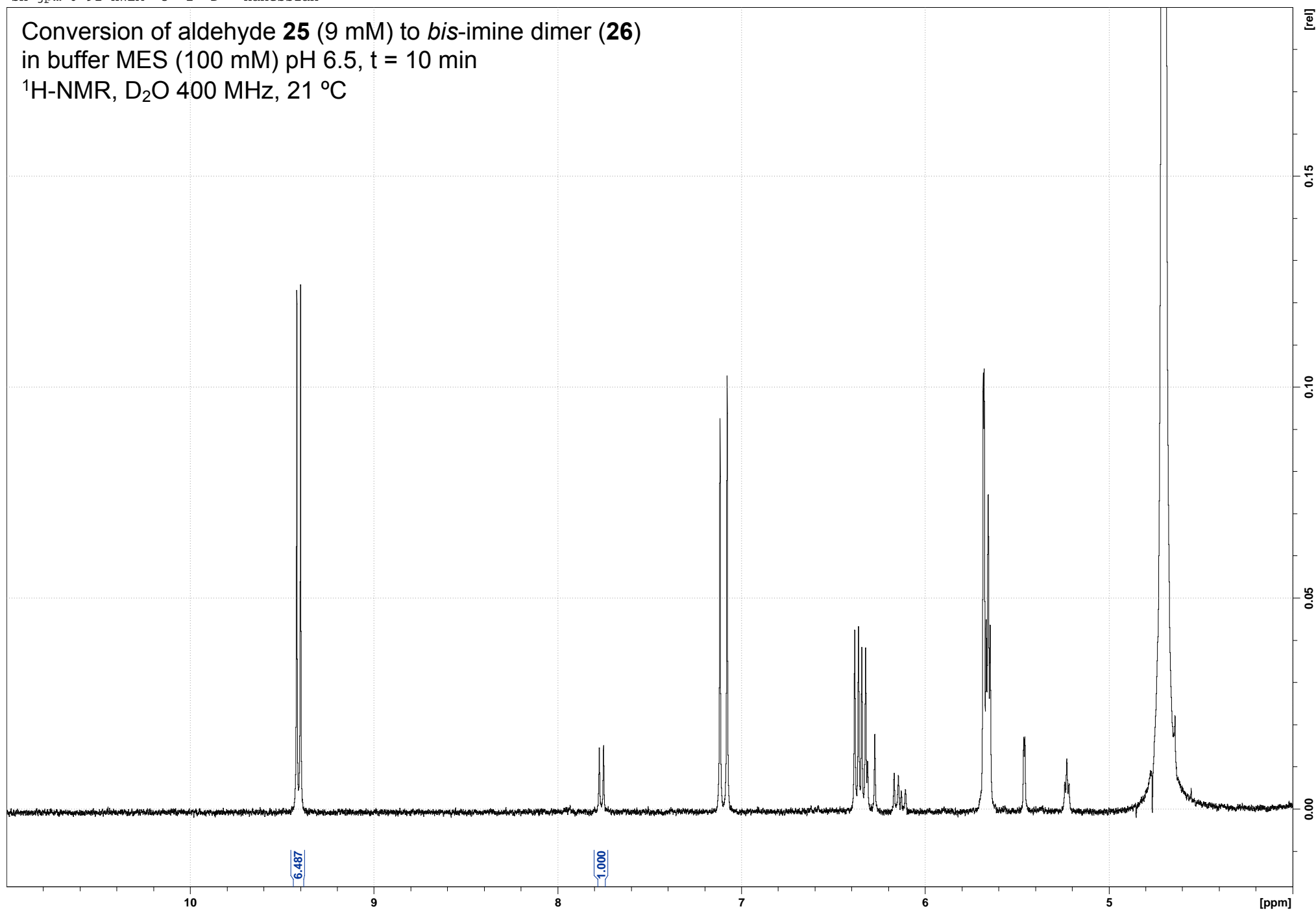
sh-jpm-6-91-HWEA 2 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



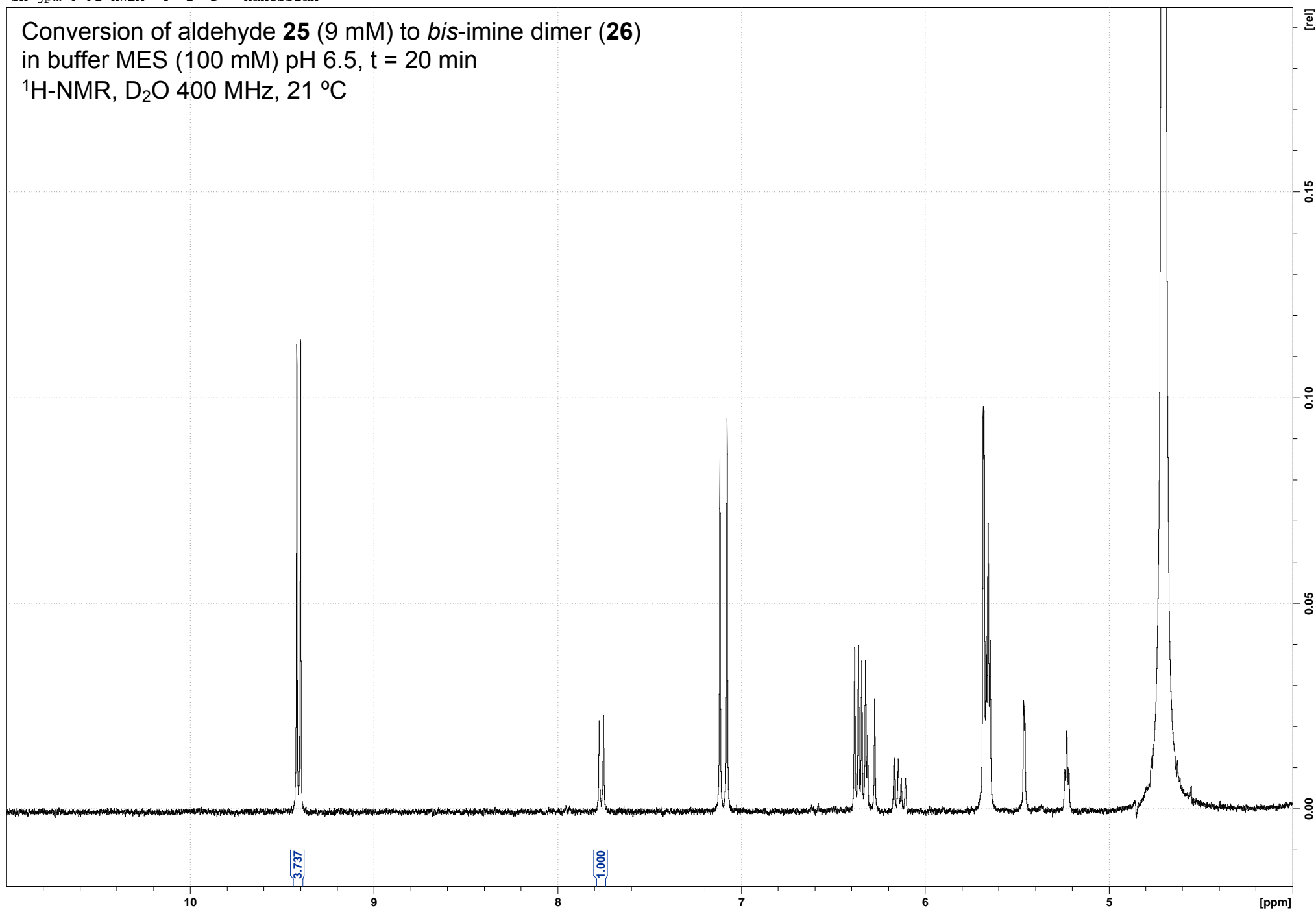
sh-jpm-6-91-HWEA 3 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 10 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



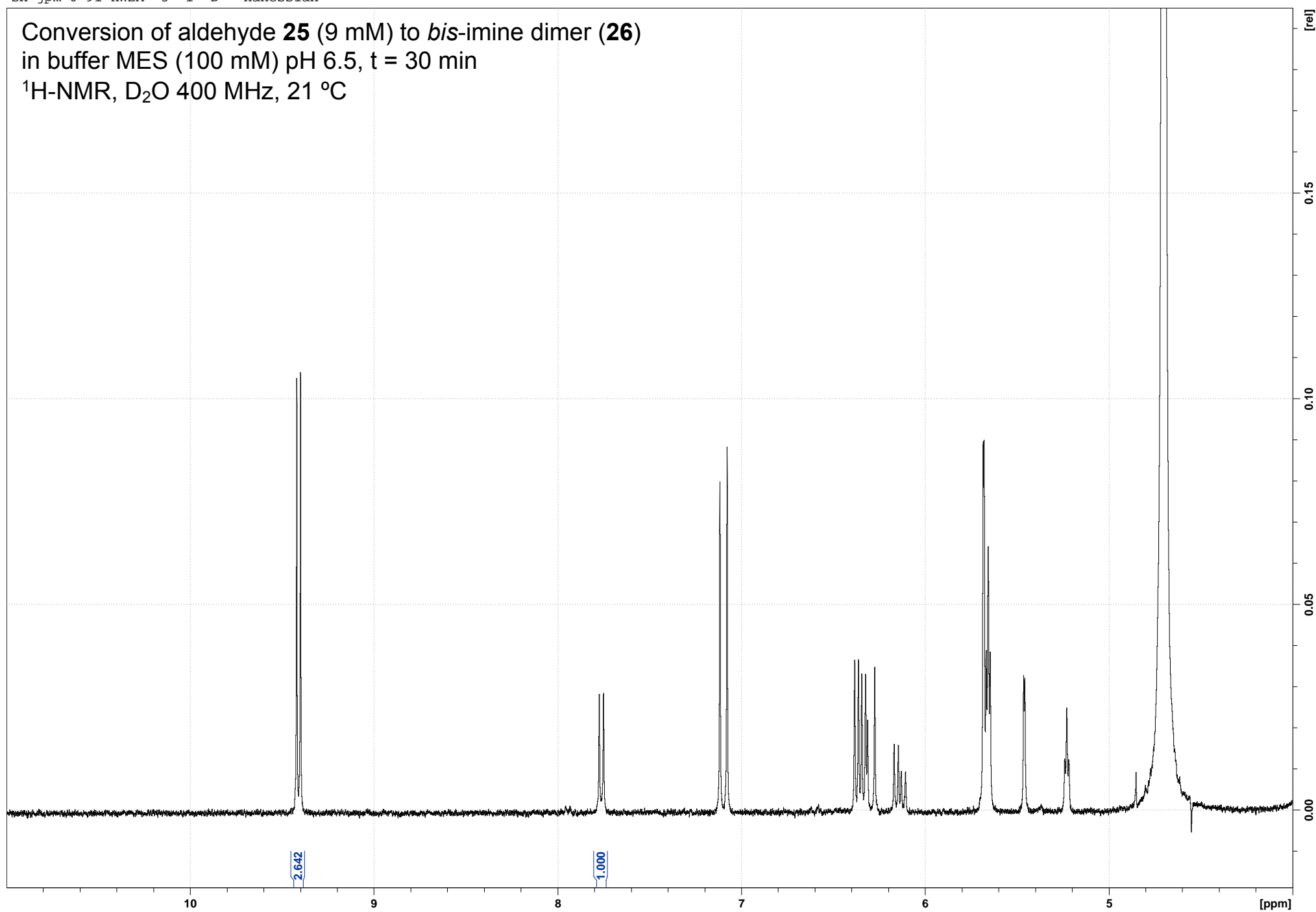
sh-jpm-6-91-HWEA 4 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 20 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



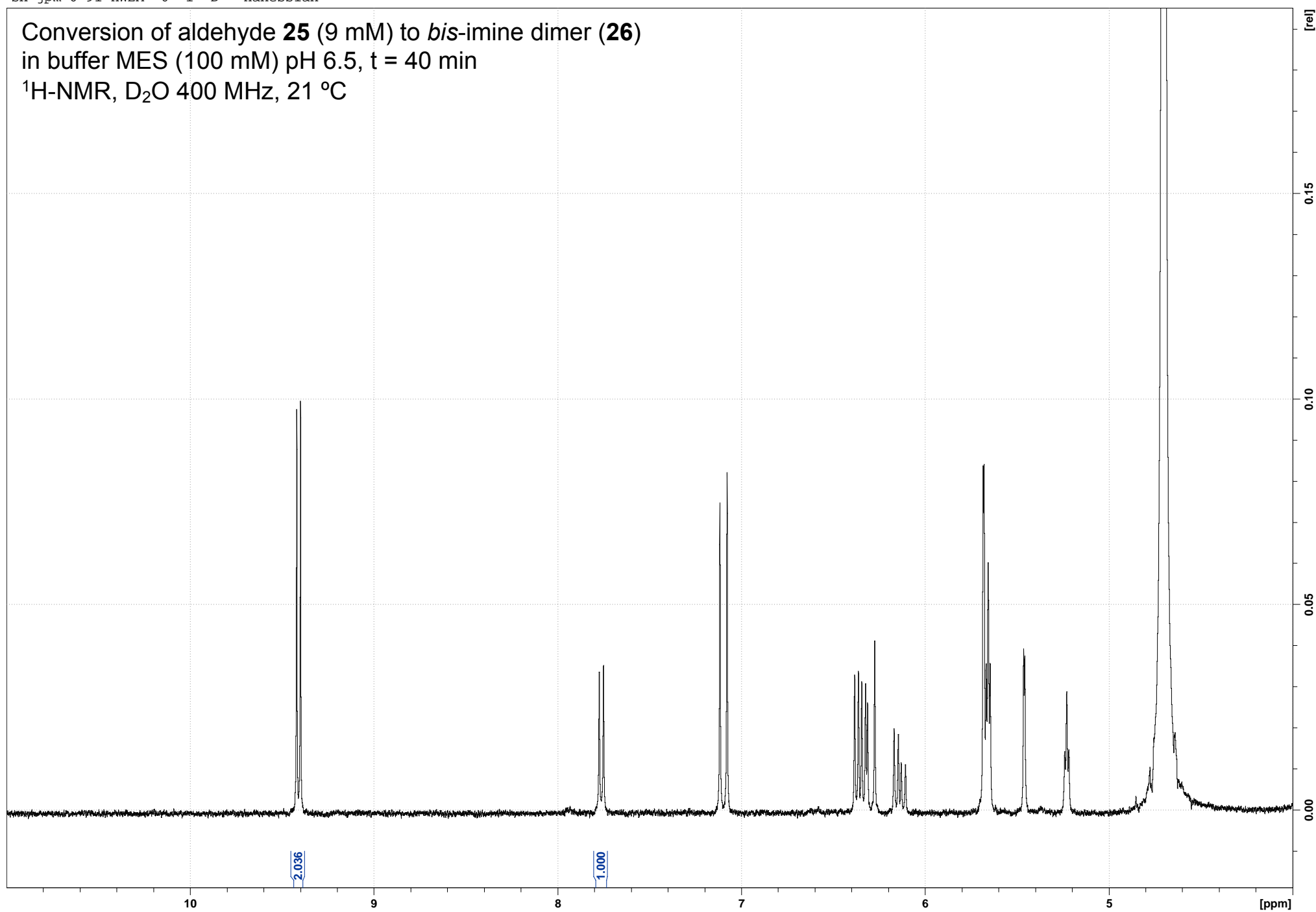
sh-jpm-6-91-HWEA 5 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 30 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



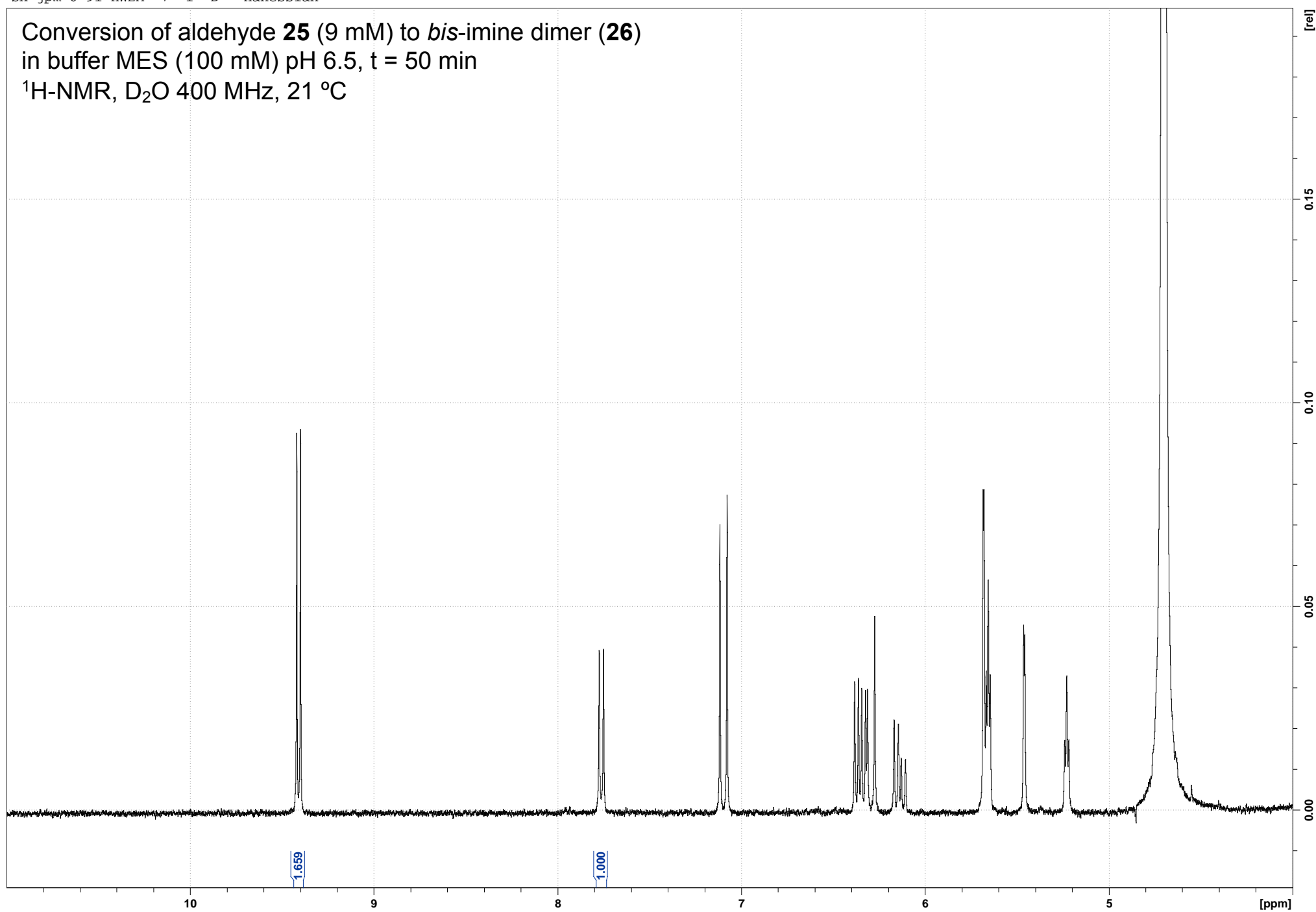
sh-jpm-6-91-HWEA 6 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 40 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



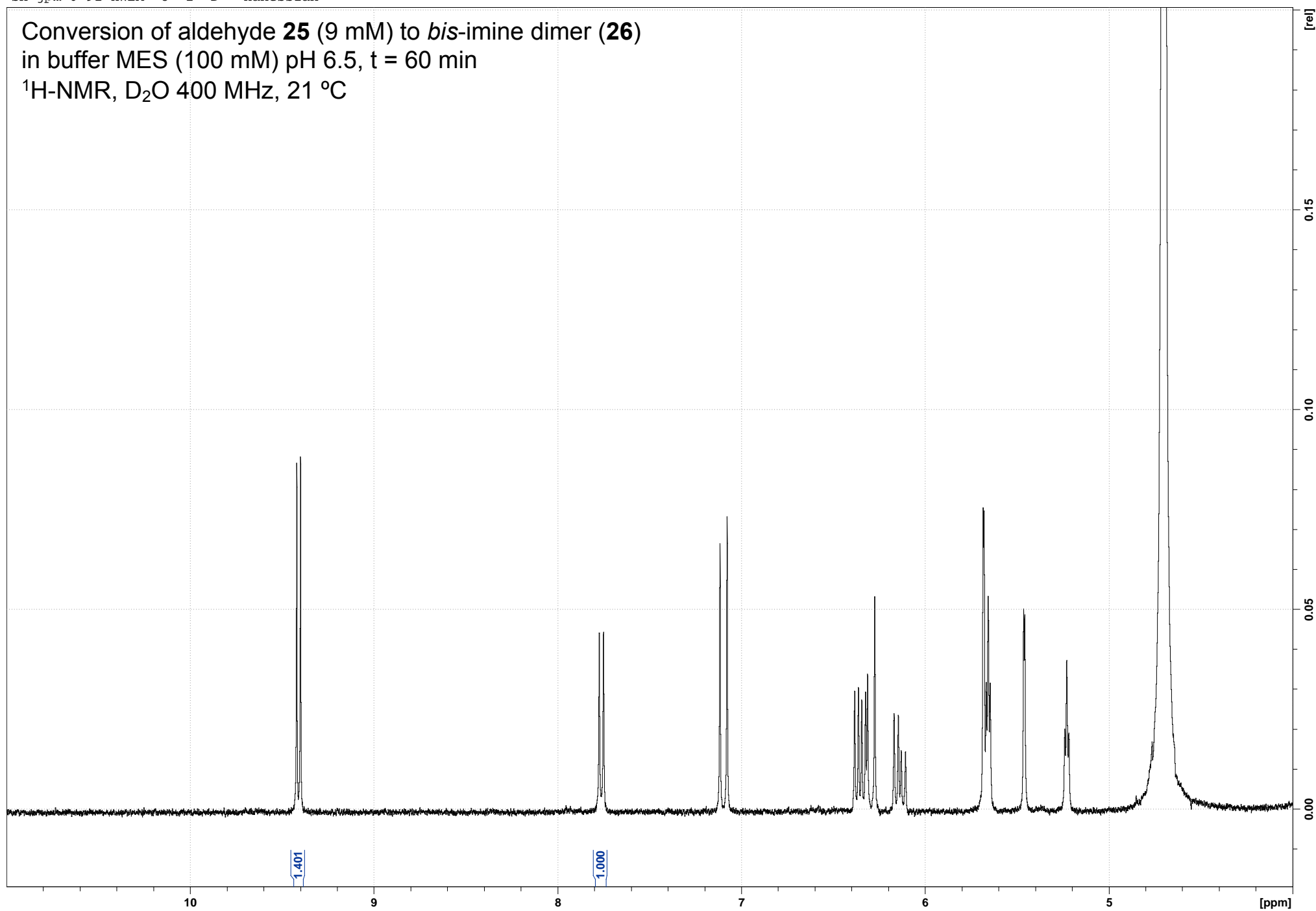
sh-jpm-6-91-HWEA 7 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 50 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



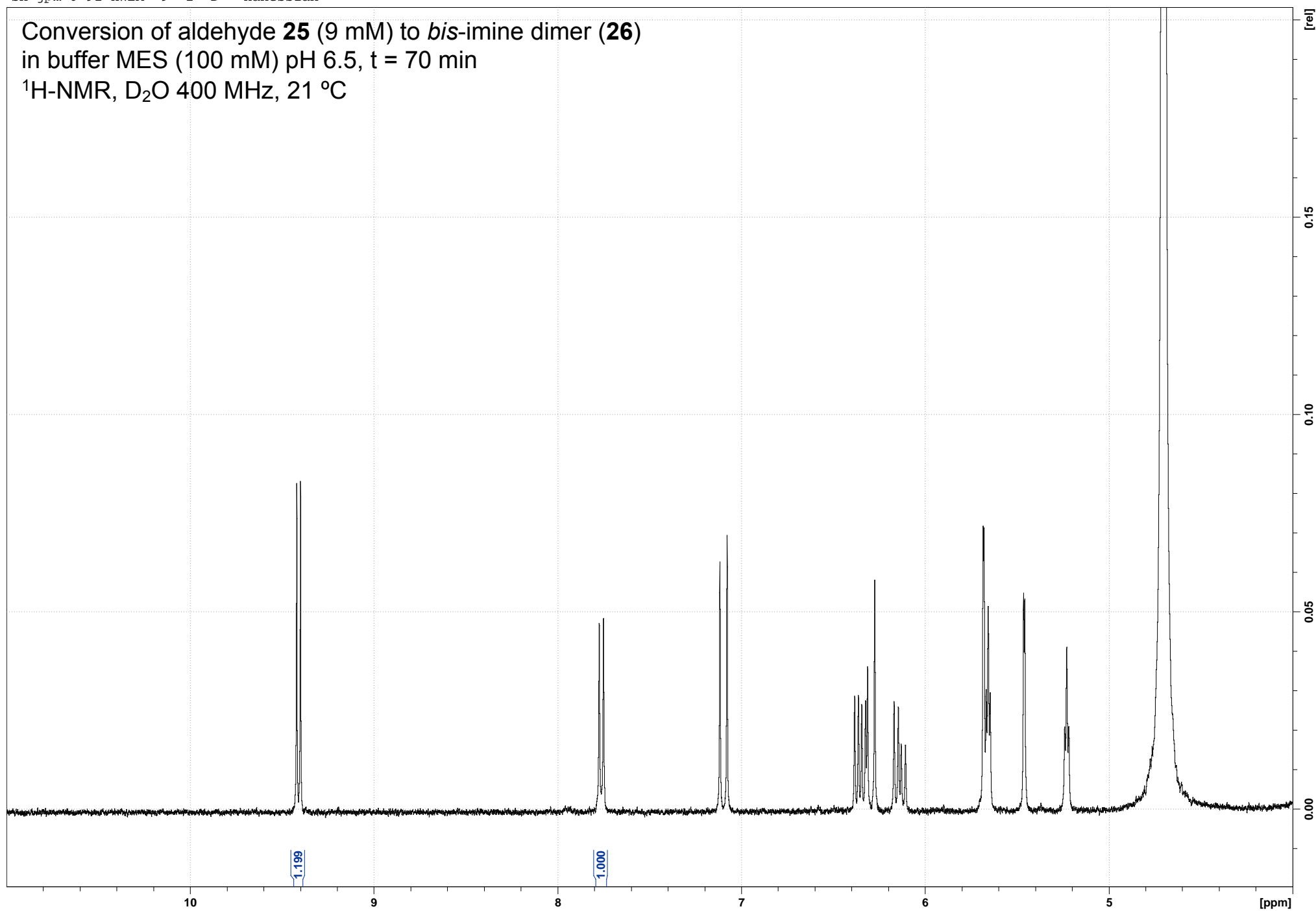
sh-jpm-6-91-HWEA 8 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 60 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-HWEA 9 1 D: Hanessian

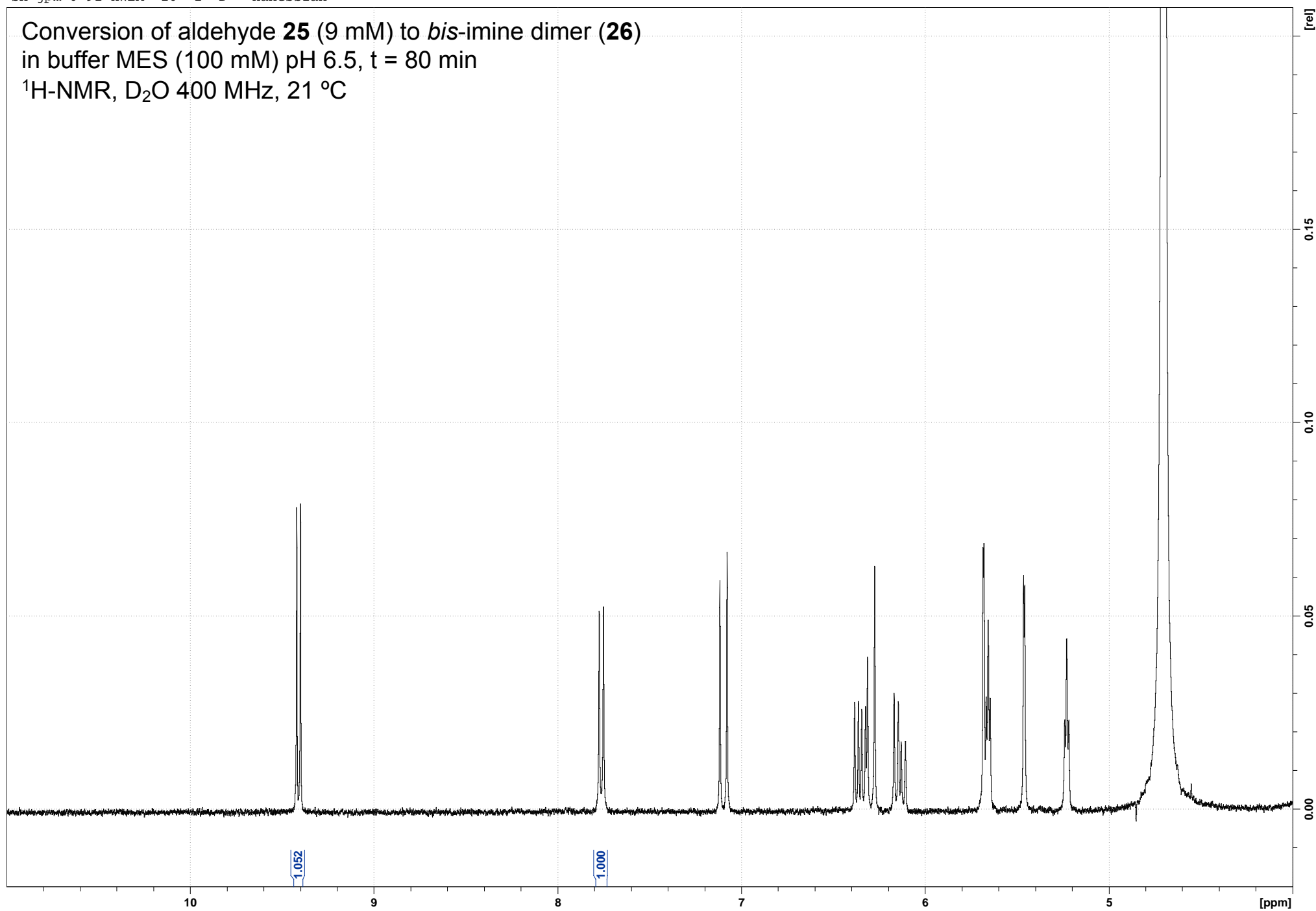
Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 70 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





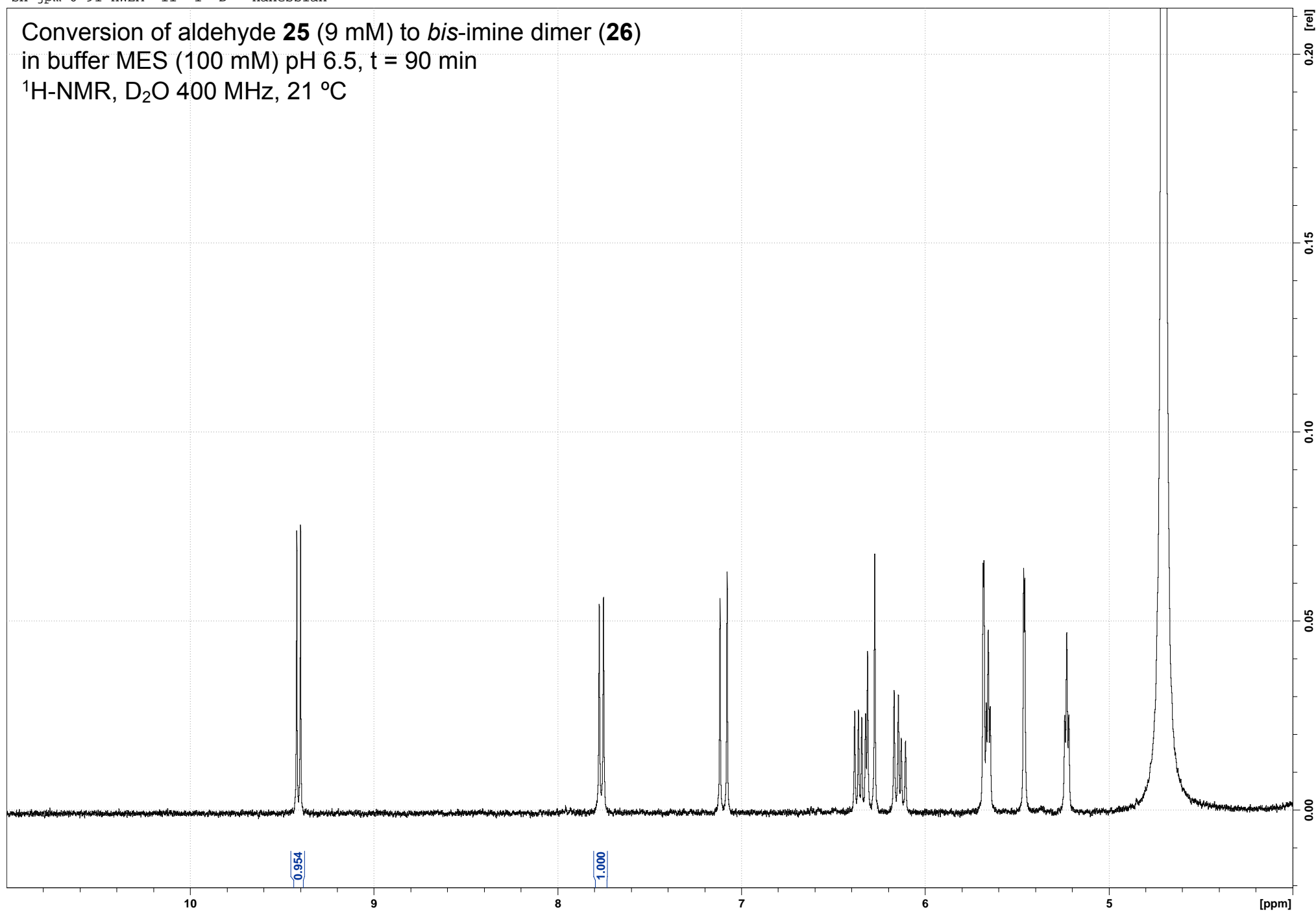
sh-jpm-6-91-HWEA 10 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 80 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



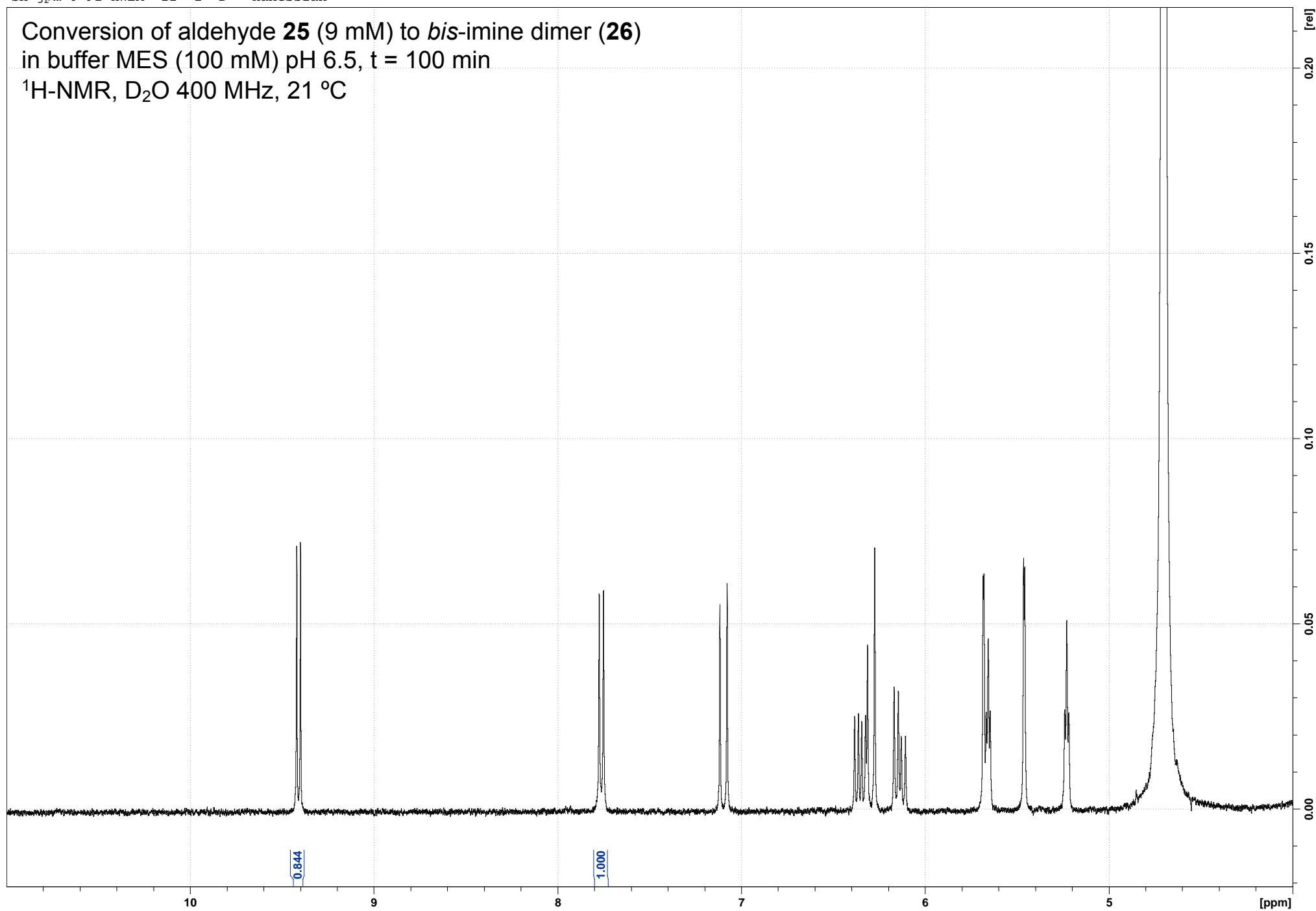
sh-jpm-6-91-HWEA 11 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 90 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



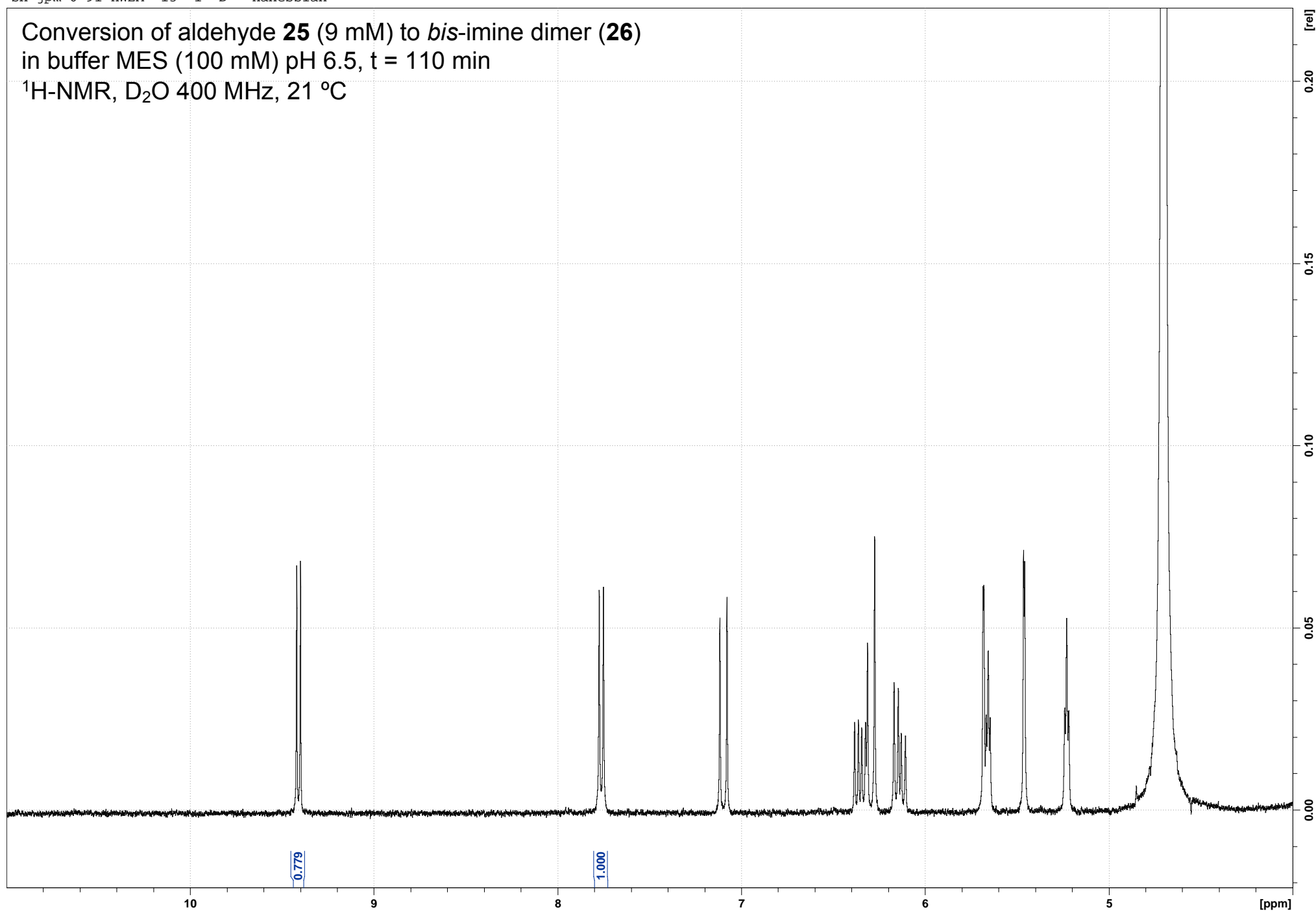
sh-jpm-6-91-HWEA 12 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 100 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



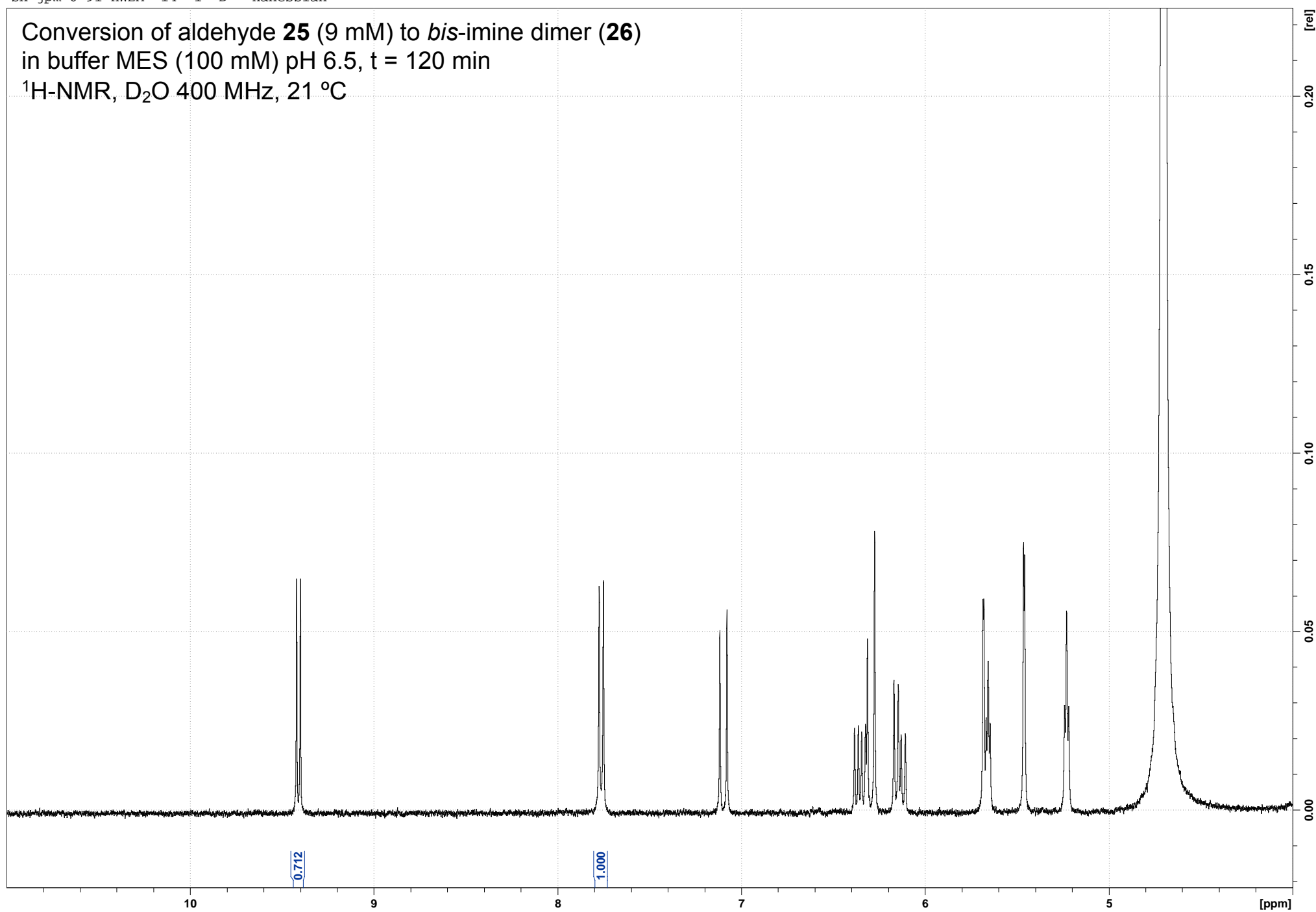
sh-jpm-6-91-HWEA 13 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 110 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



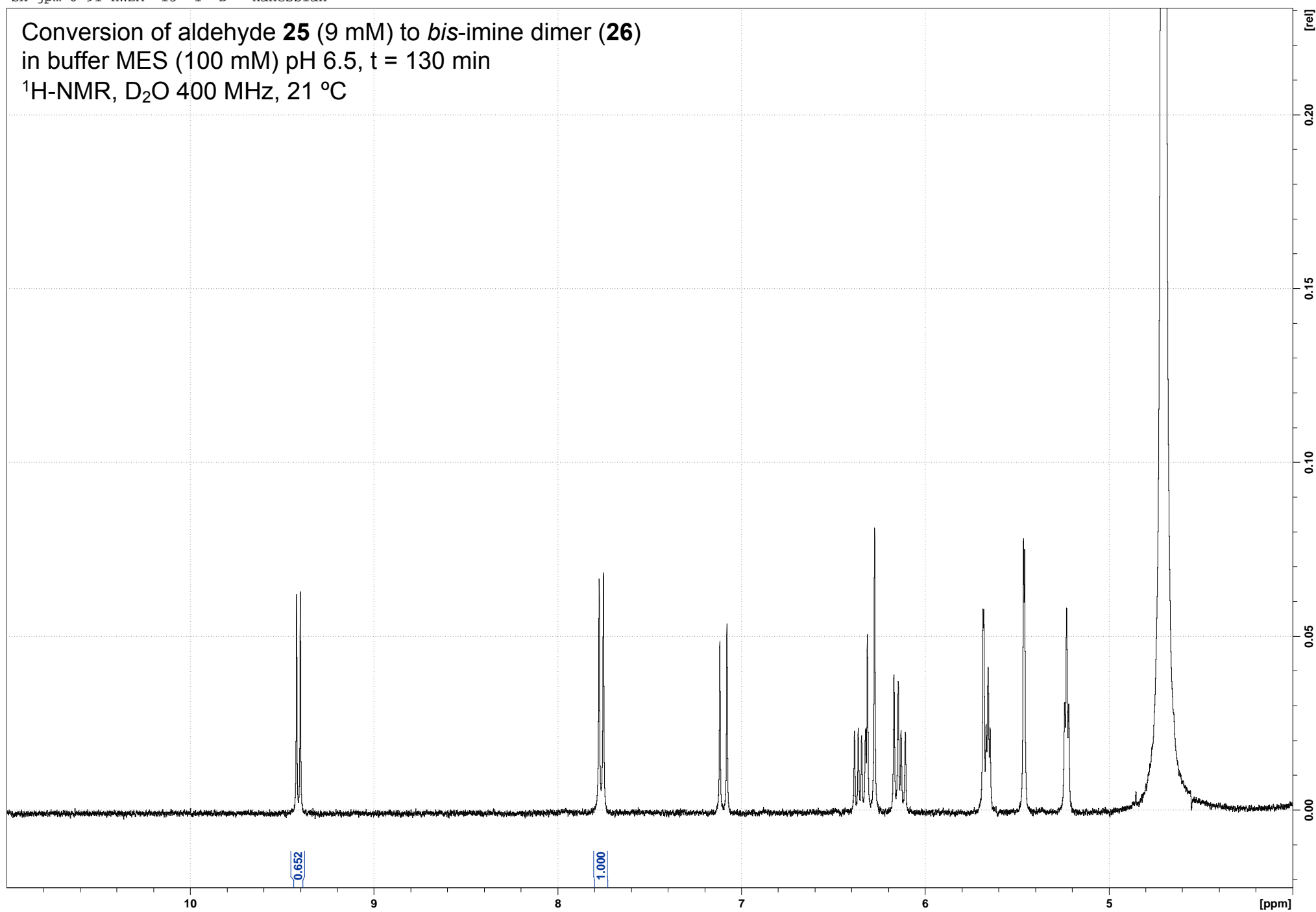
sh-jpm-6-91-HWEA 14 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 120 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



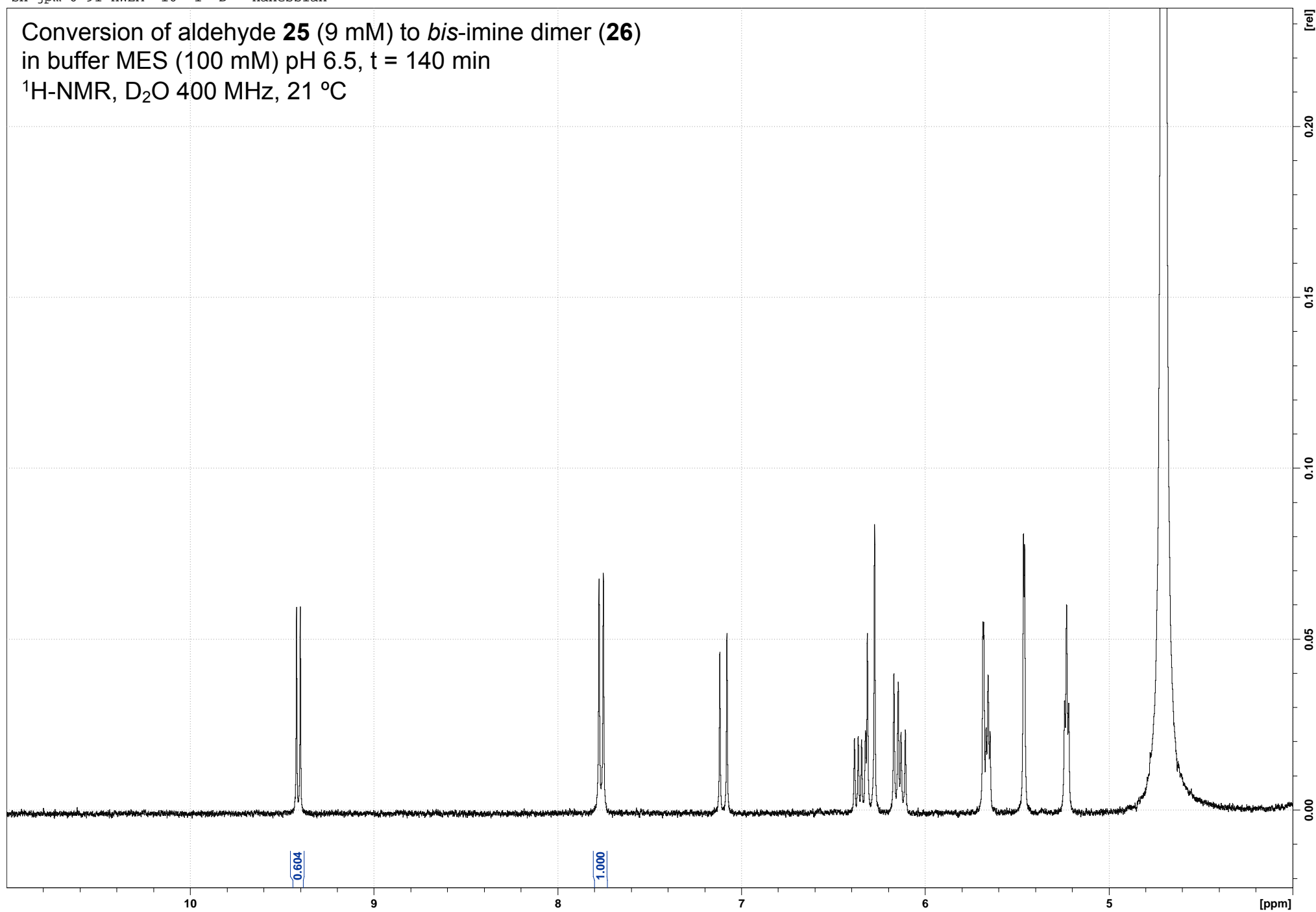
sh-jpm-6-91-HWEA 15 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 130 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



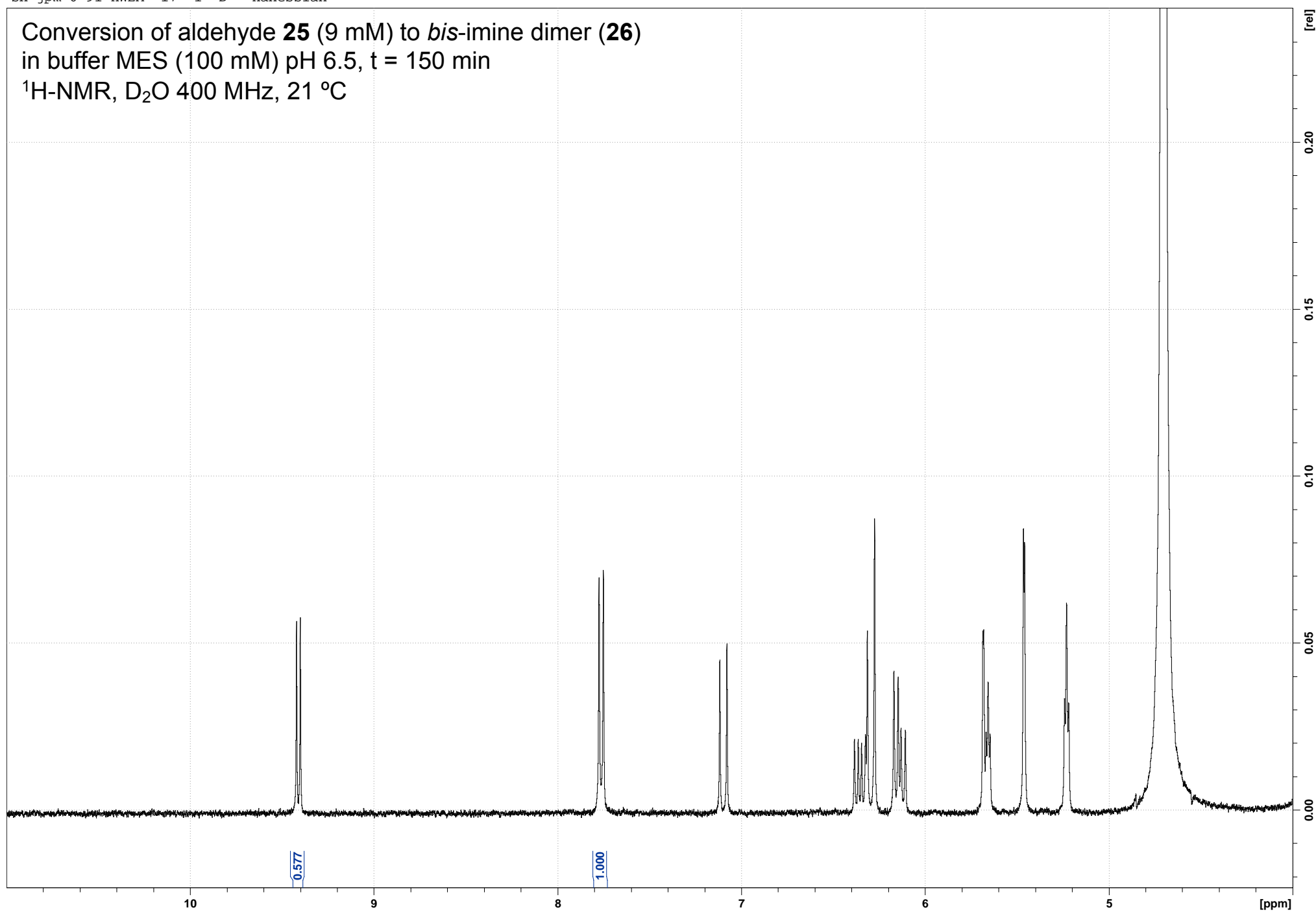
sh-jpm-6-91-HWEA 16 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 140 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-HWEA 17 1 D: Hanessian

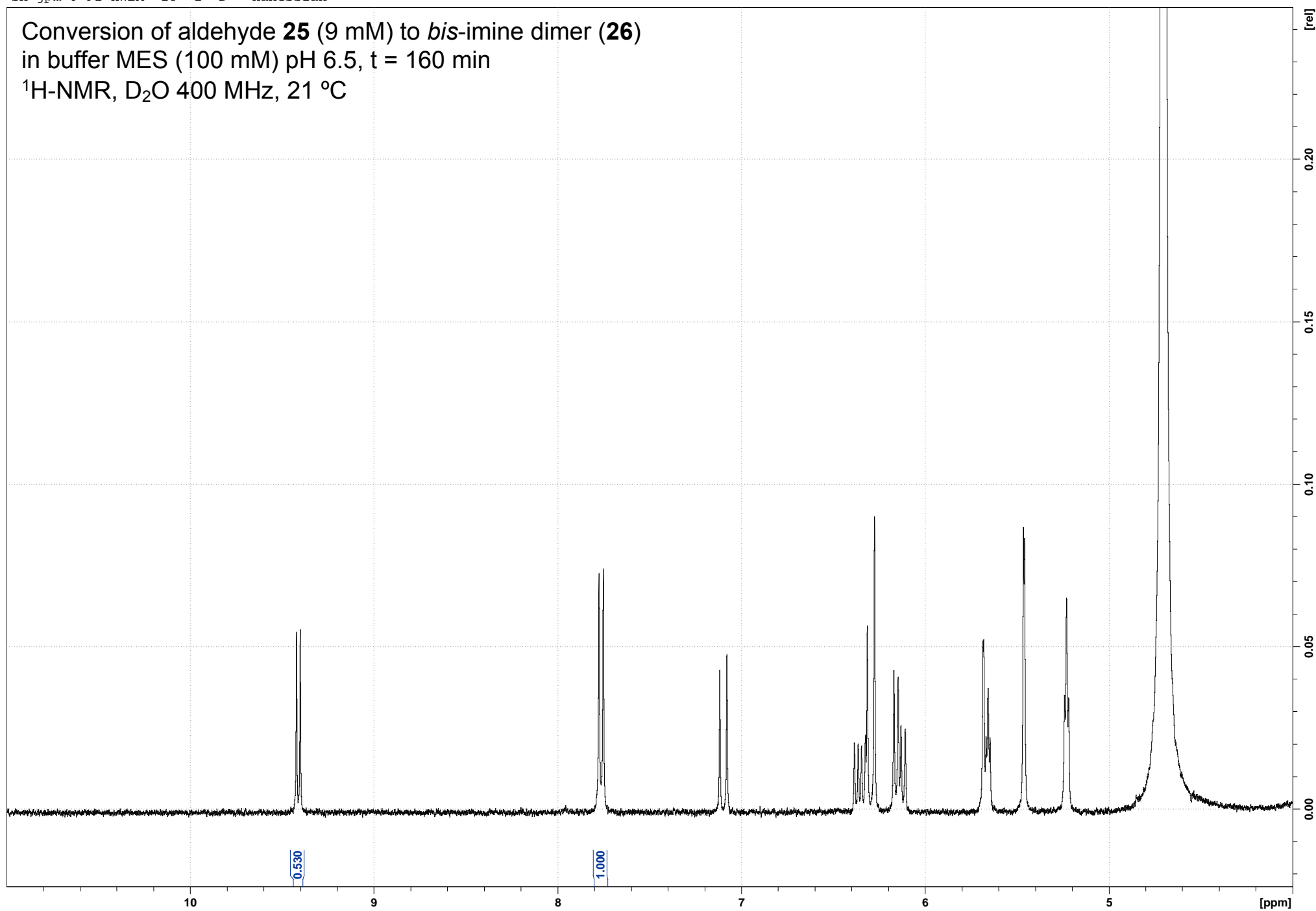
Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 150 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





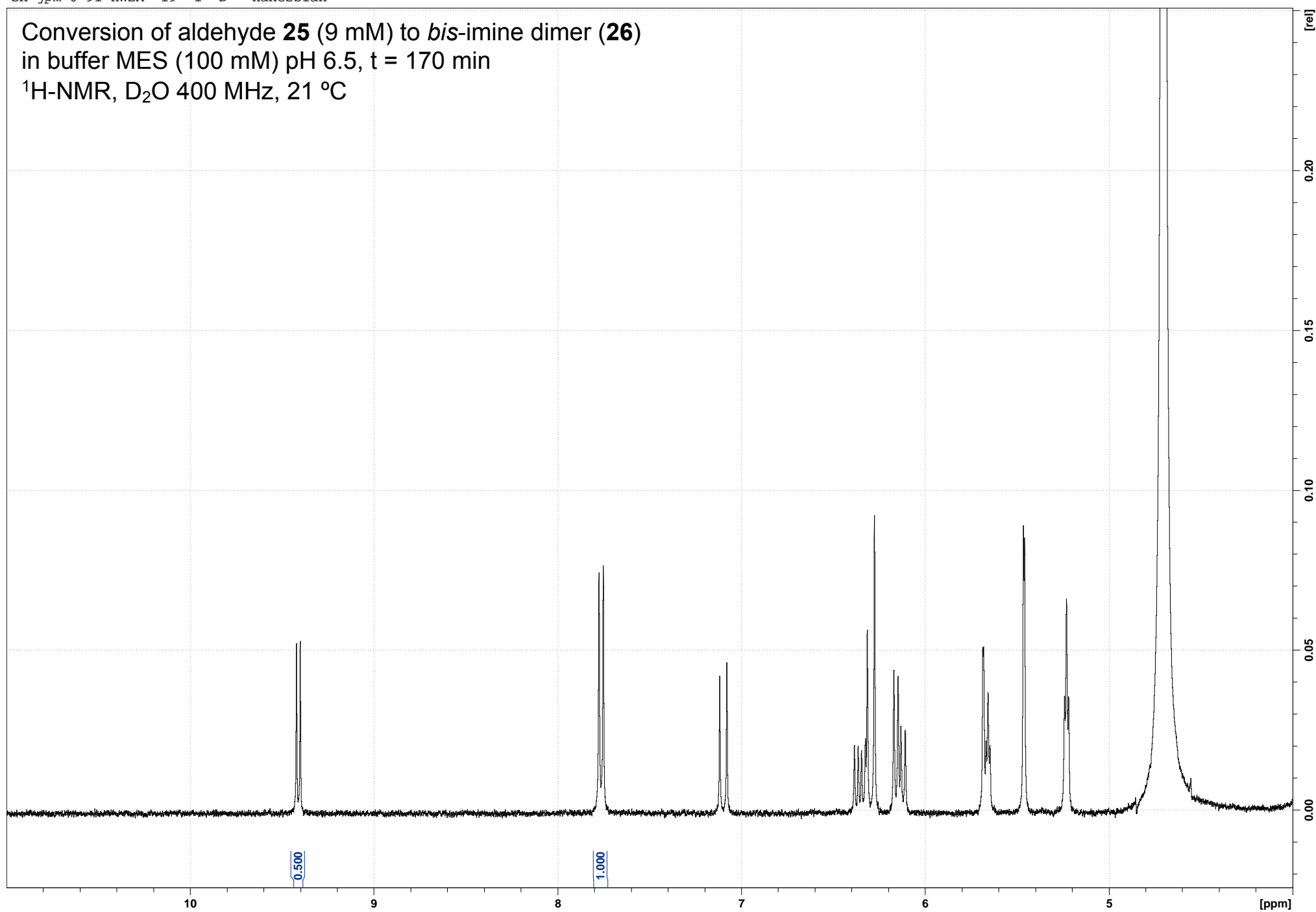
sh-jpm-6-91-HWEA 18 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 160 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



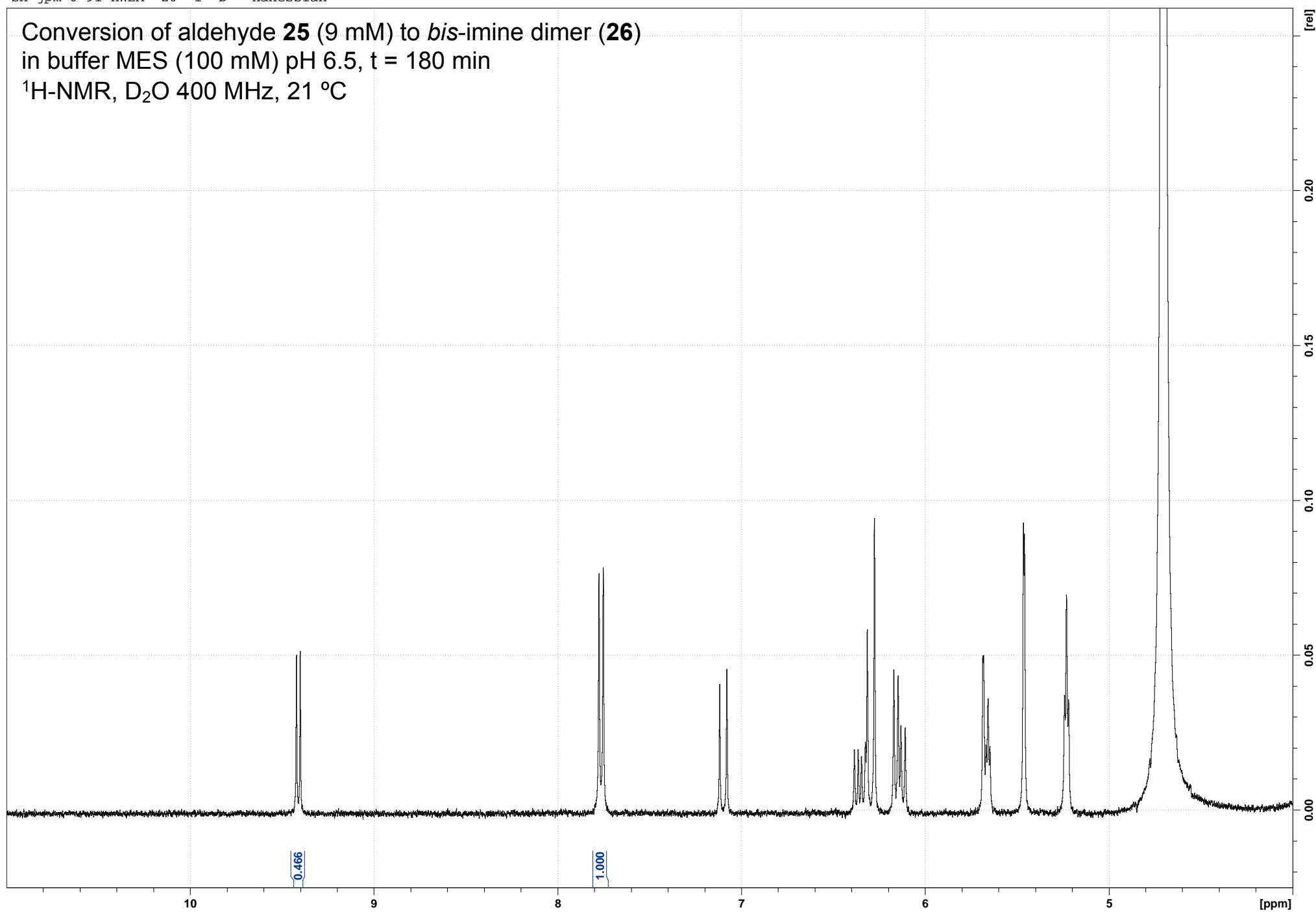
sh-jpm-6-91-HWEA 19 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 170 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



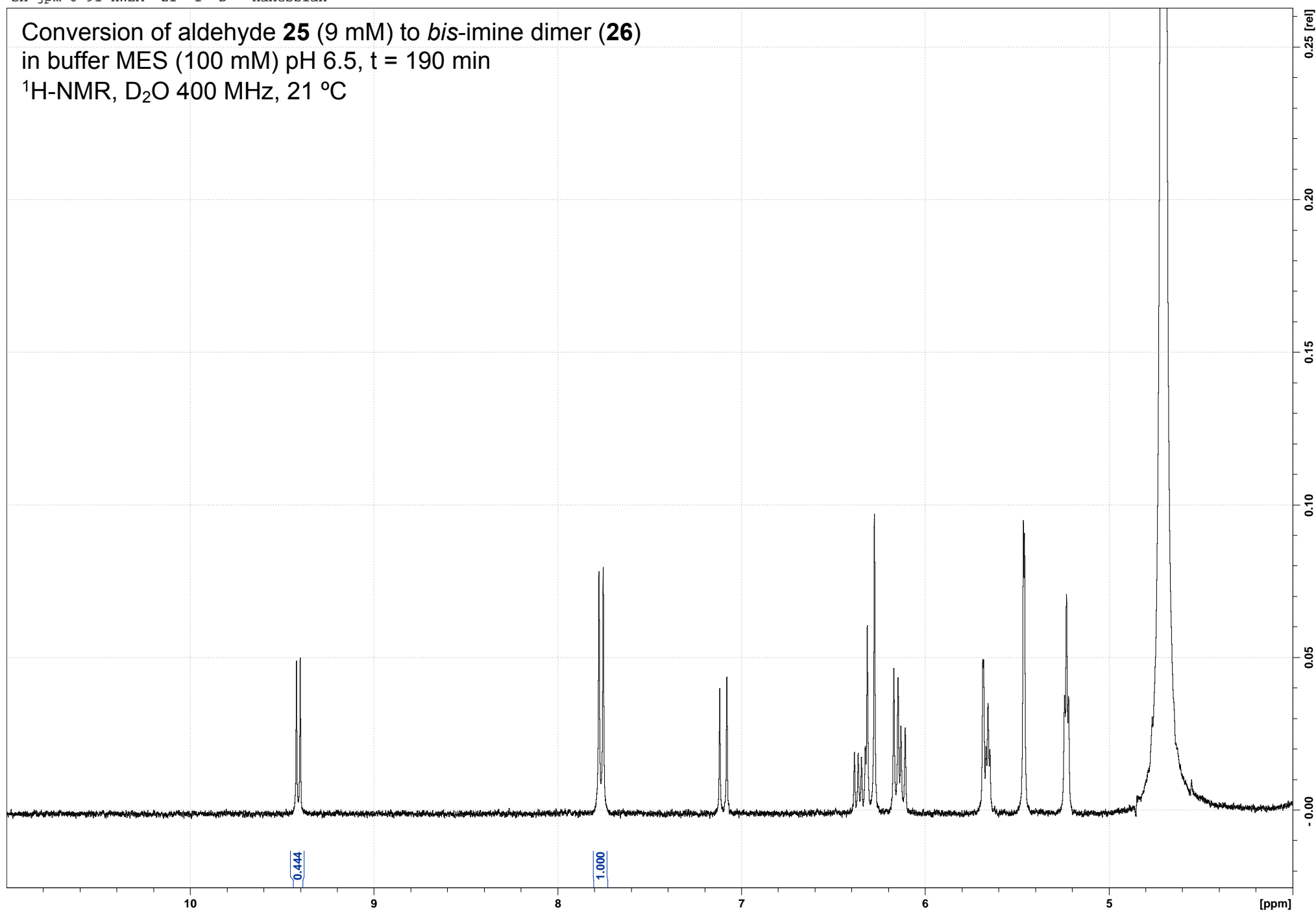
sh-jpm-6-91-HWEA 20 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 180 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



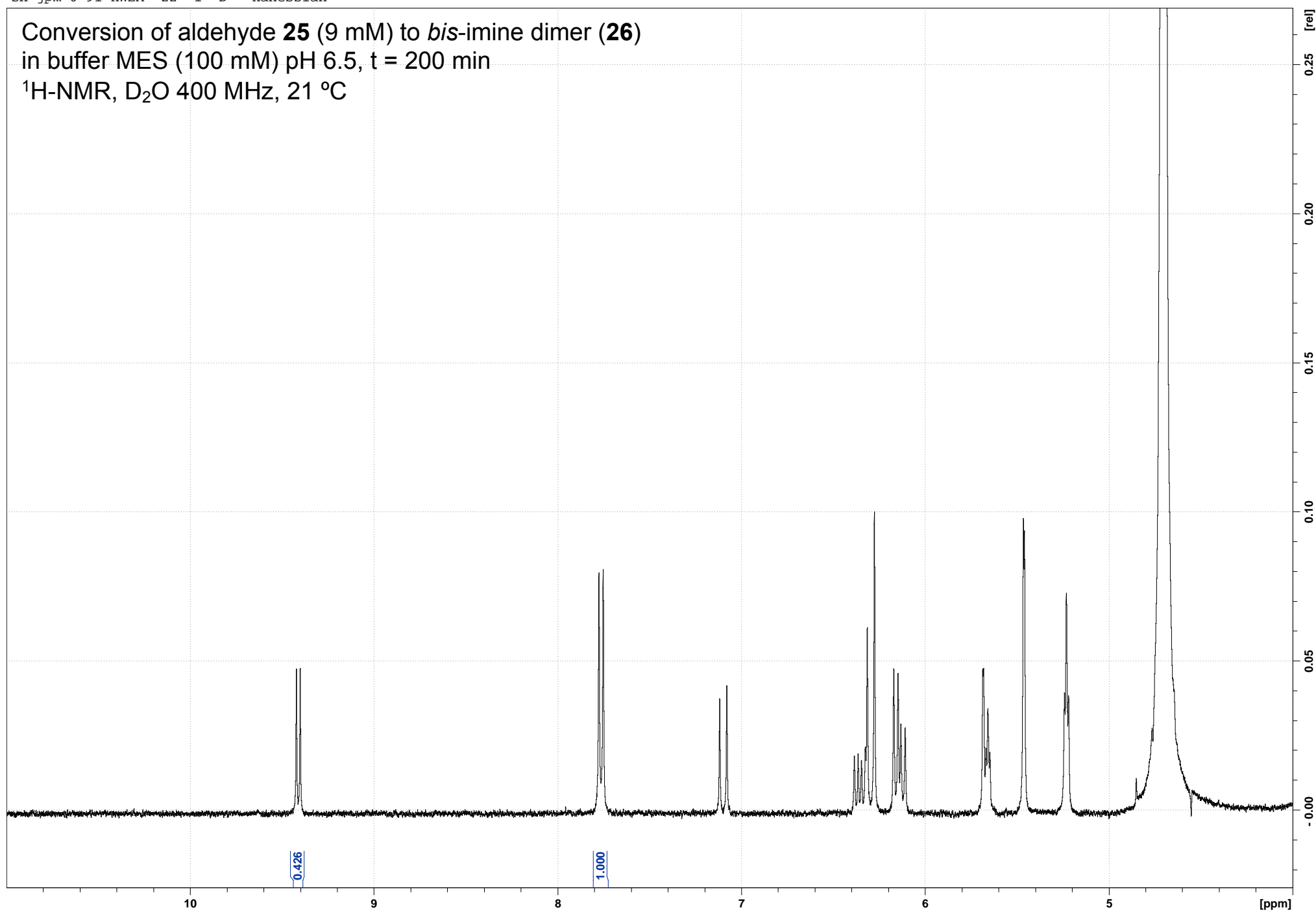
sh-jpm-6-91-HWEA 21 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 190 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



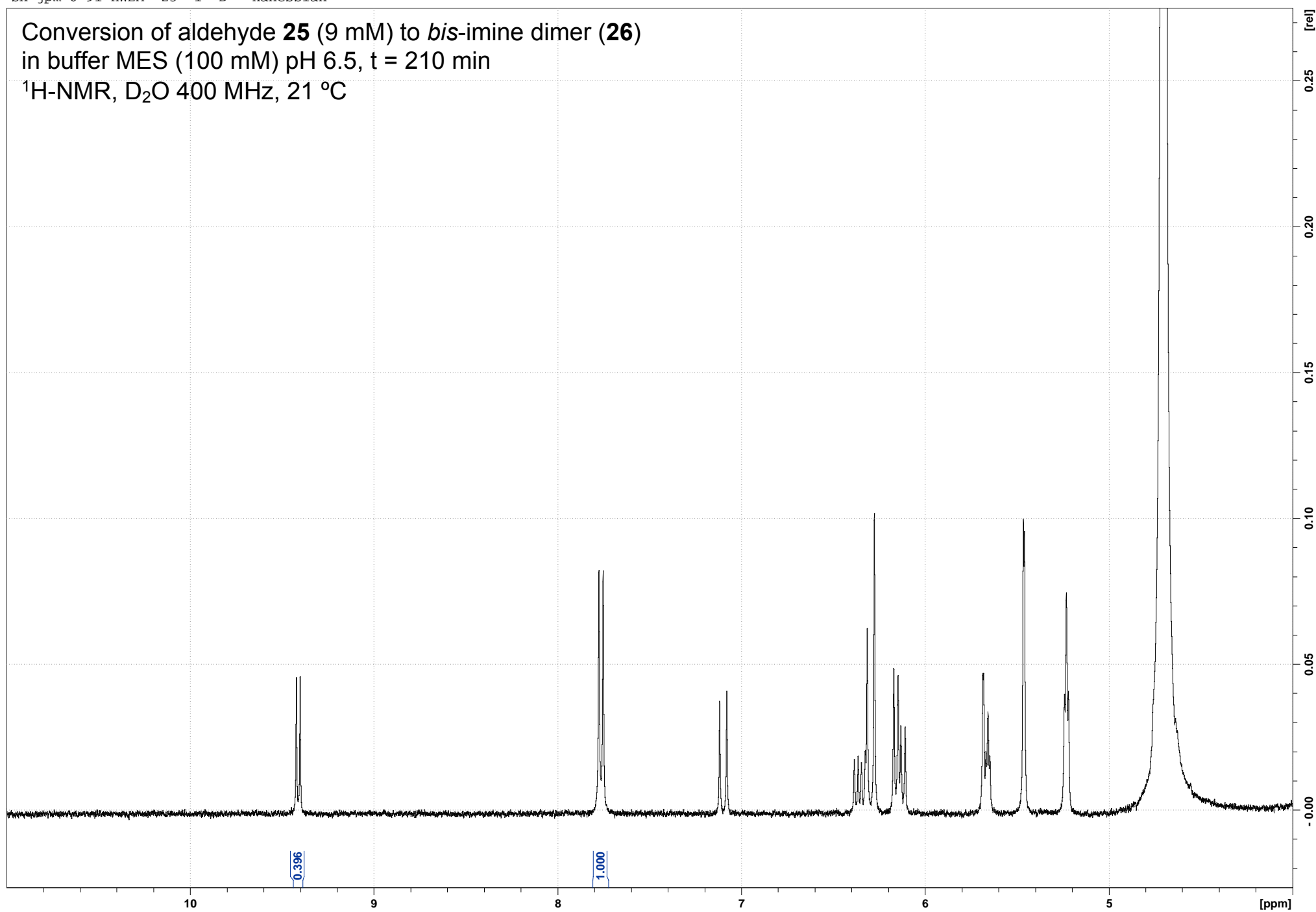
sh-jpm-6-91-HWEA 22 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 200 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



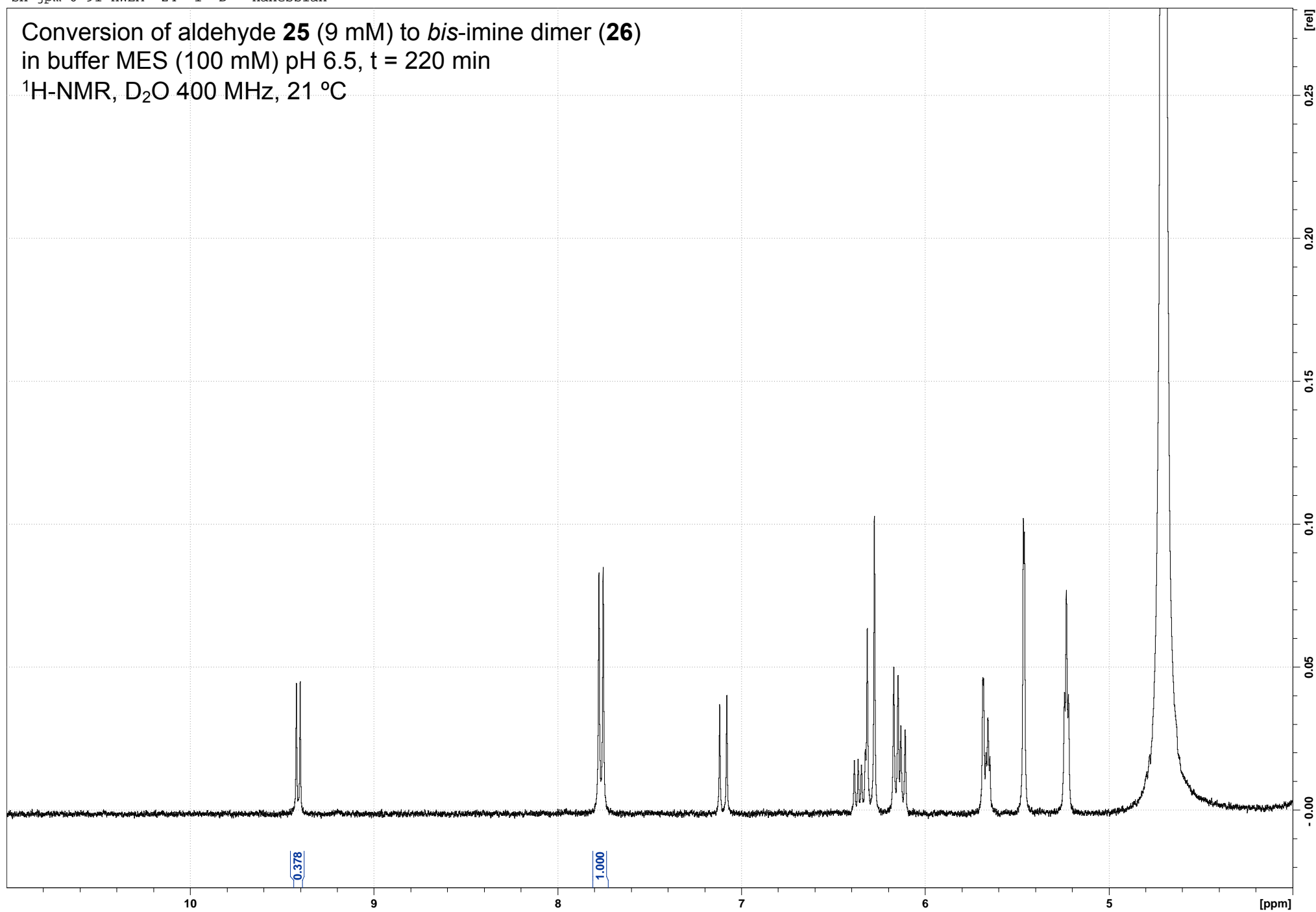
sh-jpm-6-91-HWEA 23 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 210 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



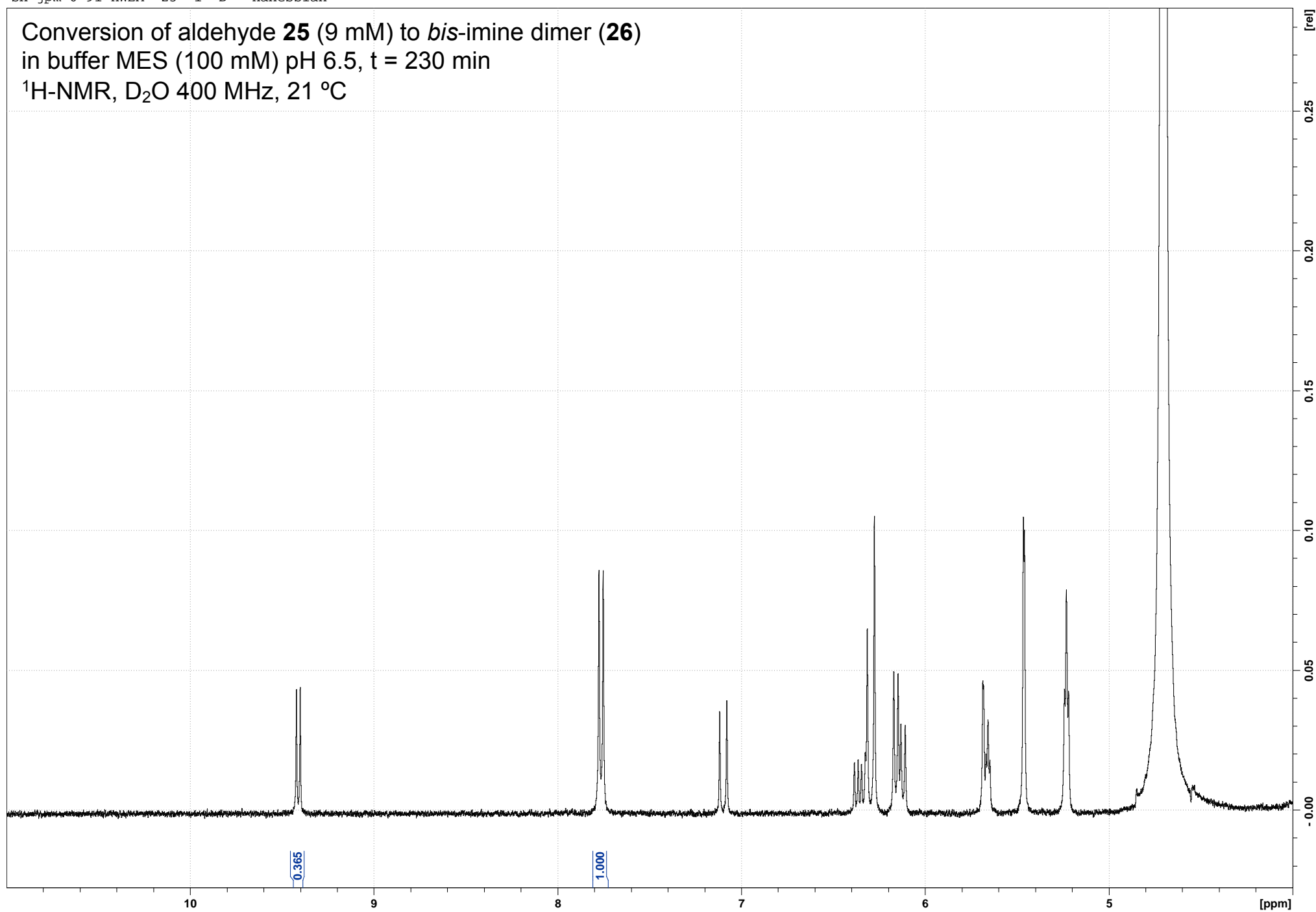
sh-jpm-6-91-HWEA 24 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 220 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-HWEA 25 1 D: Hanessian

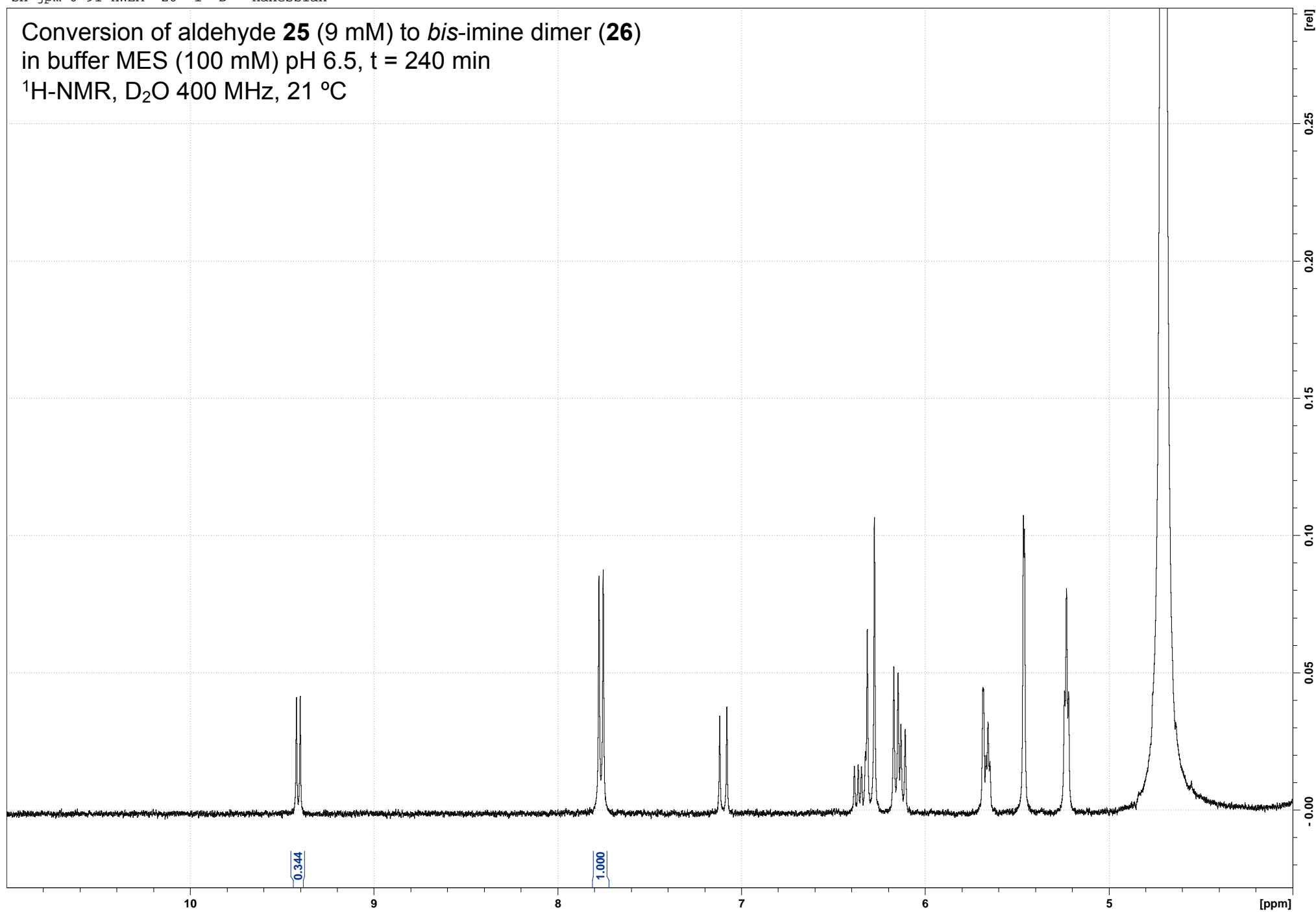
Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 230 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





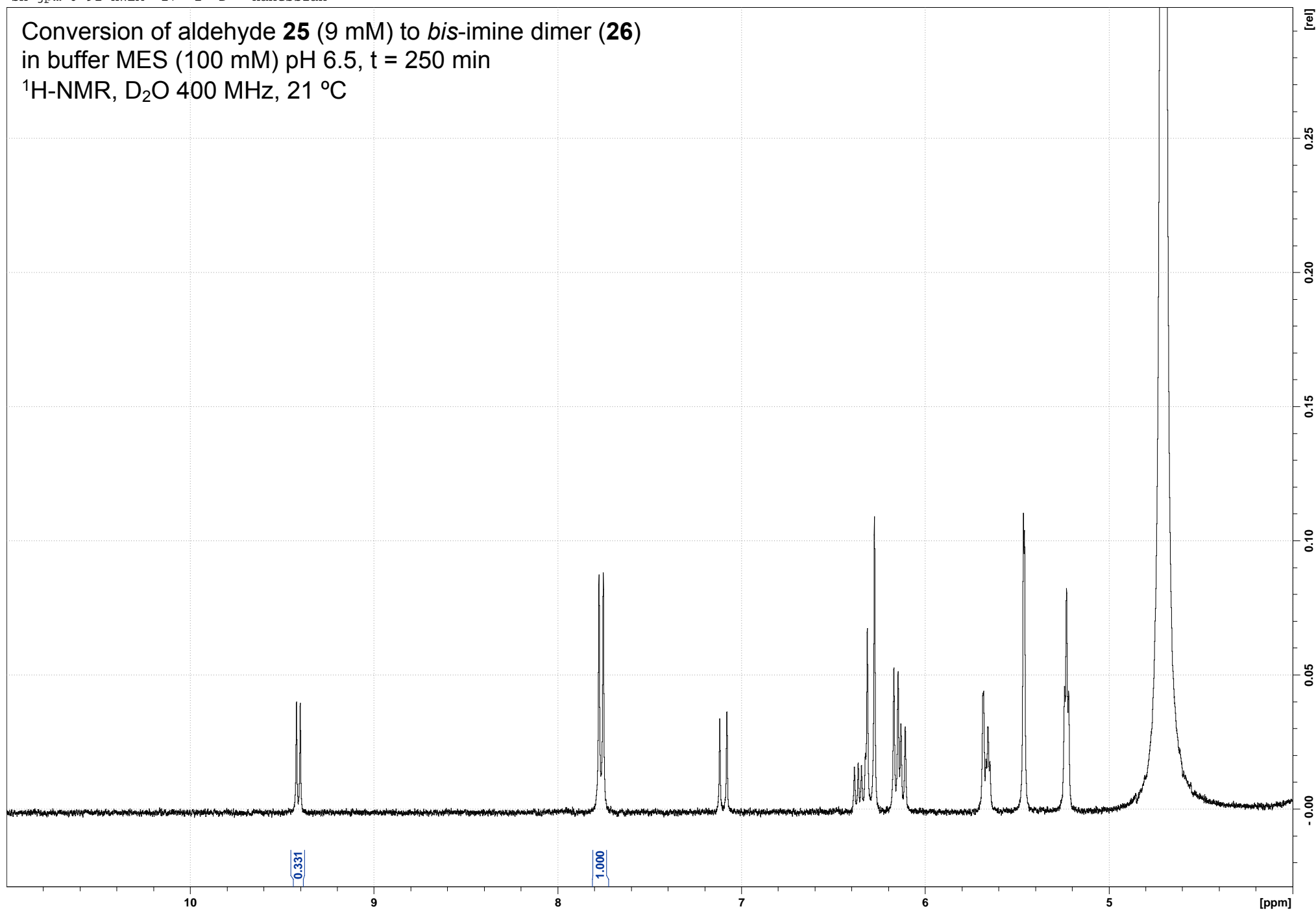
sh-jpm-6-91-HWEA 26 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 240 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



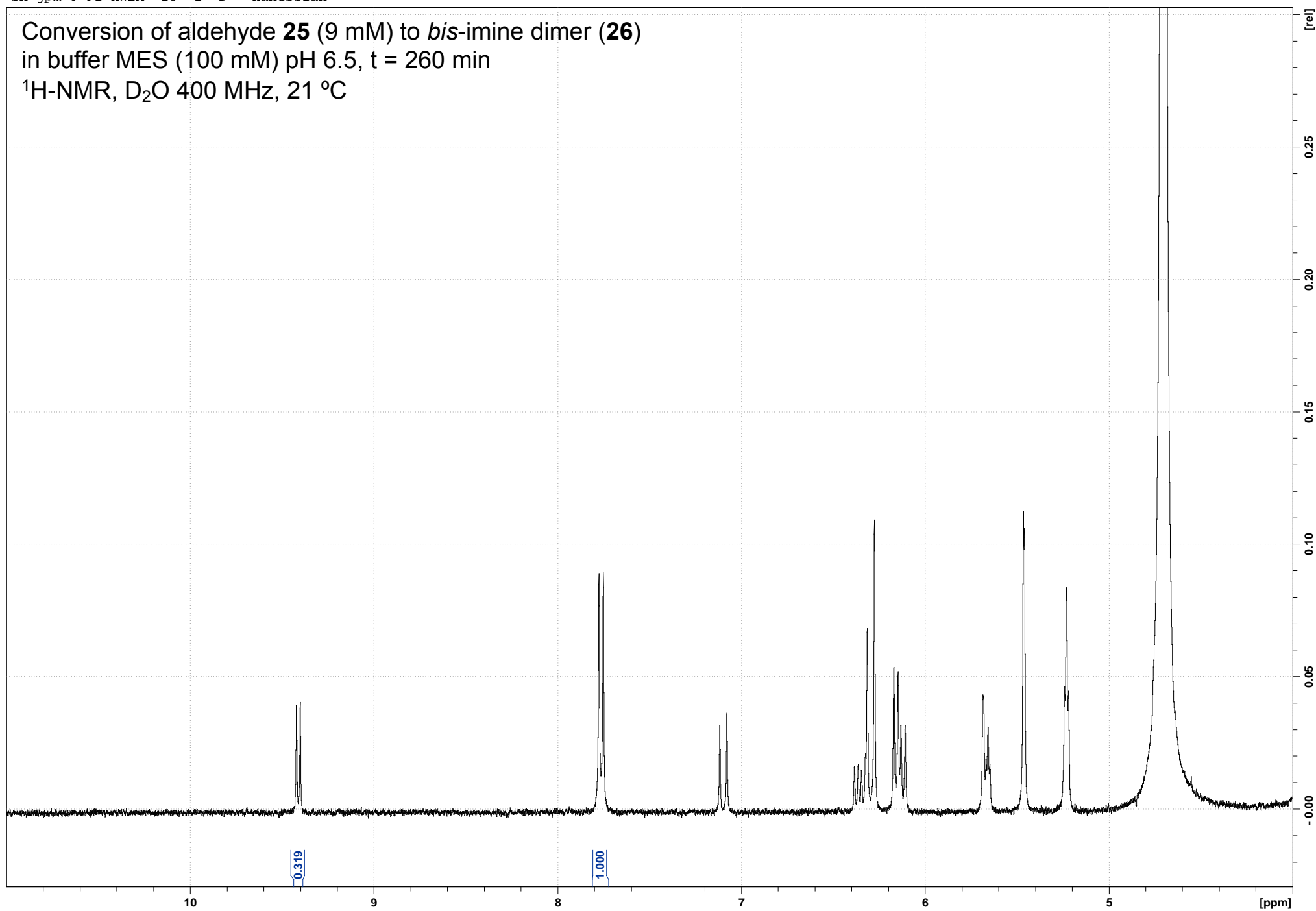
sh-jpm-6-91-HWEA 27 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 250 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



