

Supplementary data

^1H NMR, ^{13}C NMR and HRMS spectra of compounds

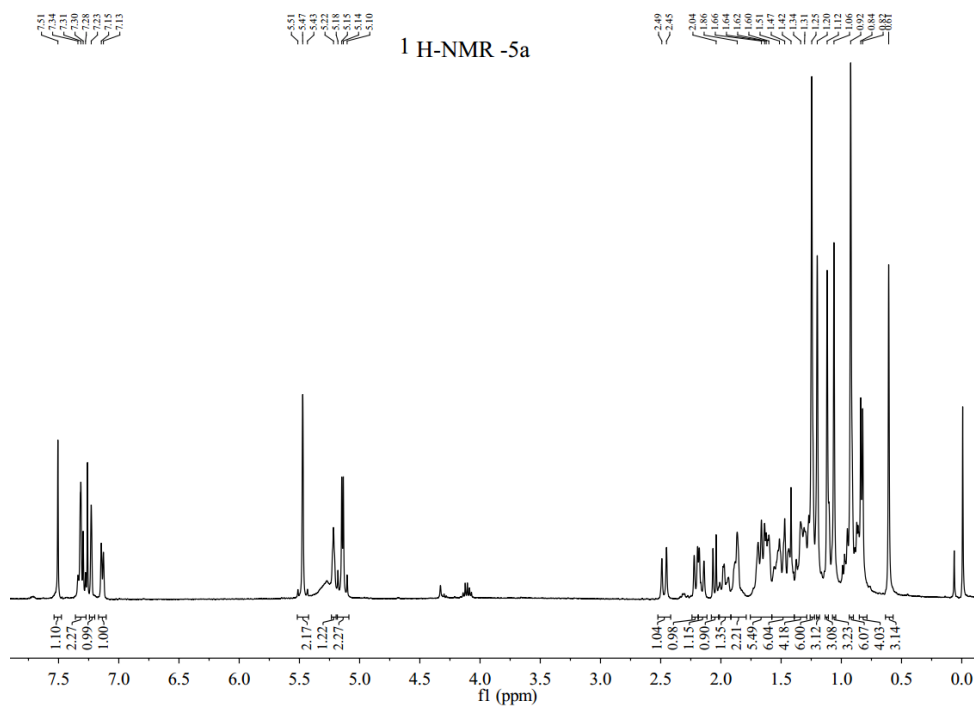


Figure 1. ^1H NMR spectra of **5a**.

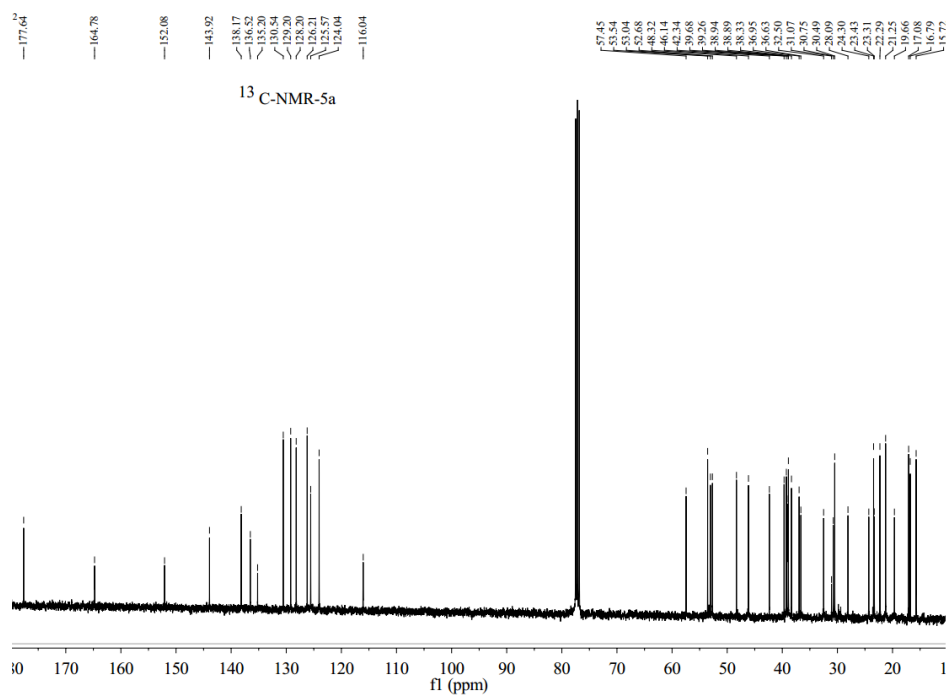


Figure 2. ^{13}C NMR spectra of **5a**.

UA-1_151215192816 #17 RT: 0.57 AV: 1 NL: 2.08E6
T: FTMS + c ESI Full ms [710.00-720.00]

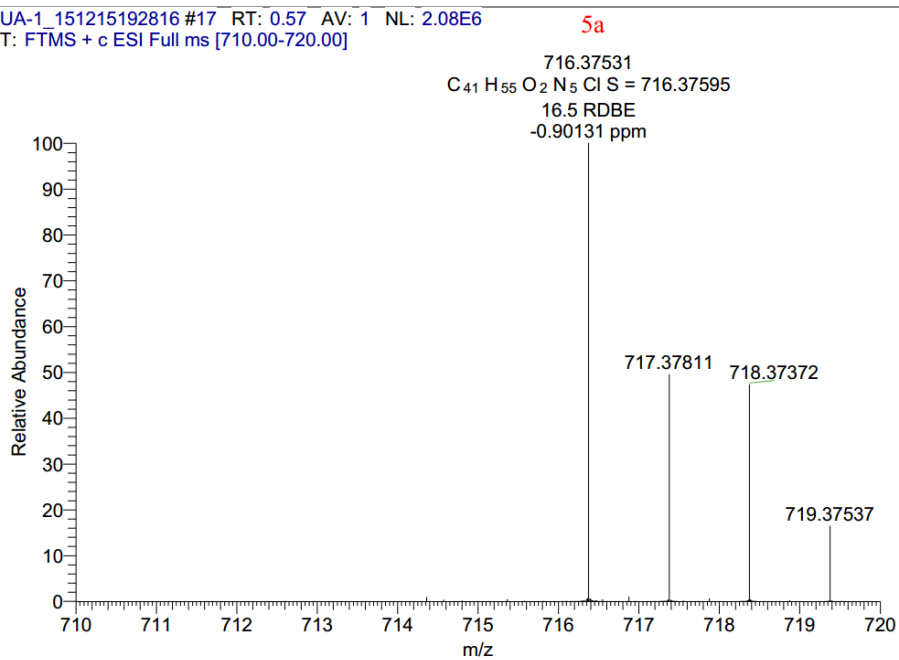


Figure 3. HR-MS spectra of **5a**.

