Supplementary Information

Synthesis and evaluation of analogs of tetracyclic *Ganoderma* alkaloids as inhibitors of the enzyme α-glucosidase

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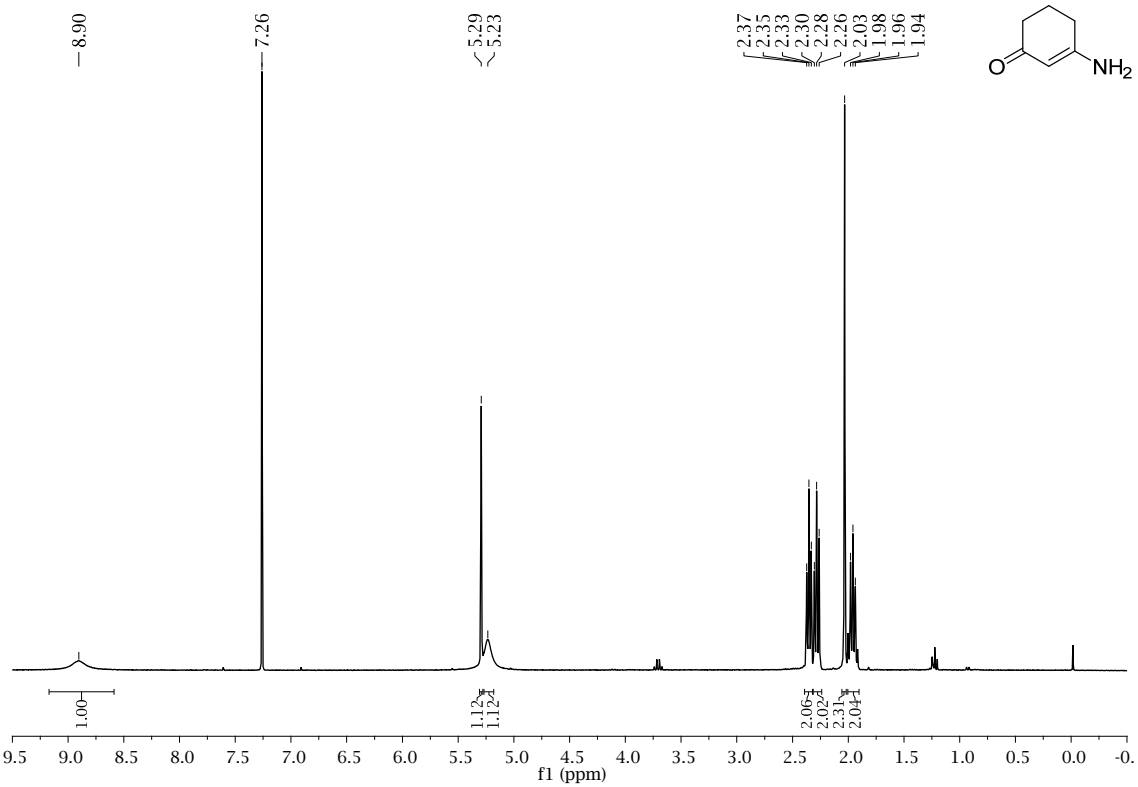

Figure S1. ^{1}H NMR (300 MHz) spectrum of **3** in $CDCl_3$.

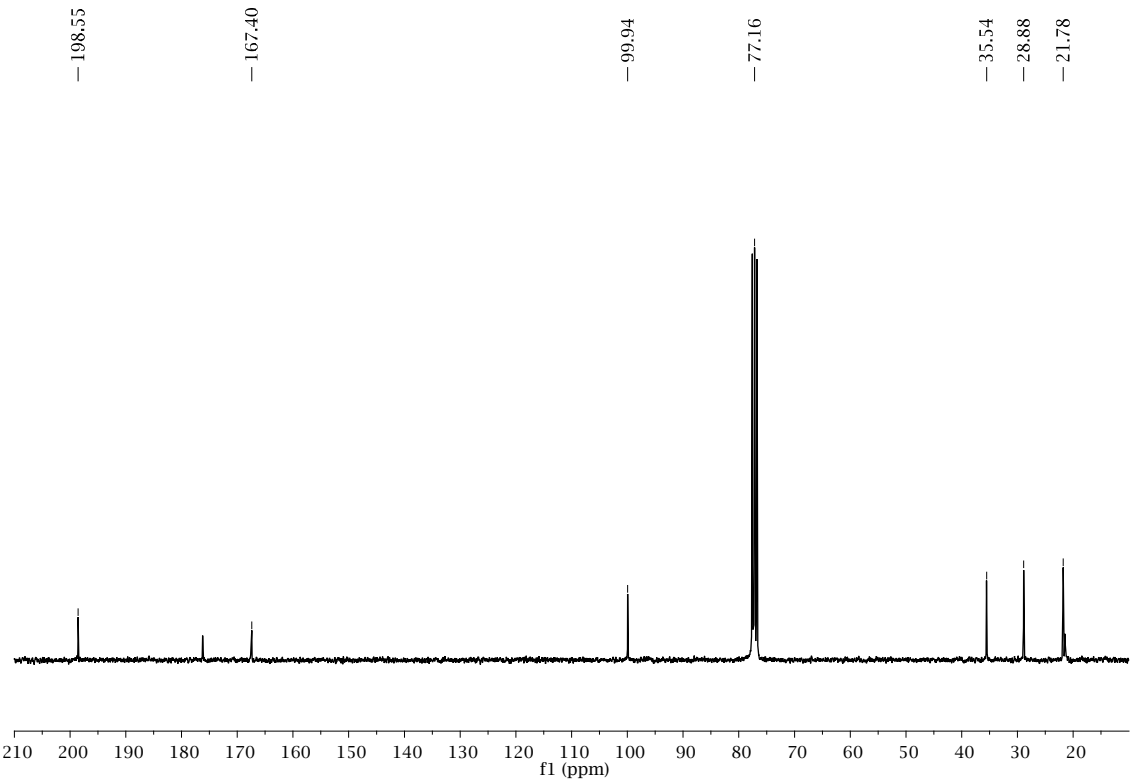

Figure S2. ^{13}C NMR (75 MHz) spectrum of **3** in $CDCl_3$.

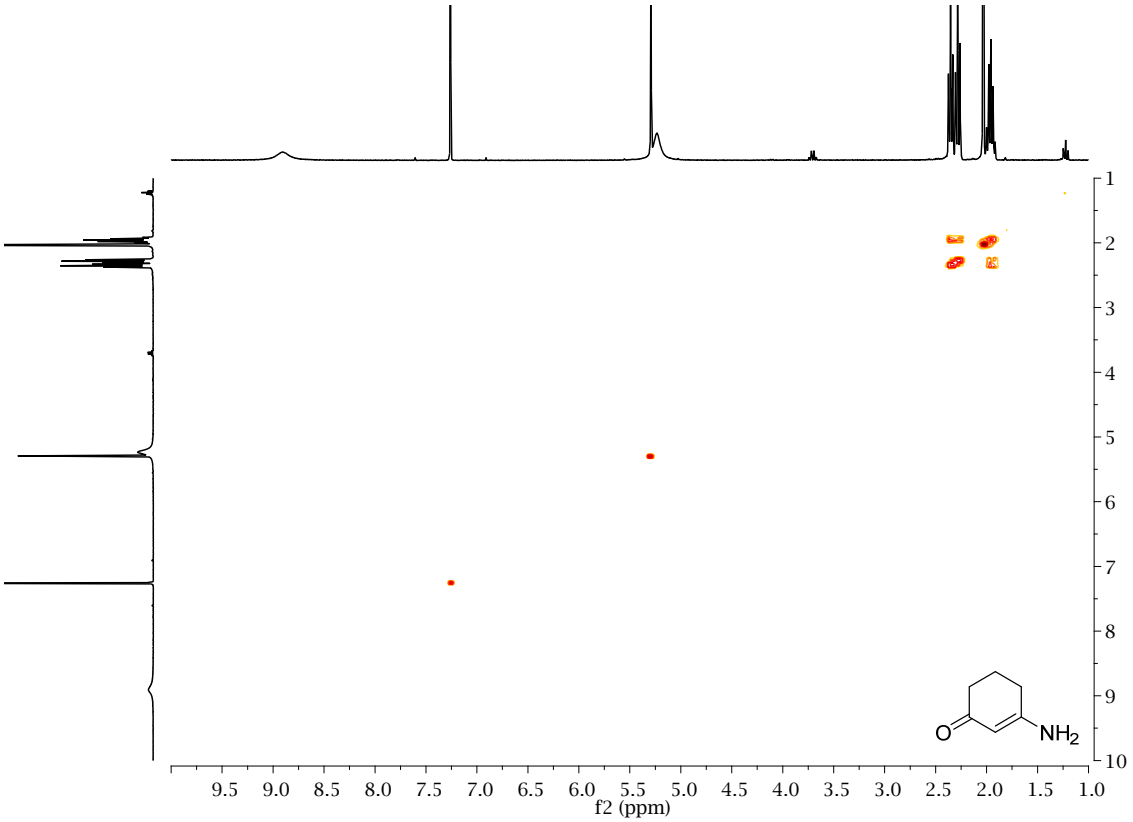

Figure S3. COSY spectrum of **3** in $CDCl_3$.

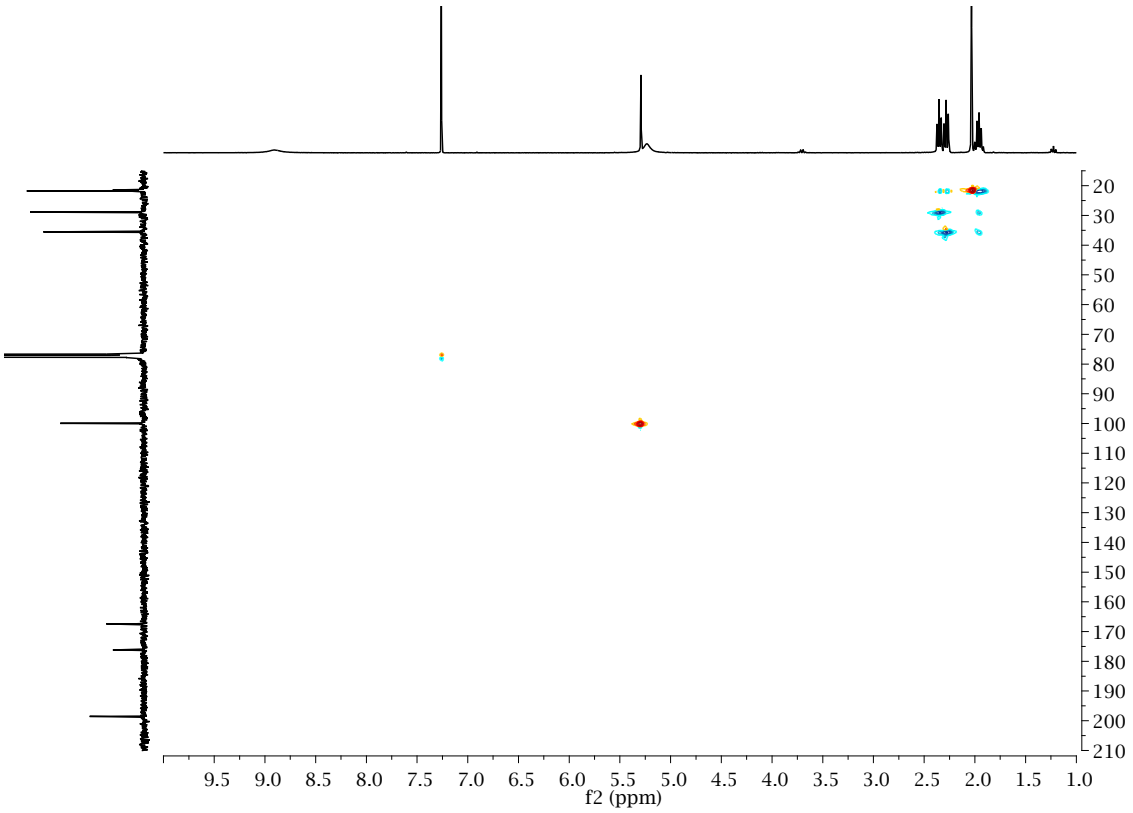

Figure S4. HSQC spectrum of **3** in $CDCl_3$.

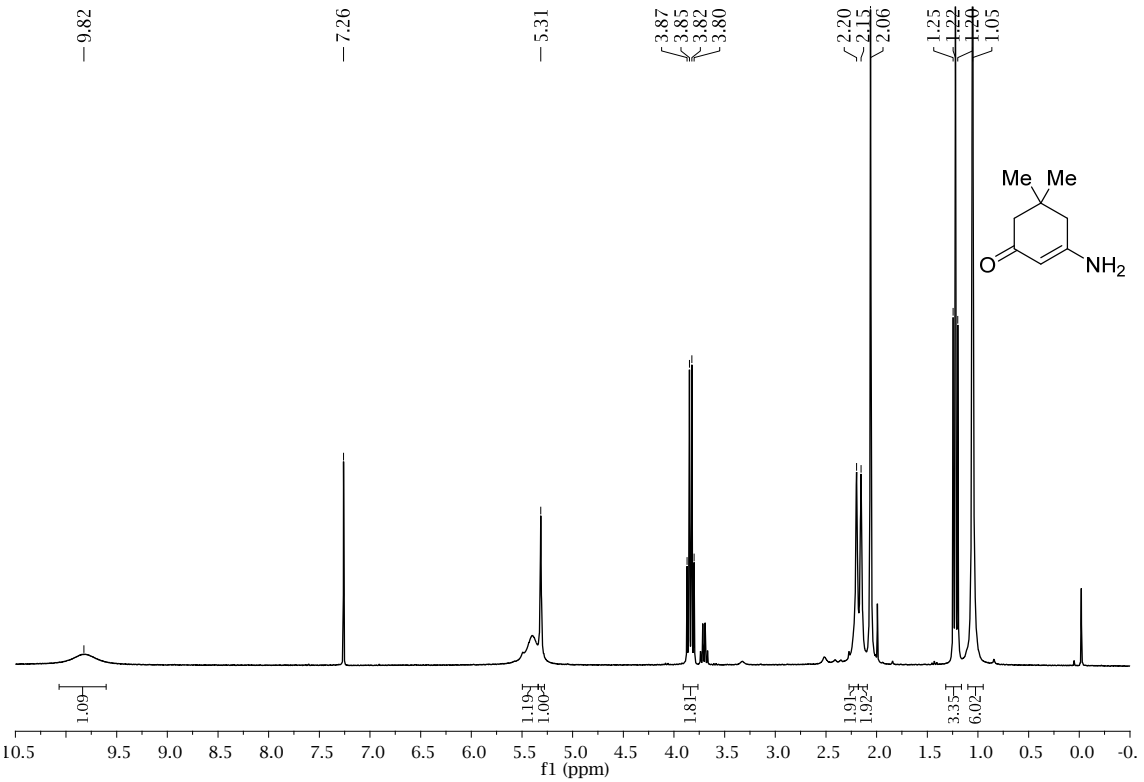

Figure S5. ^{1}H NMR (300 MHz) spectrum of **3a** in $CDCl_3$.

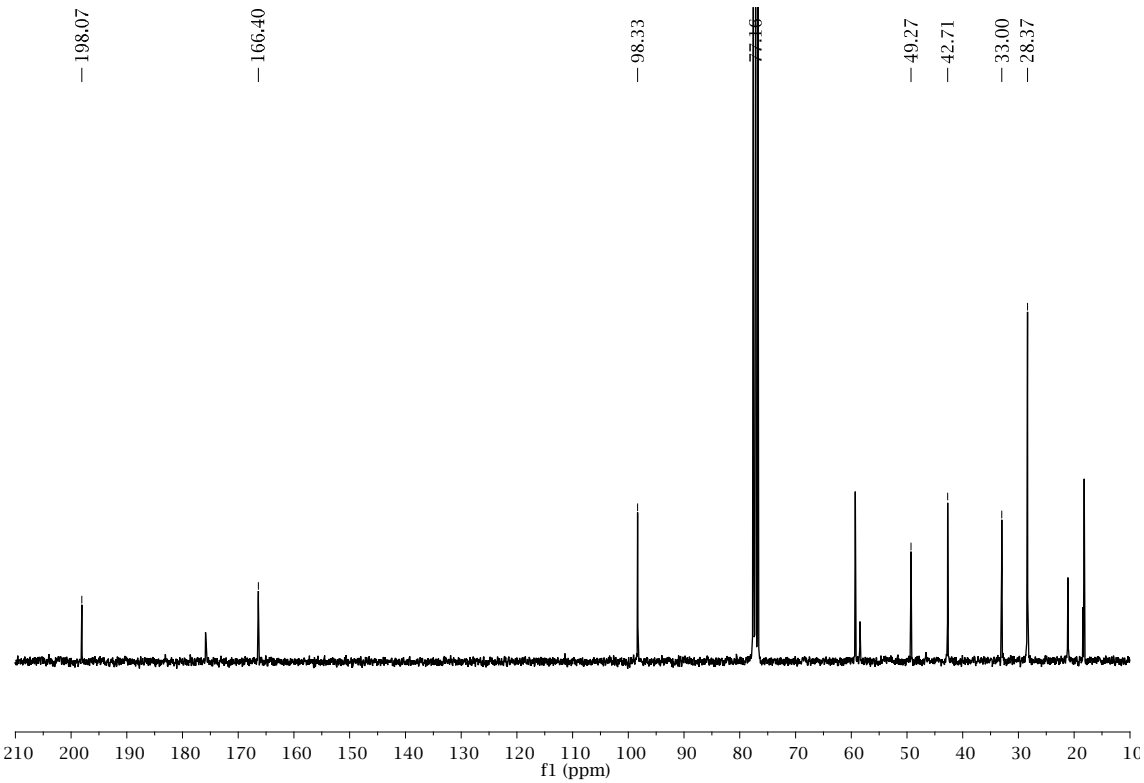

Figure S6. ^{13}C NMR (75 MHz) spectrum of **3a** in $CDCl_3$.

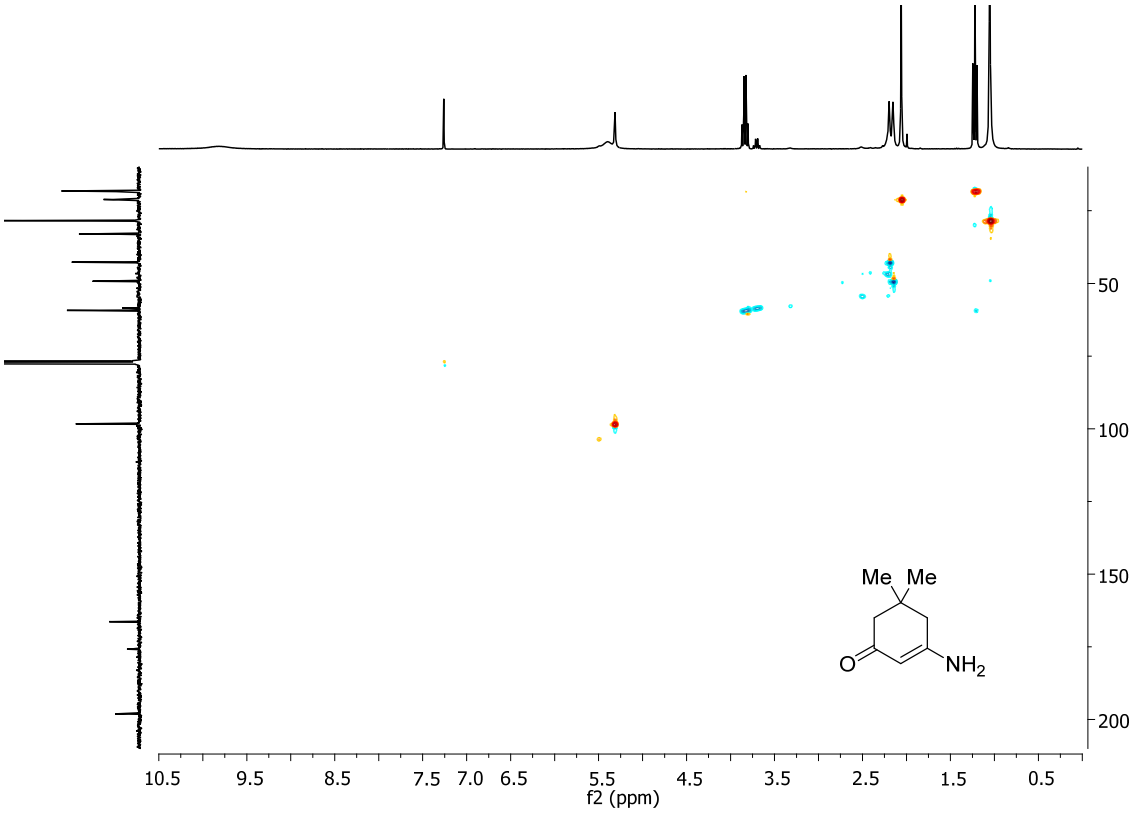

Figure S7. HSQC spectrum of **3a** in $CDCl_3$.