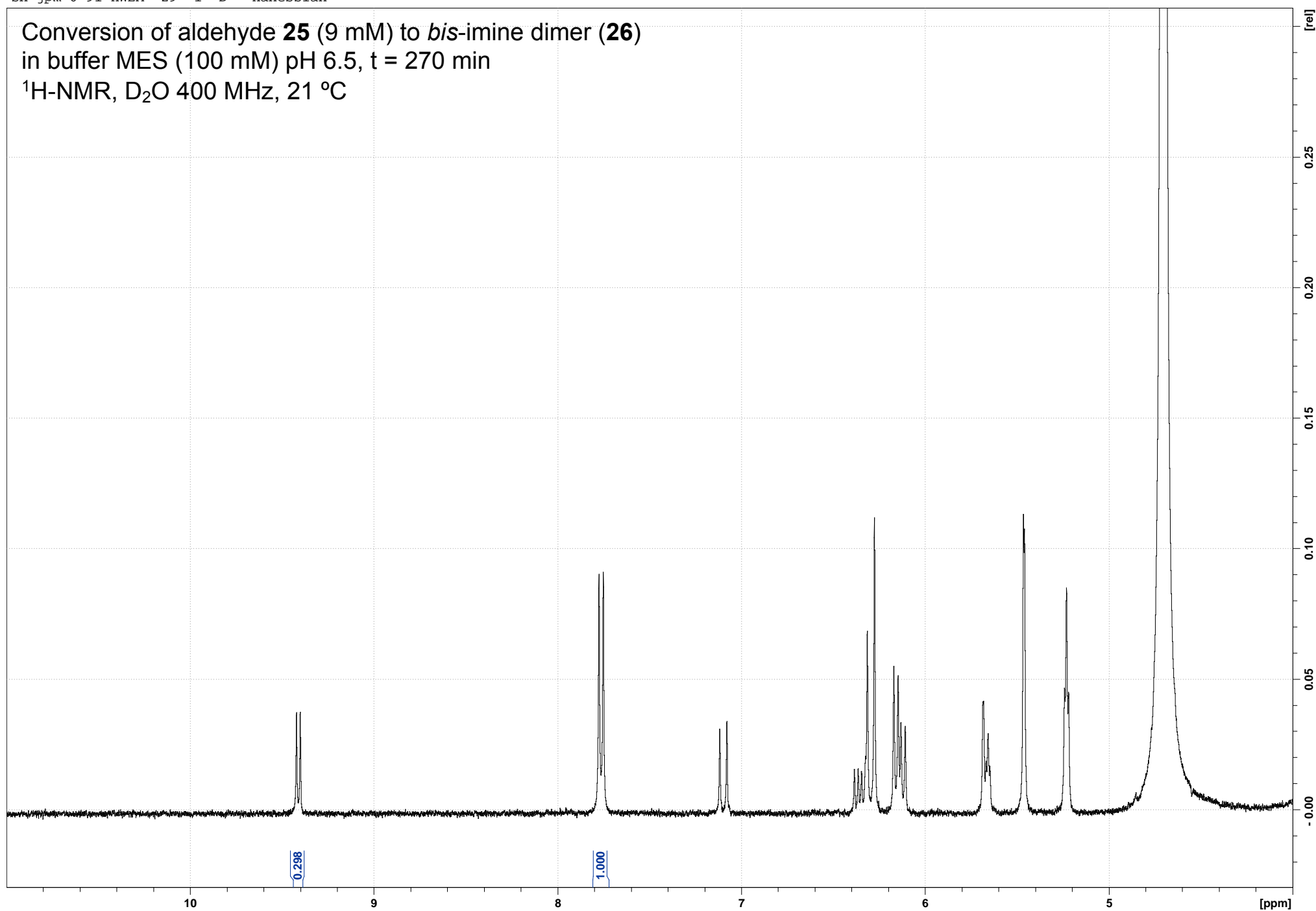
sh-jpm-6-91-HWEA 28 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 260 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



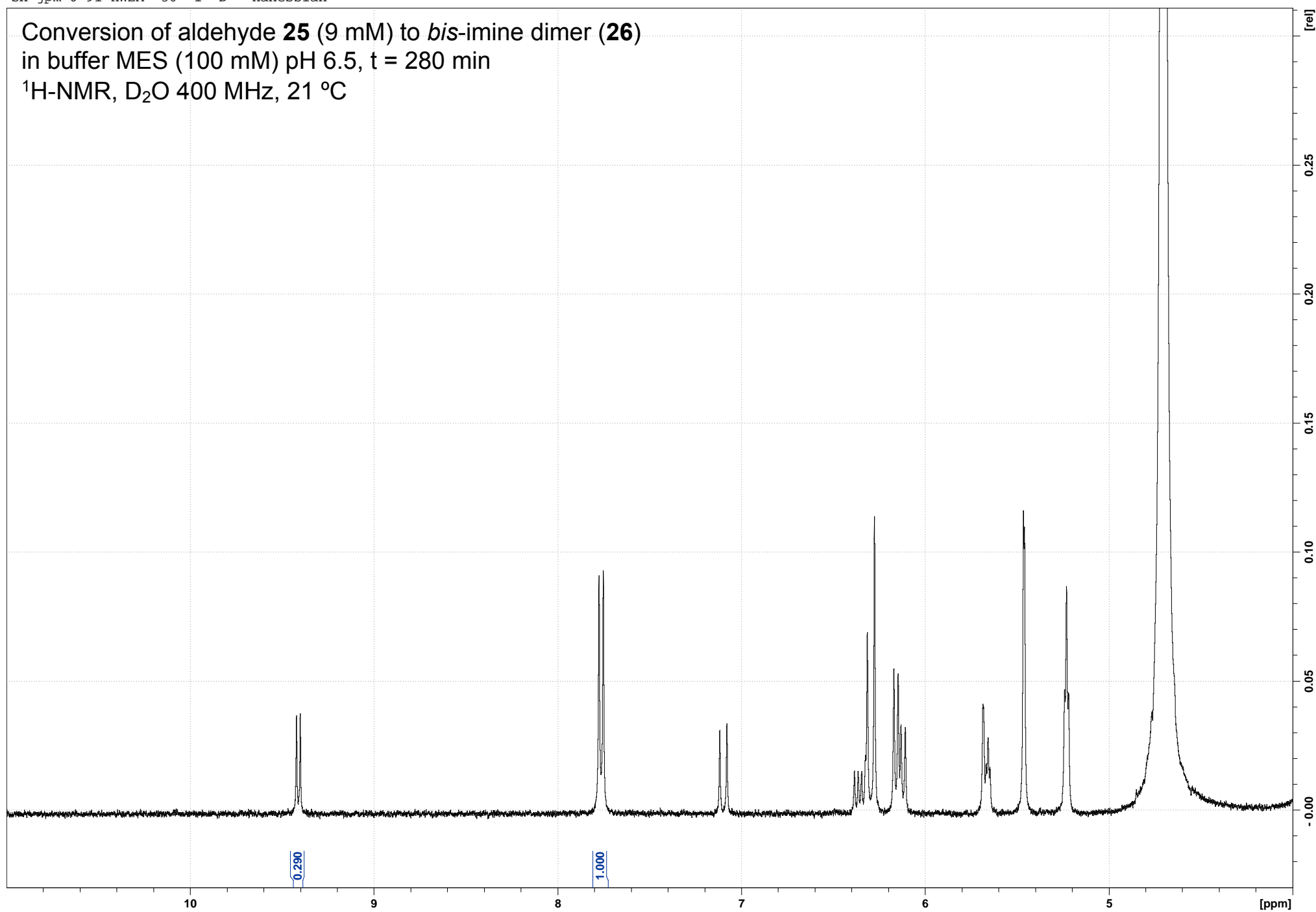
sh-jpm-6-91-HWEA 29 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 270 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



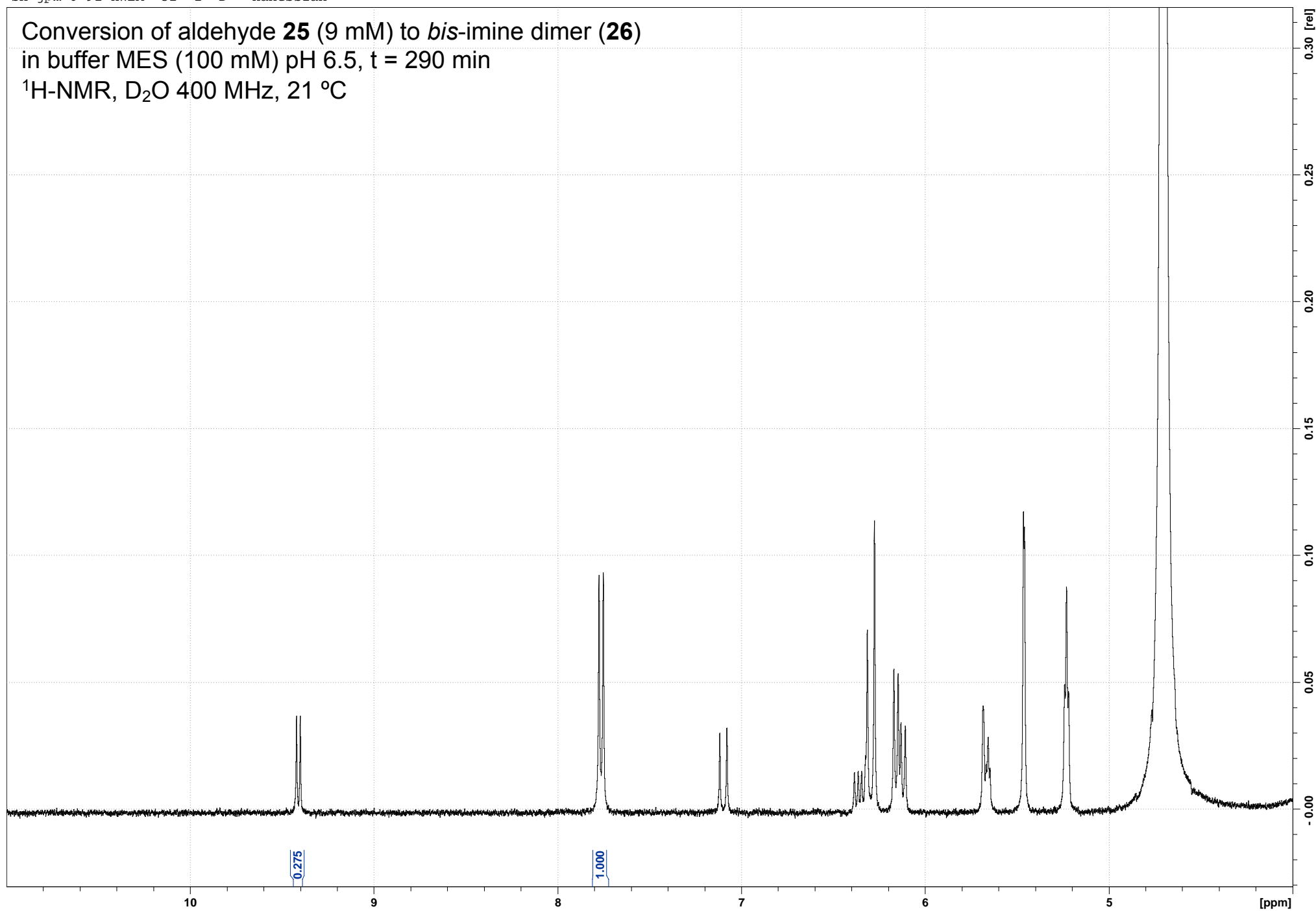
sh-jpm-6-91-HWEA 30 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 280 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



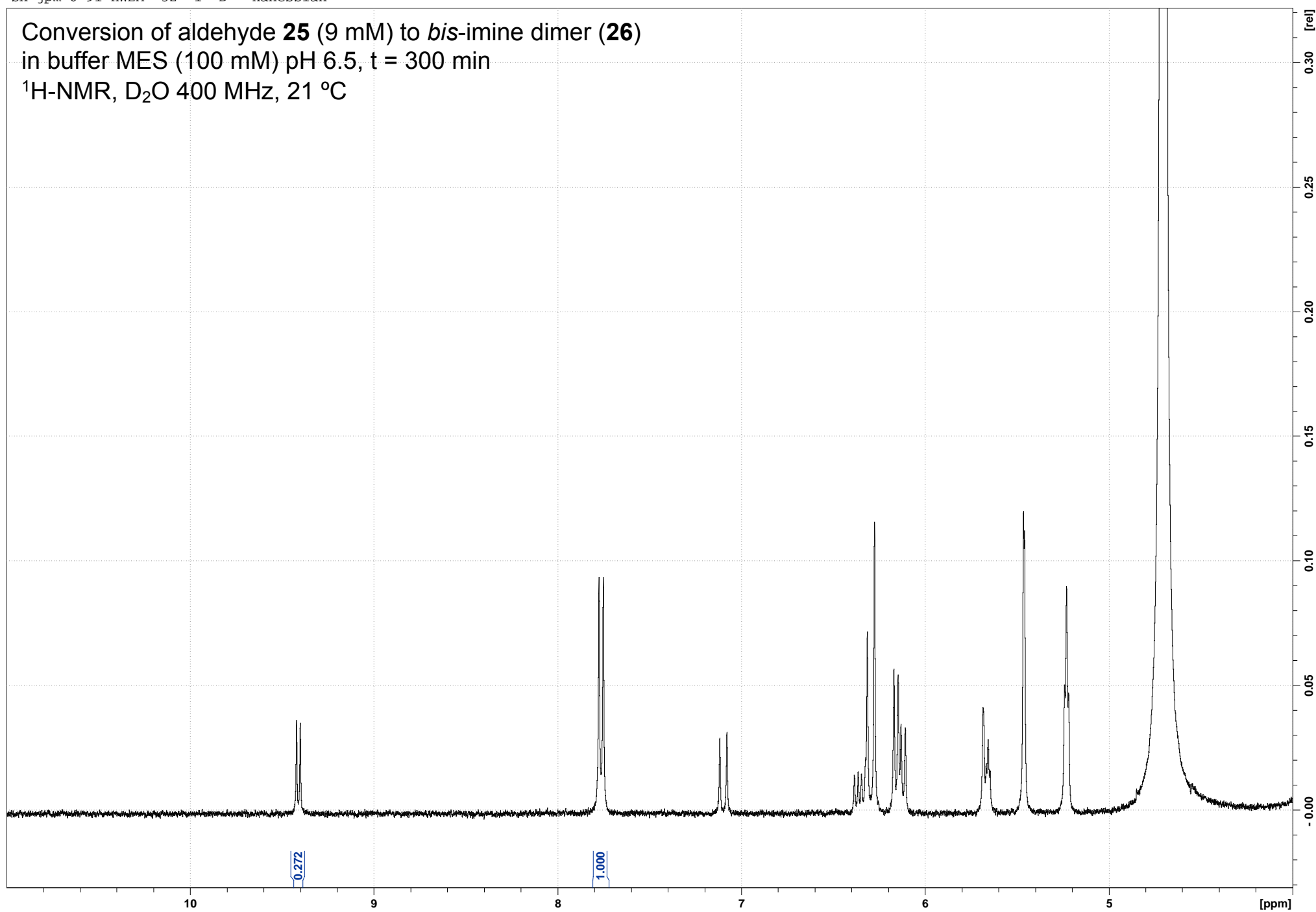
sh-jpm-6-91-HWEA 31 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 290 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



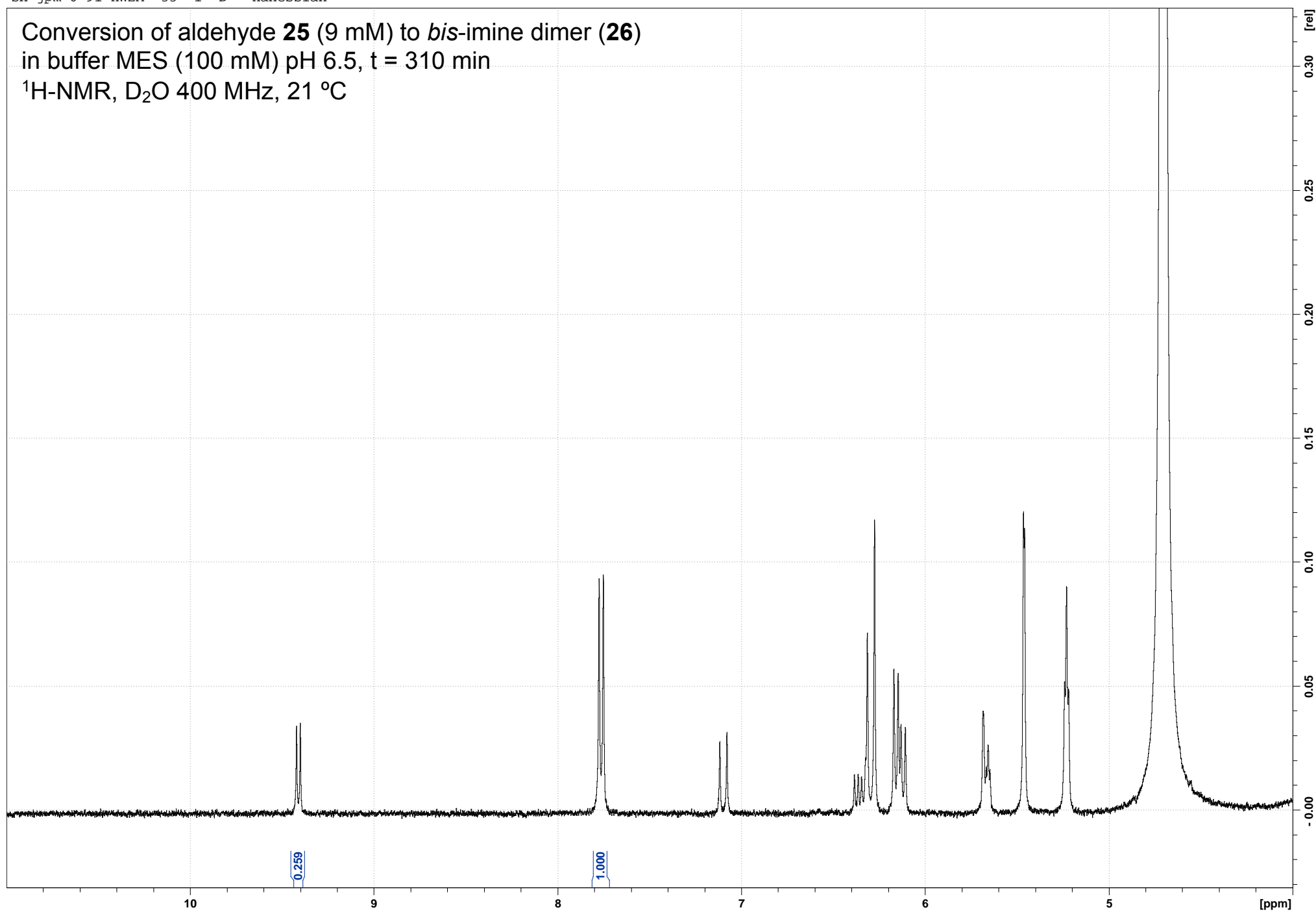
sh-jpm-6-91-HWEA 32 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 300 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-HWEA 33 1 D: Hanessian

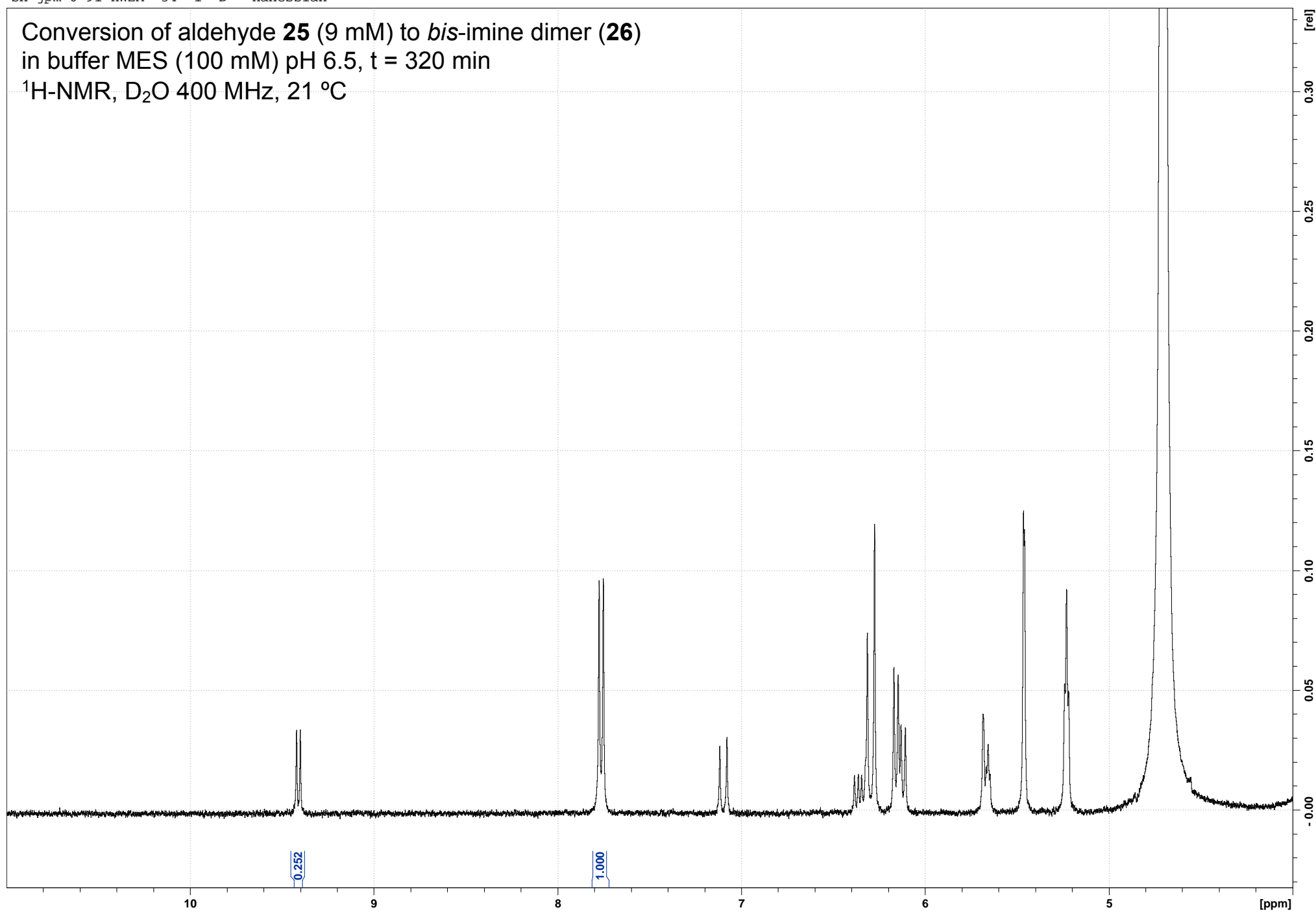
Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 310 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





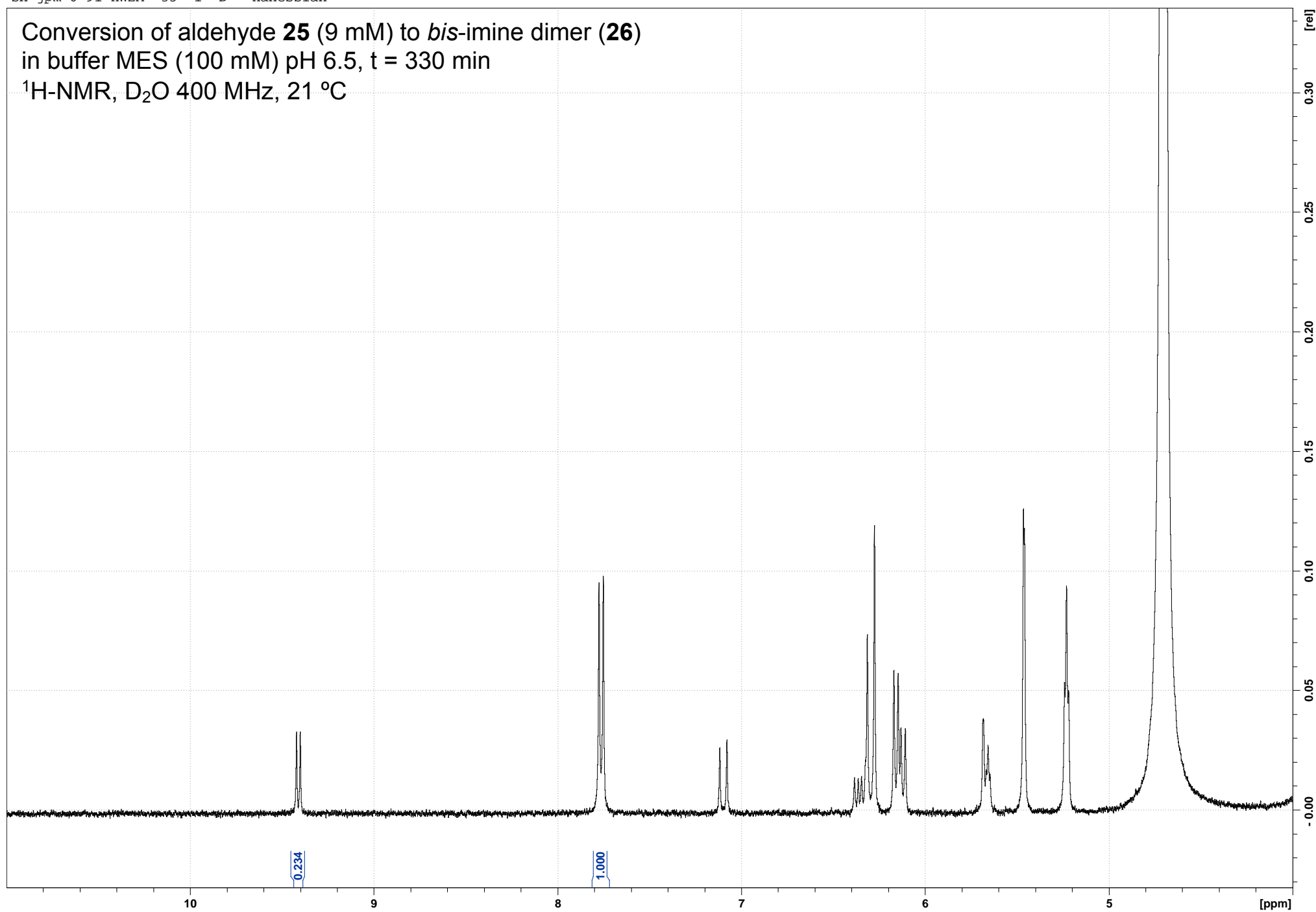
sh-jpm-6-91-HWEA 34 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 320 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



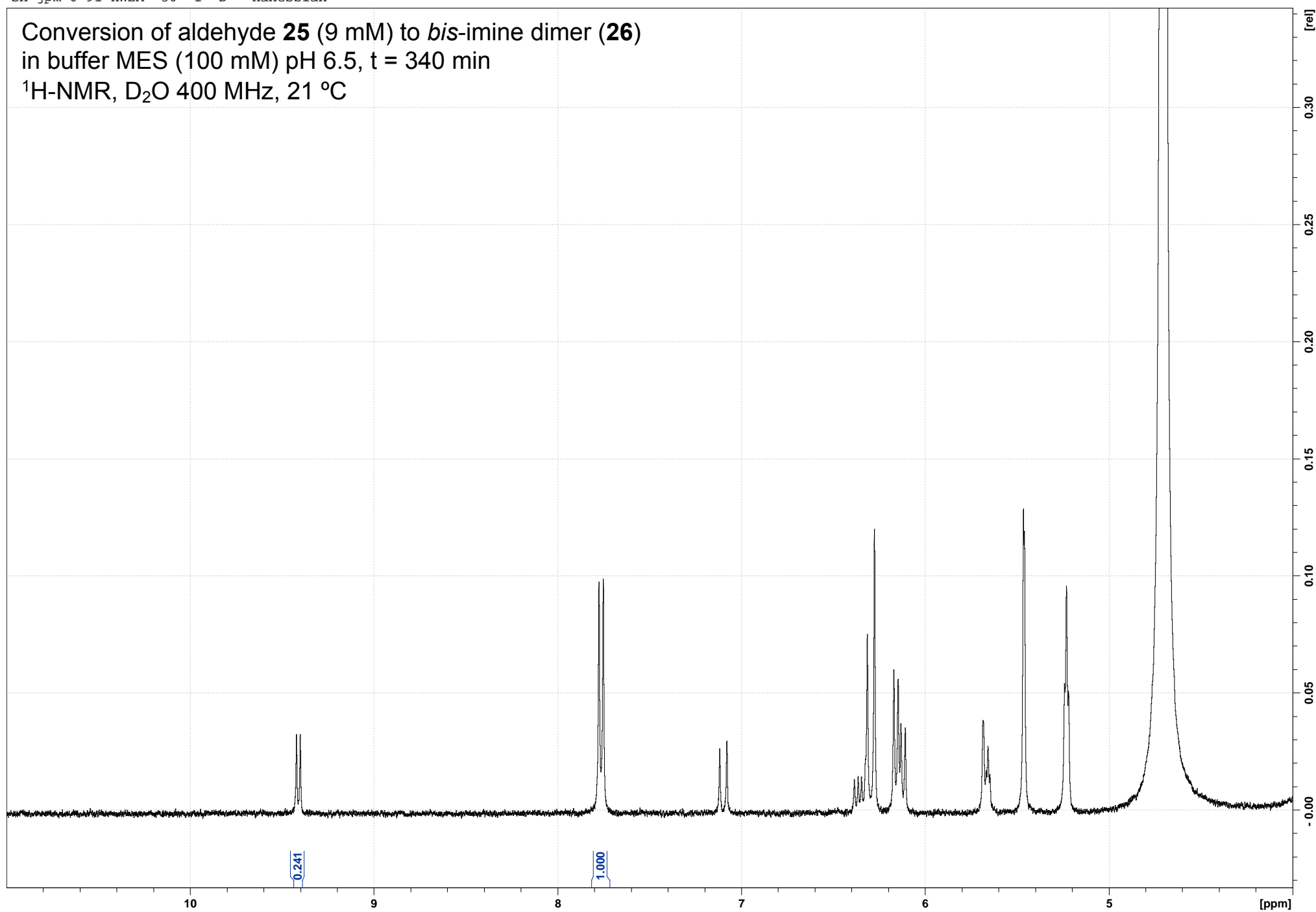
sh-jpm-6-91-HWEA 35 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 330 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



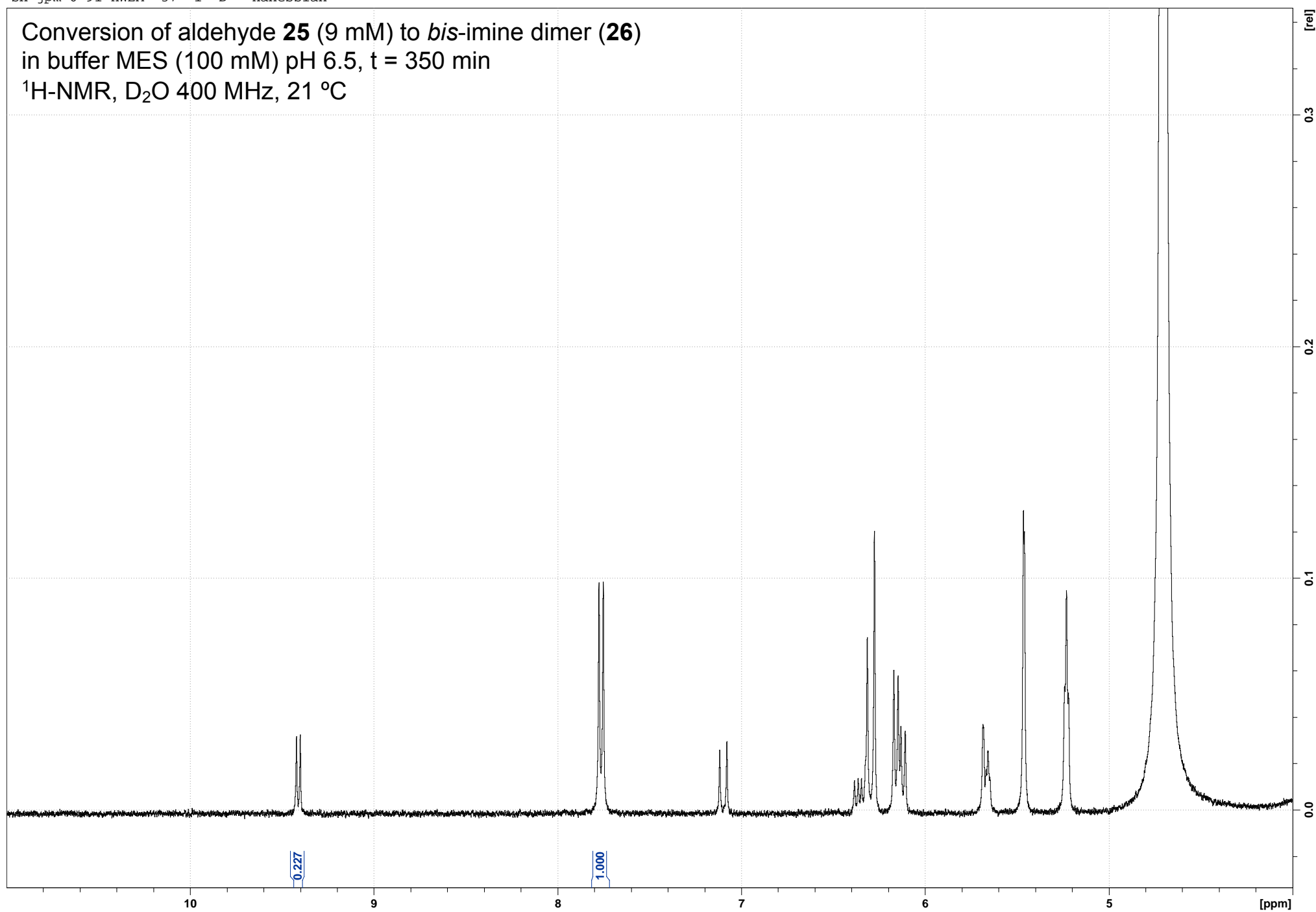
sh-jpm-6-91-HWEA 36 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 340 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



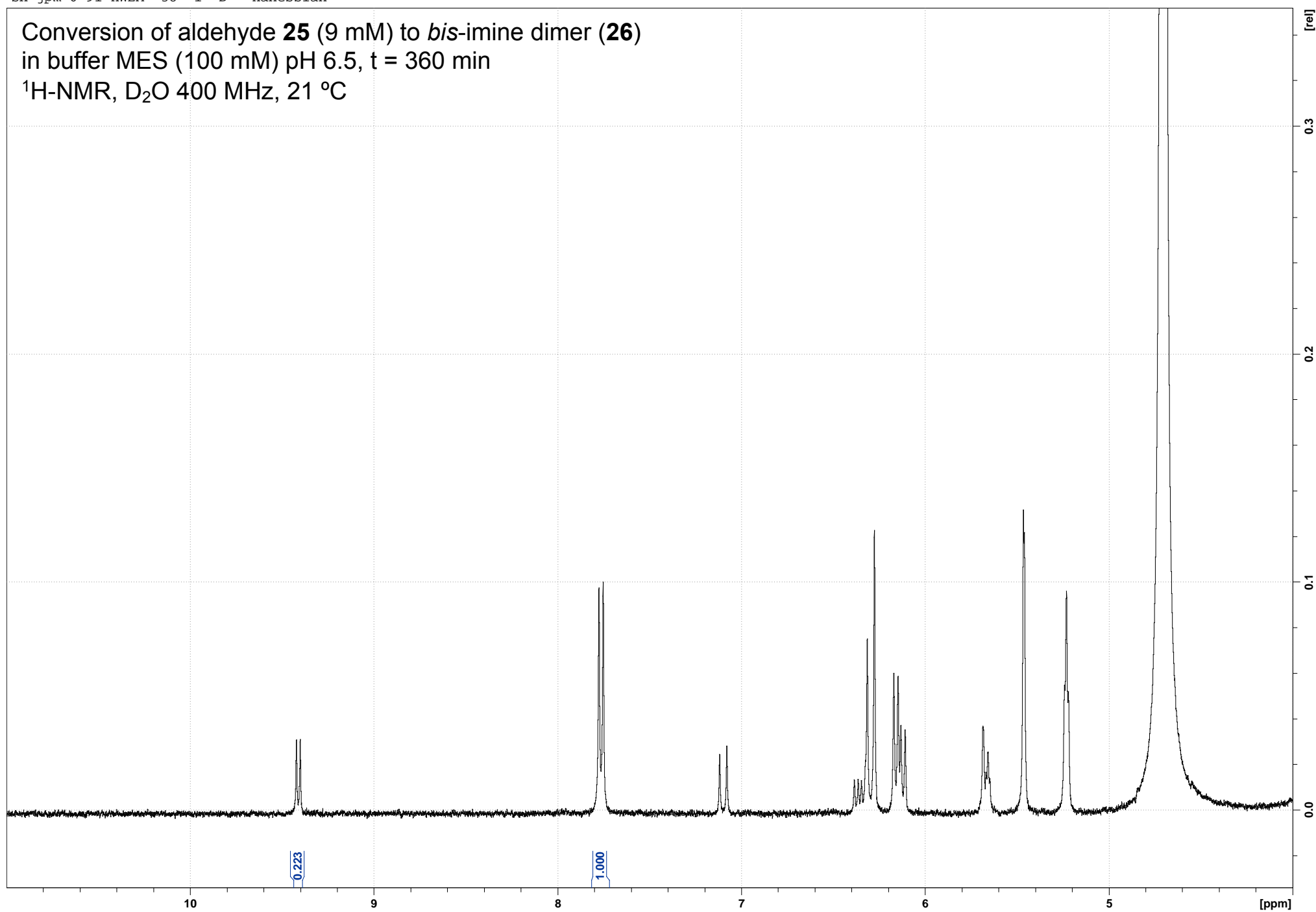
sh-jpm-6-91-HWEA 37 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 350 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



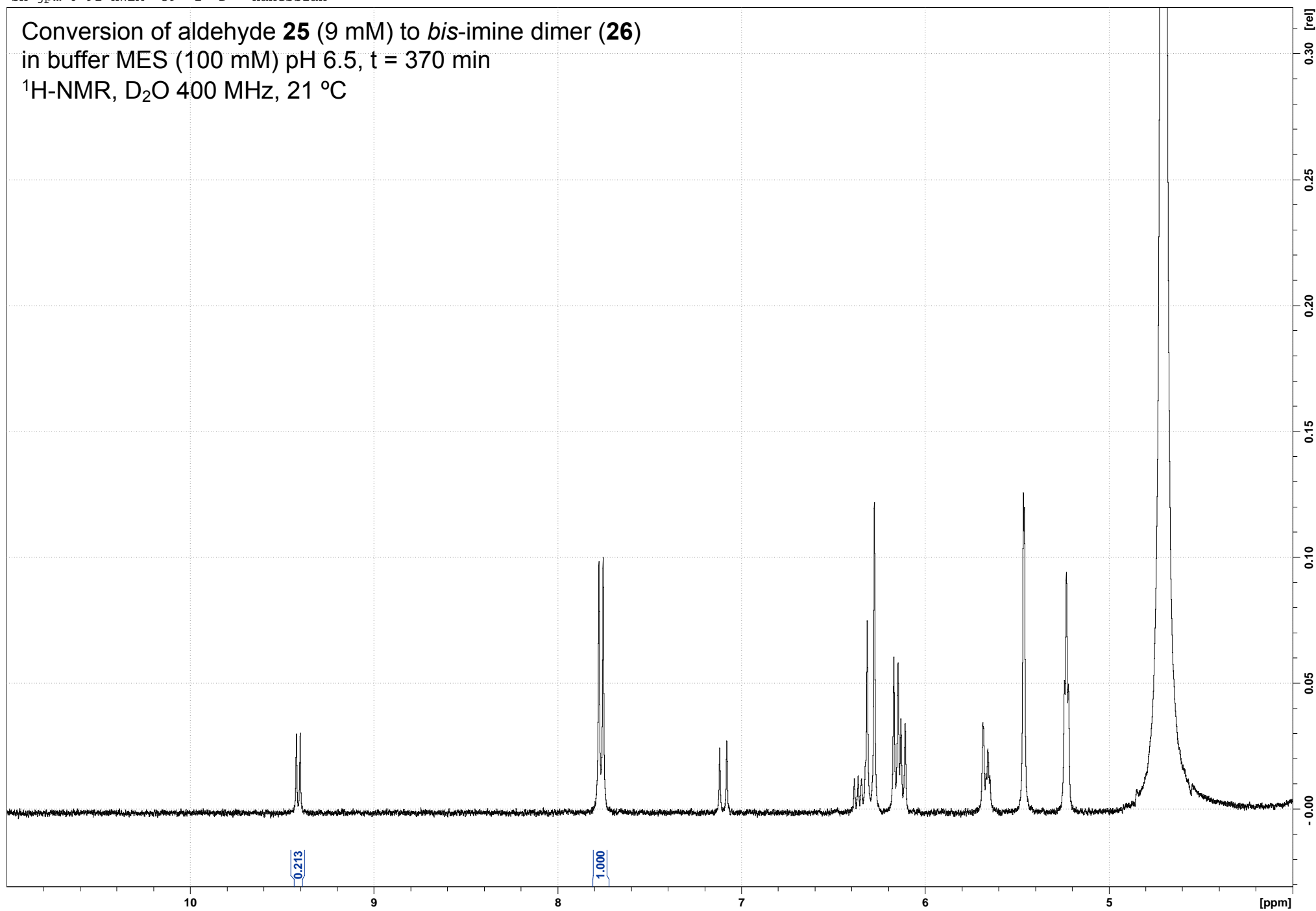
sh-jpm-6-91-HWEA 38 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 360 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



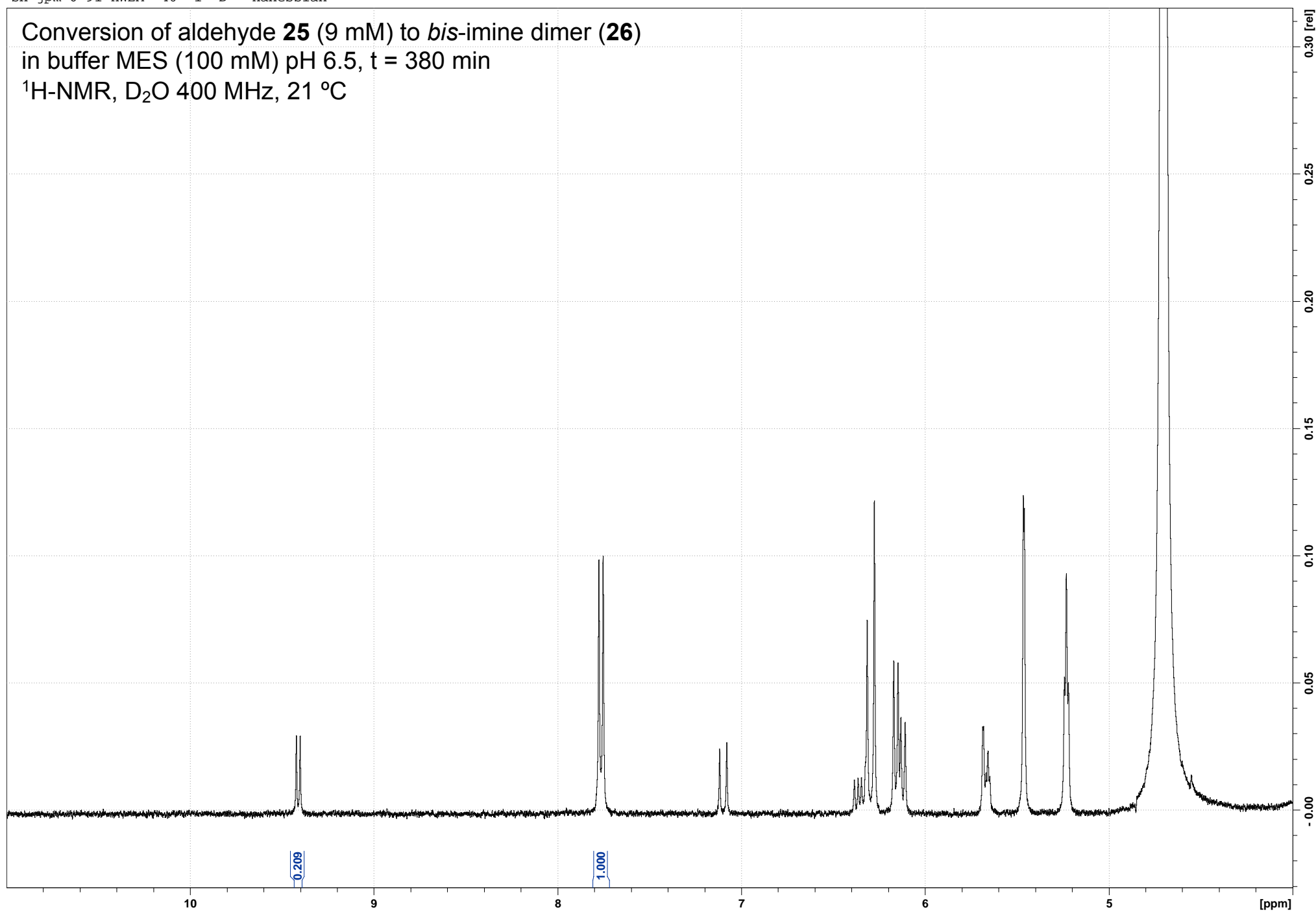
sh-jpm-6-91-HWEA 39 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 370 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



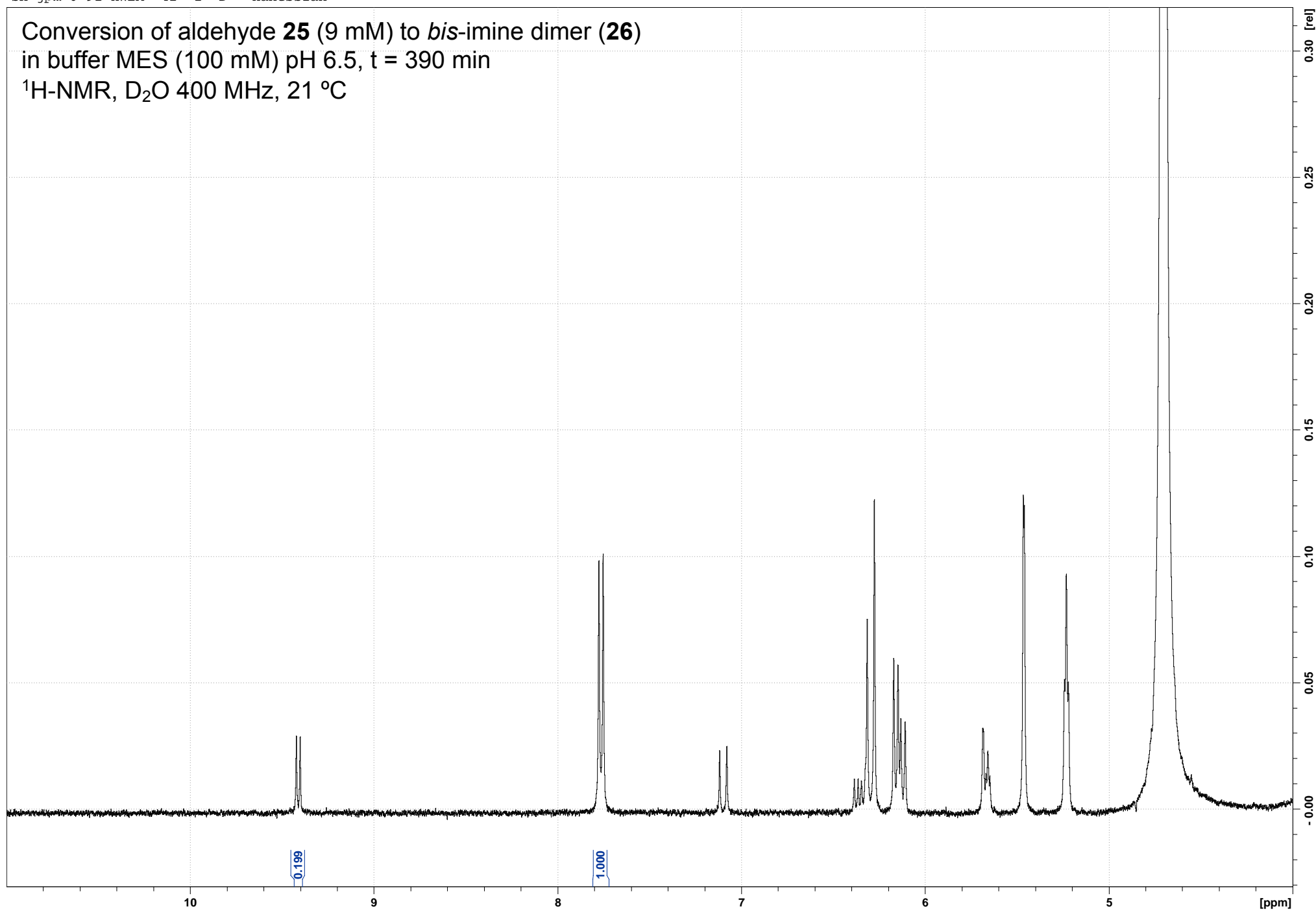
sh-jpm-6-91-HWEA 40 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 380 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-HWEA 41 1 D: Hanessian

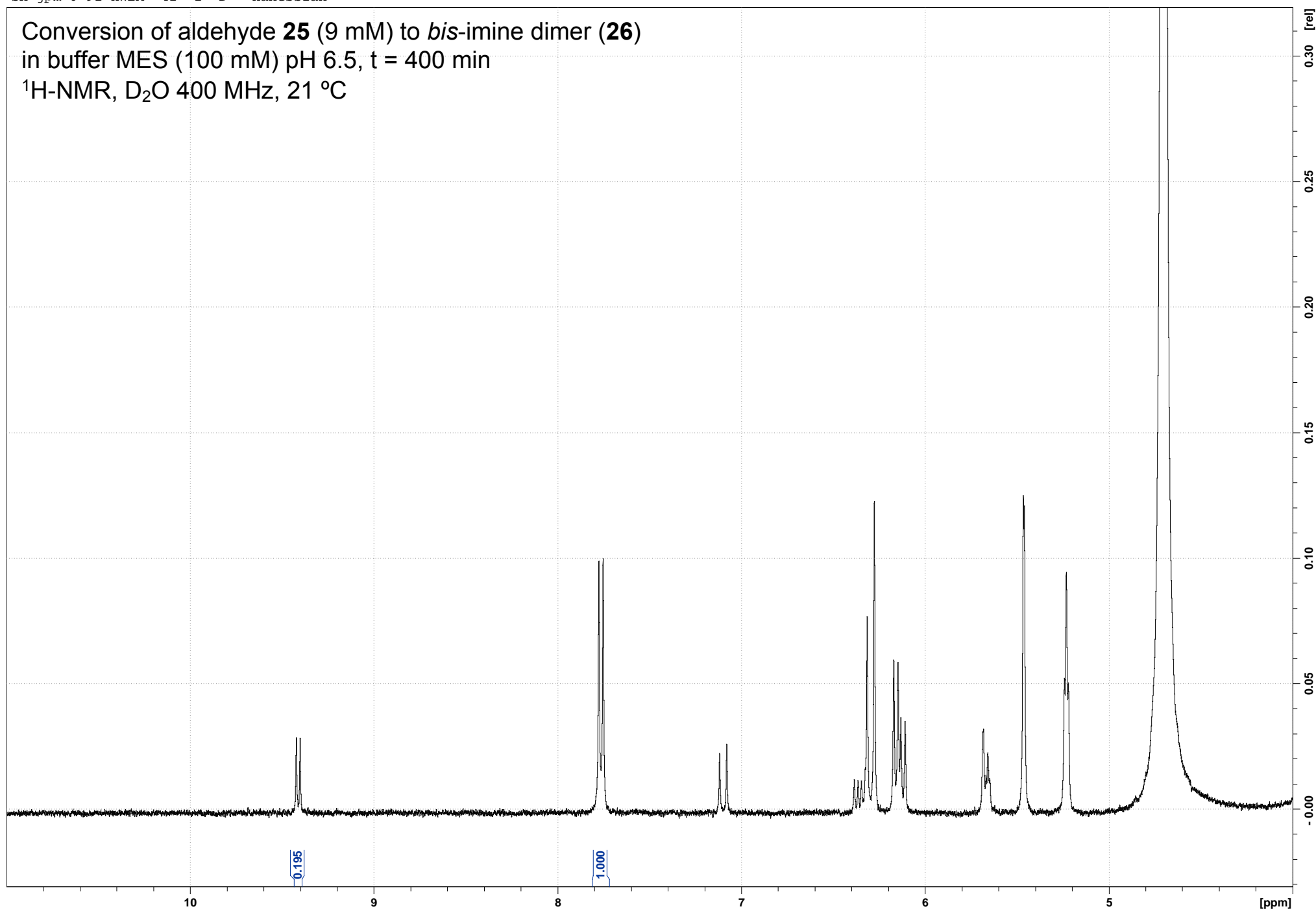
Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 390 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





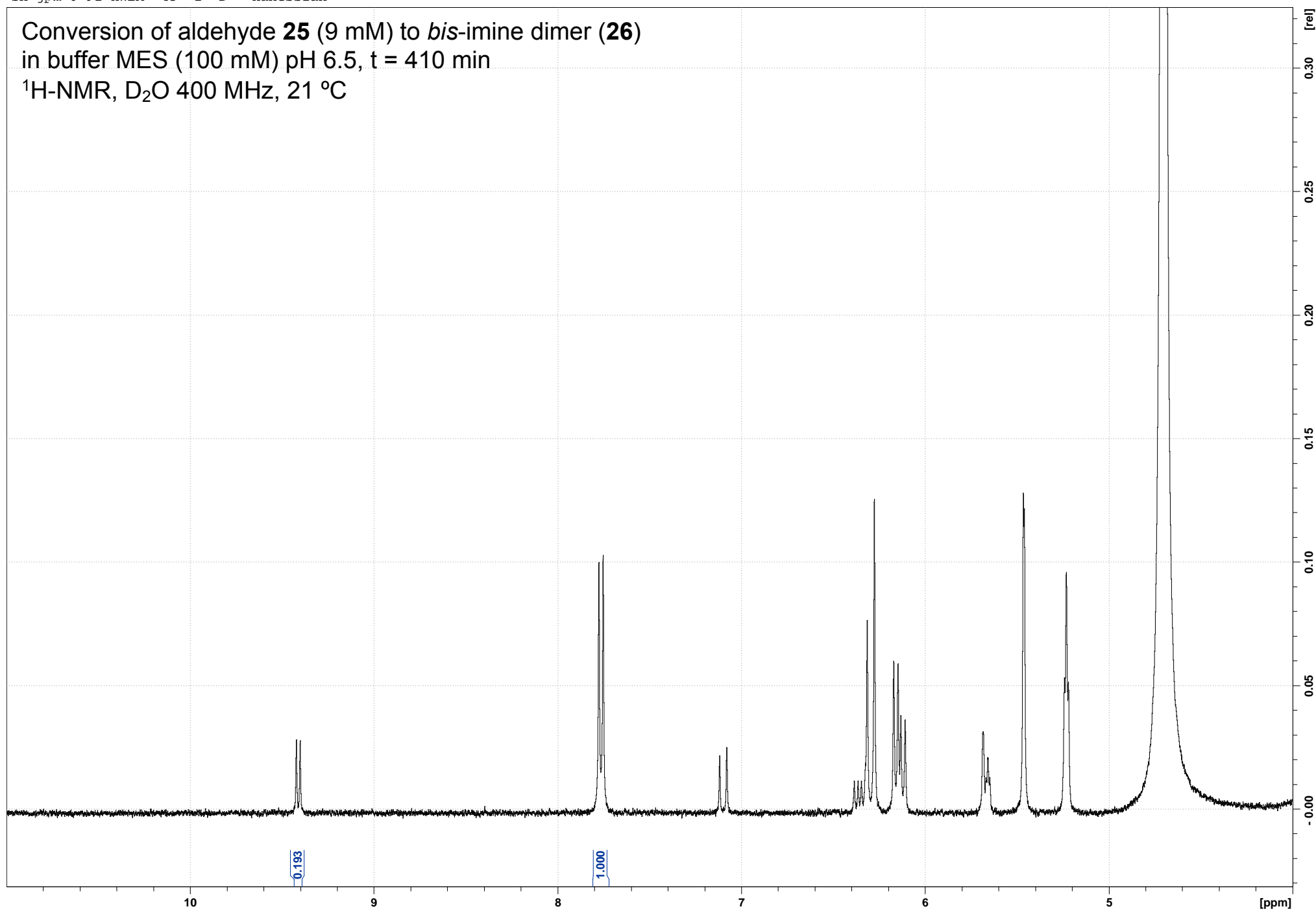
sh-jpm-6-91-HWEA 42 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 400 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



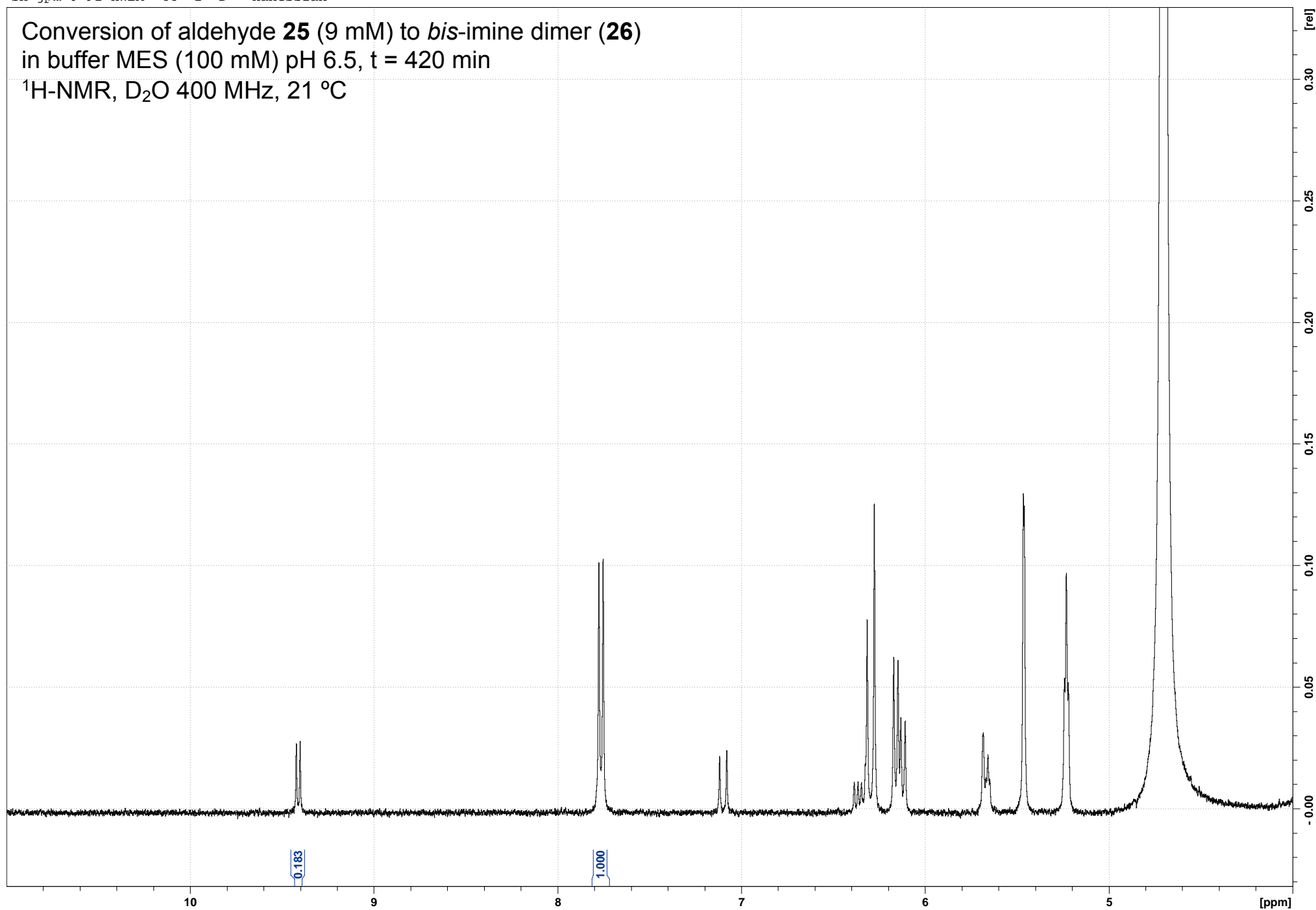
sh-jpm-6-91-HWEA 43 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 410 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



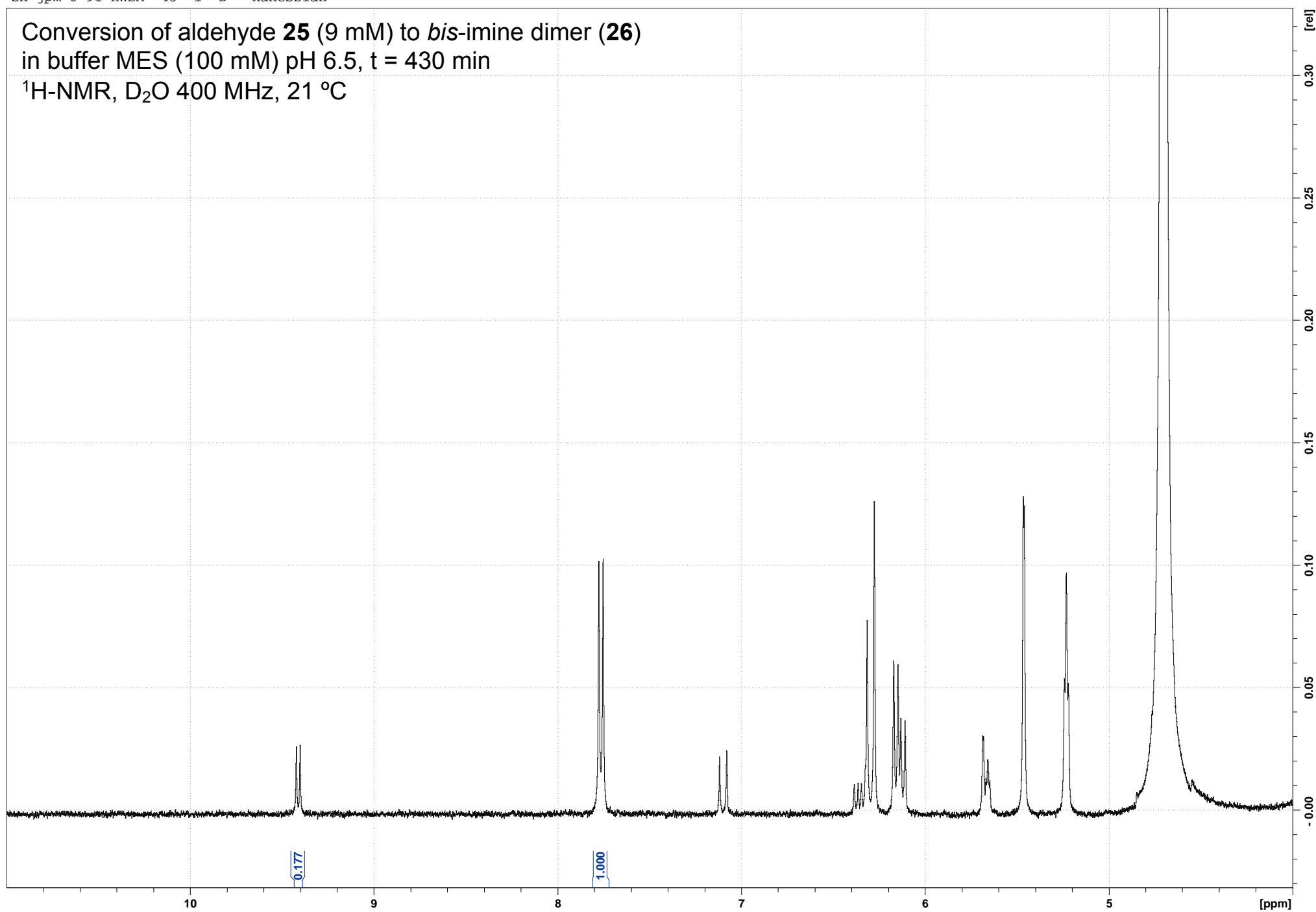
sh-jpm-6-91-HWEA 44 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 420 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



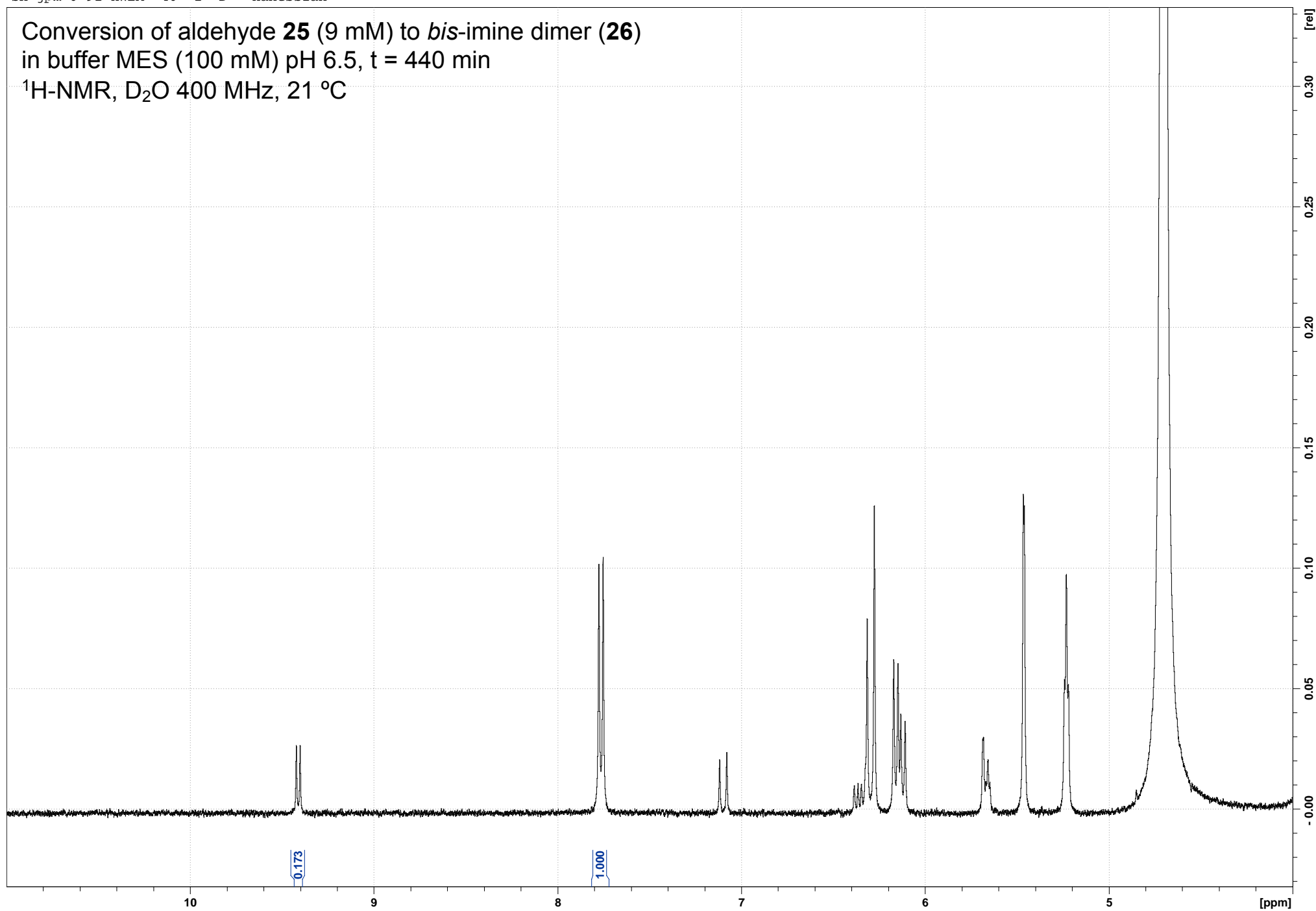
sh-jpm-6-91-HWEA 45 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 430 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



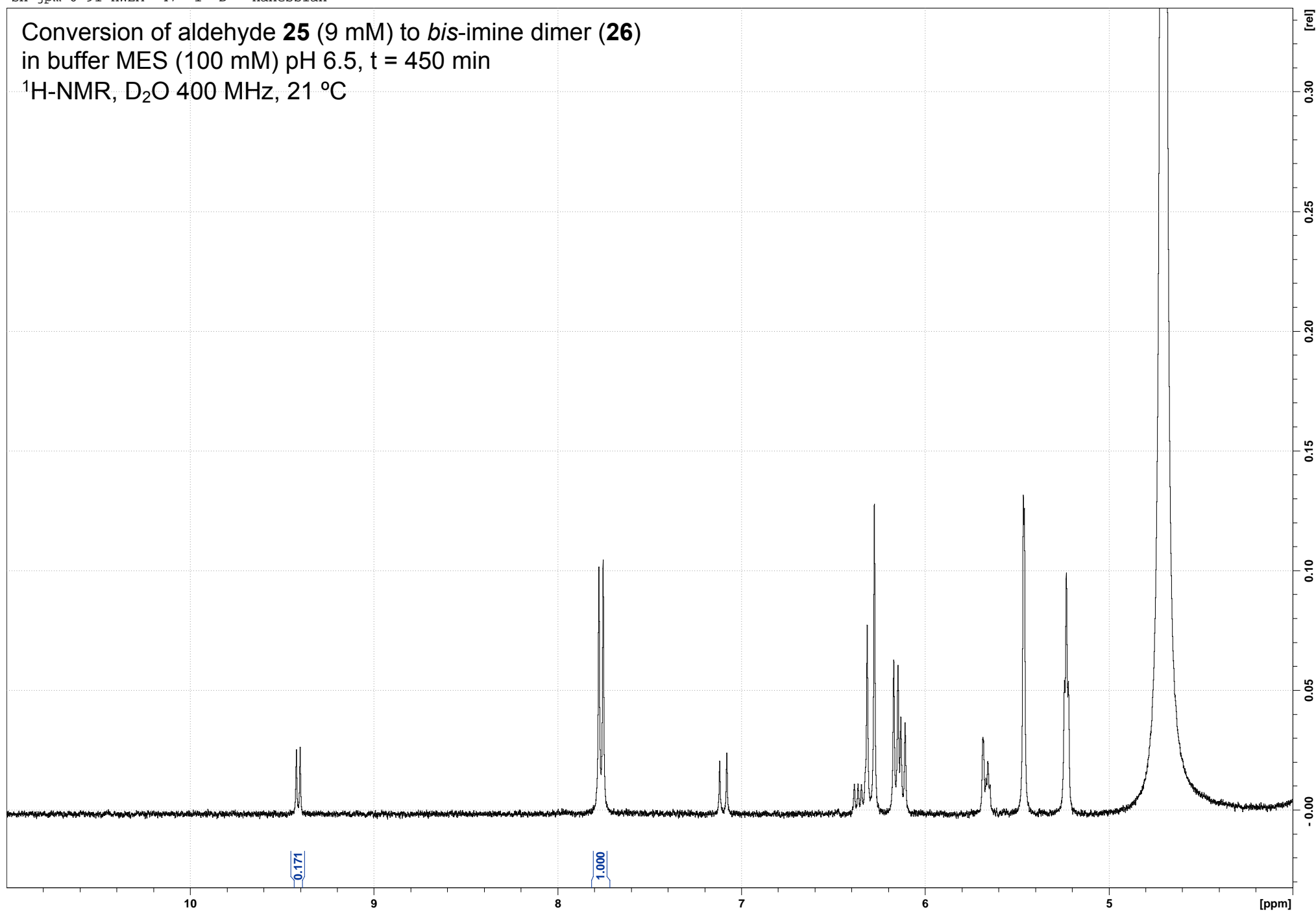
sh-jpm-6-91-HWEA 46 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 440 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



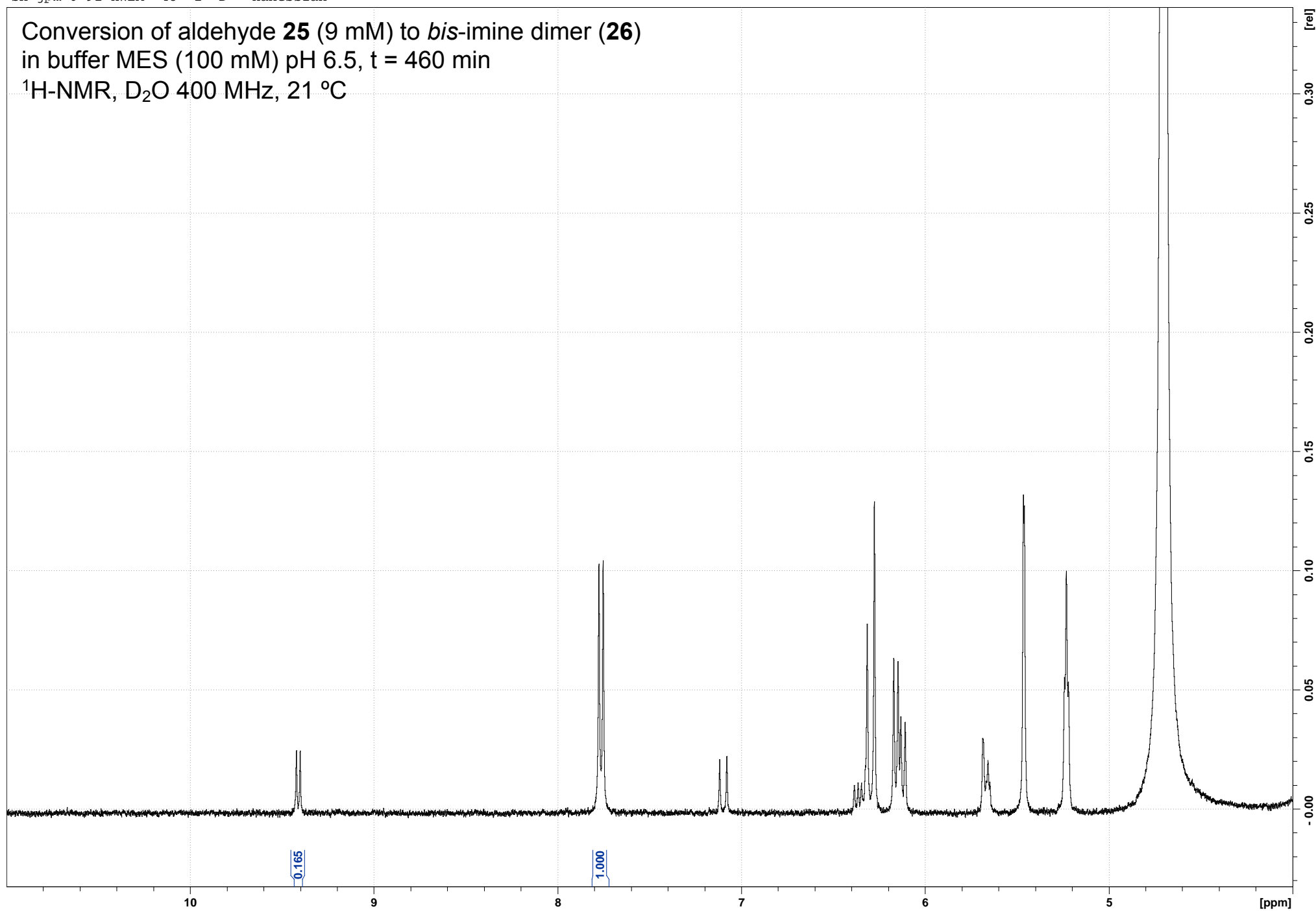
sh-jpm-6-91-HWEA 47 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 450 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



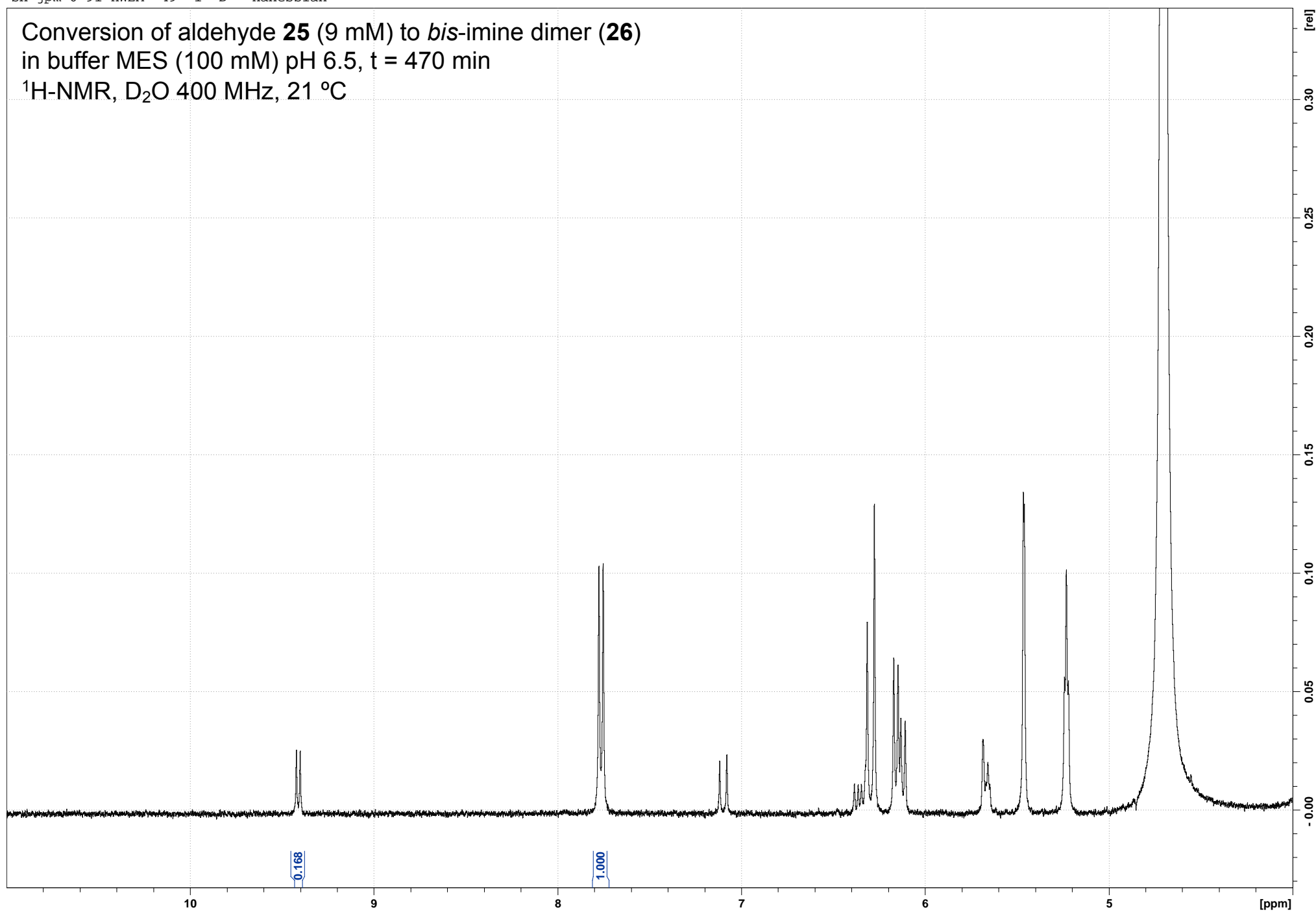
sh-jpm-6-91-HWEA 48 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 460 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-HWEA 49 1 D: Hanessian

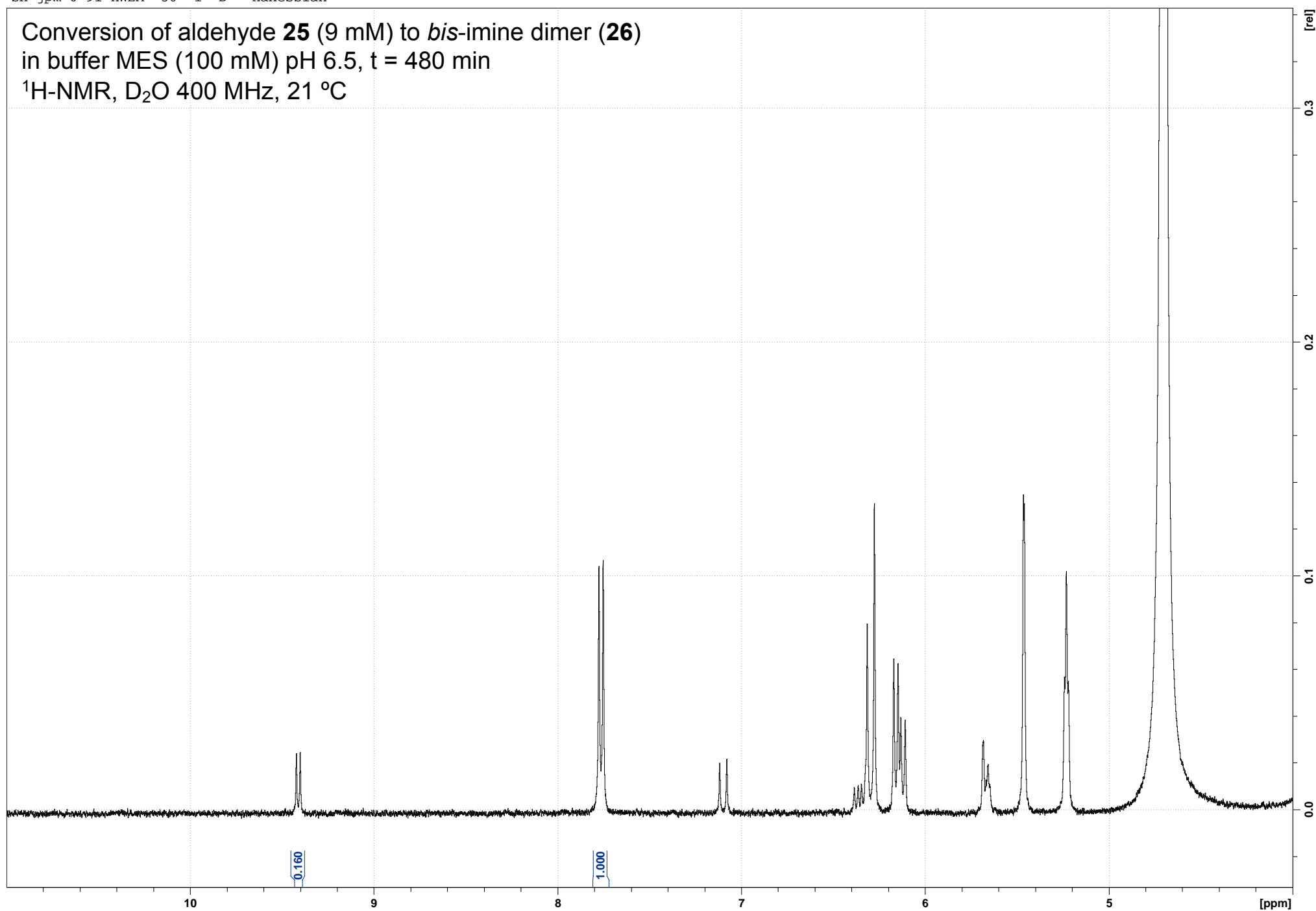
Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 470 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





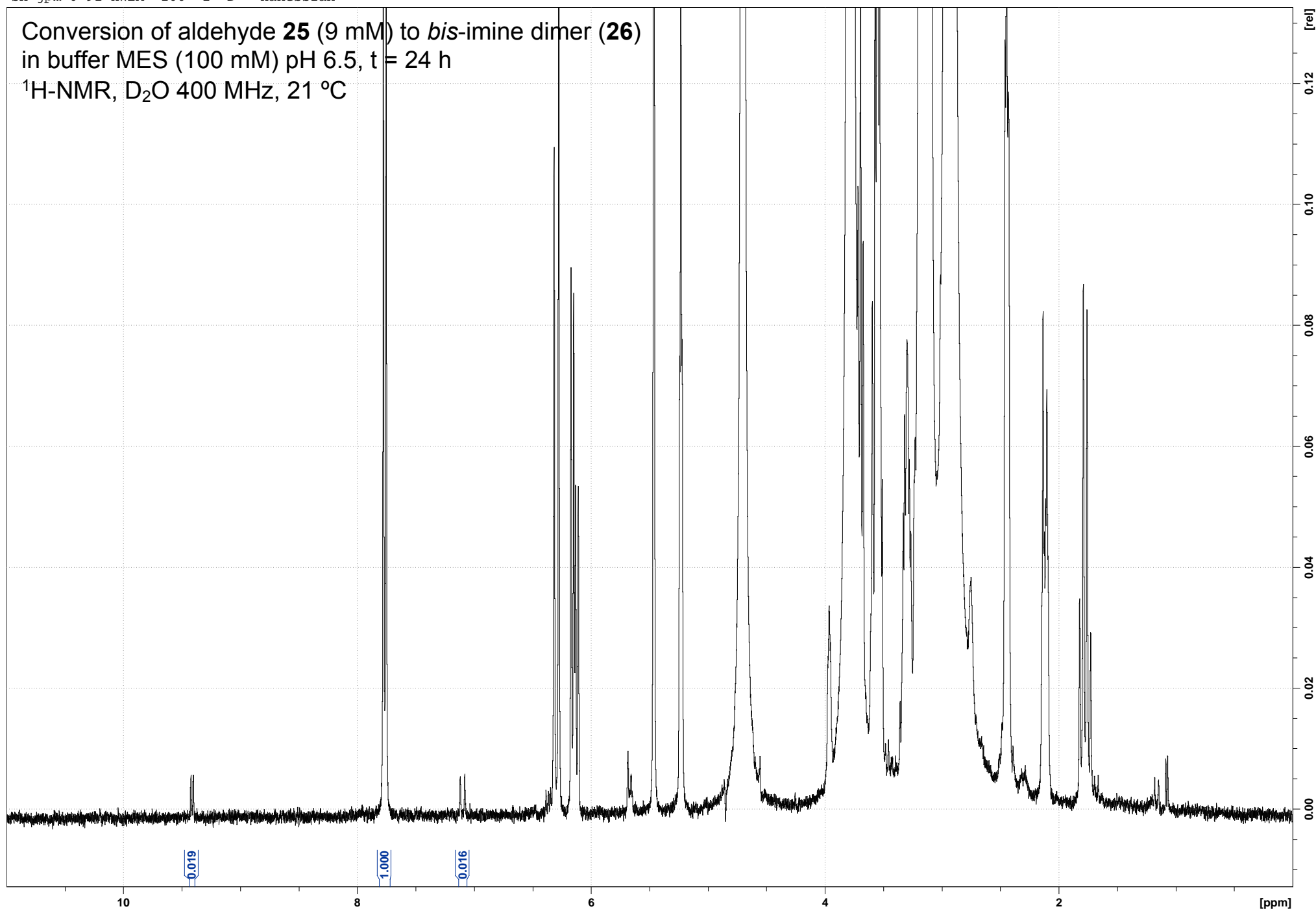
sh-jpm-6-91-HWEA 50 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 480 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C

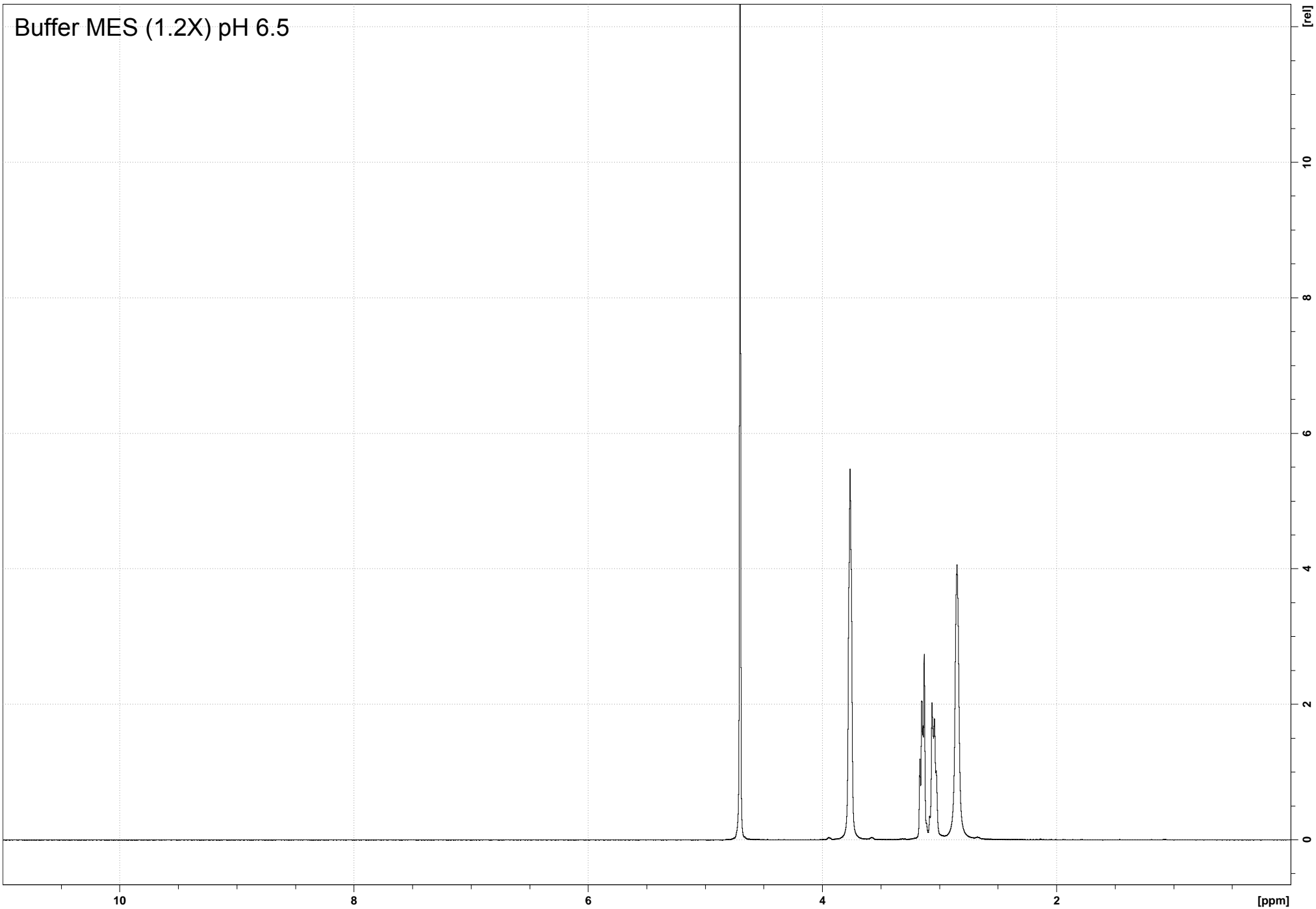


sh-jpm-6-91-HWEA 200 1 D: Hanessian

Conversion of aldehyde **25** (9 mM) to *bis*-imine dimer (**26**)  
in buffer MES (100 mM) pH 6.5, t = 24 h  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C

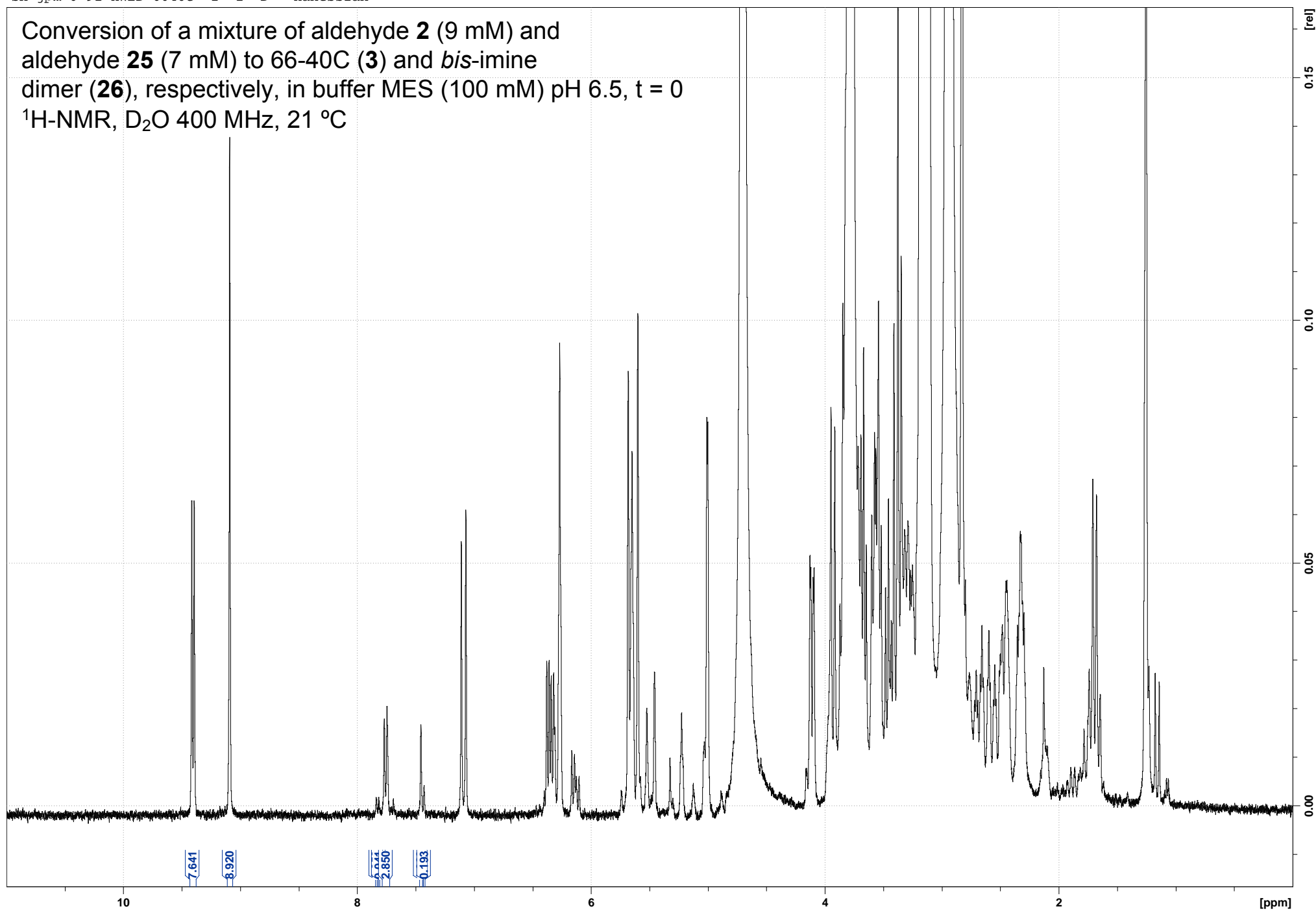


sh-jpm-6-91-HWED-6640C 1 1 D: Hanesian



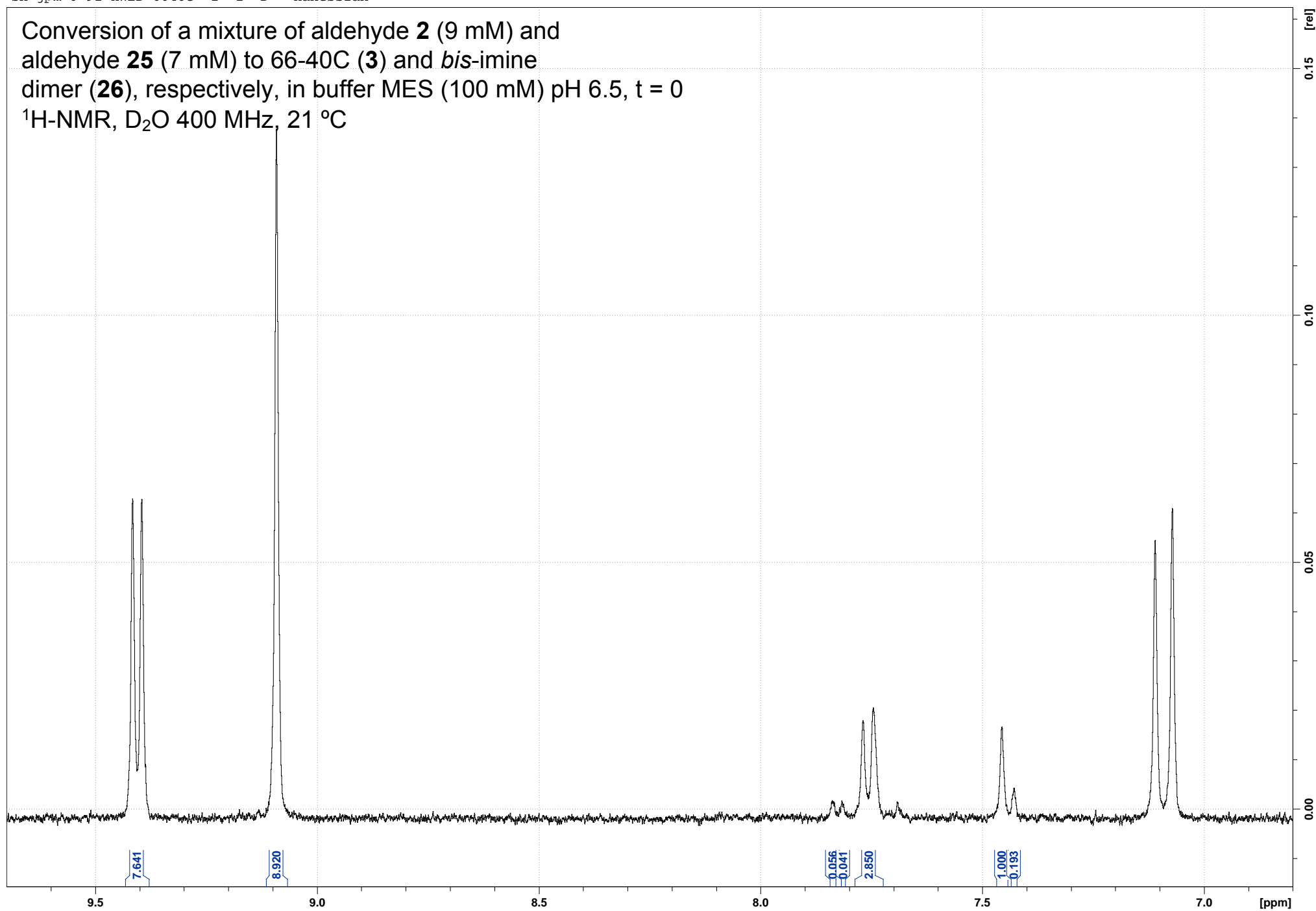
sh-jpm-6-91-HWED-6640C 2 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