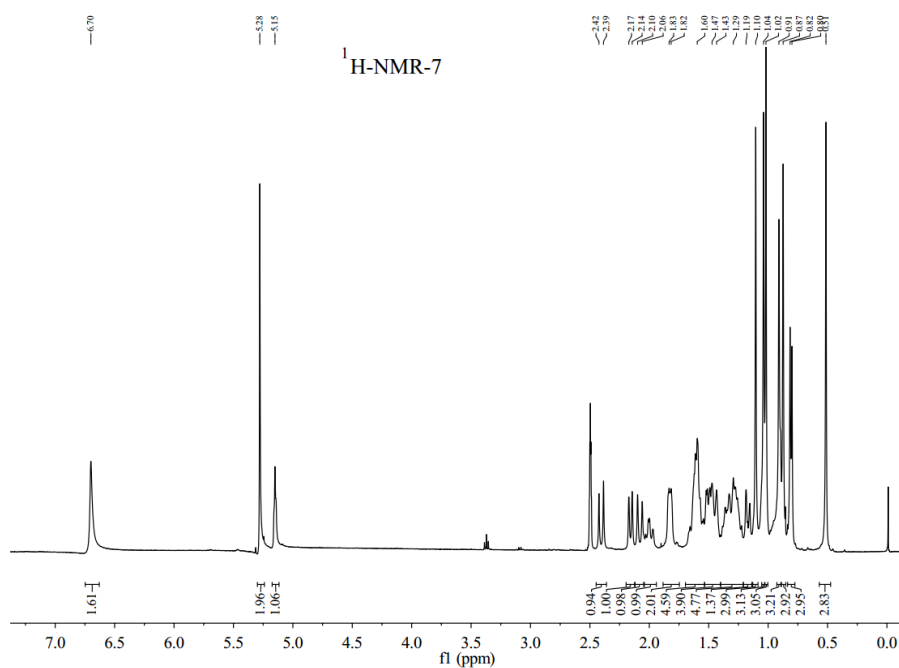


Figure S4. ¹H NMR spectra of **7**

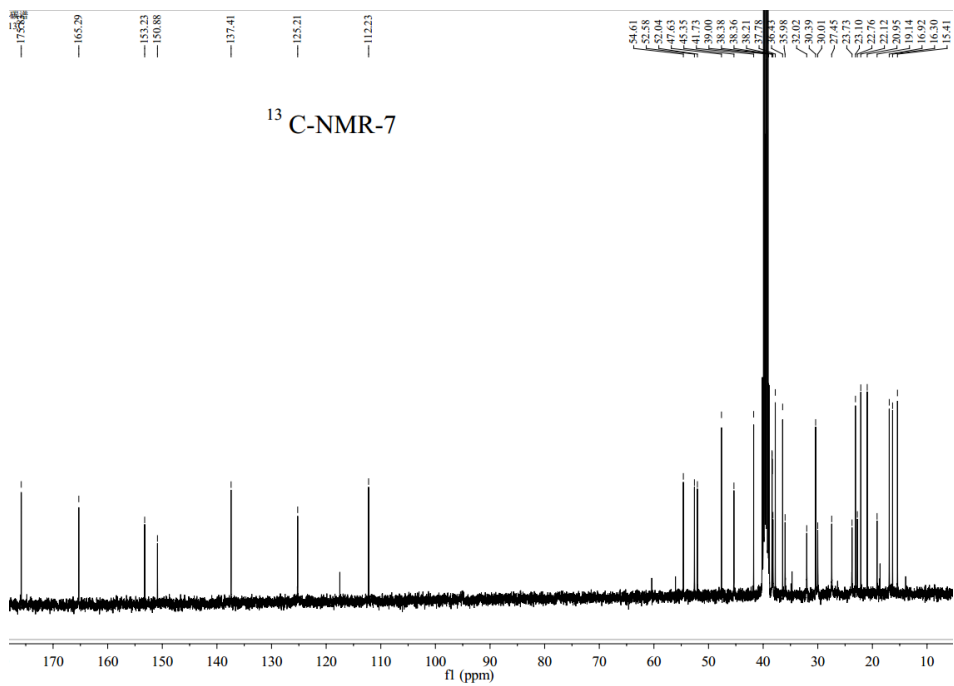


Figure 5. ¹³C NMR spectra of **7**.

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I-1 #39-42 RT: 0.41-0.44 AV: 4 NL: 1.29E8
T: FTMS + p ESI Full ms [100.00-2000.00]