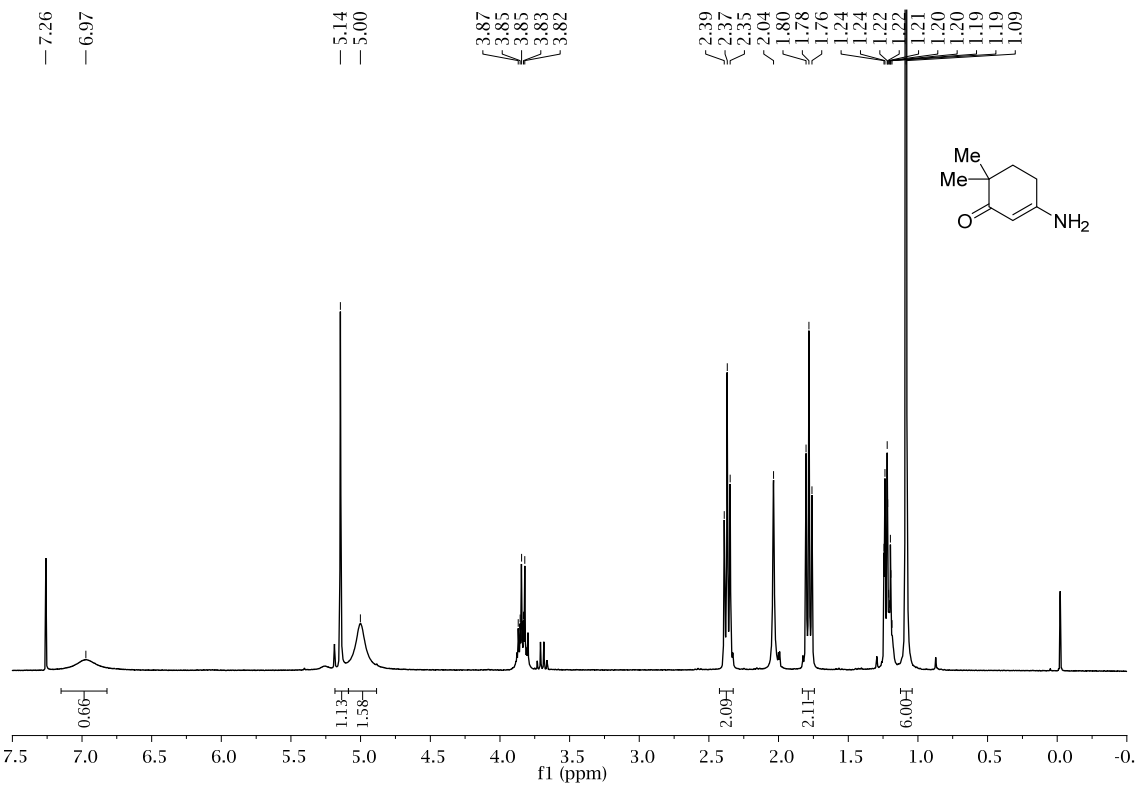

Figure S8. ^{1}H NMR (300 MHz) spectrum of **3b** in $CDCl_3$.

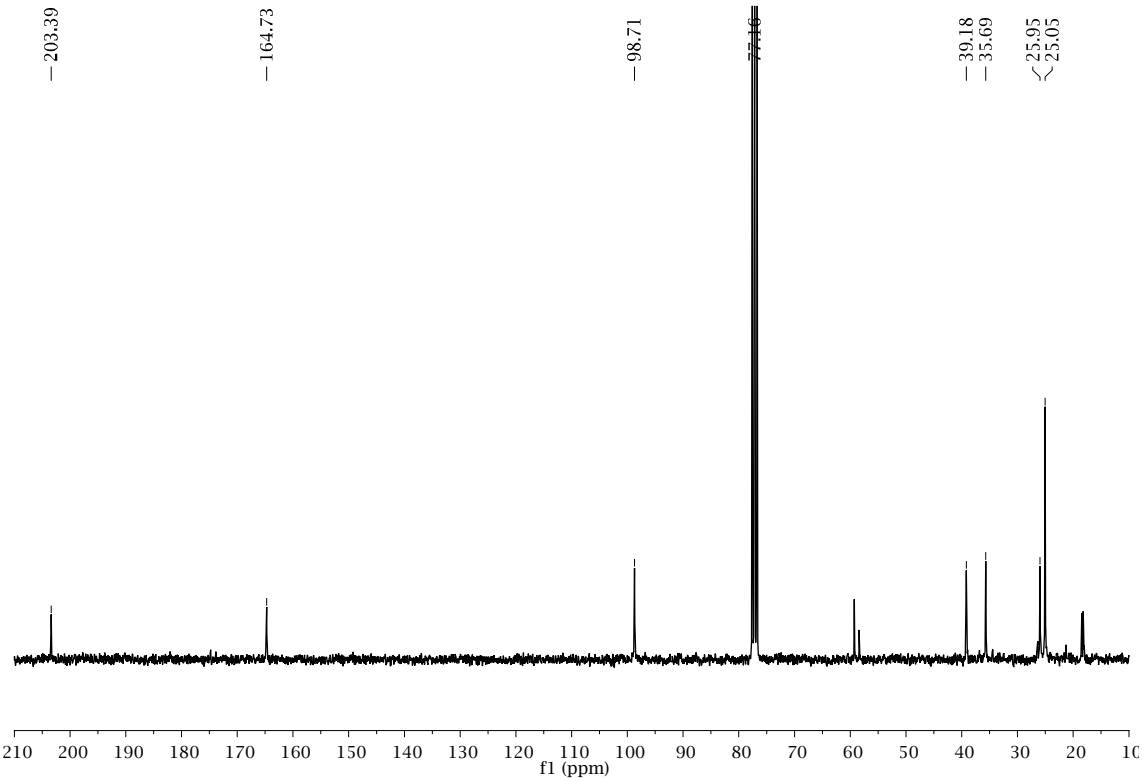

Figure S9. ^{13}C NMR (75 MHz) spectrum of **3b** in $CDCl_3$.

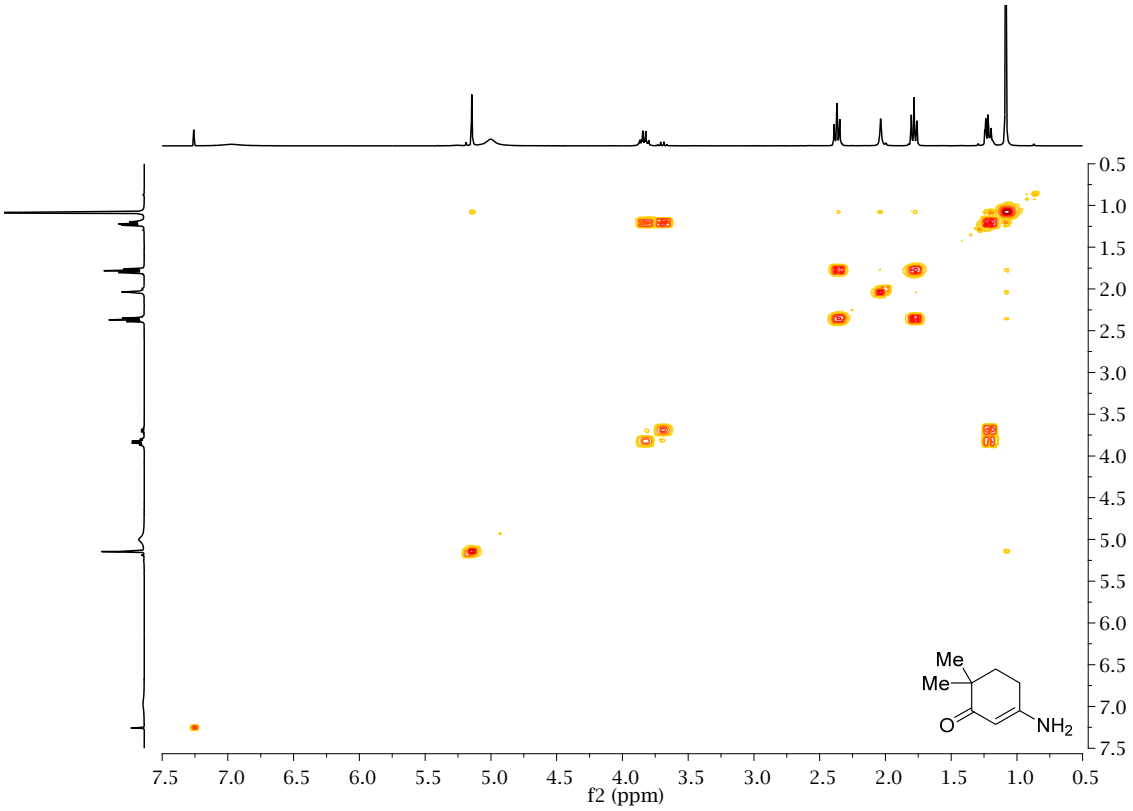

Figure S10. COSY spectrum of **3b** in $CDCl_3$.

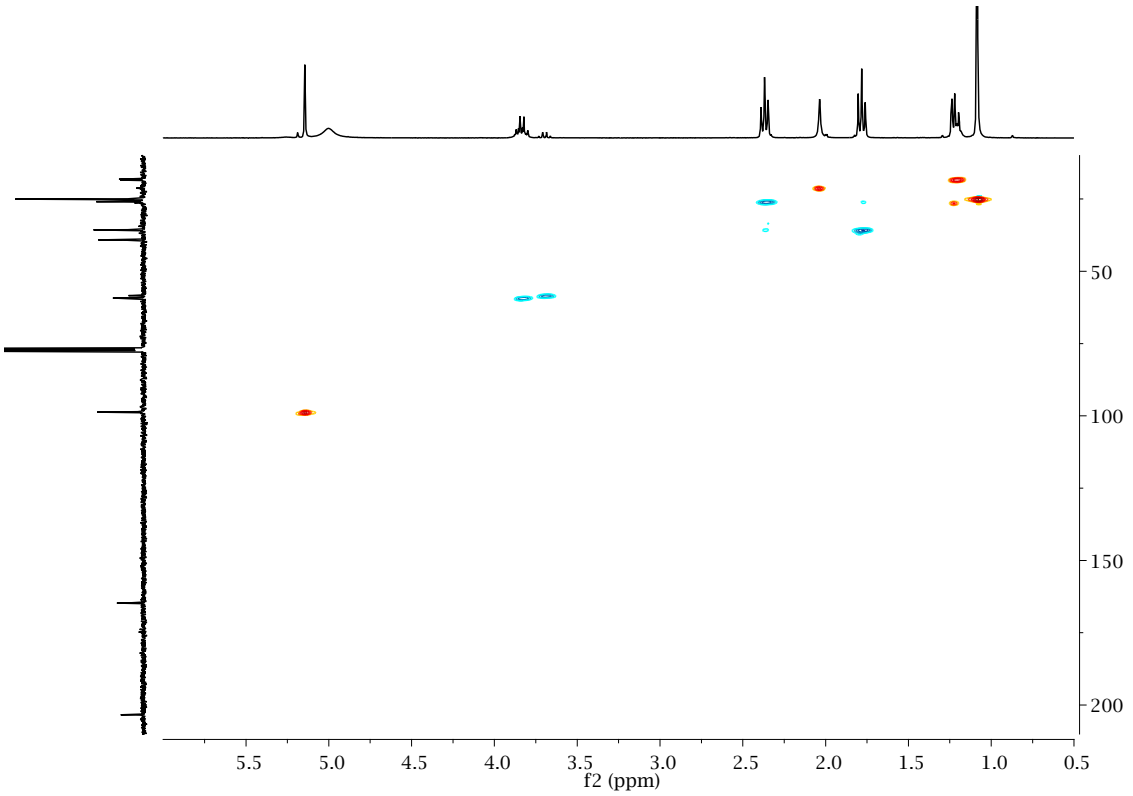

Figure S11. HSQC spectrum of **3b** in $CDCl_3$.

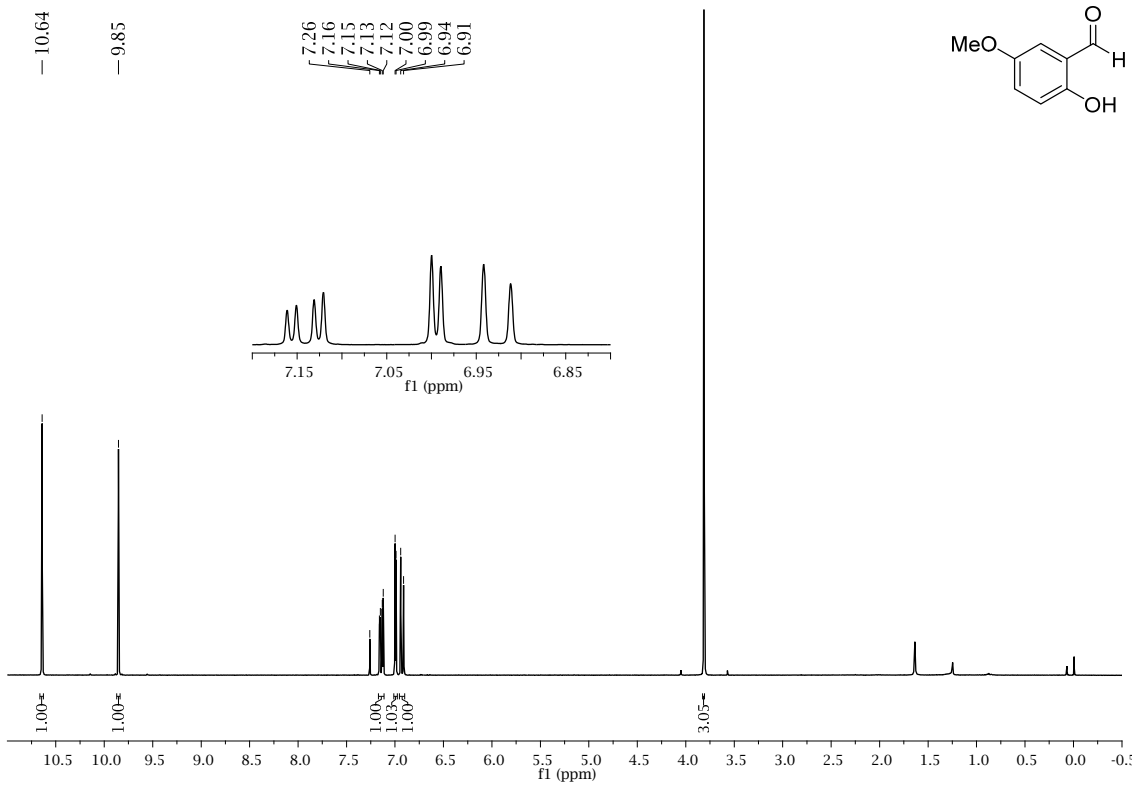

Figure S12. ^{1}H NMR (300 MHz) spectrum of **9** in $CDCl_3$.

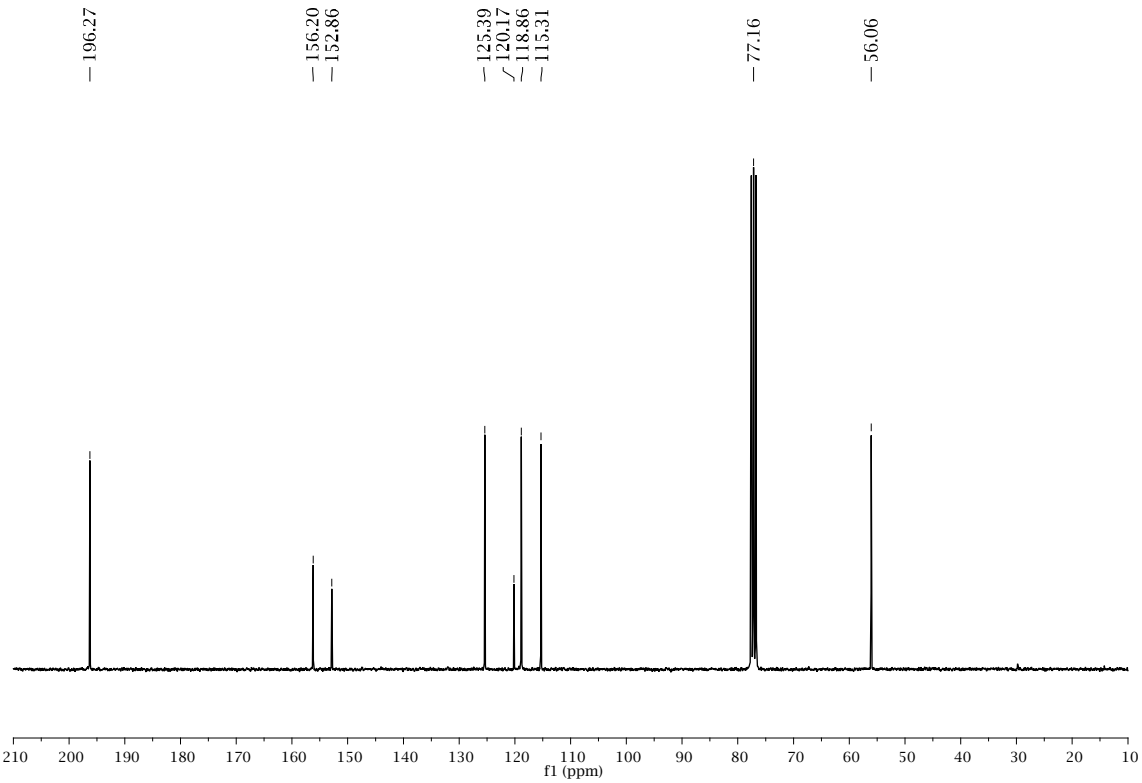

Figure S13. ^{13}C NMR (75 MHz) spectrum of **9** in $CDCl_3$.

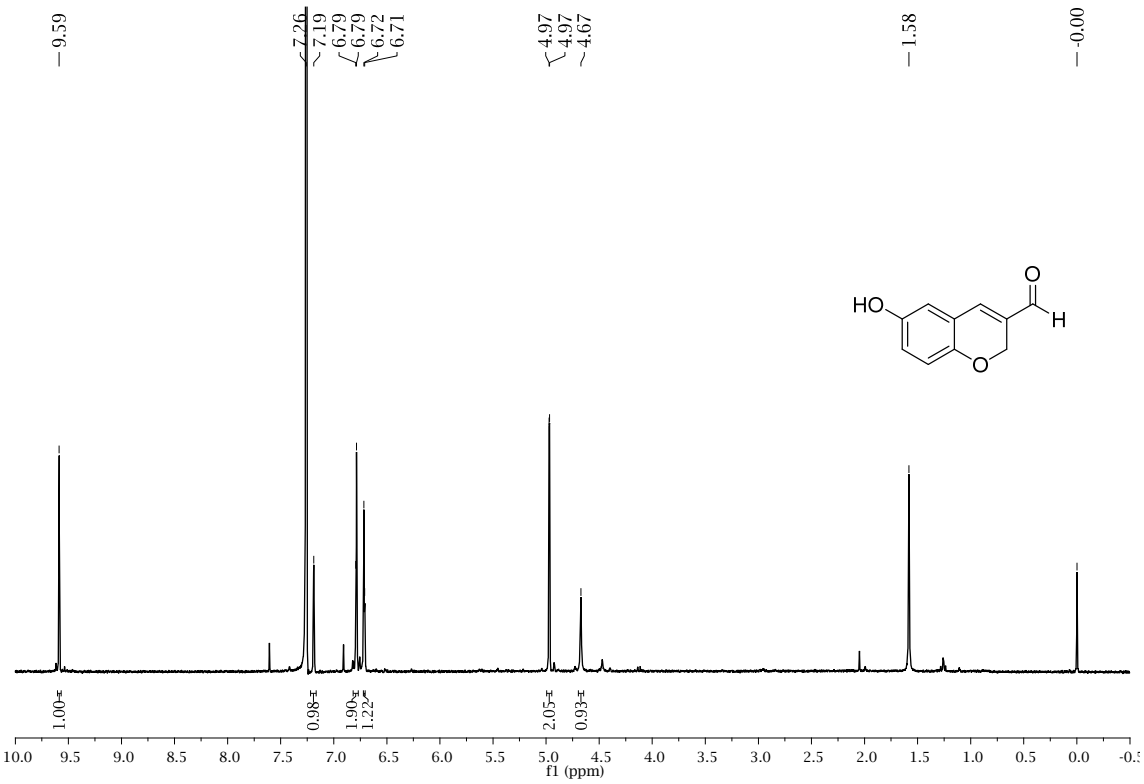

Figure S14. ^{1}H NMR (300 MHz) spectrum of **11** in $CDCl_3$.

