Electronic Supplementary Information (ESI)

Modular synthesis of polyene side chain analogues of the potent macrolide antibiotic etnangien by a flexible coupling strategy based on hetero-bis-metallated alkenes†

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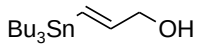
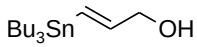
Copies of ^{1}H and ^{13}C NMR spectra.



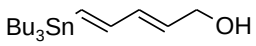
16a

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



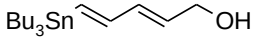
16a

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



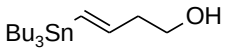
16b

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



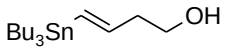
16b

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



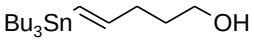
16c

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



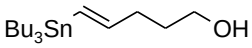
16c

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



16d

solvent: $CDCl_3$
nucleus: ^1H
frequency: 500.130 MHz



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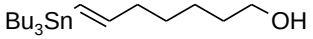
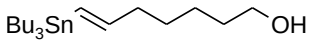
nucleus: ^{13}C
frequency: 125.78 MHz



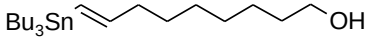
16e

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



16e

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



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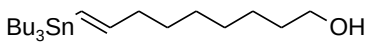
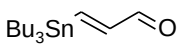
solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



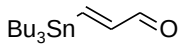
16f

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



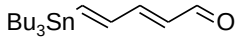
12a

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



12a

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



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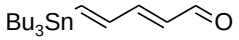
solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



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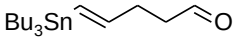
nucleus: ^{13}C
frequency: 75.48 MHz



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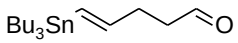
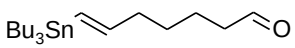
frequency: 300.132 MHz



12d

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



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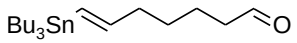
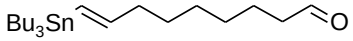
solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



12e

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



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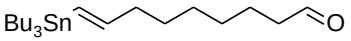
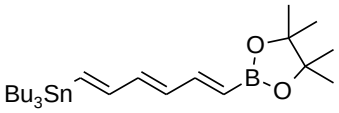
solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



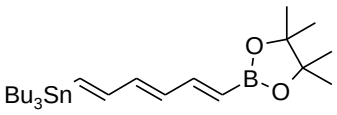
12f

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



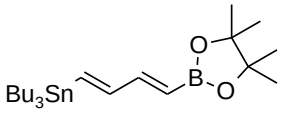
5

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



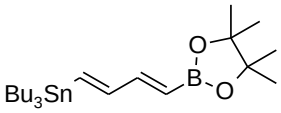
5

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 100.61 MHz



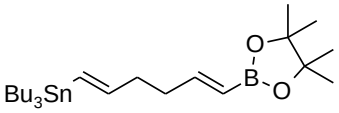
6a

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



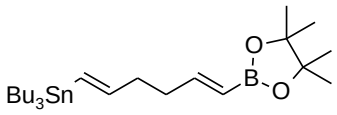
6a

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



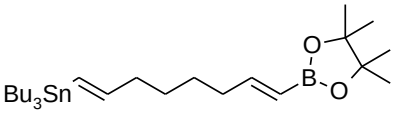
6b

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



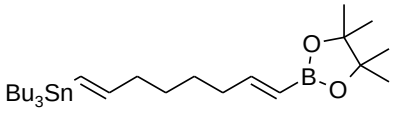
6b

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



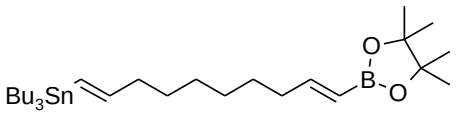
6c

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



6c

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



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solvent: $CDCl_3$
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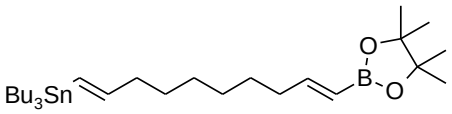
frequency: 300.132 MHz



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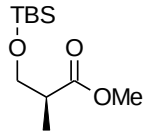

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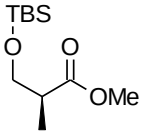

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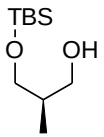

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solvent: $CDCl_3$
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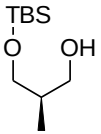
frequency: 300.132 MHz



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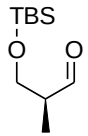
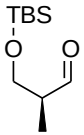
solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



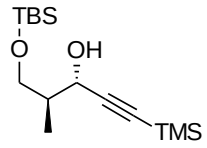
19a

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



19a

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



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solvent: $CDCl_3$
nucleus: ^1H
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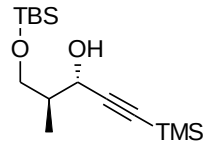
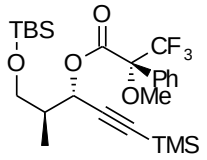


21a

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



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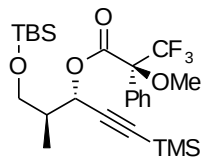
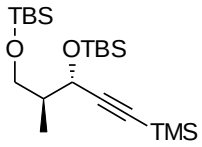
solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



46

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



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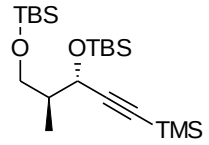
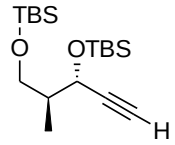
solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



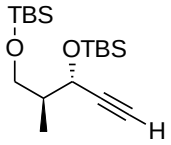
47

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



48

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



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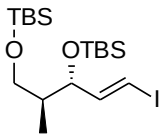
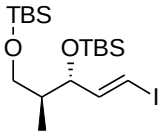
solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