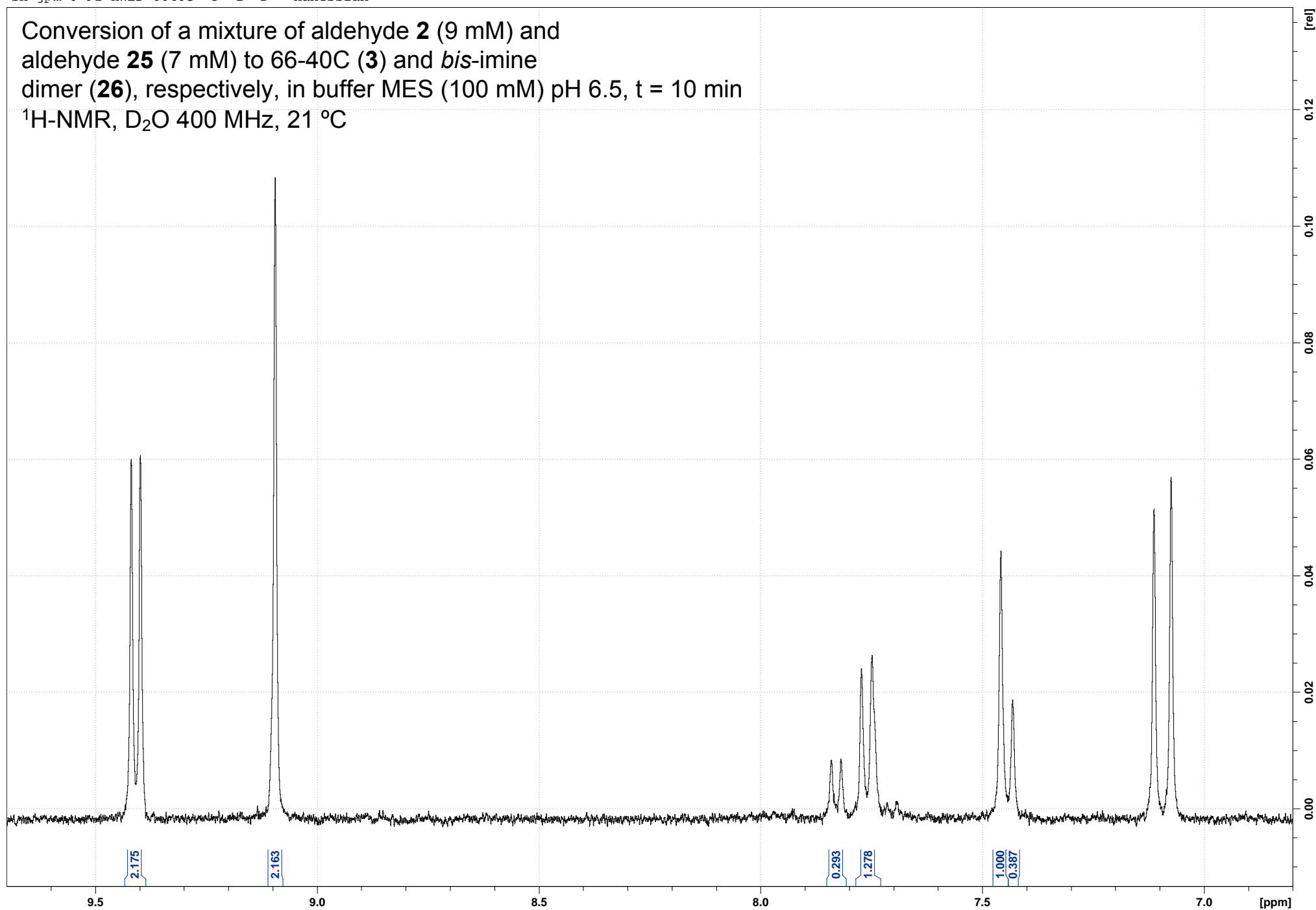
sh-jpm-6-91-HWED-6640C 2 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



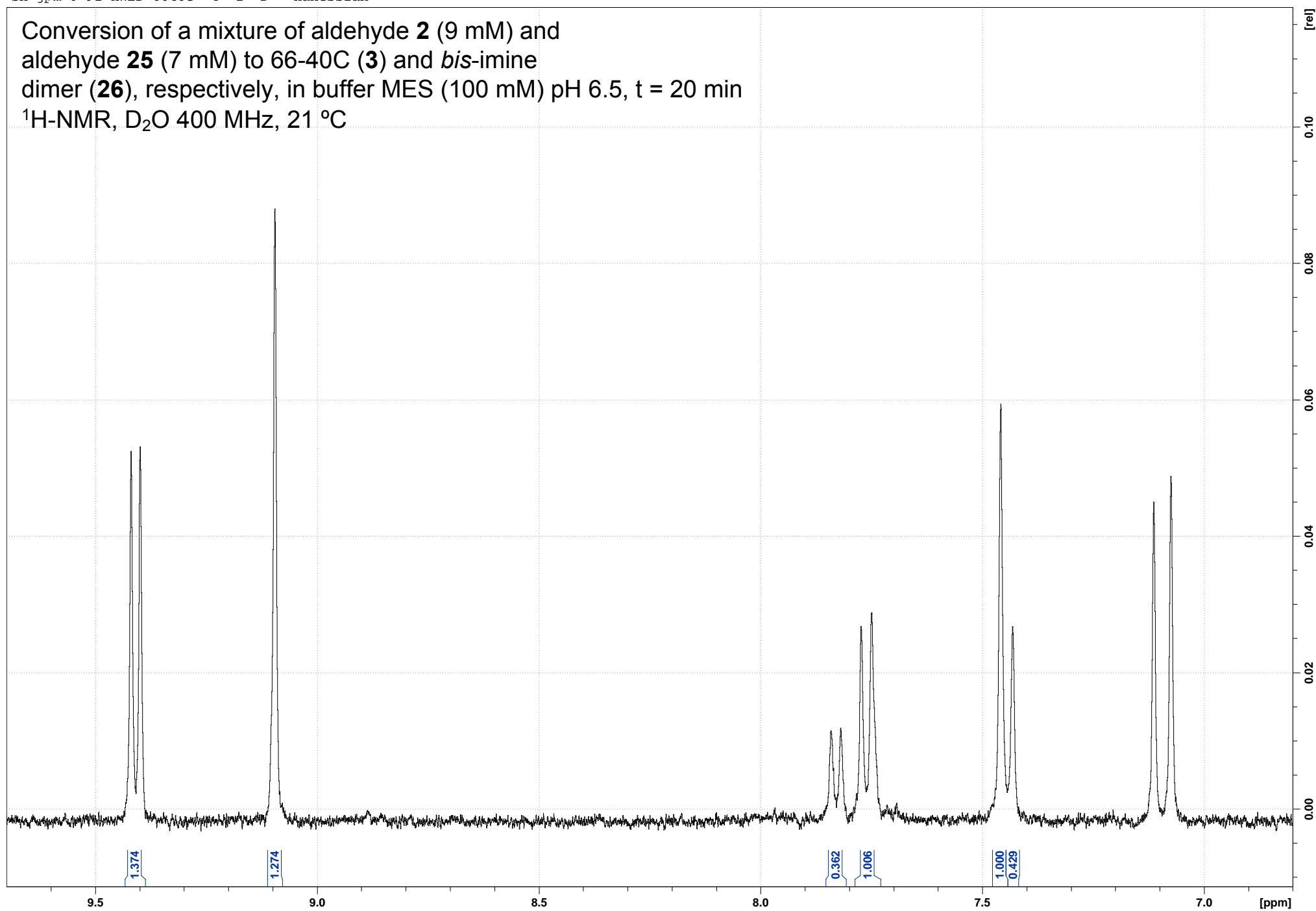
sh-jpm-6-91-HWED-6640C 3 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 10 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



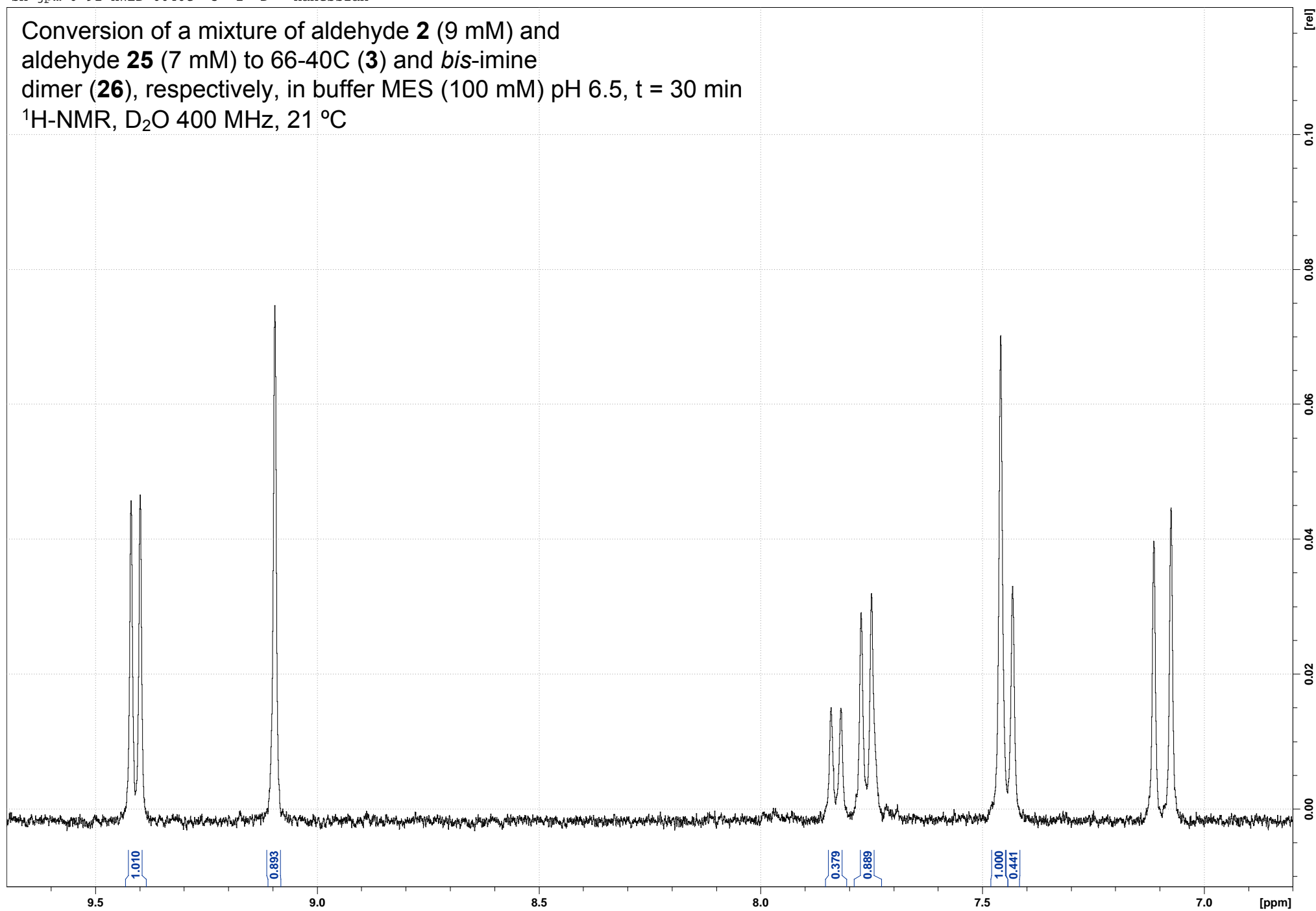
sh-jpm-6-91-HWED-6640C 4 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 20 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



sh-jpm-6-91-HWED-6640C 5 1 D: Hanessian

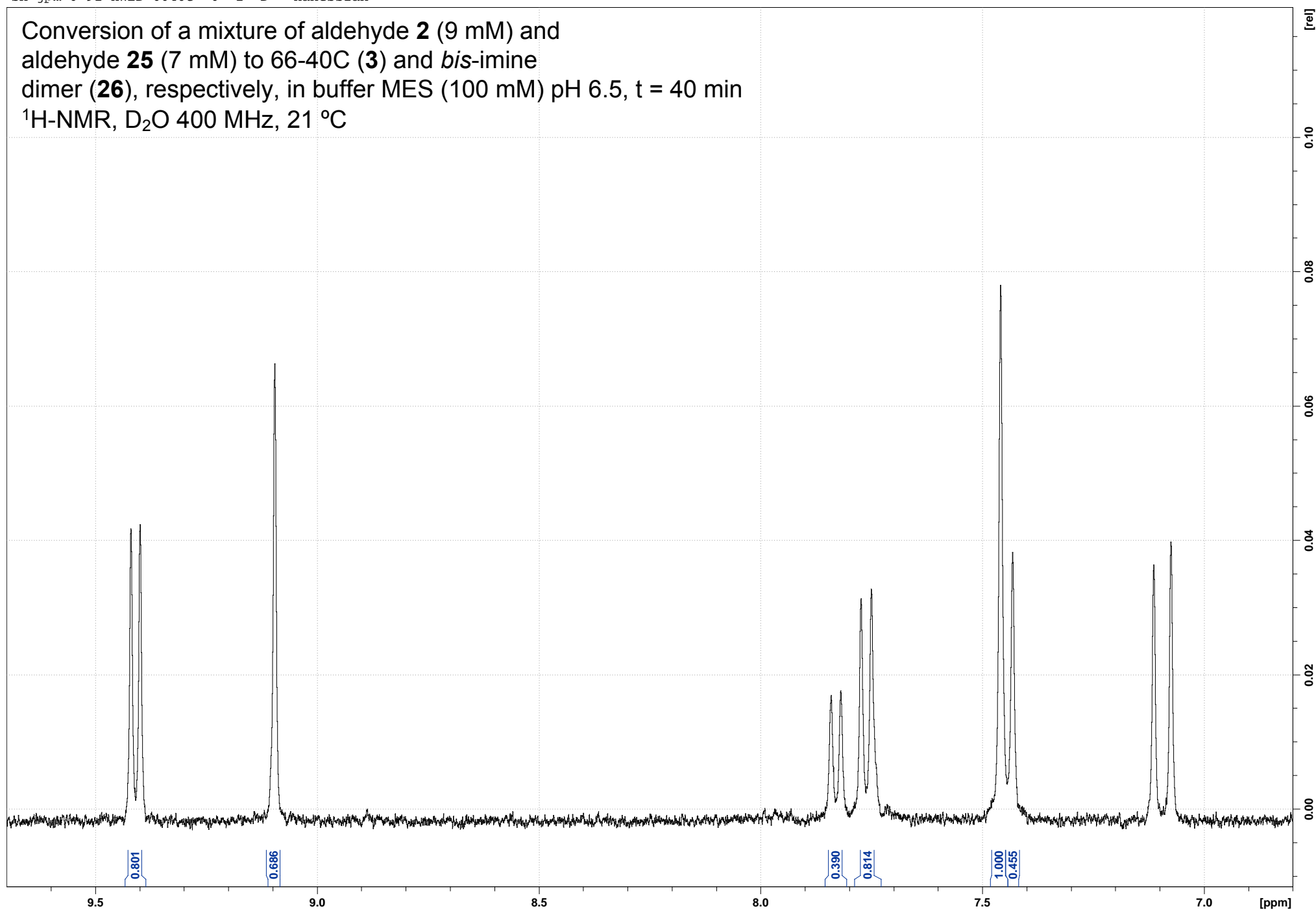
Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 30 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





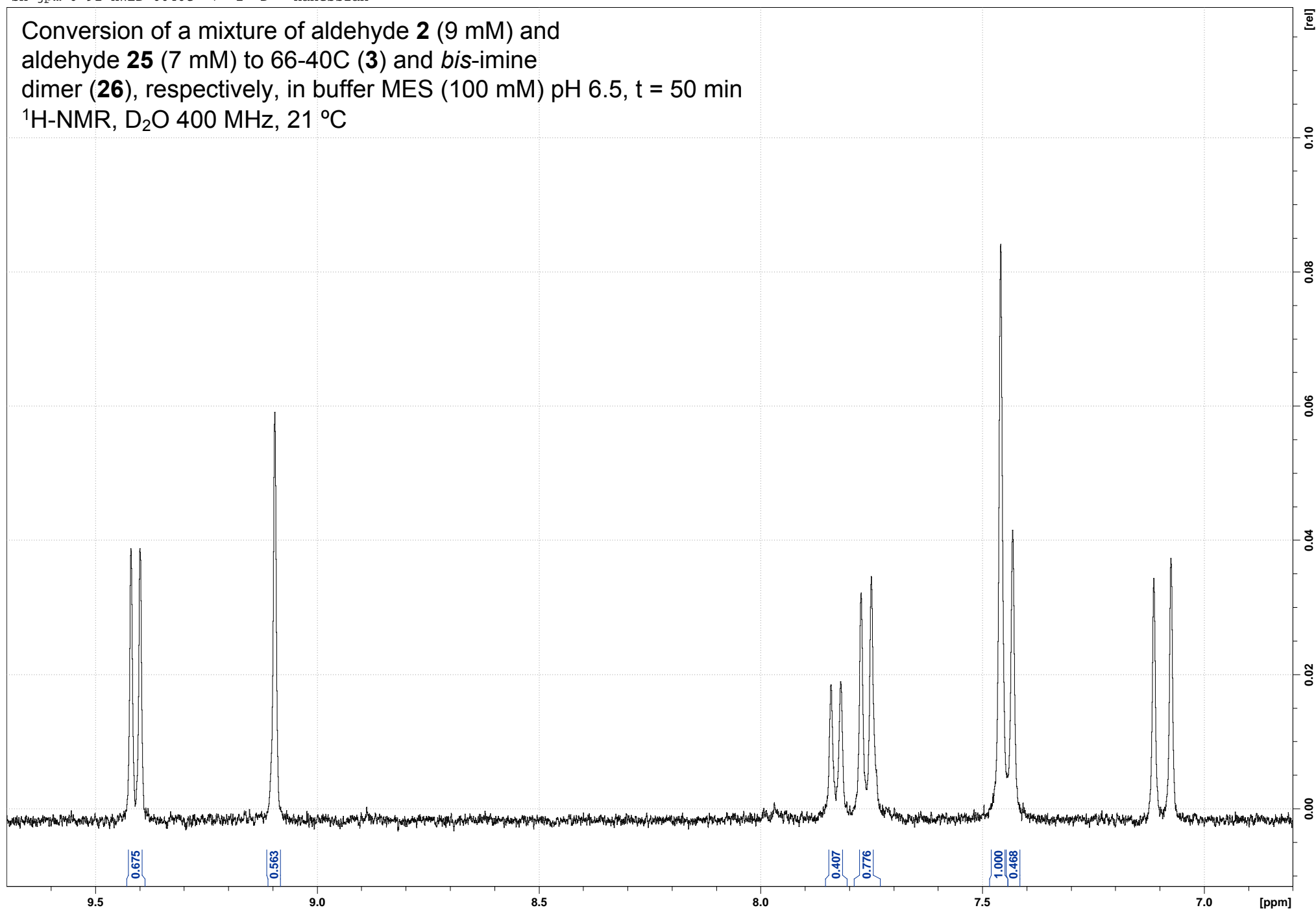
sh-jpm-6-91-HWED-6640C 6 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 40 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



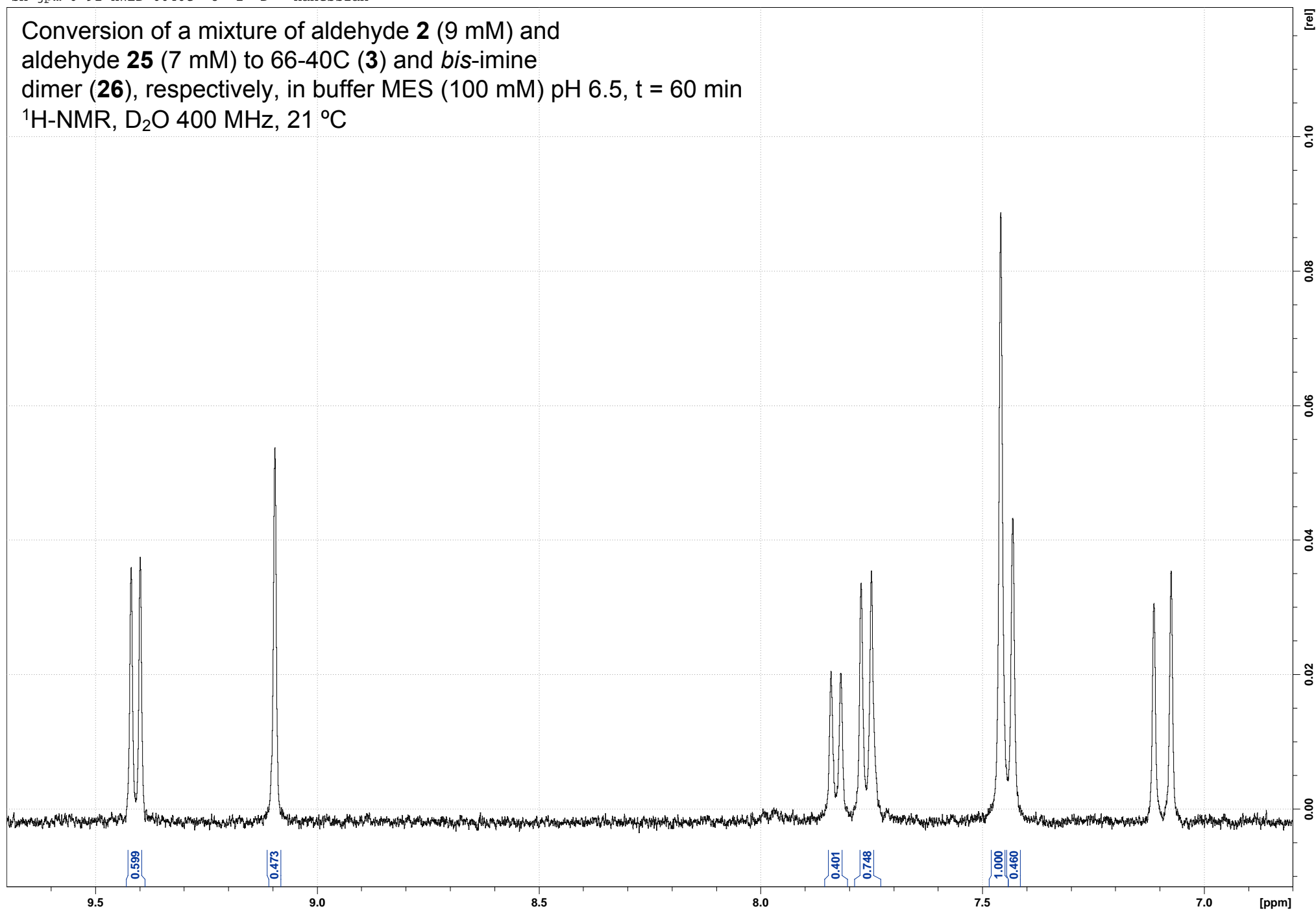
sh-jpm-6-91-HWED-6640C 7 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 50 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



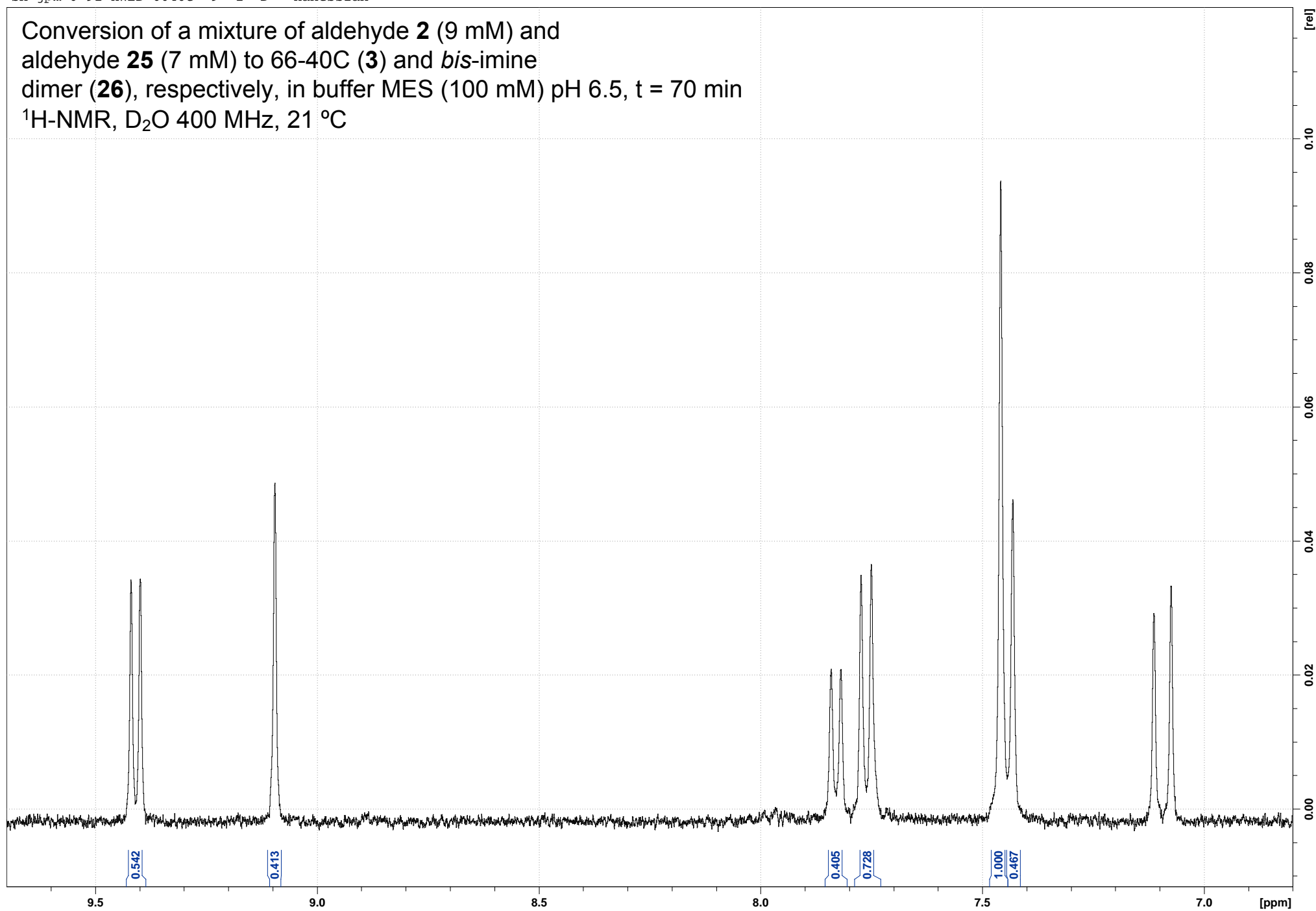
sh-jpm-6-91-HWED-6640C 8 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 60 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



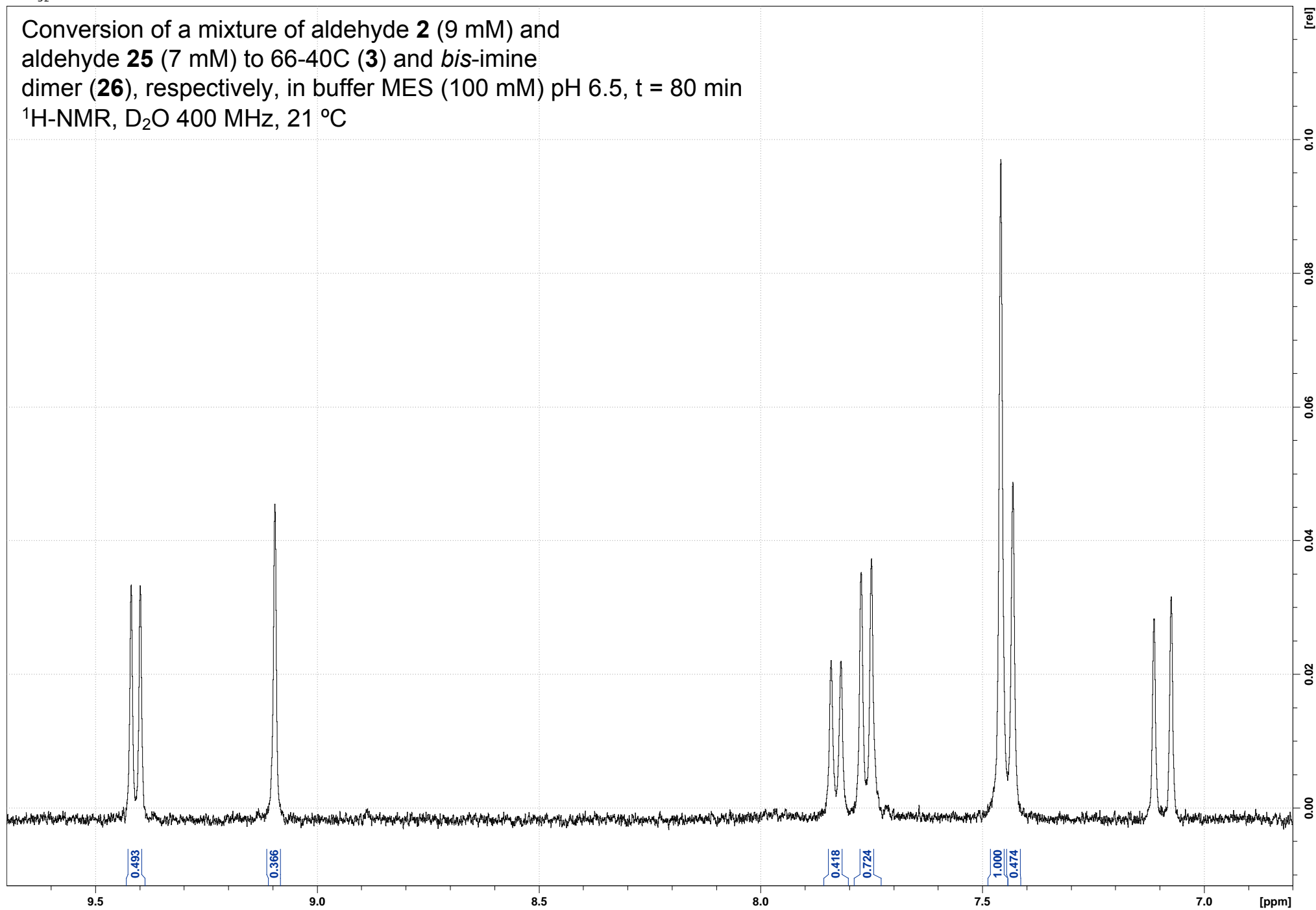
sh-jpm-6-91-HWED-6640C 9 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 70 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



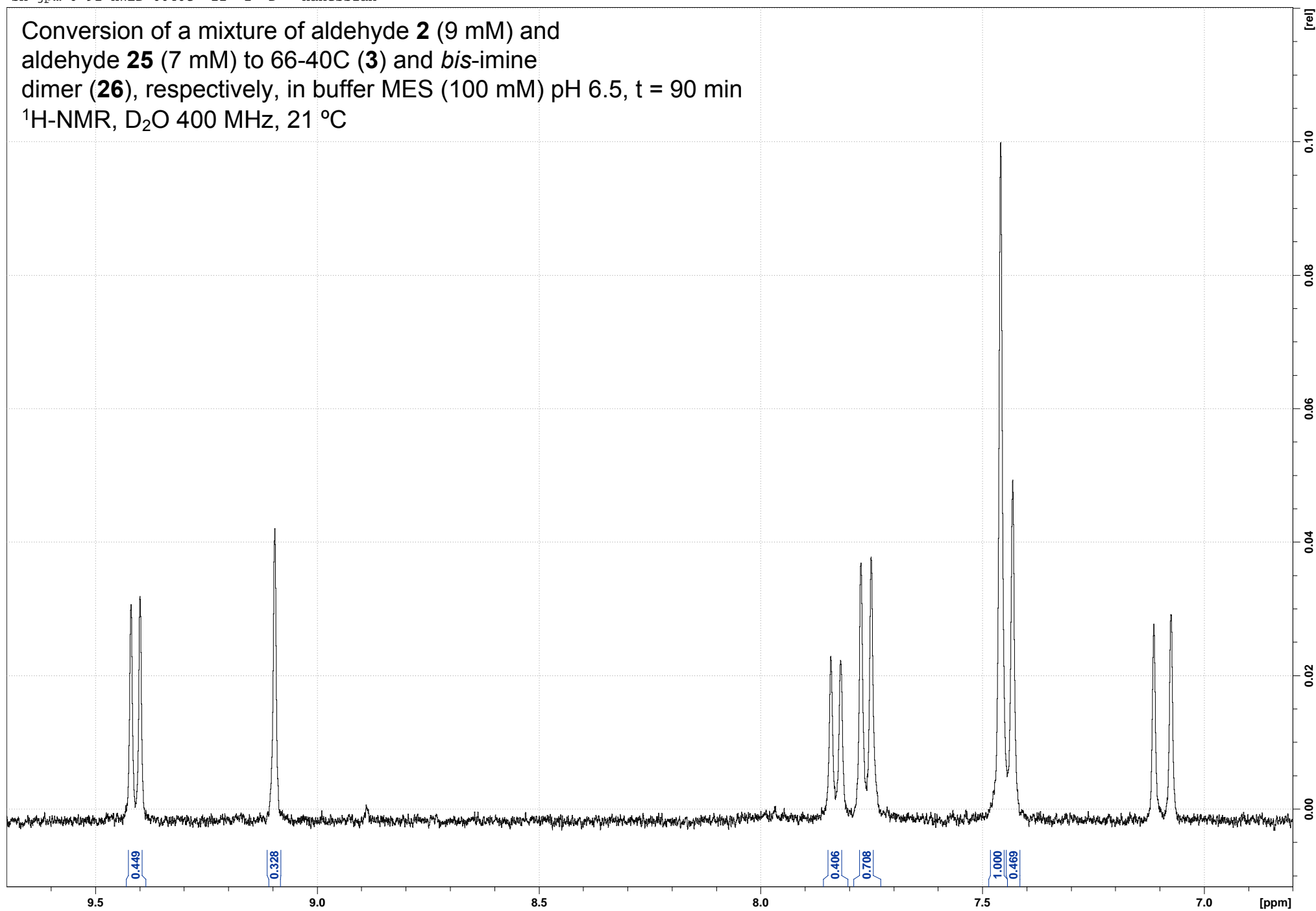
sh-jpm-6-91-HWED-6640C 10 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 80 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



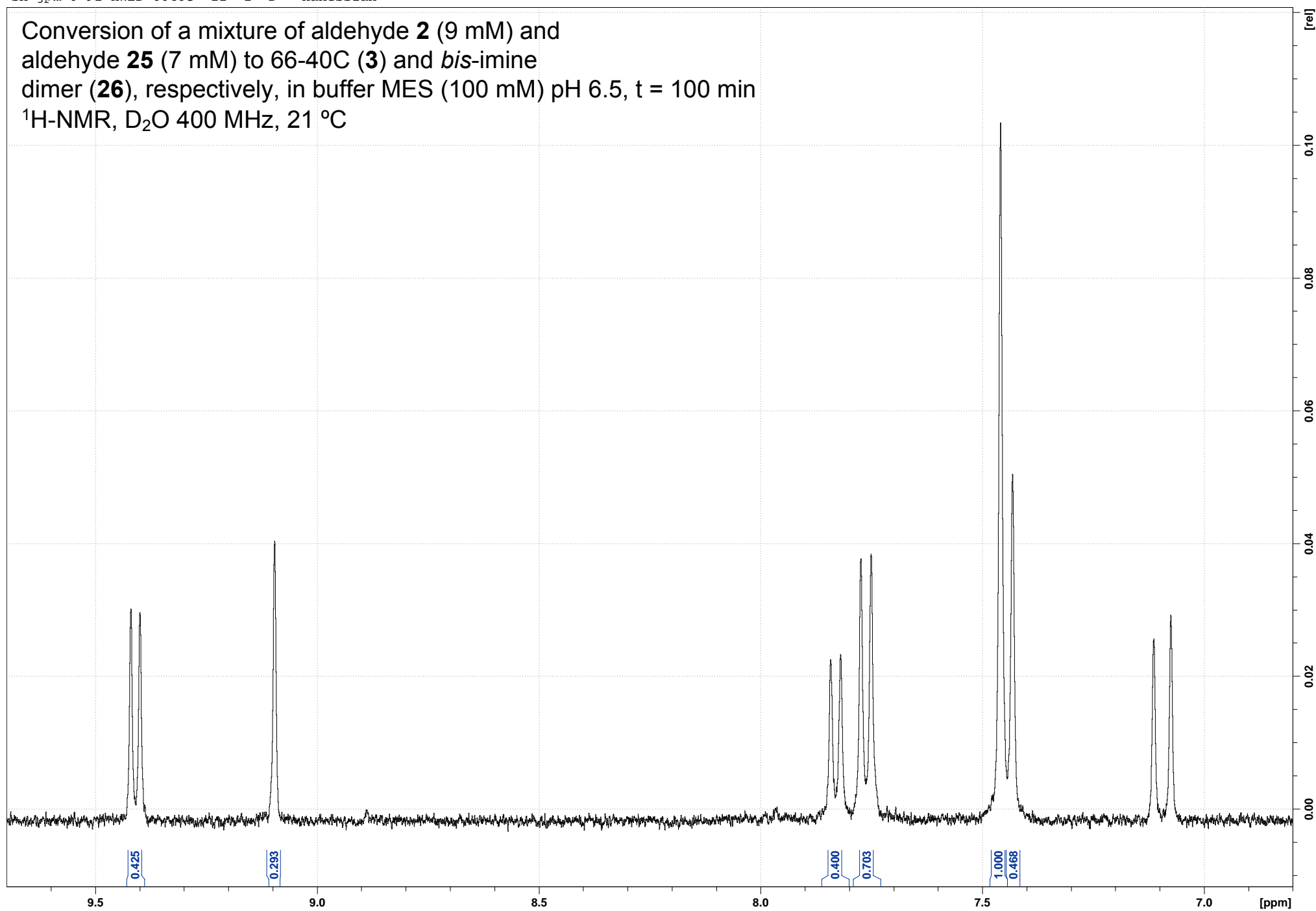
sh-jpm-6-91-HWED-6640C 11 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 90 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



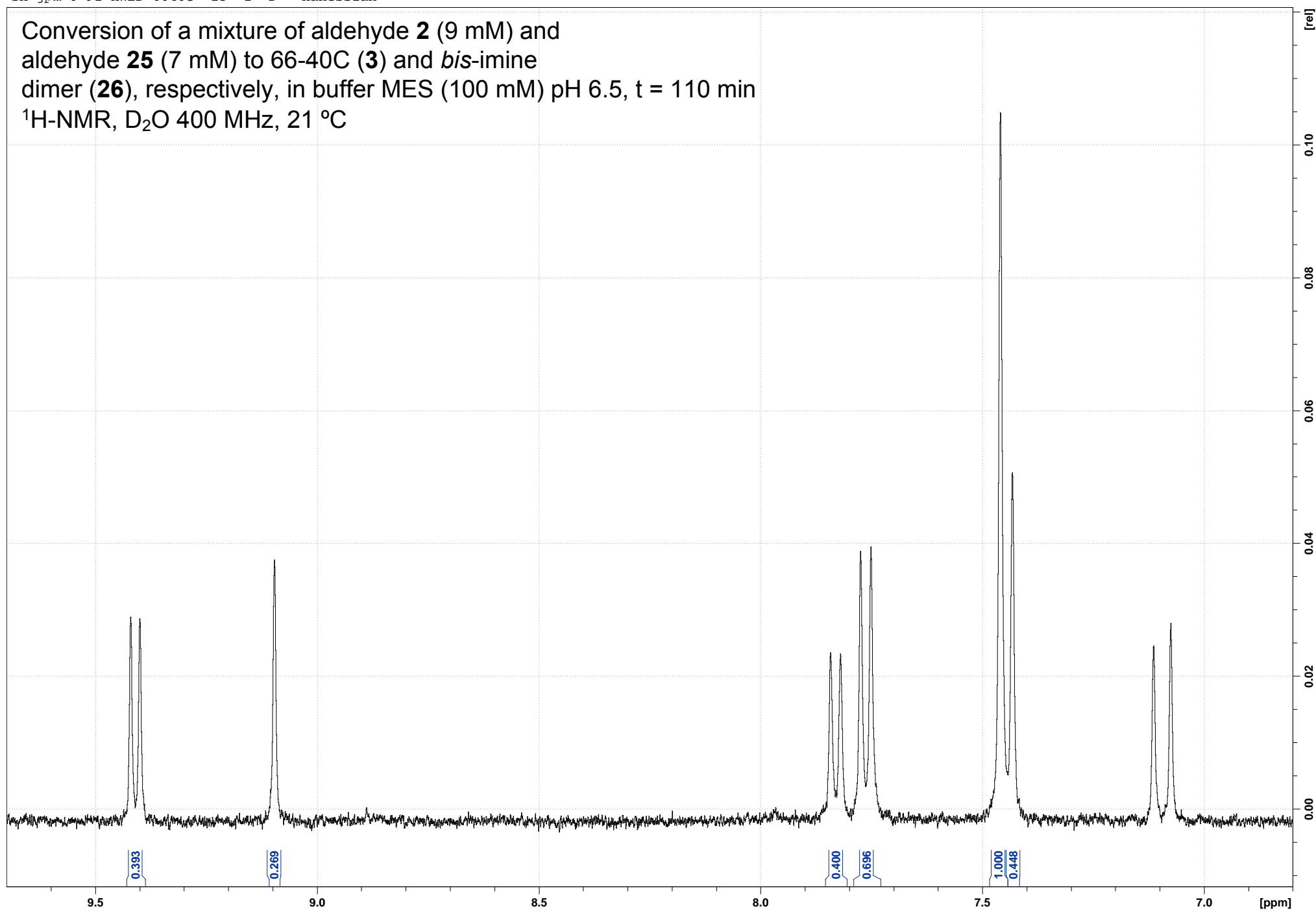
sh-jpm-6-91-HWED-6640C 12 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 100 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



sh-jpm-6-91-HWED-6640C 13 1 D: Hanessian

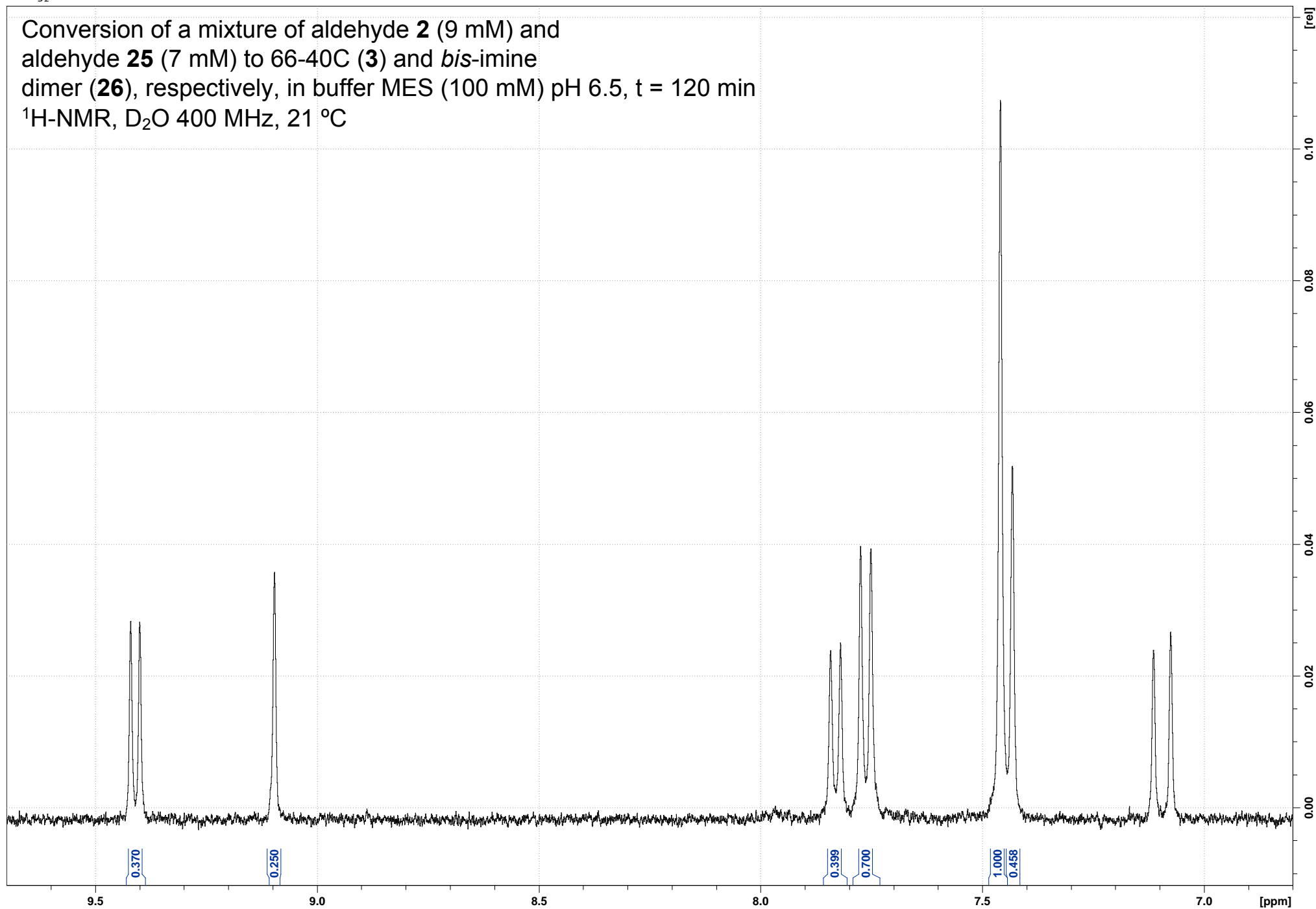
Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 110 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





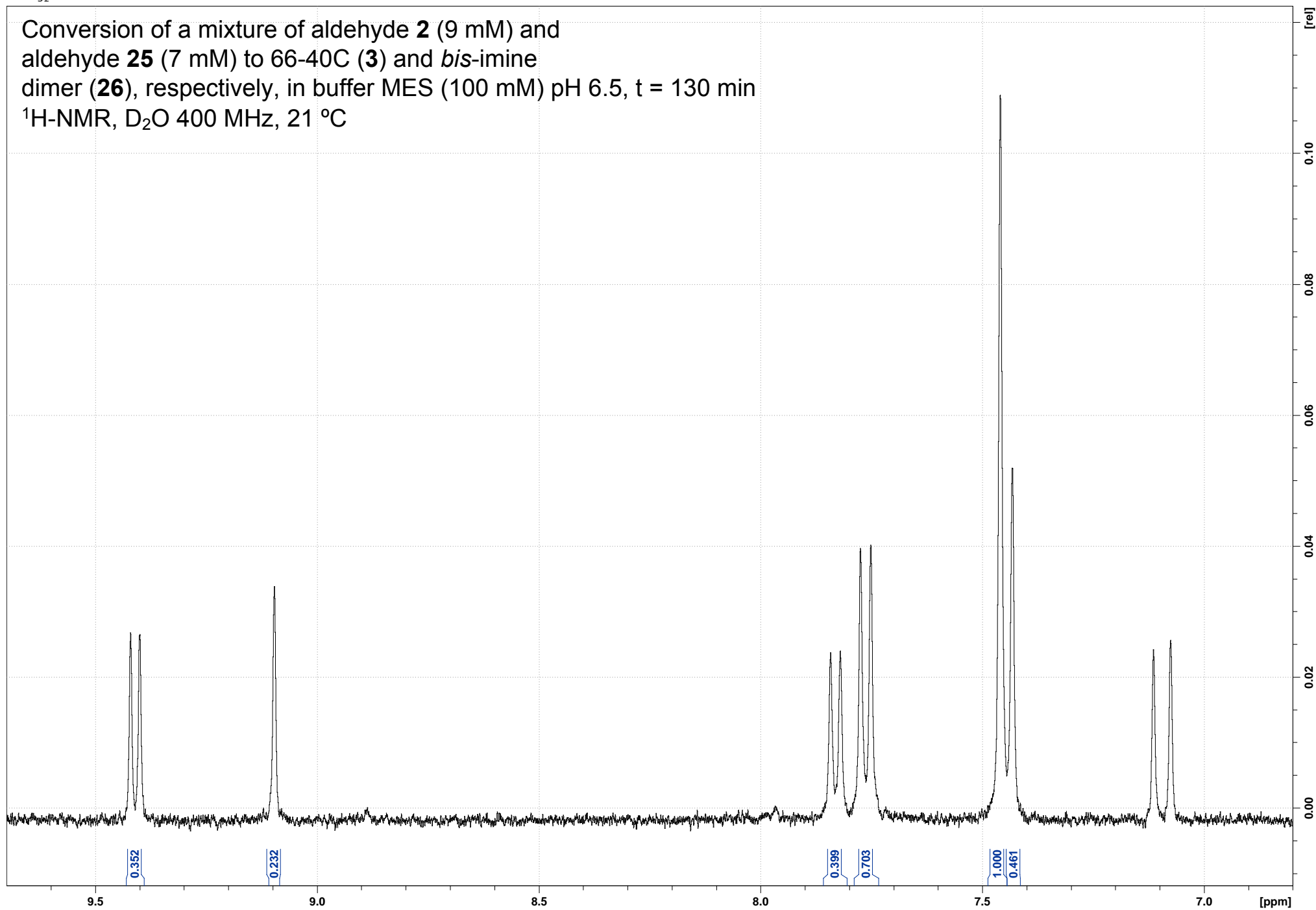
sh-jpm-6-91-HWED-6640C 14 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 120 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



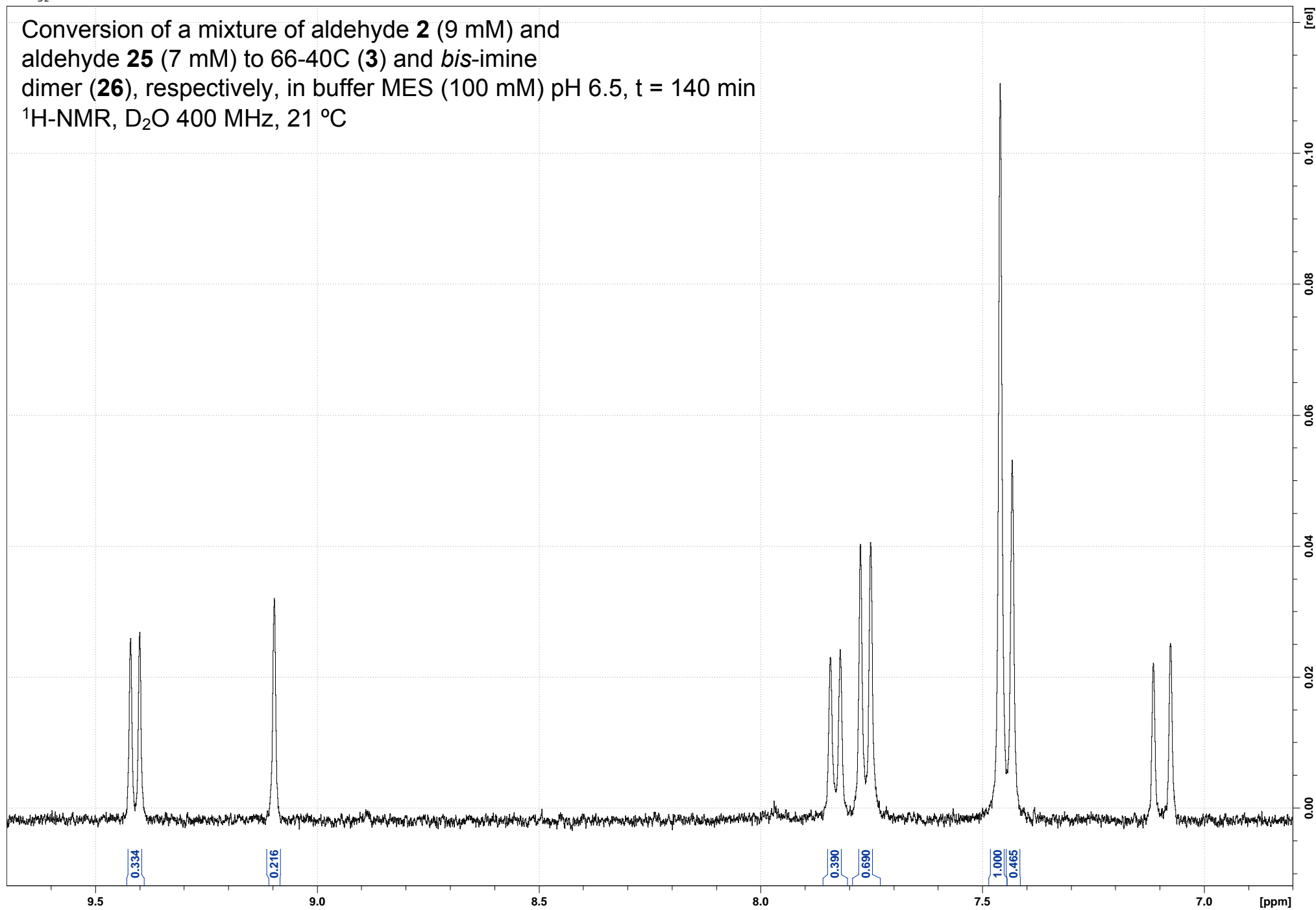
sh-jpm-6-91-HWED-6640C 15 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 130 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



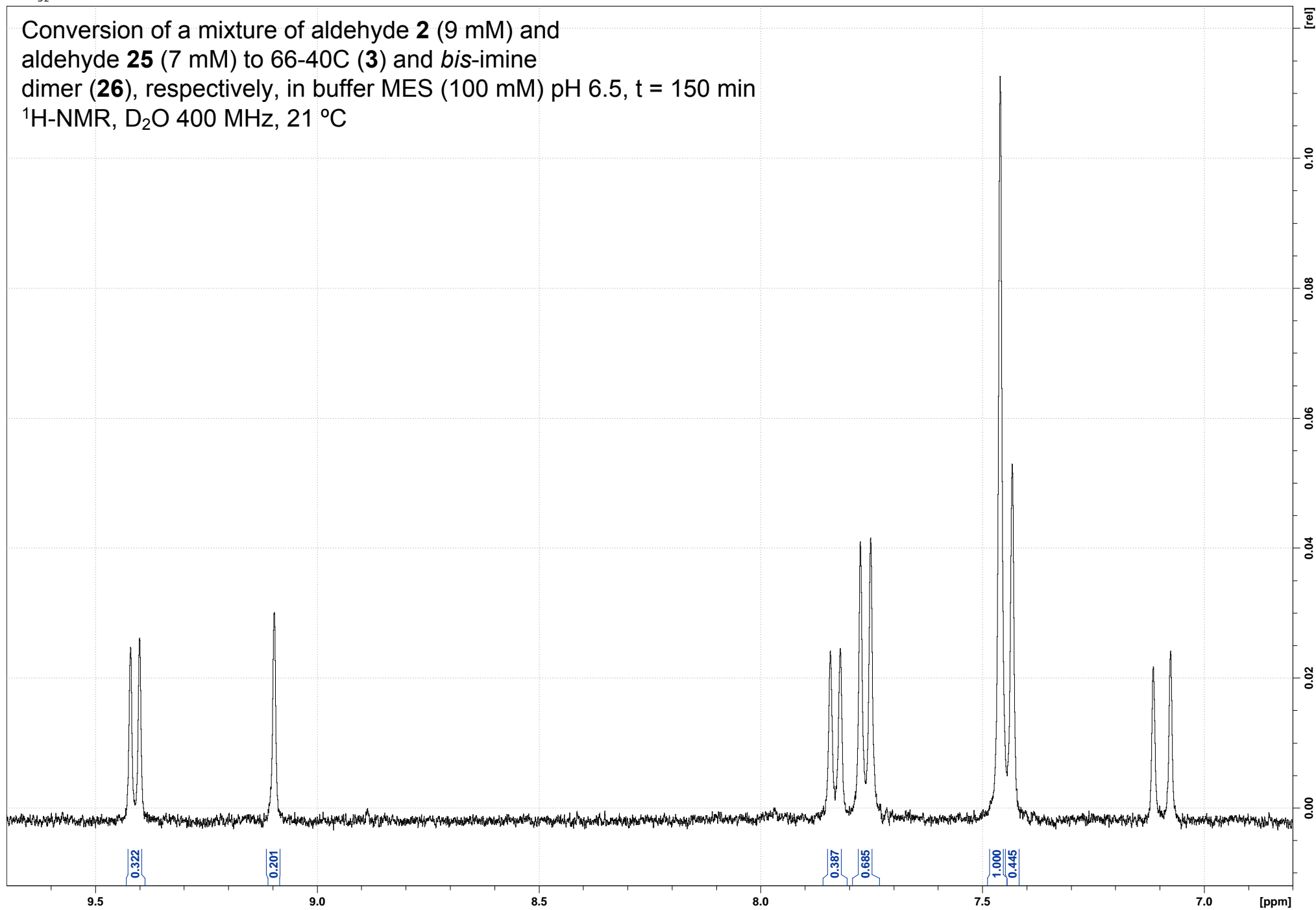
sh-jpm-6-91-HWED-6640C 16 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 140 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



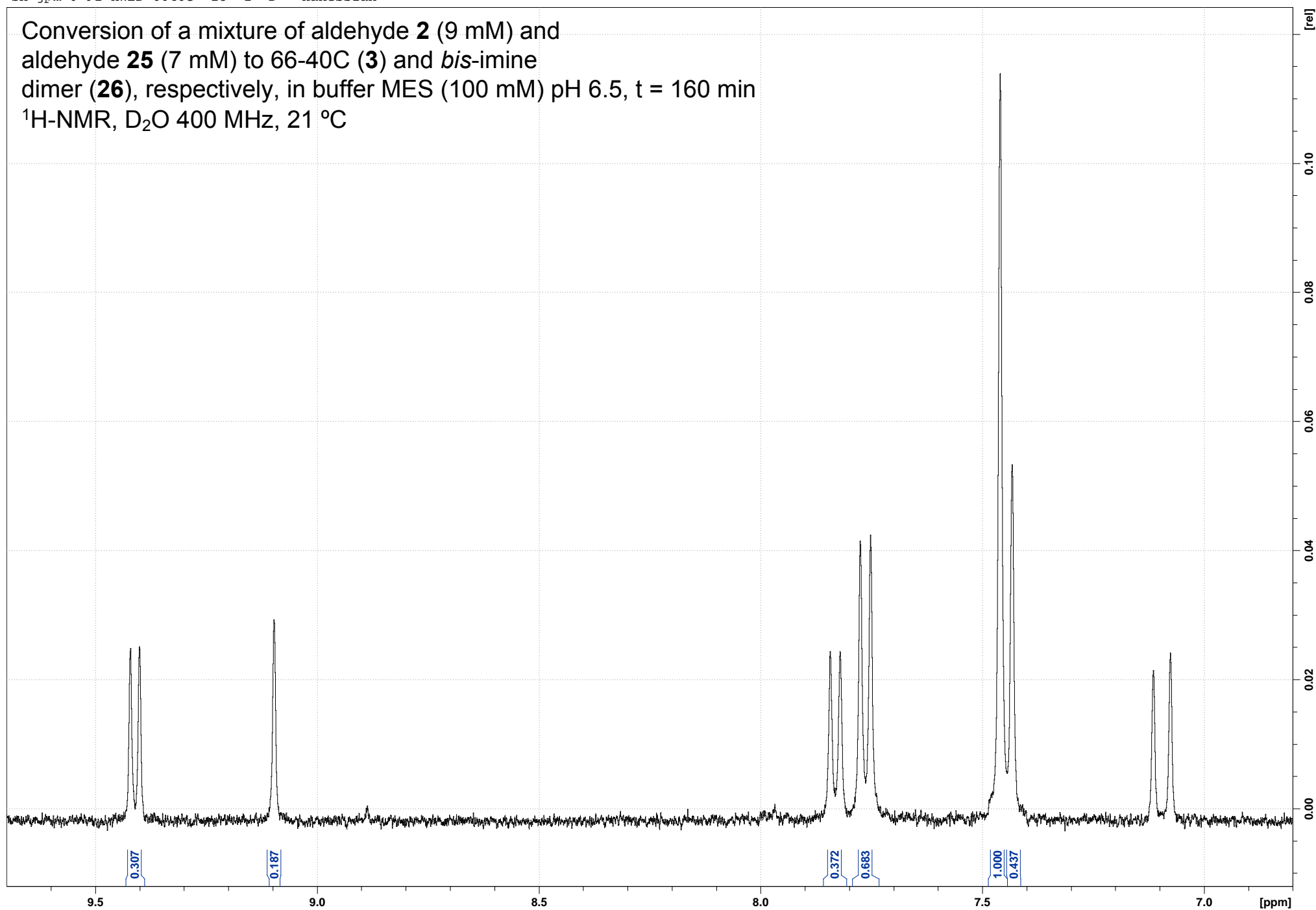
sh-jpm-6-91-HWED-6640C 17 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 150 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



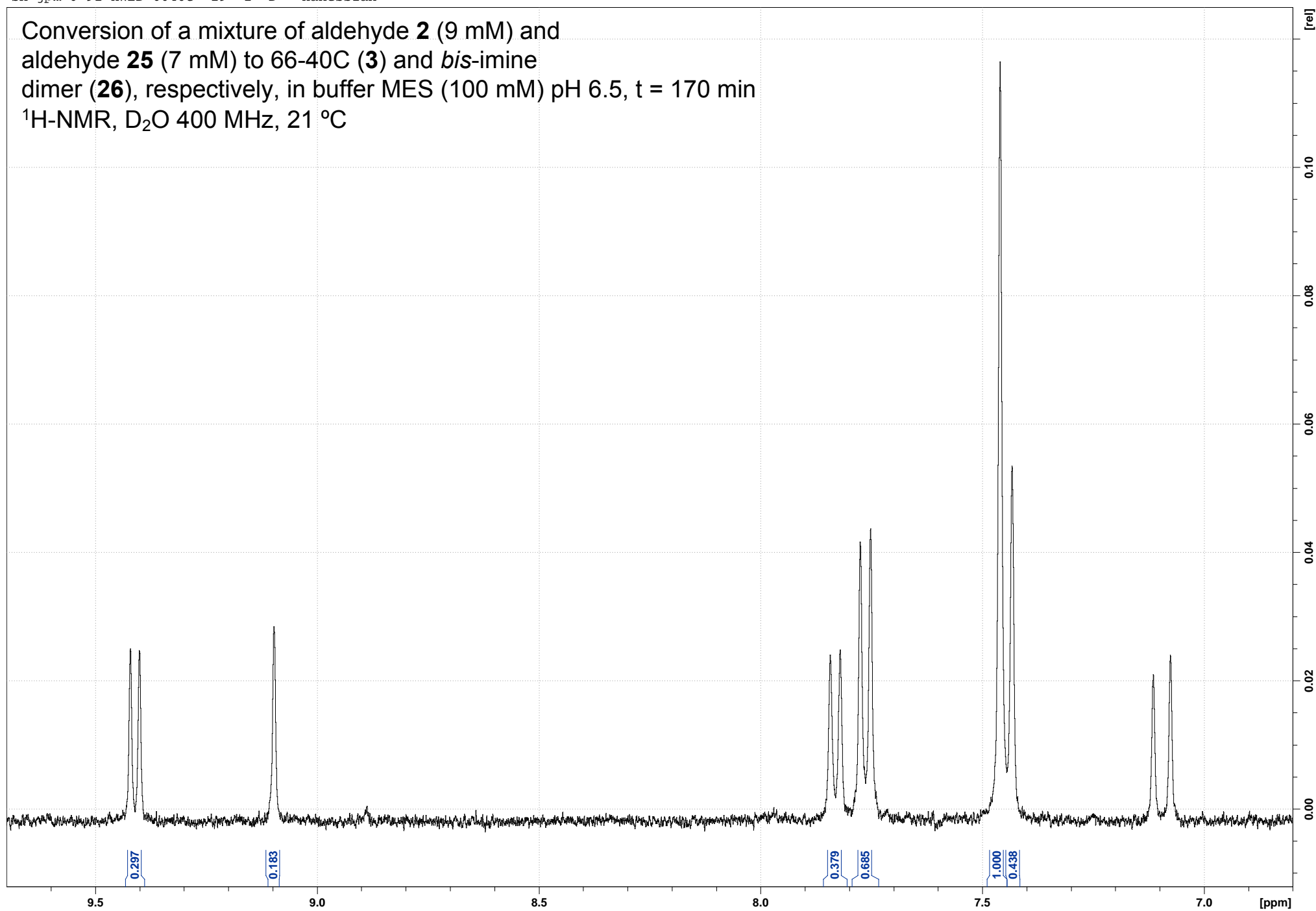
sh-jpm-6-91-HWED-6640C 18 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 160 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



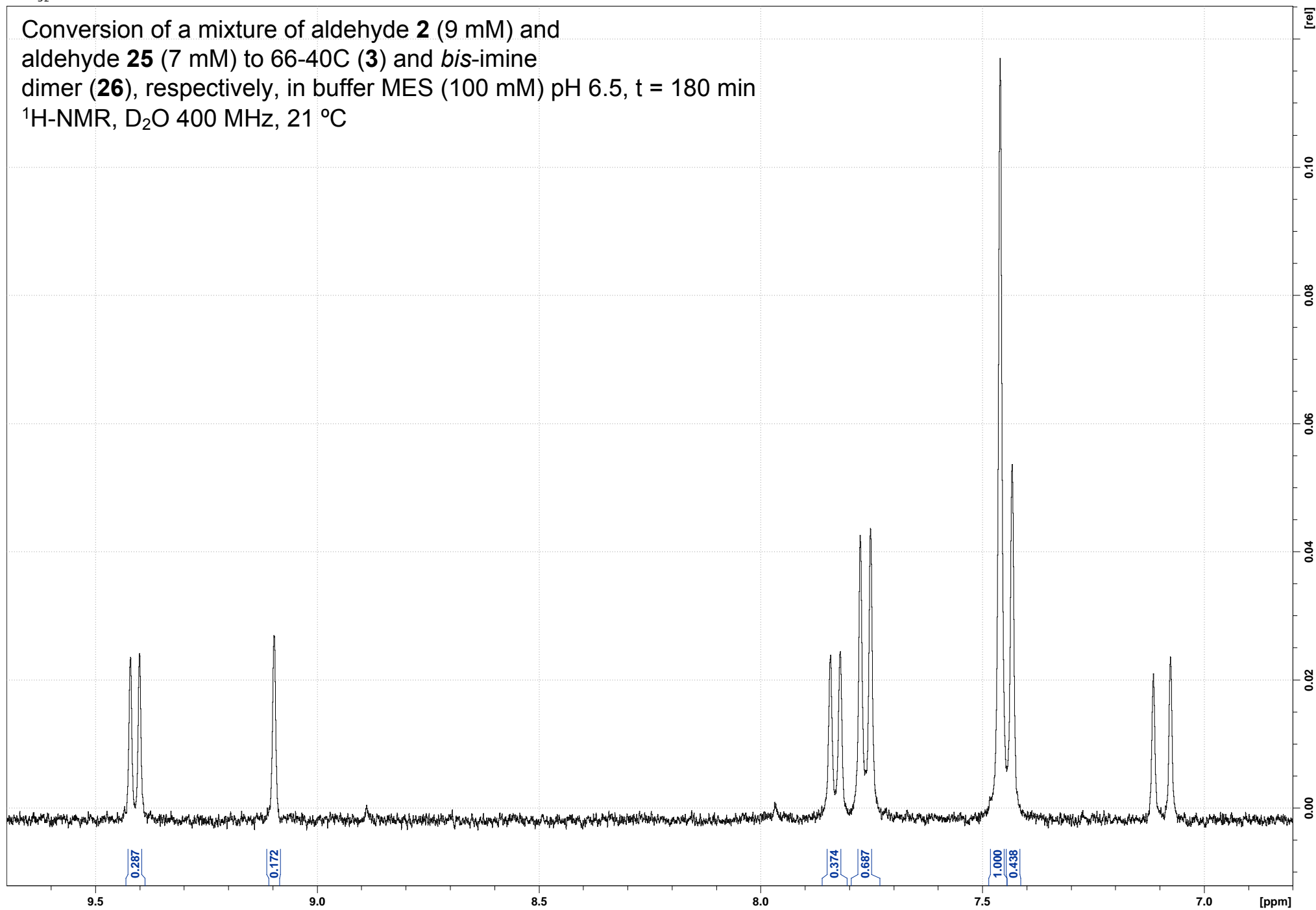
sh-jpm-6-91-HWED-6640C 19 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 170 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



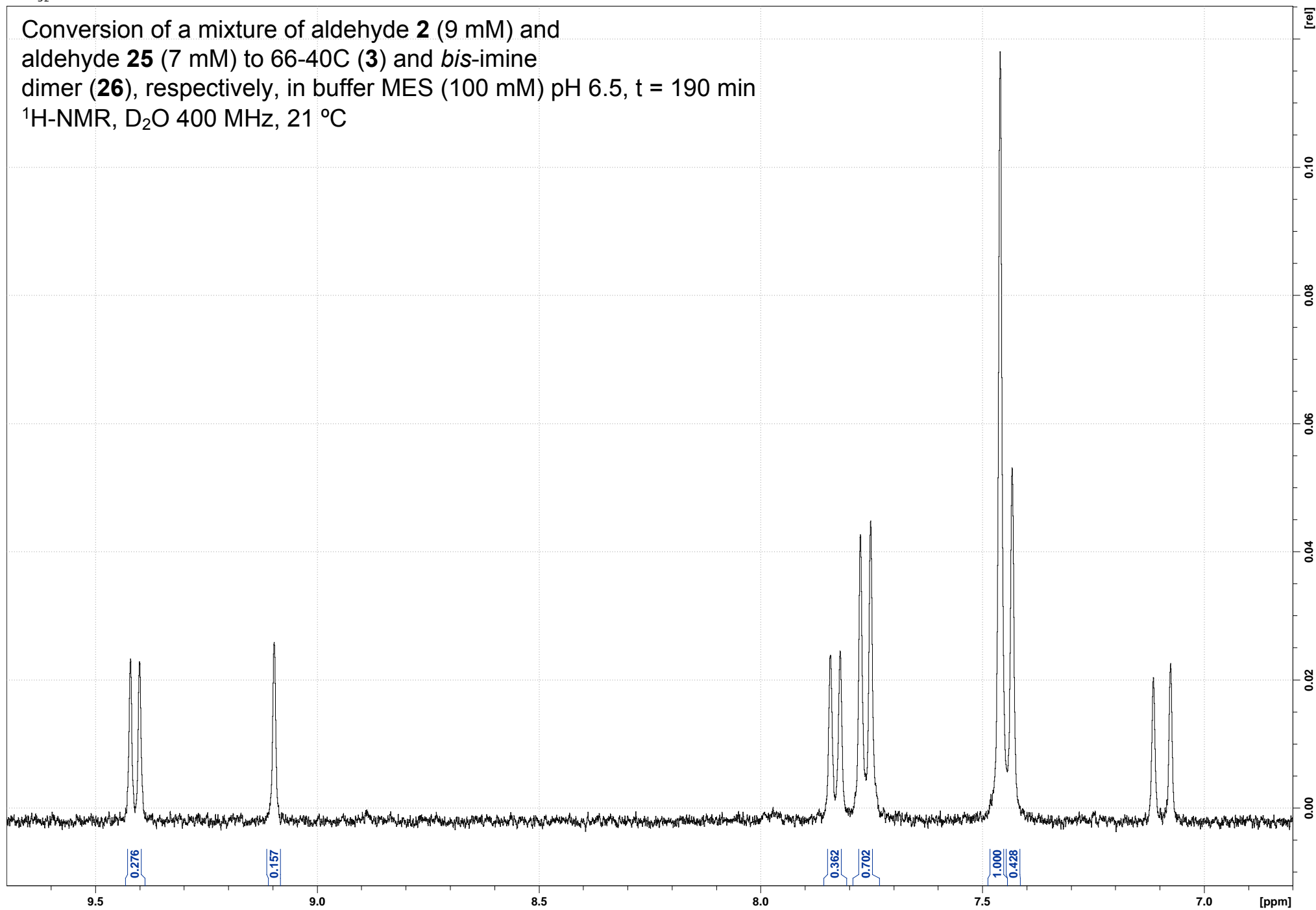
sh-jpm-6-91-HWED-6640C 20 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 180 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-HWED-6640C 21 1 D: Hanessian

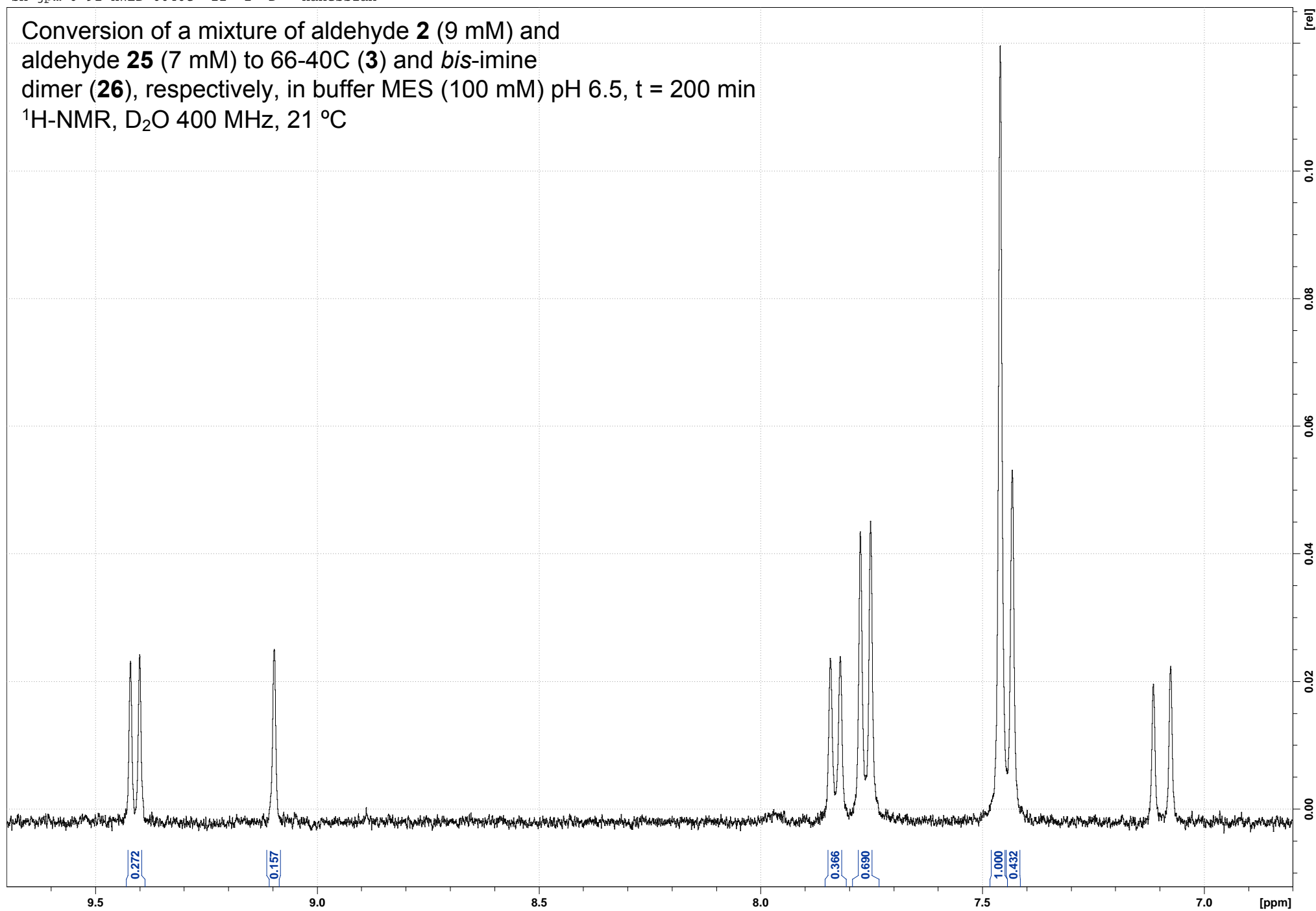
Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 190 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





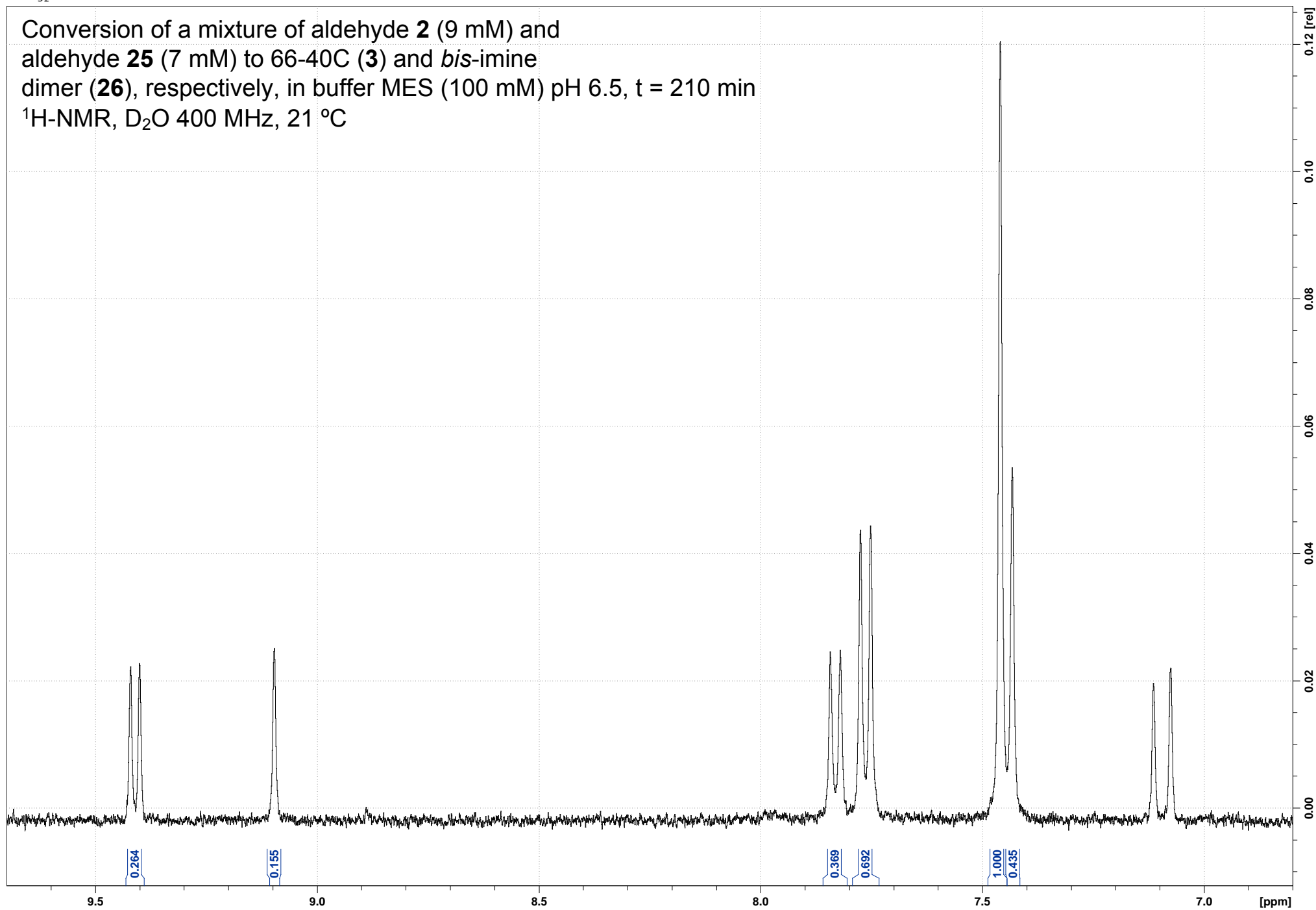
sh-jpm-6-91-HWED-6640C 22 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 200 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



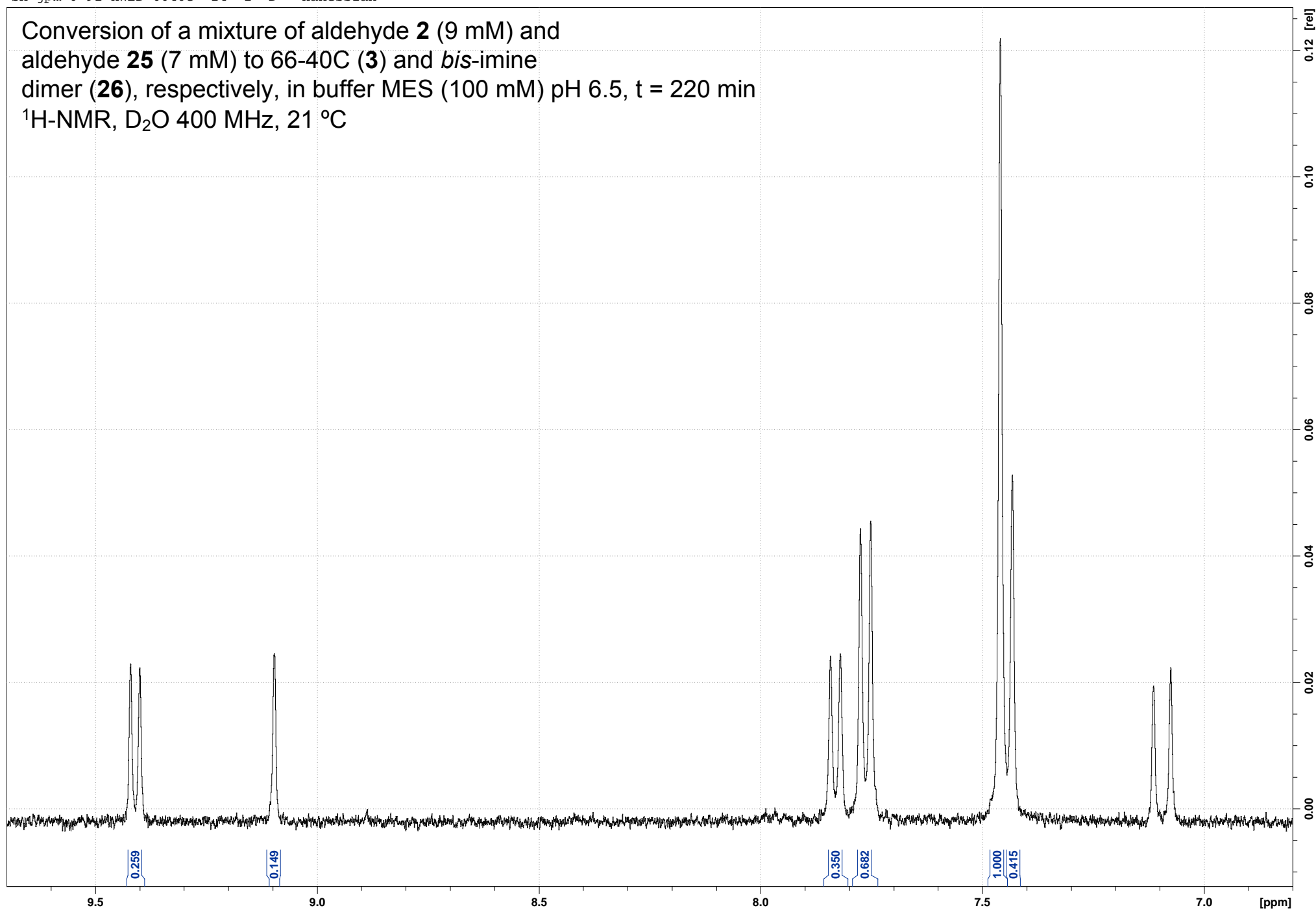
sh-jpm-6-91-HWED-6640C 23 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 210 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



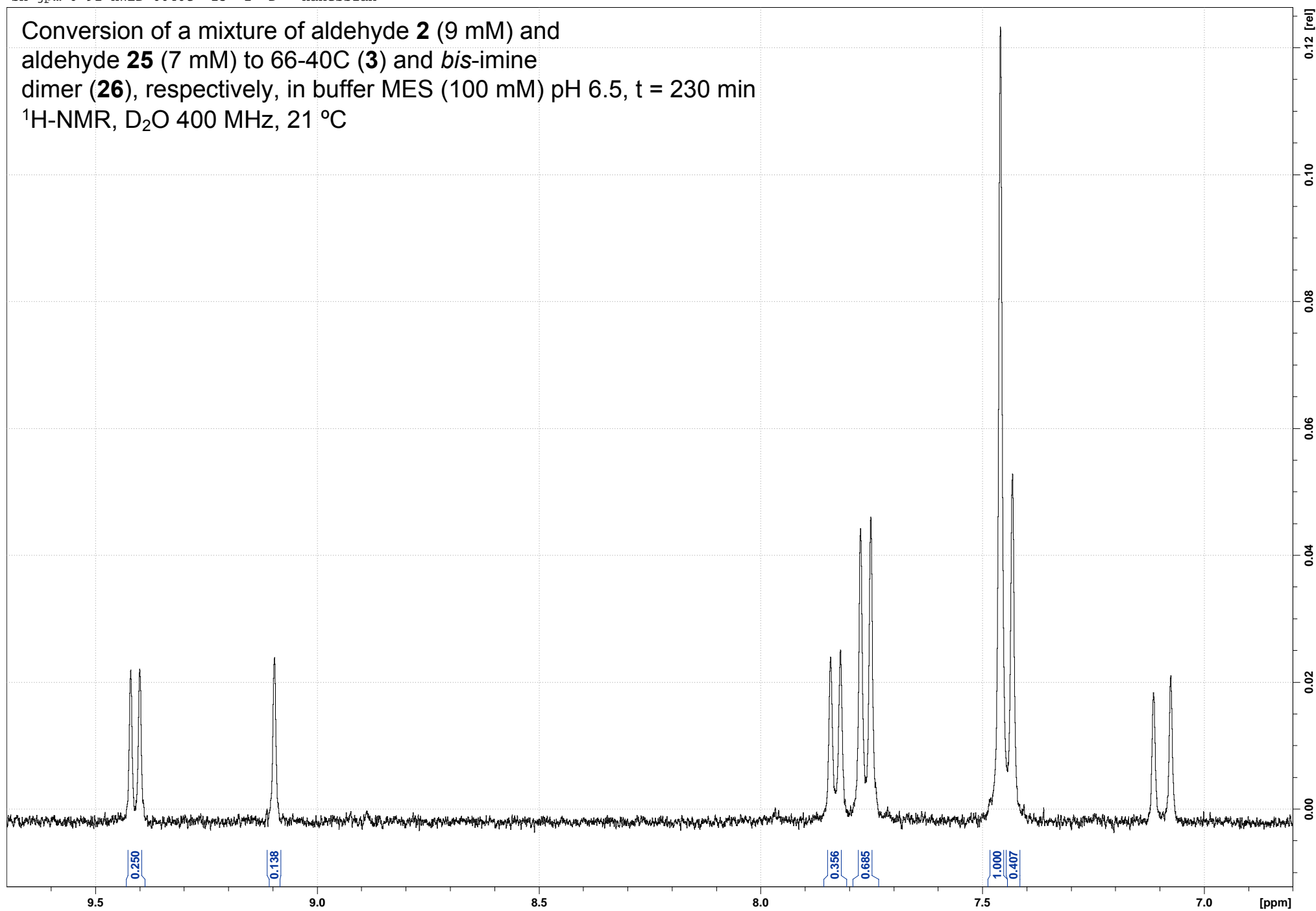
sh-jpm-6-91-HWED-6640C 24 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 220 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



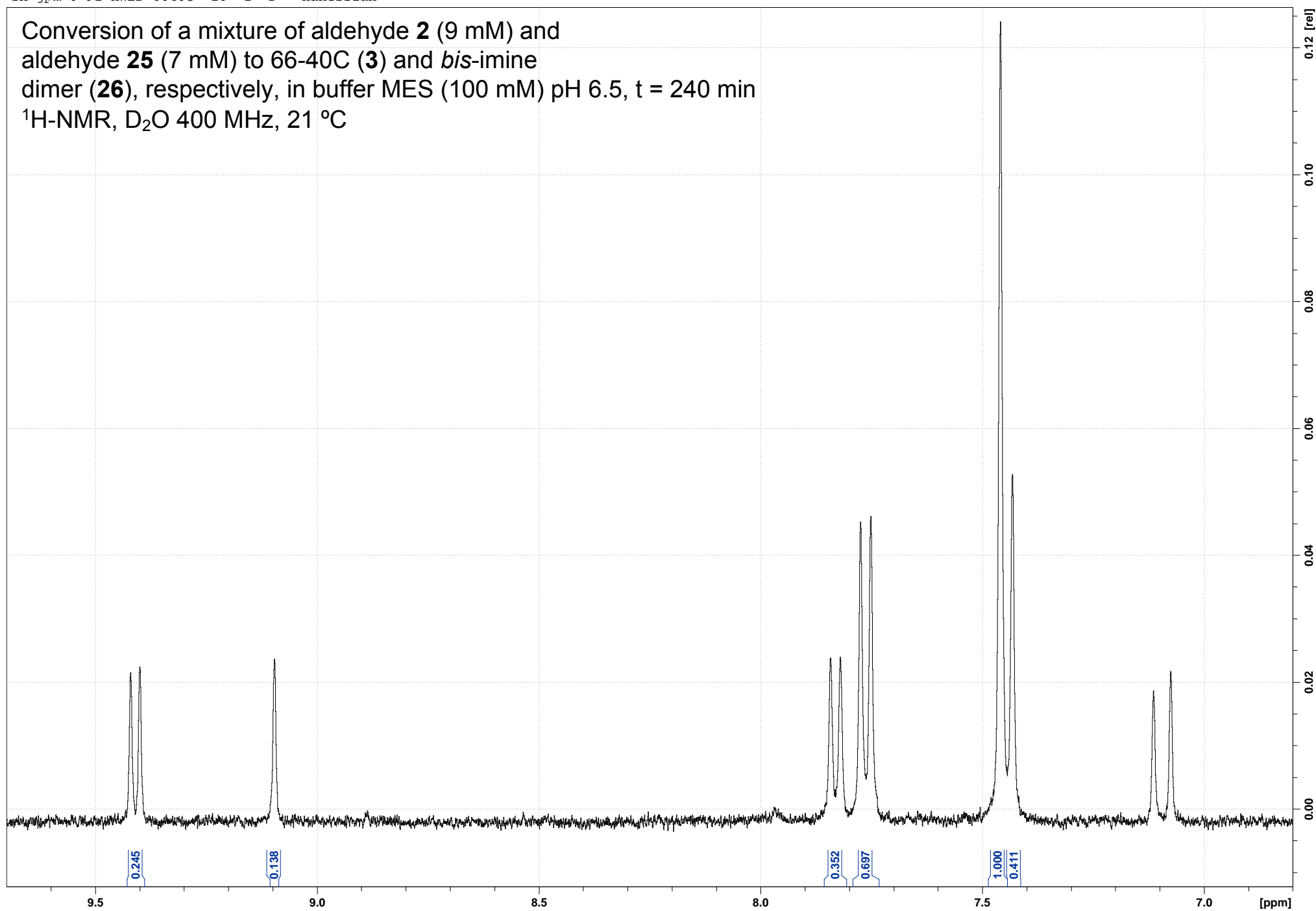
sh-jpm-6-91-HWED-6640C 25 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 230 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



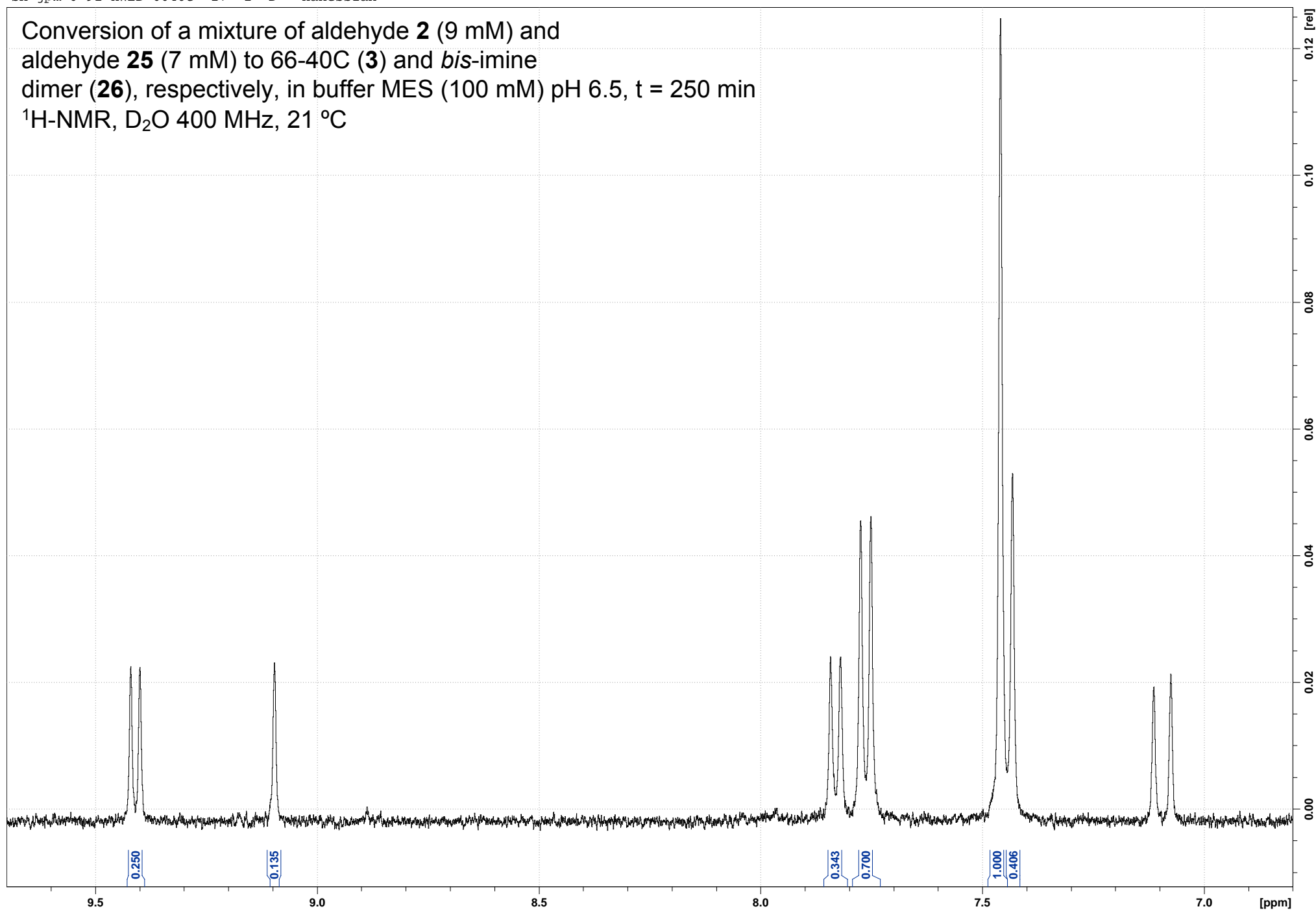
sh-jpm-6-91-HWED-6640C 26 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 240 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



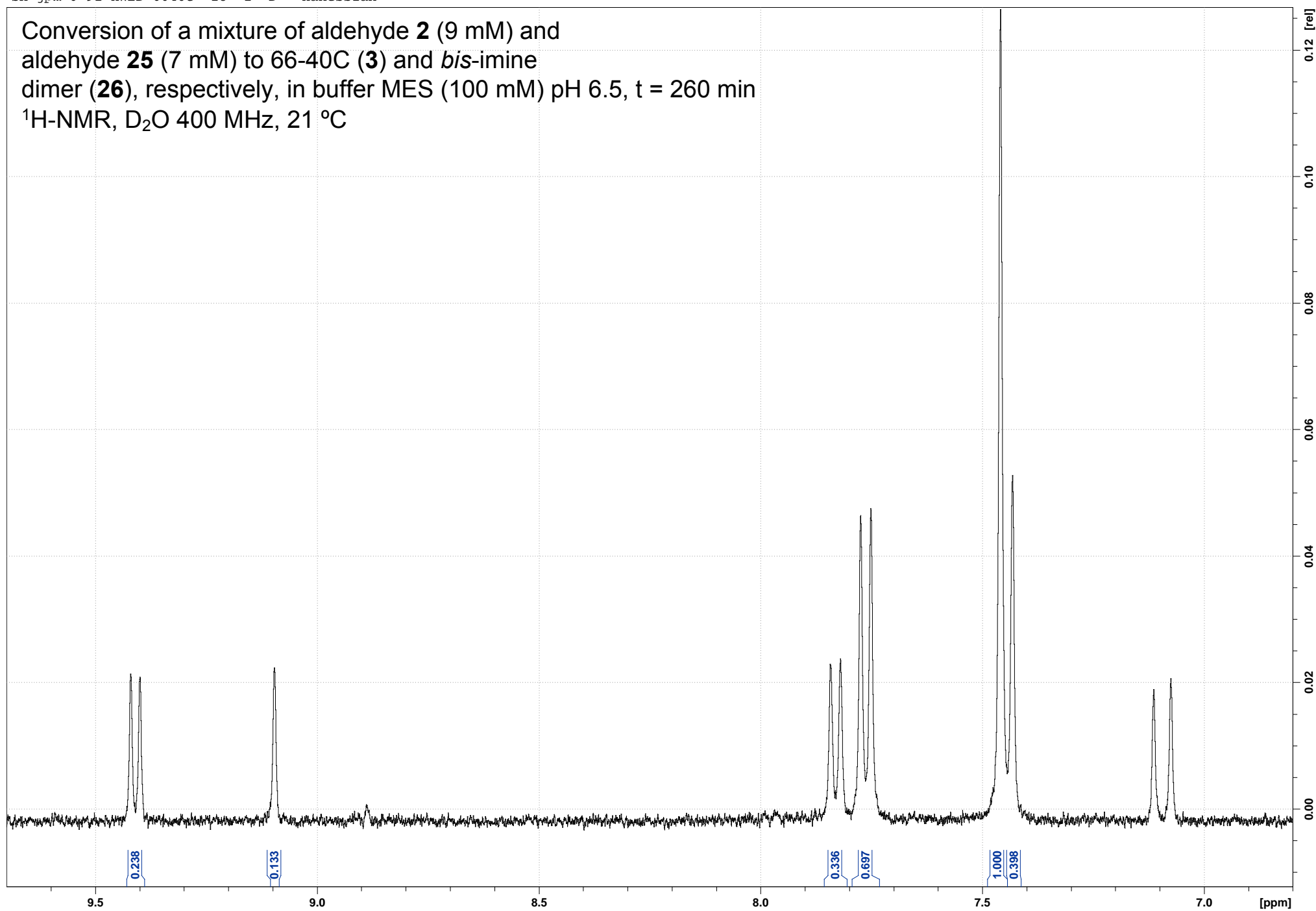
sh-jpm-6-91-HWED-6640C 27 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 250 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



