

Facile functionalization at the C4 position of pyrimidine nucleosides *via* amide group activation with (benzotriazol-1-yloxy)tris(dimethylamino)phosphonium hexafluorophosphate (BOP) and biological evaluations of the products

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Jan Balzarini, Lijia Yang and Mahesh K. Lakshman*

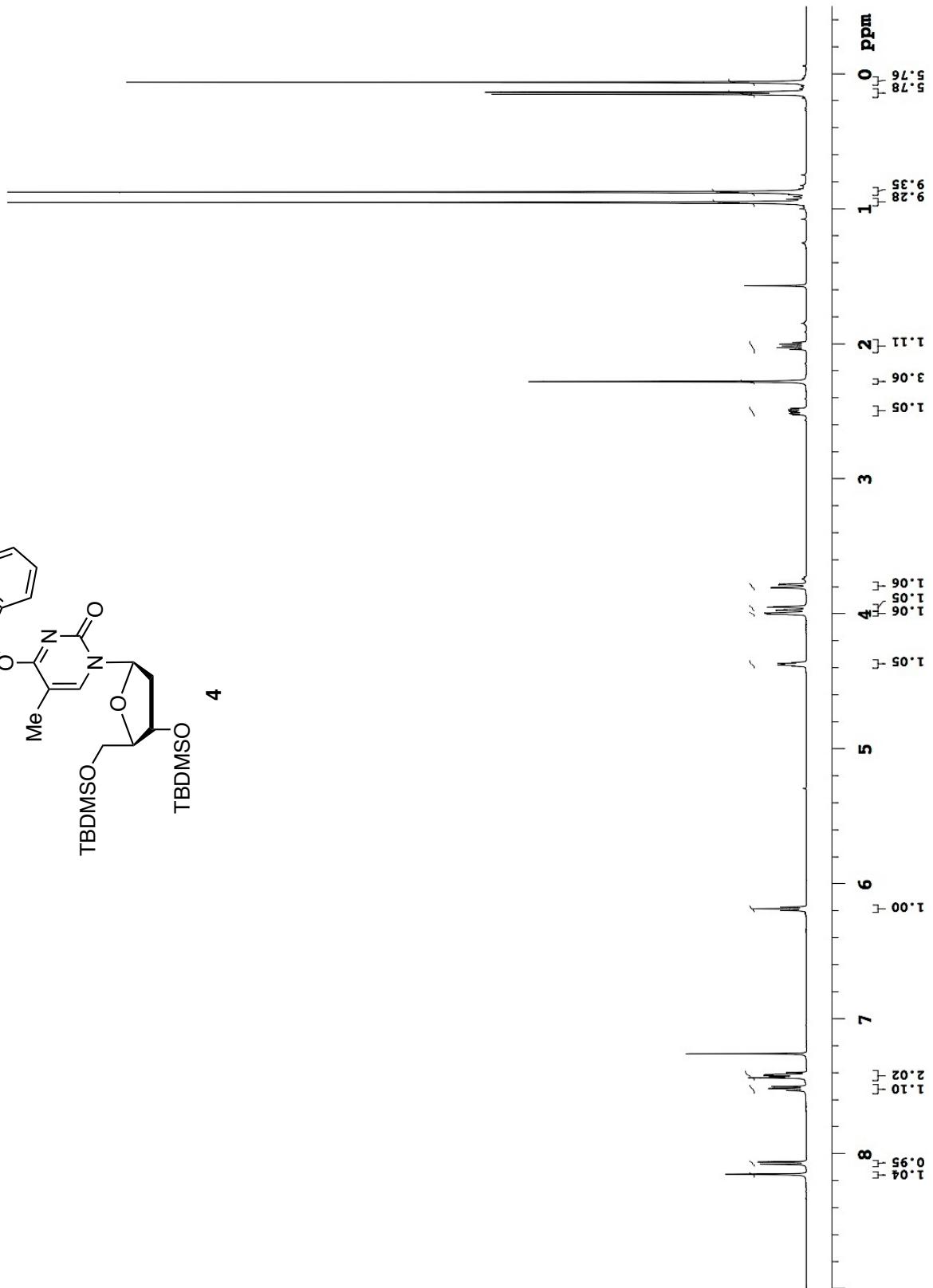
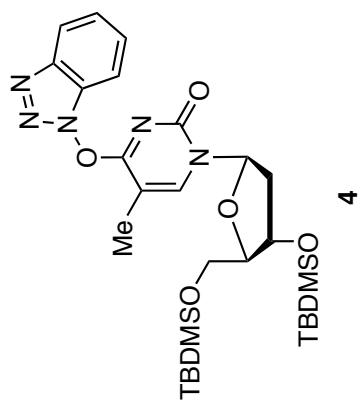
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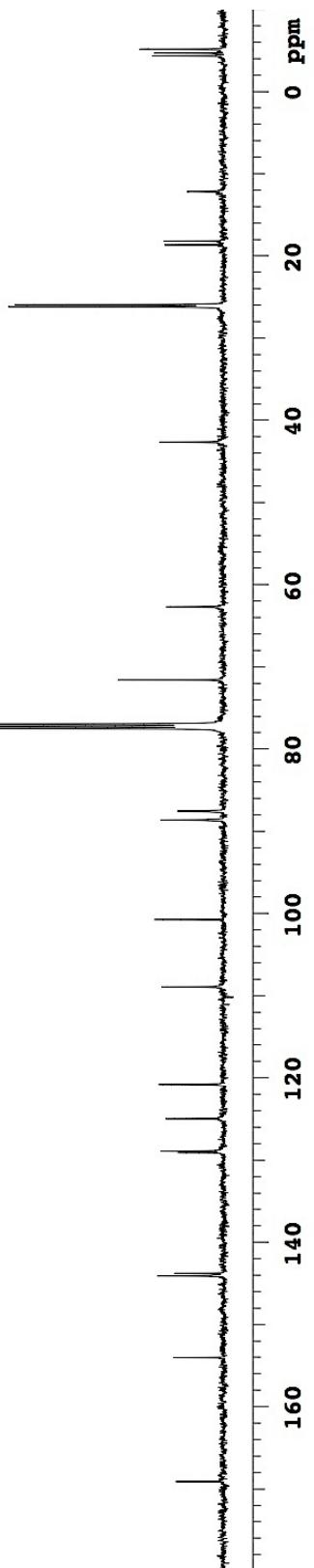
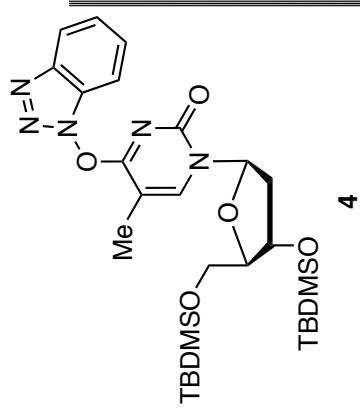
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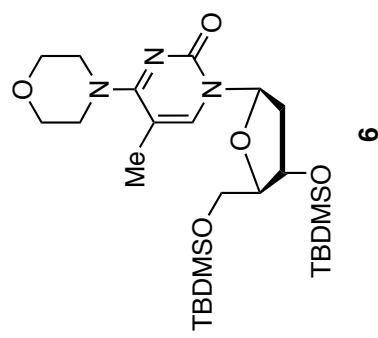
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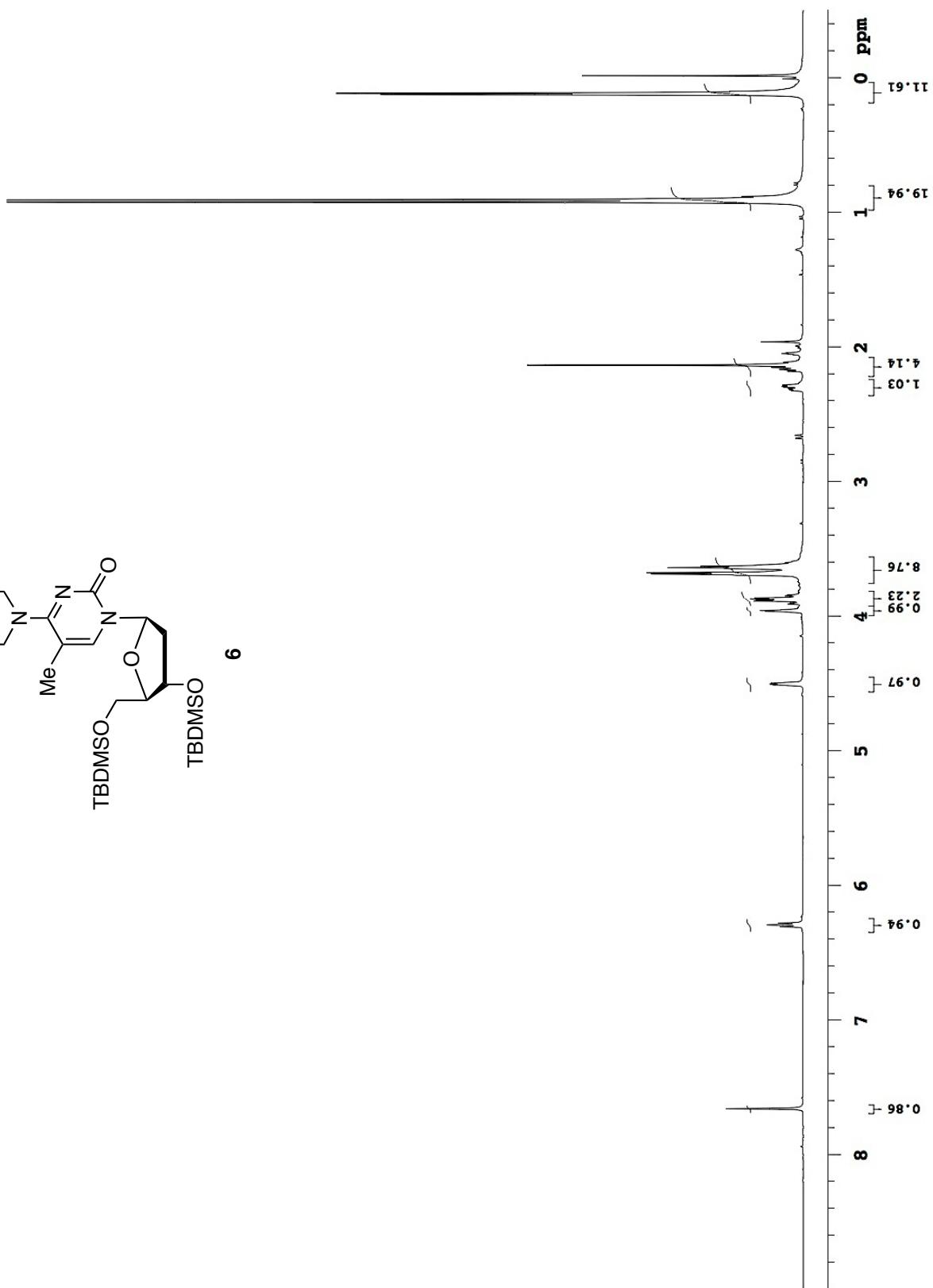
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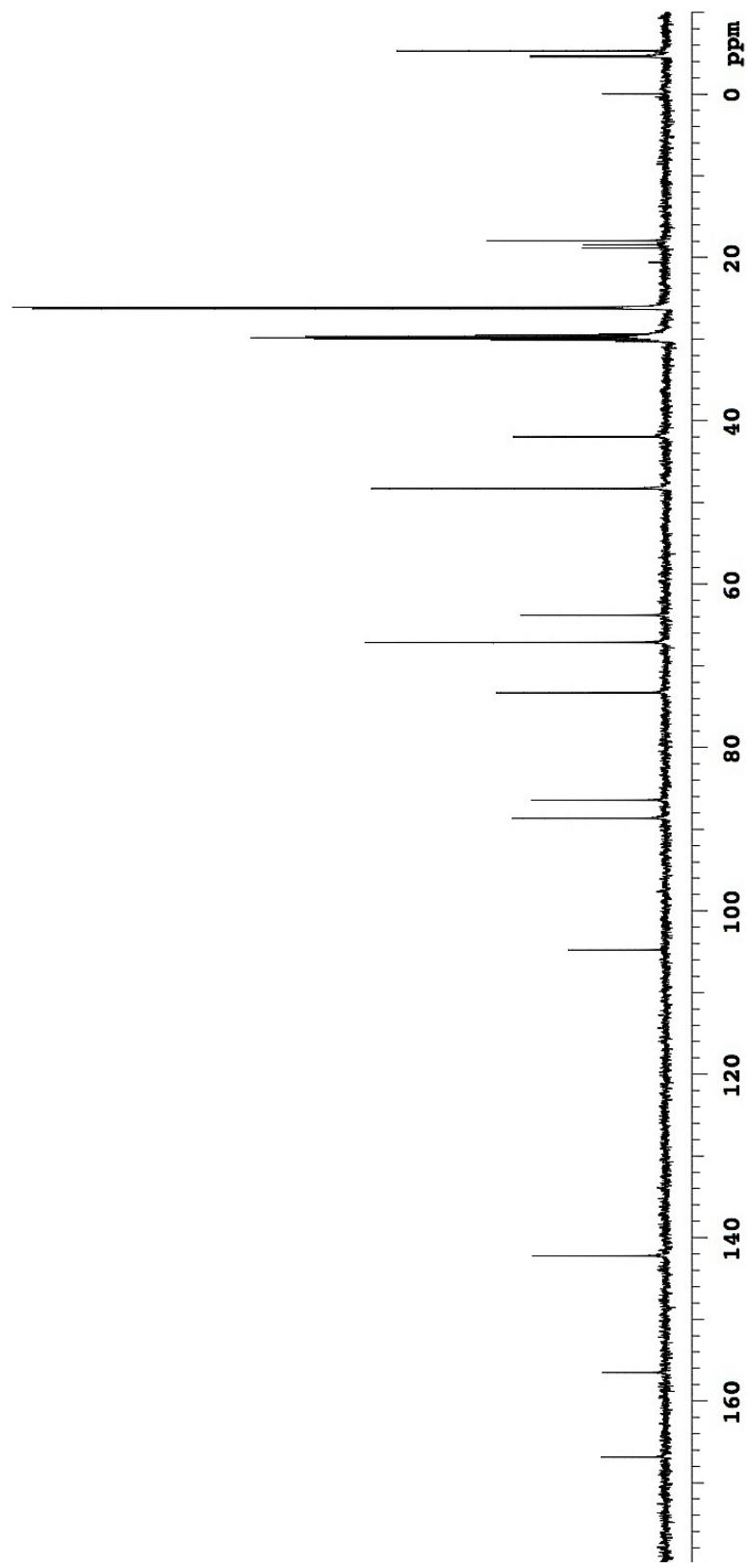
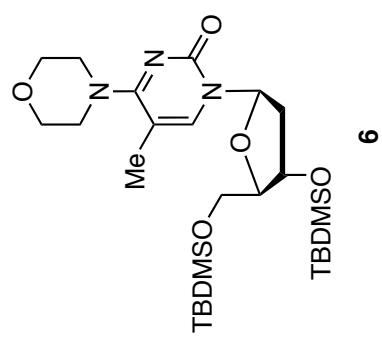


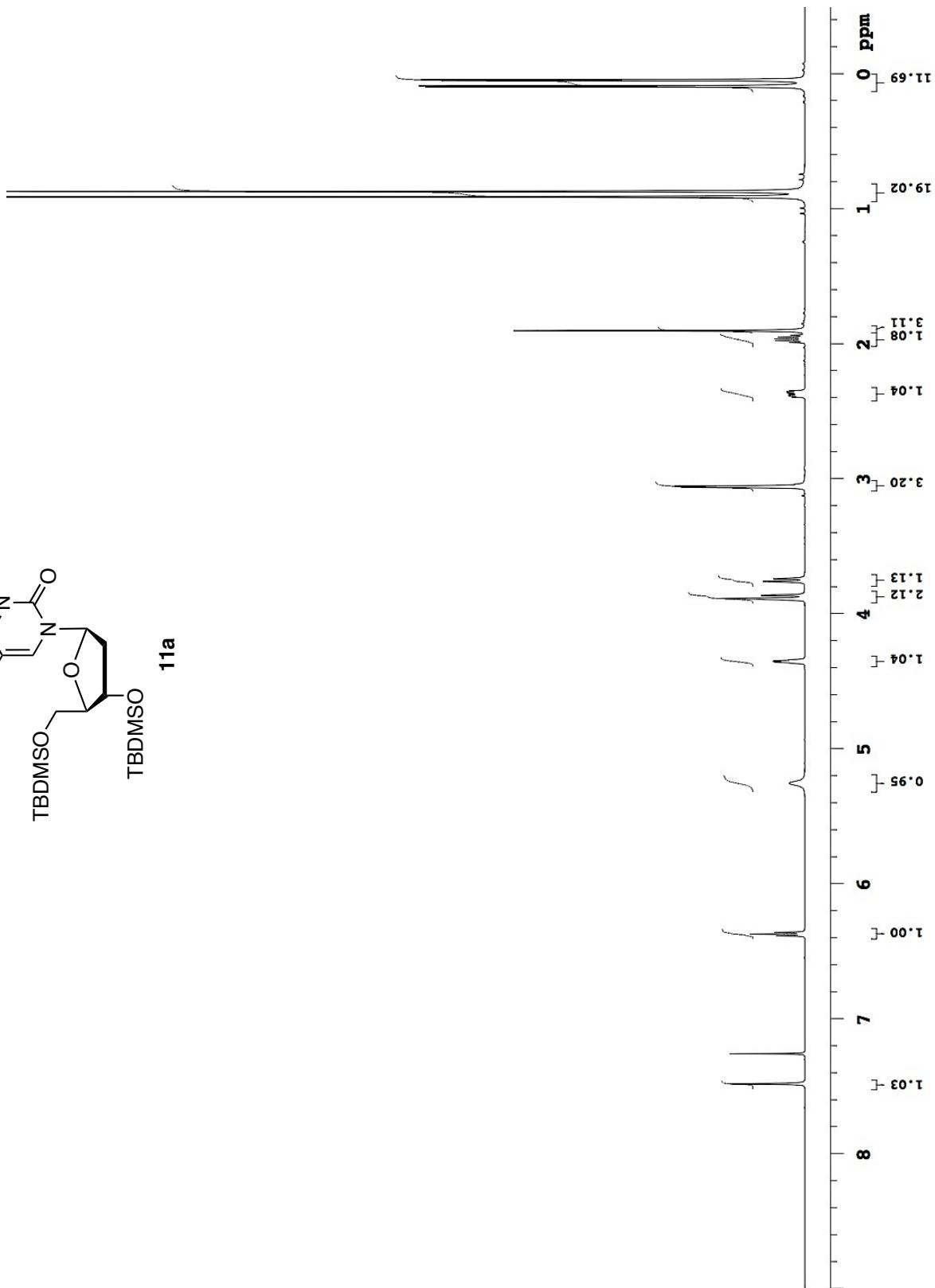
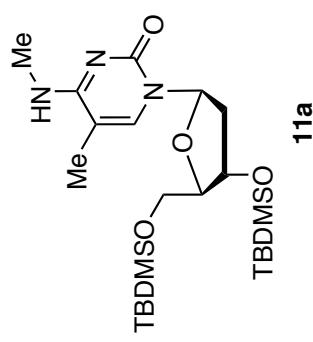


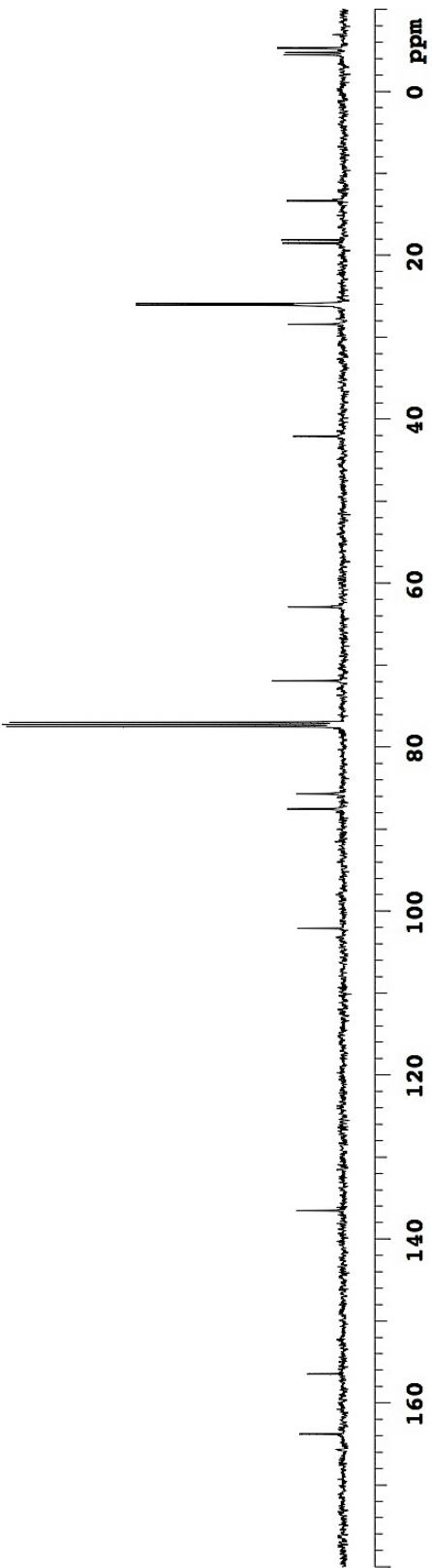
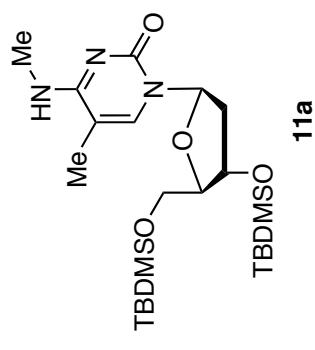


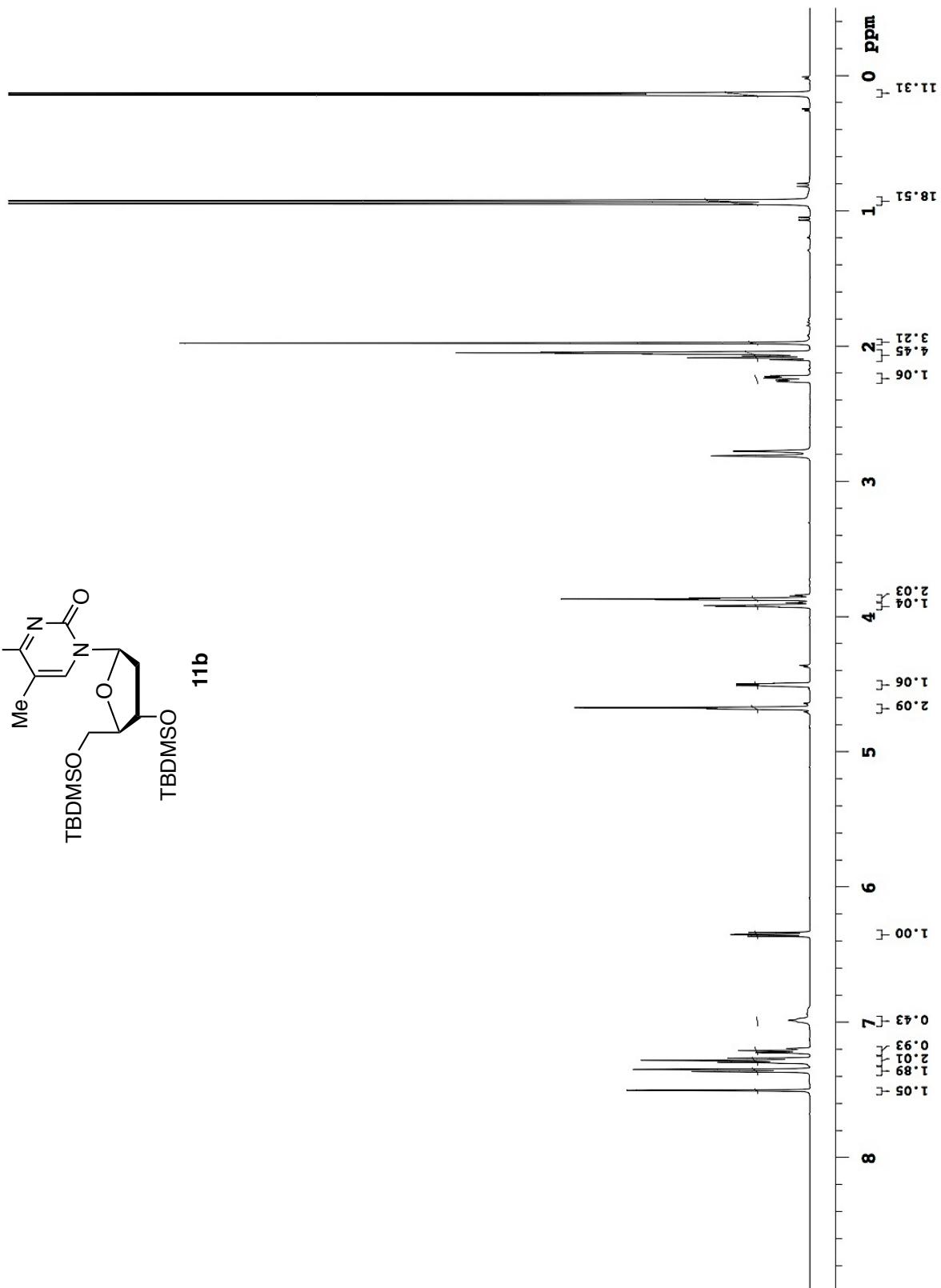
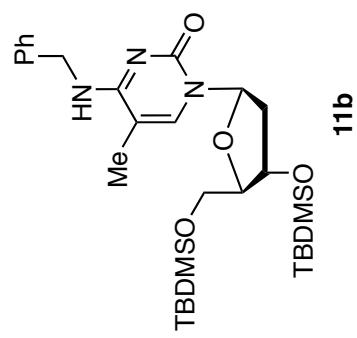
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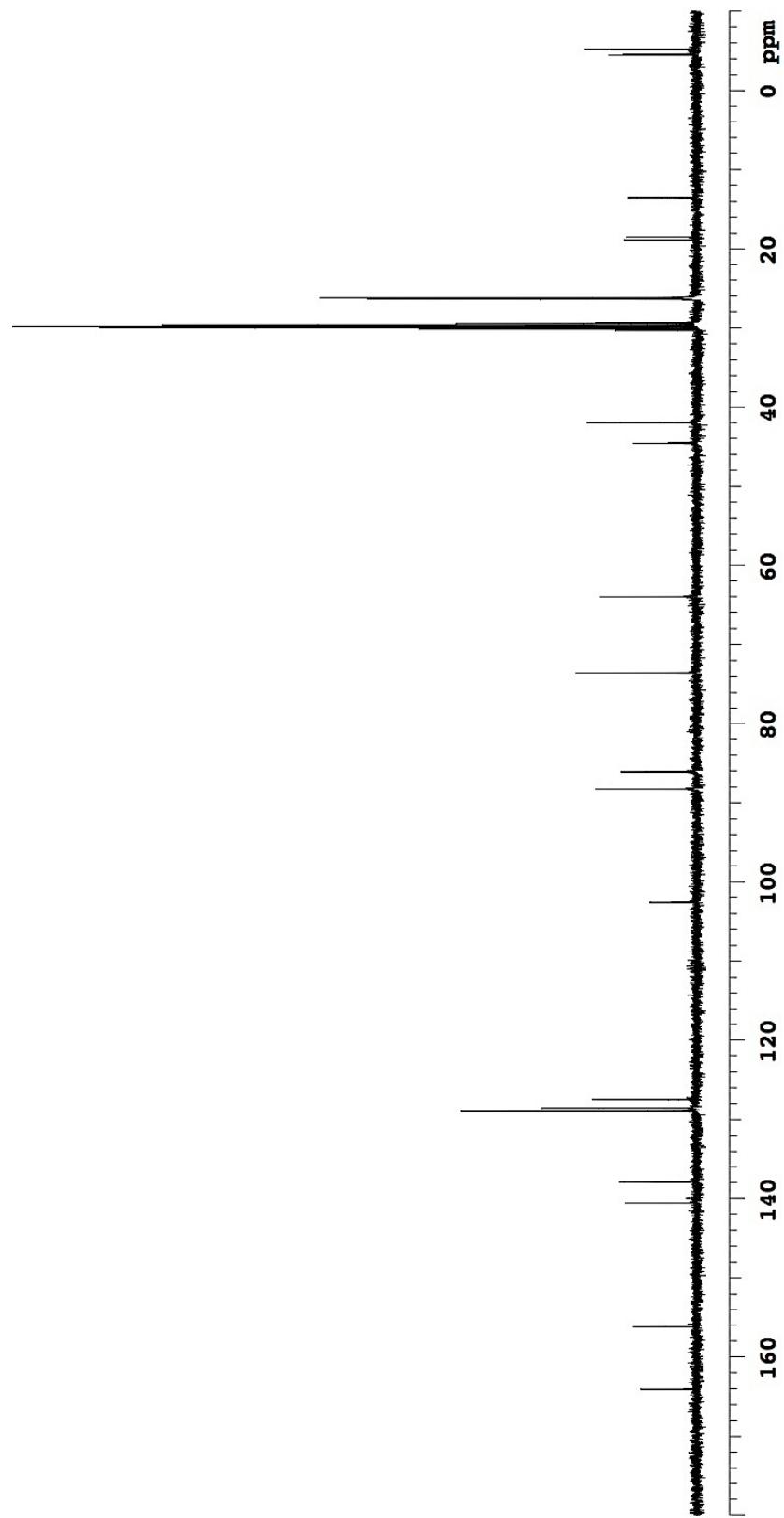
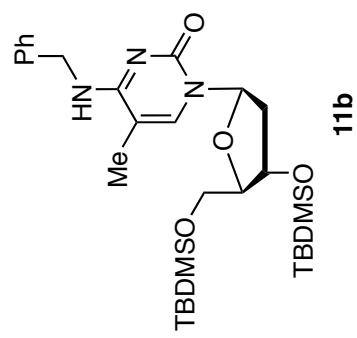




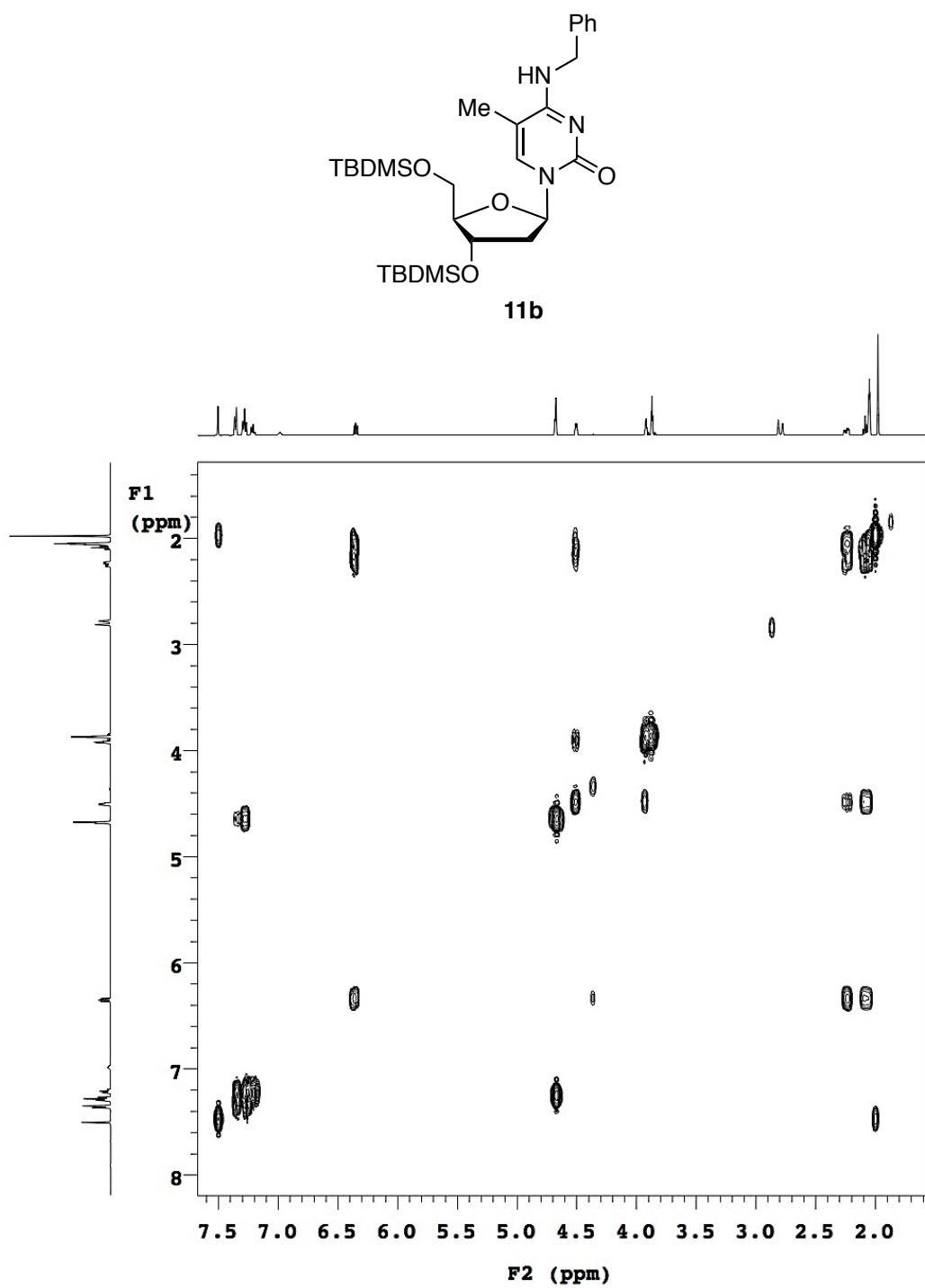


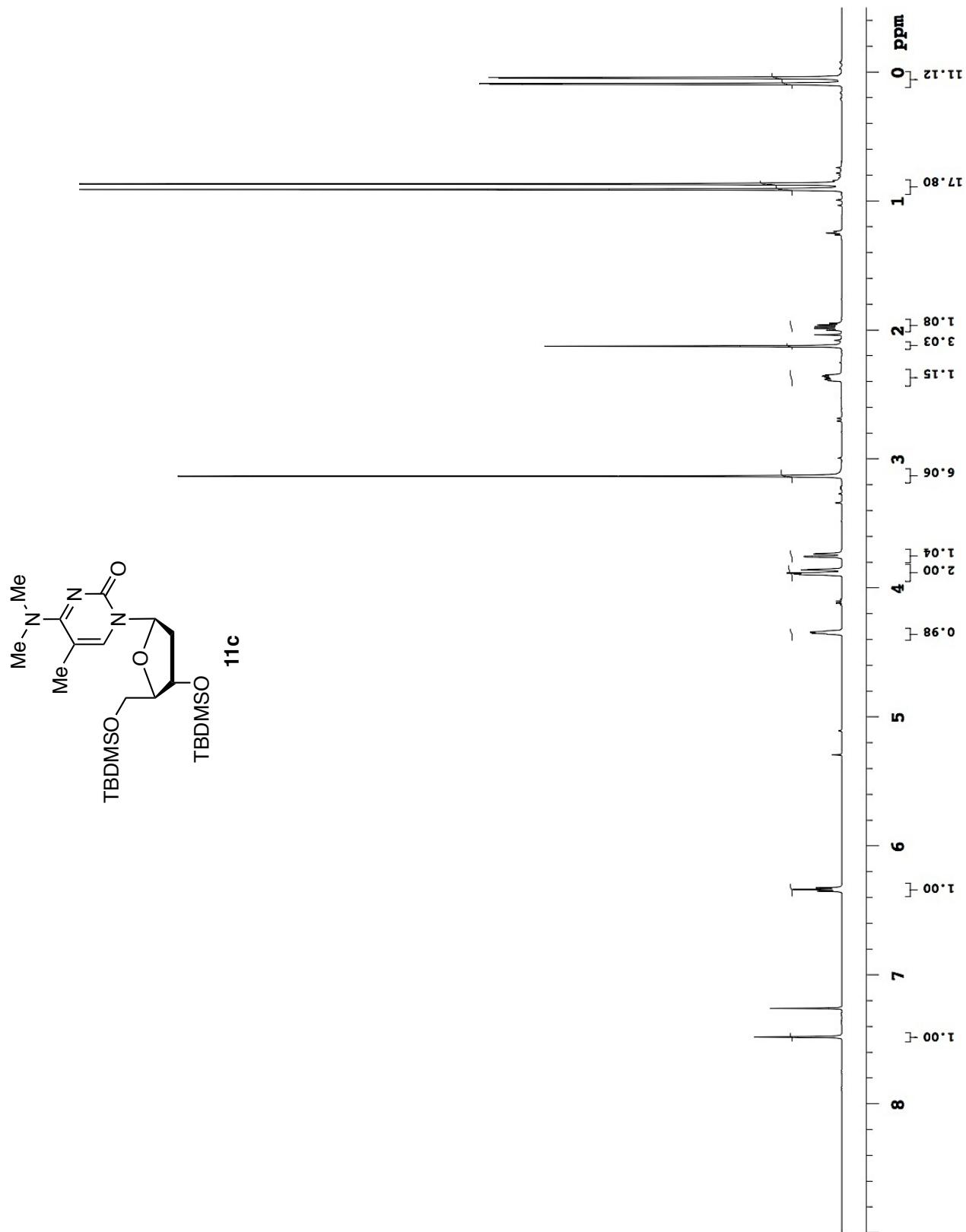


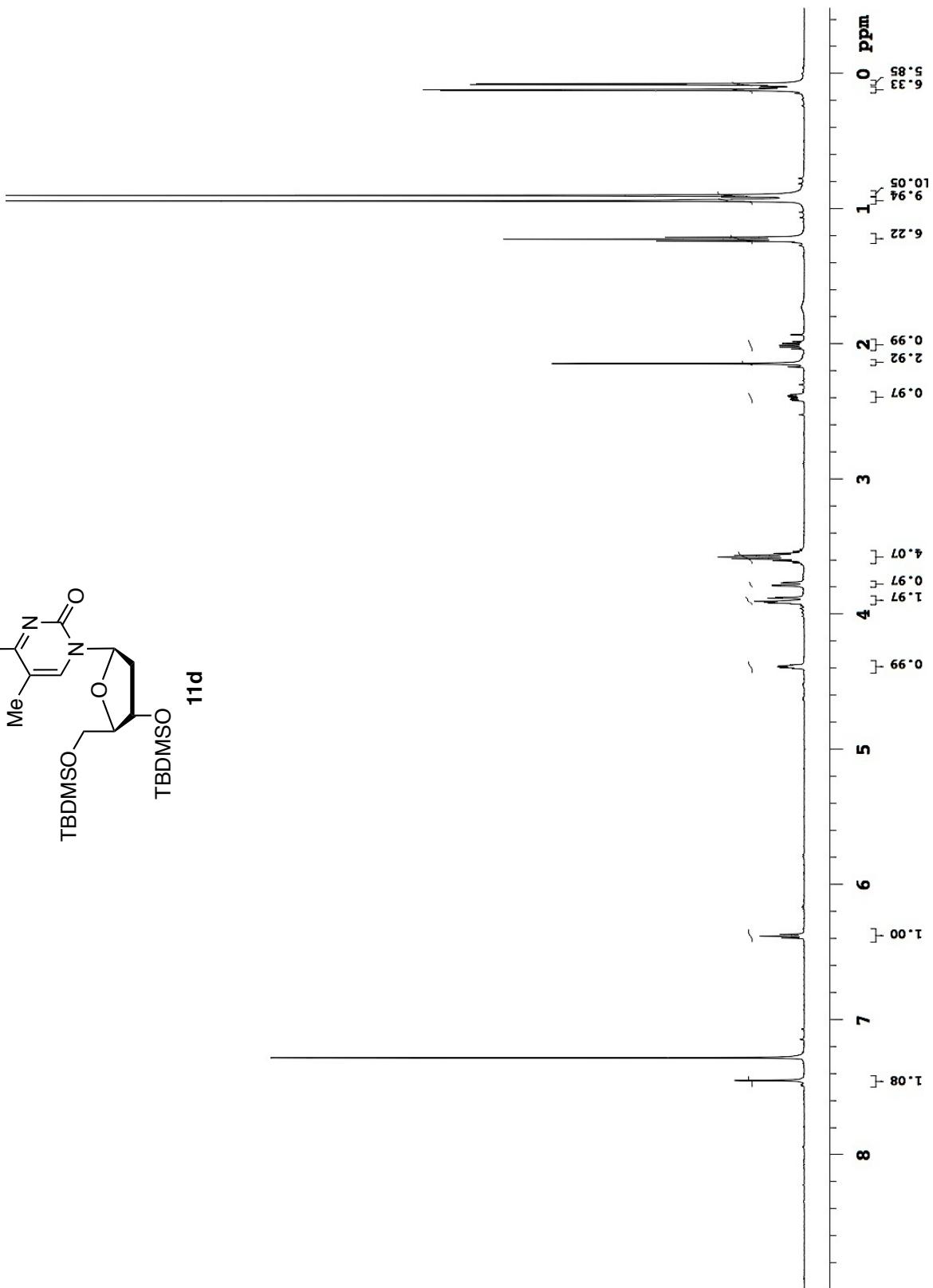
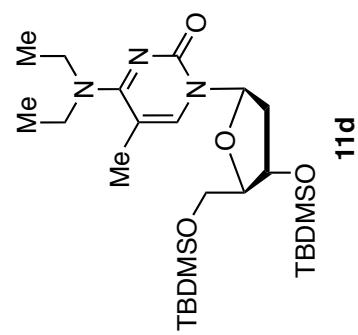


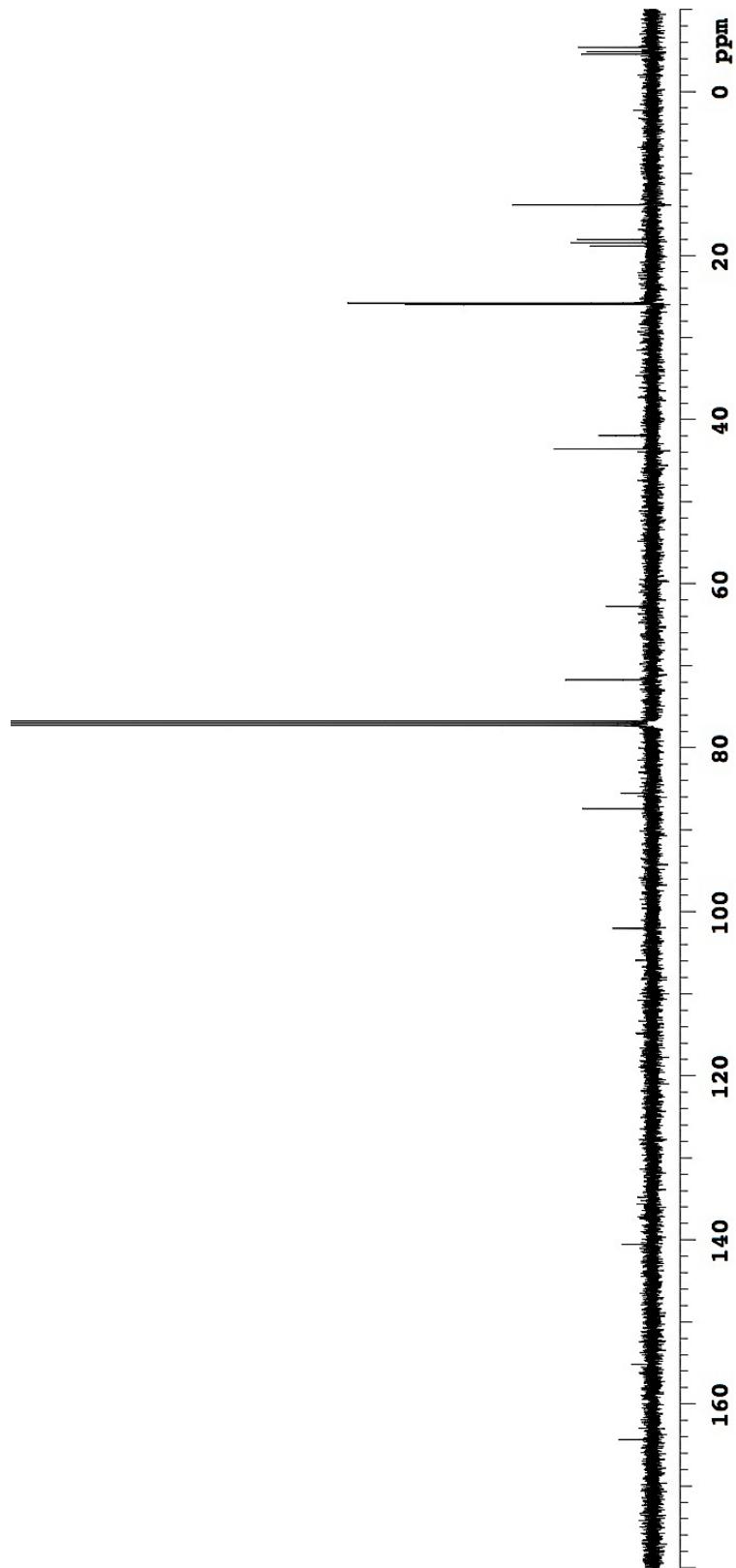
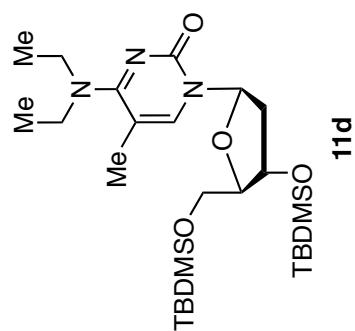


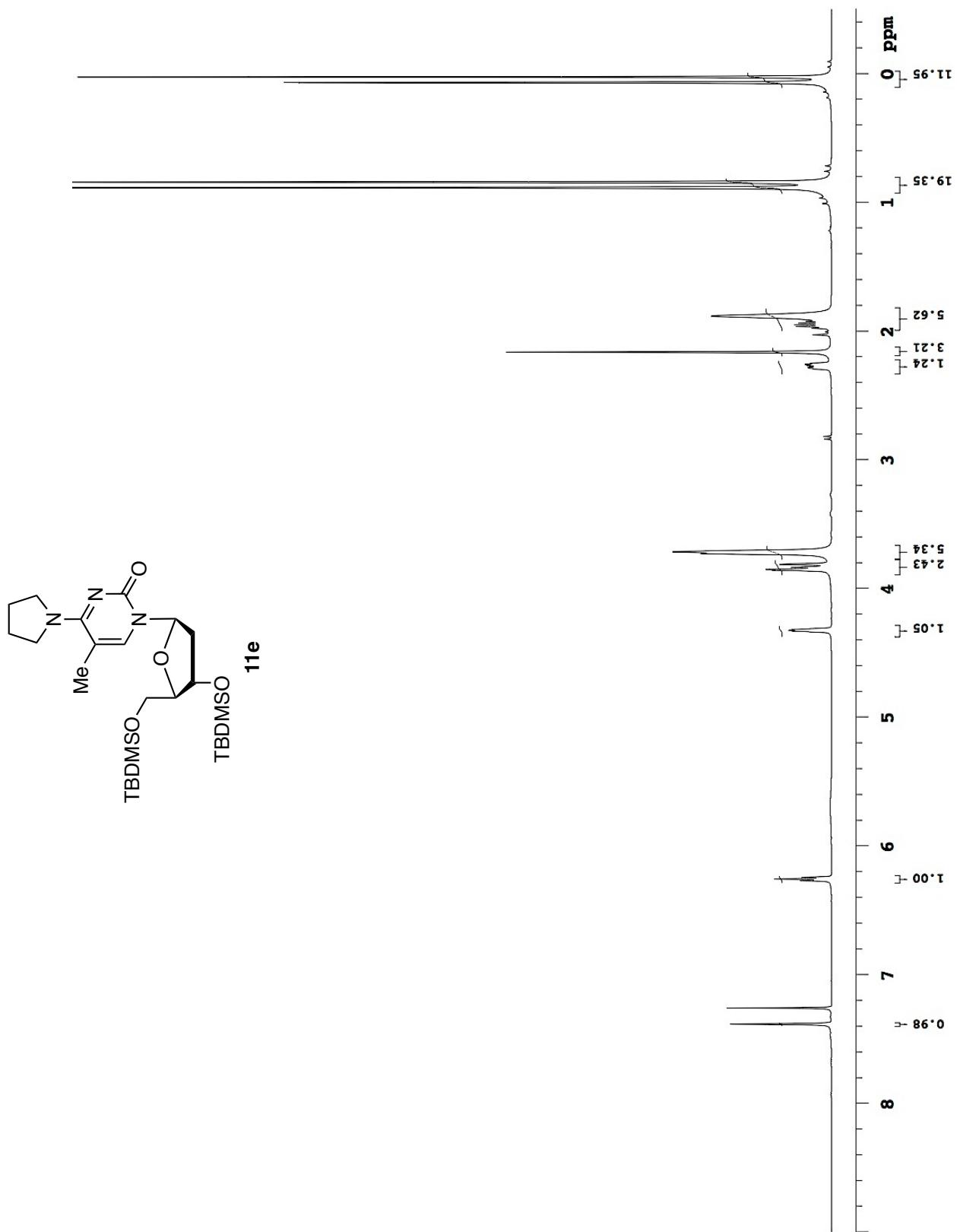
gCOSY spectrum of compound **11b** in acetone-*d*₆

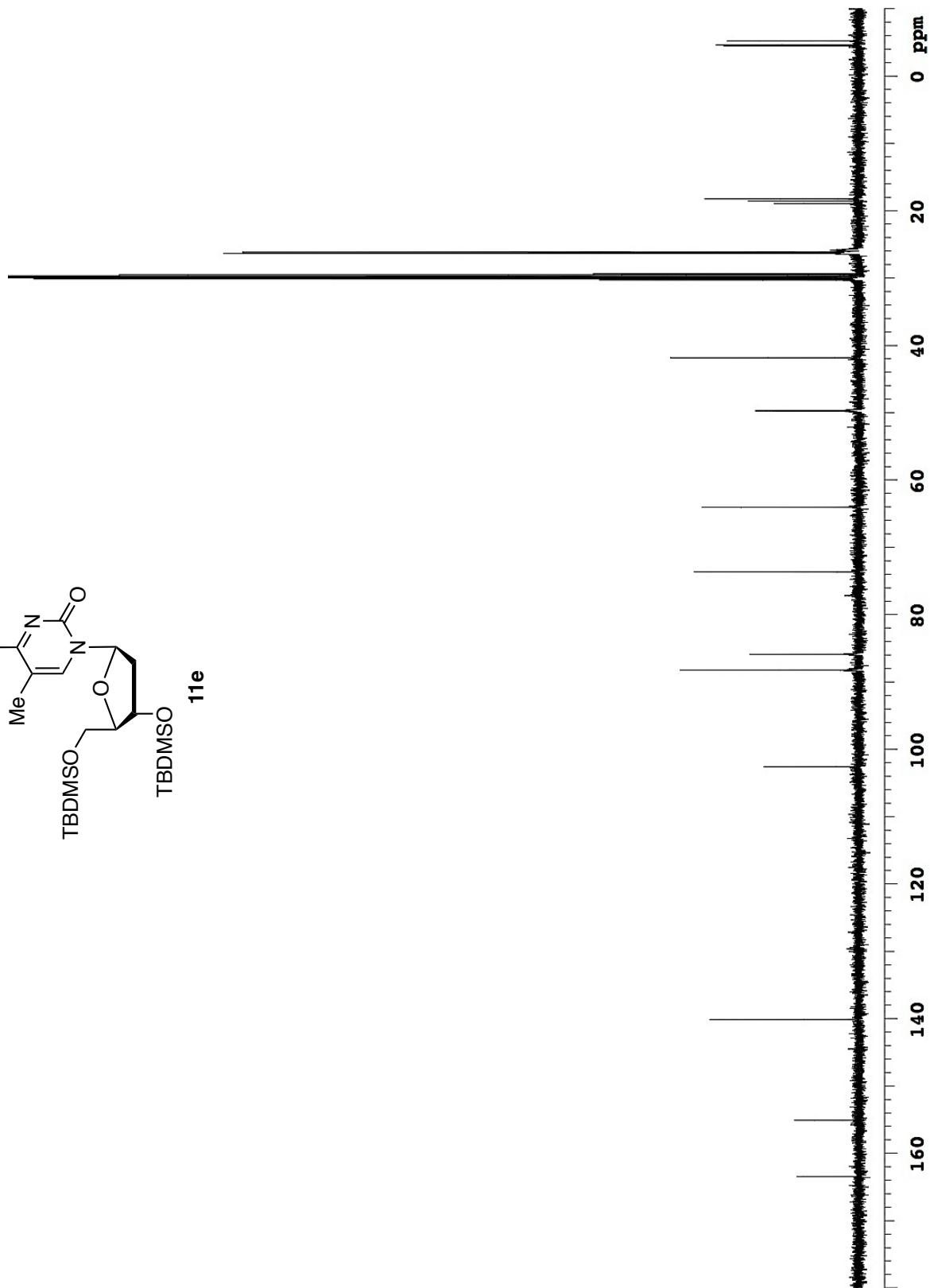
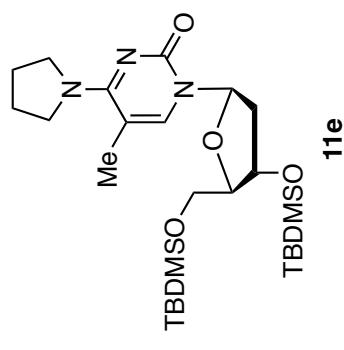


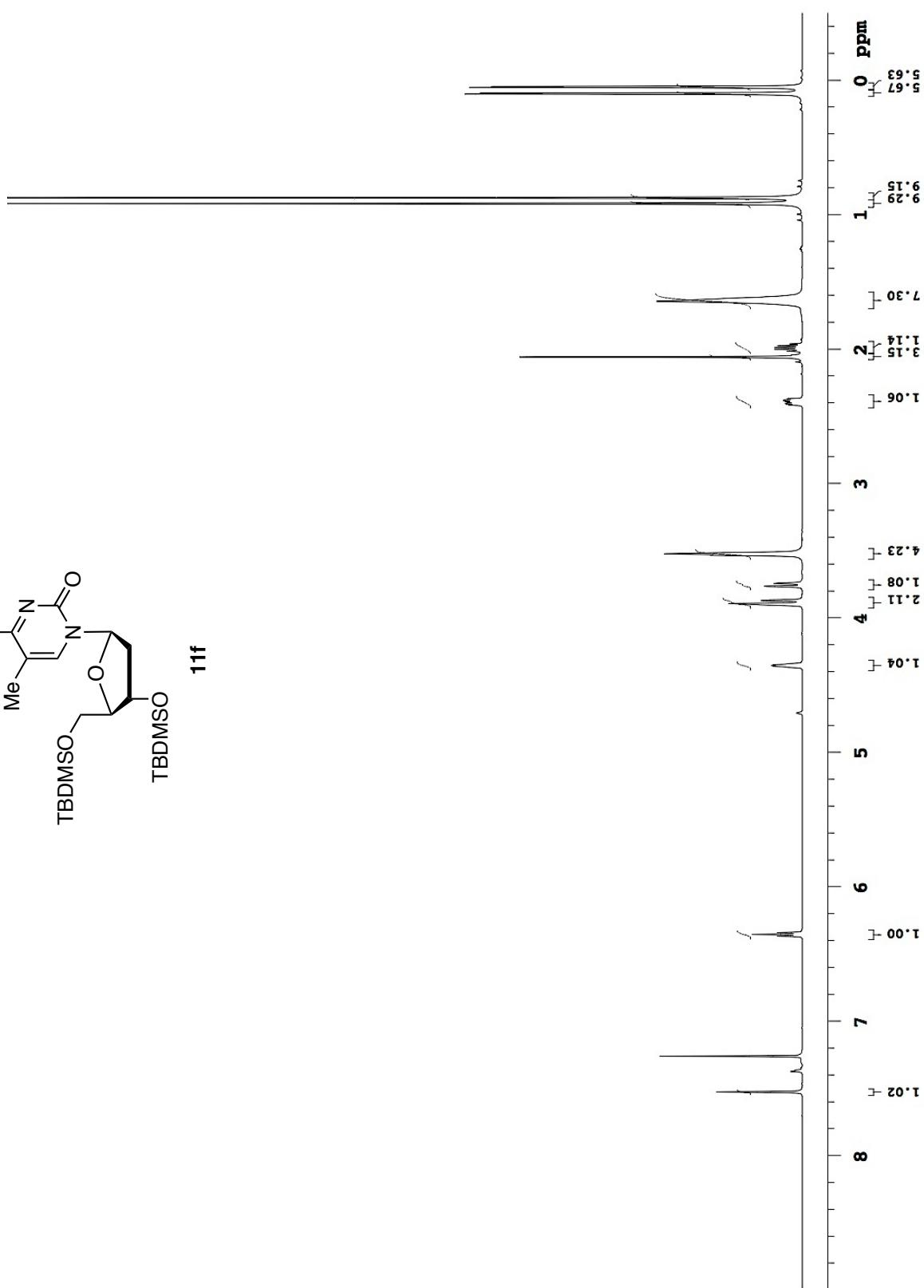
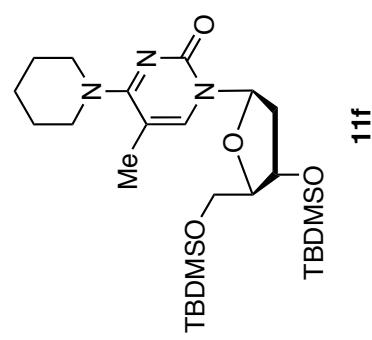