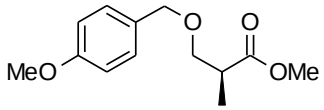
8a

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



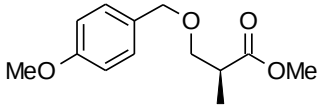
8a

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



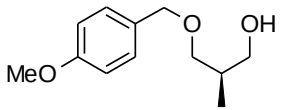
49

solvent: $CDCl_3$
nucleus: ^1H
frequency: 500.130 MHz



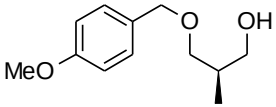
49

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 125.76 MHz



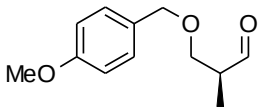
50

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



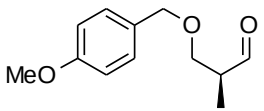
50

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



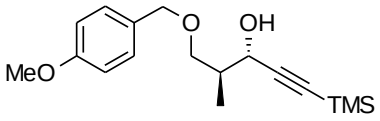
19b

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



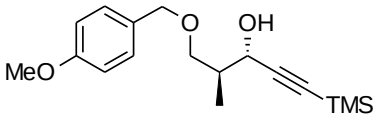
19b

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



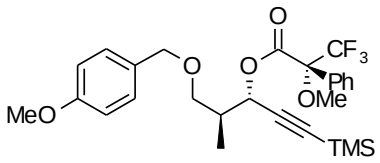
21b

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



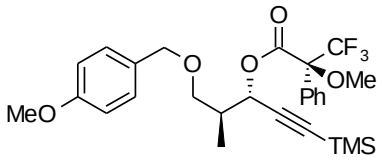
21b

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



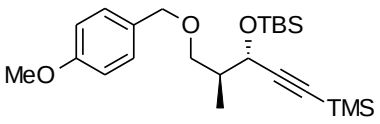
51

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



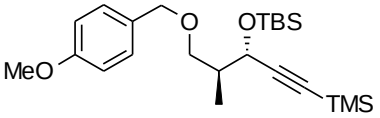
52

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



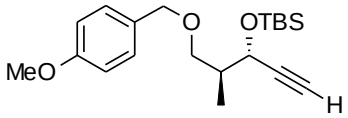
53

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



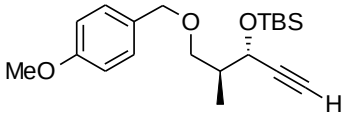
53

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



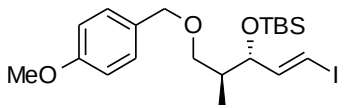
54

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



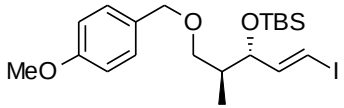
54

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



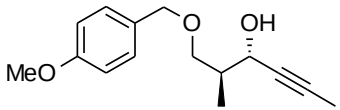
8b

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



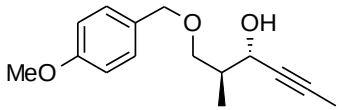
8b

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



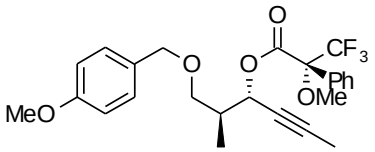
22

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



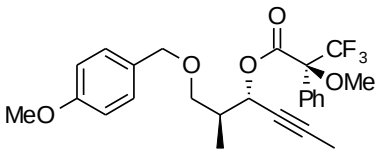
22

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



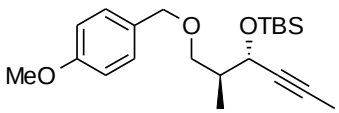
55

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



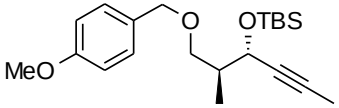
56

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



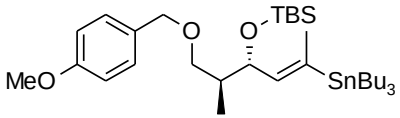
57

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



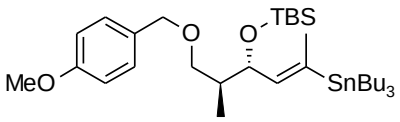
57

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



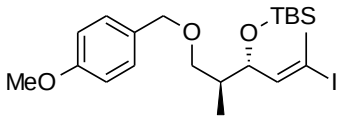
58

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



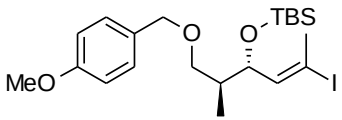
58

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



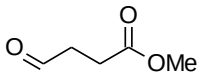
7

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



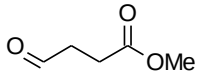
7

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



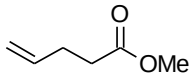
24

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



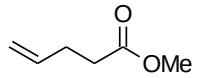
24

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



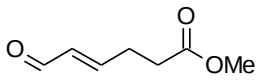
59

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



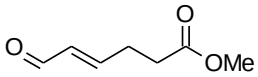
59

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



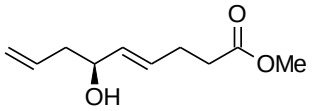
26

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



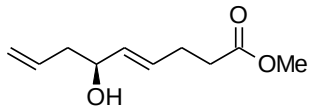
26

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



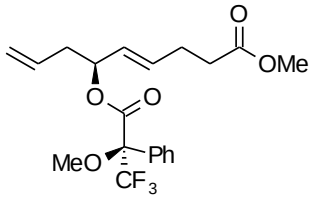
27

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



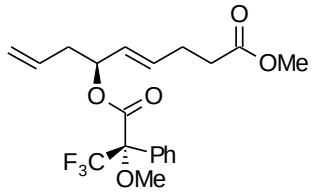
27

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



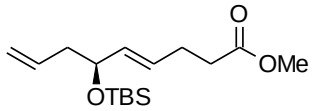
60

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



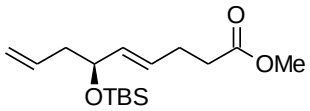
61

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



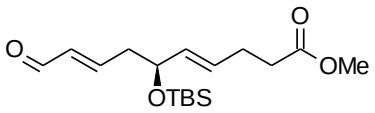
62

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



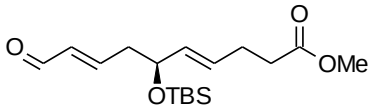
62

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



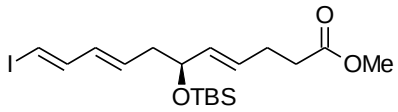
63

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



63

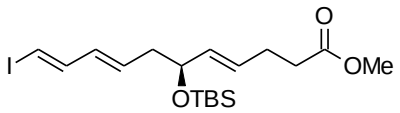
solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



10

E/*Z* = 7:1

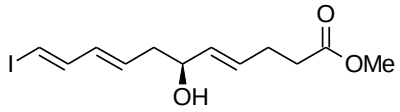
solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



10

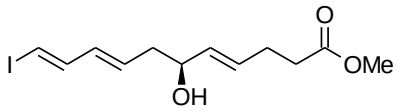
E/*Z* = 7:1

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



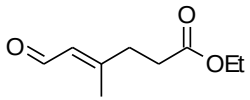
28

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



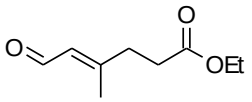
28

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



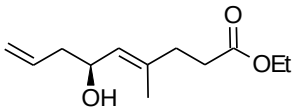
64

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



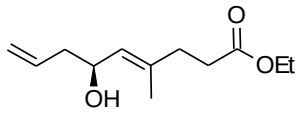
64

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



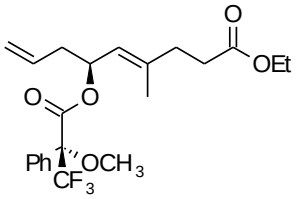
32

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



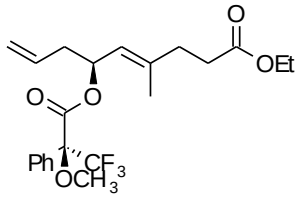
32

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



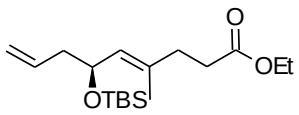
65

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



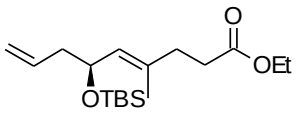
66

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



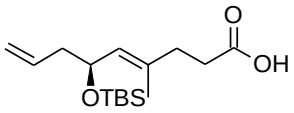
67

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



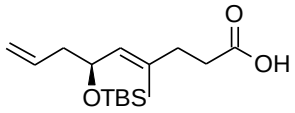
67

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



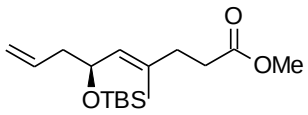
68

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



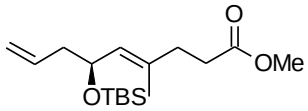
68

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



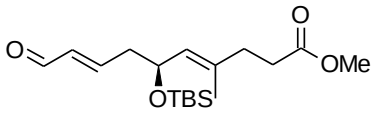
33

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



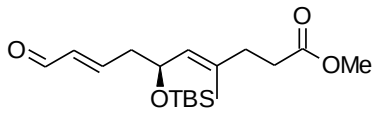
33

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



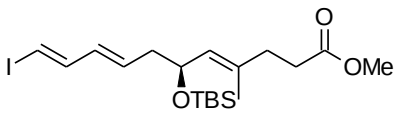
69

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



69

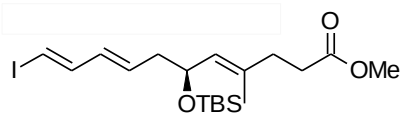
solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



