

Supplementary Materials: Unique Phenanthrenes from *Juncus ensifolius* and Their Antiproliferative and Synergistic Effects with the Conventional Anticancer Agent Doxorubicin against Human Cancer Cell Lines

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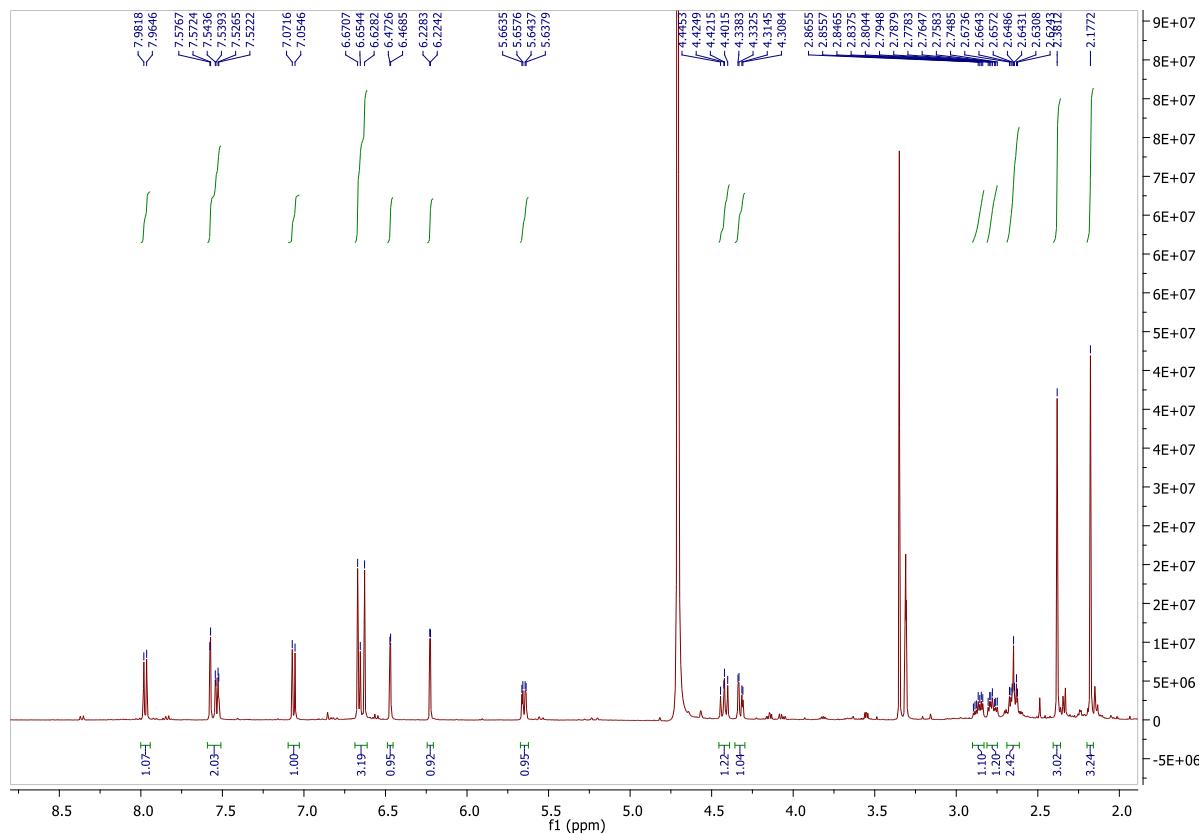


Figure S1. ¹H NMR spectrum of compound 1 (500 MHz, in CD₃OD).

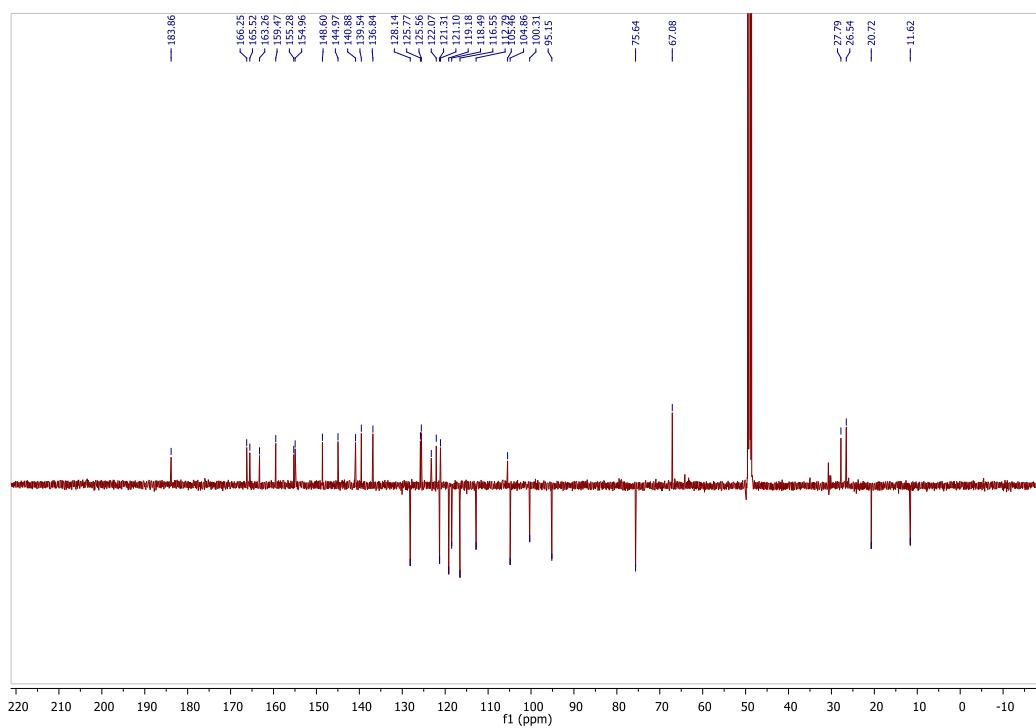


Figure S2. ¹³C (JMOD) NMR spectrum of compound 1 (125 MHz, in CD₃OD).

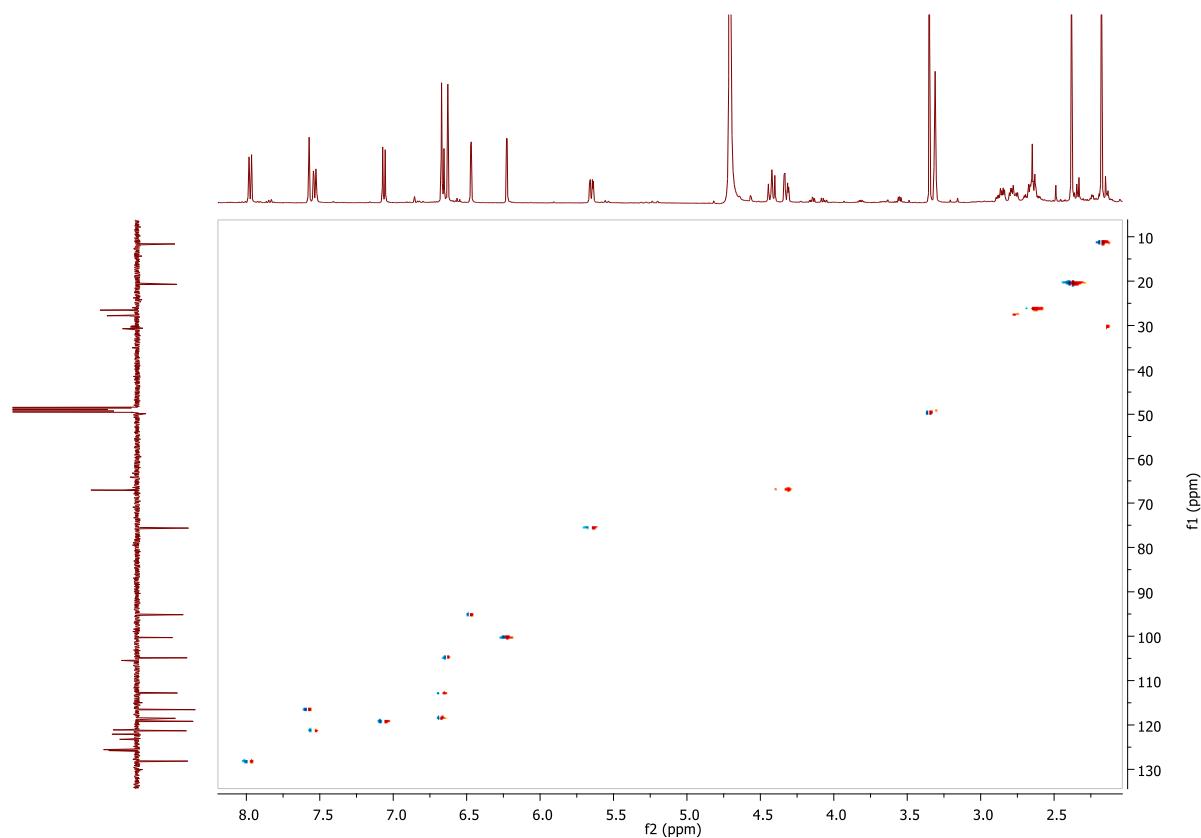


Figure S3. HSQC spectrum of compound **1** (in CD_3OD).

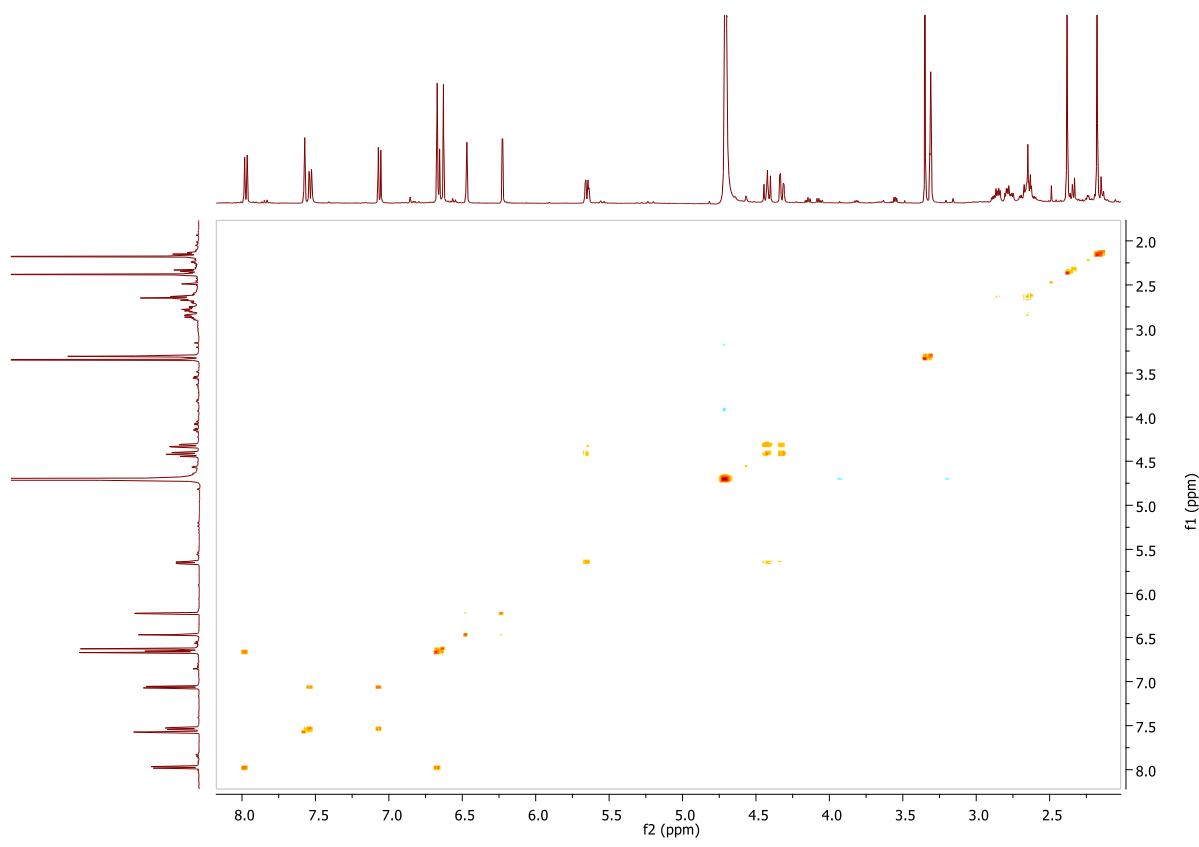


Figure S4. ¹H-

Figure S4. ¹H-

¹H COSY spectrum of compound **1** (in CD_3OD).

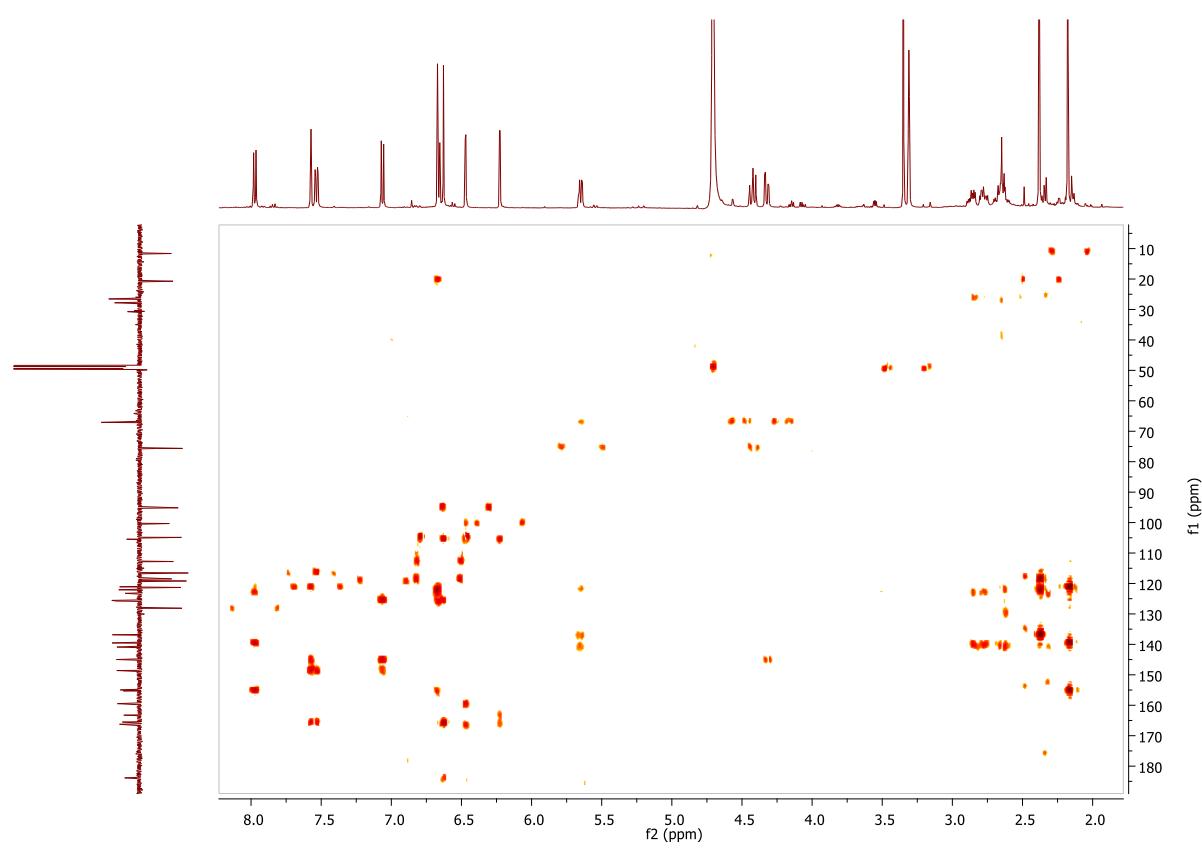


Figure S5. HMBC spectrum of compound **1** (in CD_3OD).

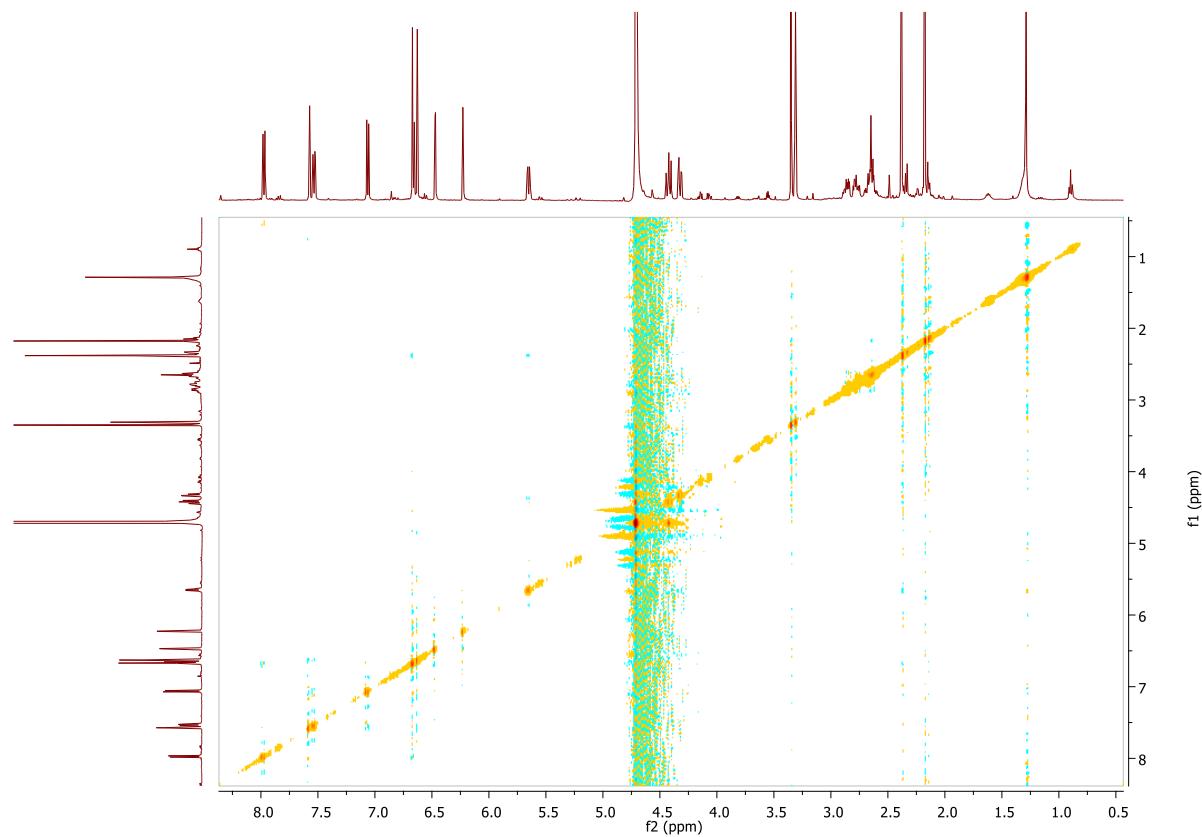
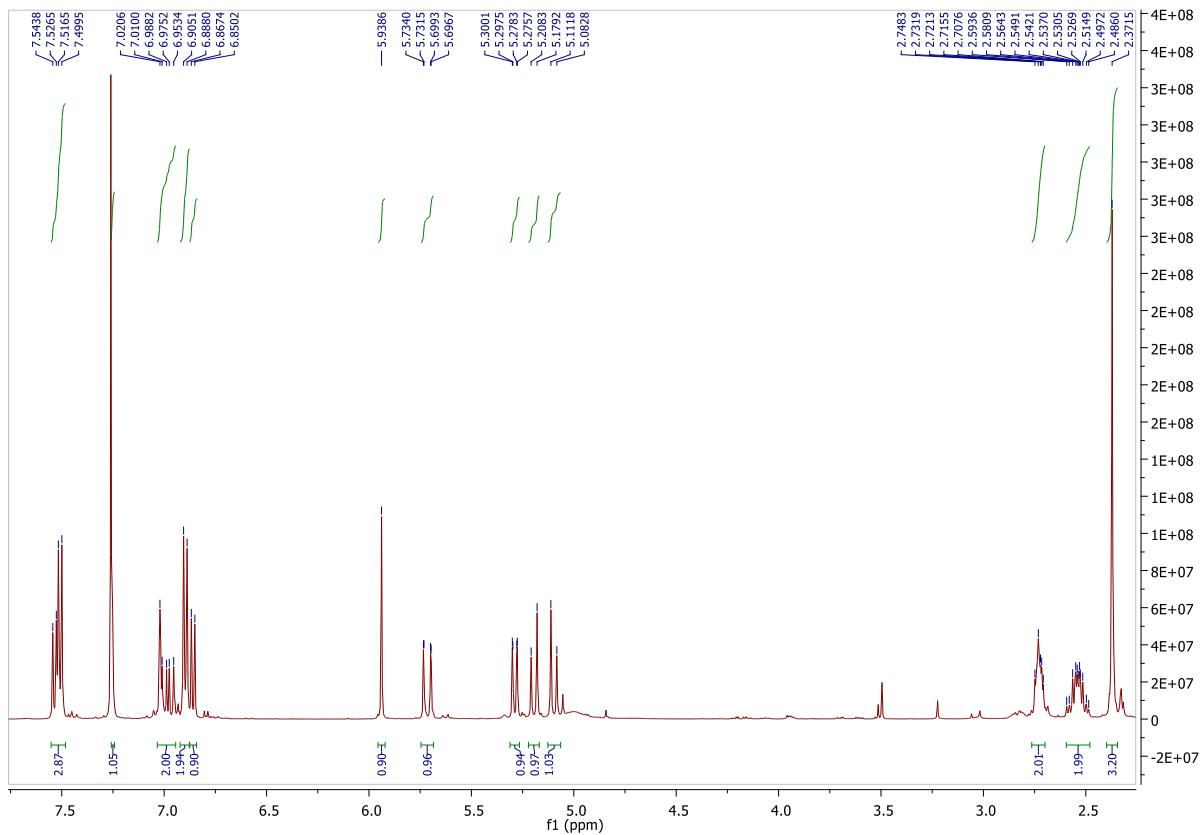


Figure S6. NOESY spectrum of compound **1** (in CD₃OD).**Figure S7.** ¹H NMR spectrum of compound **2** (in CDCl₃).

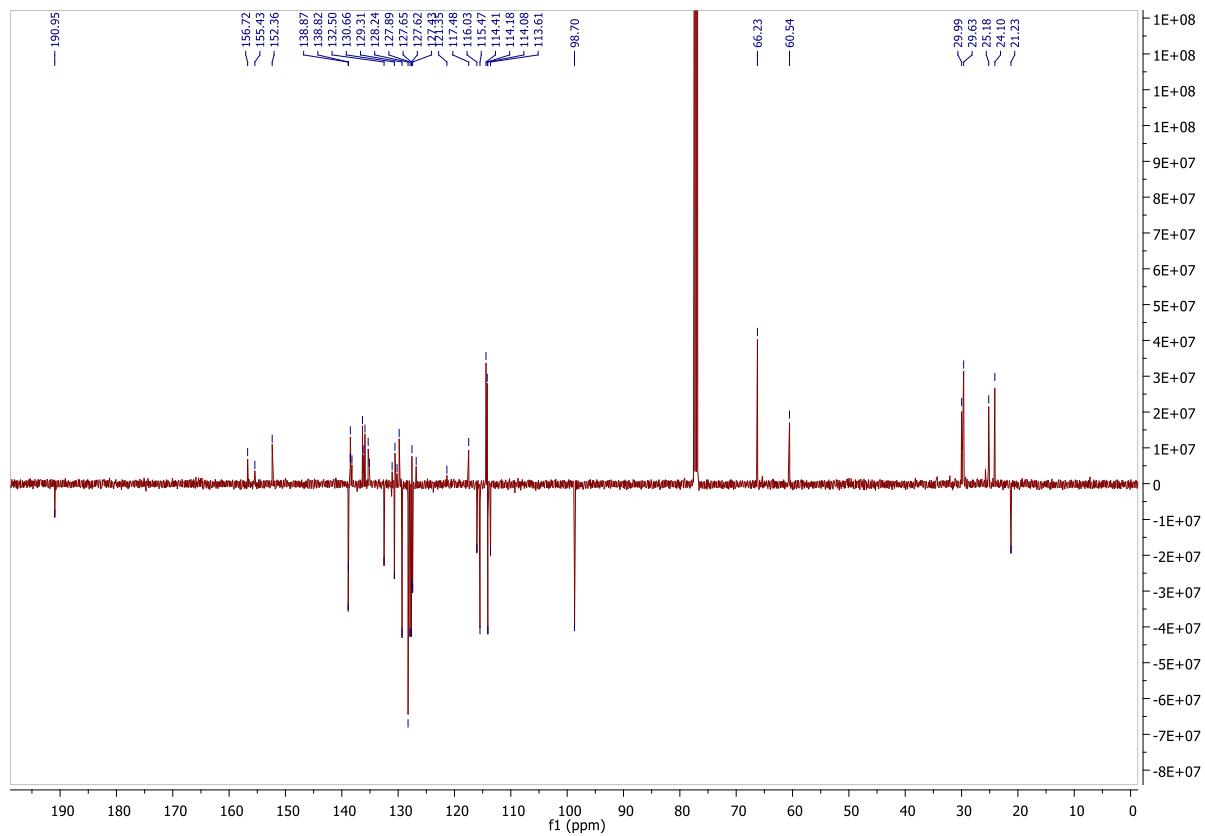


Figure S8. ^{13}C (JMOD) NMR spectrum of compound 2 (in CDCl_3).

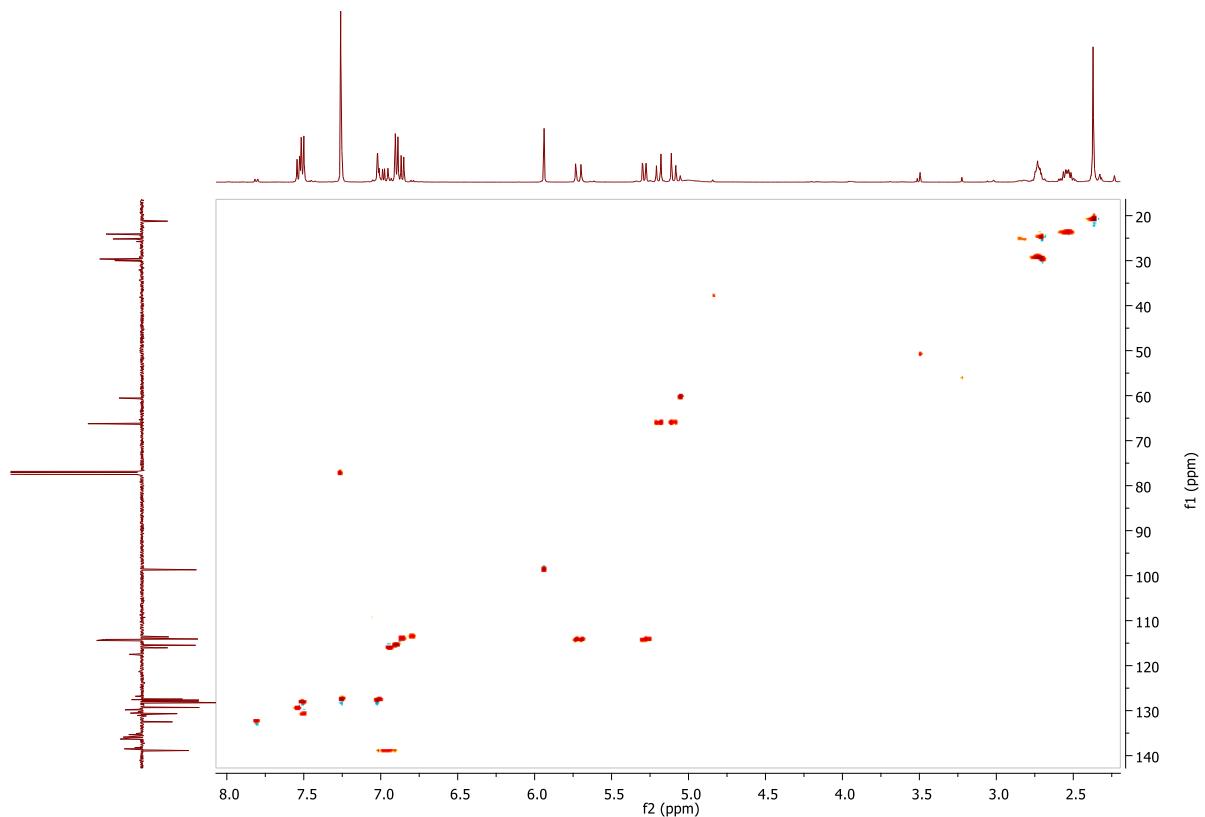
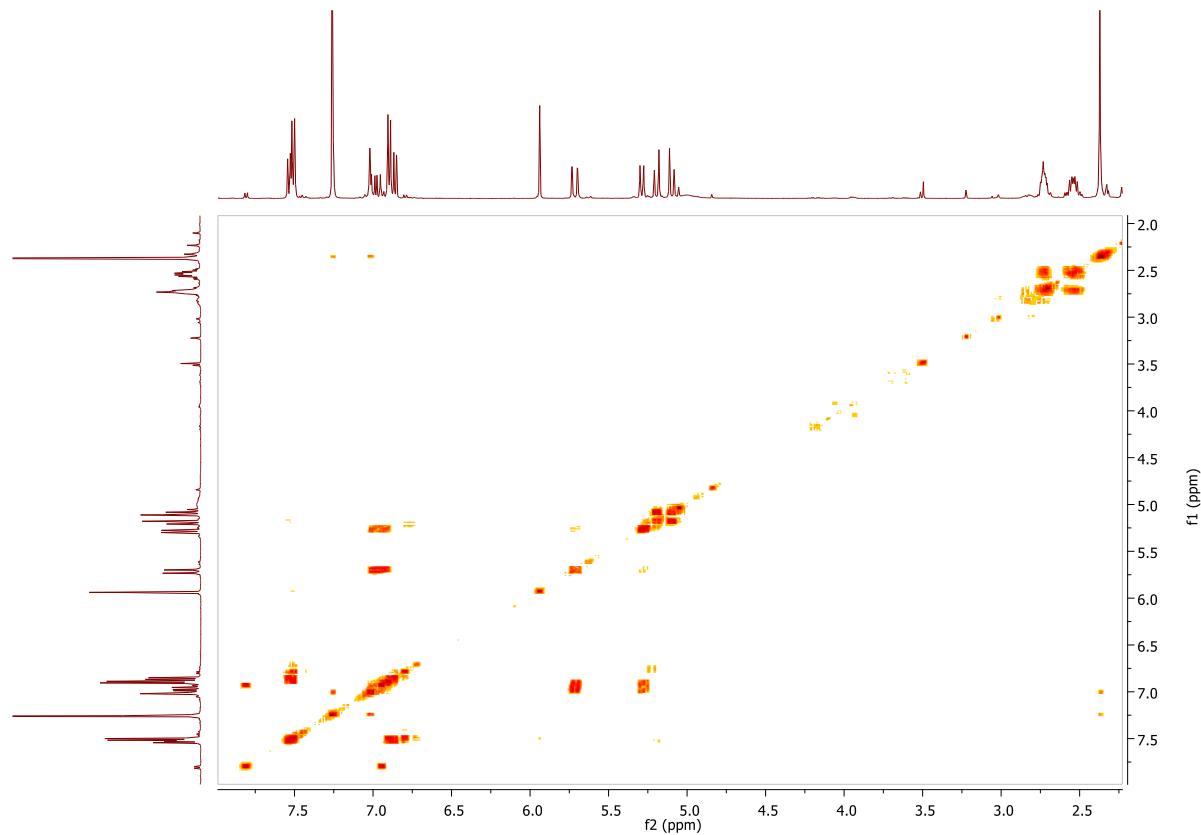


Figure S9. HSQC spectrum of compound **2** (in CDCl_3).**Figure S10.** ^1H - ^1H COSY spectrum of compound **2** (in CDCl_3).