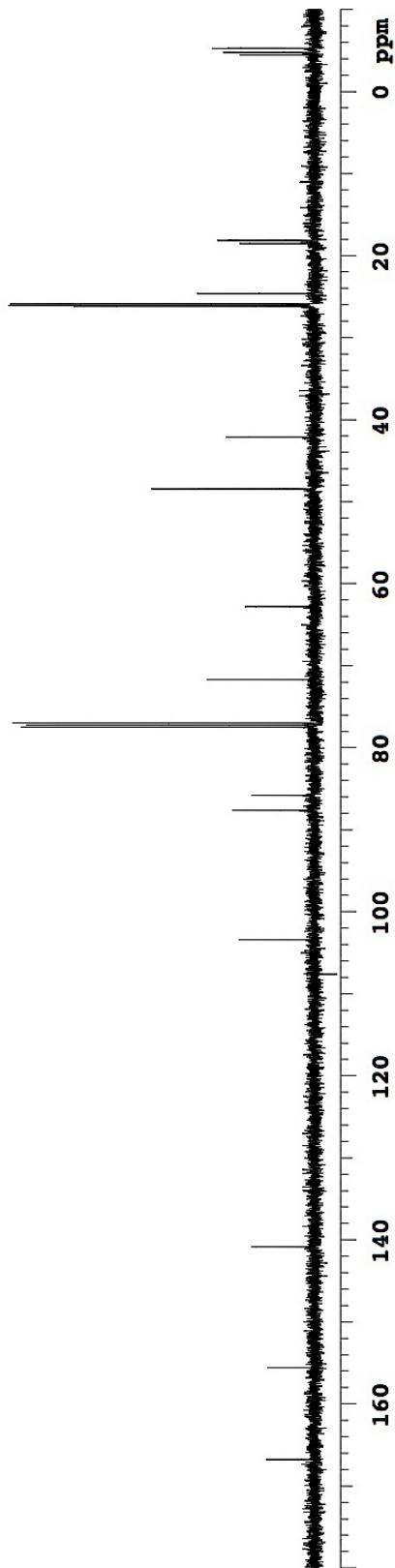
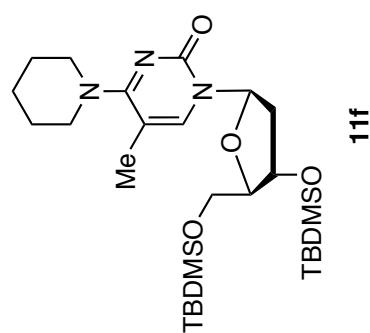




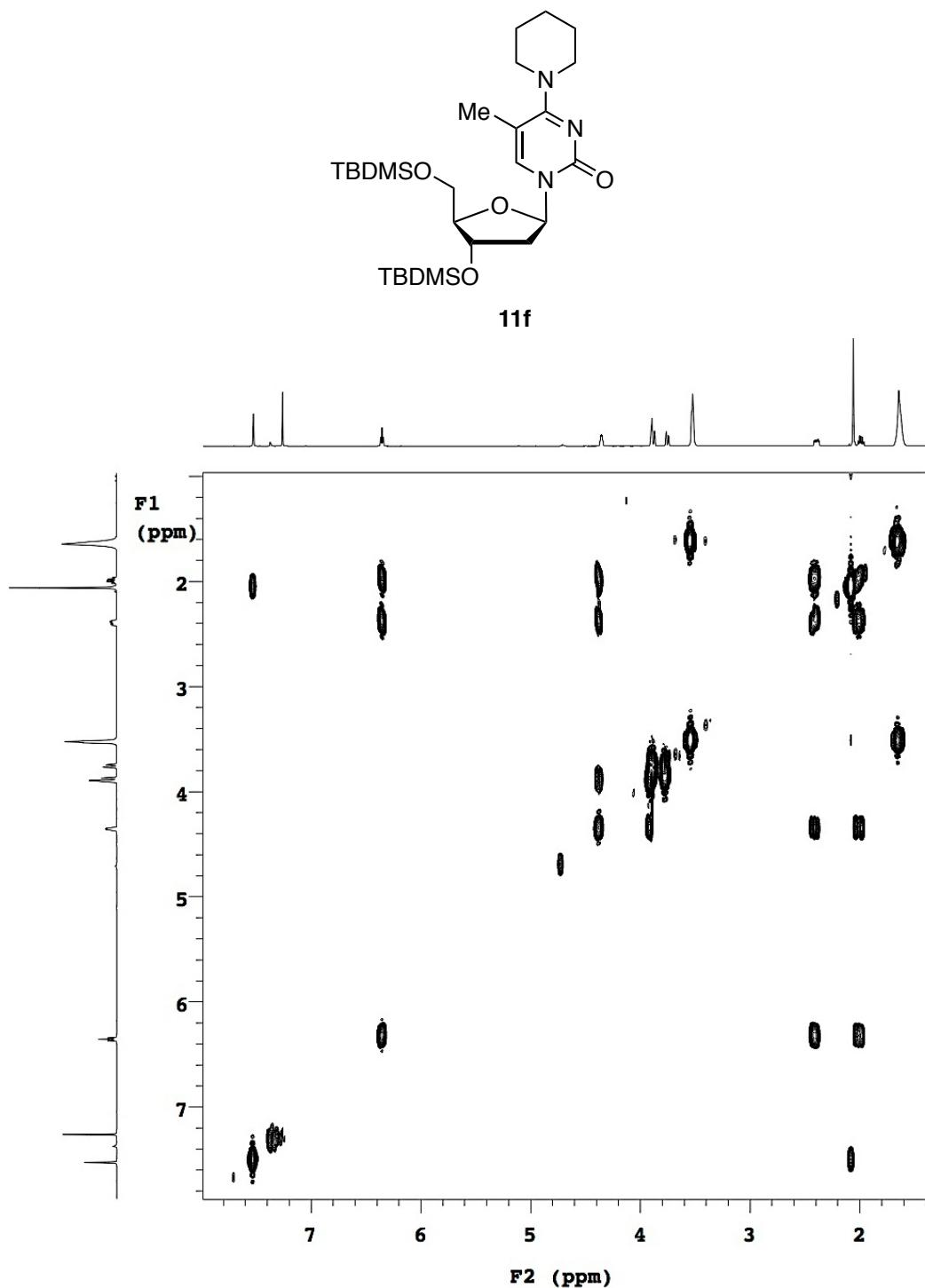


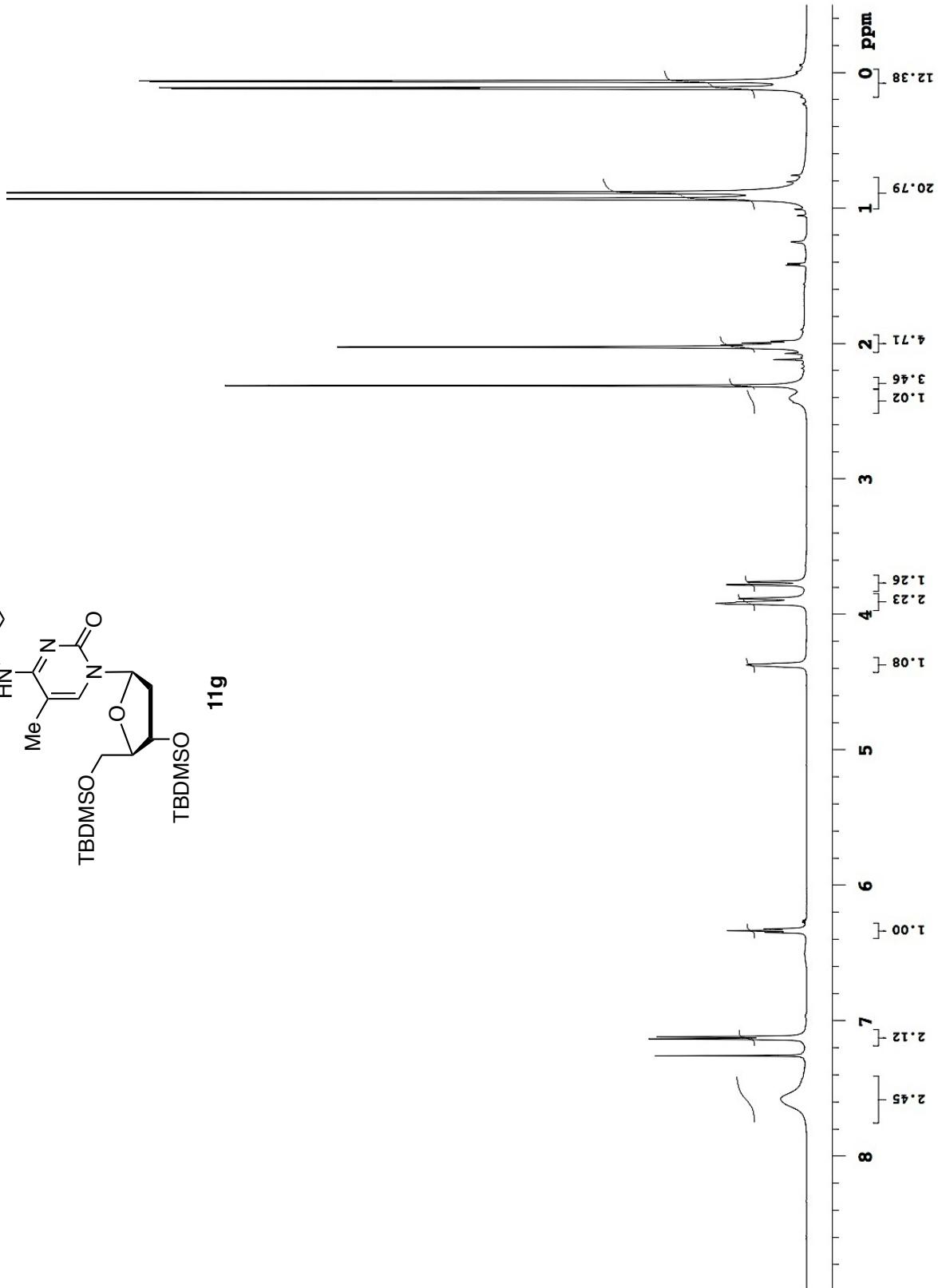
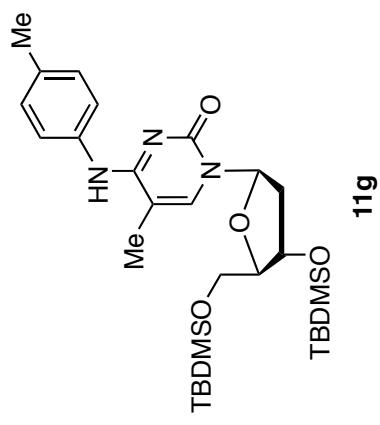


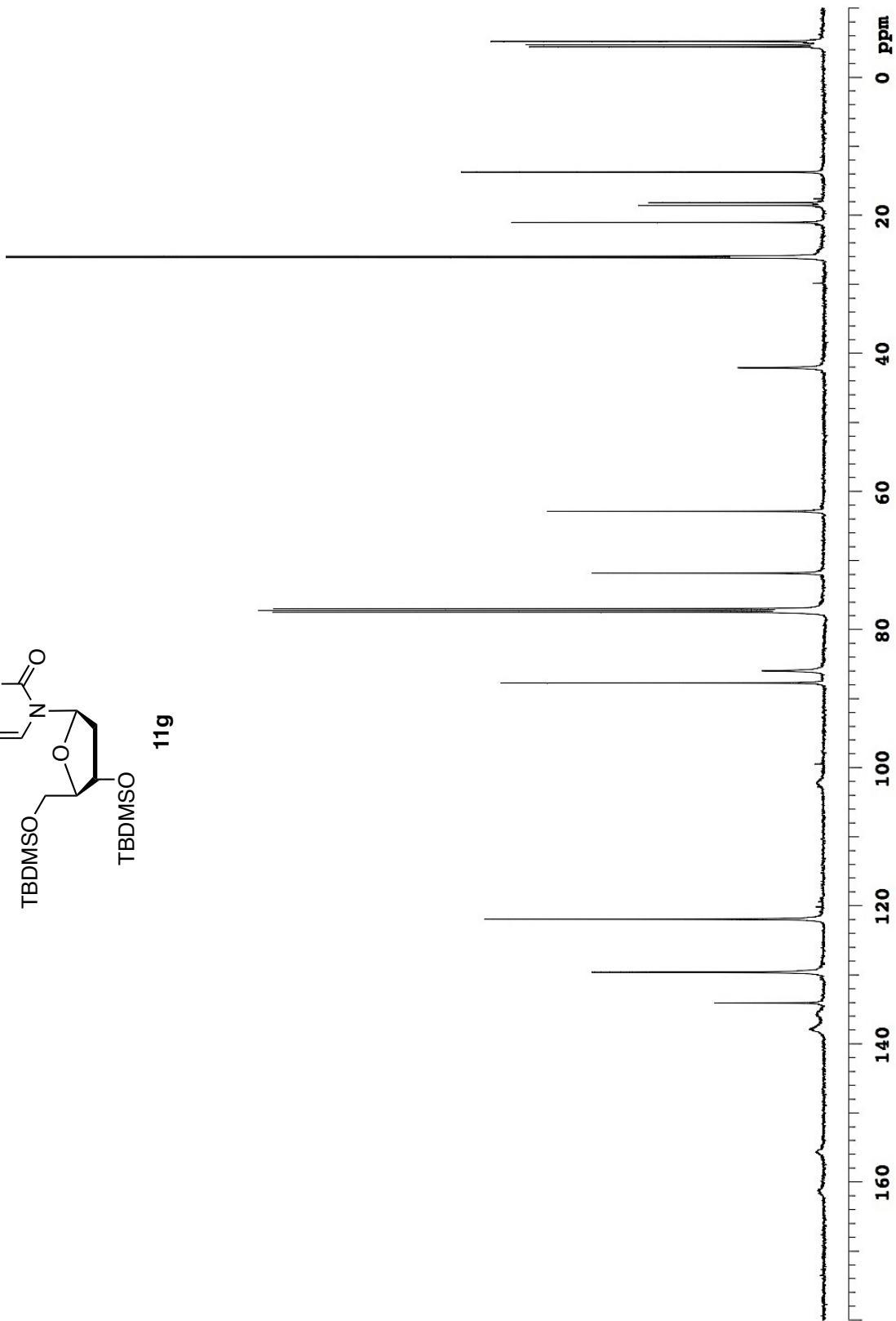
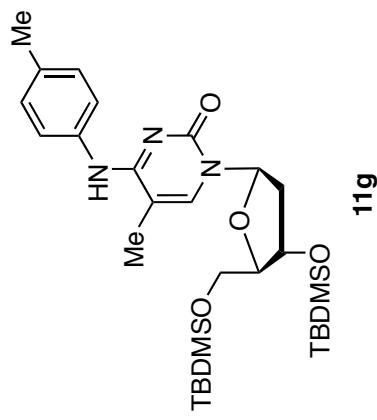




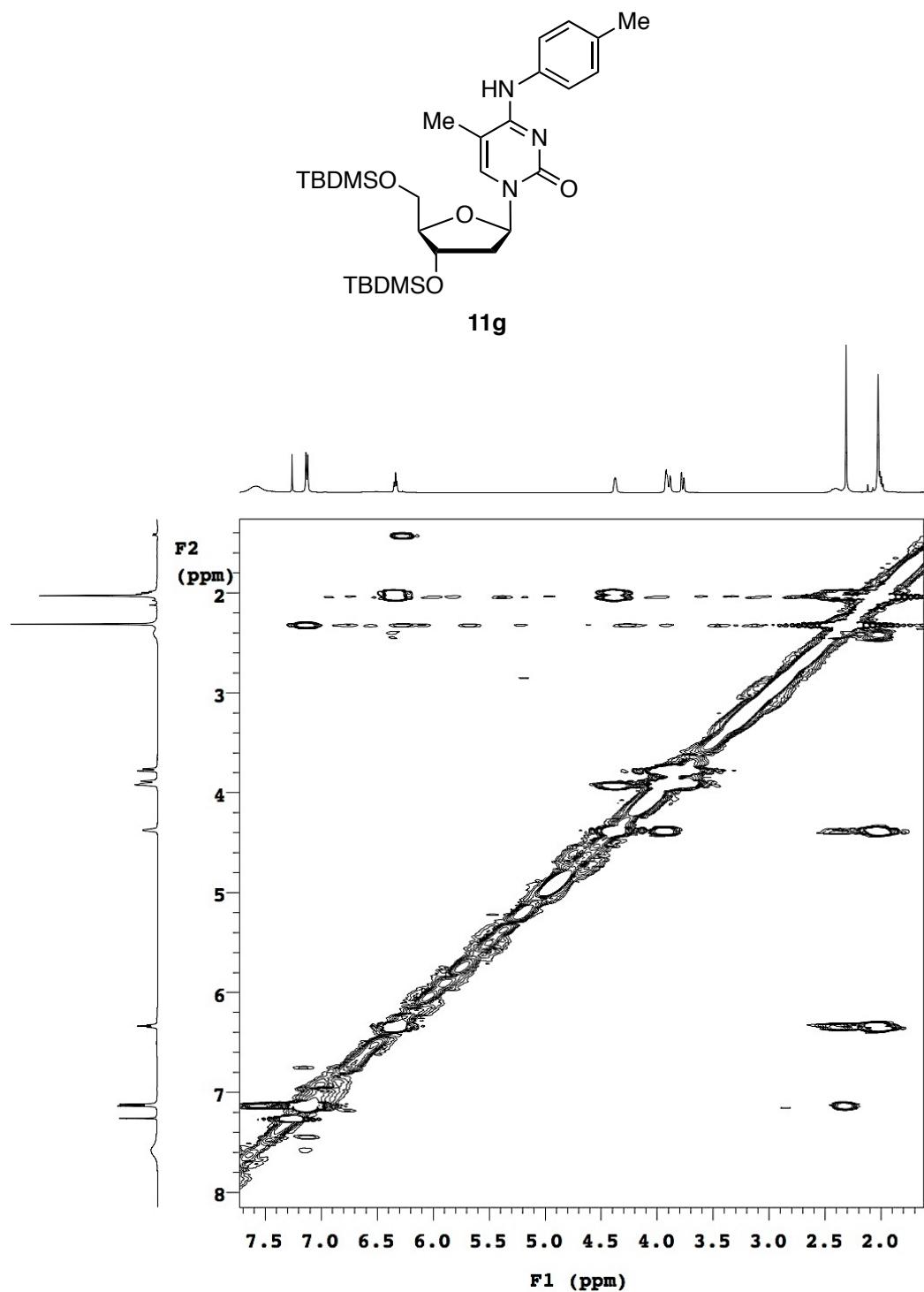
gCOSY spectrum of compound **11f** in CDCl_3



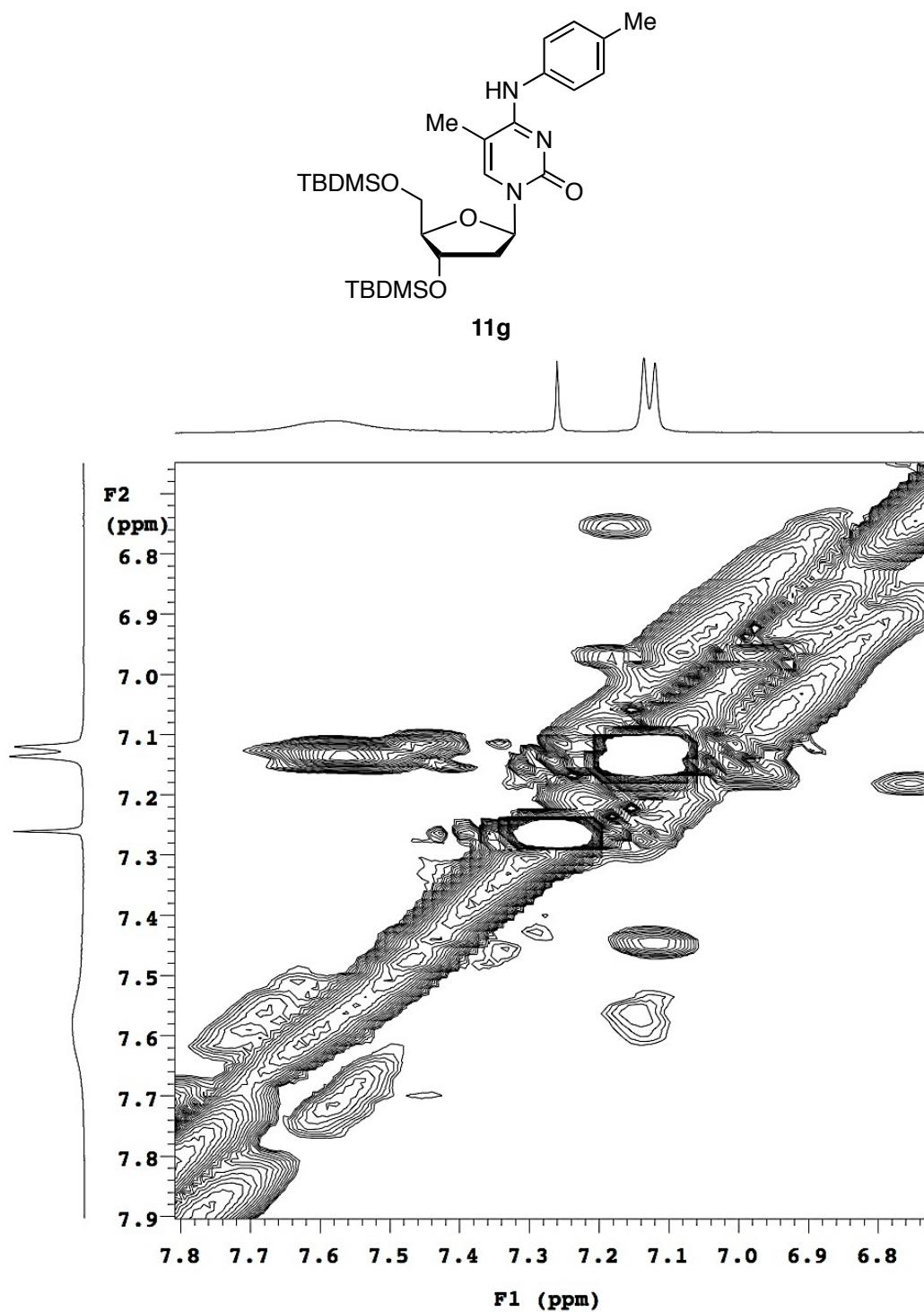


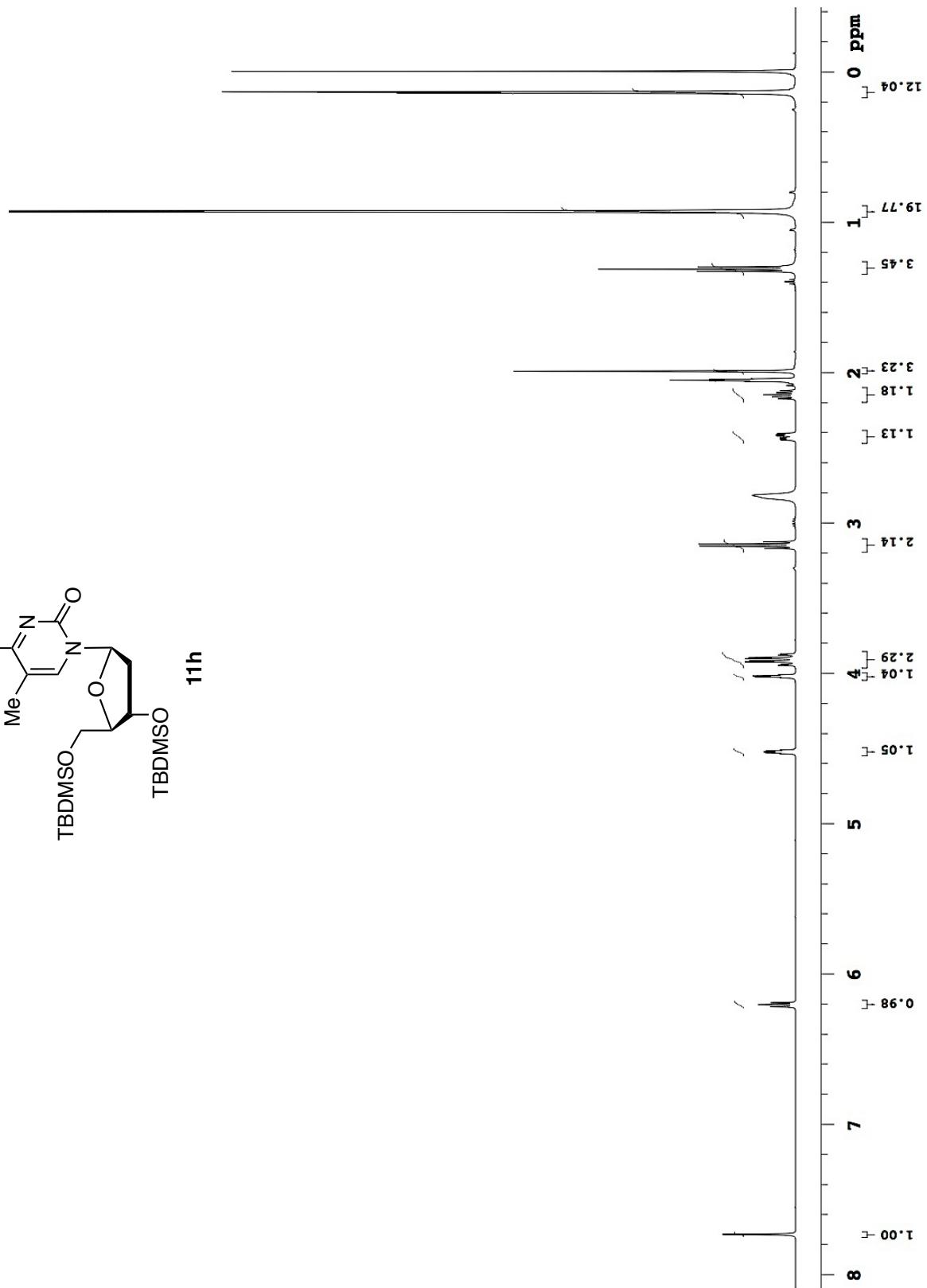
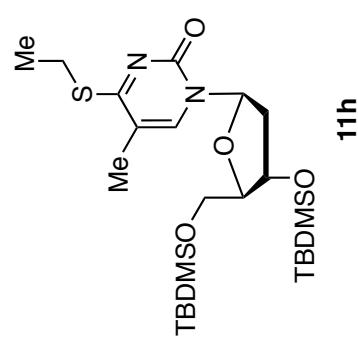


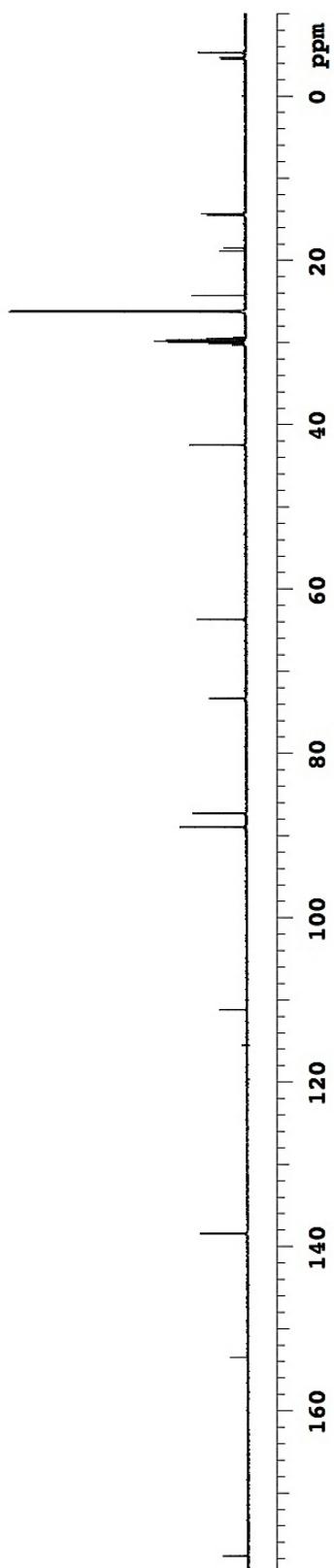
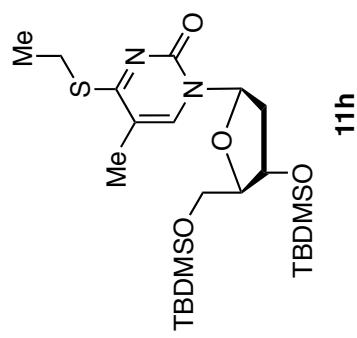
gCOSY spectrum of compound **11g** in CDCl_3

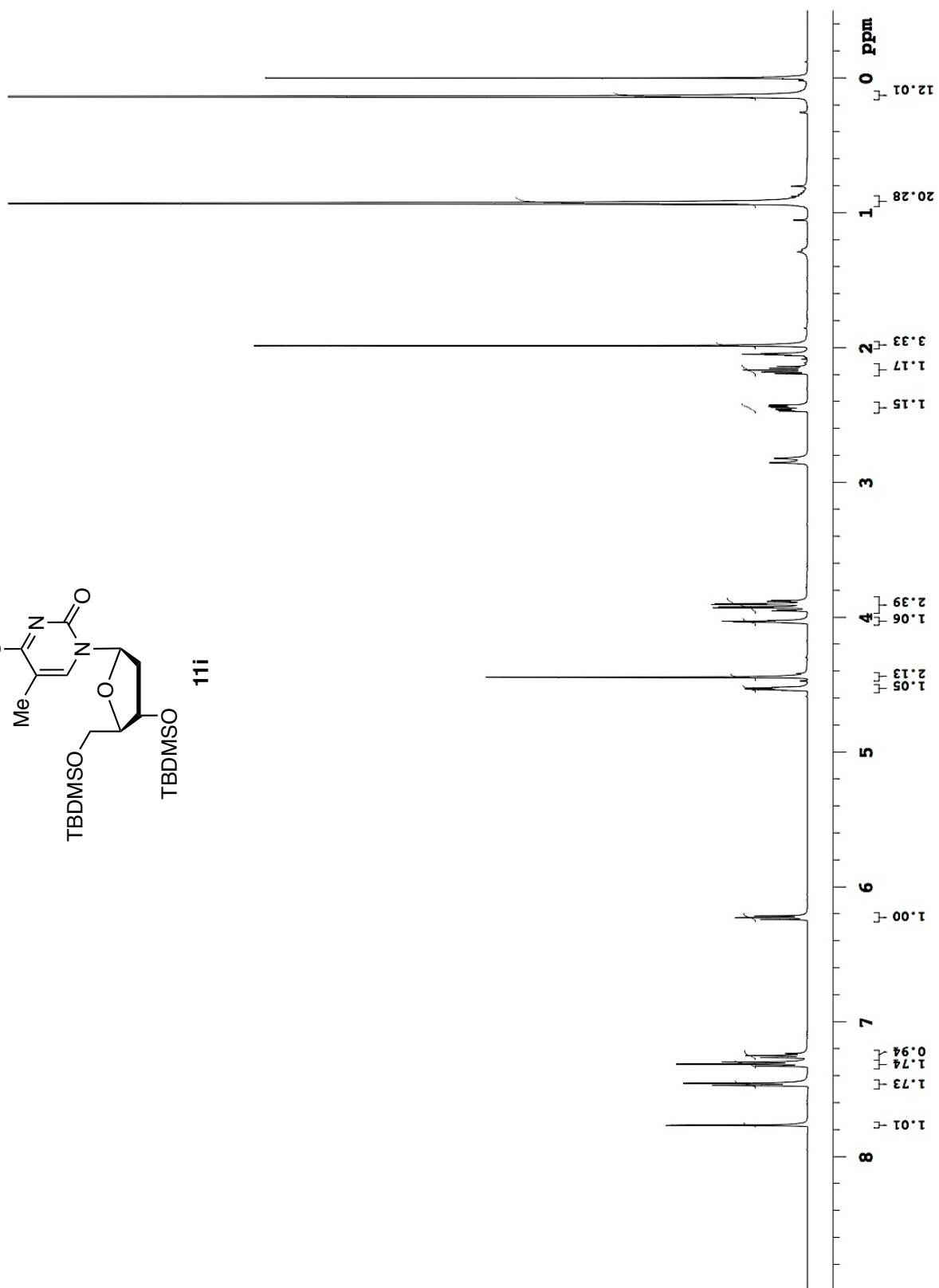
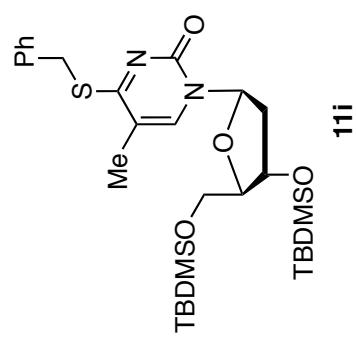


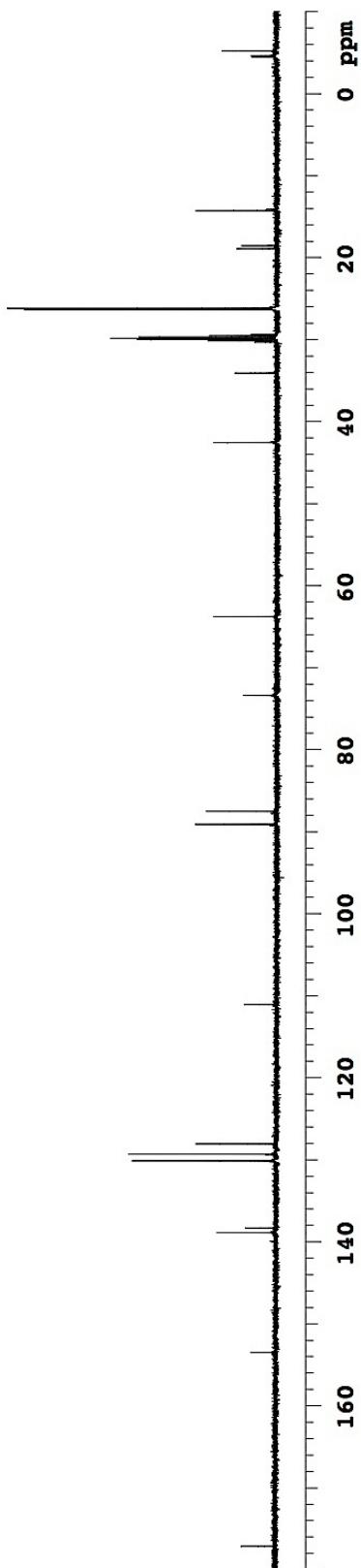
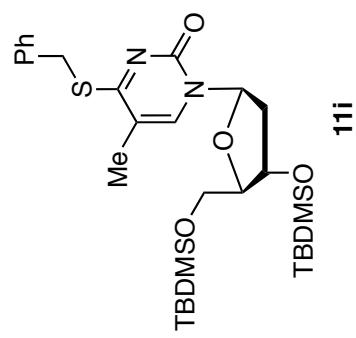
Expansion of gCOSY spectrum of compound **11g** in CDCl_3

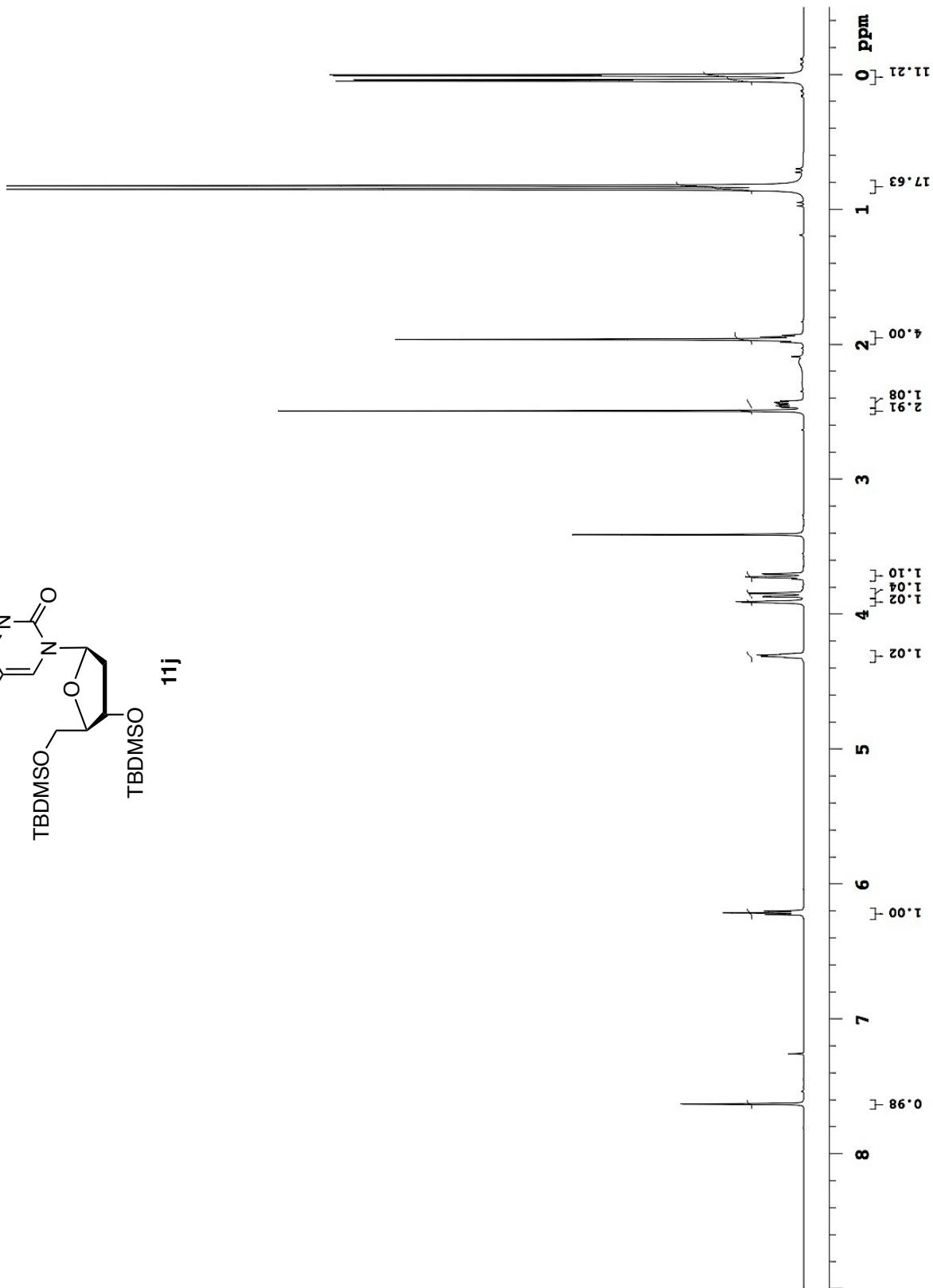
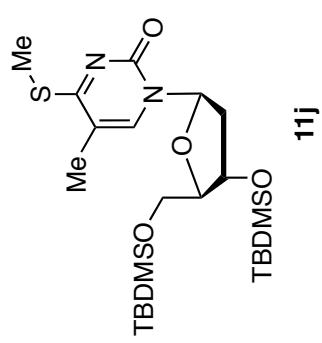


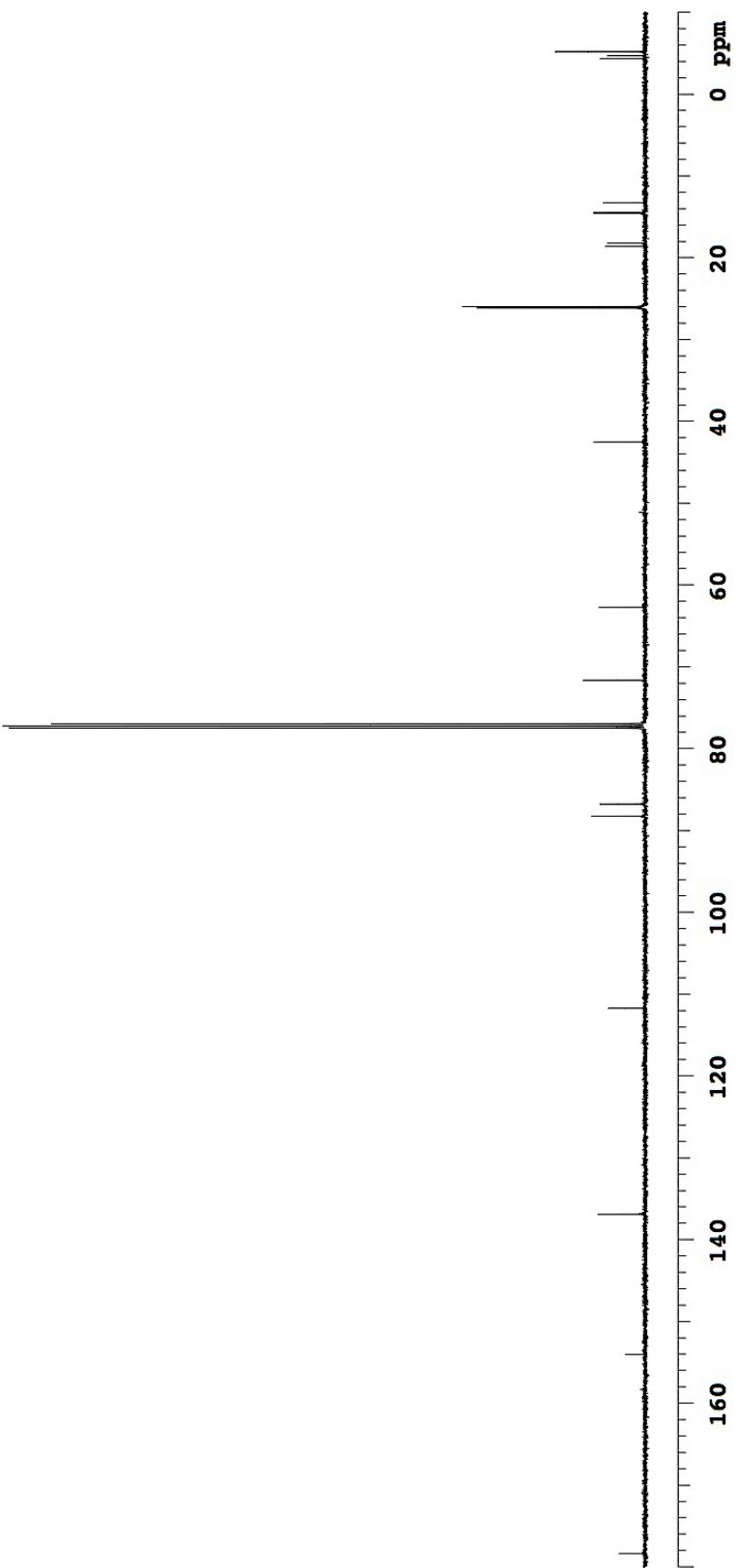
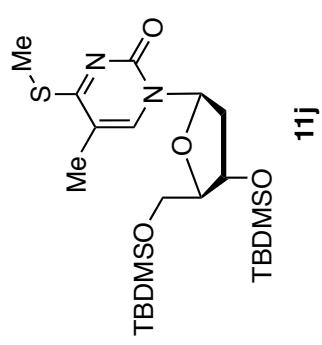


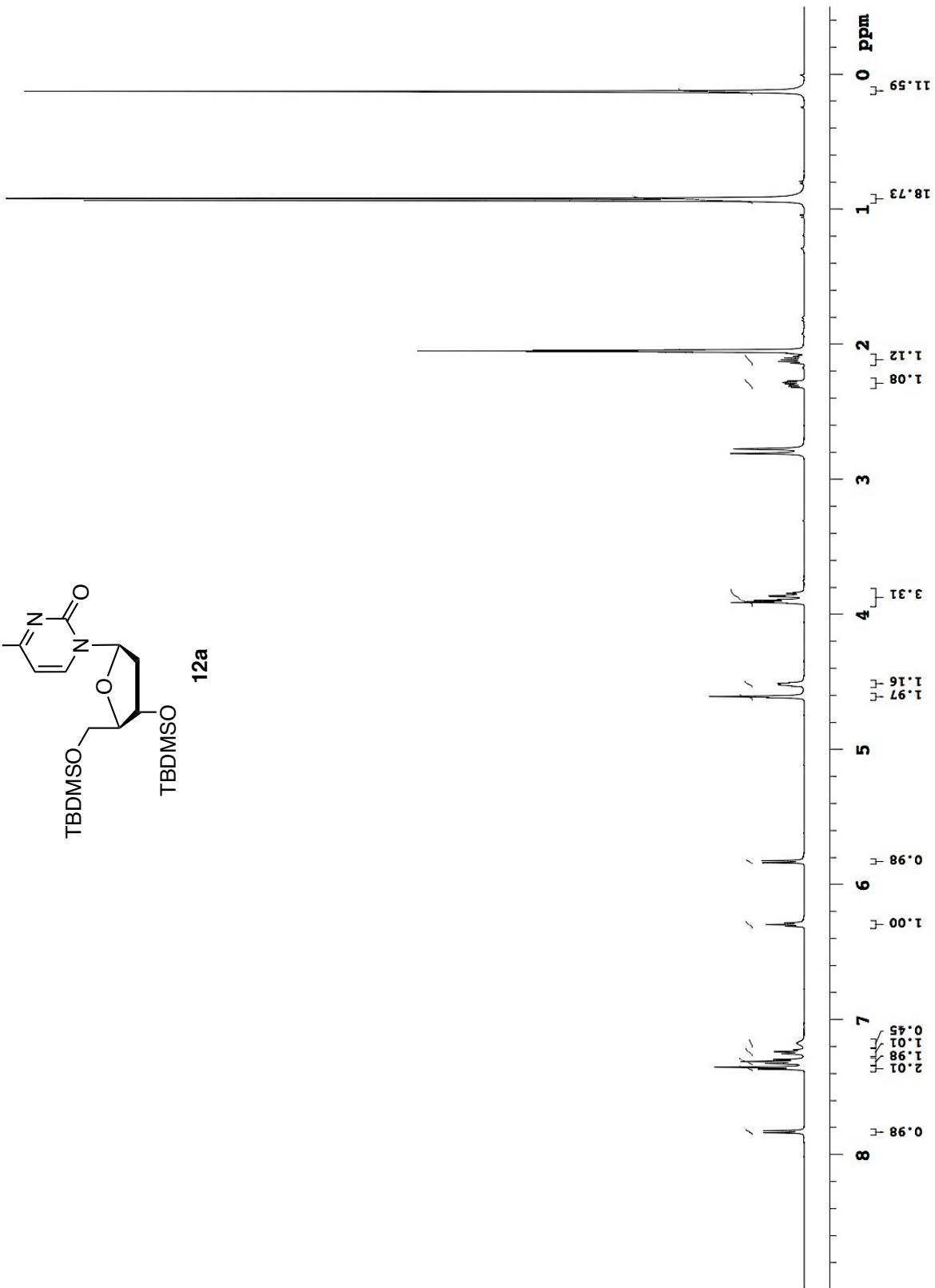
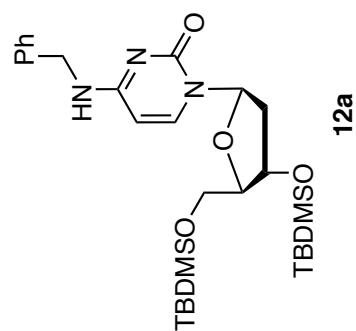


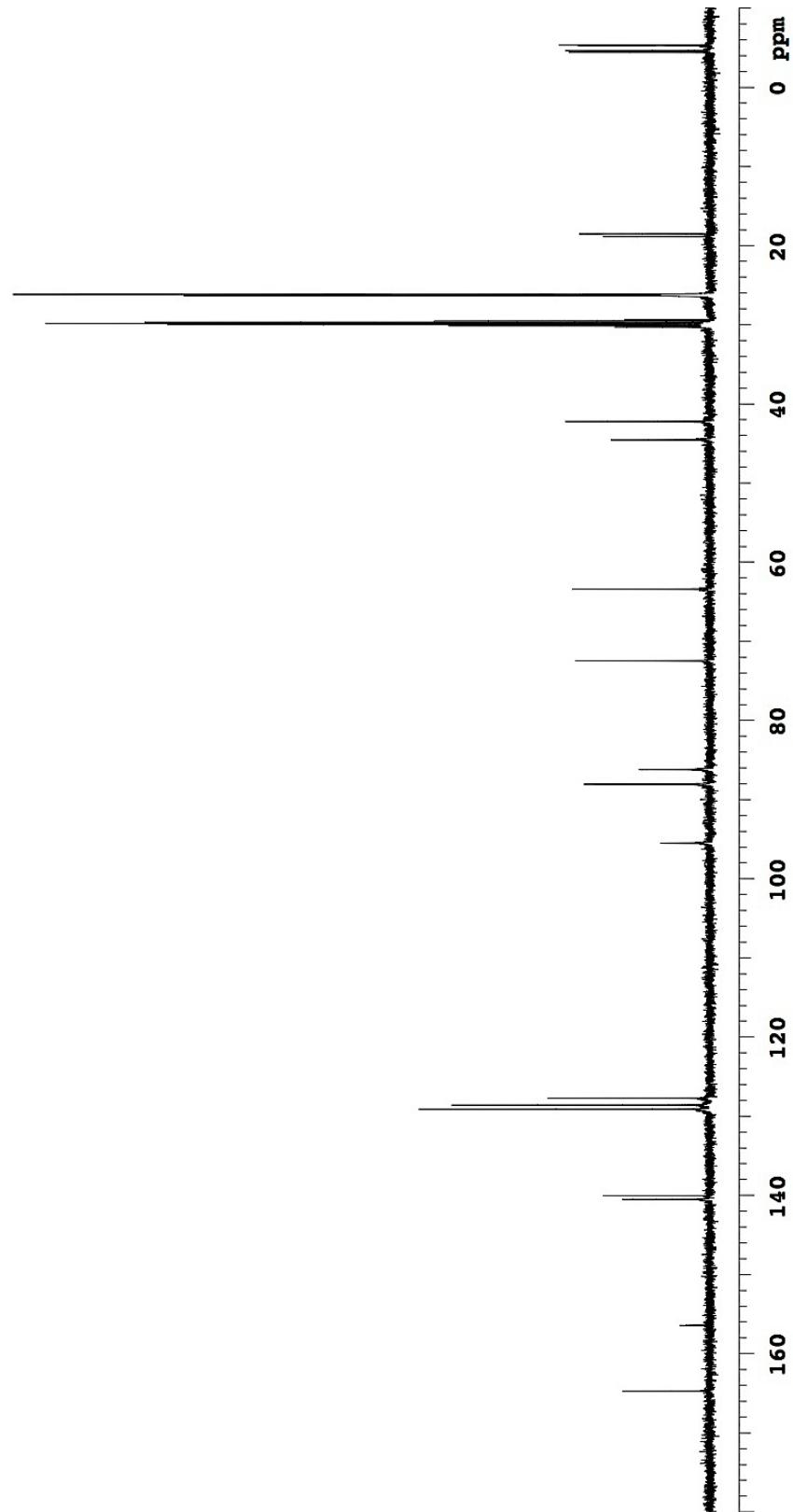
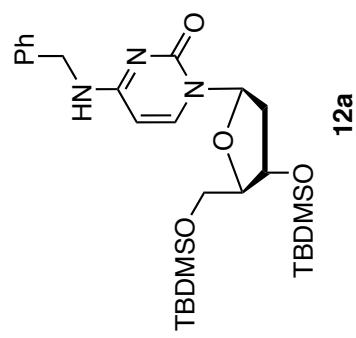


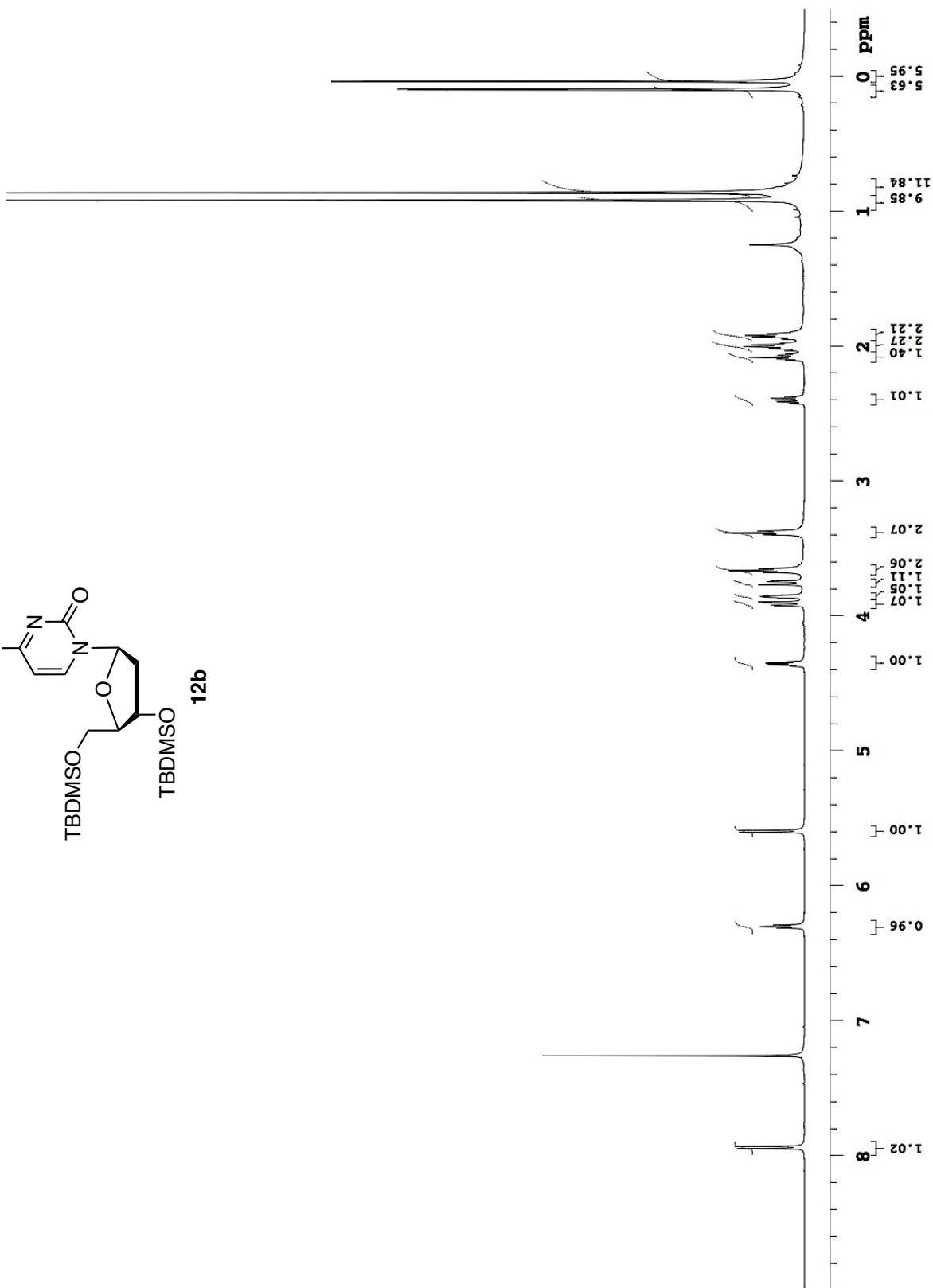
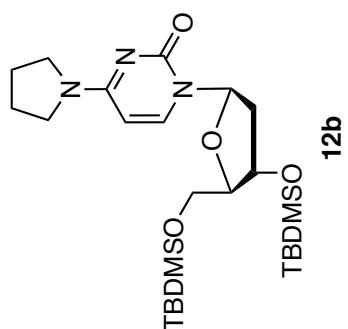