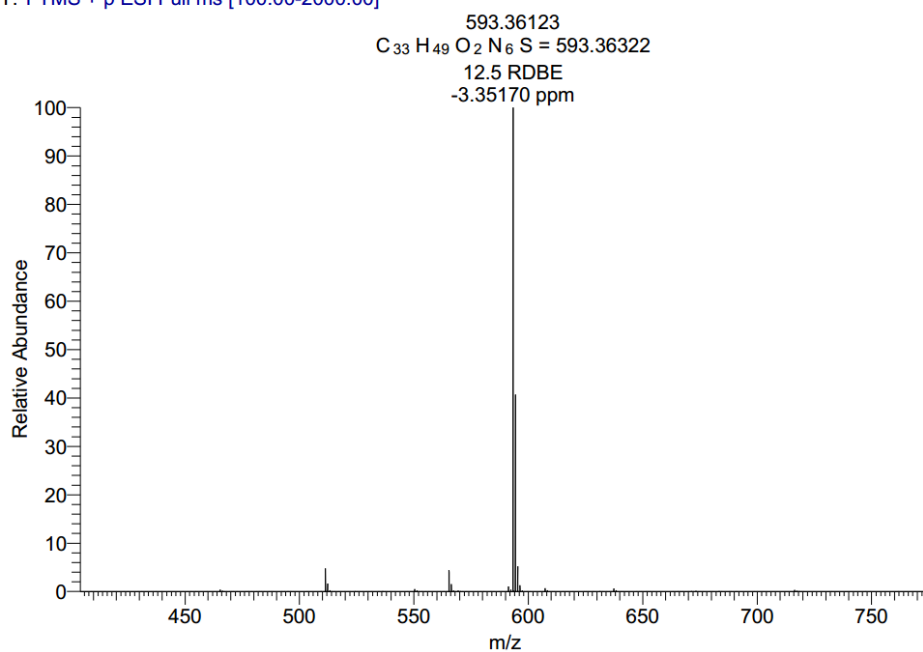


Figure S6. HRMS spectra of **7**

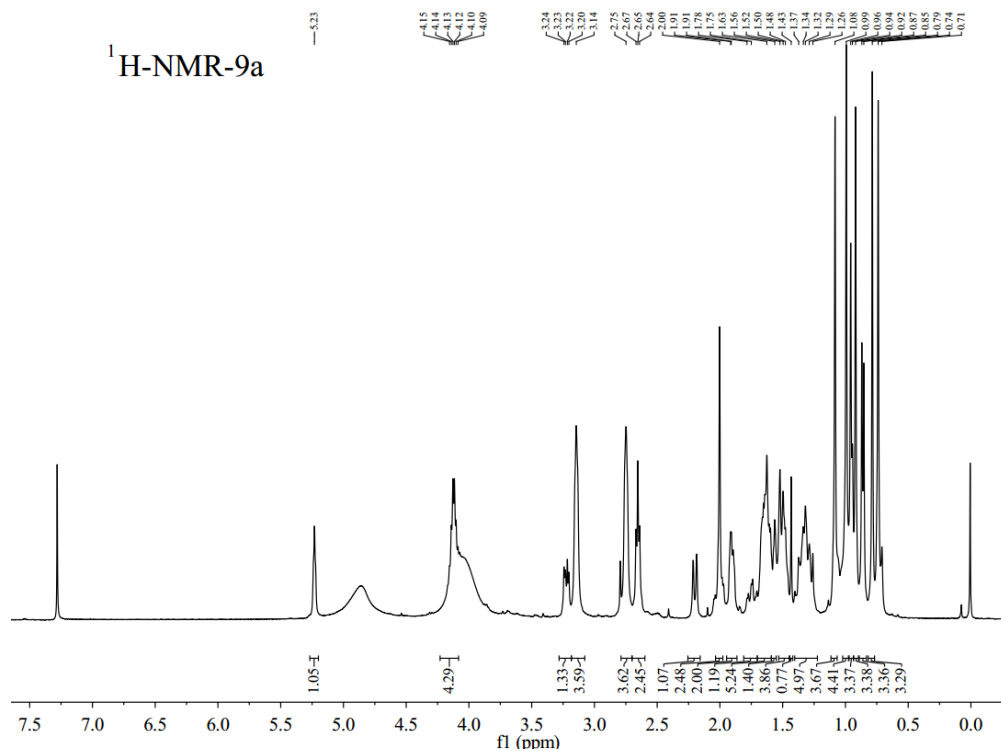


Figure 7. ¹H NMR spectra of 9a.

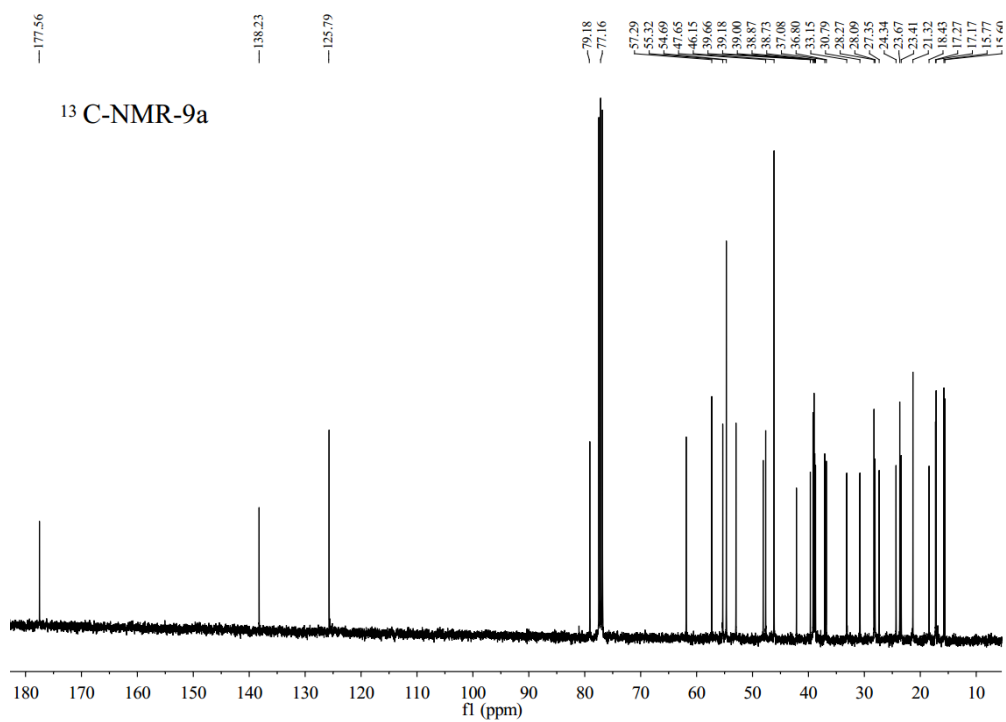
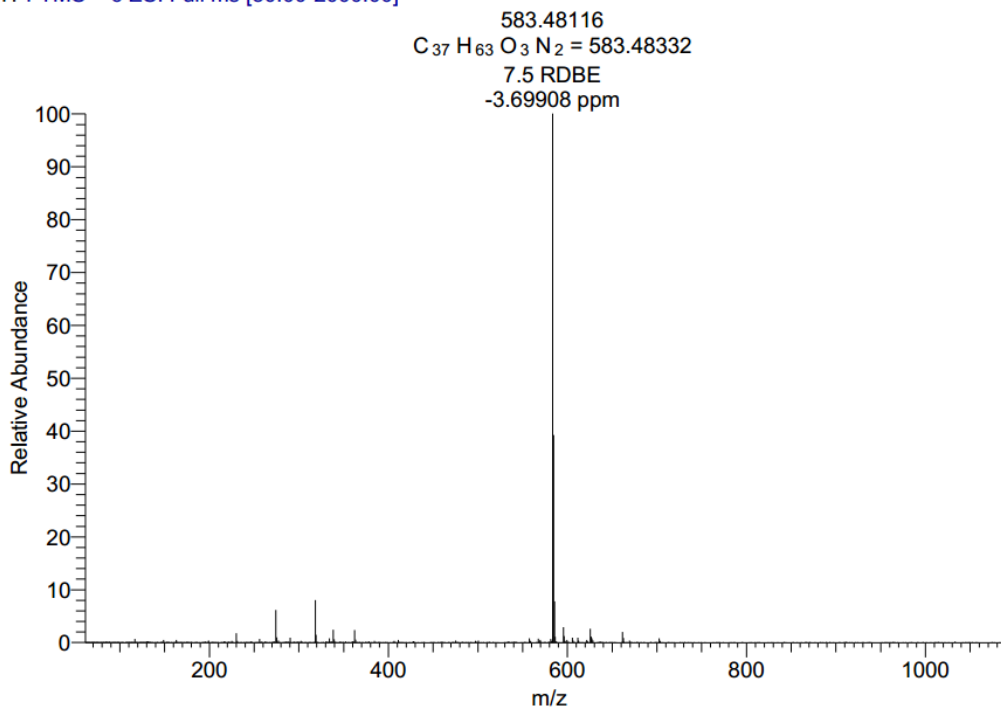
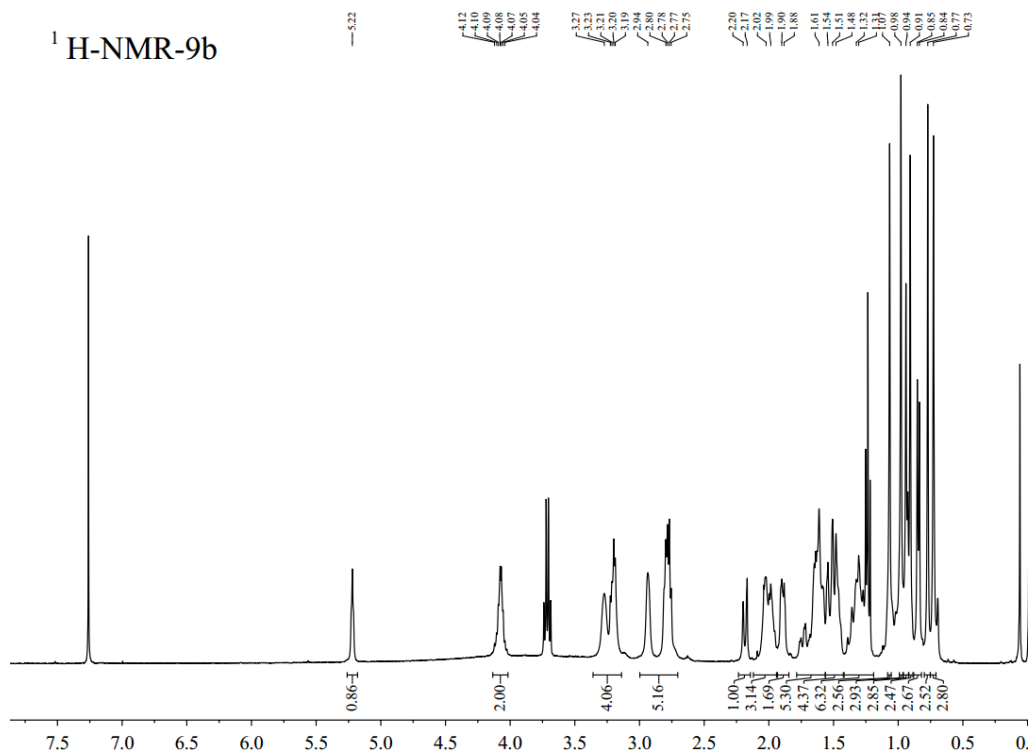