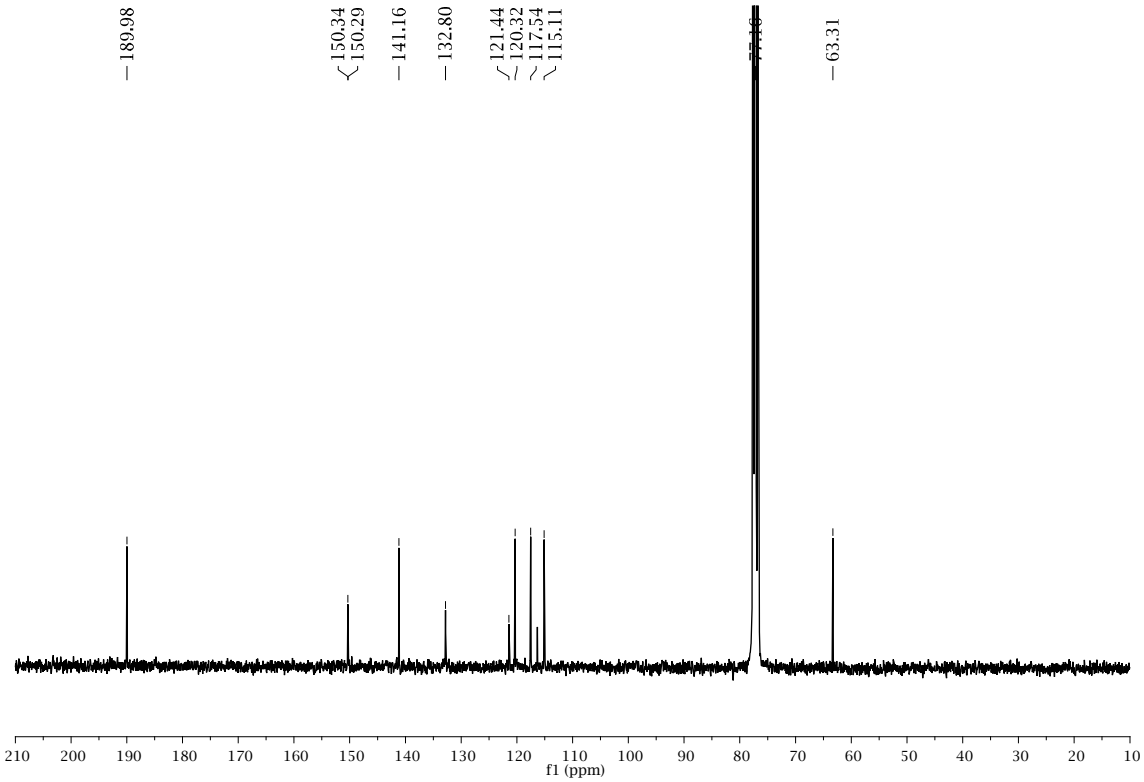

Figure S15. ^{13}C NMR (75 MHz) spectrum of **11** in $CDCl_3$.

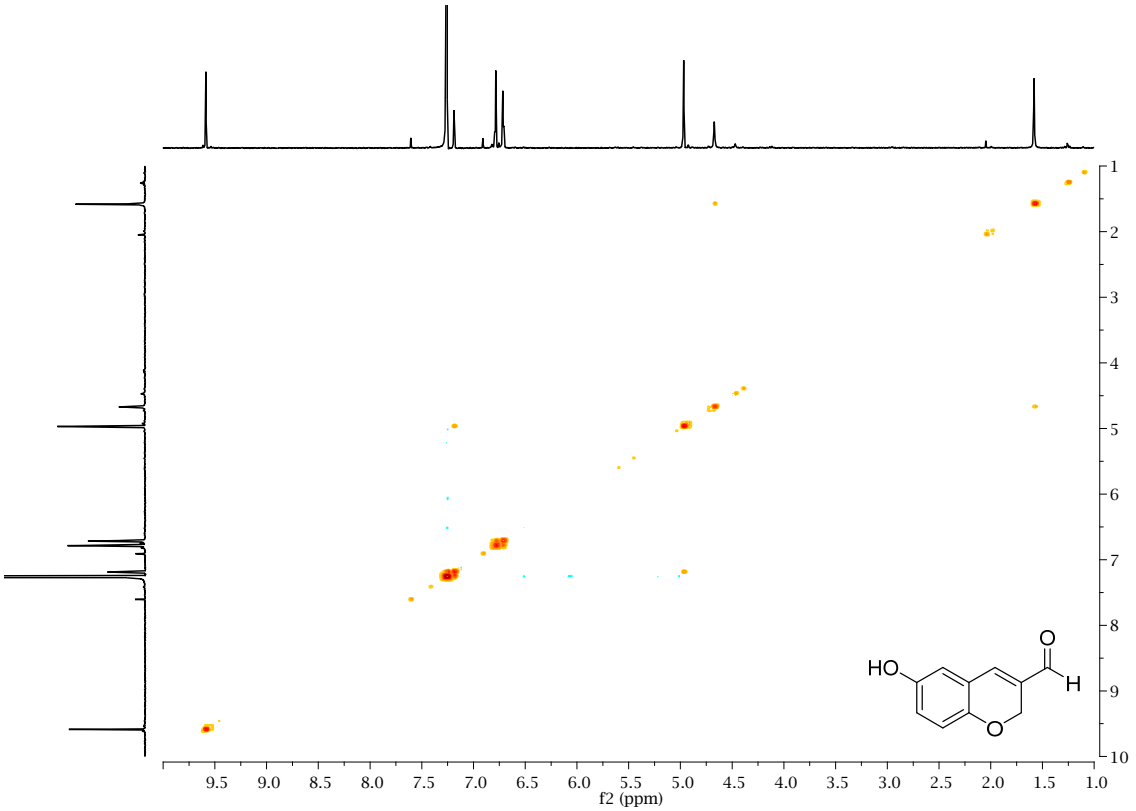

Figure S16. COSY spectrum of **11** in $CDCl_3$.

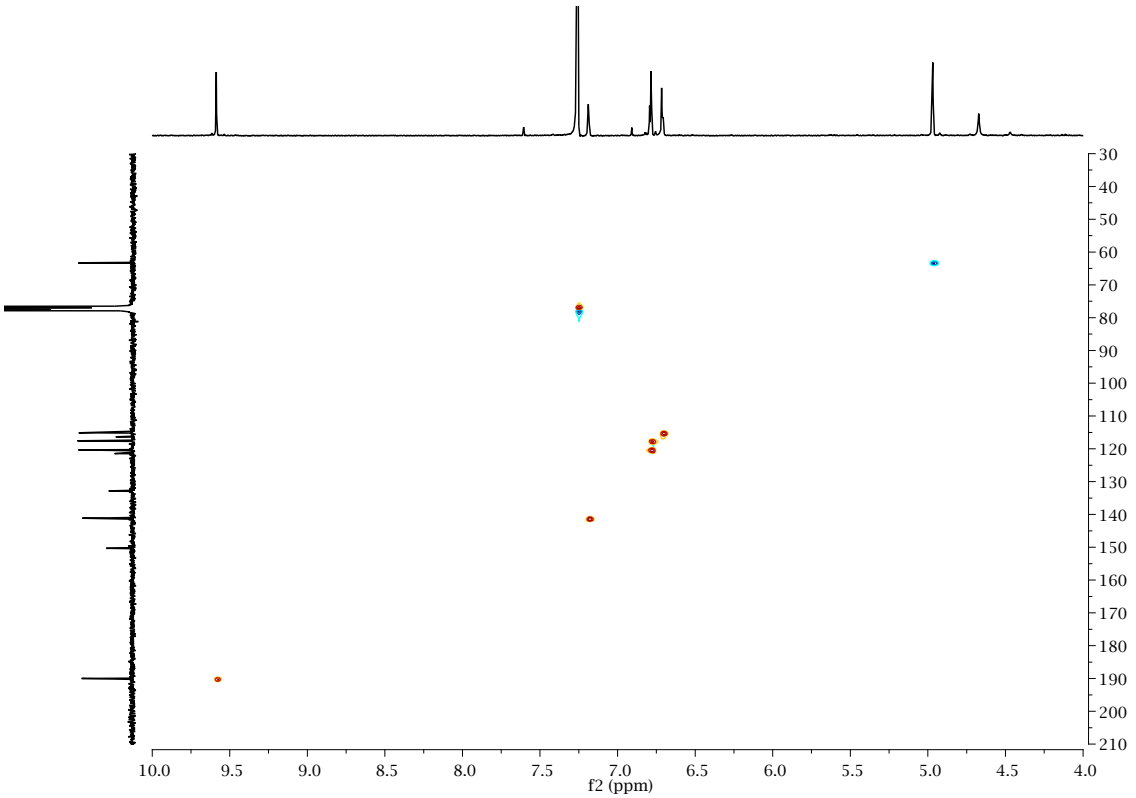

Figure S17. HSQC spectrum of **11** in $CDCl_3$.

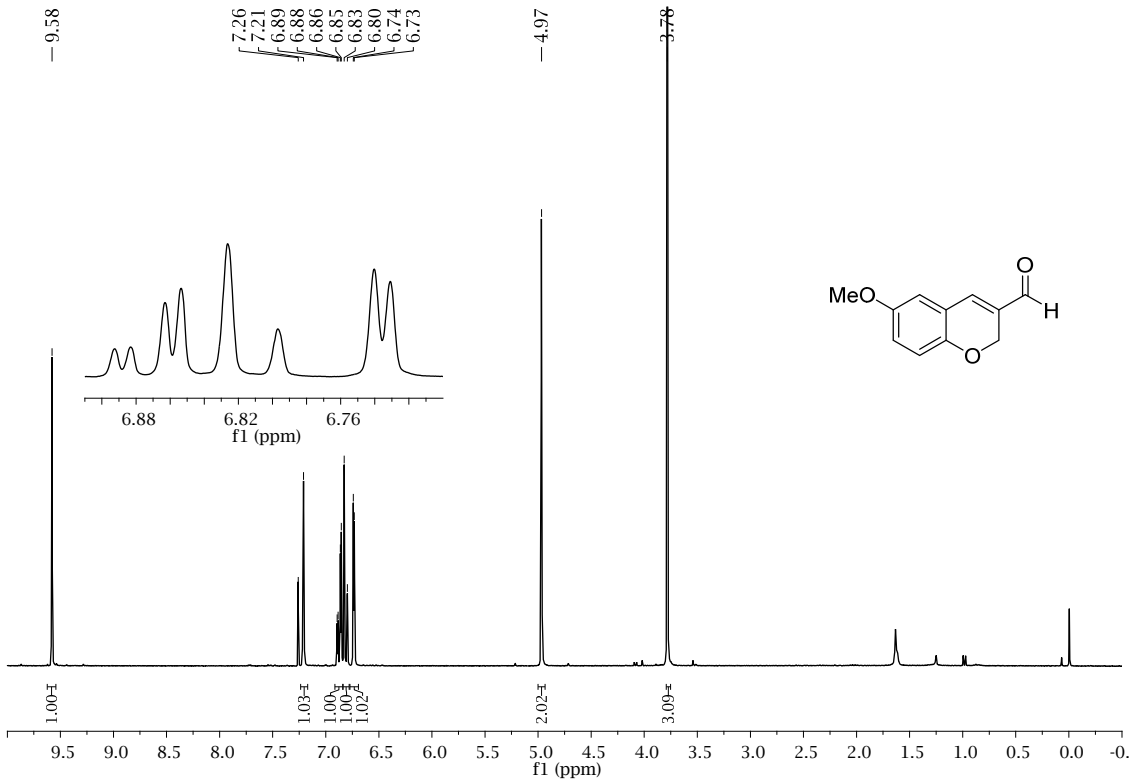

Figure S18. ^{1}H NMR (300 MHz) spectrum of **12** in $CDCl_3$.

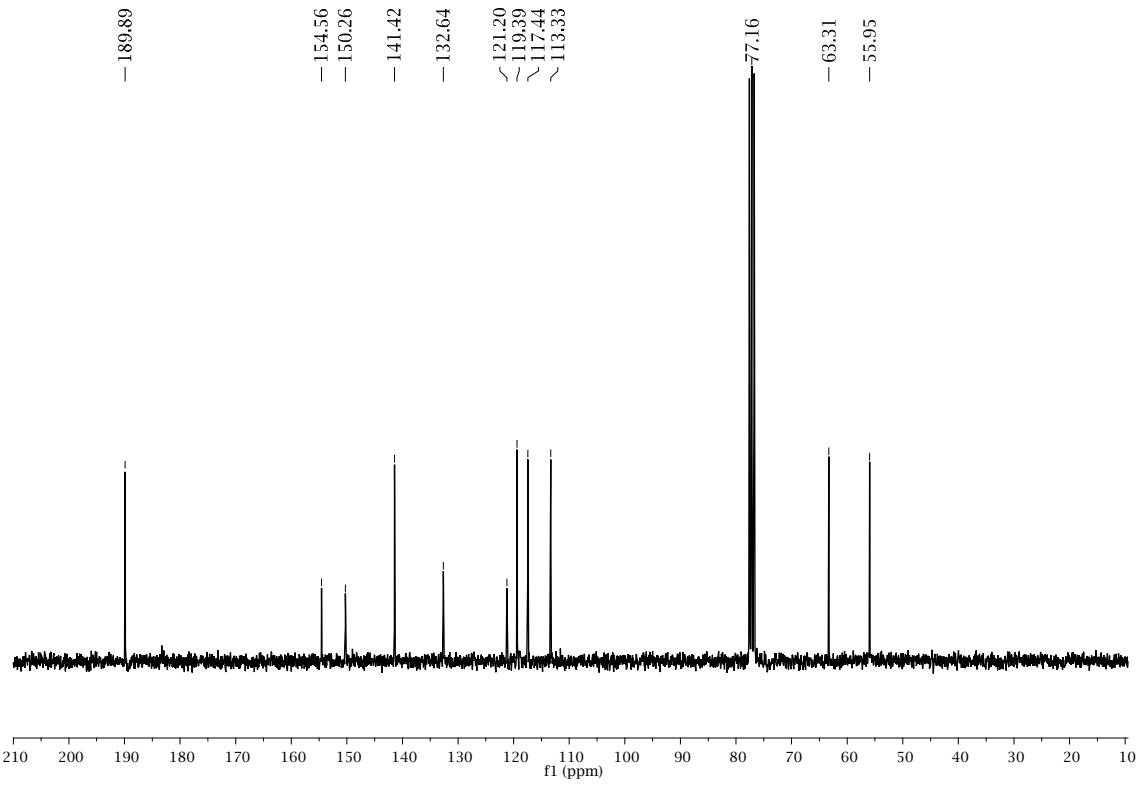

Figure S19. ^{13}C NMR (75 MHz) spectrum of **12** in $CDCl_3$.

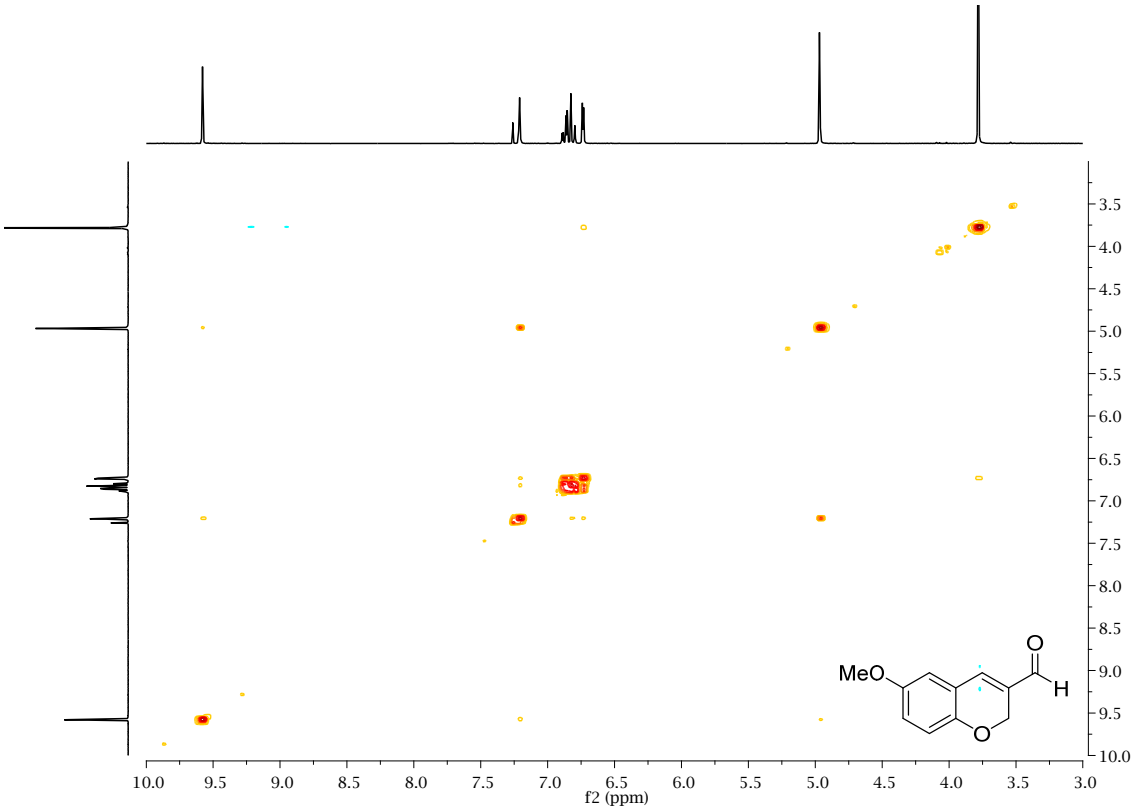

Figure S20. COSY spectrum of **12** in $CDCl_3$.

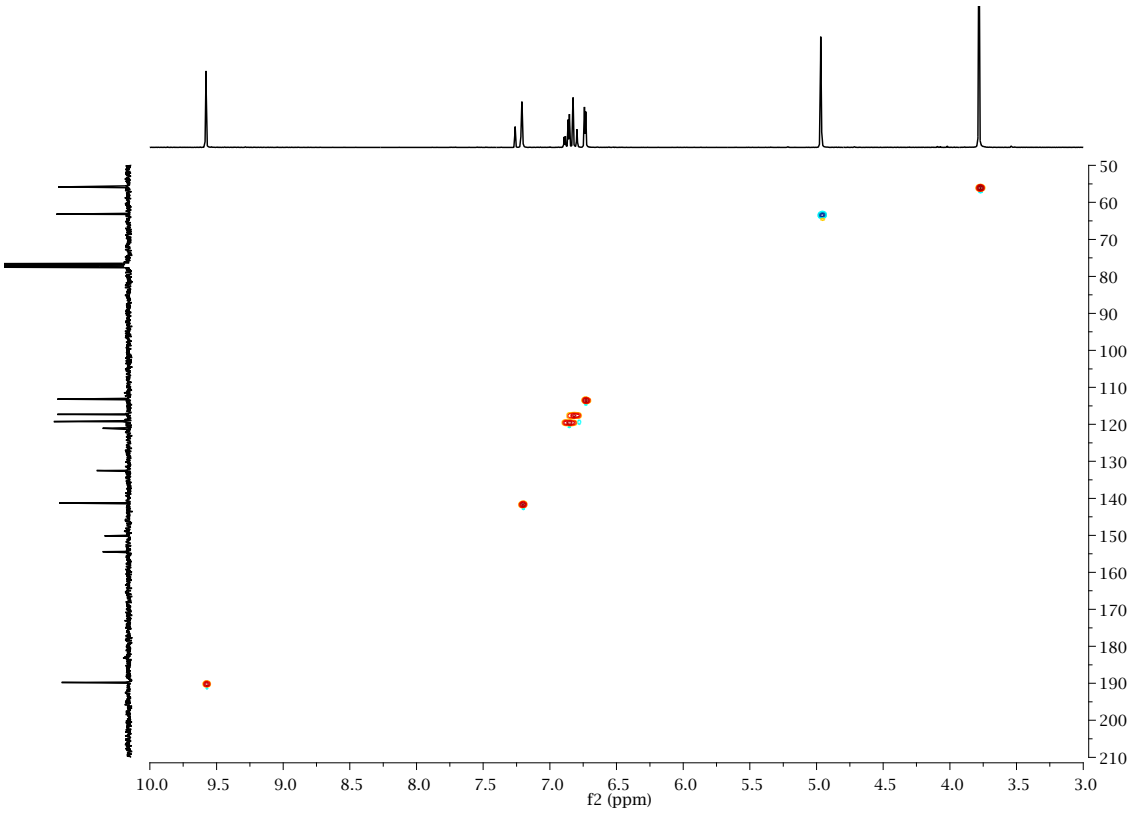

Figure S21. HSQC spectrum of **12** in $CDCl_3$.