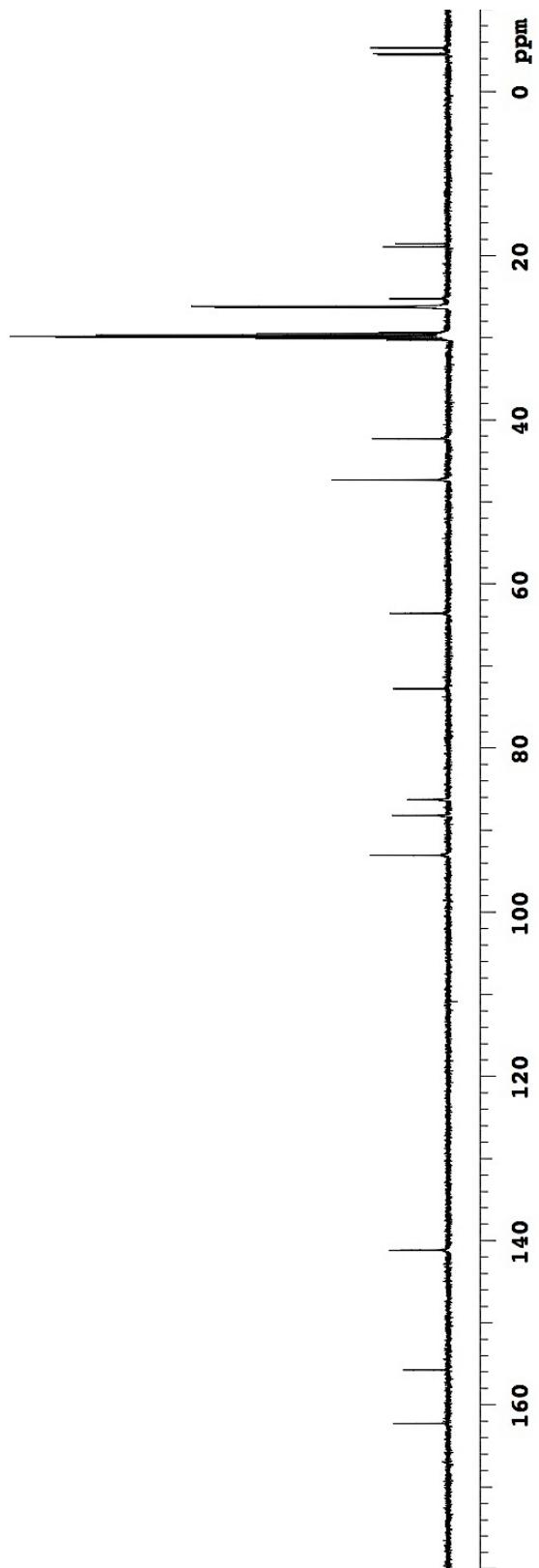
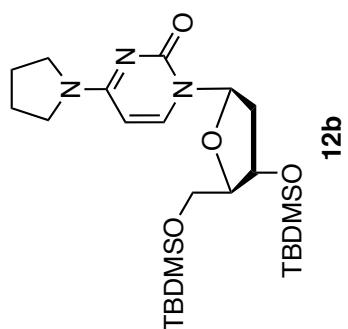


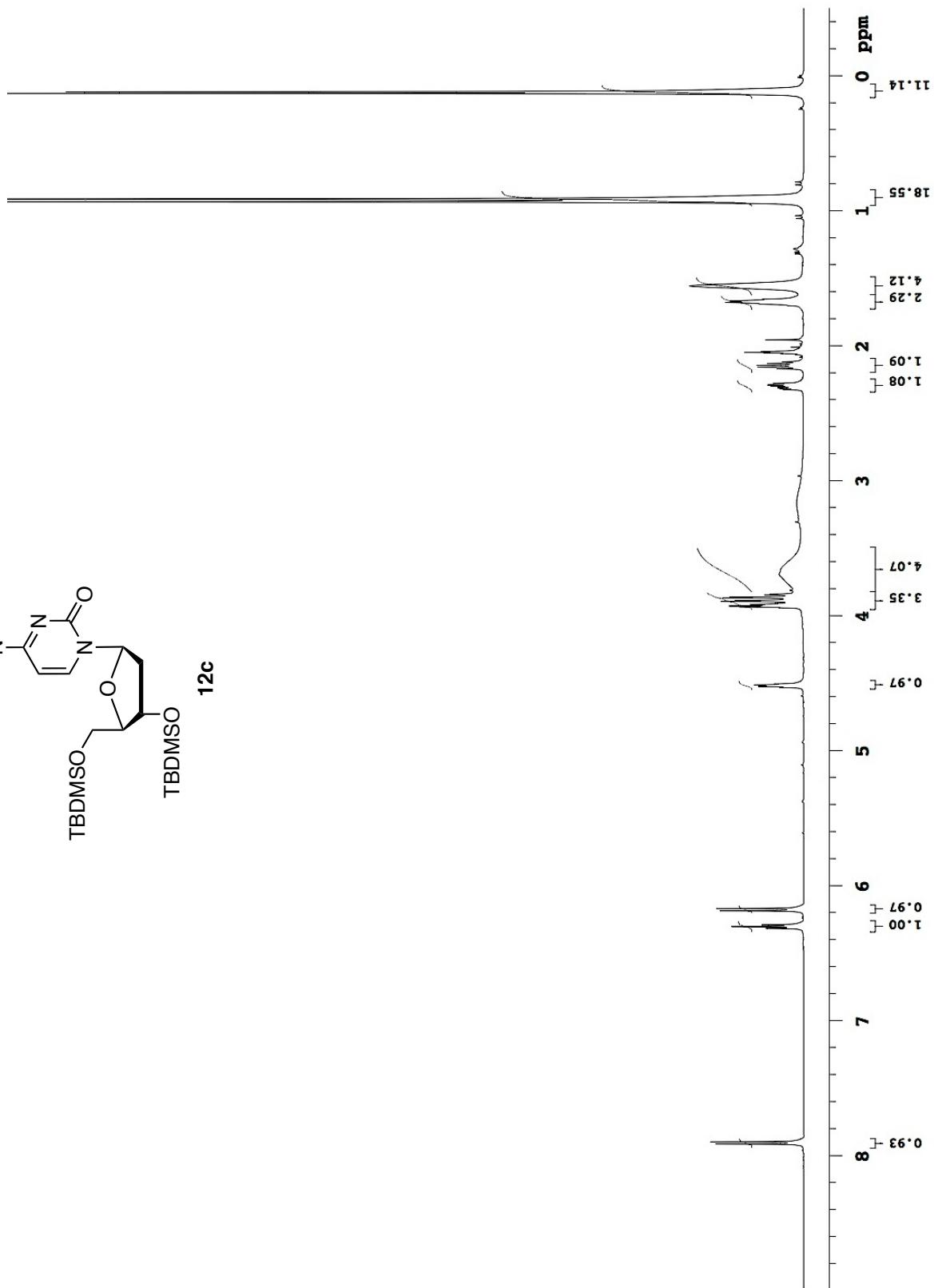
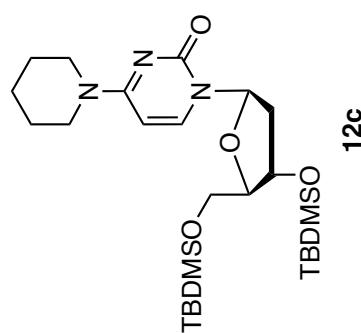


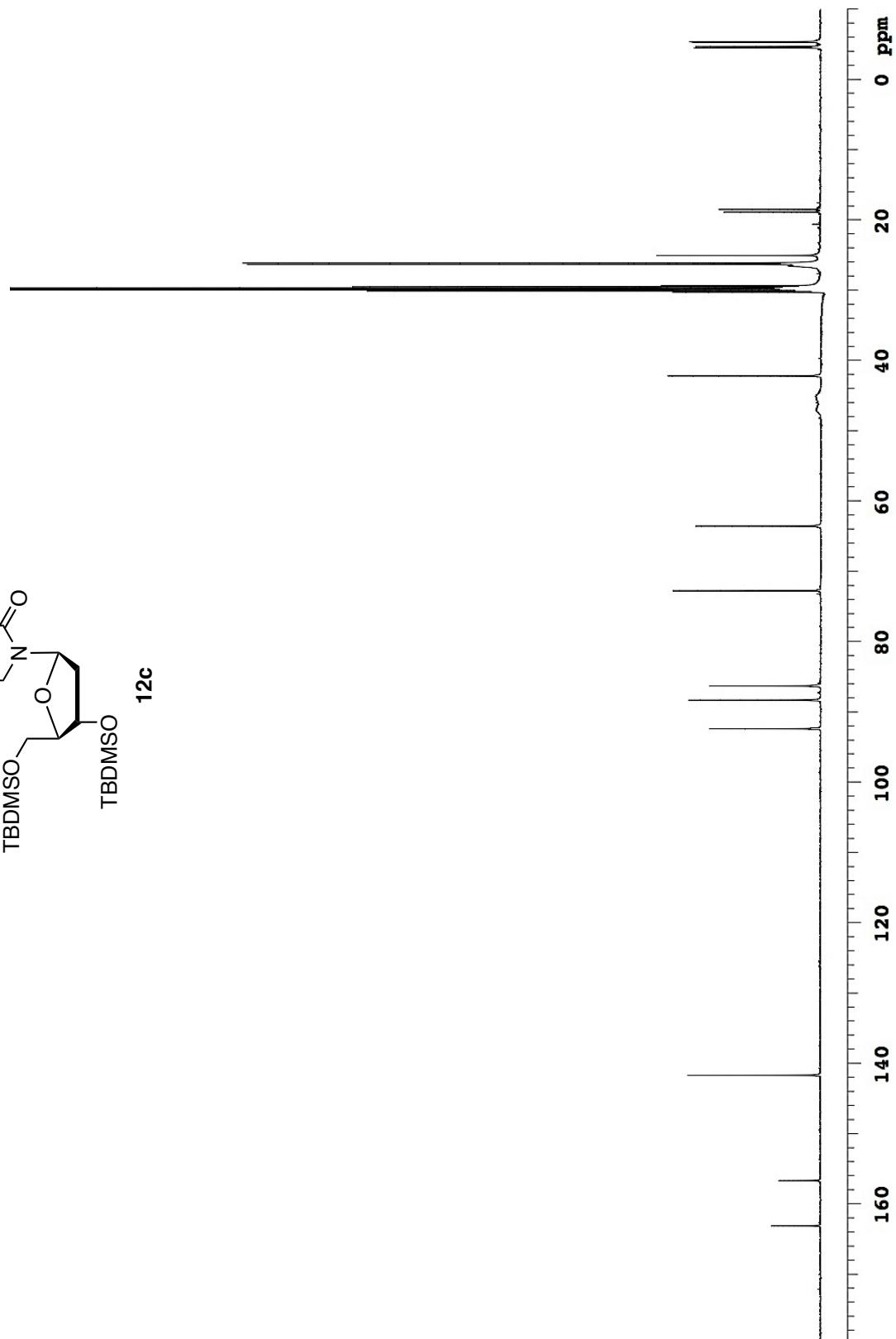
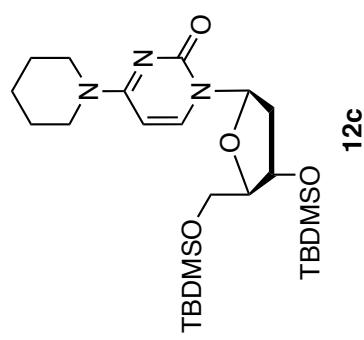




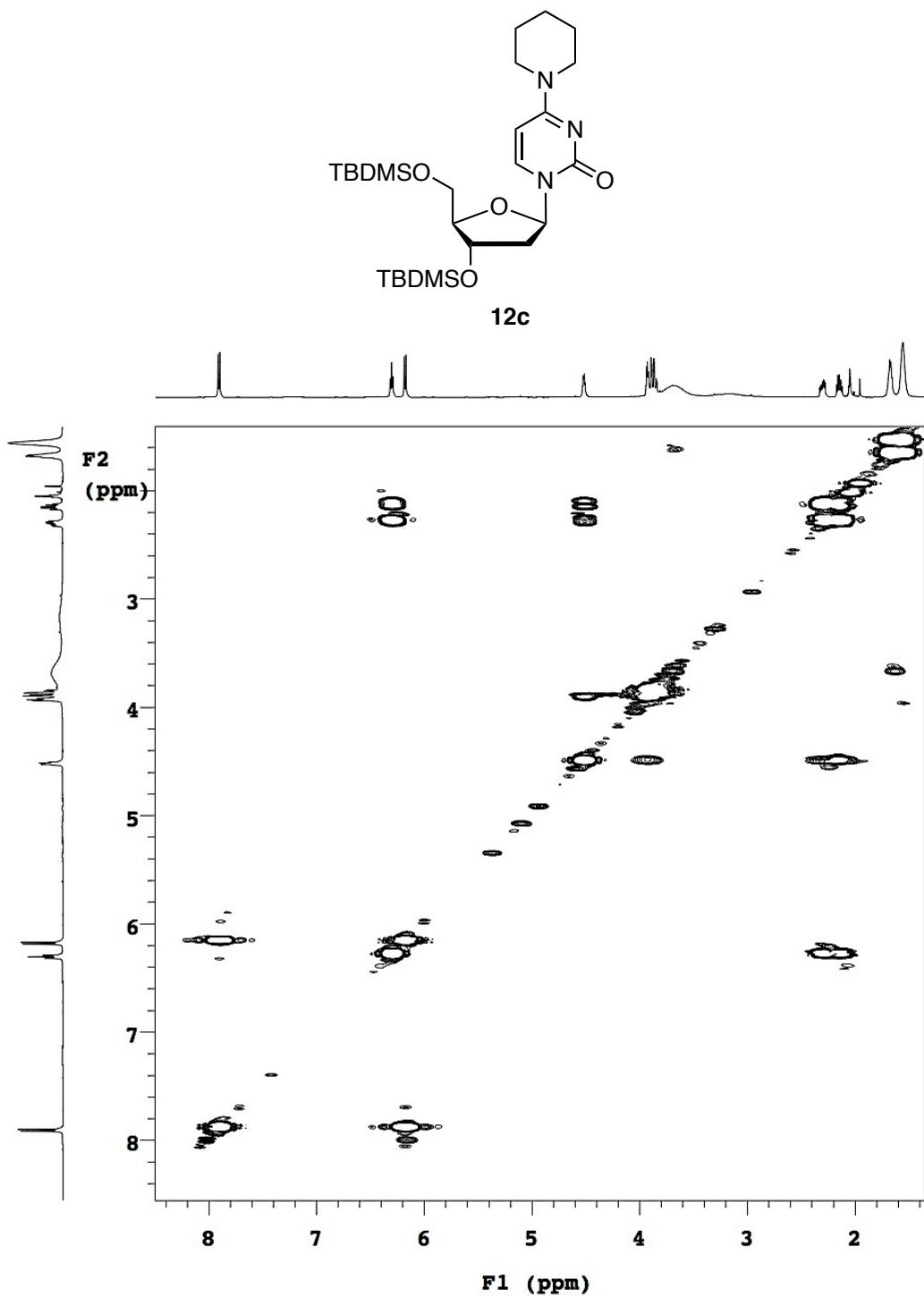




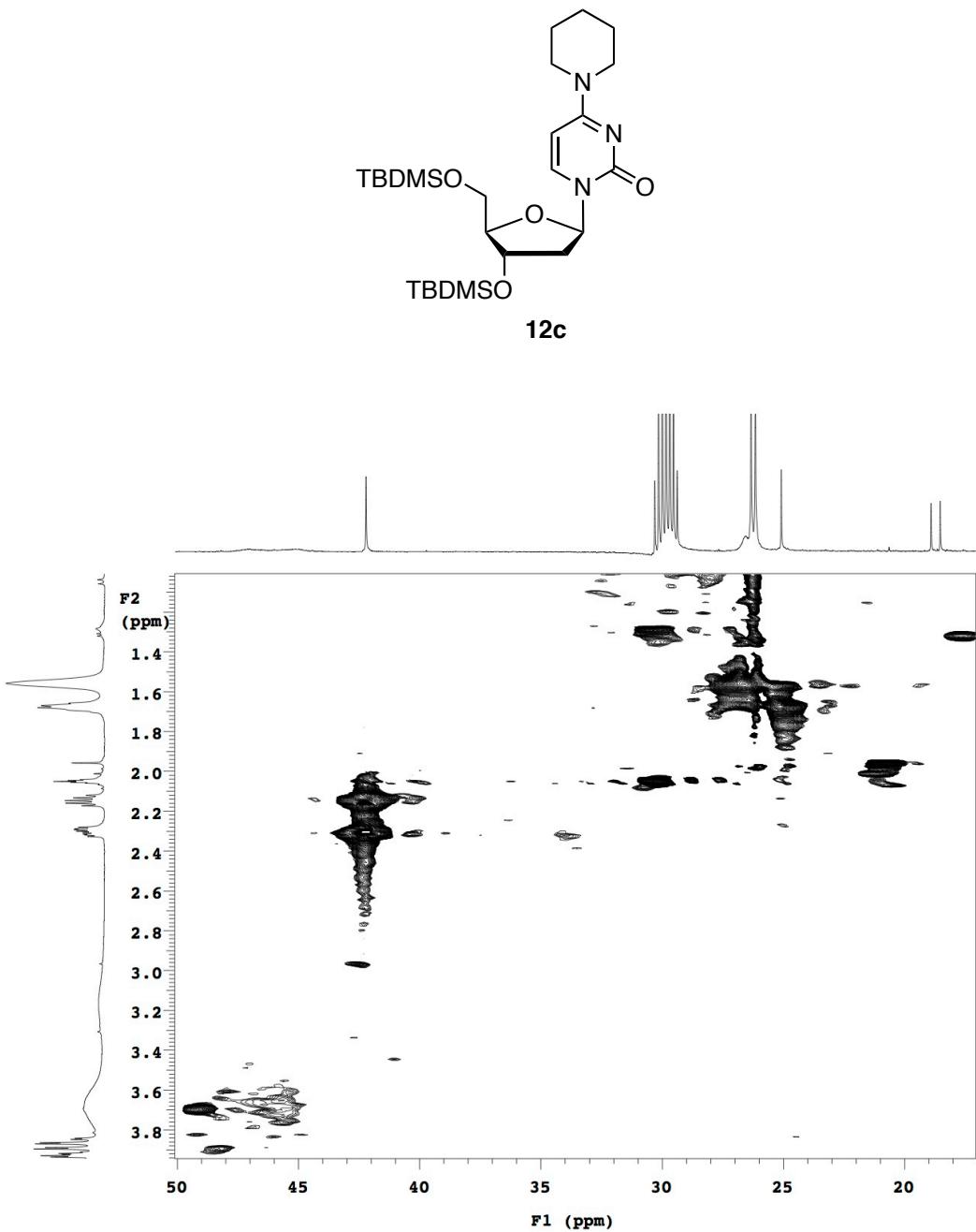


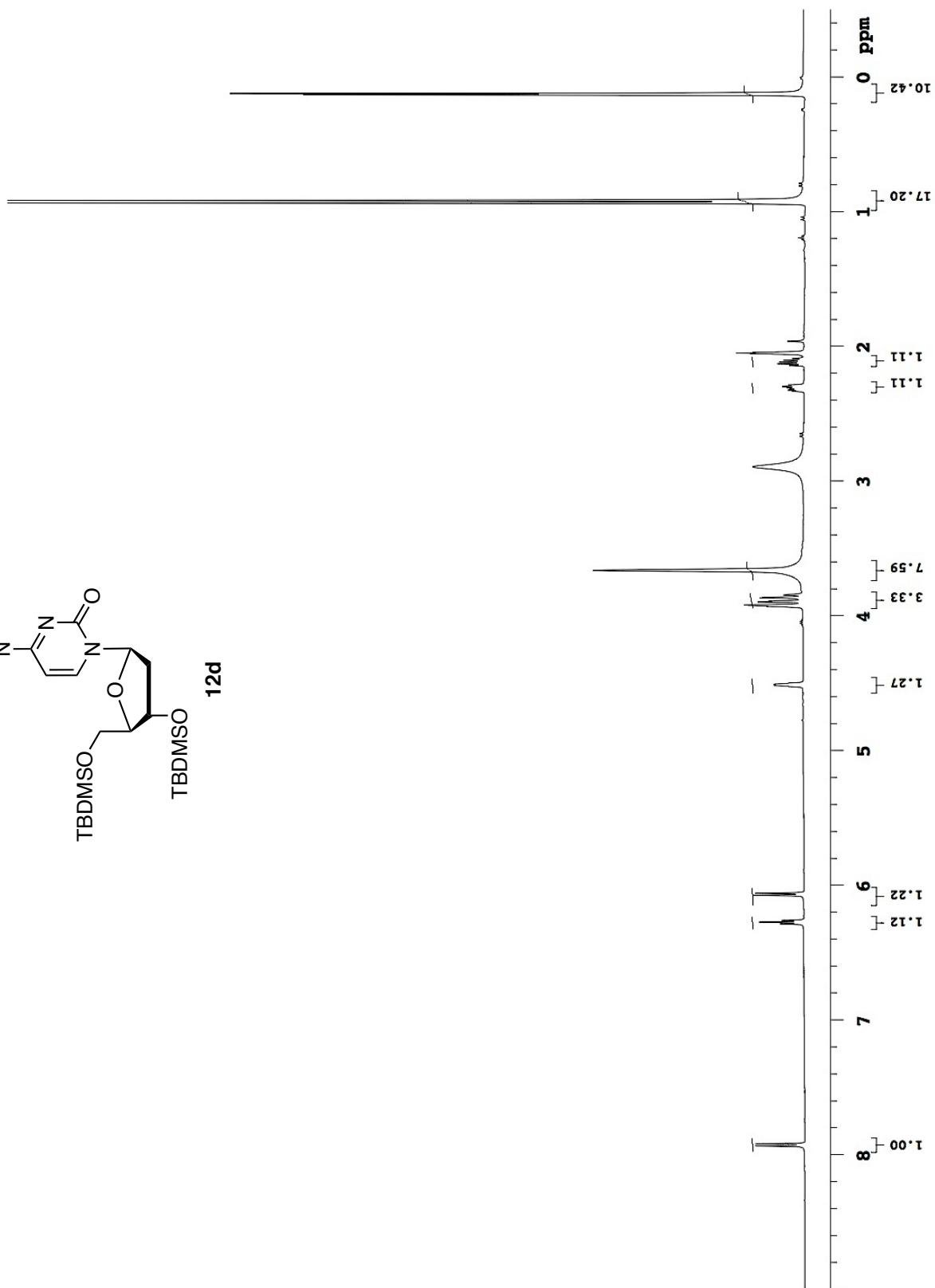
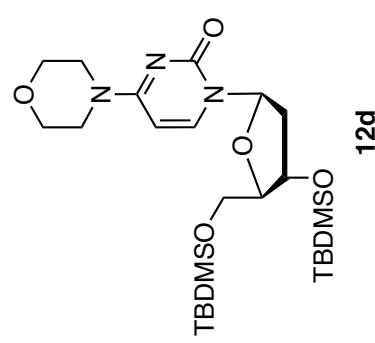


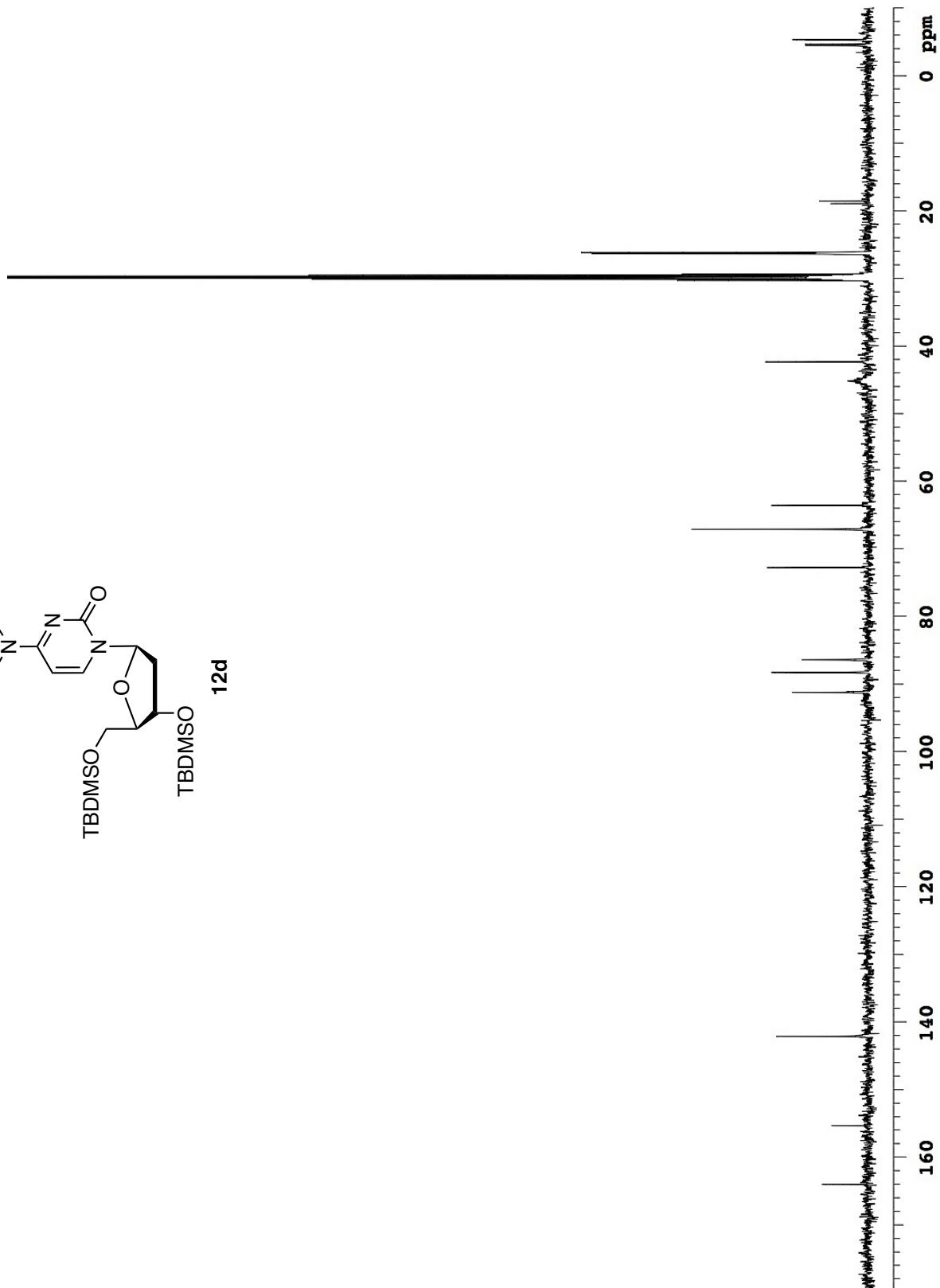
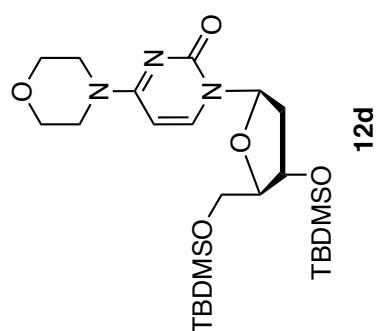
gCOSY spectrum of compound **12c** in acetone-*d*₆

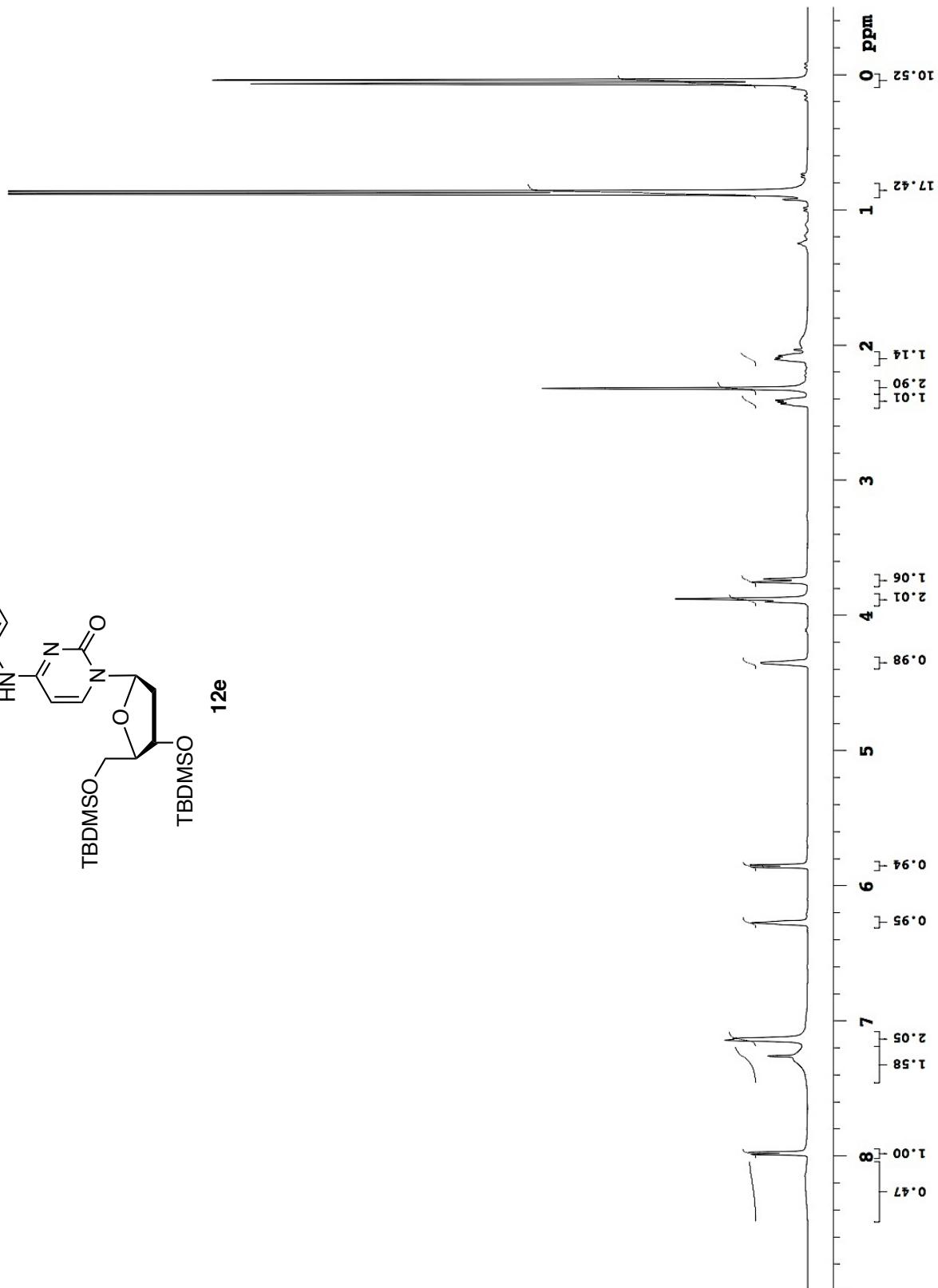
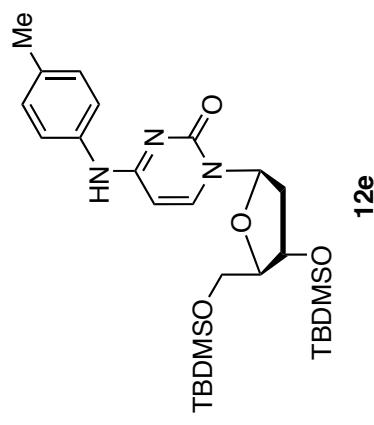


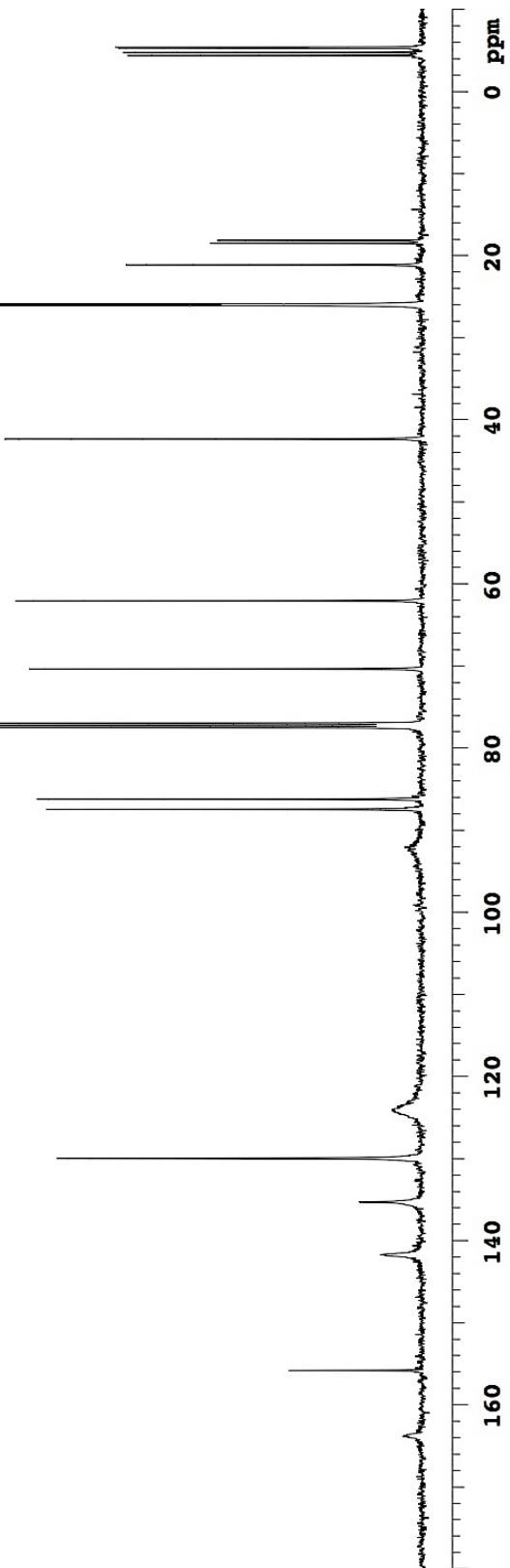
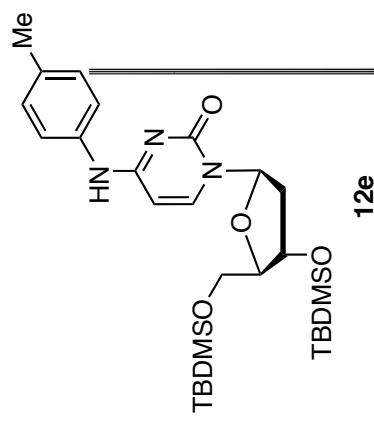
gHMQC spectrum of compound **12c** in acetone-*d*₆



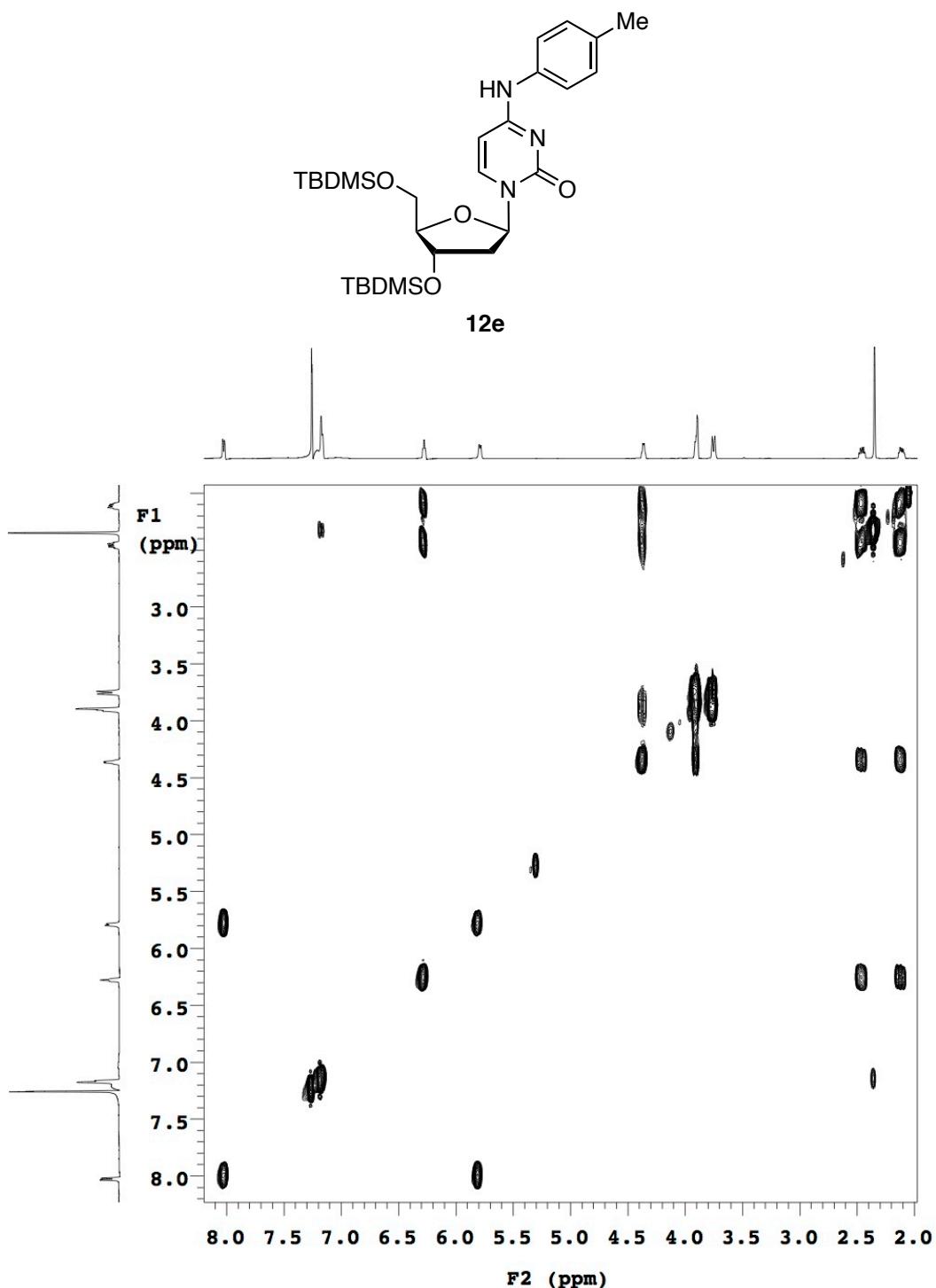


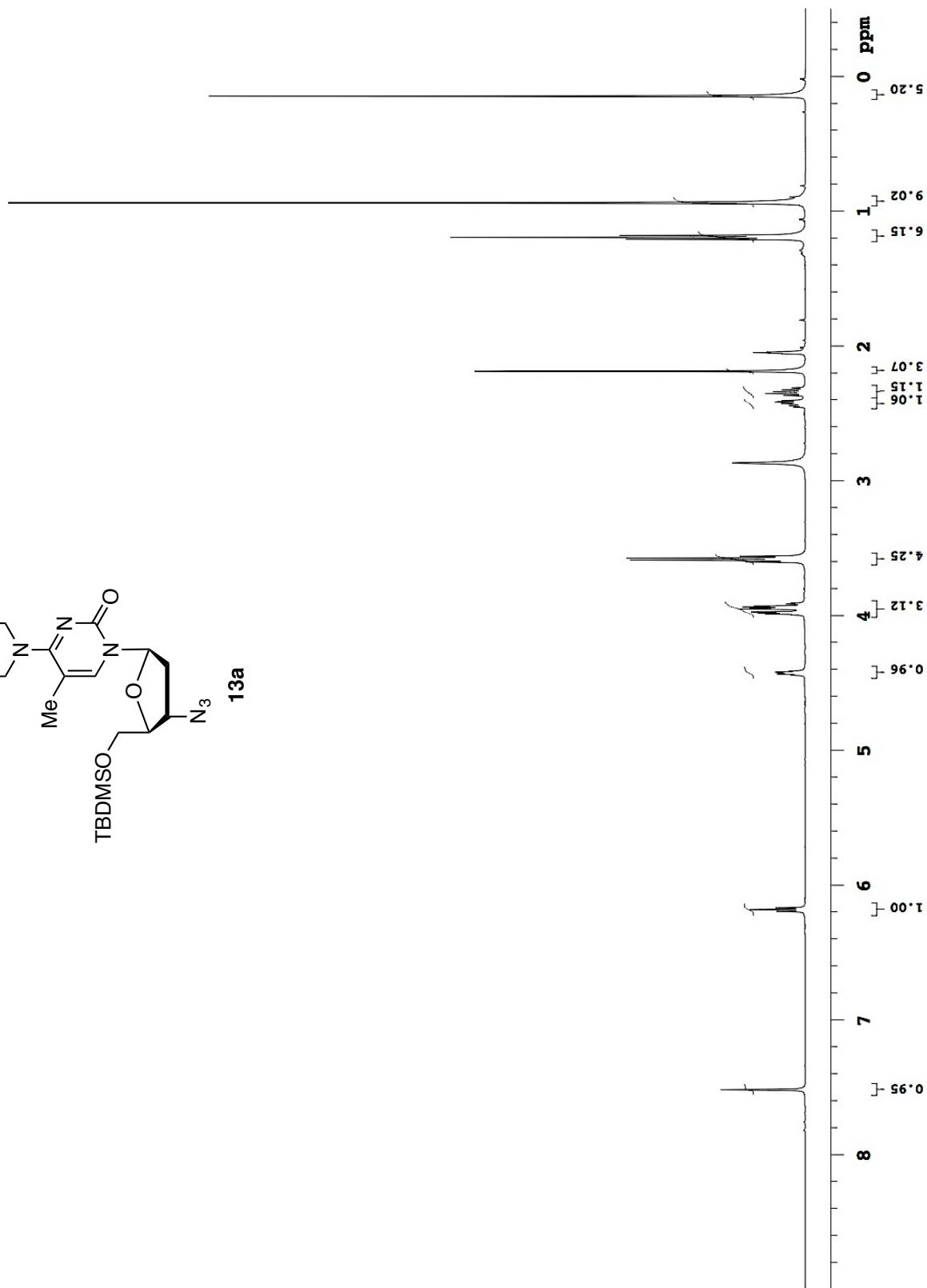
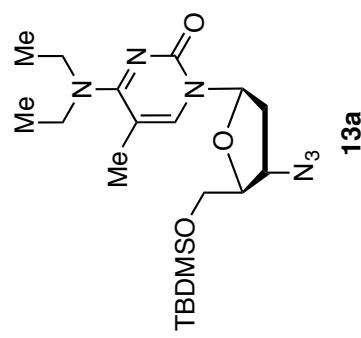


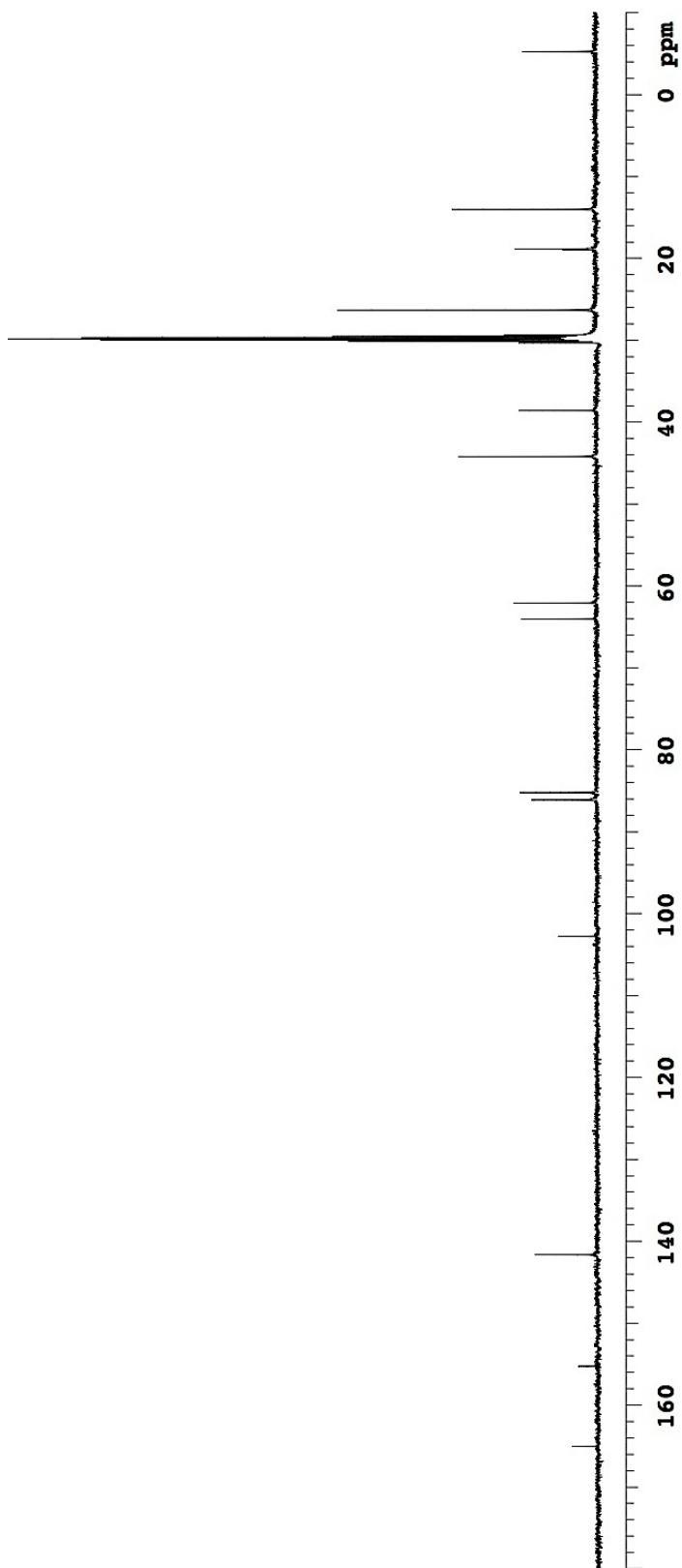
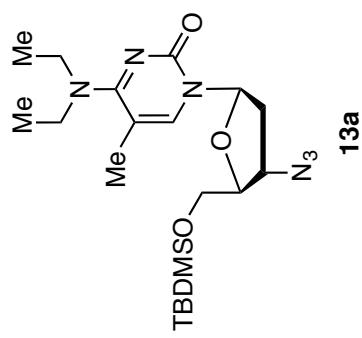


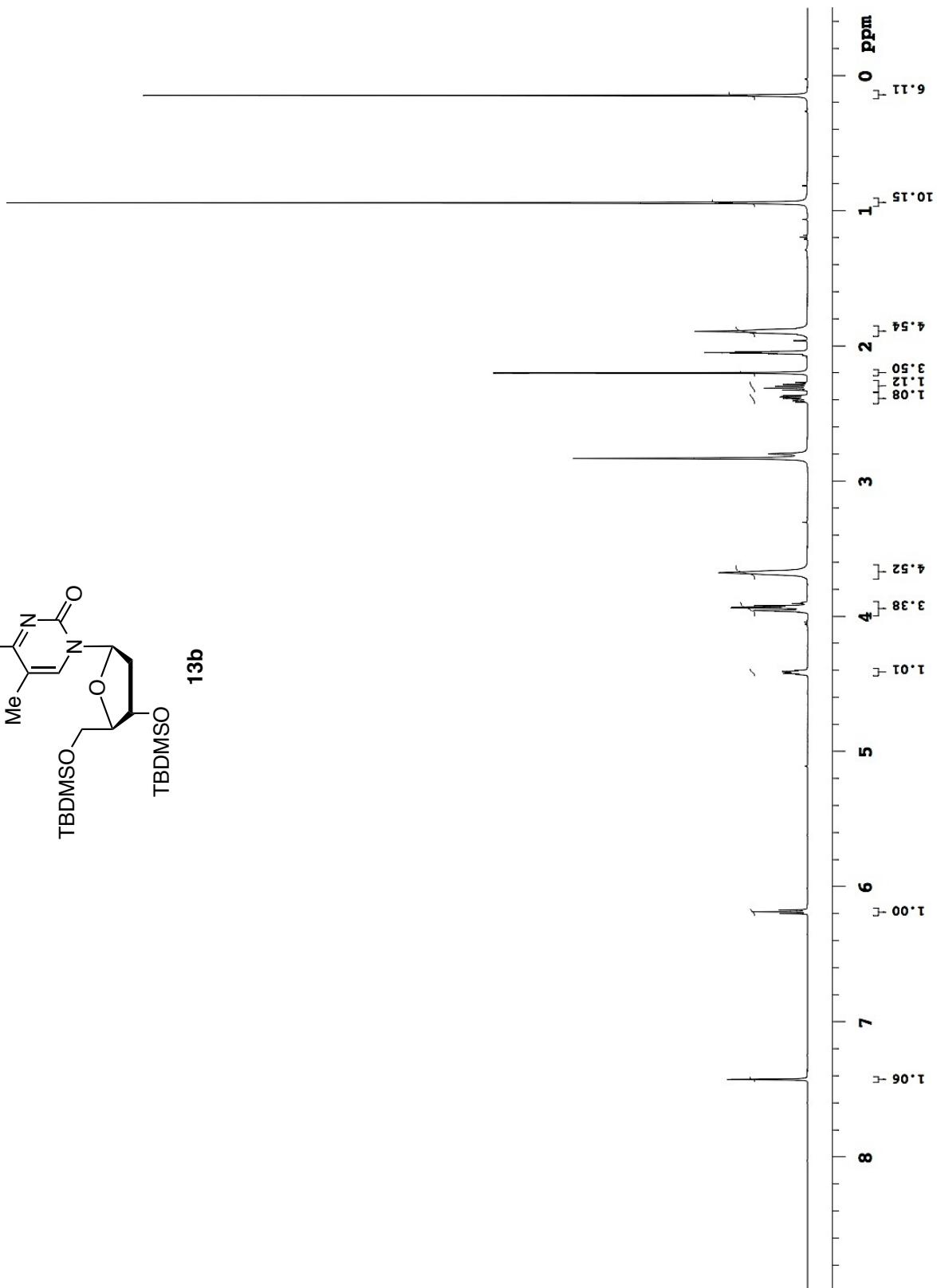
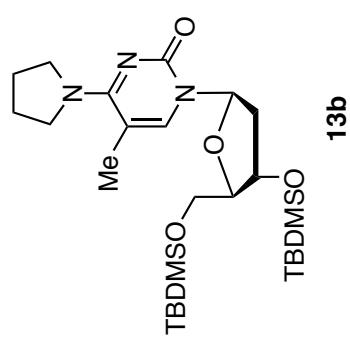


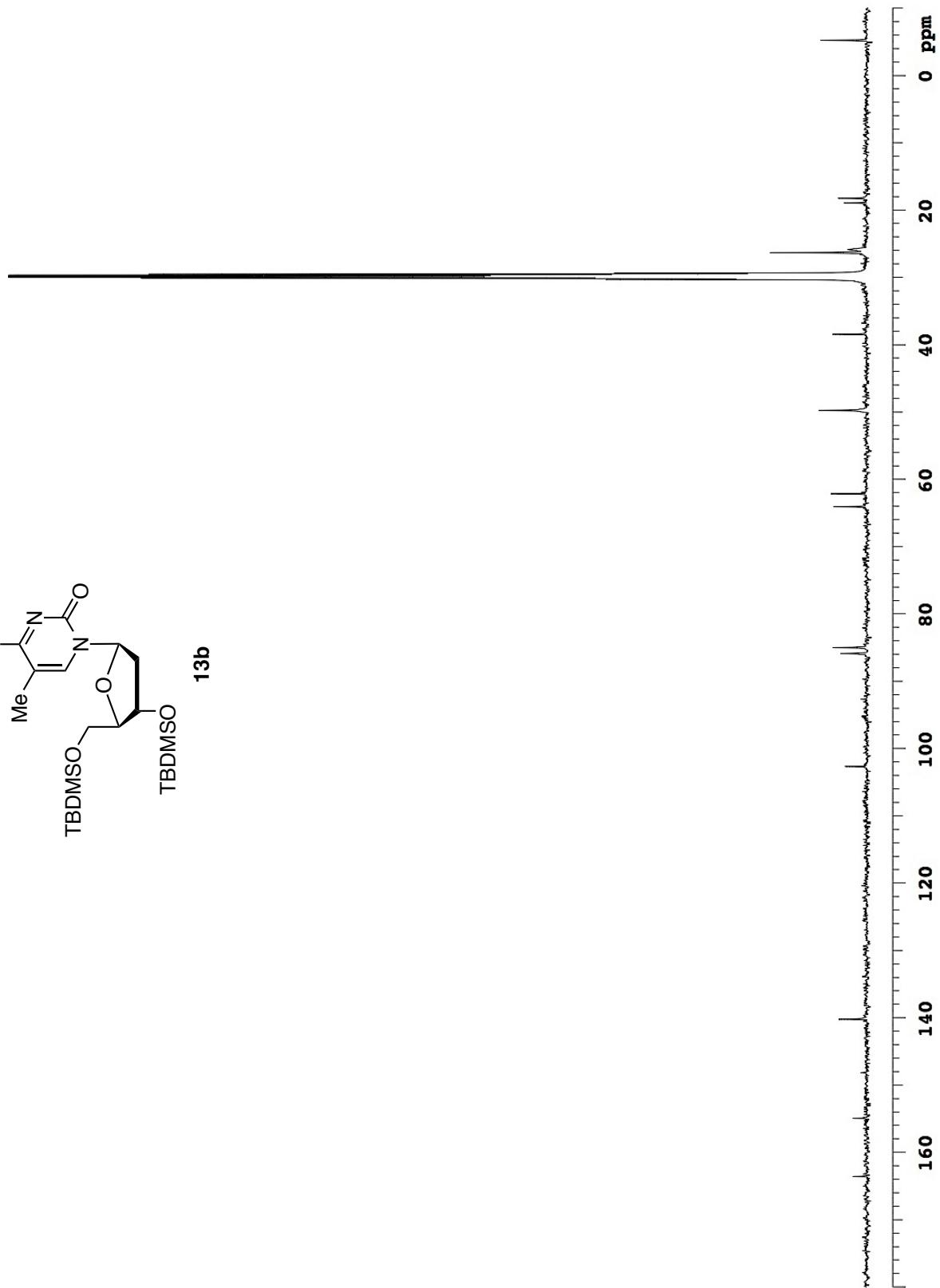
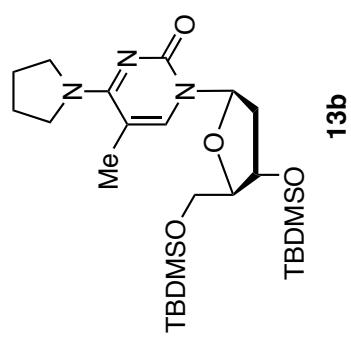
gCOSY spectrum of compound **12e** in CDCl_3

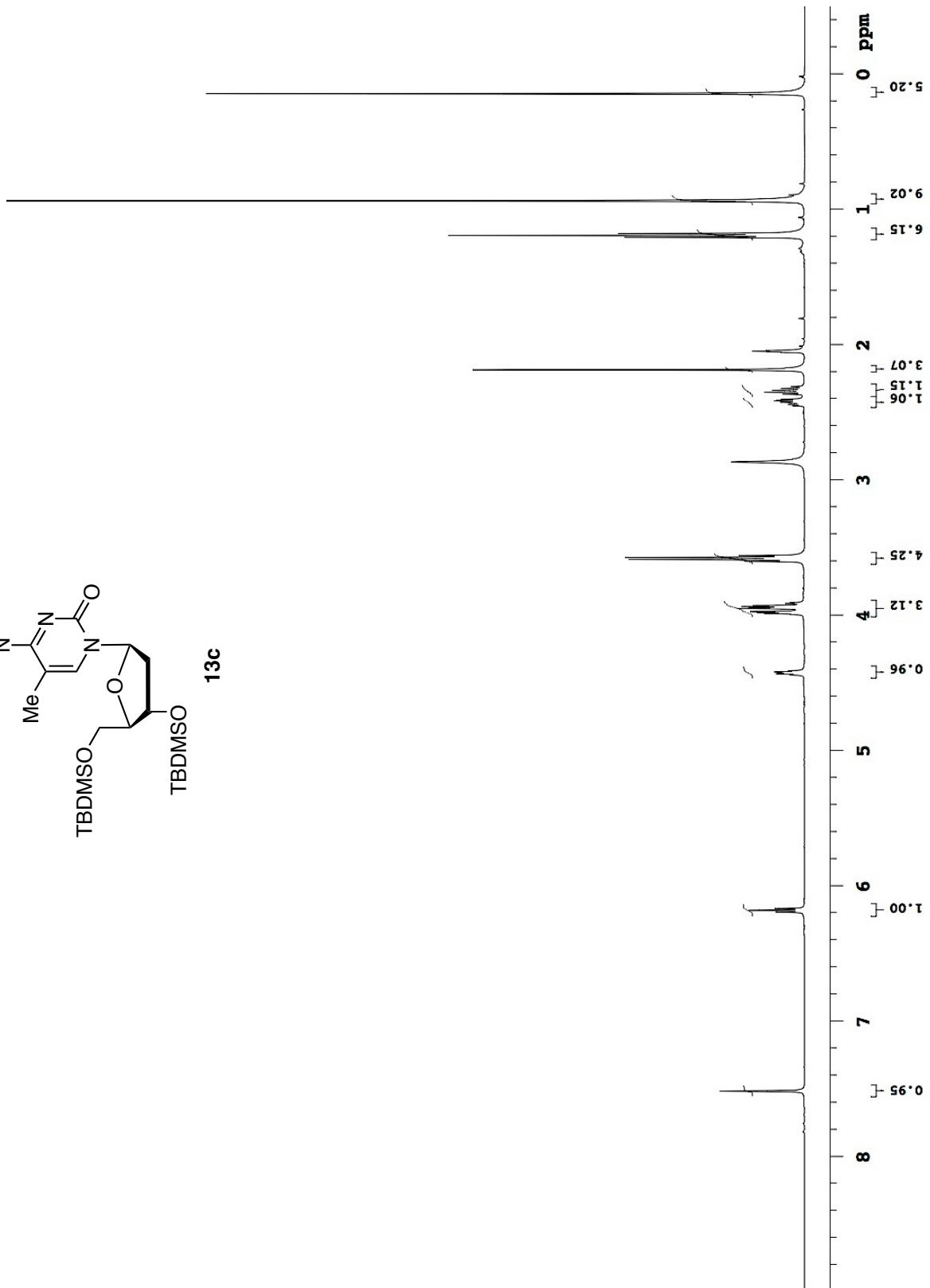
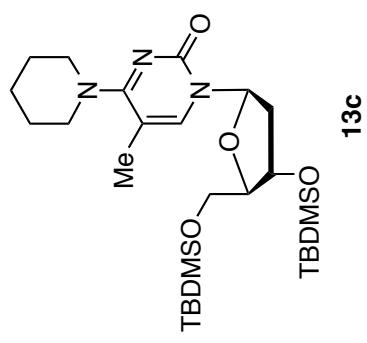