Figure 8. ¹³C NMR spectra of 9a.

9a3-5 #76-83 RT: 0.83-0.89 AV: 8 SB: 17 0.77-0.83 , 1.15-1.23 NL: 4.22E7
T: FTMS + c ESI Full ms [50.00-2000.00]Figure 9. HRMS spectra of **9a**.Figure S10. ¹H NMR spectra of **9b**

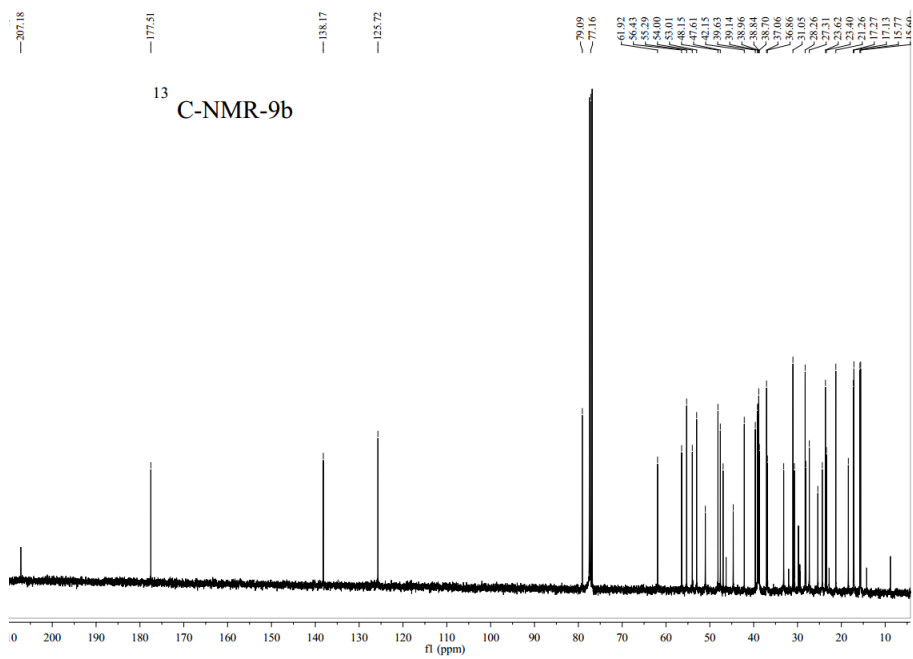


Figure S11. ¹³C NMR spectra of **9b**

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u-4

9b

u-4 #40-46 RT: 0.35-0.40 AV: 7 SB: 9 0.32-0.35 , 0.37-0.41 NL: 2.72E6
T: FTMS + c ESI Full ms [50.00-1500.00]