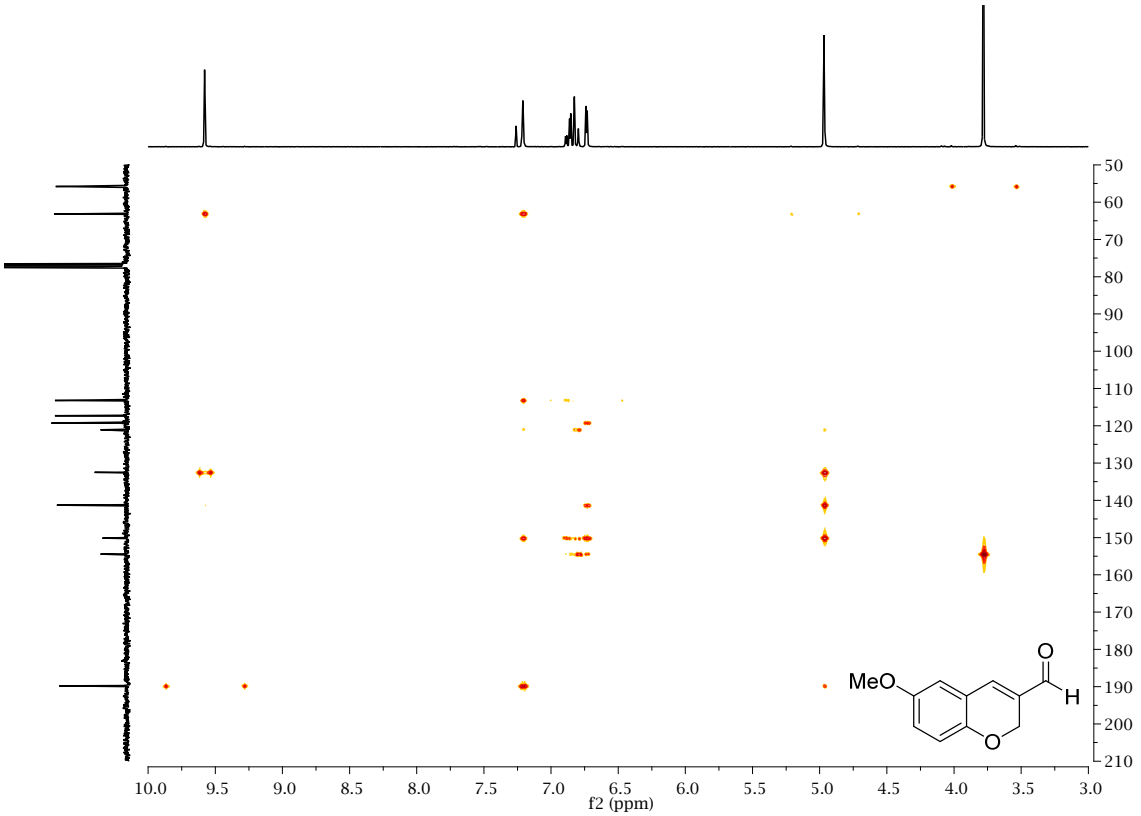

Figure S22. HMBC spectrum of **12** in $CDCl_3$.

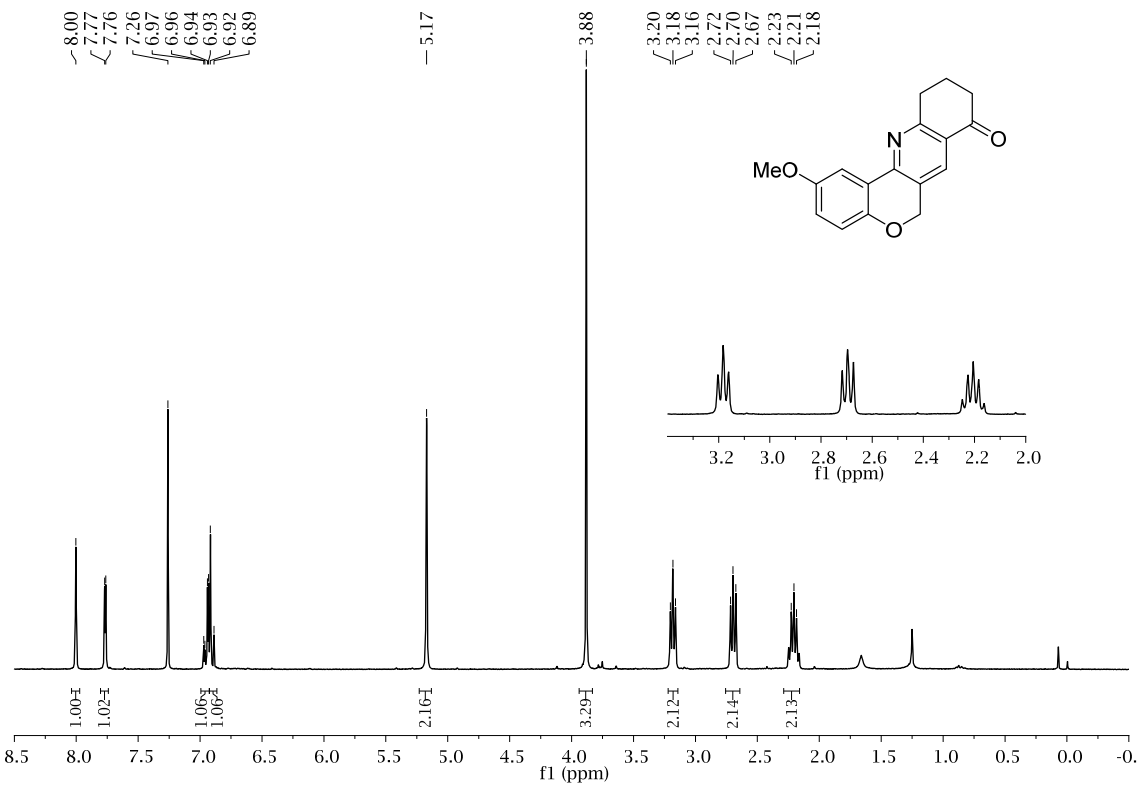

Figure S23. ^{1}H NMR (300 MHz) spectrum of **13** in $CDCl_3$.

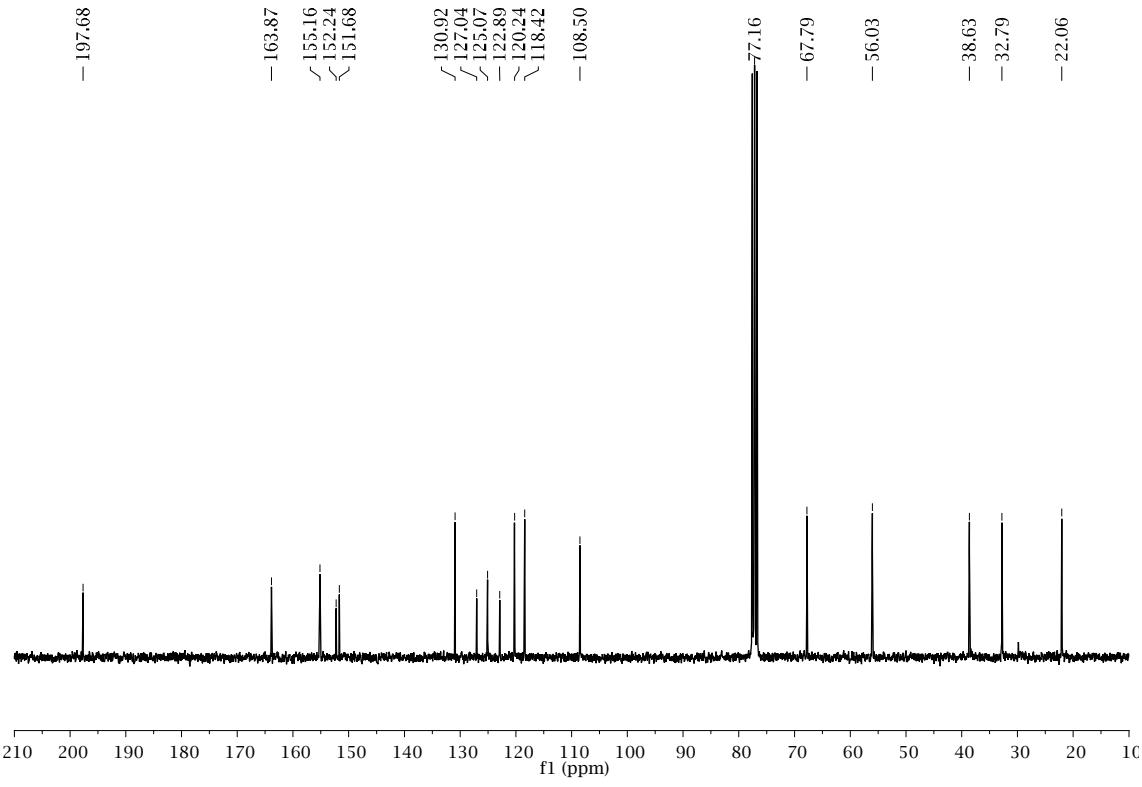

Figure S24. ^{13}C NMR (75 MHz) spectrum of **13** in $CDCl_3$.

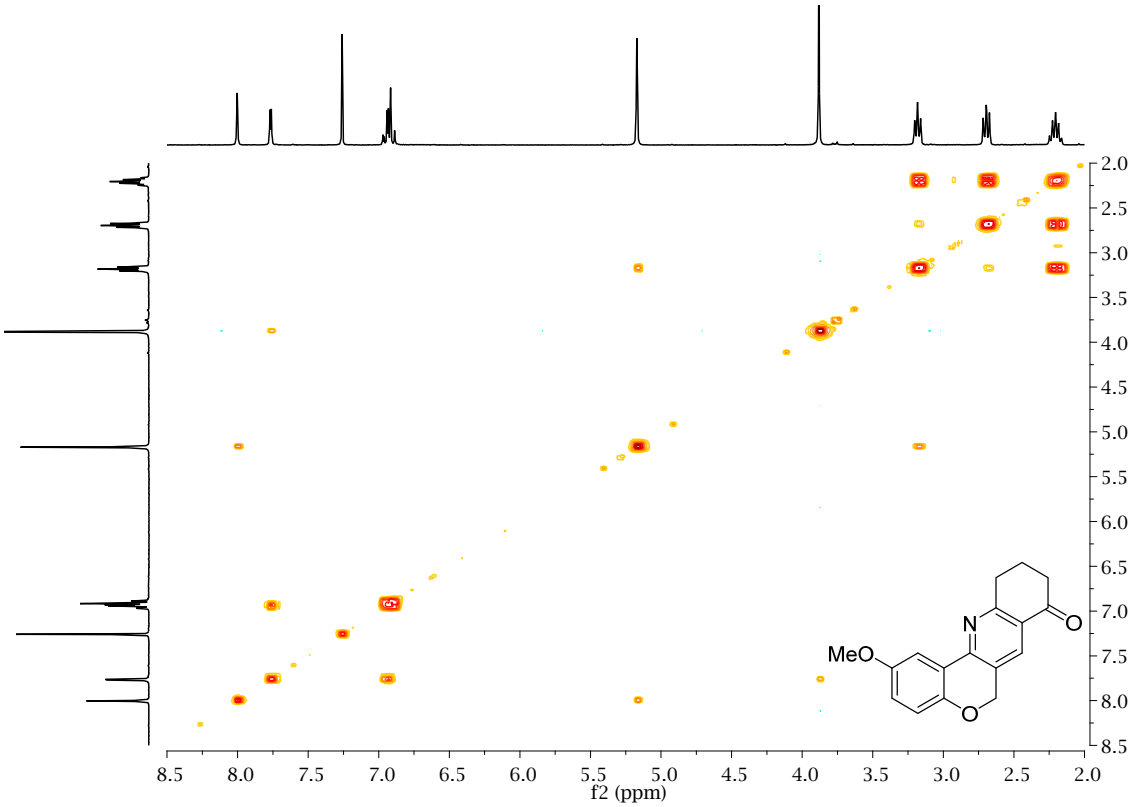

Figure S25. COSY spectrum of **13** in $CDCl_3$.

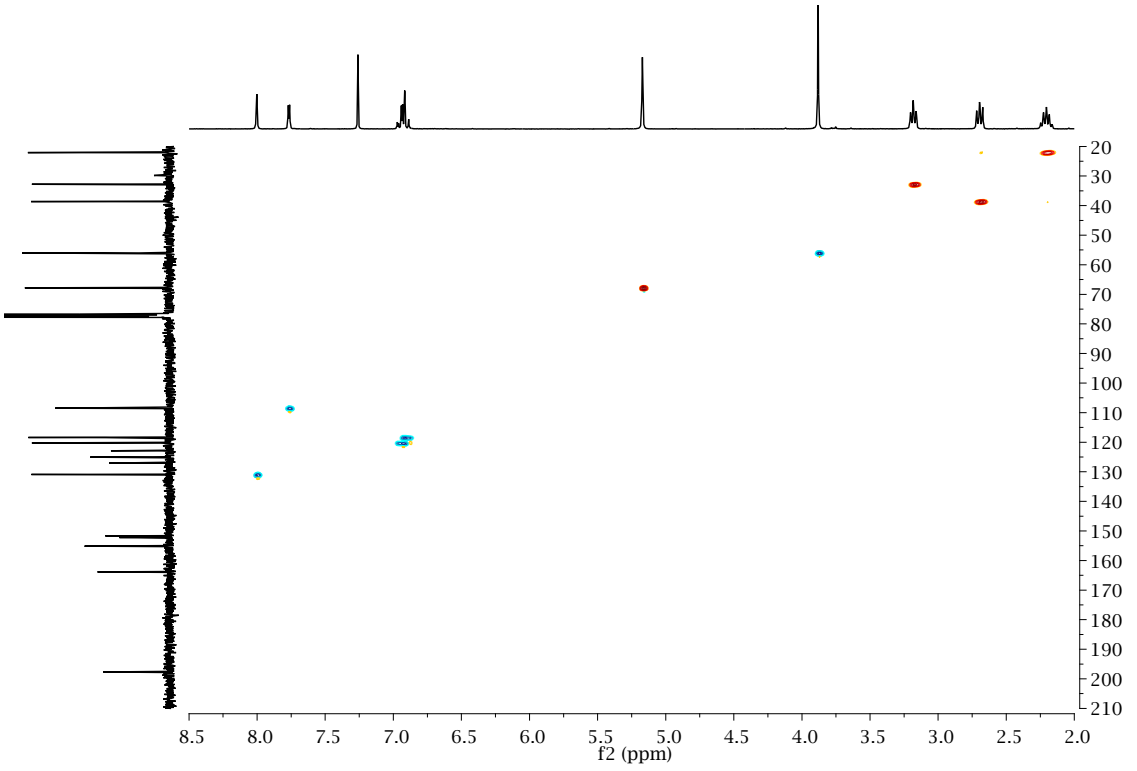

Figure S26. HSQC spectrum of **13** in $CDCl_3$.

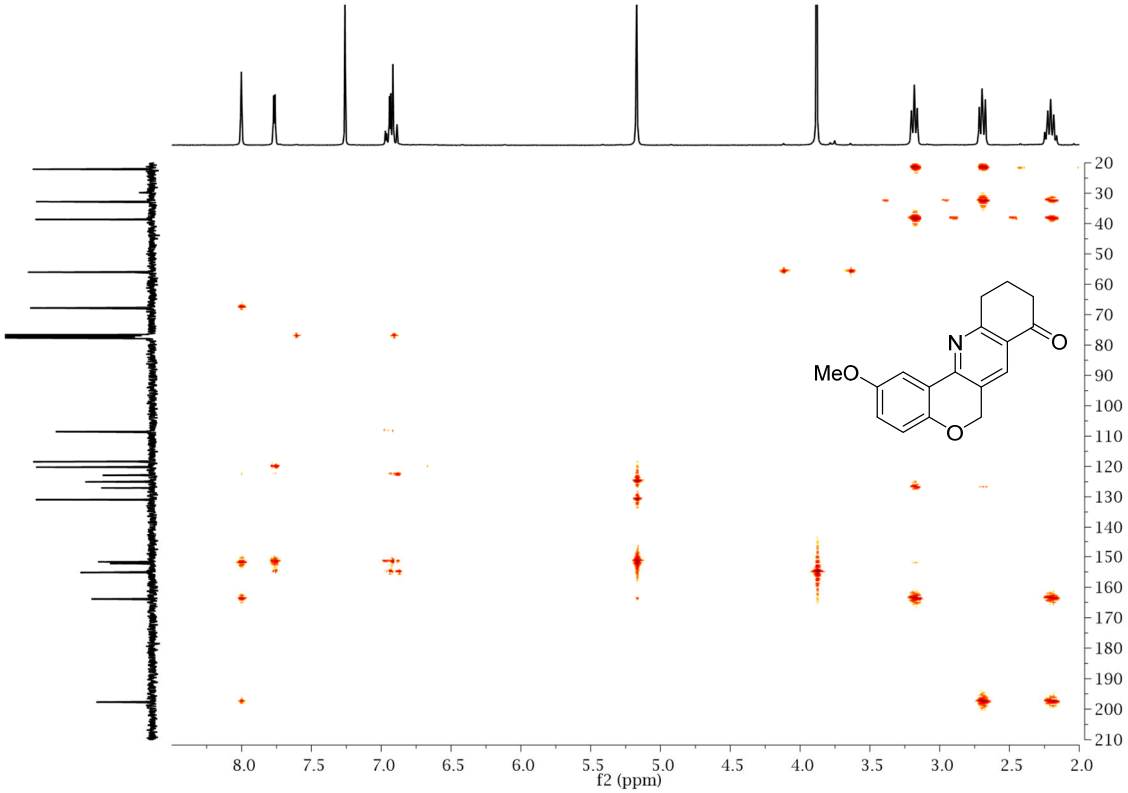

Figure S27. HMBC spectrum of **13** in $CDCl_3$.

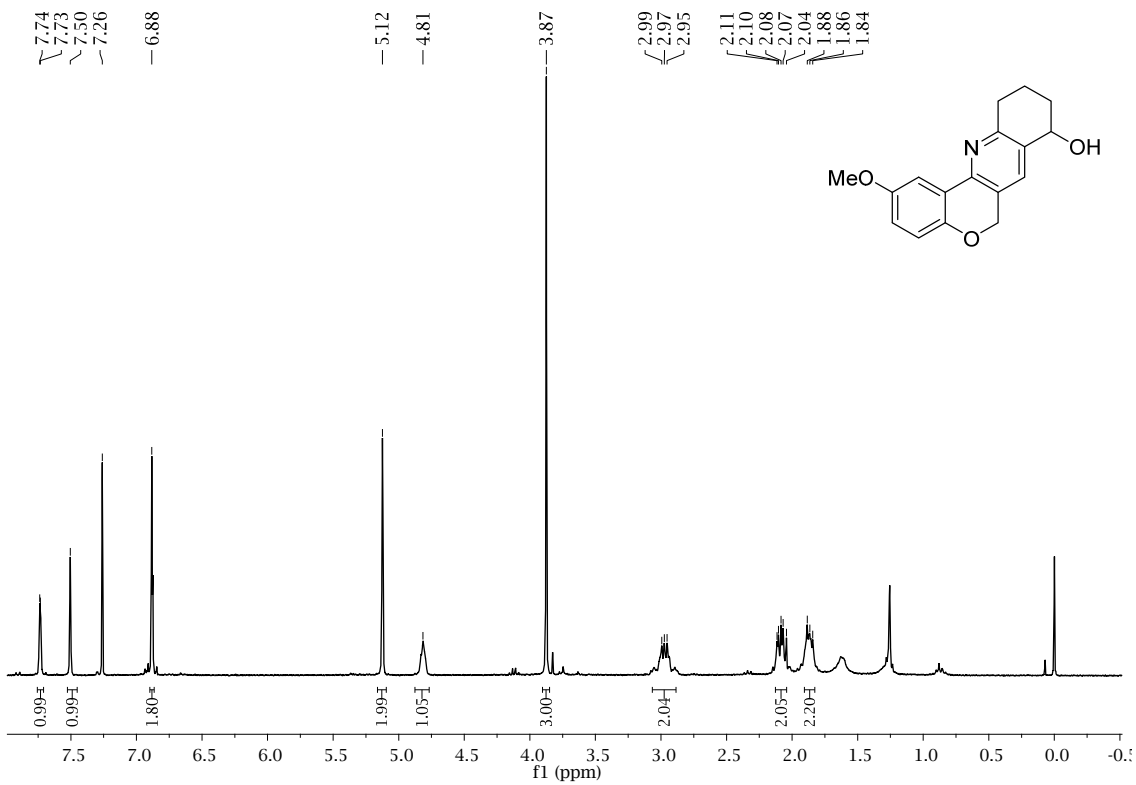

Figure S28. ^{1}H NMR (300 MHz) spectrum of **14** in $CDCl_3$.