9

E/*Z* = 8:1

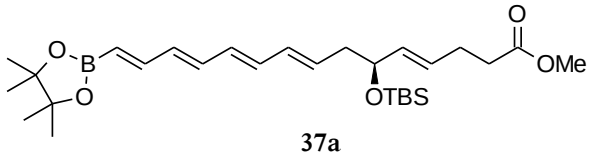
solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



9

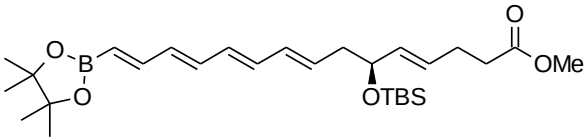
E/*Z* = 8:1

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



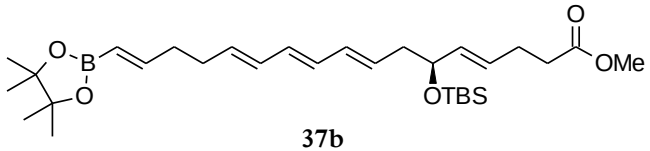
37a

solvent: $CDCl_3$
nucleus: ^1H
frequency: 600.130 MHz



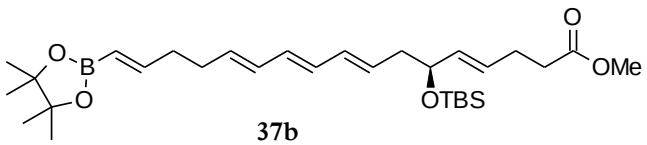
37a

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



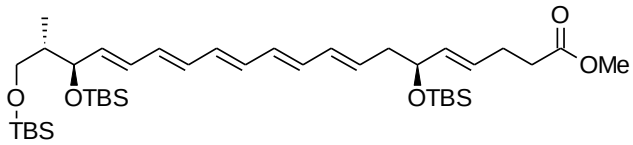
37b

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



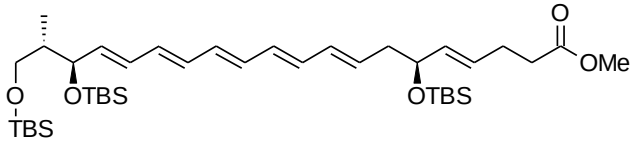
37b

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz



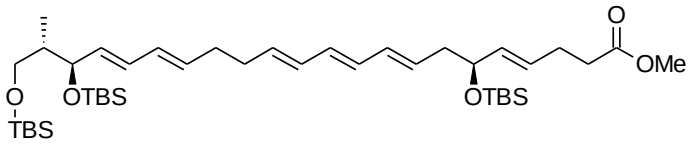
38a

solvent: $CDCl_3$
nucleus: ^1H
frequency: 600.130 MHz



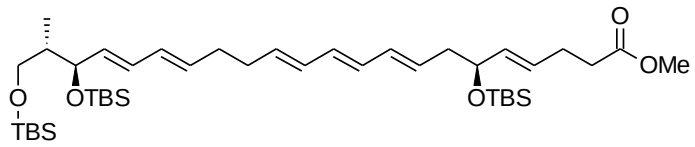
38a

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 150.90 MHz



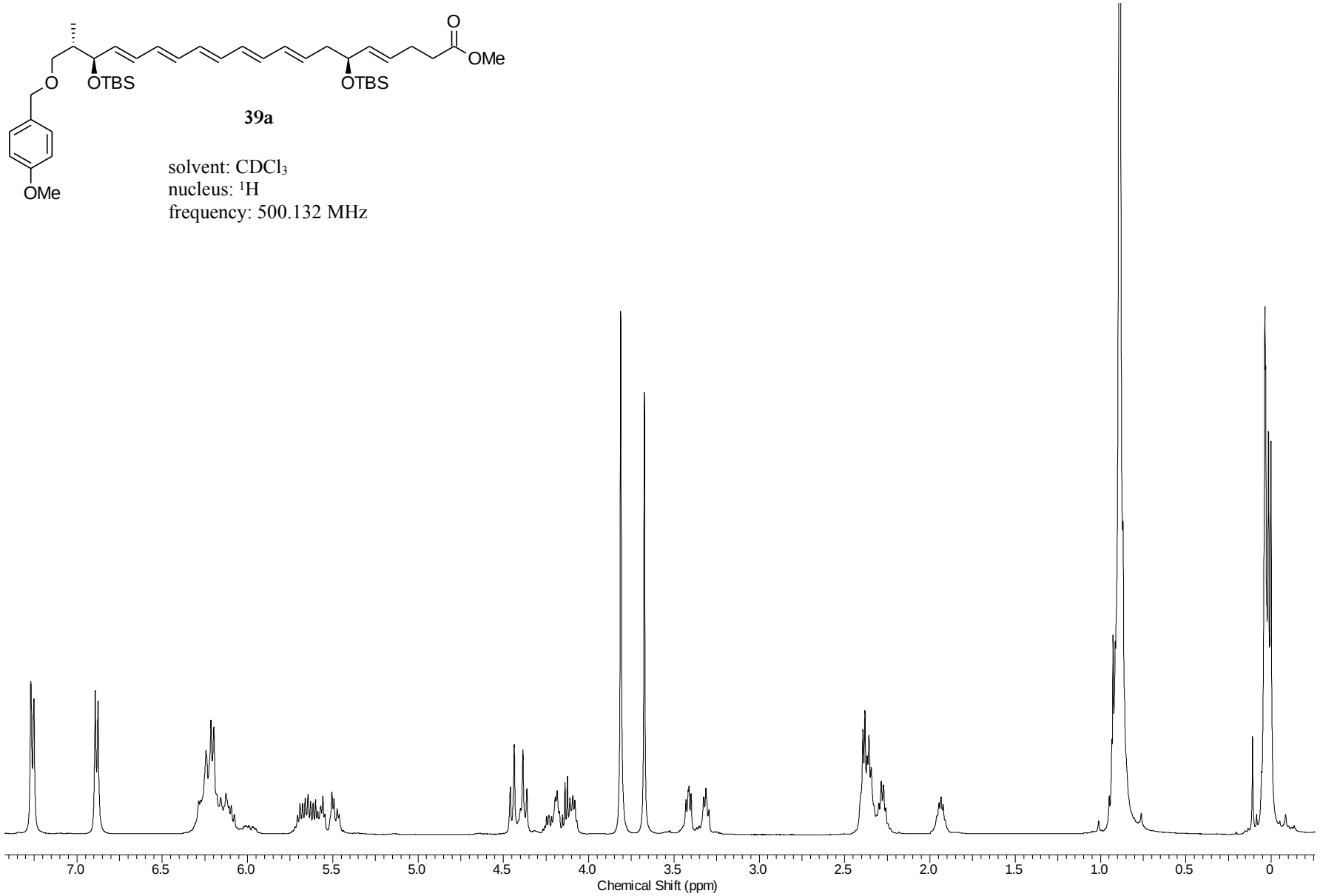
38b

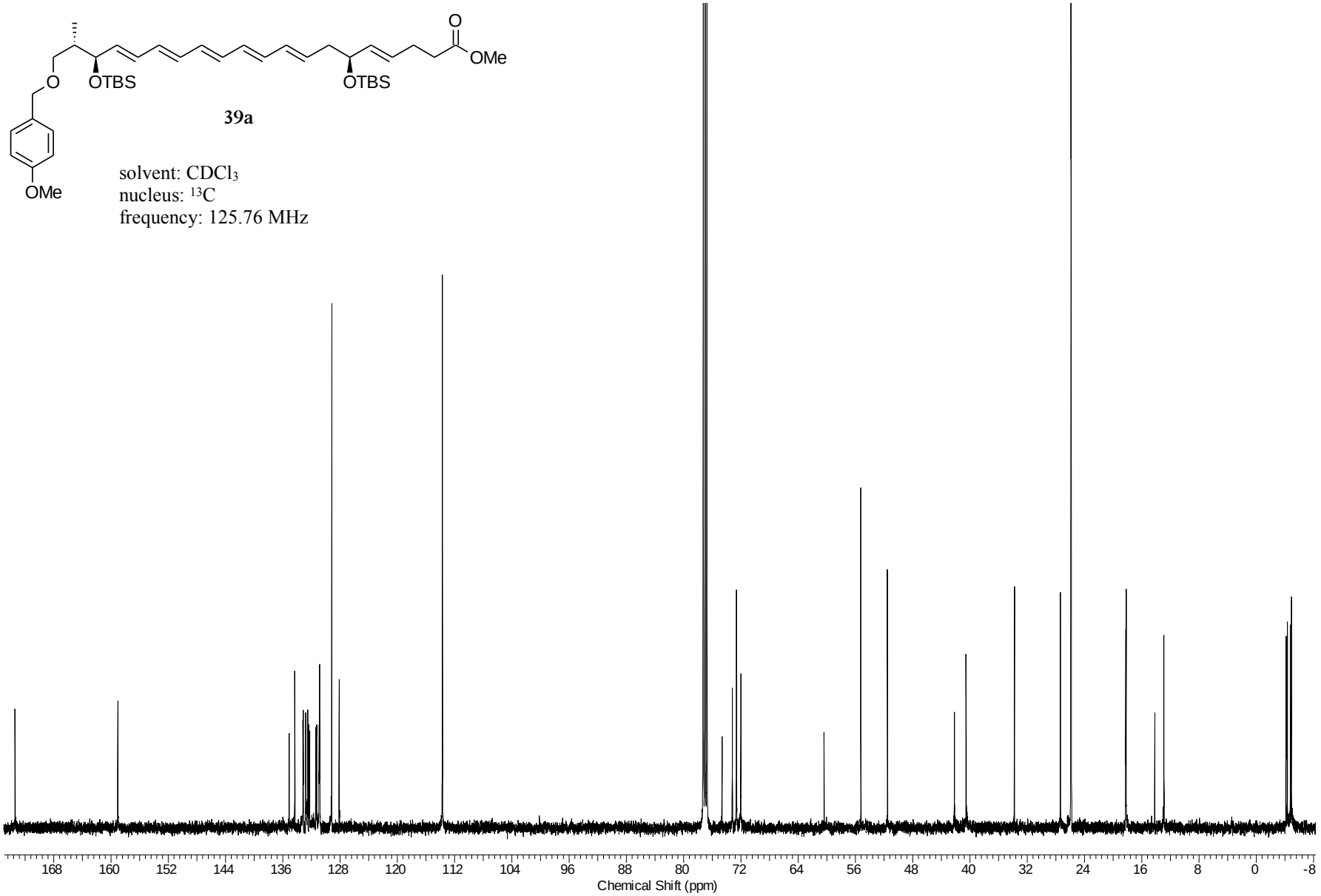
solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