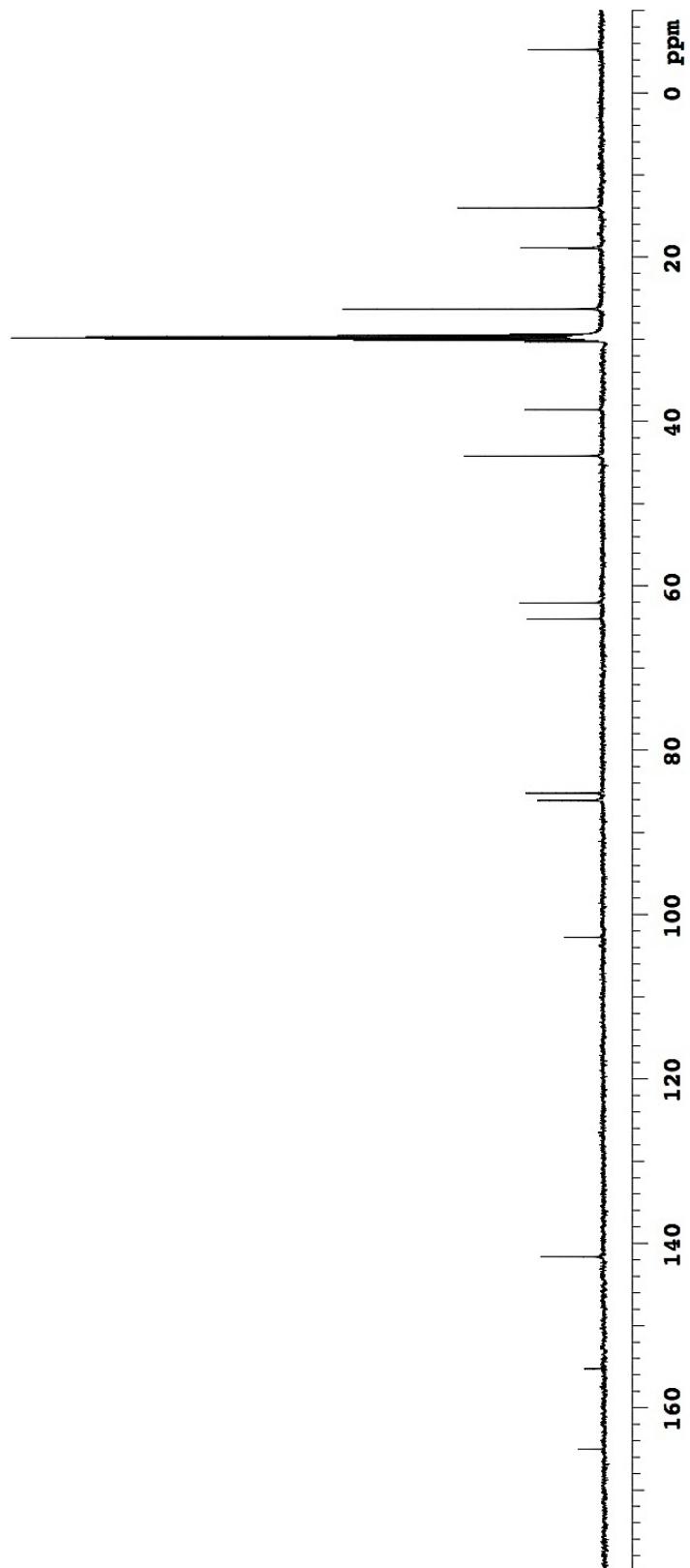
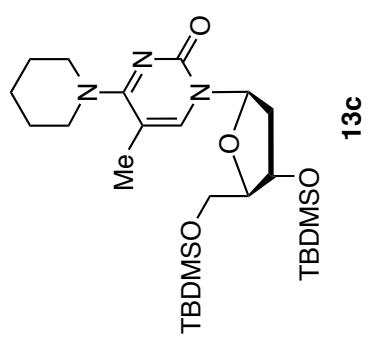




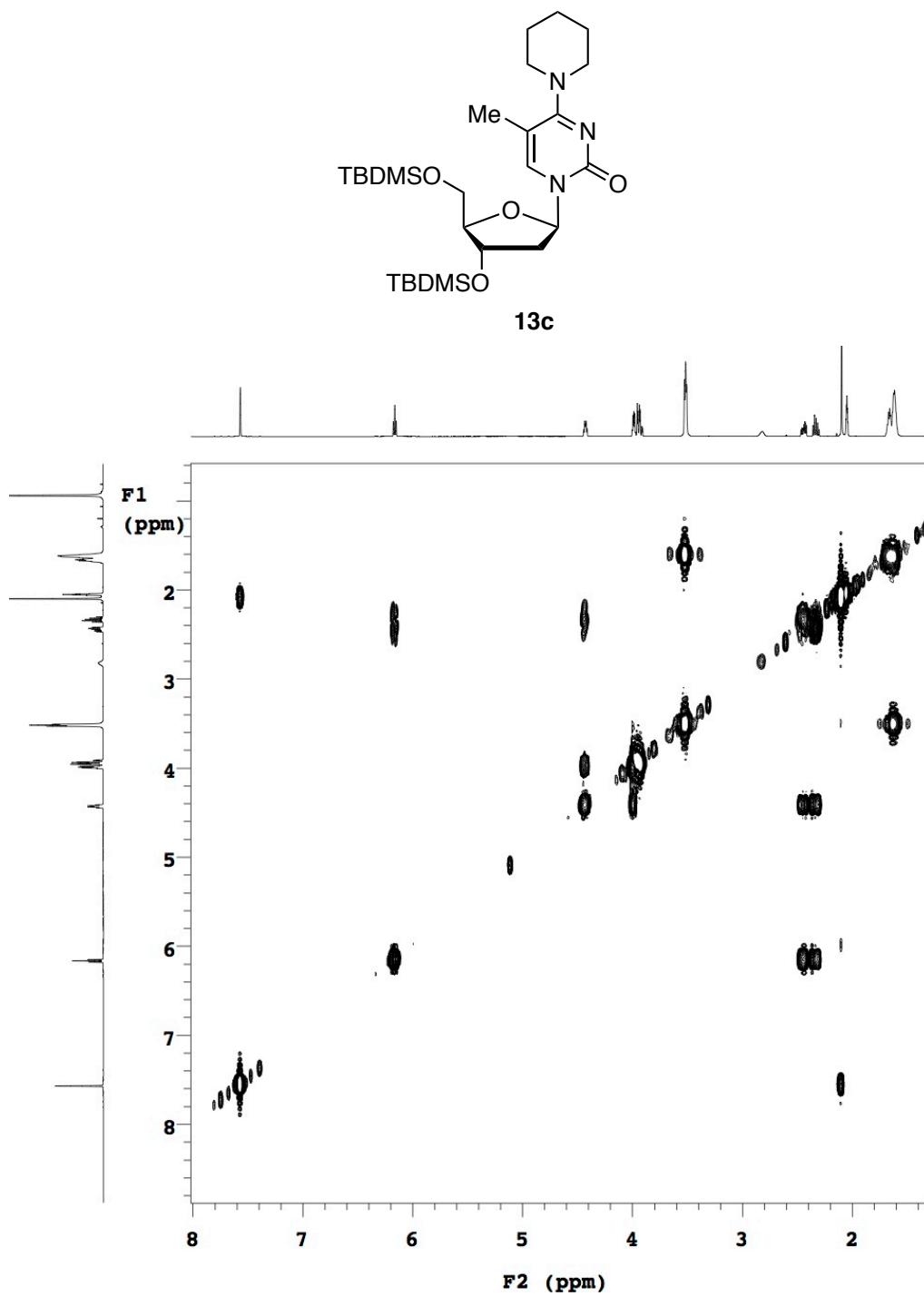


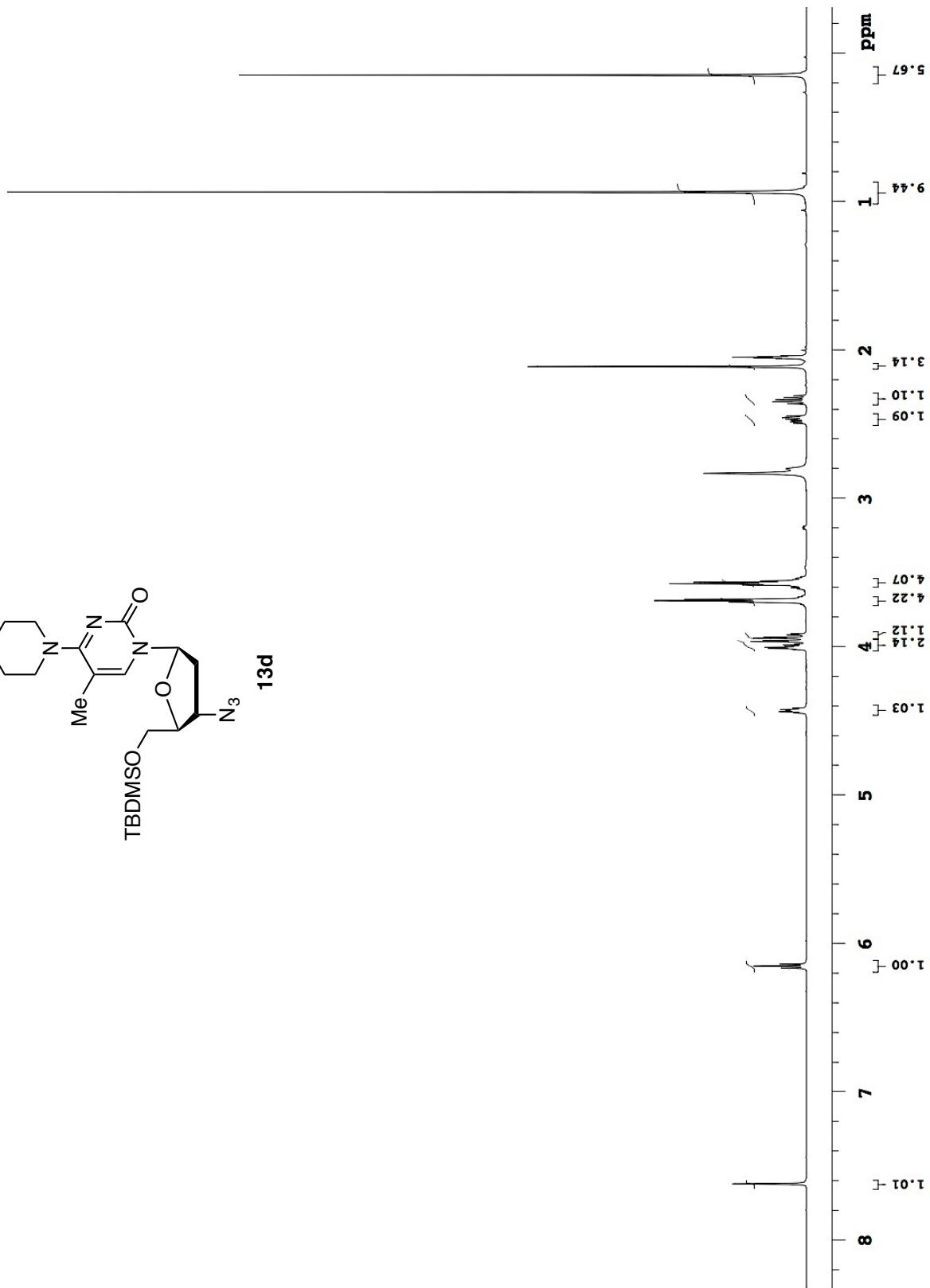
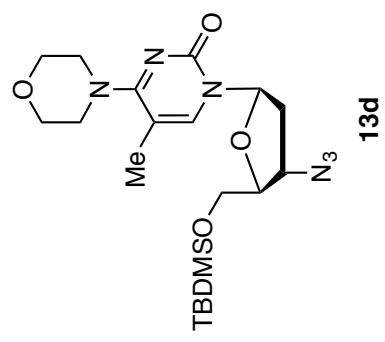


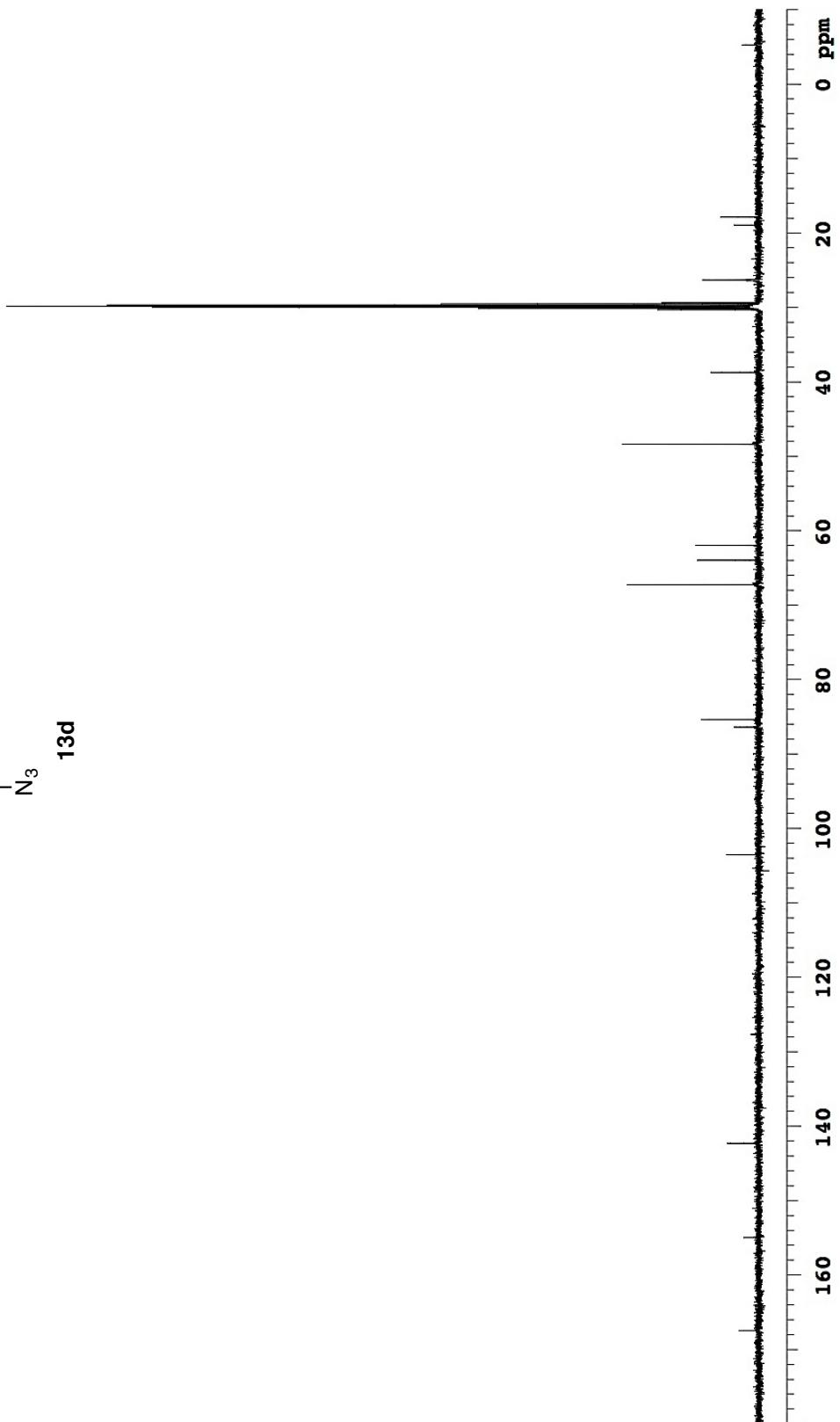
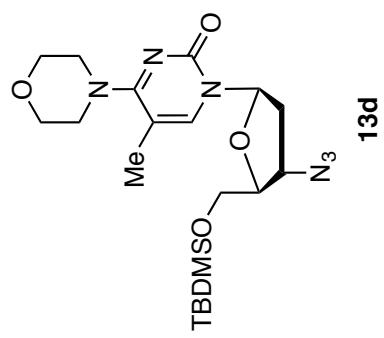


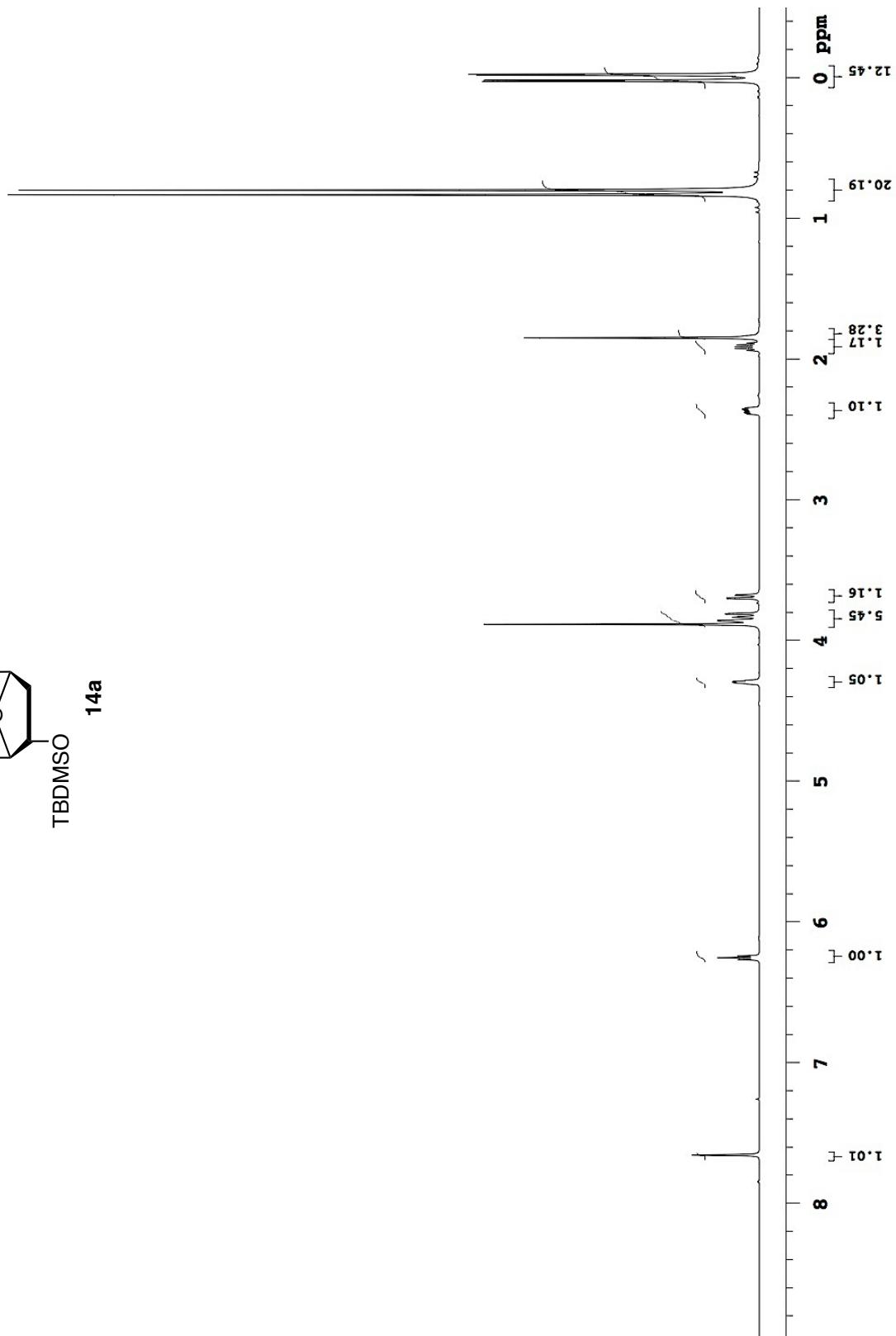
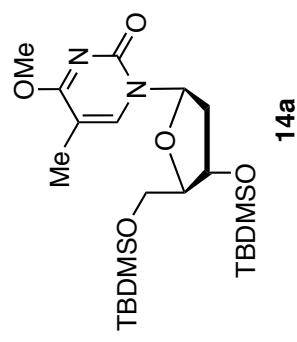


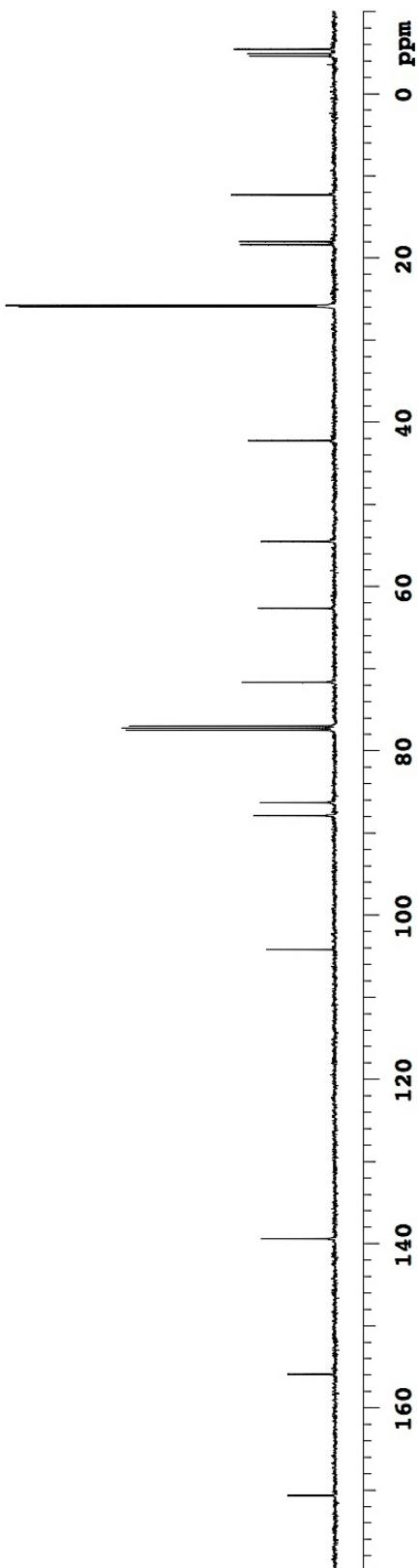
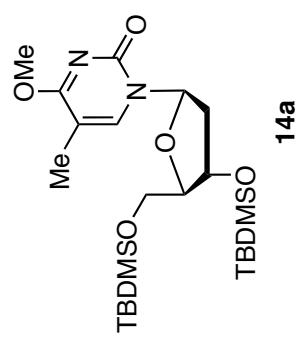
gCOSY spectrum of compound **13c** in acetone-*d*₆

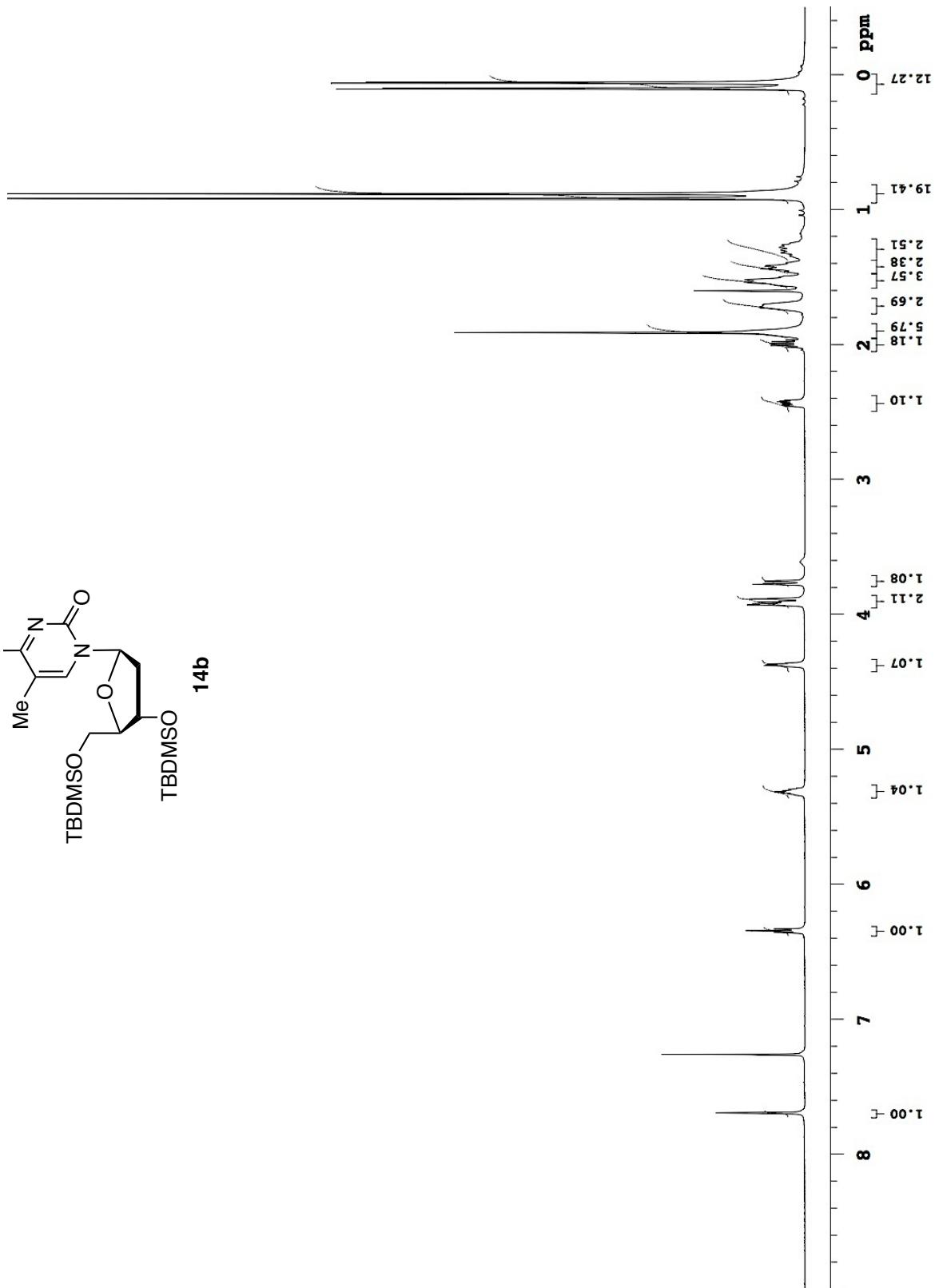
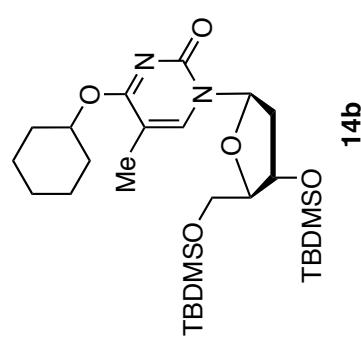


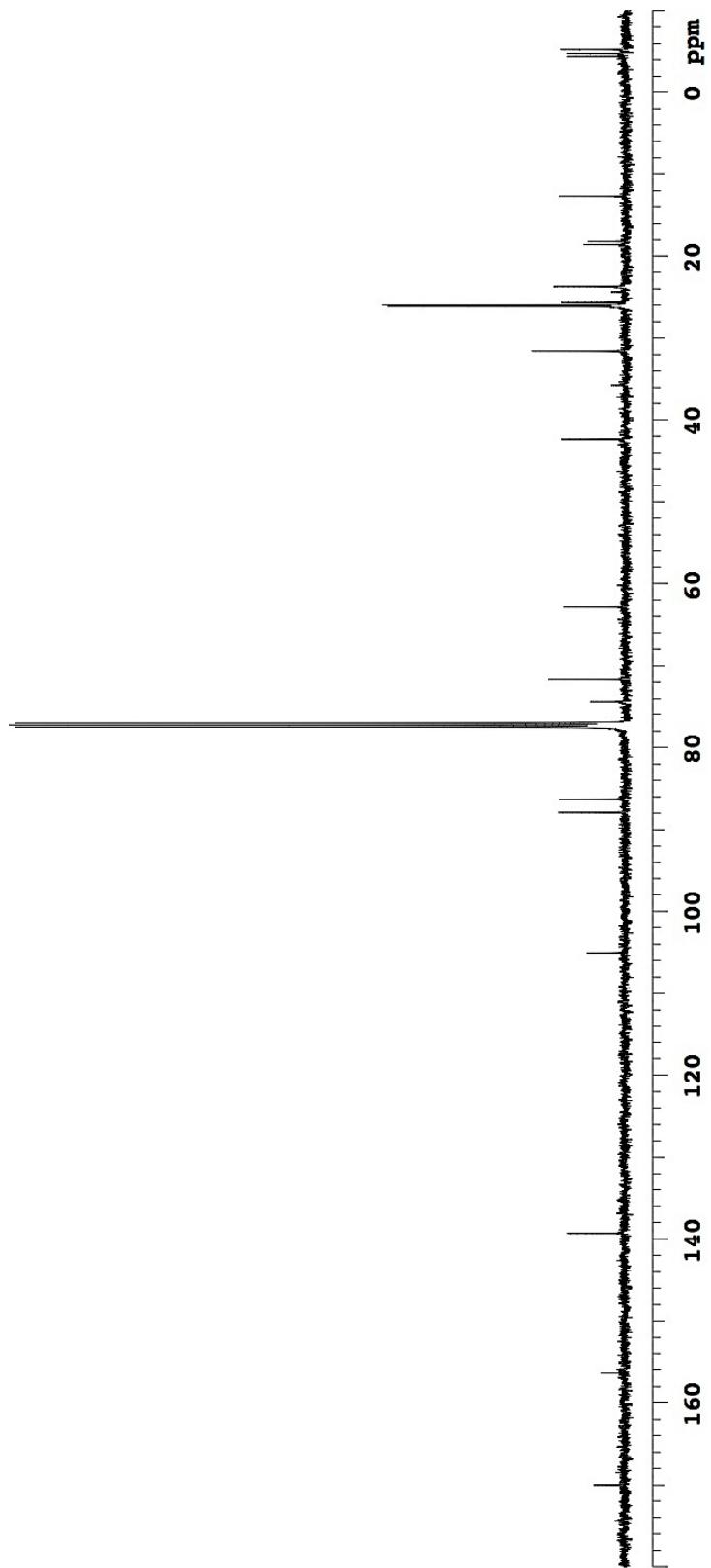
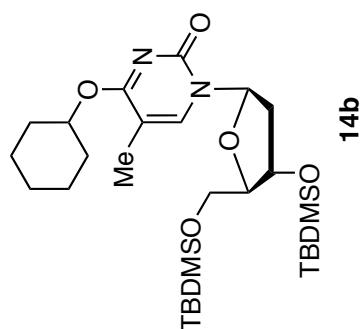


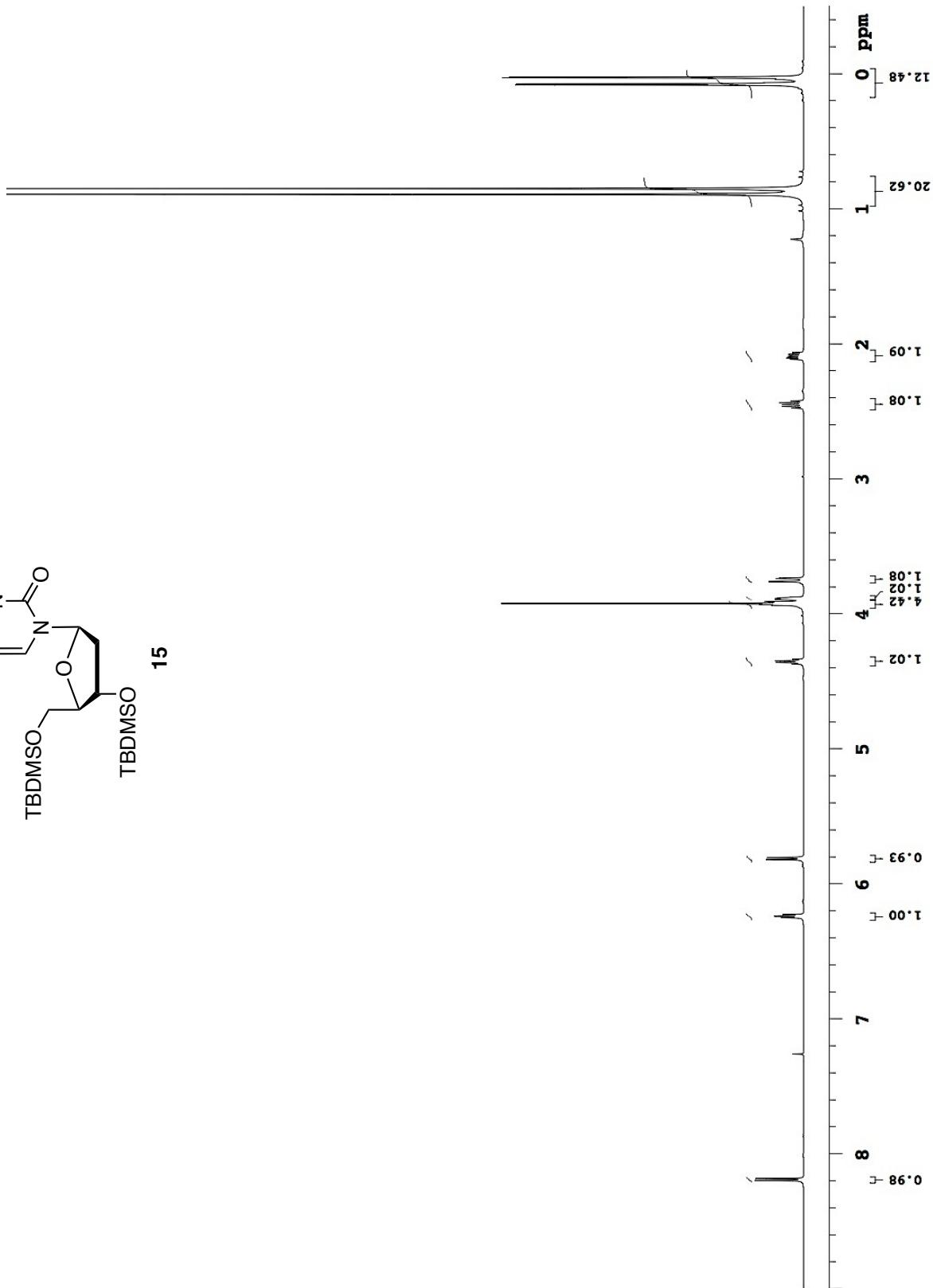
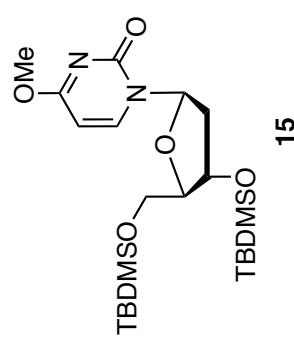


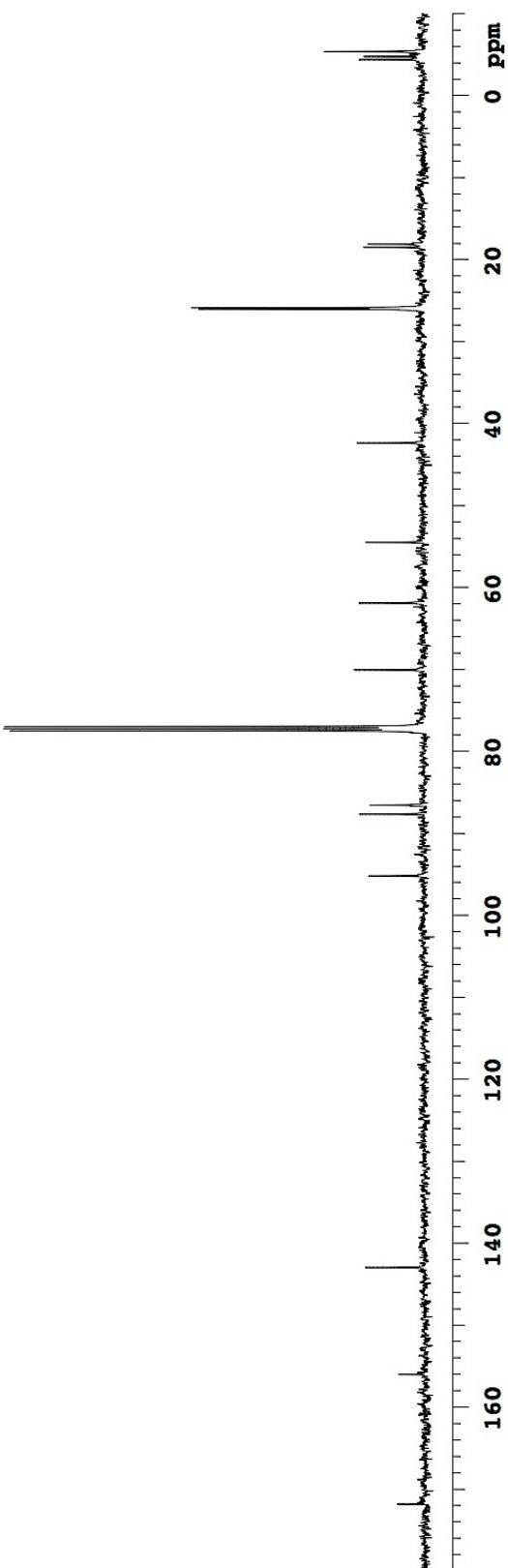
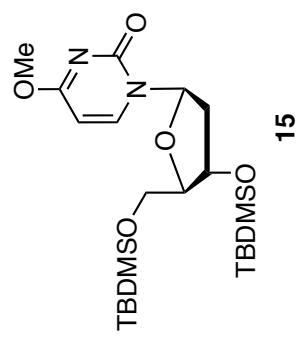


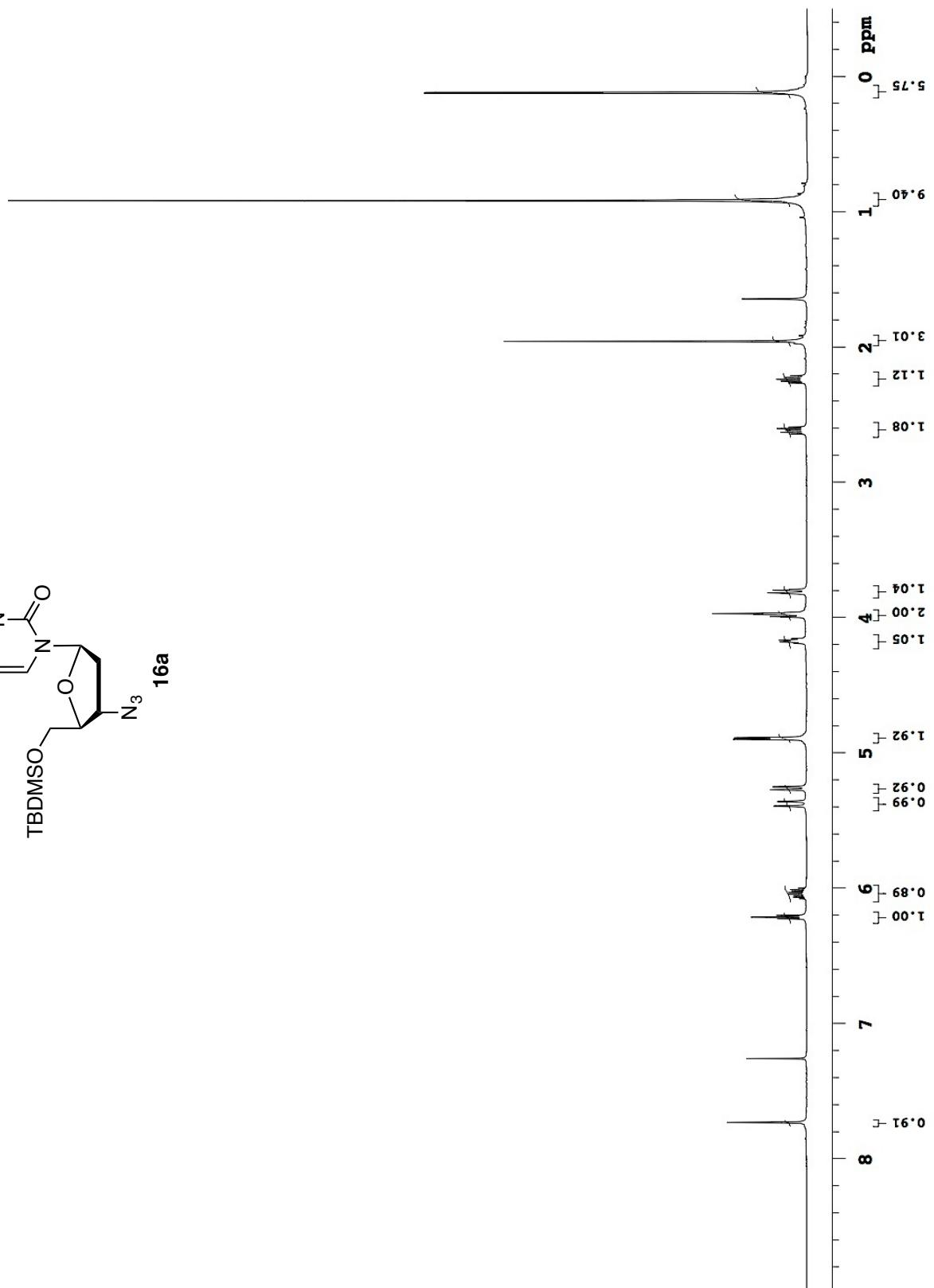
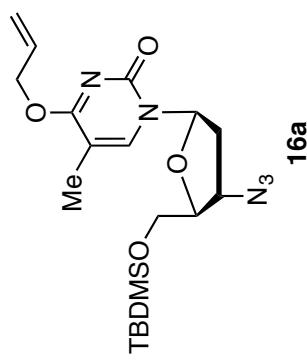


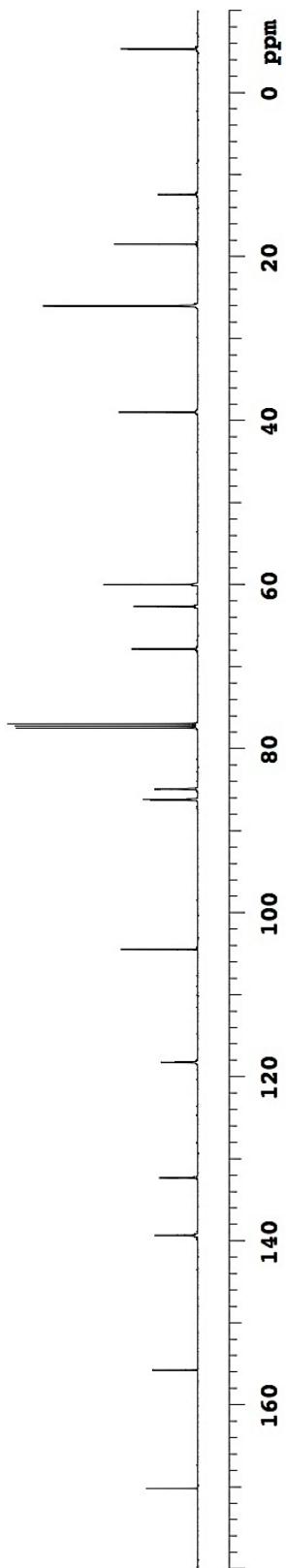
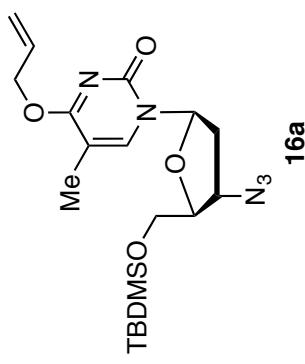


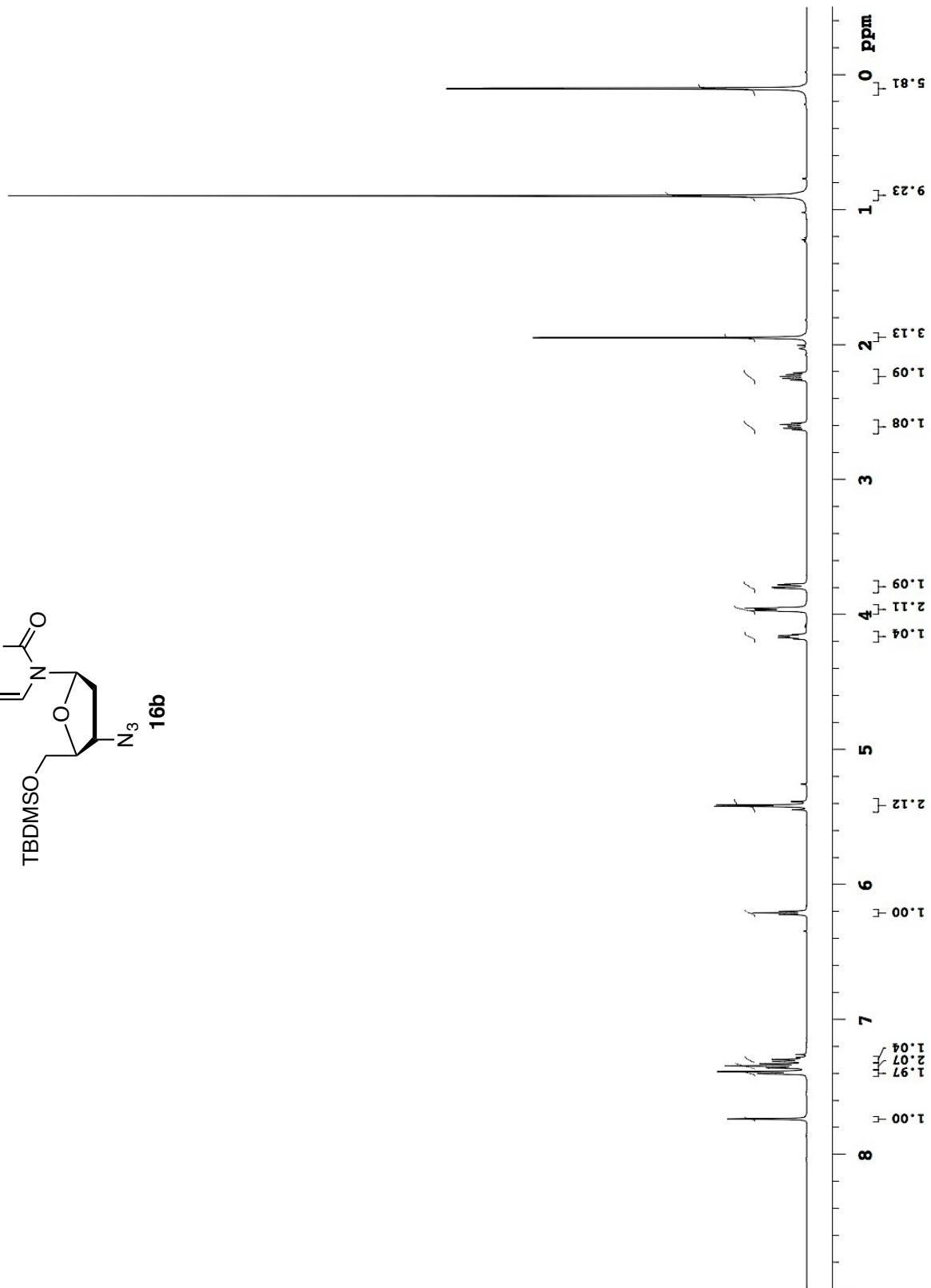
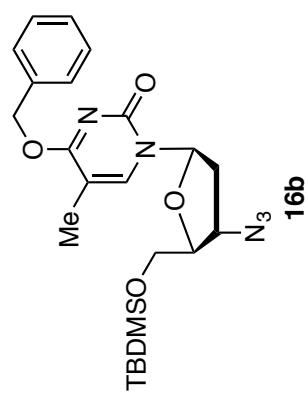


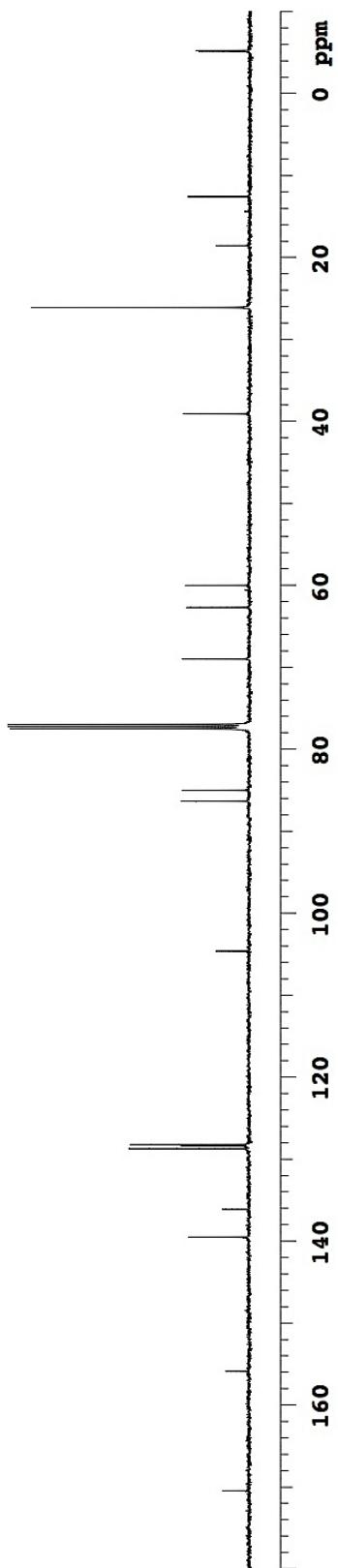
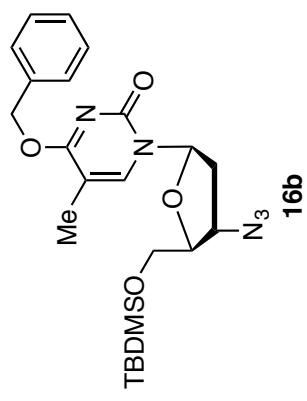


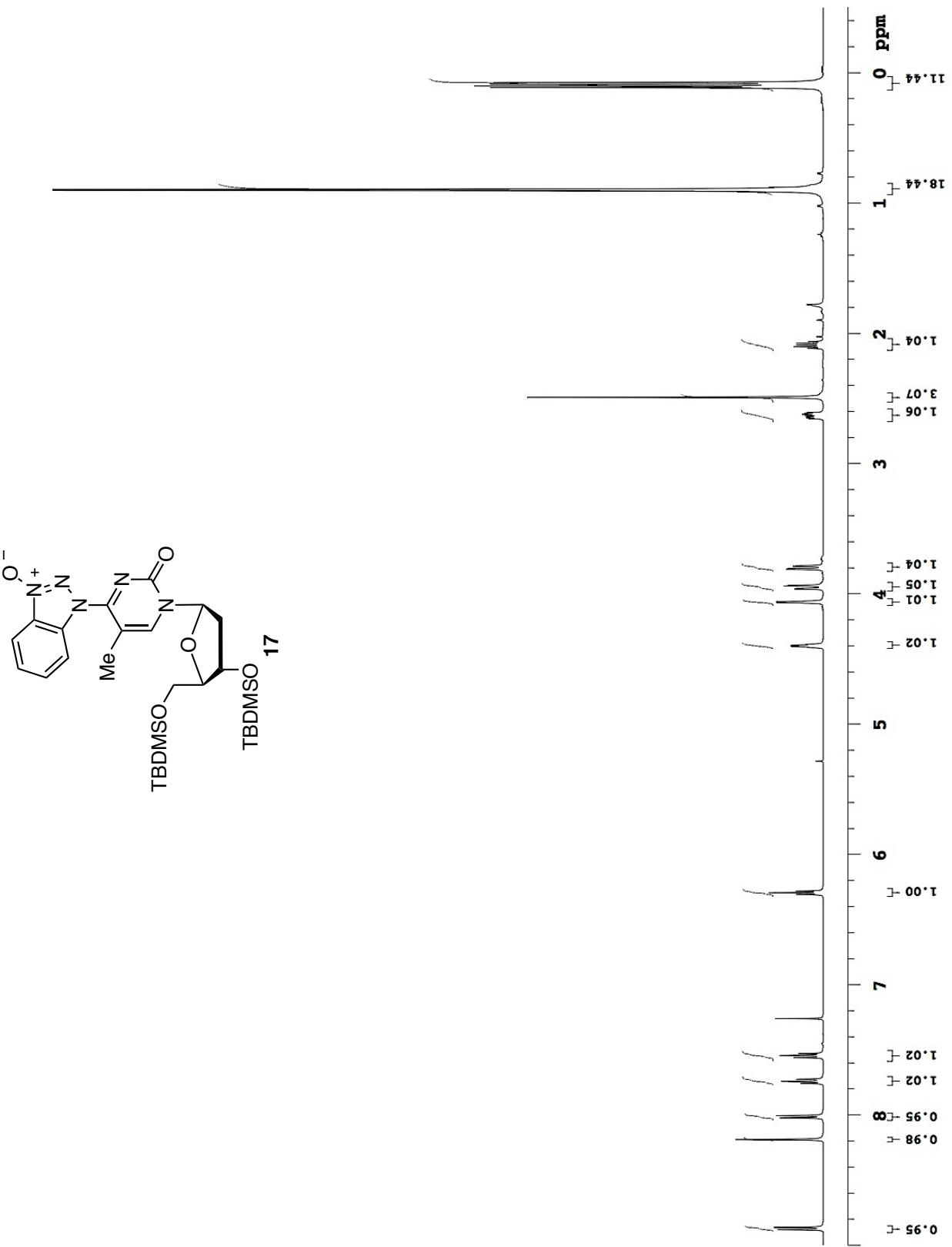


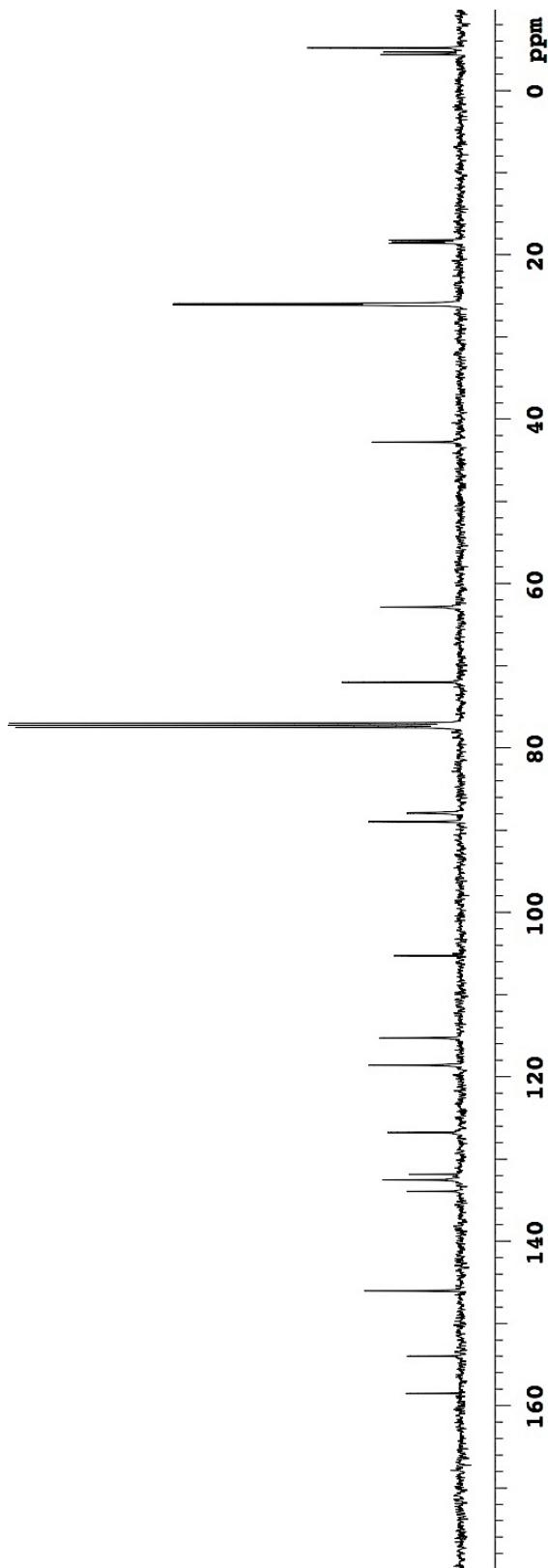
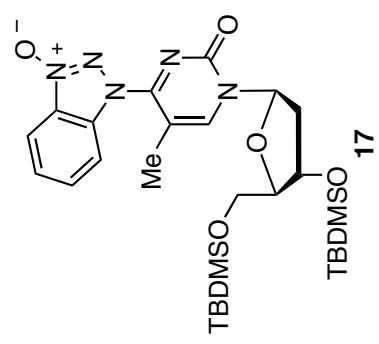