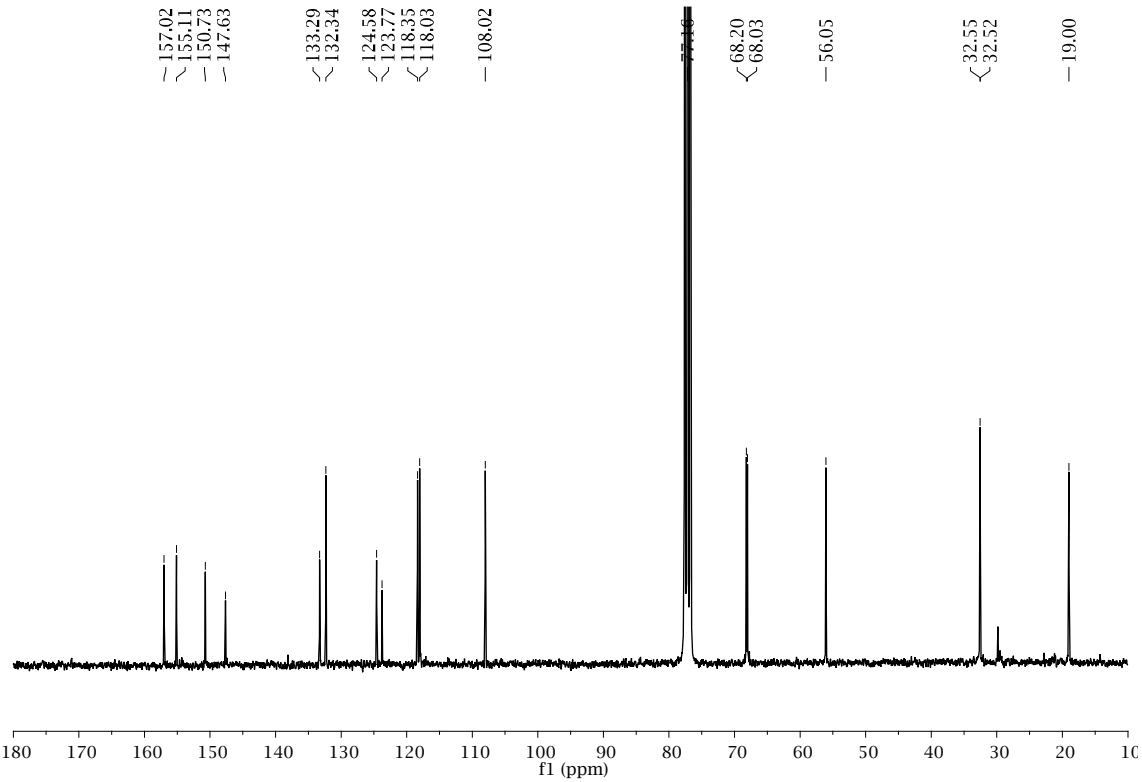

Figure S29. ^{13}C NMR (75 MHz) spectrum of **14** in $CDCl_3$.

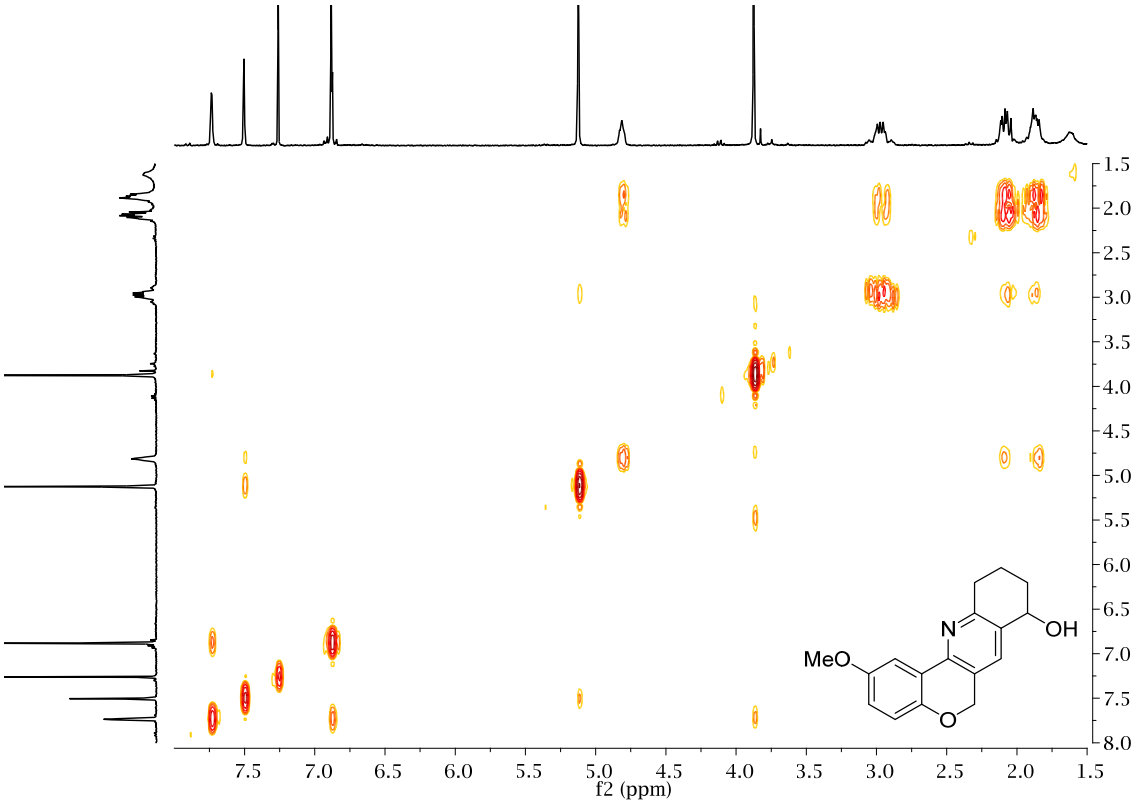

Figure S30. COSY spectrum of **14** in $CDCl_3$.

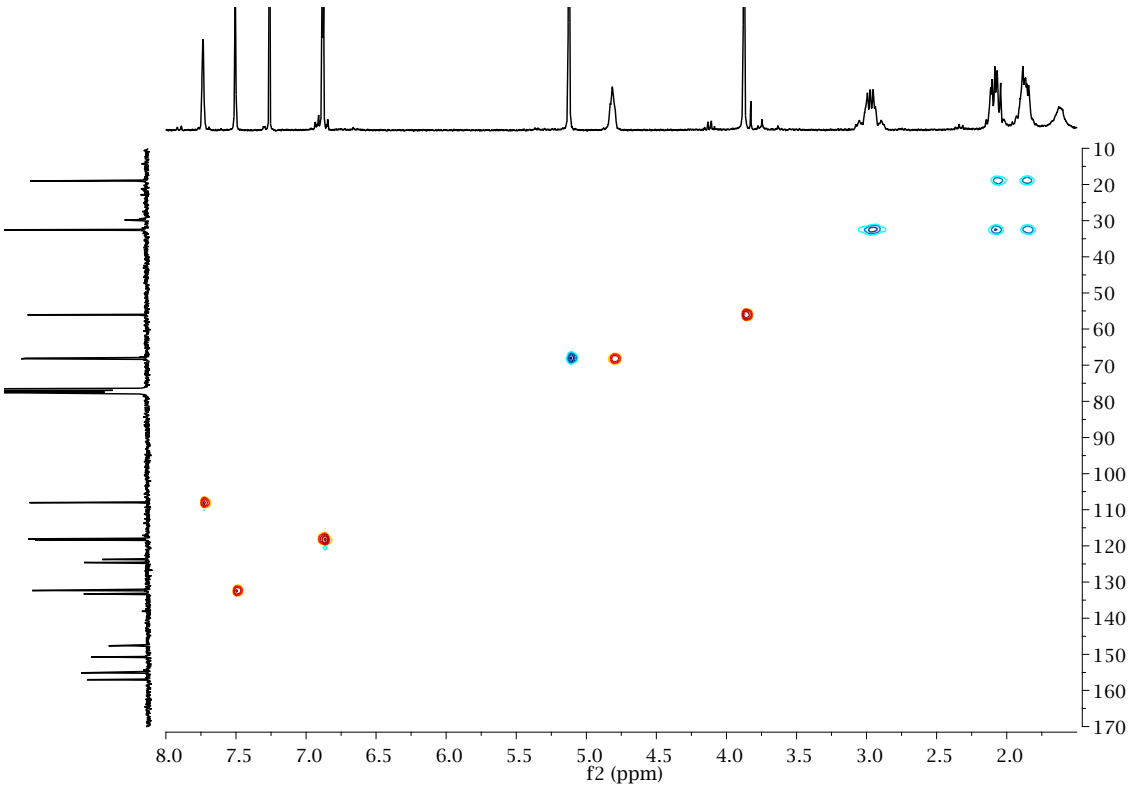

Figure S31. HSQC spectrum of **14** in $CDCl_3$.

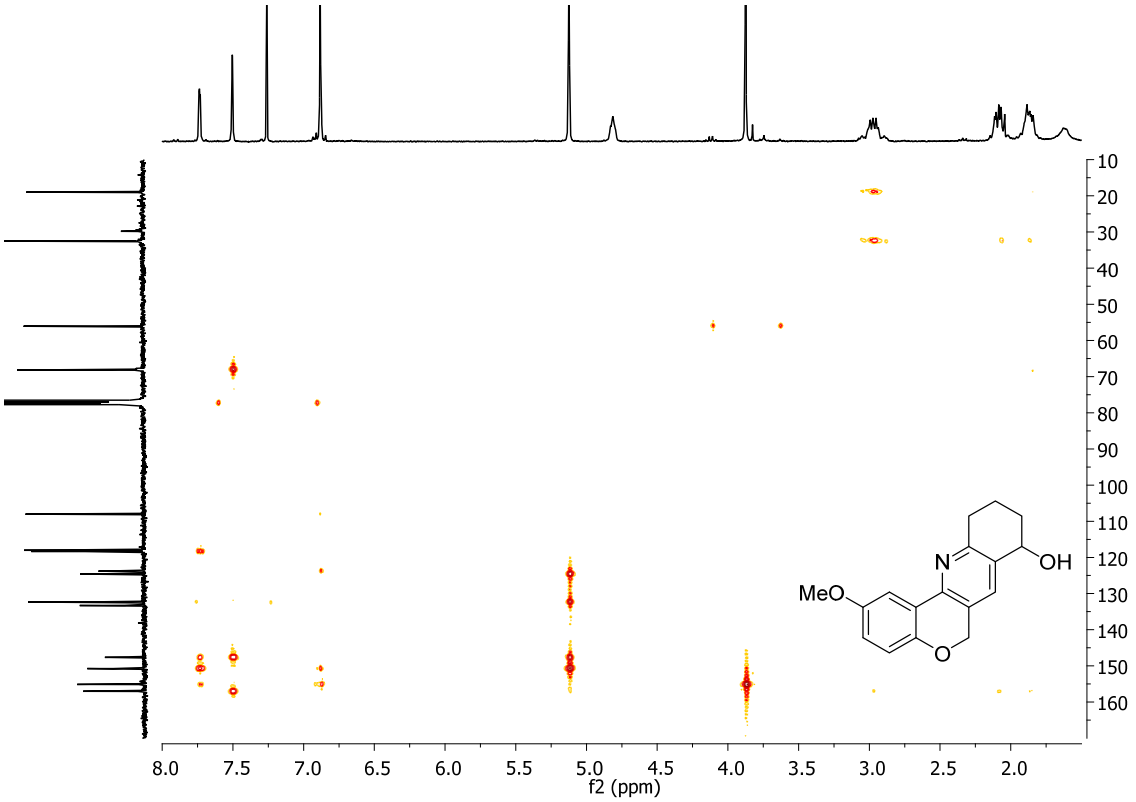

Figure S32. HMBC spectrum of **14** in $CDCl_3$.

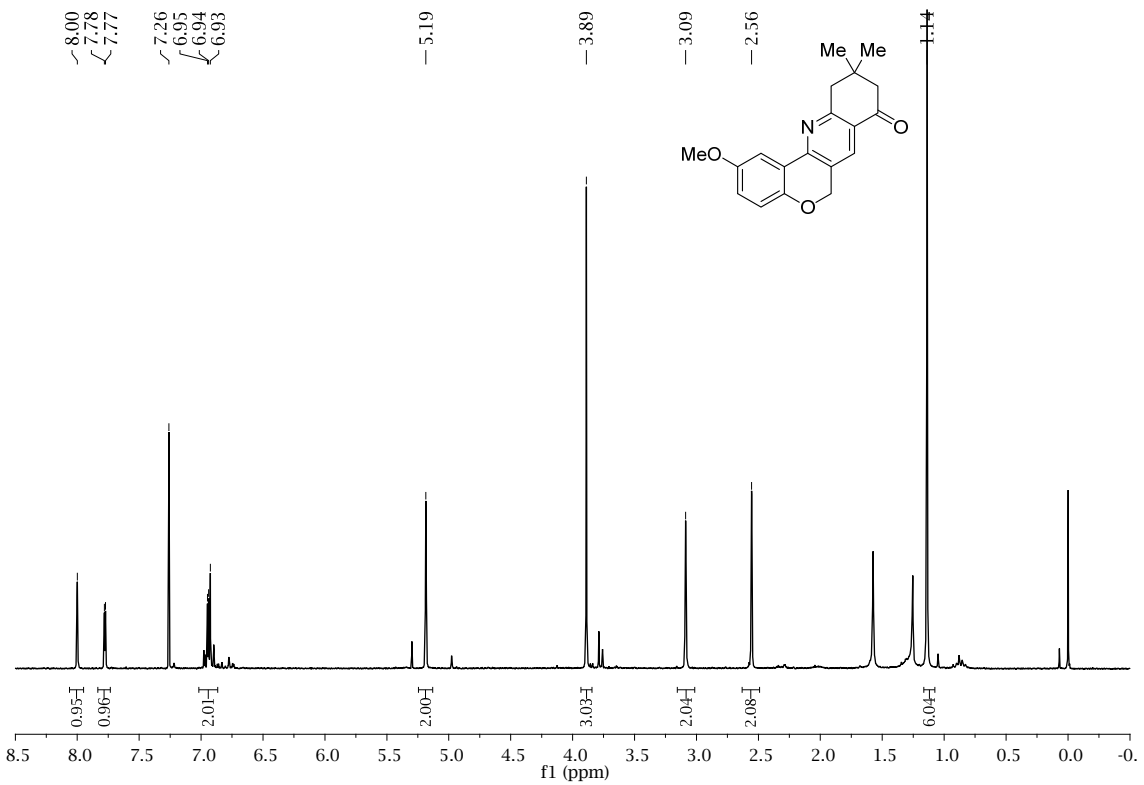

Figure S33. ^{1}H NMR (300 MHz) spectrum of **16** in $CDCl_3$.

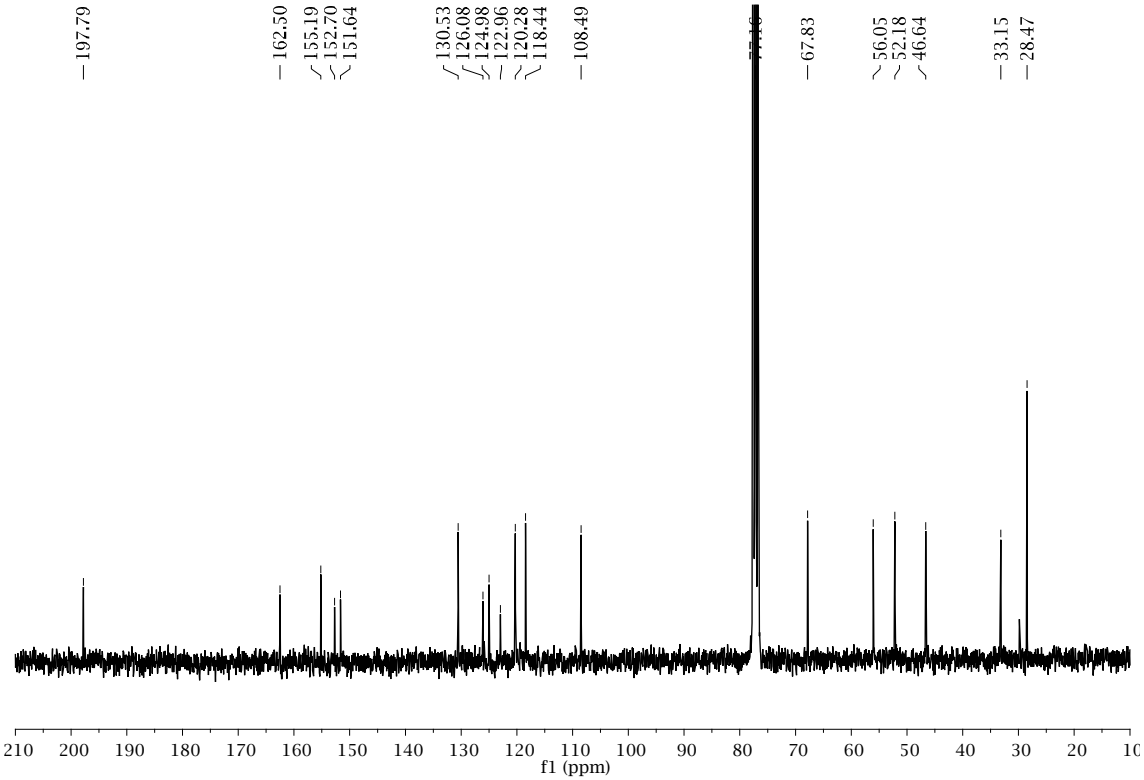

Figure S34. ^{13}C NMR (75 MHz) spectrum of **16** in $CDCl_3$.

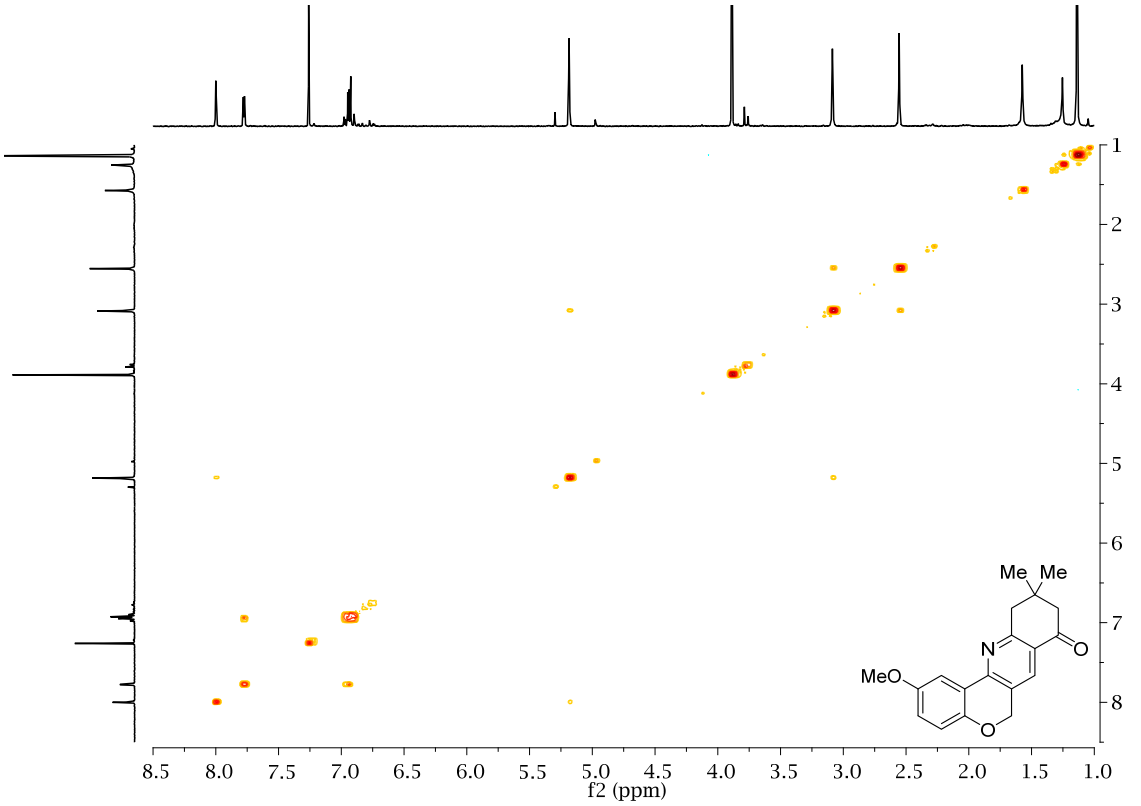

Figure S35. COSY spectrum of **16** in $CDCl_3$.