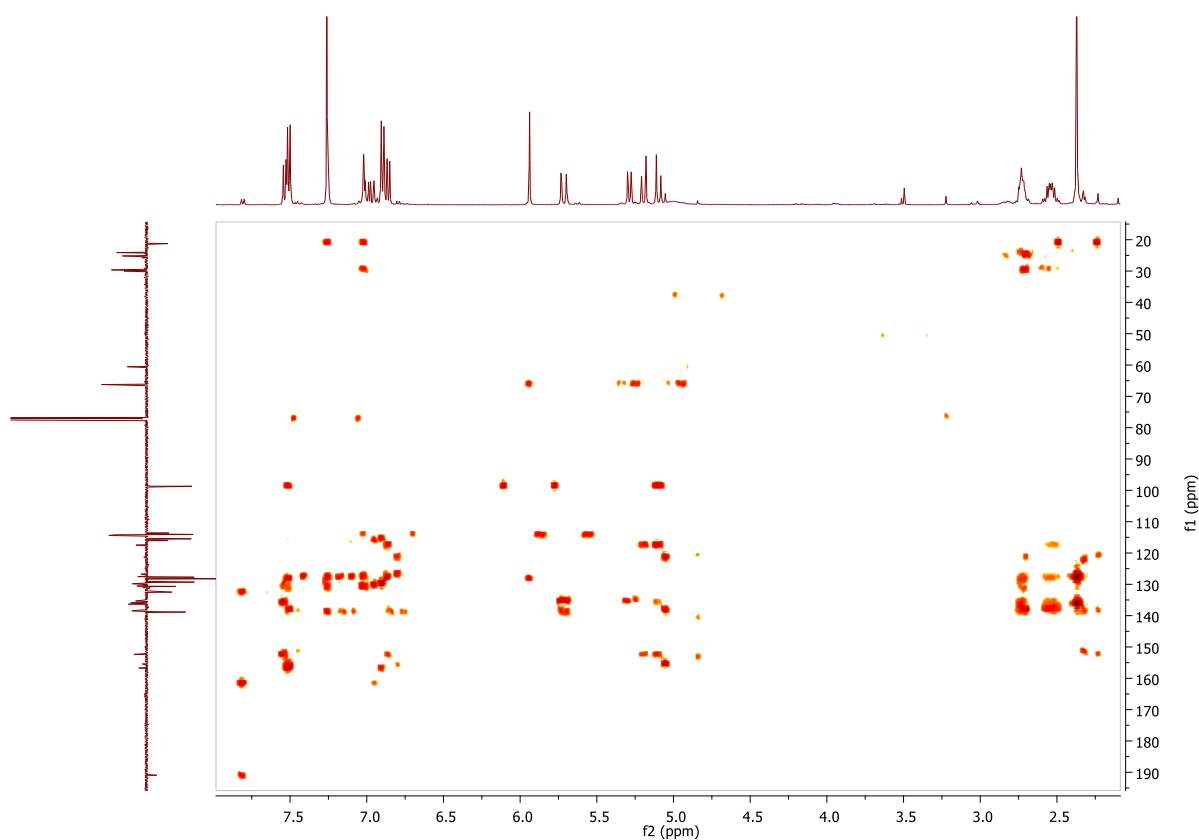


Figure S11. HMBC spectrum of compound **2** (in CDCl_3).

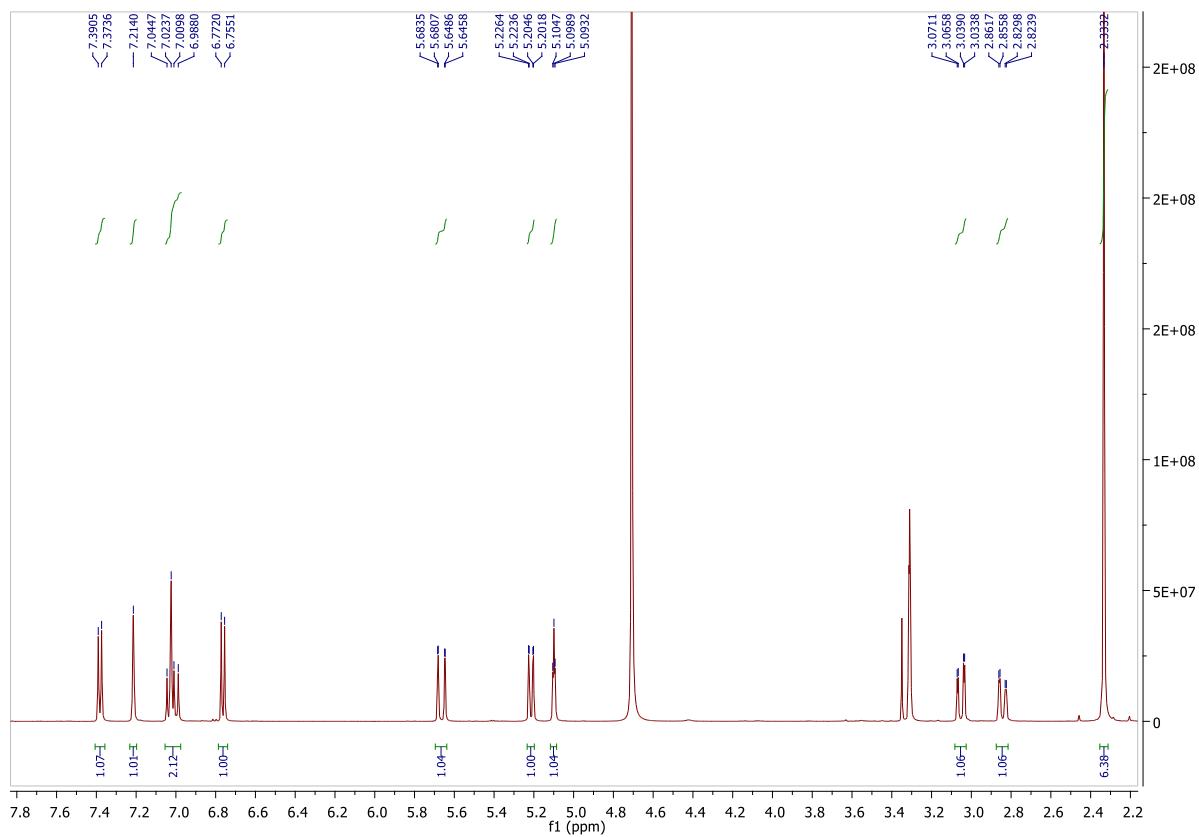


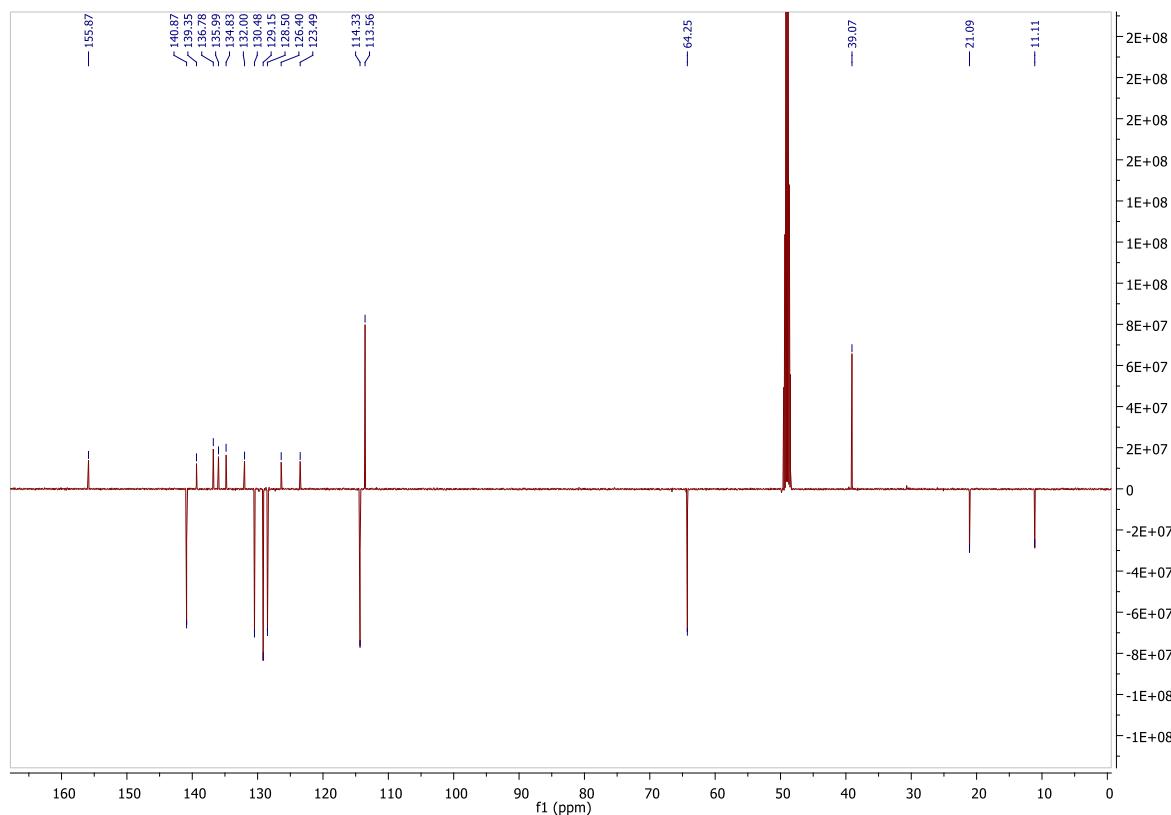
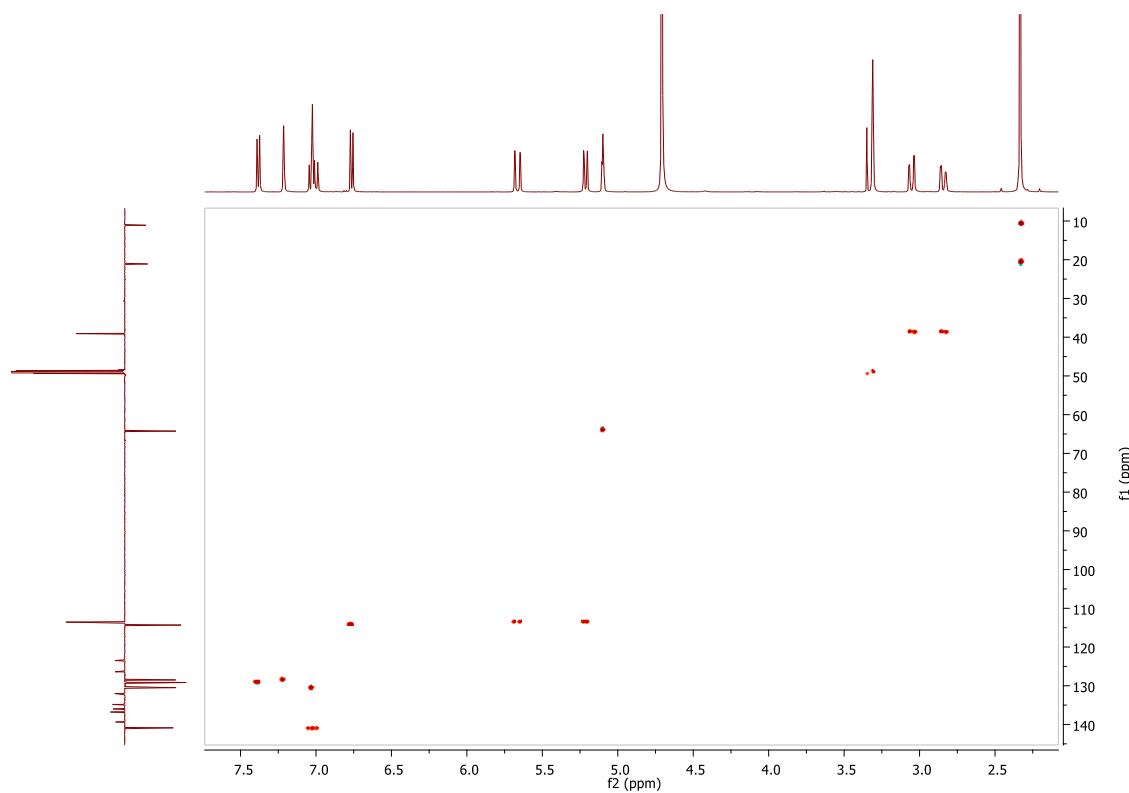
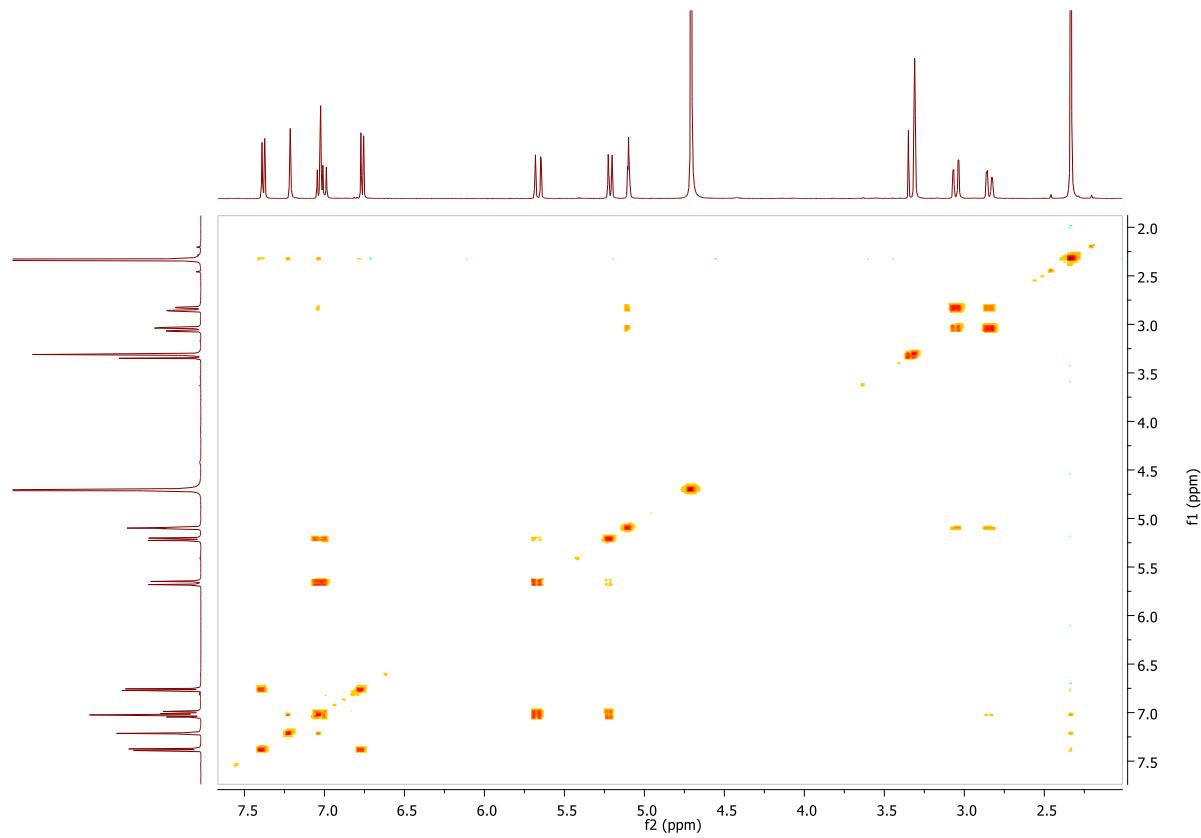
Figure S12. ^1H NMR spectrum of compound 3 (in CD_3OD).**Figure S13.** ^{13}C (JMOD) NMR spectrum of compound 3 (in CD_3OD).

Figure S14. HSQC spectrum of compound **3** (in CD₃OD).**Figure S15.** ¹H-¹H COSY spectrum of compound **3** (in CD₃OD).

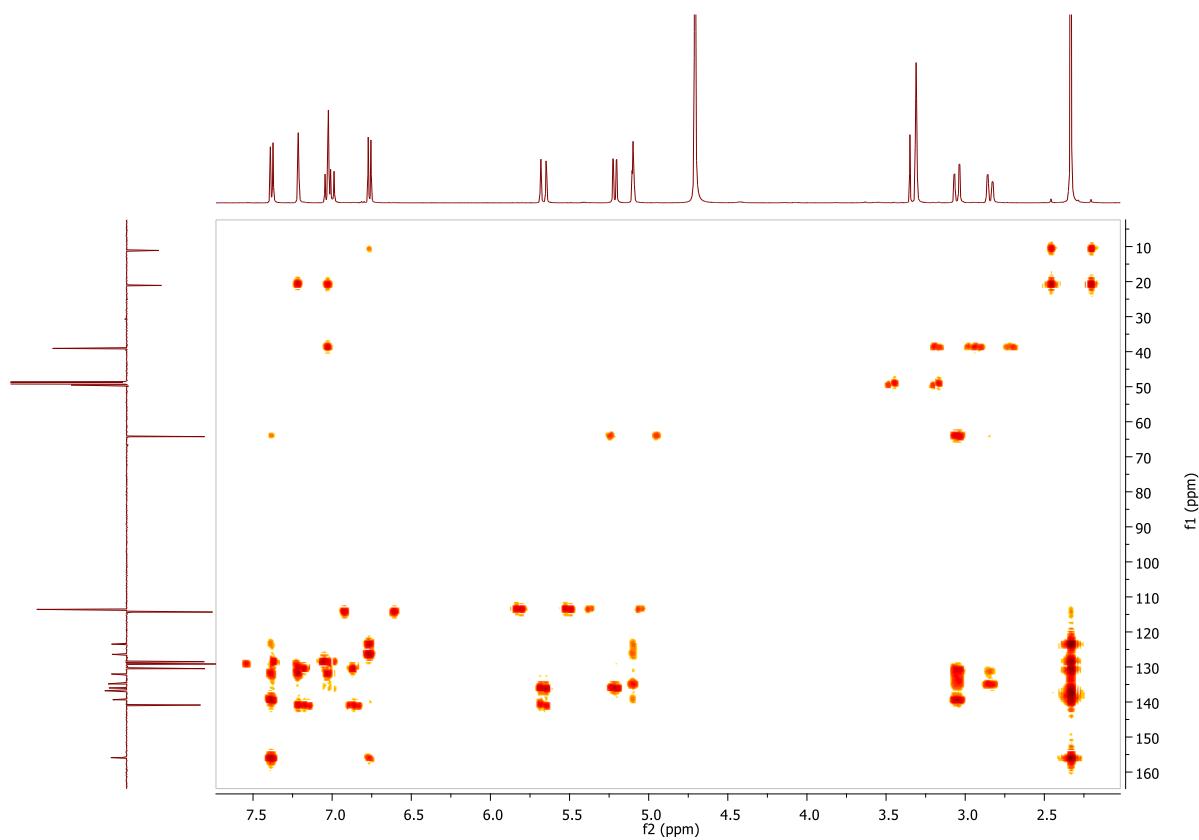


Figure S16. HMBC spectrum of compound 3 (in CD_3OD).

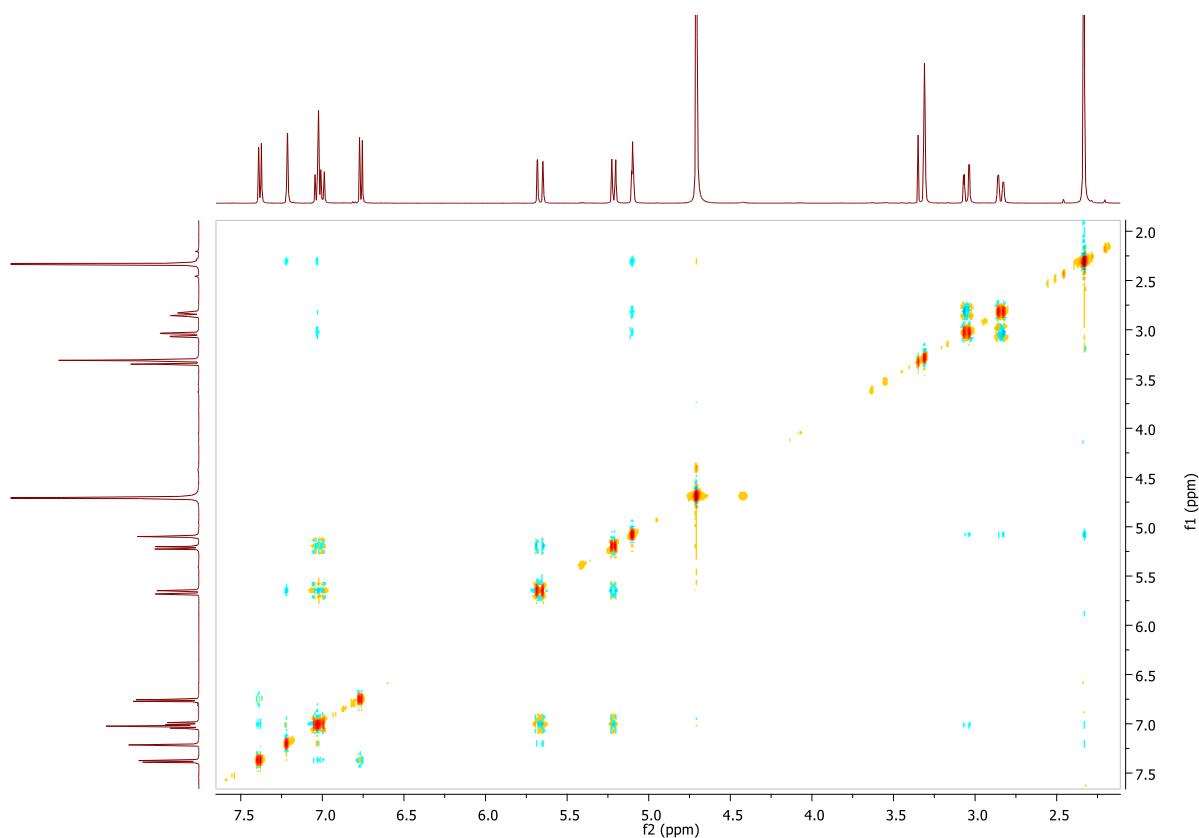
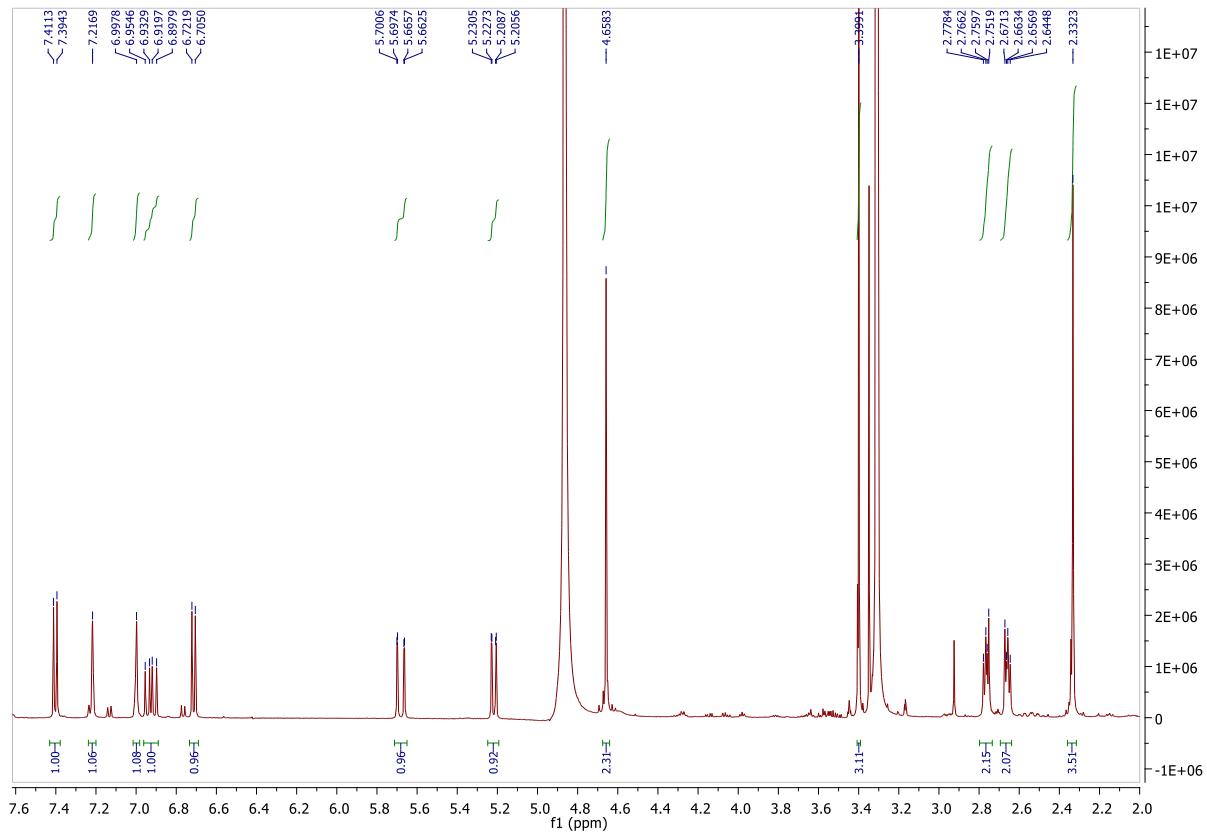


Figure S17. NOESY spectrum of compound 3 (in CD₃OD).**Figure S18.** ¹H NMR spectrum of compound 4 (in CD₃OD).

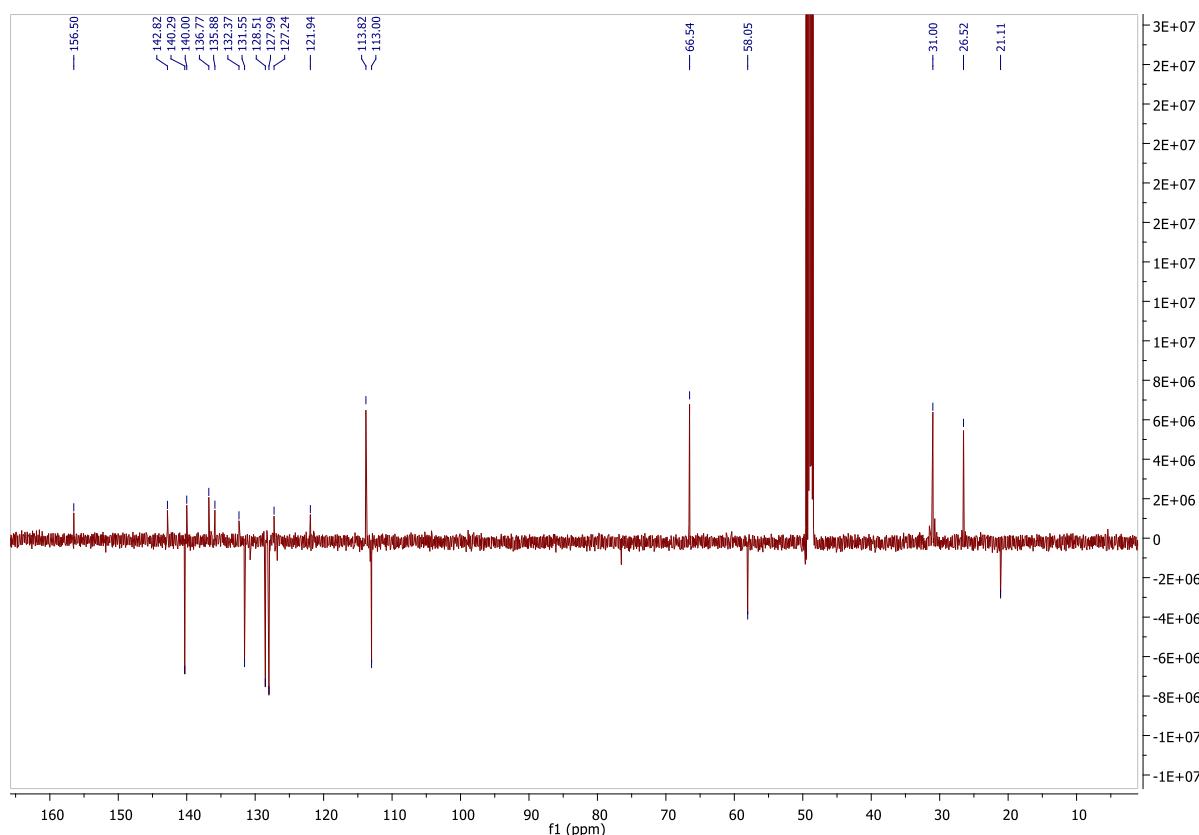


Figure S19. ^{13}C (JMOD) NMR spectrum of compound 4 (in CD_3OD).