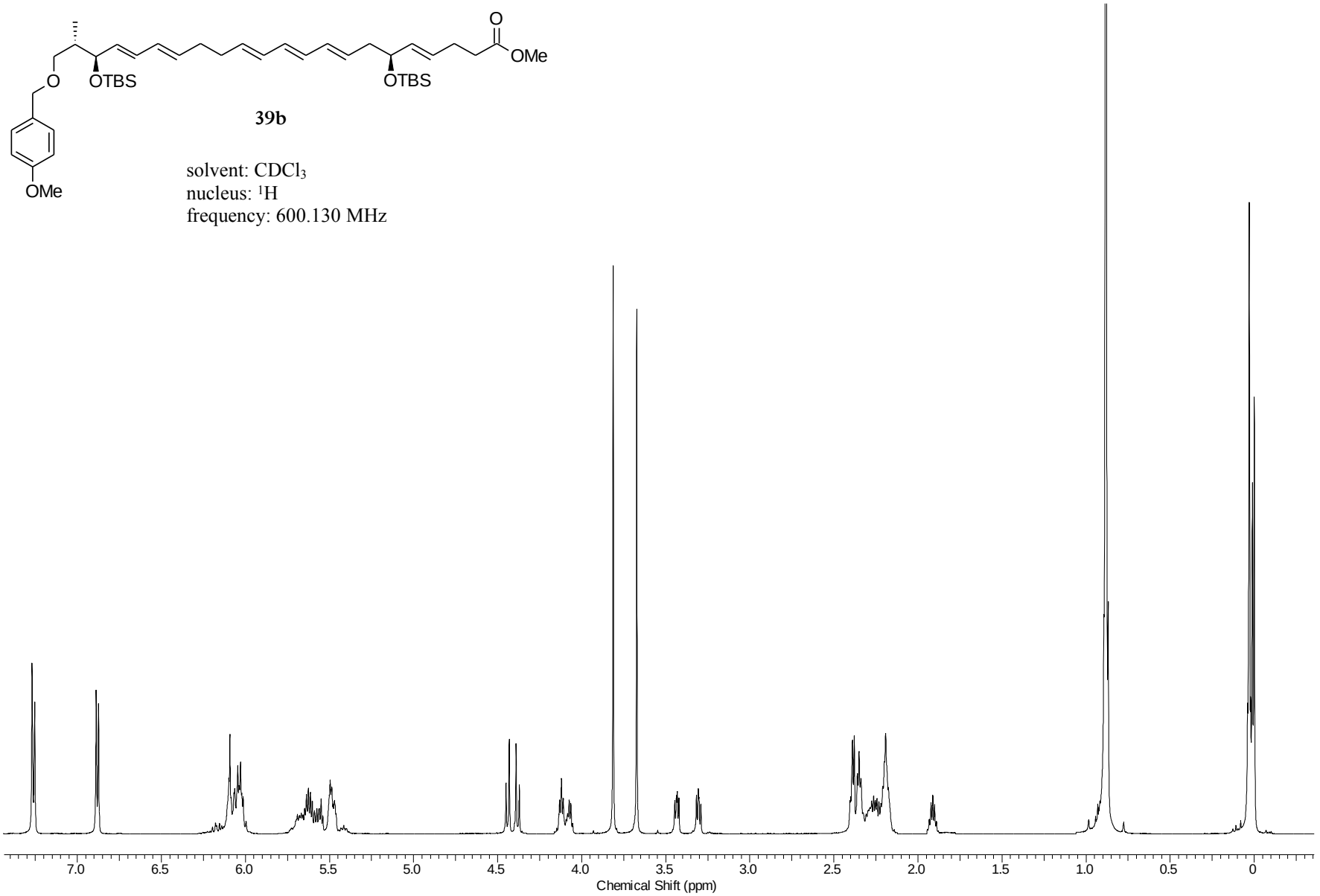
38b

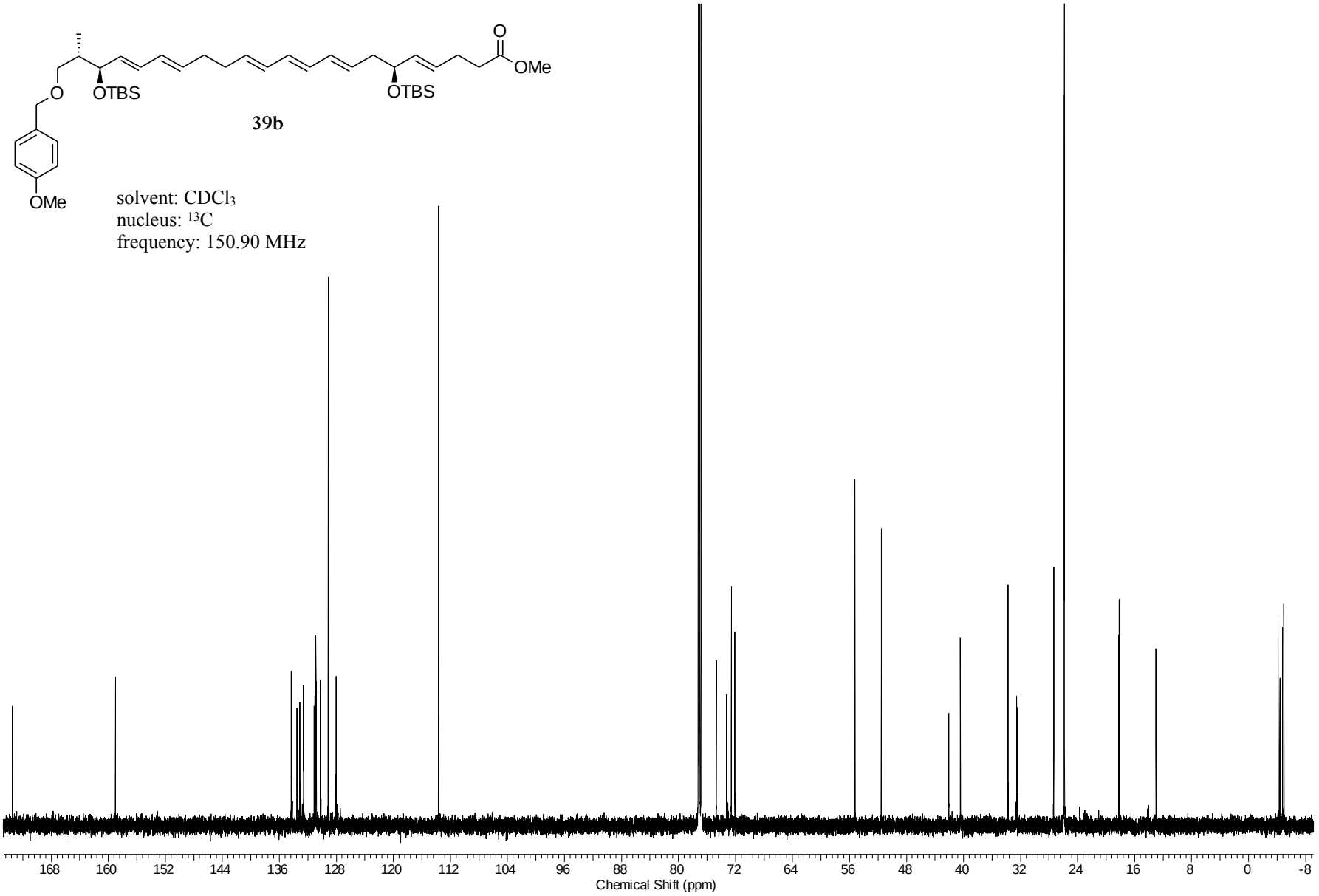
solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz