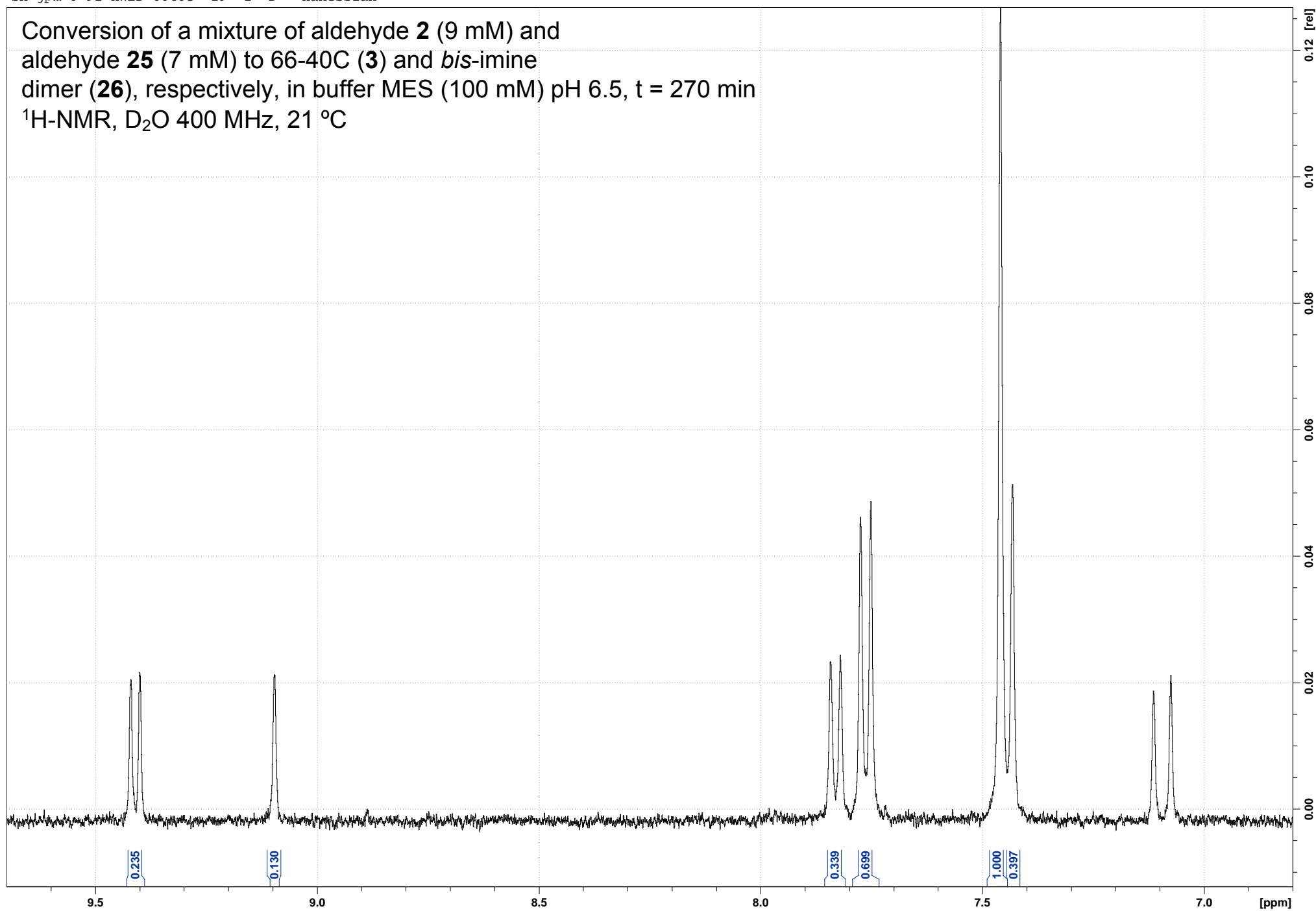
sh-jpm-6-91-HWED-6640C 28 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 260 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-HWED-6640C 29 1 D: Hanessian

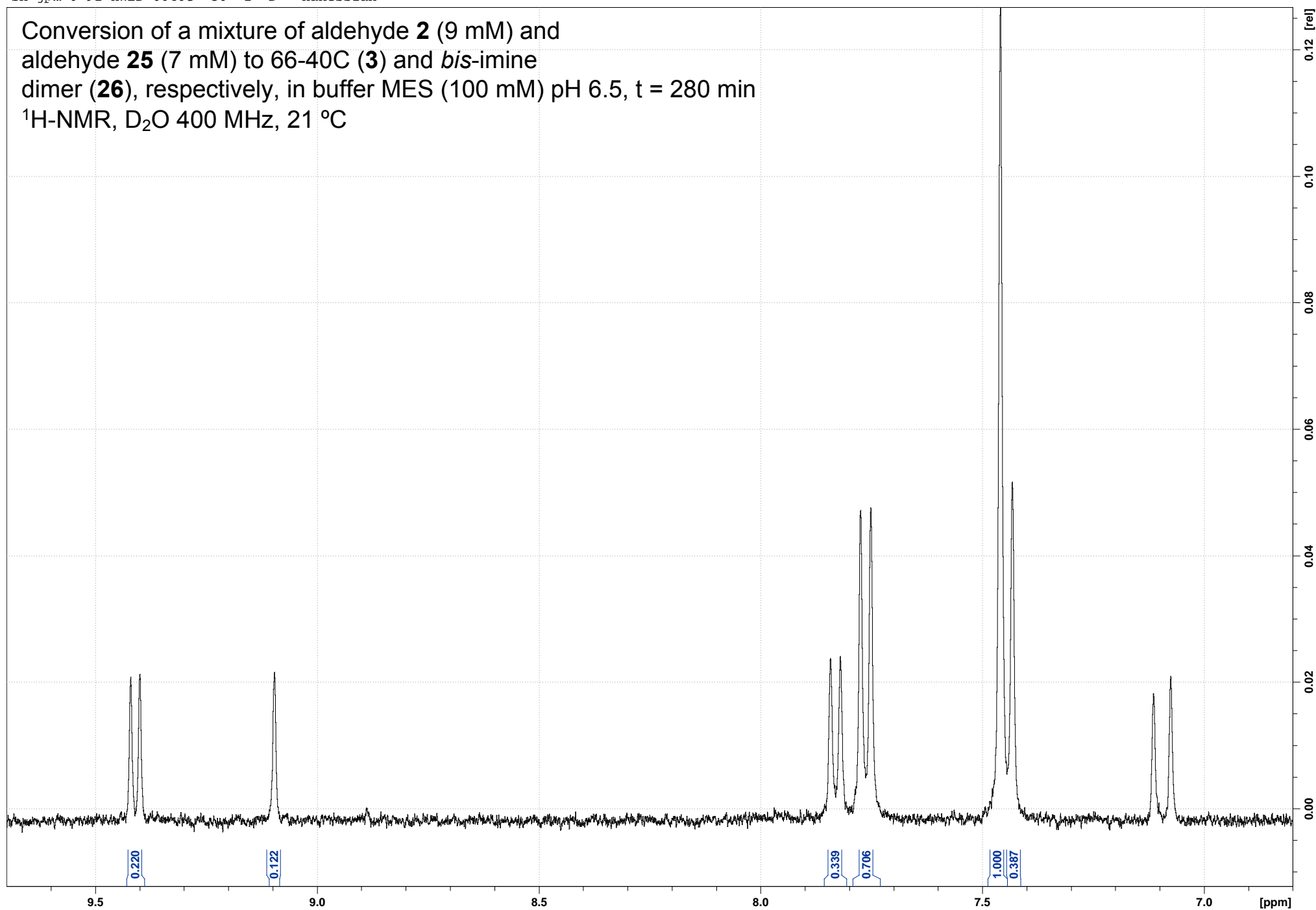
Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 270 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





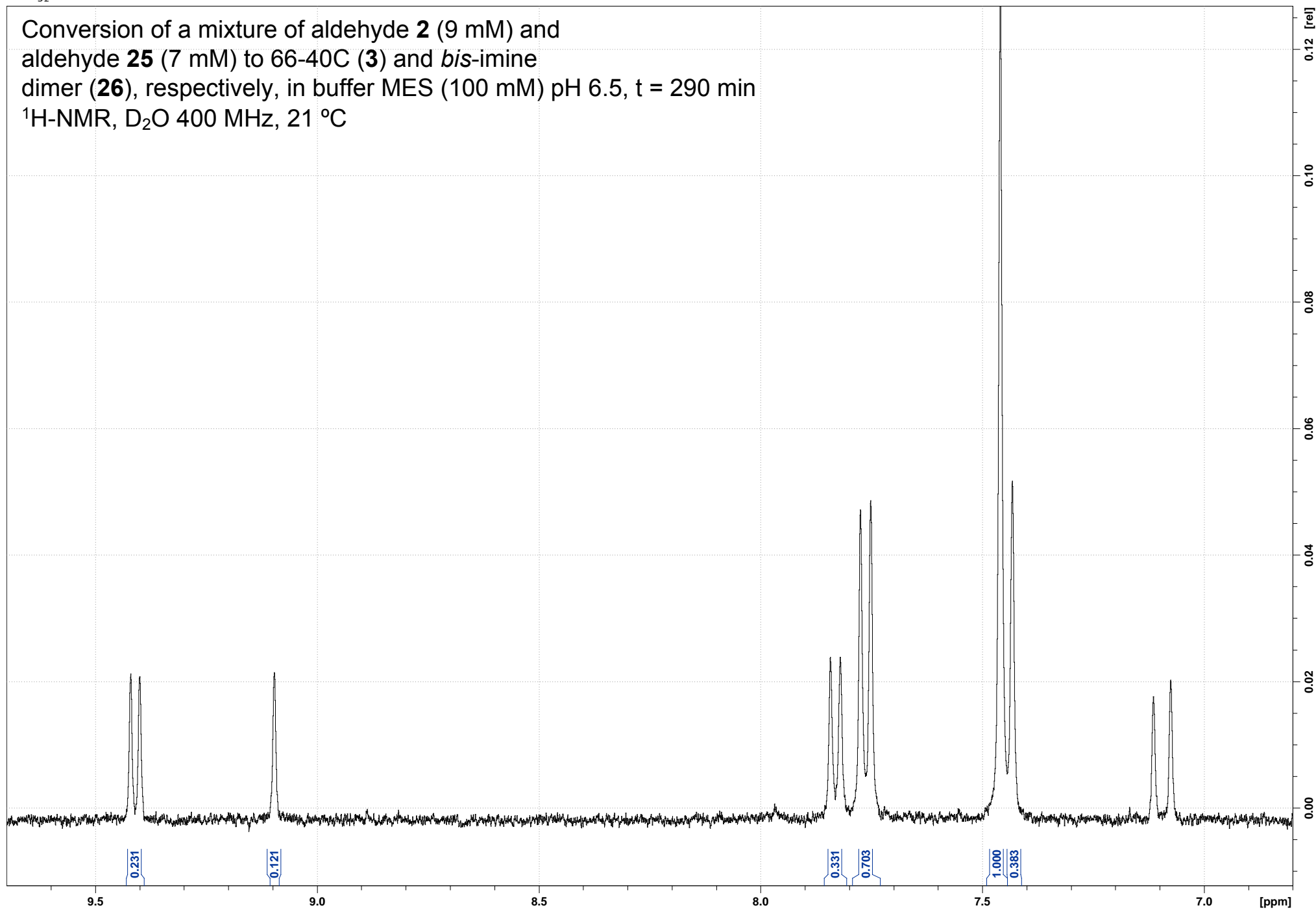
sh-jpm-6-91-HWED-6640C 30 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 280 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



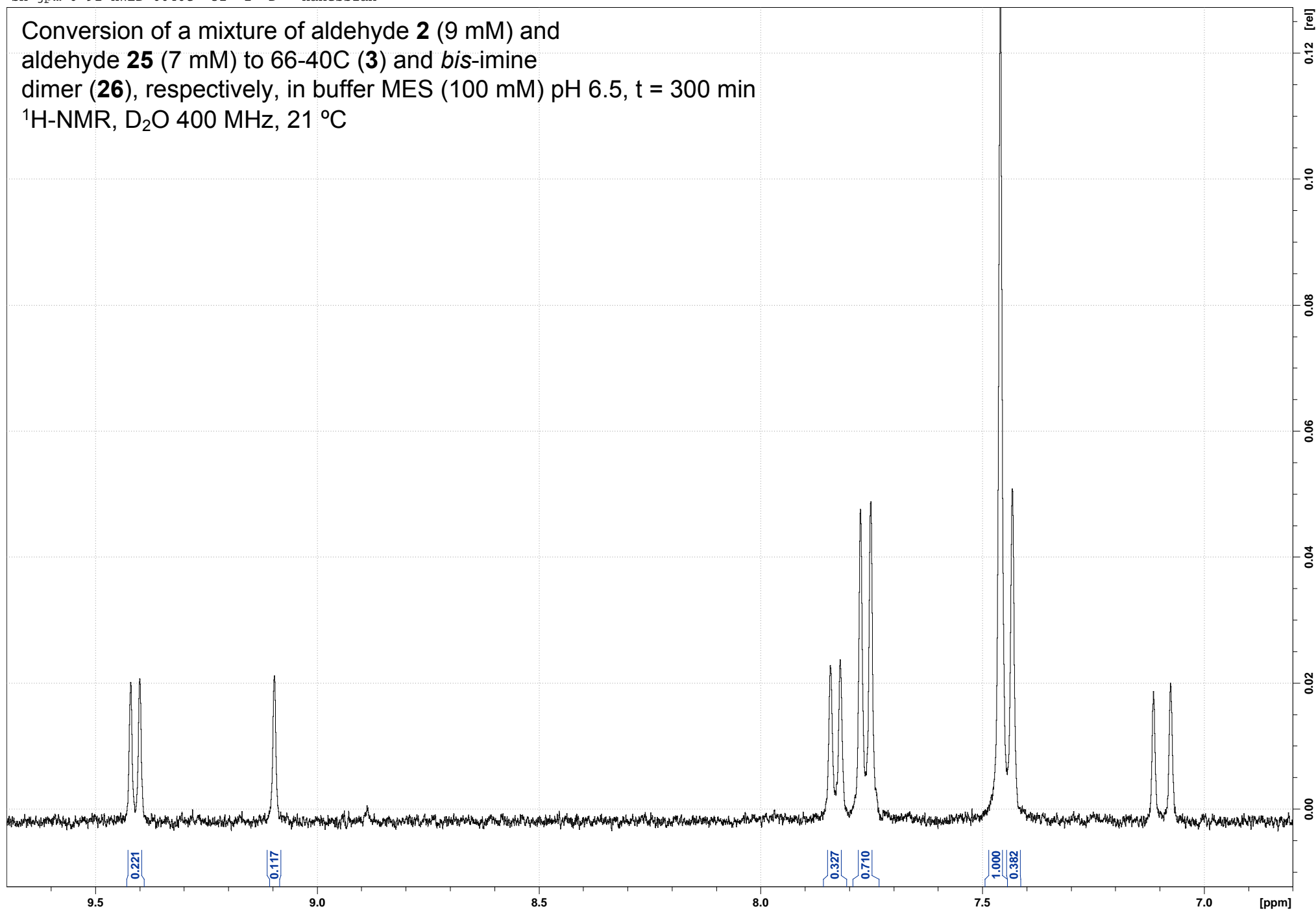
sh-jpm-6-91-HWED-6640C 31 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 290 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



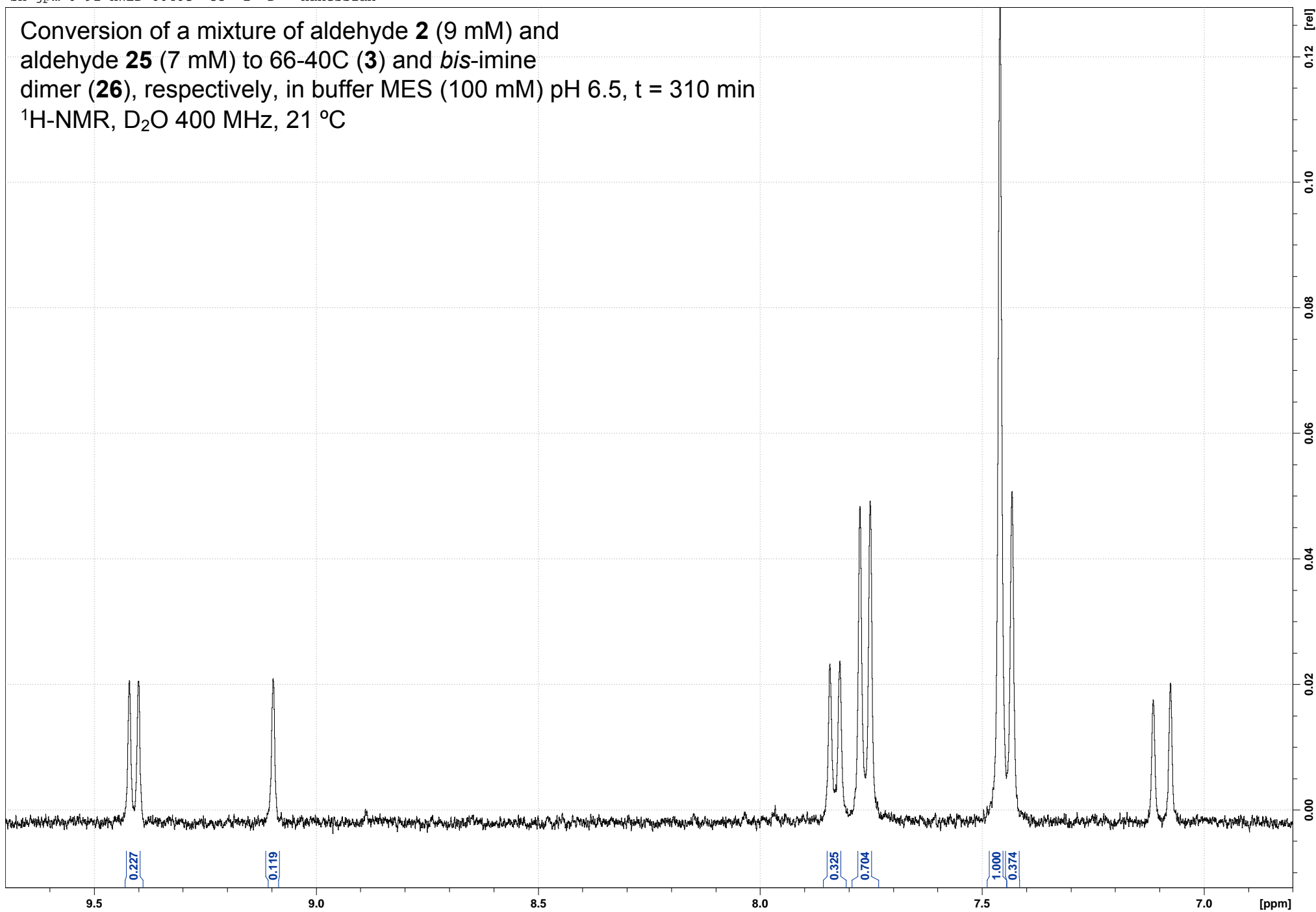
sh-jpm-6-91-HWED-6640C 32 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 300 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



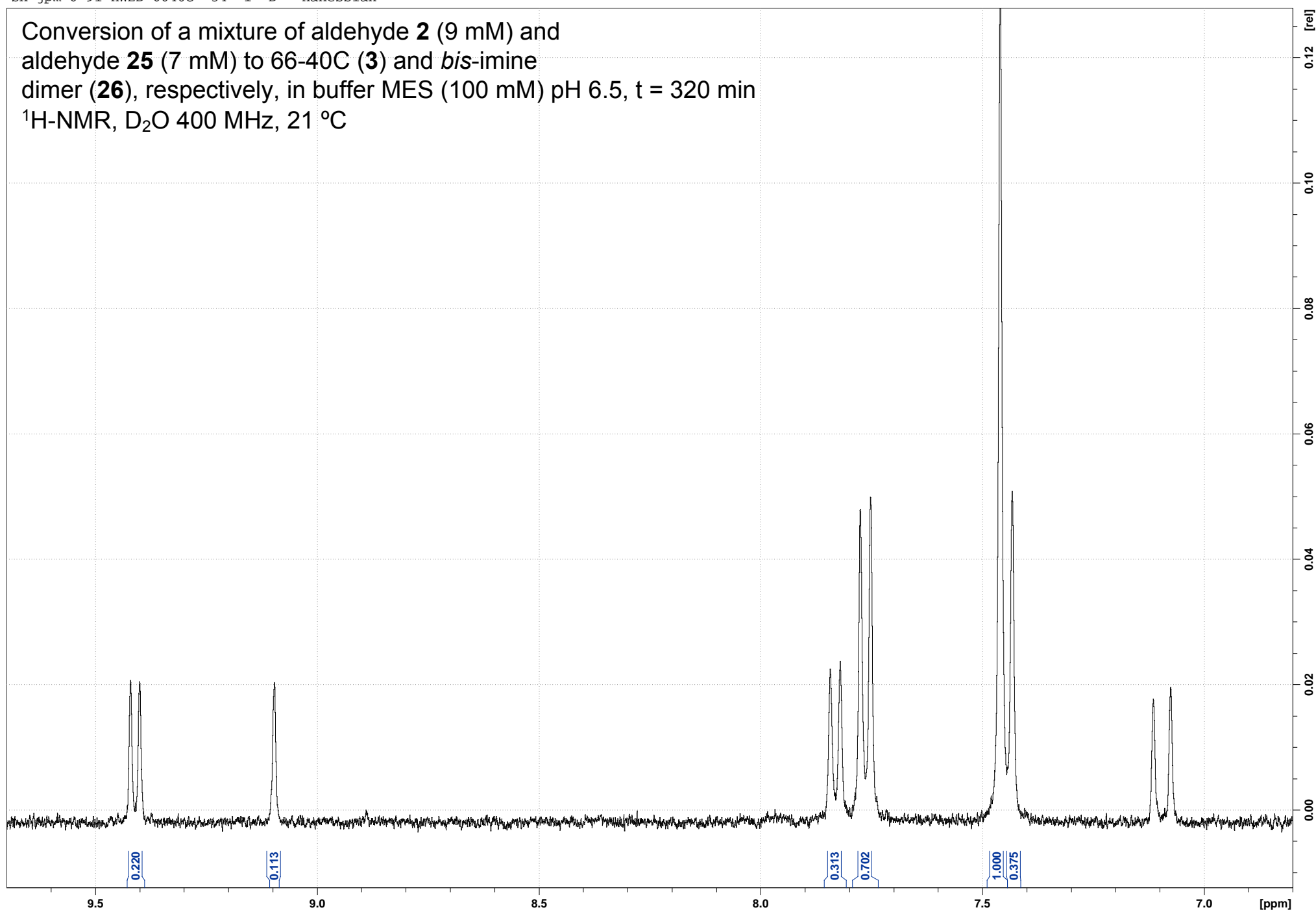
sh-jpm-6-91-HWED-6640C 33 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 310 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



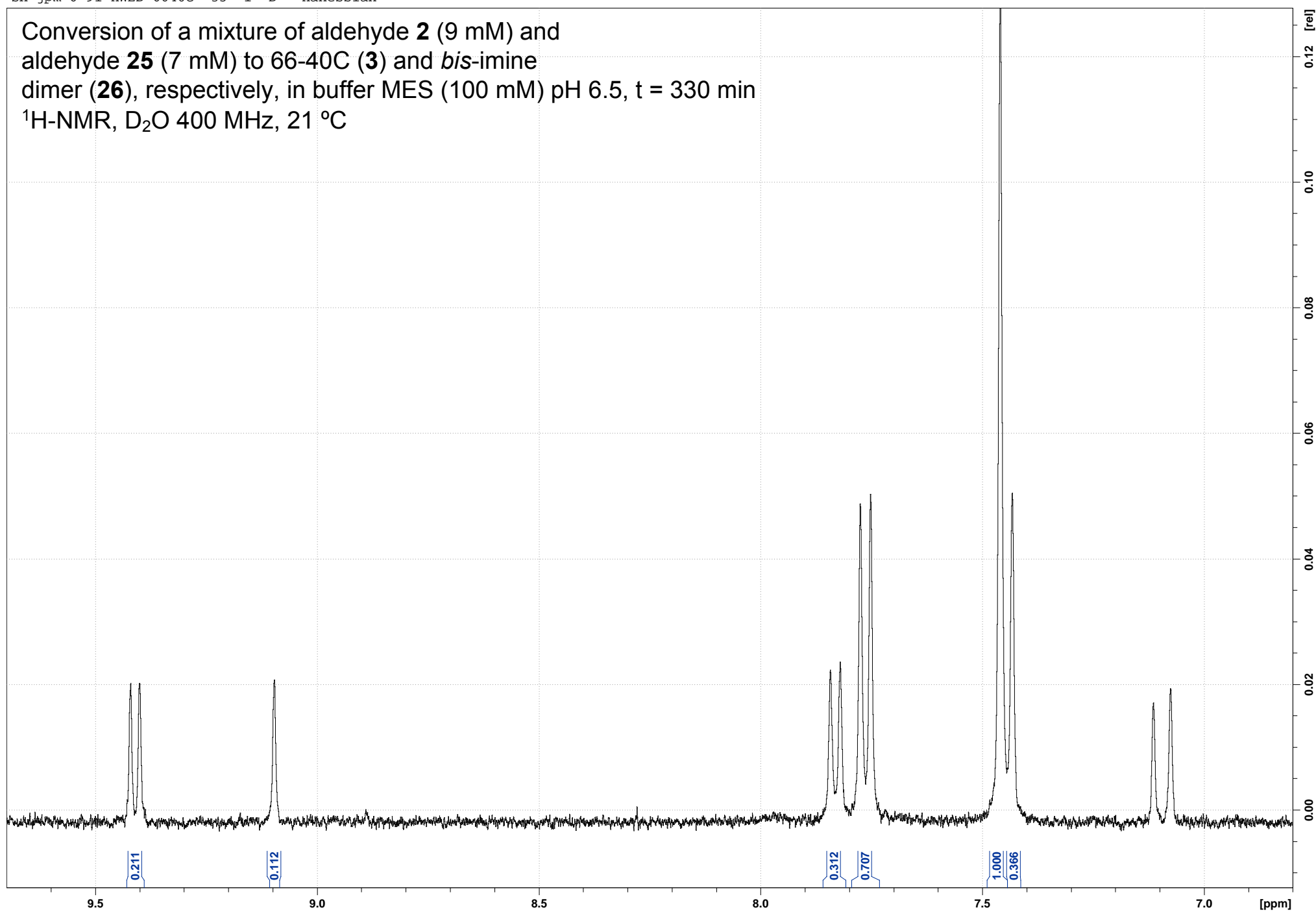
sh-jpm-6-91-HWED-6640C 34 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 320 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



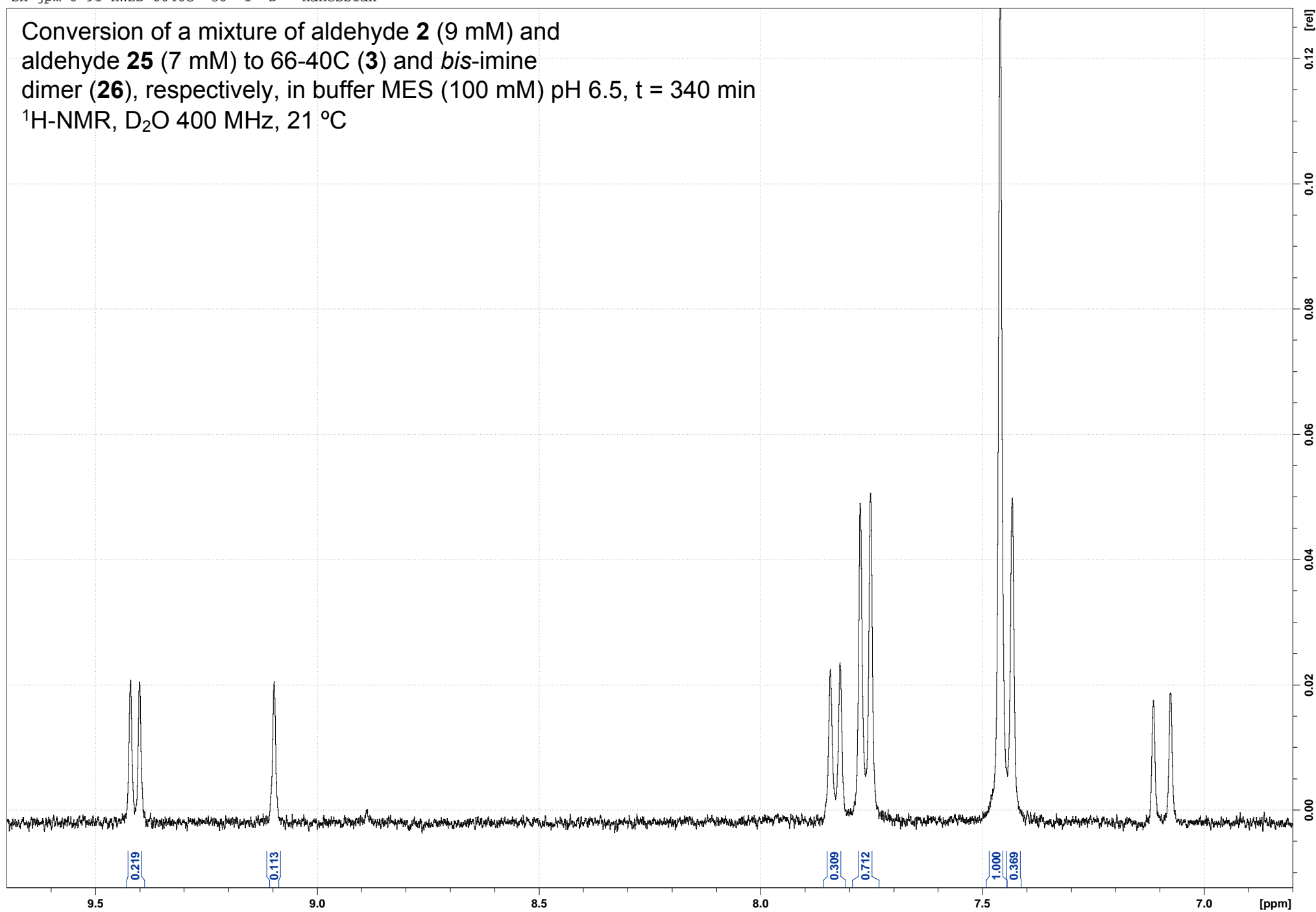
sh-jpm-6-91-HWED-6640C 35 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 330 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



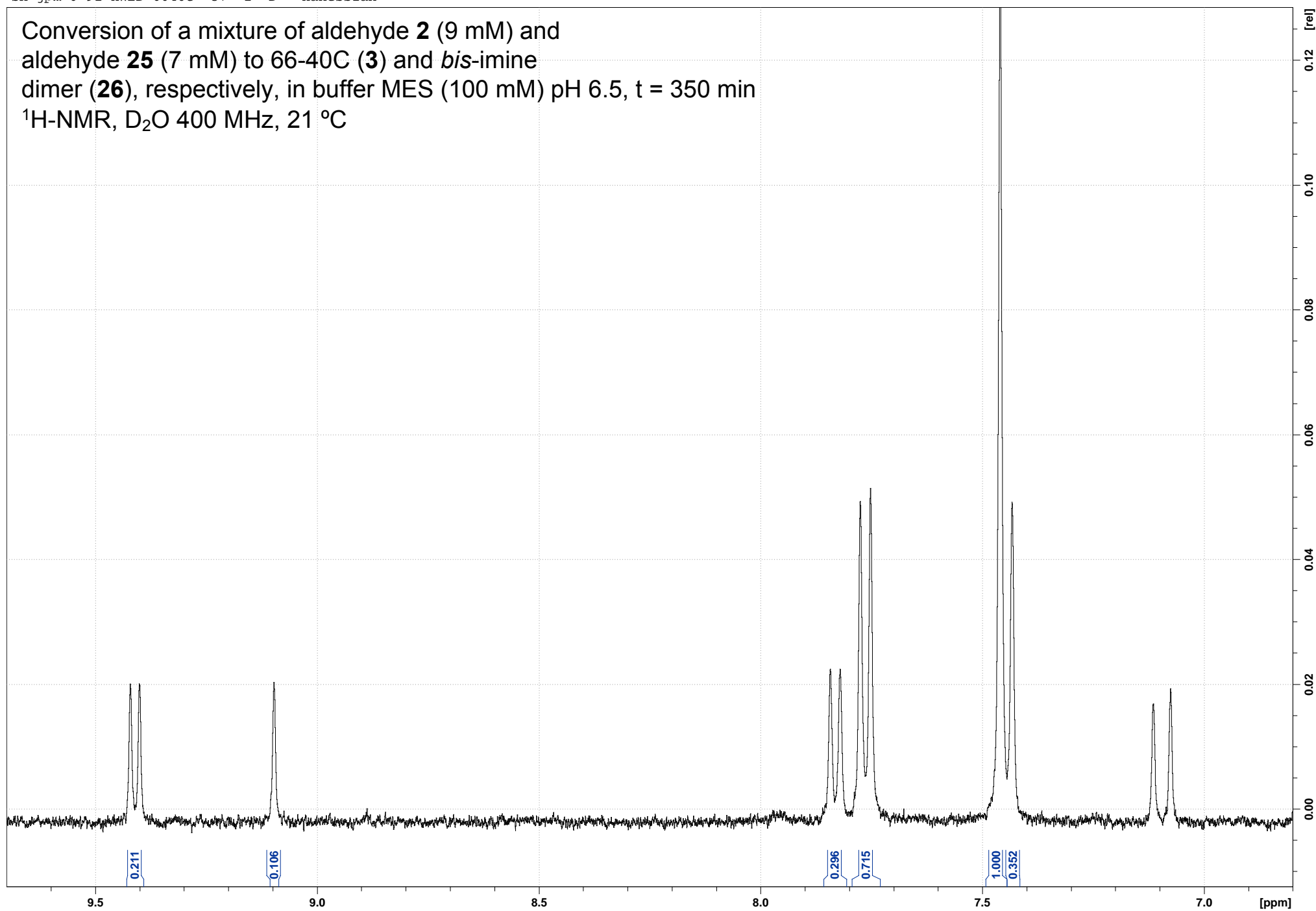
sh-jpm-6-91-HWED-6640C 36 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 340 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-HWED-6640C 37 1 D: Hanessian

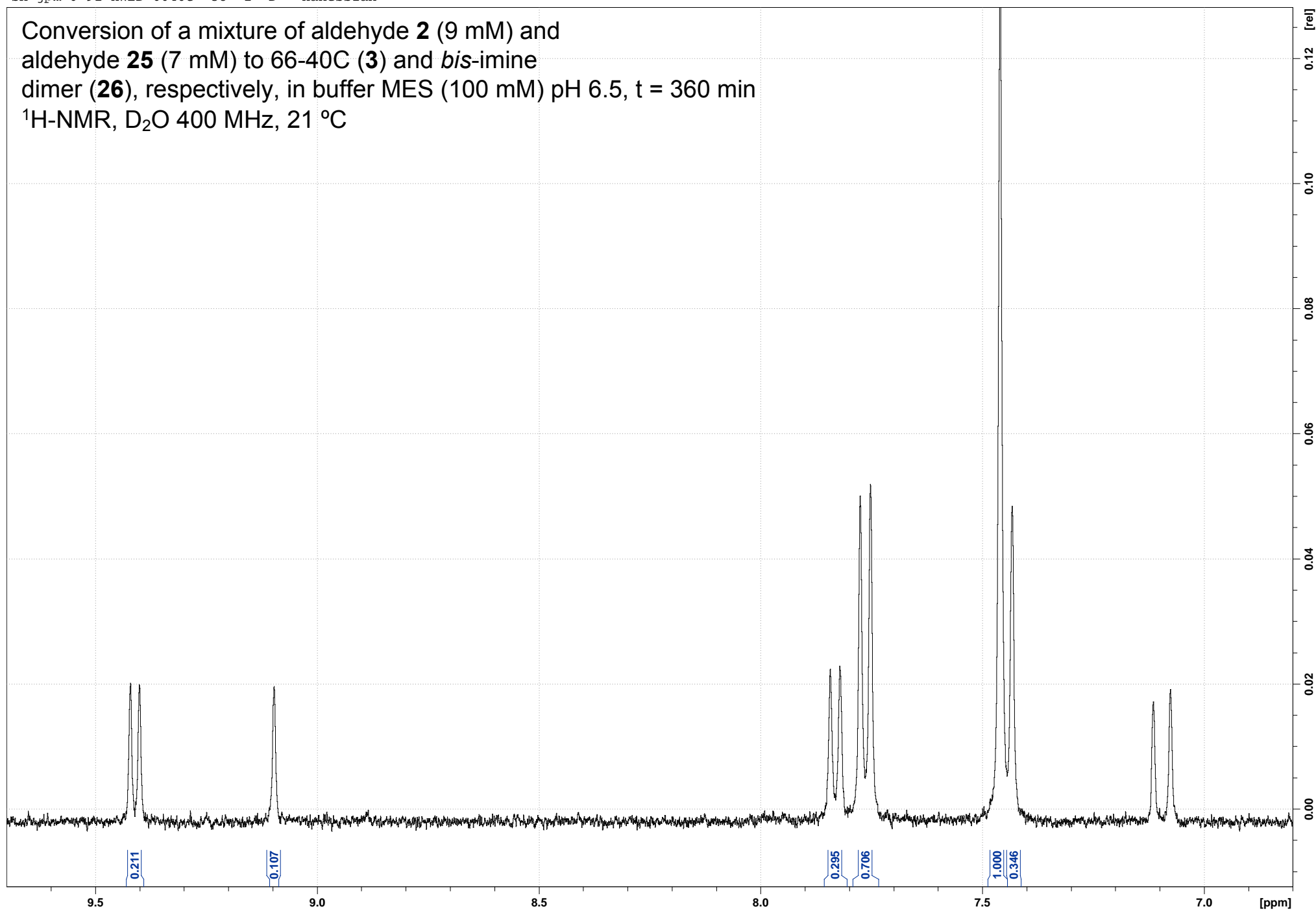
Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 350 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





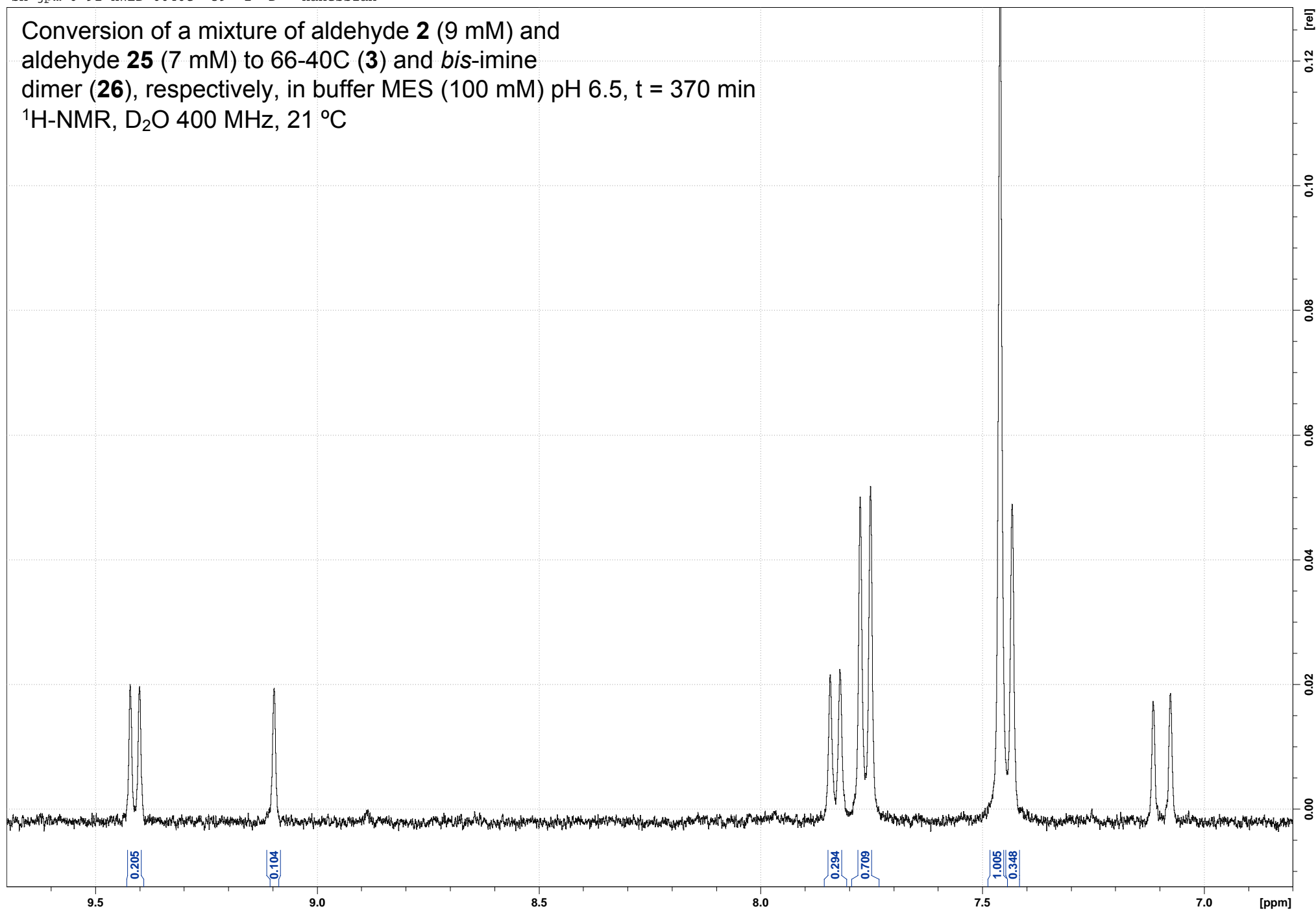
sh-jpm-6-91-HWED-6640C 38 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 360 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



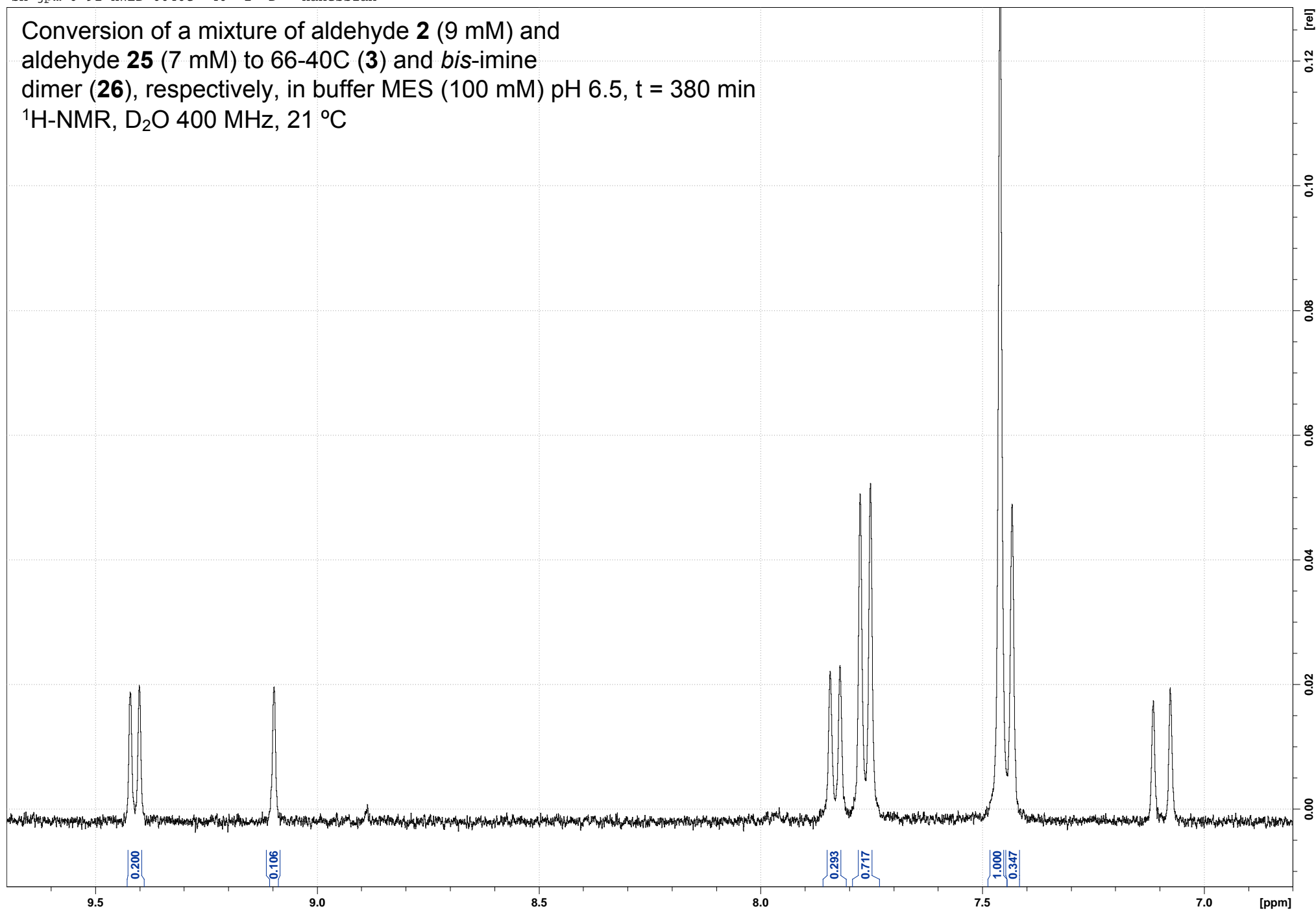
sh-jpm-6-91-HWED-6640C 39 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 370 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



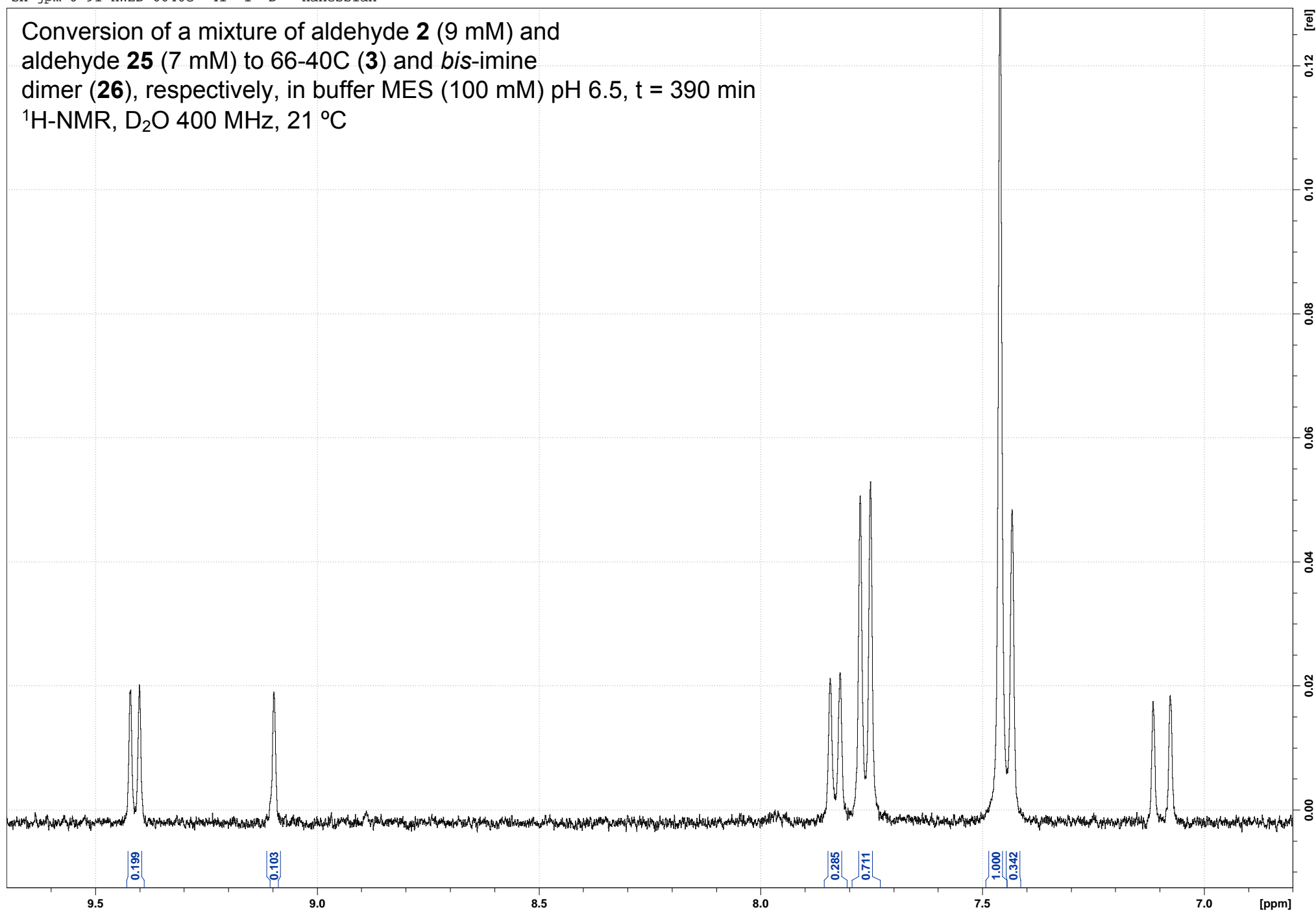
sh-jpm-6-91-HWED-6640C 40 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 380 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



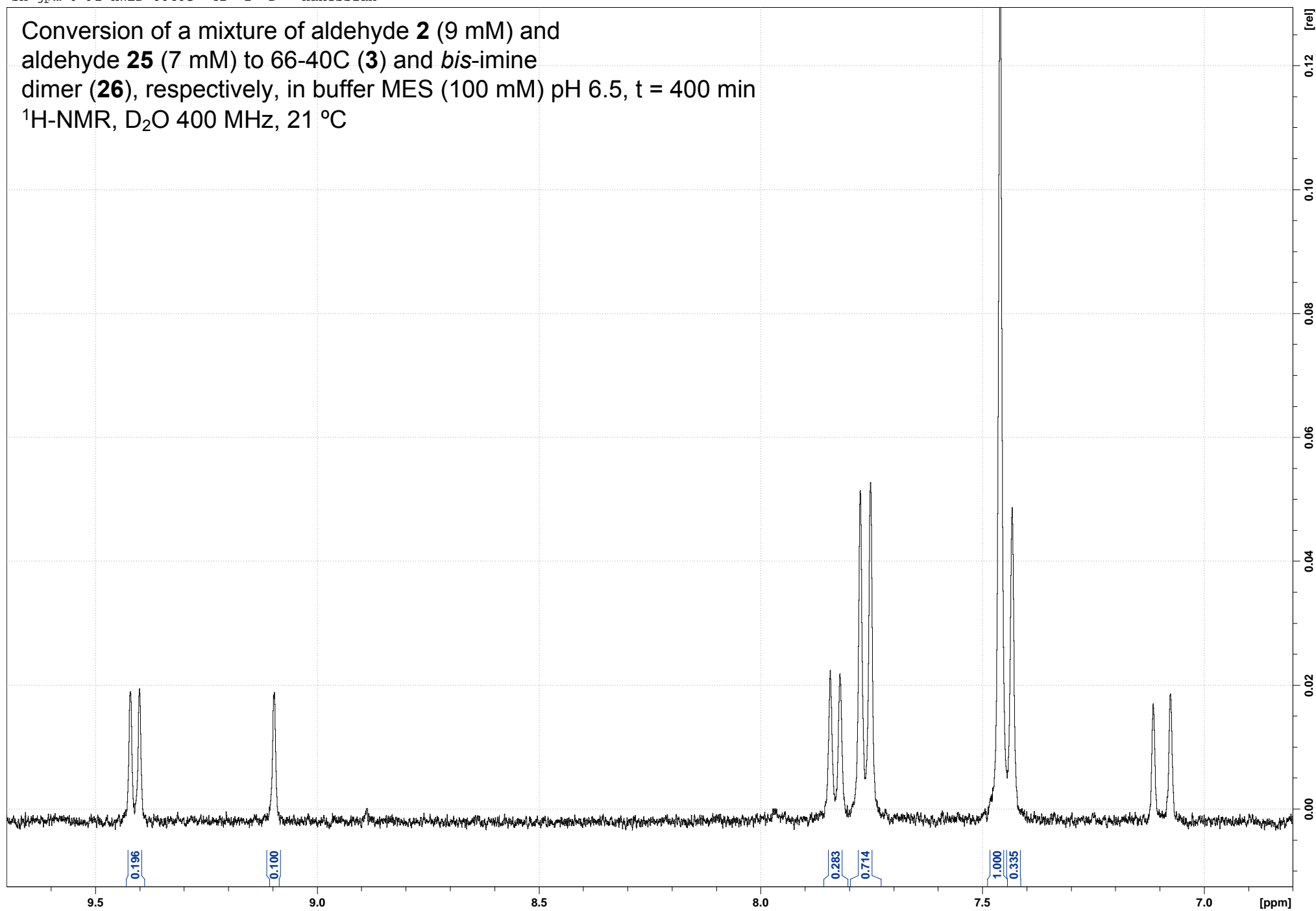
sh-jpm-6-91-HWED-6640C 41 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 390 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



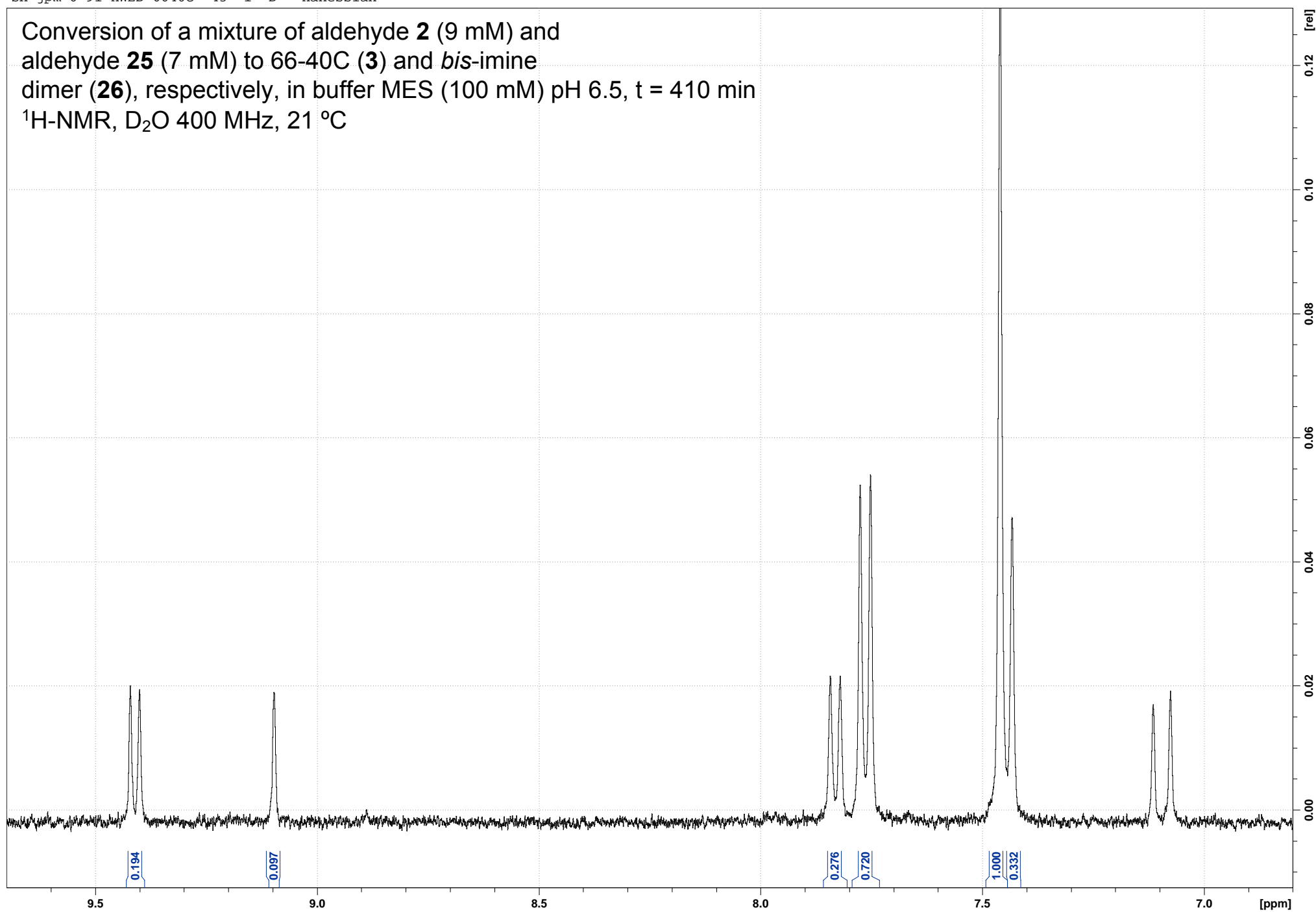
sh-jpm-6-91-HWED-6640C 42 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 400 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



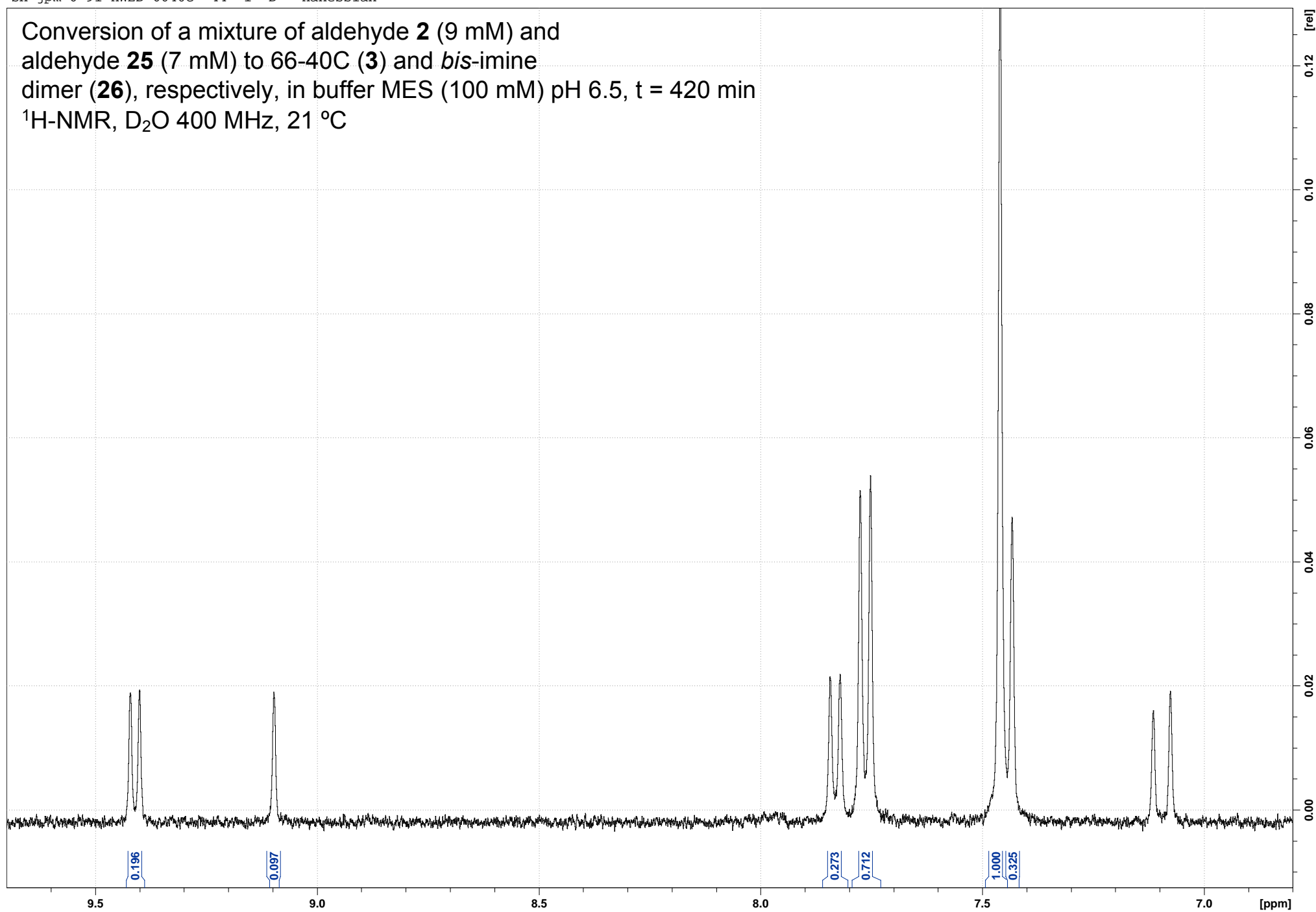
sh-jpm-6-91-HWED-6640C 43 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 410 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



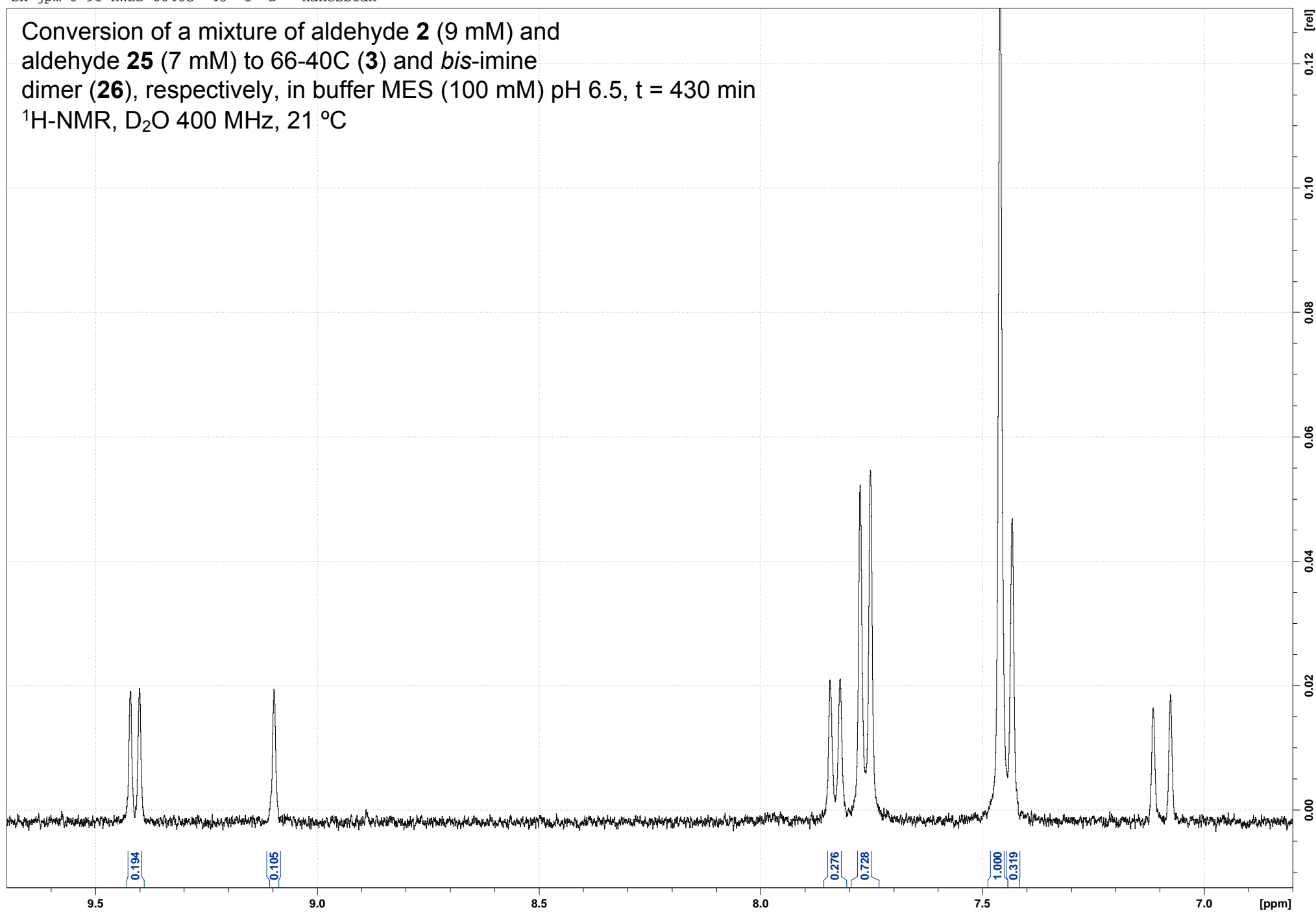
sh-jpm-6-91-HWED-6640C 44 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 420 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



sh-jpm-6-91-HWED-6640C 45 1 D: Hanessian

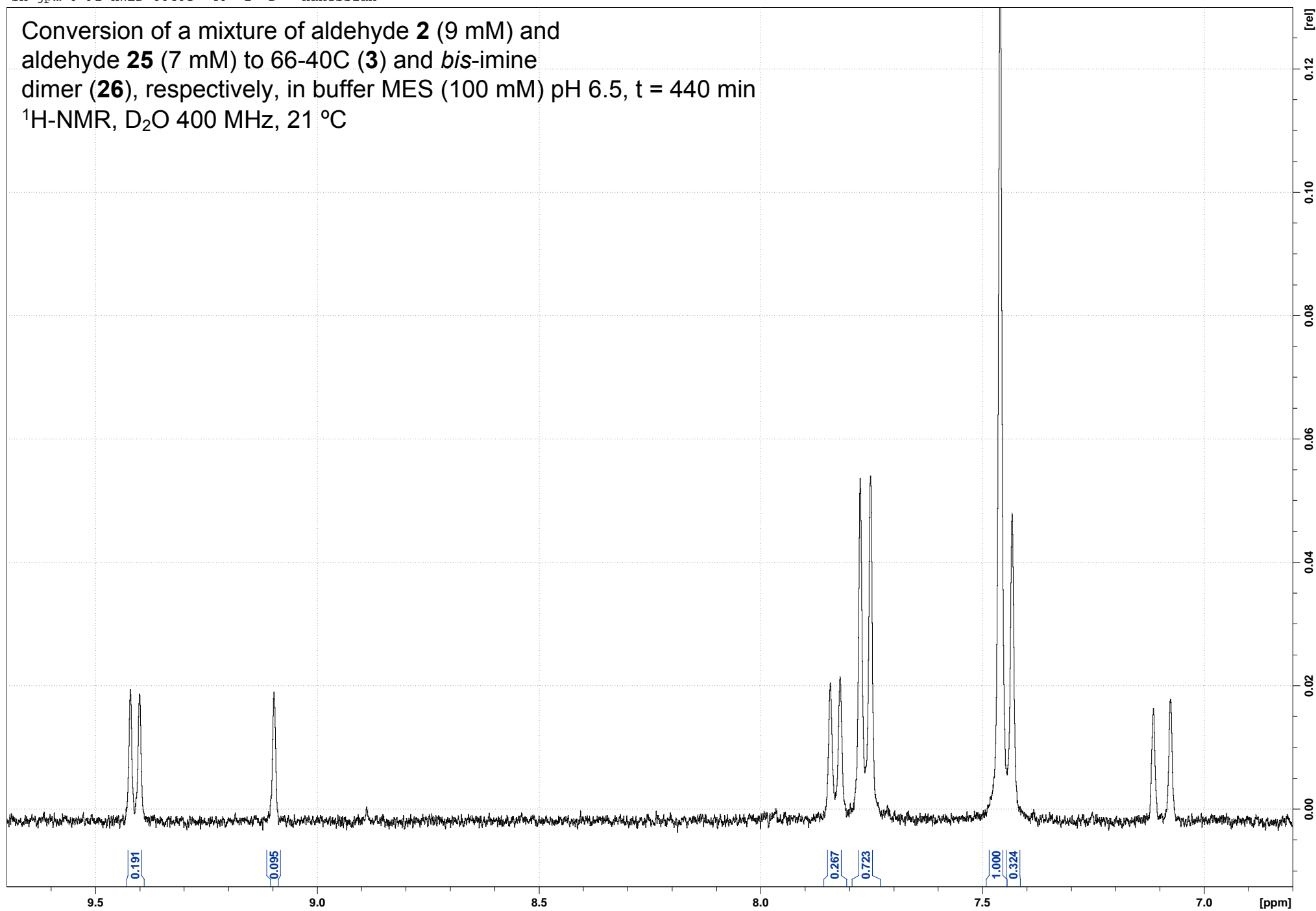
Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 430 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





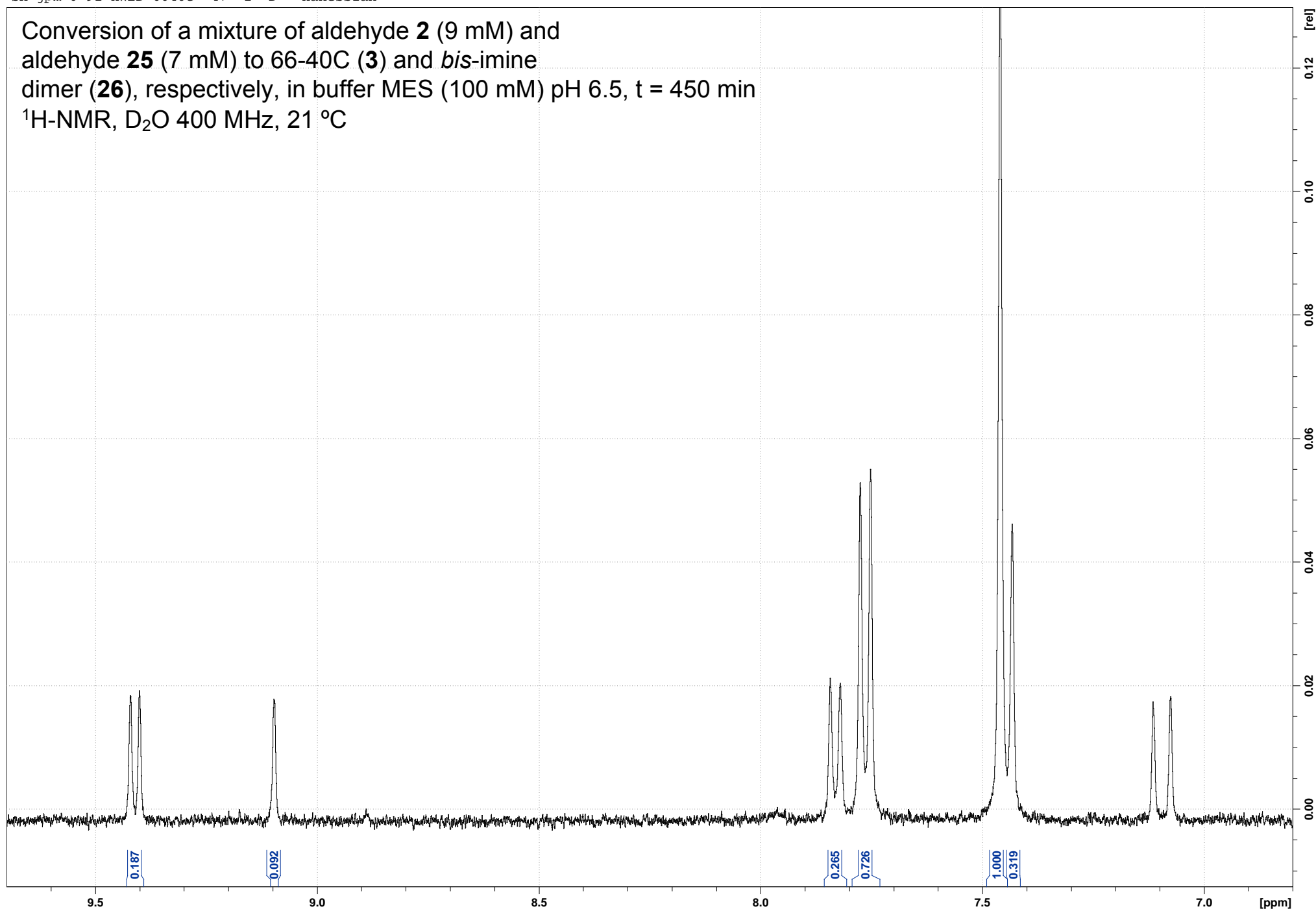
sh-jpm-6-91-HWED-6640C 46 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 440 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



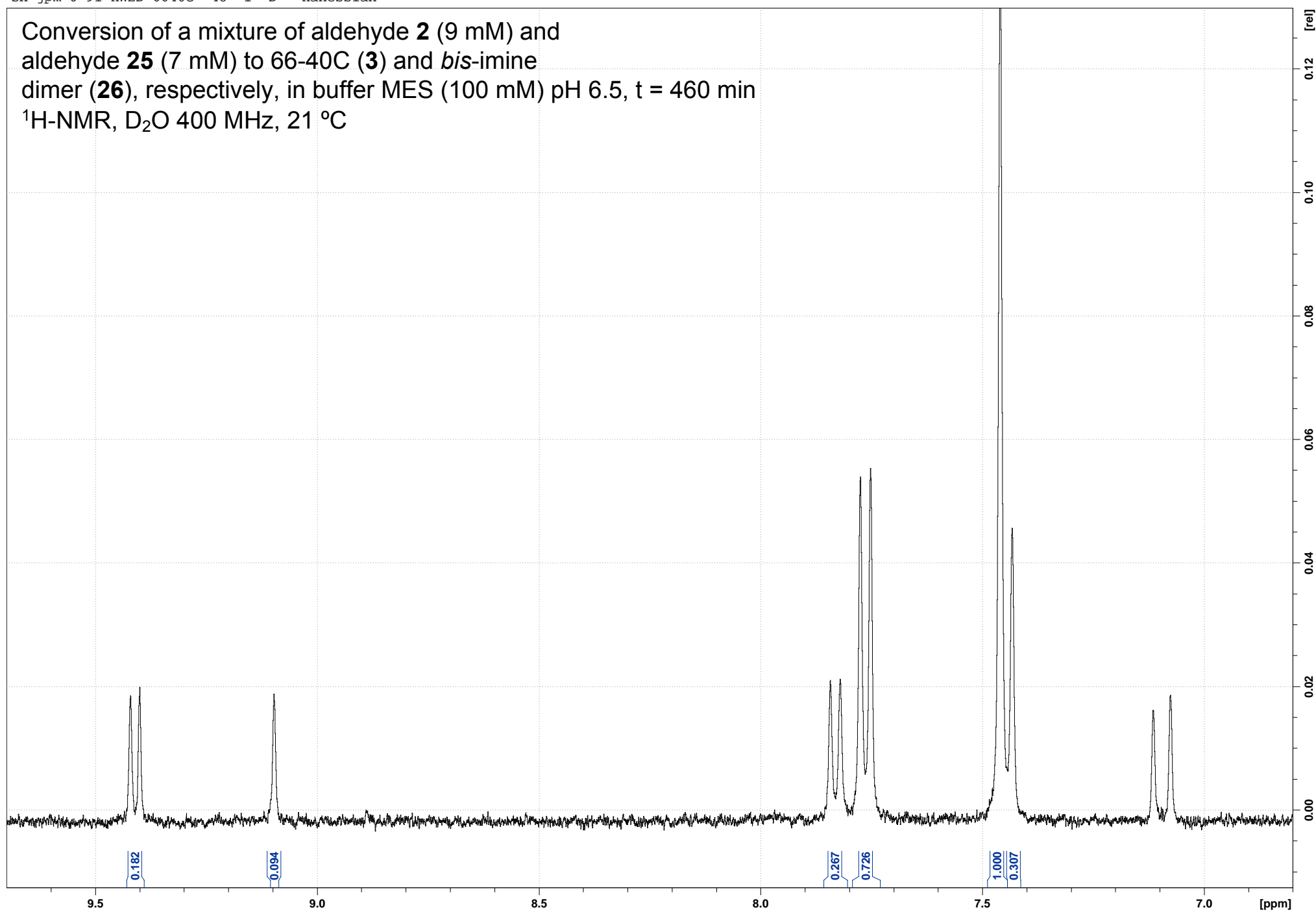
sh-jpm-6-91-HWED-6640C 47 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 450 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



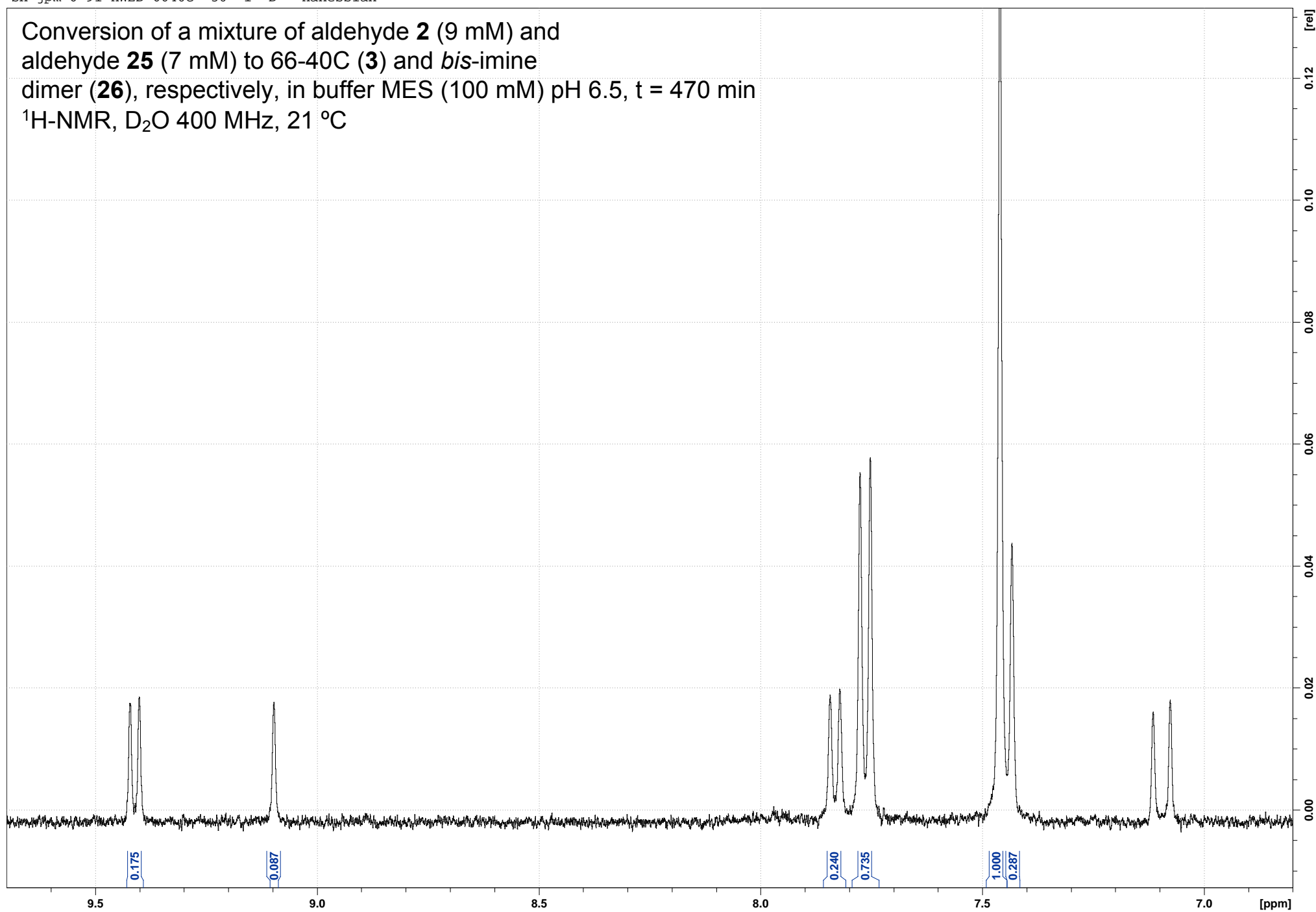
sh-jpm-6-91-HWED-6640C 48 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 460 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



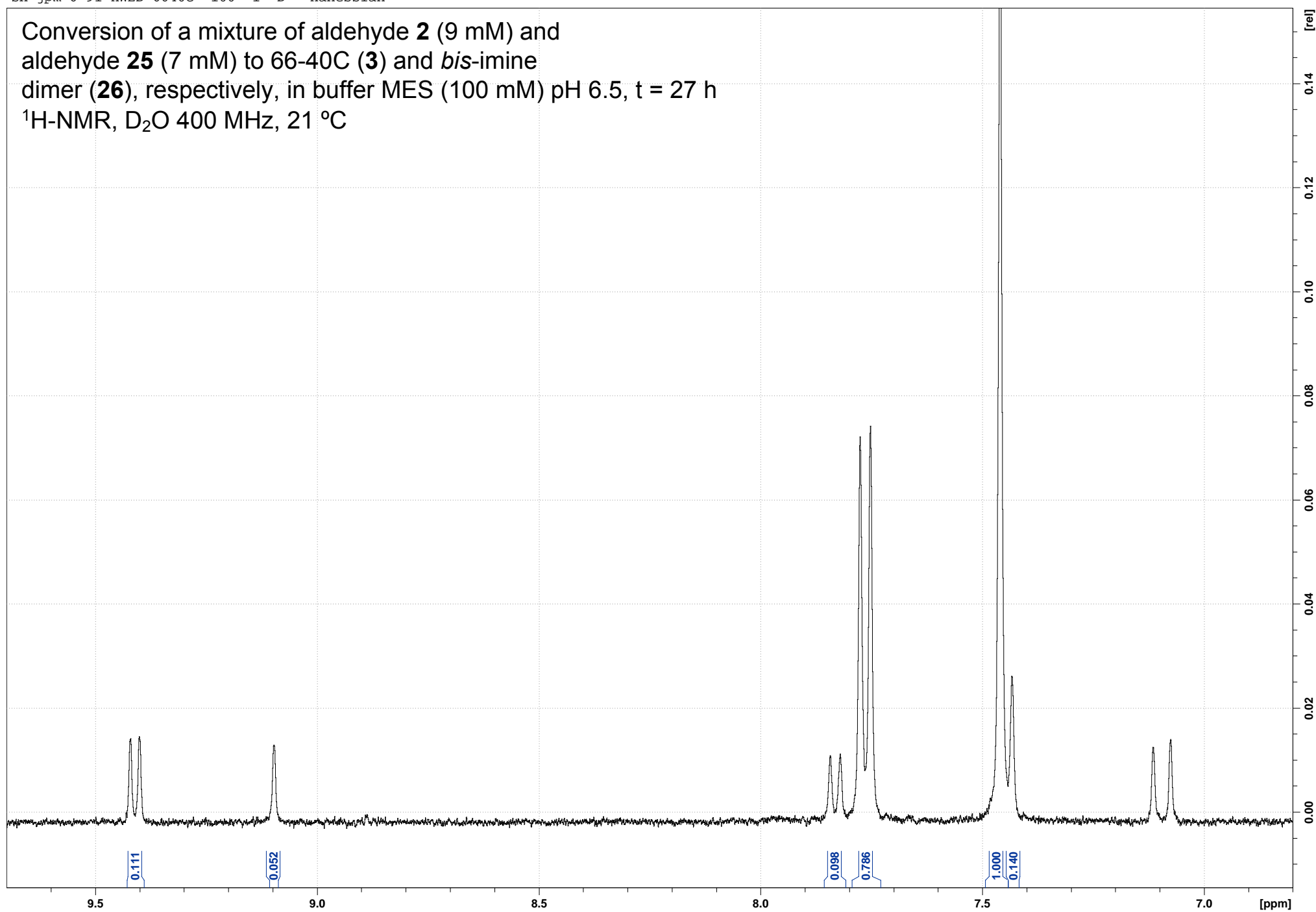
sh-jpm-6-91-HWED-6640C 50 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 470 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



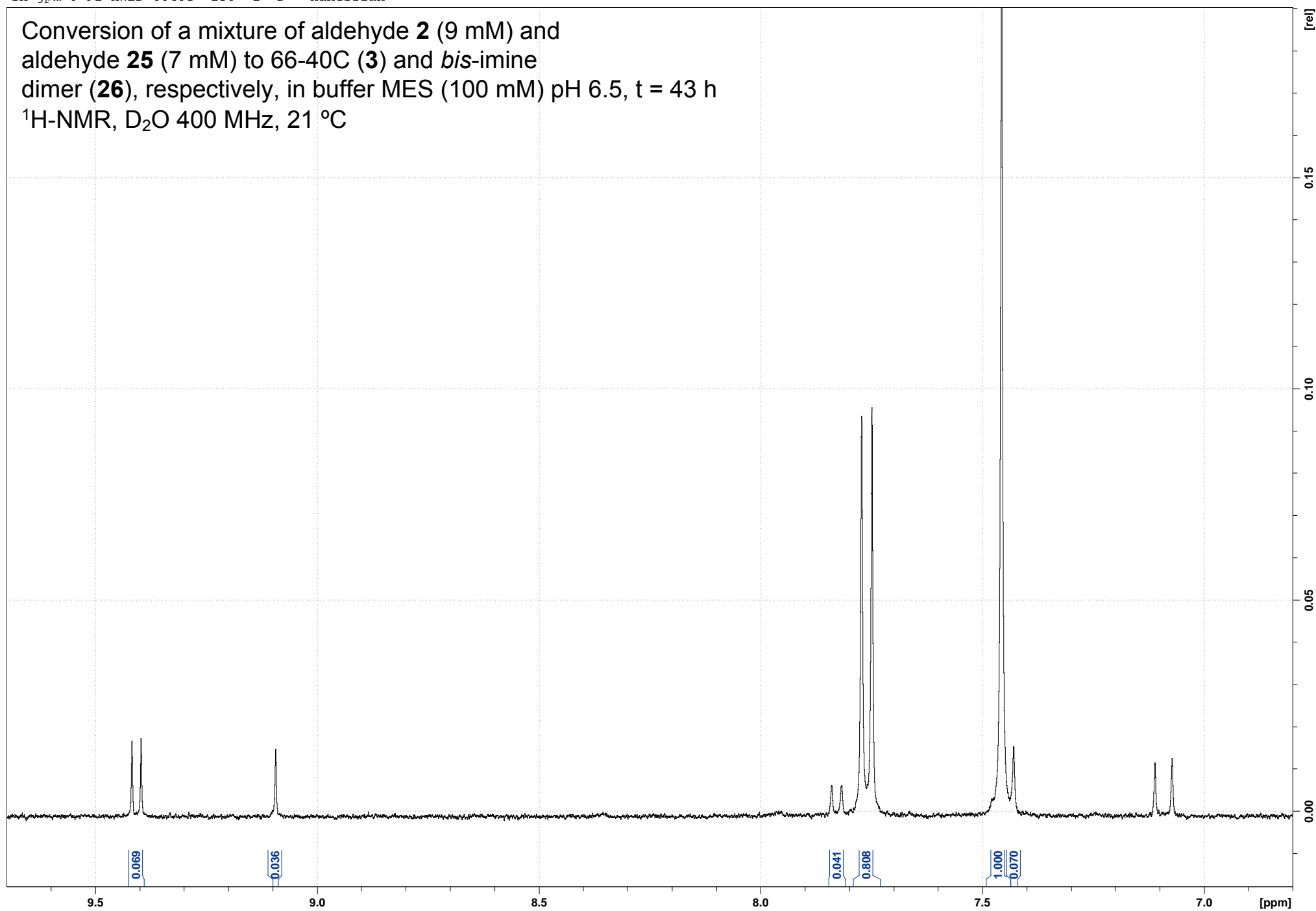
sh-jpm-6-91-HWED-6640C 100 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 27 h  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



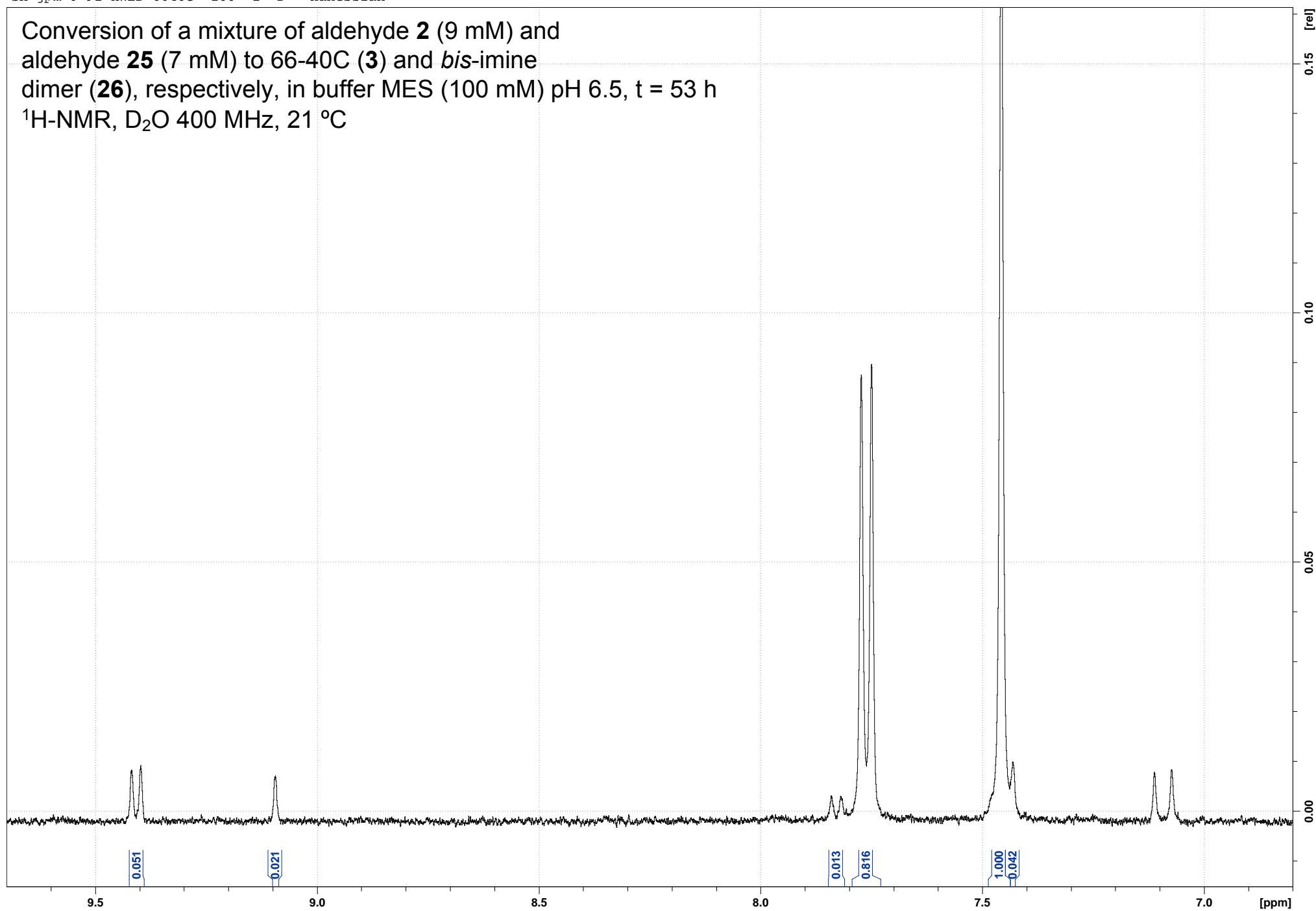
sh-jpm-6-91-HWED-6640C 150 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 43 h  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



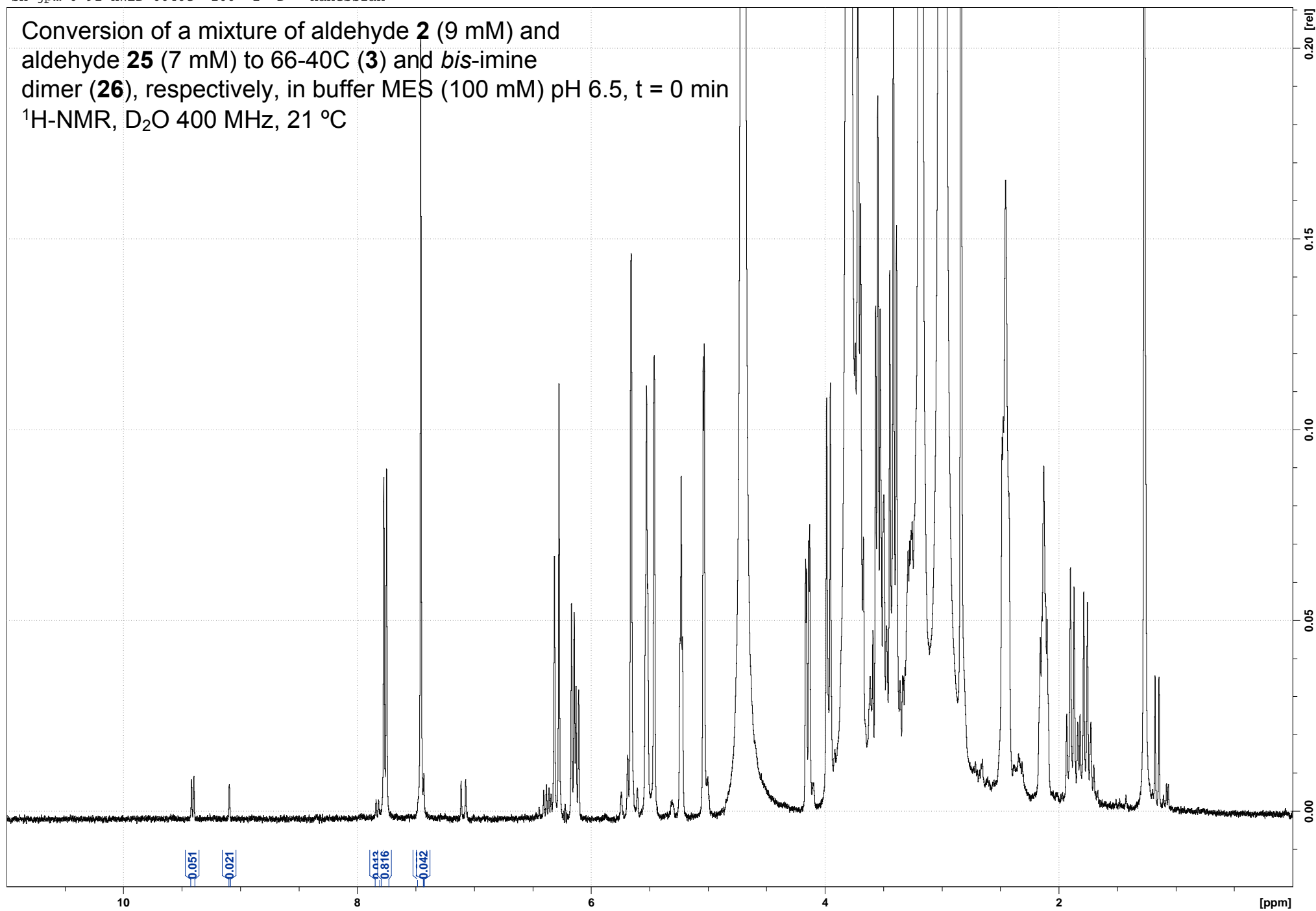
sh-jpm-6-91-HWED-6640C 200 1 D: Hanessian

Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 53 h  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91-HWED-6640C 200 1 D: Hanessian

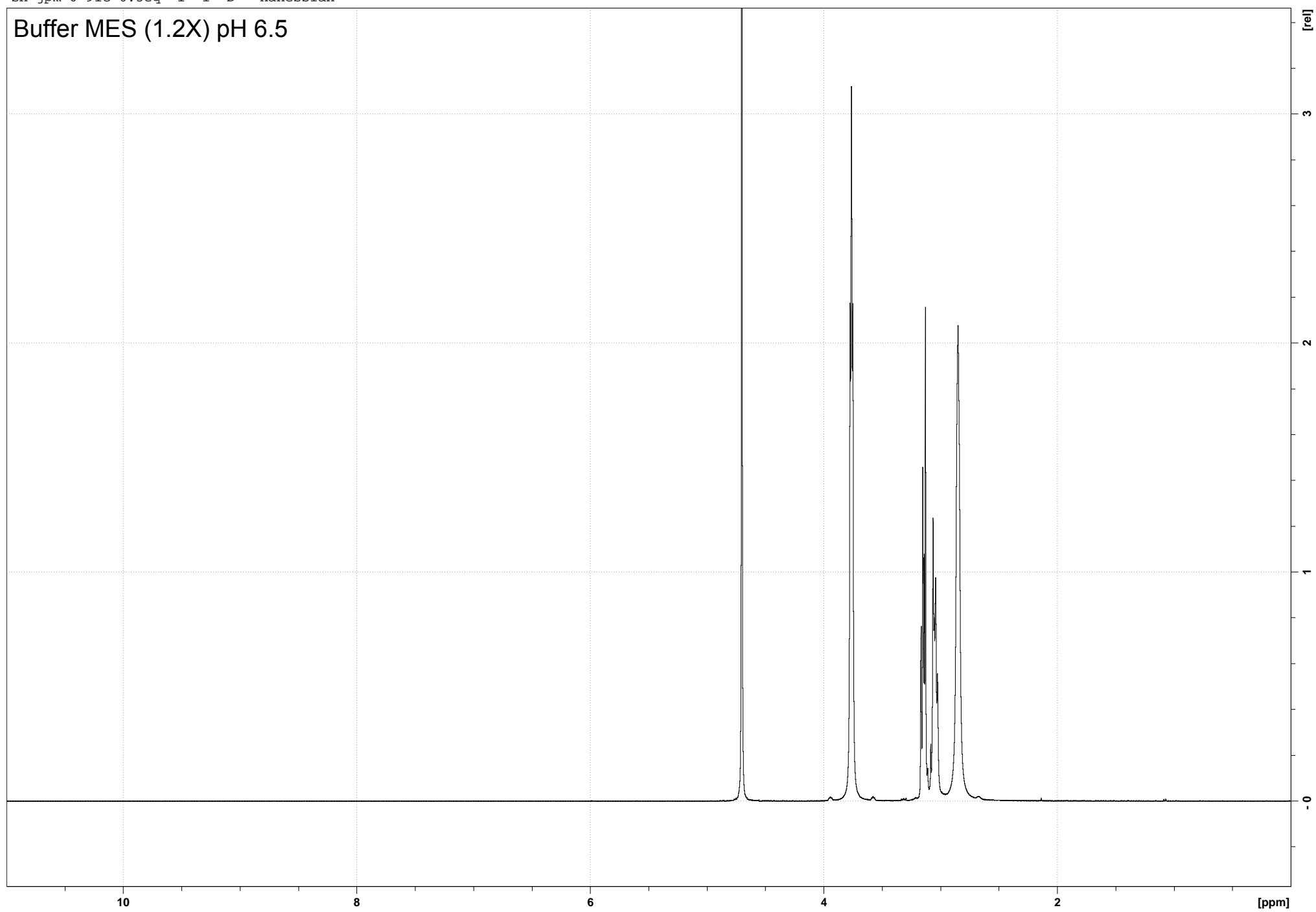
Conversion of a mixture of aldehyde **2** (9 mM) and aldehyde **25** (7 mM) to 66-40C (**3**) and *bis*-imine dimer (**26**), respectively, in buffer MES (100 mM) pH 6.5, t = 0 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