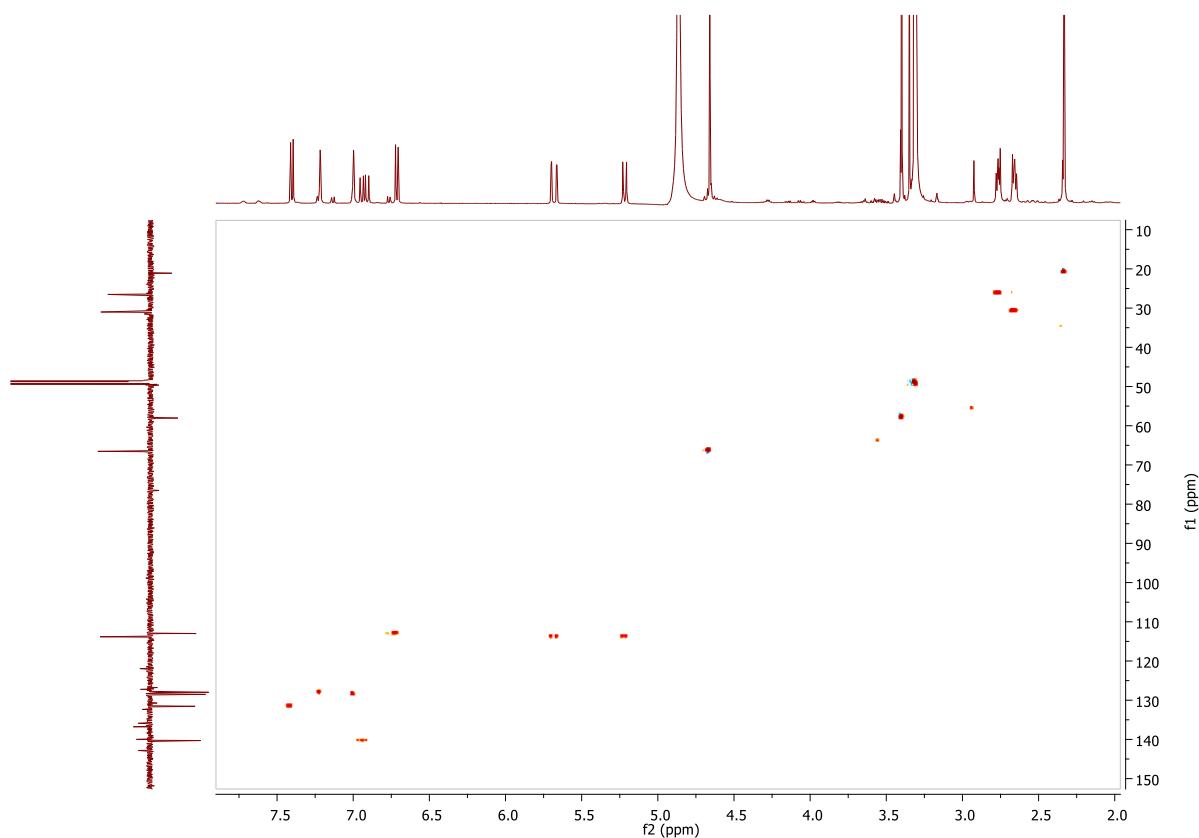
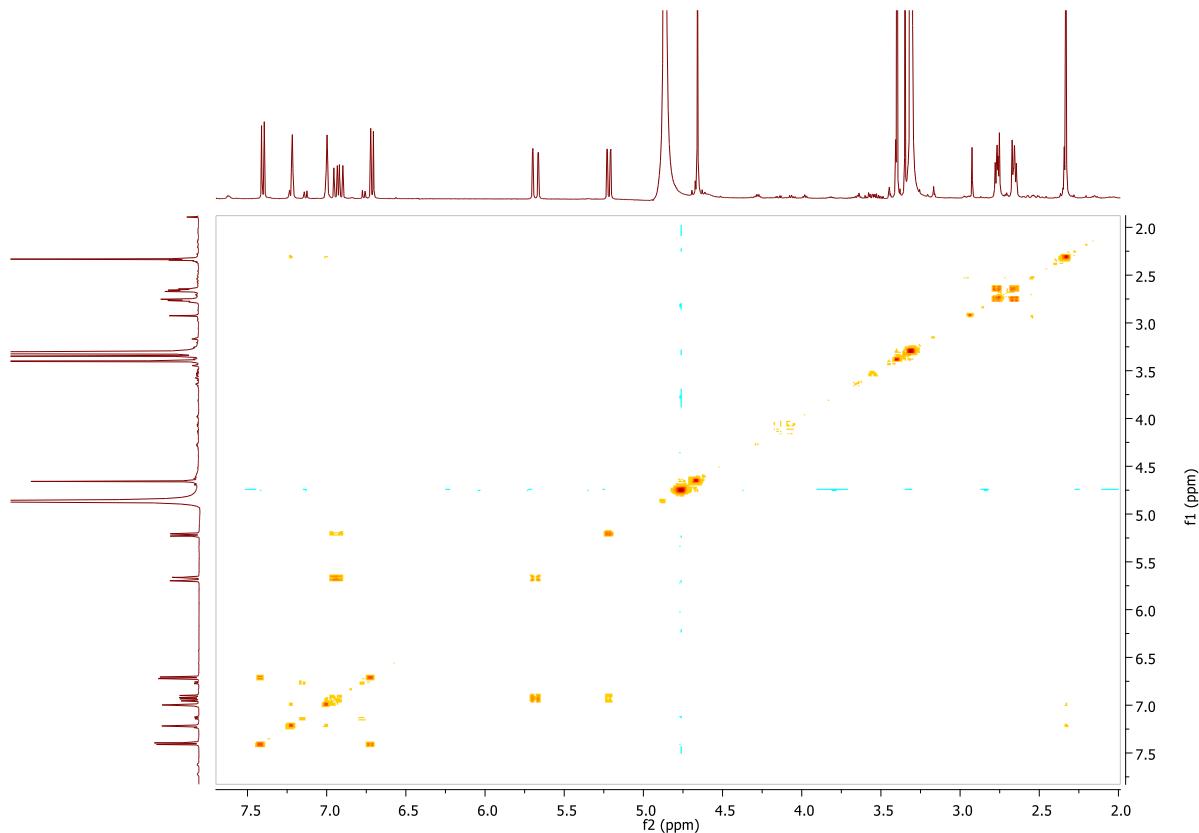


Figure S20. HSQC spectrum of compound 4 (in CD₃OD).**Figure S21.** ¹H-¹H COSY spectrum of compound 4 (in CD₃OD).

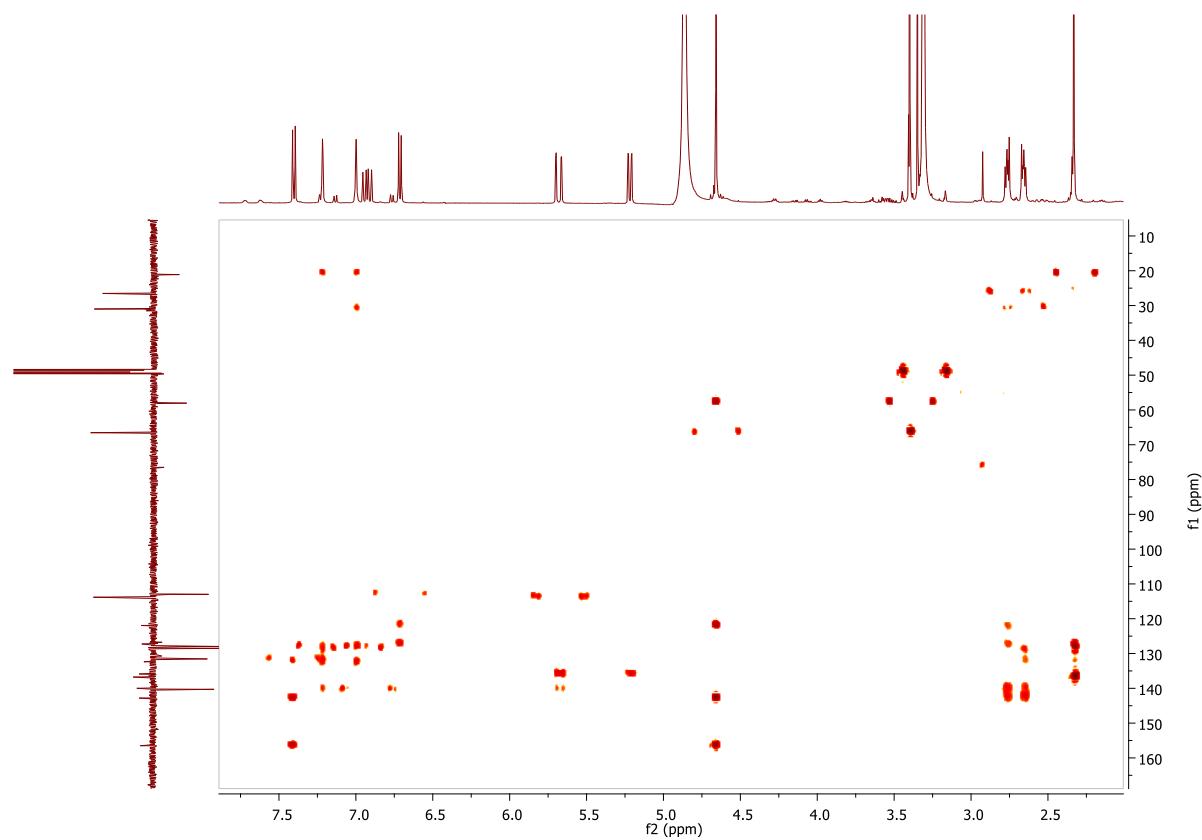


Figure S22. HMBC spectrum of compound **4** (in CD_3OD).

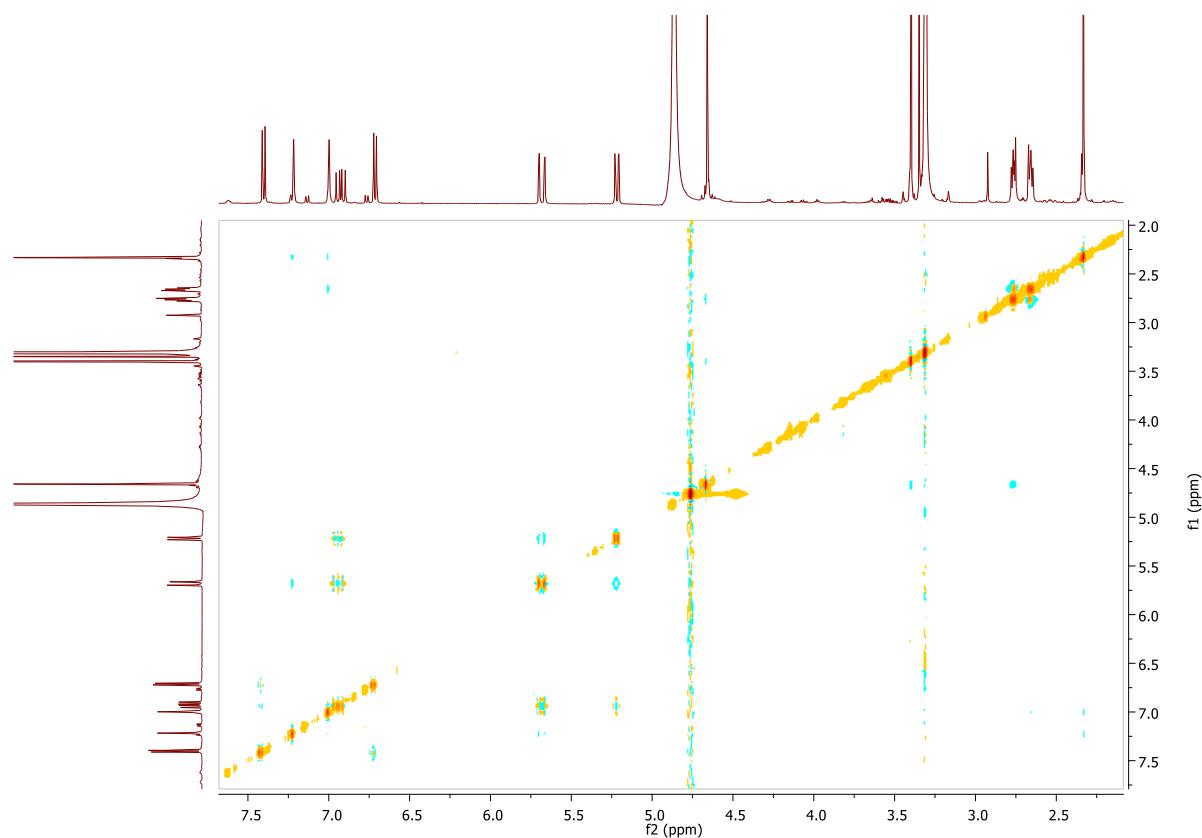
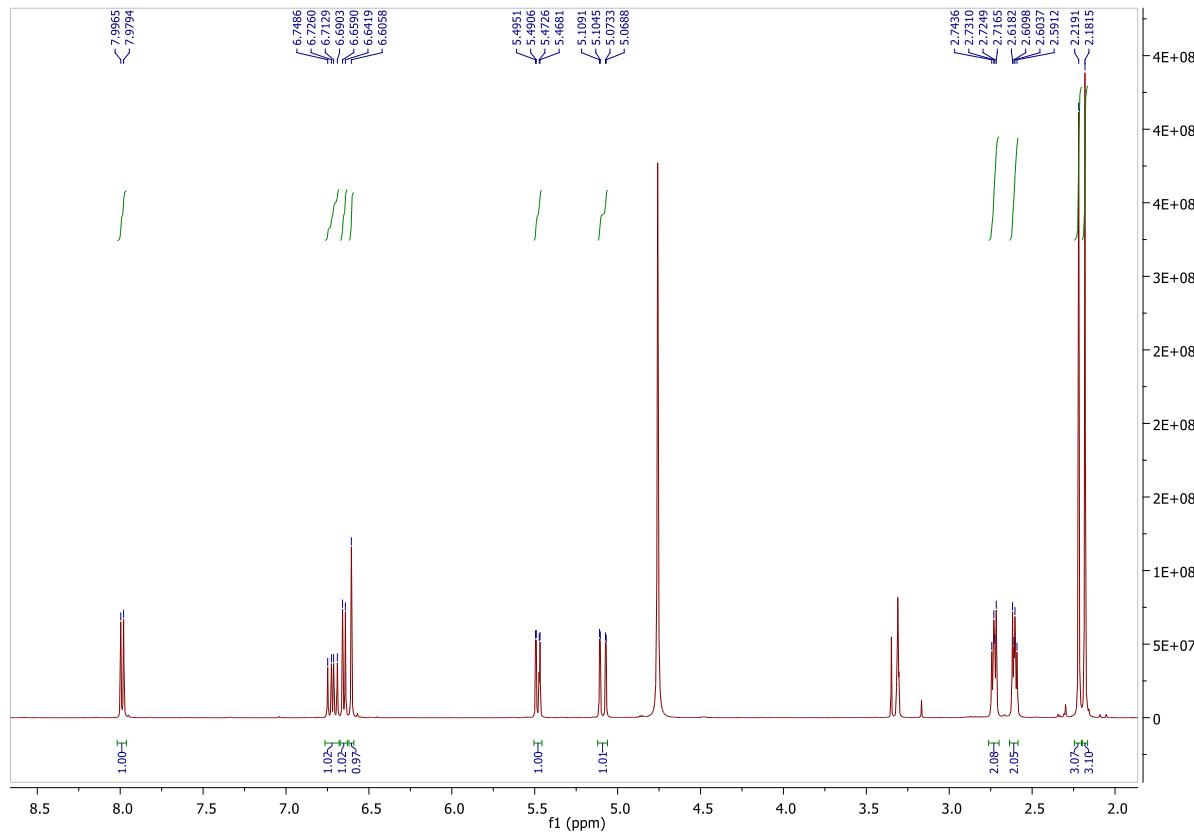


Figure S23. NOESY spectrum of compound 4 (in CD₃OD).**Figure S24.** ¹H NMR spectrum of compound 5 (in CD₃OD).

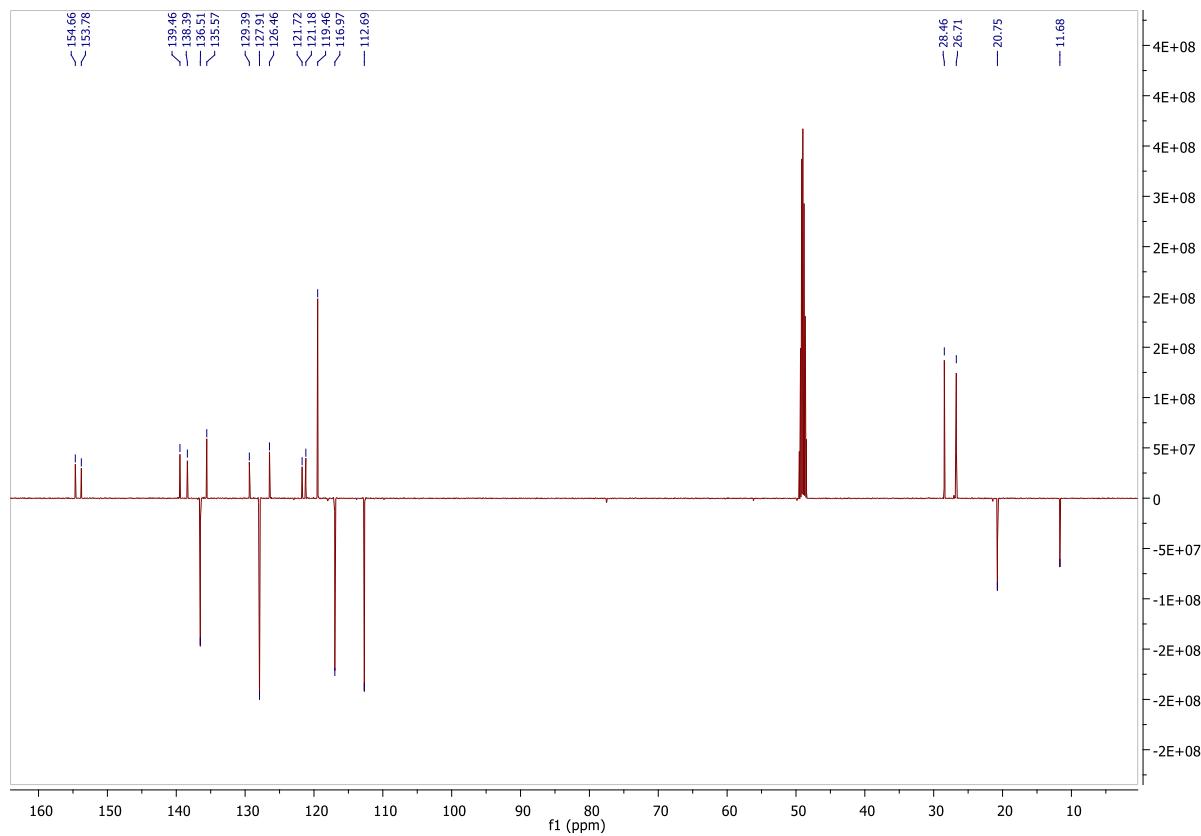


Figure S25. ^{13}C (JMOD) NMR spectrum of compound 5 (in CD_3OD).

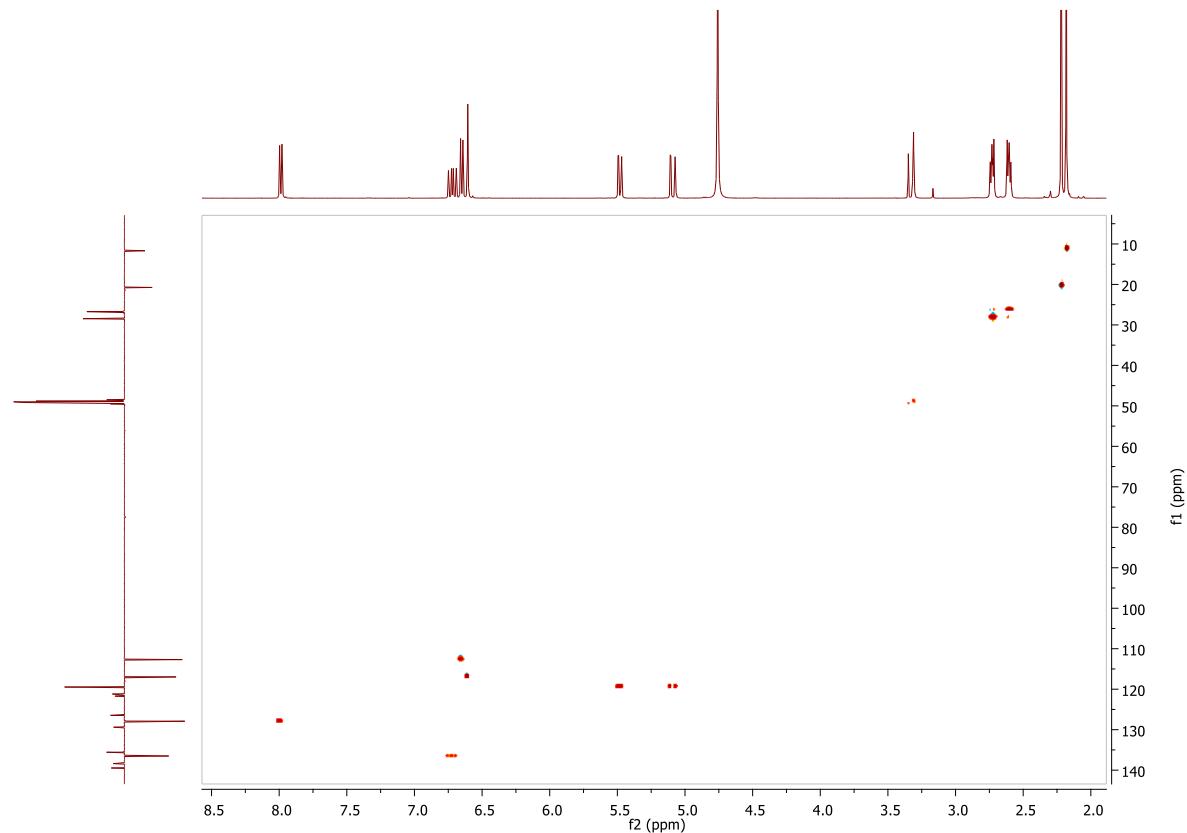
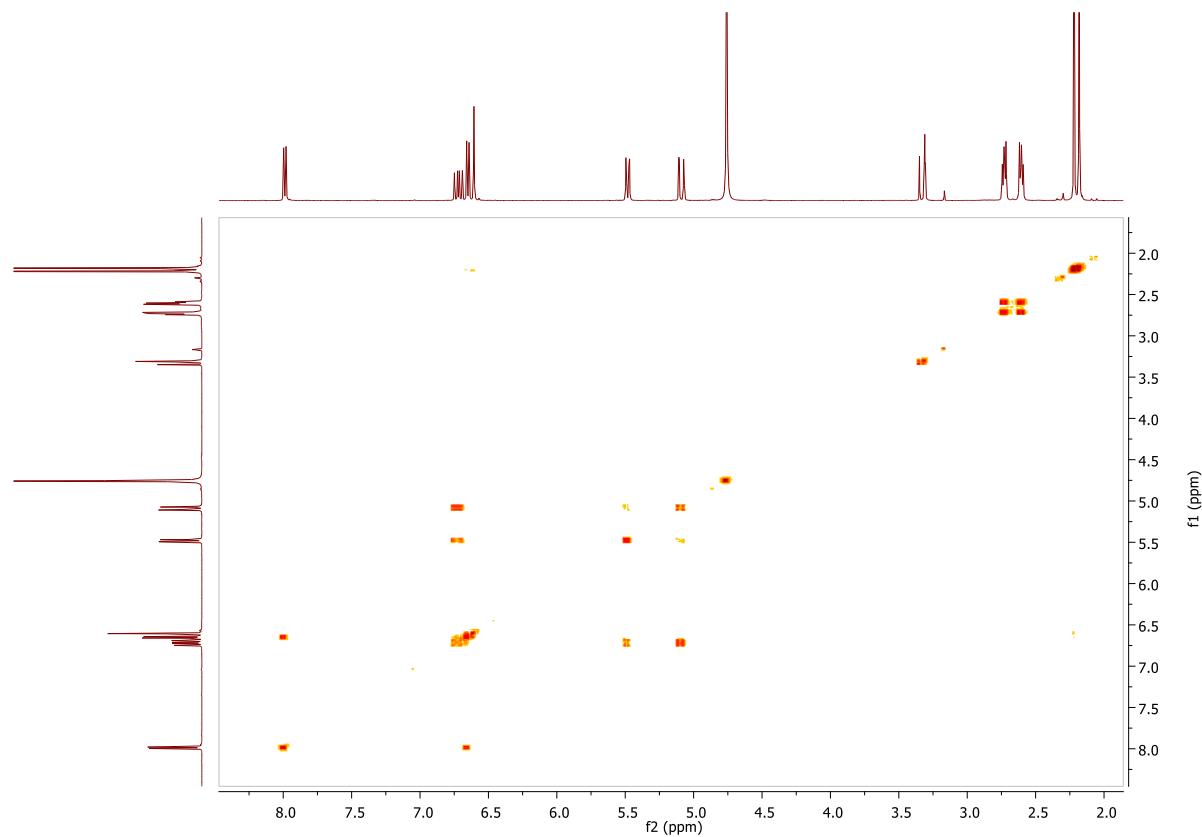


Figure S25. HSQC spectrum of compound 5 (in CD₃OD).**Figure S26.** ¹H-¹H COSY spectrum of compound 5 (in CD₃OD).

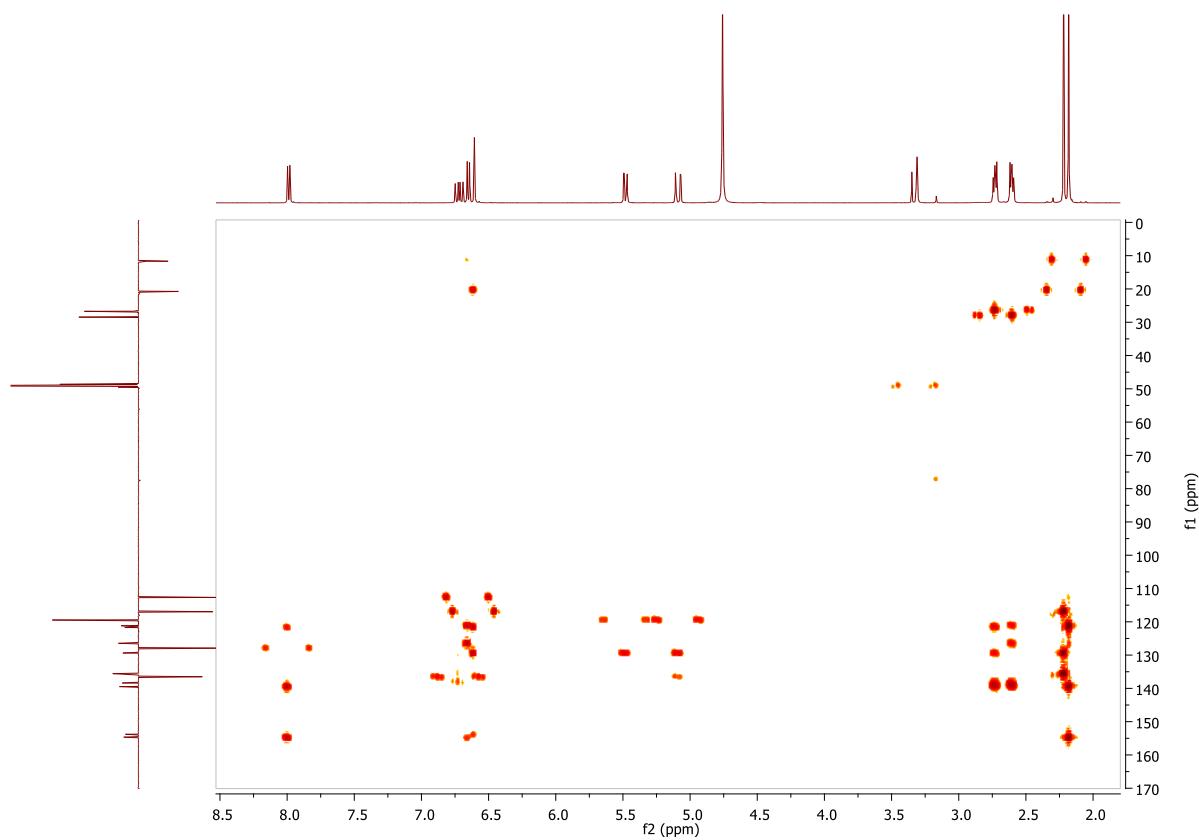


Figure S27. HMBC spectrum of compound 5 (in CD_3OD).