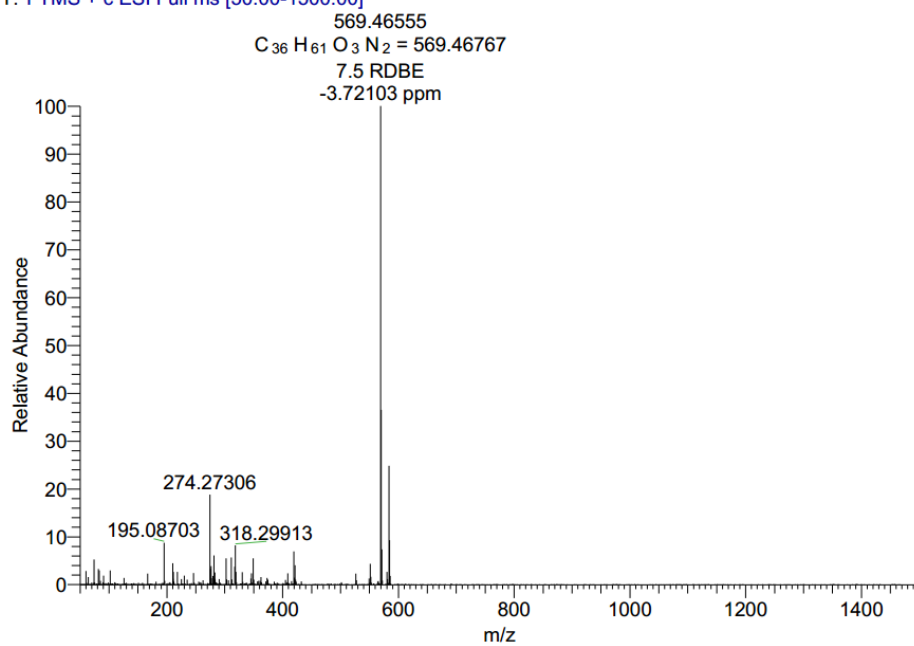


Figure S12. HRMS spectra of **9b**

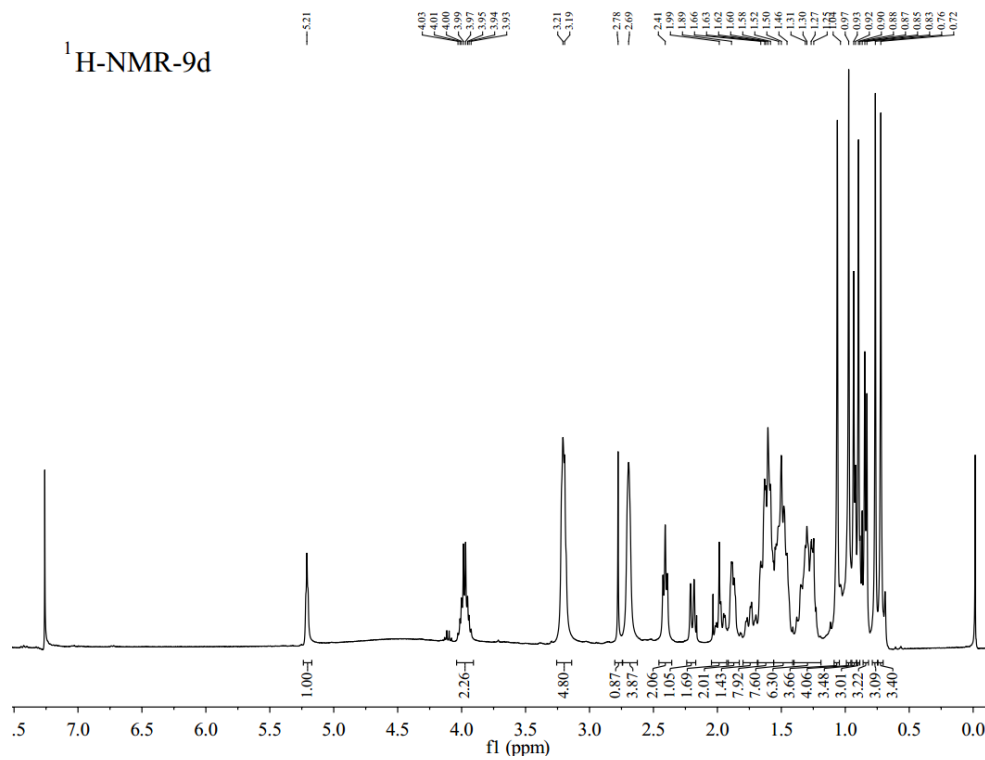


Figure S13. ¹H NMR spectra of **9d**

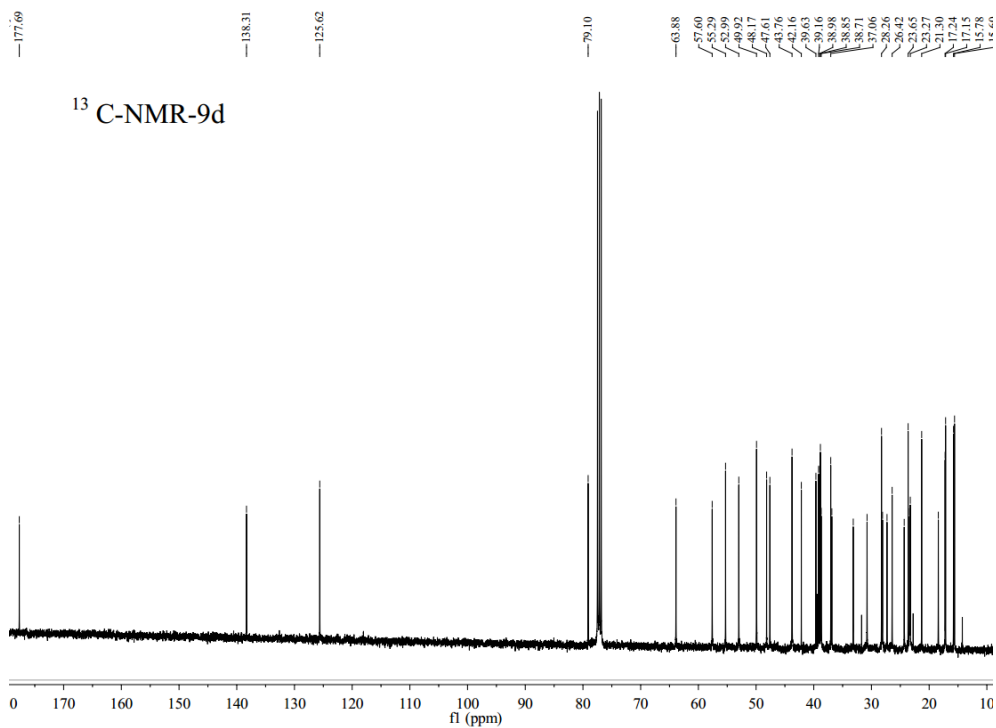


Figure S14. ¹³C NMR spectra of **9d**

9d

3-9 #30-32 RT: 0.31-0.33 AV: 3 SB: 8 0.21-0.24, 0.53-0.55 NL: 8.22E7
T: FTMS + c ESI Full ms [50.00-2000.00]