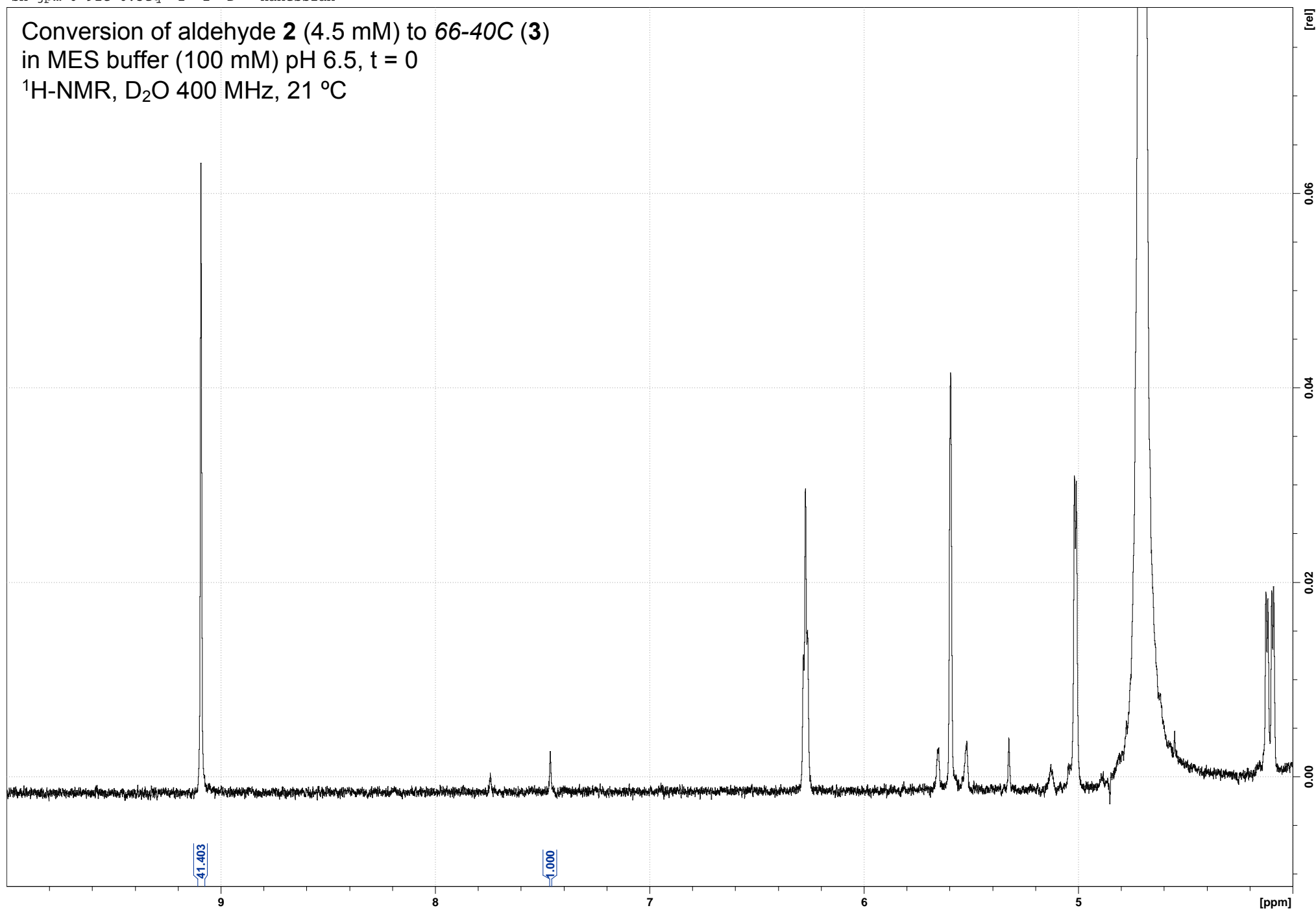
sh-jpm-6-91C-0.5eq 1 1 D: Hanessian

Buffer MES (1.2X) pH 6.5



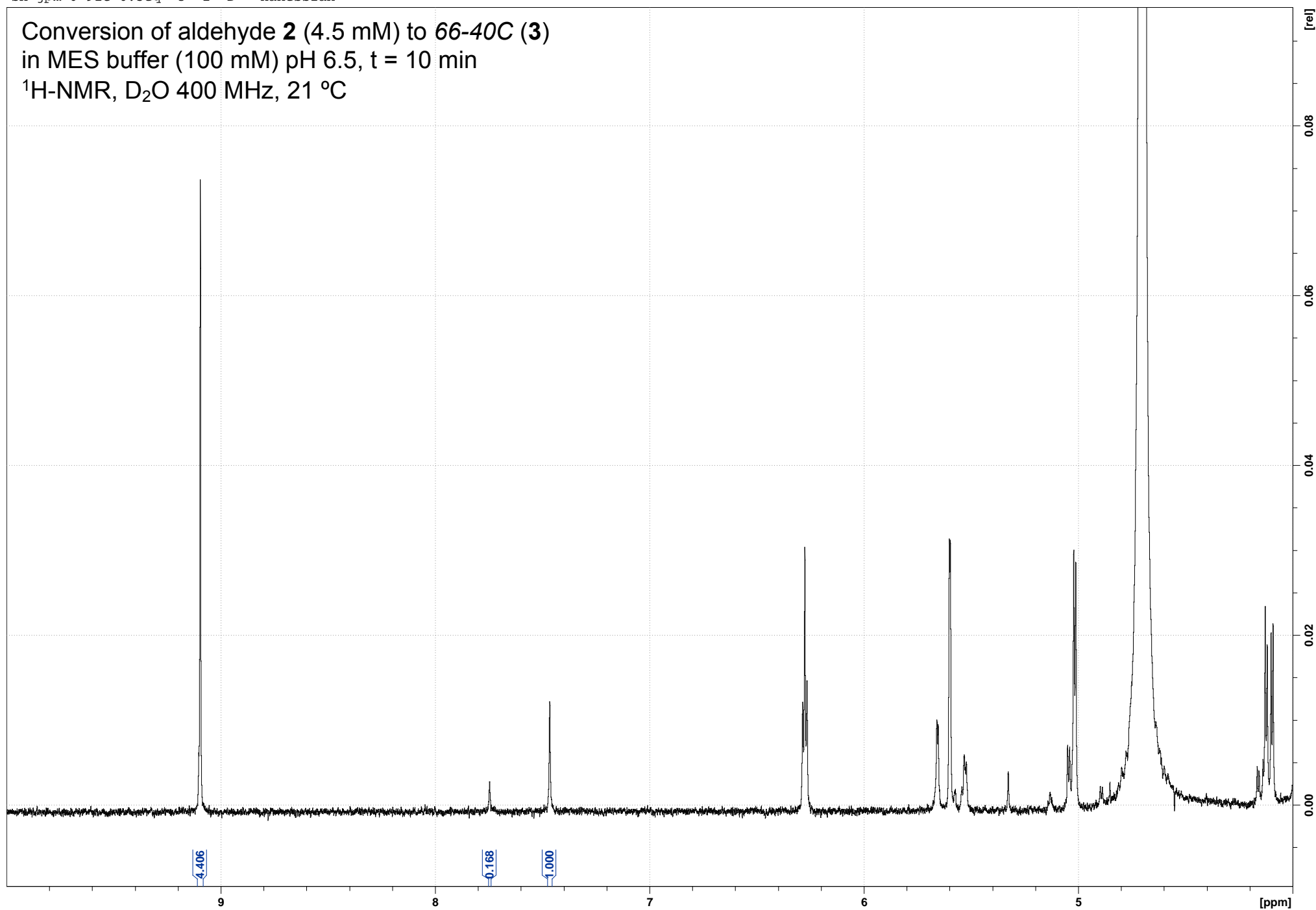
sh-jpm-6-91C-0.5eq 2 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



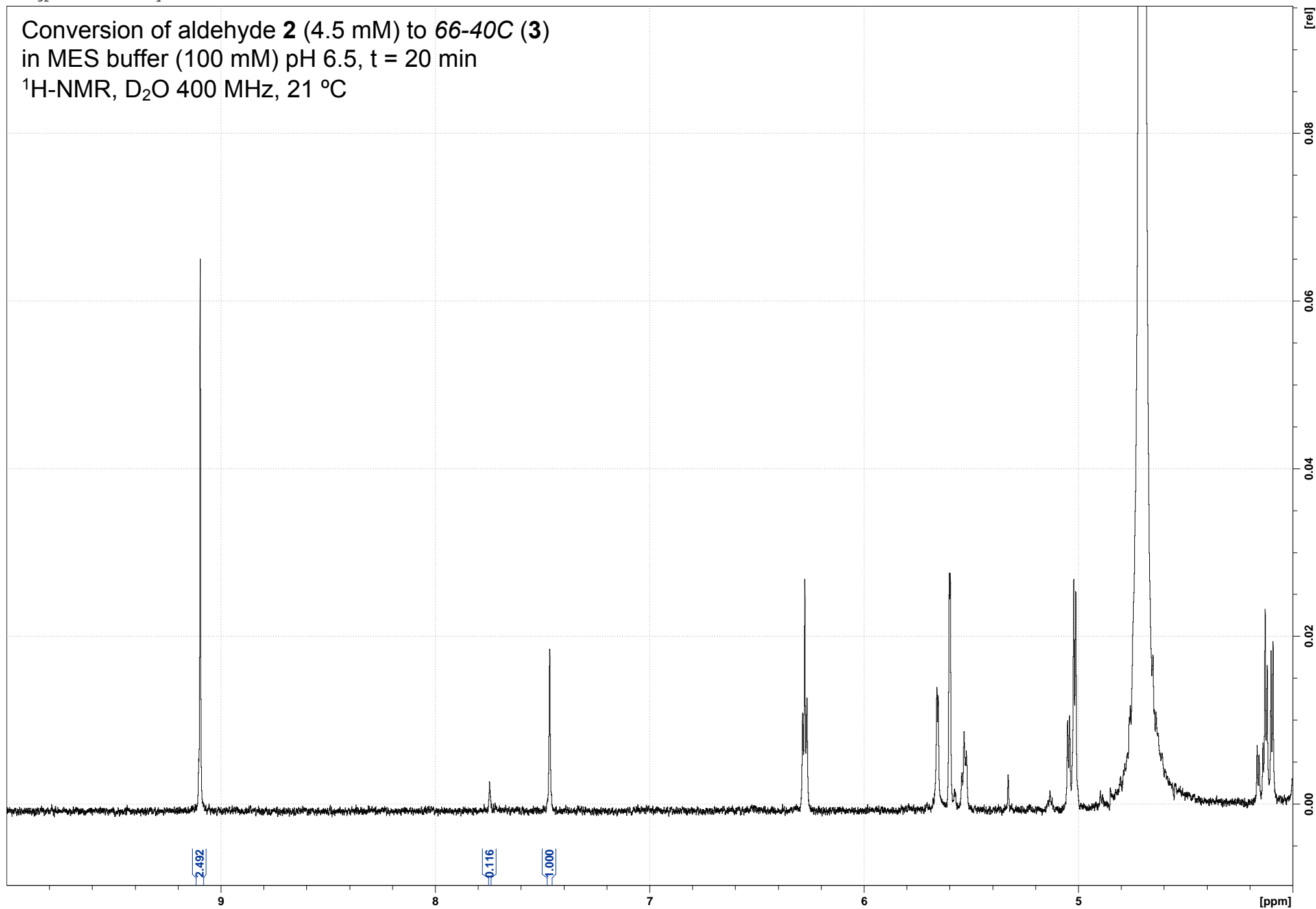
sh-jpm-6-91C-0.5eq 3 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 10 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



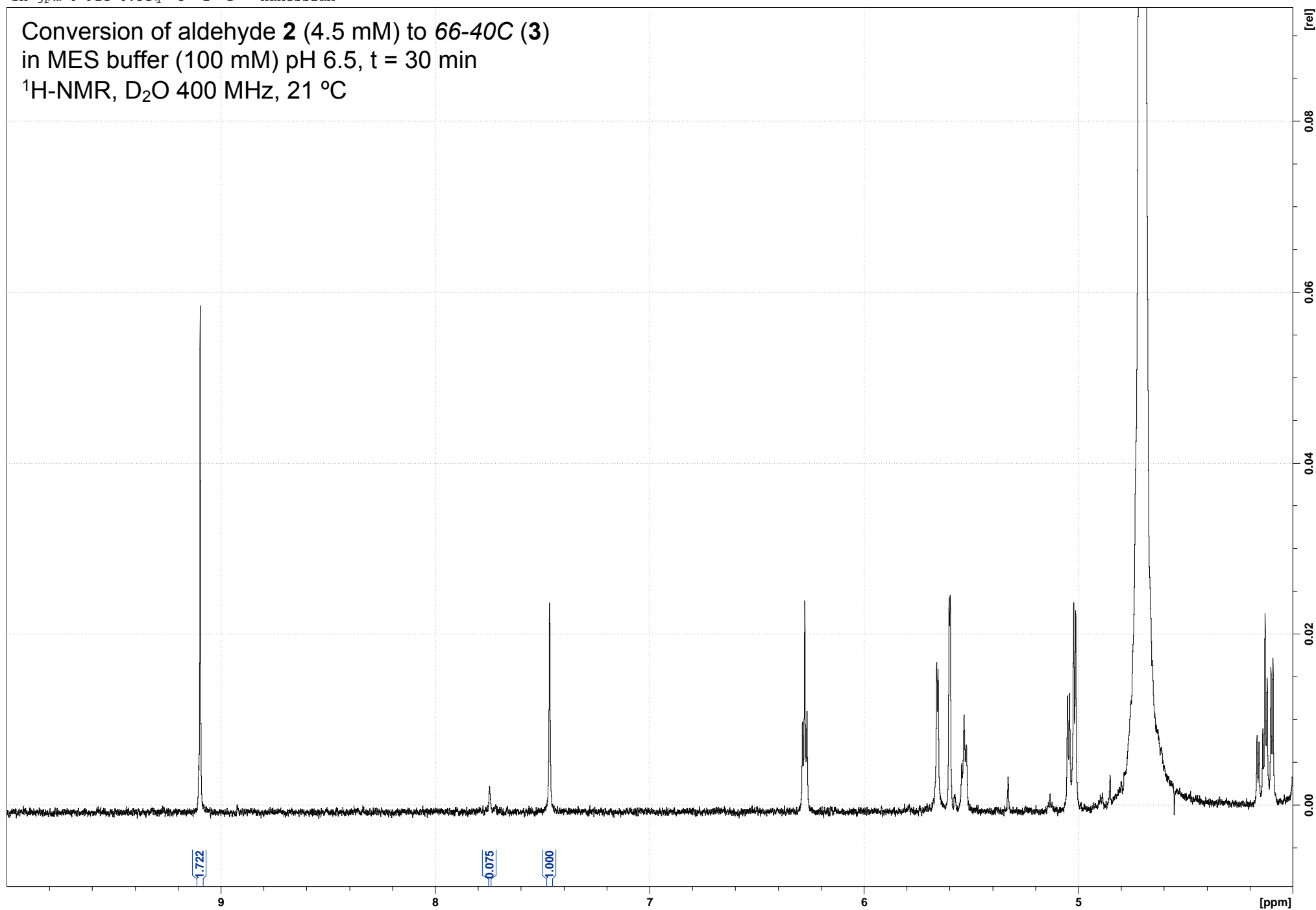
sh-jpm-6-91C-0.5eq 4 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 20 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



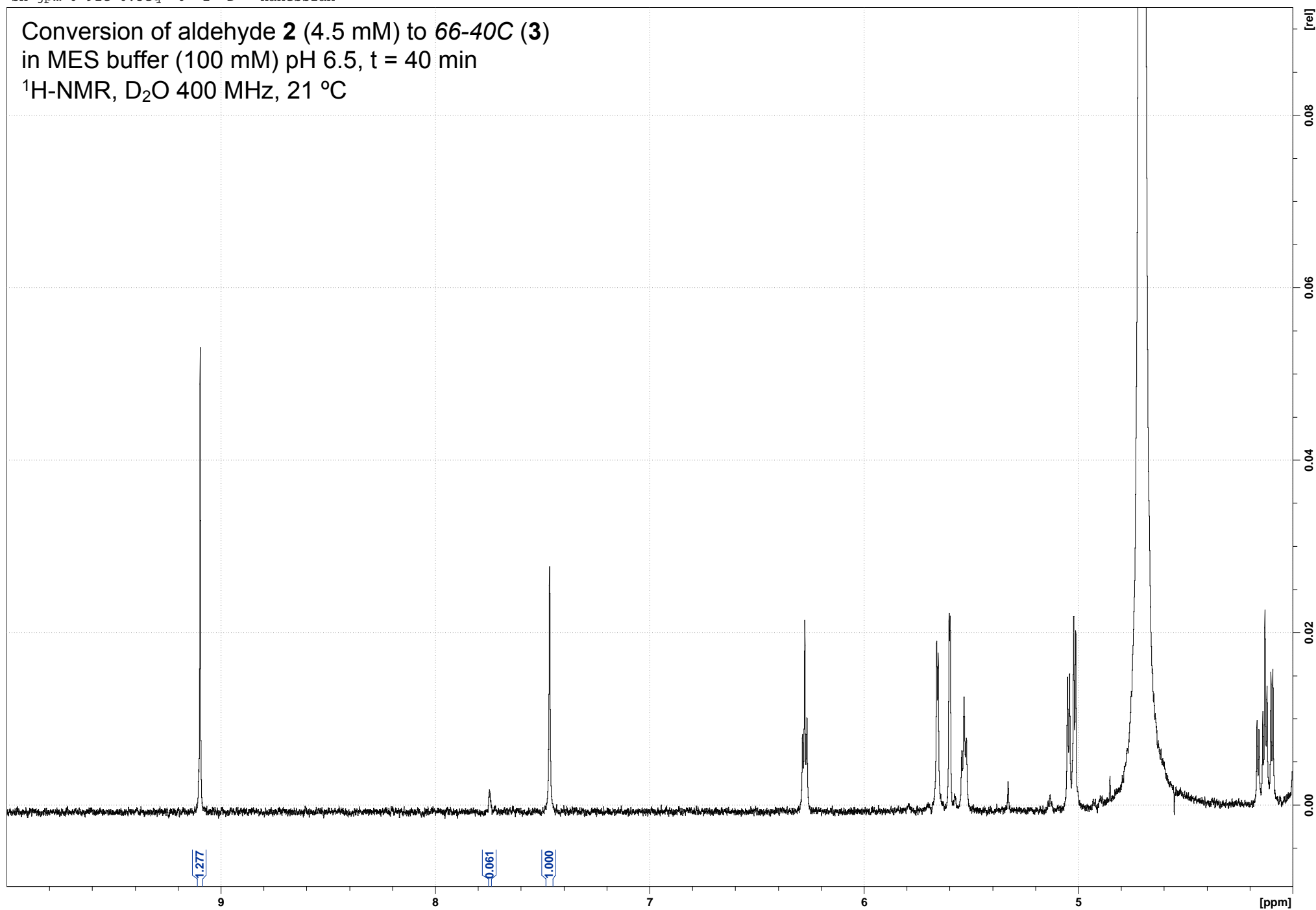
sh-jpm-6-91C-0.5eq 5 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 30 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



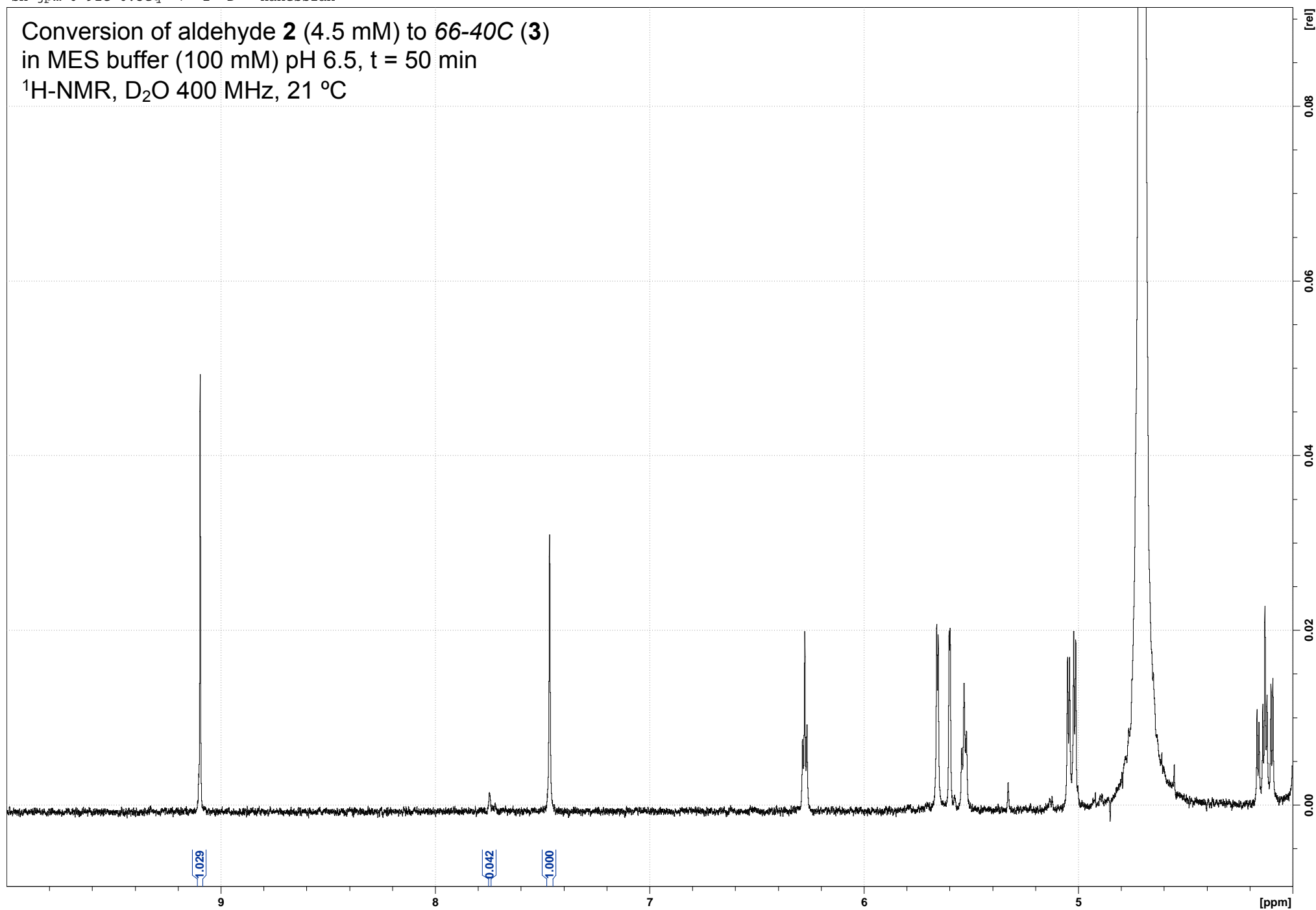
sh-jpm-6-91C-0.5eq 6 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 40 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



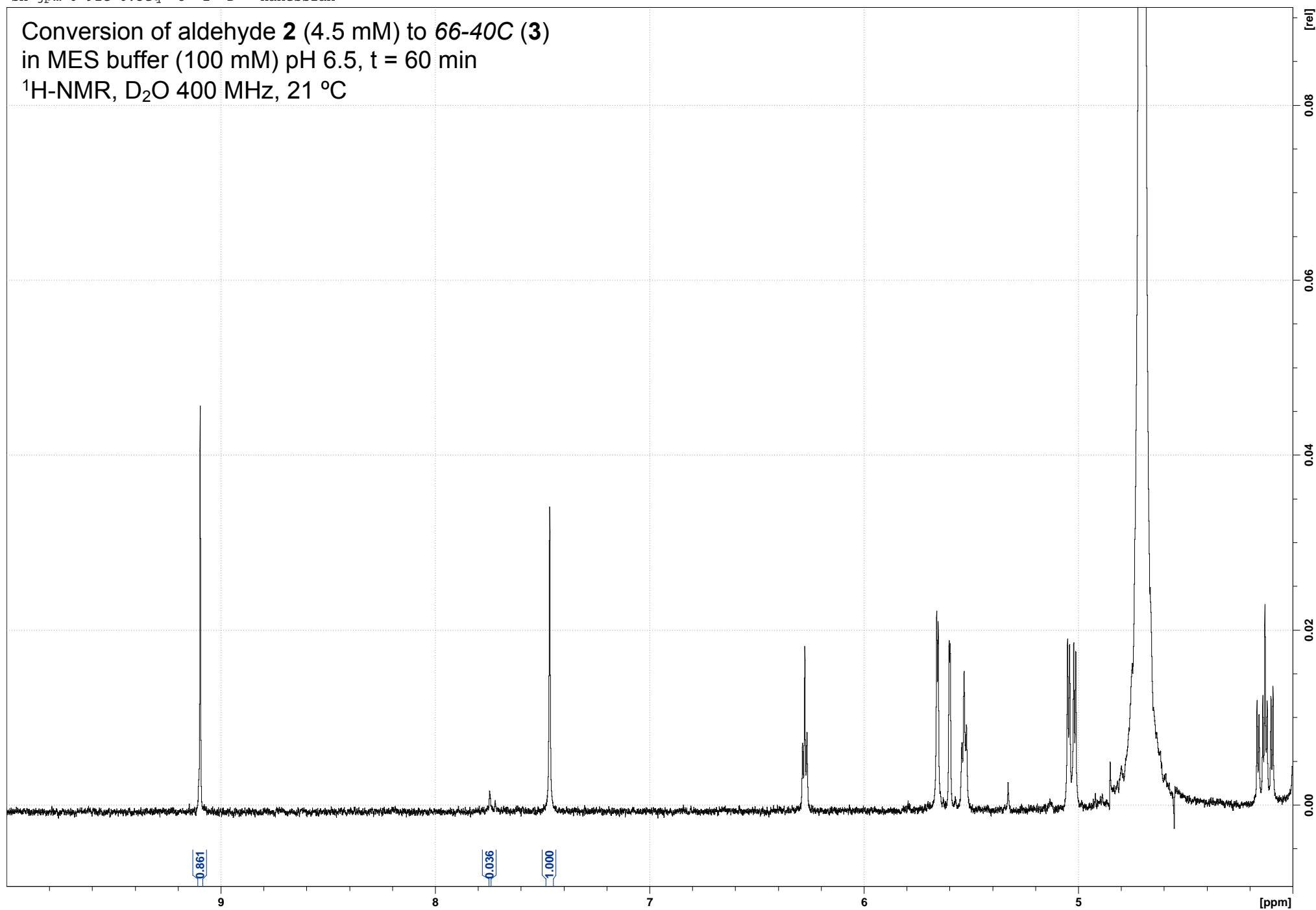
sh-jpm-6-91C-0.5eq 7 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 50 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91C-0.5eq 8 1 D: Hanessian

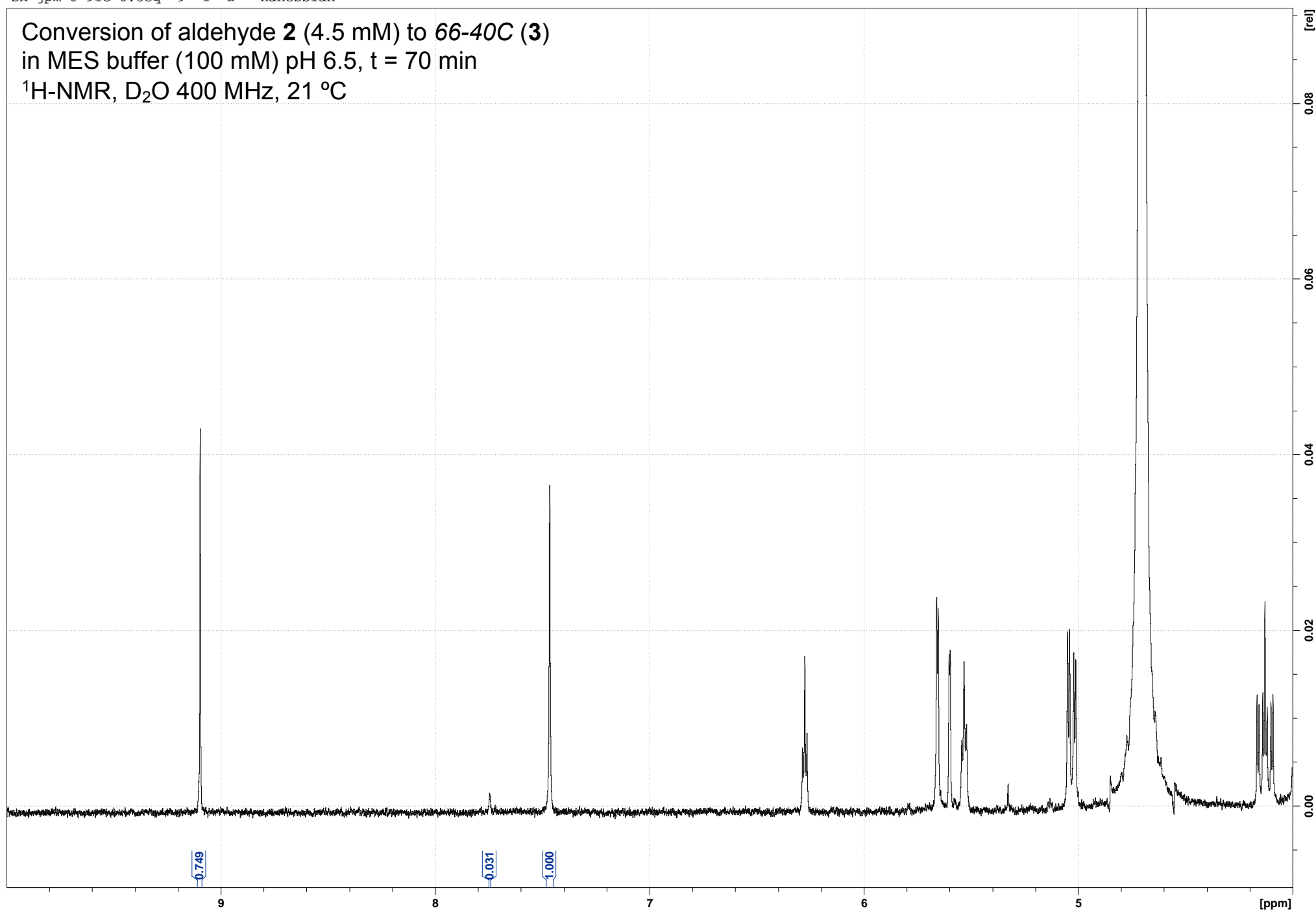
Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 60 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





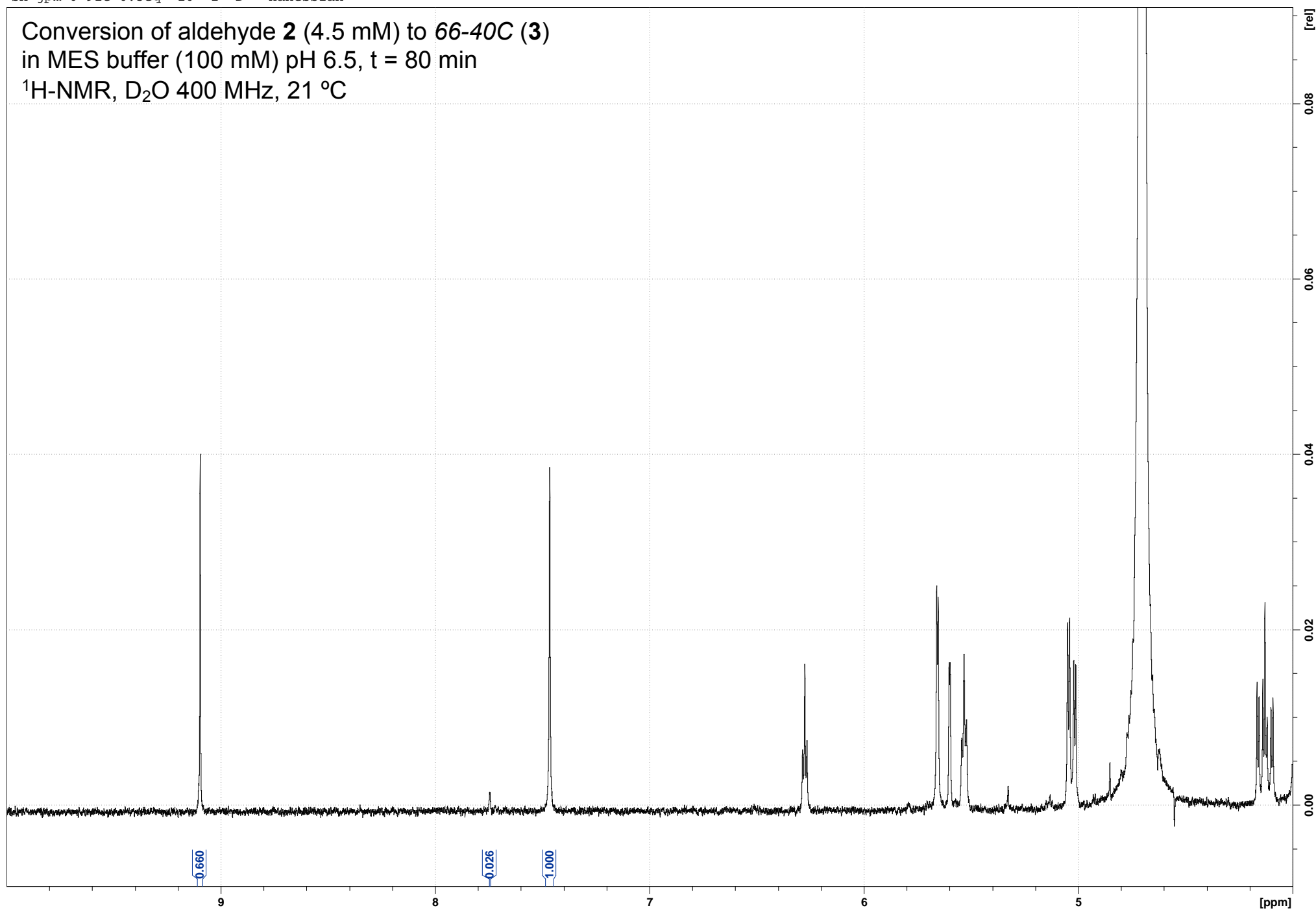
sh-jpm-6-91C-0.5eq 9 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 70 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



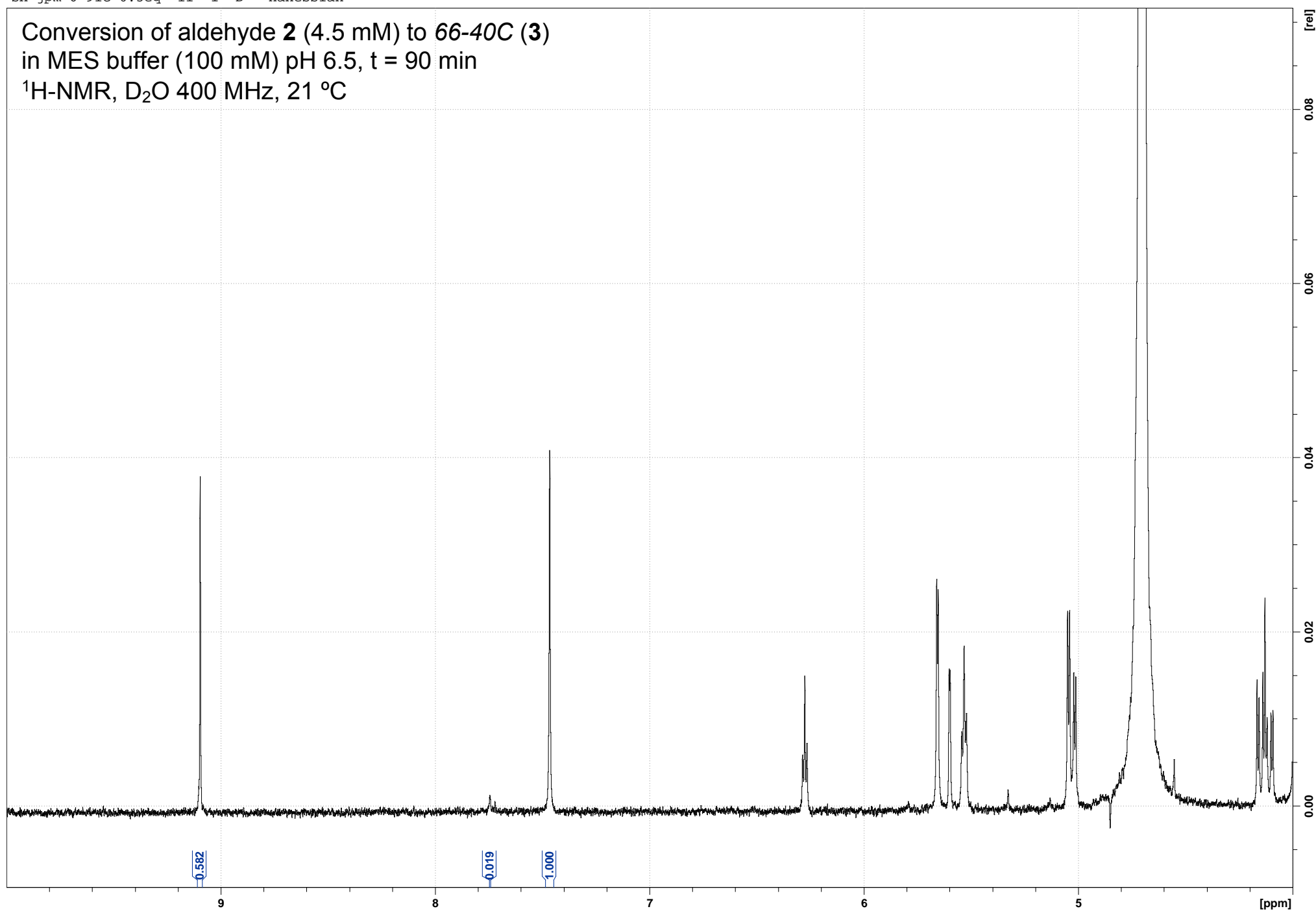
sh-jpm-6-91C-0.5eq 10 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 80 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



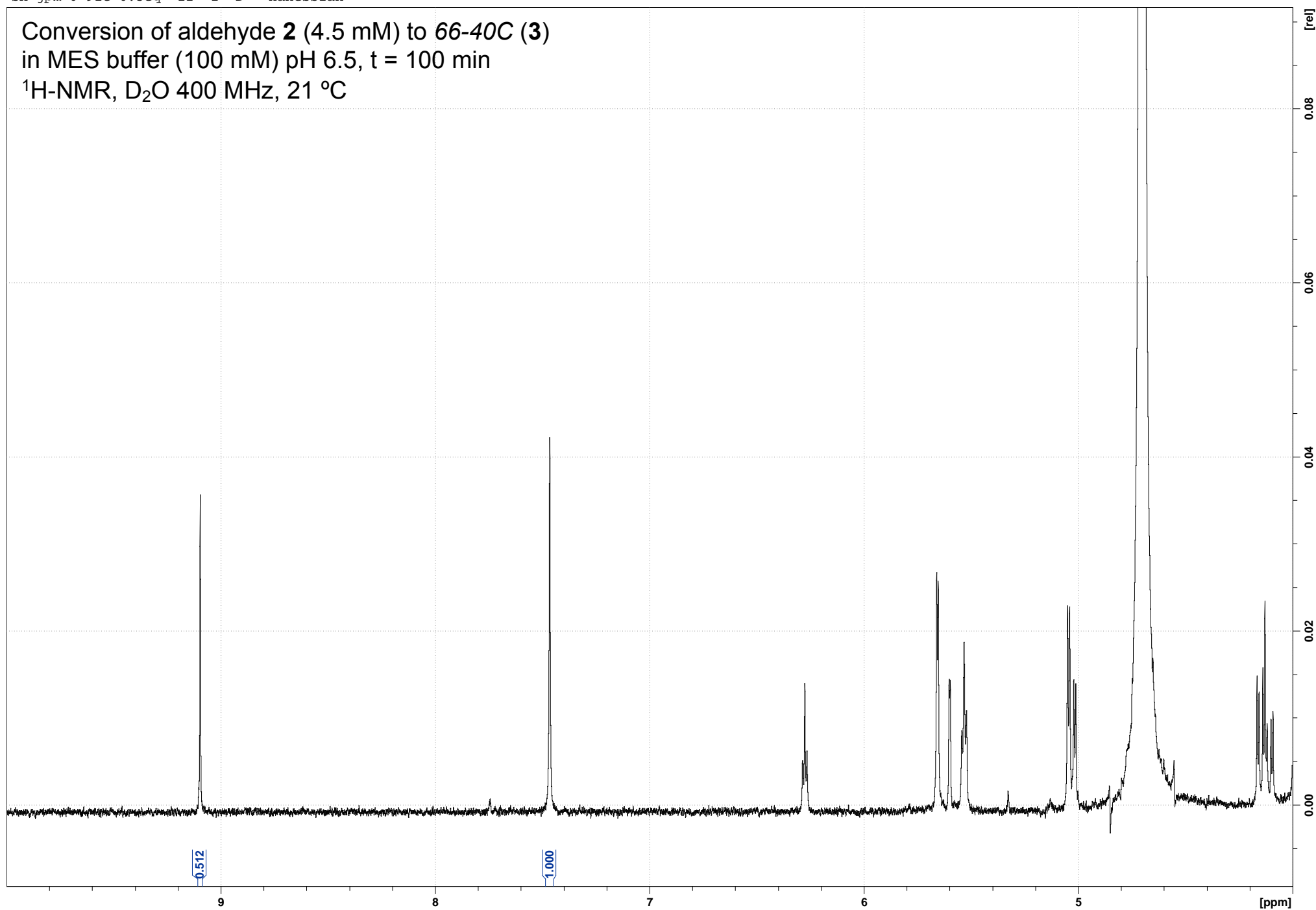
sh-jpm-6-91C-0.5eq 11 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 90 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



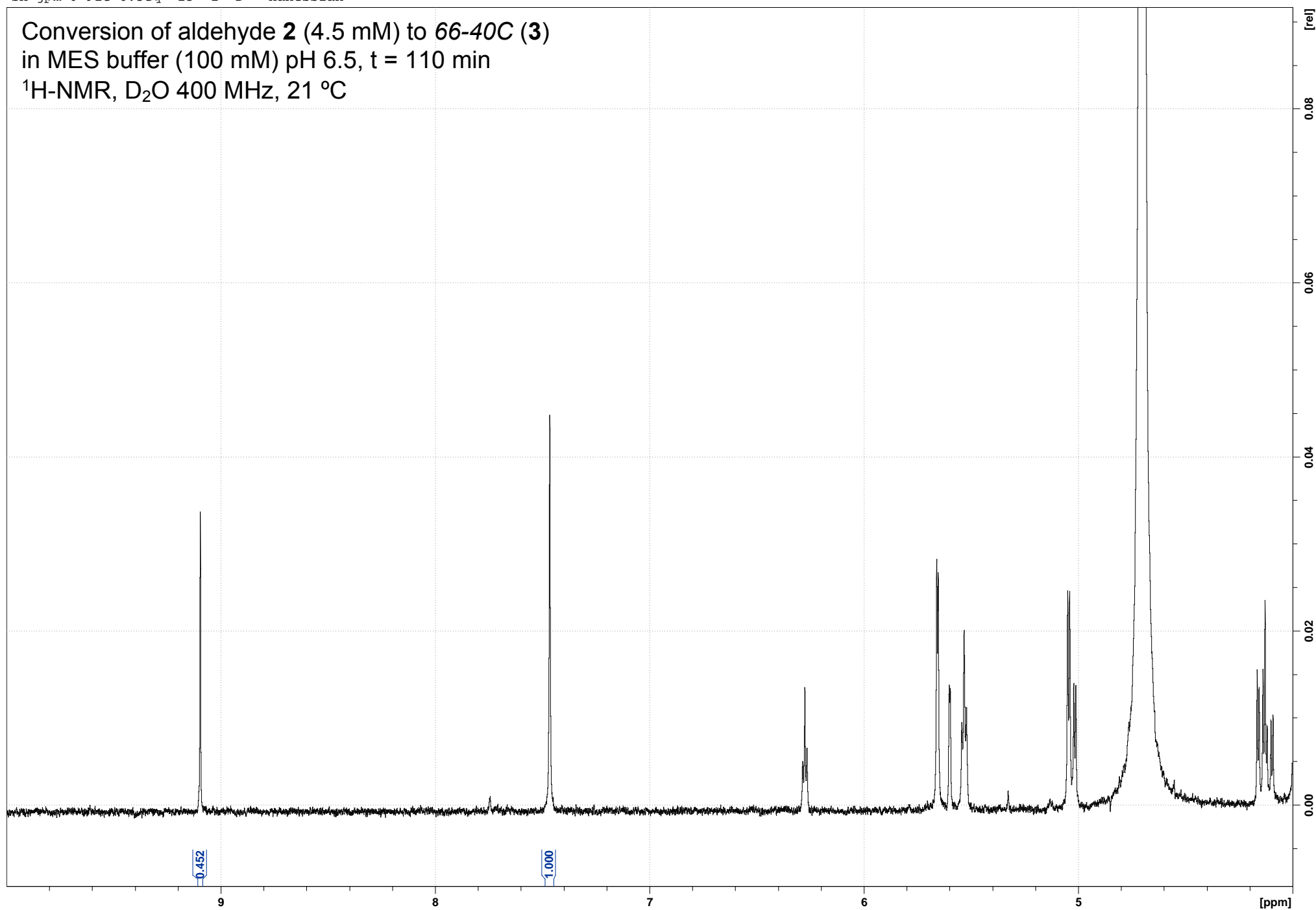
sh-jpm-6-91C-0.5eq 12 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 100 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



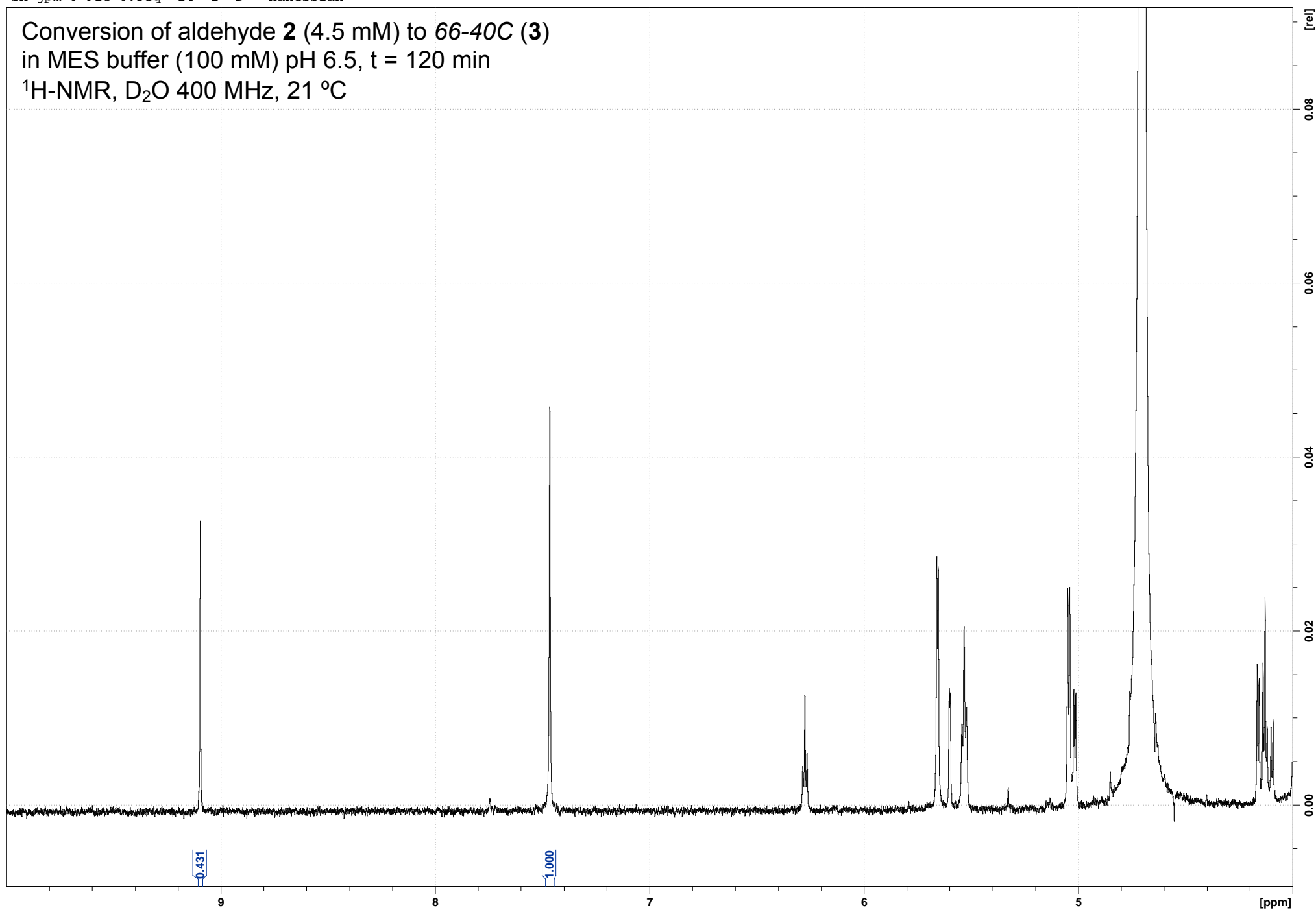
sh-jpm-6-91C-0.5eq 13 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 110 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



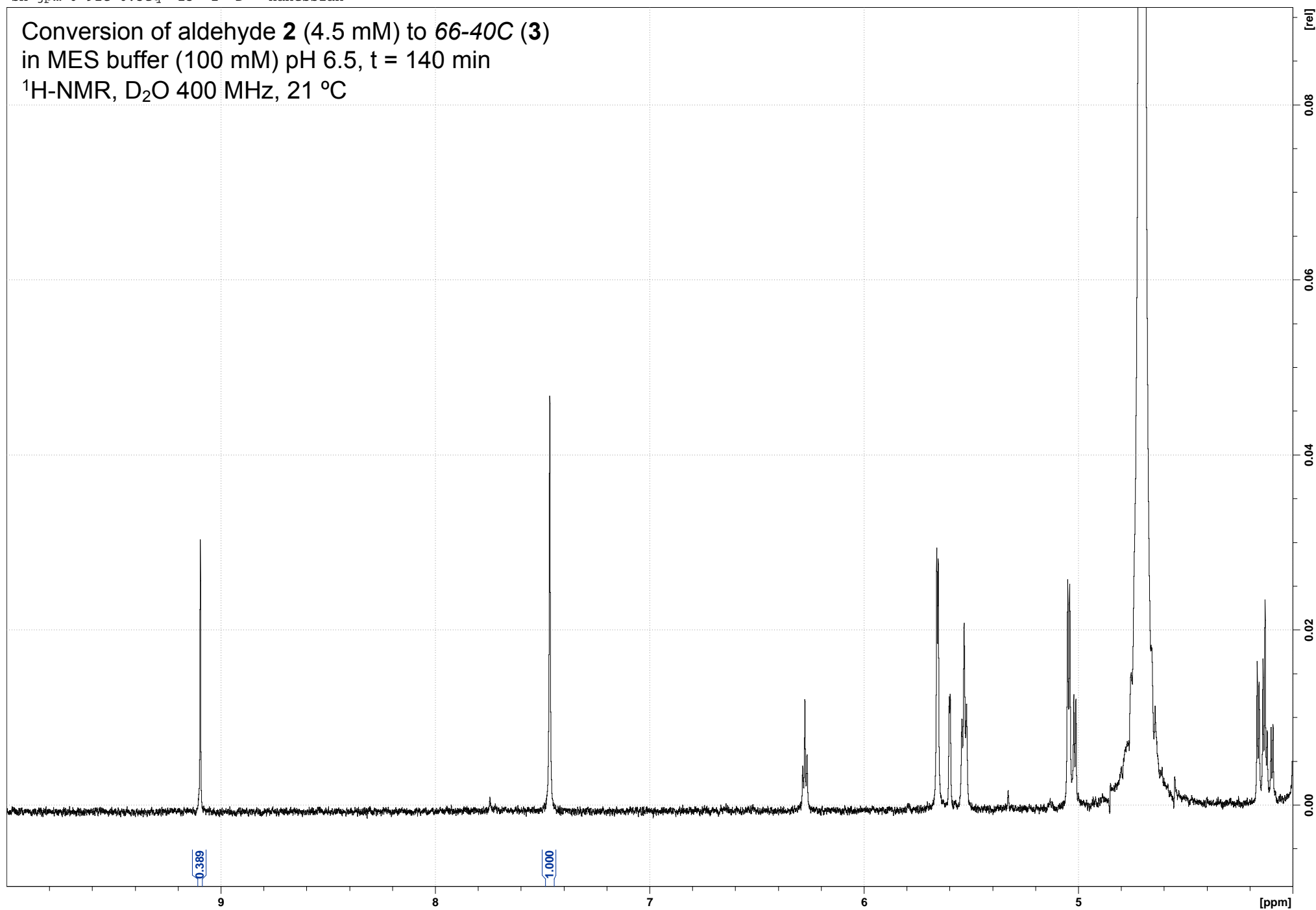
sh-jpm-6-91C-0.5eq 14 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 120 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



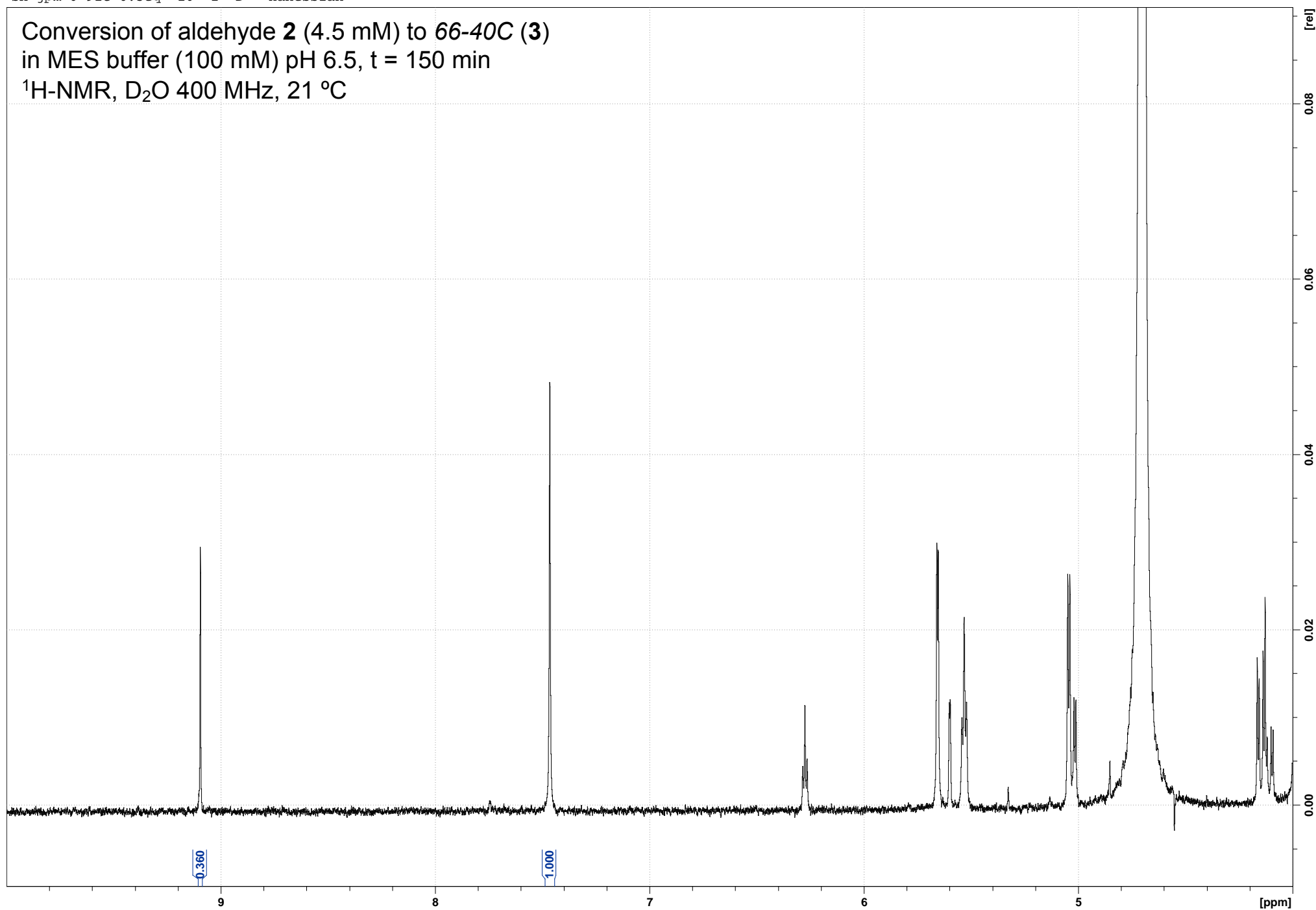
sh-jpm-6-91C-0.5eq 15 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 140 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91C-0.5eq 16 1 D: Hanessian

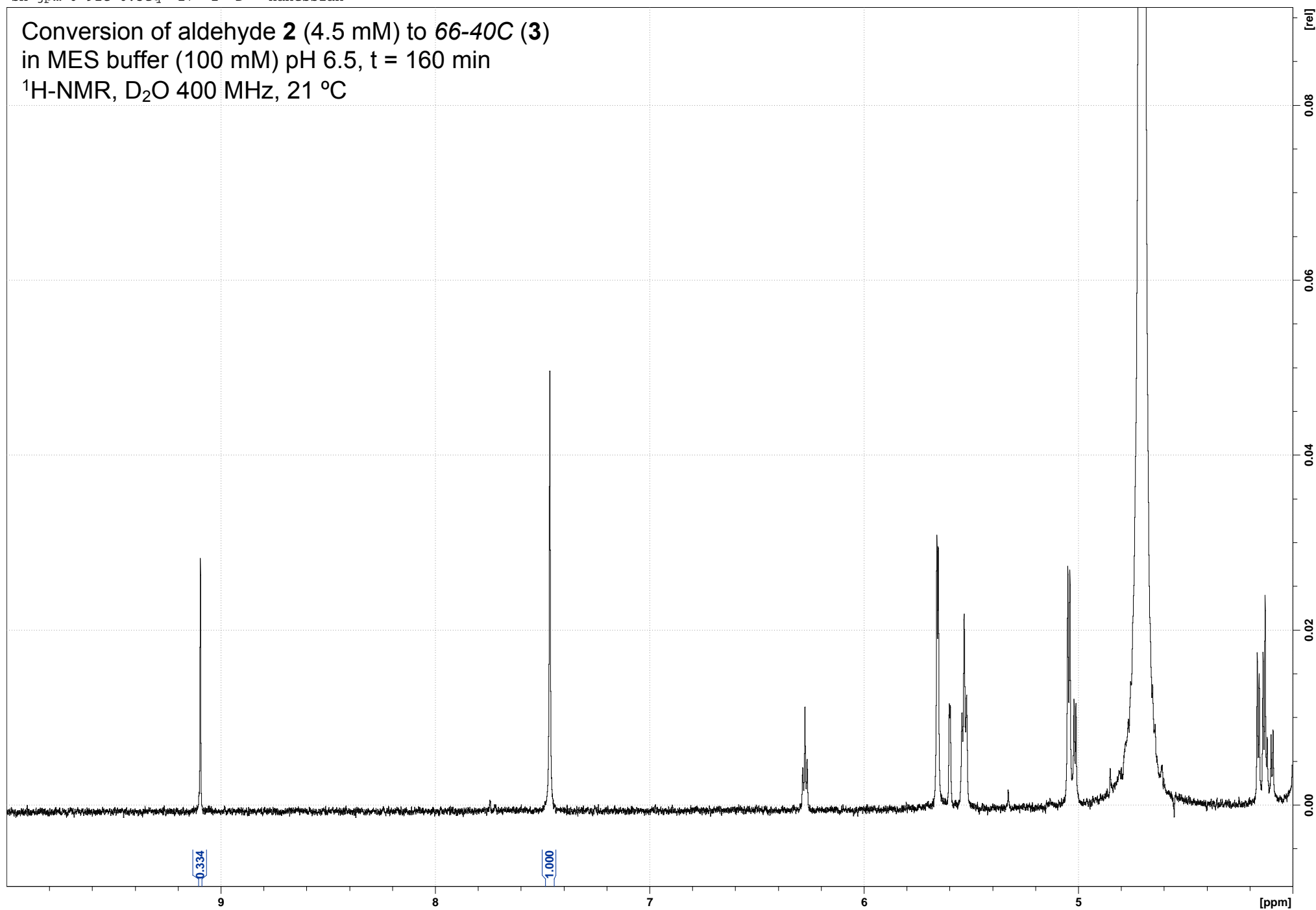
Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 150 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





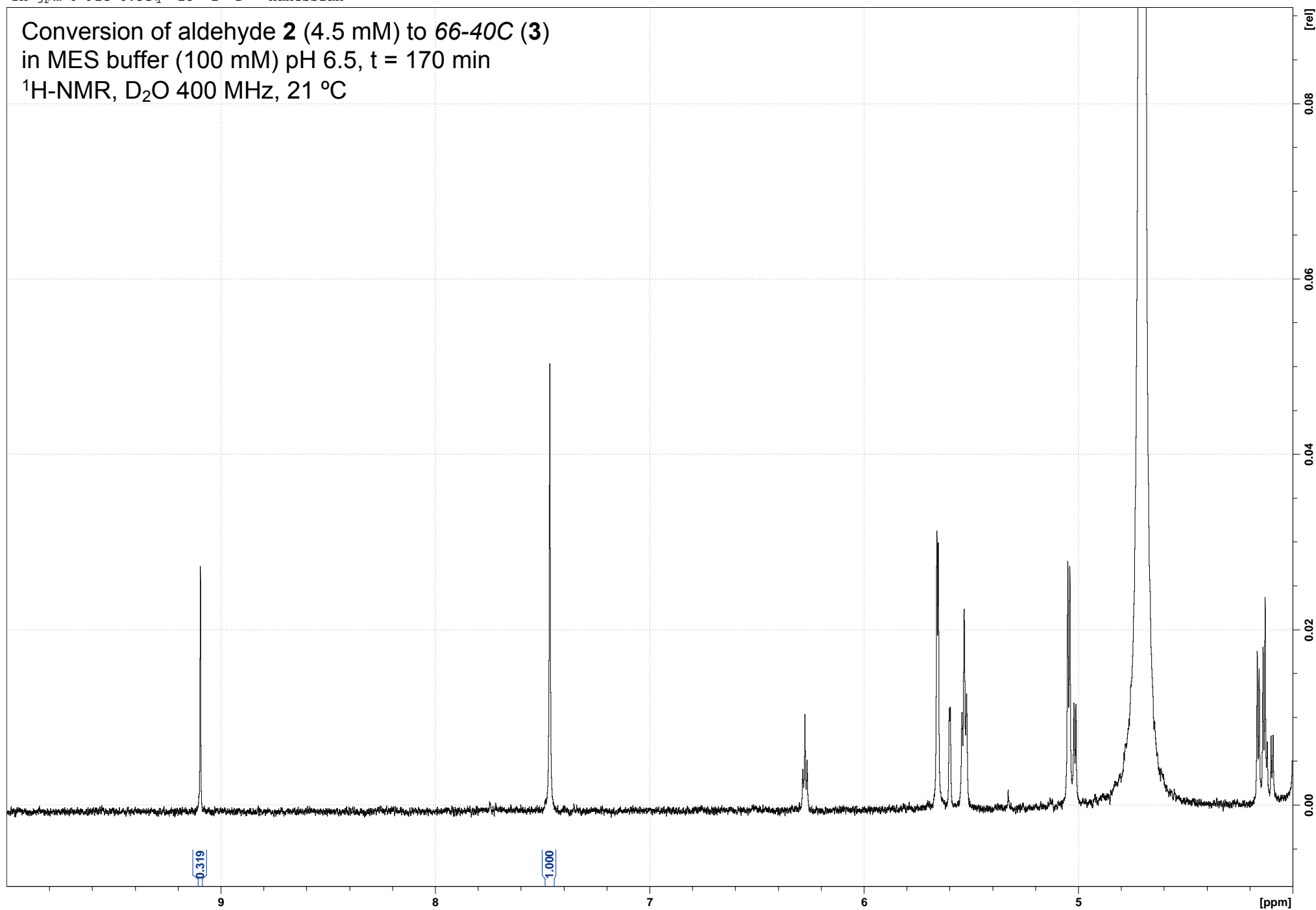
sh-jpm-6-91C-0.5eq 17 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 160 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



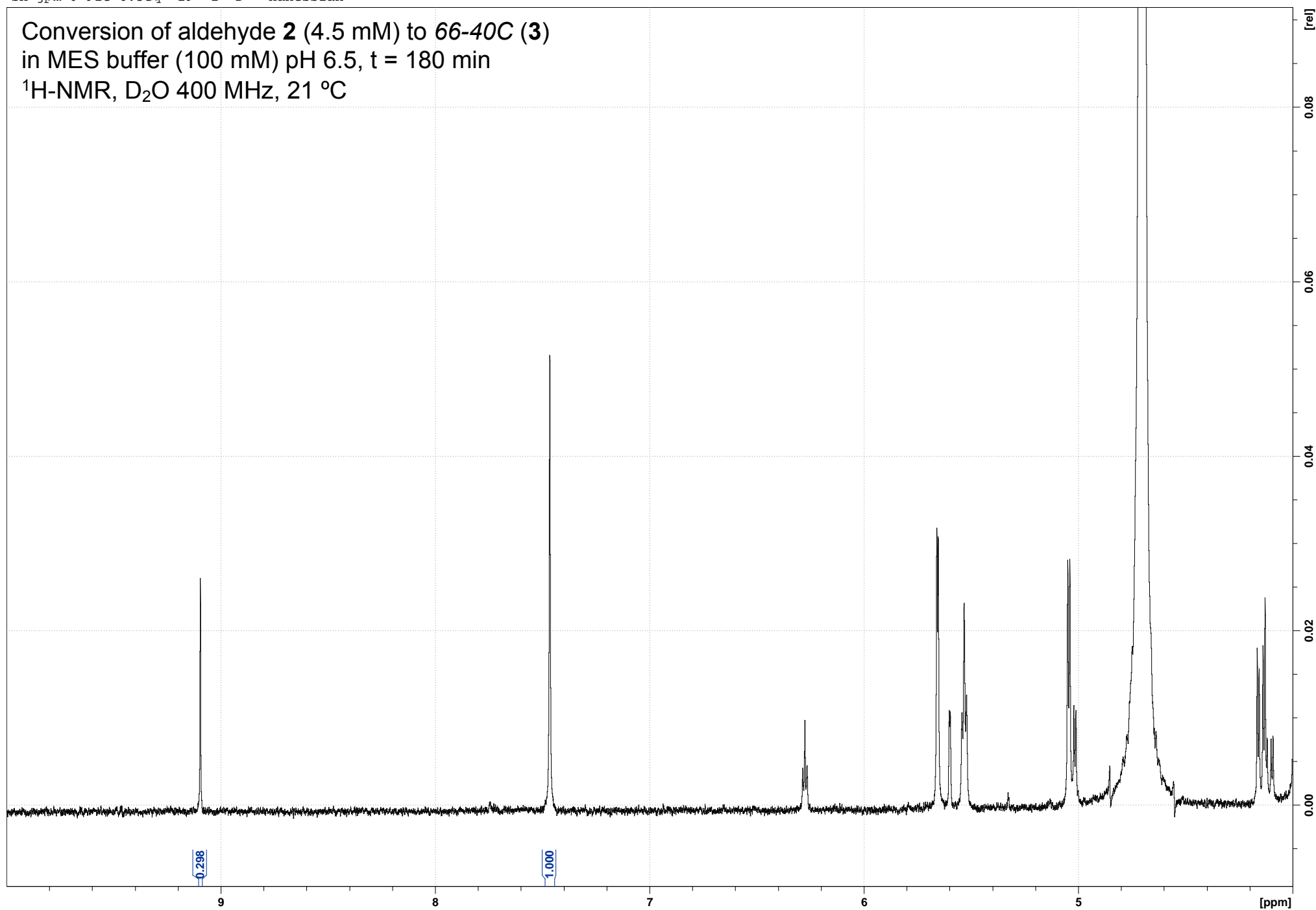
sh-jpm-6-91C-0.5eq 18 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 170 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



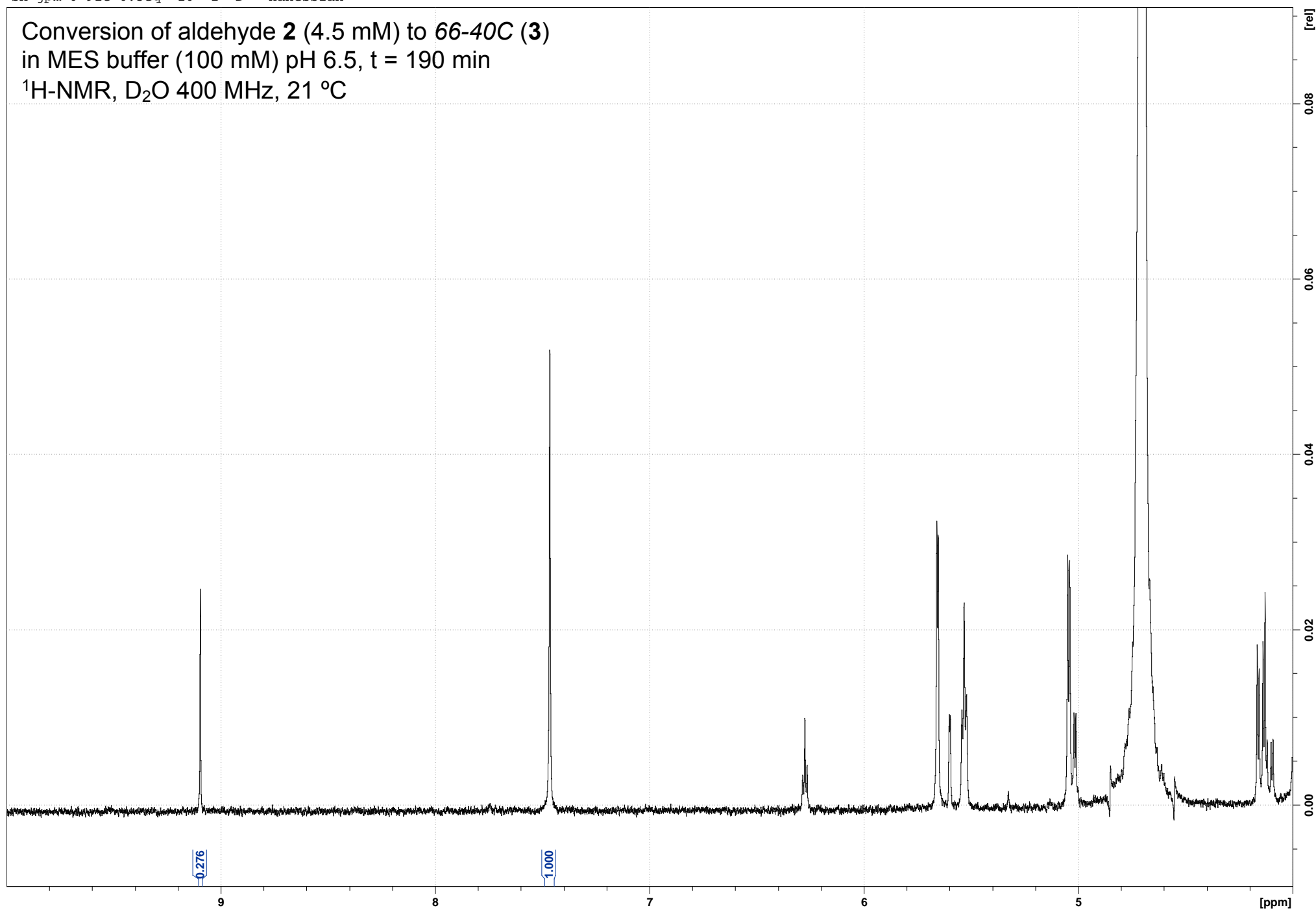
sh-jpm-6-91C-0.5eq 19 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 180 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



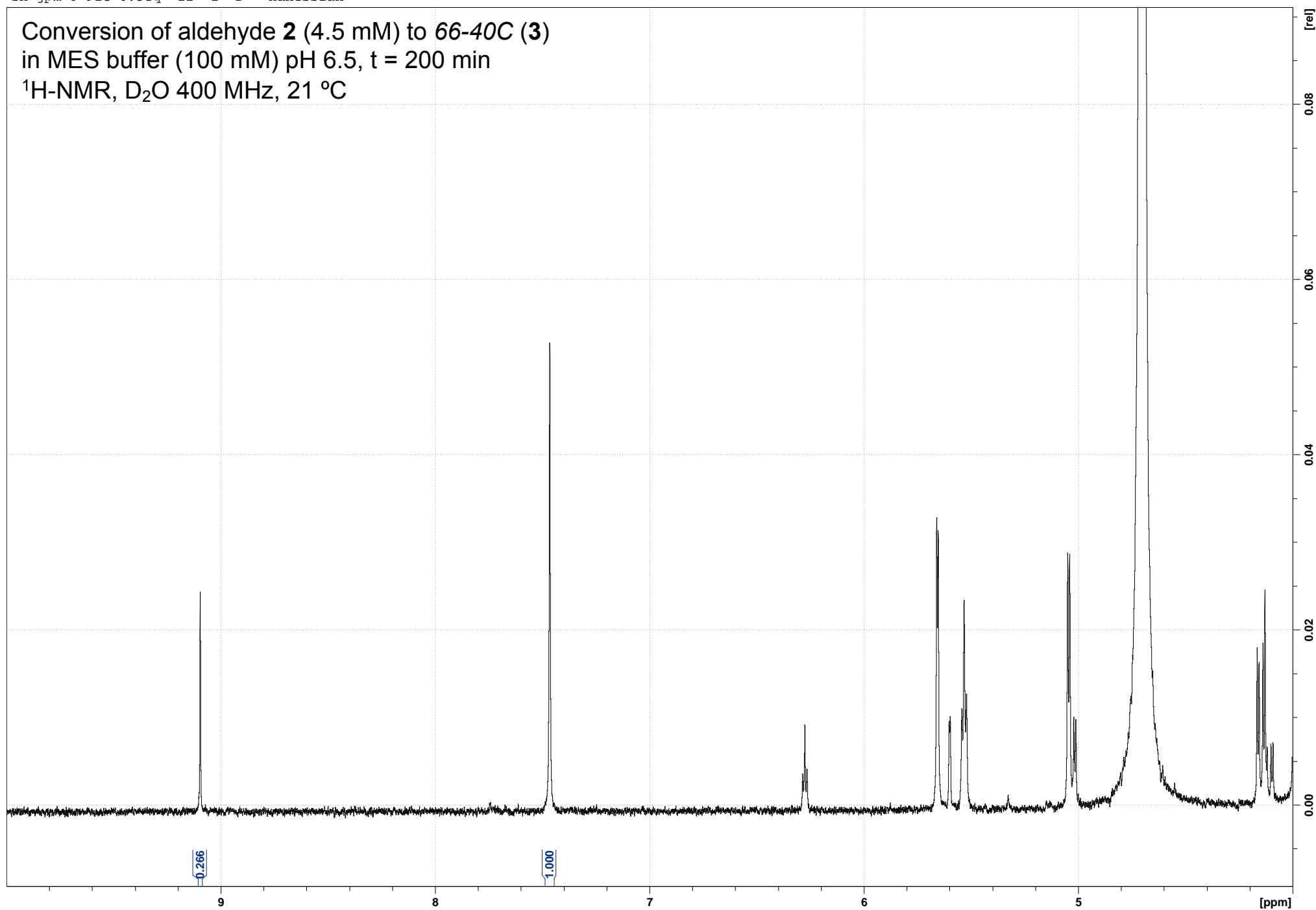
sh-jpm-6-91C-0.5eq 20 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 190 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



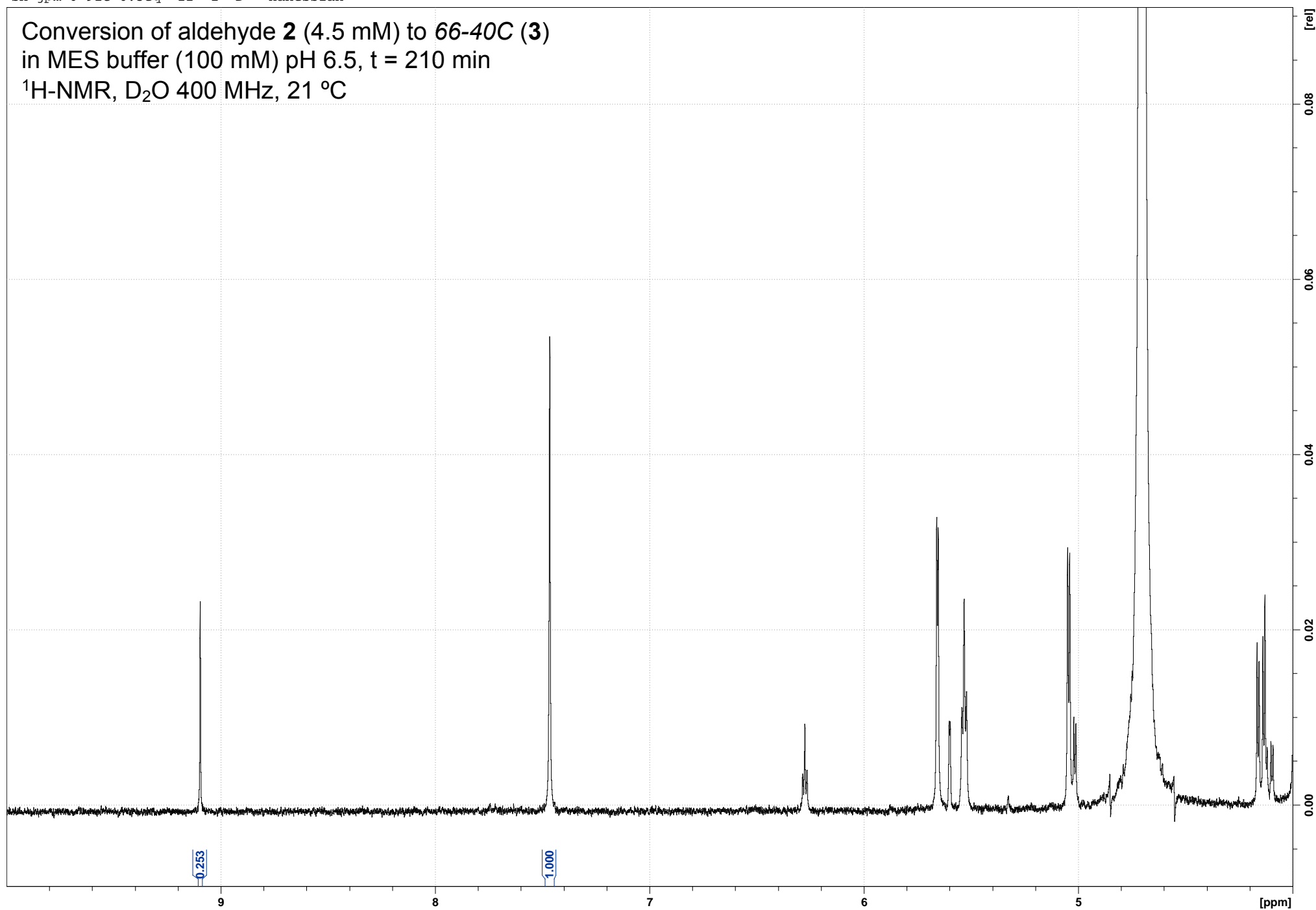
sh-jpm-6-91C-0.5eq 21 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 200 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



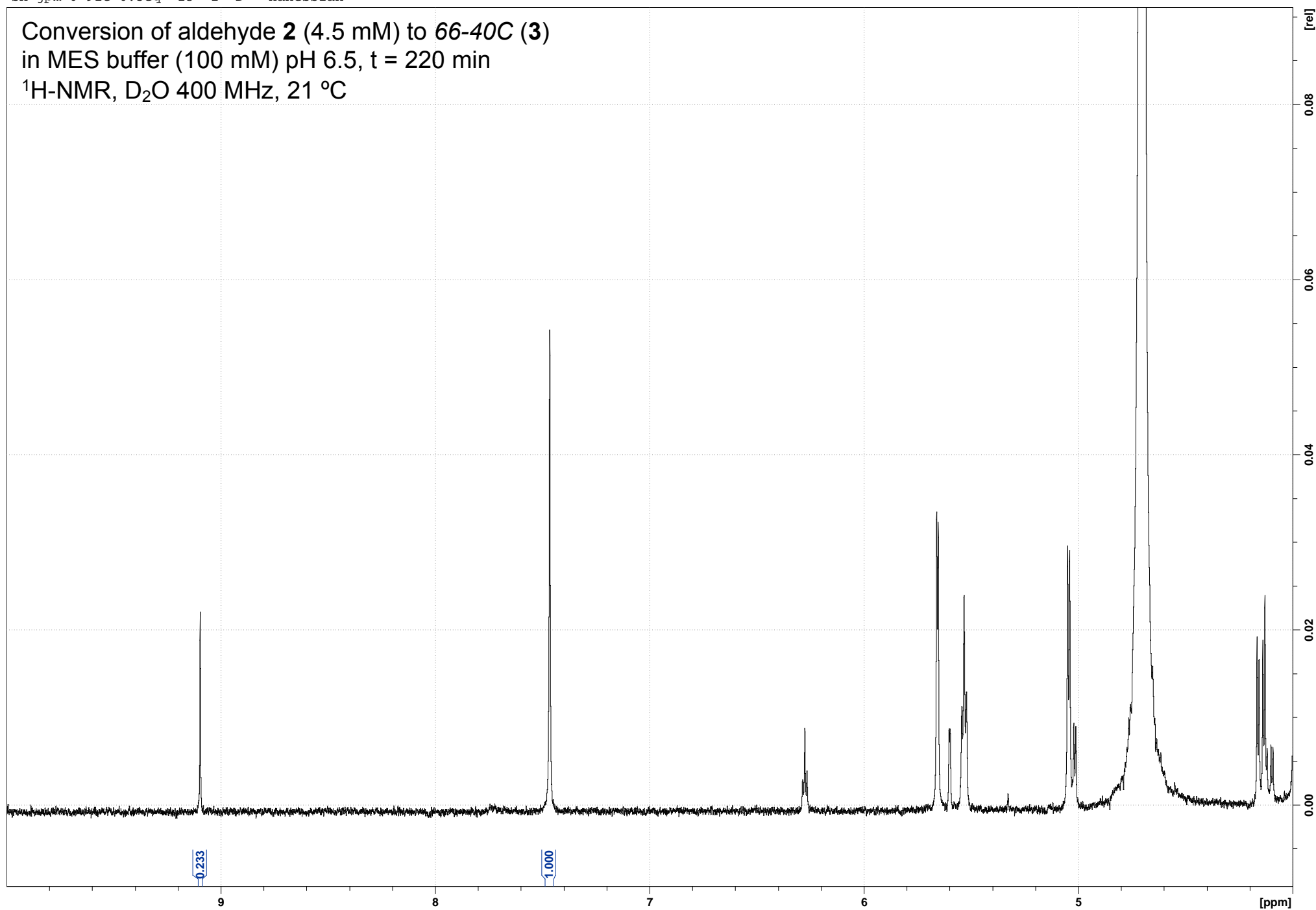
sh-jpm-6-91C-0.5eq 22 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 210 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



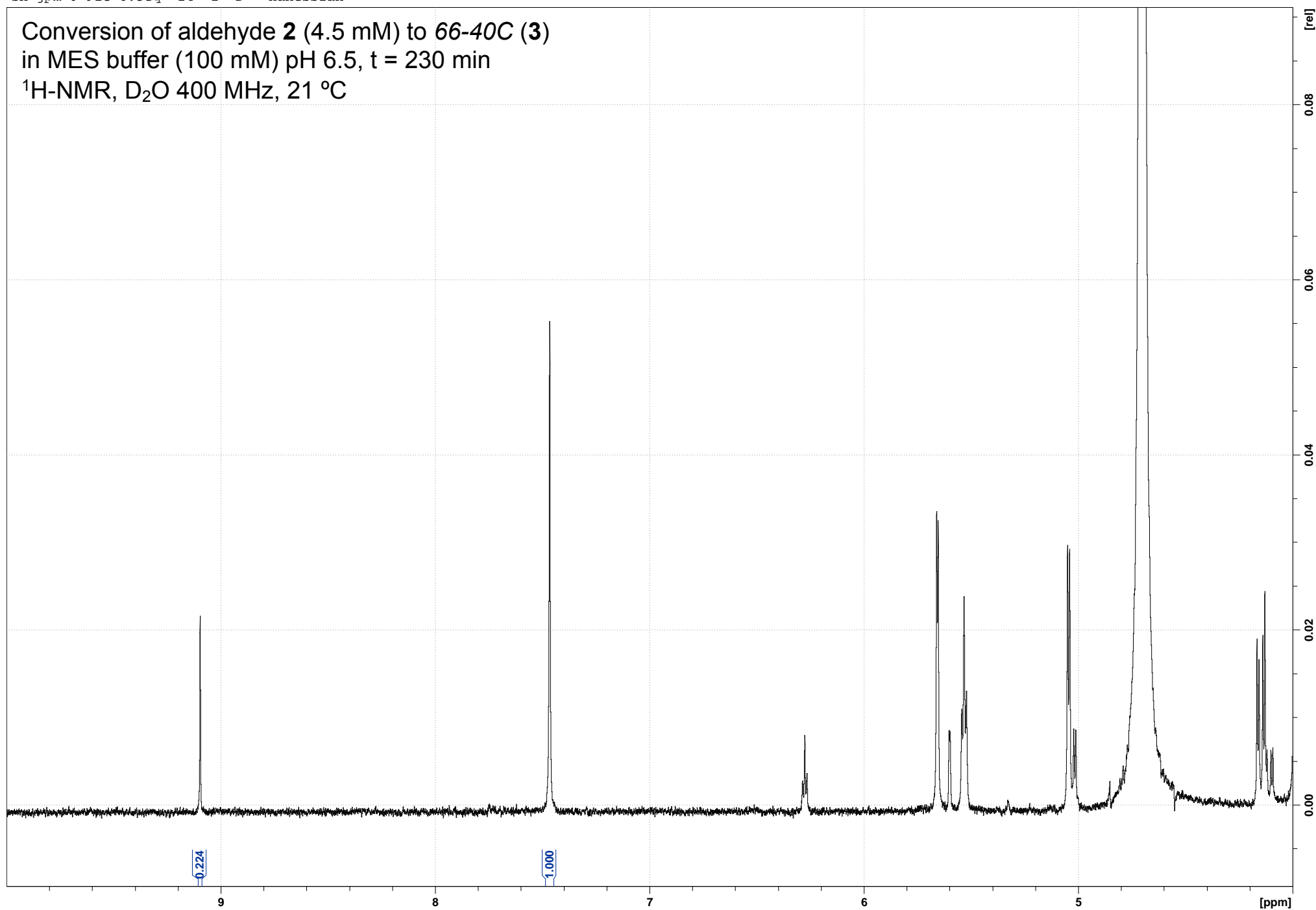
sh-jpm-6-91C-0.5eq 23 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 220 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91C-0.5eq 24 1 D: Hanessian

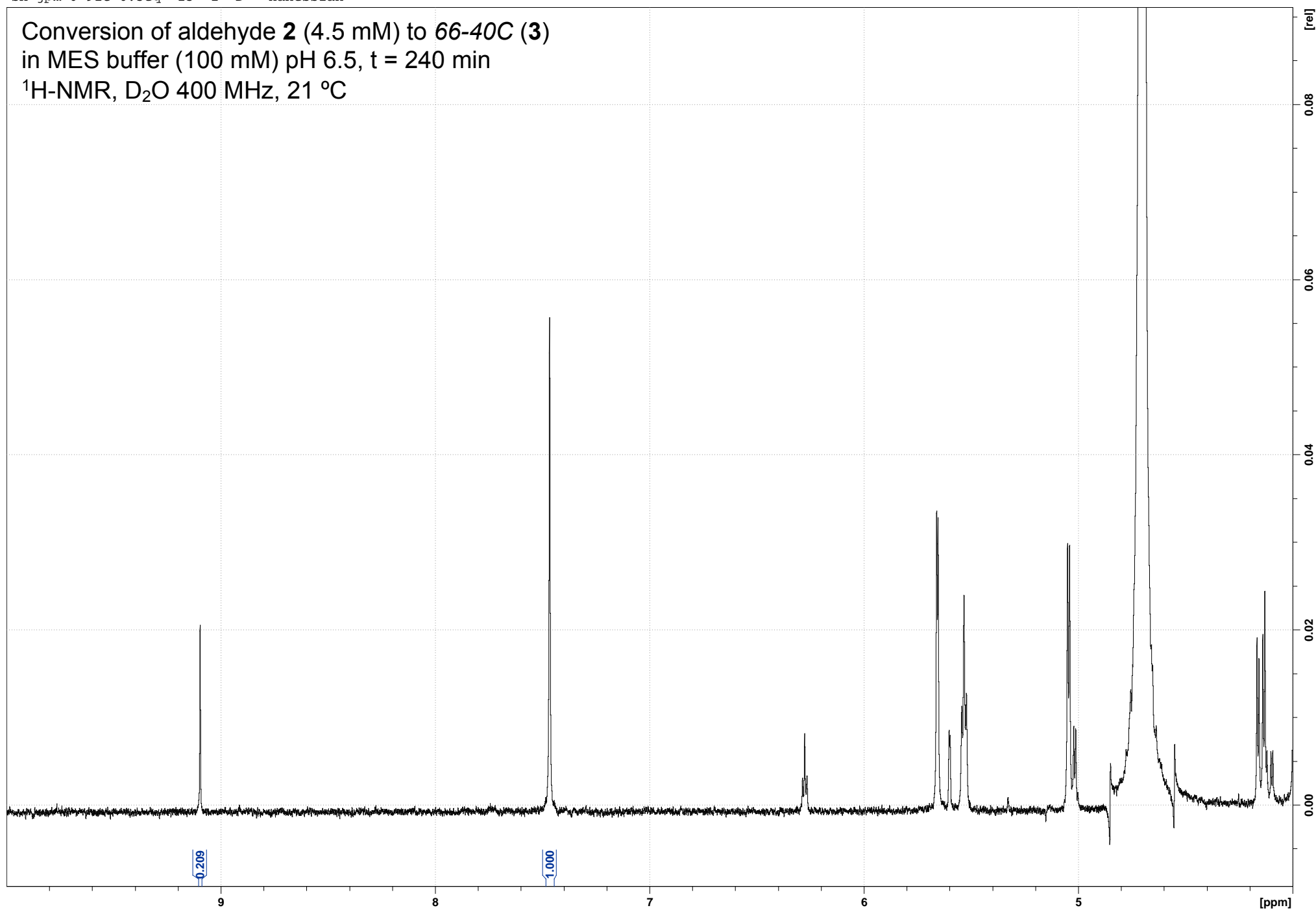
Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 230 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





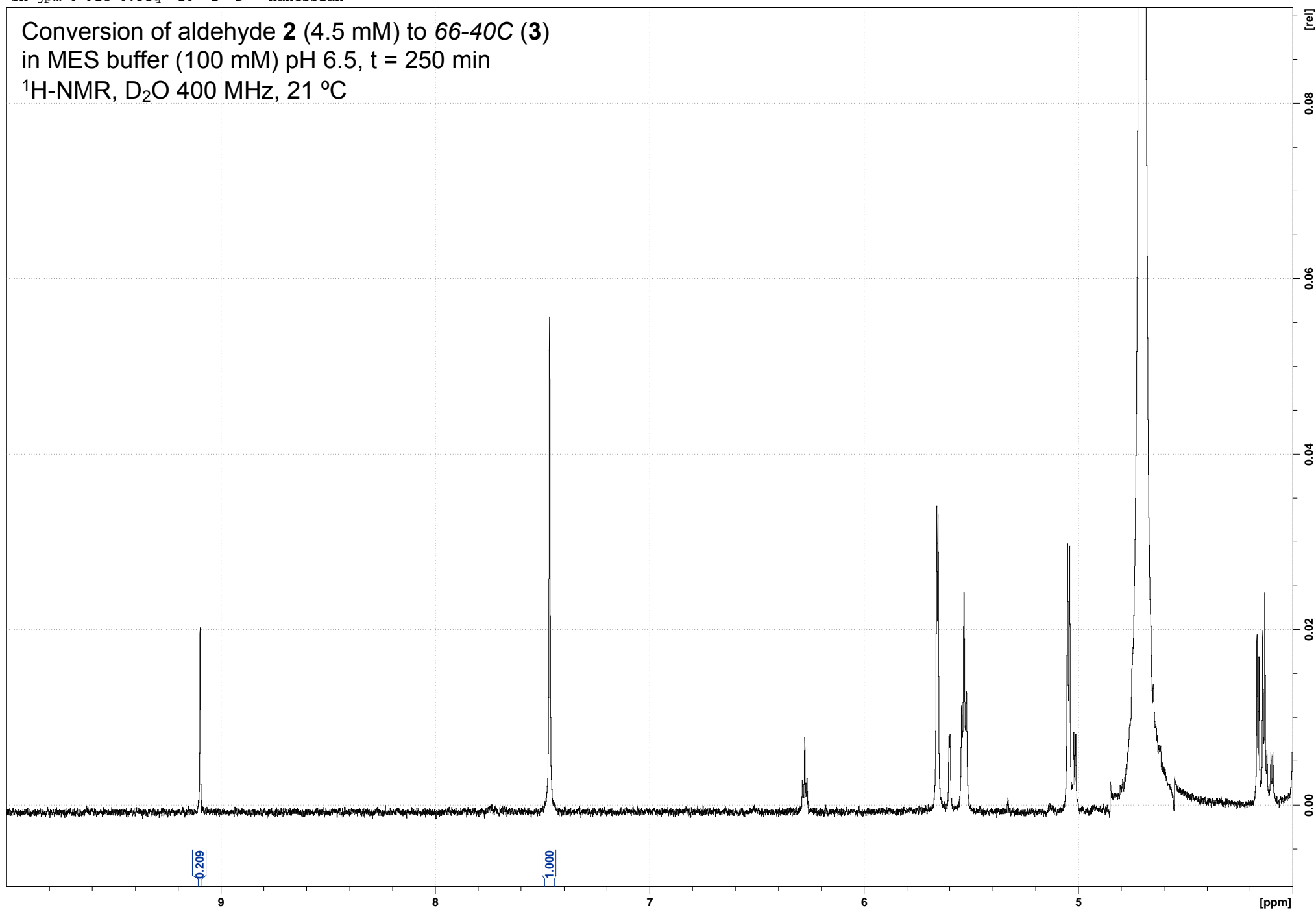
sh-jpm-6-91C-0.5eq 25 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 240 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



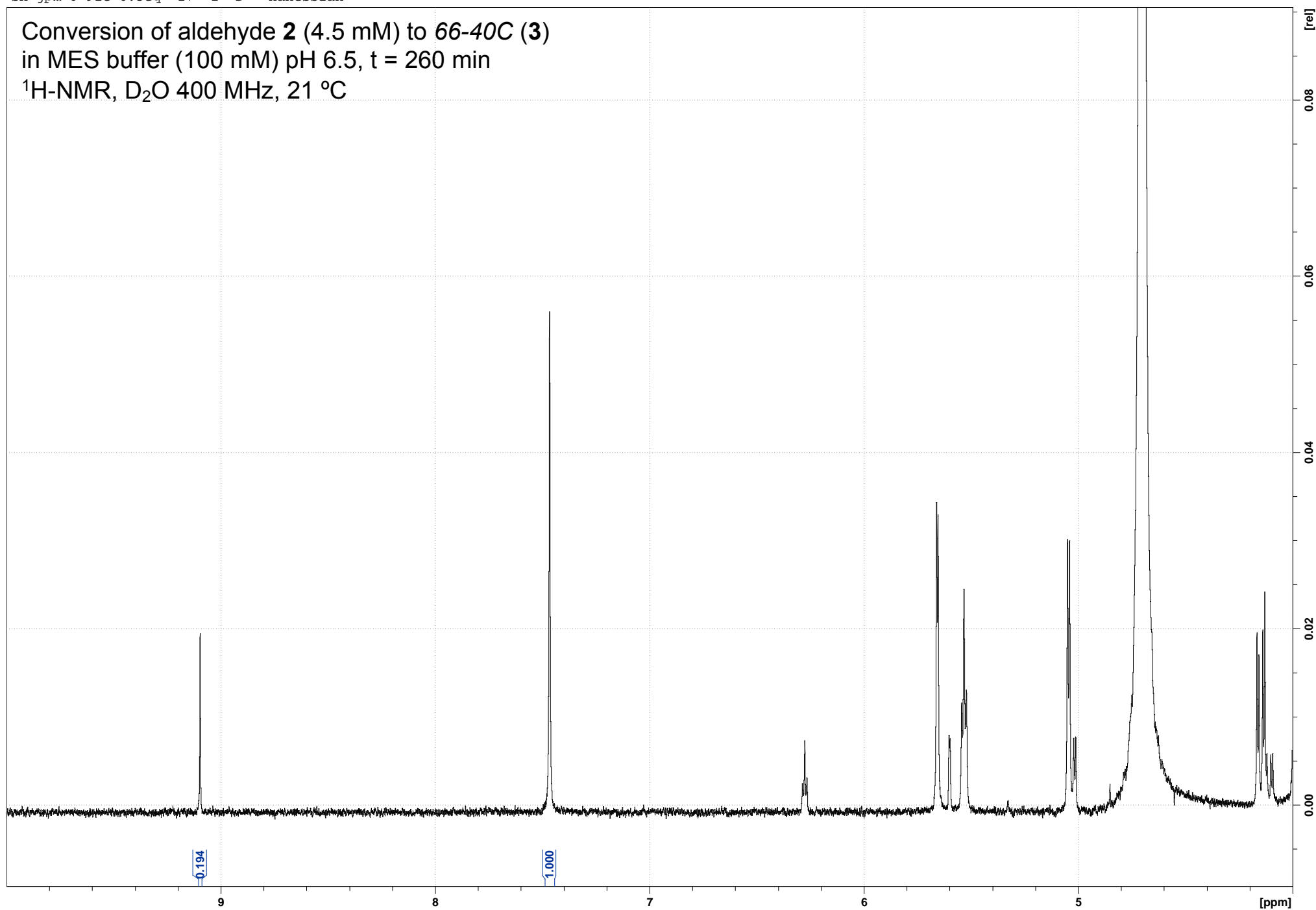
sh-jpm-6-91C-0.5eq 26 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 250 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