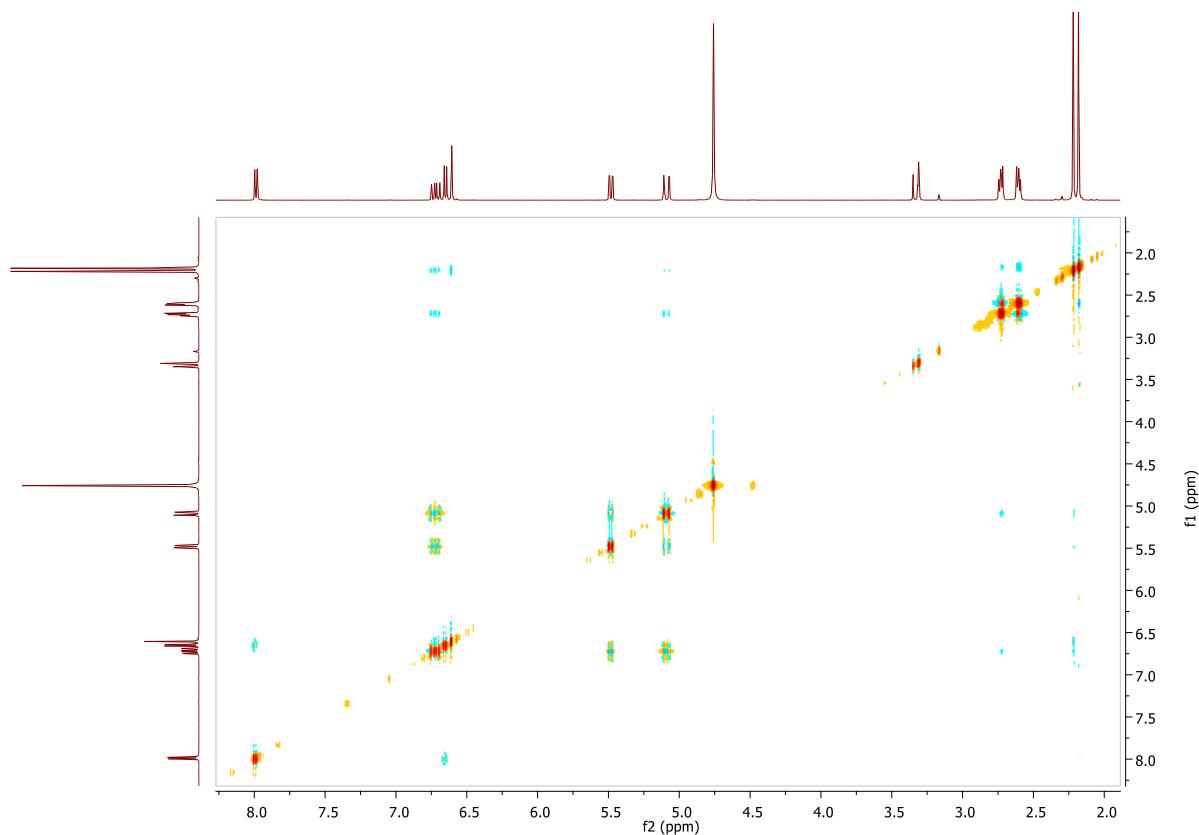
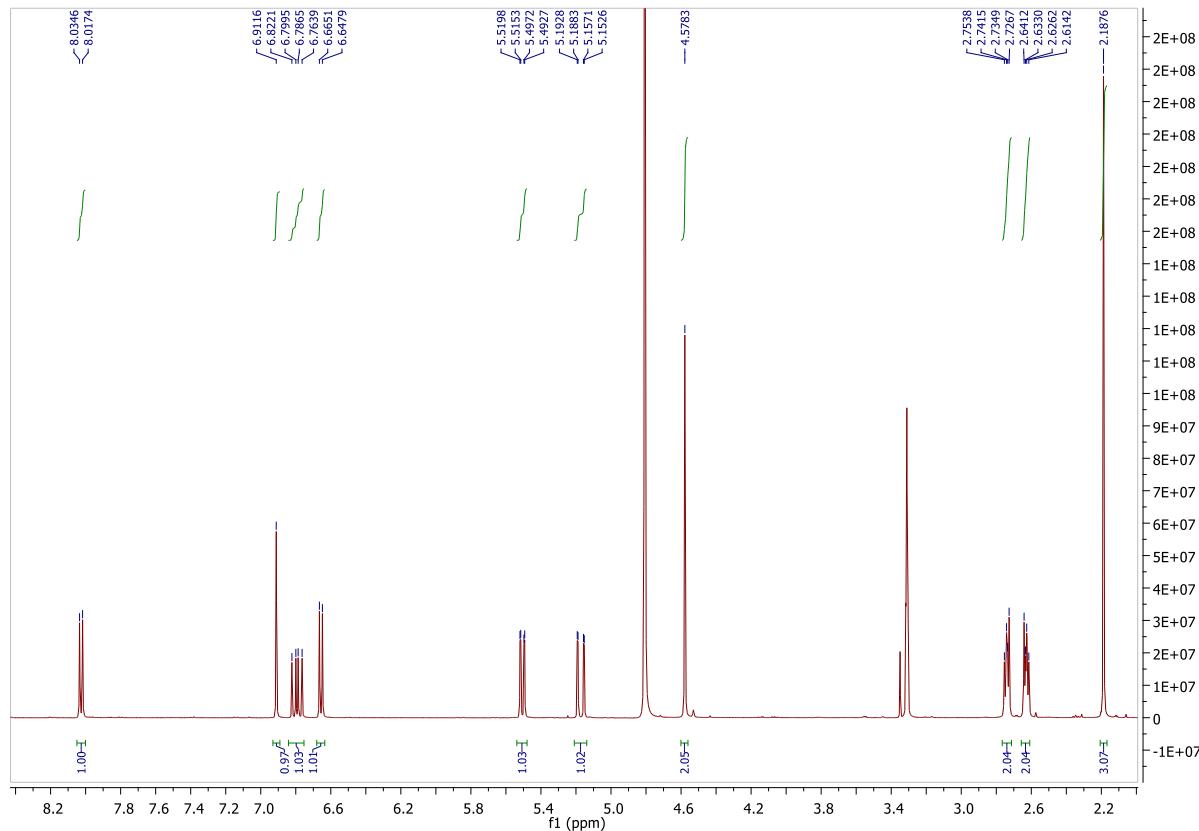


Figure S28. NOESY spectrum of compound 5 (in CD₃OD).**Figure S29.** ¹H NMR spectrum of compound 6 (in CD₃OD).

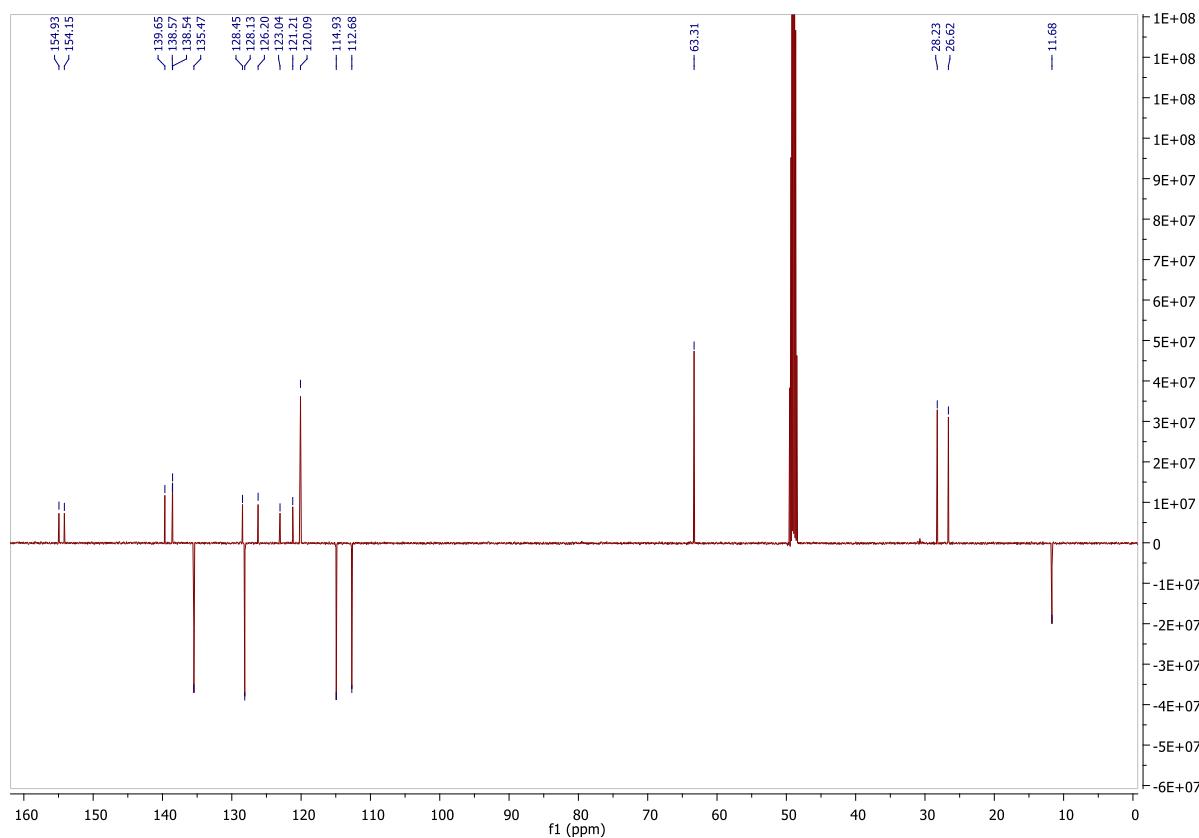


Figure S30. ^{13}C (JMOD) NMR spectrum of compound 6 (in CD_3OD).

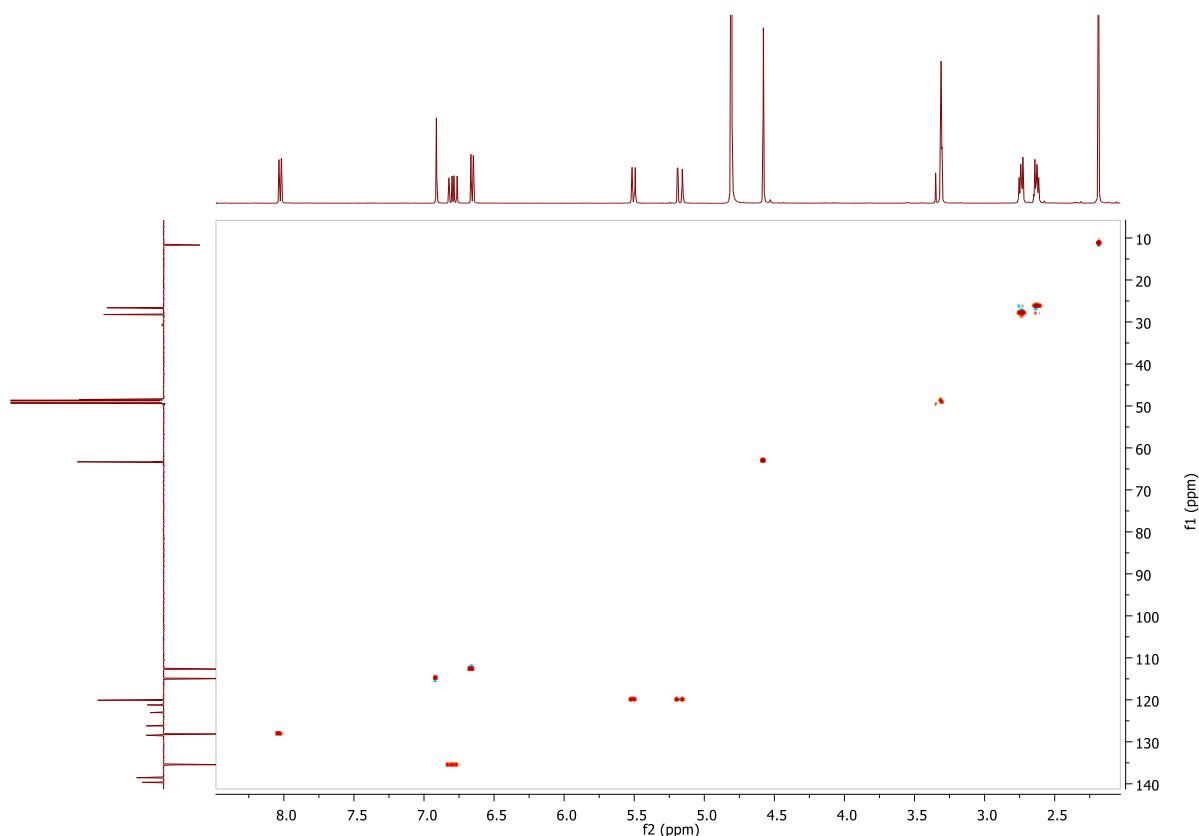
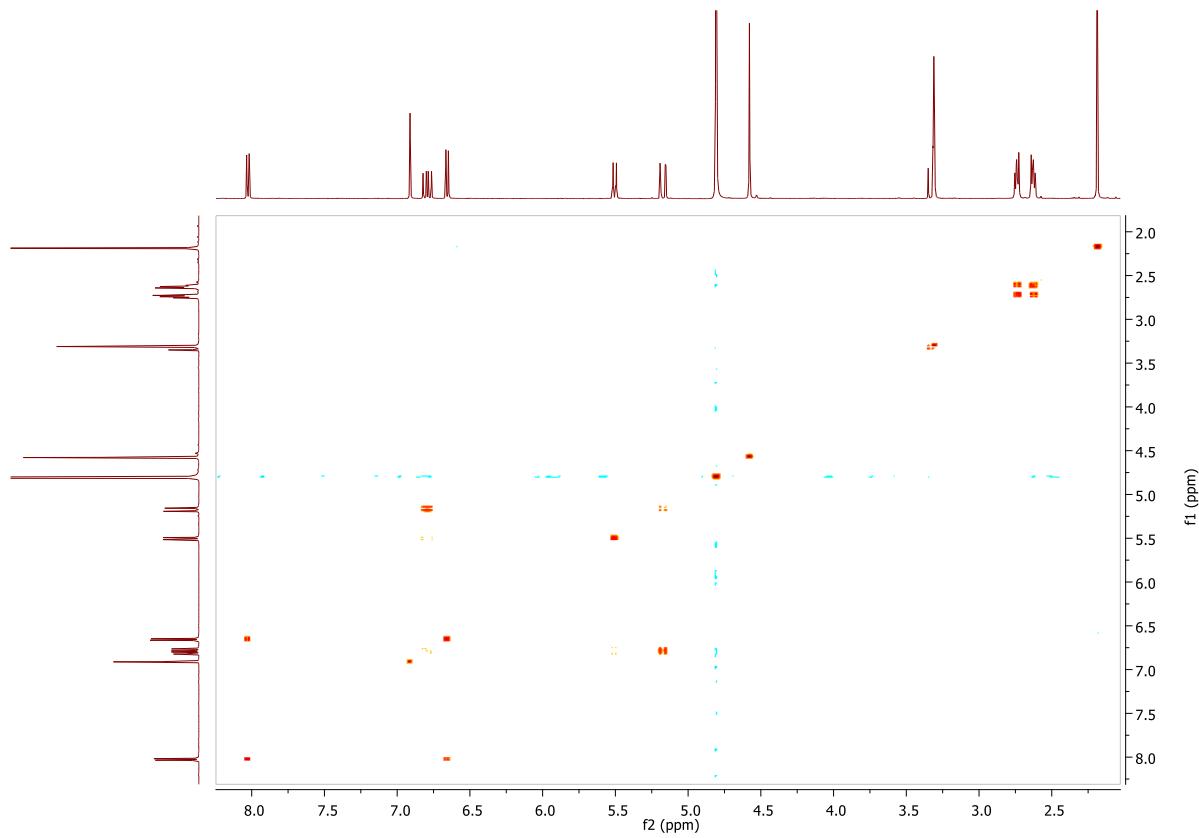


Figure S31. HSQC spectrum of compound **6** (in CD₃OD).**Figure S32.** ¹H-¹H COSY spectrum of compound **6** (in CD₃OD).

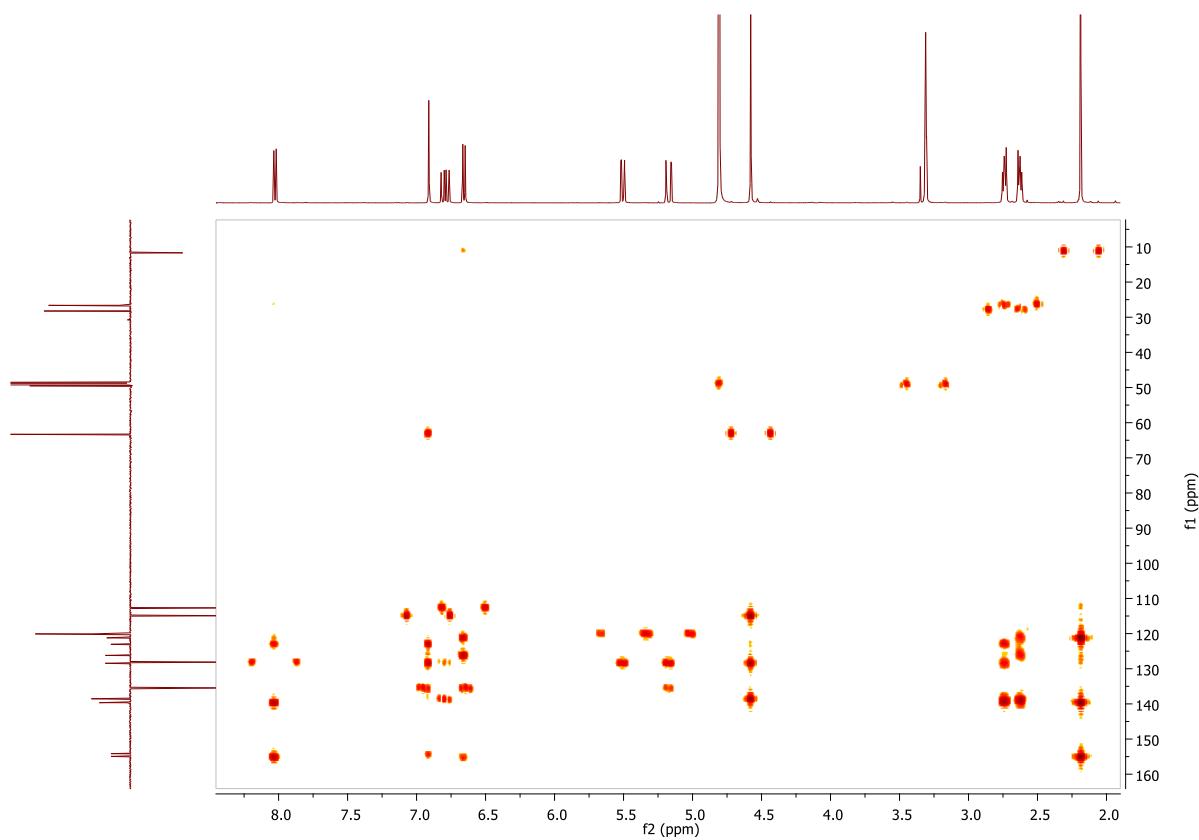


Figure S33. HMBC spectrum of compound **6** (in CD_3OD).

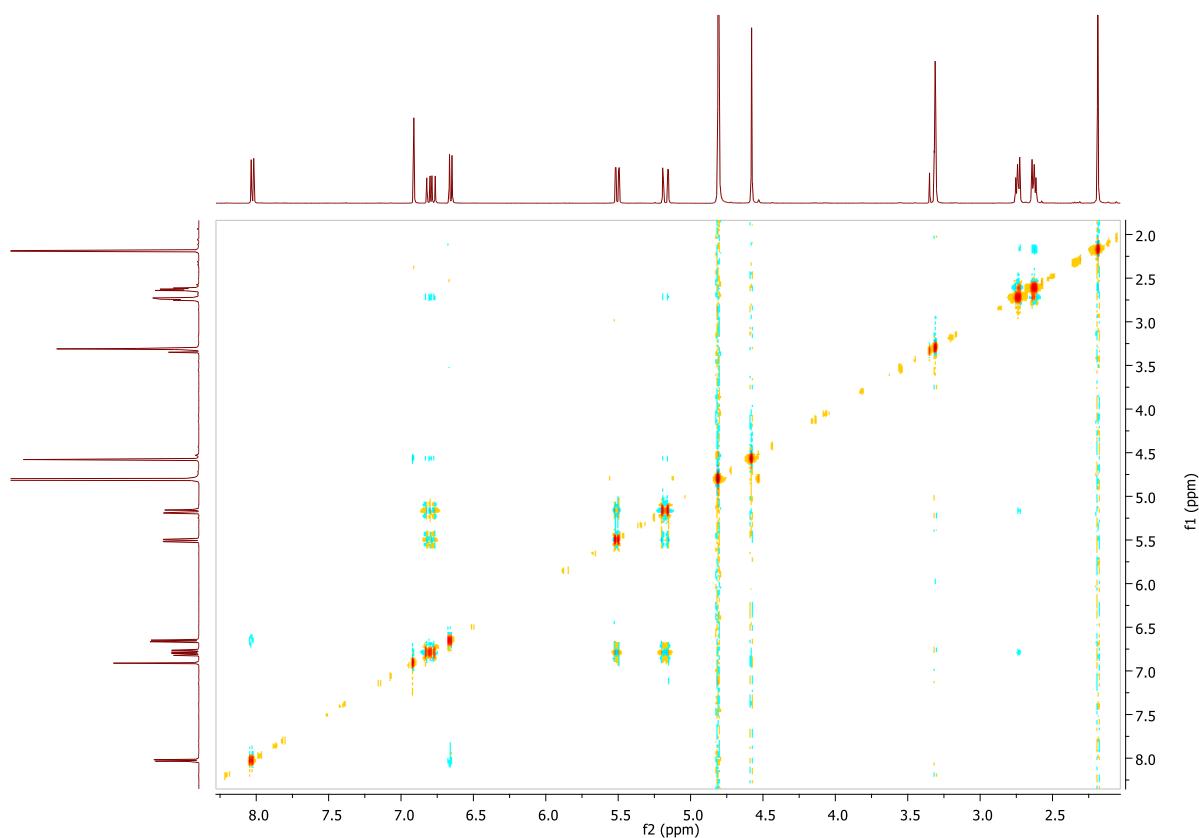
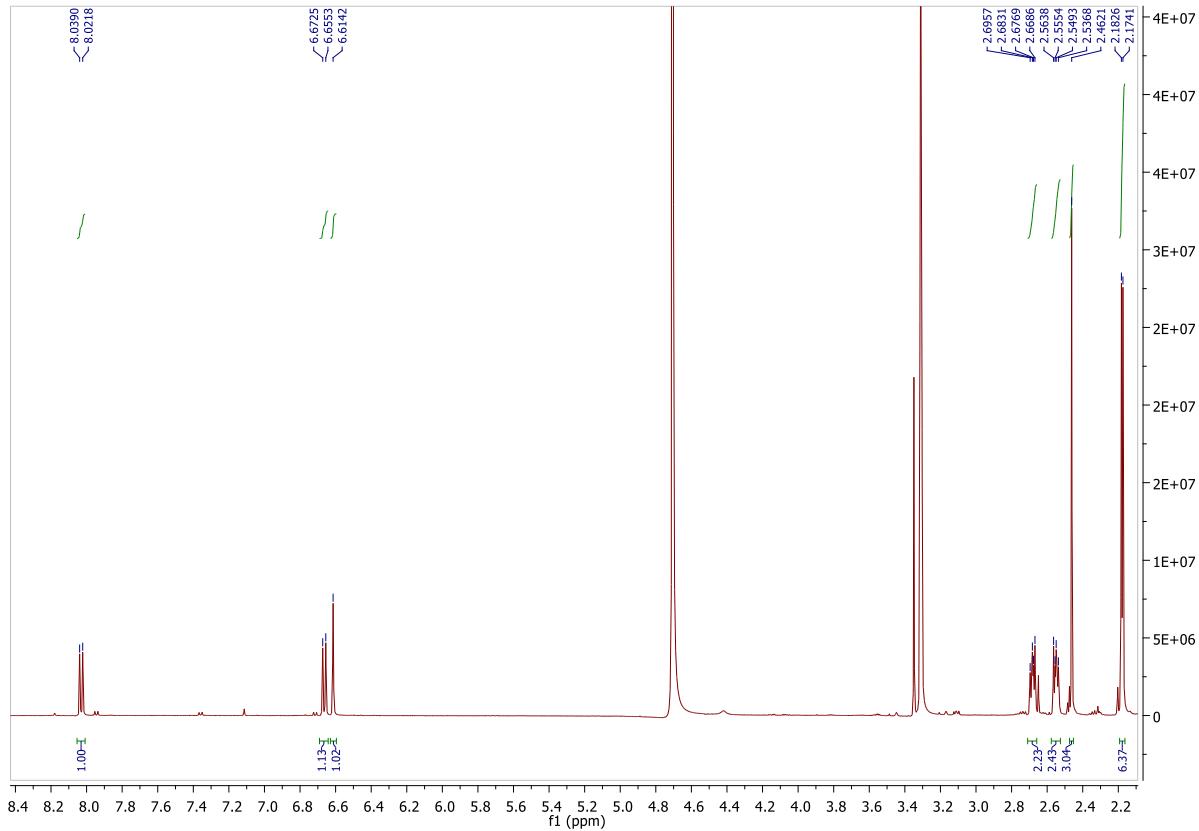


Figure S34. NOESY spectrum of compound 6 (in CD₃OD).**Figure S35.** ¹H NMR spectrum of compound 7 (in CD₃OD).

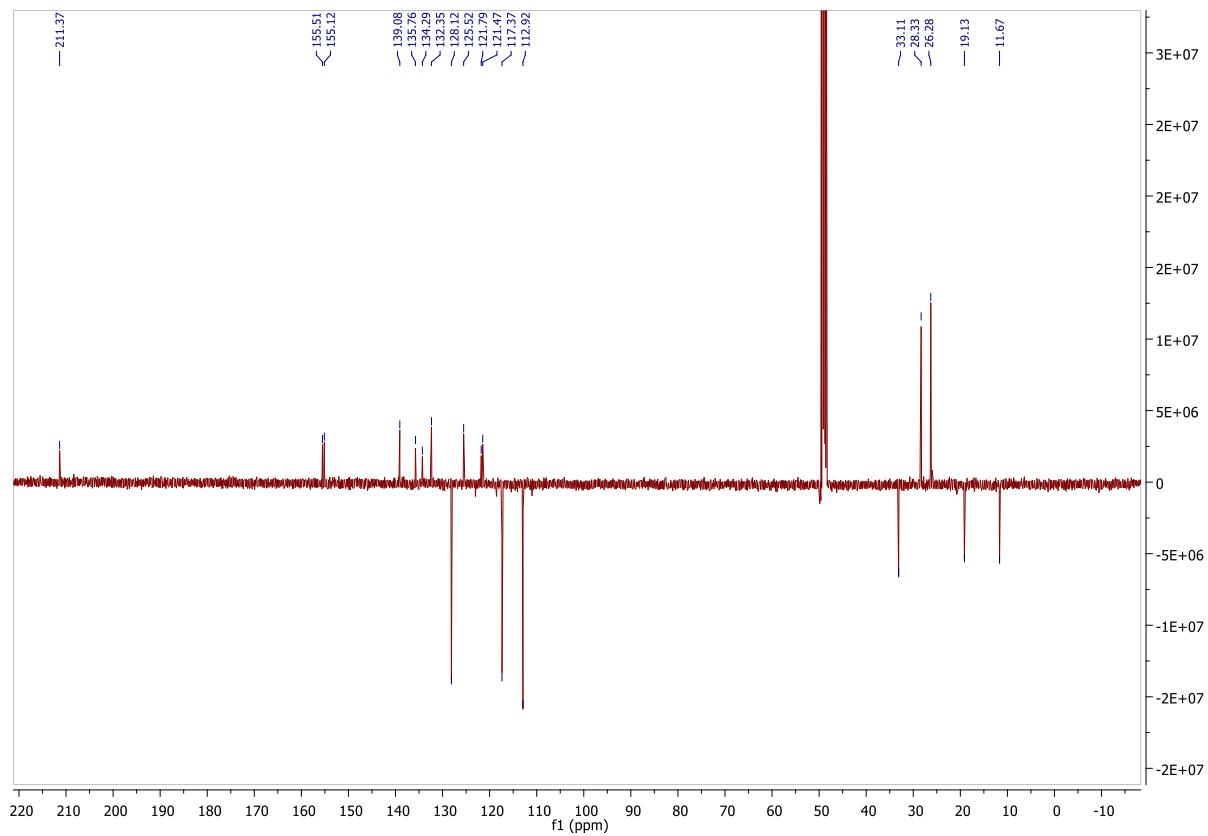


Figure S36. ¹³C (JMOD) spectrum of compound 7 (in CD₃OD).

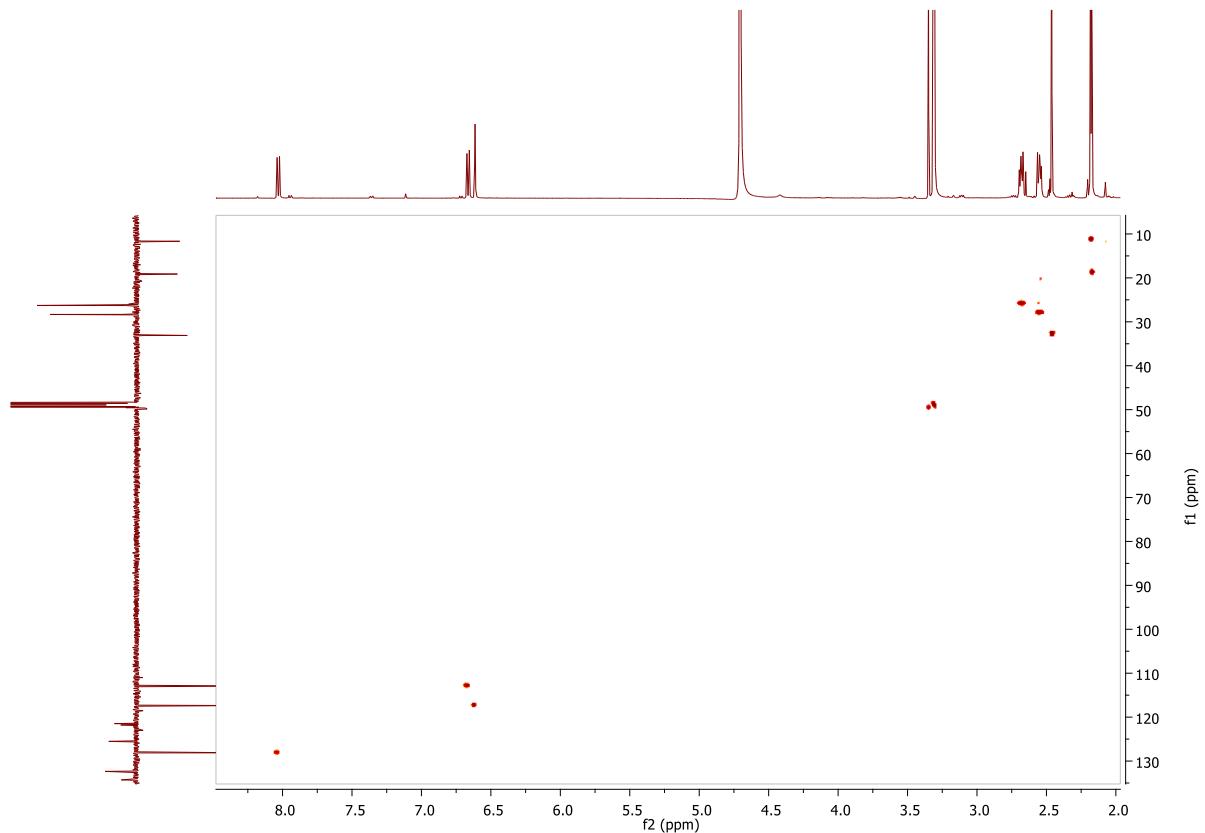
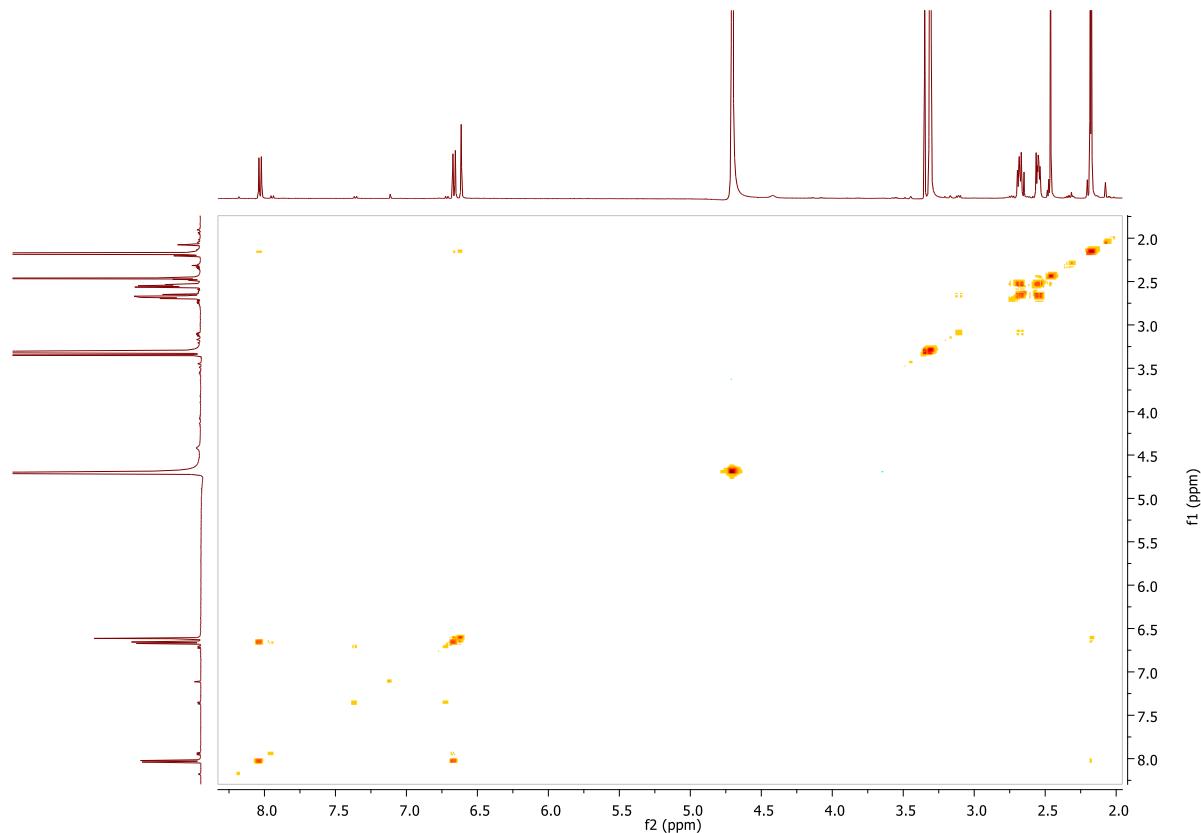


Figure S37. HSQC spectrum of compound 7 (in CD₃OD).**Figure S38.** ¹H-¹H COSY spectrum of compound 7 (in CD₃OD).