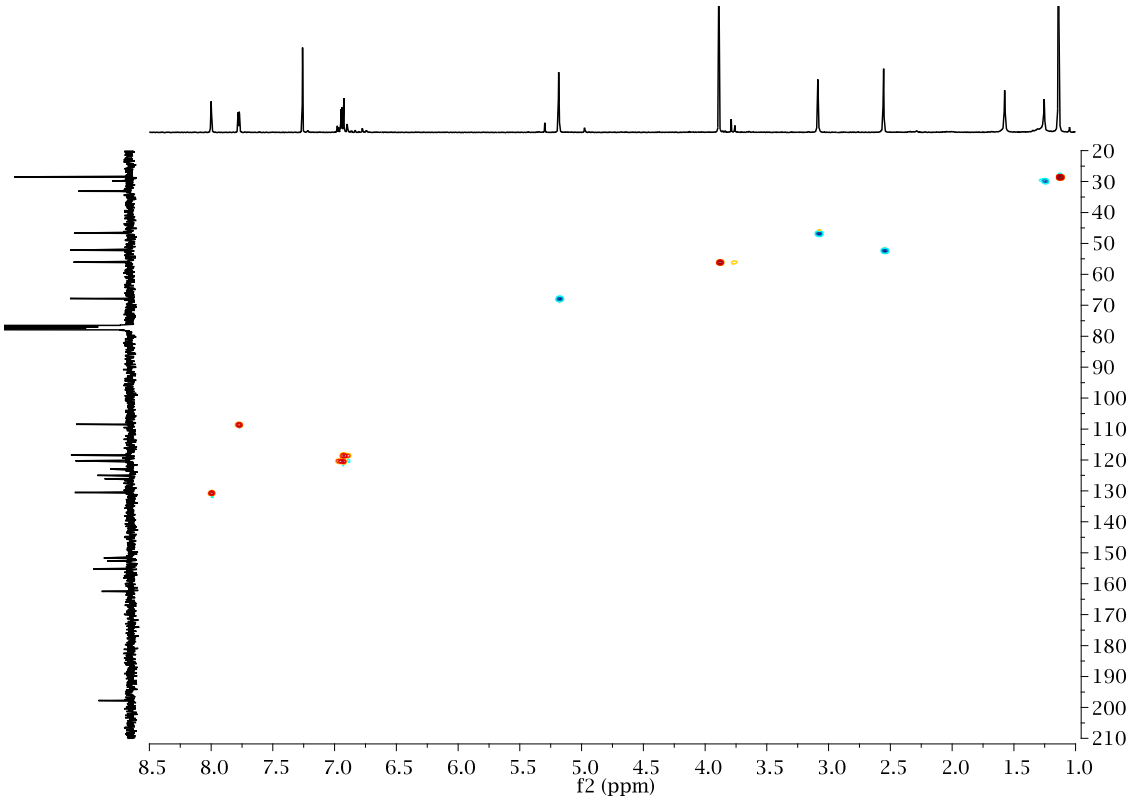

Figure S36. HSQC spectrum of **16** in $CDCl_3$.

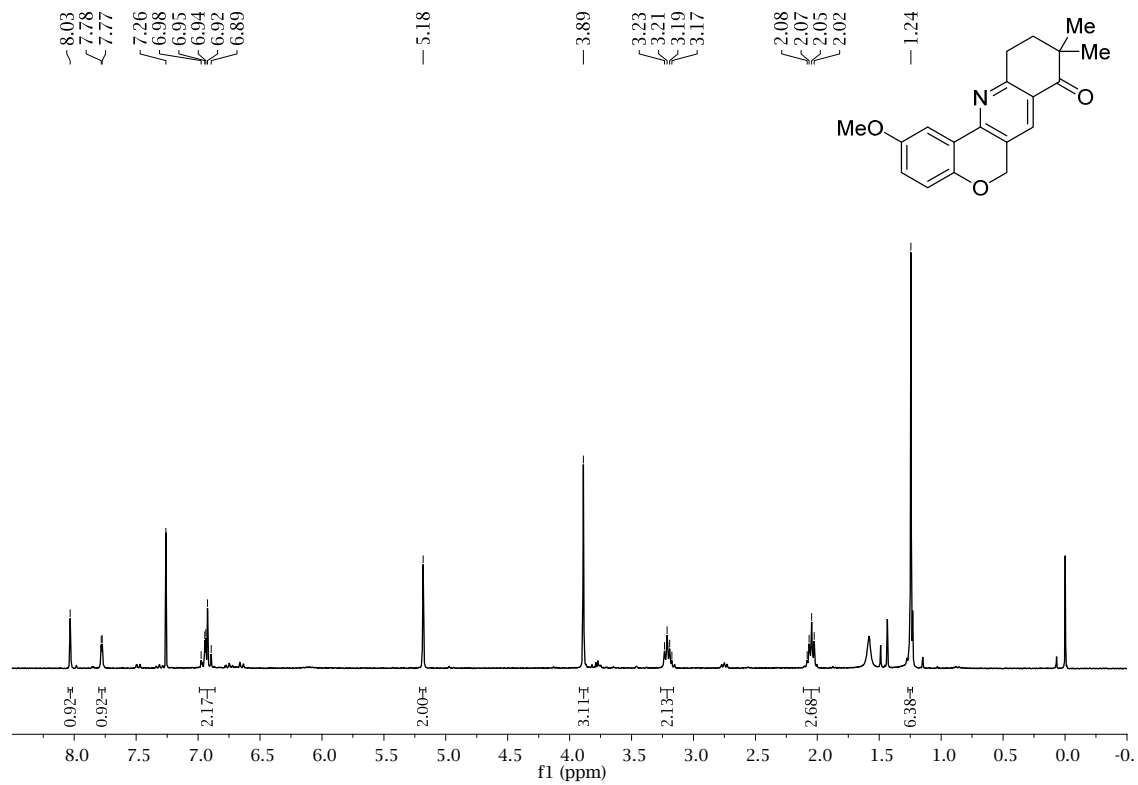

Figure S37. ^{1}H NMR (300 MHz) spectrum of **17** in $CDCl_3$.

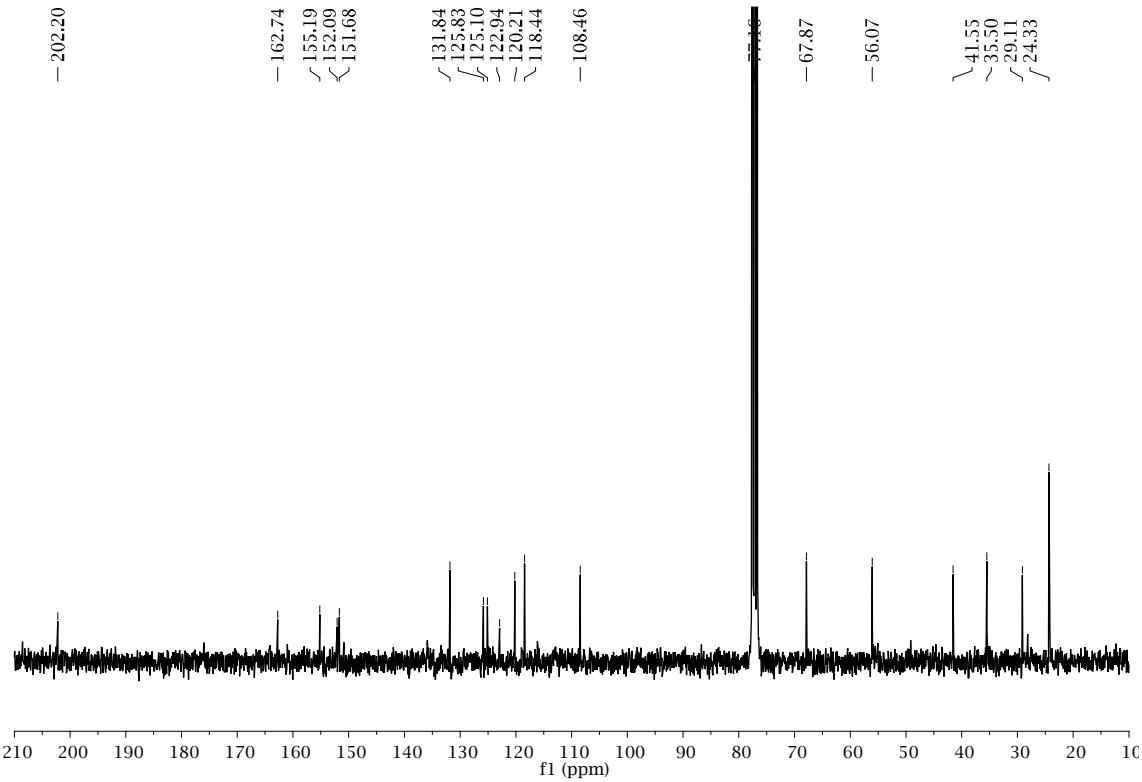

Figure S38. ^{13}C NMR (75 MHz) spectrum of **17** in $CDCl_3$.

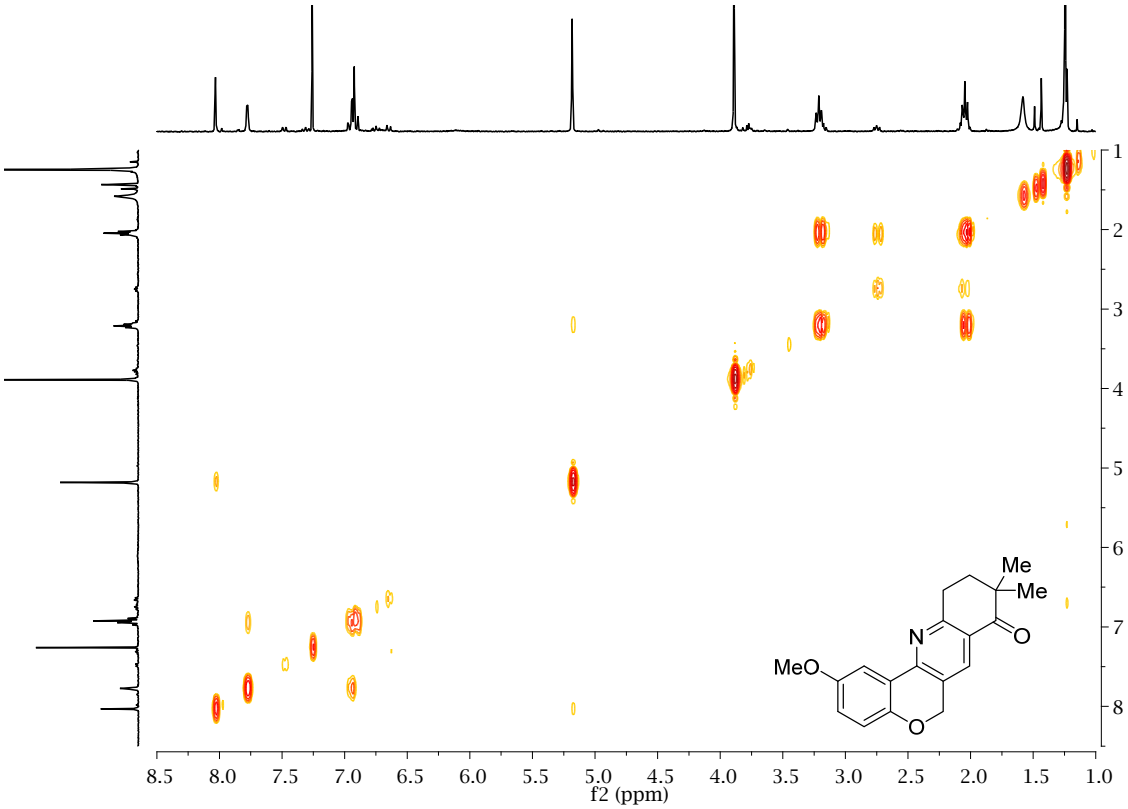

Figure S39. COSY spectrum of **17** in $CDCl_3$.

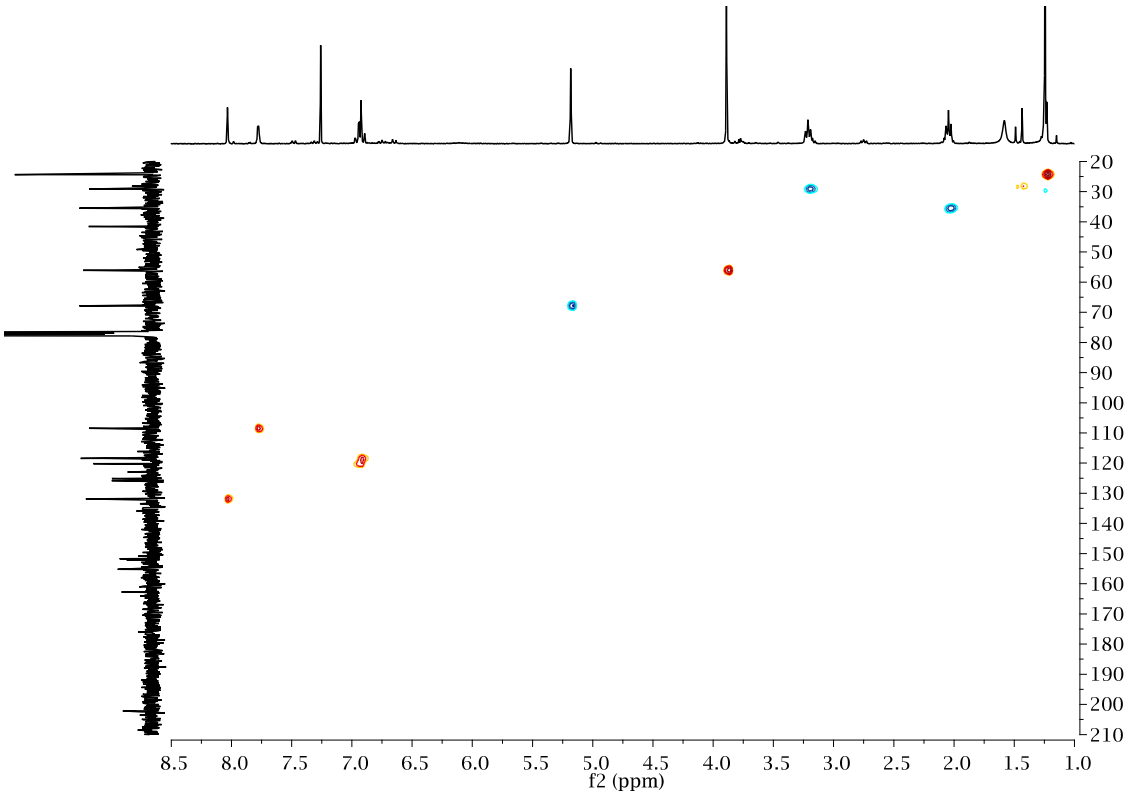

Figure S40. HSQC spectrum of **17** in $CDCl_3$.

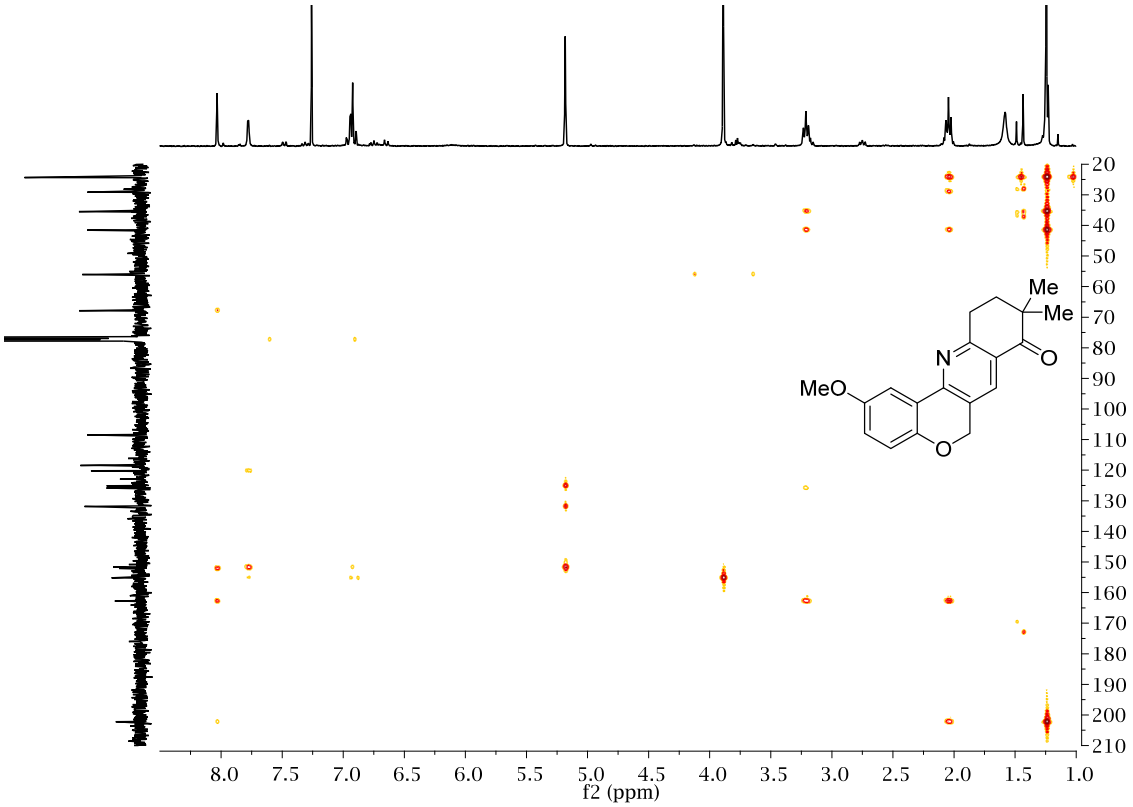

Figure S41. HMBC spectrum of **17** in $CDCl_3$.

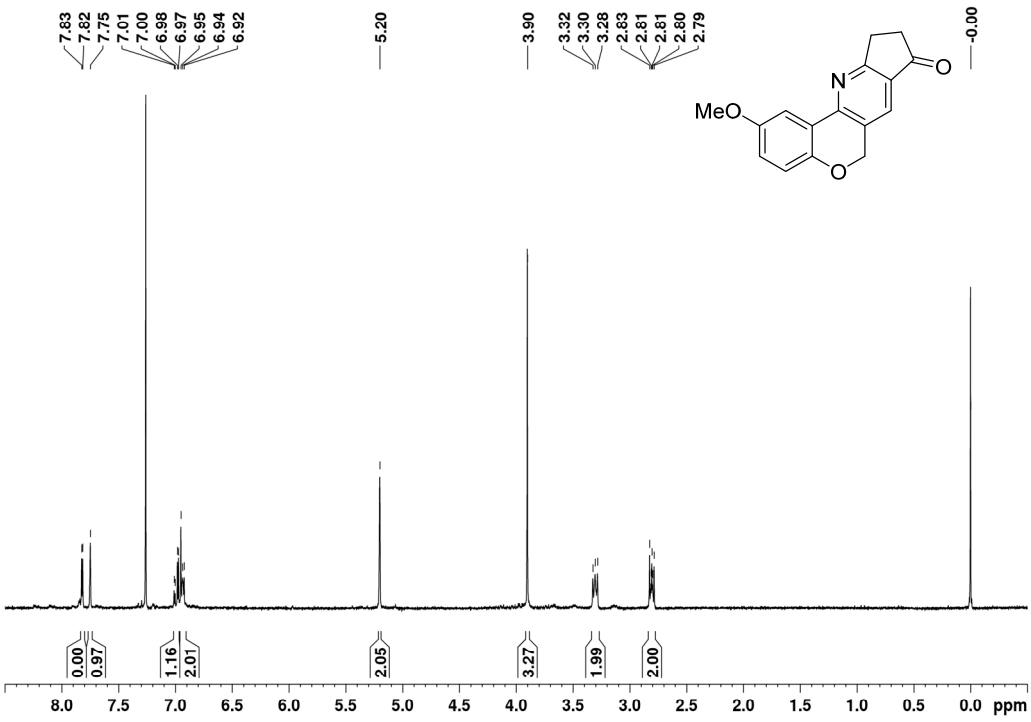

Figure S42. ^{1}H NMR (300 MHz) spectrum of **18** in $CDCl_3$.