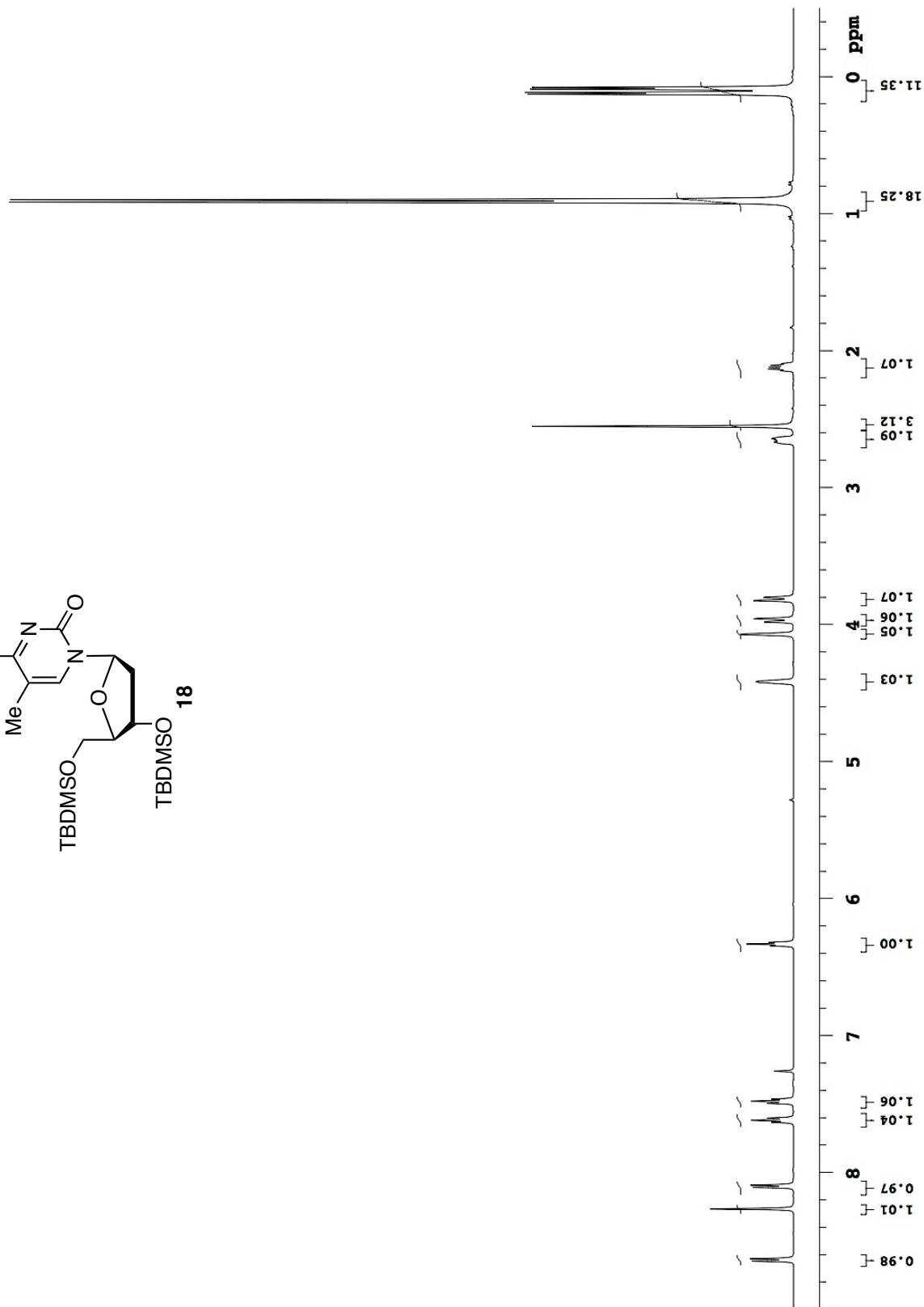
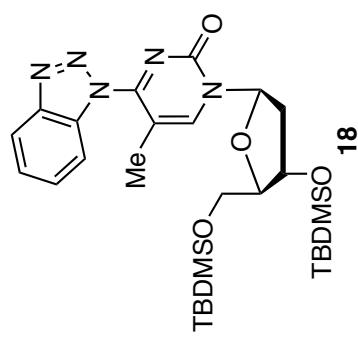


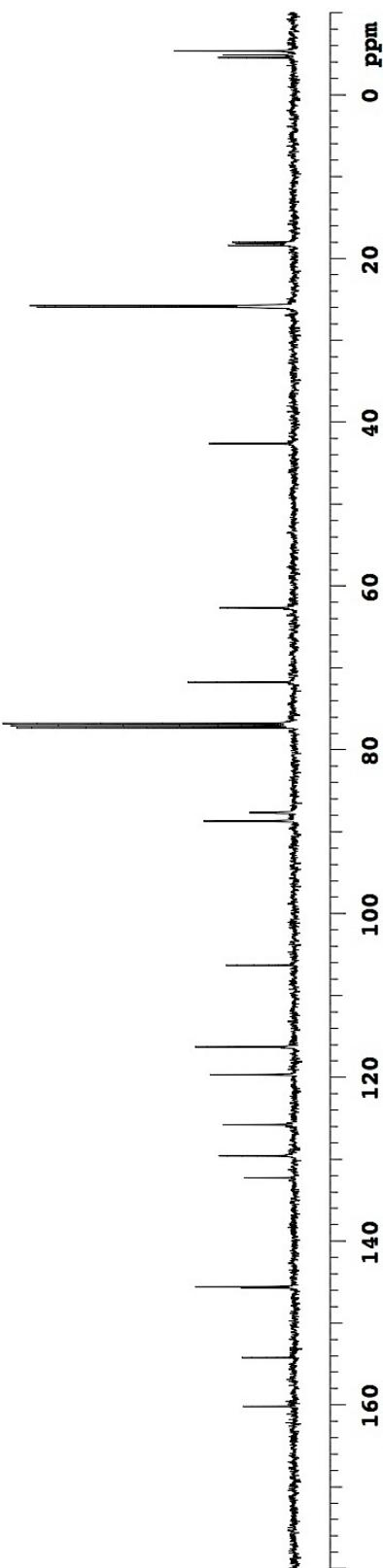
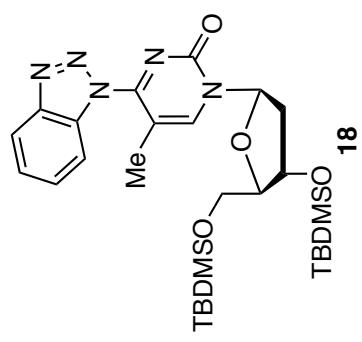


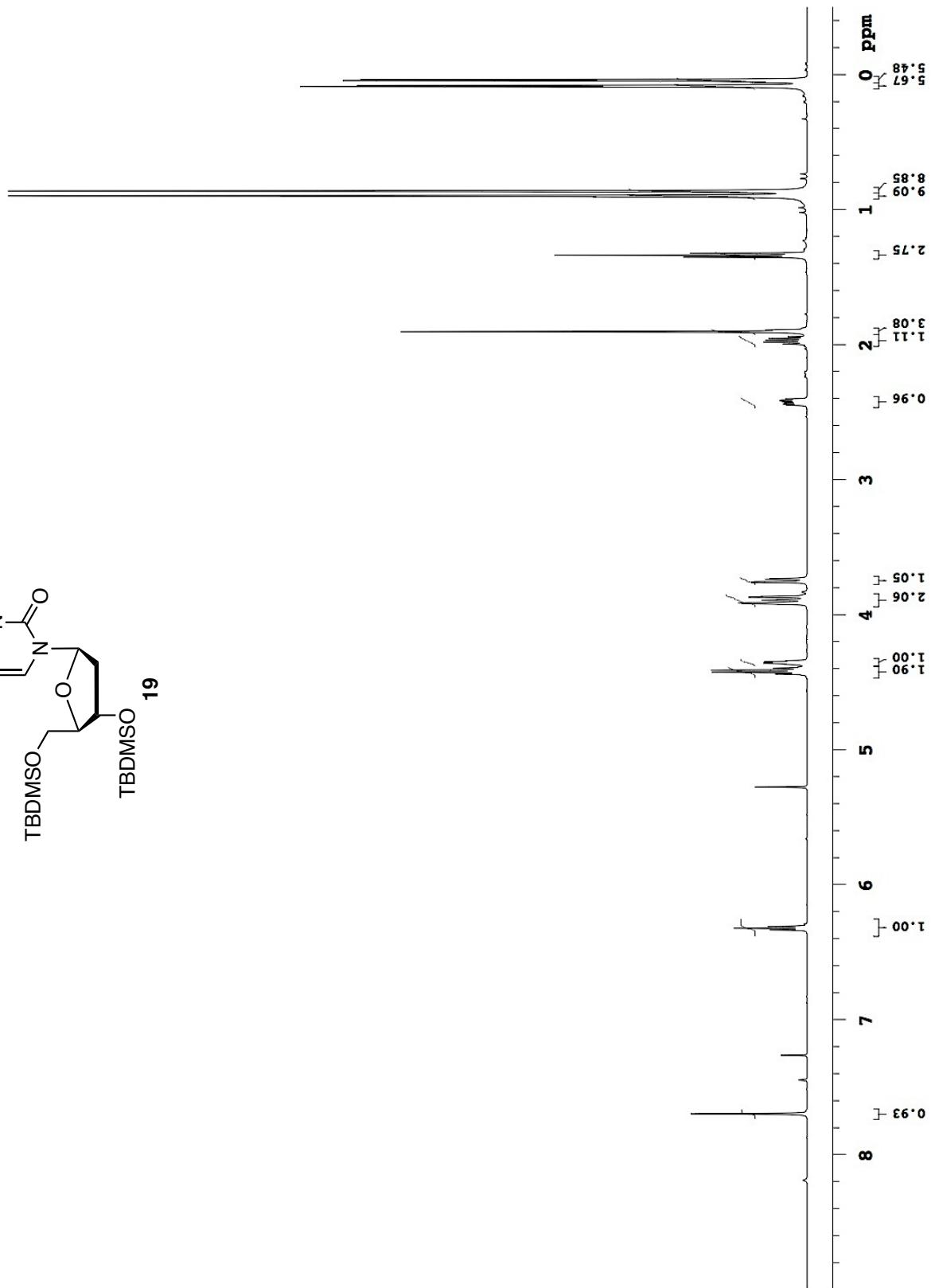
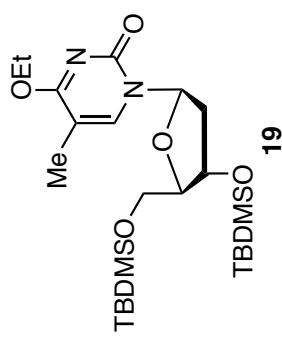


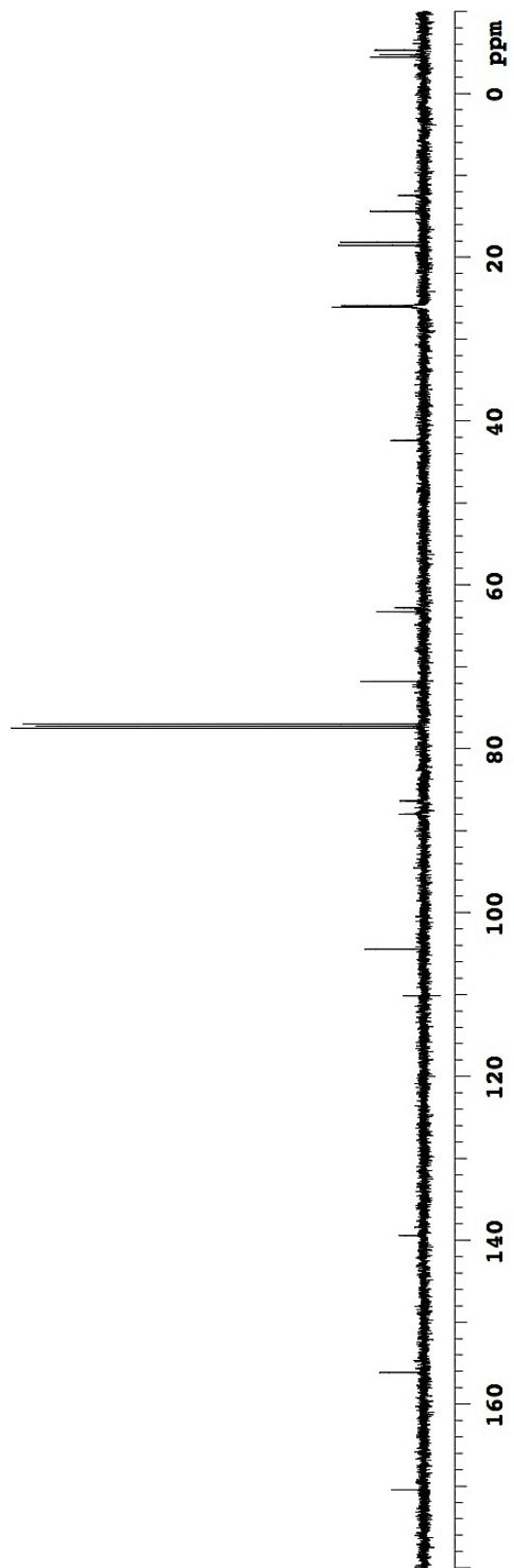
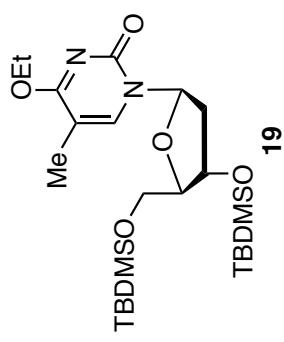


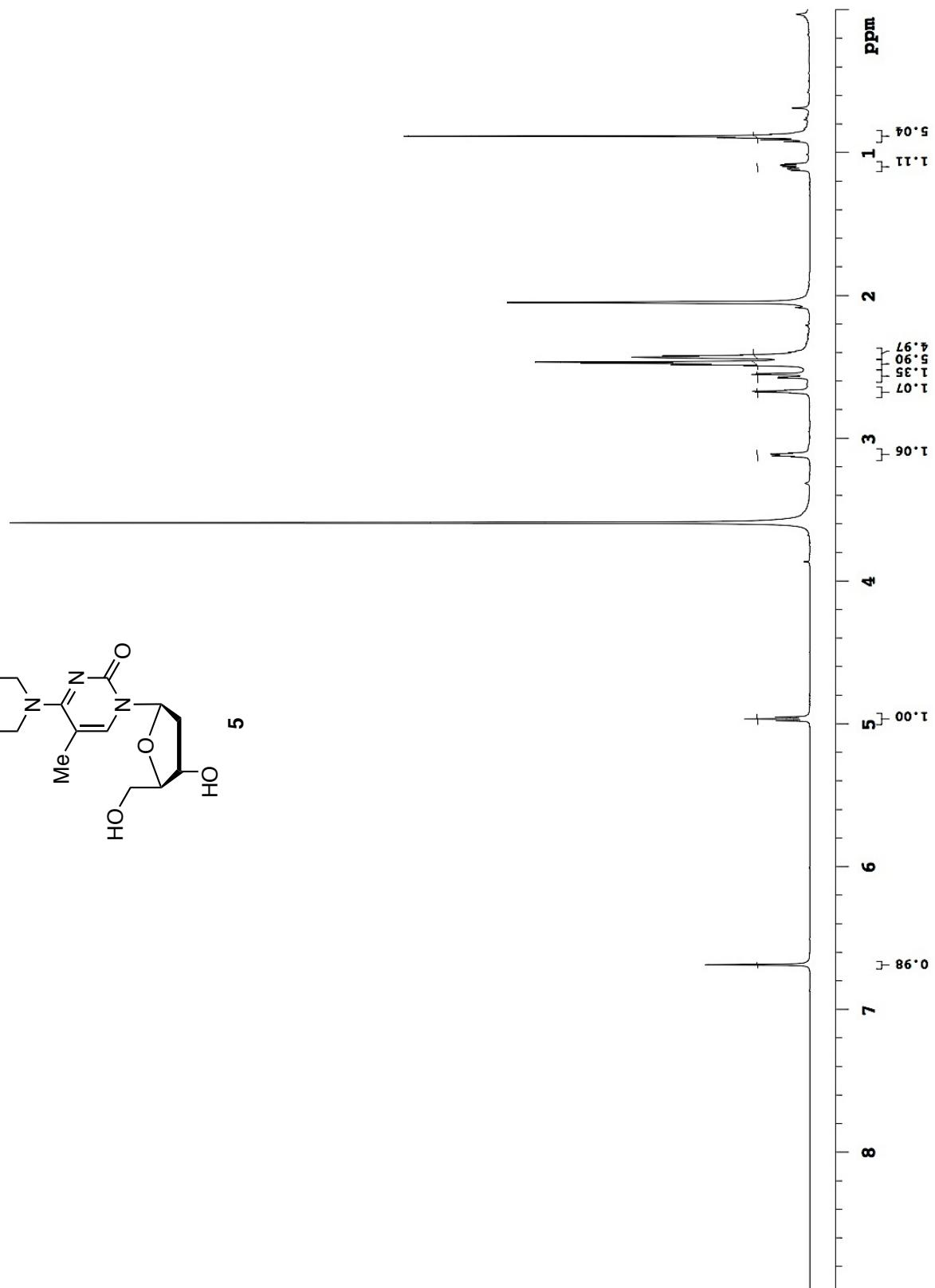
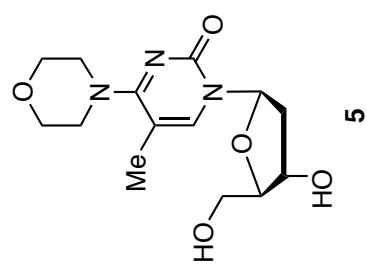


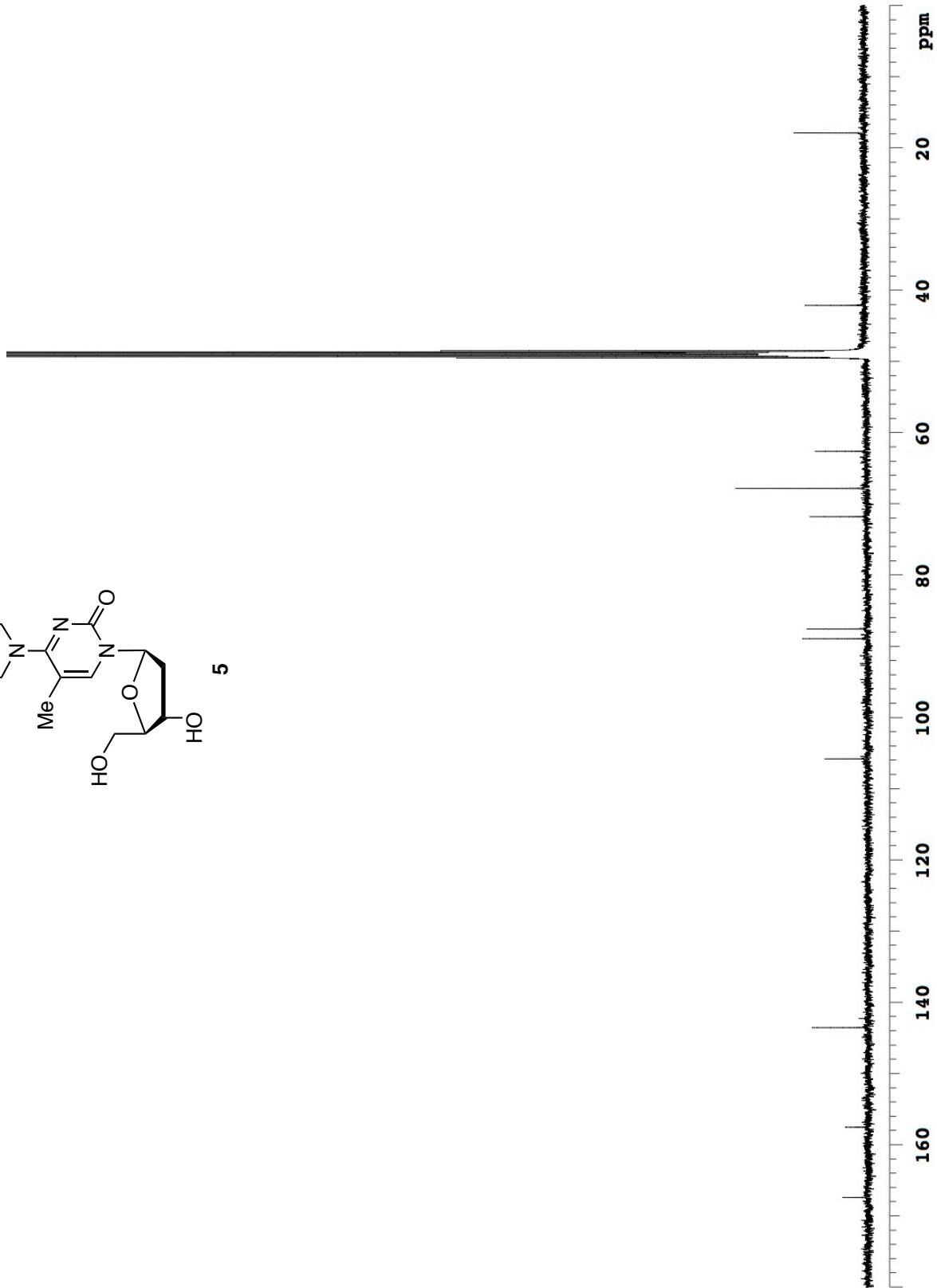
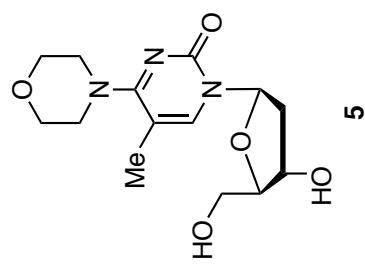


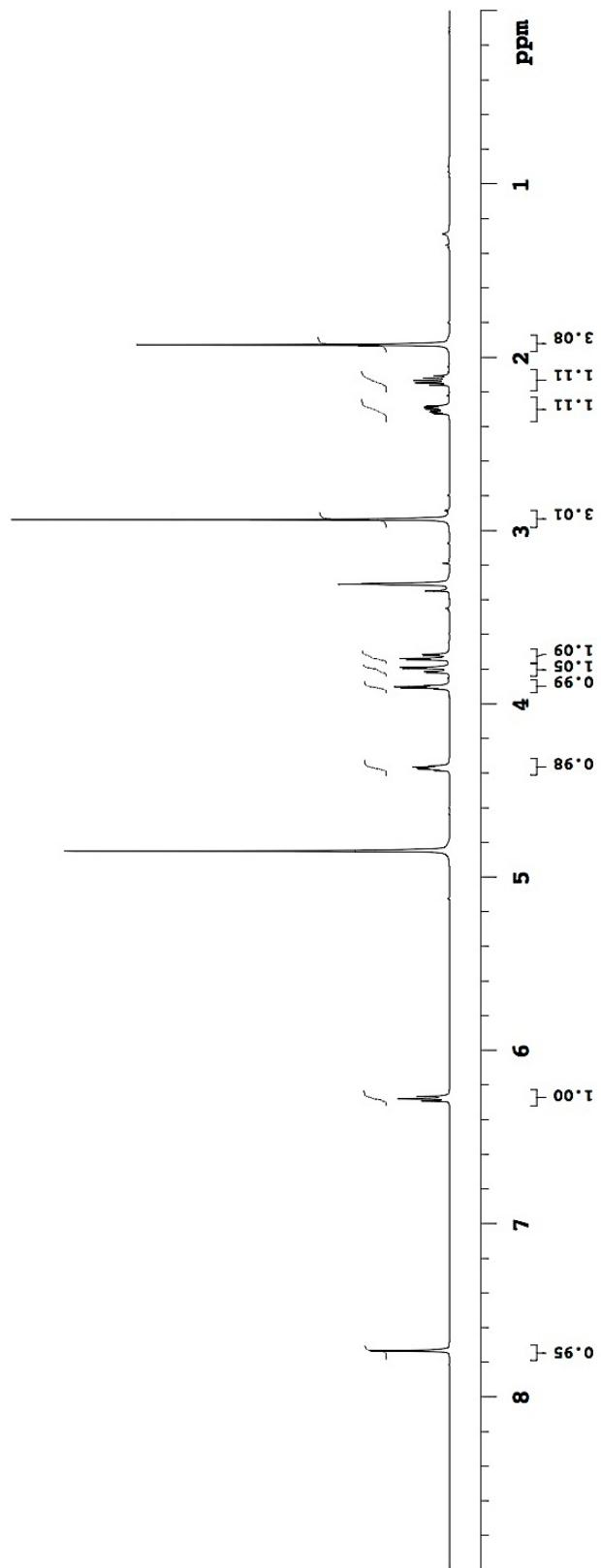
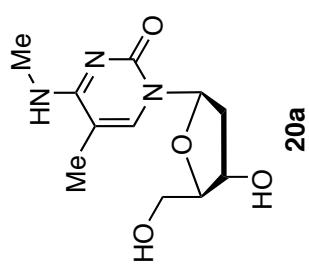


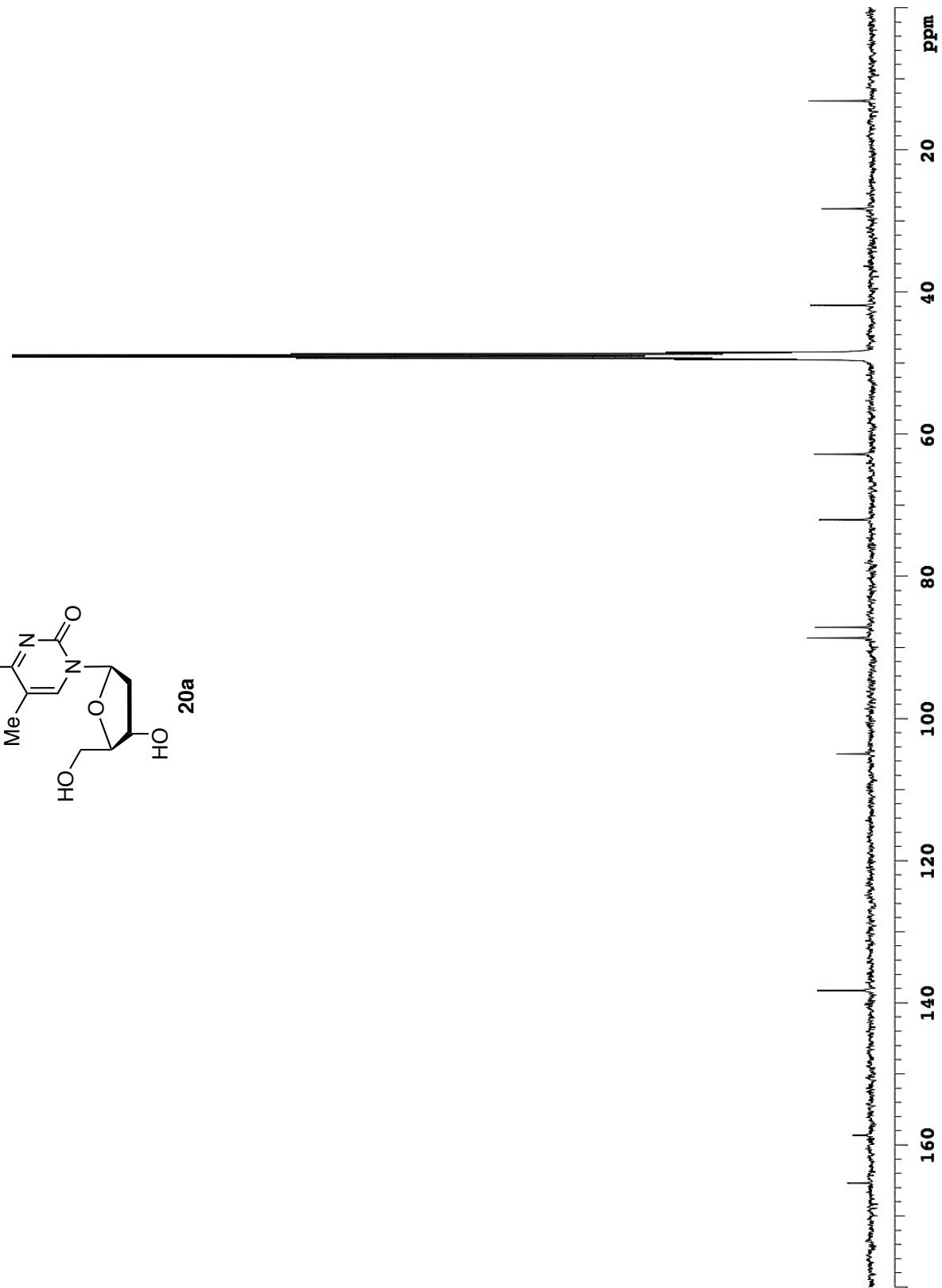
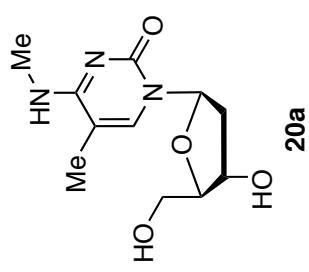


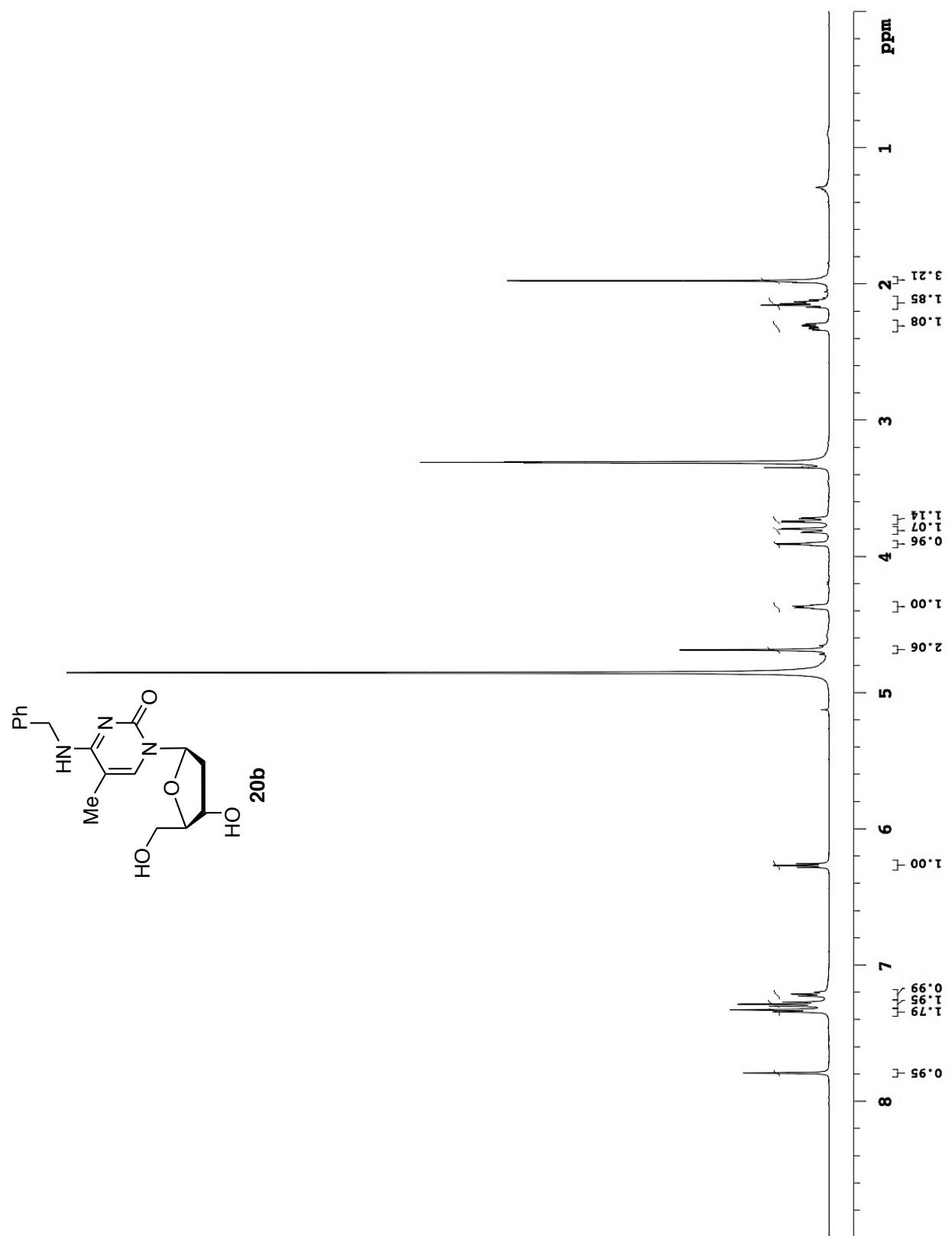


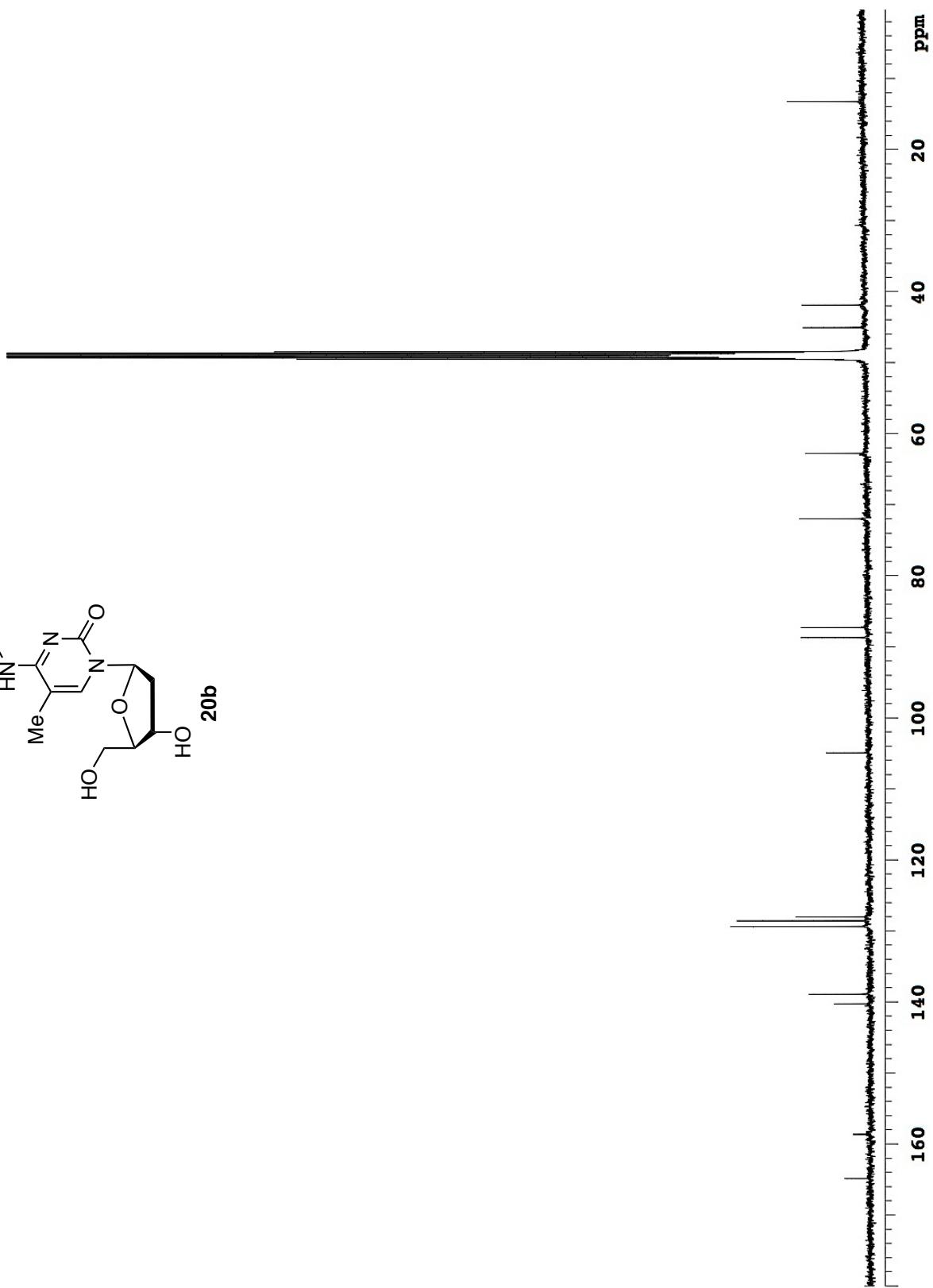
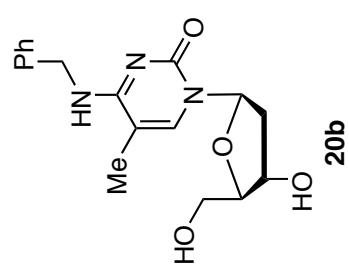


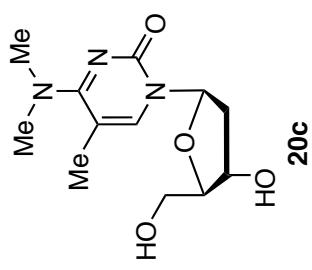


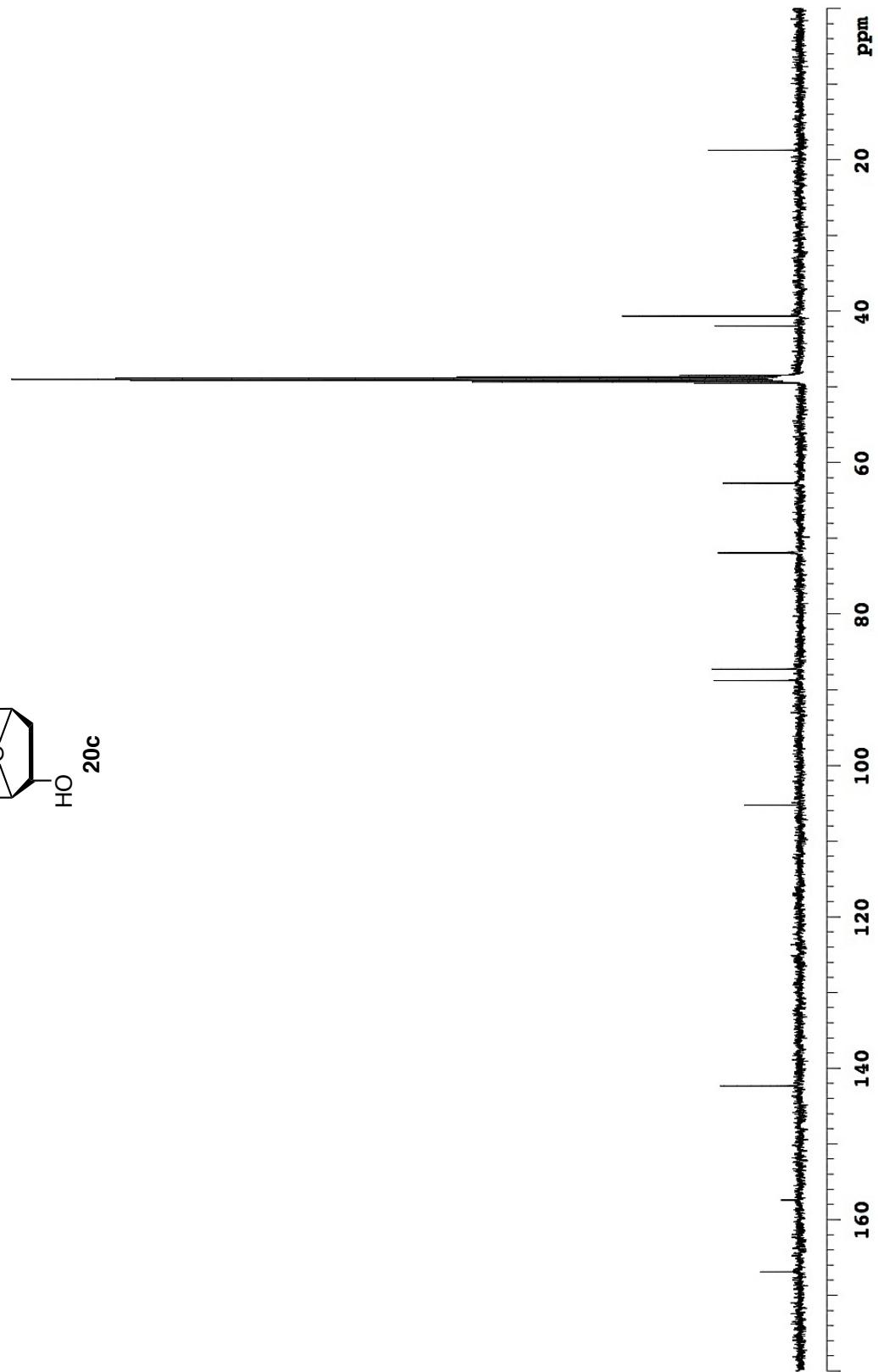
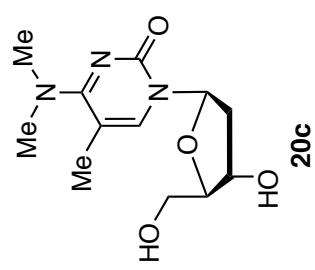


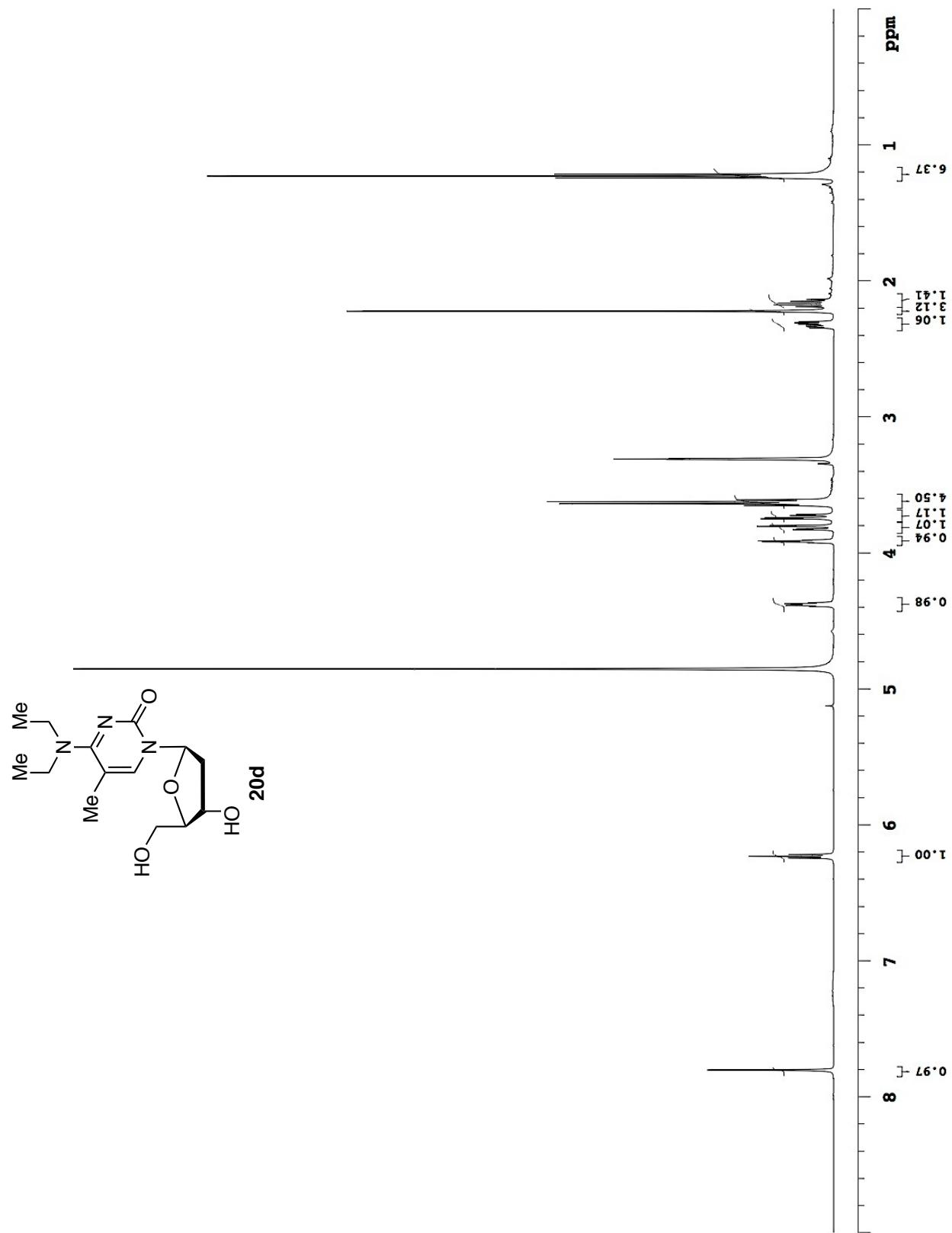


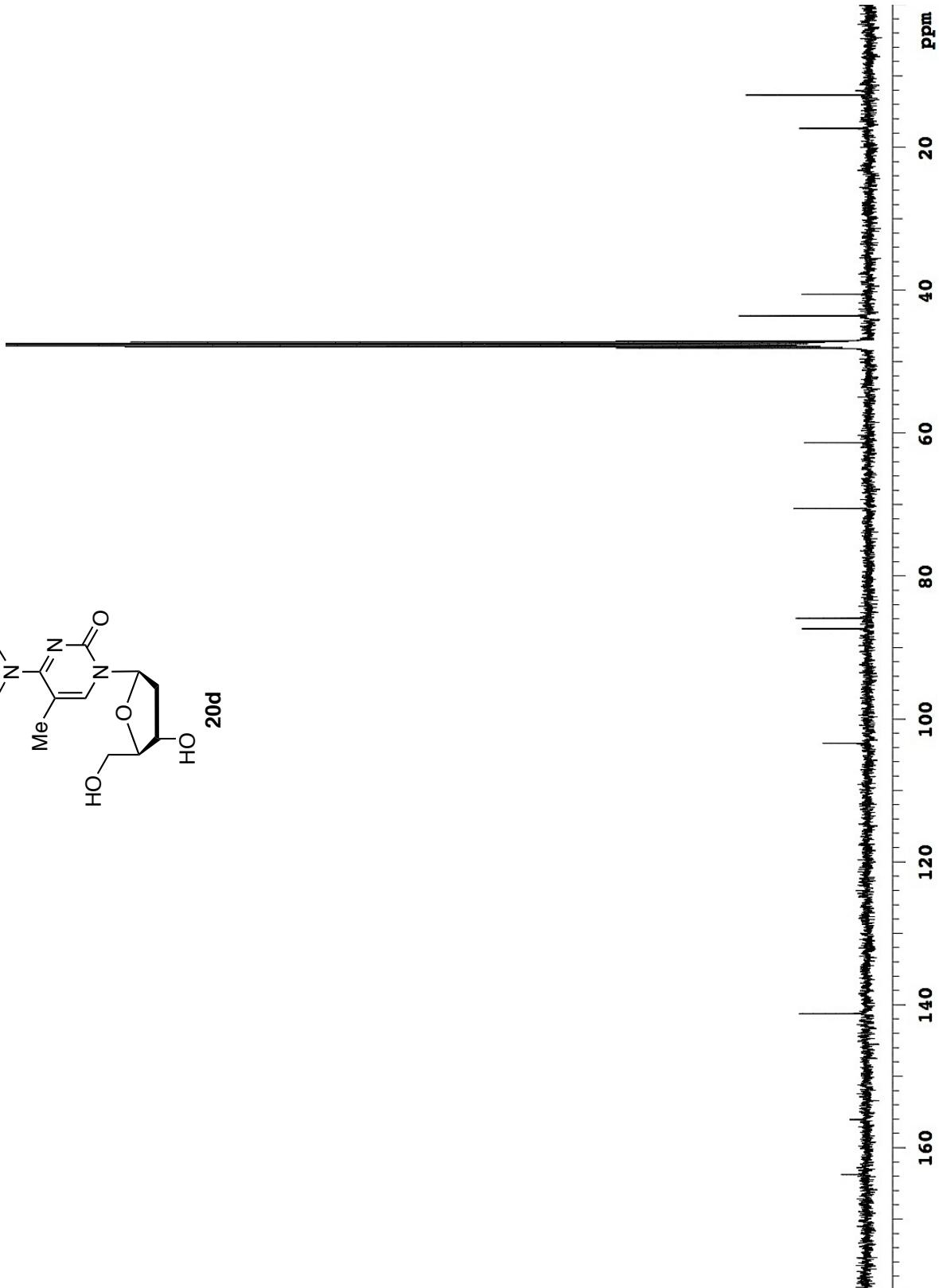
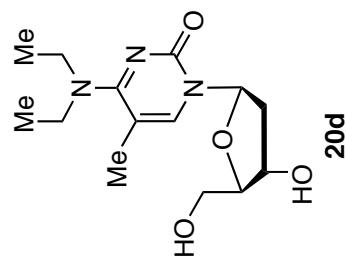


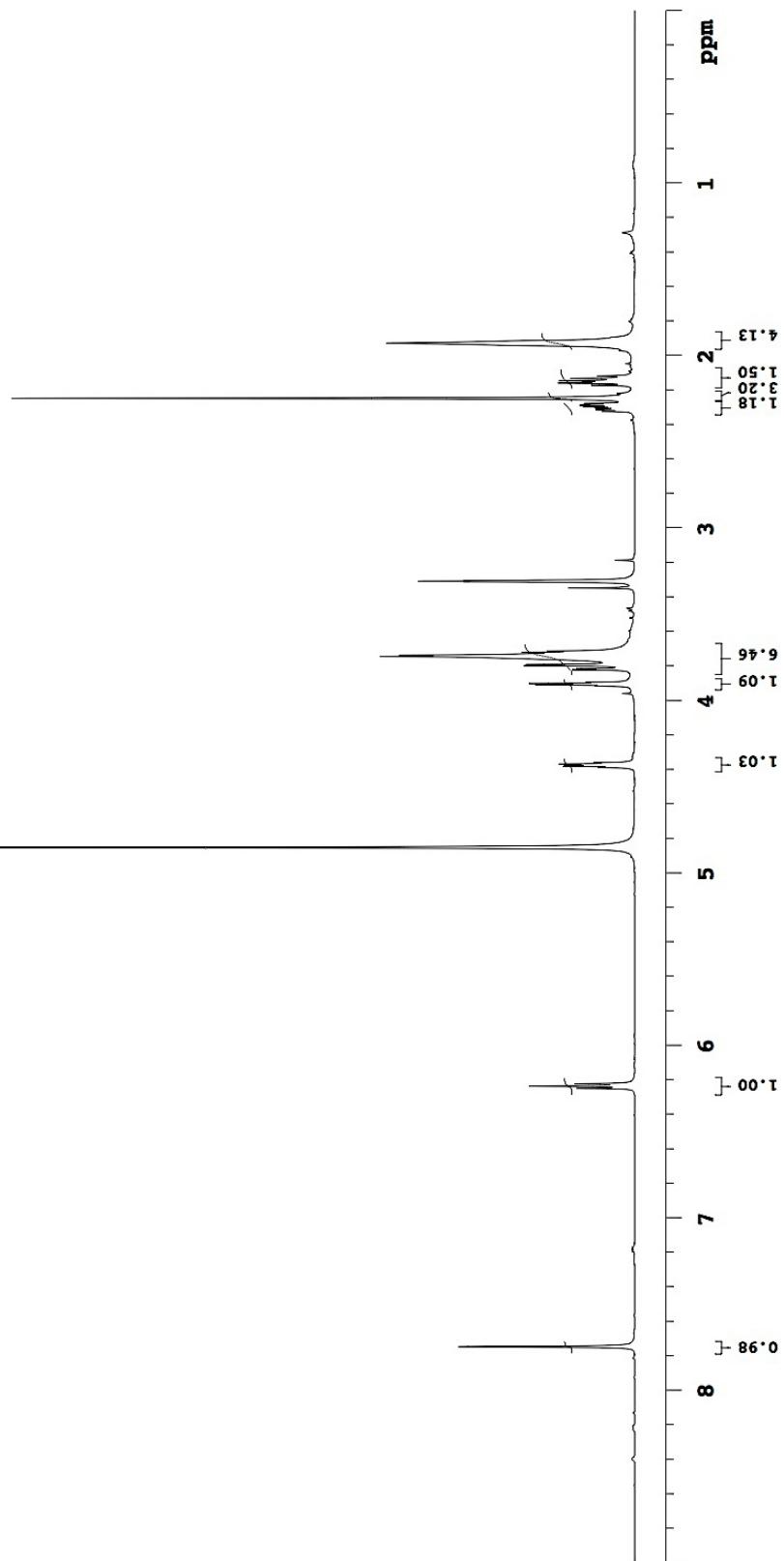
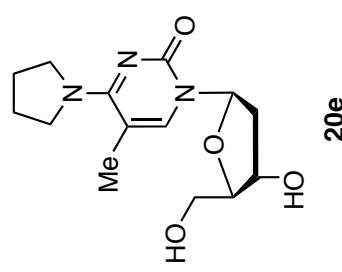


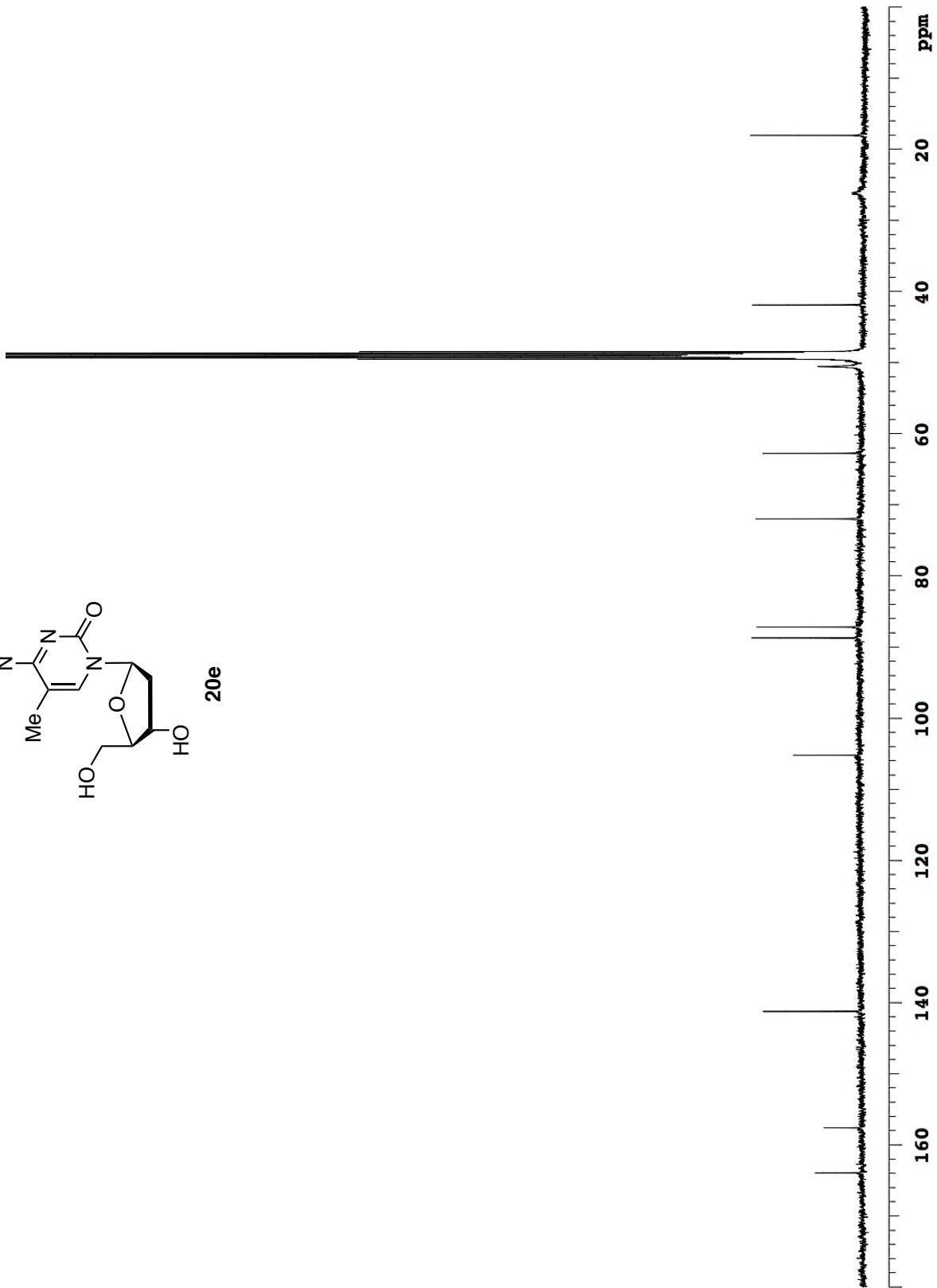
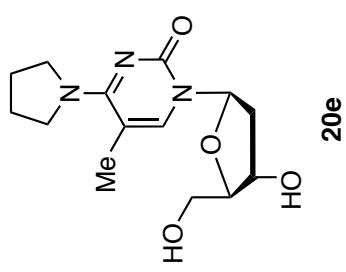