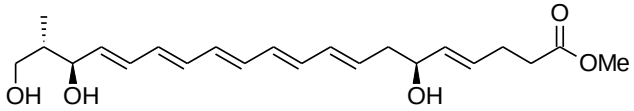




39a

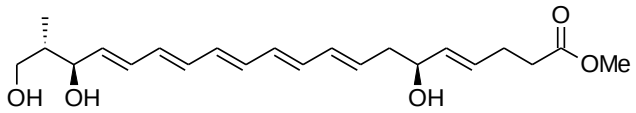






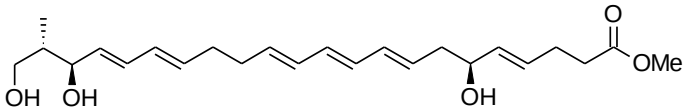
4a

solvent: $CDCl_3$
nucleus: ^1H
frequency: 500.132 MHz



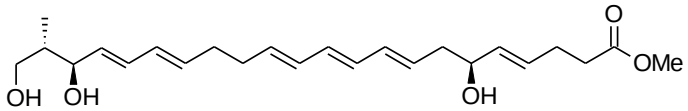
4a

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 125.76 MHz



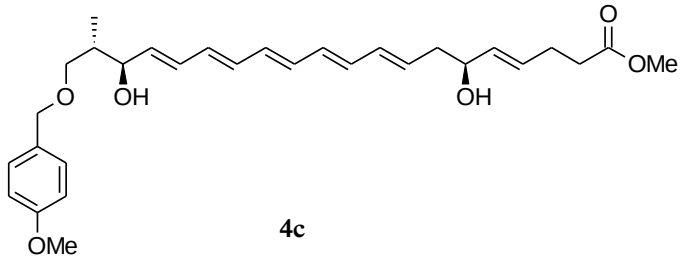
4b

solvent: $CDCl_3$
nucleus: ^1H
frequency: 500.132 MHz



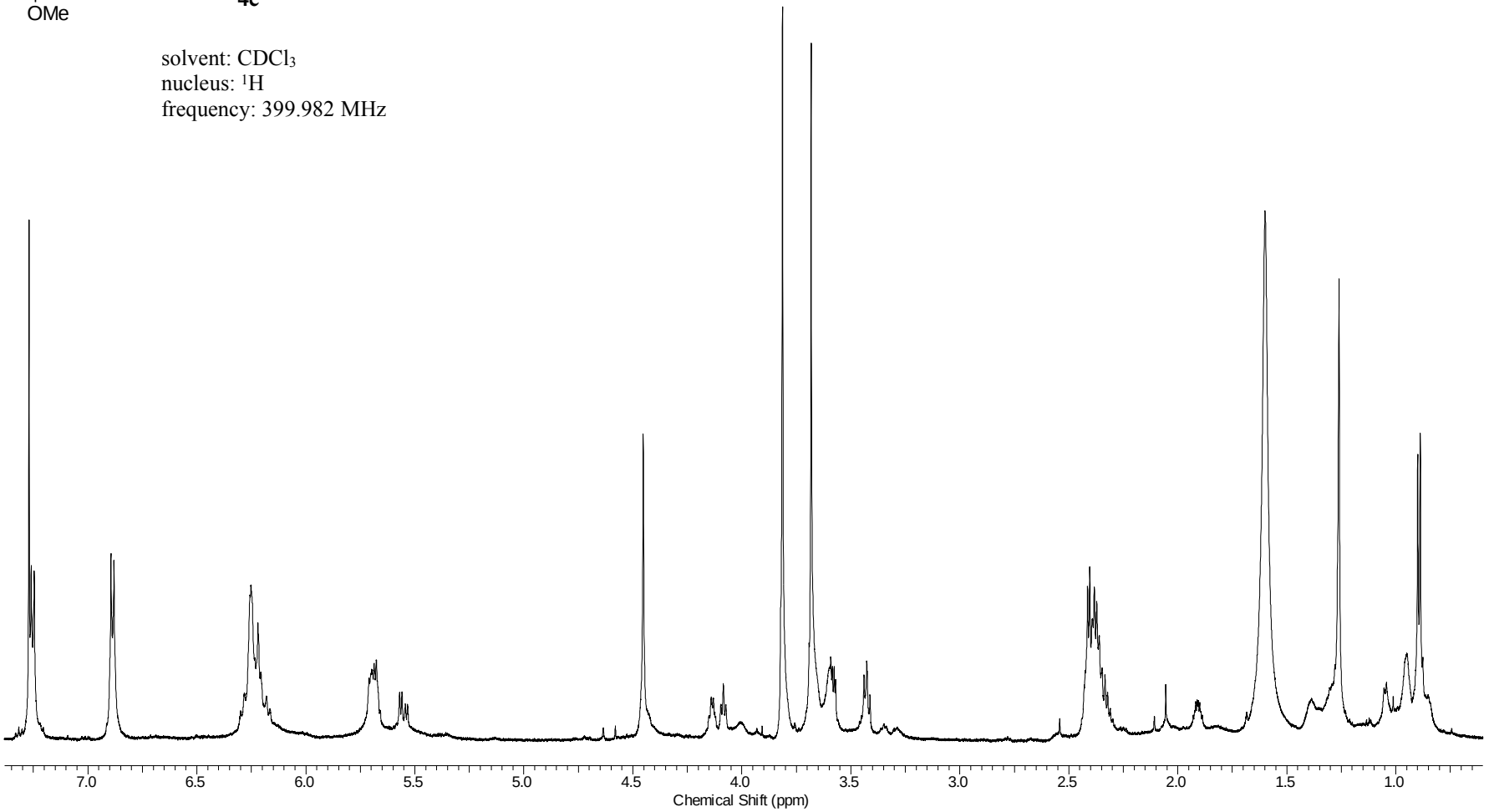
4b

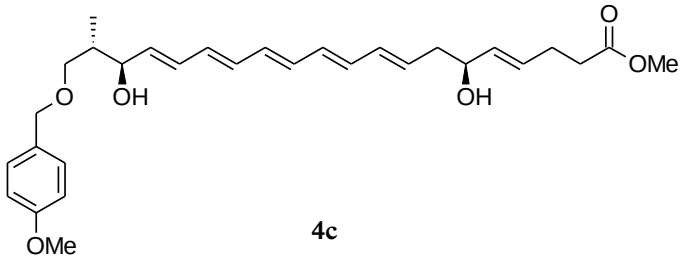
solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 125.76 MHz



4c

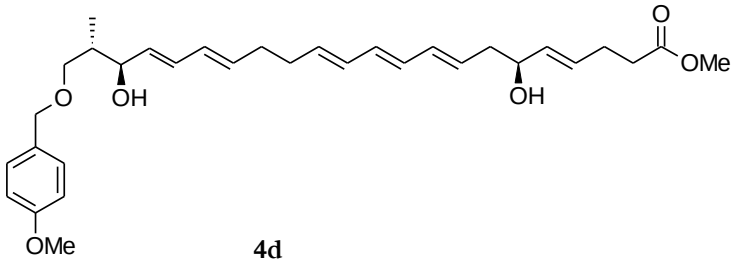
solvent: $CDCl_3$
nucleus: ^1H
frequency: 399.982 MHz