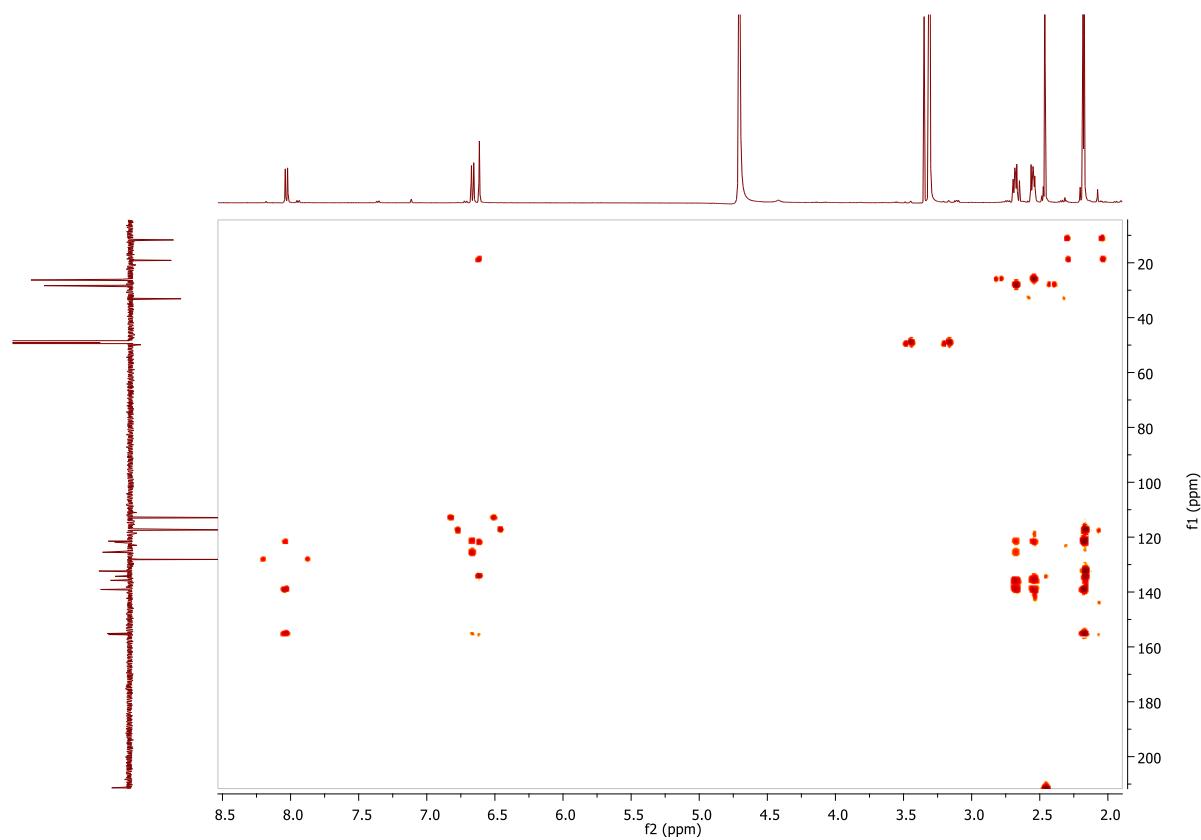


Figure S39. HMBC spectrum of compound 7 (in CD_3OD).

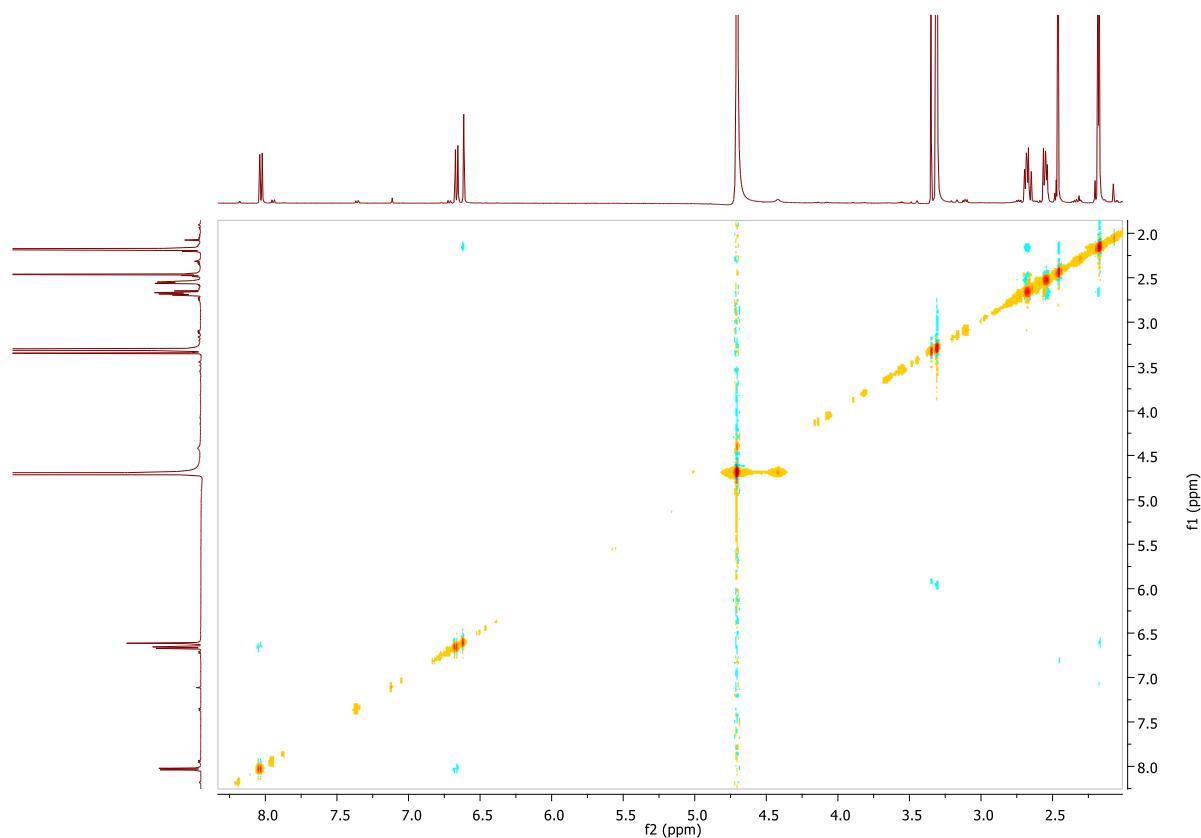
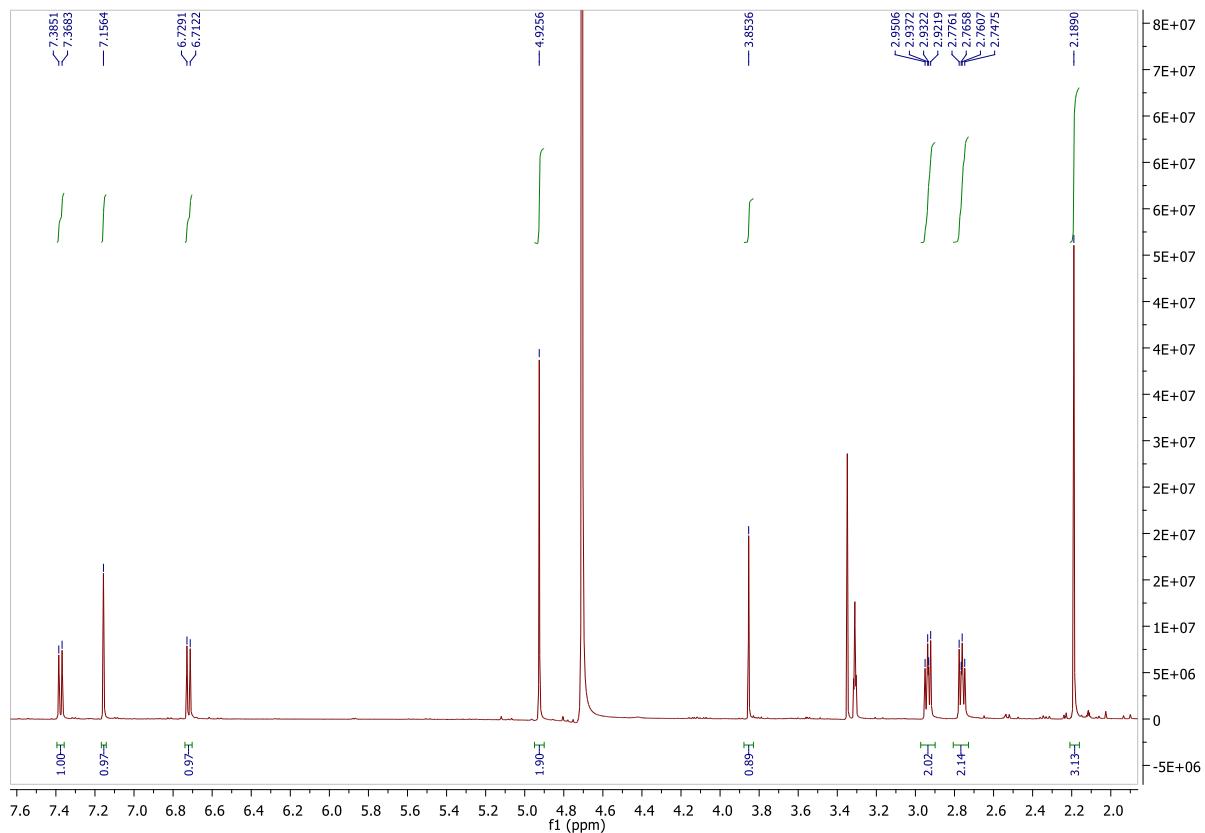


Figure S40. NOESY spectrum of compound 7 (in CD₃OD).**Figure S41.** ¹H NMR spectrum of compound 8 (in CD₃OD).

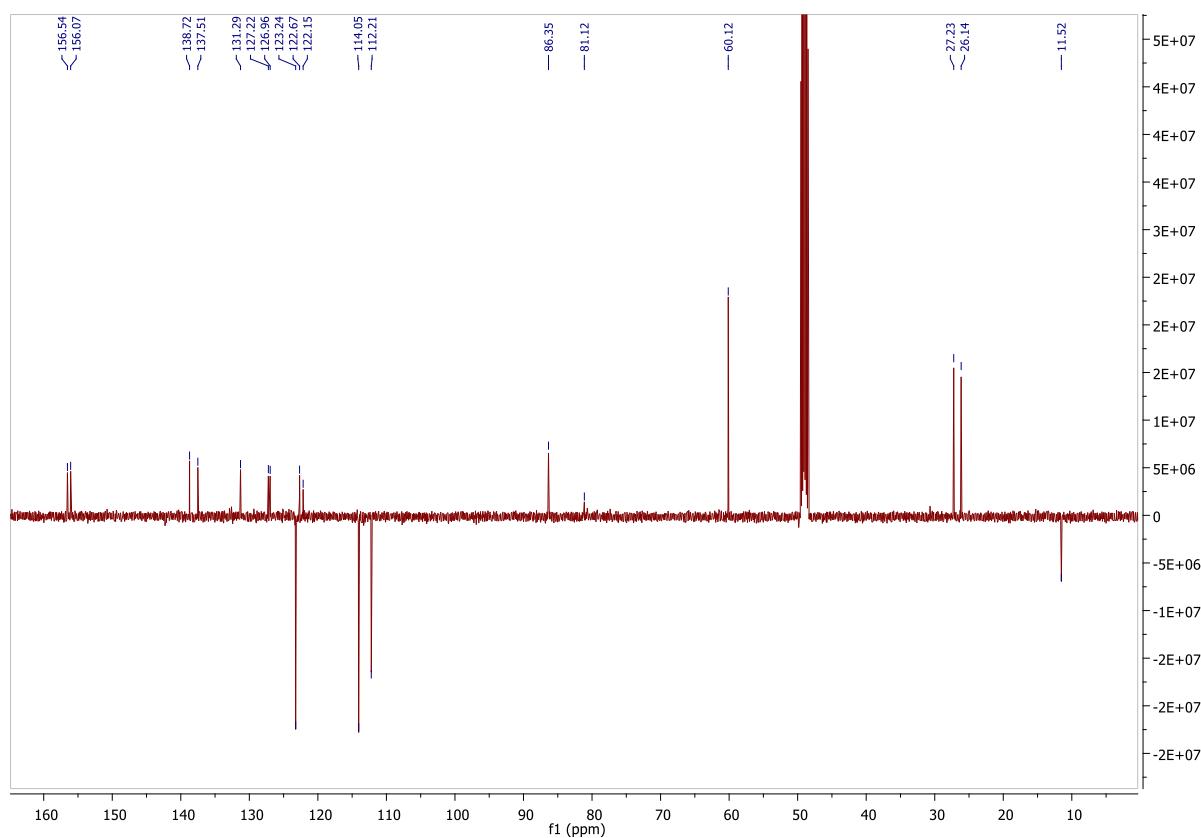


Figure S42. ^{13}C (JMOD) NMR spectrum of compound 8 (in CD_3OD).

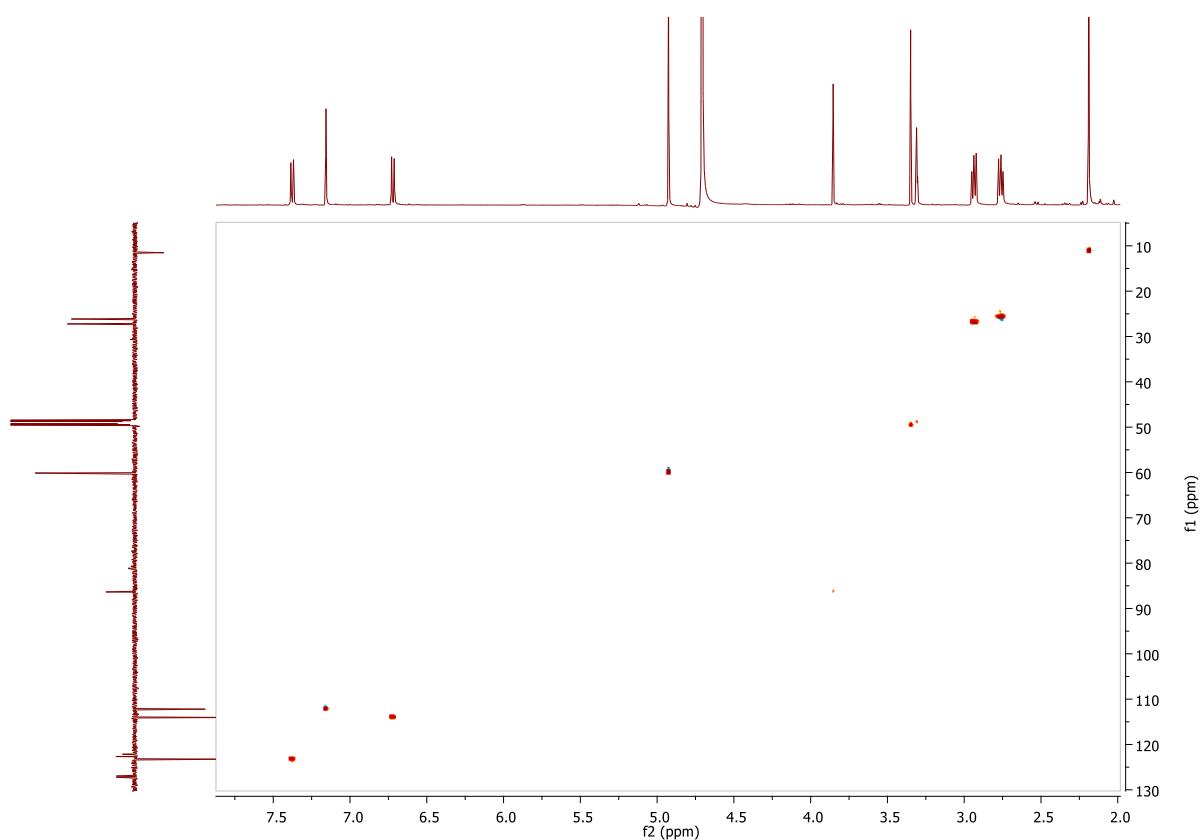
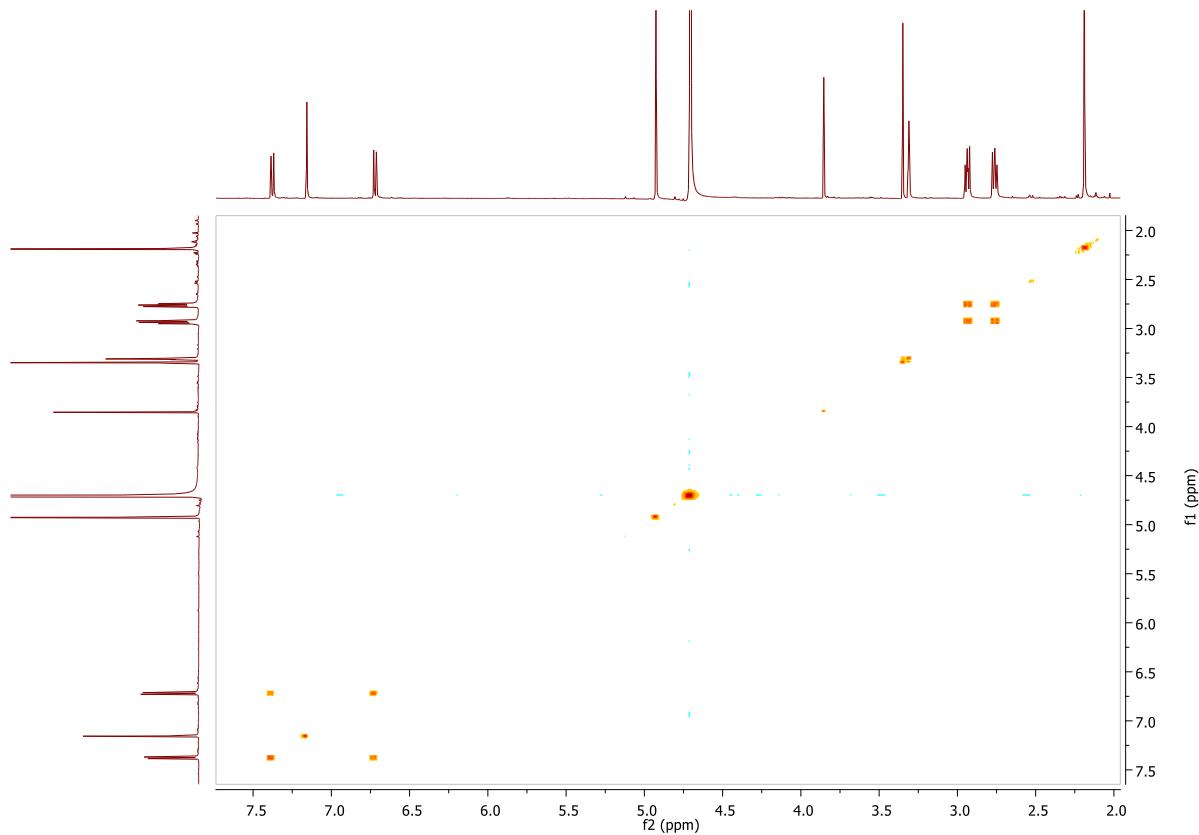


Figure S43. HSQC spectrum of compound 8 (in CD₃OD).**Figure S44.** ¹H-¹H COSY spectrum of compound 8 (in CD₃OD).

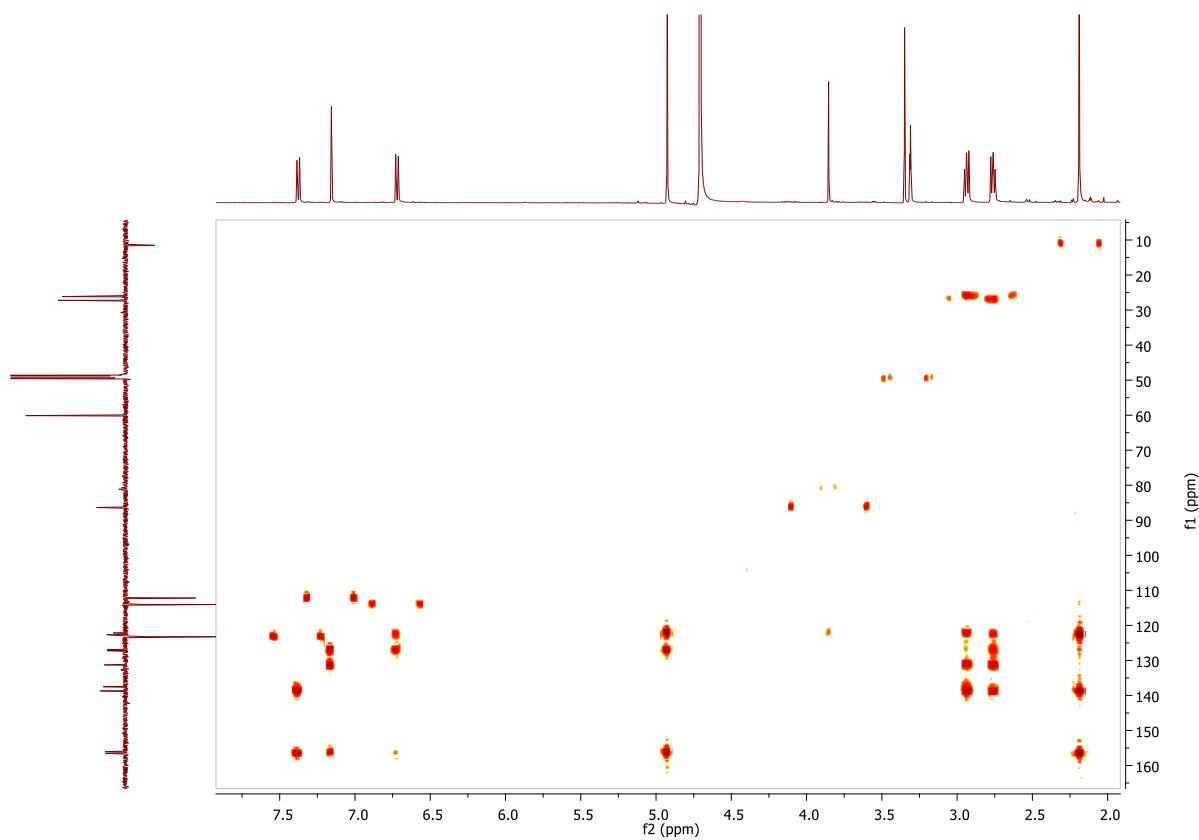


Figure S45. HMBC spectrum of compound 8 (in CD_3OD).

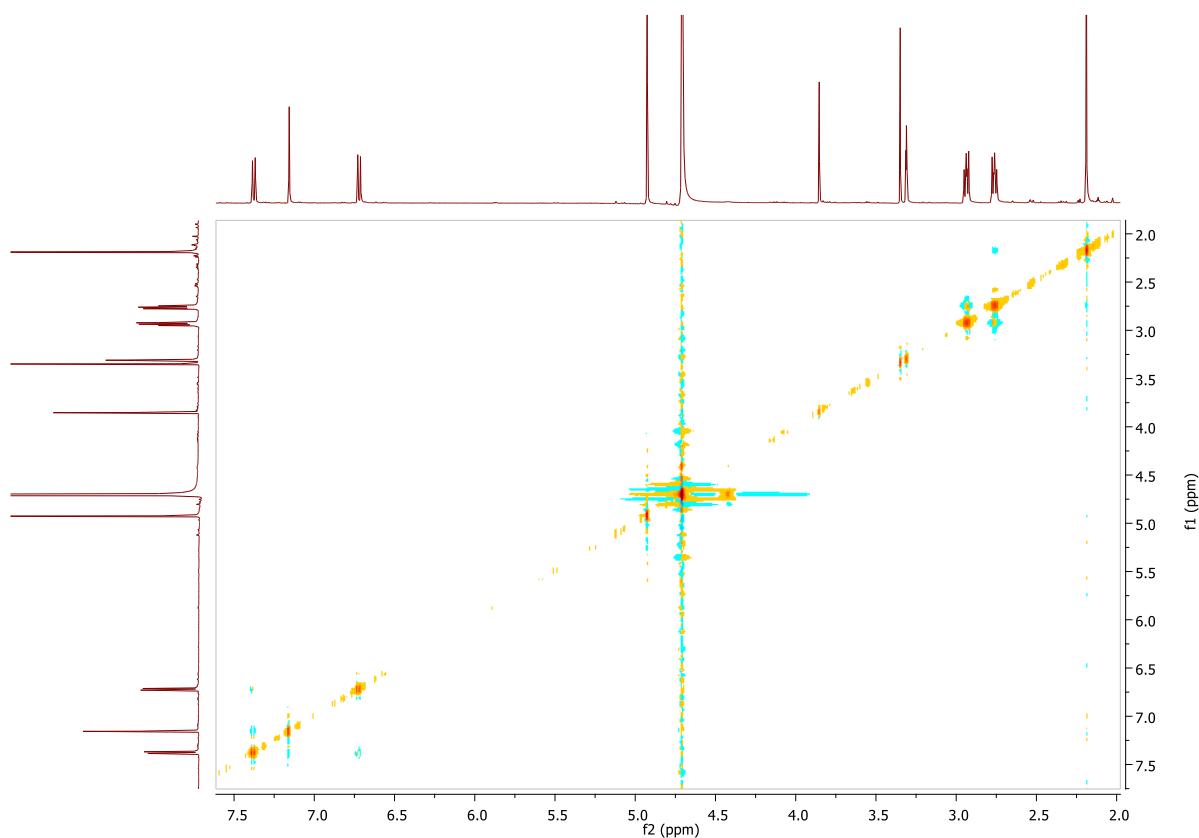
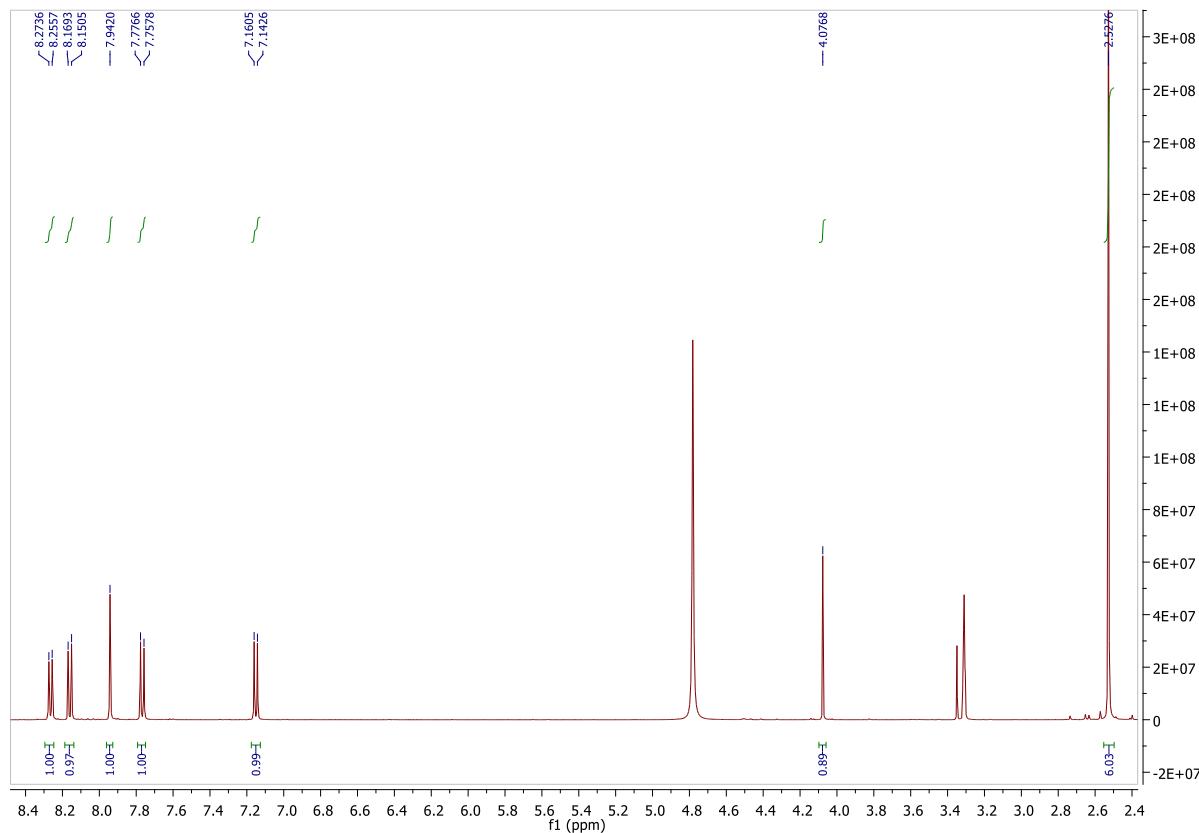


Figure S46. NOESY spectrum of compound 8 (in CD₃OD).**Figure S47.** ¹H NMR spectrum of compound 9 (in CDCl₃).