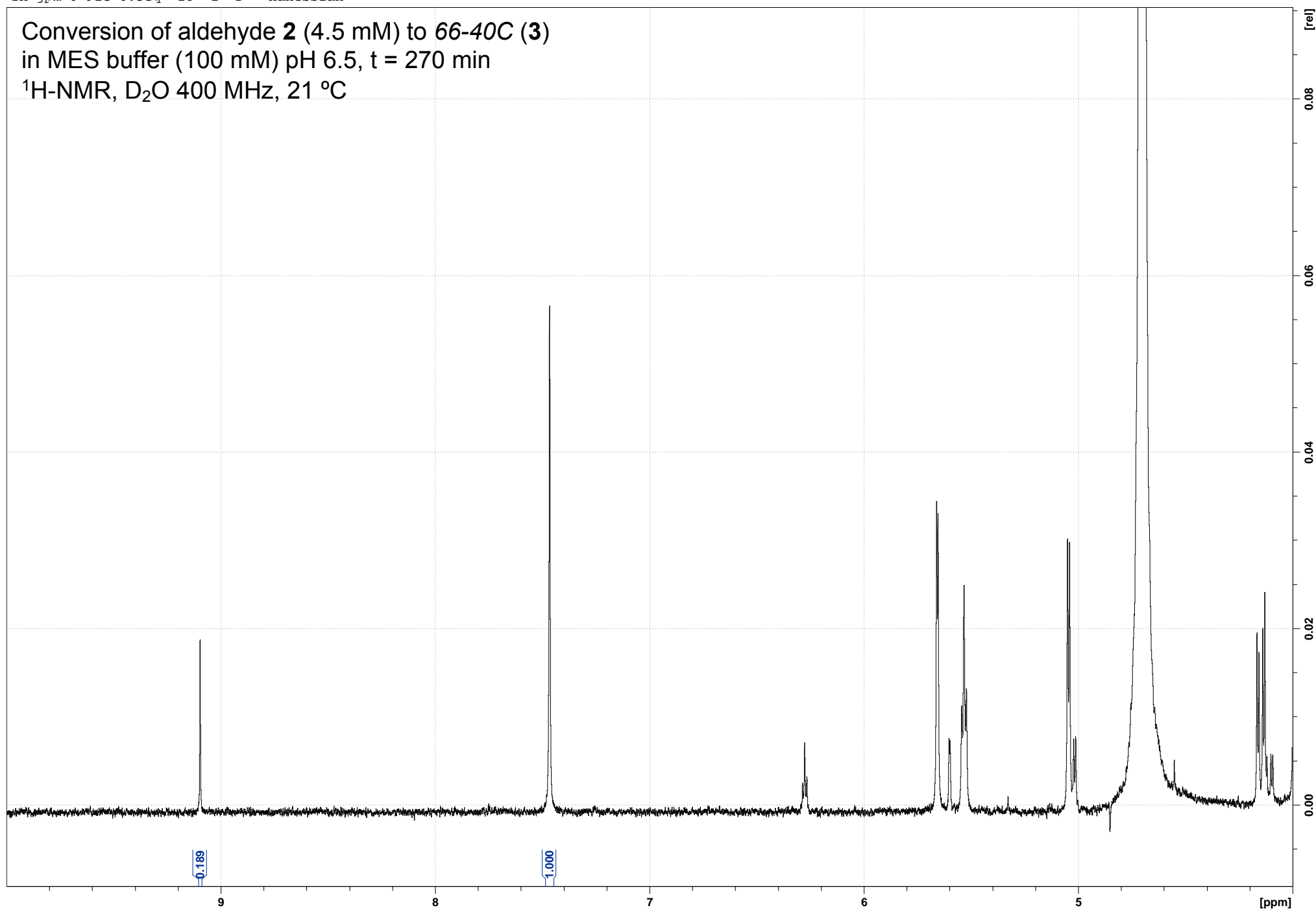
sh-jpm-6-91C-0.5eq 27 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 260 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



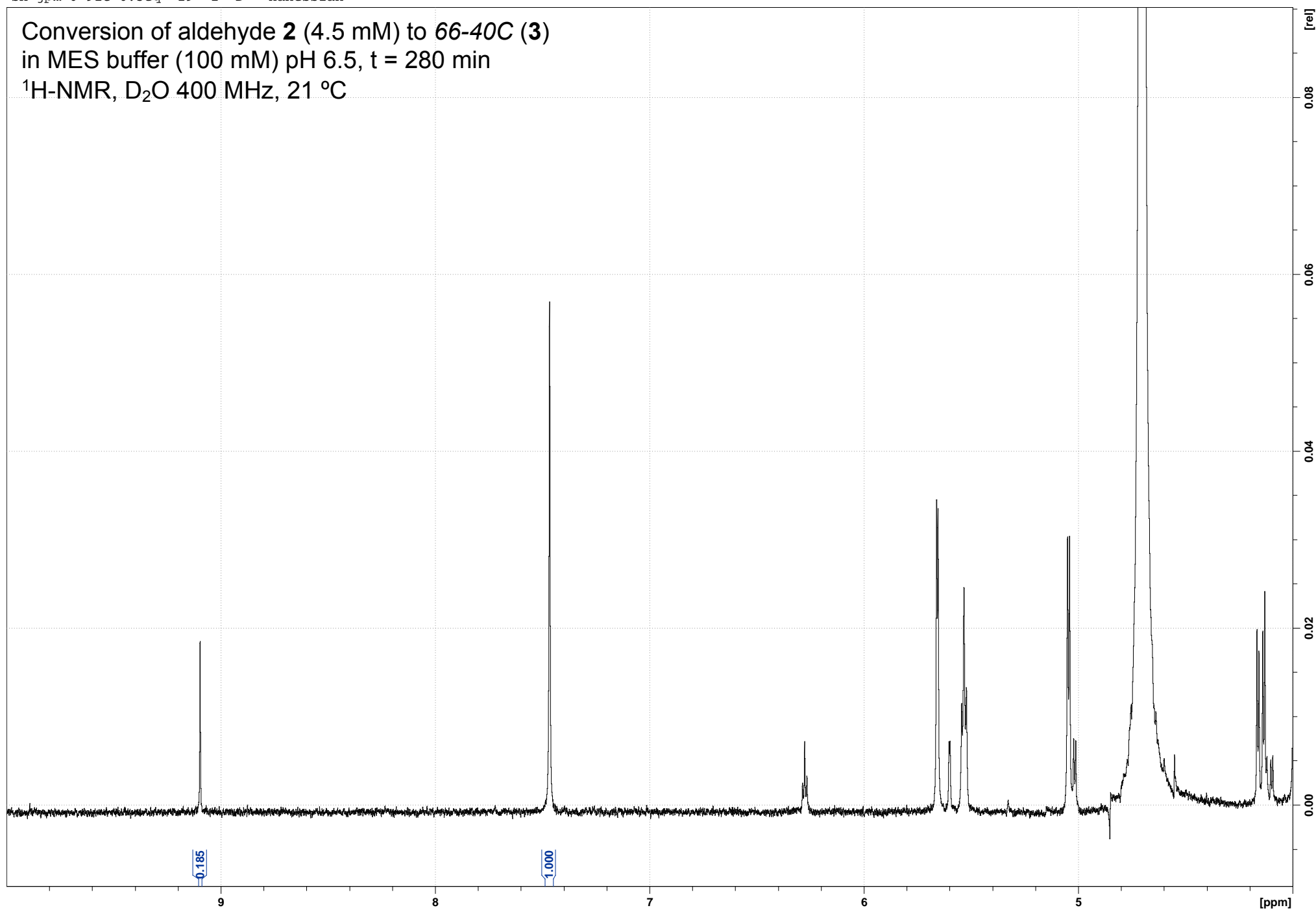
sh-jpm-6-91C-0.5eq 28 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 270 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



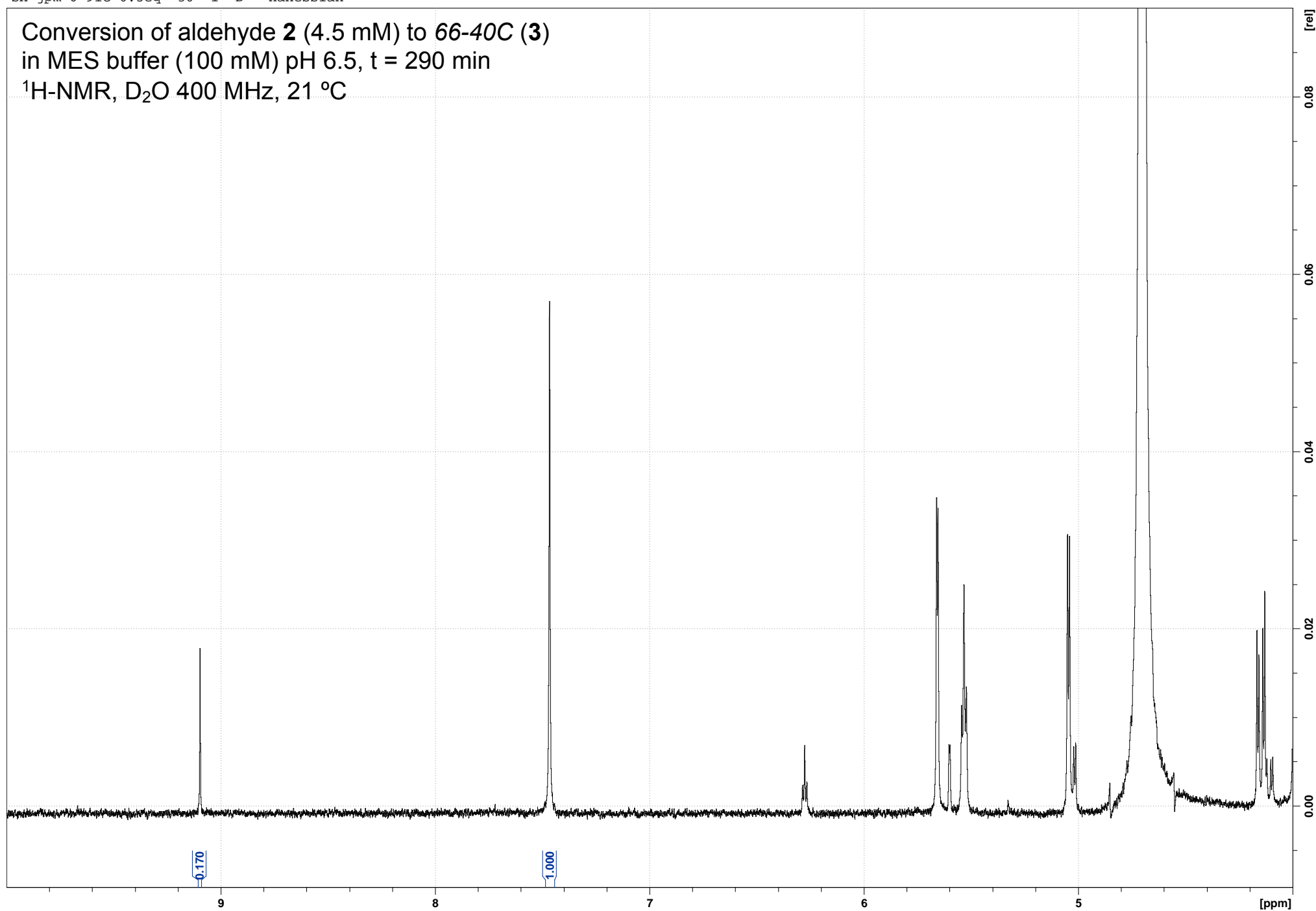
sh-jpm-6-91C-0.5eq 29 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 280 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



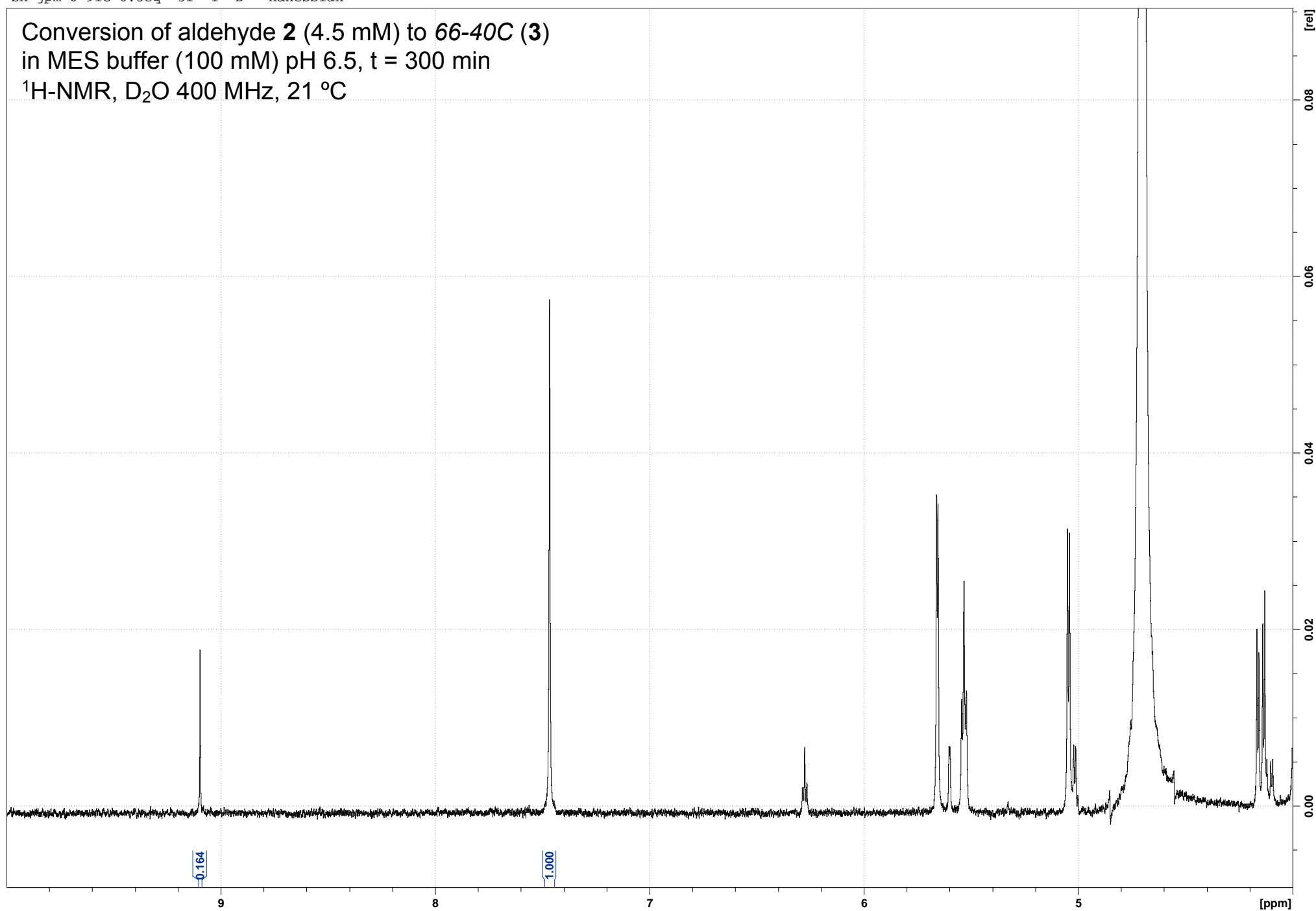
sh-jpm-6-91C-0.5eq 30 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 290 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



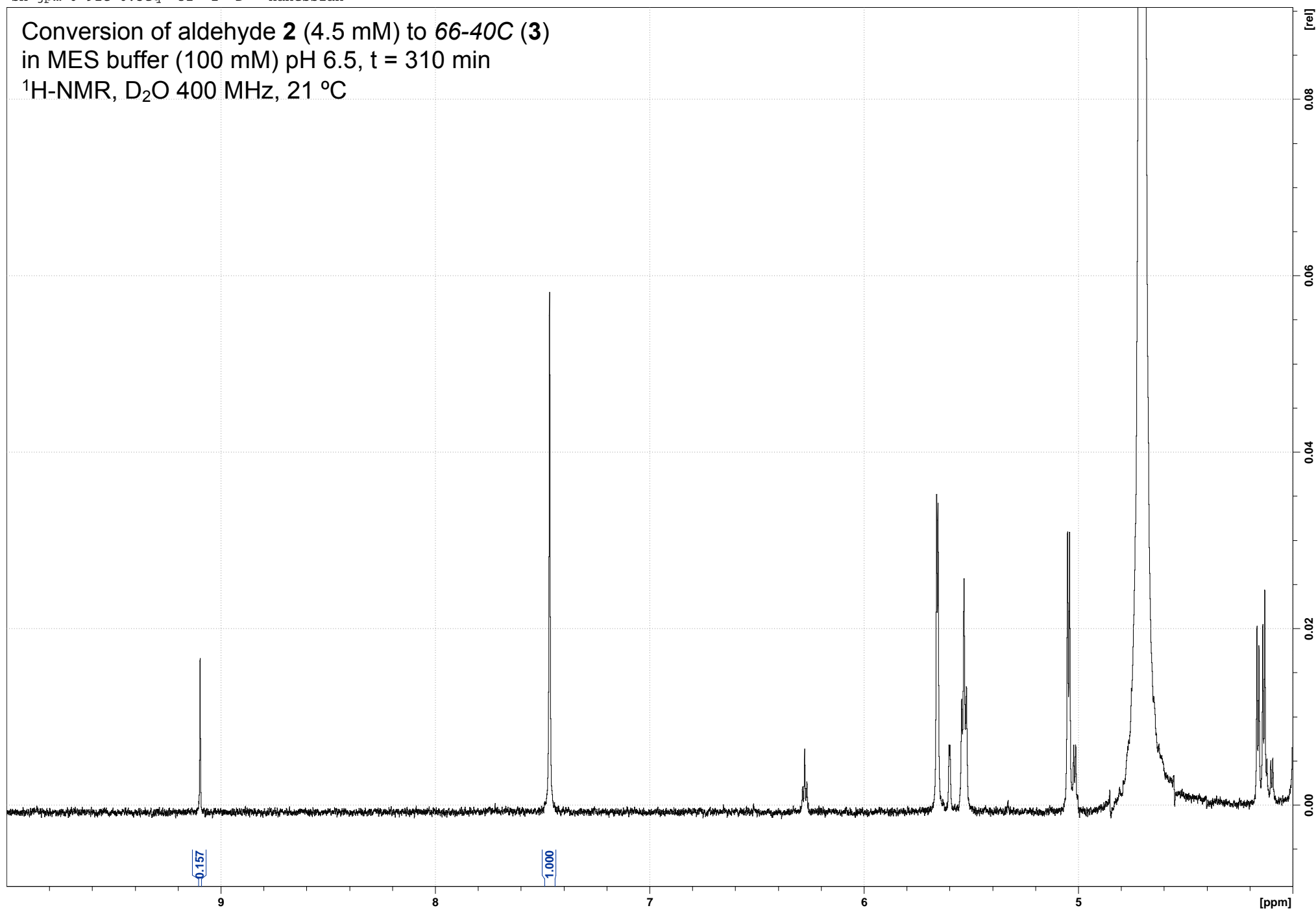
sh-jpm-6-91C-0.5eq 31 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 300 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91C-0.5eq 32 1 D: Hanessian

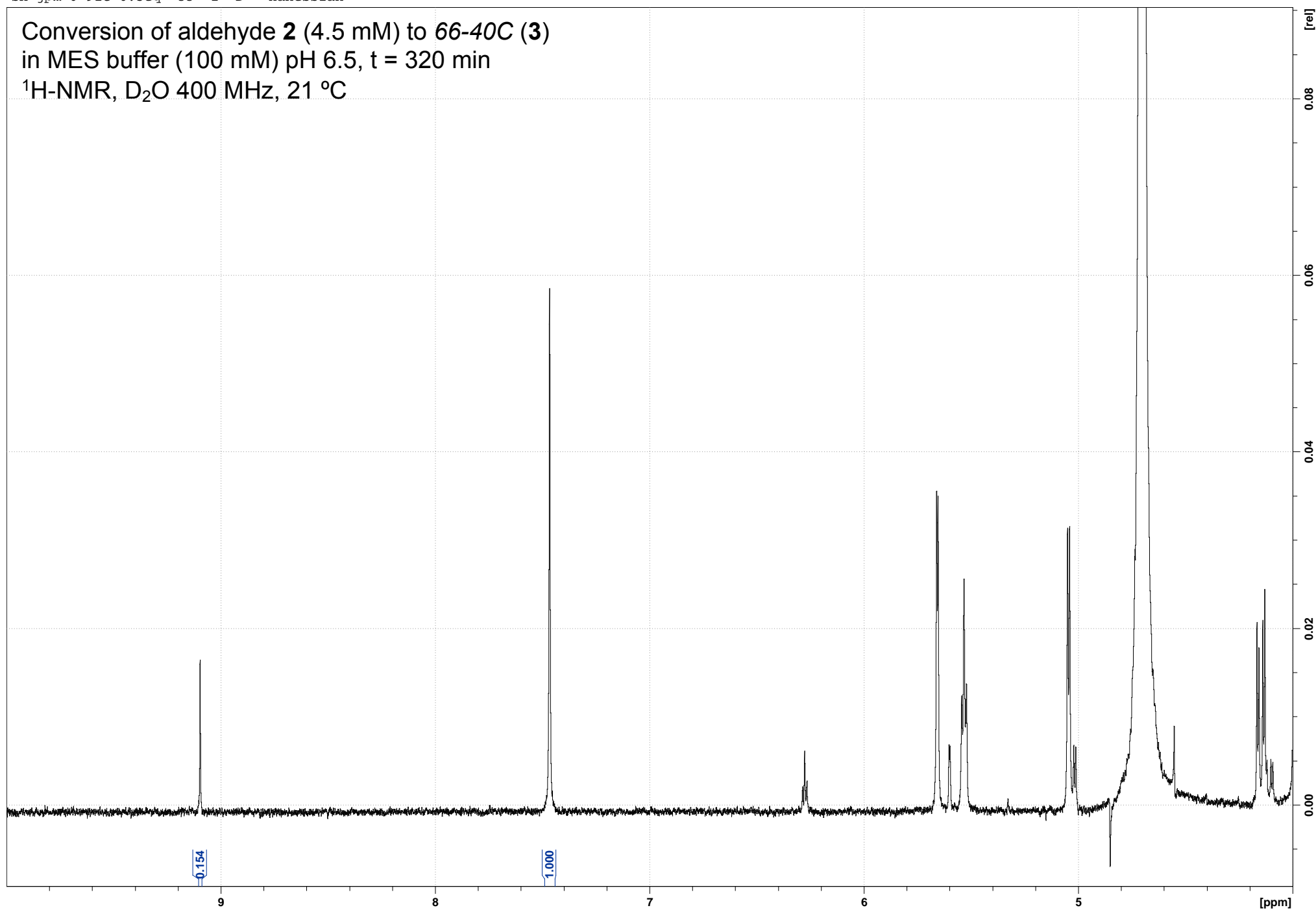
Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 310 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





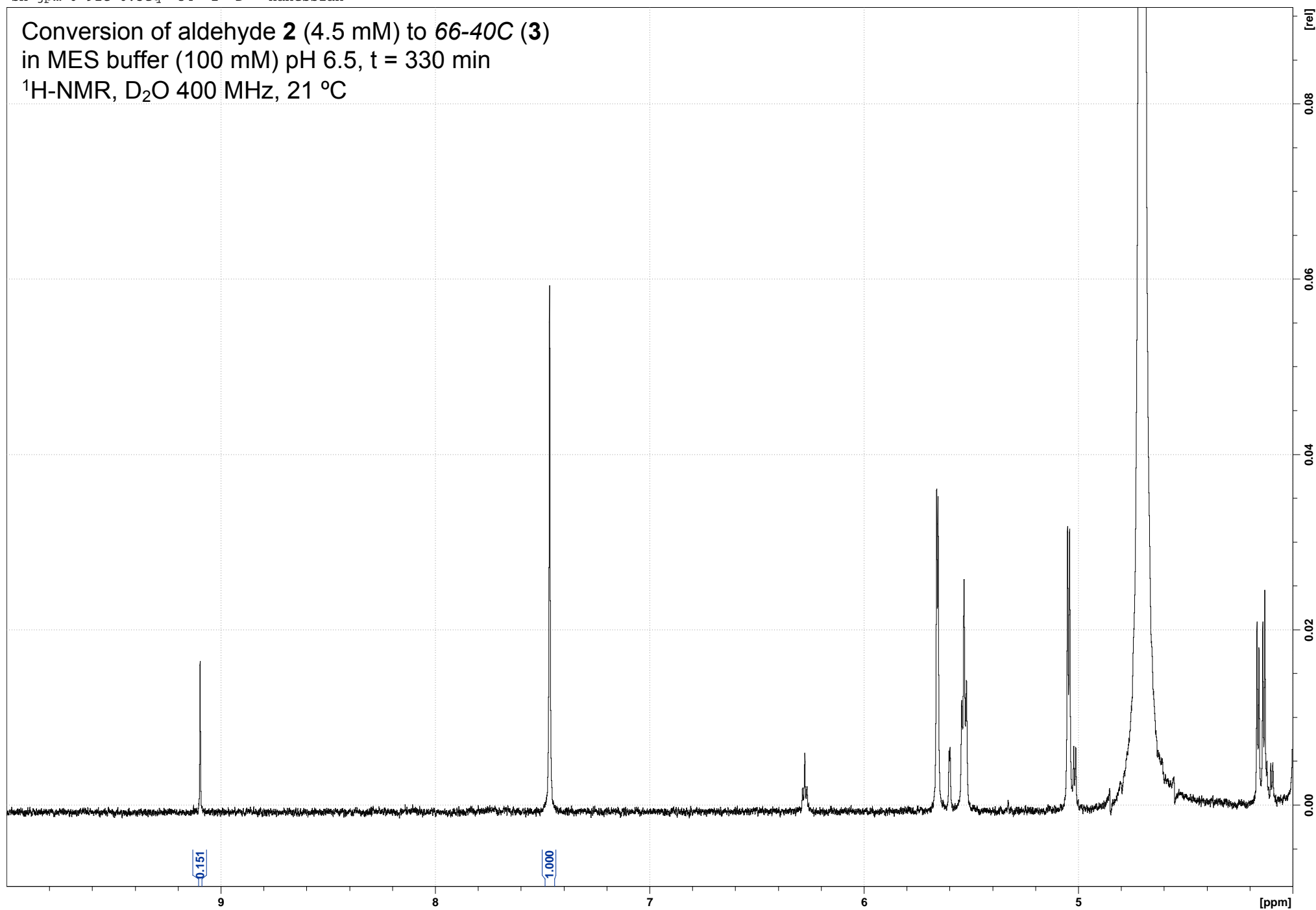
sh-jpm-6-91C-0.5eq 33 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 320 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



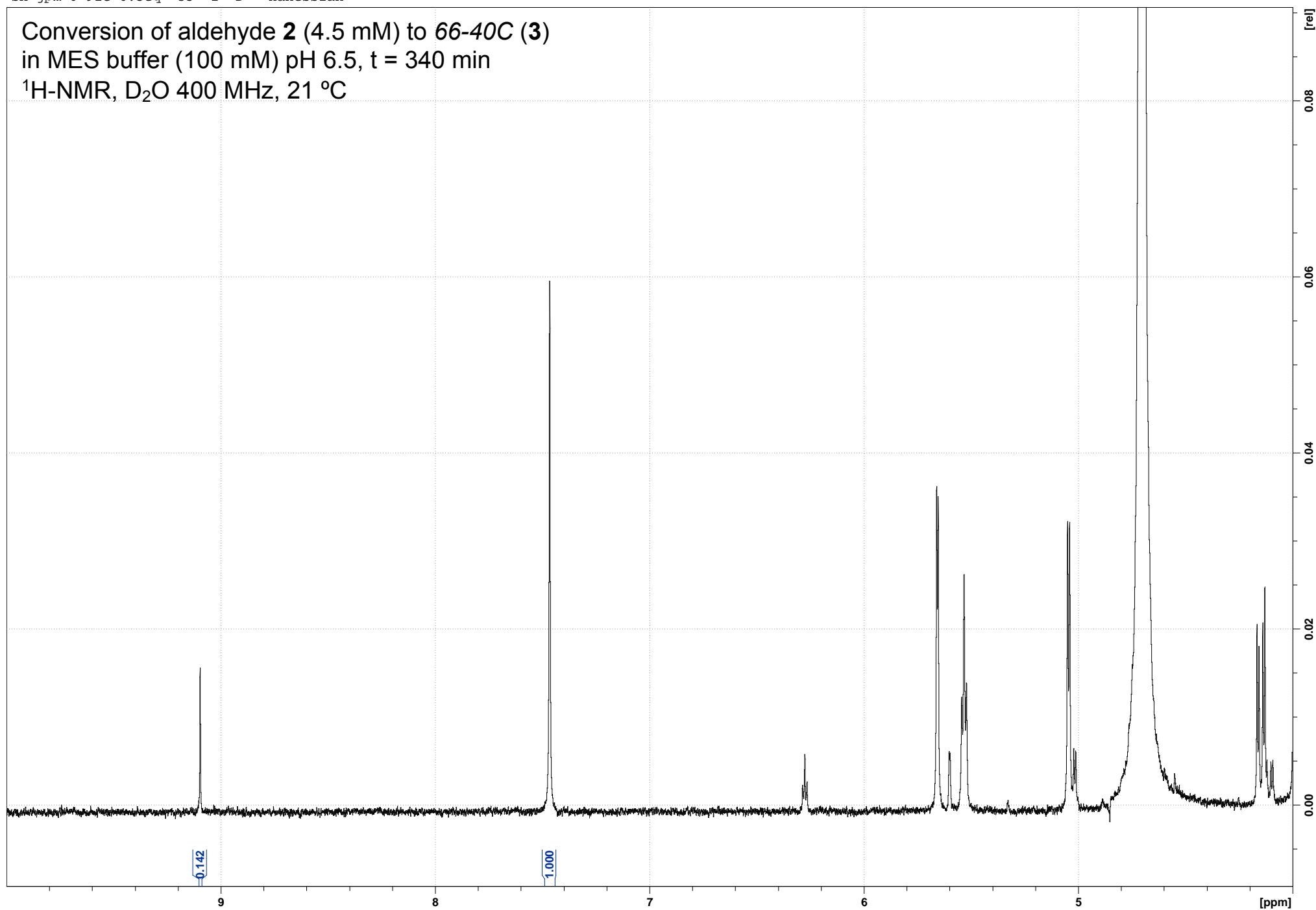
sh-jpm-6-91C-0.5eq 34 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 330 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



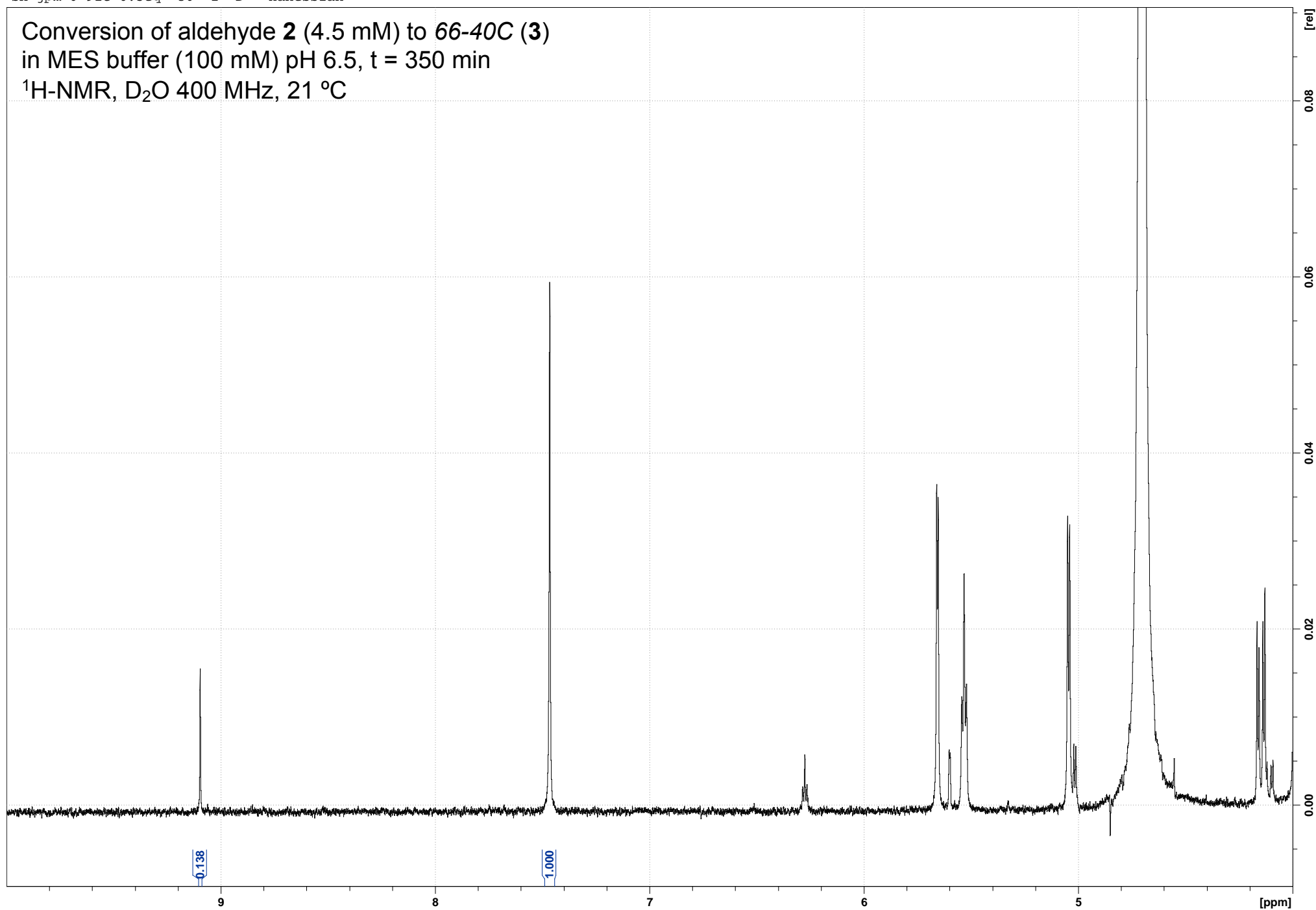
sh-jpm-6-91C-0.5eq 35 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 340 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



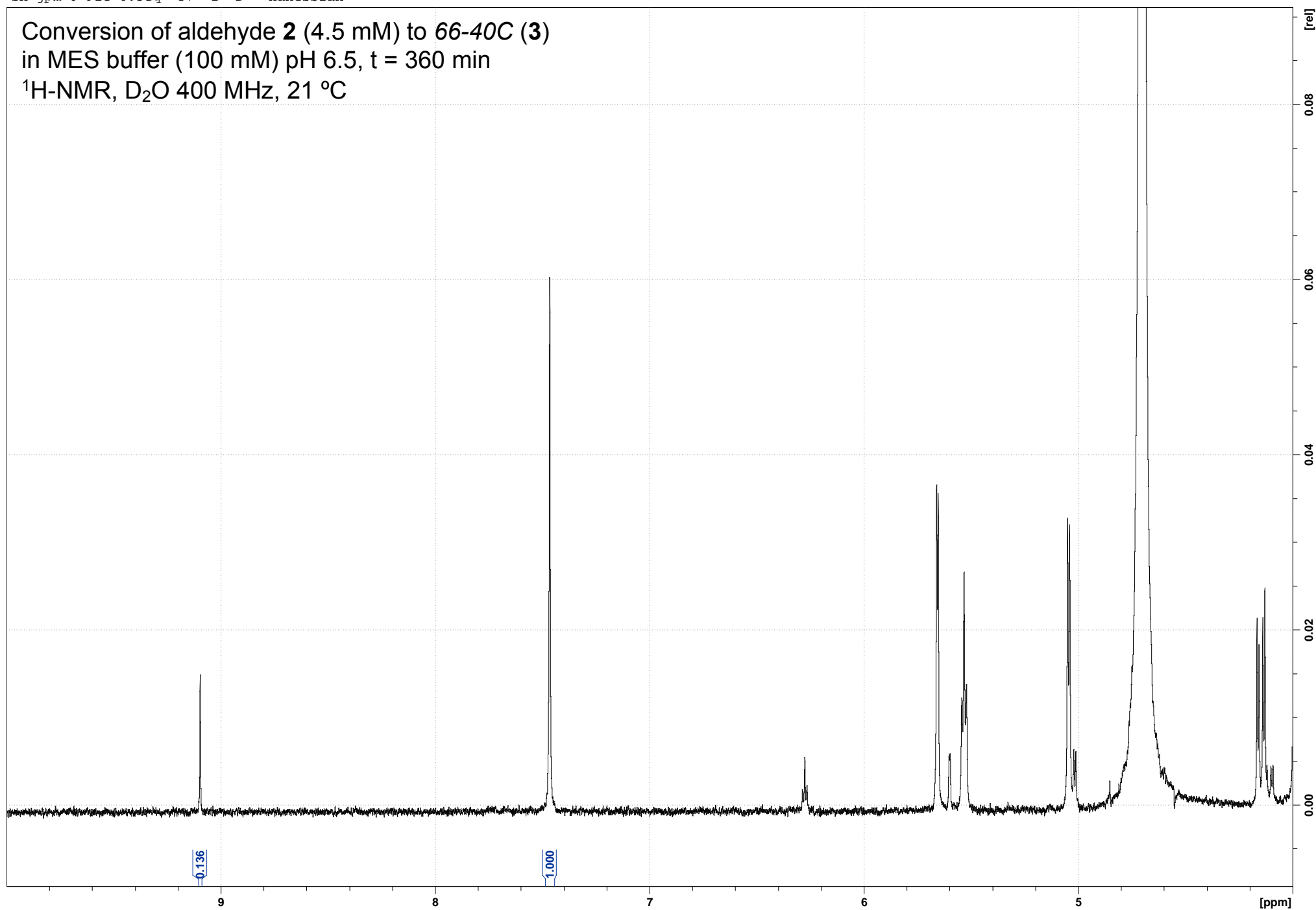
sh-jpm-6-91C-0.5eq 36 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 350 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



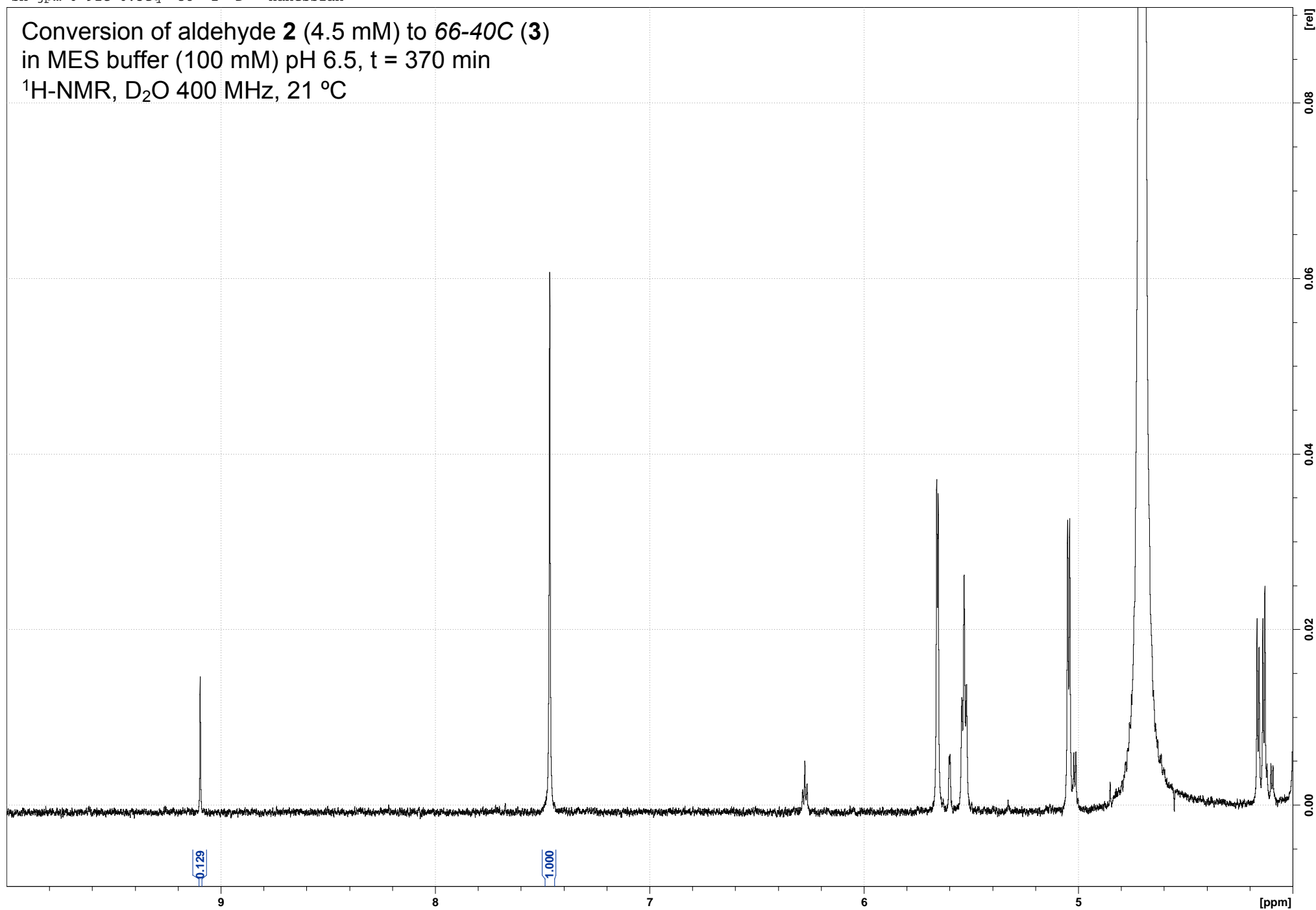
sh-jpm-6-91C-0.5eq 37 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 360 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



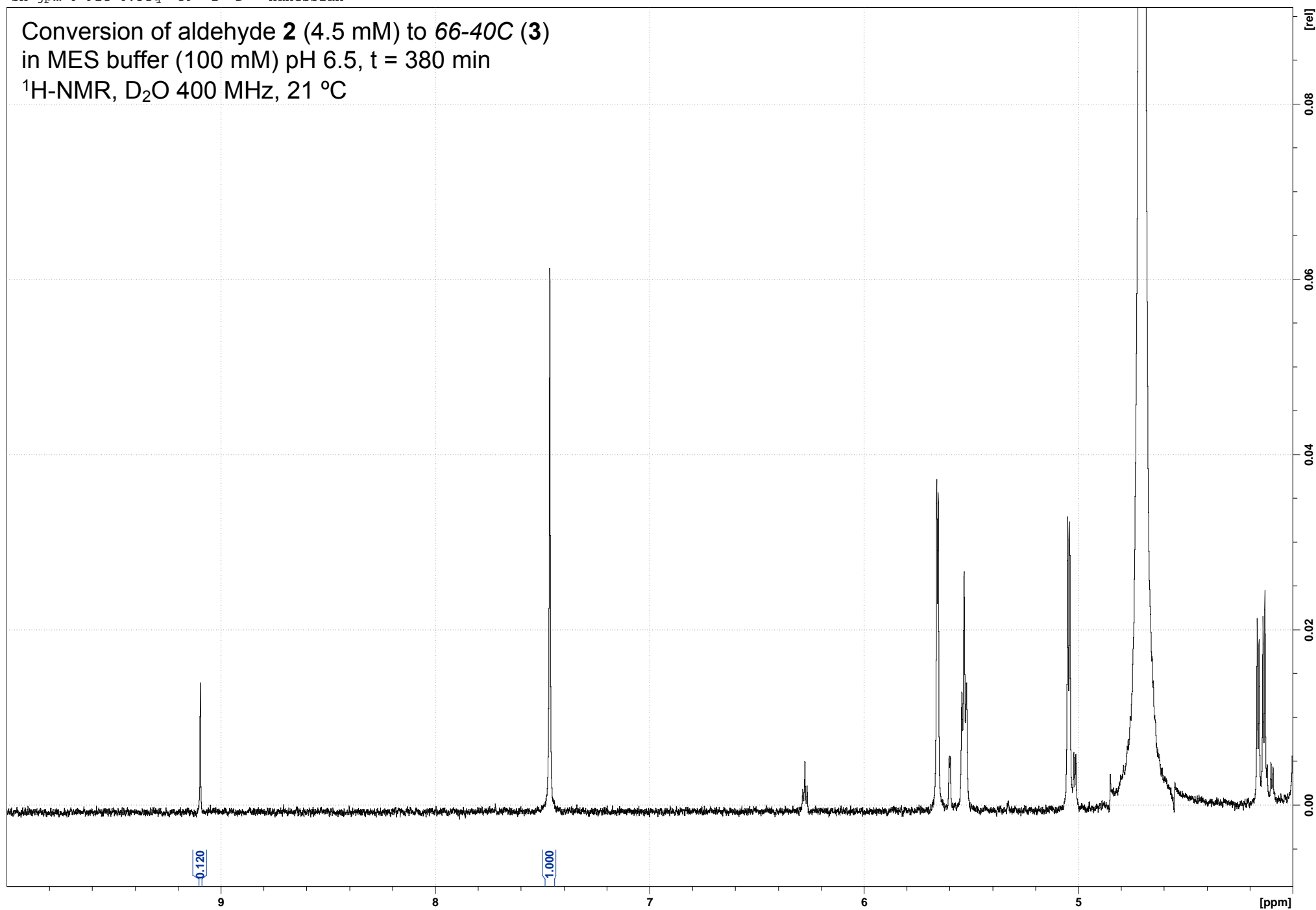
sh-jpm-6-91C-0.5eq 38 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 370 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



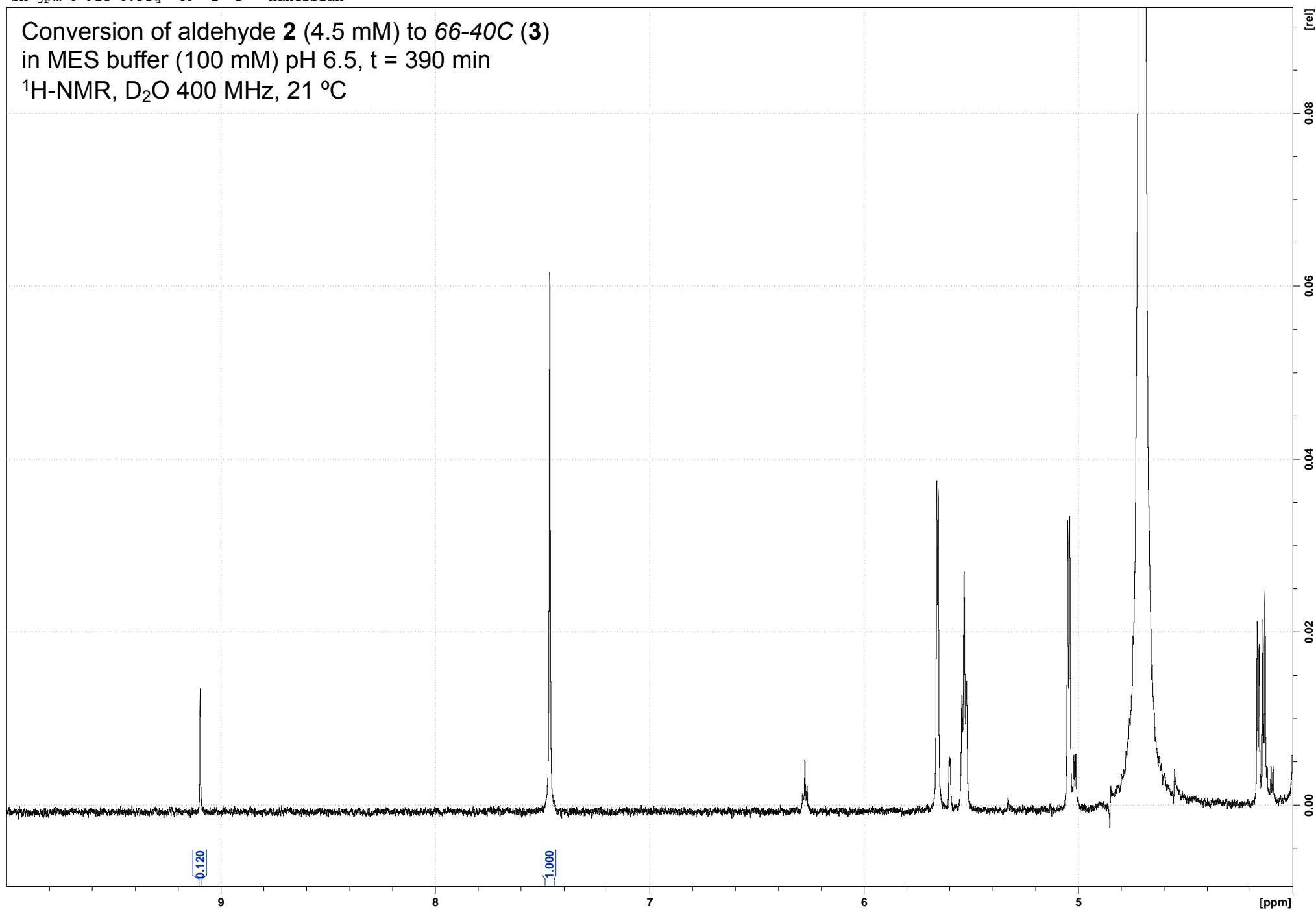
sh-jpm-6-91C-0.5eq 39 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 380 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91C-0.5eq 40 1 D: Hanessian

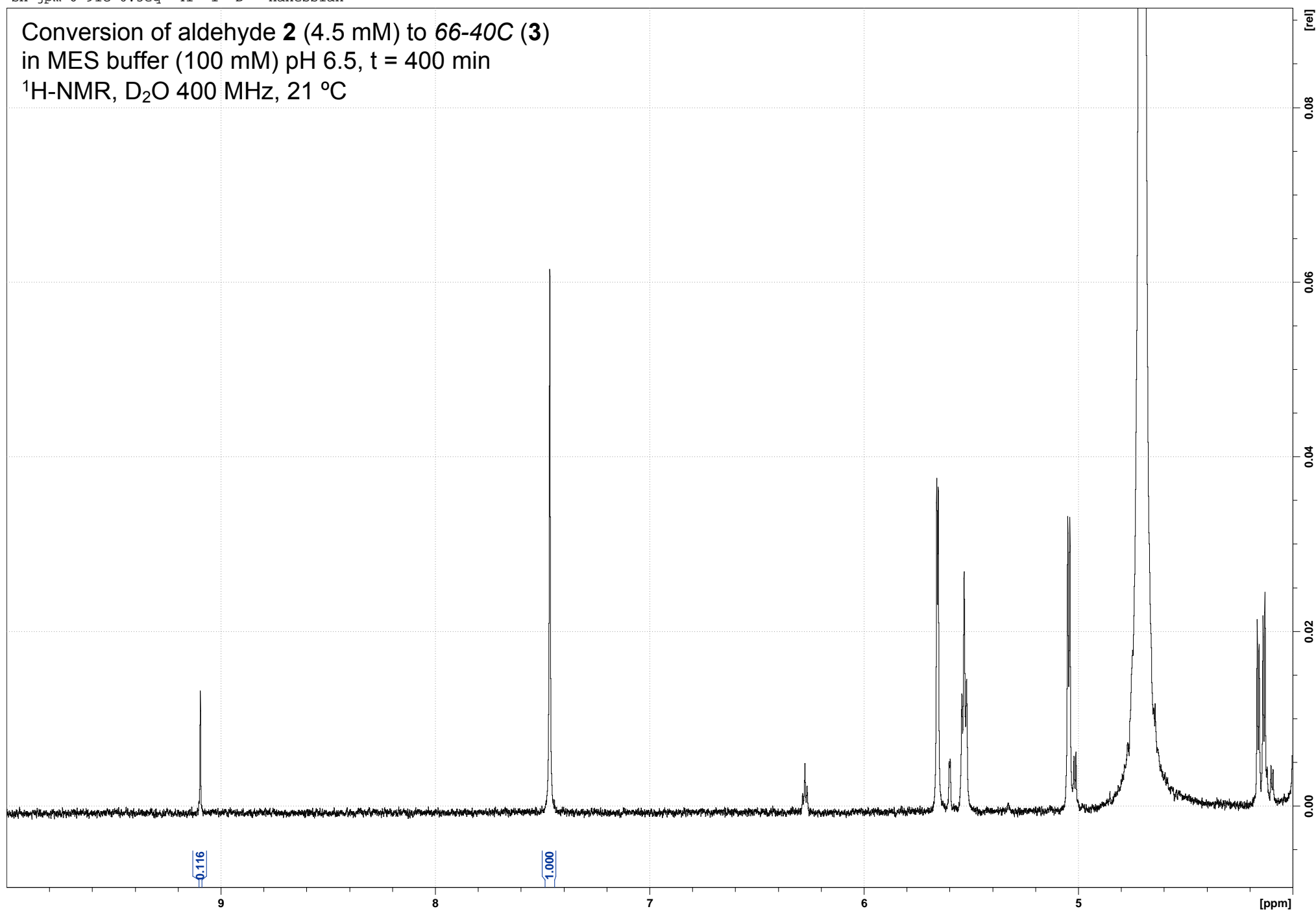
Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 390 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





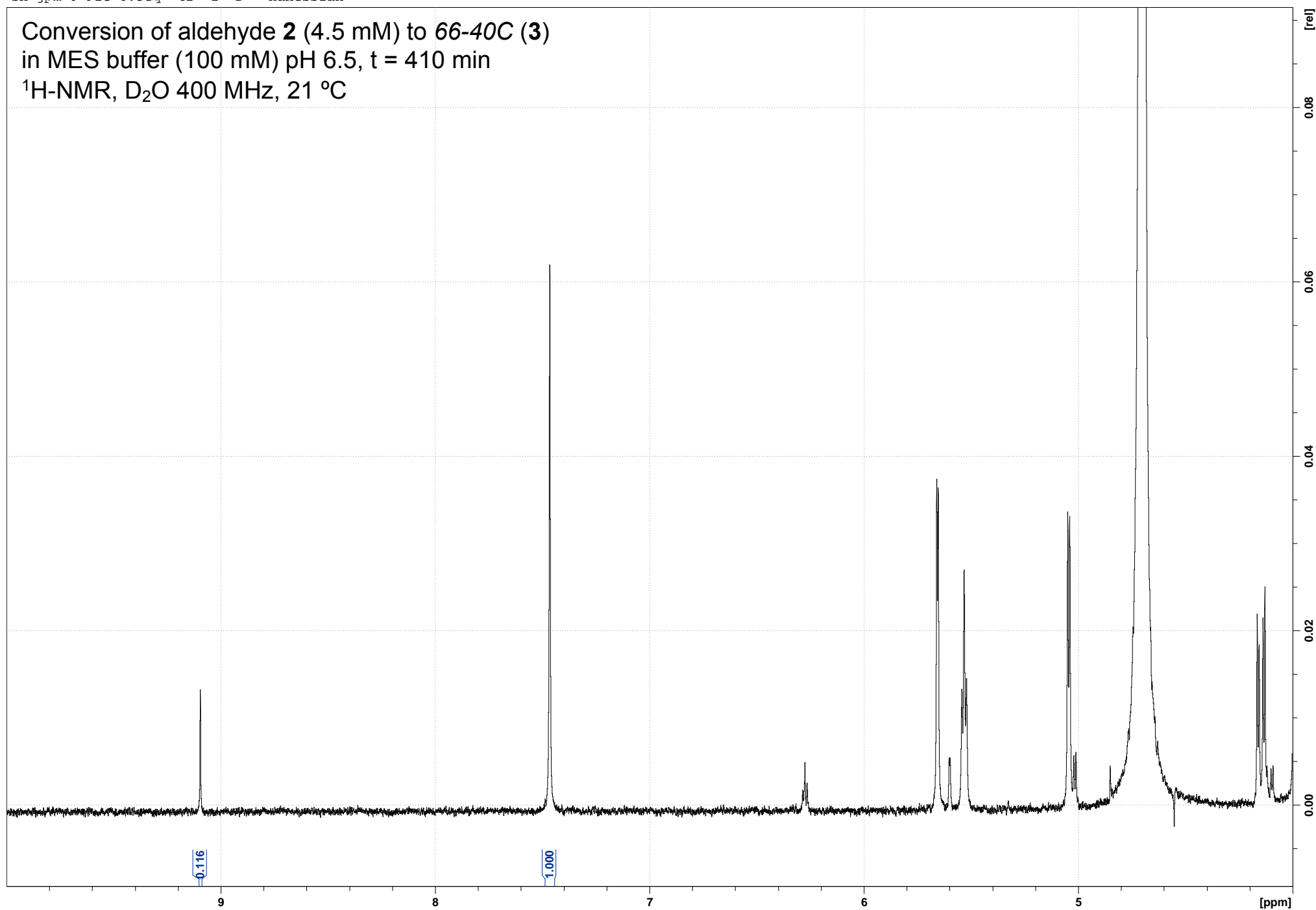
sh-jpm-6-91C-0.5eq 41 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 400 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



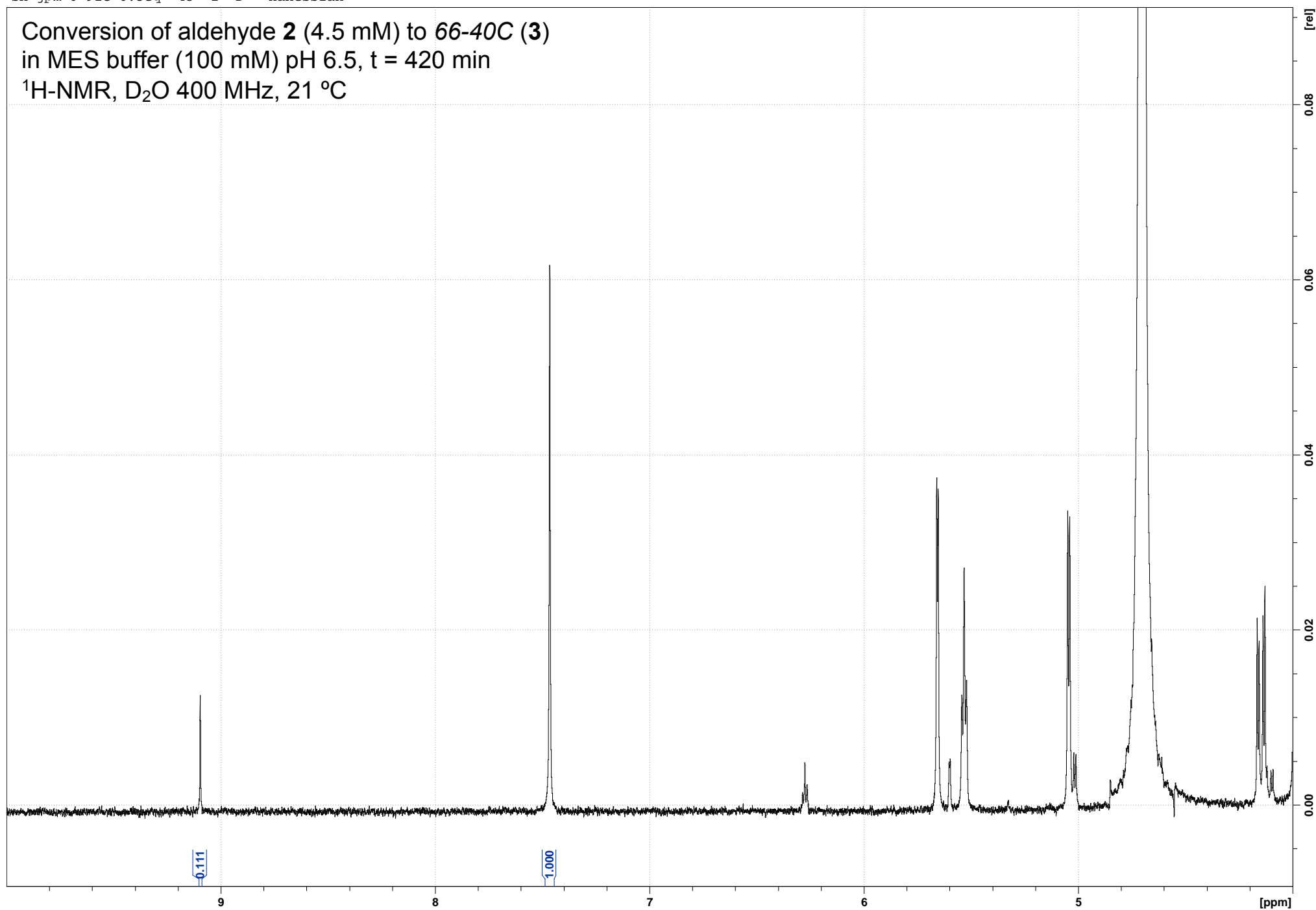
sh-jpm-6-91C-0.5eq 42 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 410 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



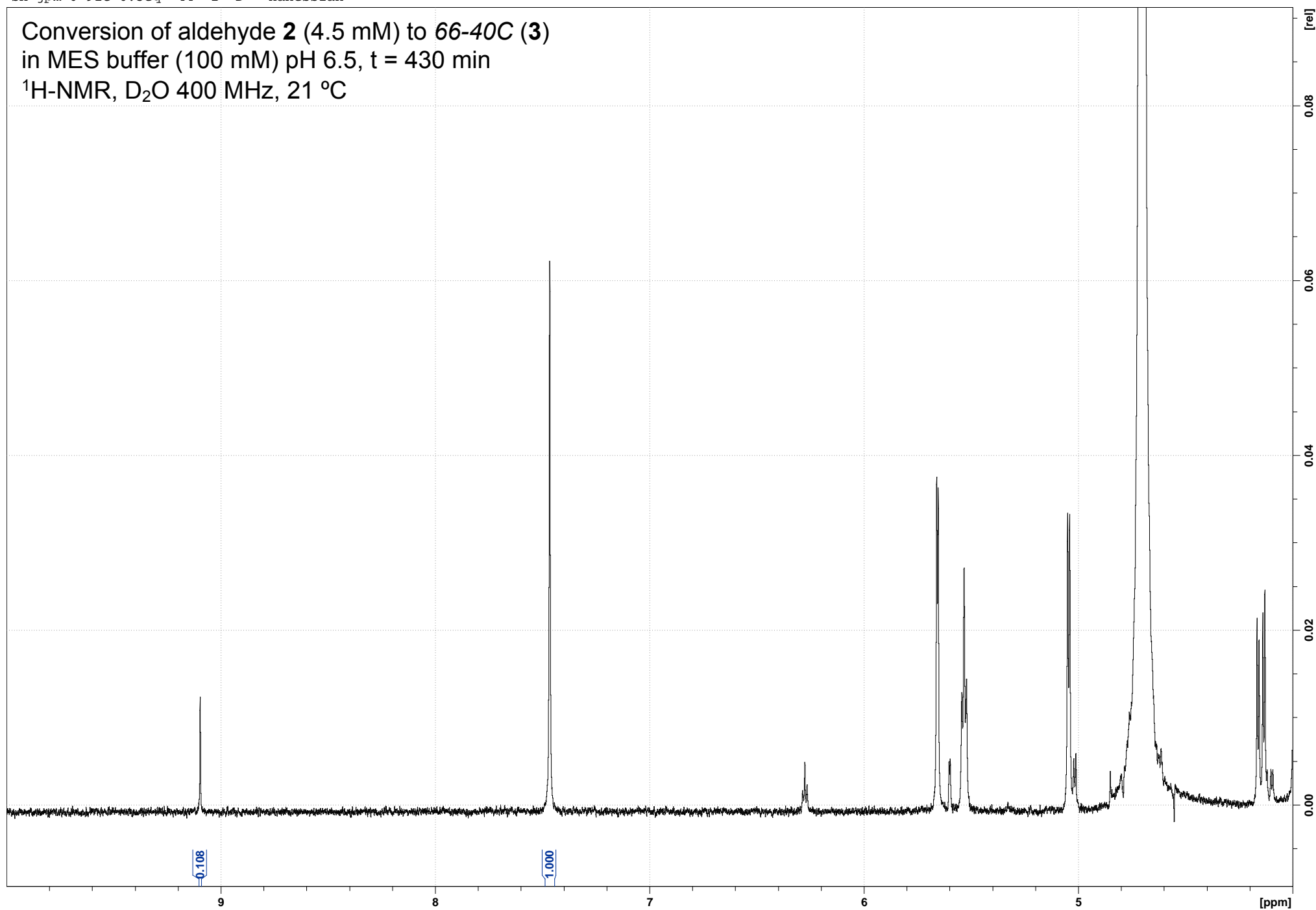
sh-jpm-6-91C-0.5eq 43 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 420 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



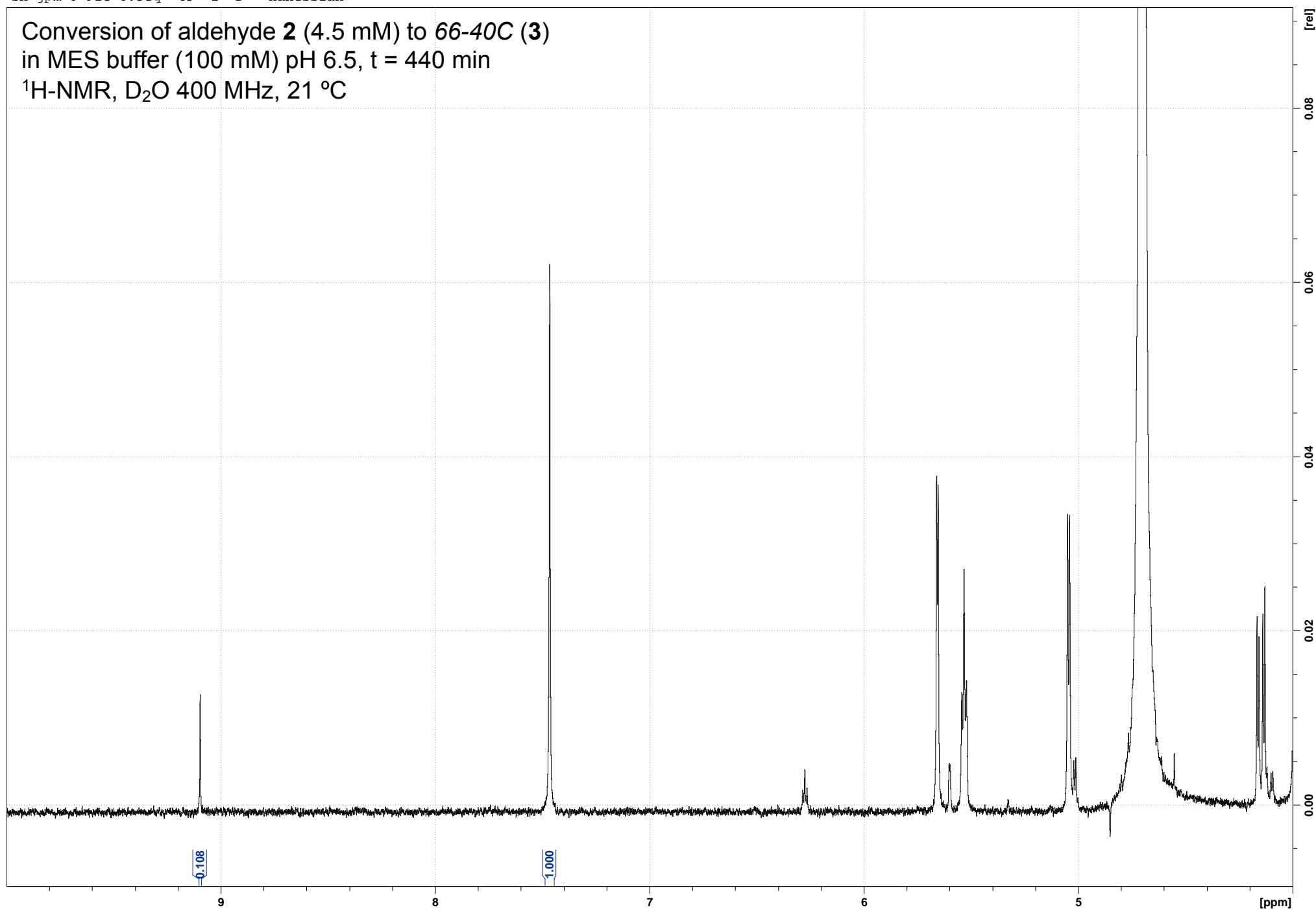
sh-jpm-6-91C-0.5eq 44 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 430 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



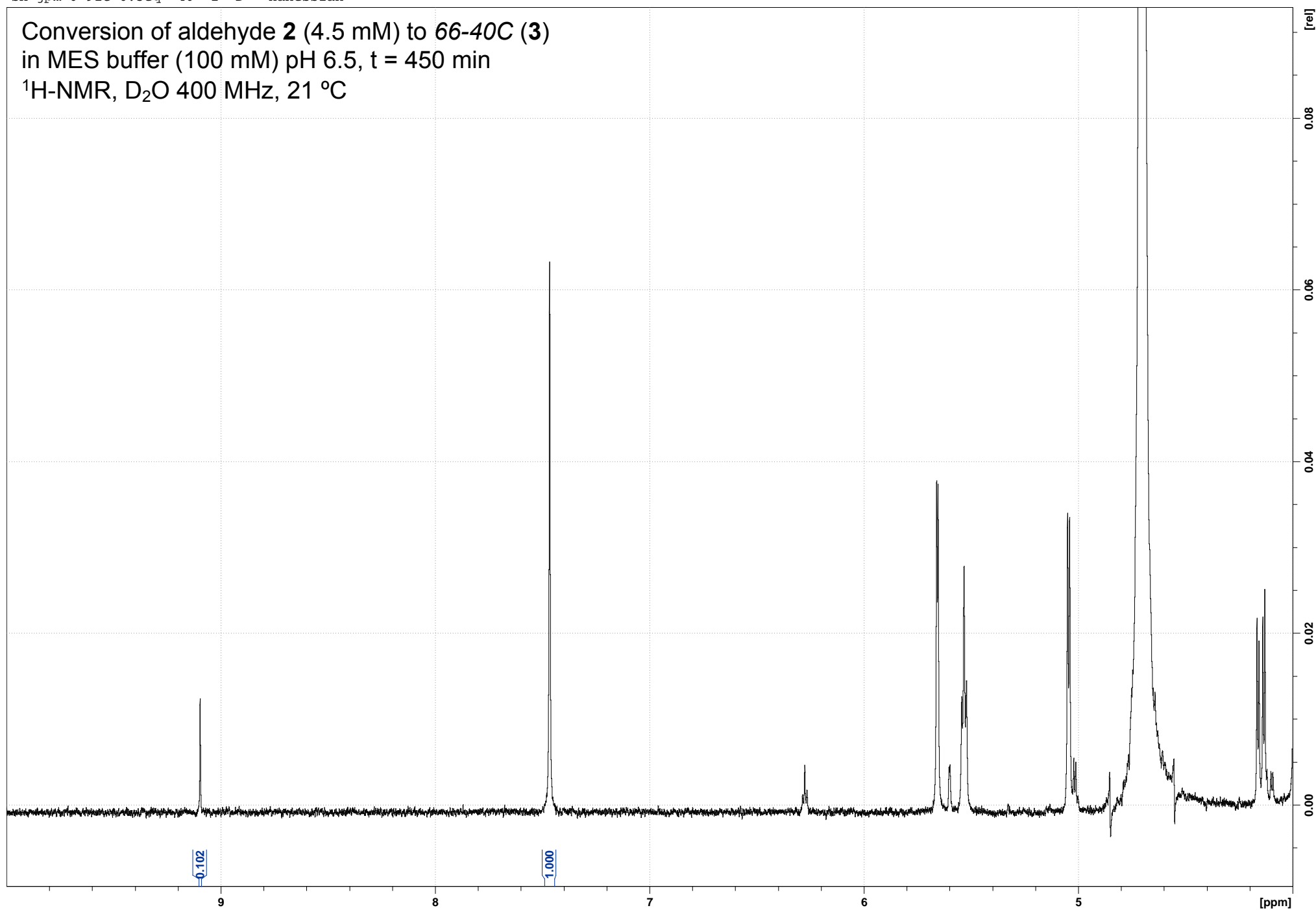
sh-jpm-6-91C-0.5eq 45 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 440 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



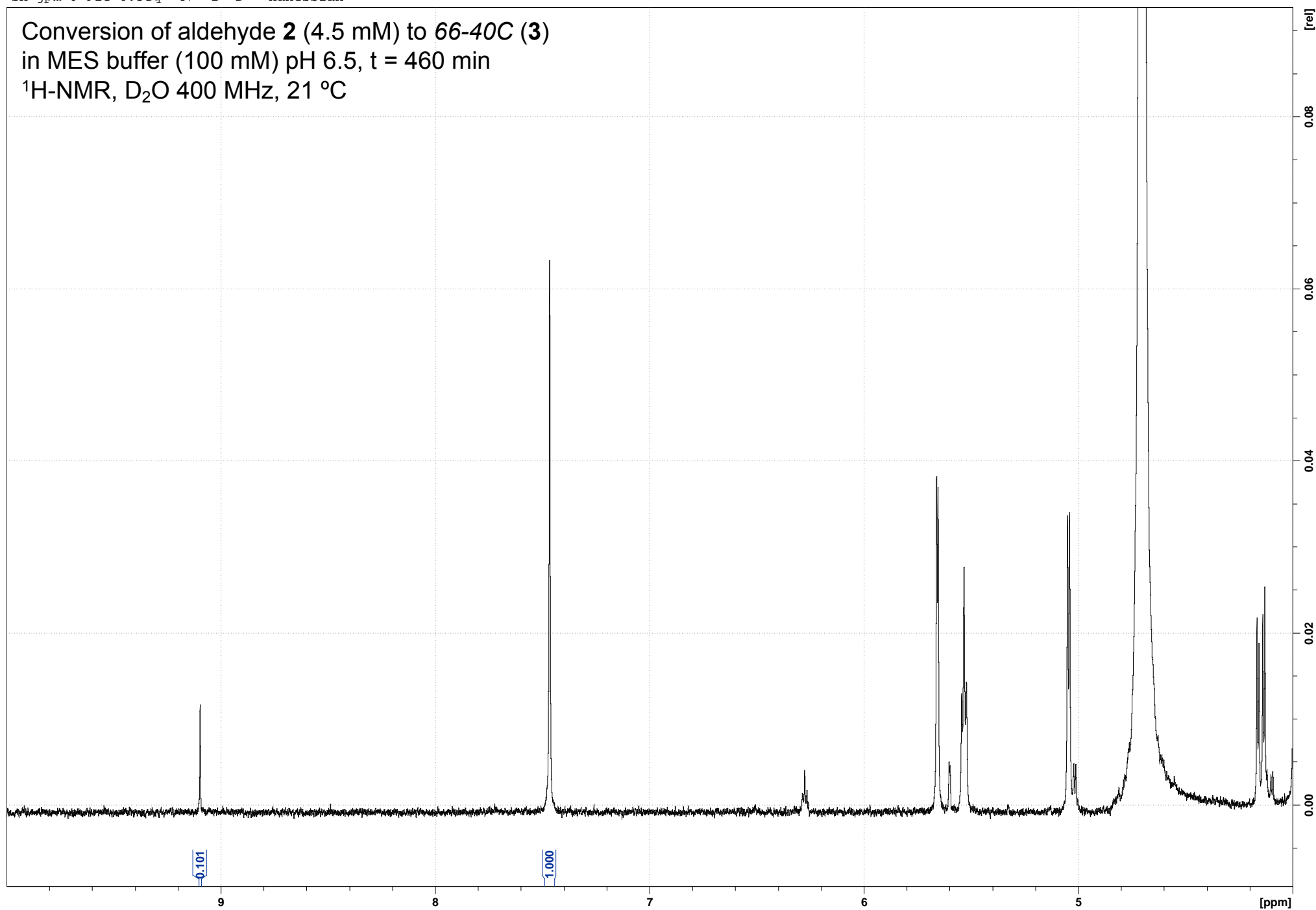
sh-jpm-6-91C-0.5eq 46 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 450 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



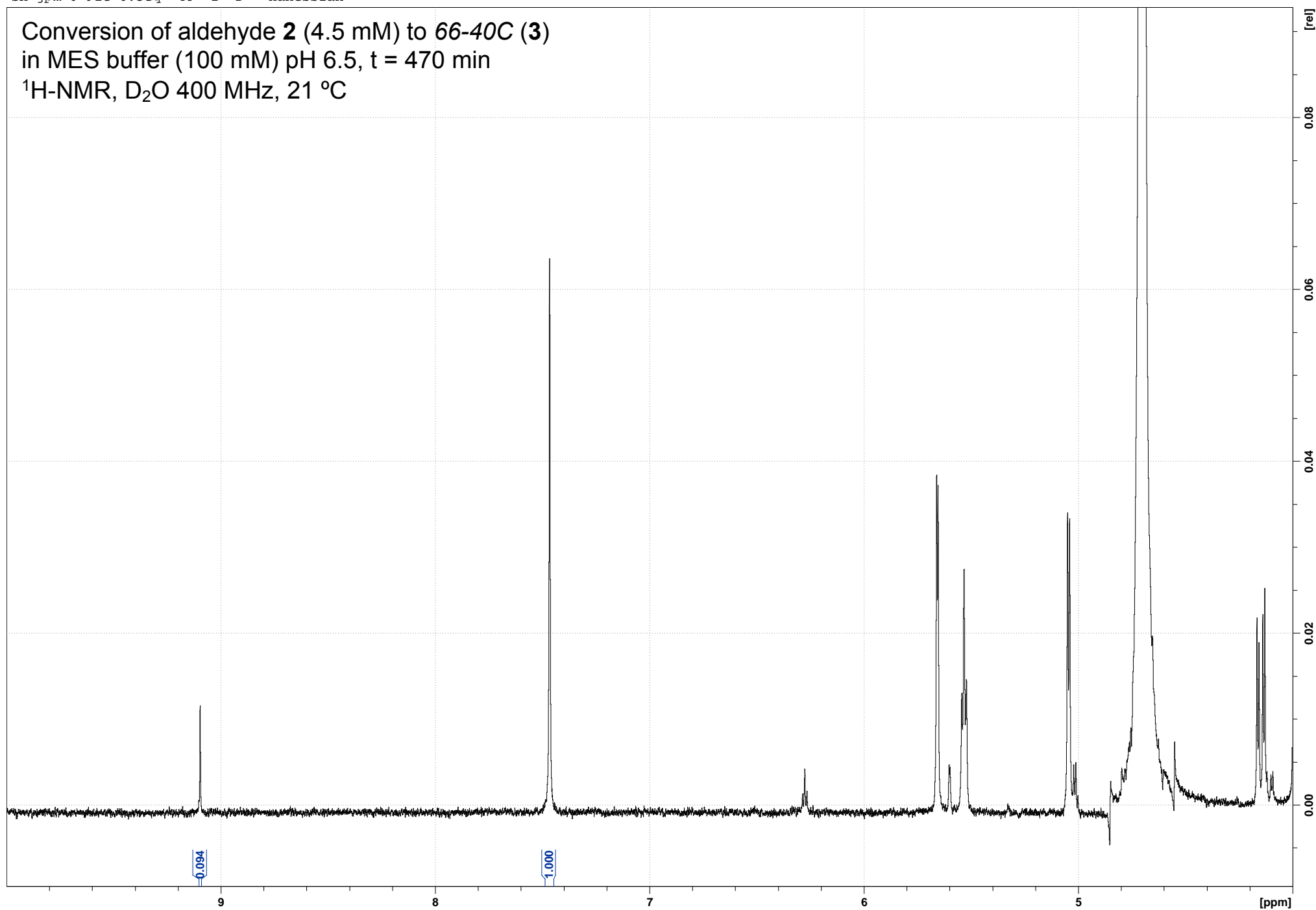
sh-jpm-6-91C-0.5eq 47 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 460 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91C-0.5eq 48 1 D: Hanessian

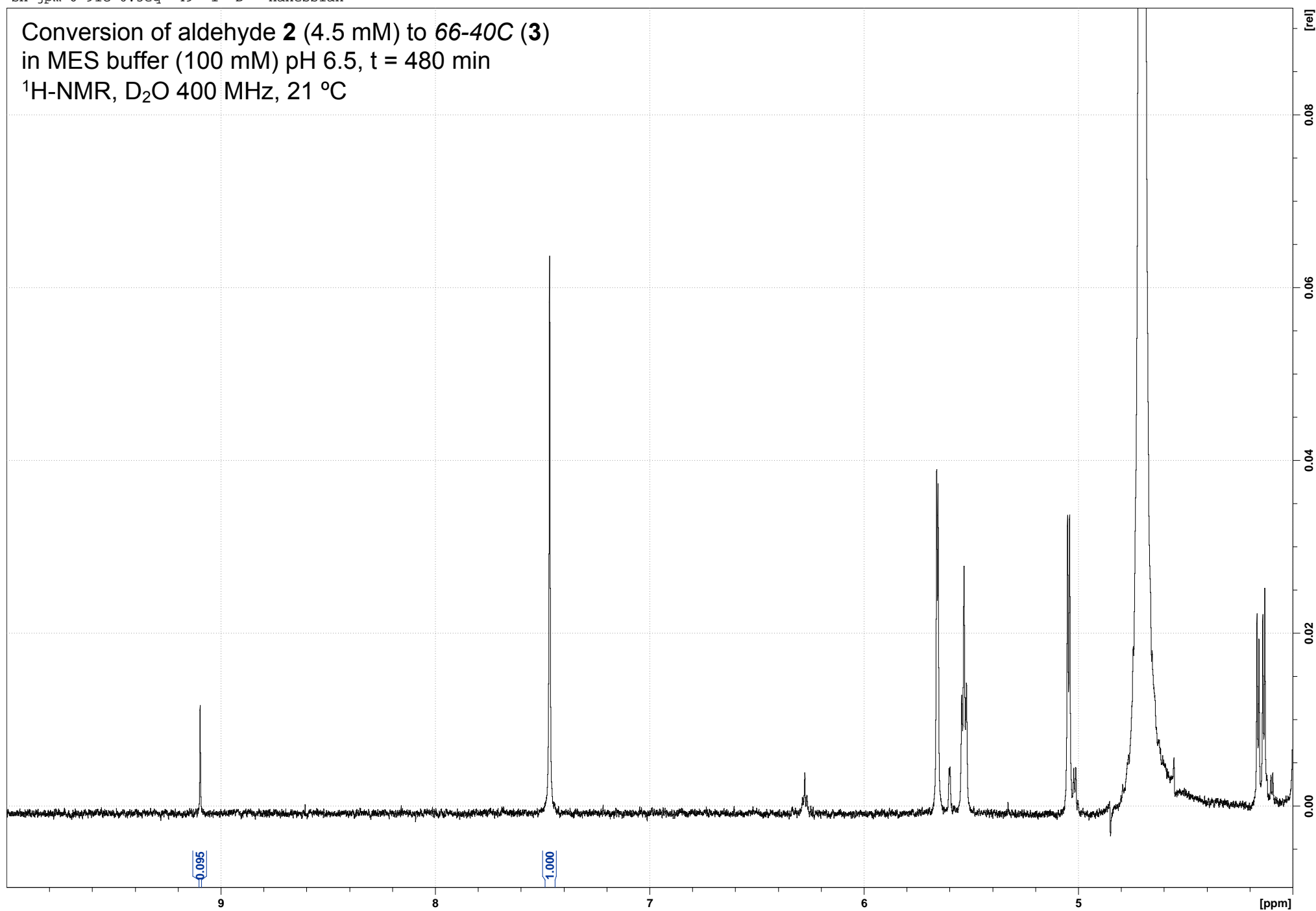
Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 470 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





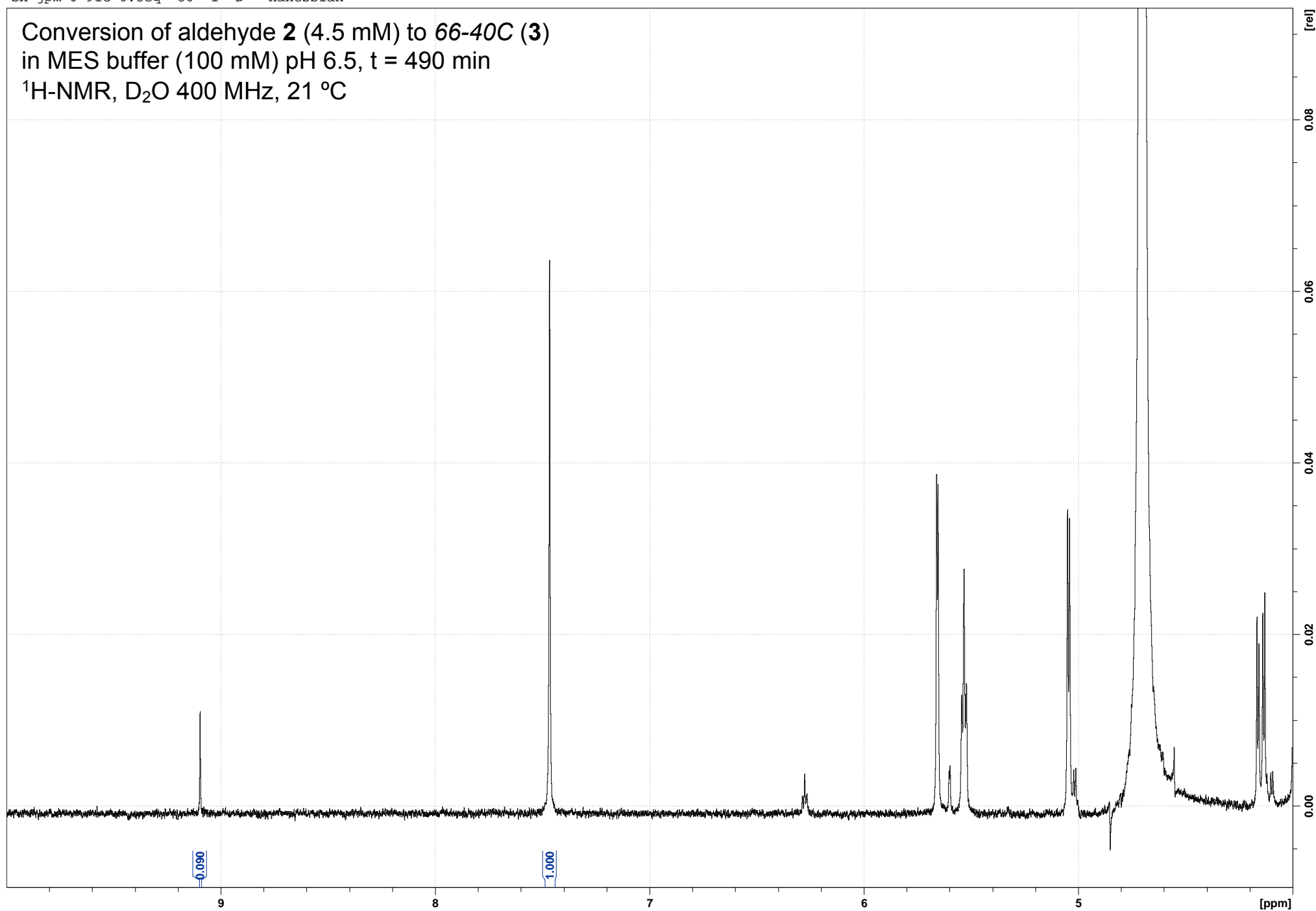
sh-jpm-6-91C-0.5eq 49 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 480 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



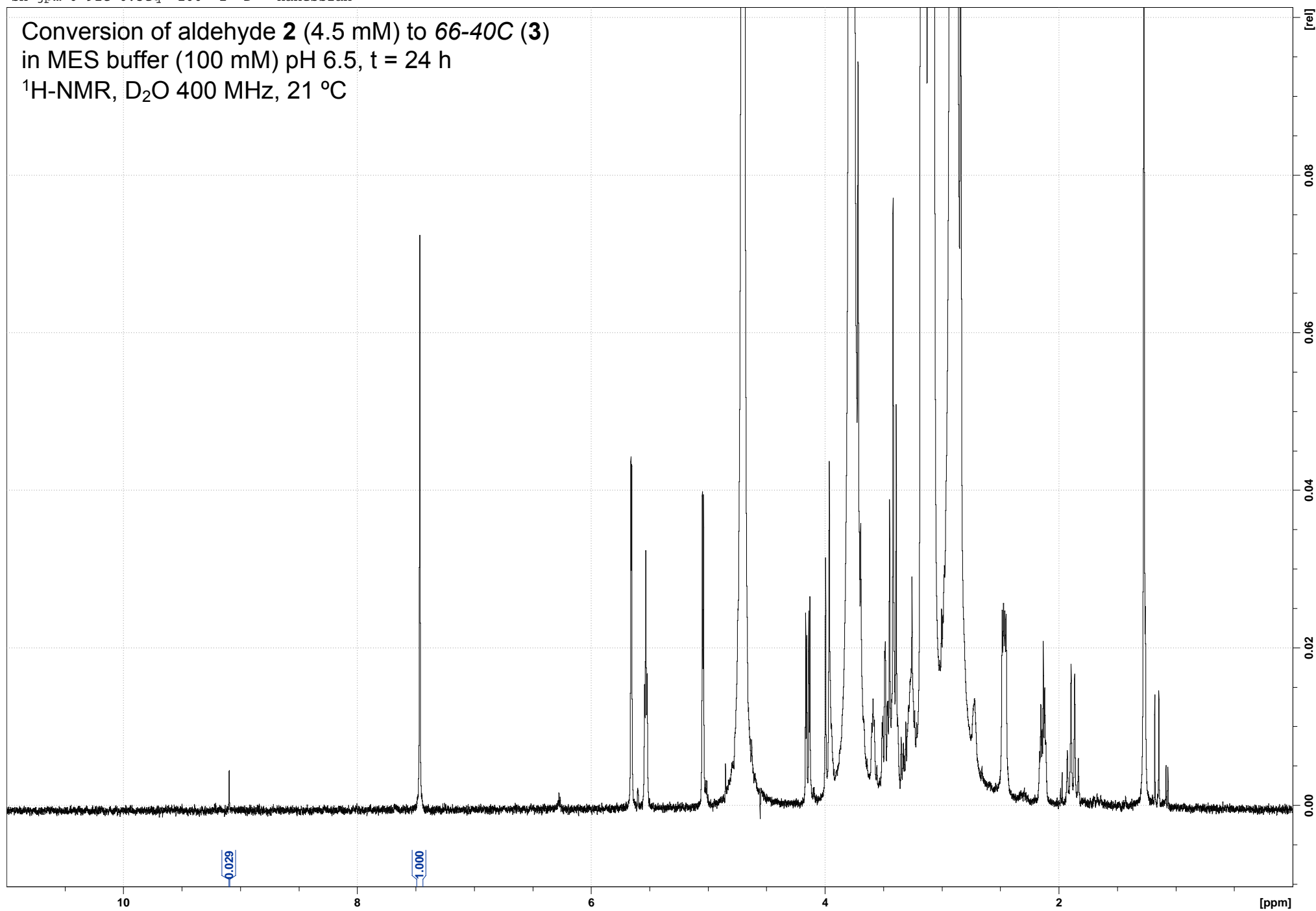
sh-jpm-6-91C-0.5eq 50 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 490 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



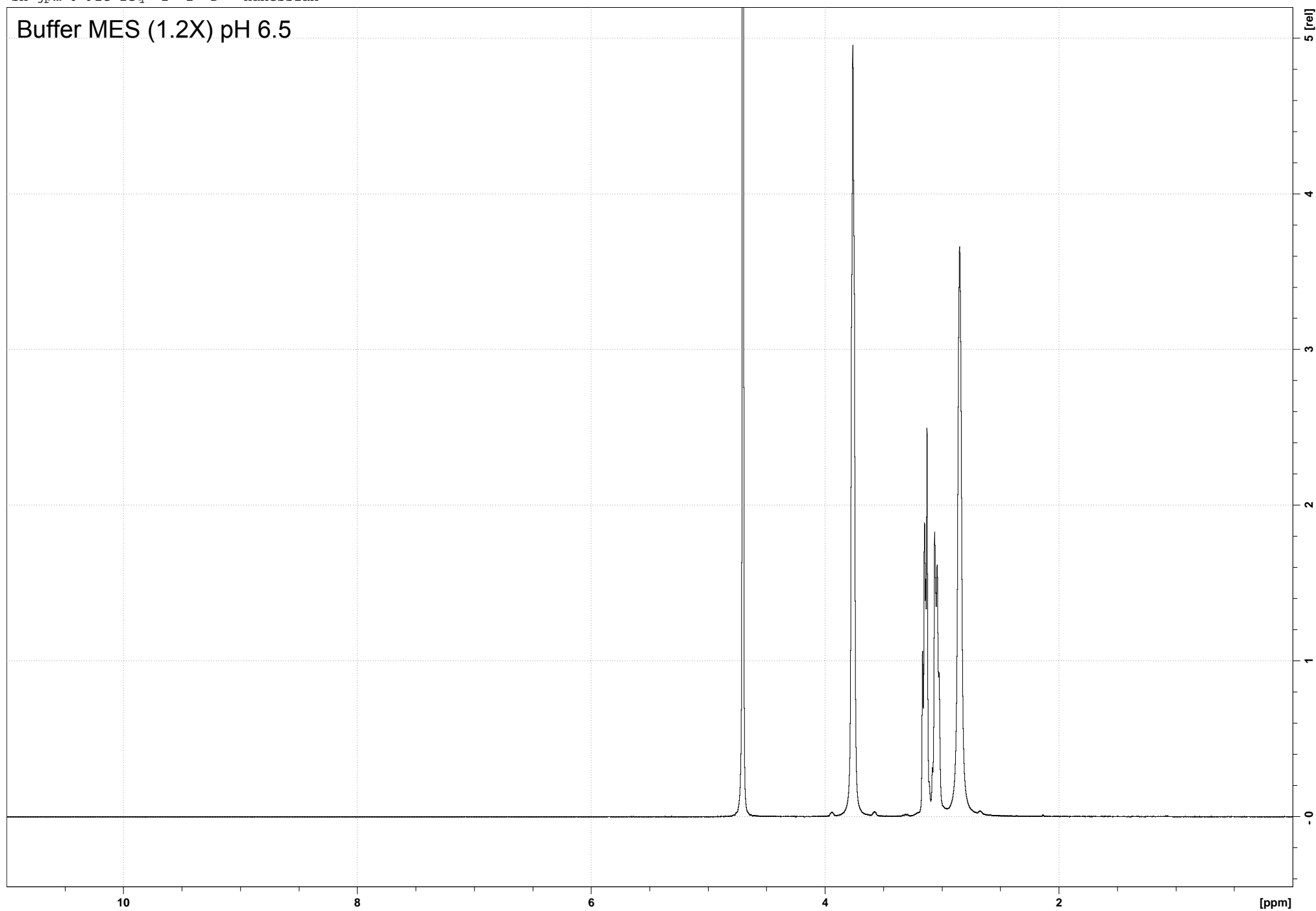
sh-jpm-6-91C-0.5eq 100 1 D: Hanessian

Conversion of aldehyde **2** (4.5 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 24 h  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