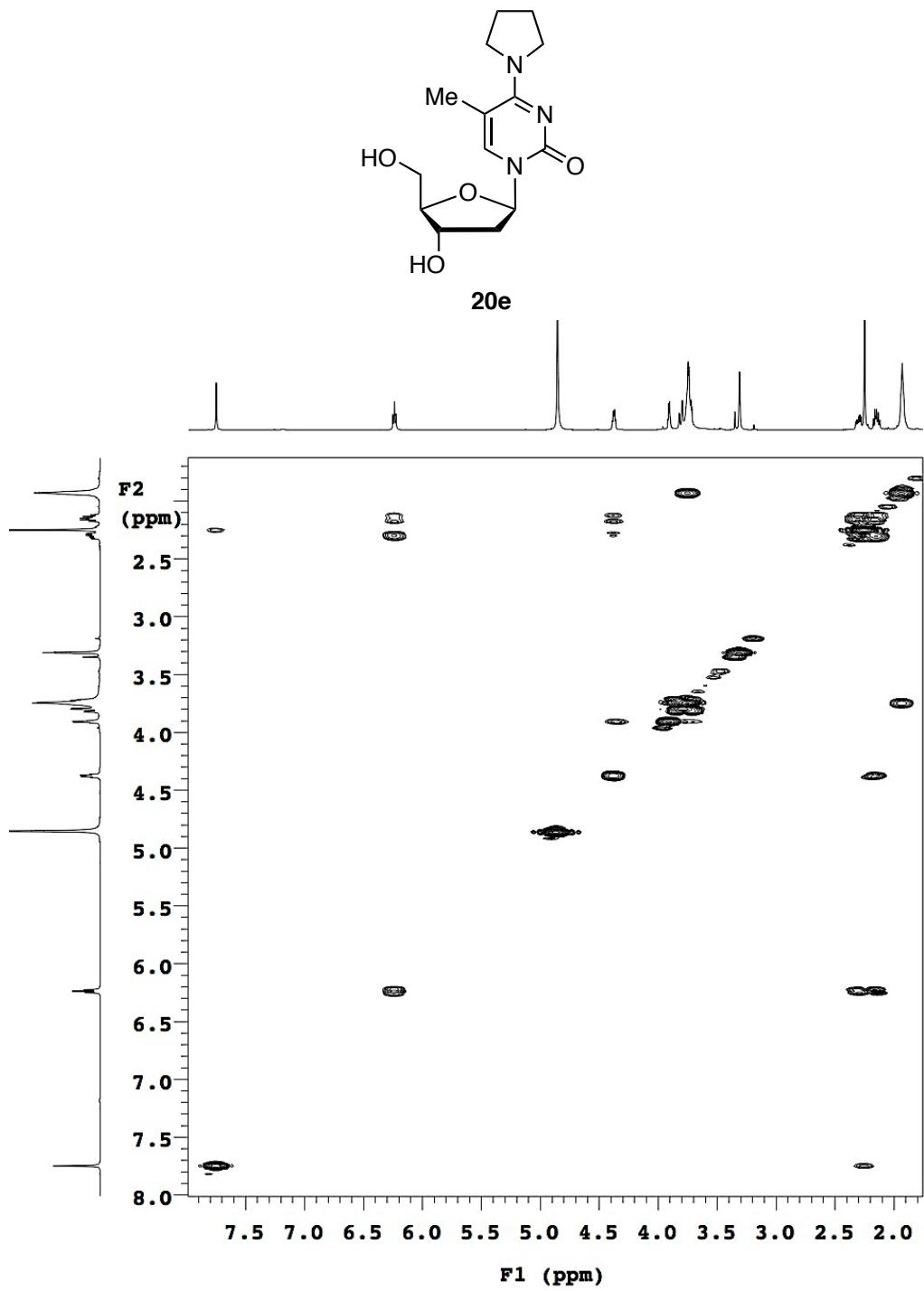




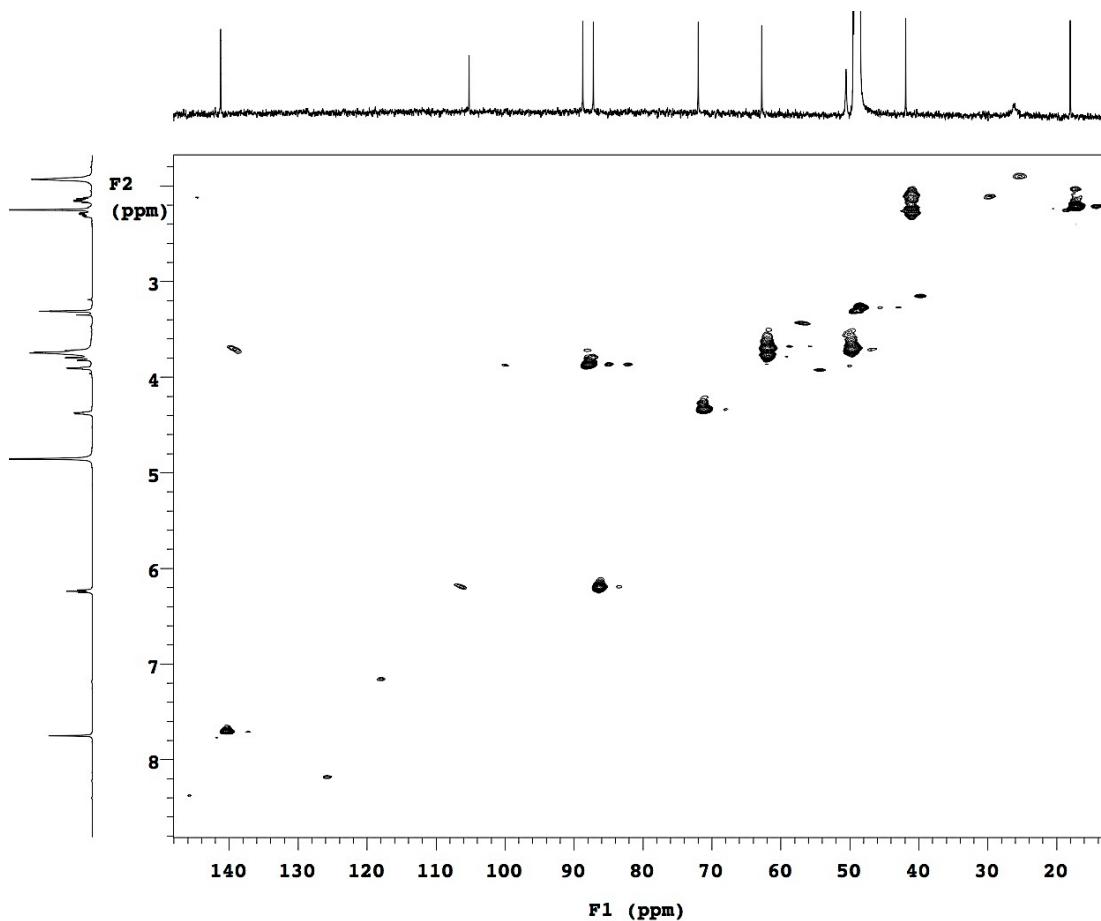
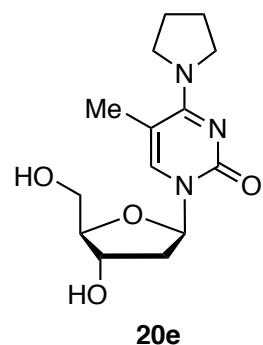




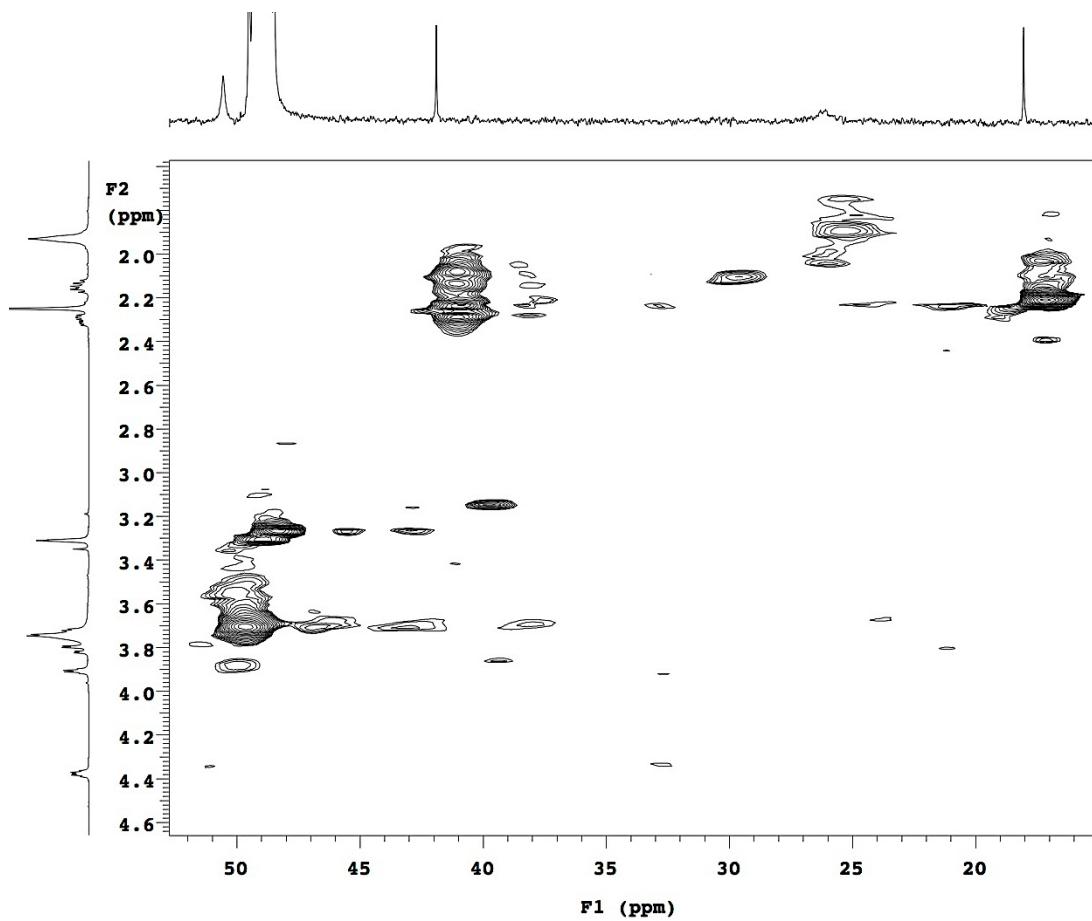
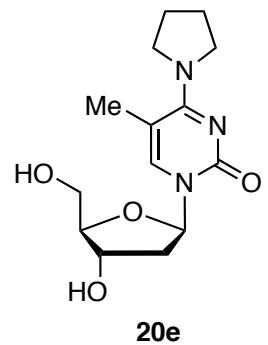
gCOSY spectrum of compound **20e** in CD₃OD



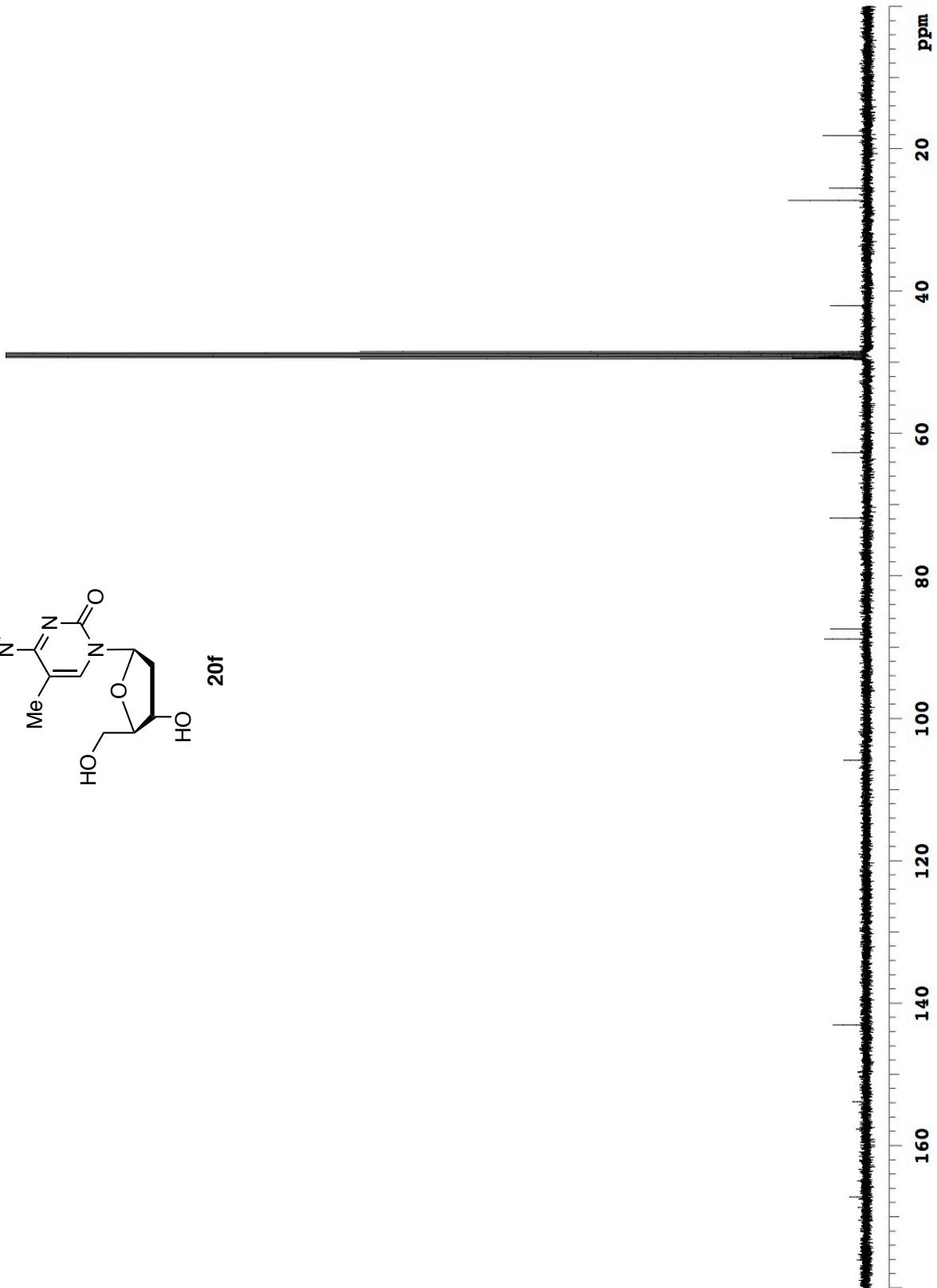
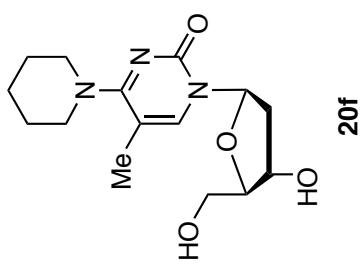
gHMQC spectrum of compound **20e** in CD₃OD

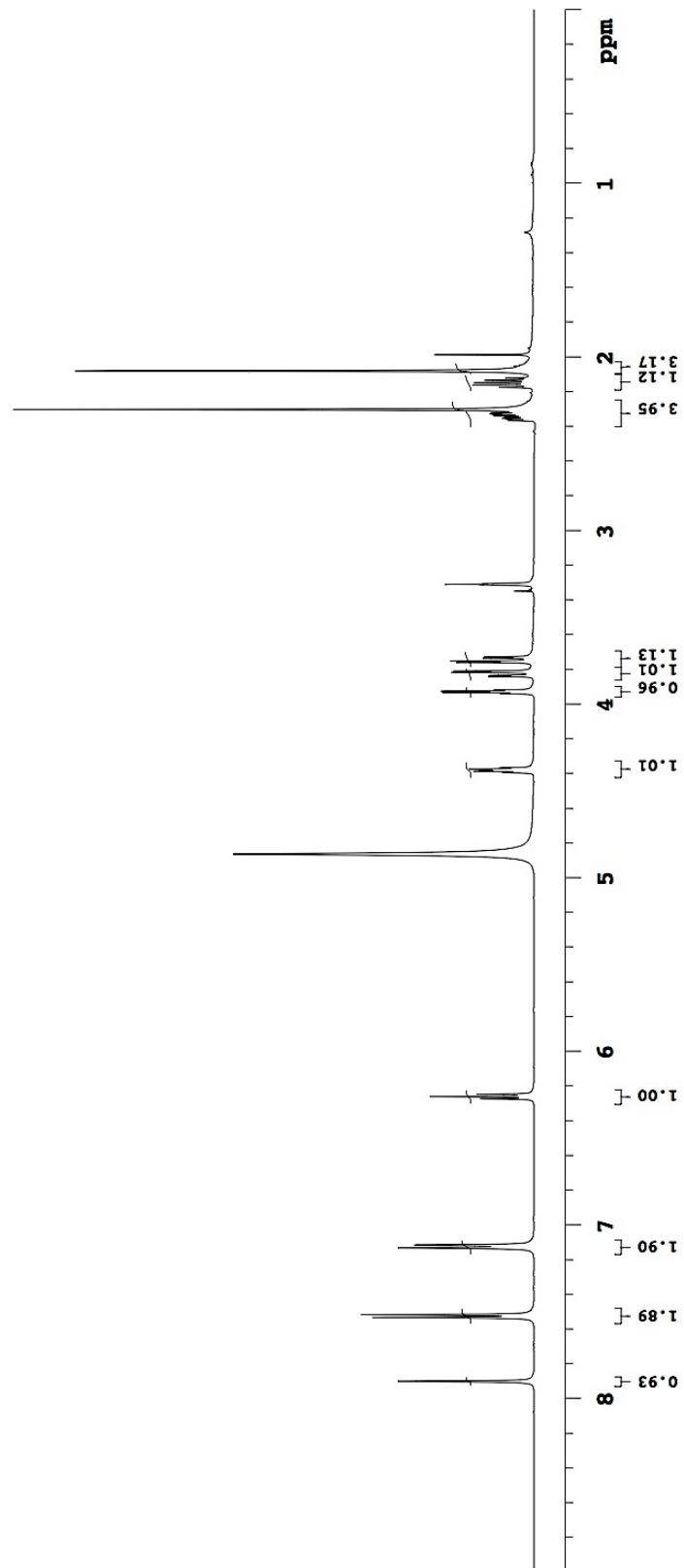
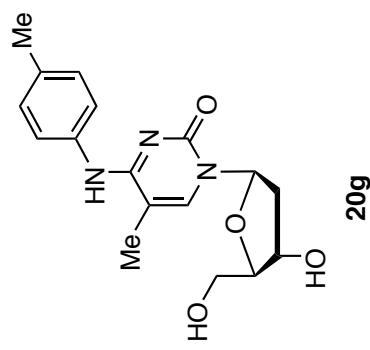


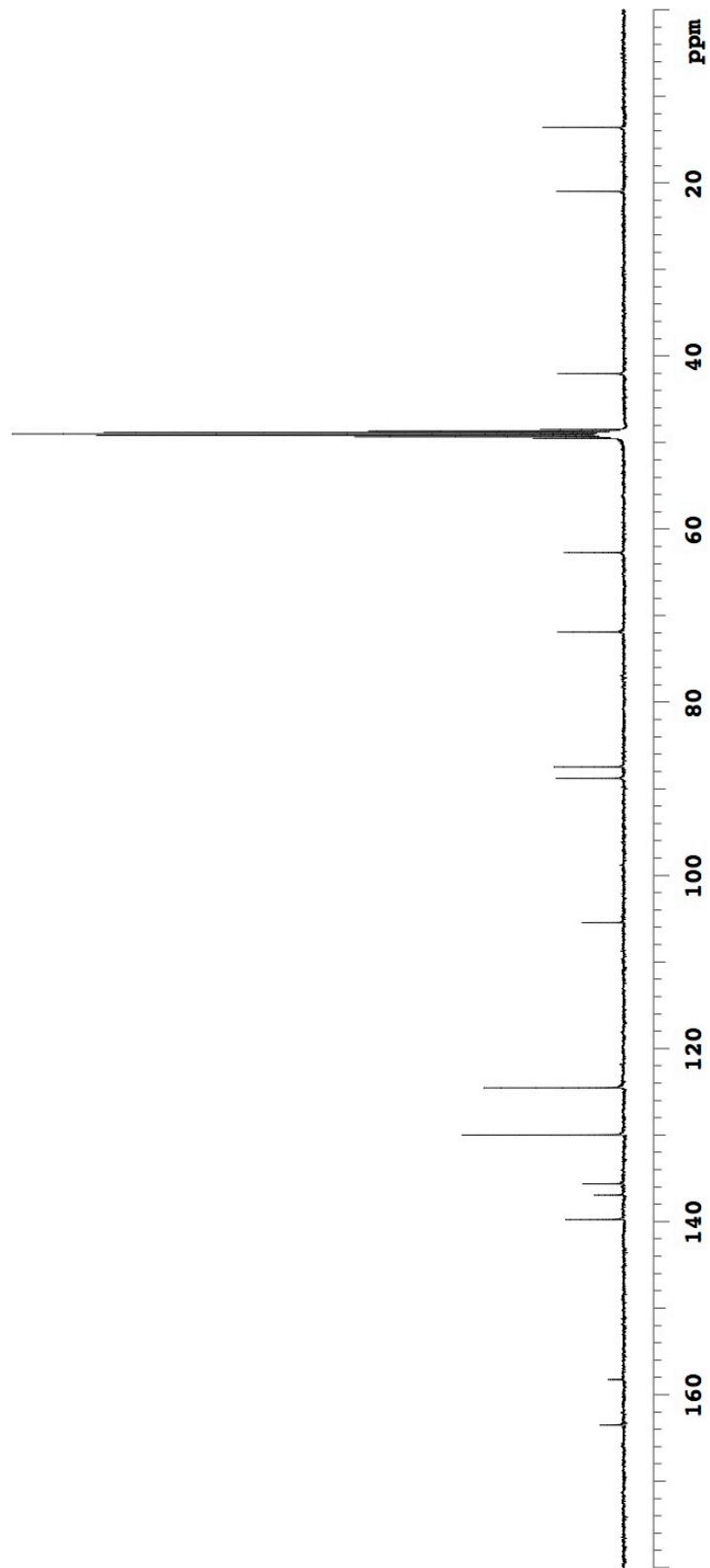
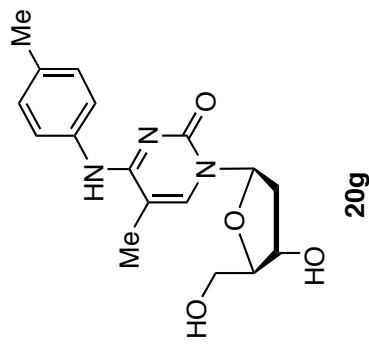
gHMQC spectrum of compound **20e** in CD₃OD

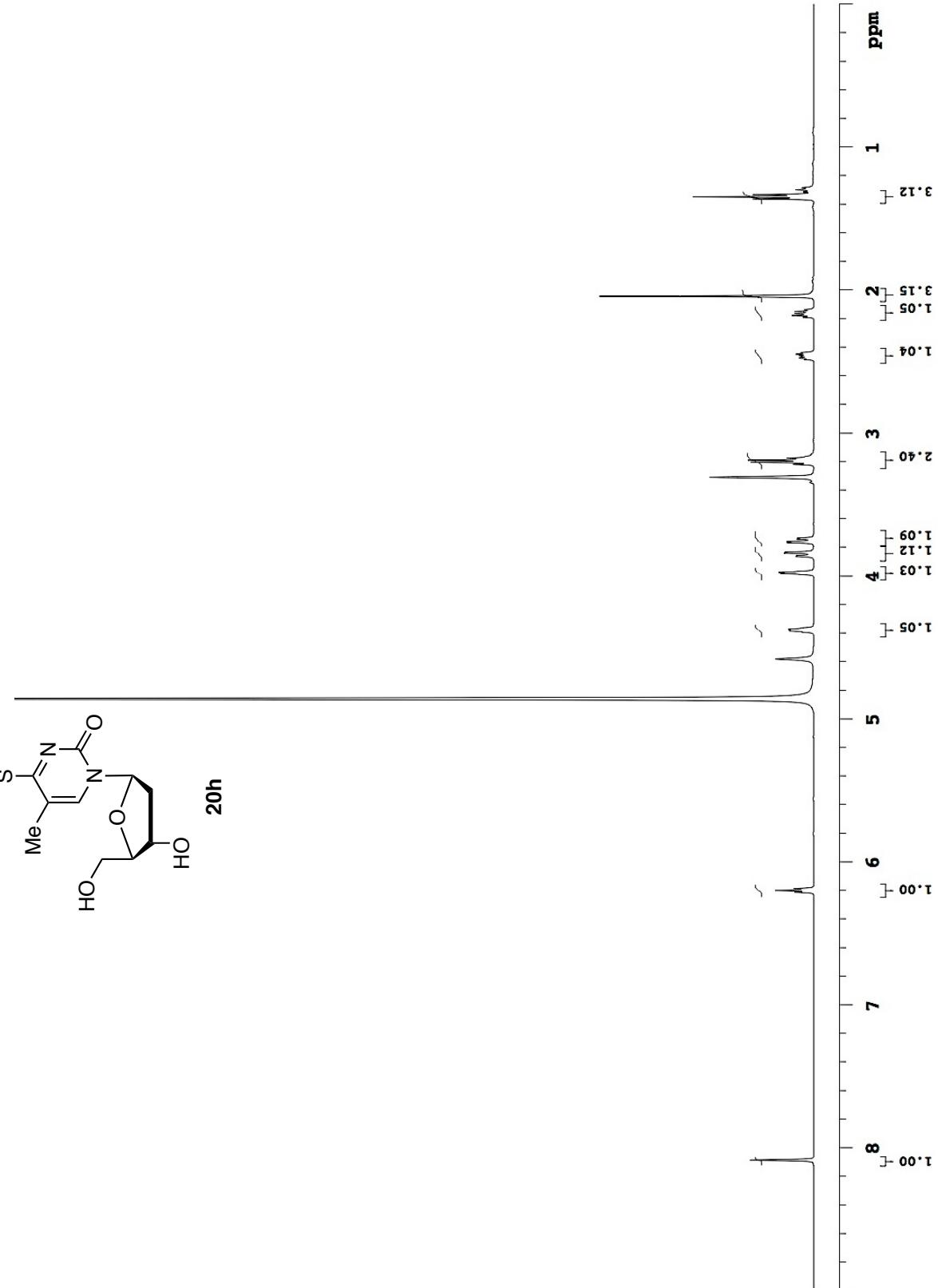
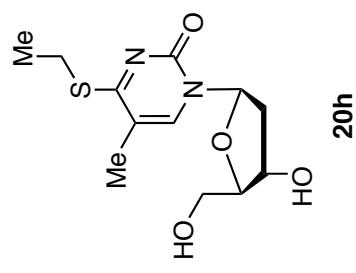


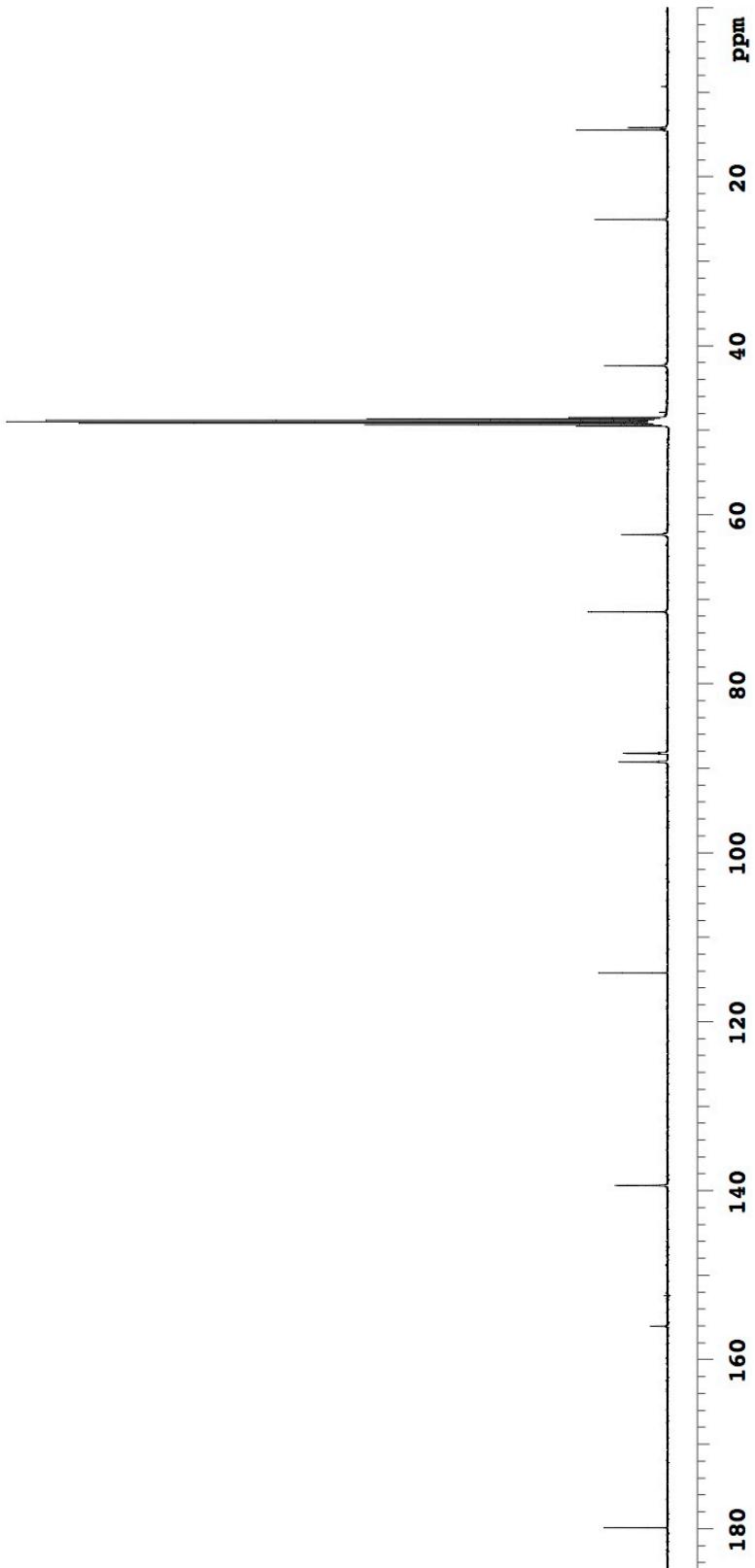
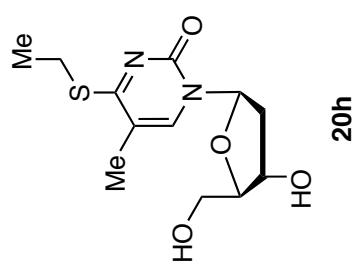


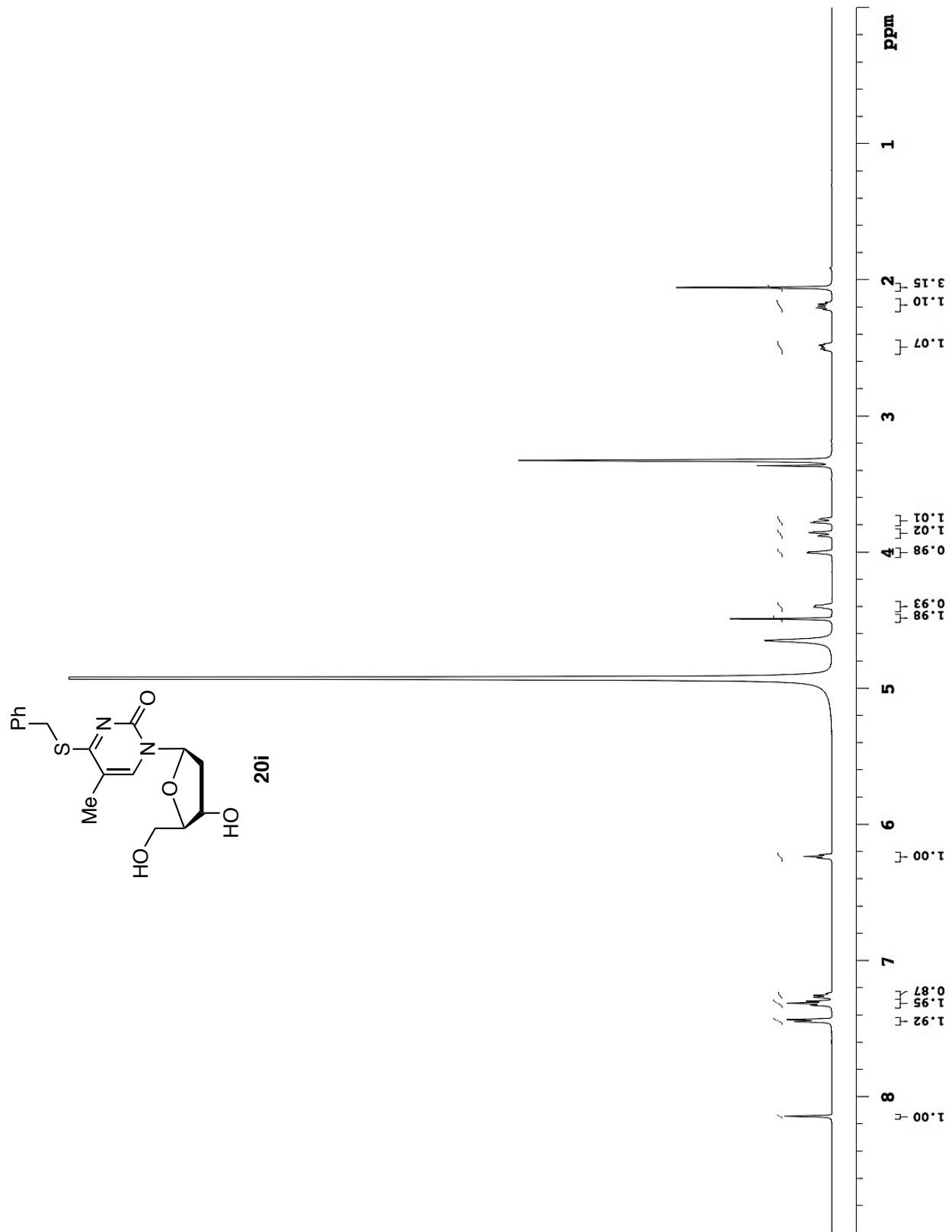


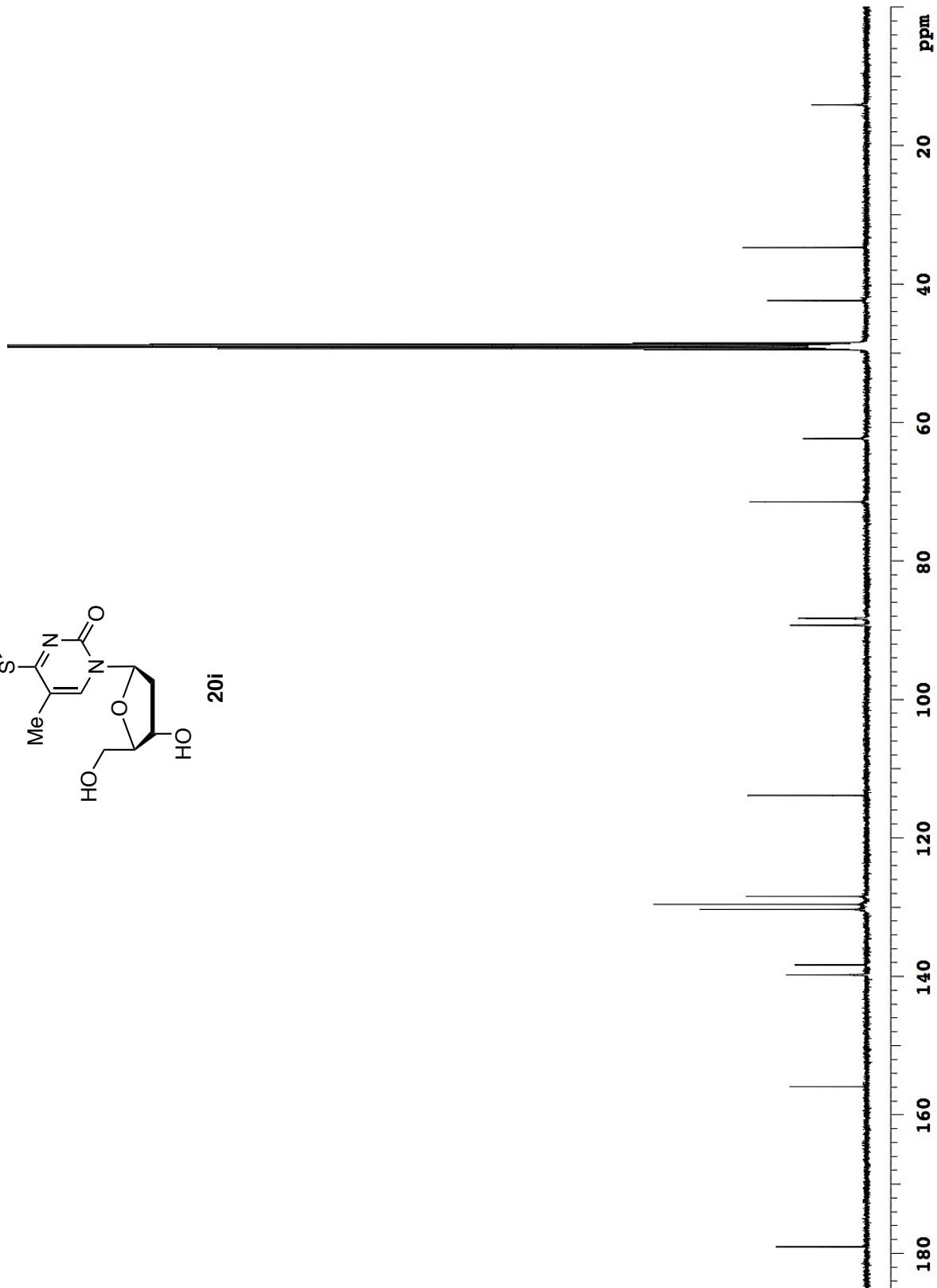
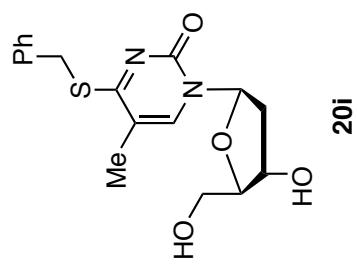


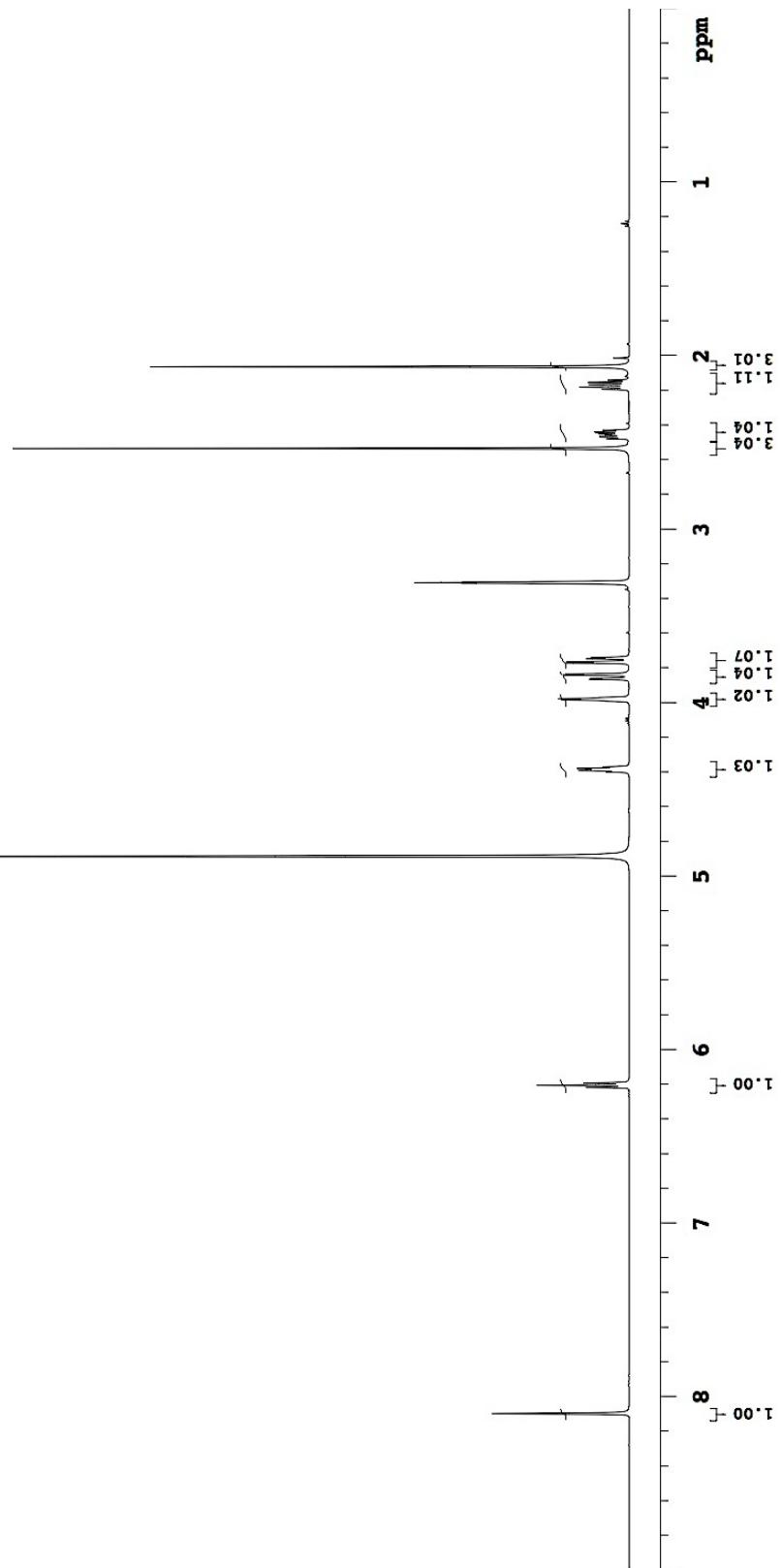
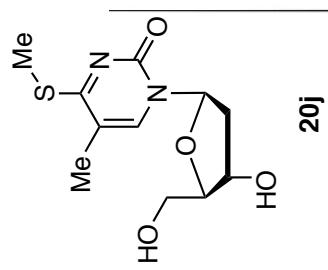


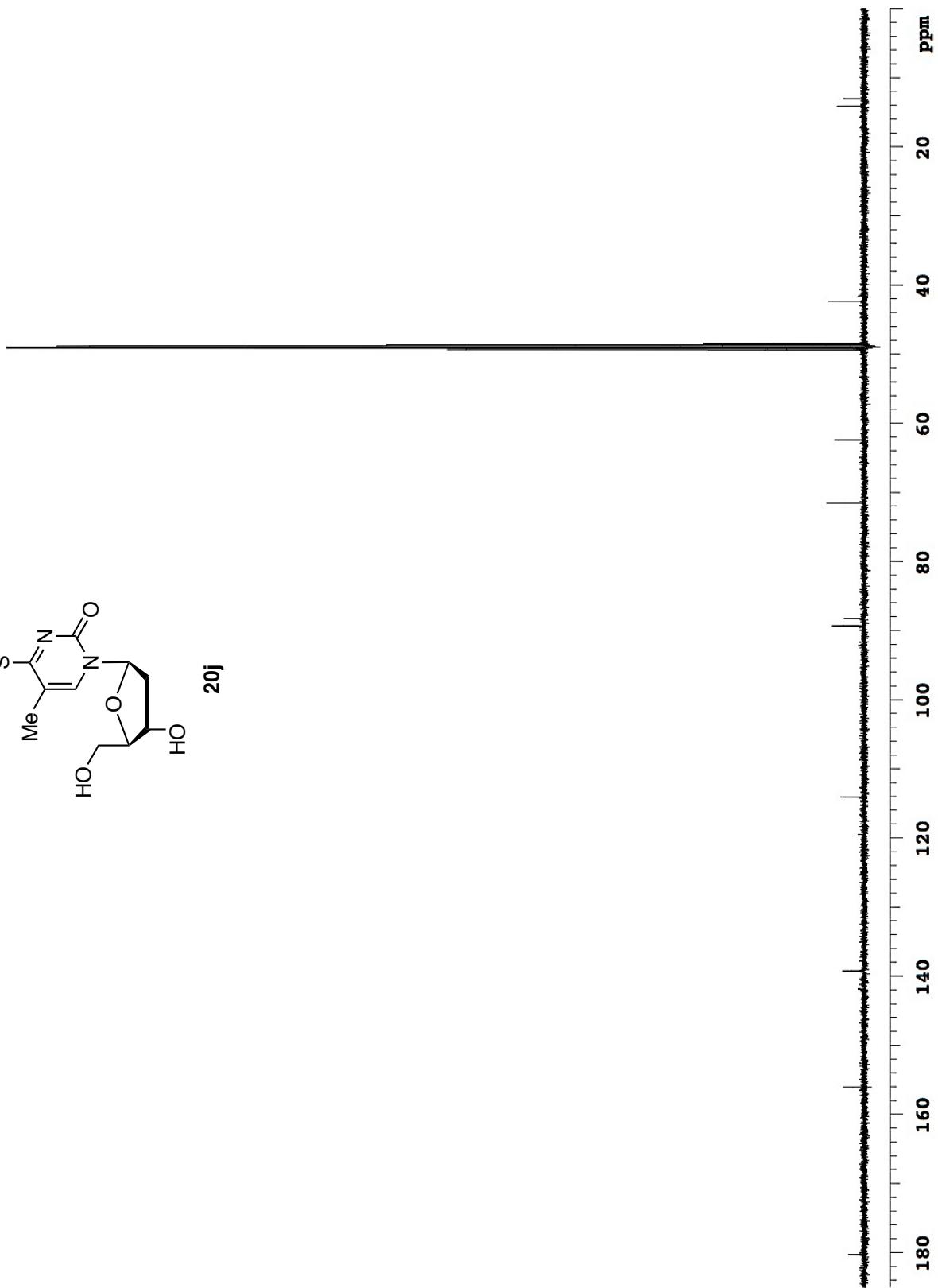
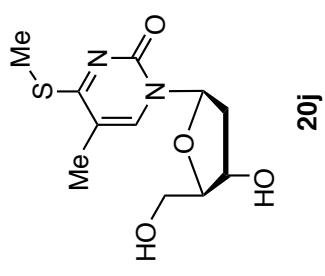


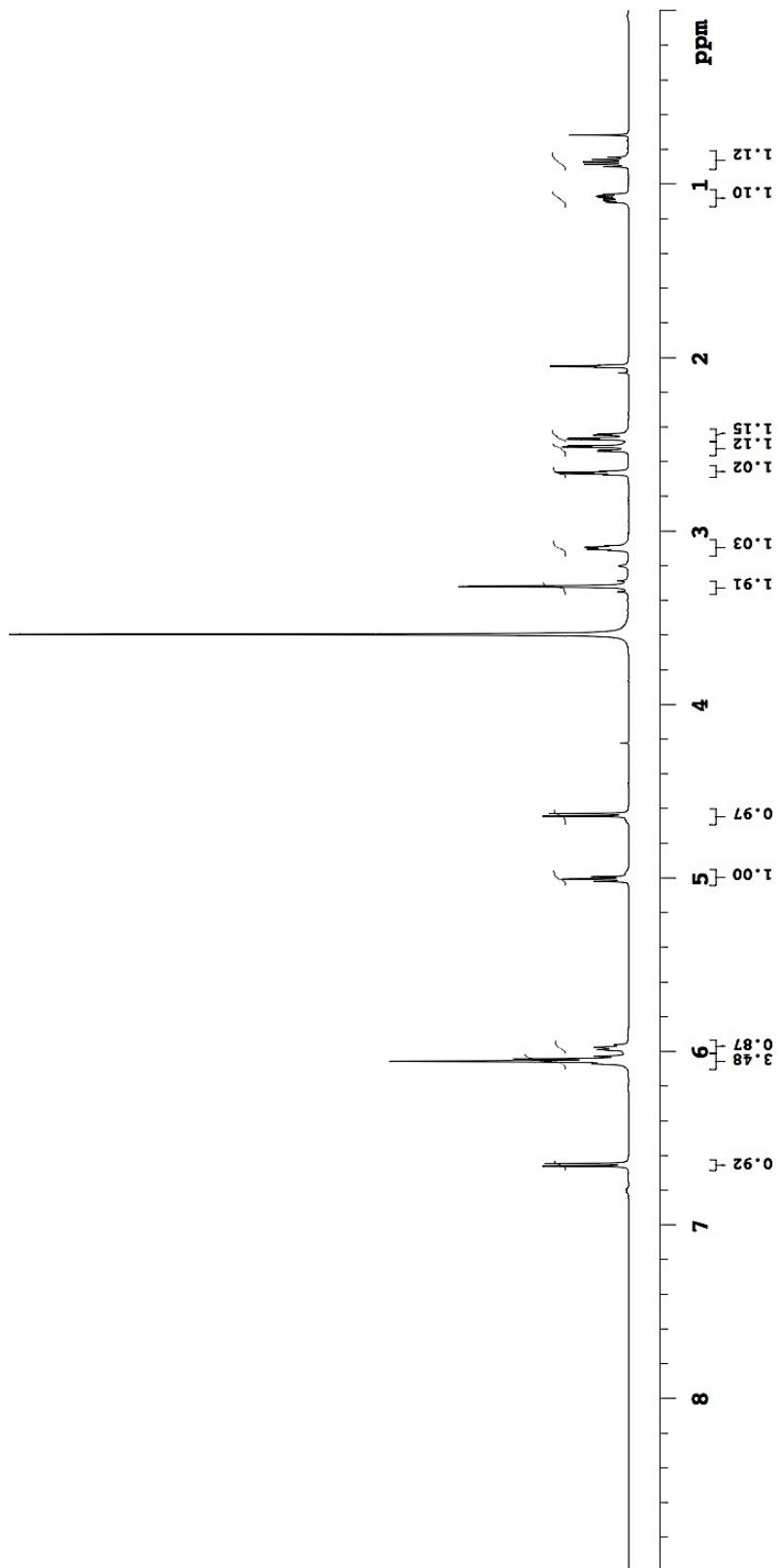
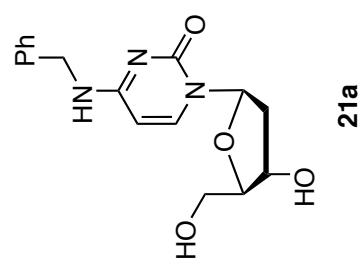


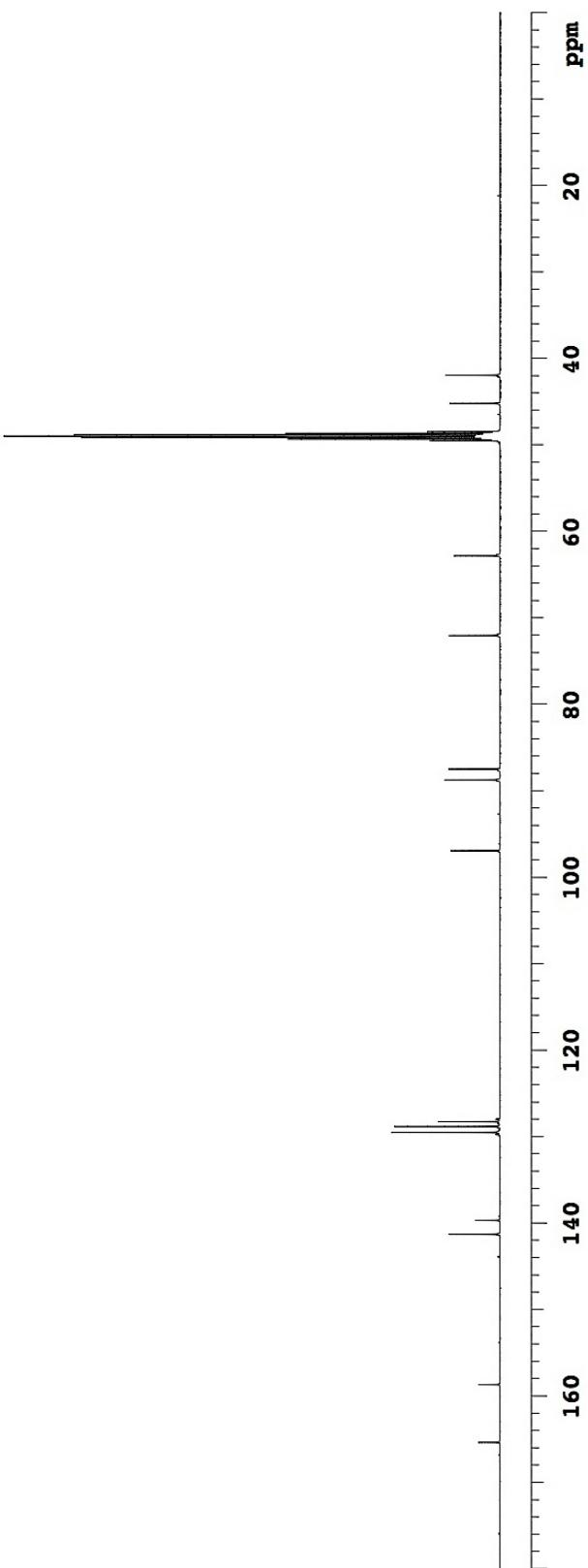
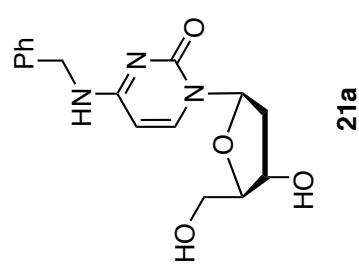


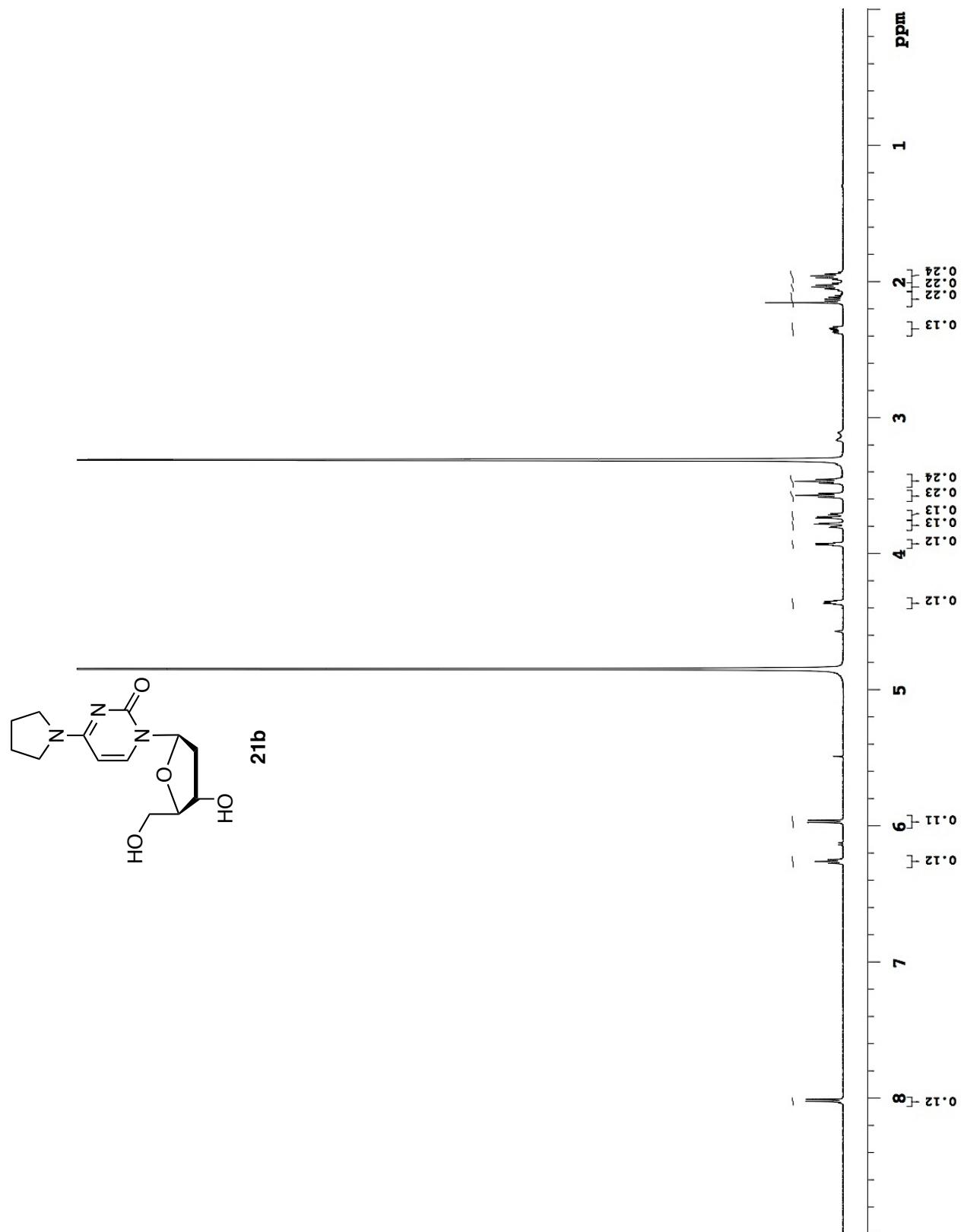


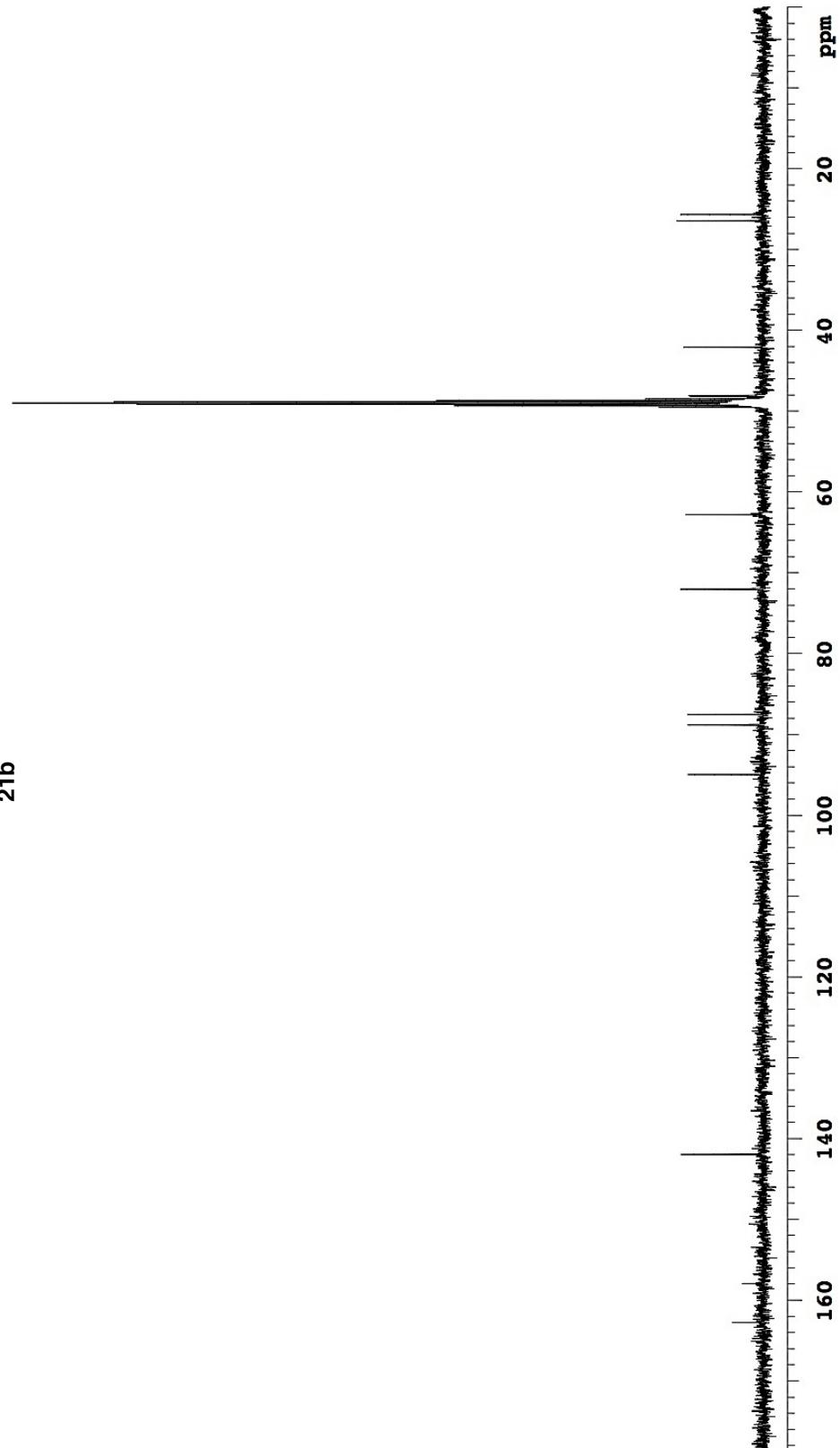
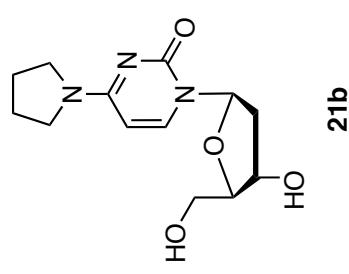