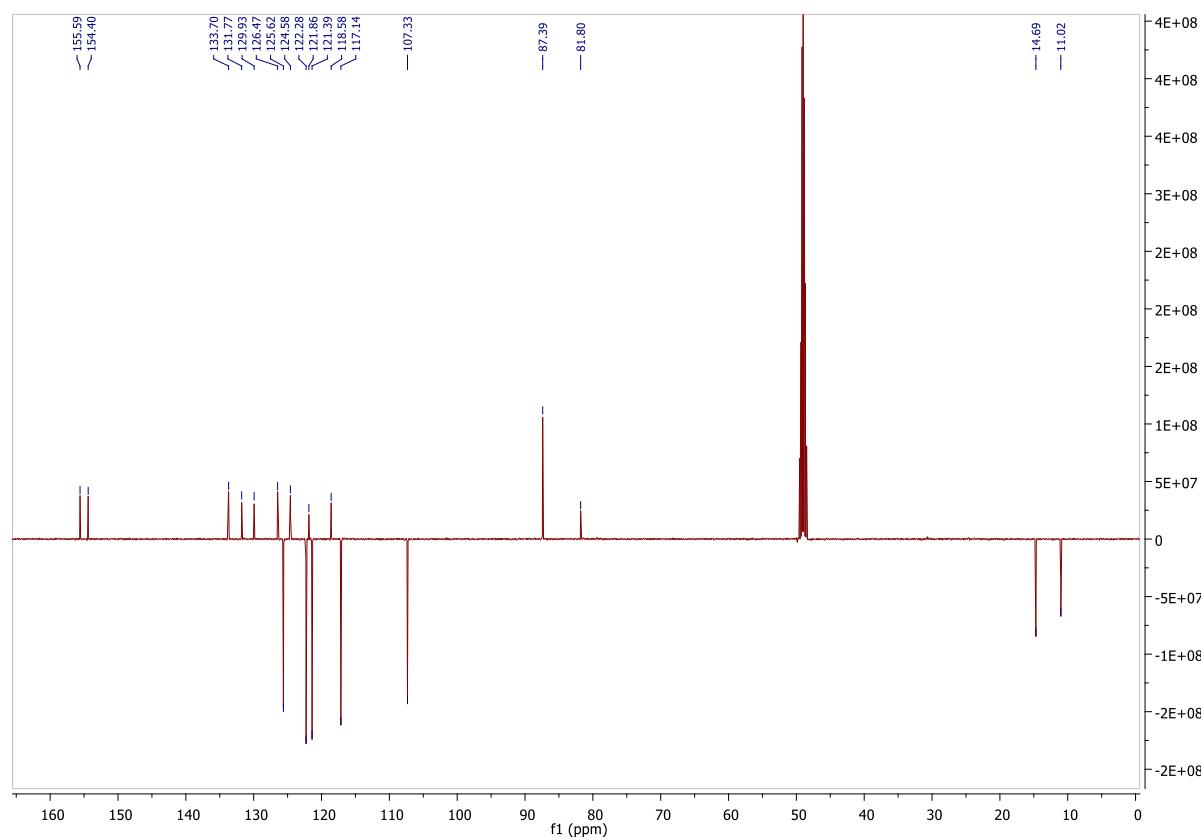


Figure S48. ^{13}C (JMOD) NMR spectrum of compound 9 (in CDCl_3).

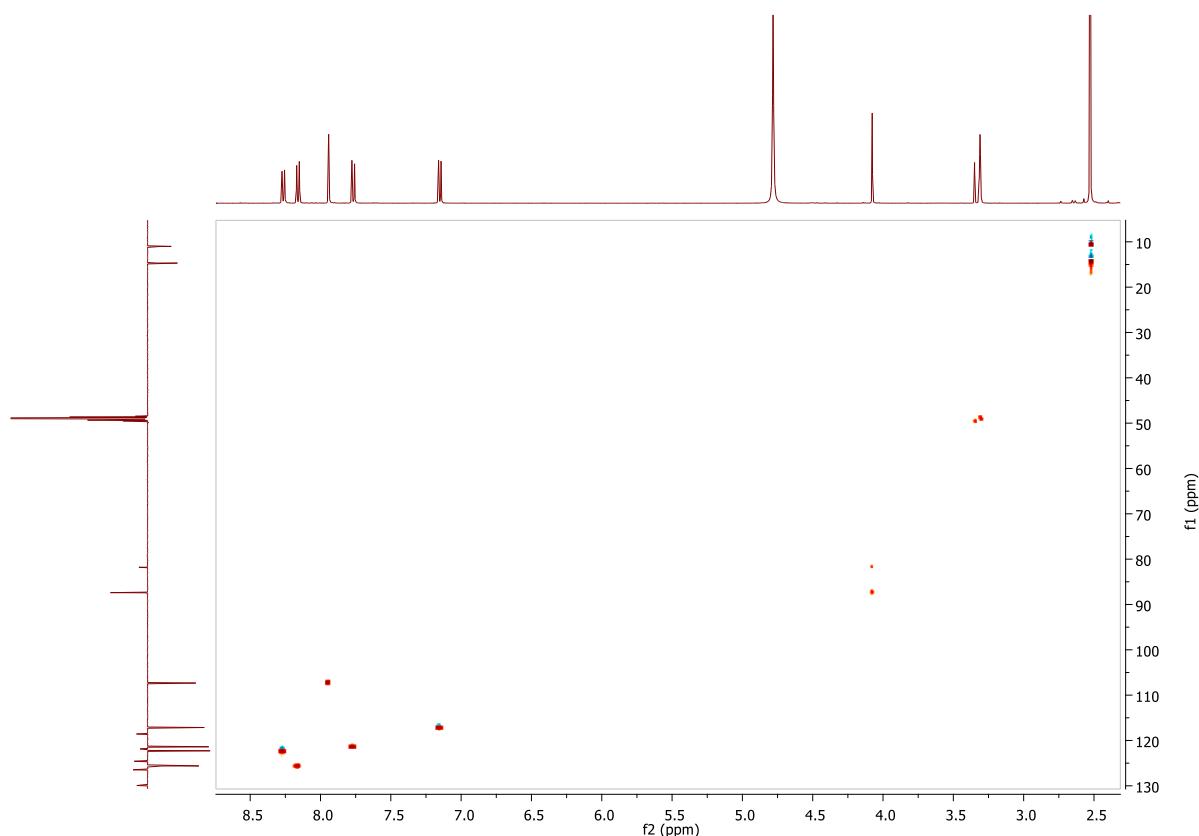
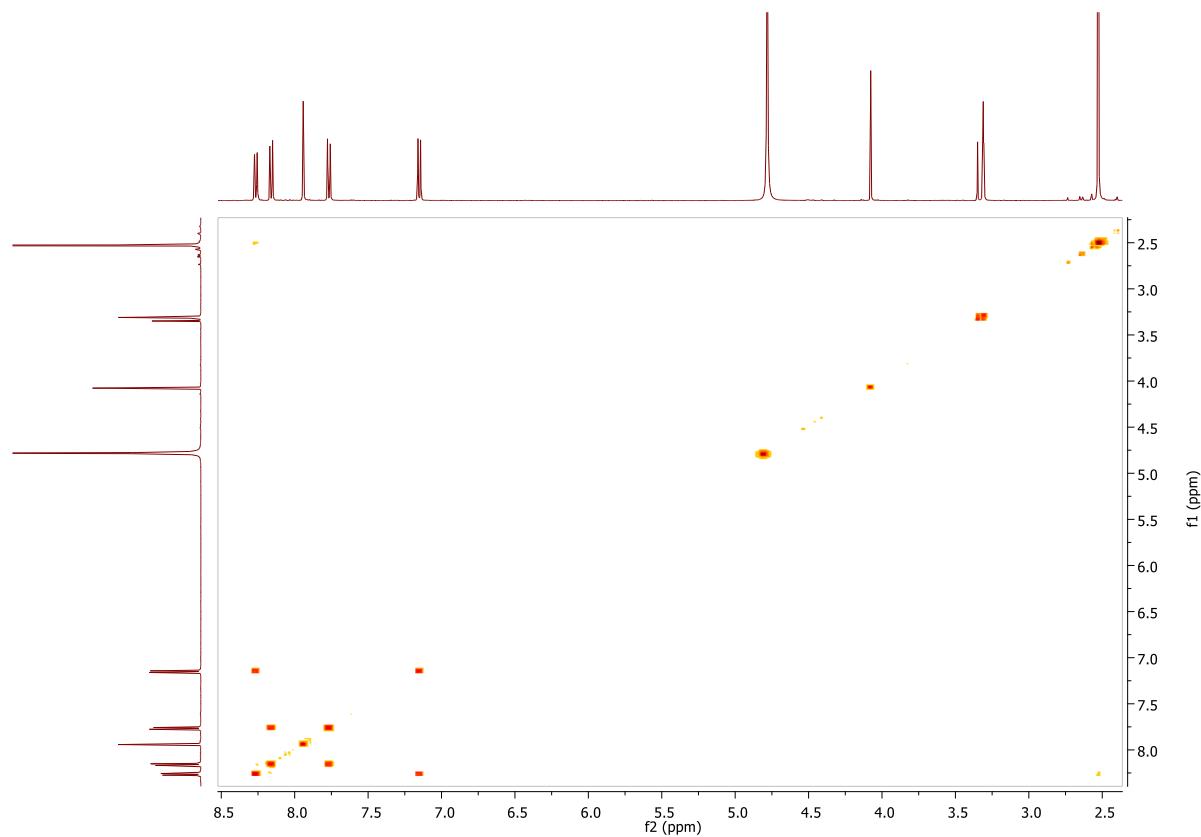


Figure S49. HSQC spectrum of compound 9 (in CDCl_3).**Figure S50.** ^1H - ^1H COSY spectrum of compound 9 (in CDCl_3).

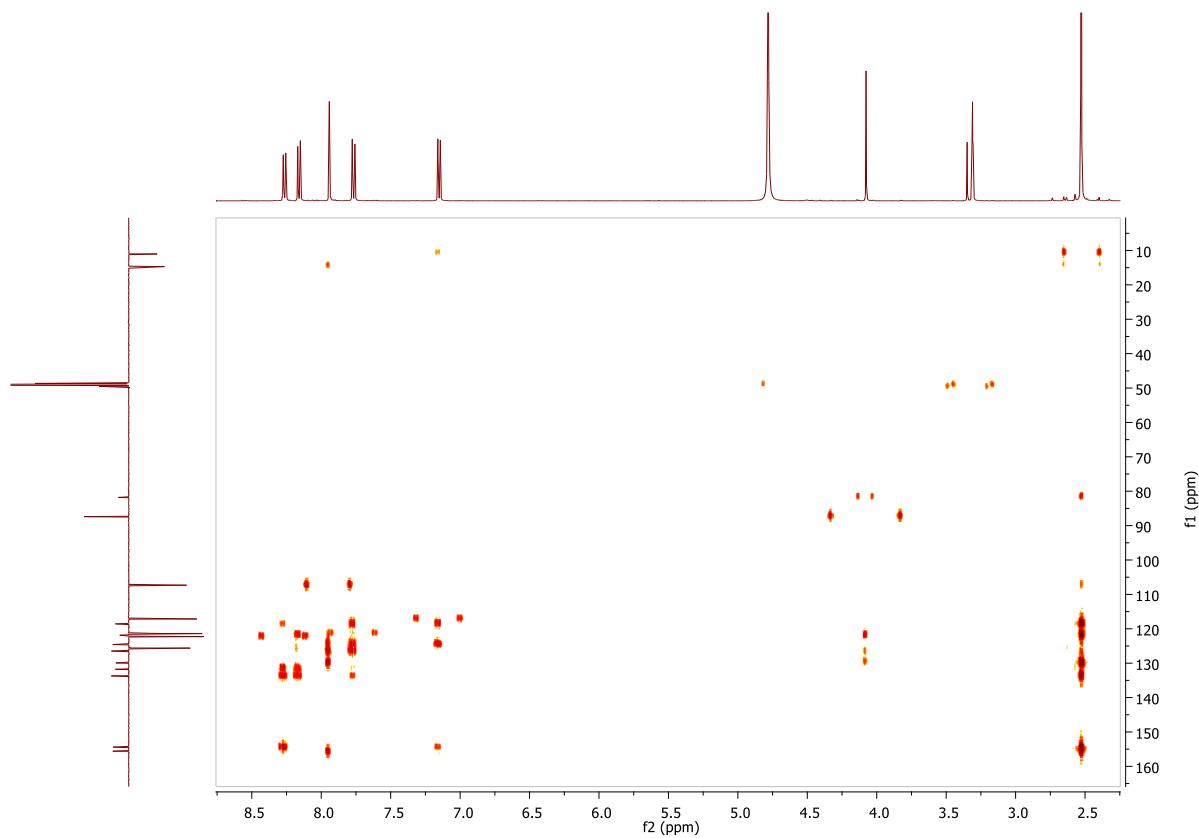


Figure S51. HMBC spectrum of compound **9** (in CDCl_3).

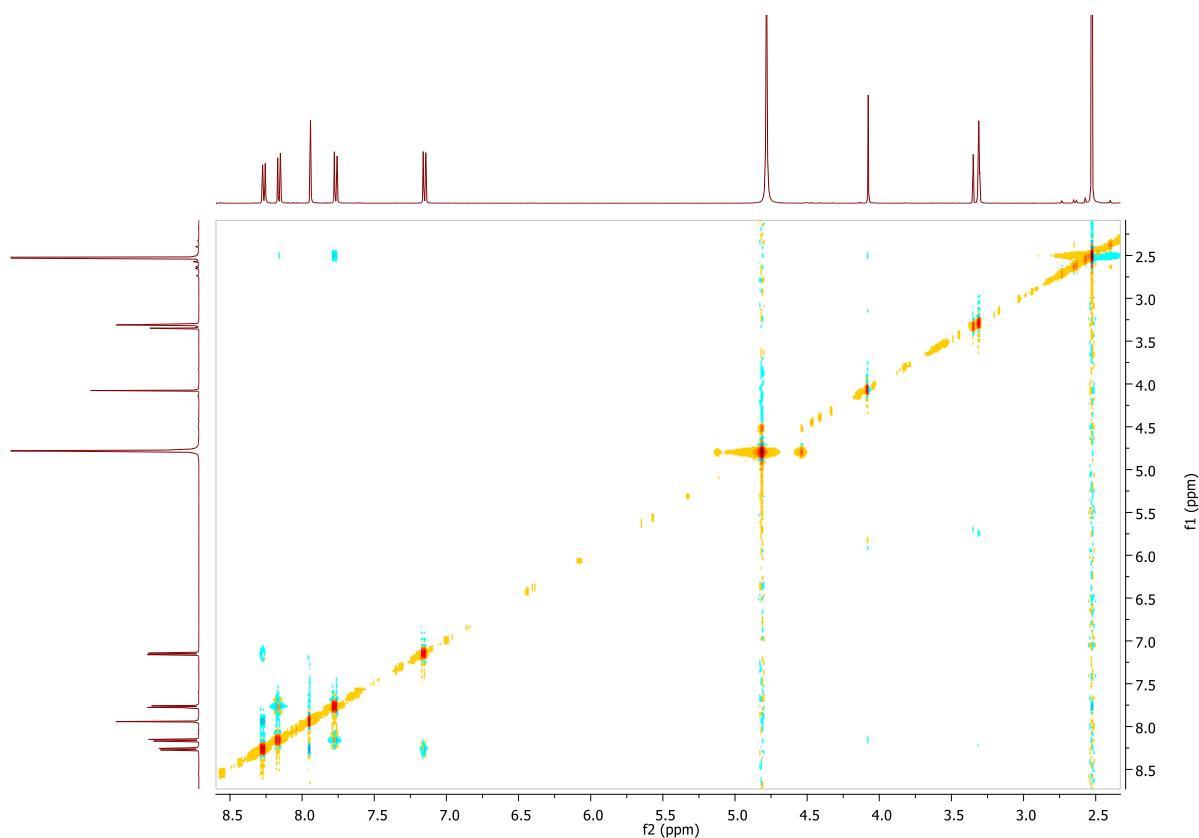
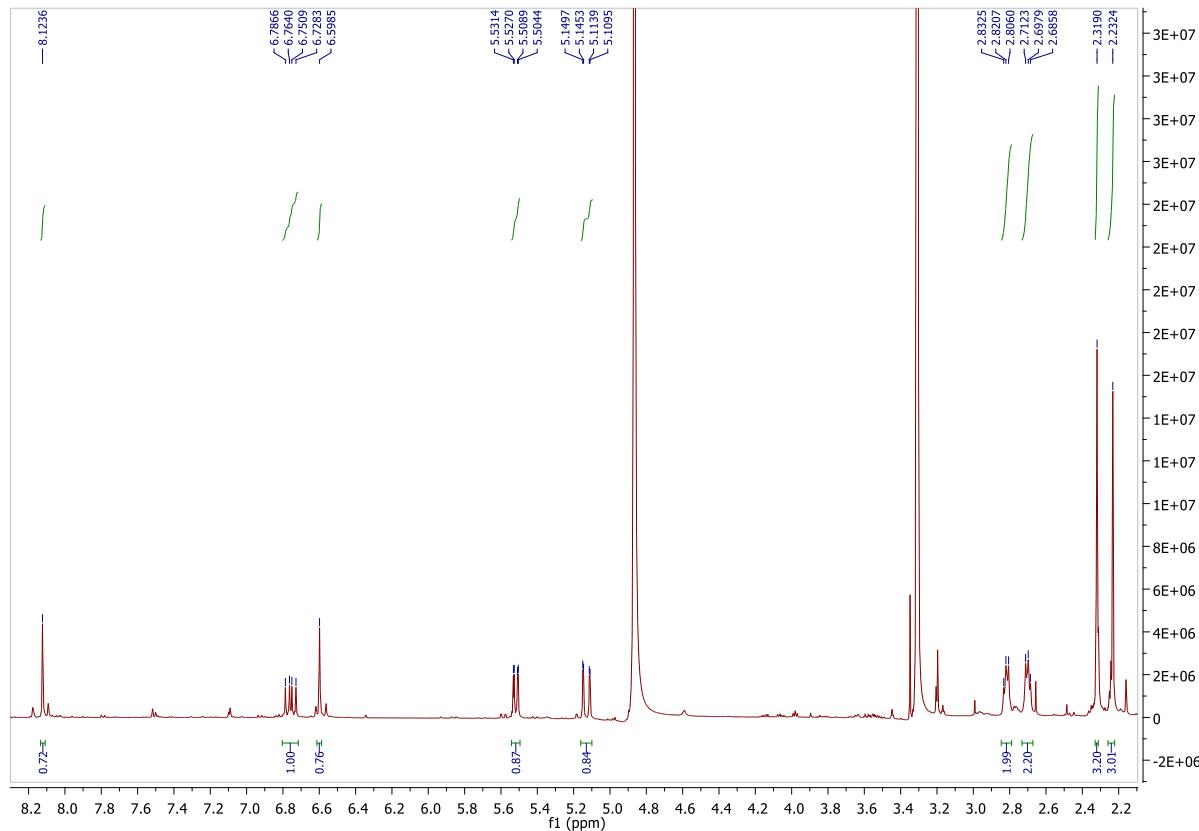


Figure S52. NOESY spectrum of compound **9** (in CDCl_3).**Figure S53.** ^1H NMR spectrum of compound **10** (in CD_3OD).

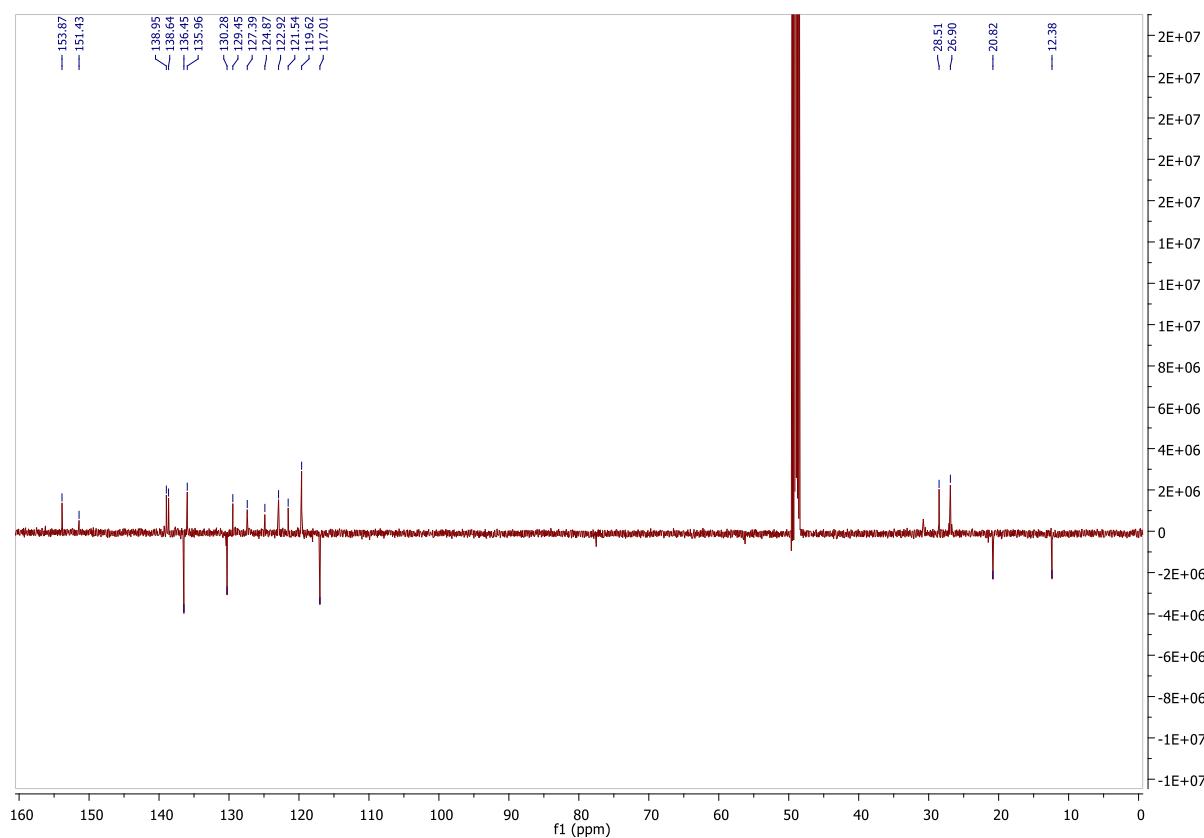


Figure S54. ^{13}C (JMOD) NMR spectrum of compound **10** (in CD_3OD).

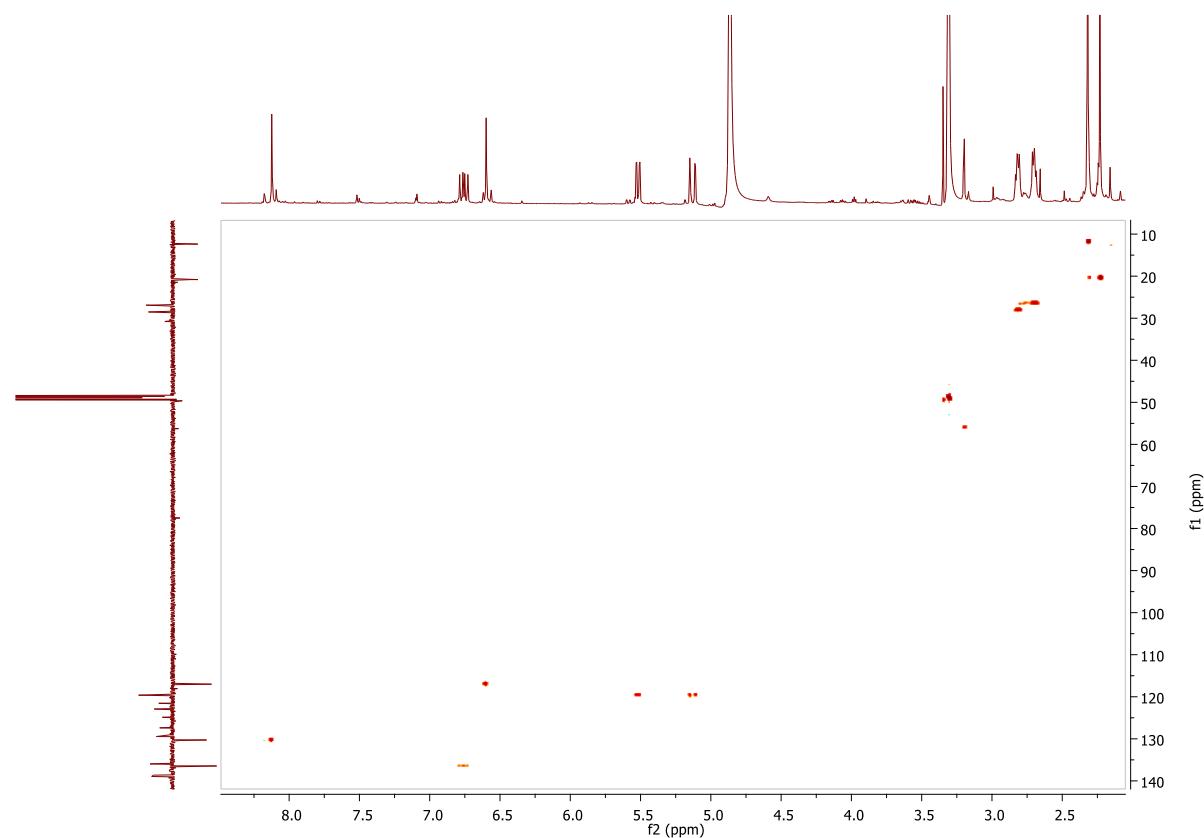


Figure S55. HSQC spectrum of compound **10** (in CD₃OD).

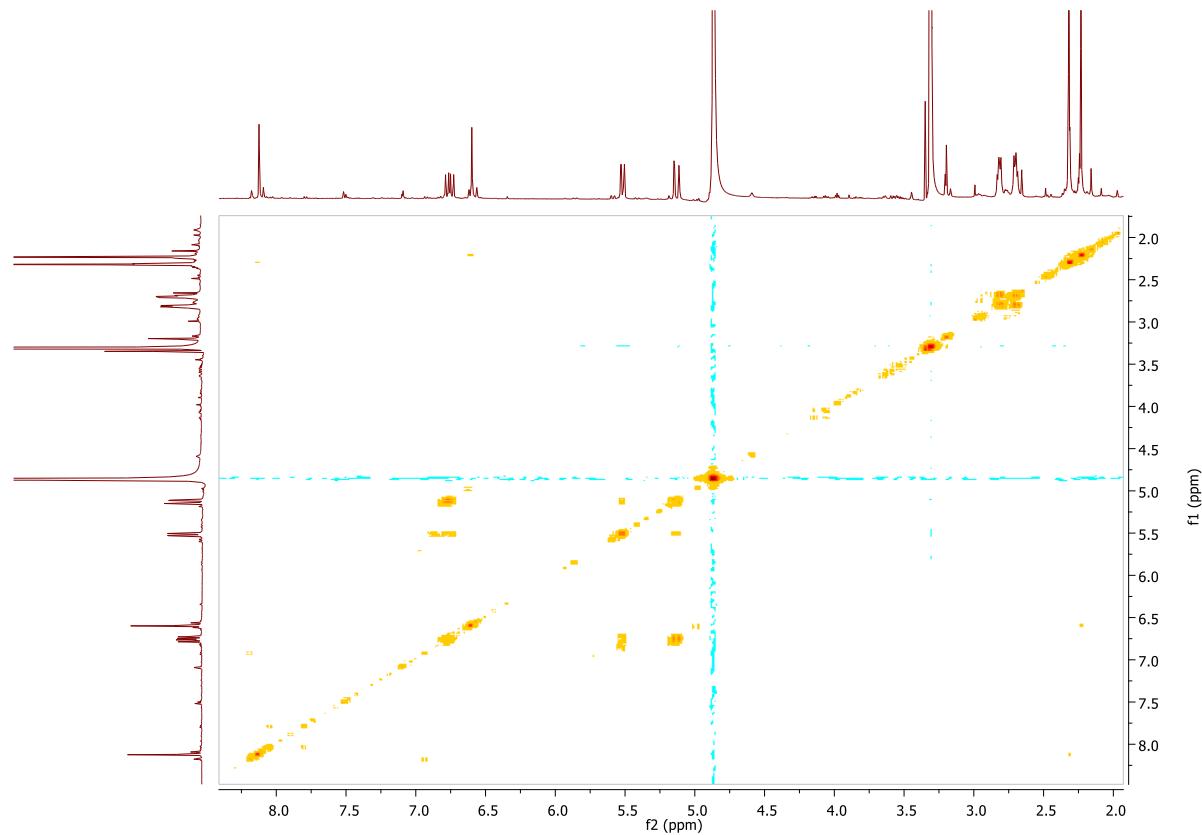


Figure S56. ¹H-¹H COSY spectrum of compound **10** (in CD₃OD).

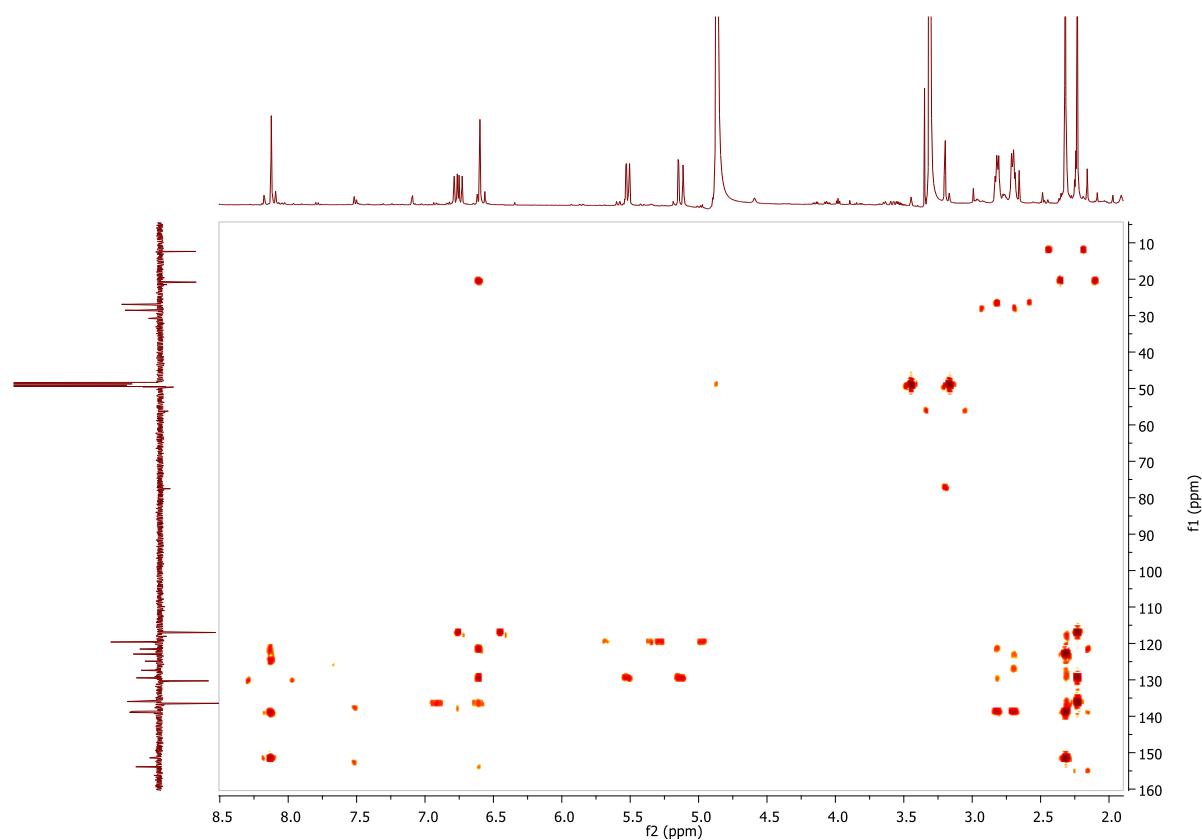


Figure S57. HMBC spectrum of compound **10** (in CD_3OD).