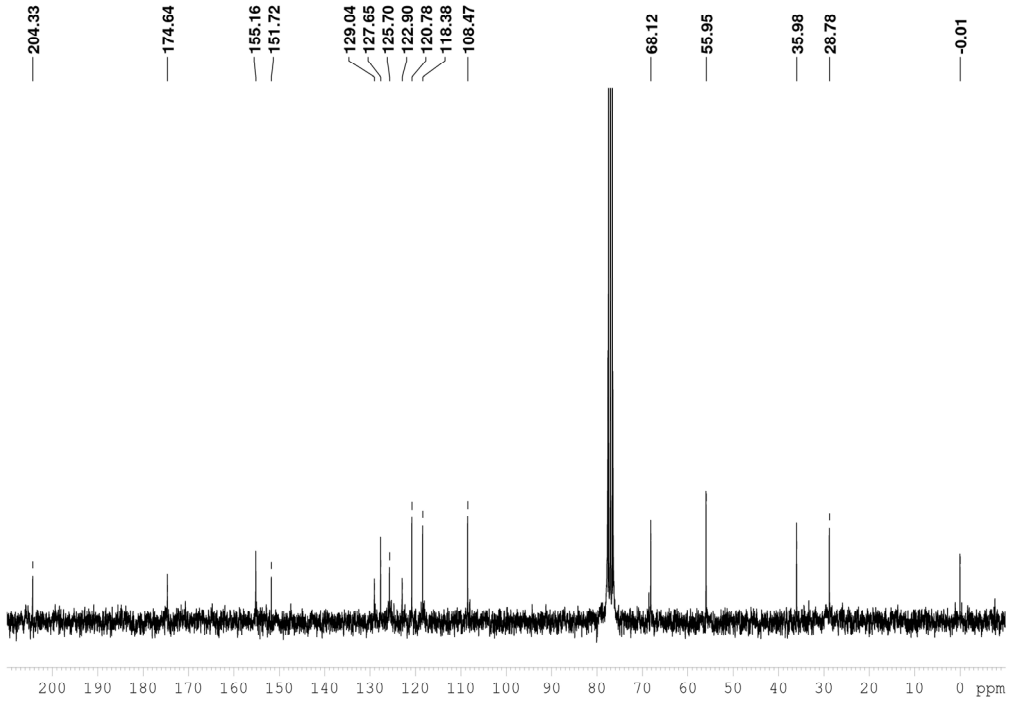

Figure S43. ^{13}C NMR (75 MHz) spectrum of **18** in $CDCl_3$.

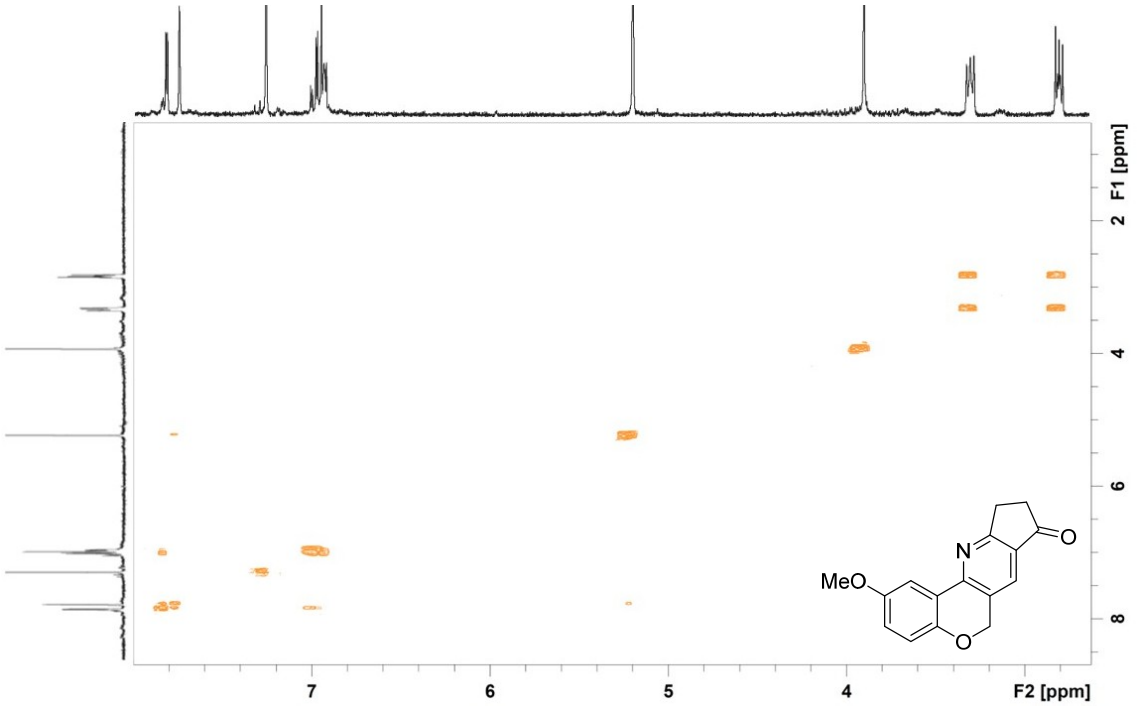

Figure S44. COSY spectrum of **18** in $CDCl_3$.

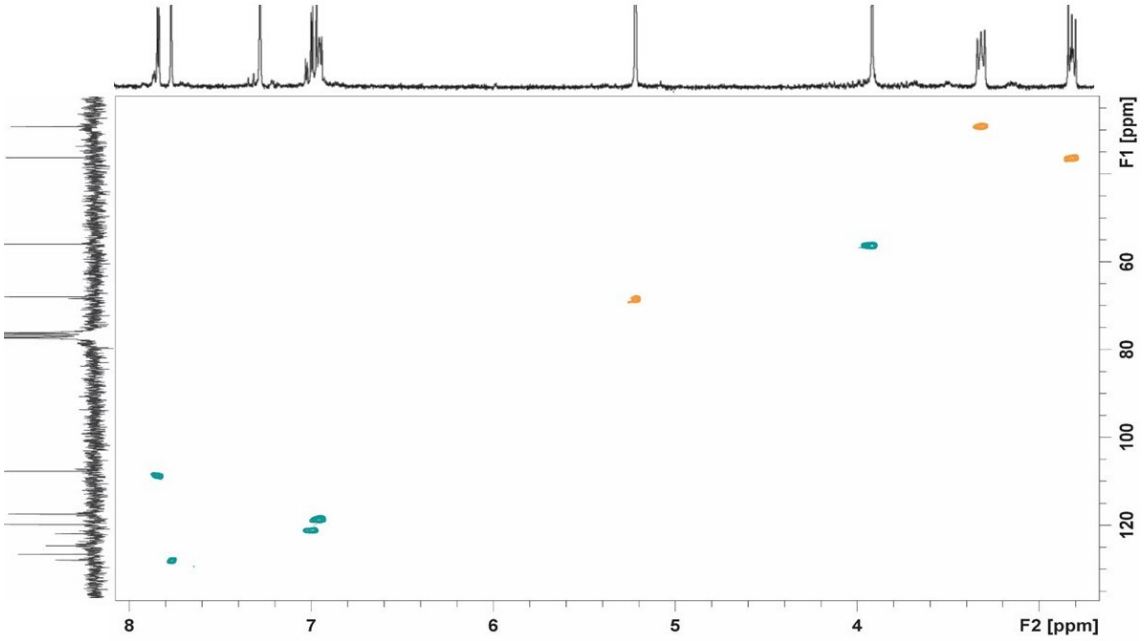

Figure S45. HSQC spectrum of **18** in $CDCl_3$.

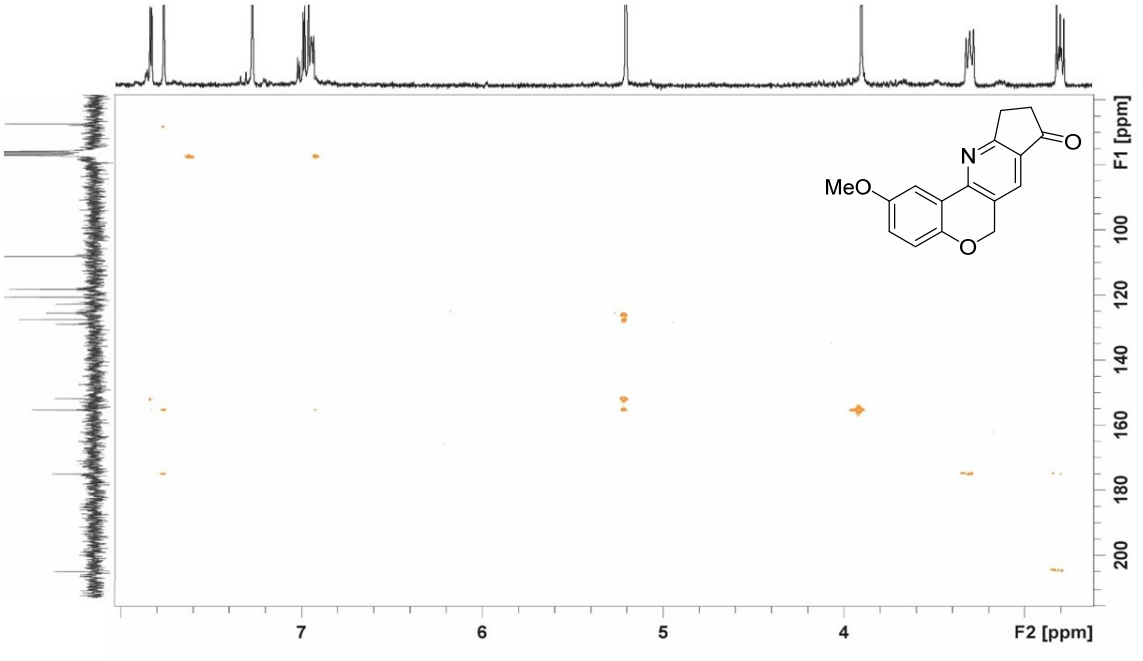

Figure S46. HMBC spectrum of **18** in $CDCl_3$.

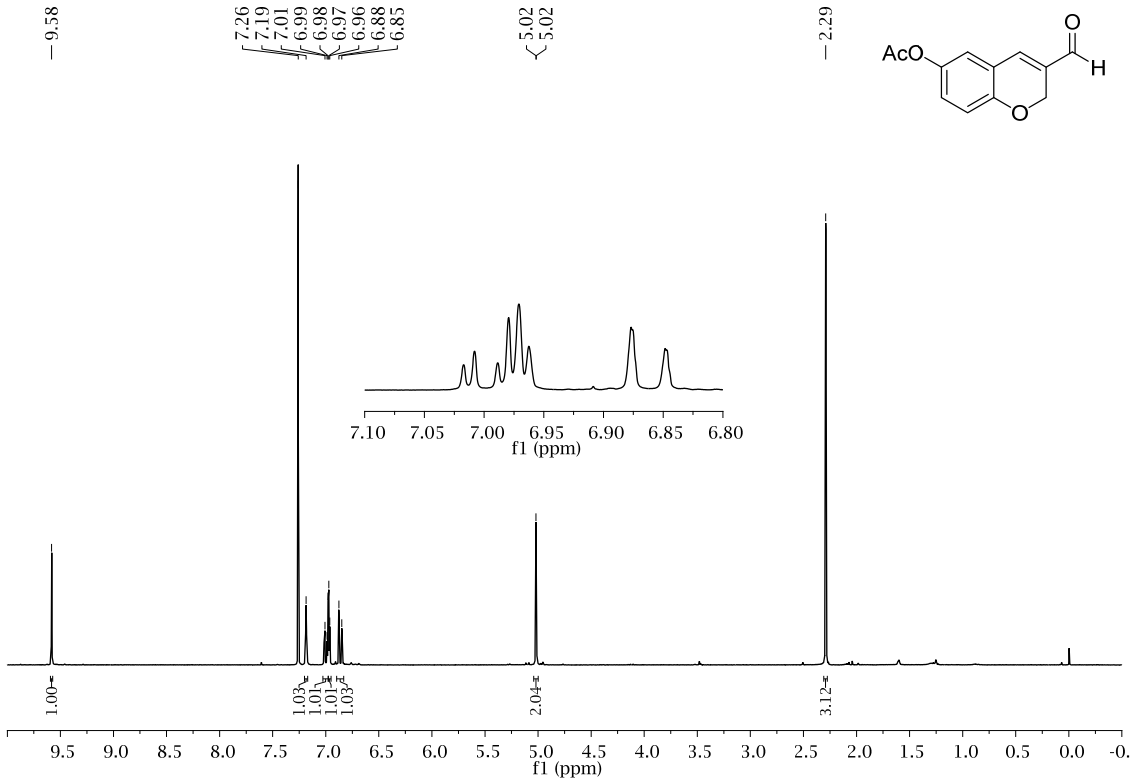

Figure S47. ^{1}H NMR (300 MHz) spectrum of **20** in $CDCl_3$.

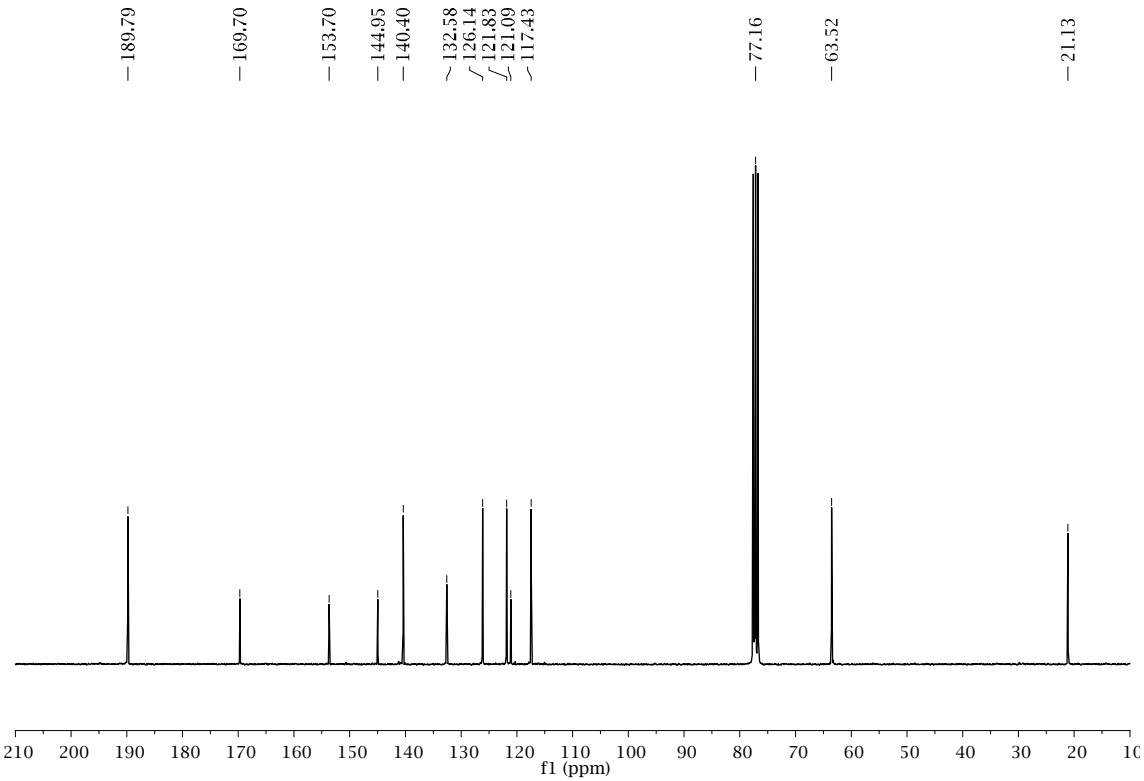

Figure S48. ^{13}C NMR (75 MHz) spectrum of **20** in $CDCl_3$.

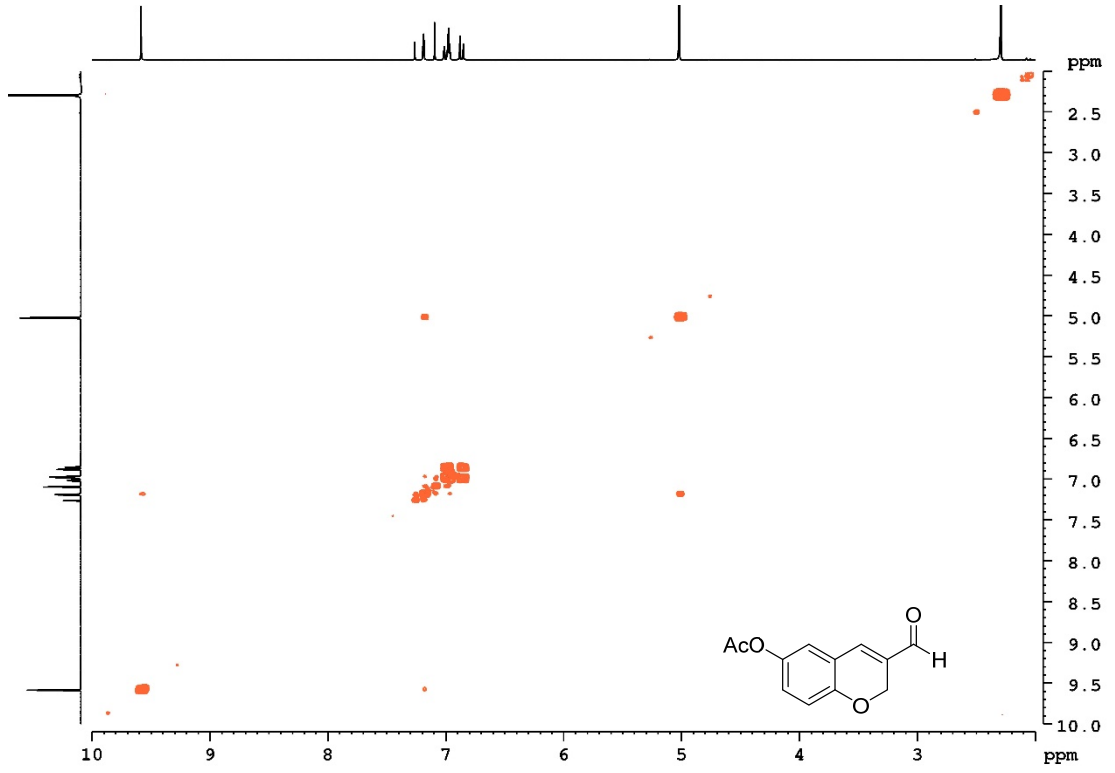

Figure S49. COSY spectrum of **20** in $CDCl_3$.

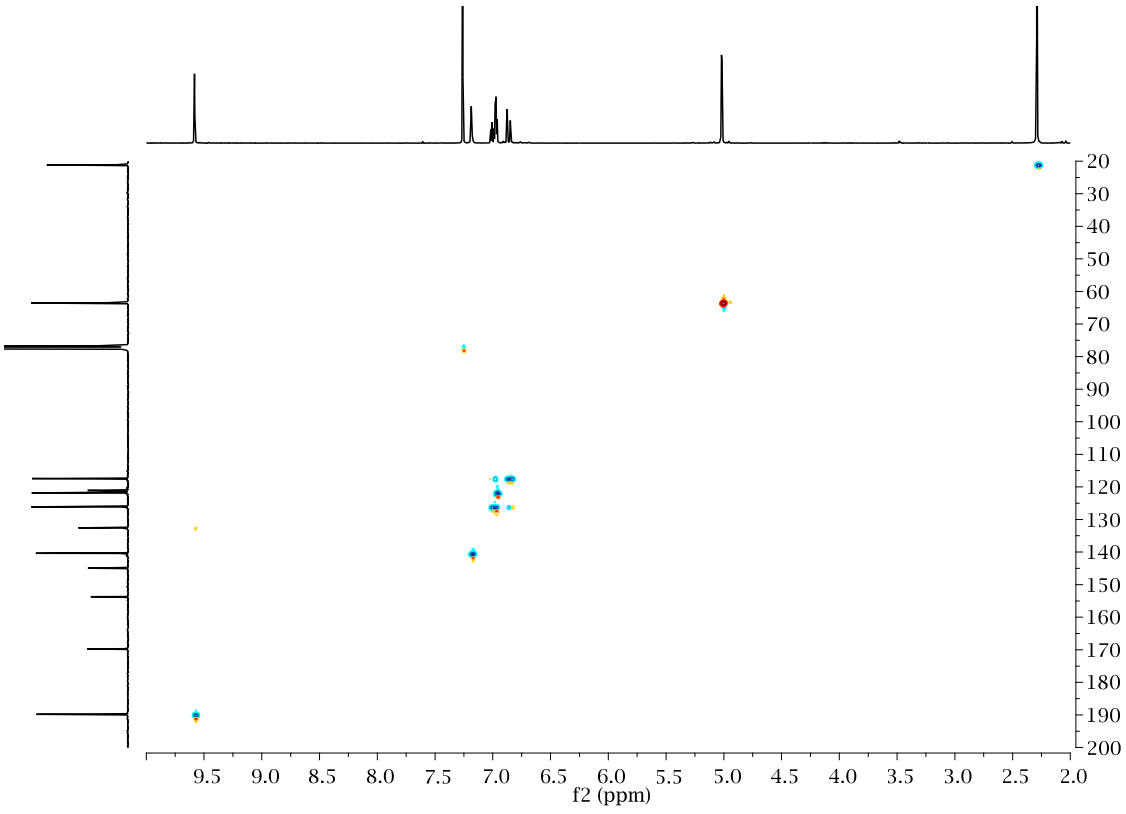

Figure S50. HSQC spectrum of **20** in $CDCl_3$.