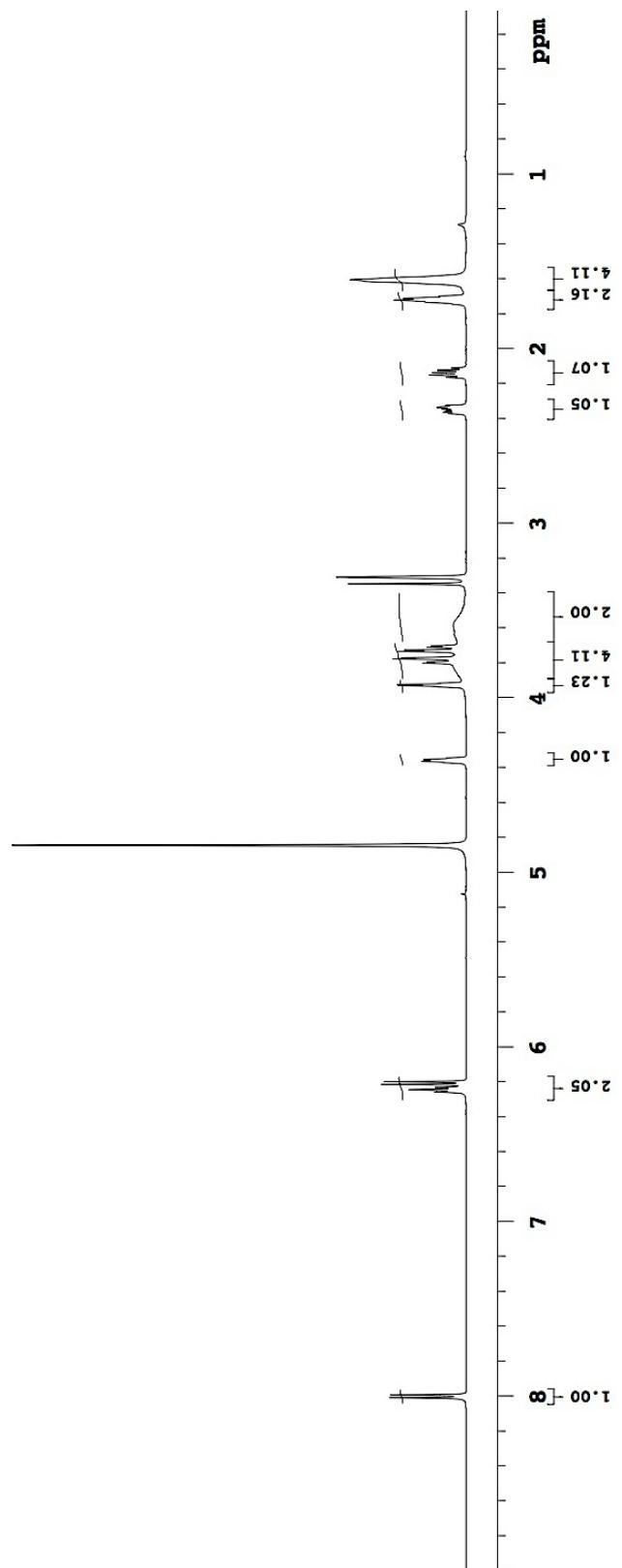
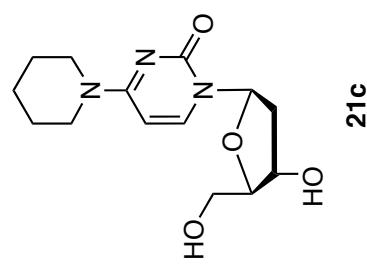


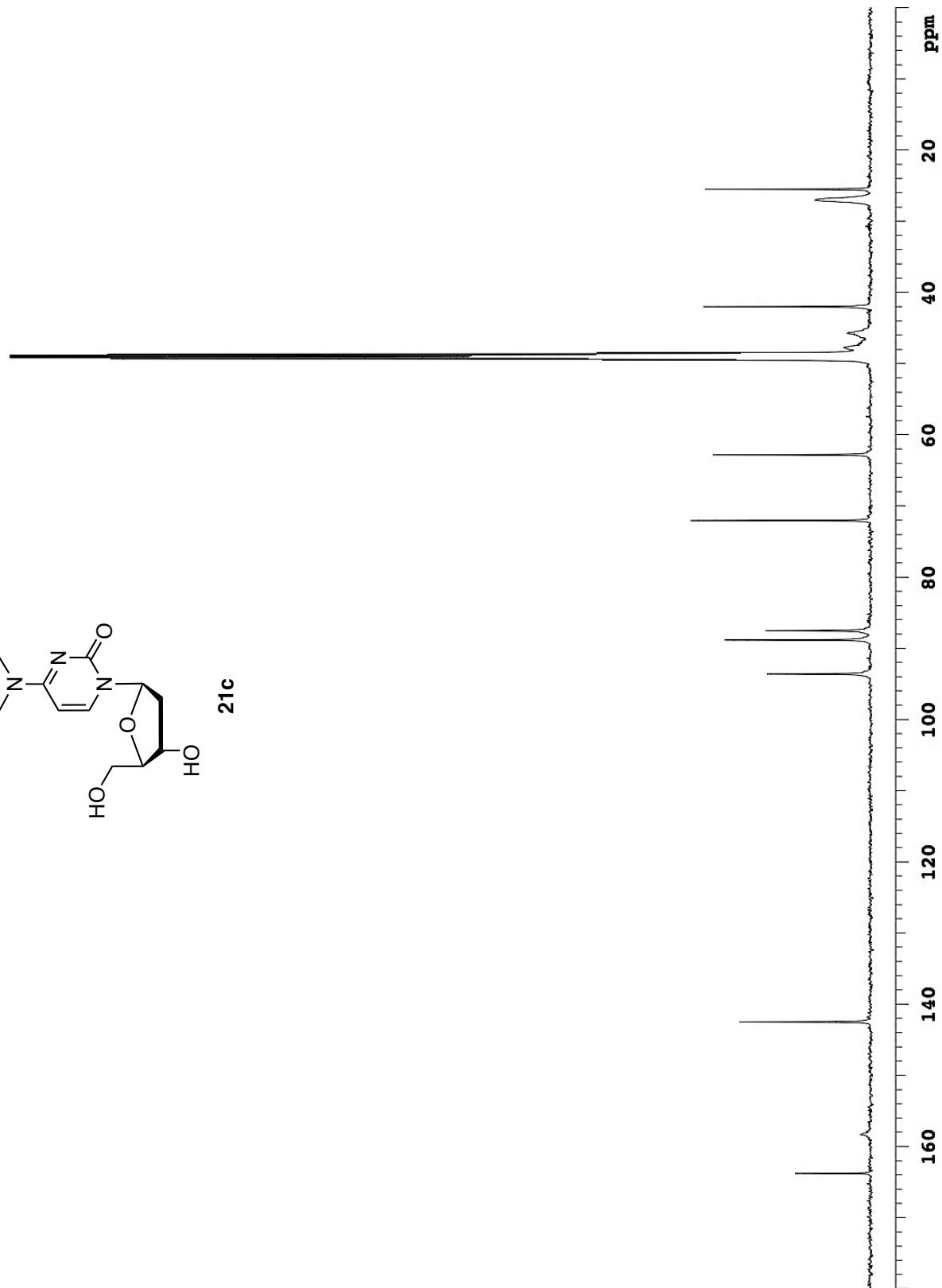
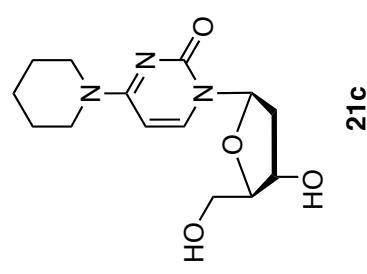


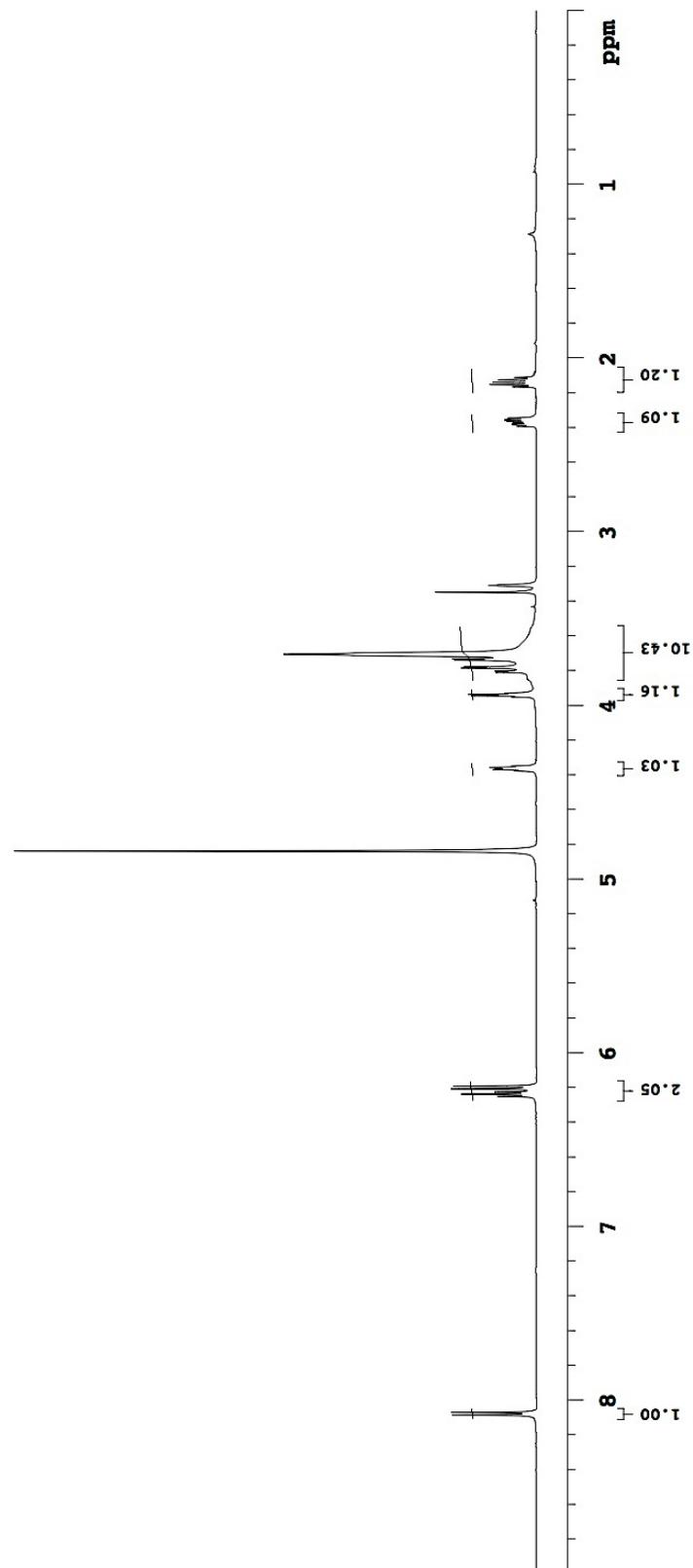
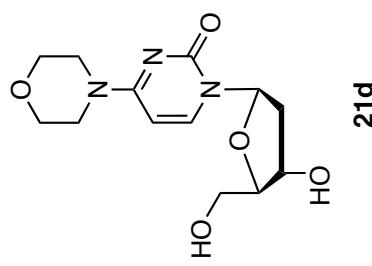


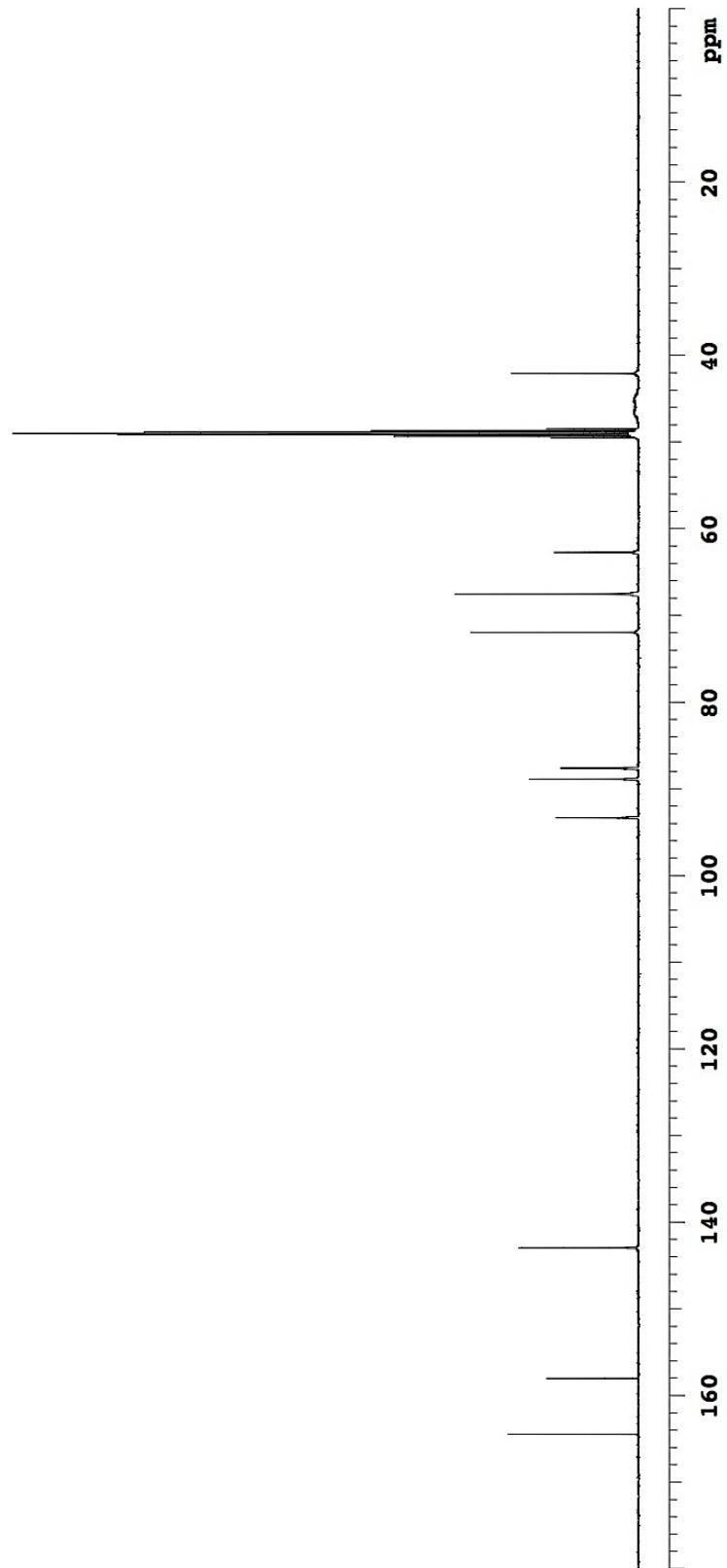
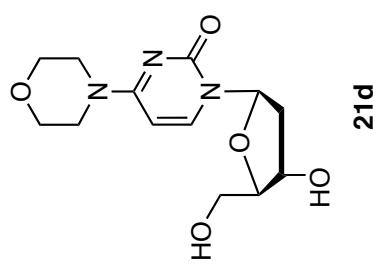




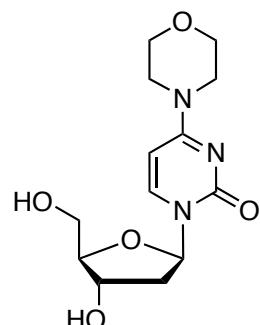




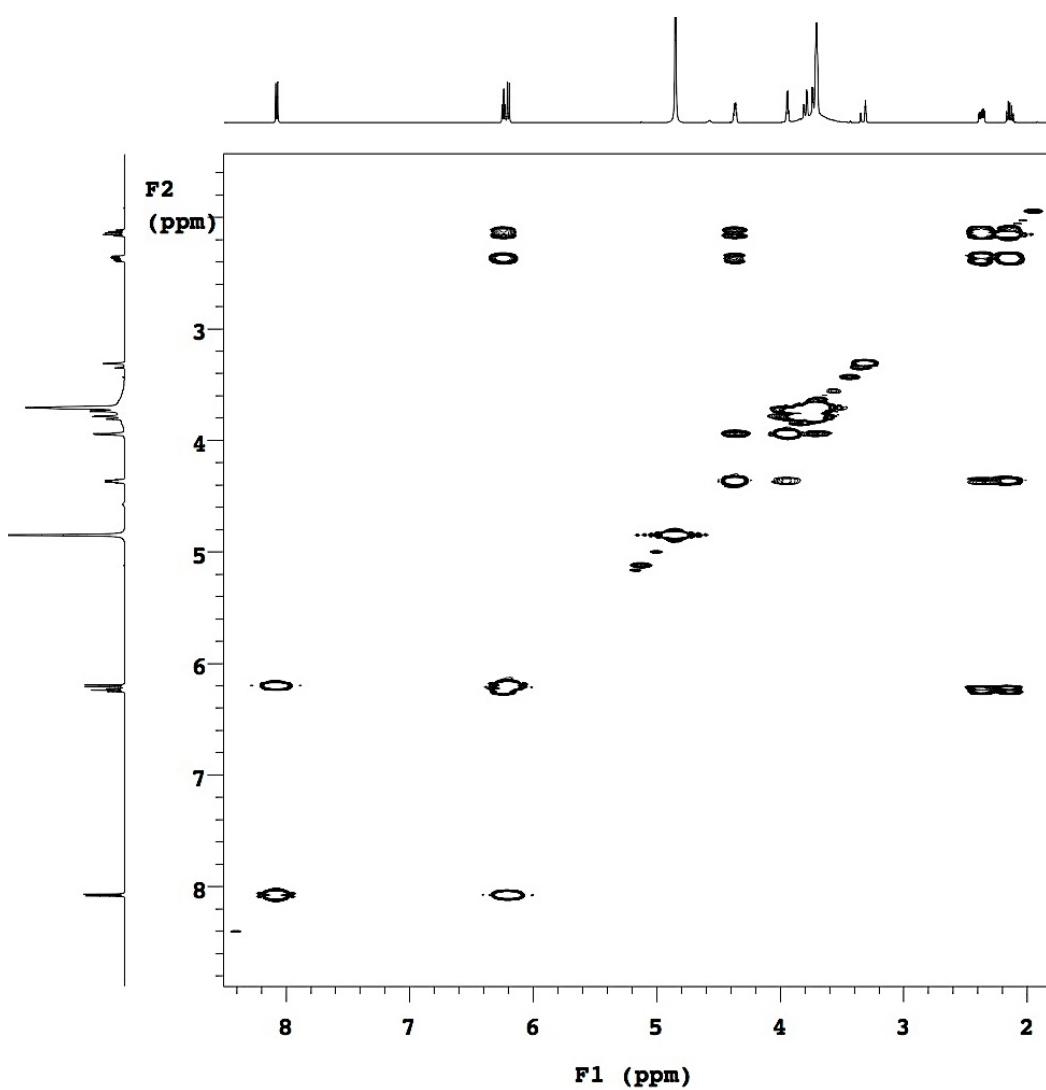


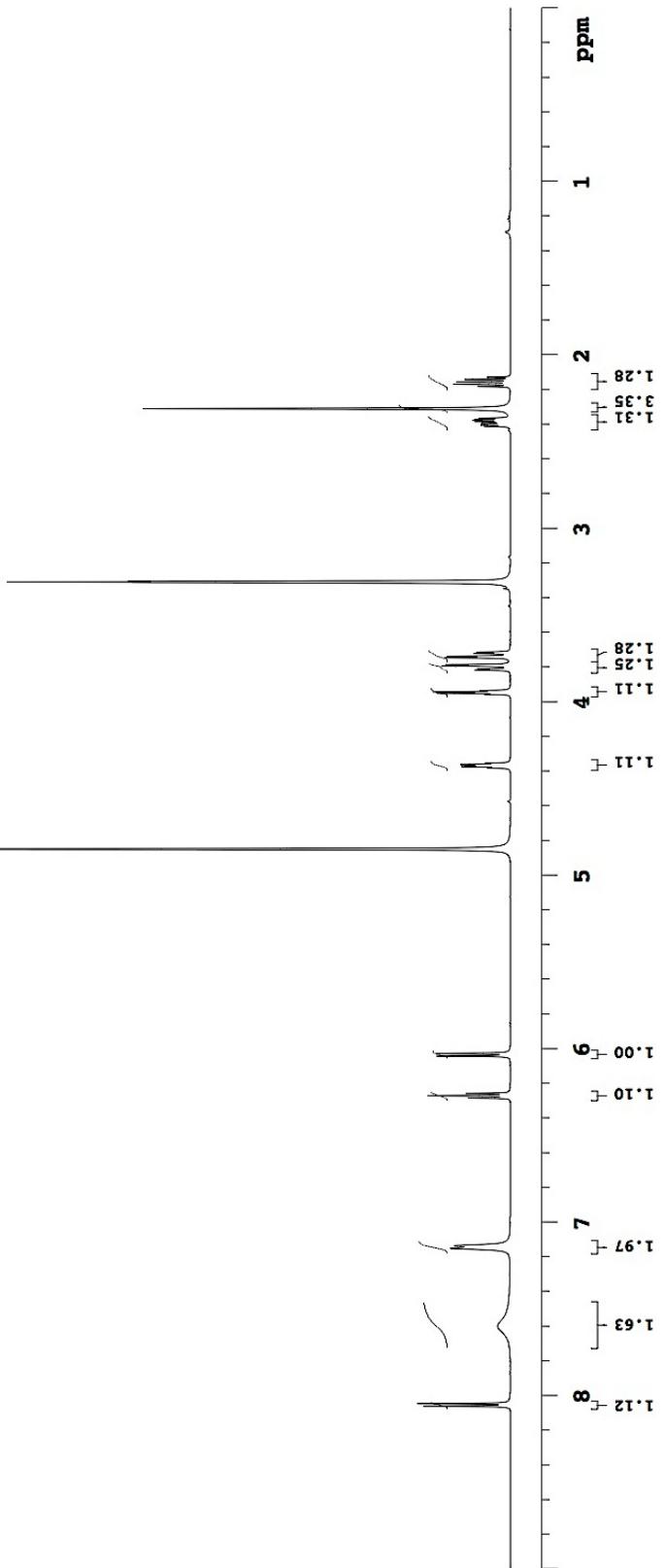
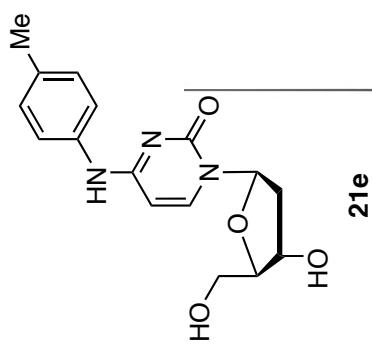


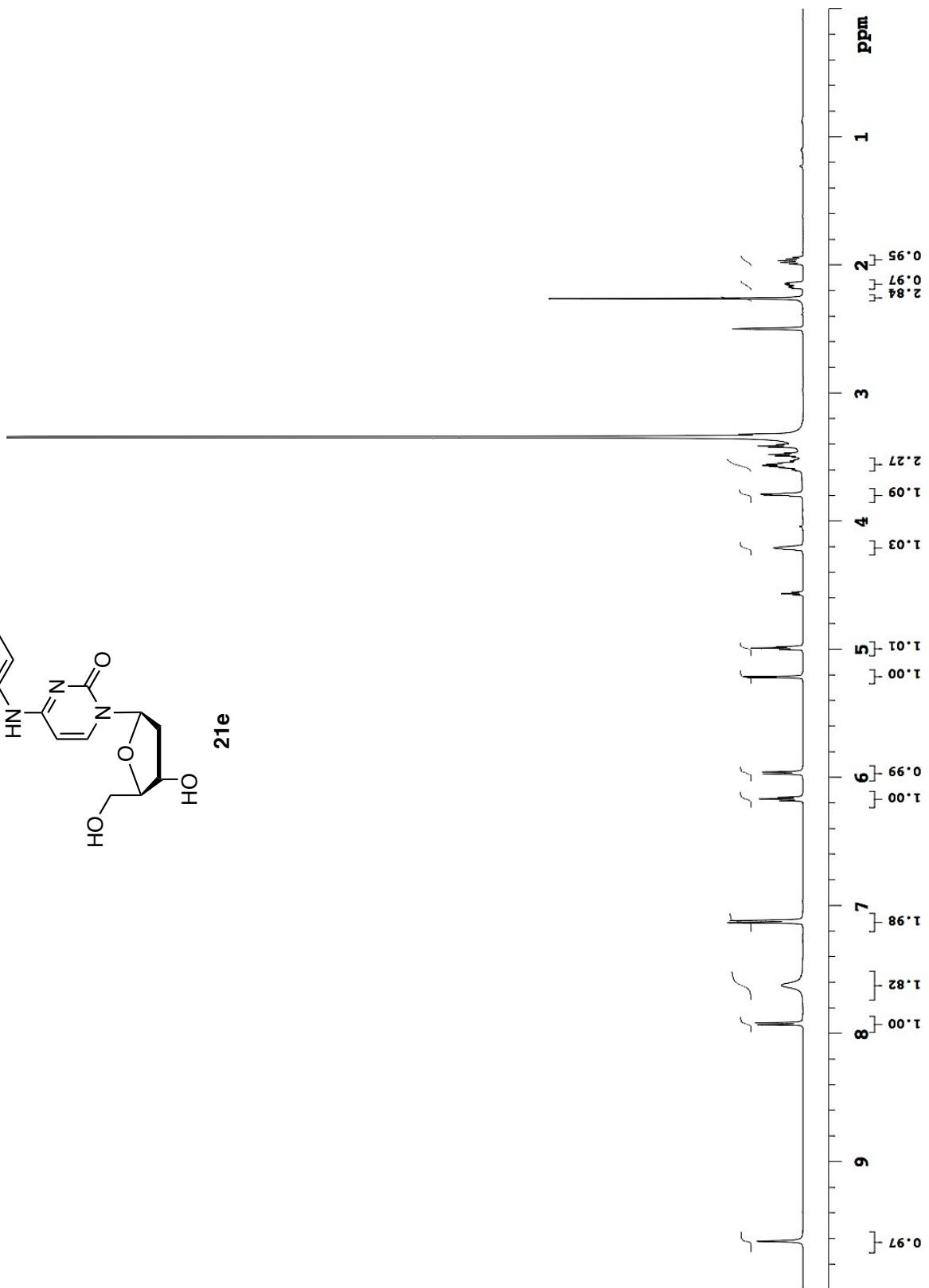
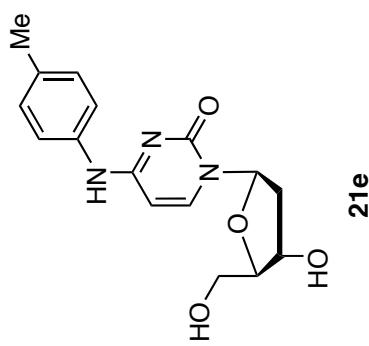
gCOSY spectrum of compound **21d** in CD₃OD

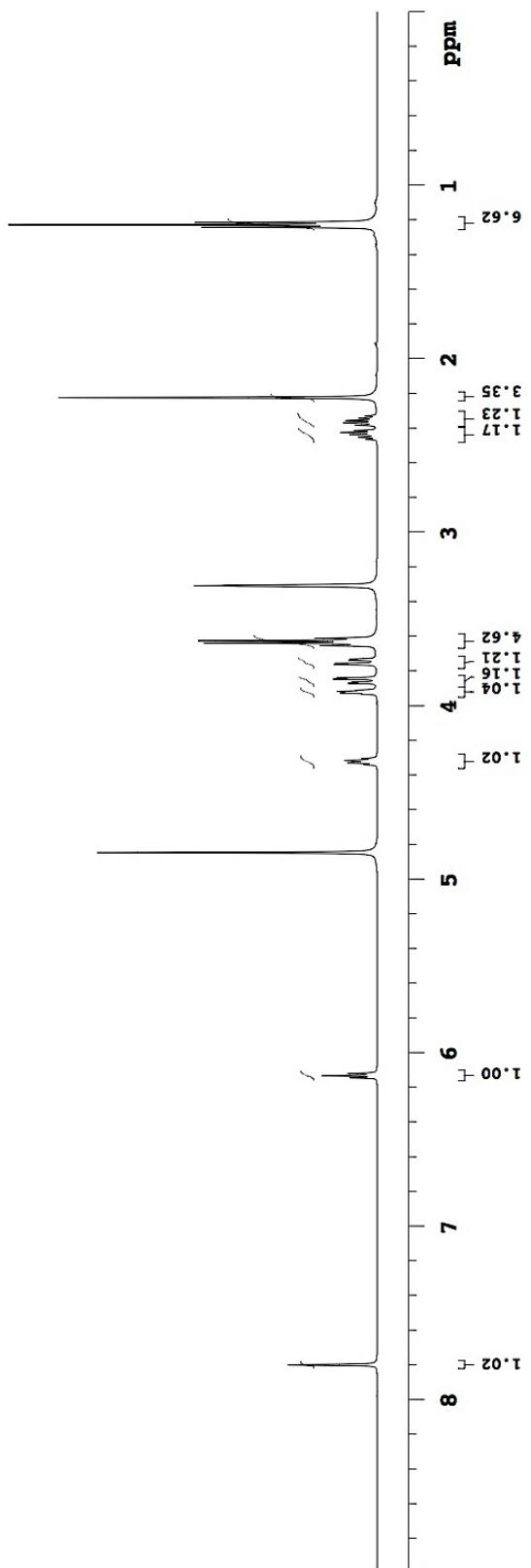
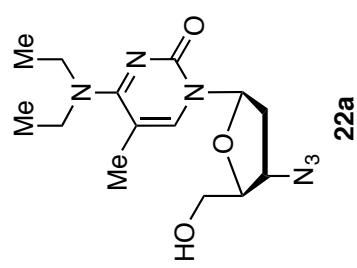


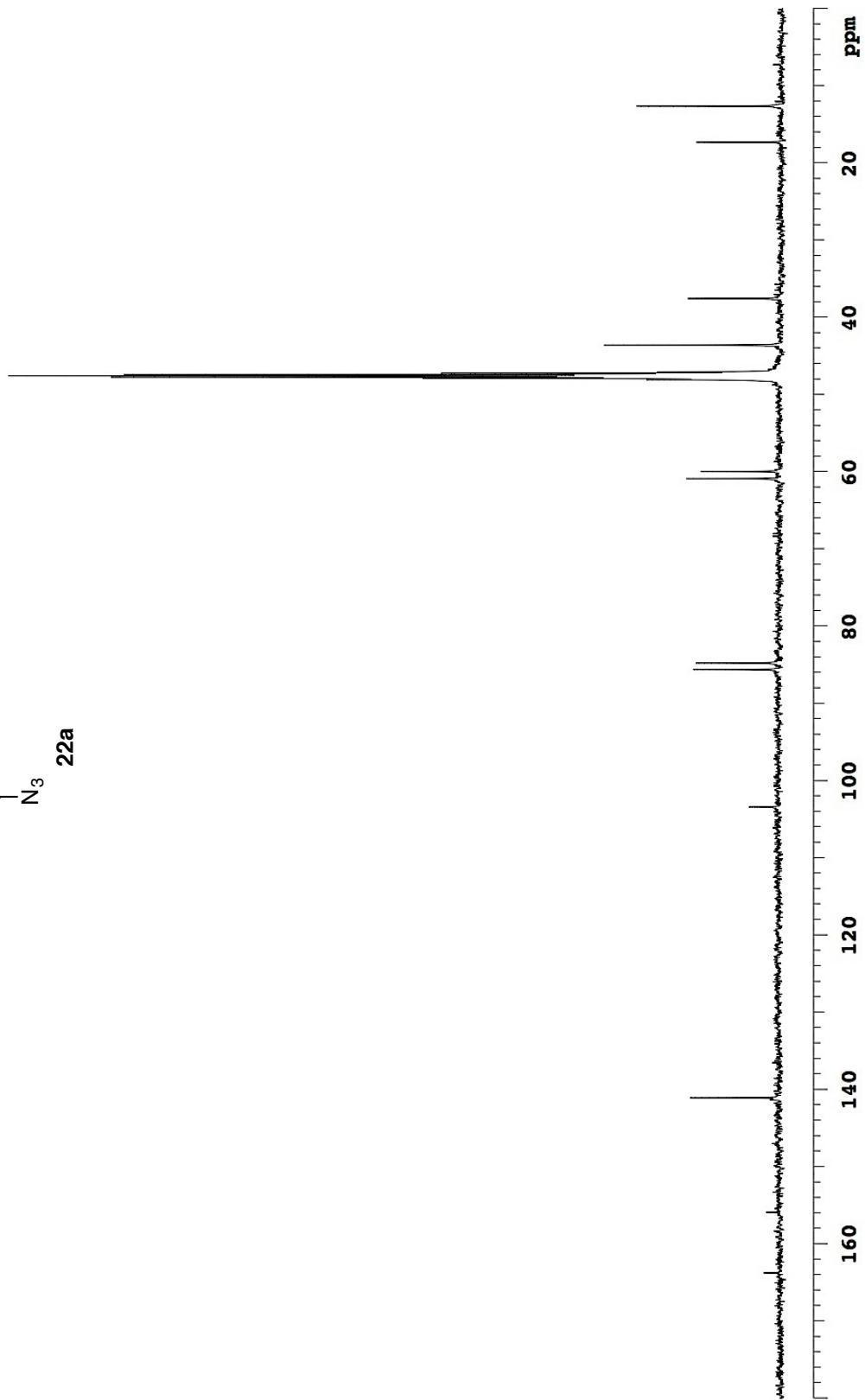
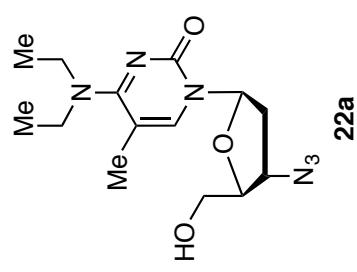
21d

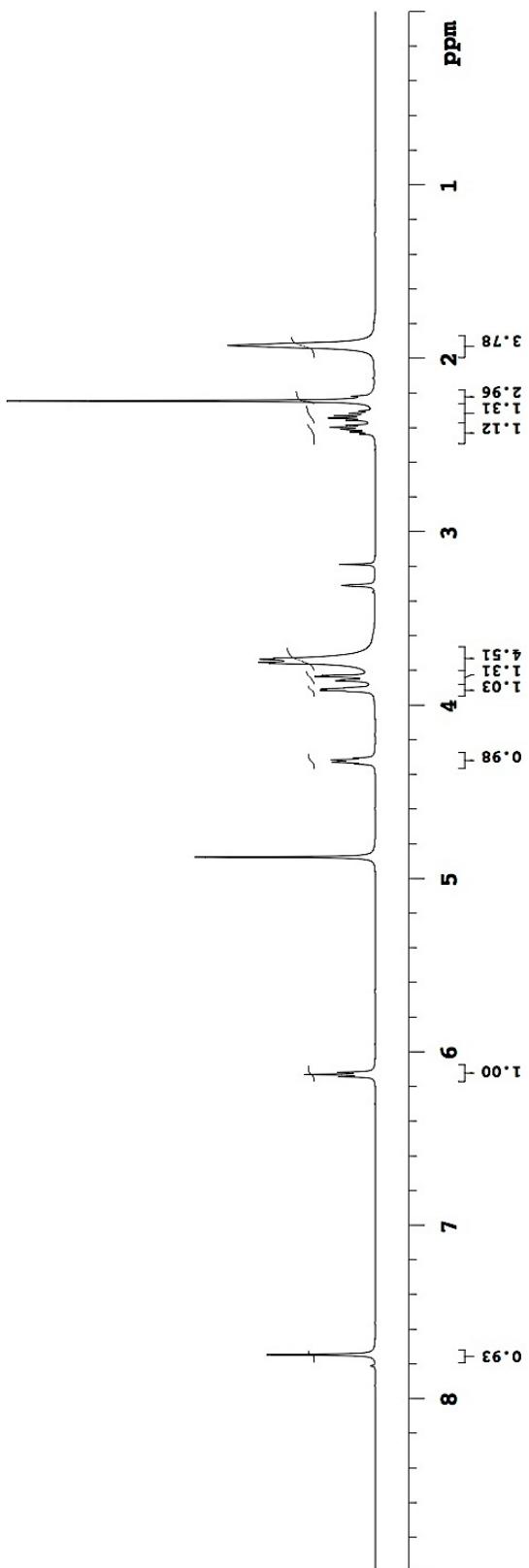
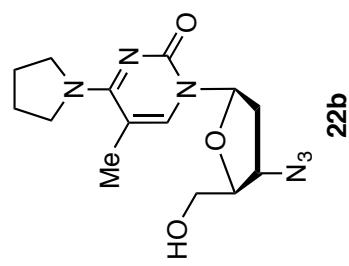


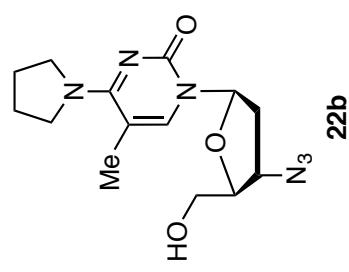




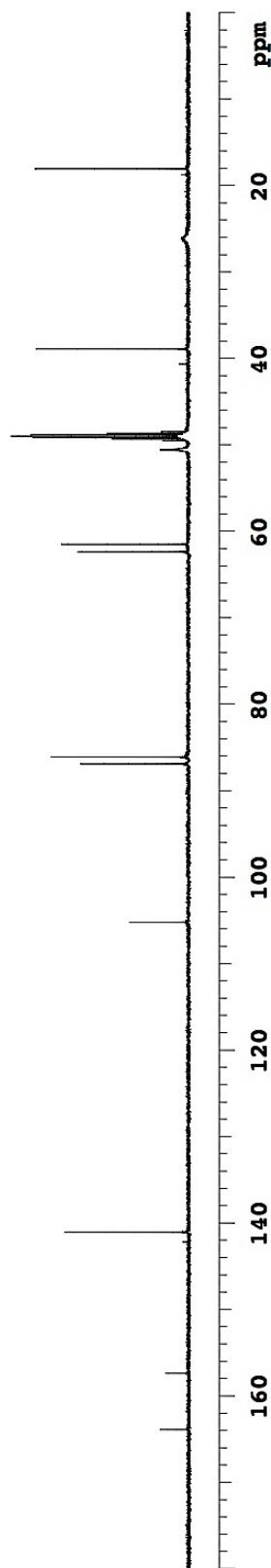




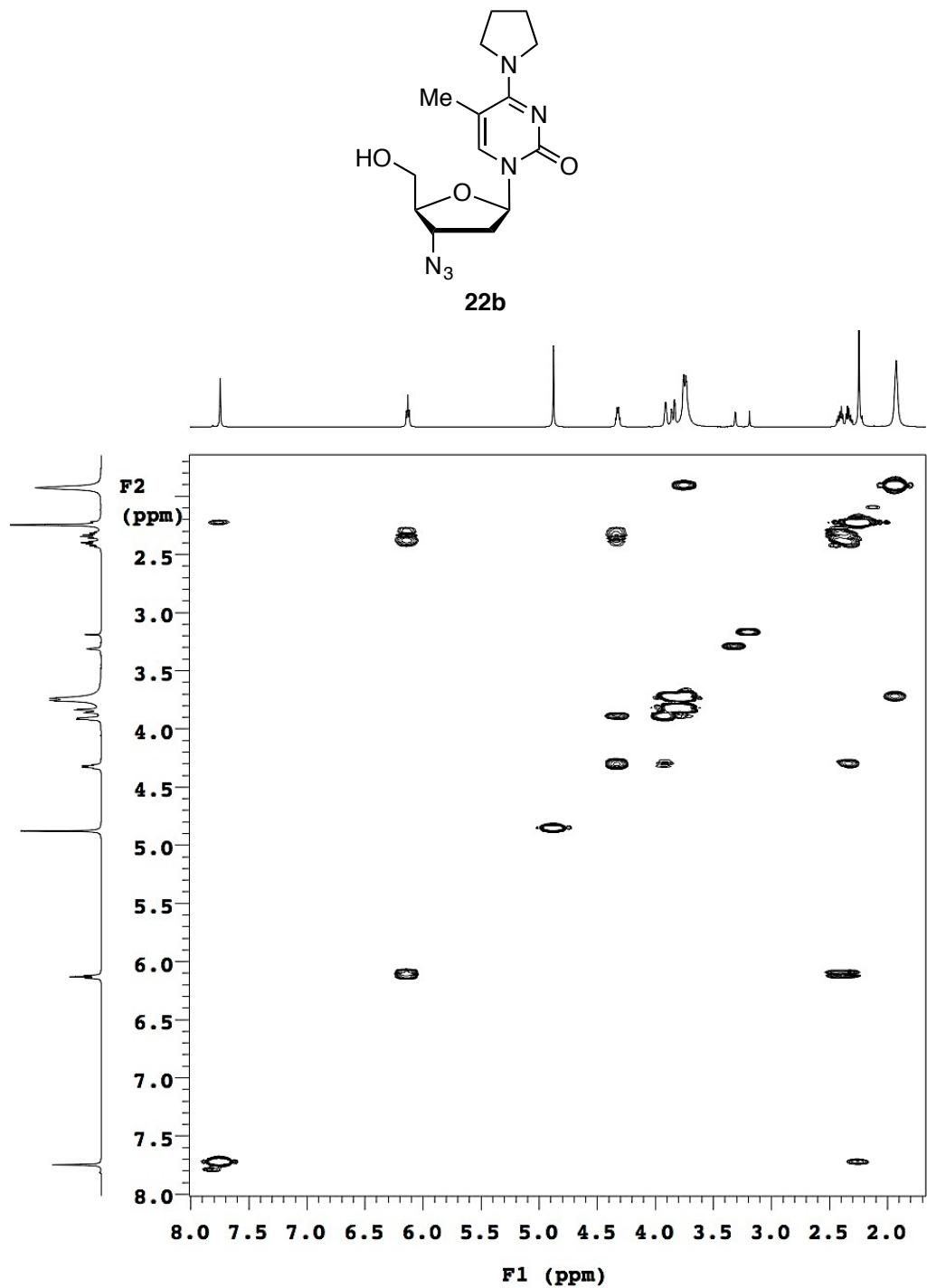




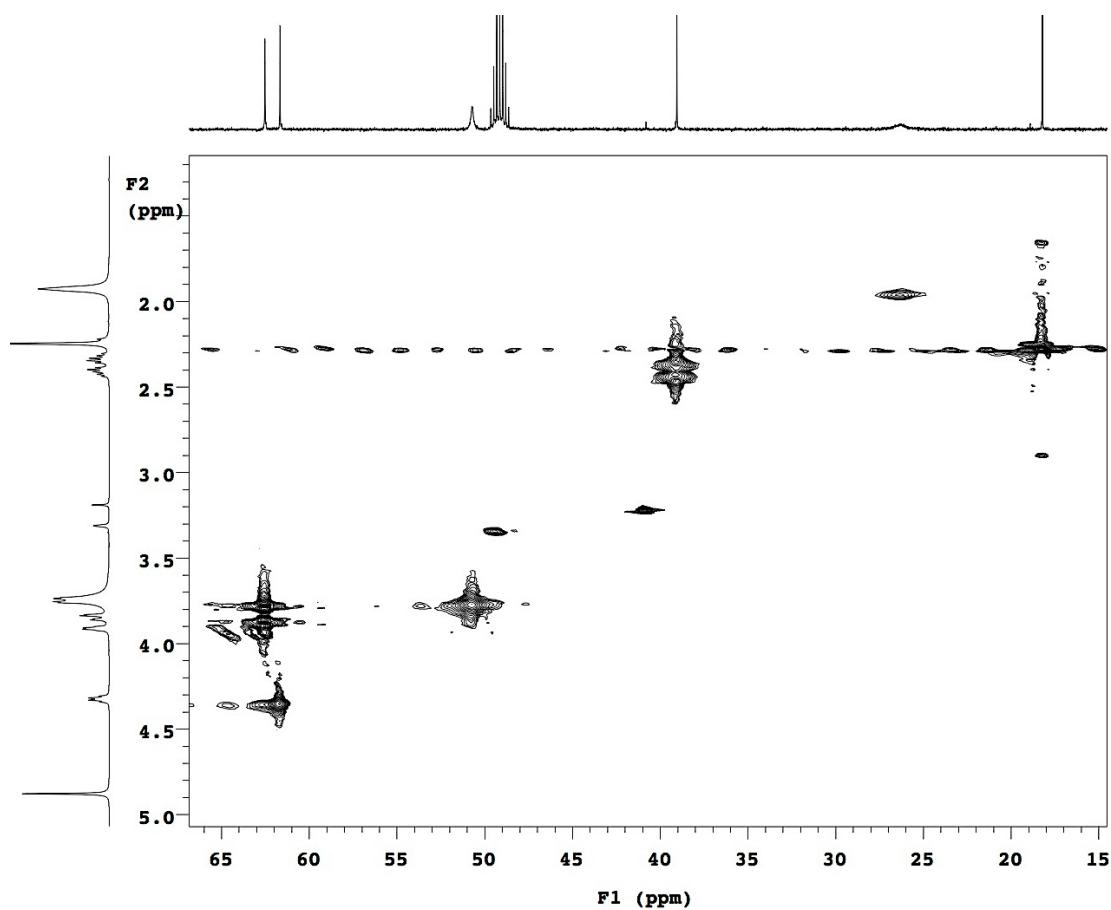
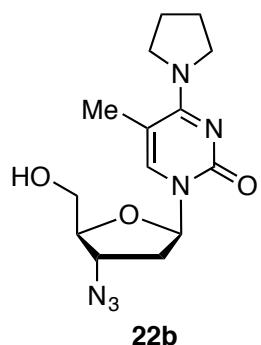
22b

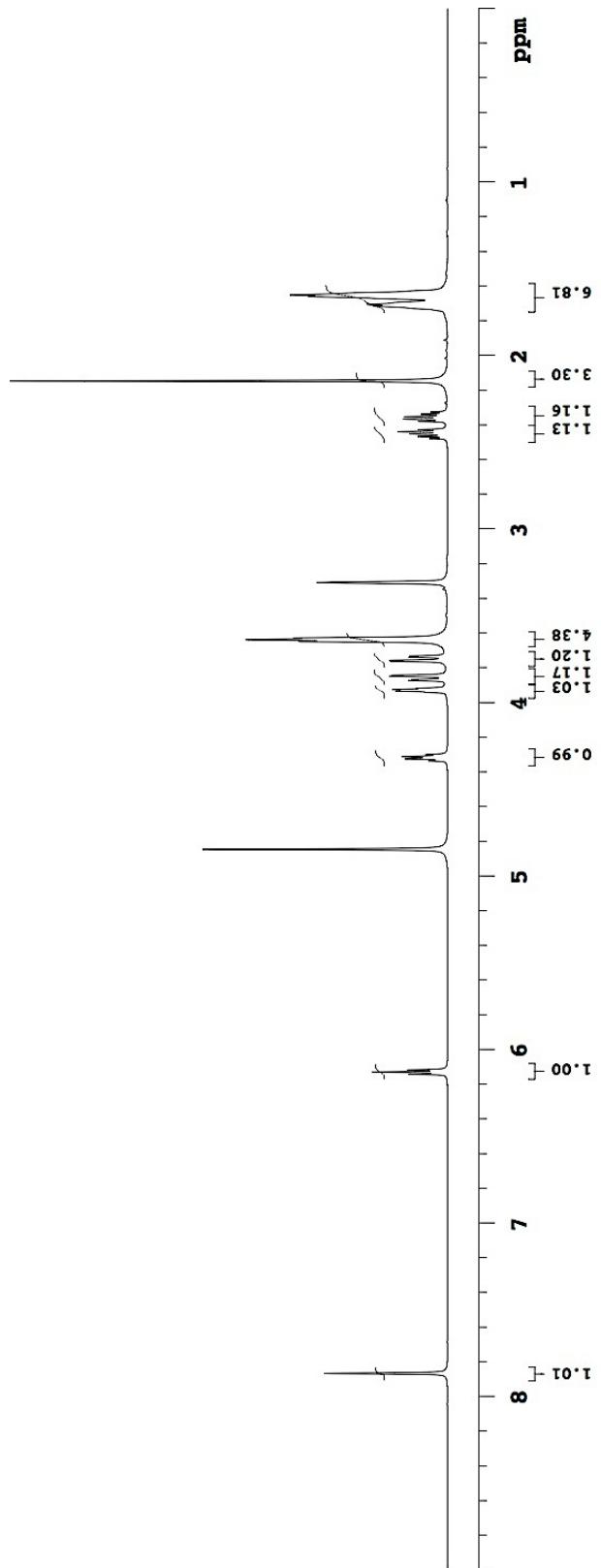
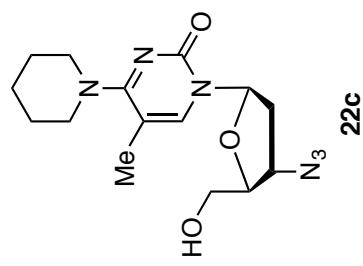


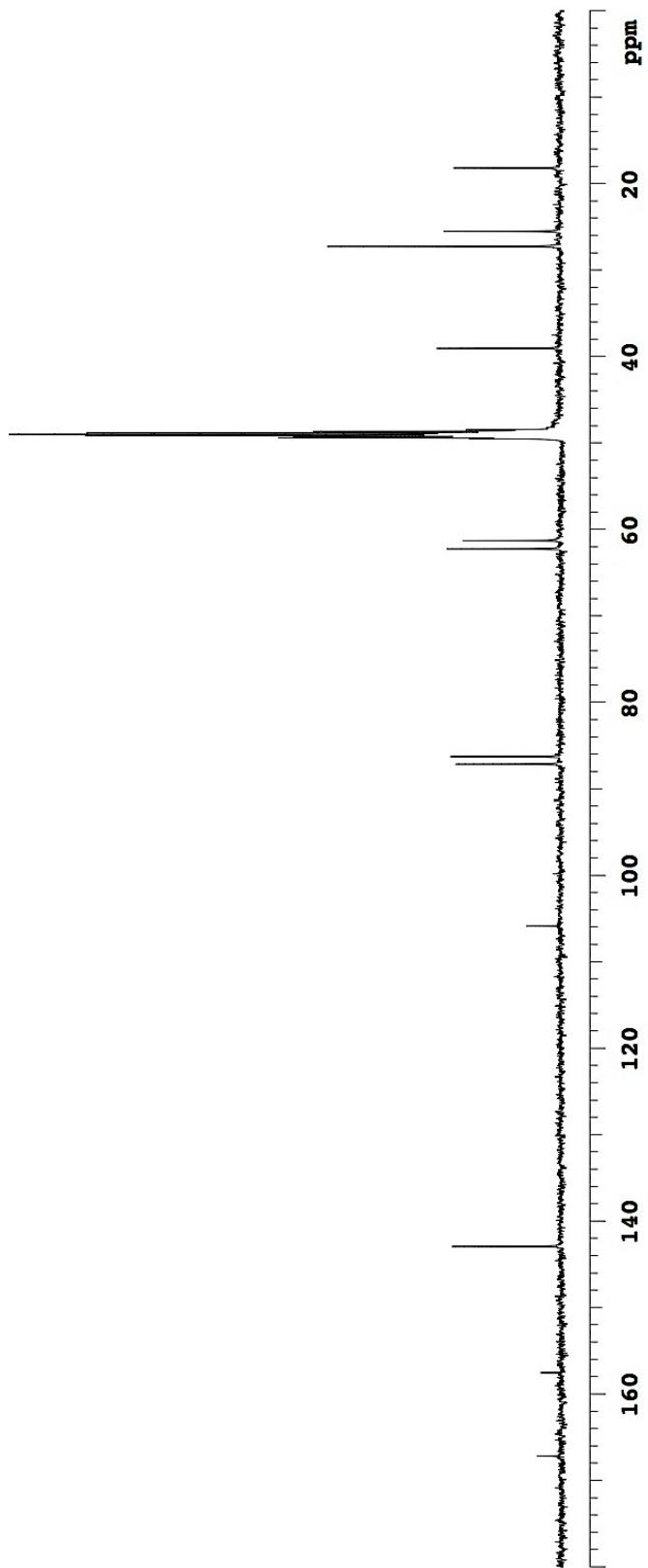
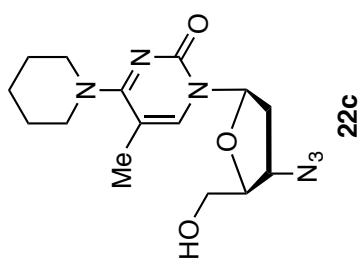
gCOSY spectrum of compound **22b** in CD₃OD