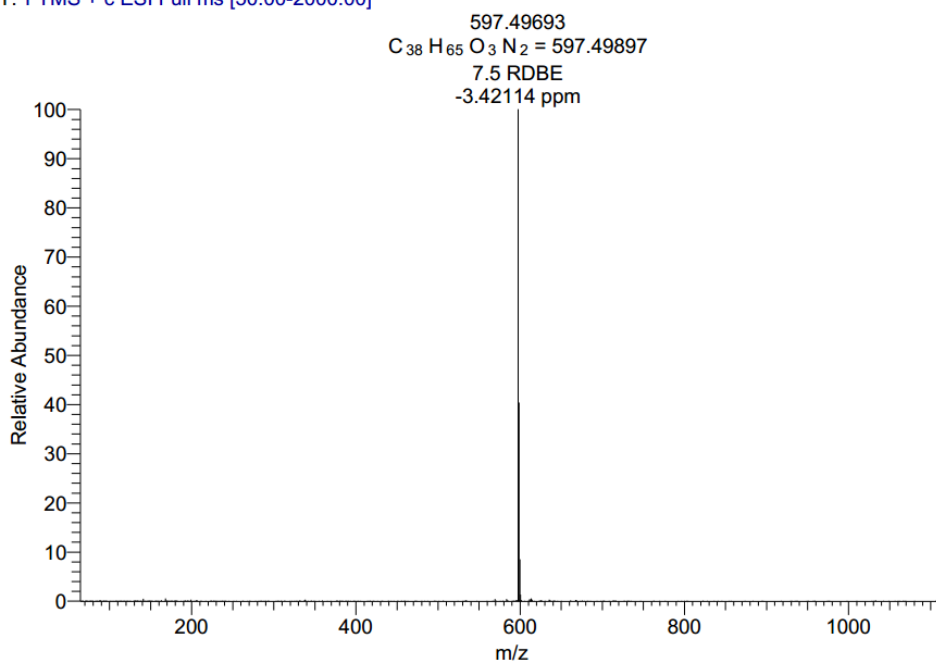
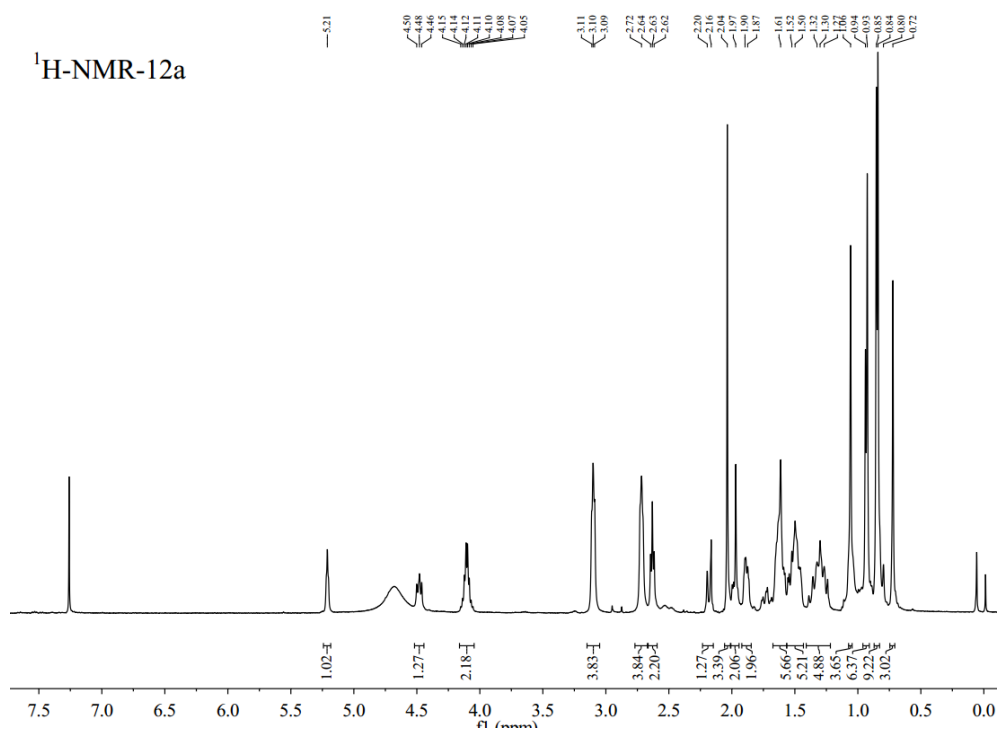


Figure S15. HRMS spectra of 9d

Figure S16. 1H NMR spectra of 12a

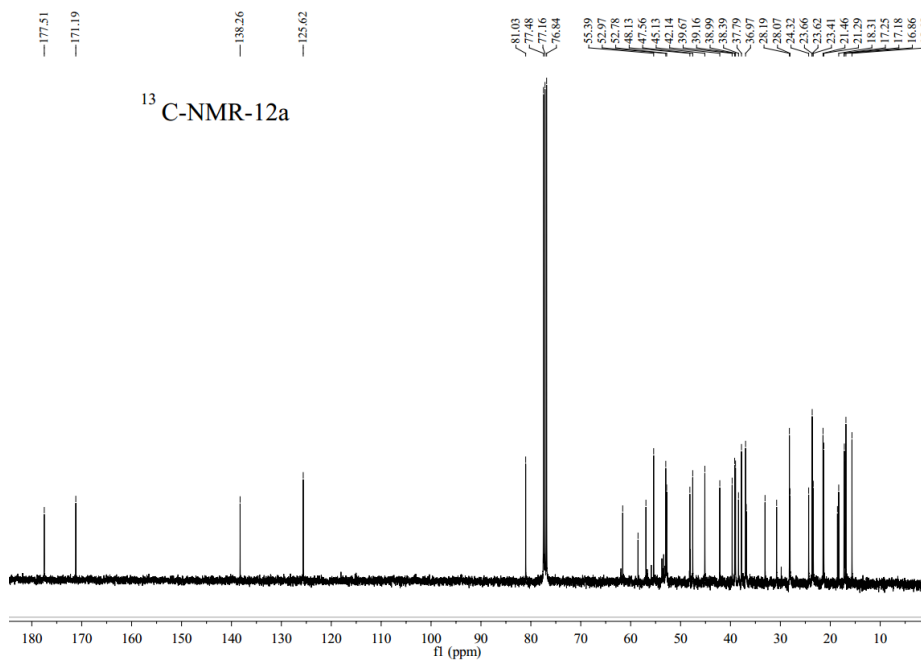


Figure S17. ¹³C NMR spectra of 12a

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12a

3-10 #2-10 RT: 0.02-0.28 AV: 9 NL: 1.14E7
T: FTMS + p ESI Full ms [100.00-1000.00]