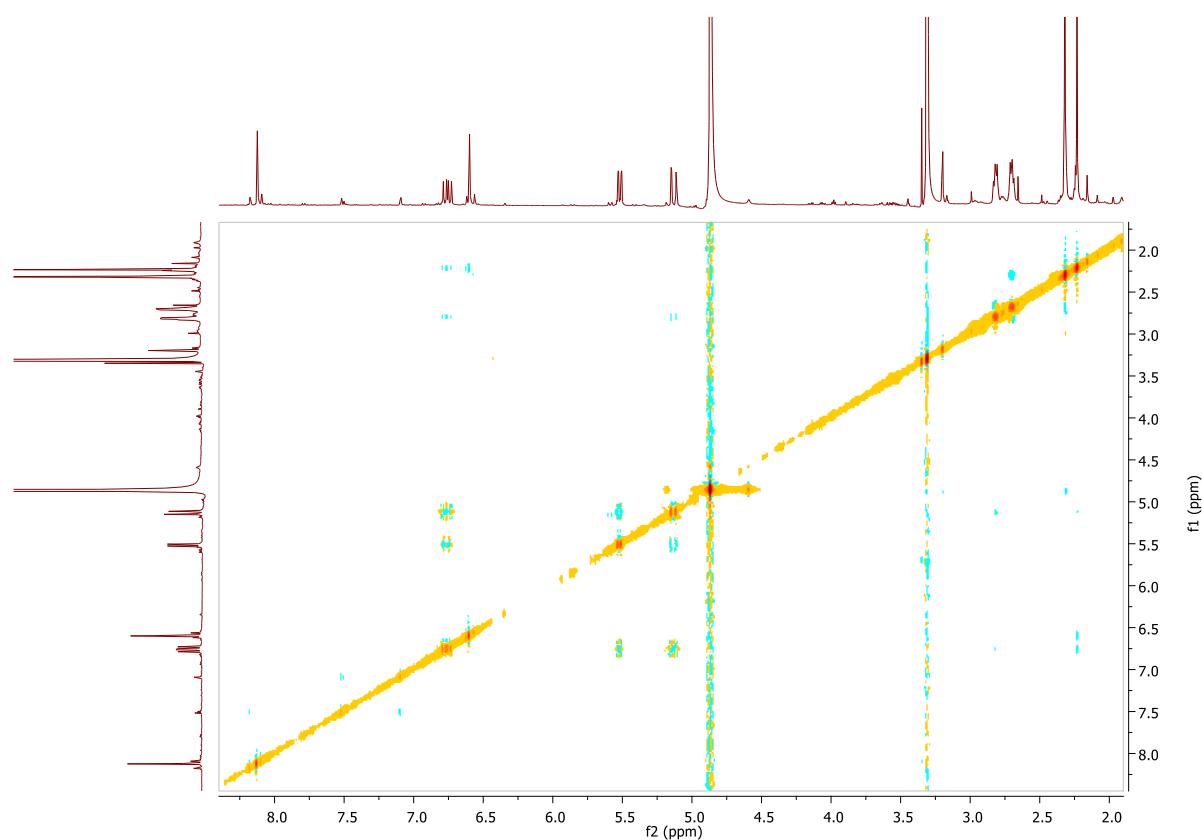
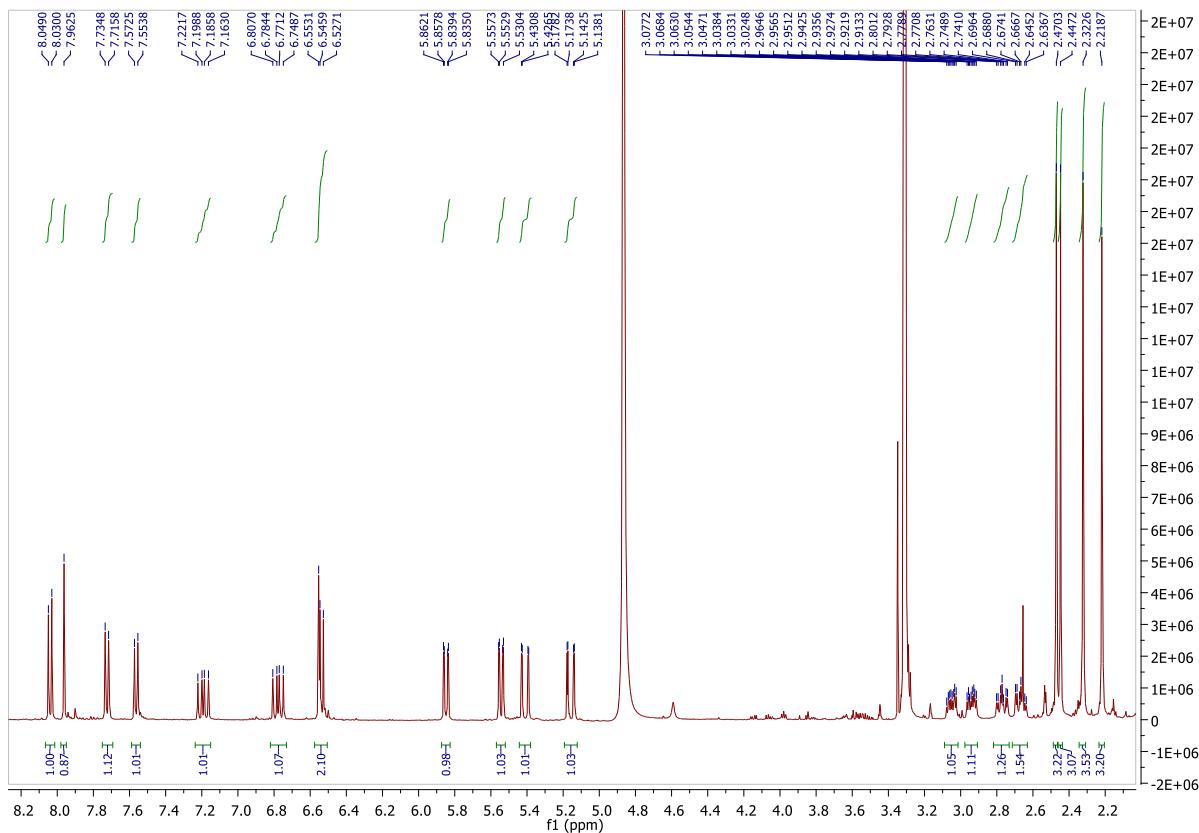


Figure S58. NOESY spectrum of compound **10** (in CD₃OD).**Figure S59.** ¹H NMR spectrum of compound **11** (in CD₃OD).

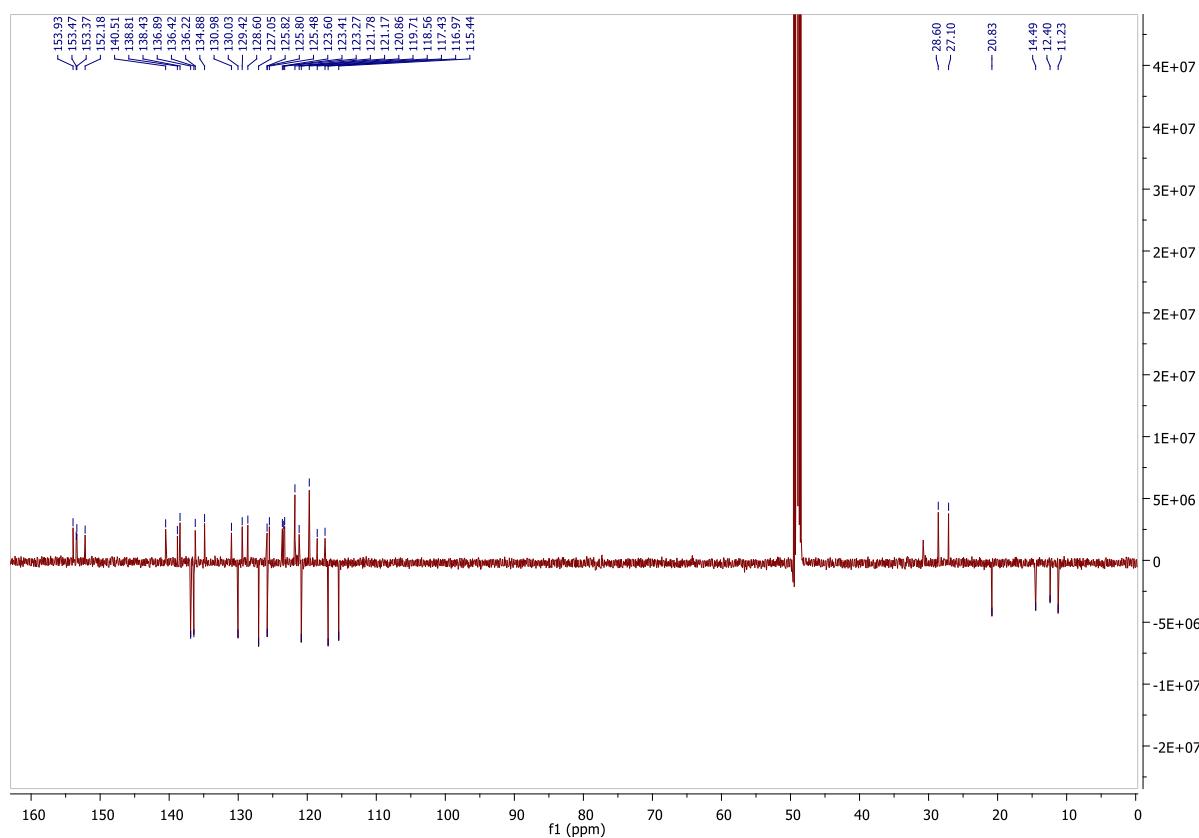


Figure S60. ^{13}C (JMOD) NMR spectrum of compound **11** (in CD_3OD).

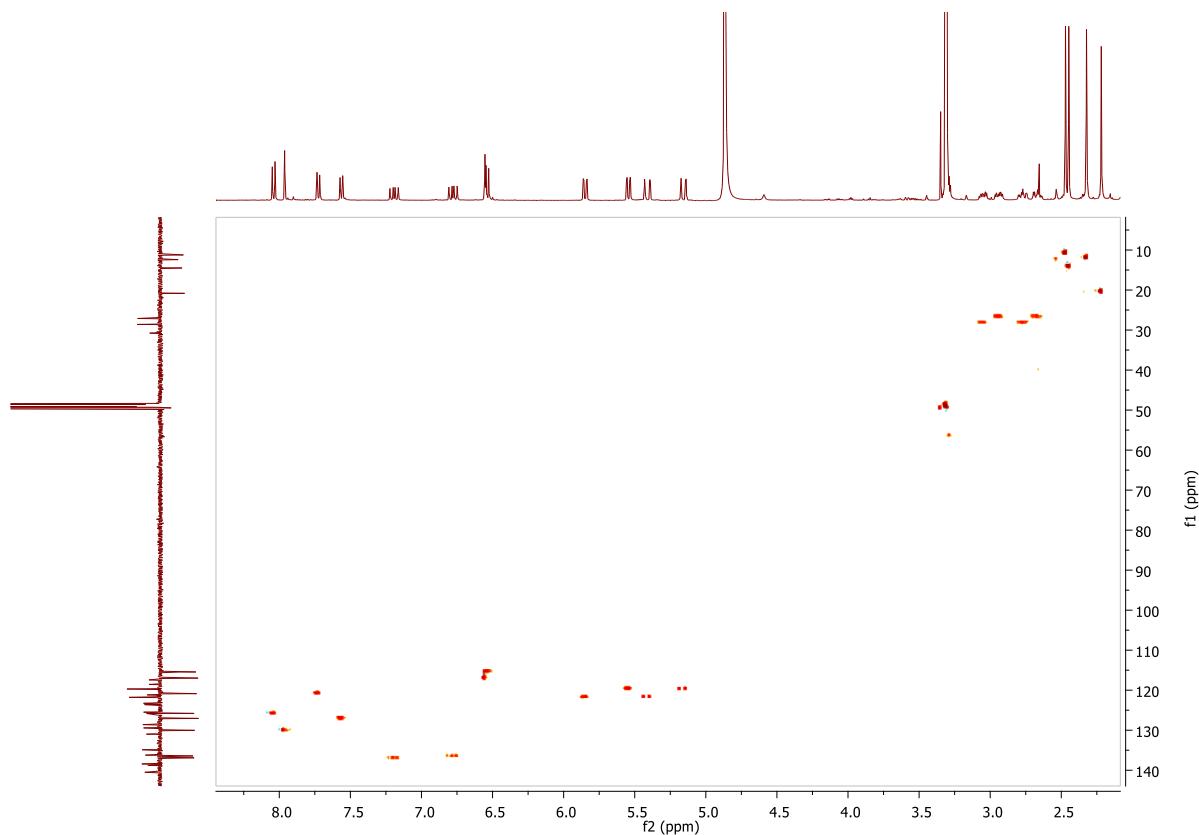


Figure S61. HSQC spectrum of compound **11** (in CD₃OD).

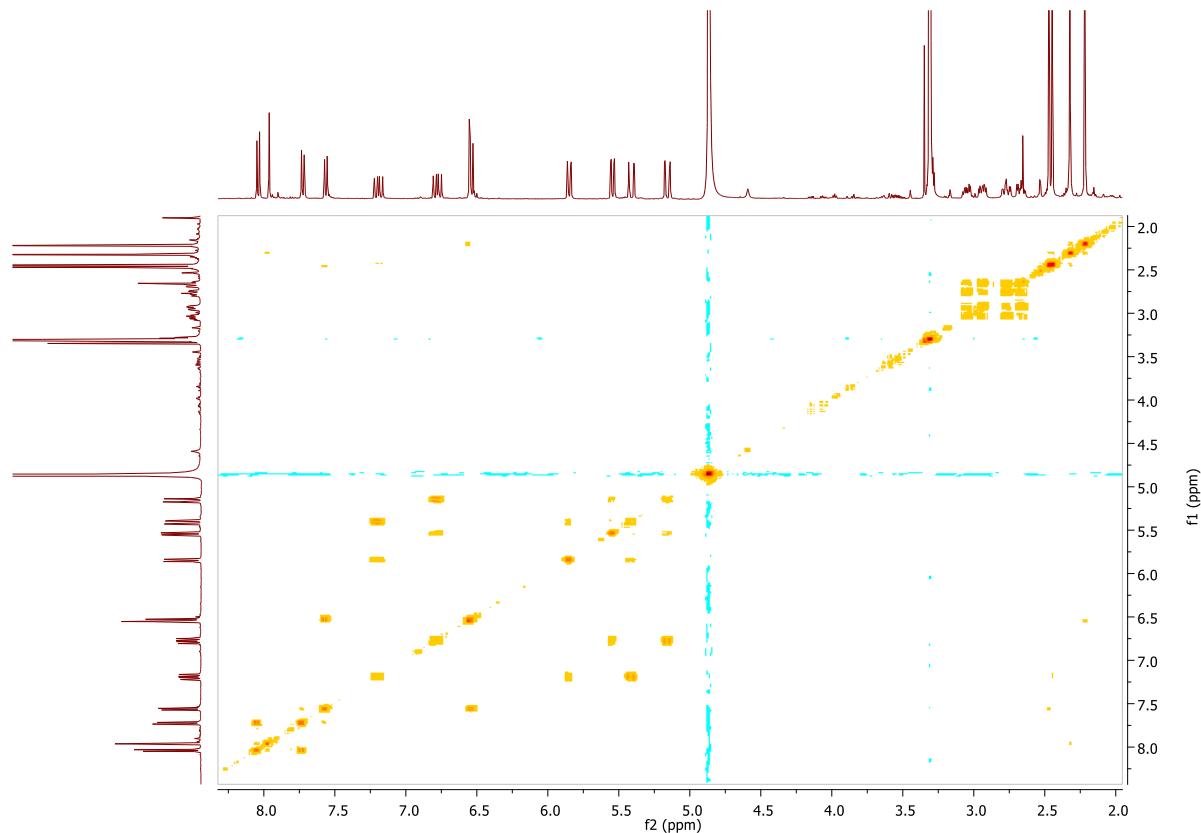


Figure S62. ¹H-¹H COSY spectrum of compound **11** (in CD₃OD).

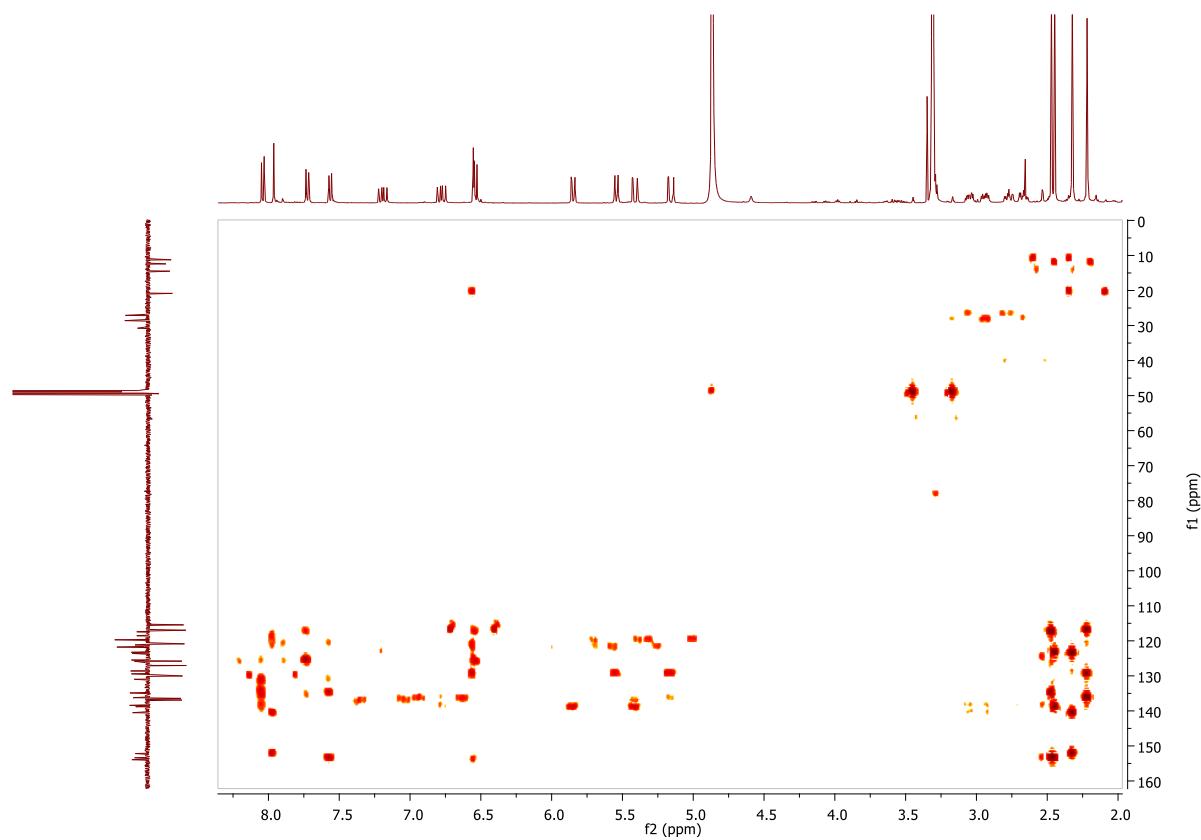


Figure S63. HMBC spectrum of compound **11** (in CD_3OD).

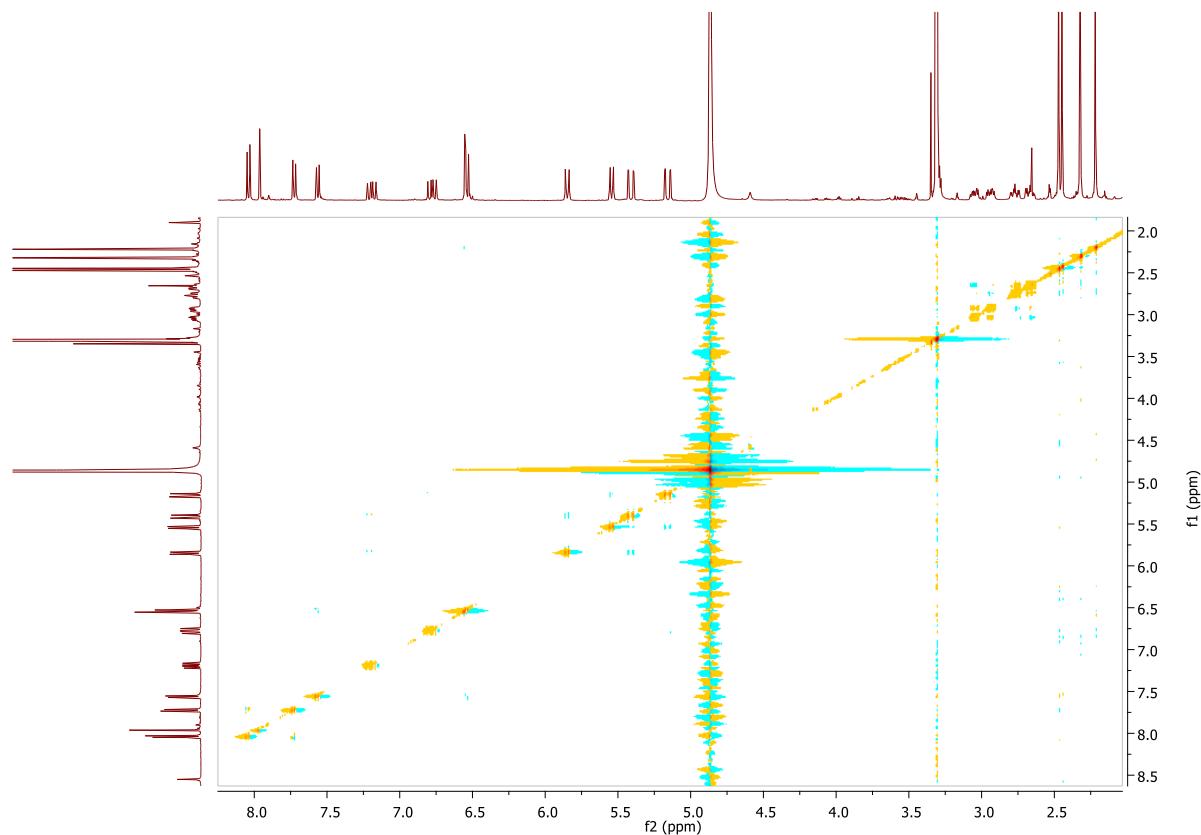
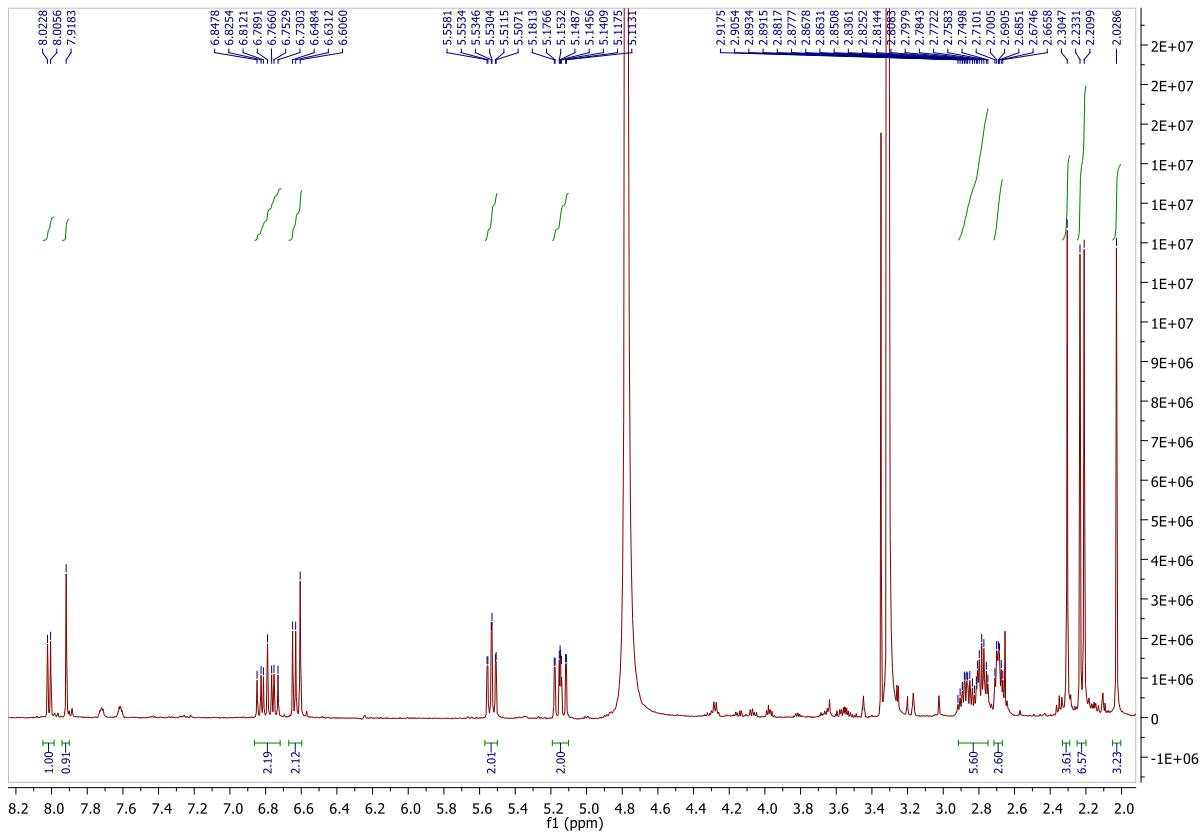


Figure S64. NOESY spectrum of compound 11 (in CD₃OD).**Figure S65.** ¹H NMR spectrum of compound 12 (in CD₃OD).

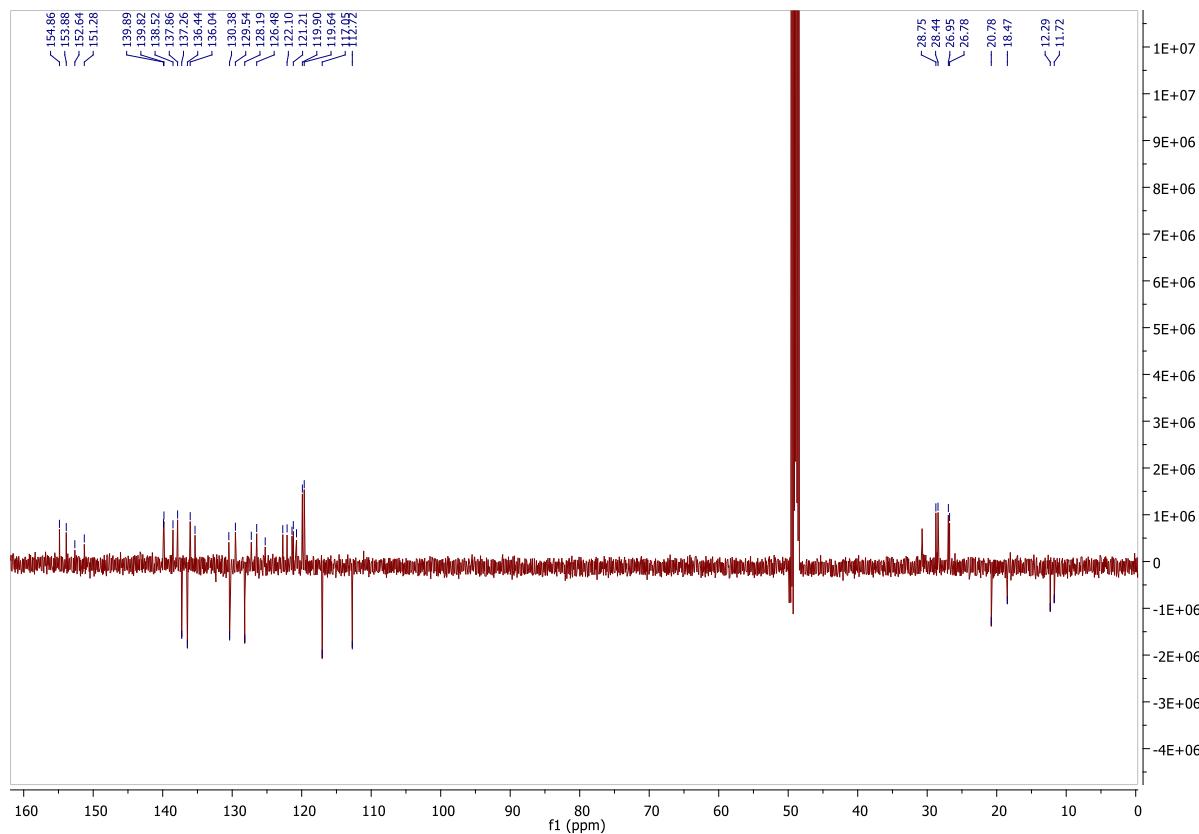


Figure S66. ¹³C (JMOD) NMR spectrum of compound **12** (in CD₃OD).