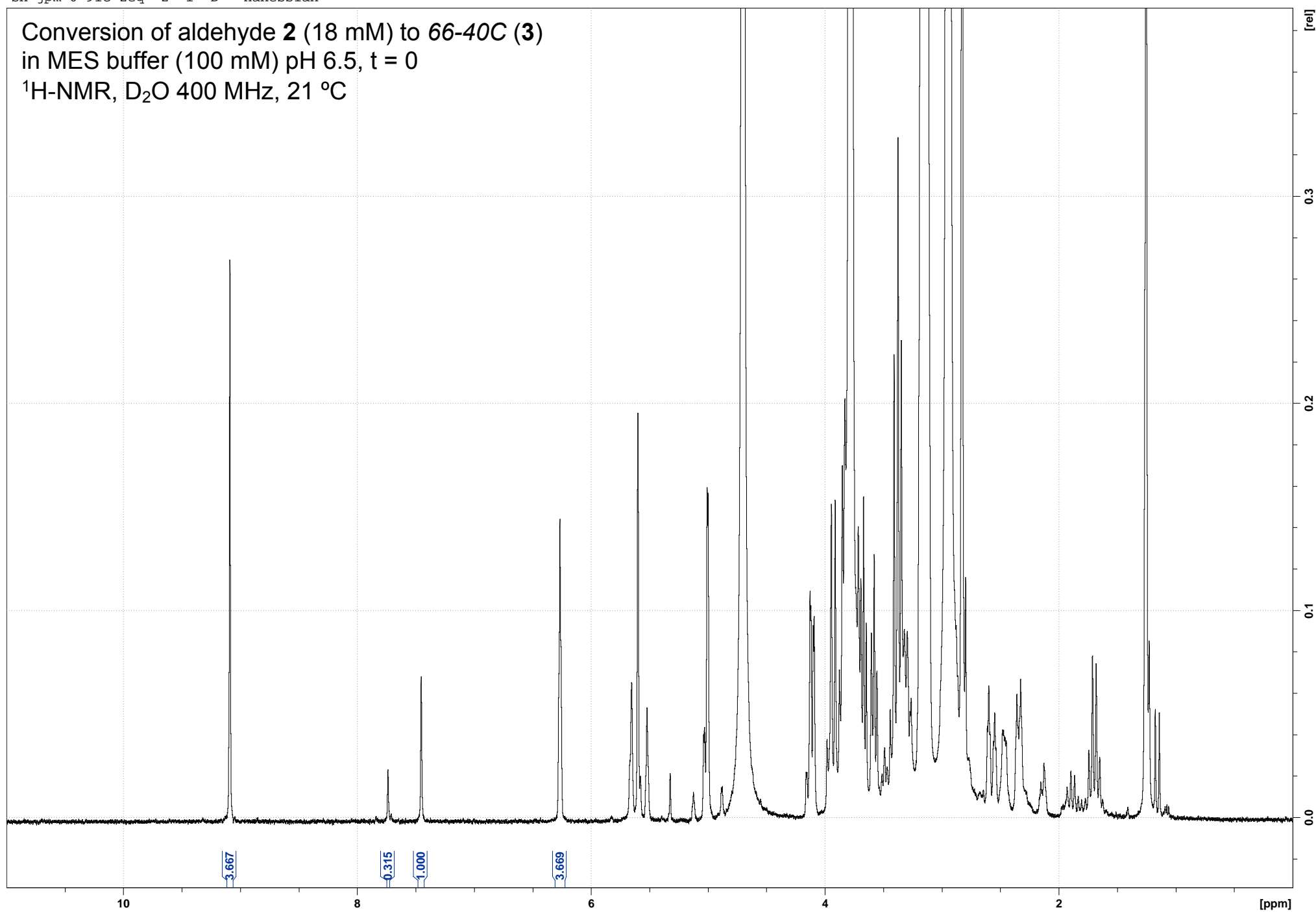
sh-jpm-6-91C-2eq 1 1 D: Hanessian

Buffer MES (1.2X) pH 6.5



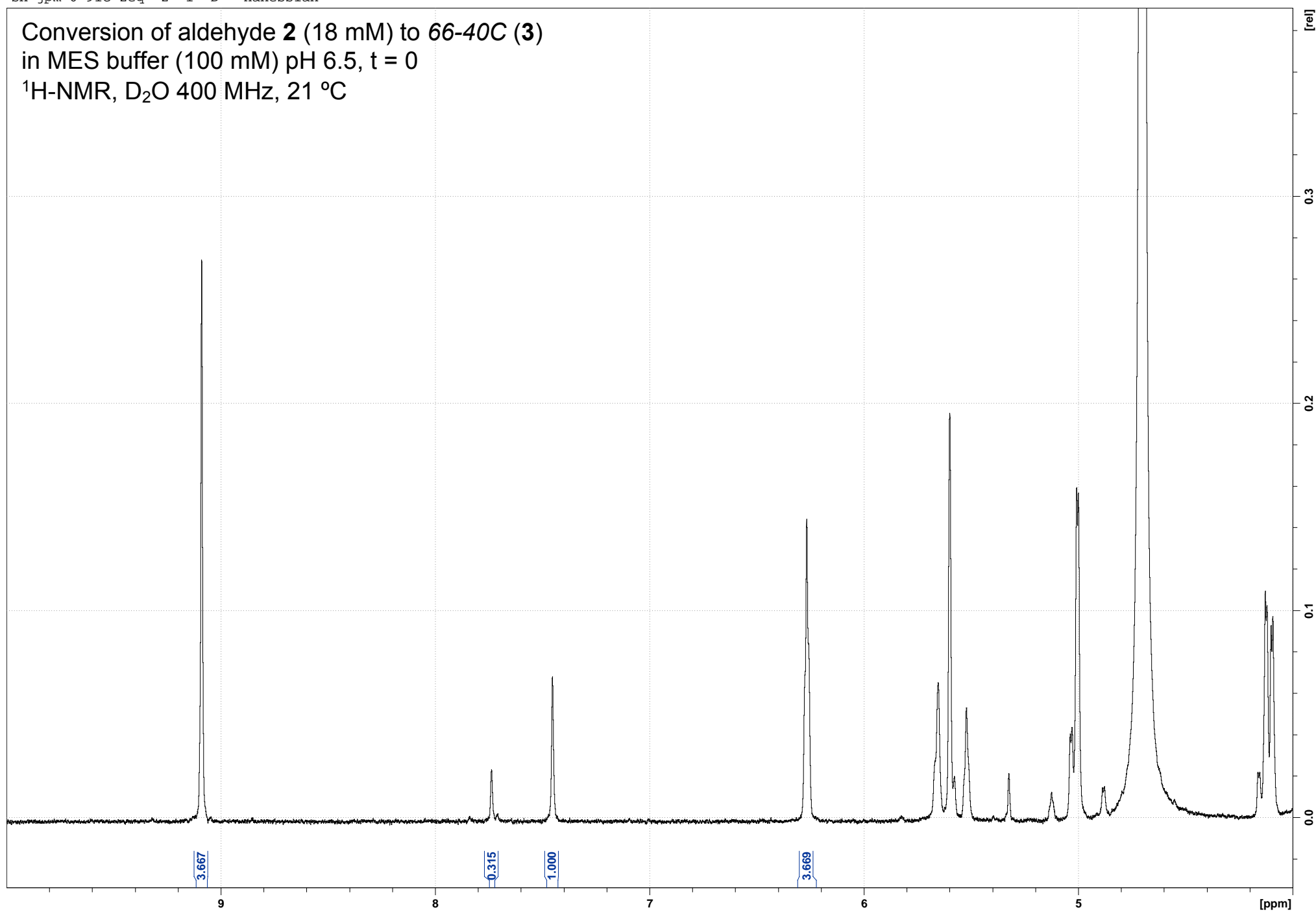
sh-jpm-6-91C-2eq 2 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



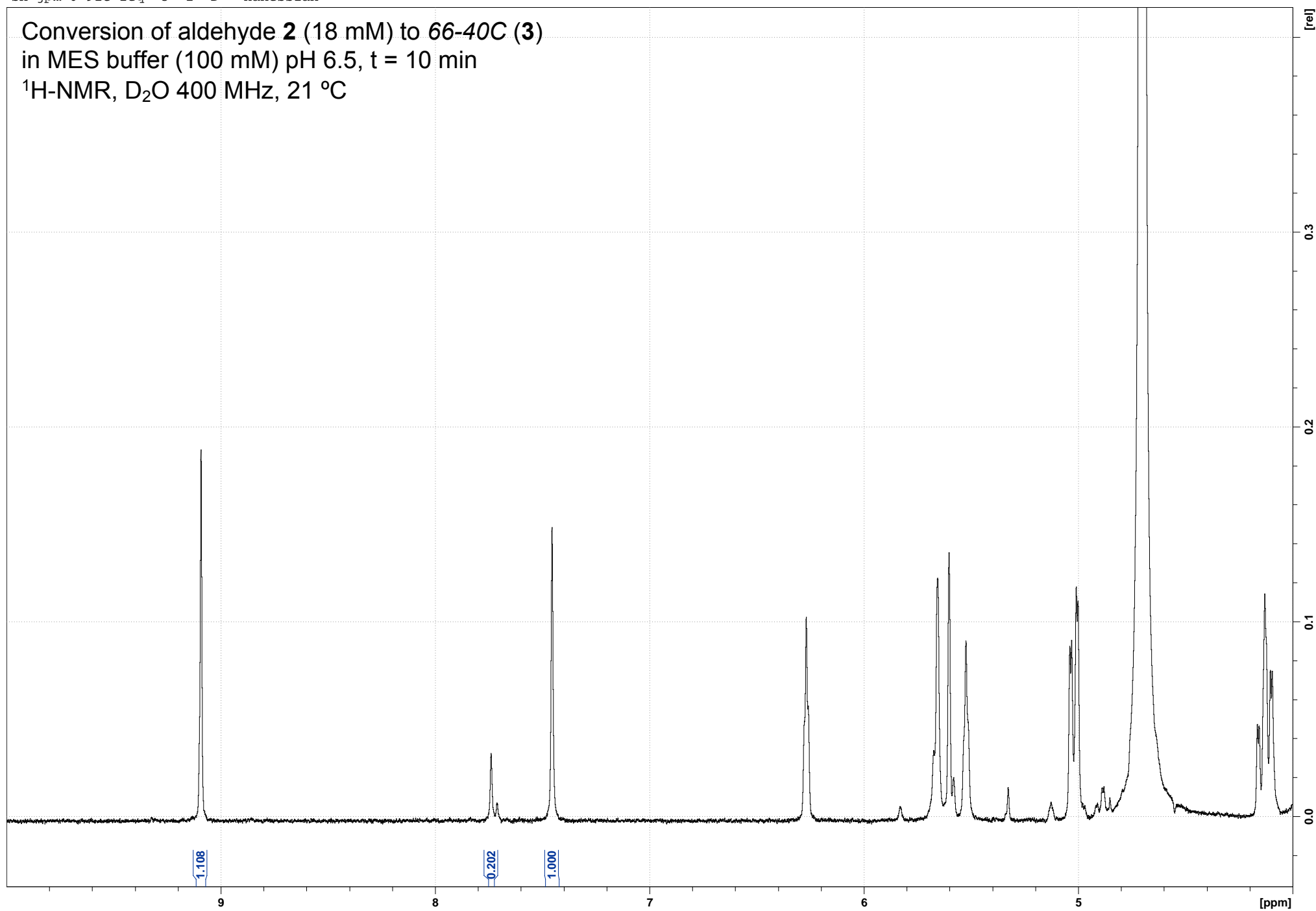
sh-jpm-6-91C-2eq 2 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 0  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



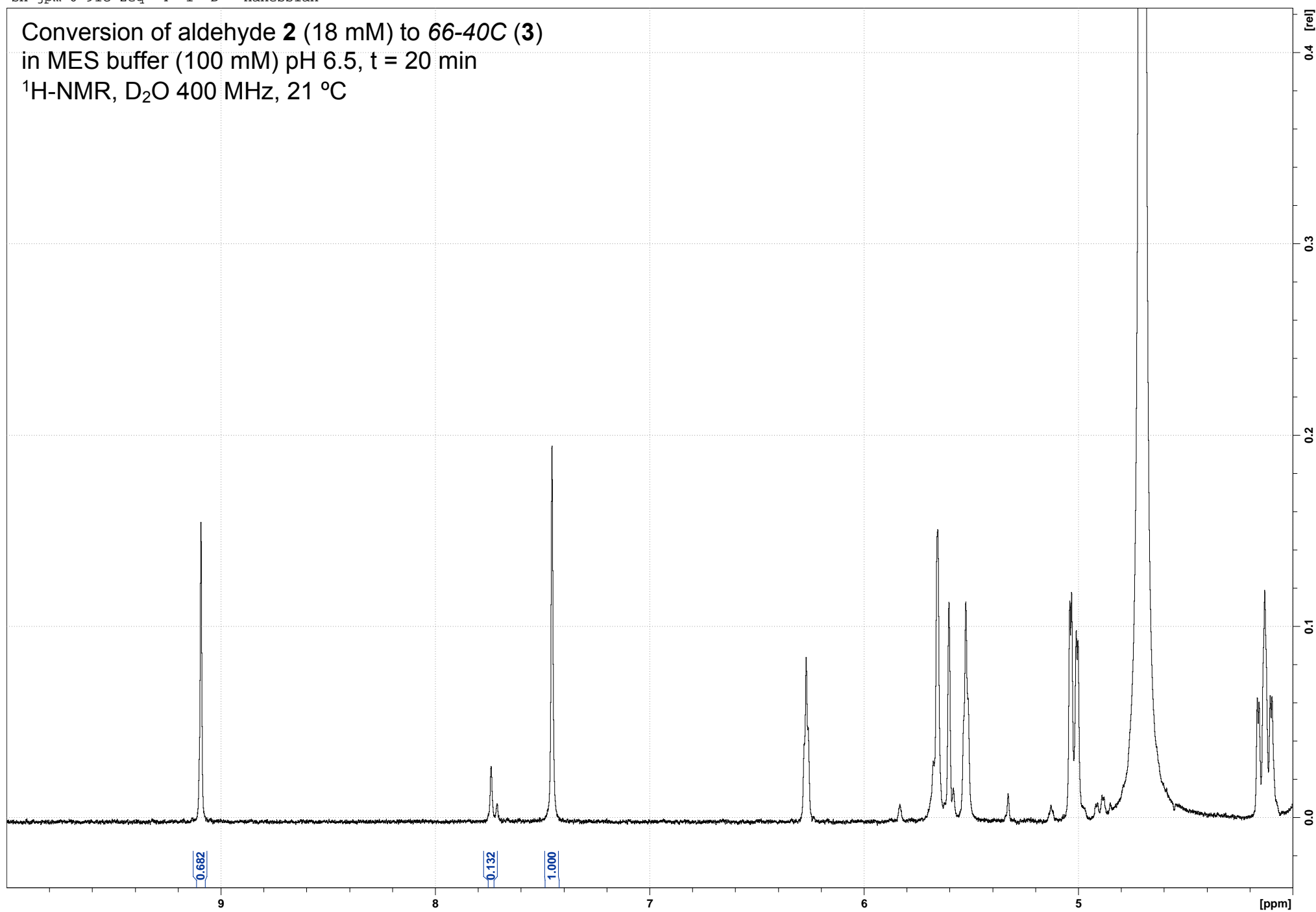
sh-jpm-6-91C-2eq 3 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 10 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91C-2eq 4 1 D: Hanessian

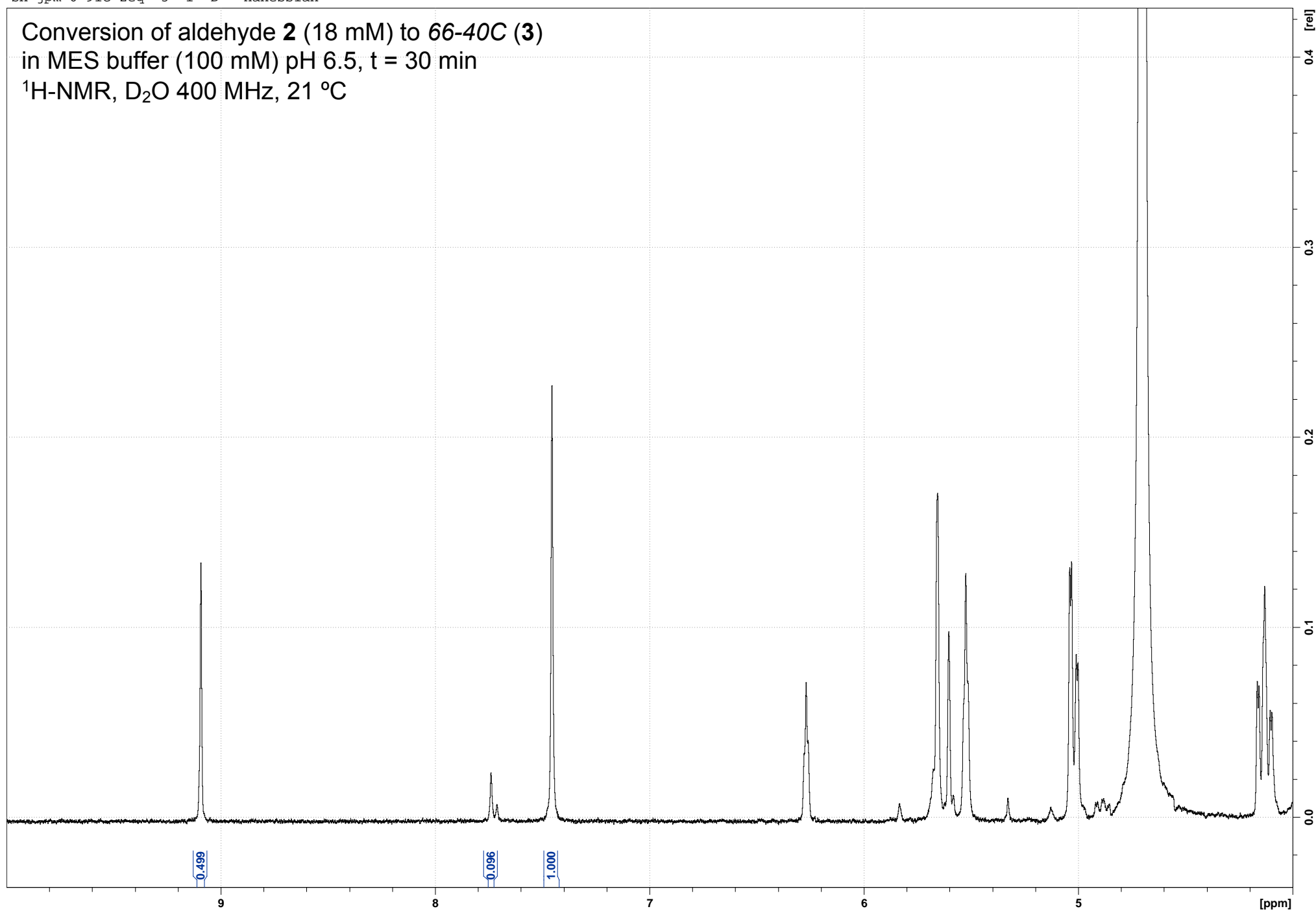
Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 20 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





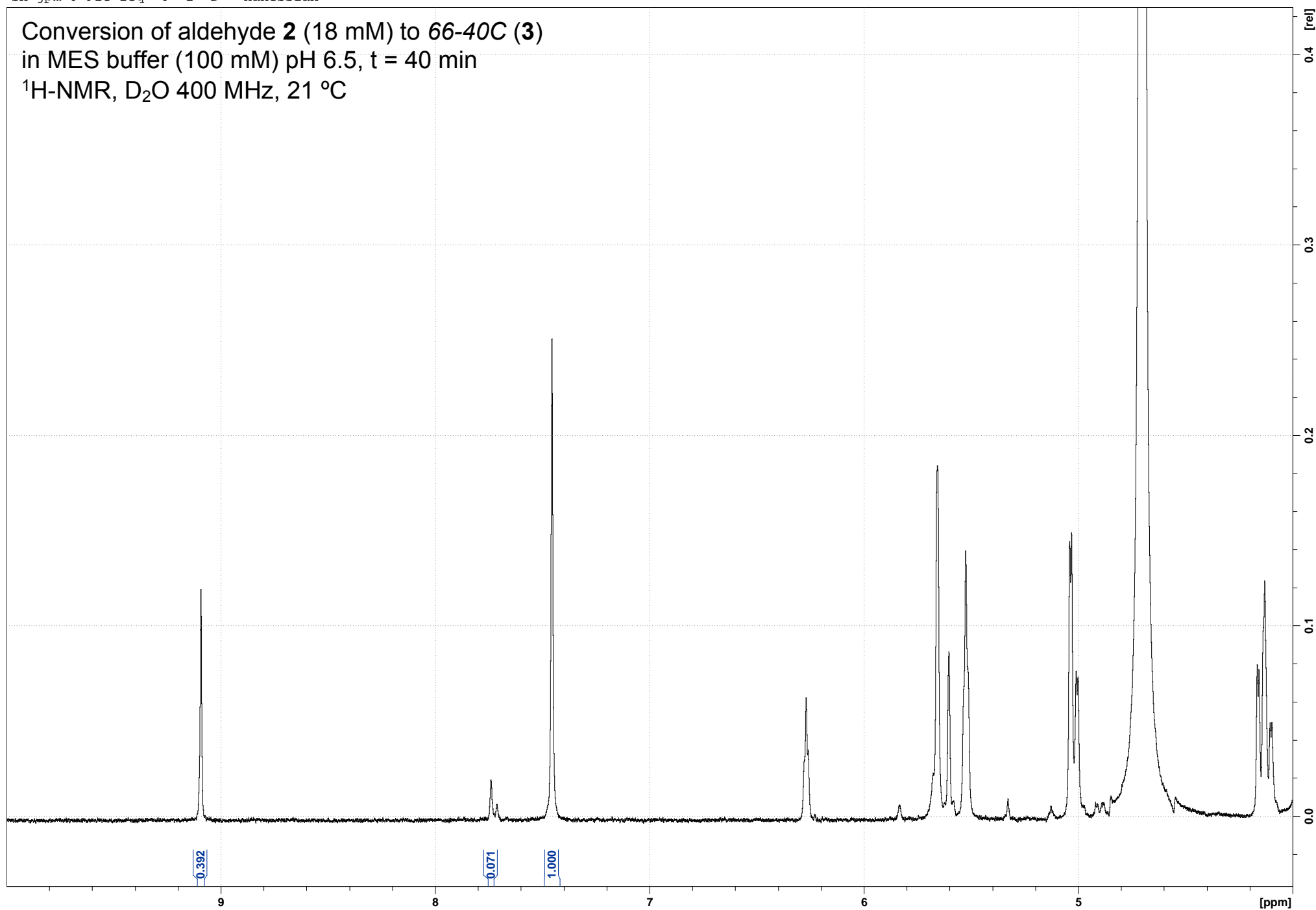
sh-jpm-6-91C-2eq 5 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 30 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



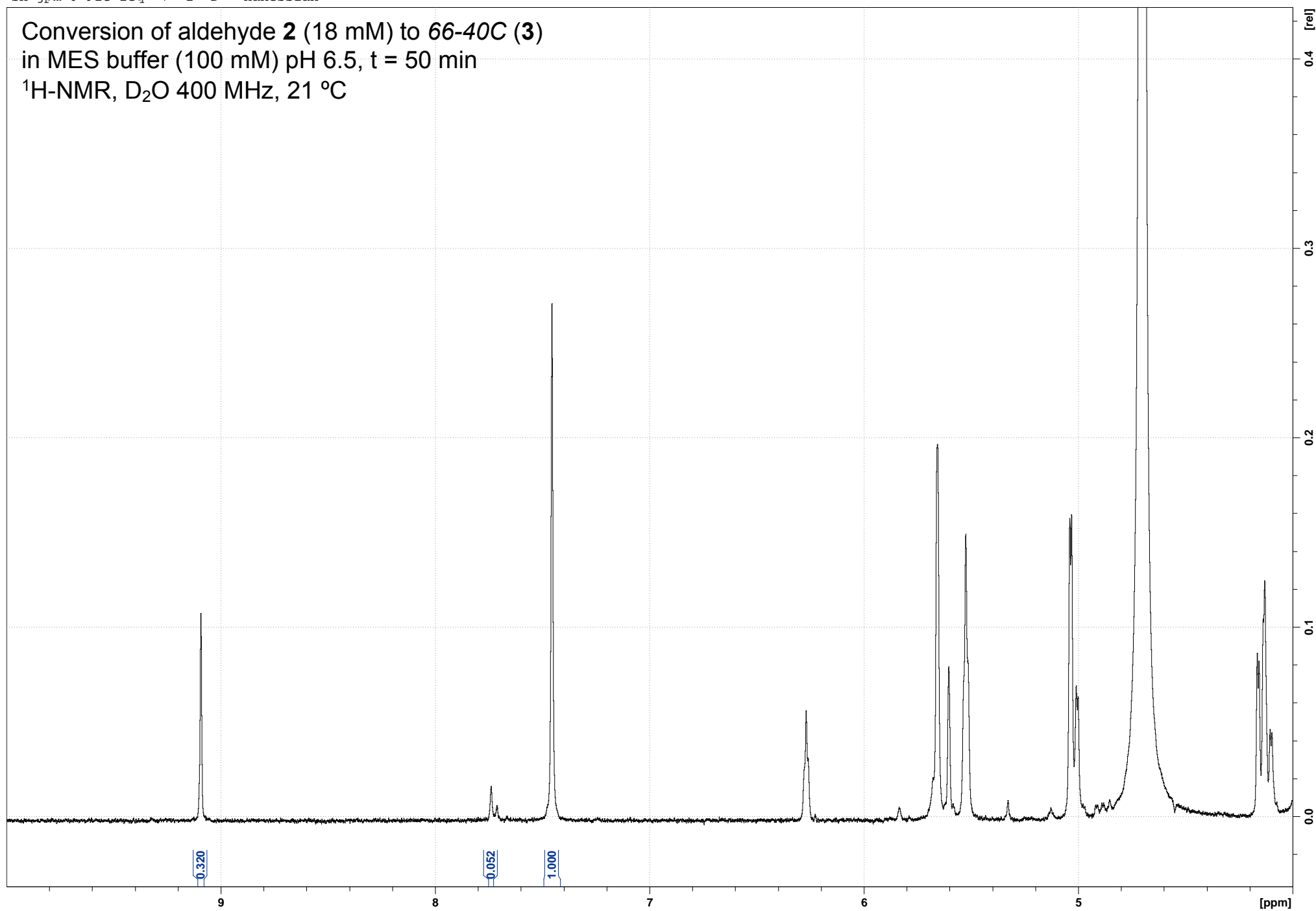
sh-jpm-6-91C-2eq 6 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 40 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



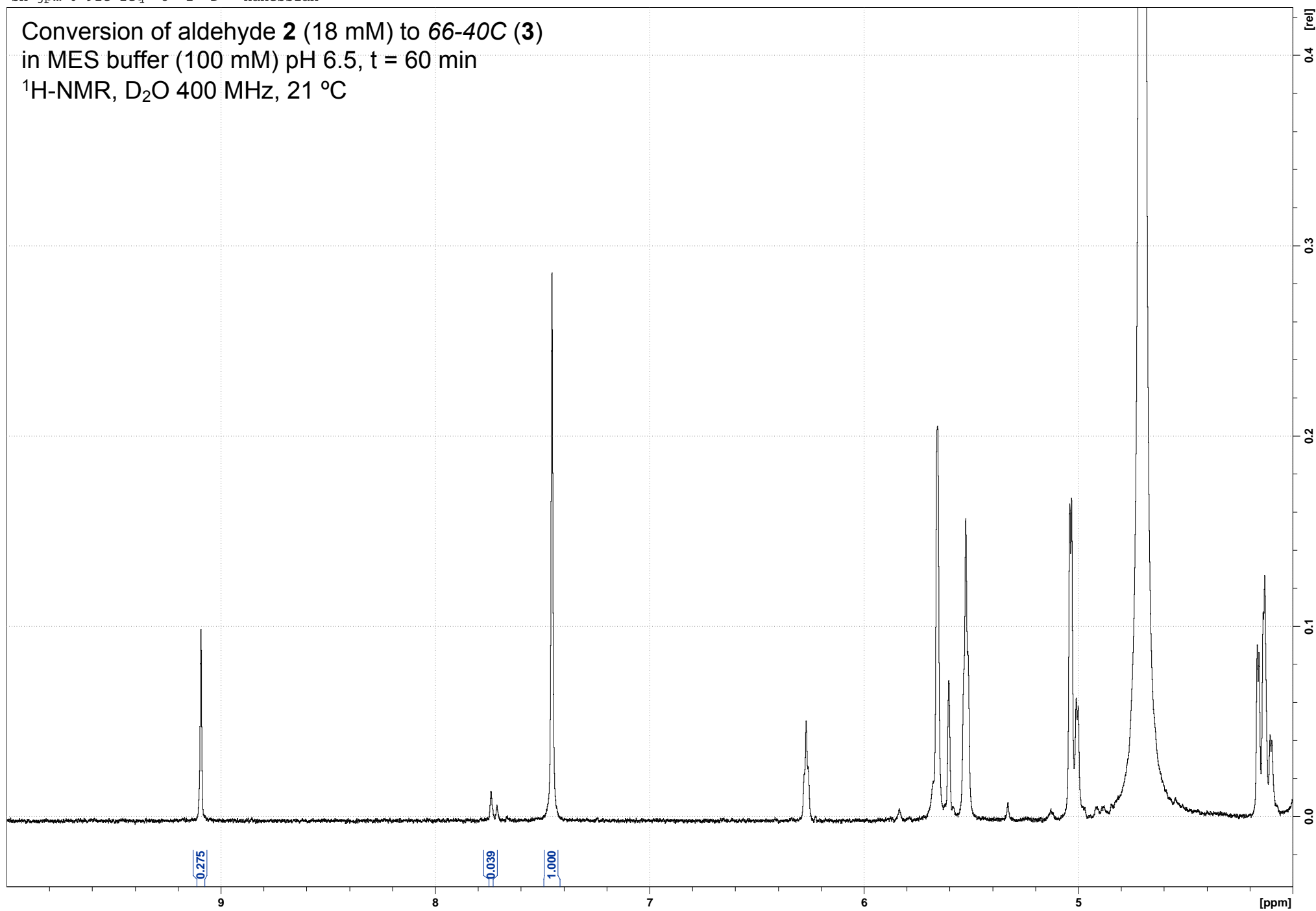
sh-jpm-6-91C-2eq 7 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 50 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



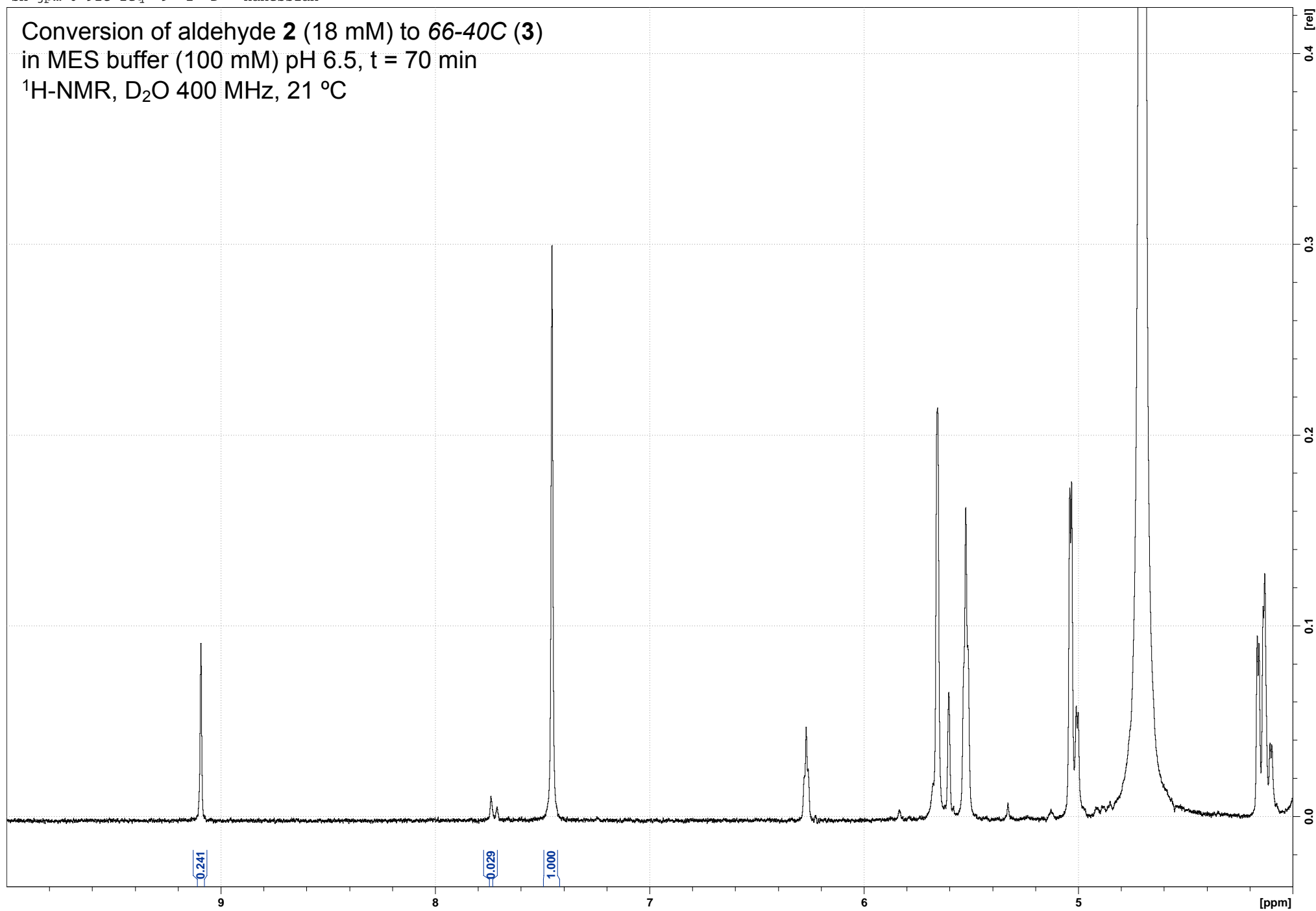
sh-jpm-6-91C-2eq 8 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 60 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



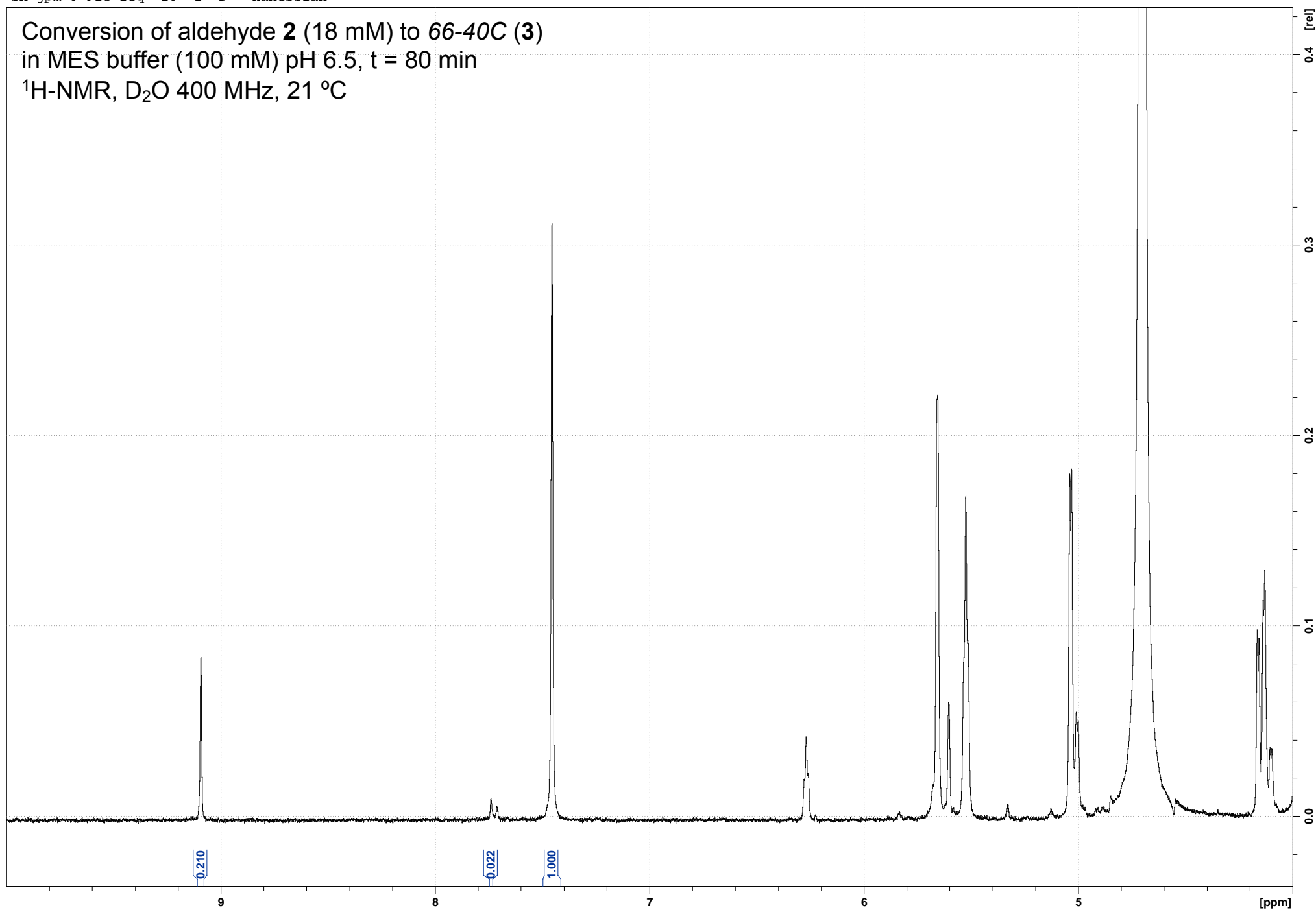
sh-jpm-6-91C-2eq 9 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 70 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



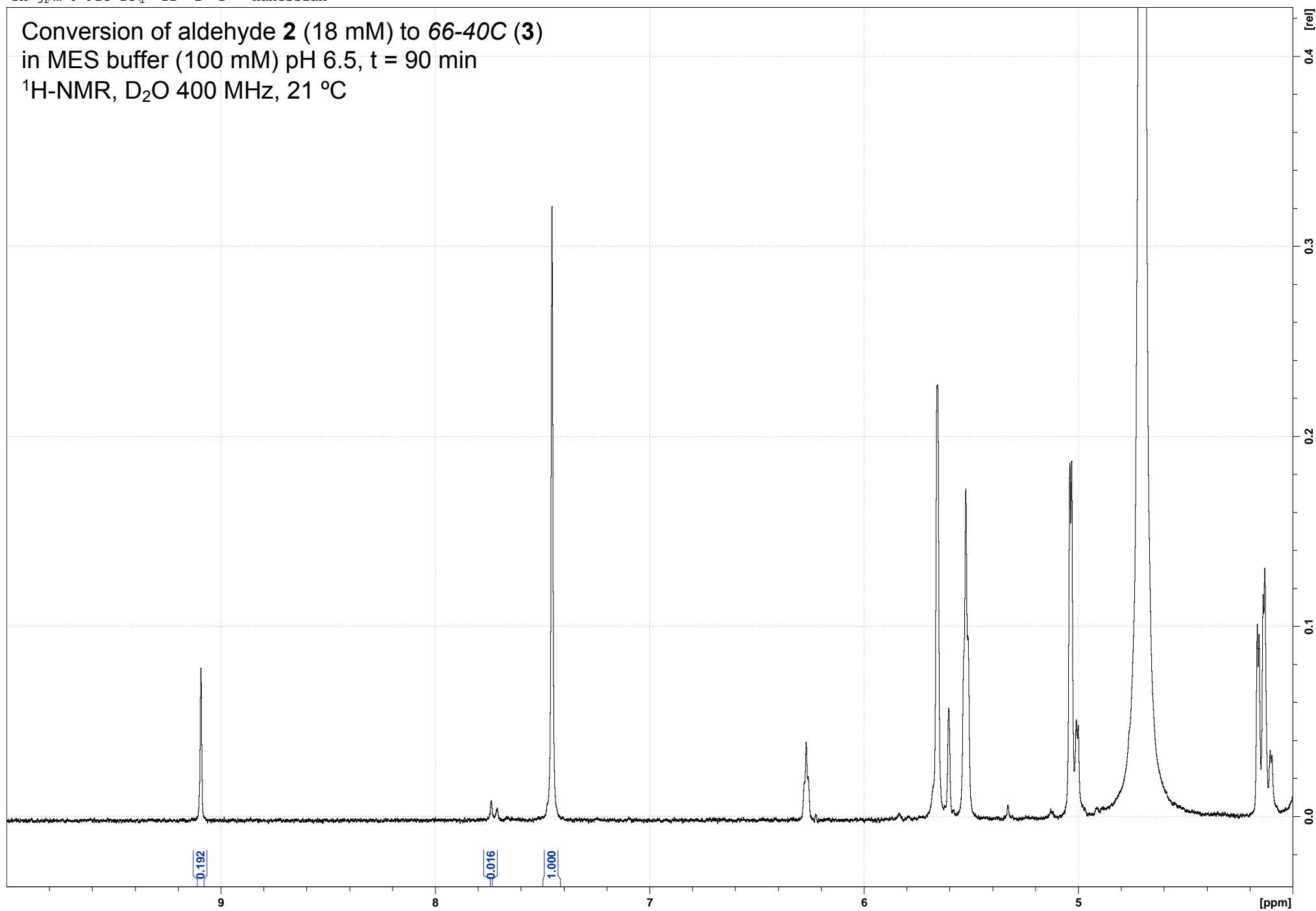
sh-jpm-6-91C-2eq 10 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 80 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



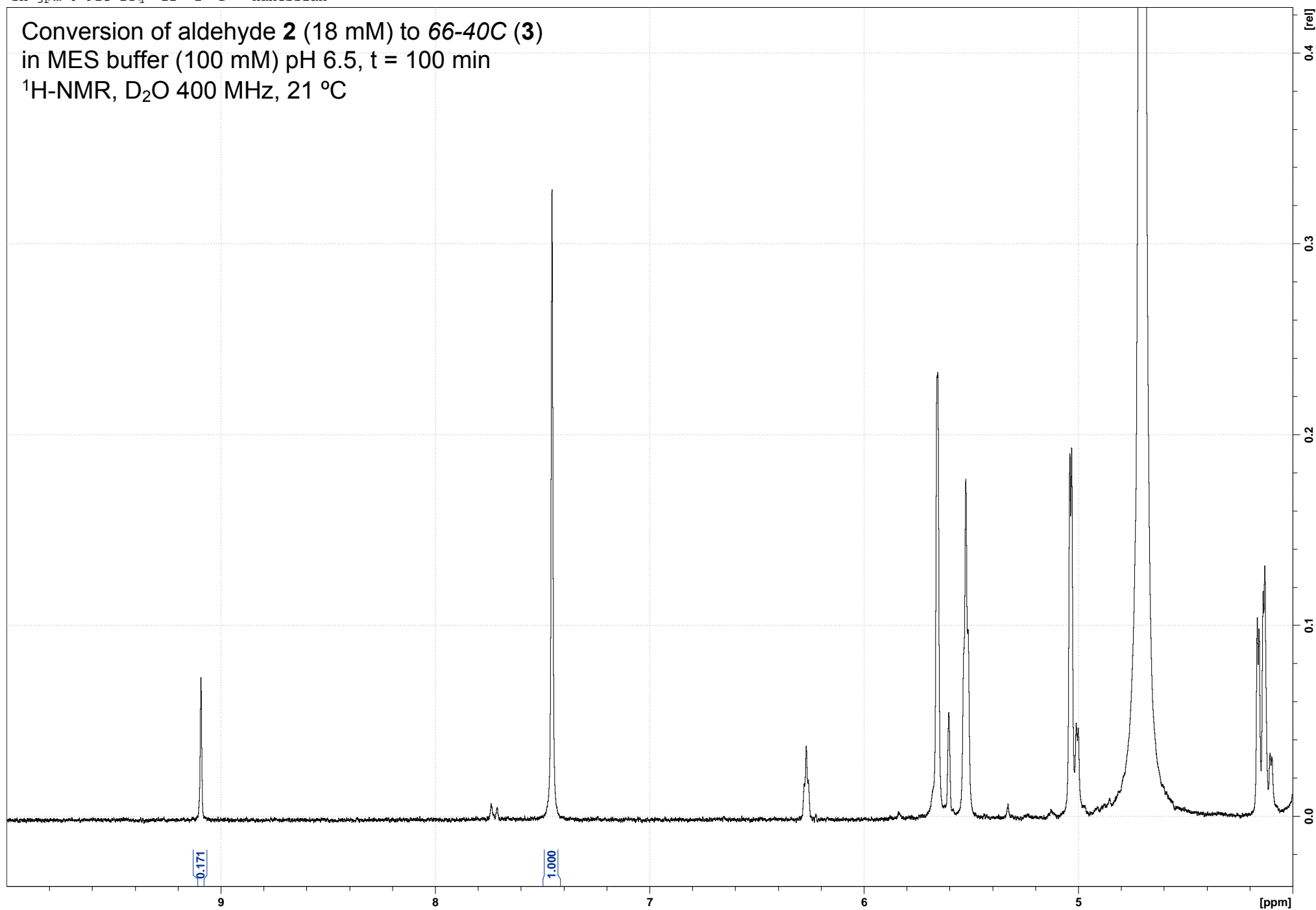
sh-jpm-6-91C-2eq 11 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 90 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91C-2eq 12 1 D: Hanessian

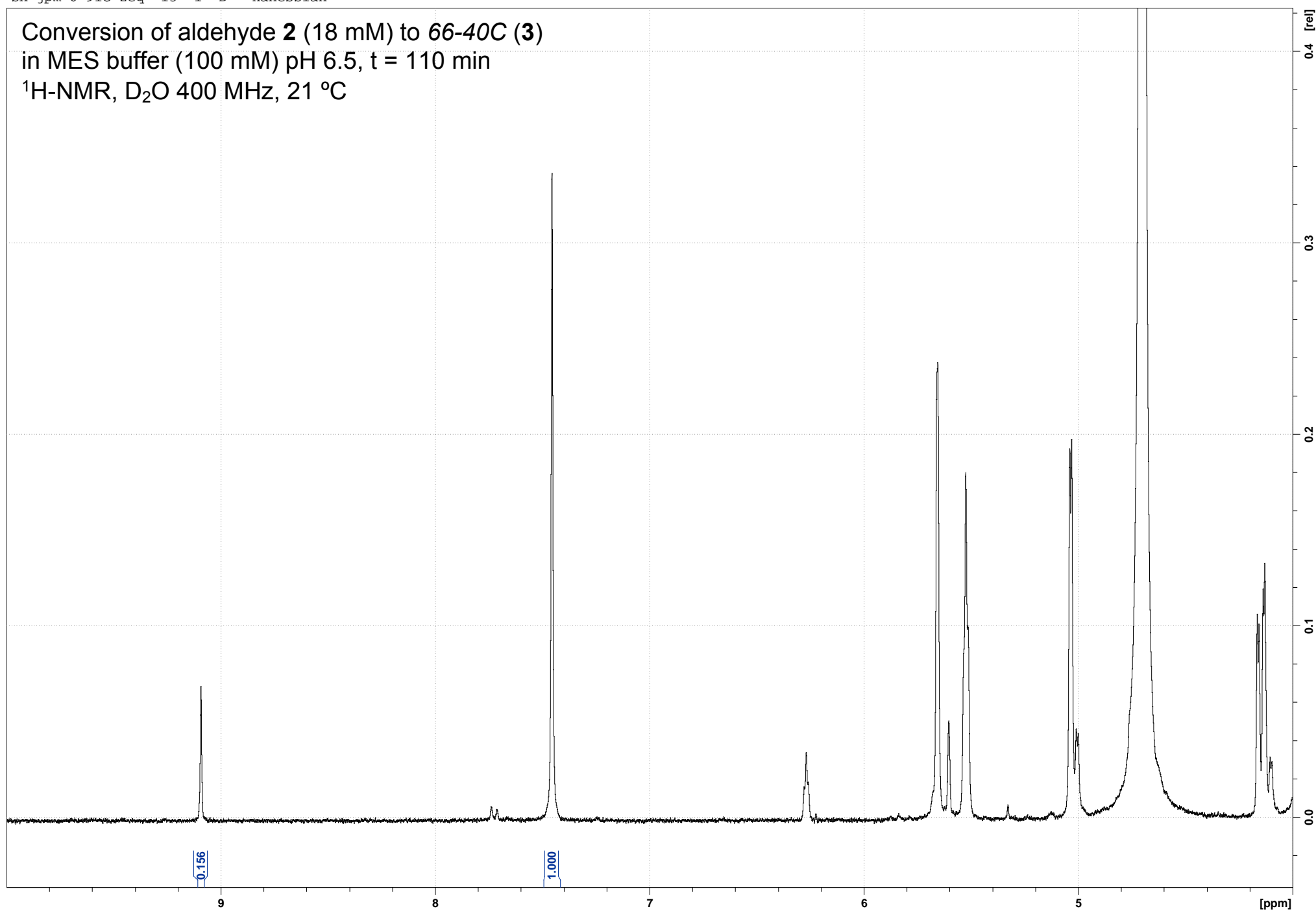
Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 100 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





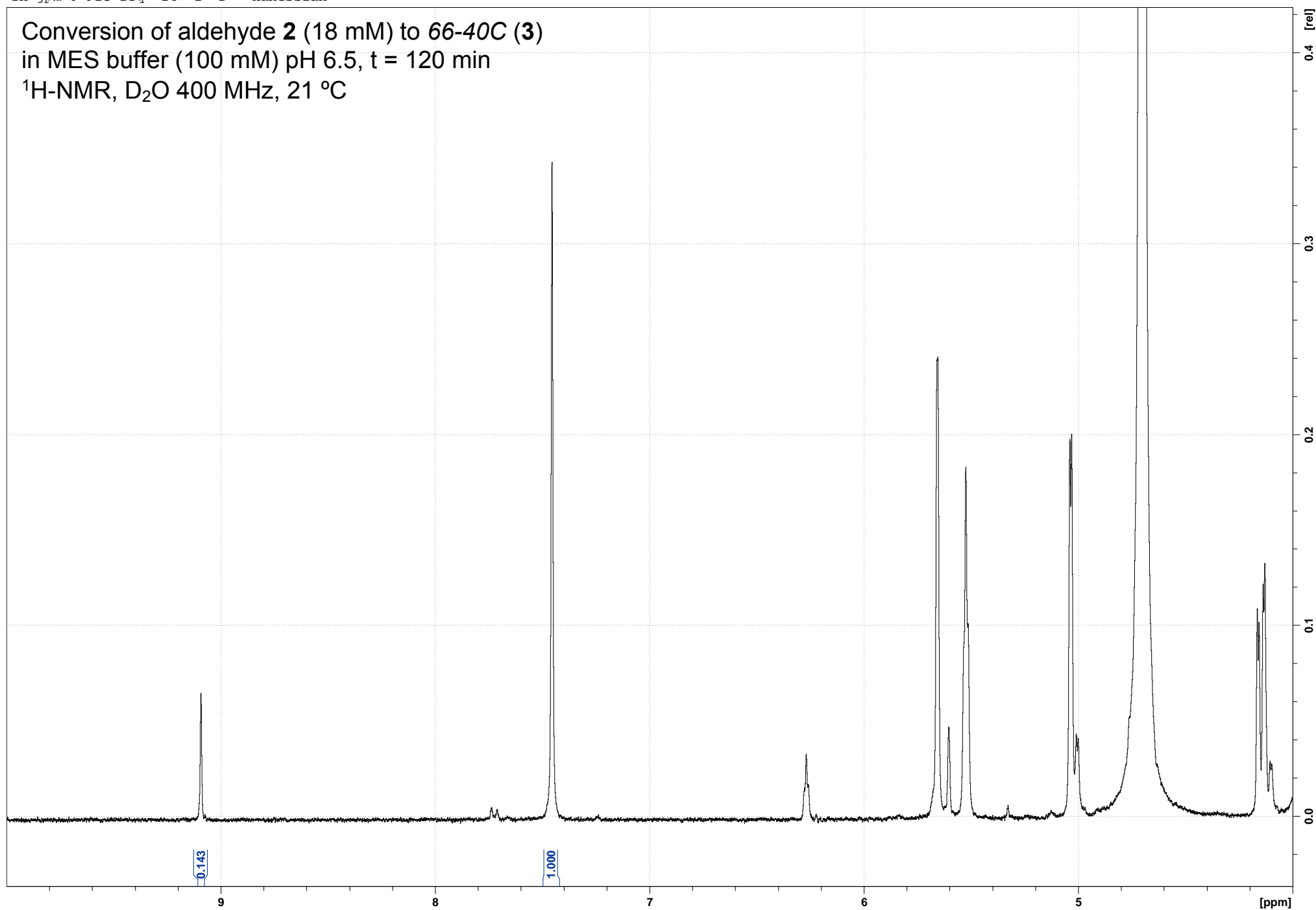
sh-jpm-6-91C-2eq 13 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 110 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



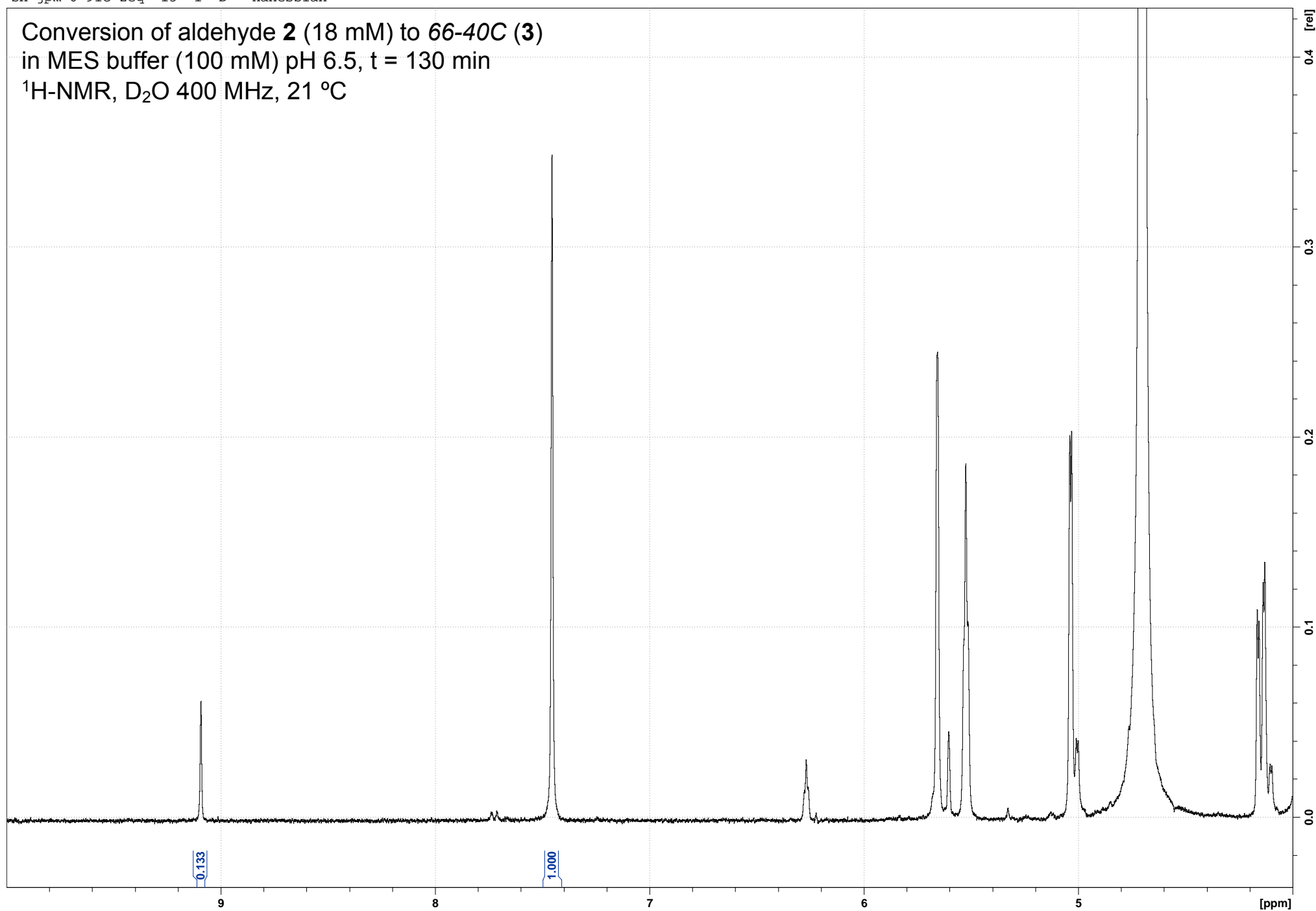
sh-jpm-6-91C-2eq 14 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 120 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



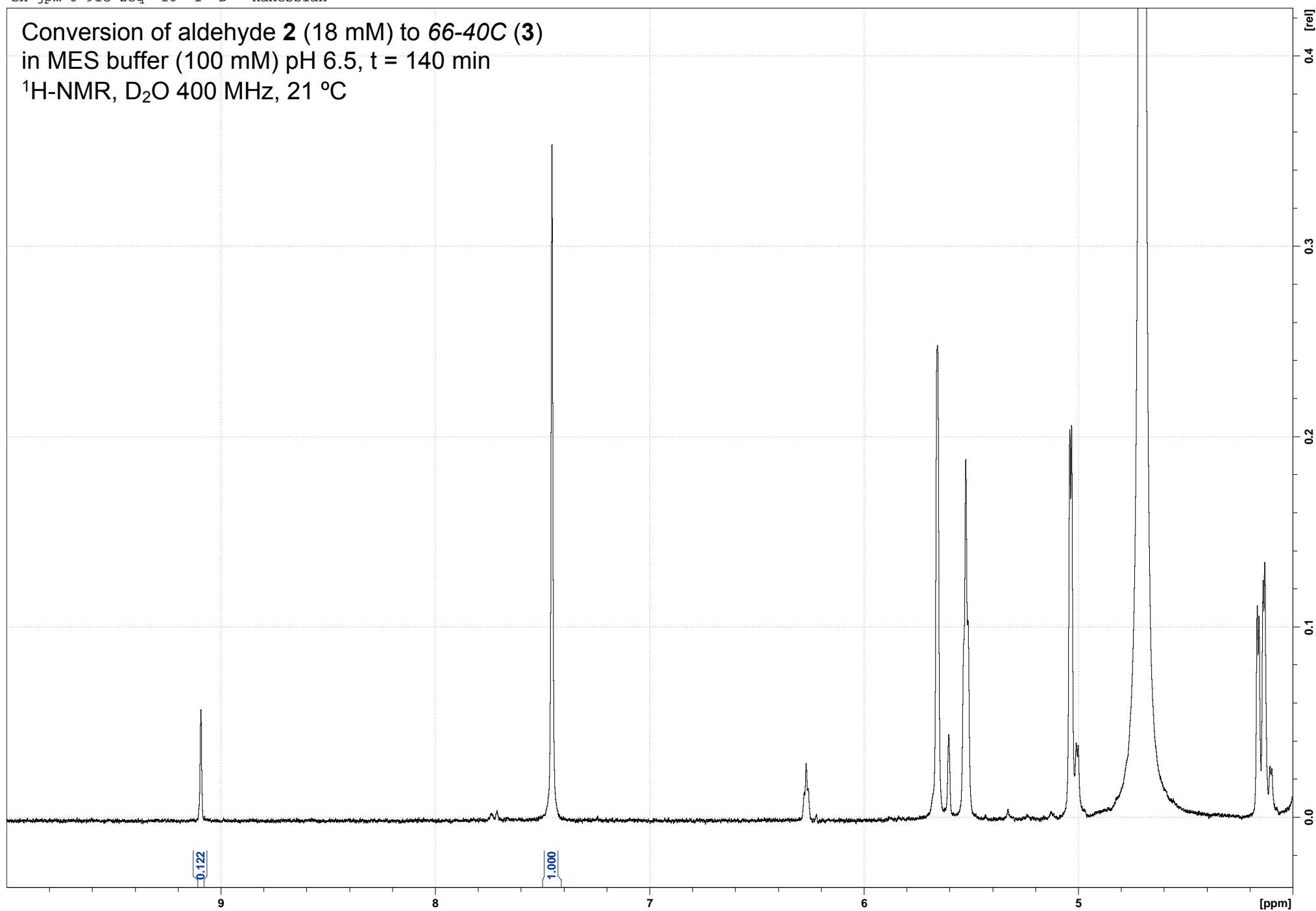
sh-jpm-6-91C-2eq 15 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 130 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



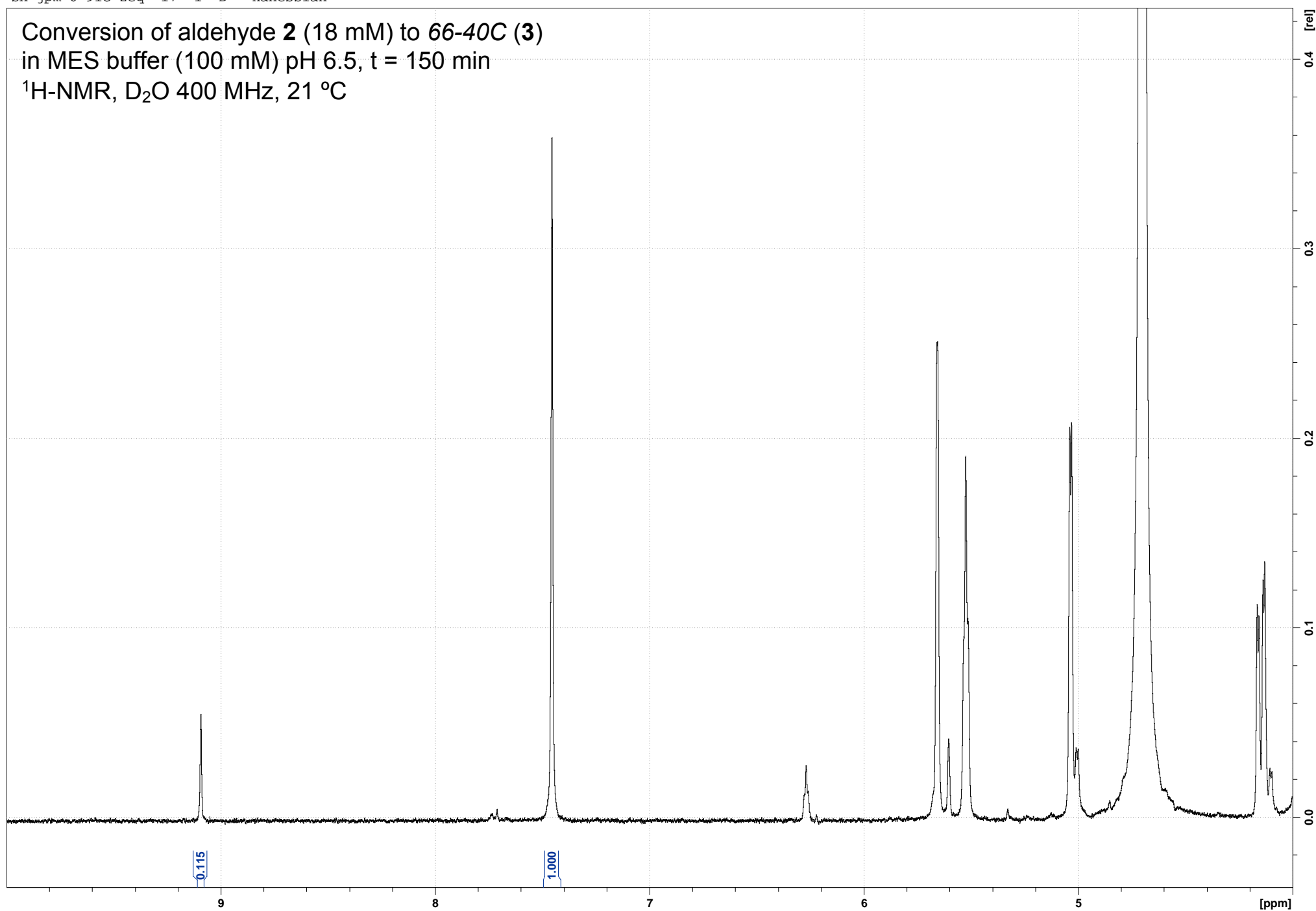
sh-jpm-6-91C-2eq 16 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 140 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



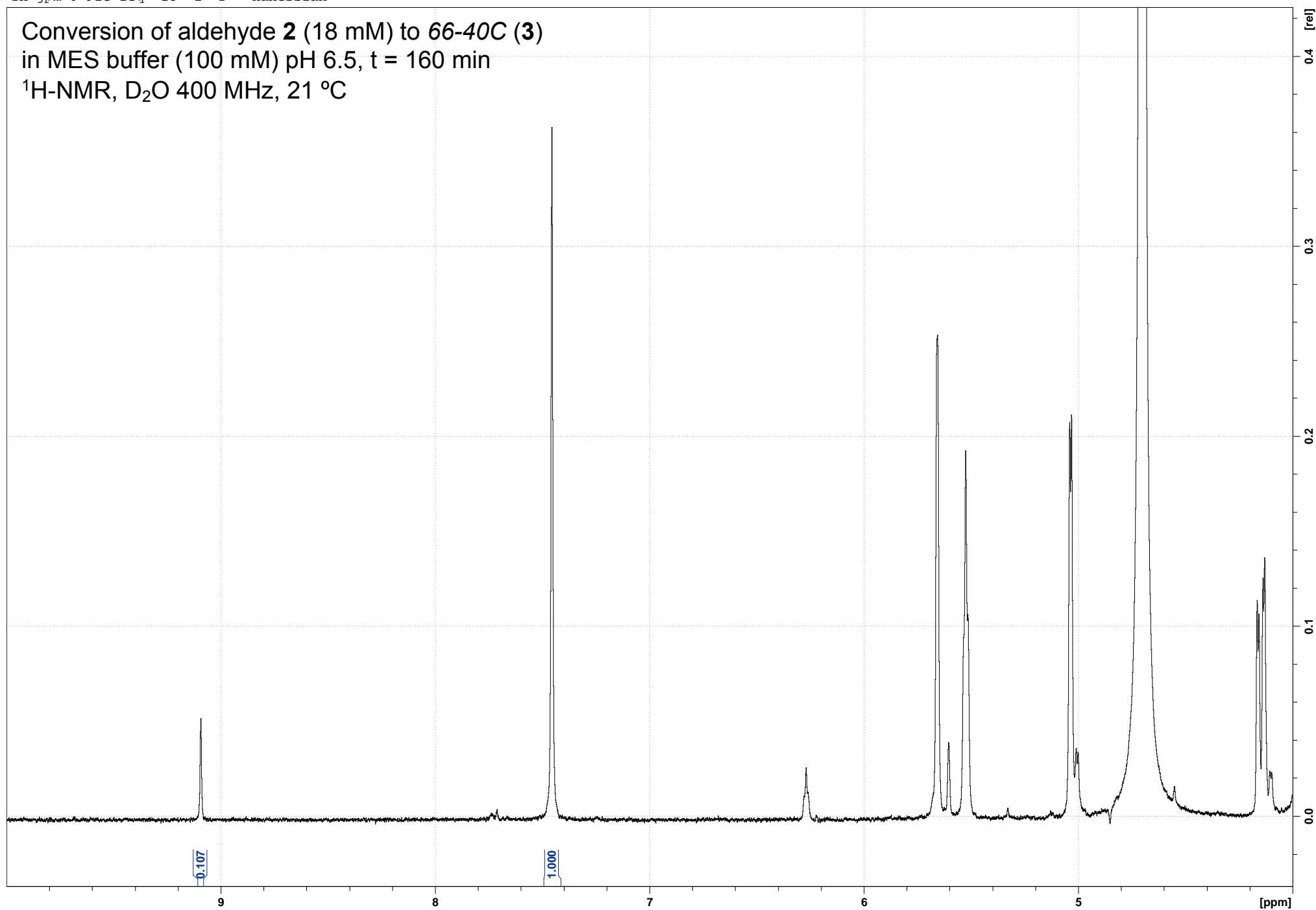
sh-jpm-6-91C-2eq 17 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 150 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



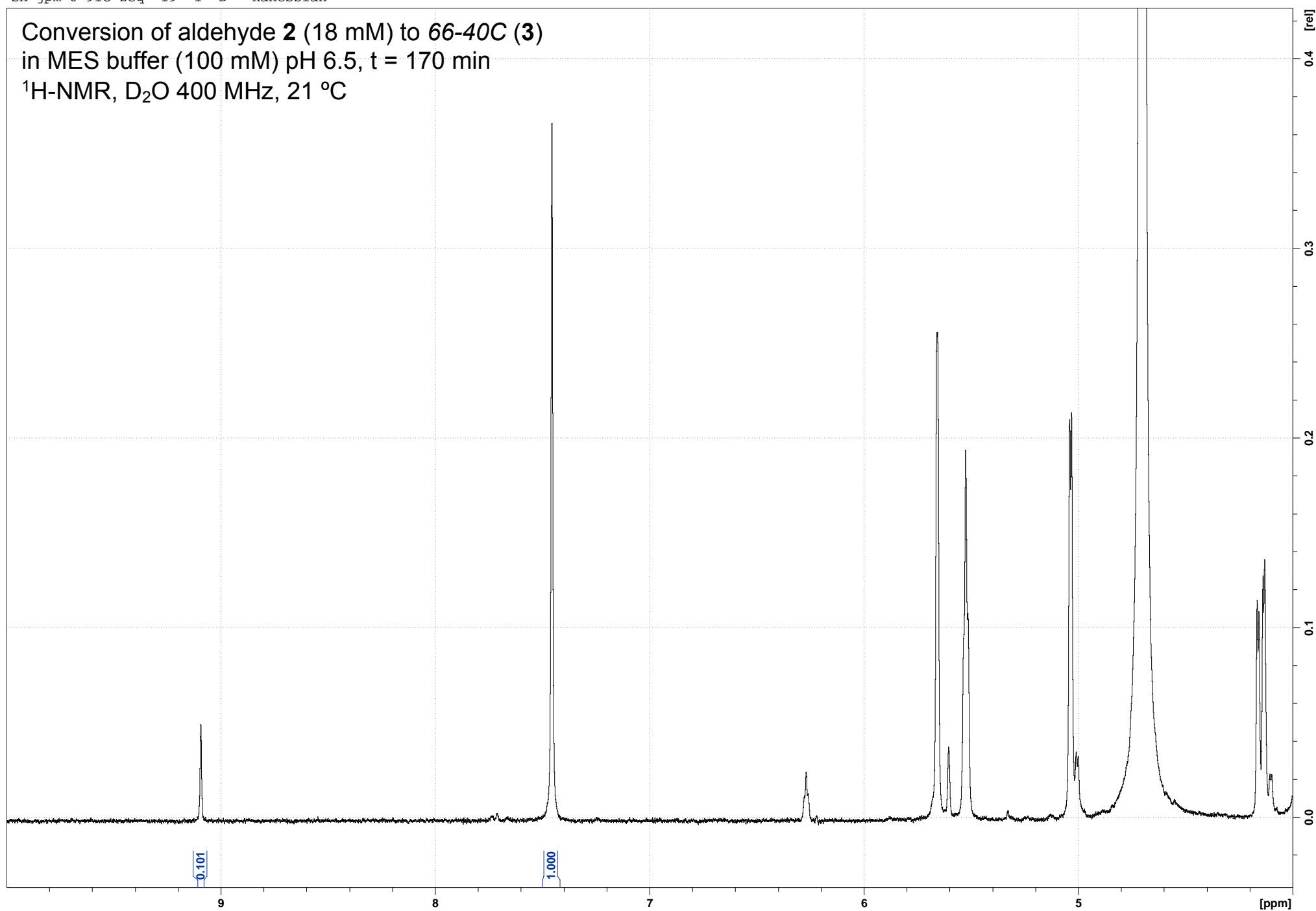
sh-jpm-6-91C-2eq 18 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 160 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



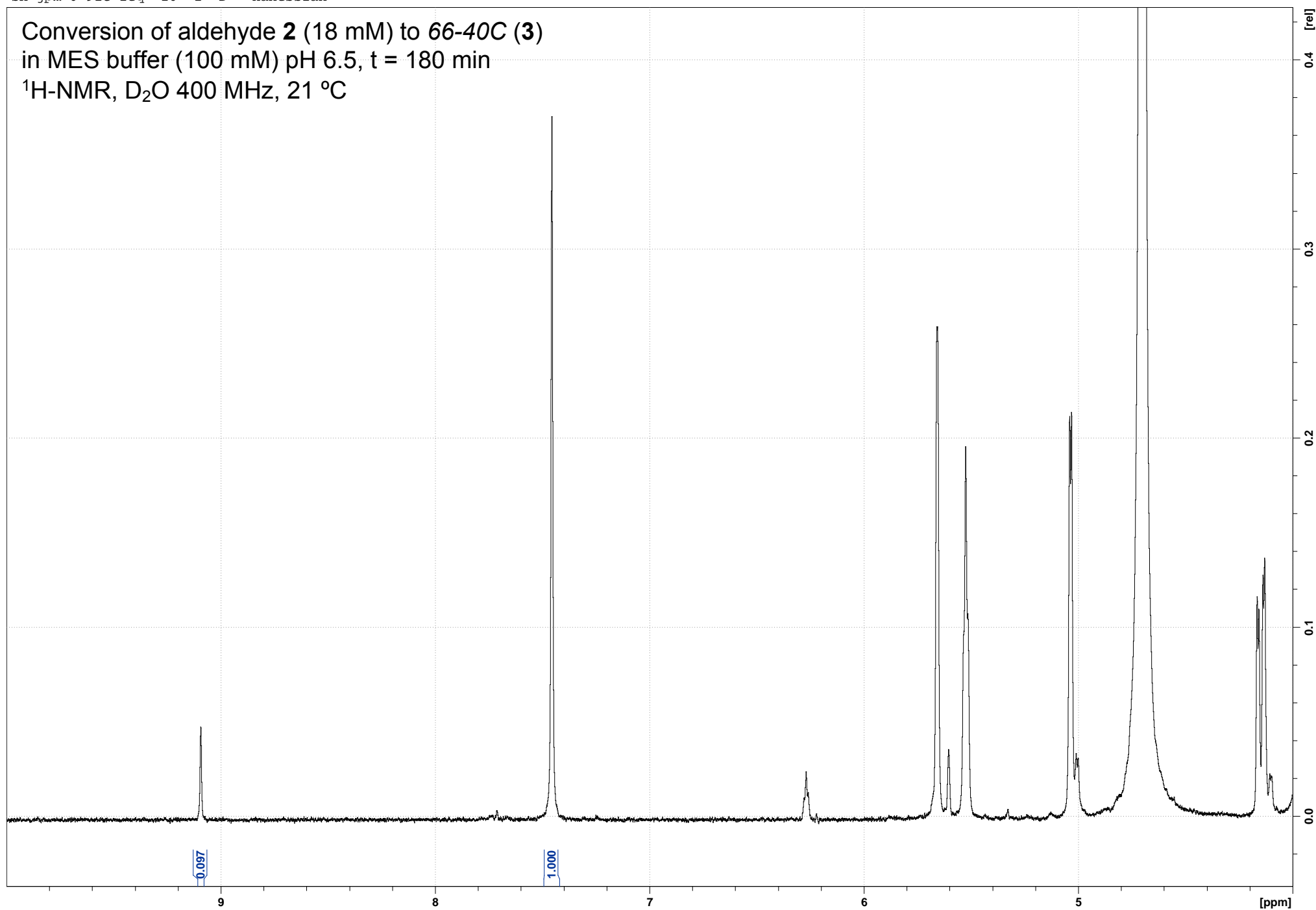
sh-jpm-6-91C-2eq 19 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 170 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91C-2eq 20 1 D: Hanessian

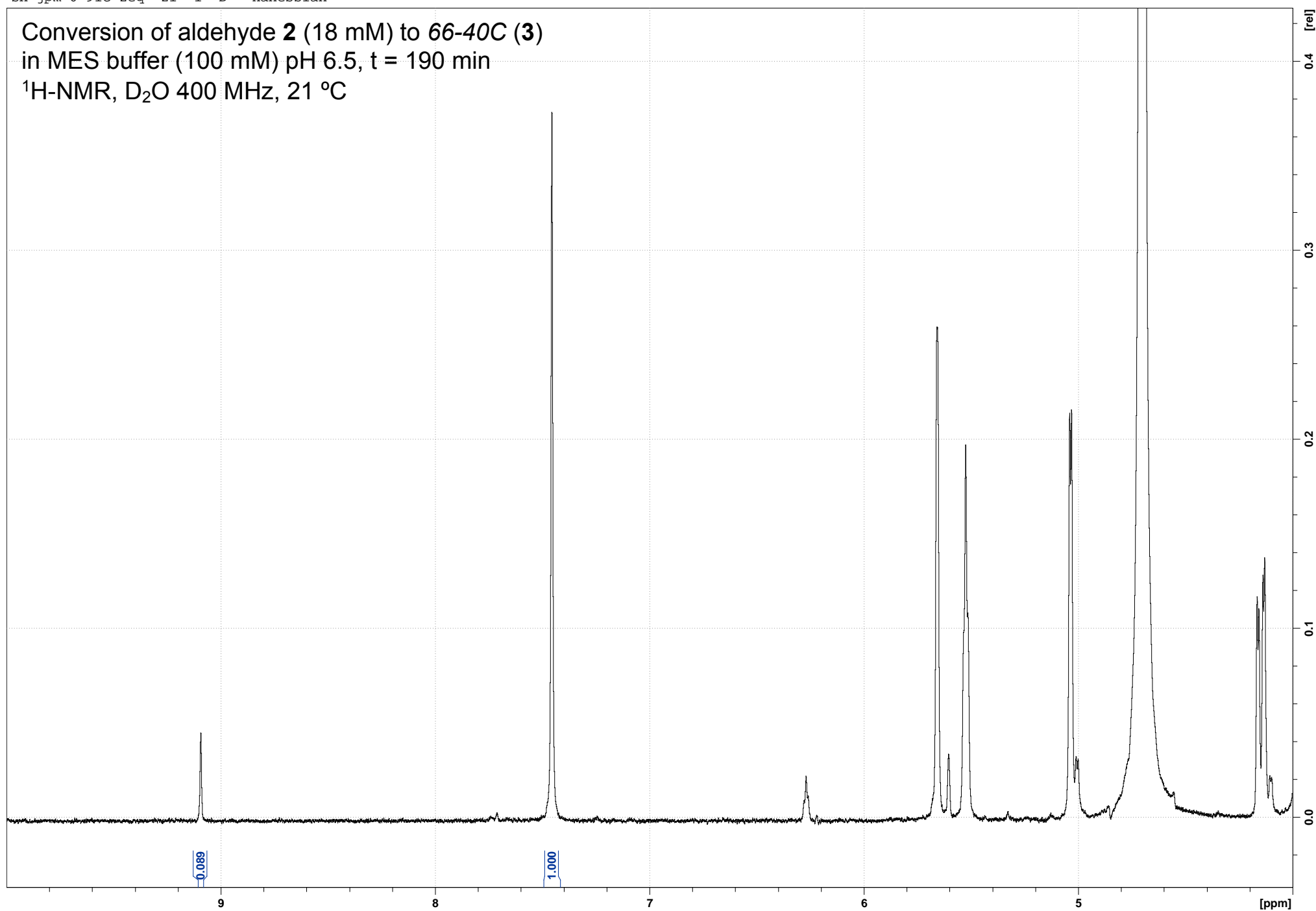
Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 180 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





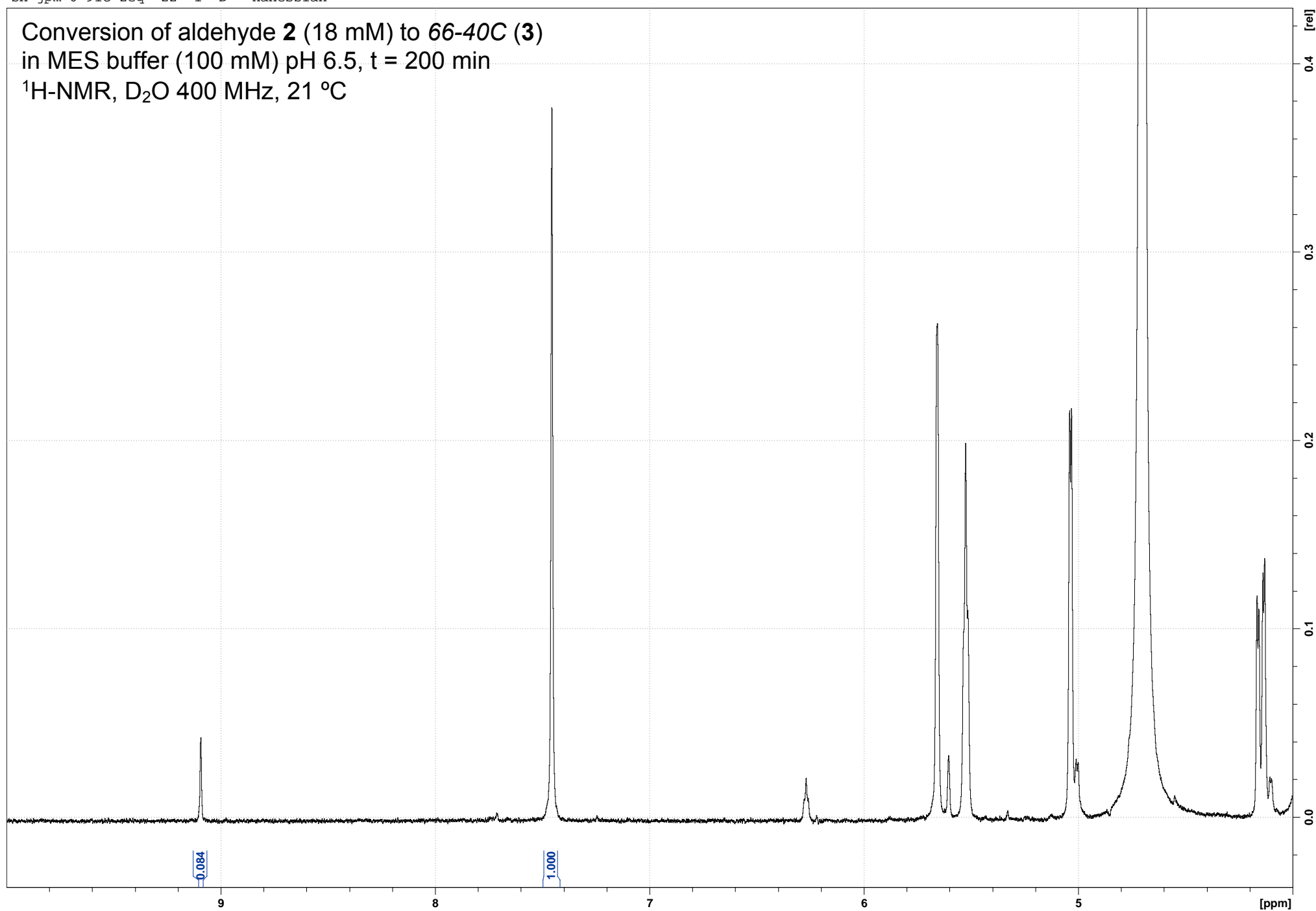
sh-jpm-6-91C-2eq 21 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 190 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



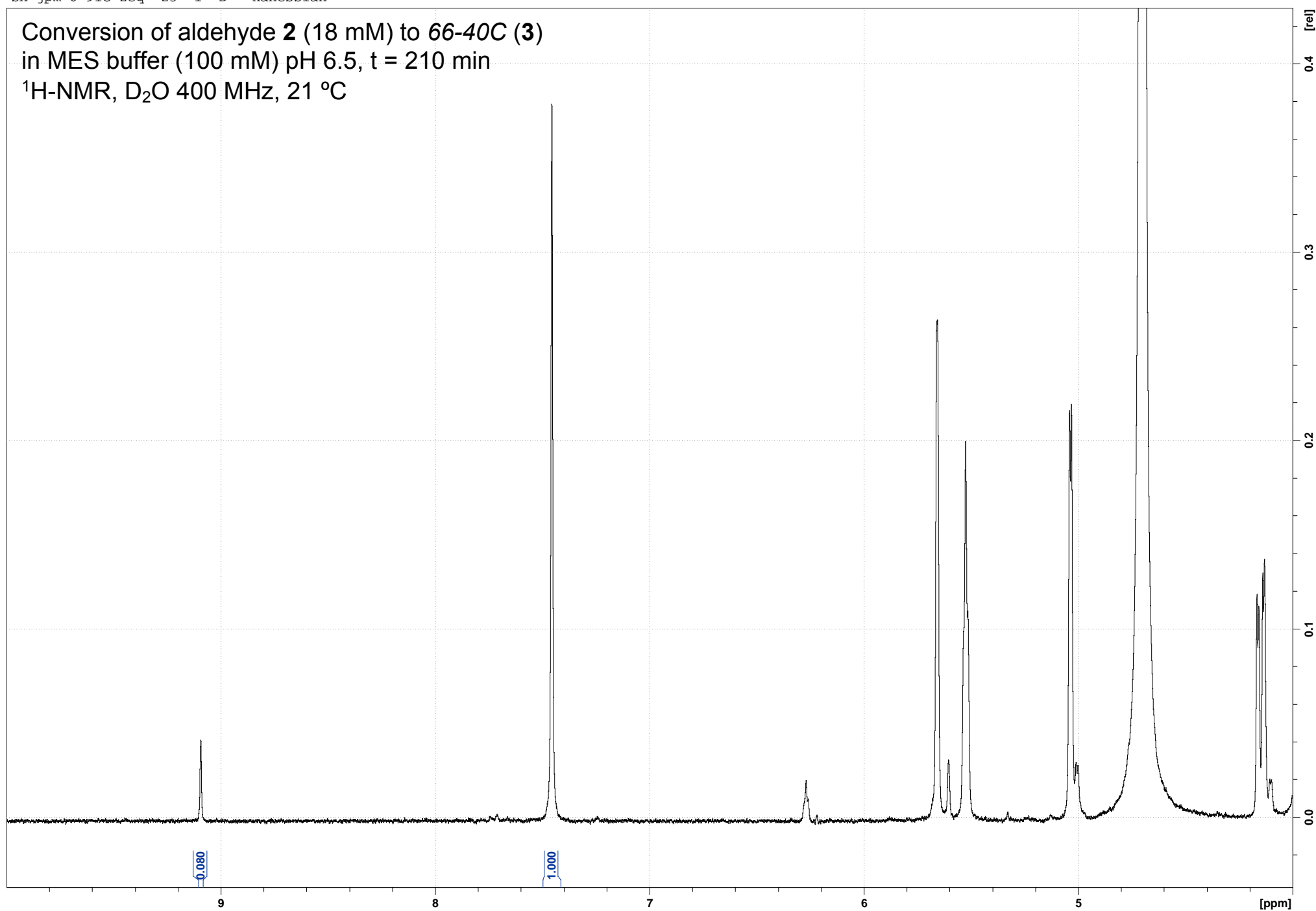
sh-jpm-6-91C-2eq 22 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 200 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



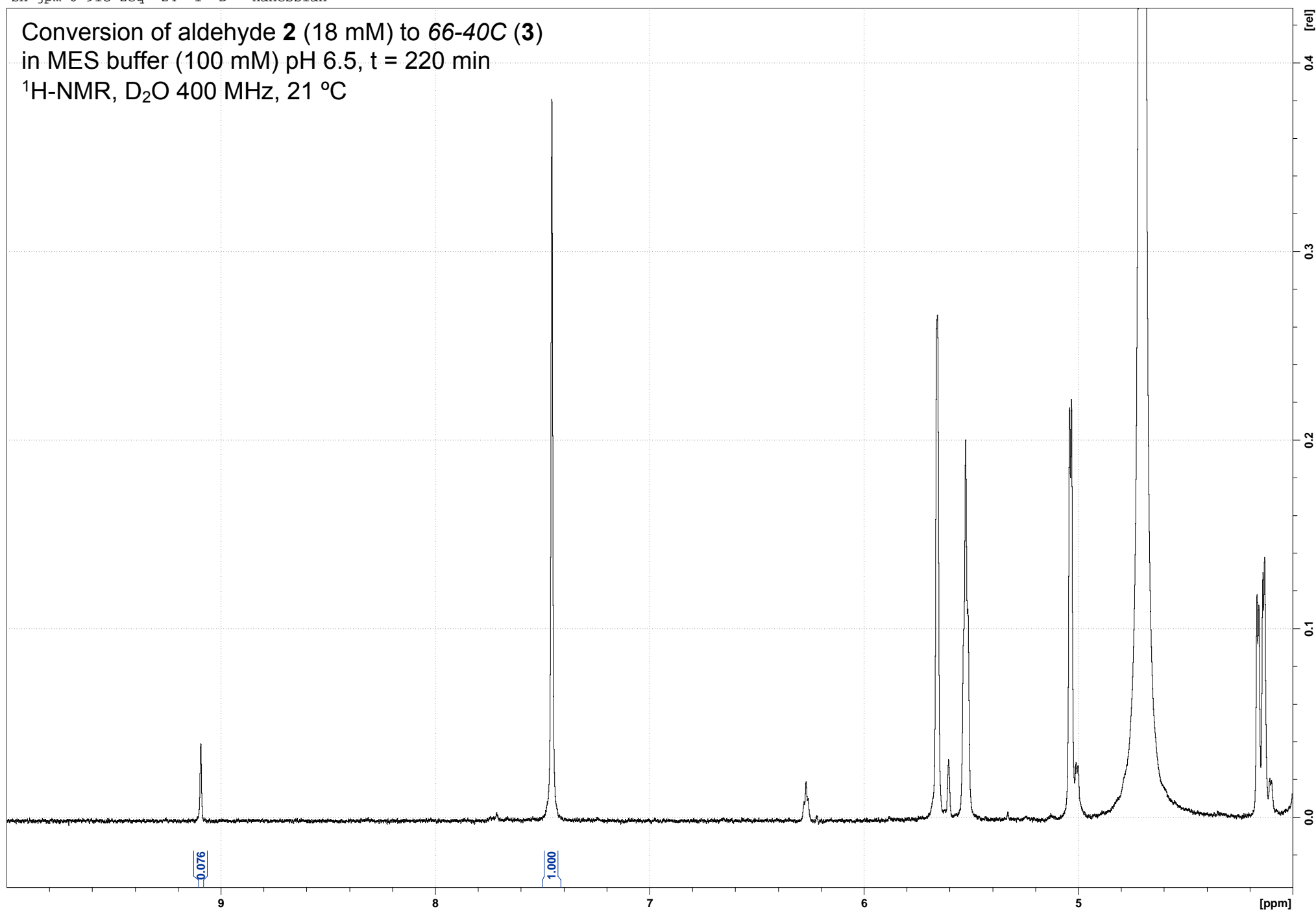
sh-jpm-6-91C-2eq 23 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 210 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



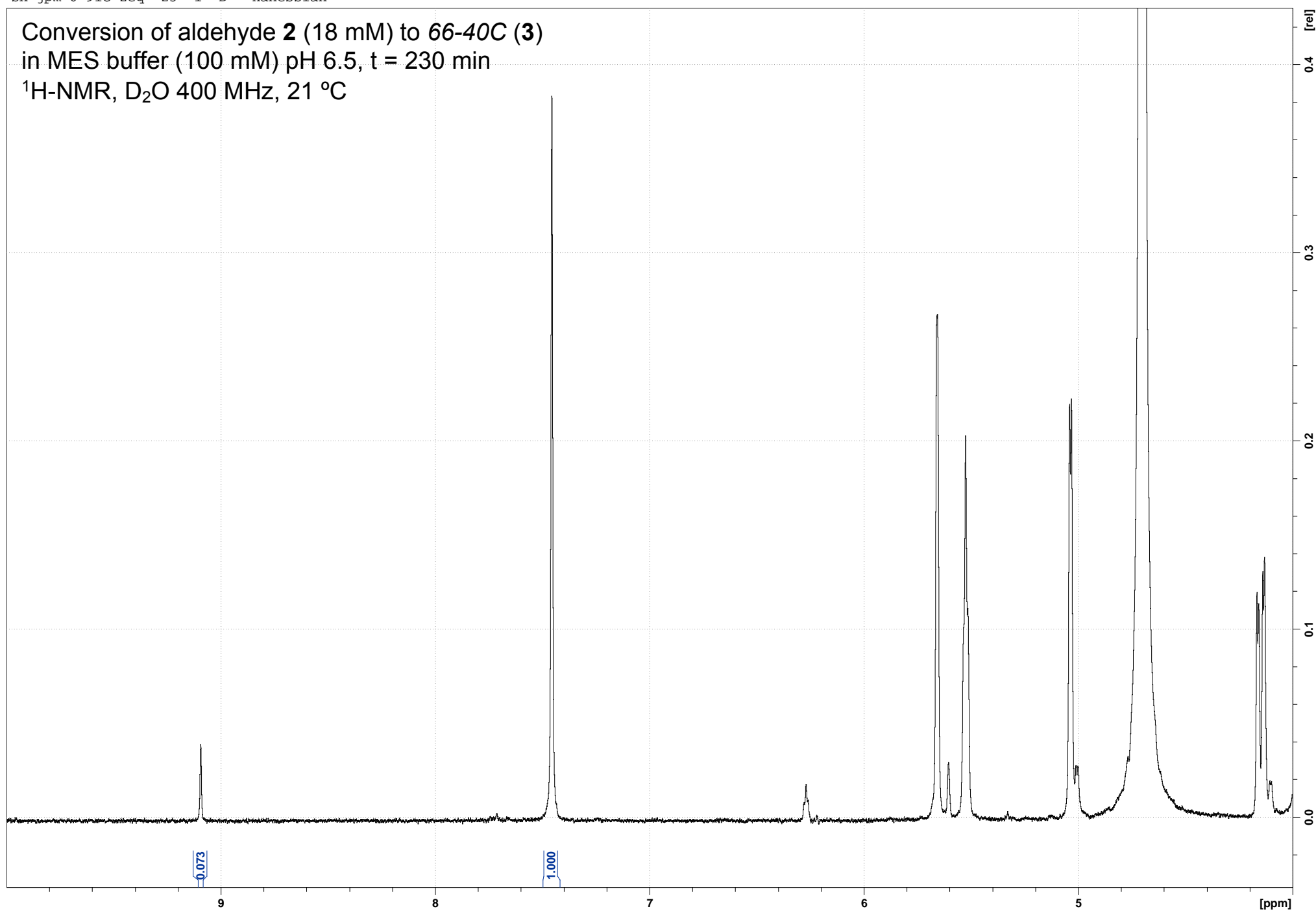
sh-jpm-6-91C-2eq 24 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 220 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



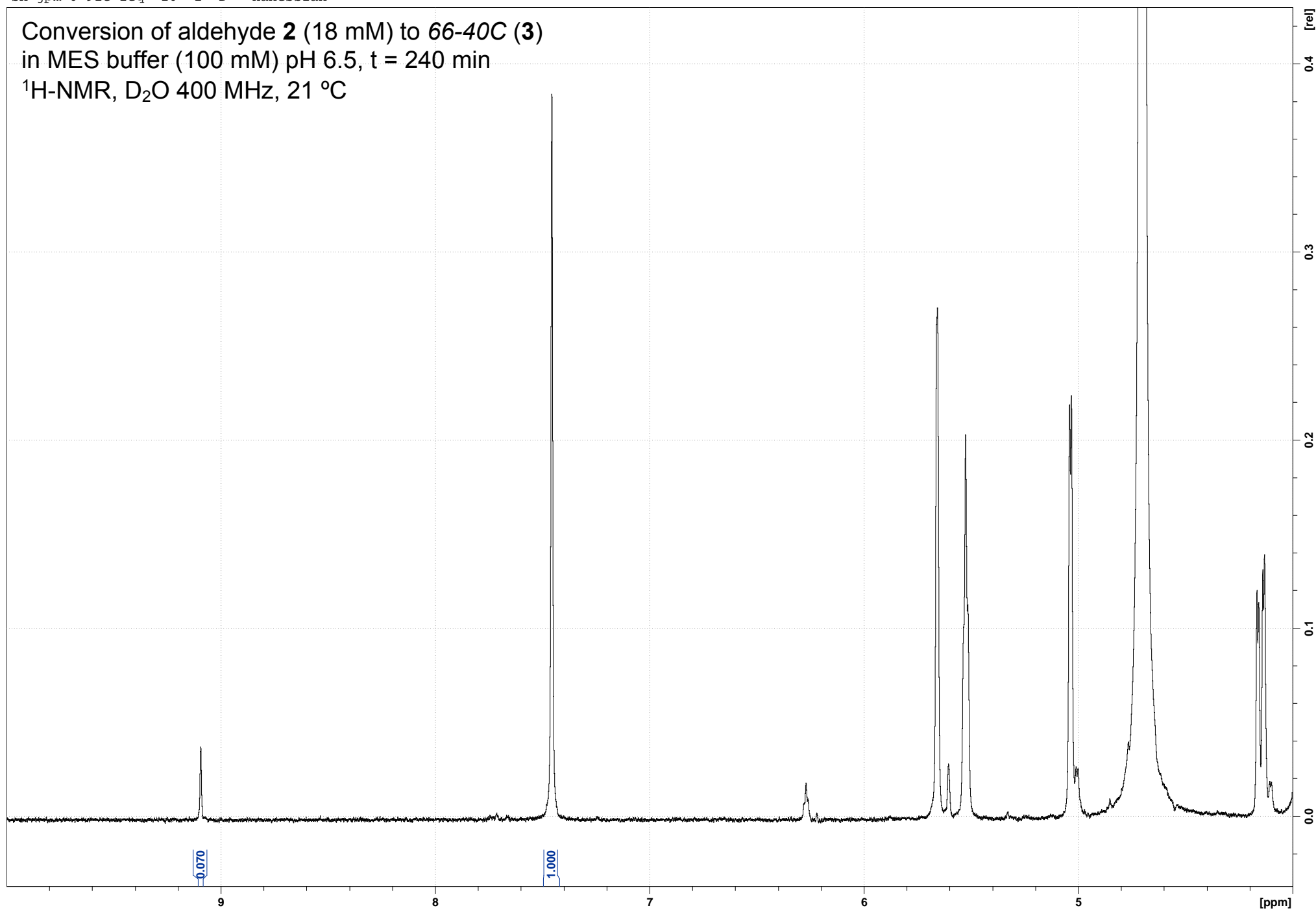
sh-jpm-6-91C-2eq 25 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 230 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



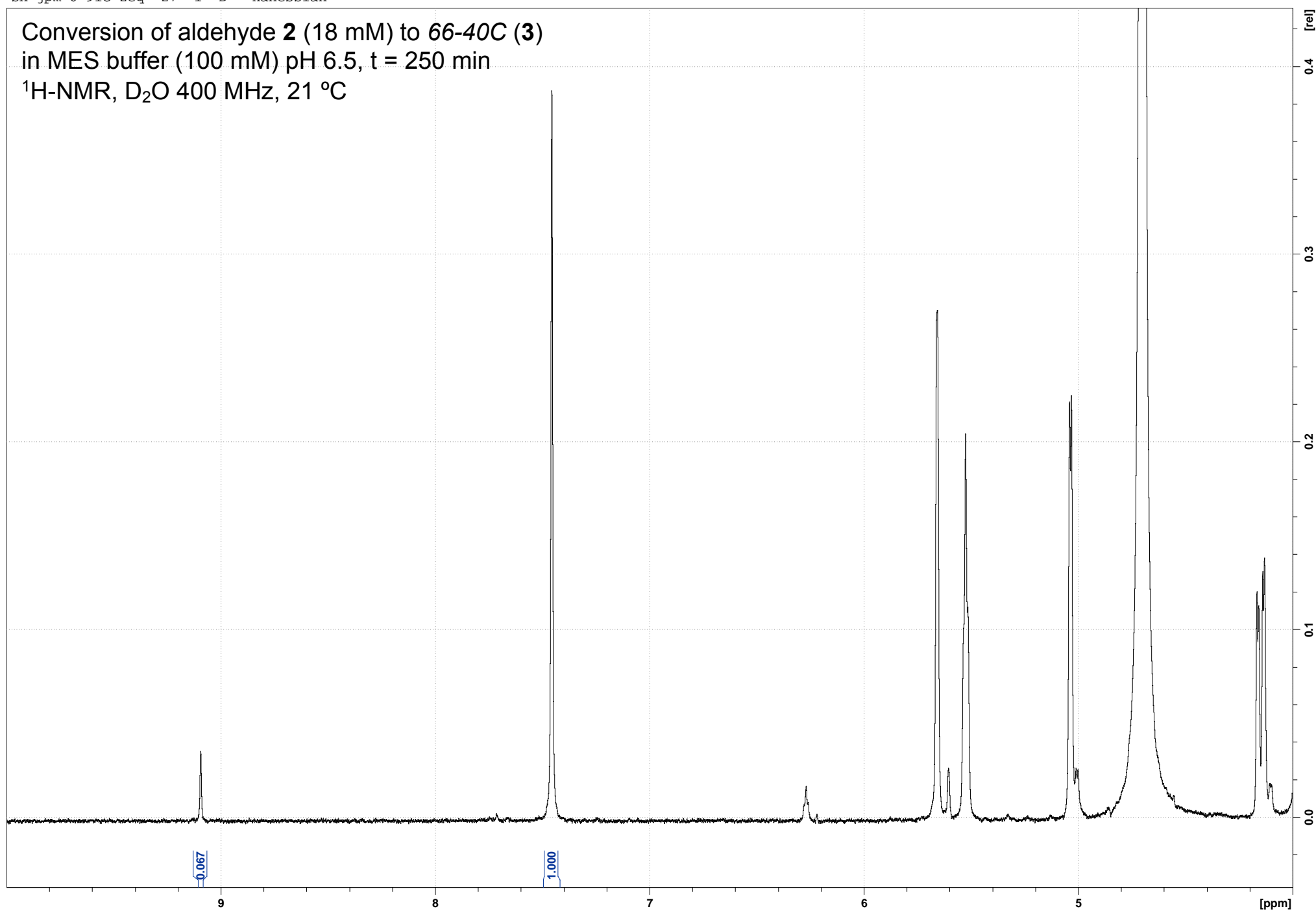
sh-jpm-6-91C-2eq 26 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 240 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