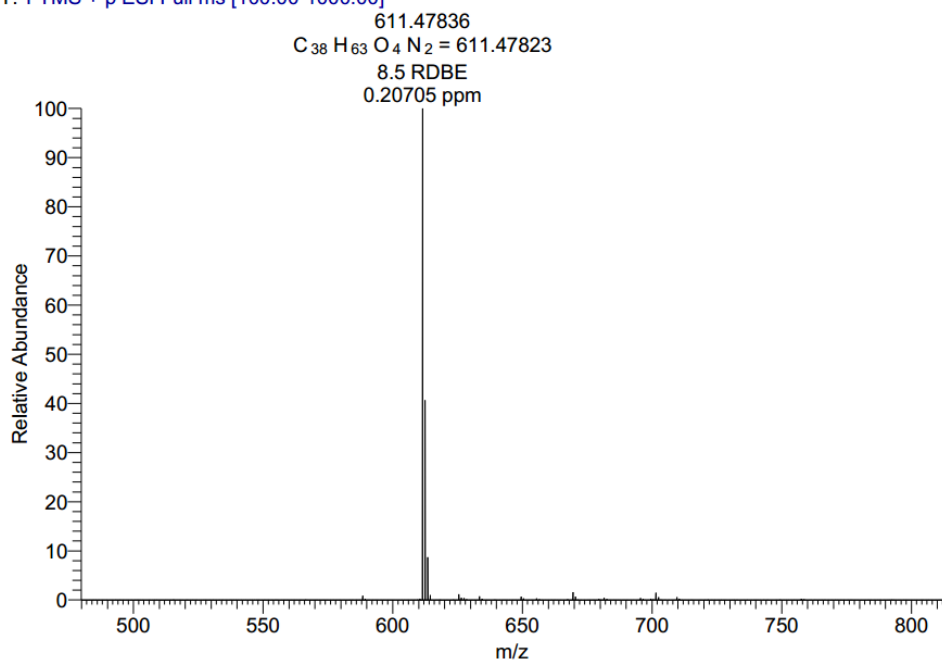


Figure S18. HRMS spectra of 12a

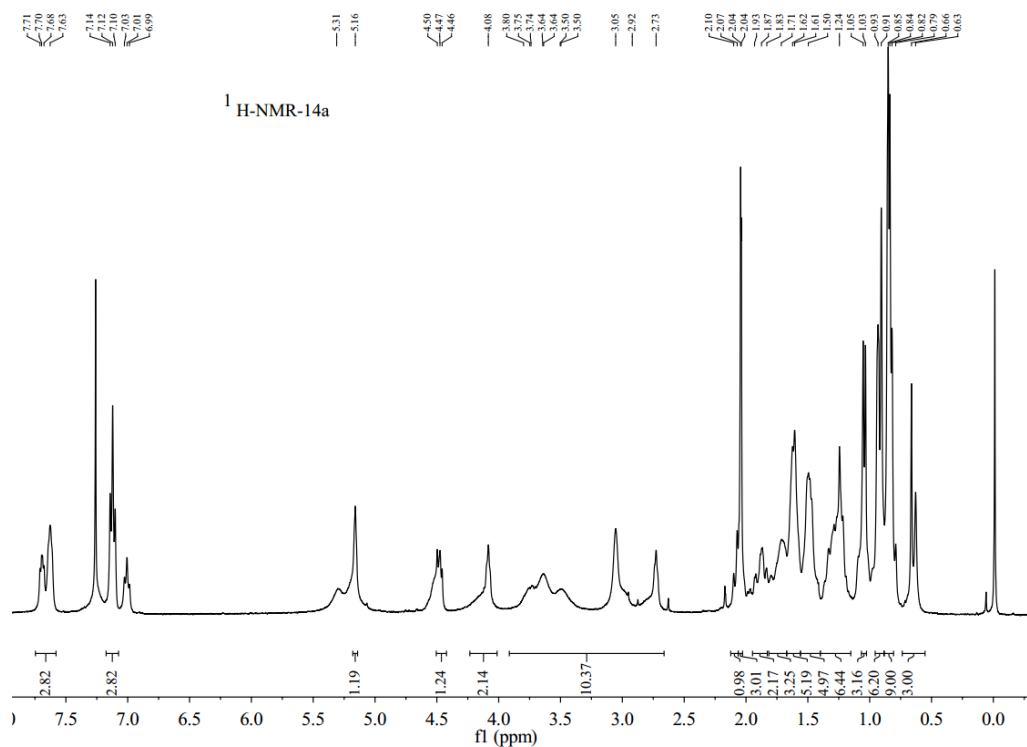


Figure S19. ¹H NMR spectra of 14a

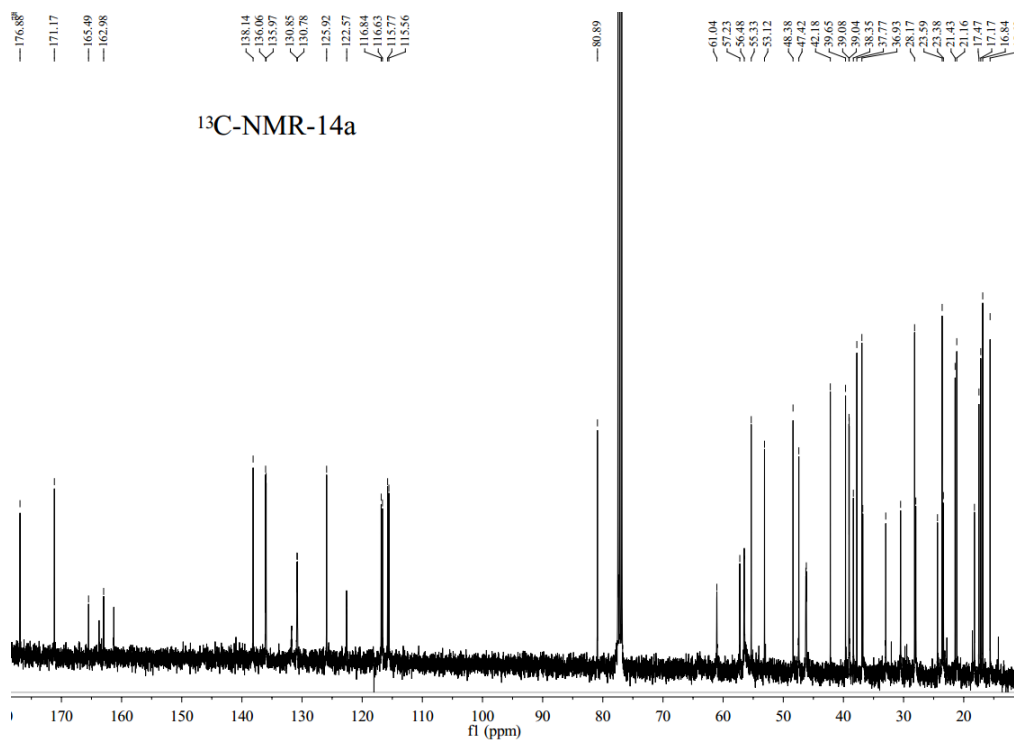


Figure S20. ¹³C NMR spectra of 14a

14a

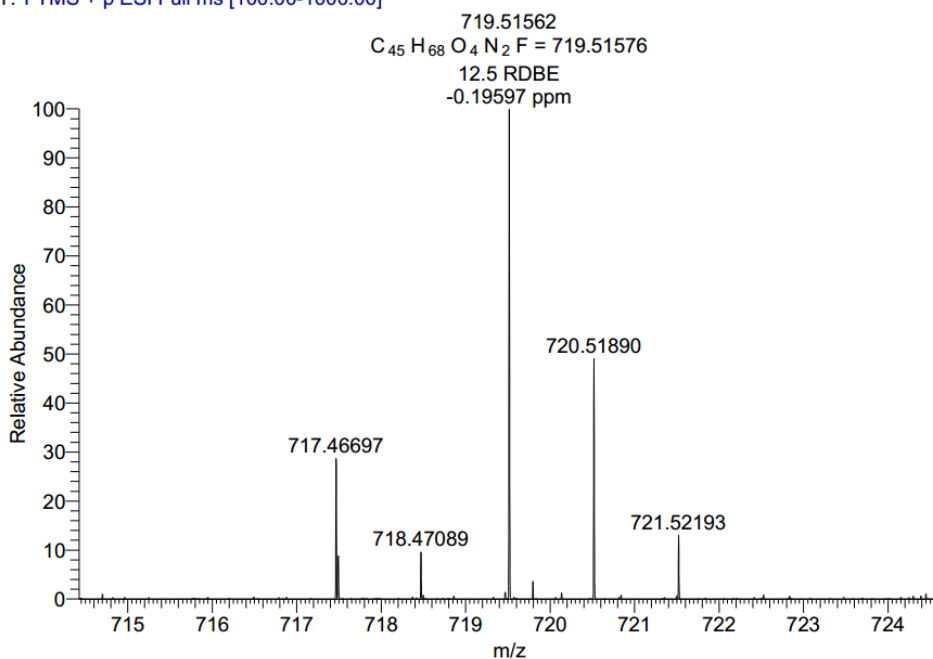
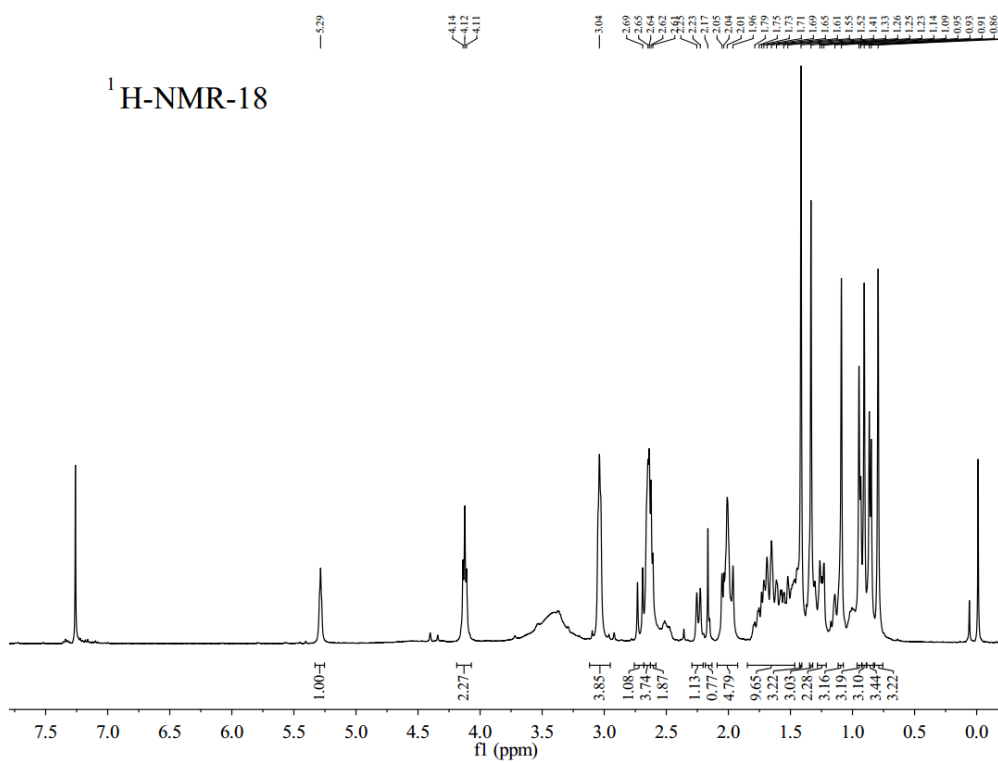
3-12 #2-11 RT: 0.02-0.31 AV: 10 NL: 1.30E4
T: FTMS + p ESI Full ms [100.00-1000.00]

Figure S21. HRMS spectra of 14a