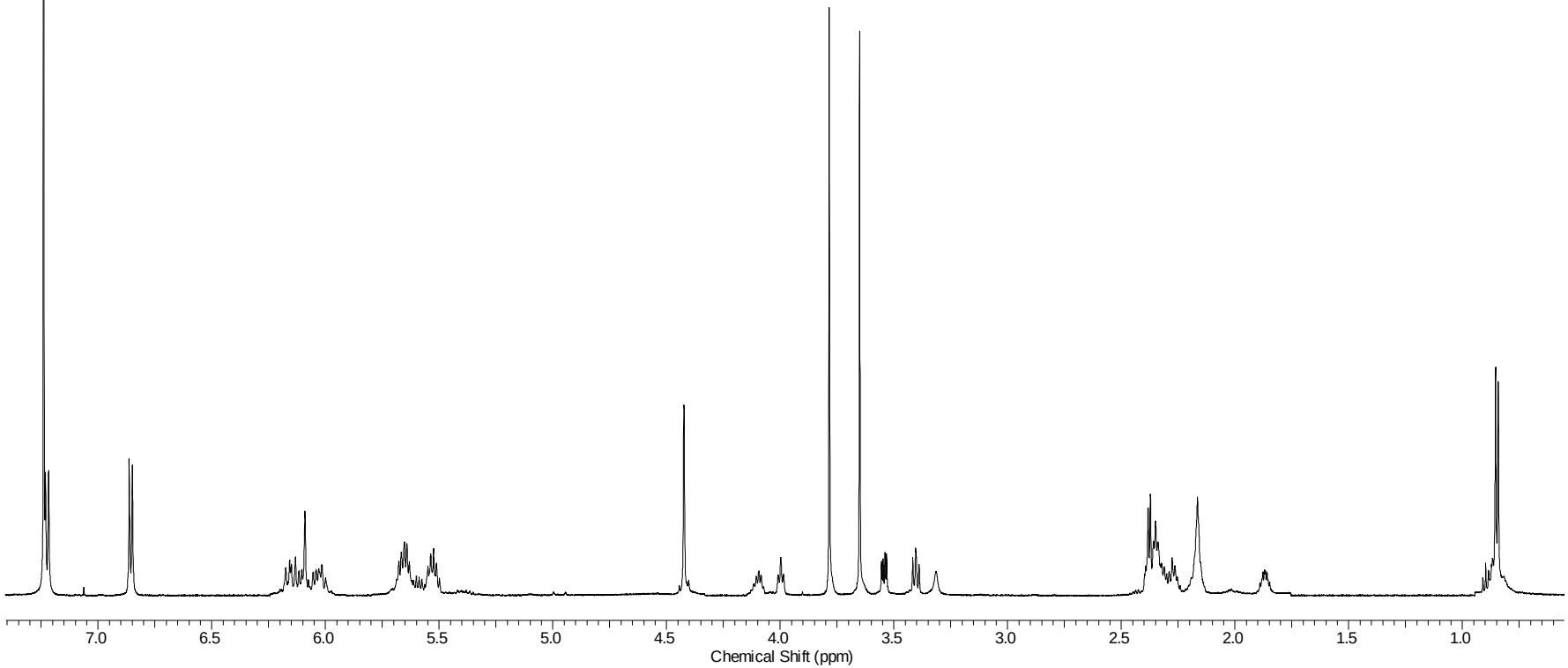
4c

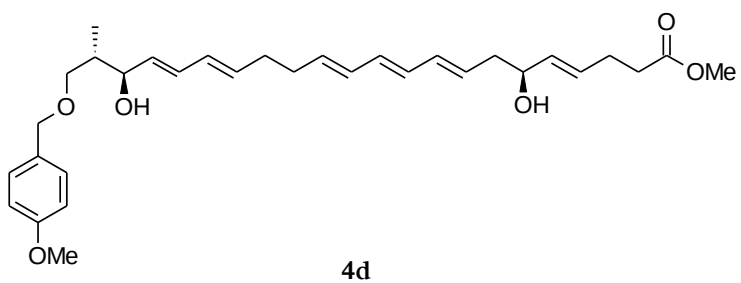
solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 150.90 MHz



4d

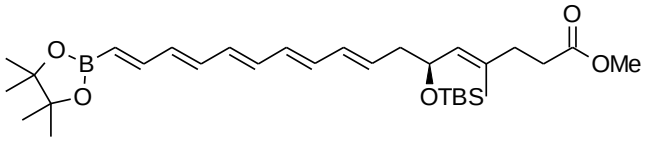
solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.13 2MHz