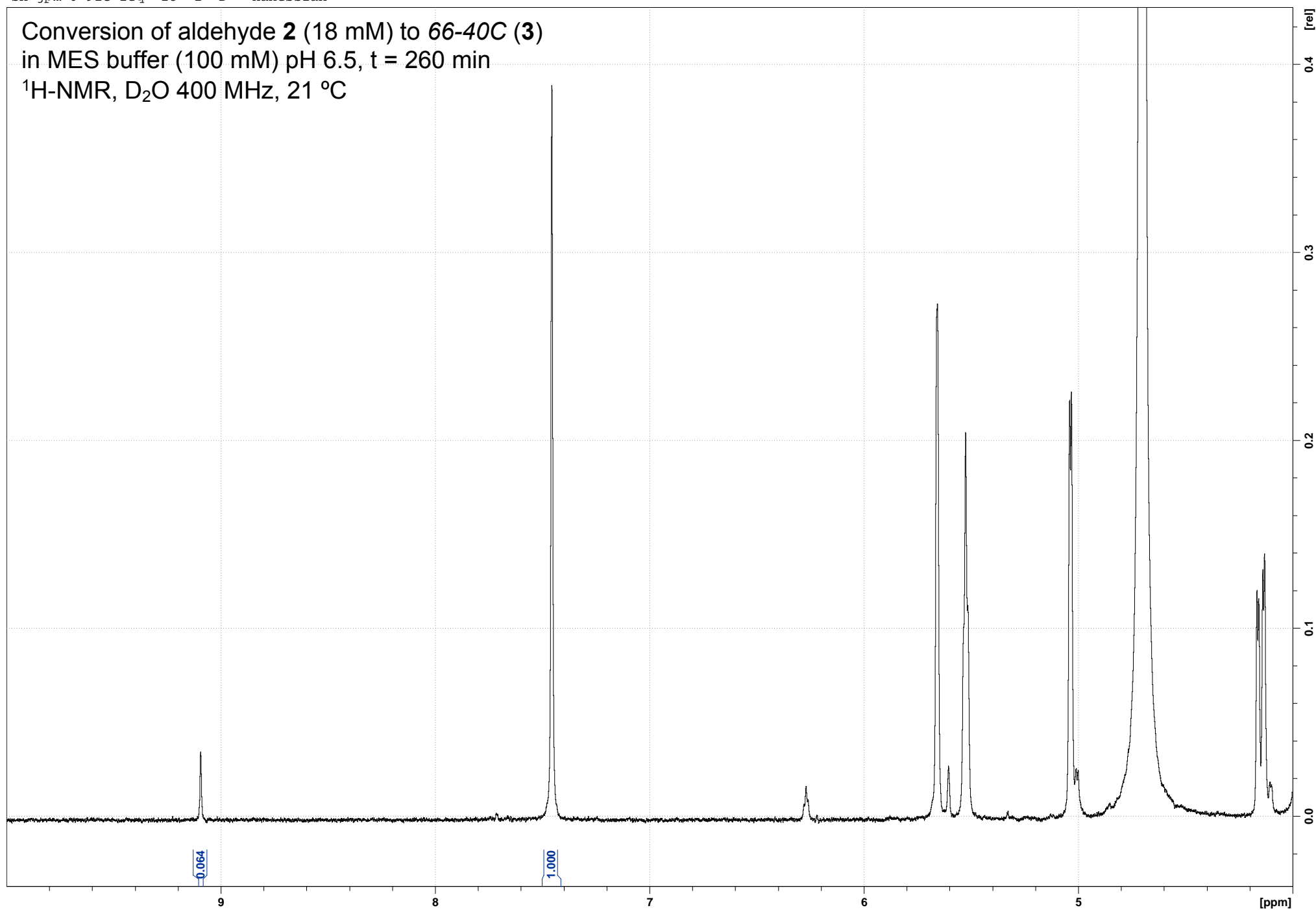
sh-jpm-6-91C-2eq 27 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 250 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91C-2eq 28 1 D: Hanessian

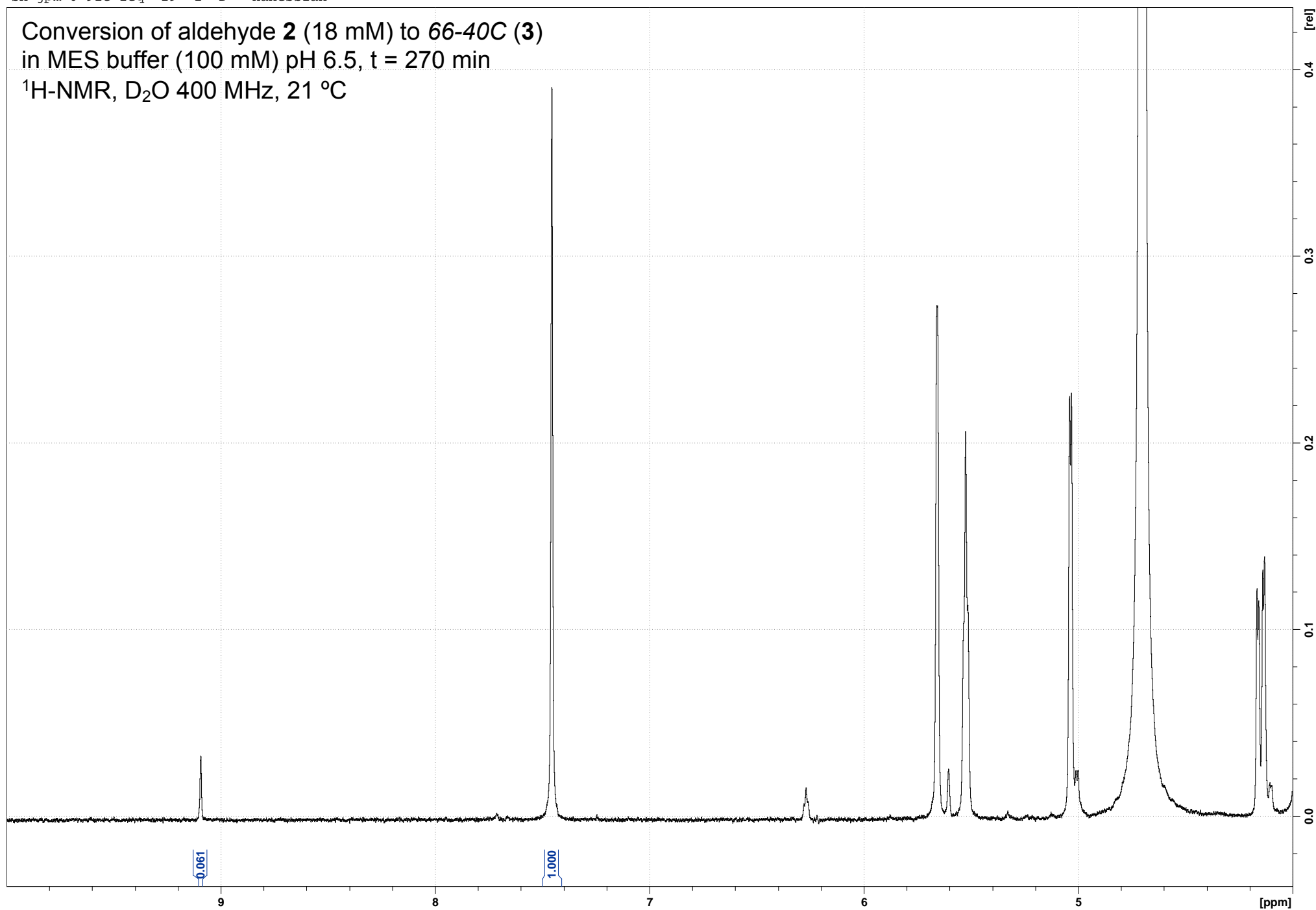
Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 260 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





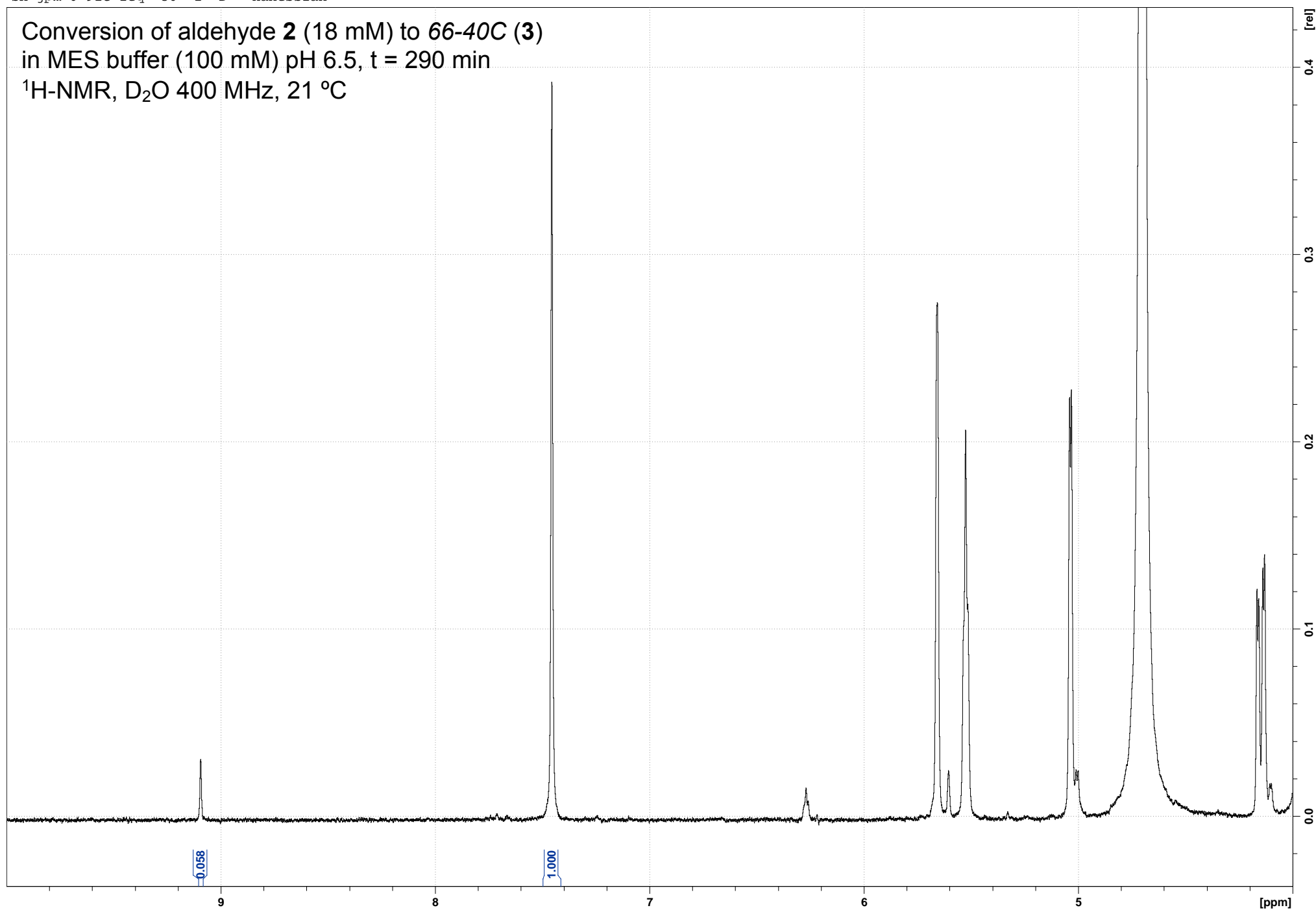
sh-jpm-6-91C-2eq 29 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 270 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



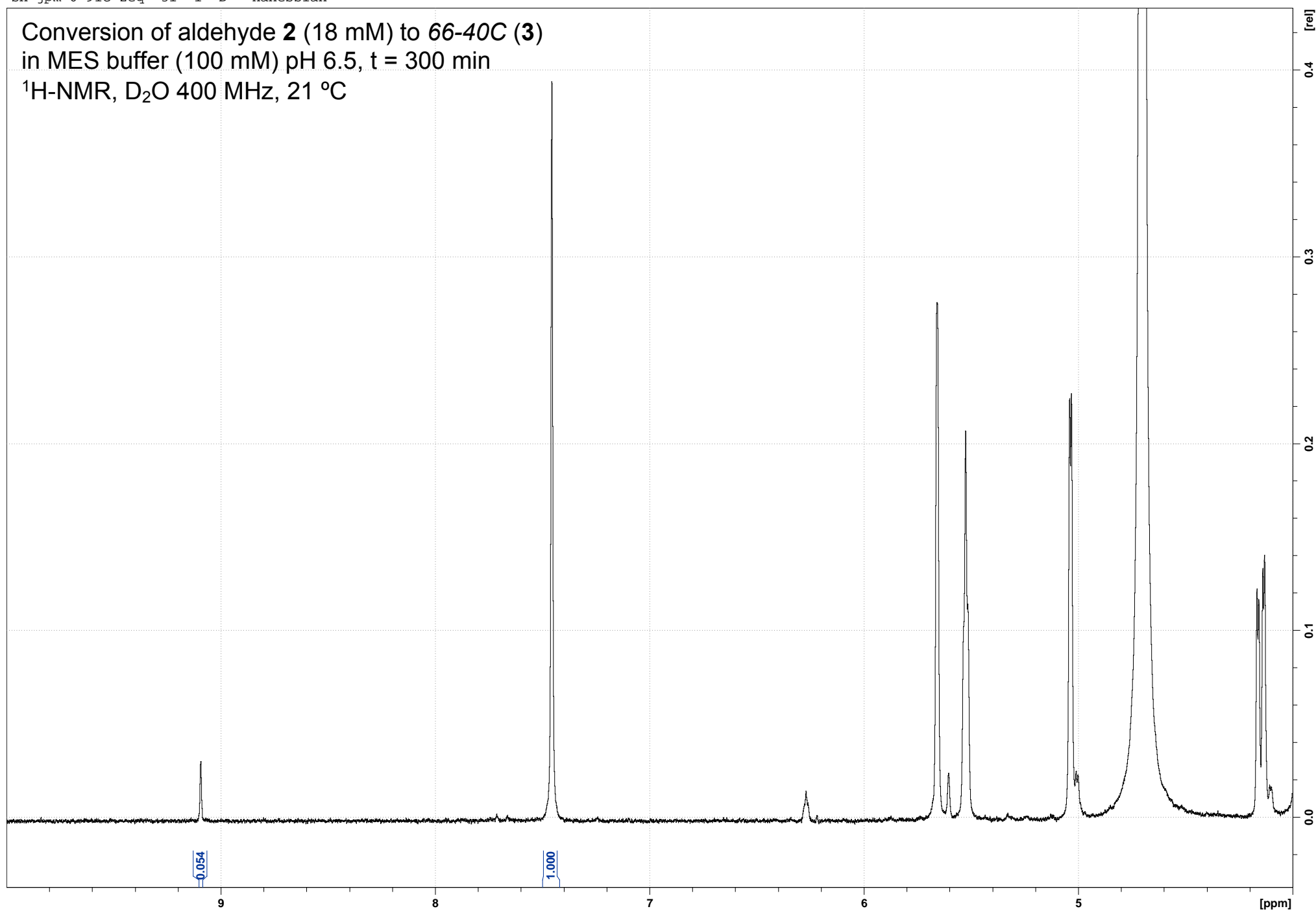
sh-jpm-6-91C-2eq 30 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 290 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



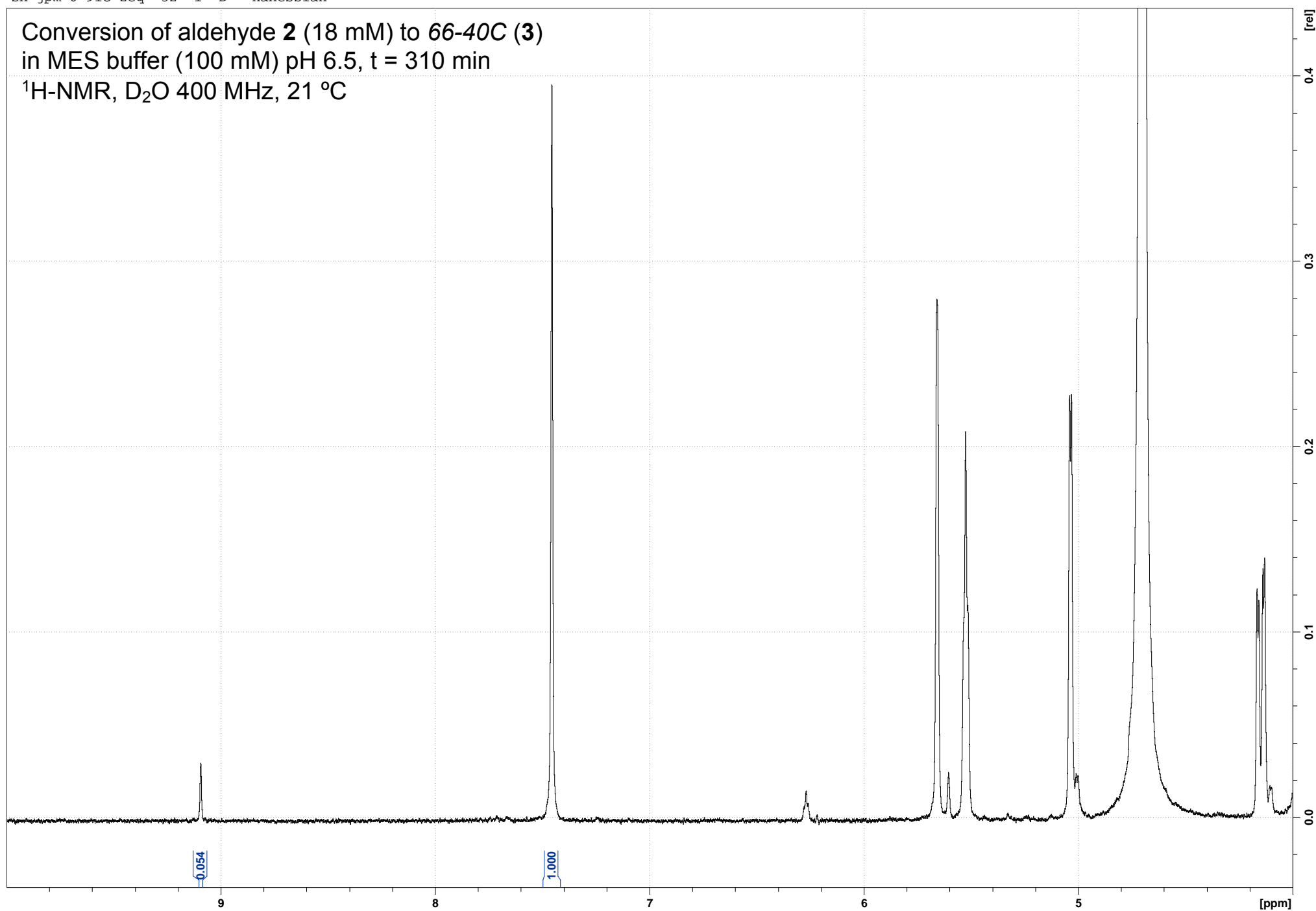
sh-jpm-6-91C-2eq 31 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 300 min  
 $^1\text{H-NMR}$ ,  $\text{D}_2\text{O}$  400 MHz, 21 °C



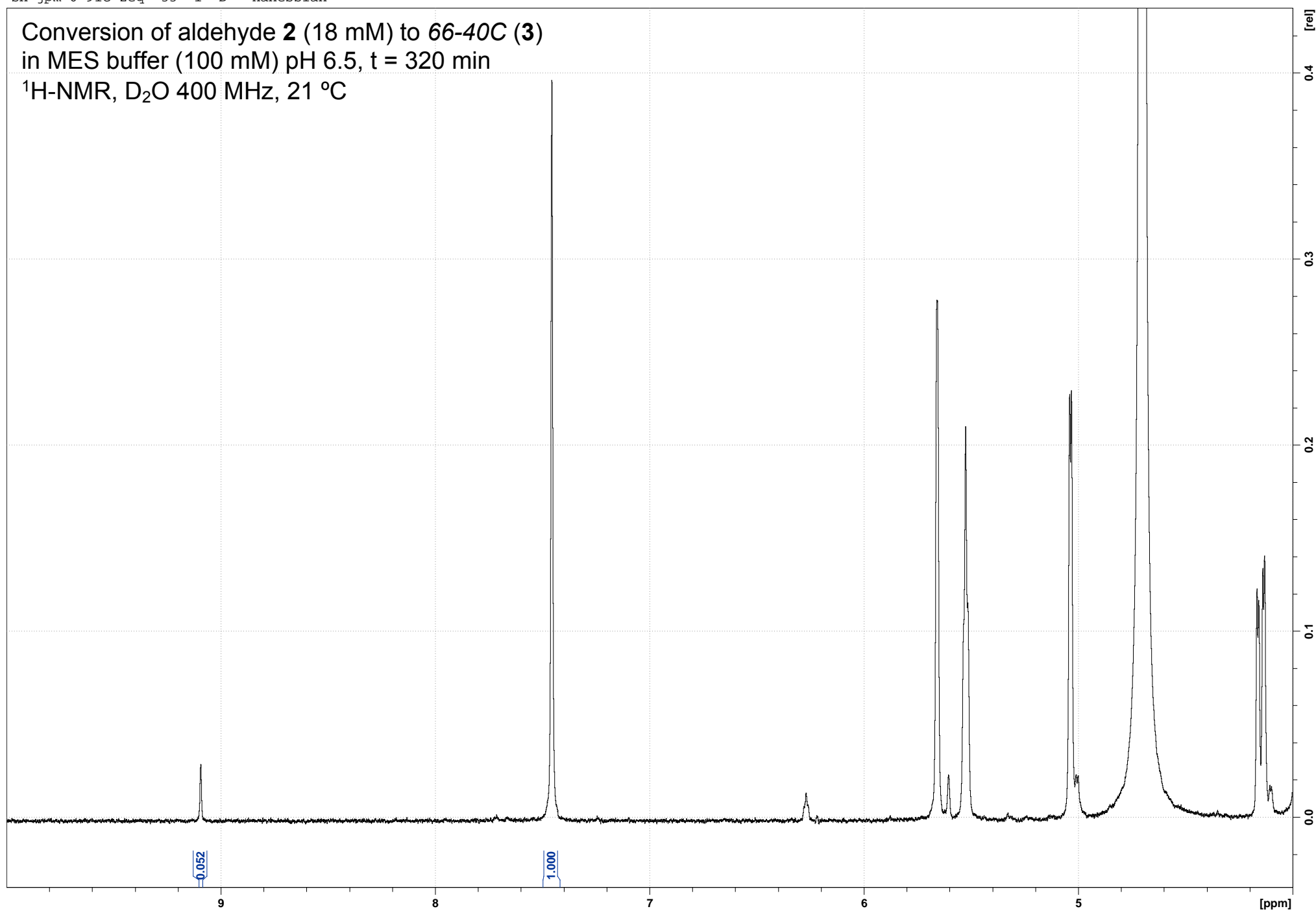
sh-jpm-6-91C-2eq 32 1 D: Hanesian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 310 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



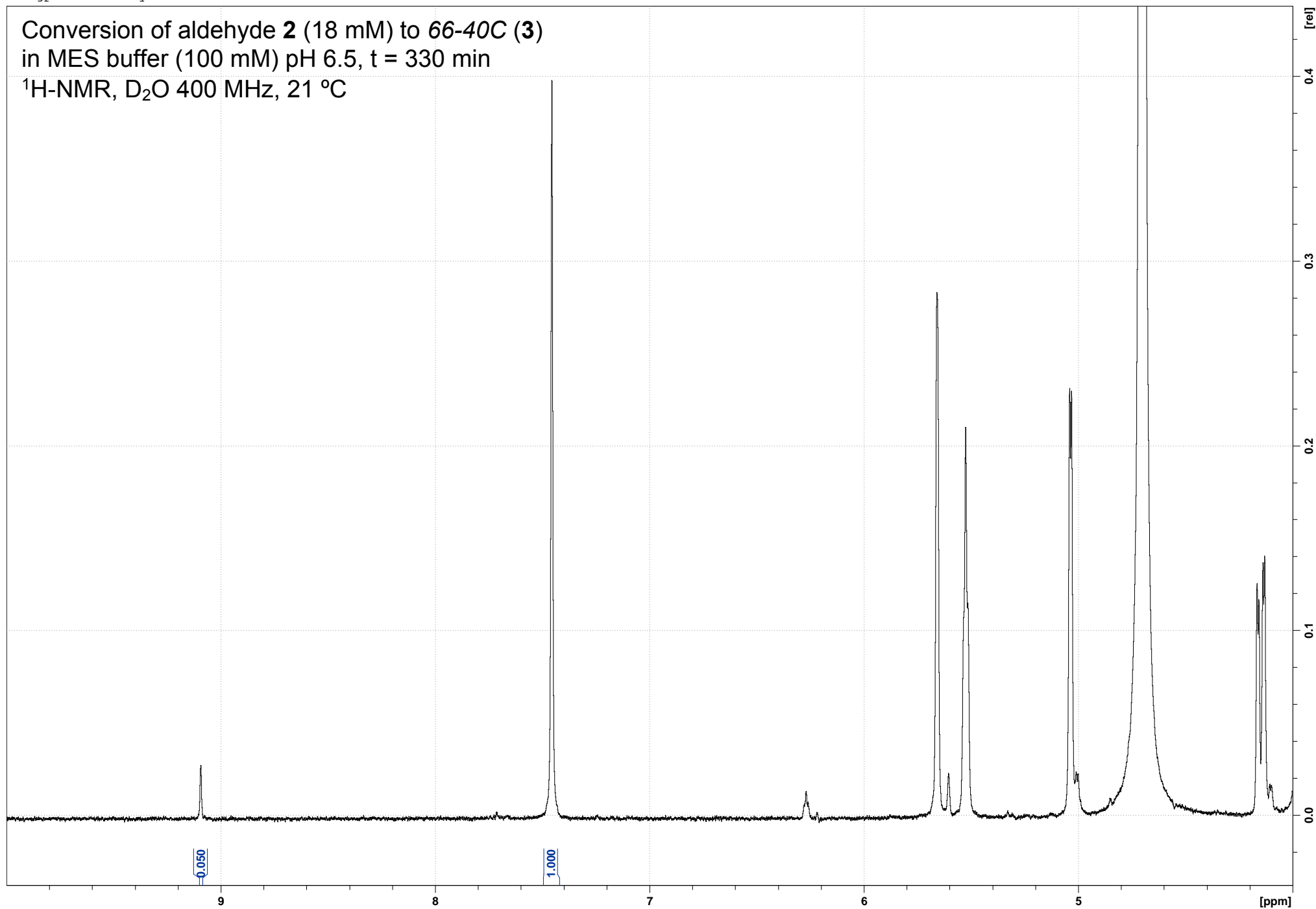
sh-jpm-6-91C-2eq 33 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 320 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



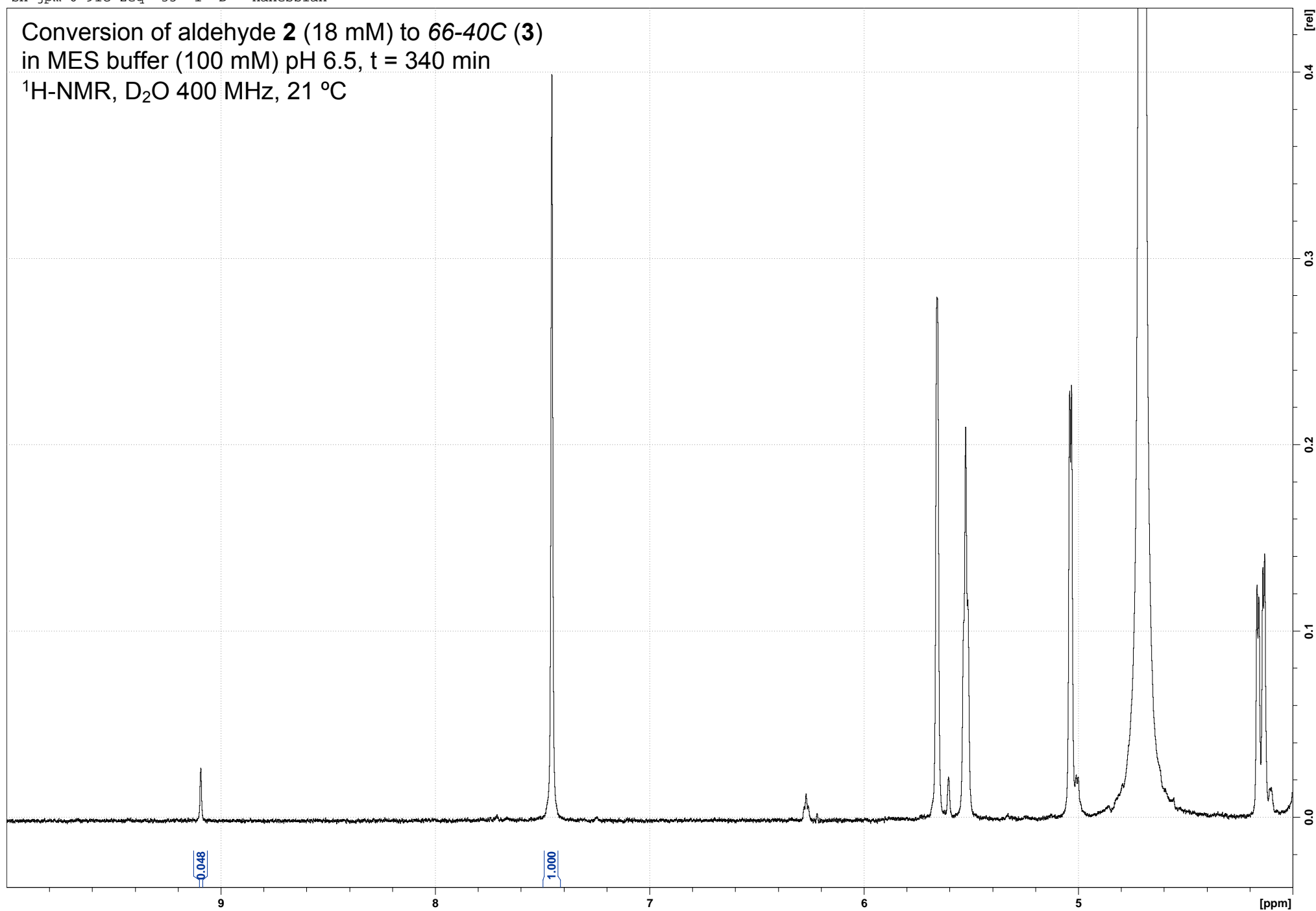
sh-jpm-6-91C-2eq 34 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 330 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



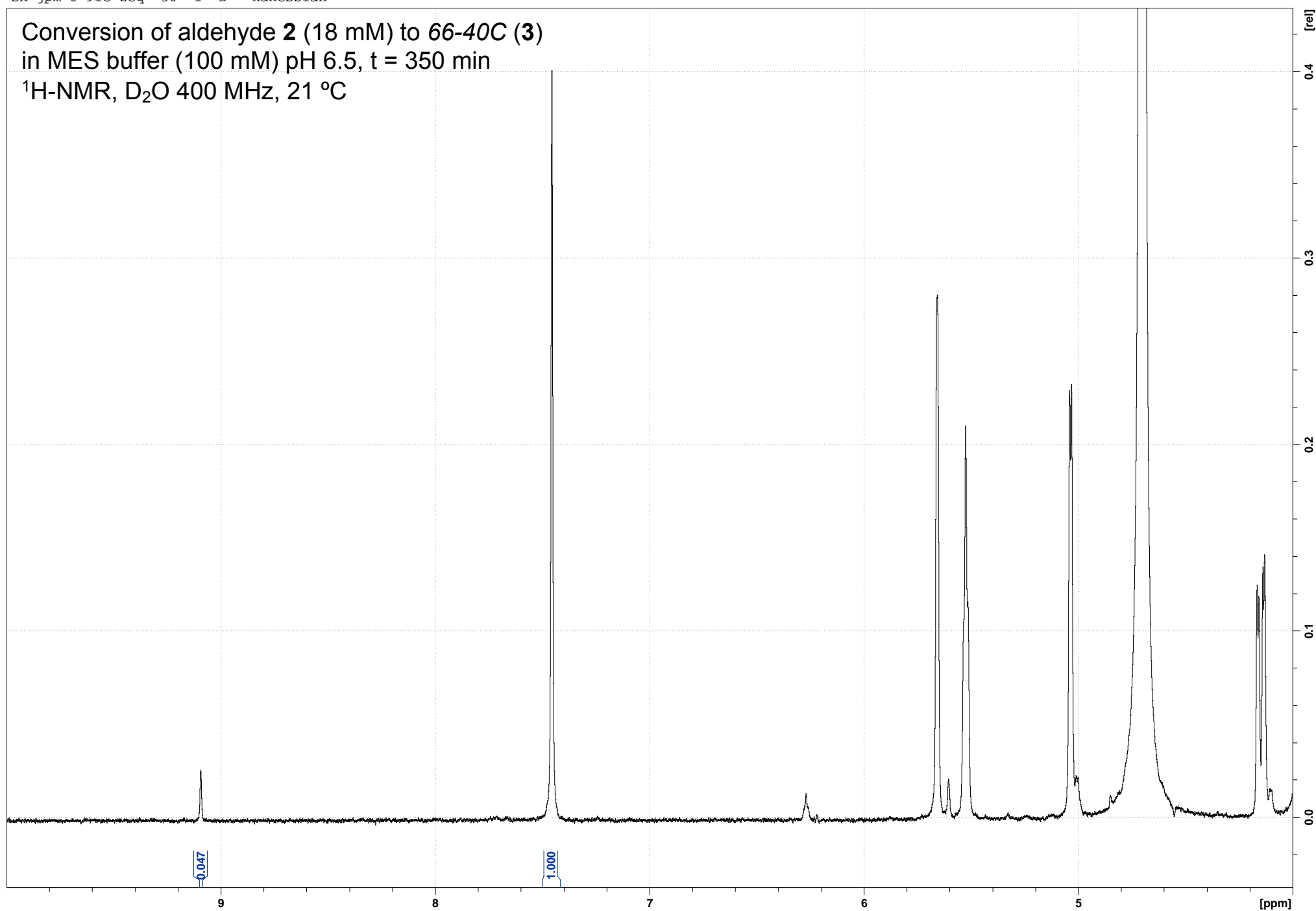
sh-jpm-6-91C-2eq 35 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 340 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91C-2eq 36 1 D: Hanessian

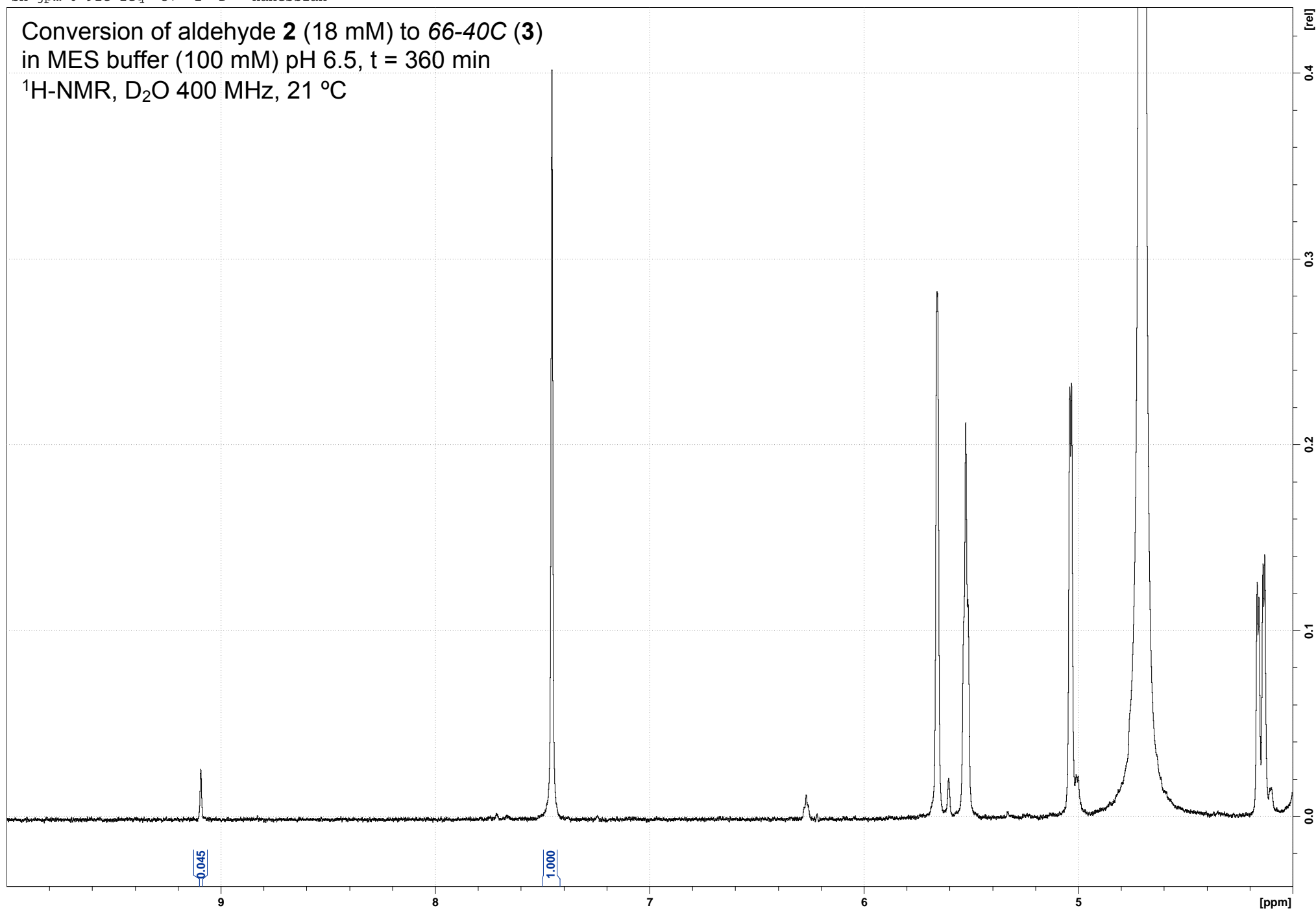
Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 350 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





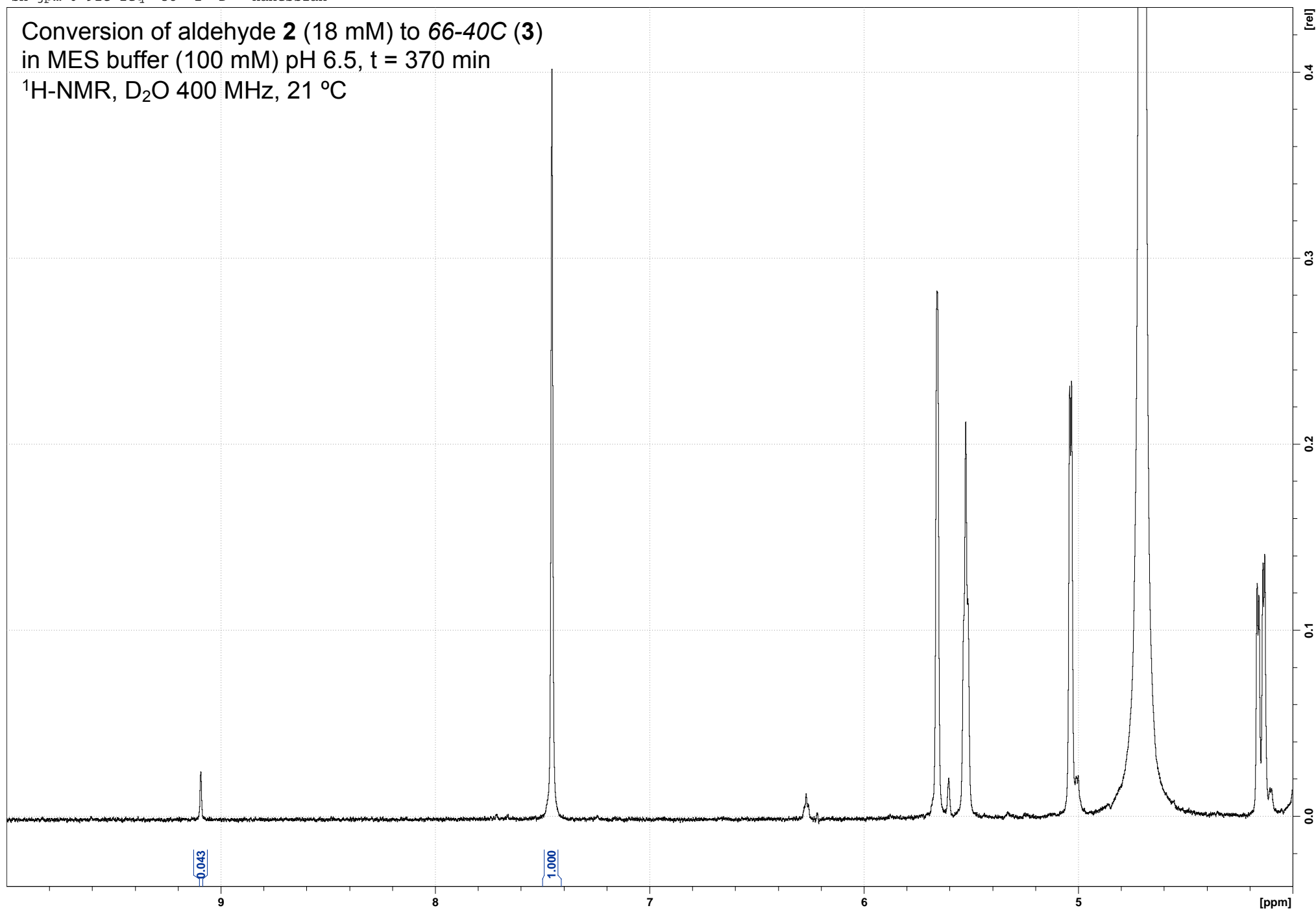
sh-jpm-6-91C-2eq 37 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 360 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



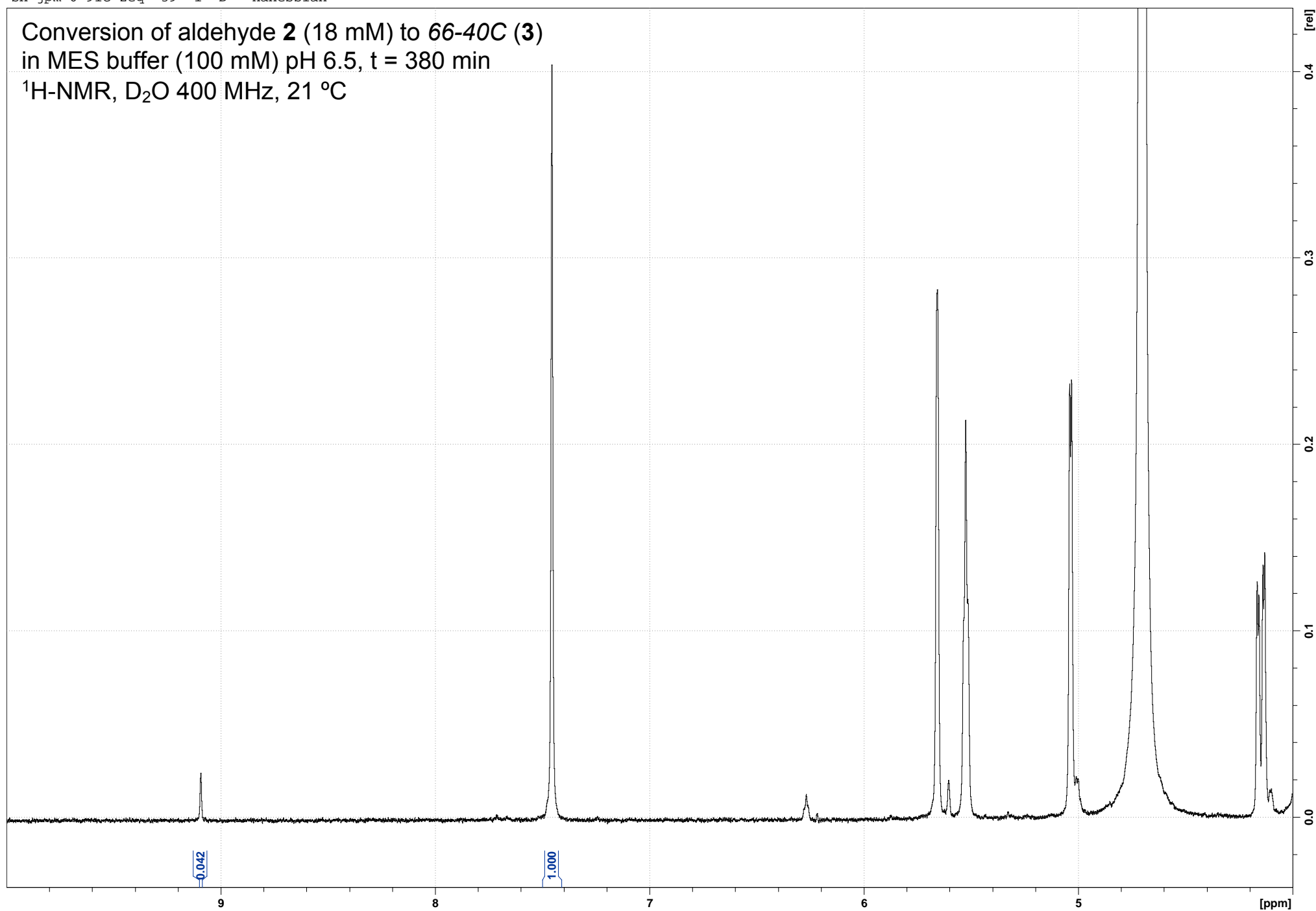
sh-jpm-6-91C-2eq 38 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 370 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



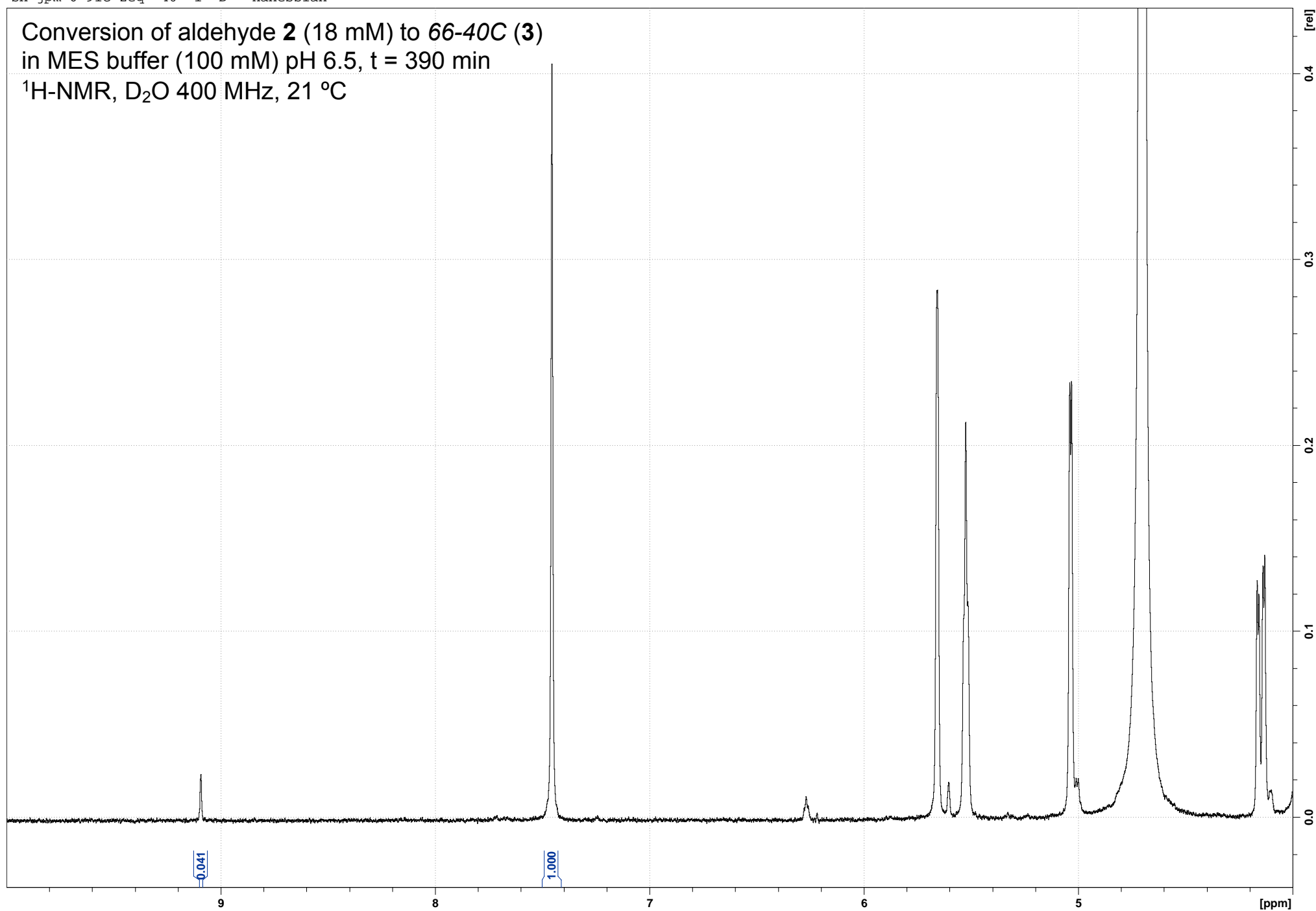
sh-jpm-6-91C-2eq 39 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 380 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



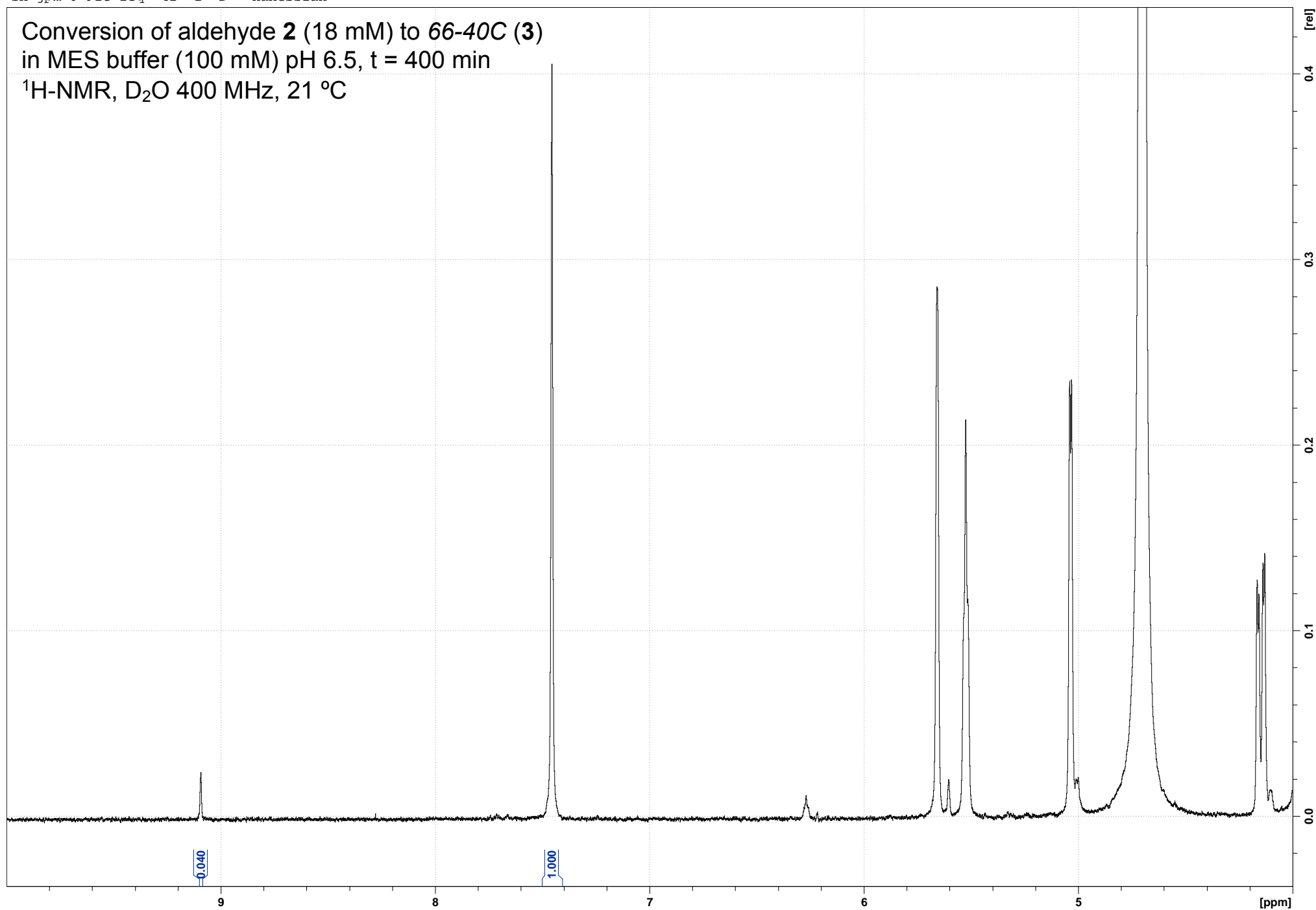
sh-jpm-6-91C-2eq 40 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 390 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



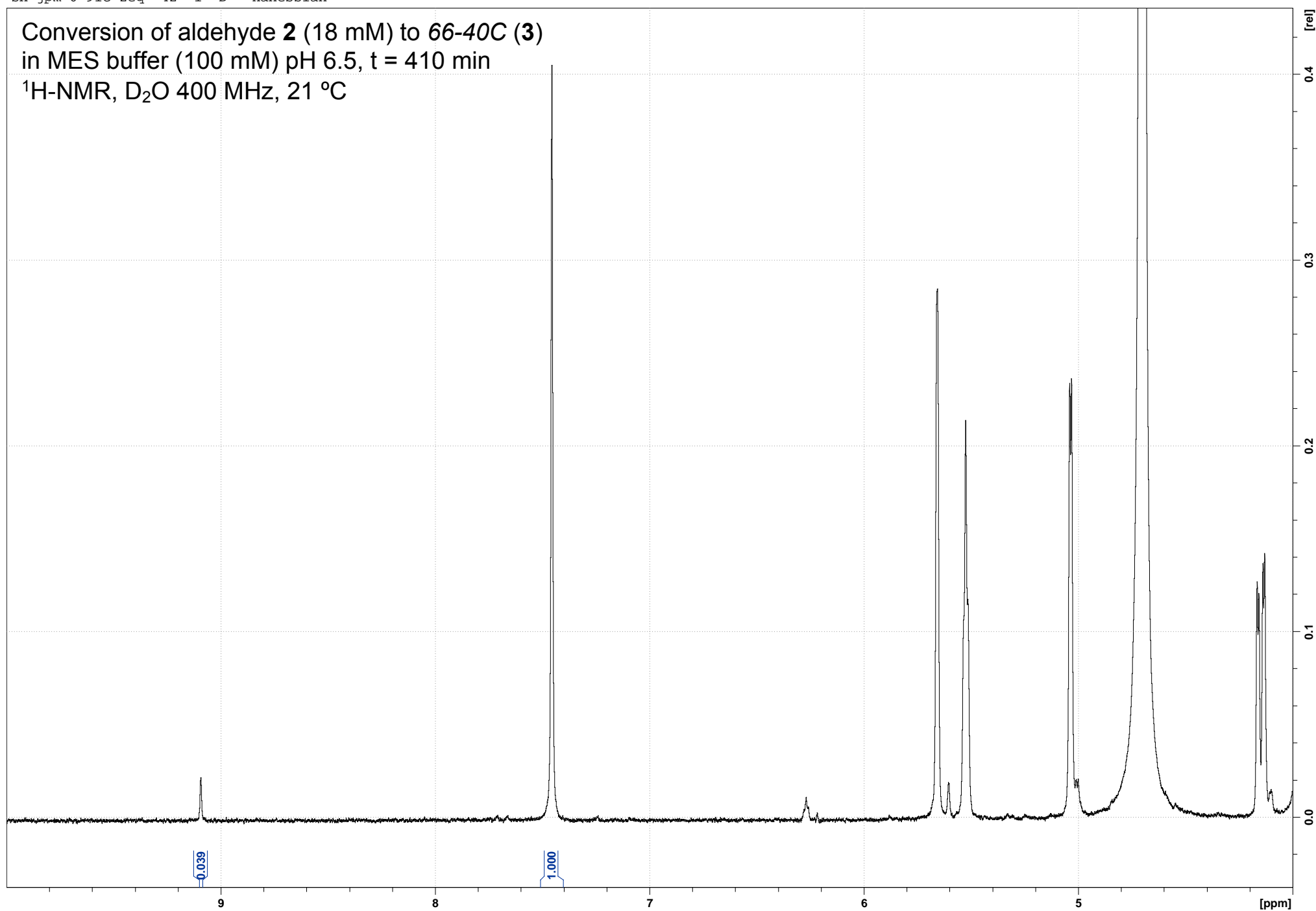
sh-jpm-6-91C-2eq 41 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 400 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



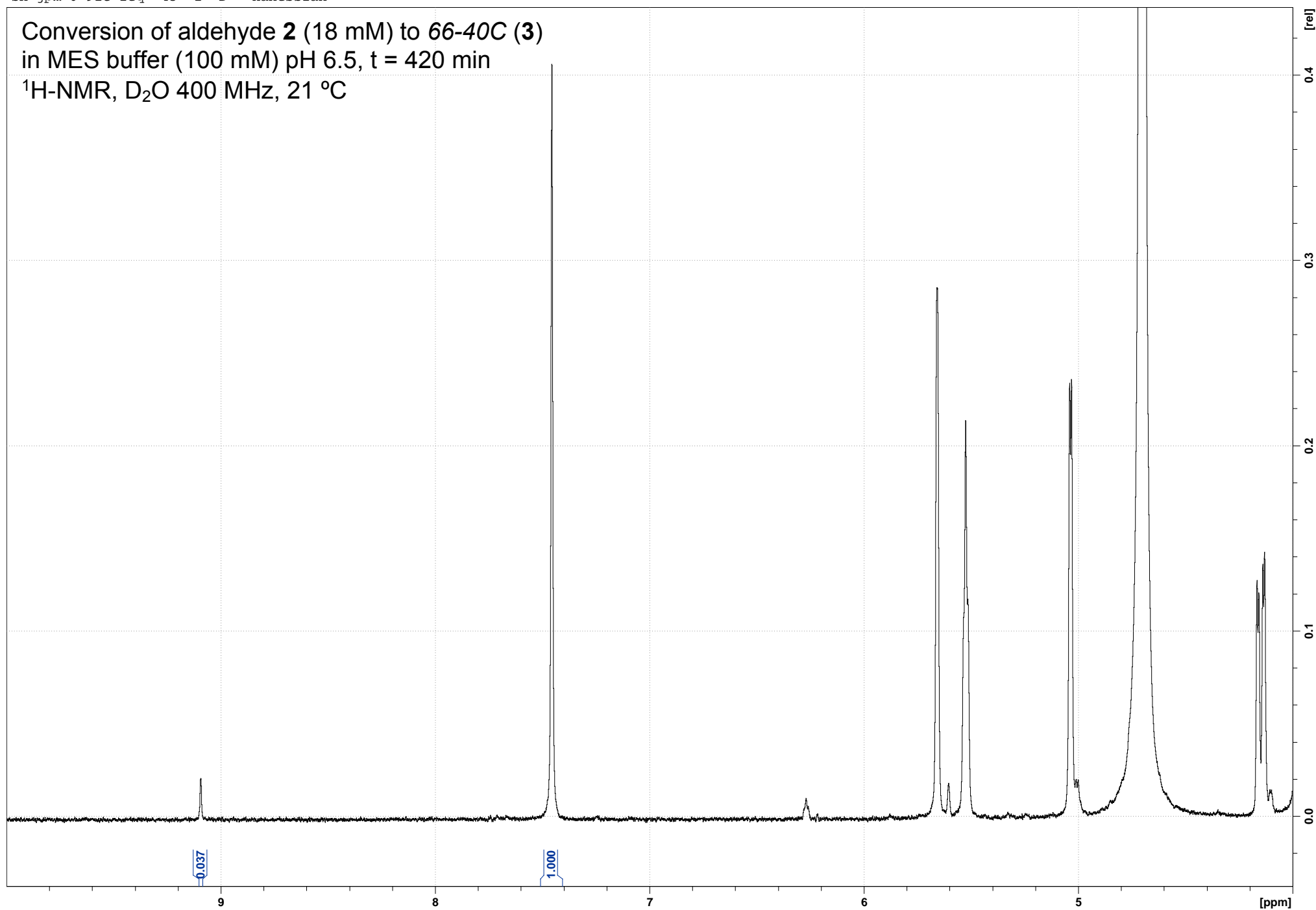
sh-jpm-6-91C-2eq 42 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 410 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



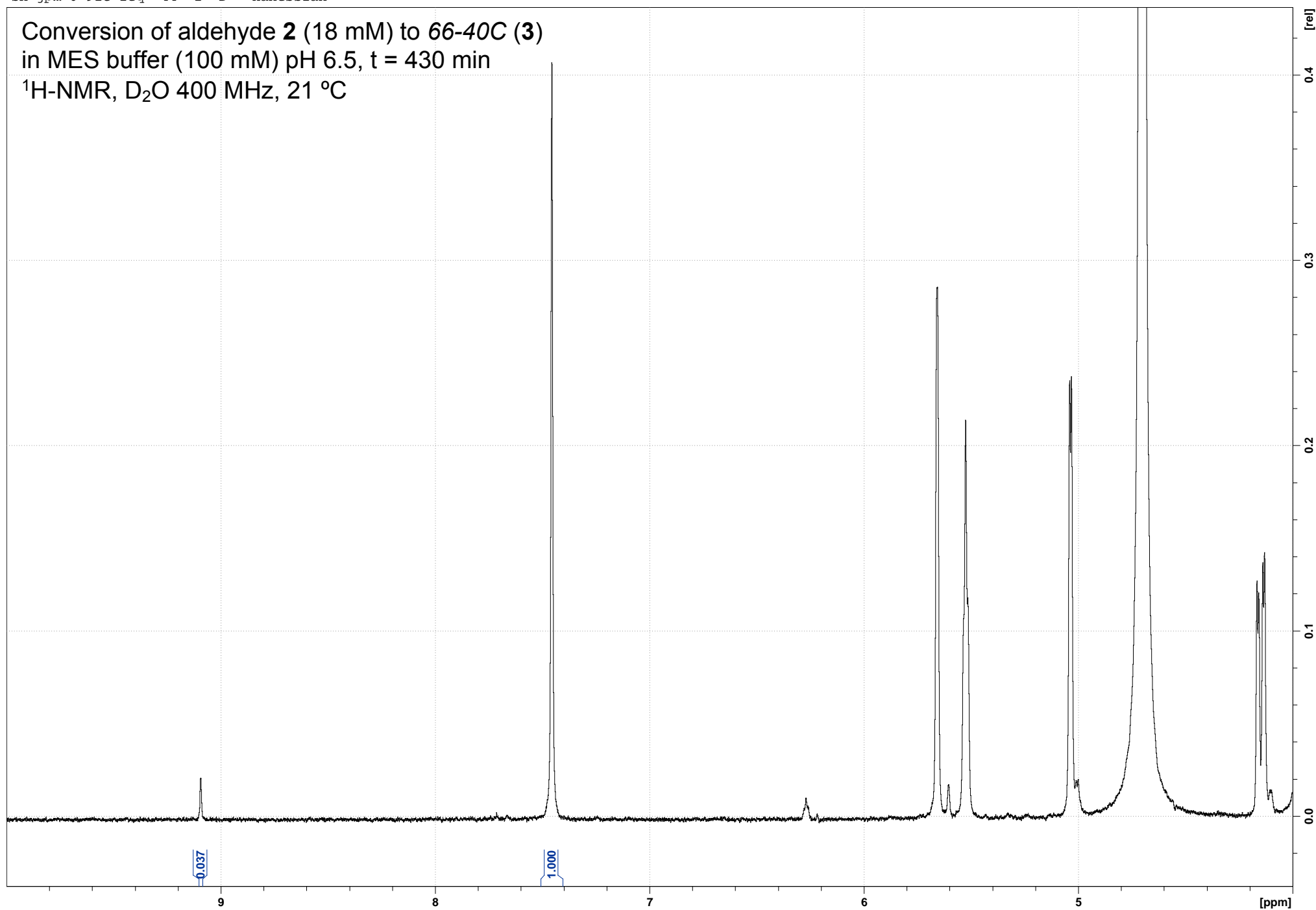
sh-jpm-6-91C-2eq 43 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 420 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91C-2eq 44 1 D: Hanessian

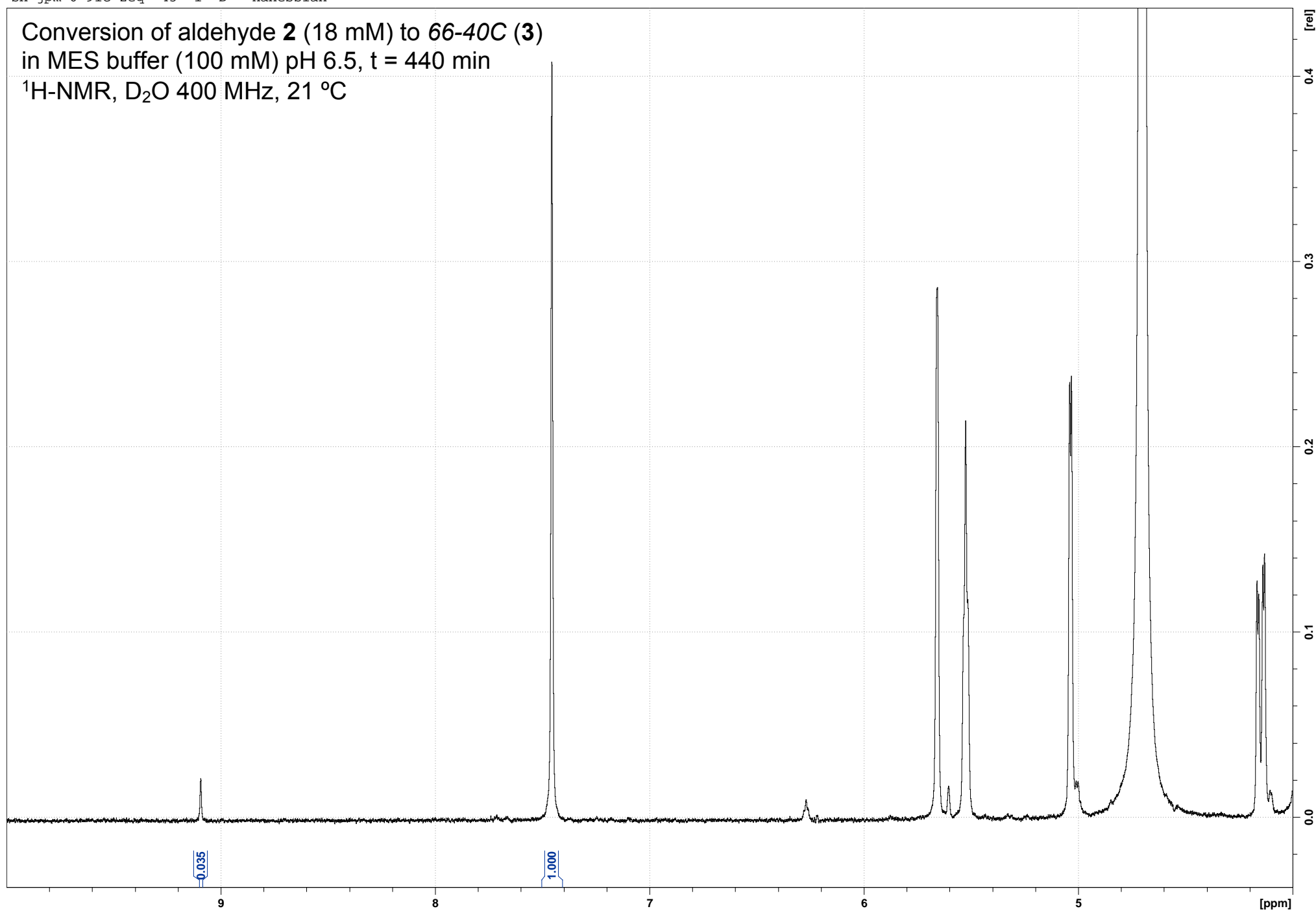
Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 430 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C





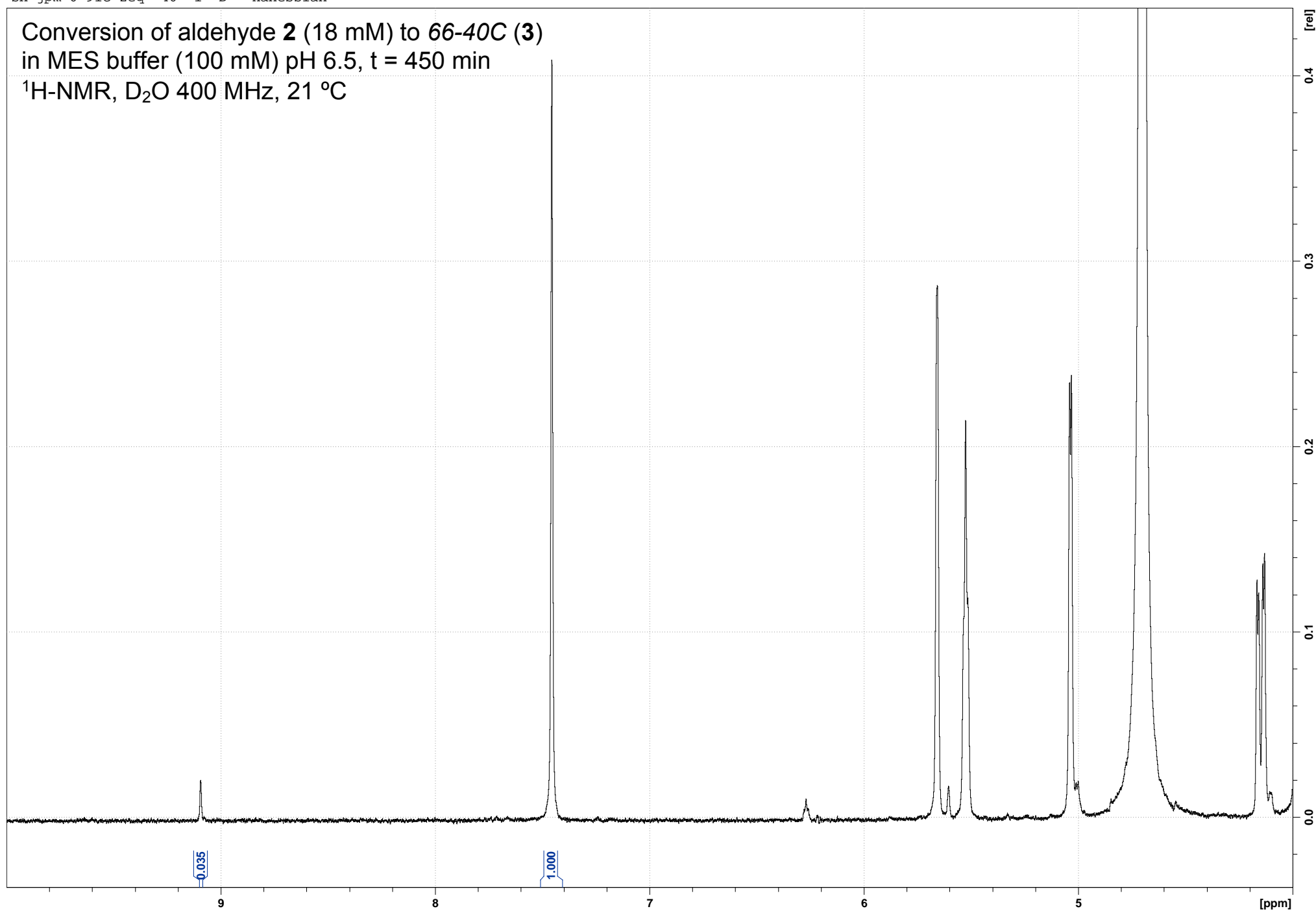
sh-jpm-6-91C-2eq 45 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 440 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



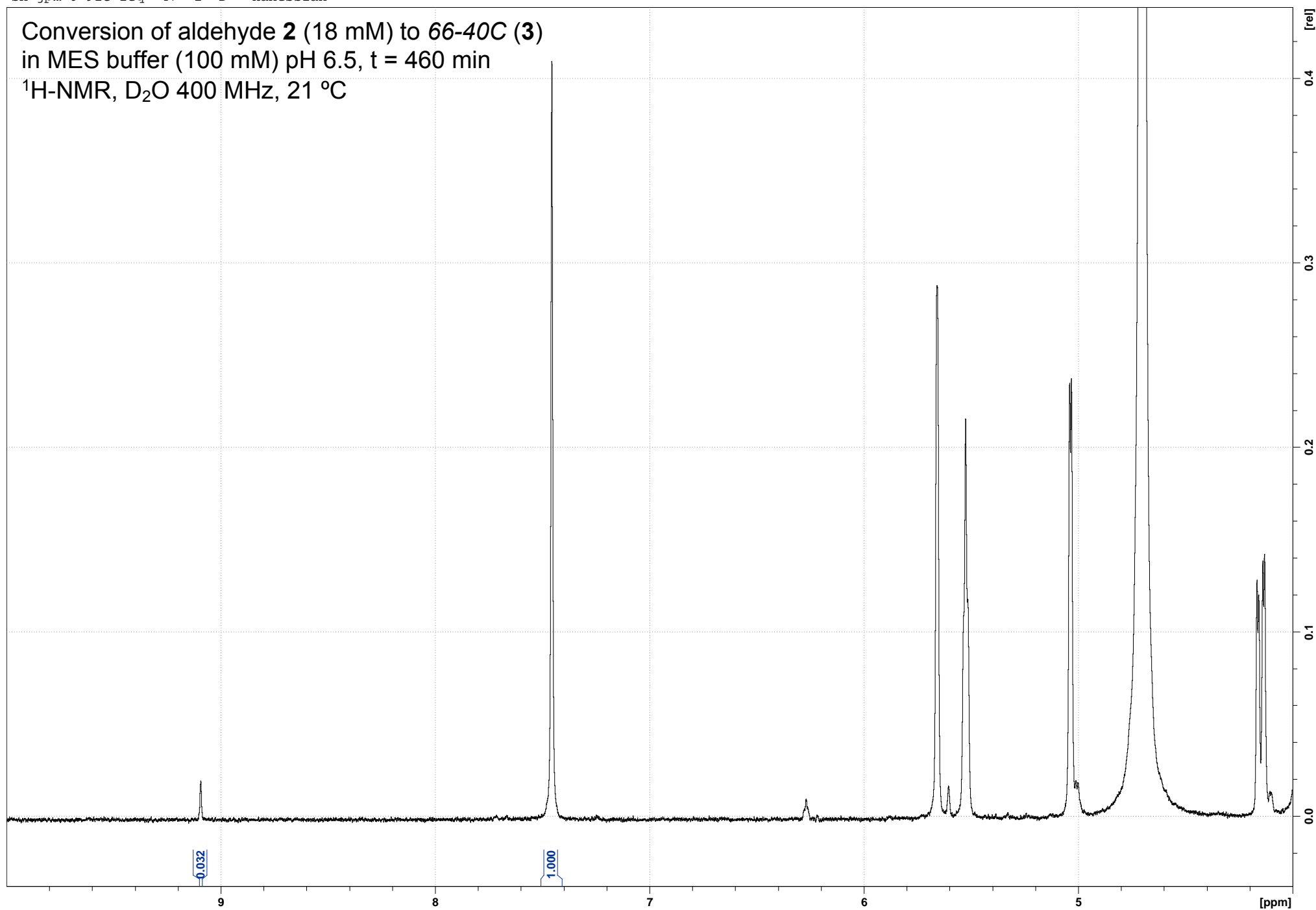
sh-jpm-6-91C-2eq 46 1 D: Hanesian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 450 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



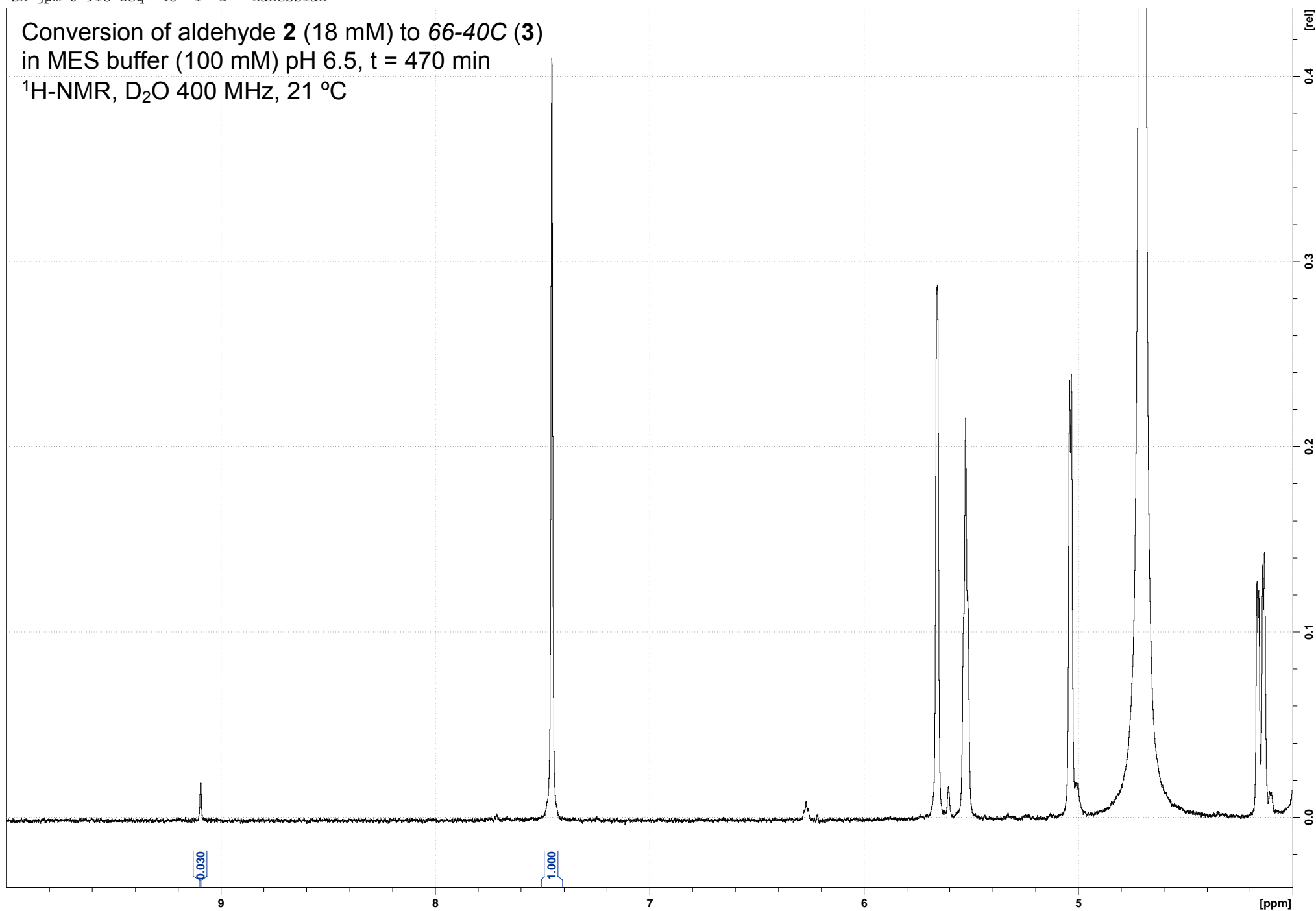
sh-jpm-6-91C-2eq 47 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 460 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



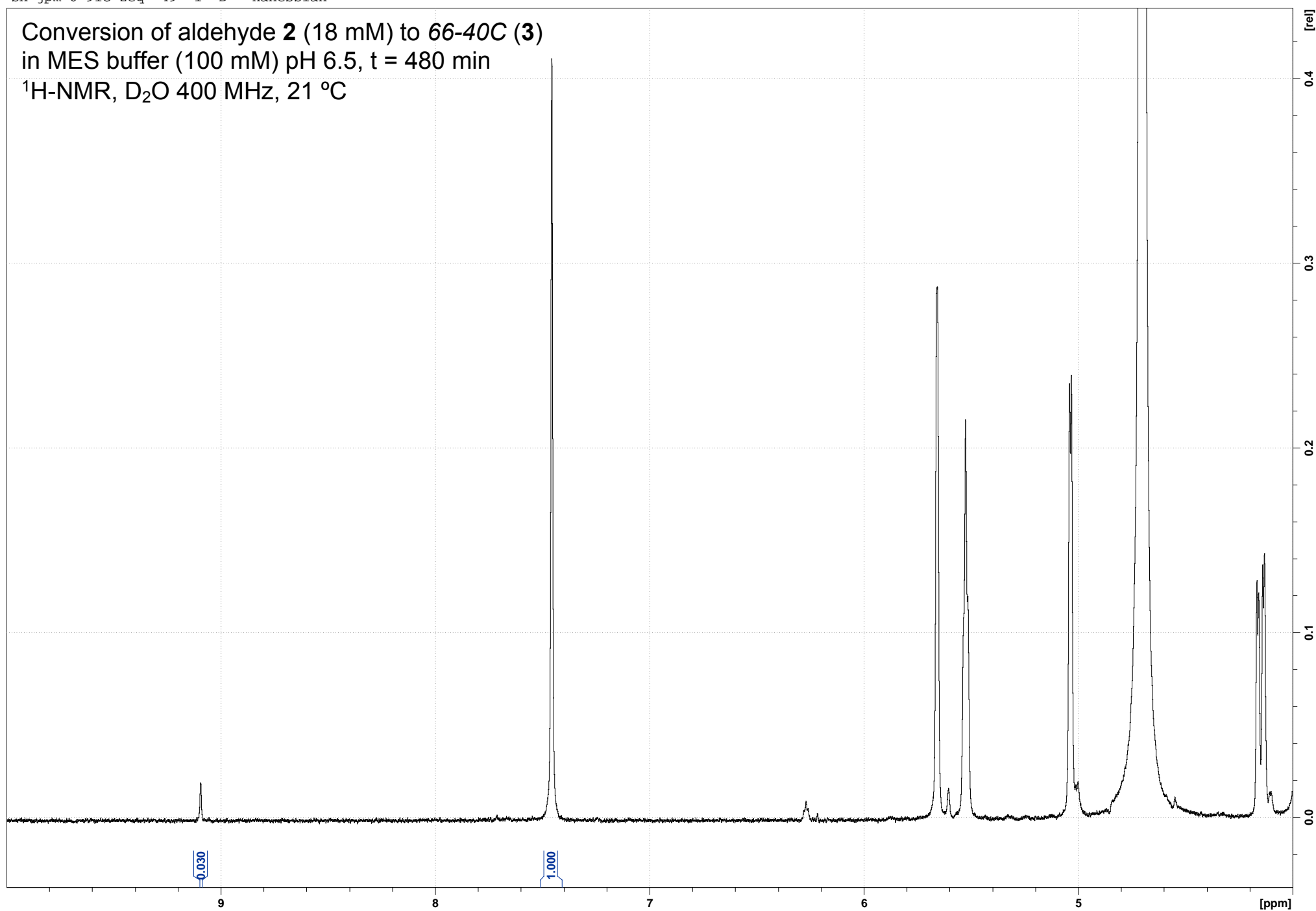
sh-jpm-6-91C-2eq 48 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 470 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



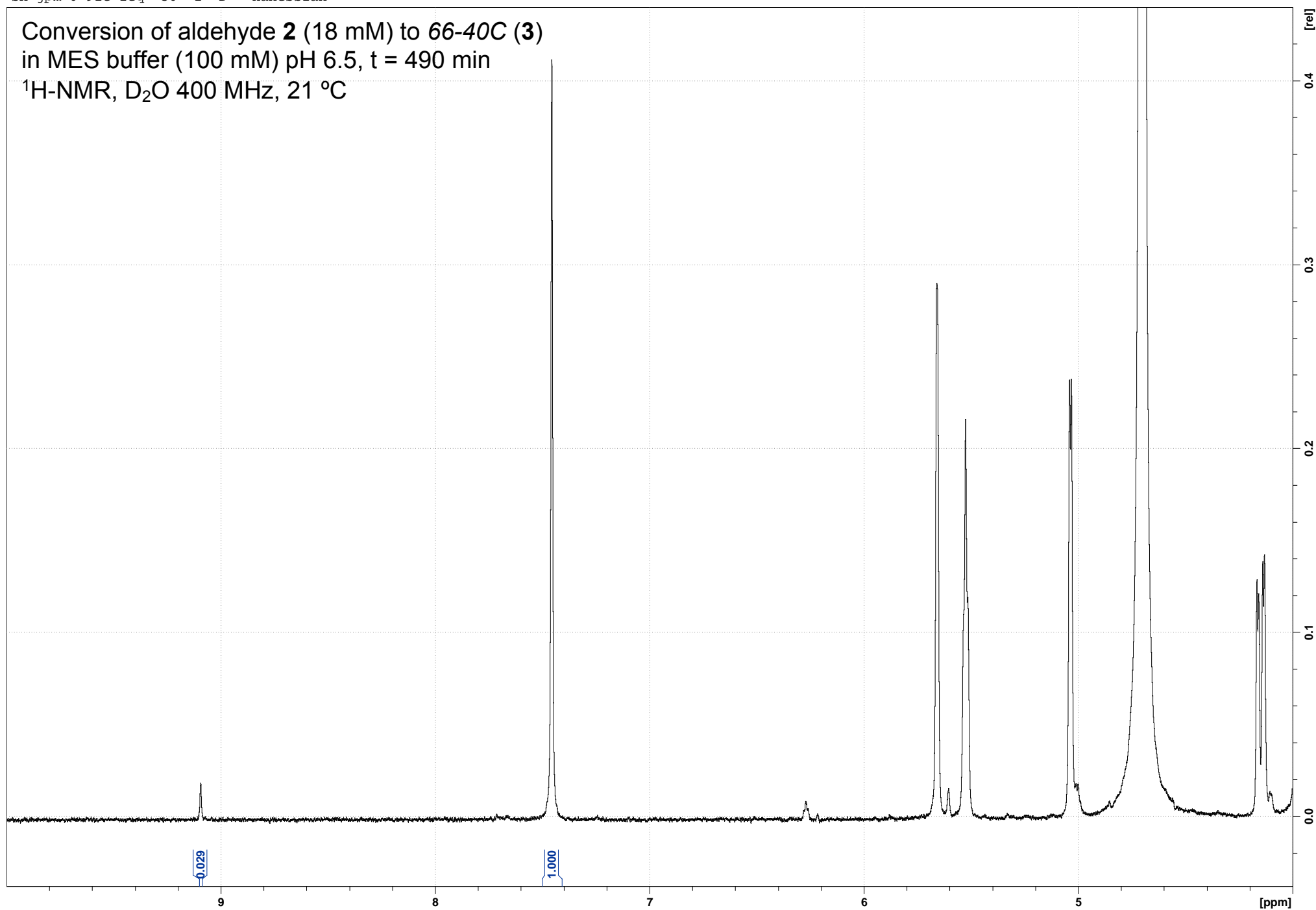
sh-jpm-6-91C-2eq 49 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 480 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



sh-jpm-6-91C-2eq 50 1 D: Hanessian

Conversion of aldehyde **2** (18 mM) to **66-40C** (**3**)  
in MES buffer (100 mM) pH 6.5, t = 490 min  
<sup>1</sup>H-NMR, D<sub>2</sub>O 400 MHz, 21 °C



**Statistics**

	ph 5	ph 5.5
Number of Points	20	16
Degrees of Freedom	17	13
Reduced Chi-Sqr	0.07614	0.25993
Residual Sum of Squares	1.29444	3.37904
Adj. R-Square	0.99923	0.99779
Fit Status	Succeeded(100)	Succeeded(100)

Fit Status Code :  
 100 : Fit converged

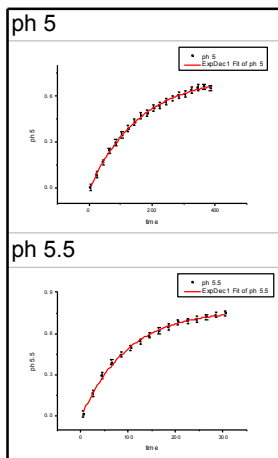
**Summary**

	y0		A1		t1		Statistics	
	Value	Error	Value	Error	Value	Error	Reduced Chi-Sqr	Adj. R-Square
ph 5	0.72763	0.00606	-0.74407	0.0054	157.2201	3.52591	0.07614	0.99923
ph 5.5	0.76993	0.00836	-0.77965	0.00952	96.93198	3.49225	0.25993	0.99779

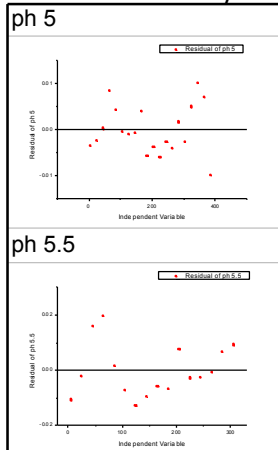
**ANOVA**

		DF	Sum of Squares	Mean Square	F Value	Prob>F
ph 5	Regression	3	3.502	1.16733	15.33064	1.56461E-4
	Residual	17	1.29444	0.07614		
	Uncorrected Total	20	4.79644			
	Corrected Total	19	1883.03048			
ph 5.5	Regression	3	1.83589	0.61196	2.35438	0.13409
	Residual	13	3.37904	0.25993		
	Uncorrected Total	16	5.21493			
	Corrected Total	15	1765.34247			

**Fitted Curves Plot**



**Residual vs. Independent Plot**



### Statistics

	ph6	ph6.5
Number of Points	14	9
Degrees of Freedom	11	6
Reduced Chi-Sqr	0.11837	0.27878
Residual Sum of Squares	1.30202	1.67266
Adj. R-Square	0.99887	0.99764
Fit Status	Succeeded(100)	Succeeded(100)

Fit Status Code :  
 100 : Fit converged

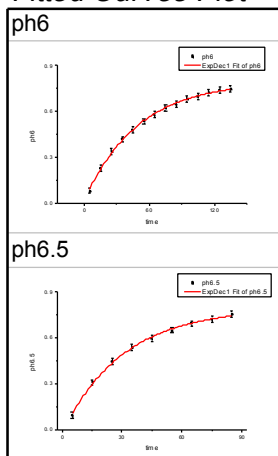
### Summary

	y0		A1		t1		Statistics	
	Value	Error	Value	Error	Value	Error	Reduced Chi-Sqr	Adj. R-Square
ph6	0.79608	0.00764	-0.77521	0.00738	49.43911	1.51717	0.11837	0.99887
ph6.5	0.79663	0.01412	-0.81148	0.01403	30.69494	1.73378	0.27878	0.99764

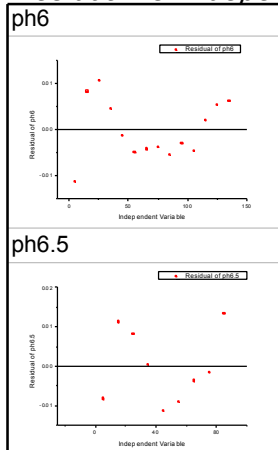
### ANOVA

		DF	Sum of Squares	Mean Square	F Value	Prob>F
ph6	Regression	3	3.30837	1.10279	9.31684	0.00429
	Residual	11	1.30202	0.11837		
	Uncorrected Total	14	4.61039			
	Corrected Total	13	1361.96162			
ph6.5	Regression	3	1.28927	0.42976	1.54159	0.28823
	Residual	6	1.67266	0.27878		
	Uncorrected Total	9	2.96193			
	Corrected Total	8	946.01406			

### Fitted Curves Plot



### Residual vs. Independent Plot





### Statistics

	ph7	ph7.5
Number of Points	8	6
Degrees of Freedom	5	3
Reduced Chi-Sqr	0.73877	0.39704
Residual Sum of Squares	3.69387	1.19111
Adj. R-Square	0.99324	0.99448
Fit Status	Succeeded(100)	Succeeded(100)

Fit Status Code :  
 100 : Fit converged

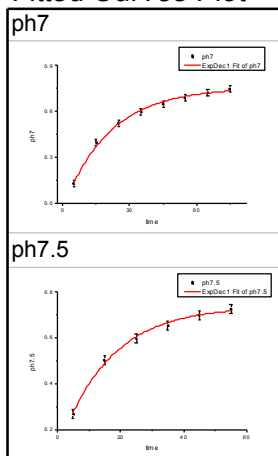
### Summary

	y0		A1		t1		Statistics	
	Value	Error	Value	Error	Value	Error	Reduced Chi-Sqr	Adj. R-Square
ph7	0.75687	0.01685	-0.78555	0.02589	20.94651	1.86693	0.73877	0.99324
ph7.5	0.73863	0.01503	-0.63516	0.02303	15.92844	1.60235	0.39704	0.99448

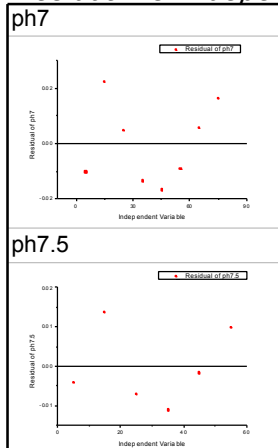
### ANOVA

		DF	Sum of Squares	Mean Square	F Value	Prob>F
ph7	Regression	3	-0.90063	-0.30021	-0.40636	1
	Residual	5	3.69387	0.73877		
	Uncorrected Total	8	2.79324			
	Corrected Total	7	764.71594			
ph7.5	Regression	3	0.94752	0.31584	0.79549	0.52823
	Residual	3	1.19111	0.39704		
	Uncorrected Total	6	2.13863			
	Corrected Total	5	359.71781			

### Fitted Curves Plot



### Residual vs. Independent Plot



**Statistics**

	ph8	ph9
Number of Points	6	6
Degrees of Freedom	3	3
Reduced Chi-Sqr	0.64376	0.74896
Residual Sum of Squares	1.93127	2.24687
Adj. R-Square	0.99201	0.97486
Fit Status	Succeeded(100)	Succeeded(100)

Fit Status Code :  
 100 : Fit converged

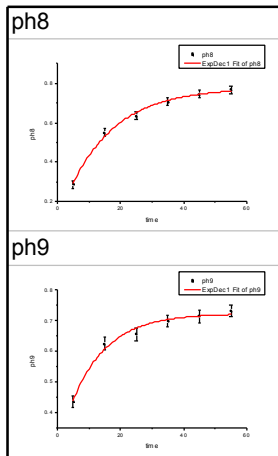
**Summary**

	y0		A1		t1		Statistics	
	Value	Error	Value	Error	Value	Error	Reduced Chi-Sqr	Adj. R-Square
ph8	0.77664	0.01732	-0.68074	0.03124	14.7221	1.72649	0.64376	0.99201
ph9	0.72394	0.01398	-0.44399	0.04442	11.17851	2.18625	0.74896	0.97486

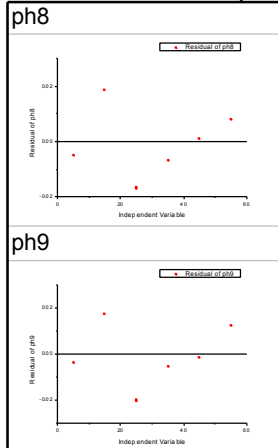
**ANOVA**

		DF	Sum of Squares	Mean Square	F Value	Prob>F
ph8	Regression	3	0.50341	0.1678	0.26066	0.78636
	Residual	3	1.93127	0.64376		
	Uncorrected Total	6	2.43468			
	Corrected Total	5	403.07296			
ph9	Regression	3	0.30334	0.10111	0.135	0.87874
	Residual	3	2.24687	0.74896		
	Uncorrected Total	6	2.55021			
	Corrected Total	5	148.9513			

**Fitted Curves Plot**



**Residual vs. Independent Plot**



**Statistics**

	ph10	extended dimer
Number of Points	4	26
Degrees of Freedom	1	23
Reduced Chi-Sqr	0.08305	0.14663
Residual Sum of Squares	0.08305	3.37259
Adj. R-Square	0.9979	0.99852
Fit Status	Succeeded(100)	Succeeded(100)

Fit Status Code :  
 100 : Fit converged

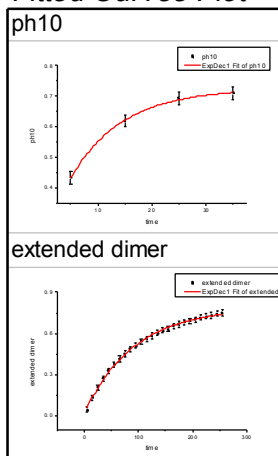
**Summary**

	y0		A1		t1		Statistics	
	Value	Error	Value	Error	Value	Error	Reduced Chi-Sqr	Adj. R-Square
ph10	0.72583	0.00835	-0.48719	0.01832	9.69042	0.87538	0.08305	0.9979
extended dimer	0.78729	0.0062	-0.76376	0.00603	92.01787	2.30886	0.14663	0.99852

**ANOVA**

		DF	Sum of Squares	Mean Square	F Value	Prob>F
ph10	Regression	3	1.47585	0.49195	5.92349	0.279
	Residual	1	0.08305	0.08305		
	Uncorrected Total	4	1.5589			
	Corrected Total	3	118.70634			
extended dimer	Regression	3	5.00847	1.66949	11.3854	3.6568E-4
	Residual	23	3.37259	0.14663		
	Uncorrected Total	26	8.38105			
	Corrected Total	25	2477.49124			

**Fitted Curves Plot**



**Residual vs. Independent Plot**