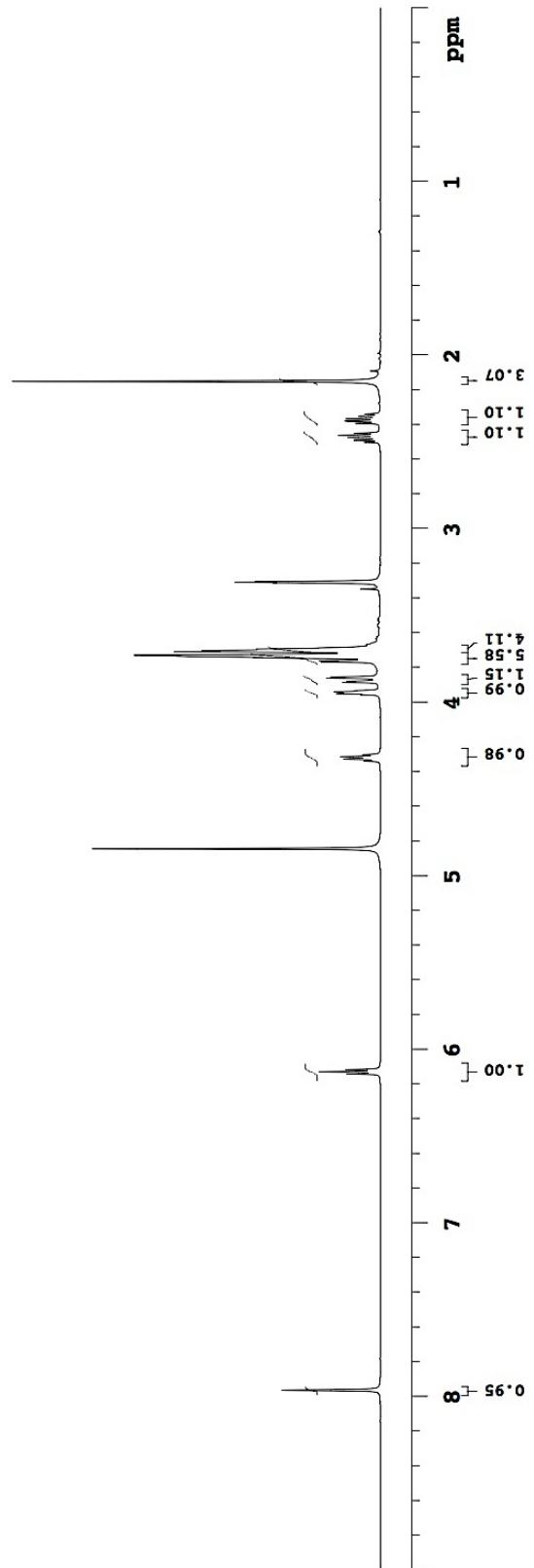
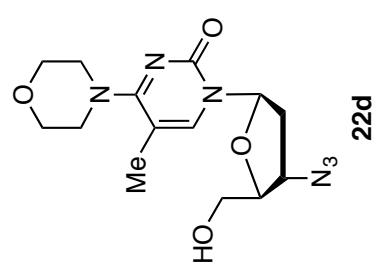


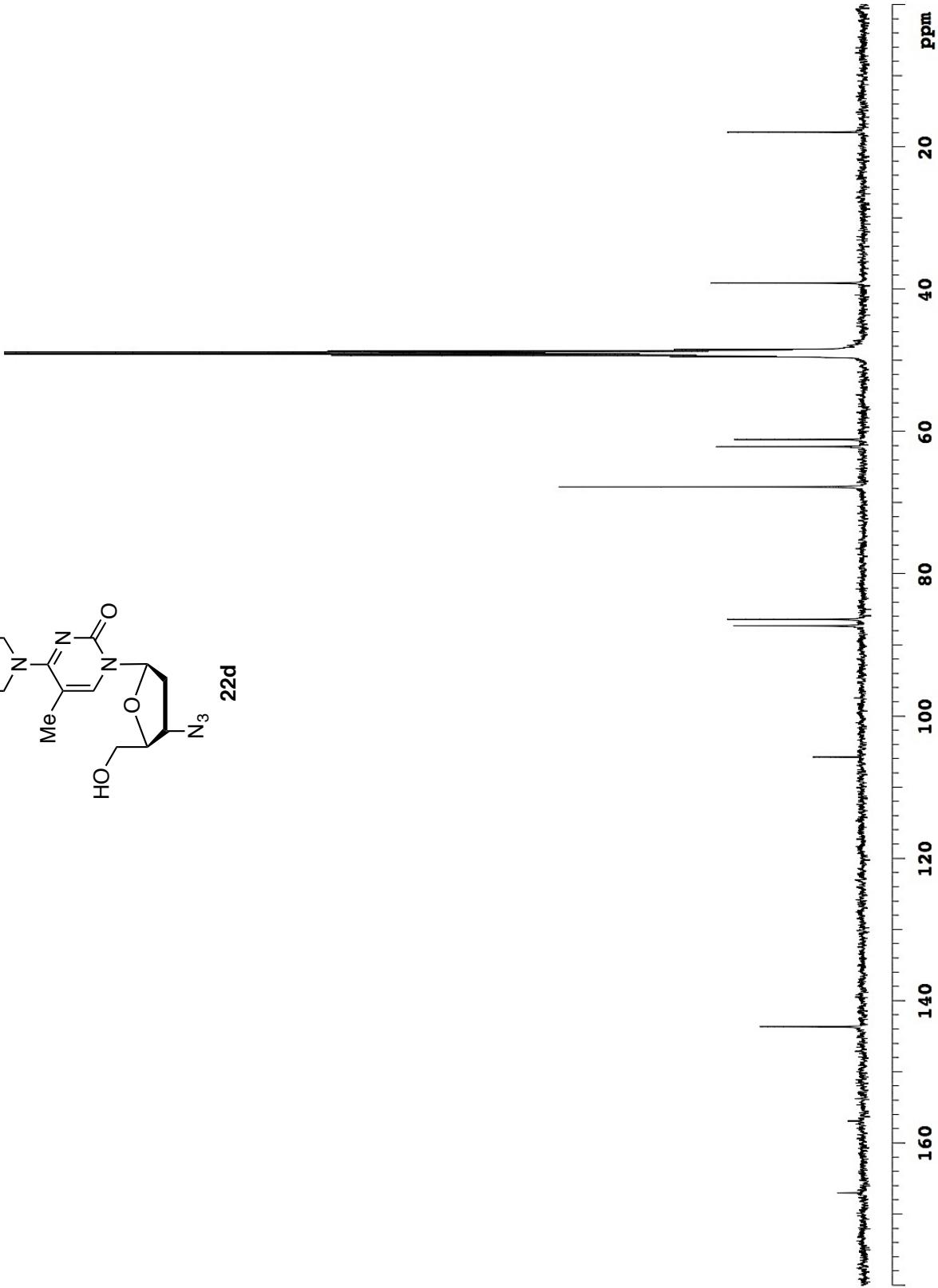
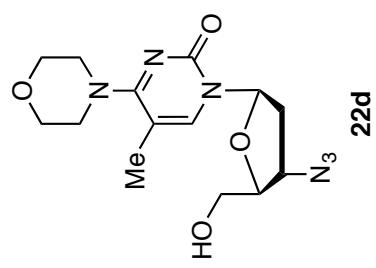
gHMQC spectrum of compound **22b** in CD₃OD

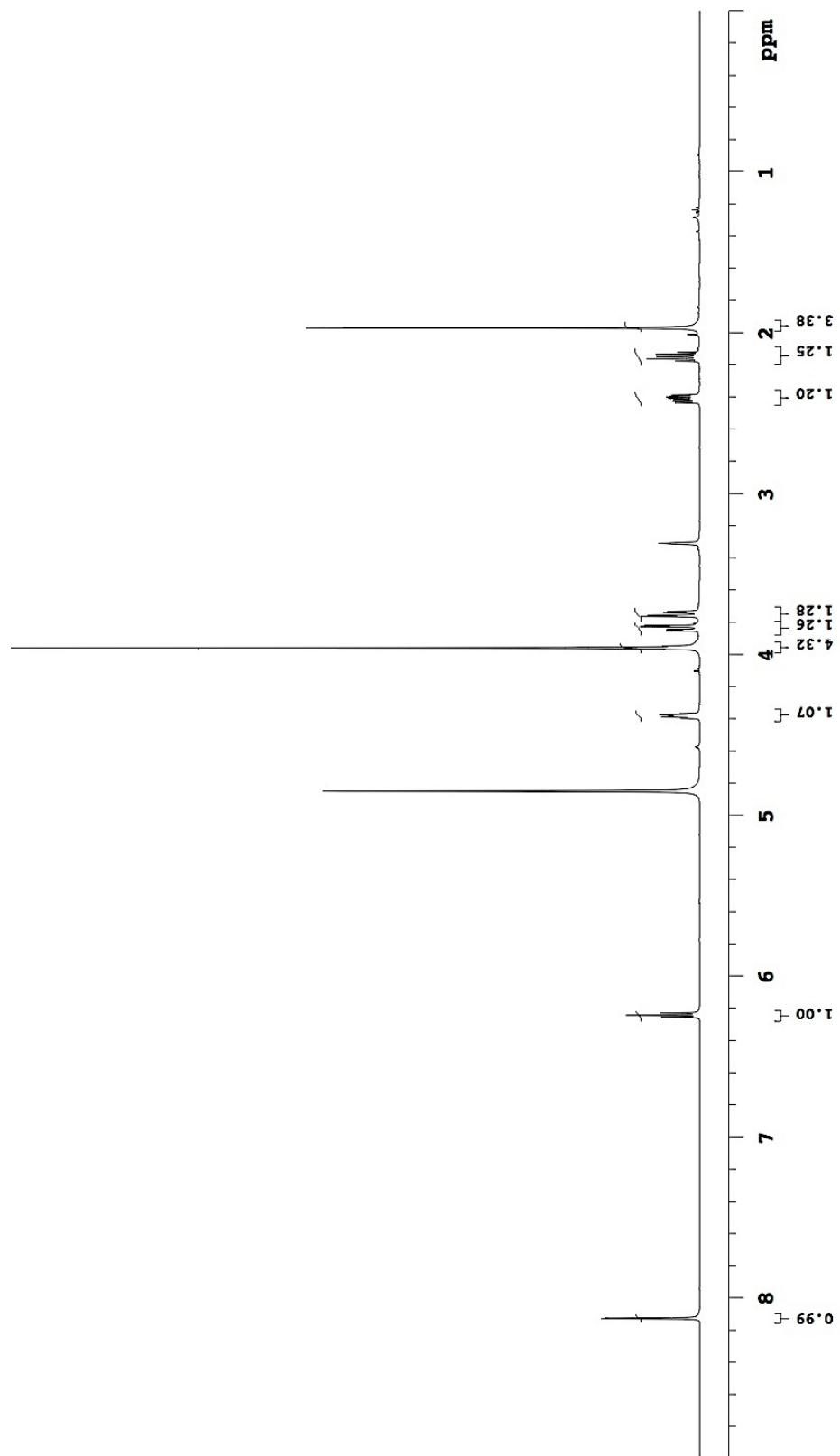
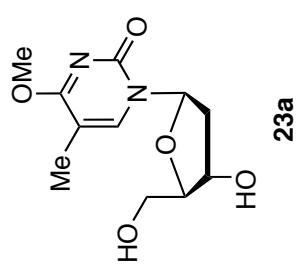


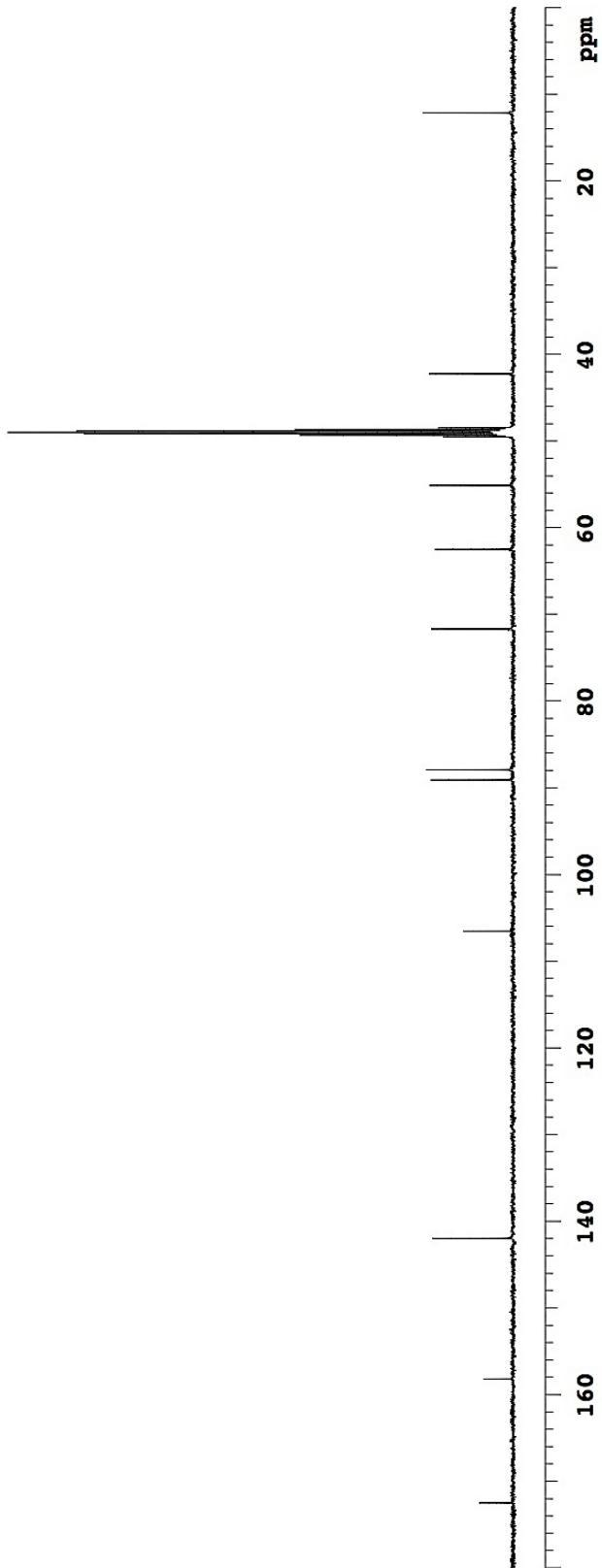
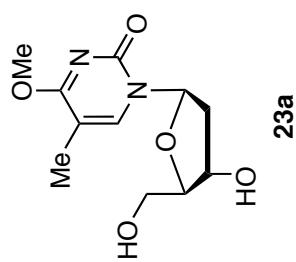


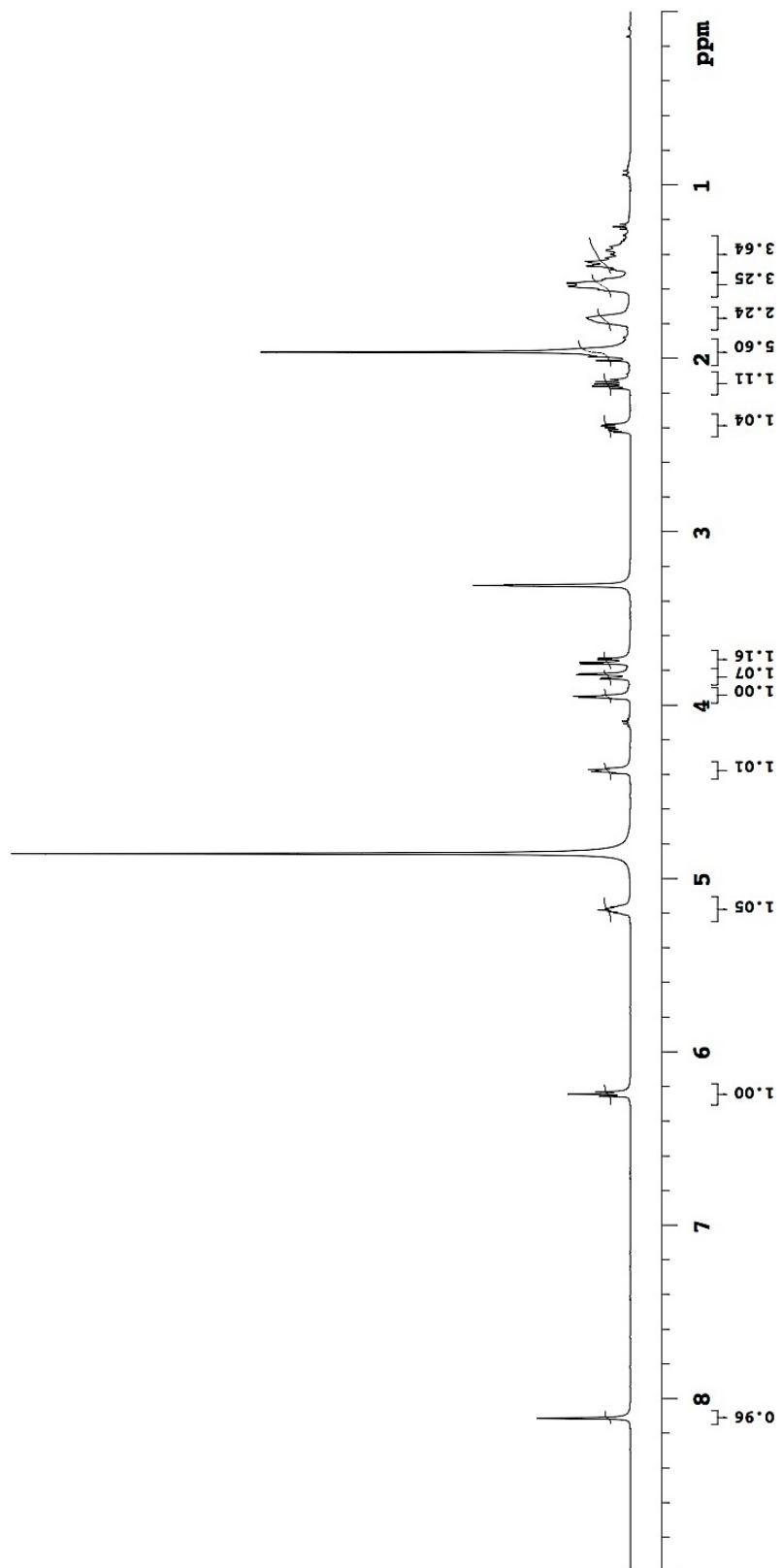
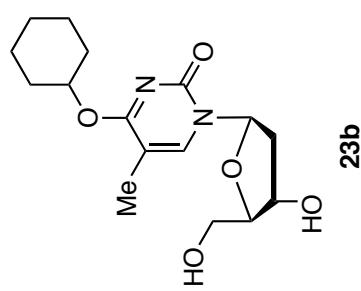


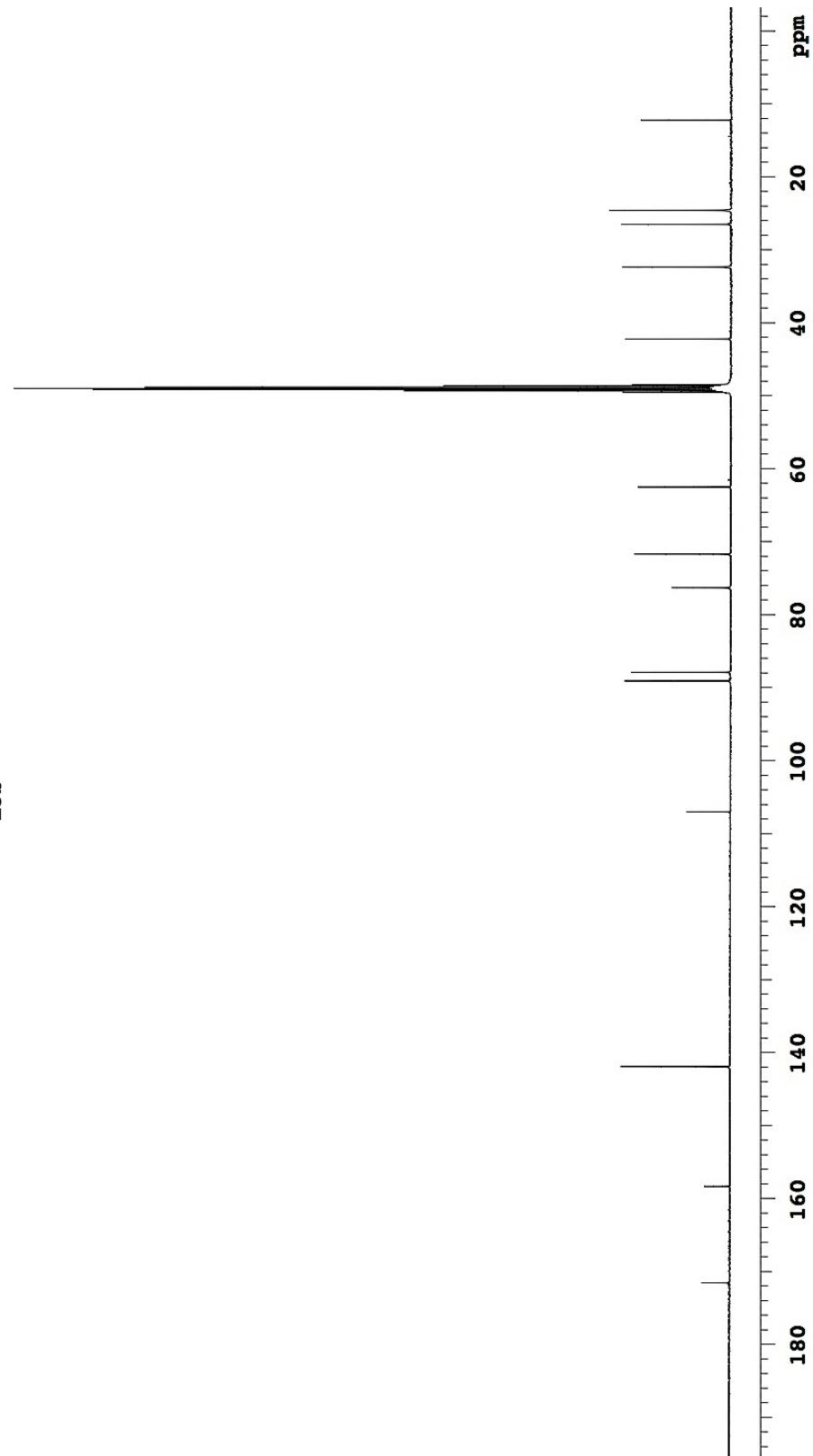
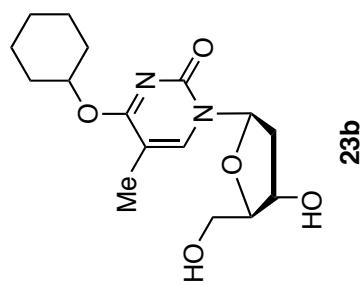


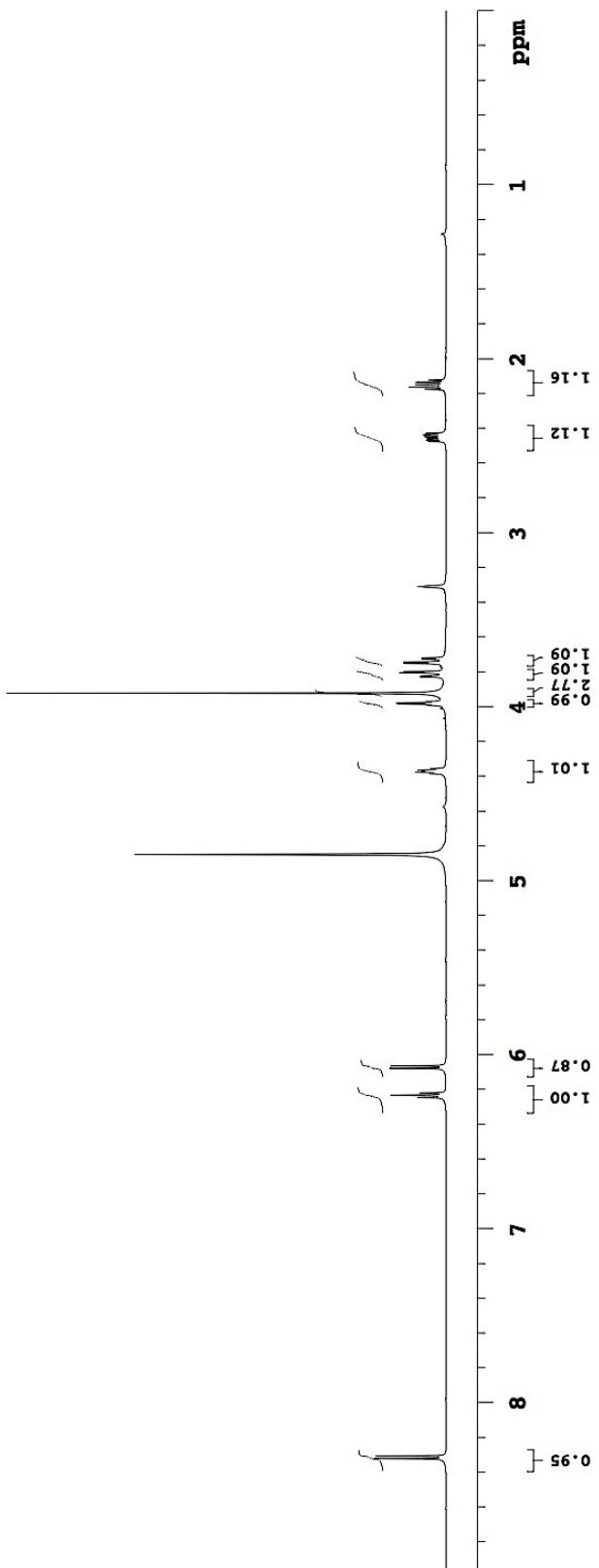
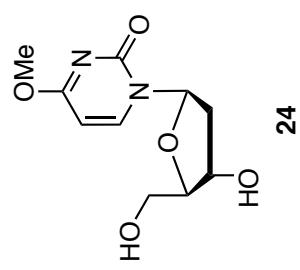


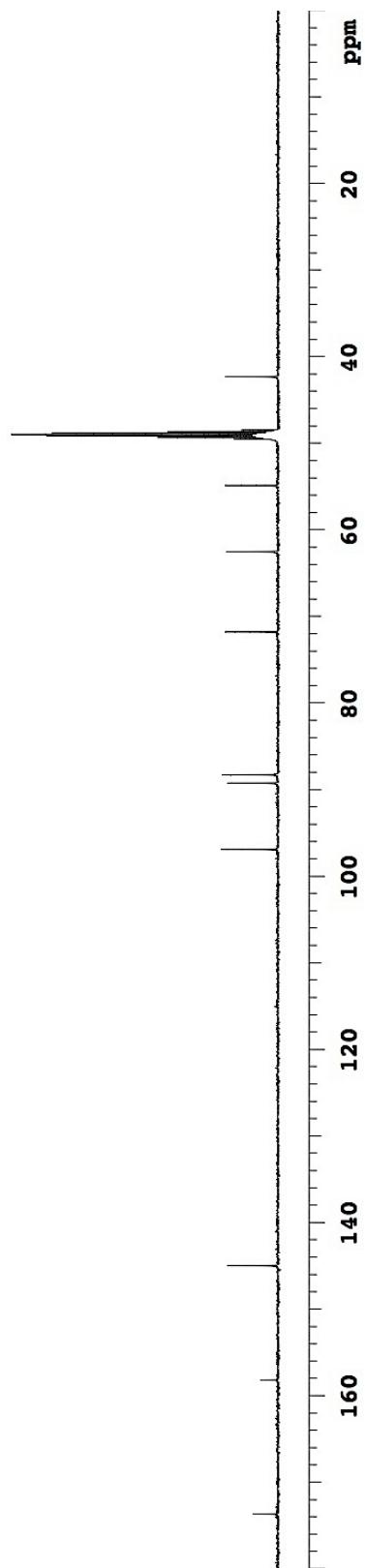
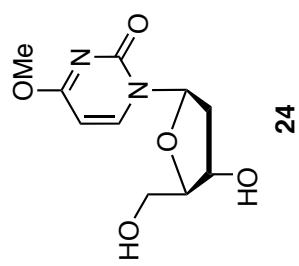


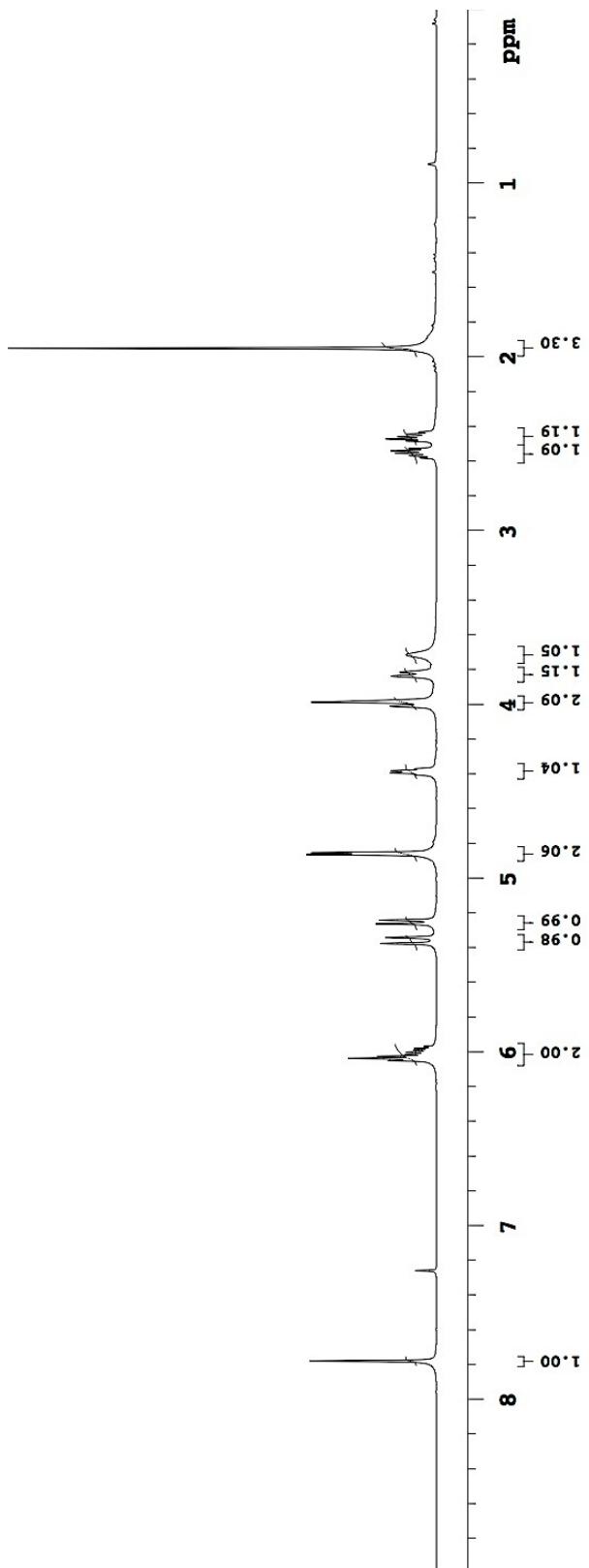
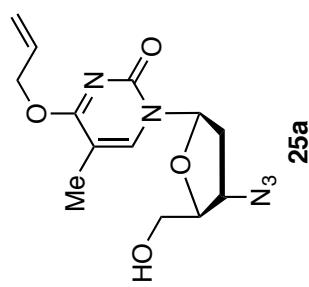


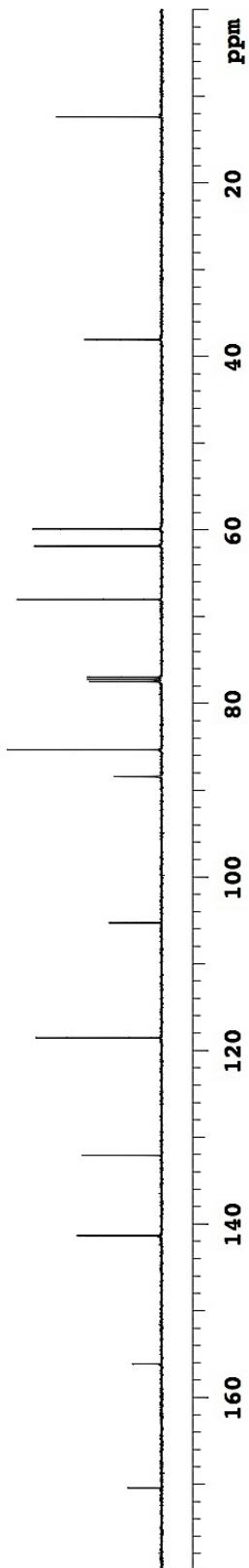
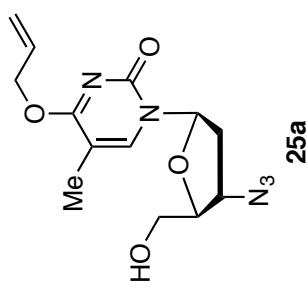


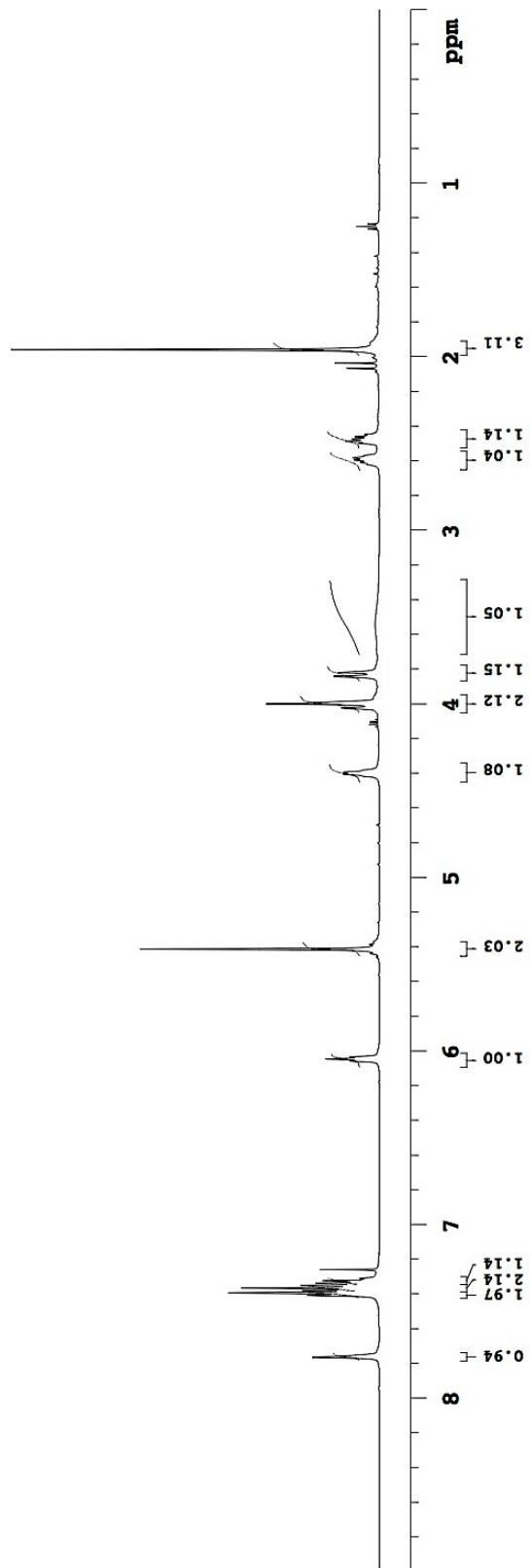
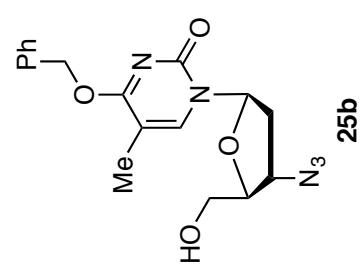


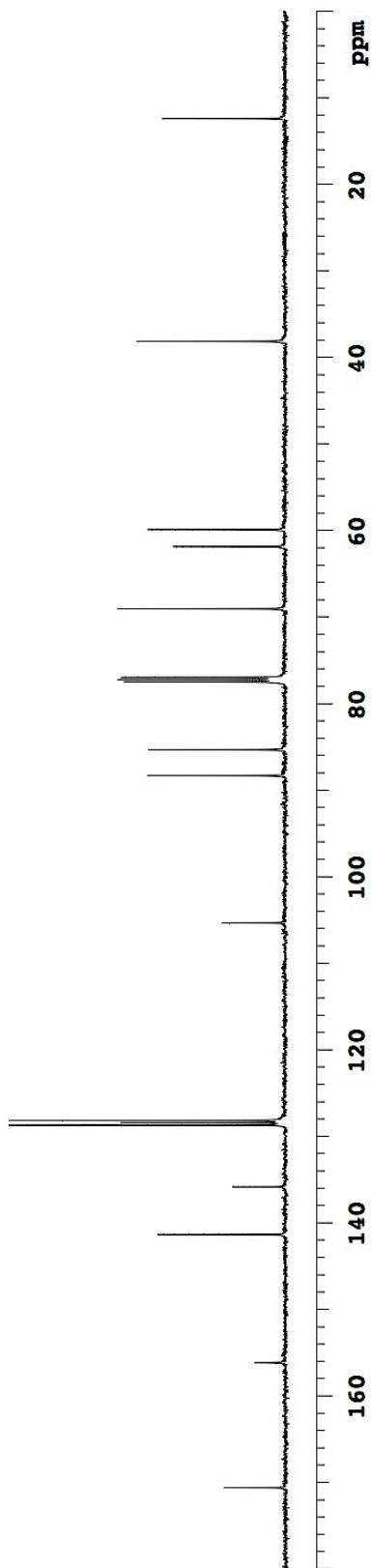
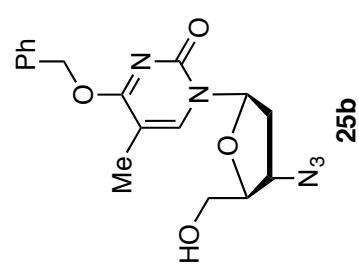


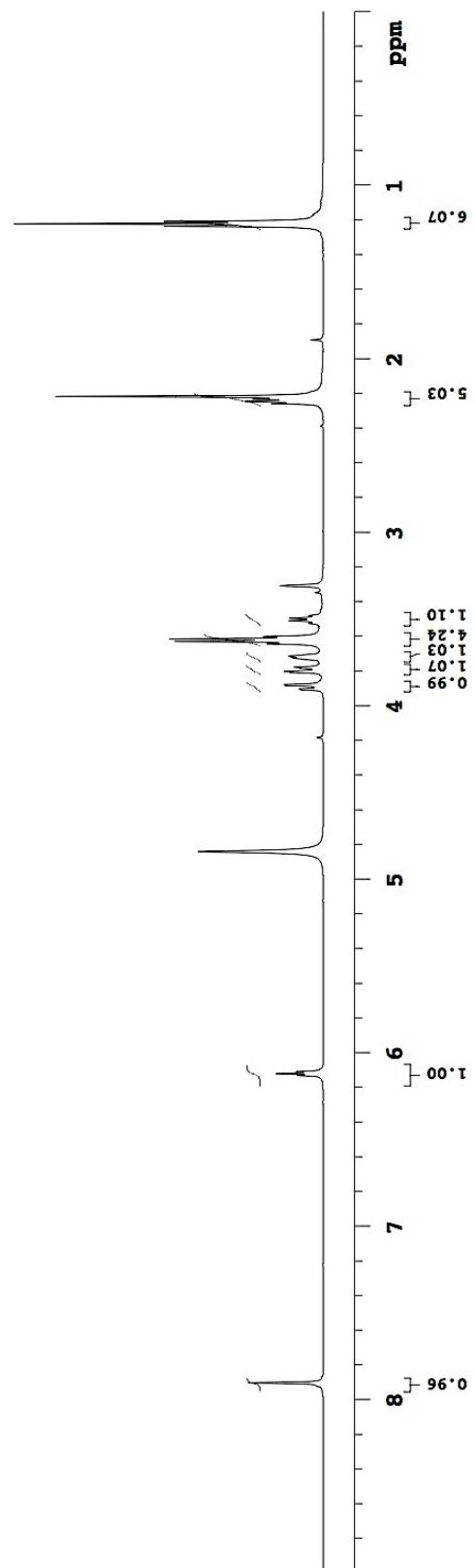
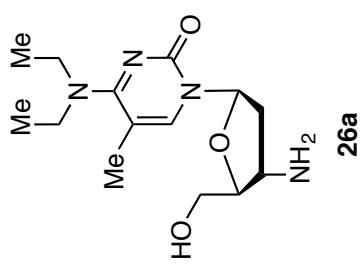


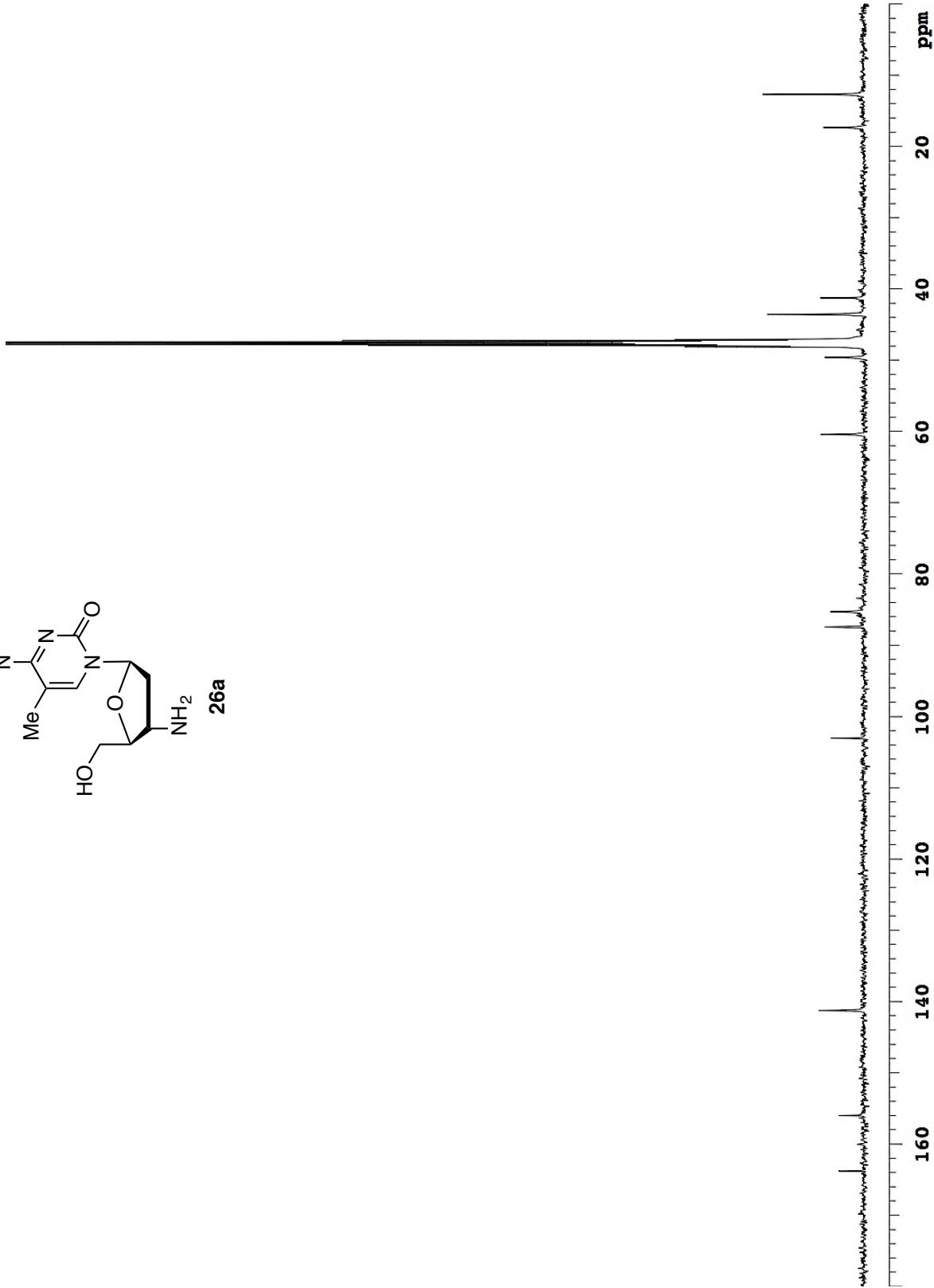
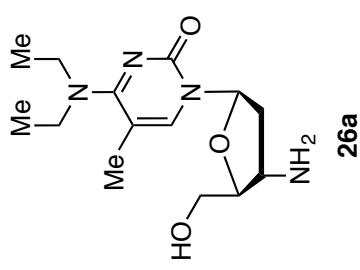


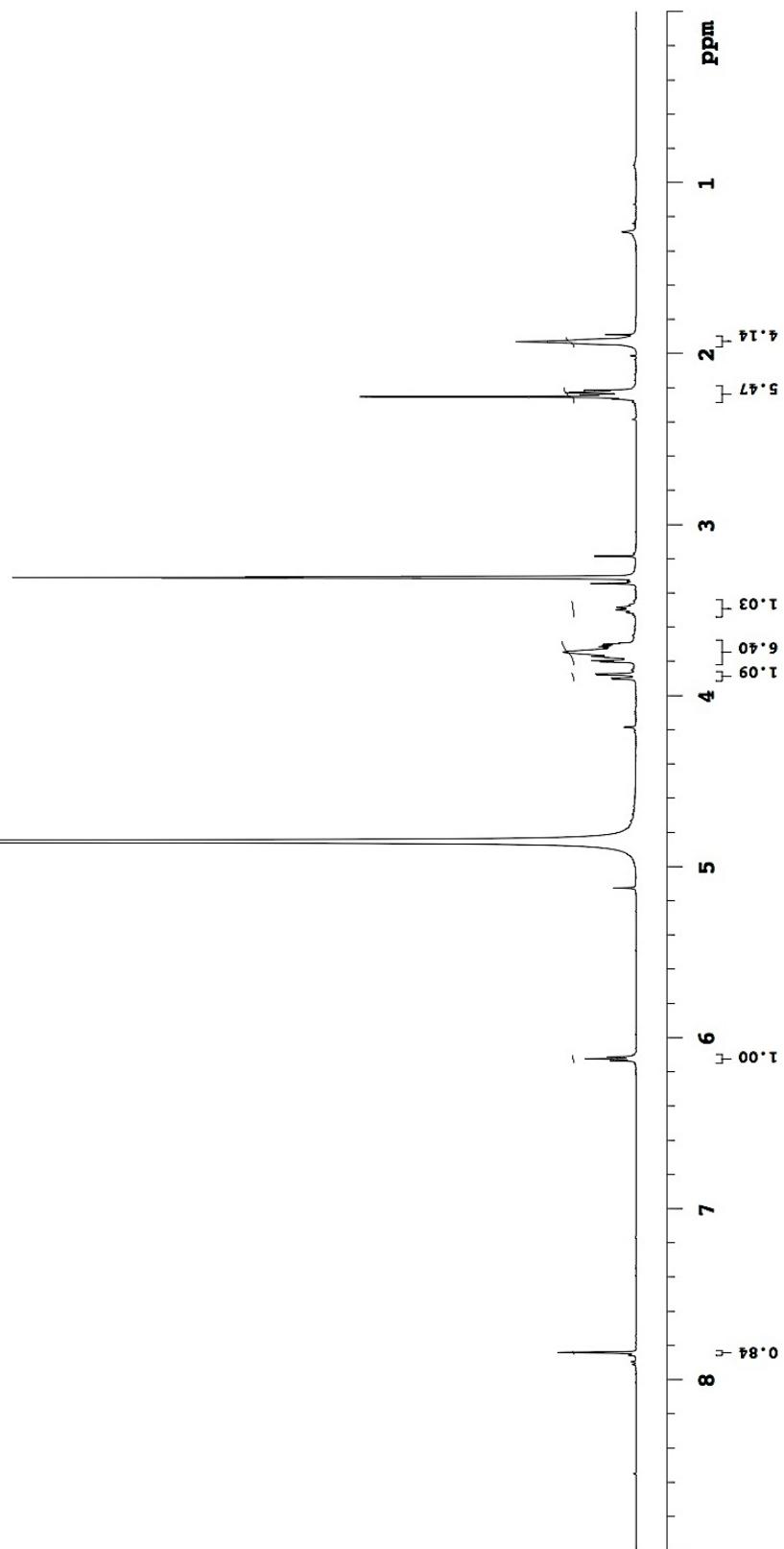
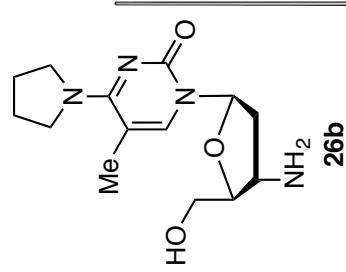


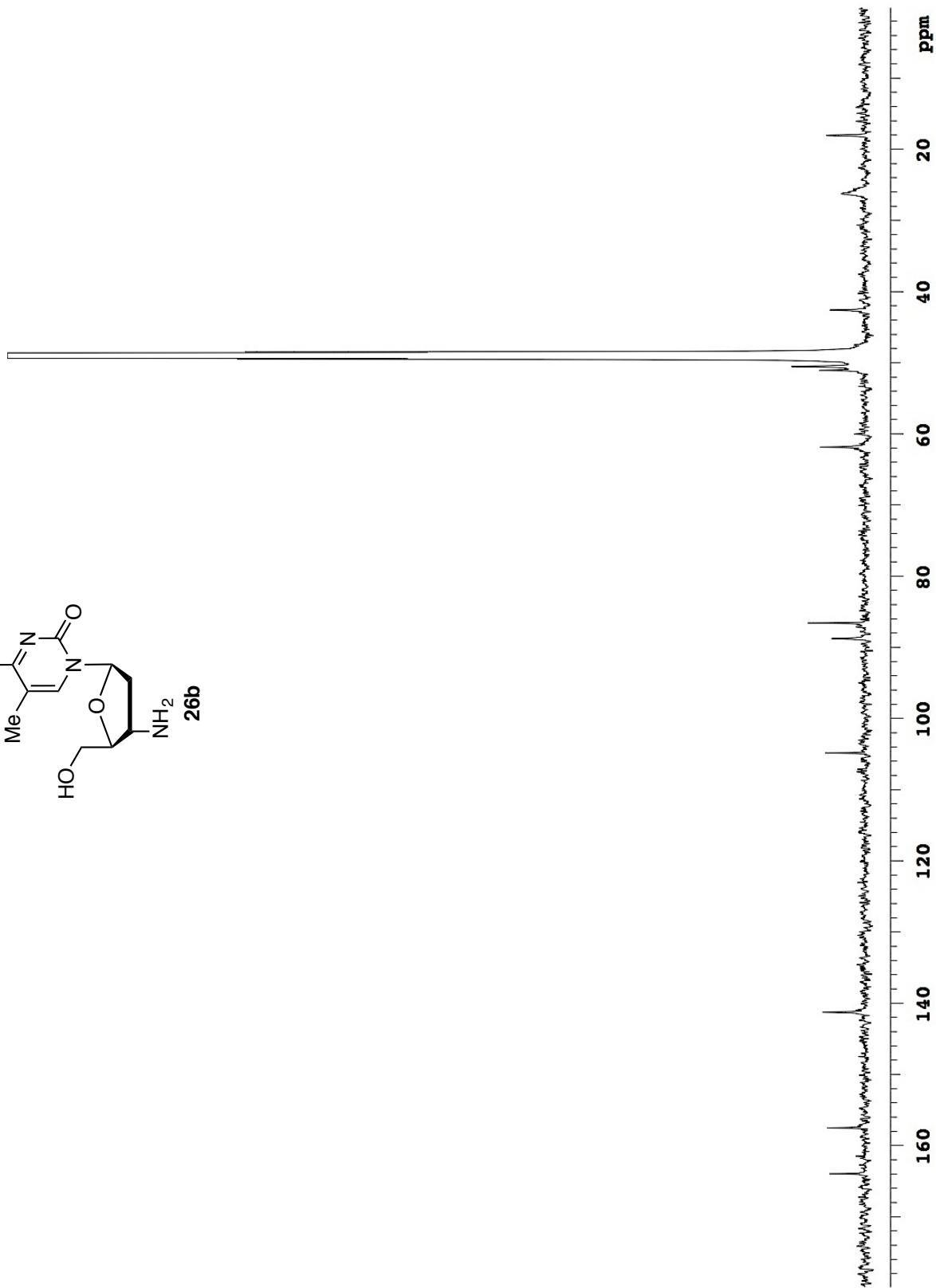
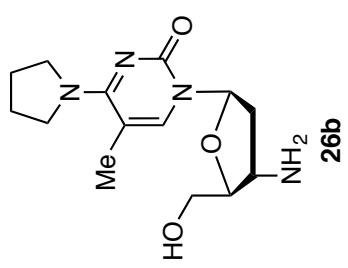


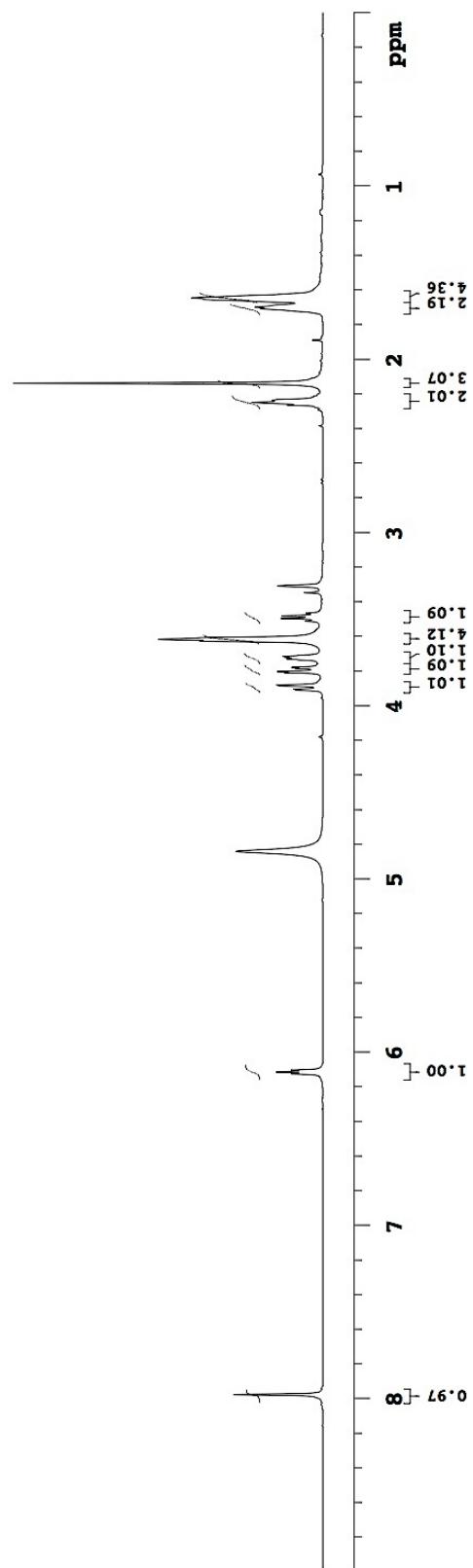
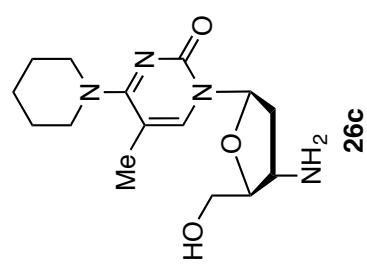


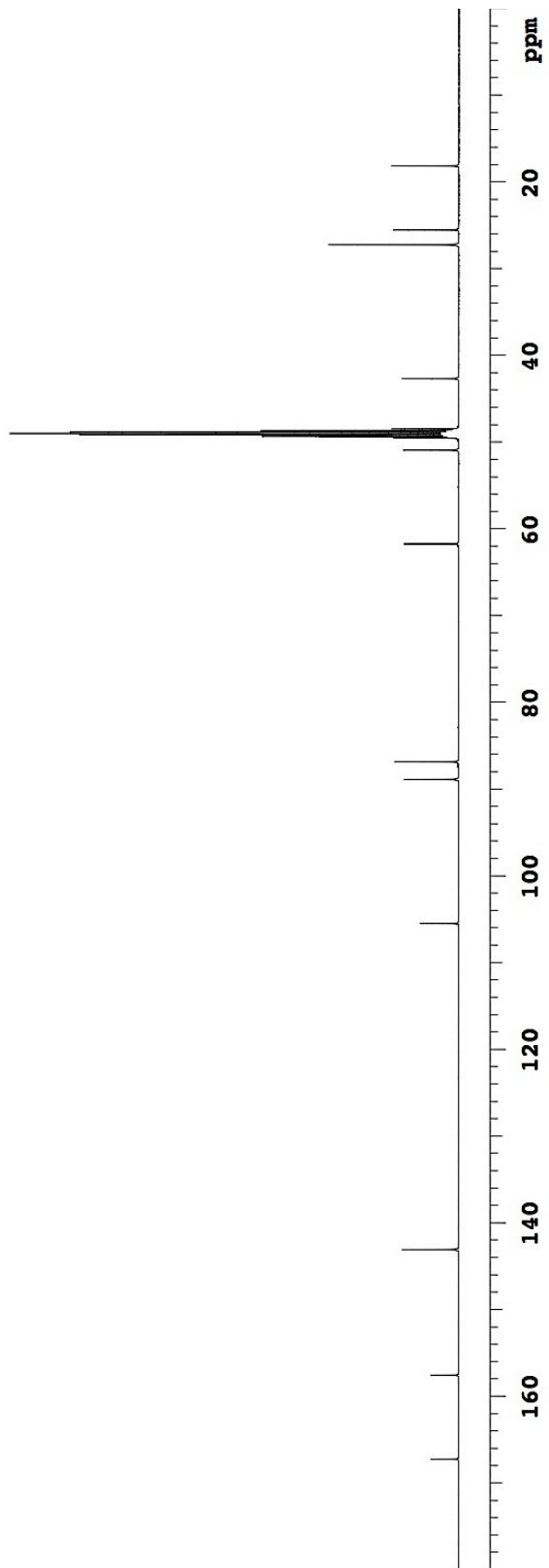
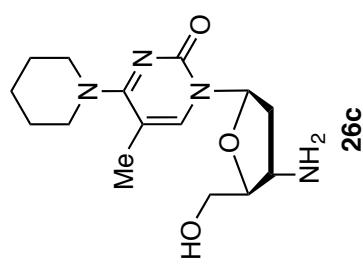












gCOSY spectrum of compound **26c** in CD₃OD