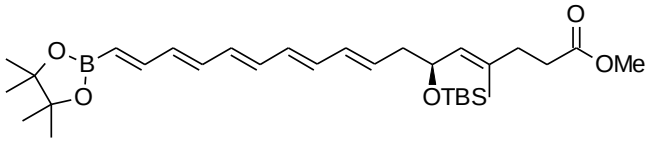
4d

solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 150.90 MHz



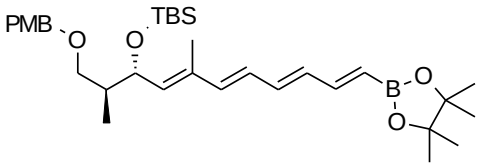
40

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz



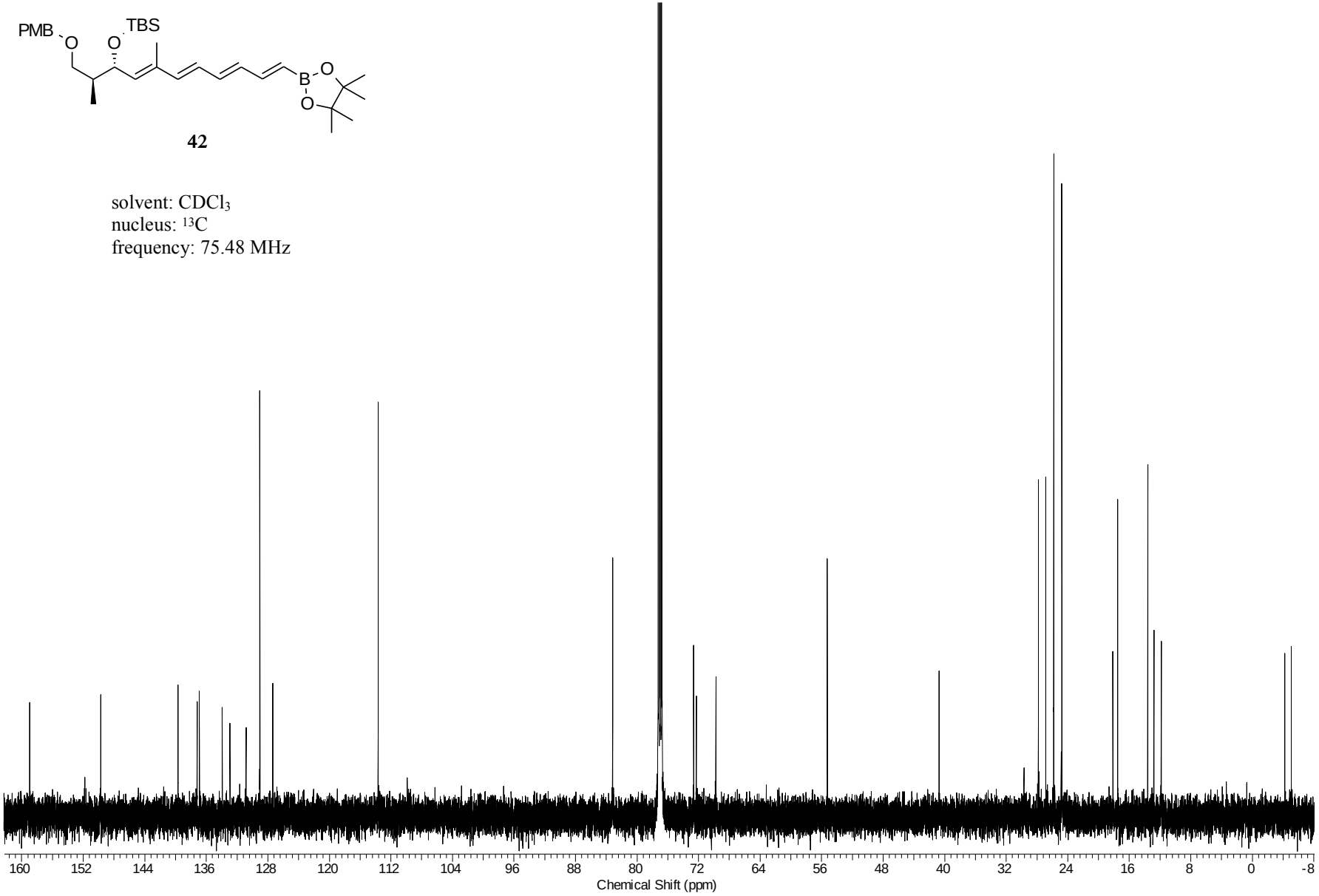
40