Figure S22. 1H NMR spectra of 18

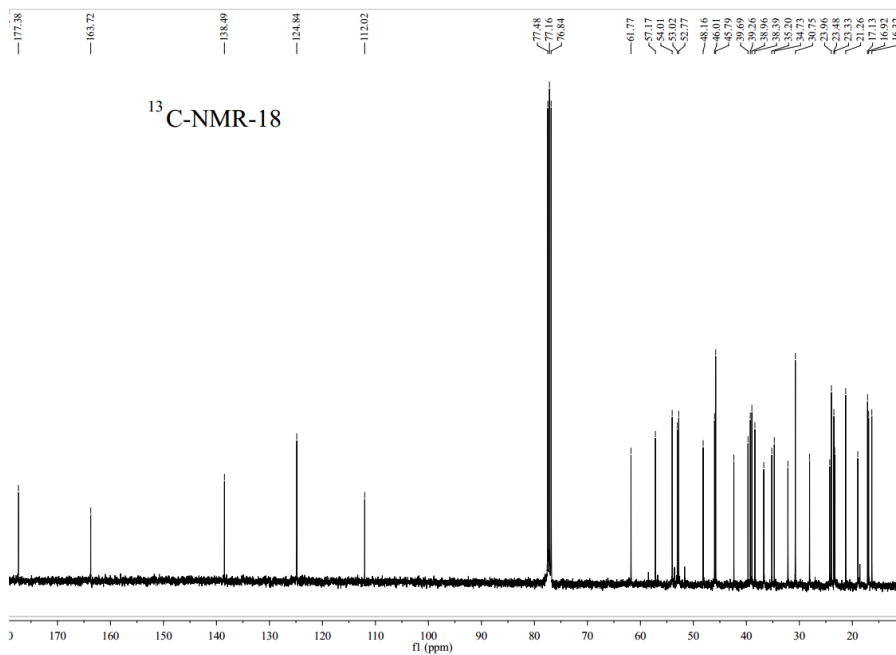


Figure S23. ¹³C NMR spectra of **18**

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18

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3-10

3-10 #32-36 RT: 0.34-0.38 AV: 5 SB: 10 0.29-0.32, 0.56-0.60 NL: 1.98E7
T: FTMS + c ESI Full ms [50.00-2000.00]

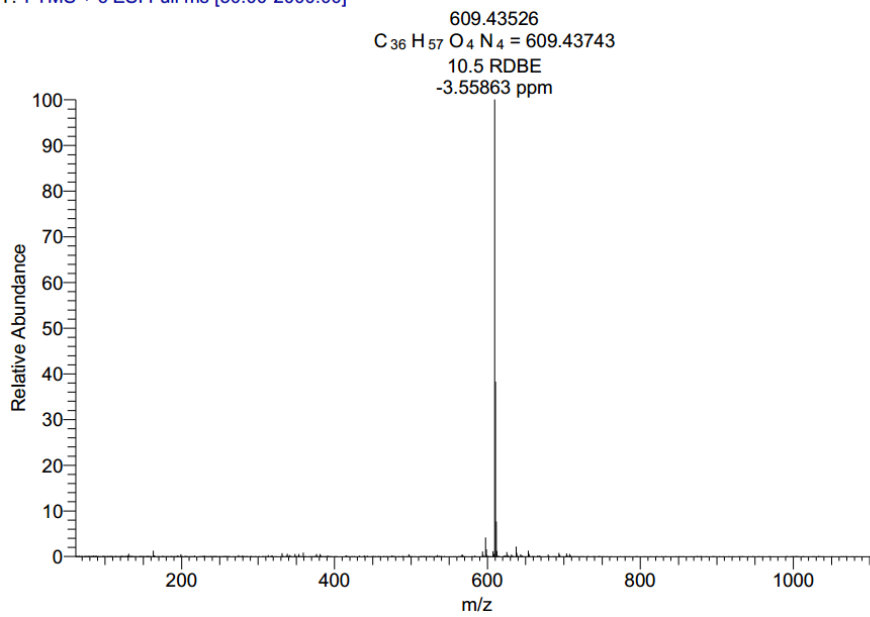


Figure S24. HRMS spectra of **18**