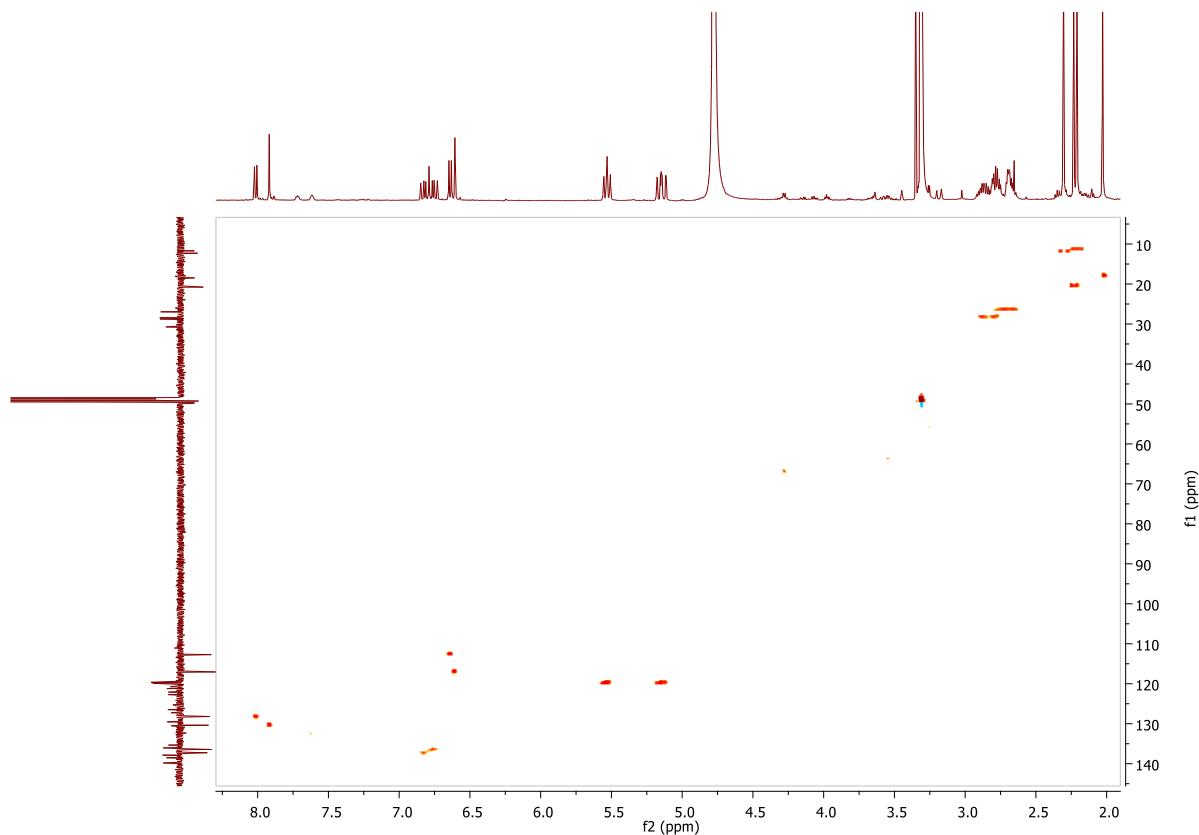


Figure S67. HSQC spectrum of compound **12** (in CD₃OD).

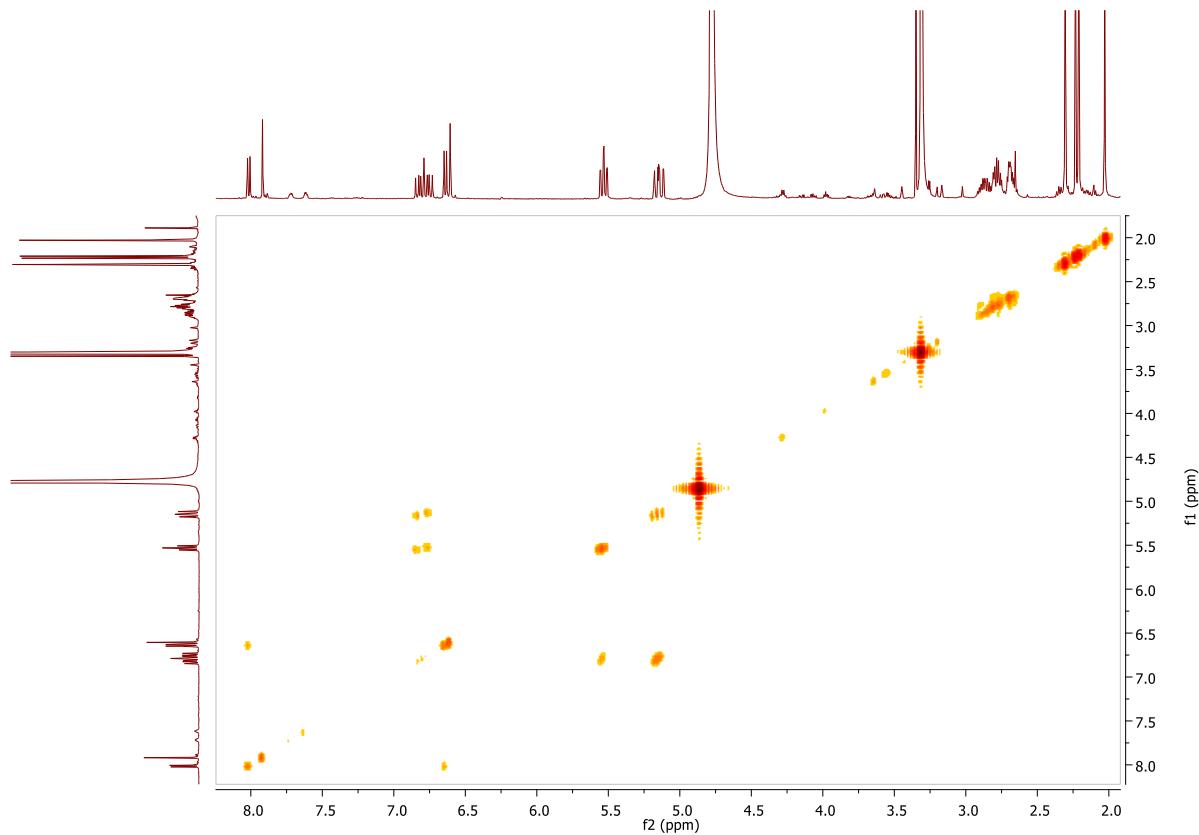


Figure S68. ¹H-¹H COSY spectrum of compound **12** (in CD₃OD).

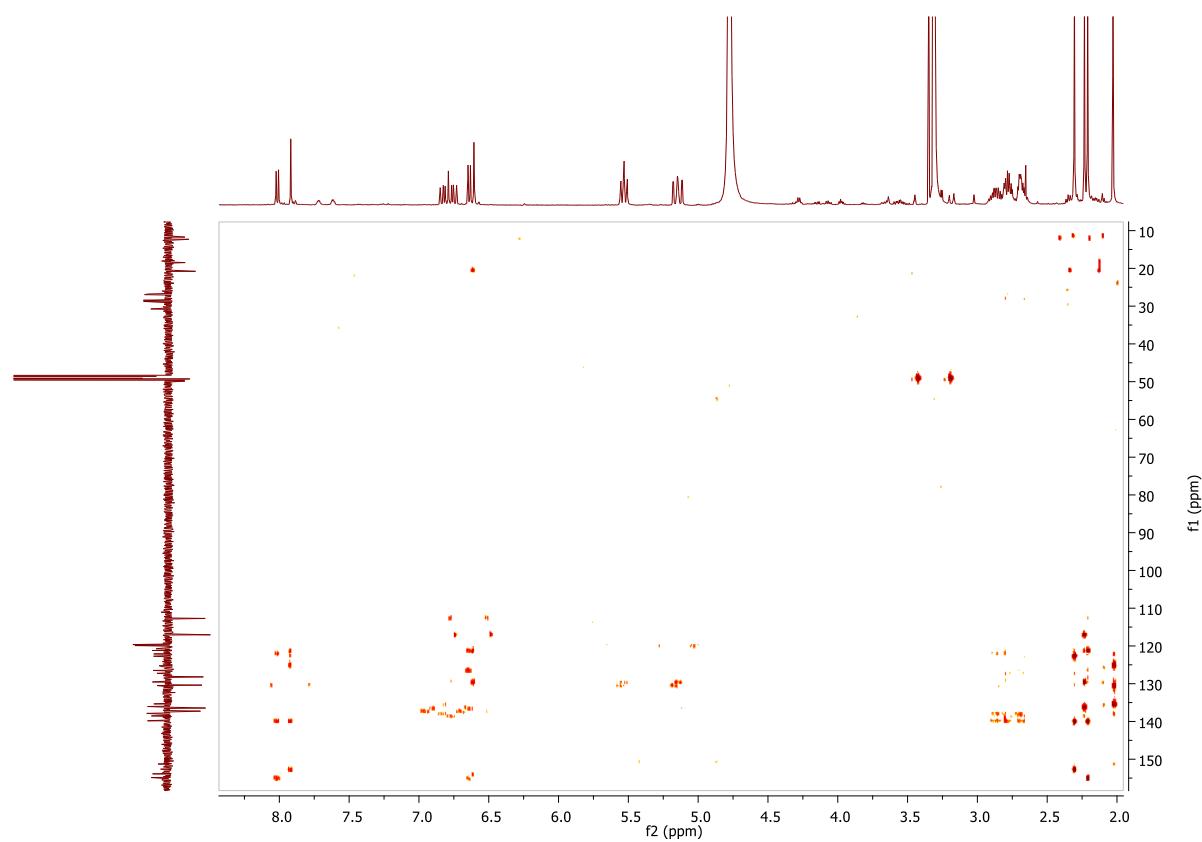


Figure S69. HMBC spectrum of compound **12** (in CD_3OD).

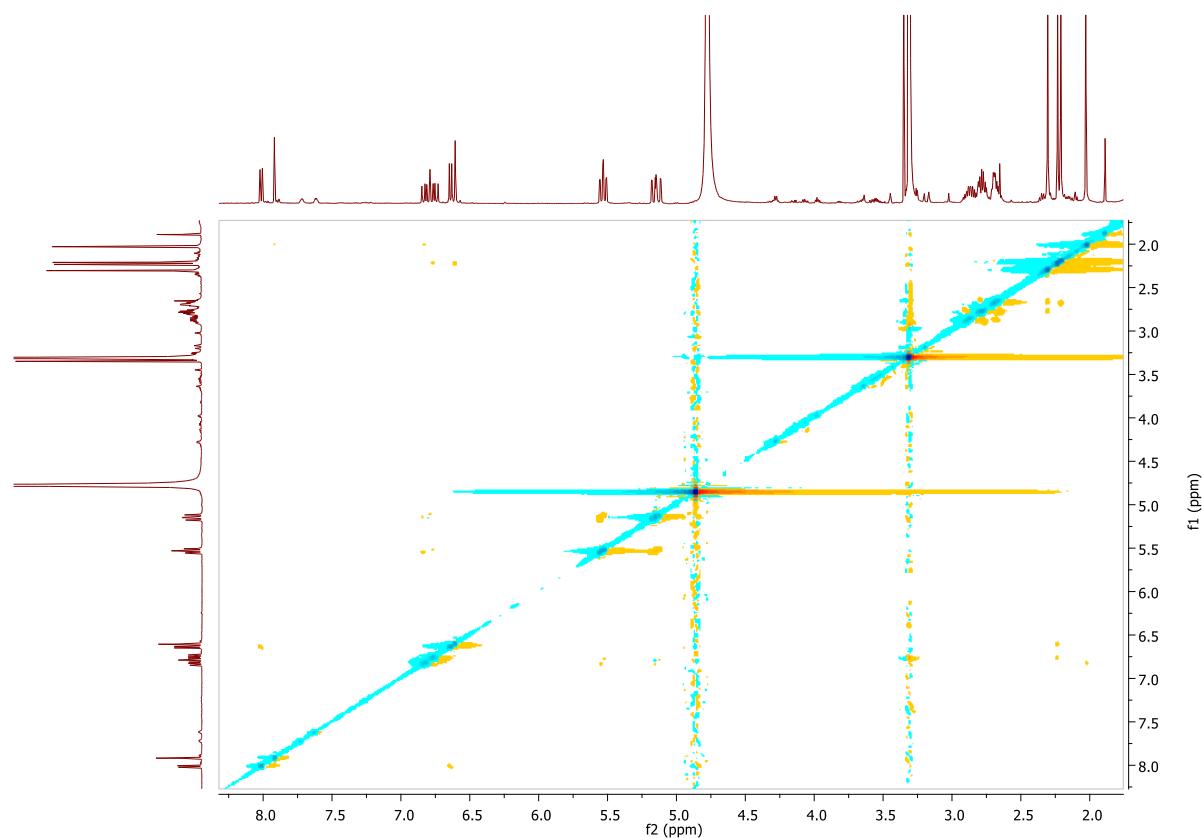
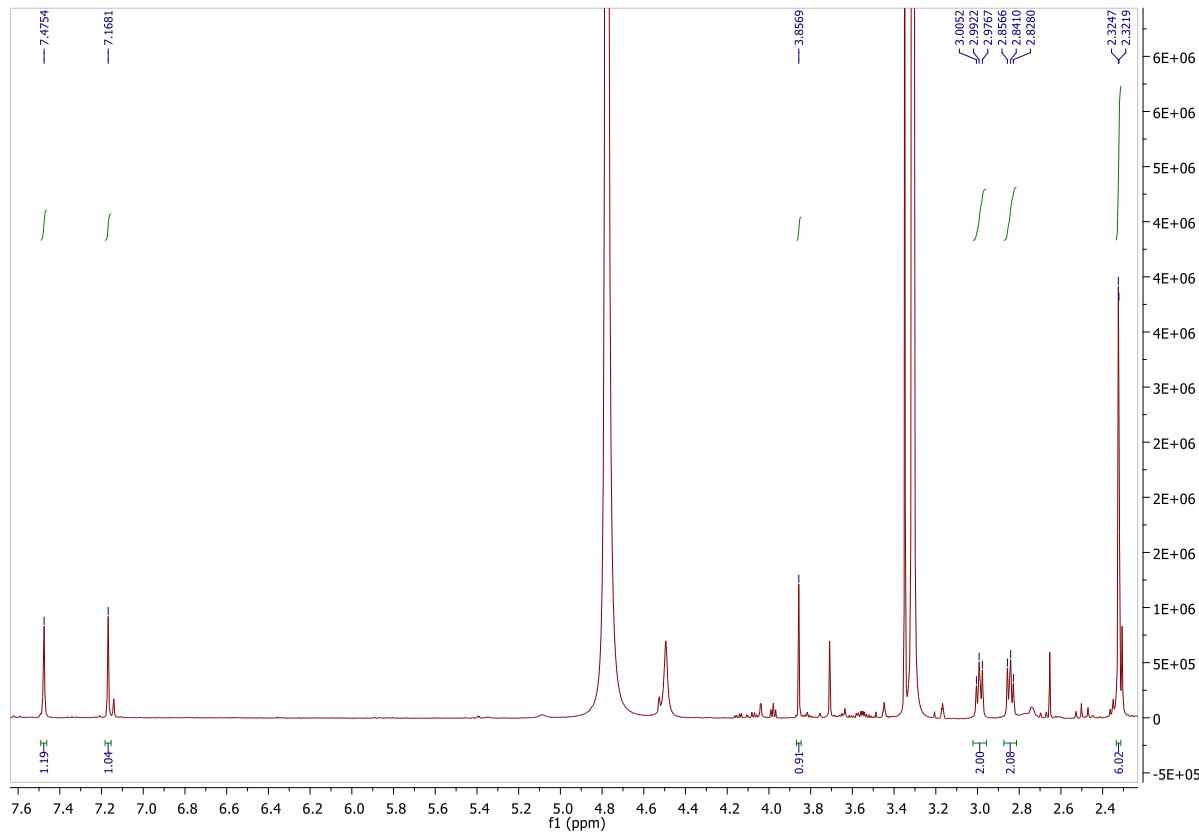


Figure S72. NOESY spectrum of compound **12** (in CD₃OD).**Figure S73.** ¹H NMR spectrum of compound **13** (in CD₃OD).

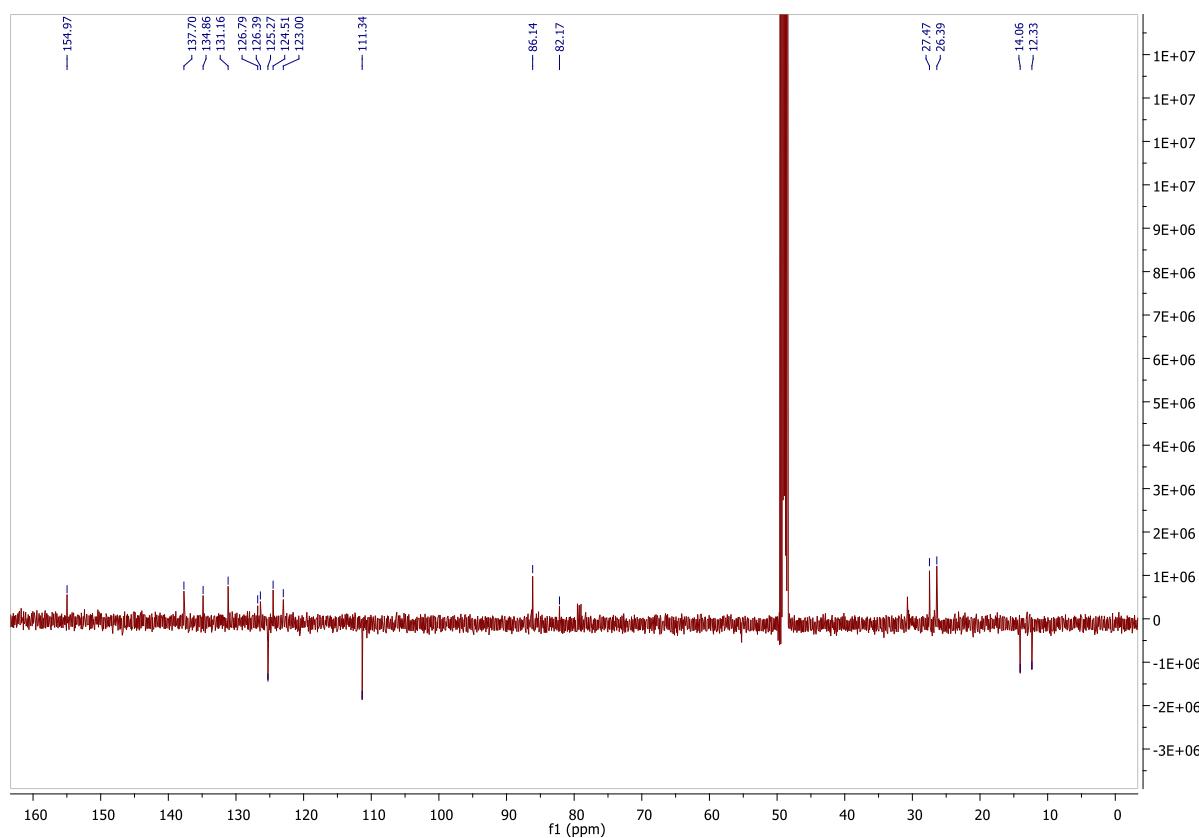


Figure S74. ^{13}C (JMOD) NMR spectrum of compound **13** (in CD_3OD).

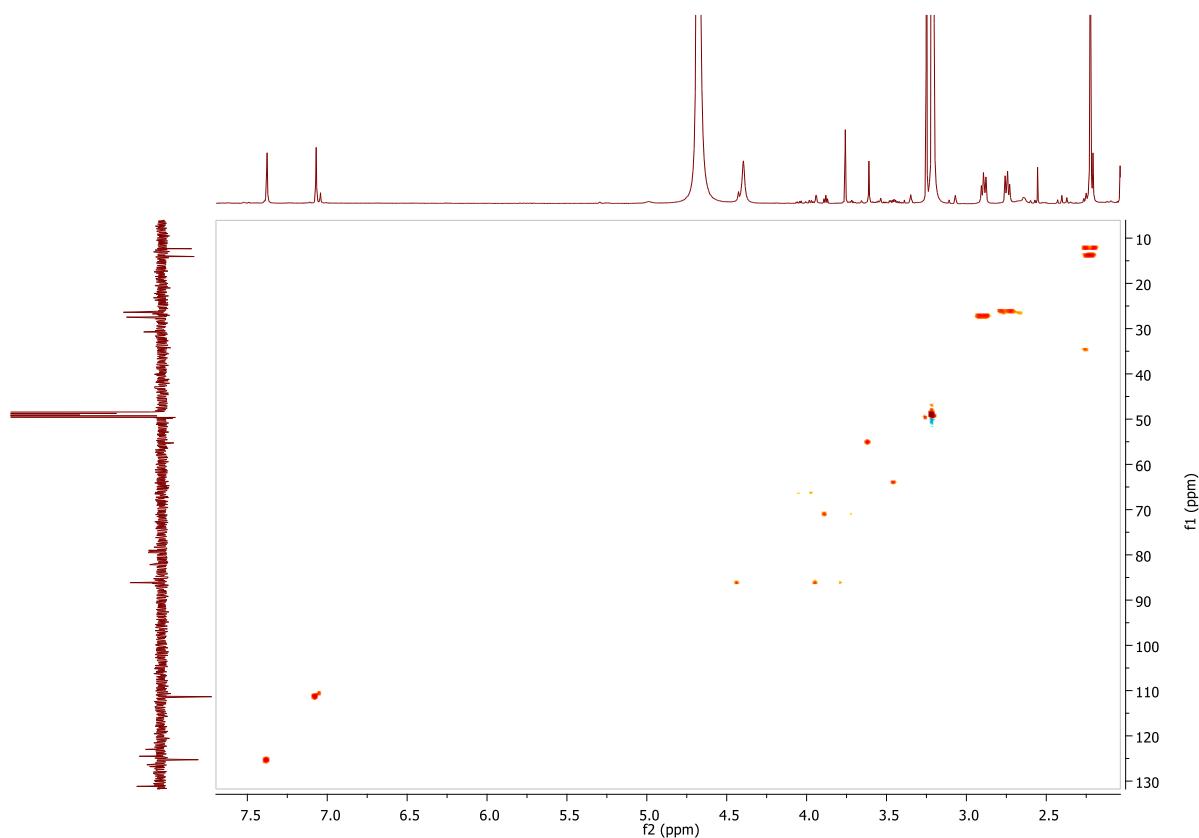


Figure S75. HSQC spectrum of compound **13** (in CD₃OD).

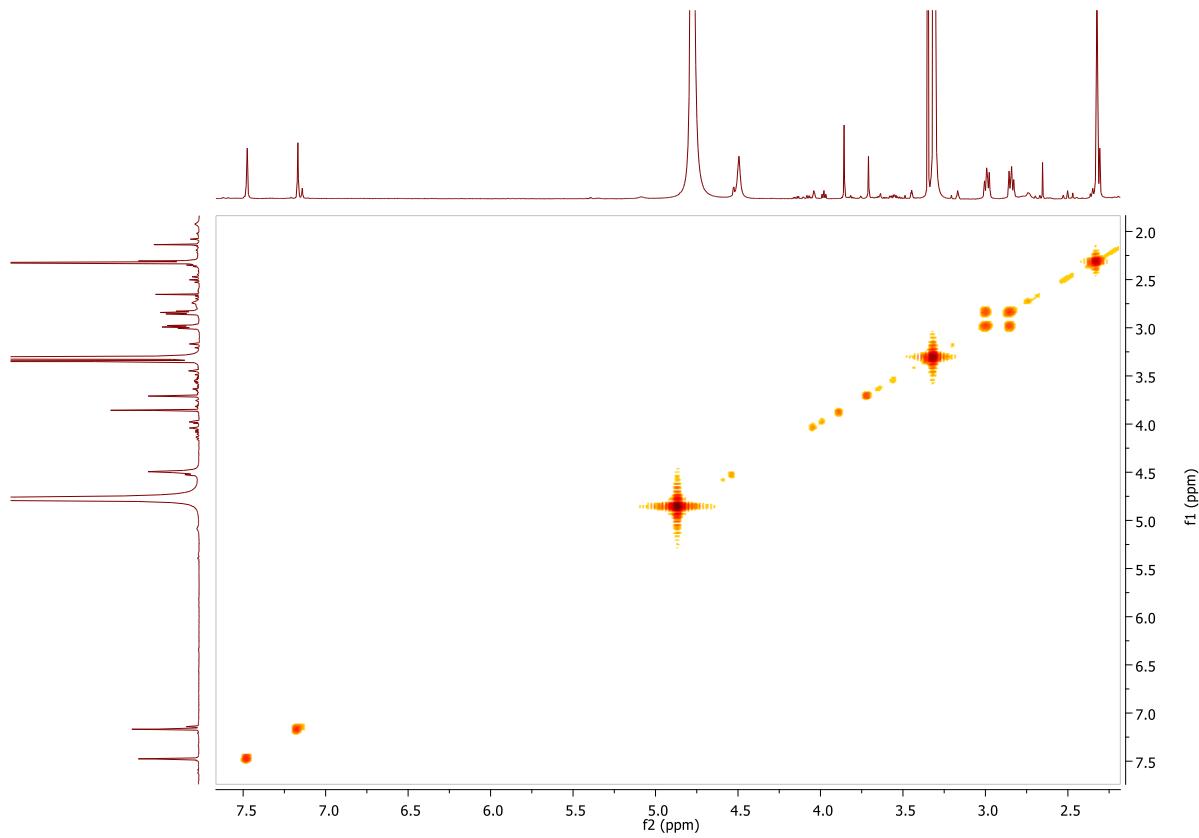


Figure S76. ¹H-¹H COSY spectrum of compound **13** (in CD₃OD).

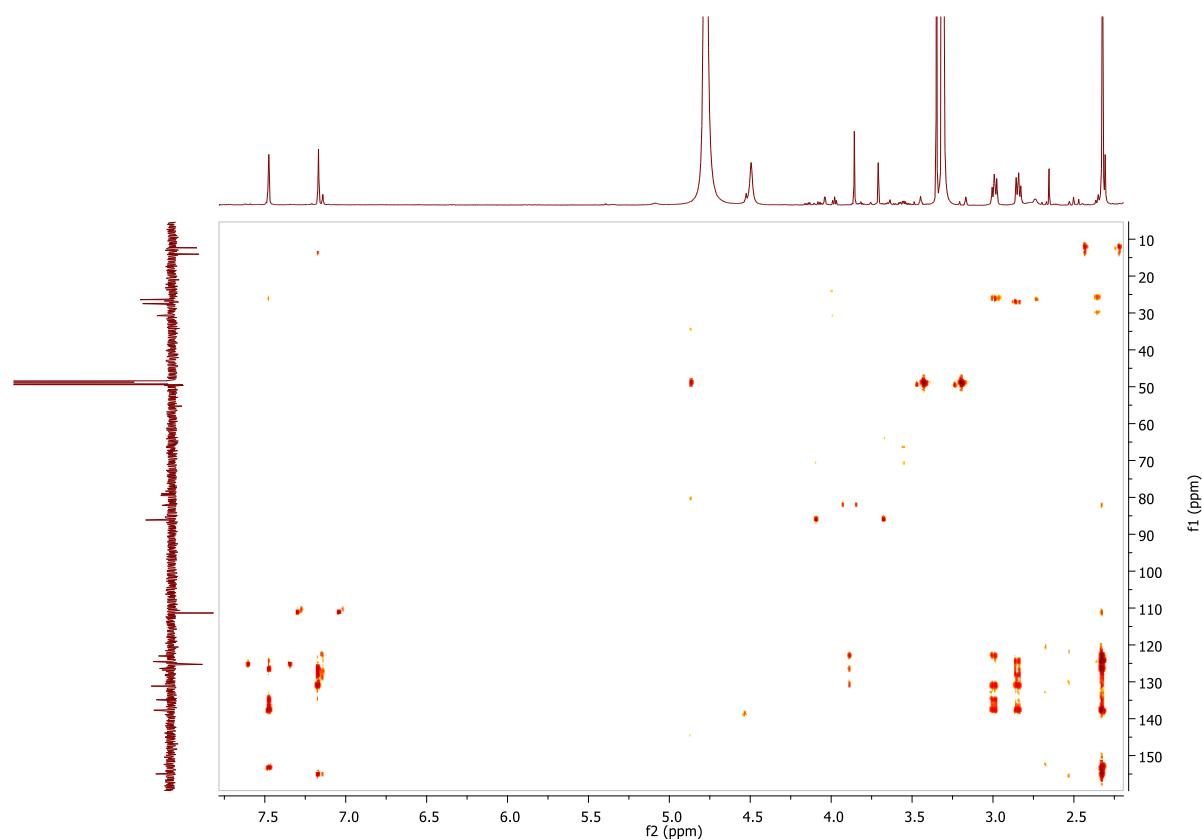


Figure S77. HMBC spectrum of compound **13** (in CD_3OD).

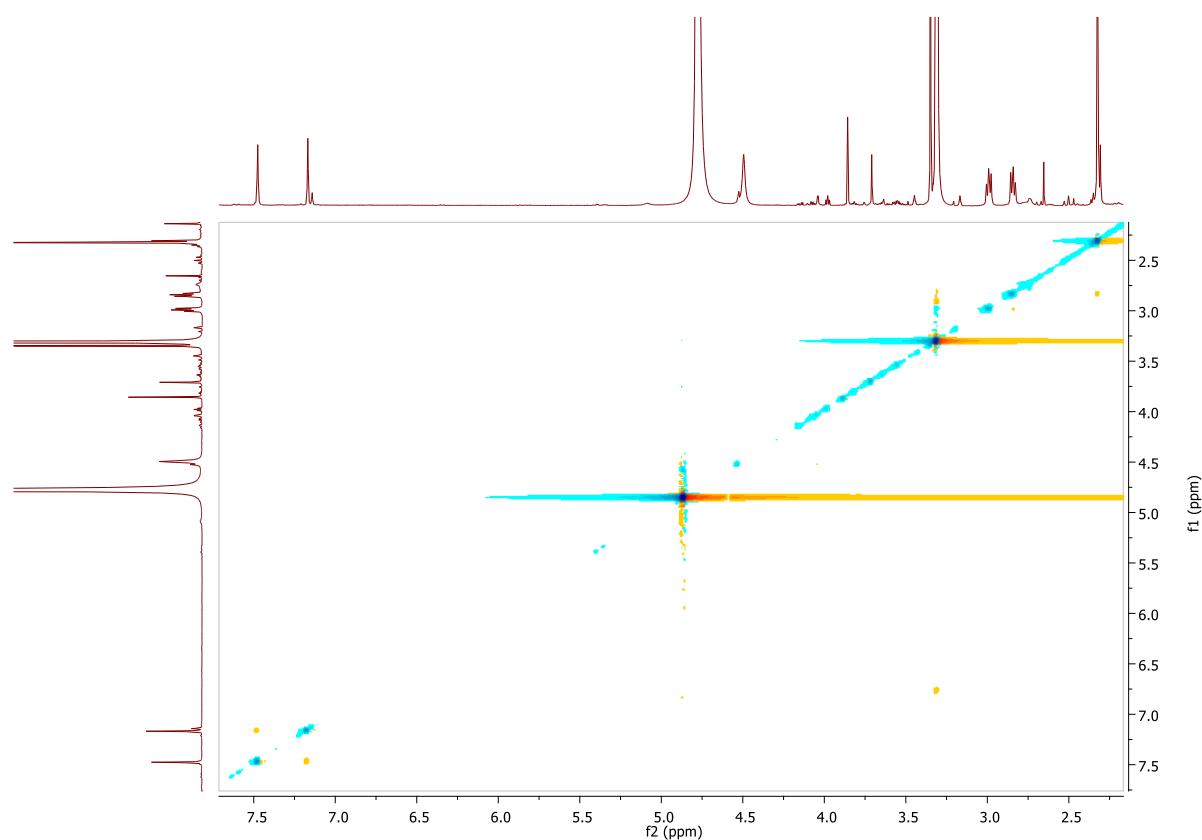


Figure S78. NOESY spectrum of compound **13** (in CD₃OD).