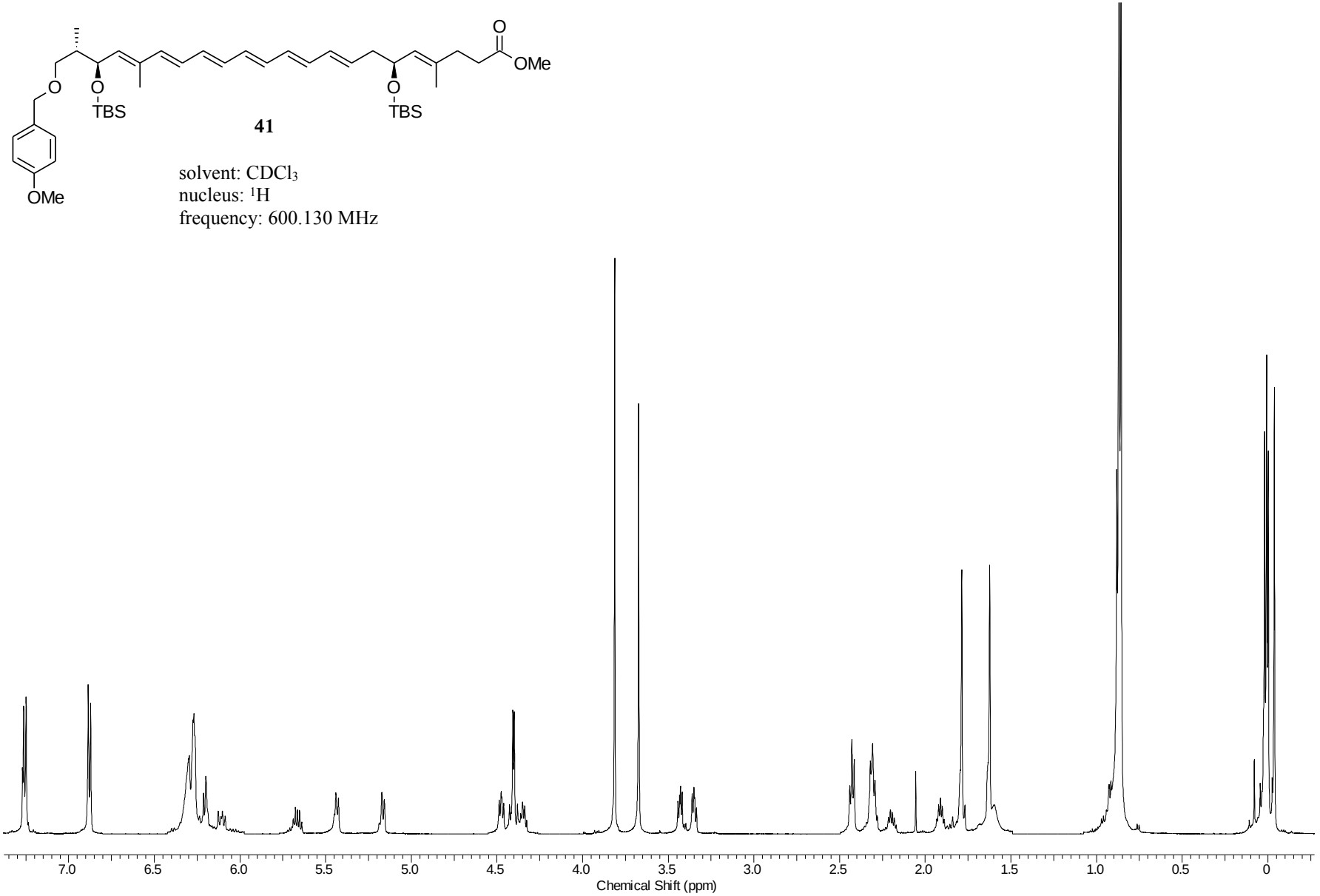
solvent: $CDCl_3$
nucleus: ^{13}C
frequency: 75.48 MHz

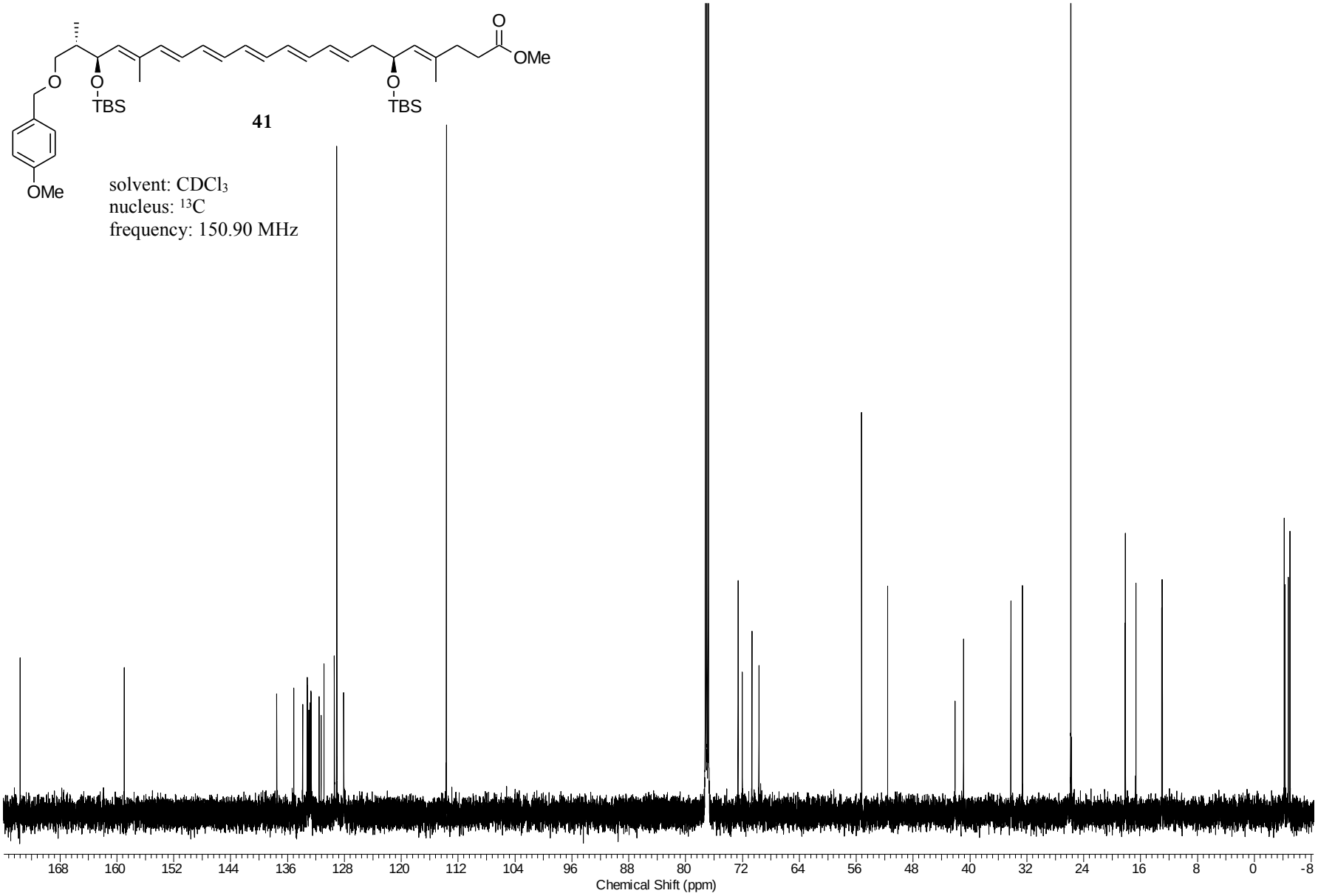


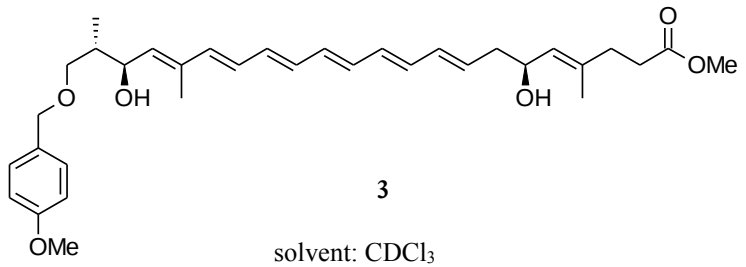
42

solvent: $CDCl_3$
nucleus: ^1H
frequency: 300.132 MHz









3

solvent: $CDCl_3$
nucleus: ^1H
frequency: 600.130 MHz