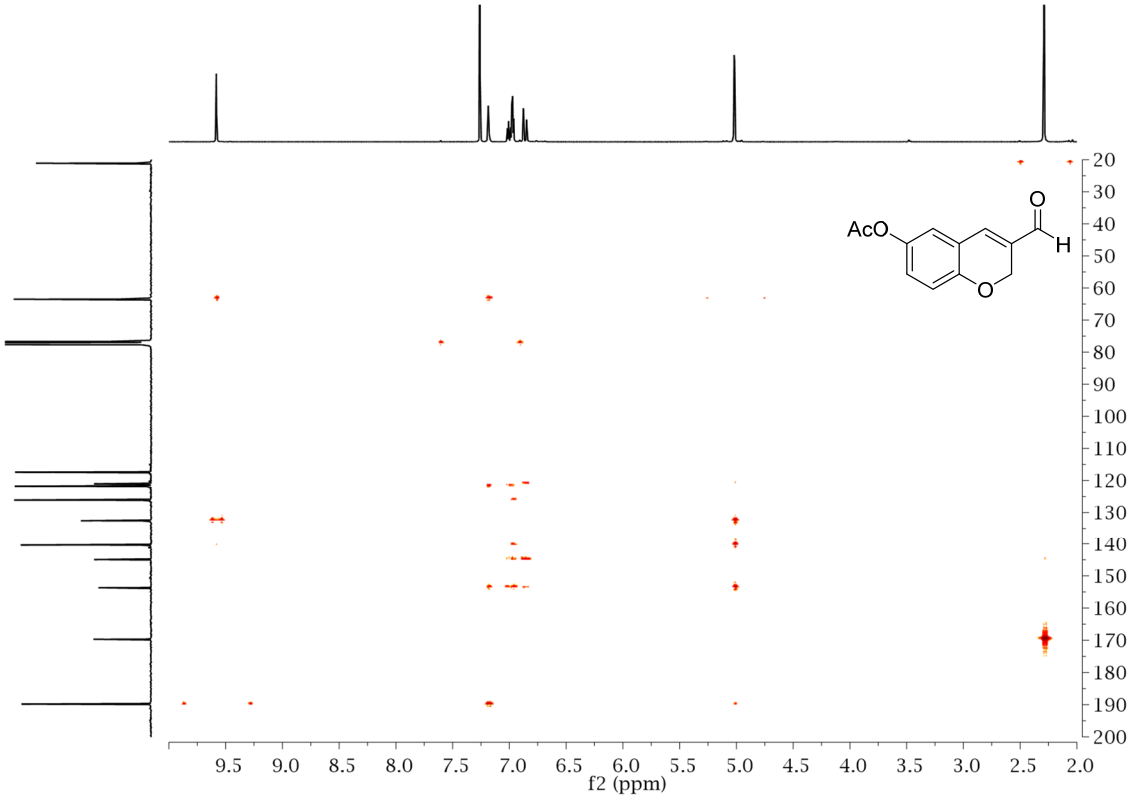

Figure S51. HMBC spectrum of **20** in $CDCl_3$.

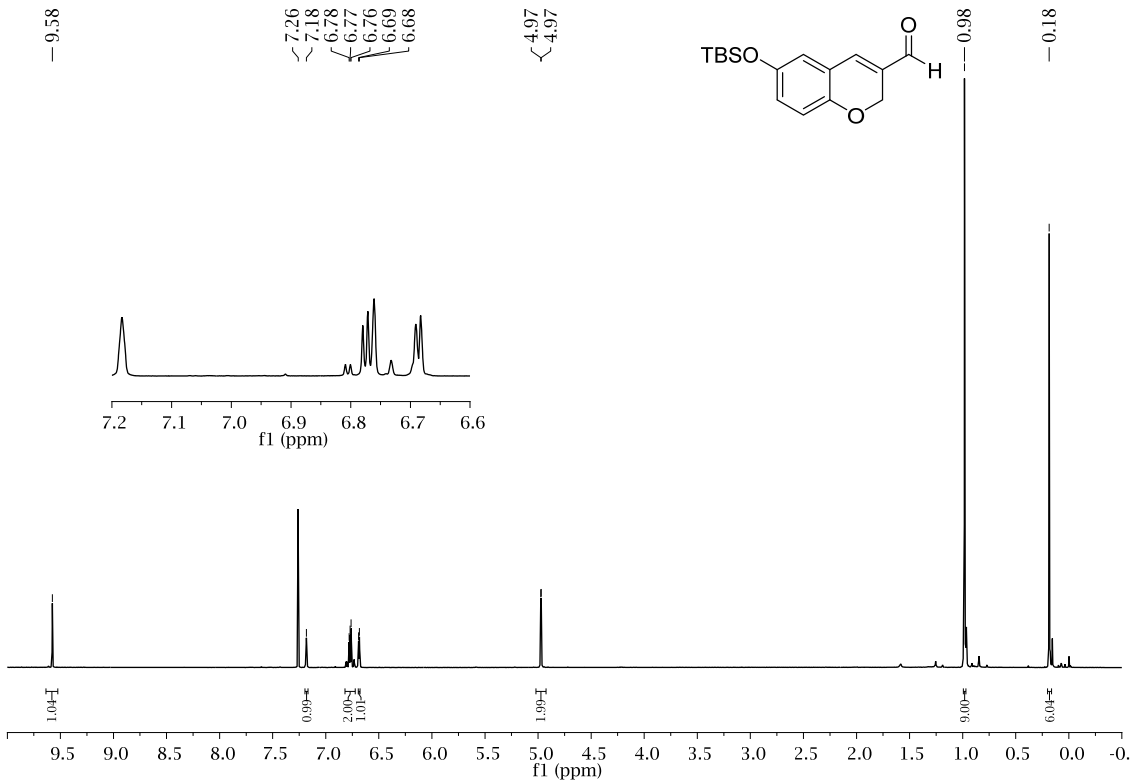

Figure S52. ^{1}H NMR (300 MHz) spectrum of **21** in $CDCl_3$.

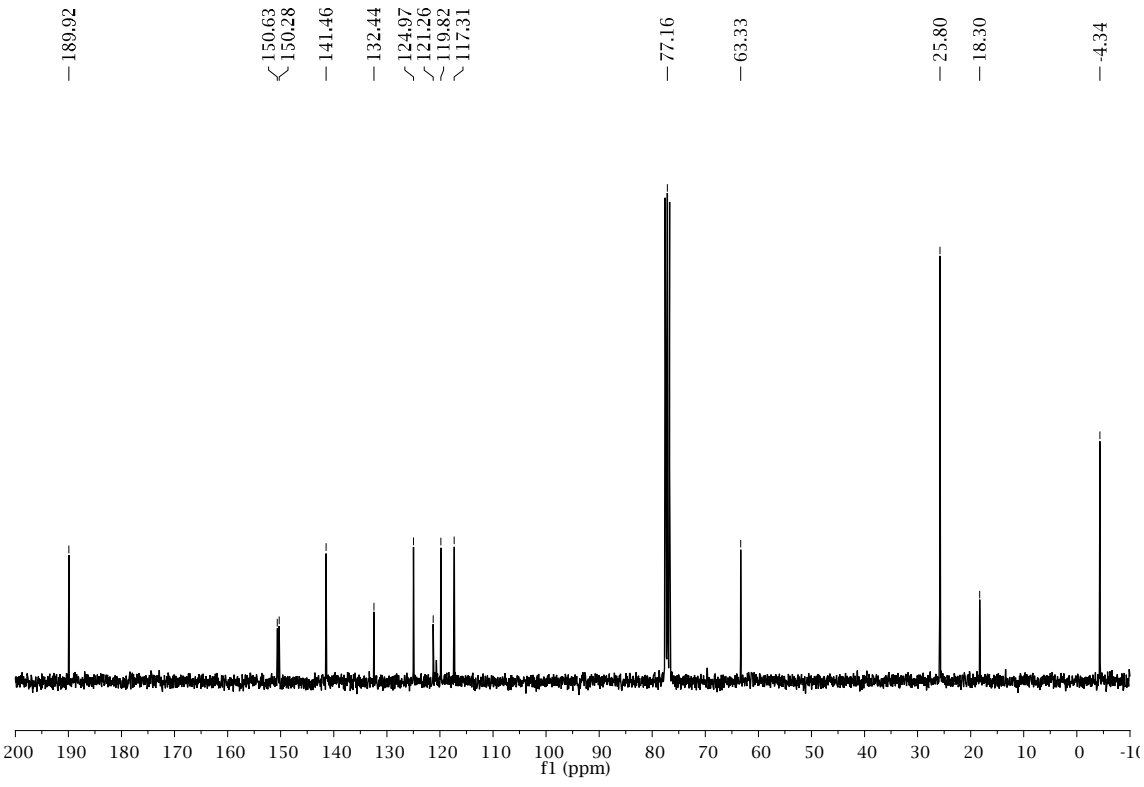

Figure S53. ^{13}C NMR (75 MHz) spectrum of **21** in $CDCl_3$.

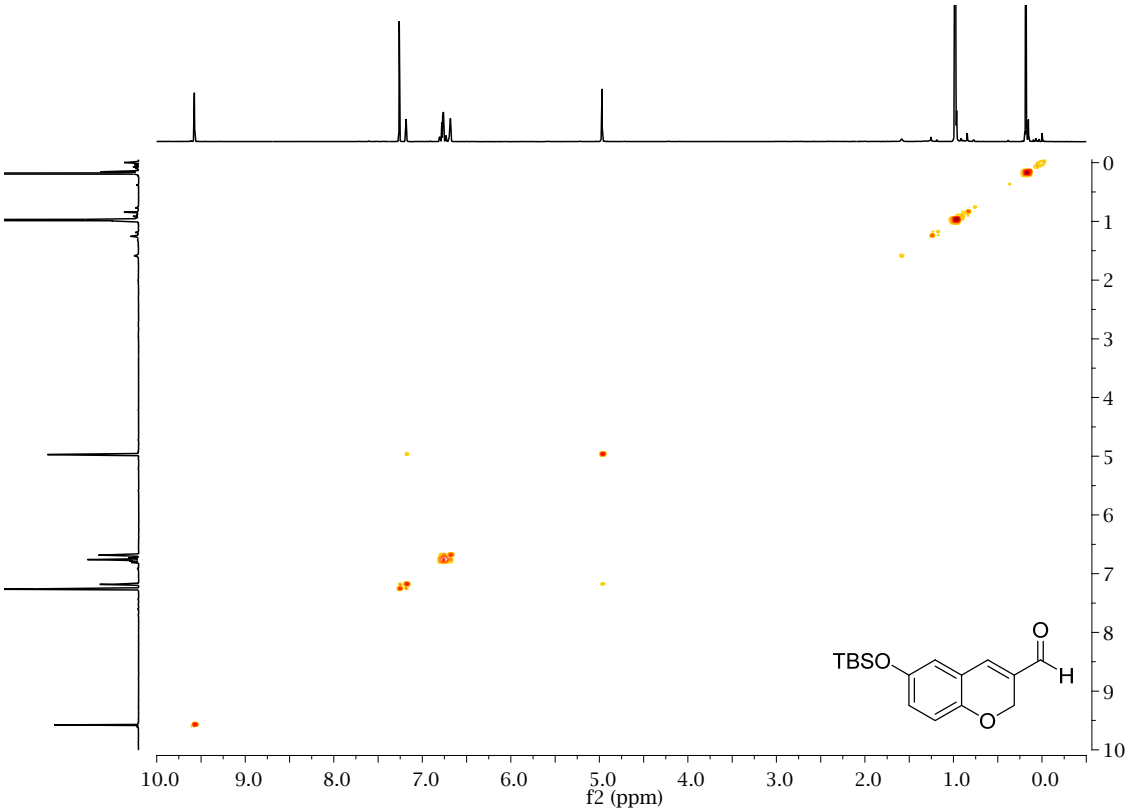

Figure S54. COSY spectrum of **21** in $CDCl_3$.

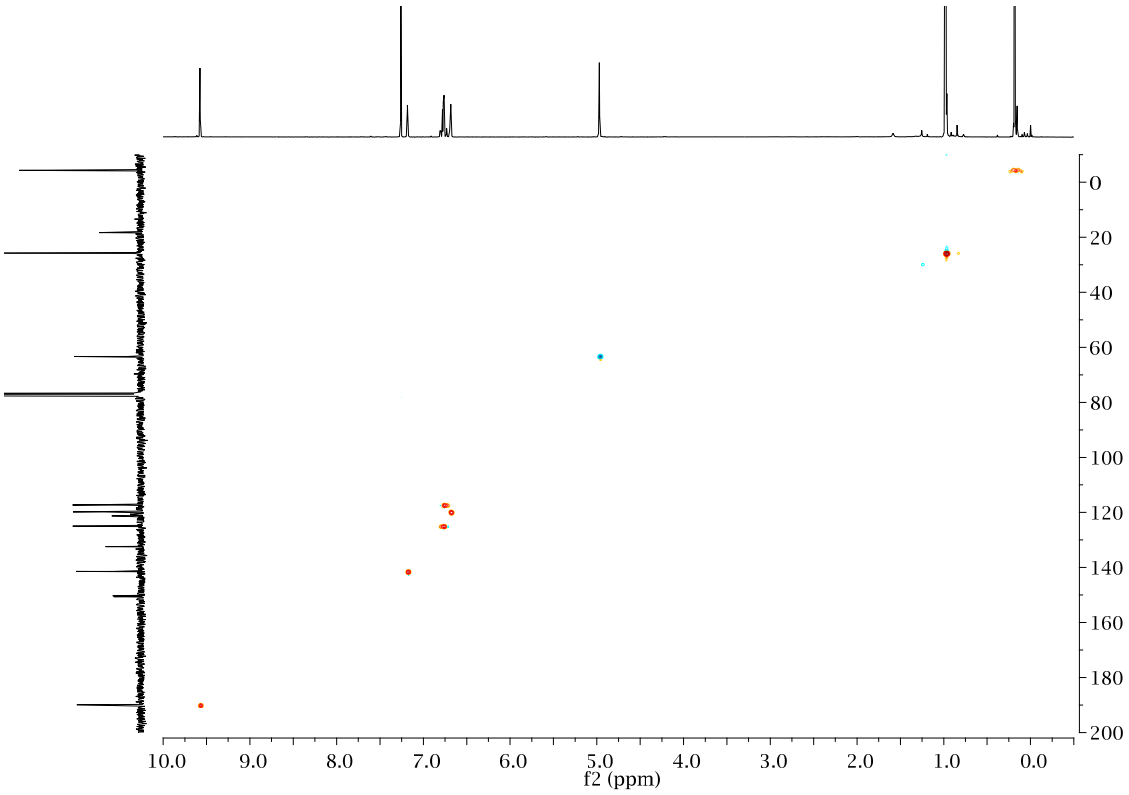

Figure S55. HSQC spectrum of **21** in $CDCl_3$.

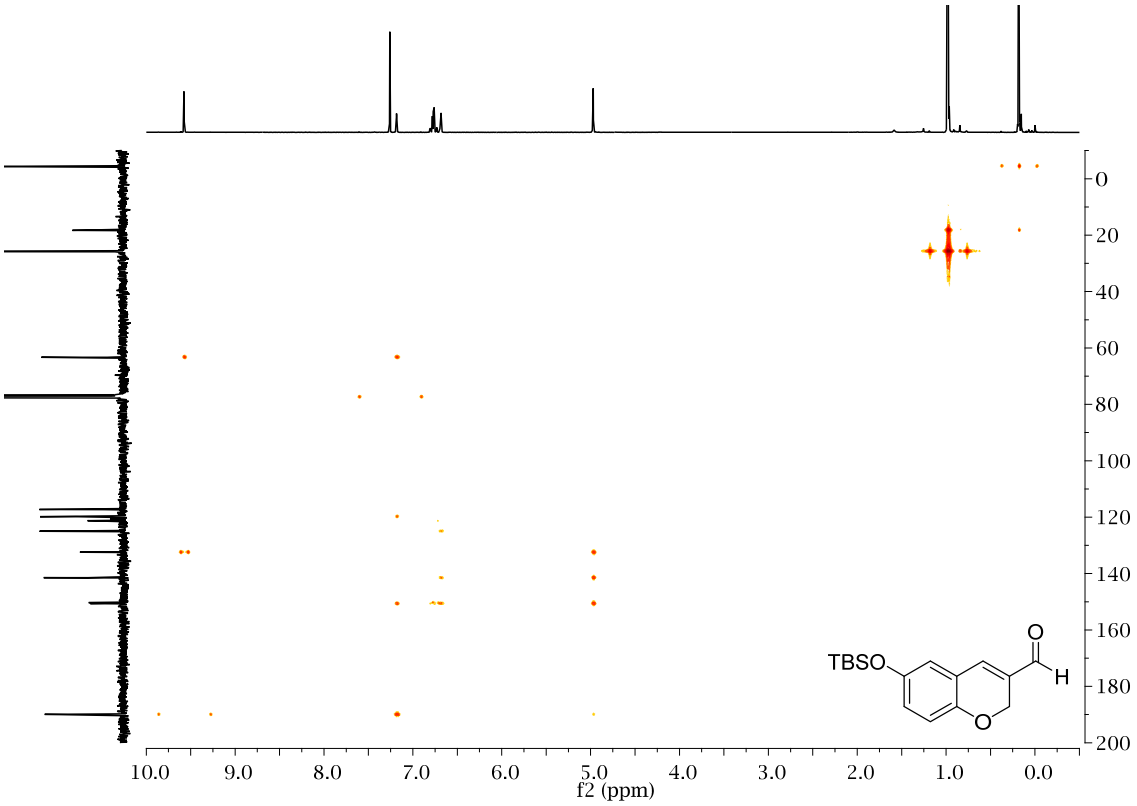

Figure S56. HMBC spectrum of **21** in $CDCl_3$.

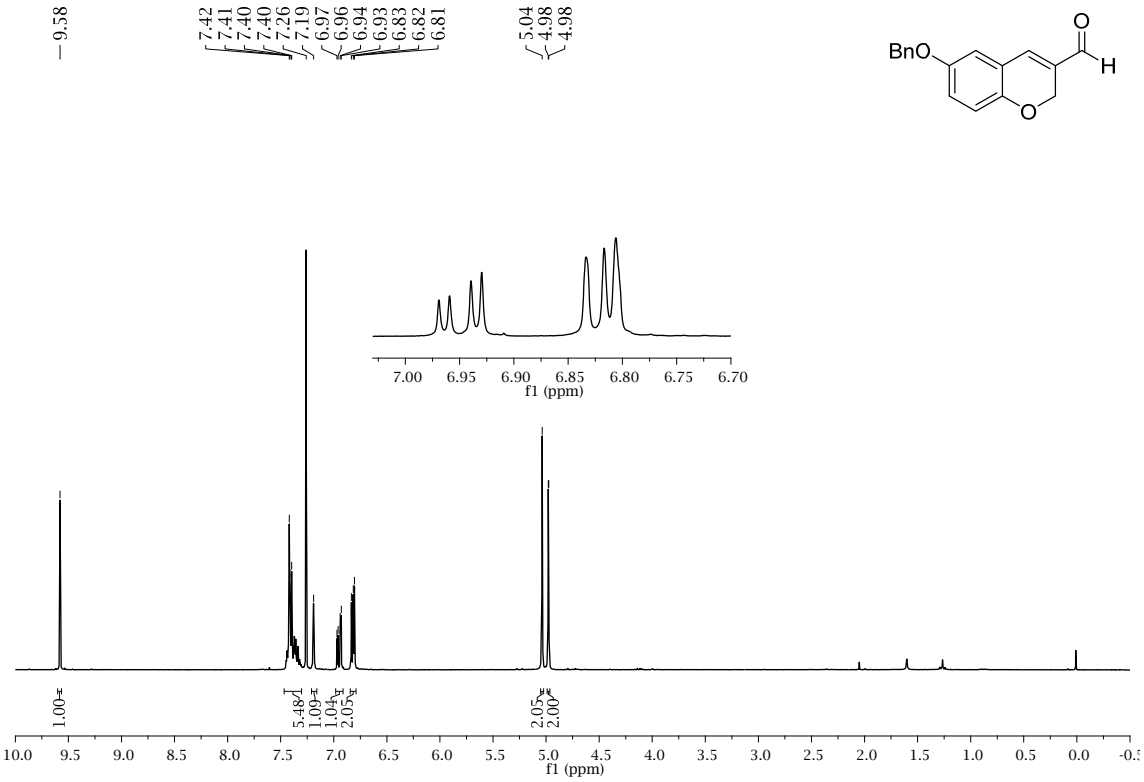

Figure S57. ^{1}H NMR (300 MHz) spectrum of **22** in $CDCl_3$.

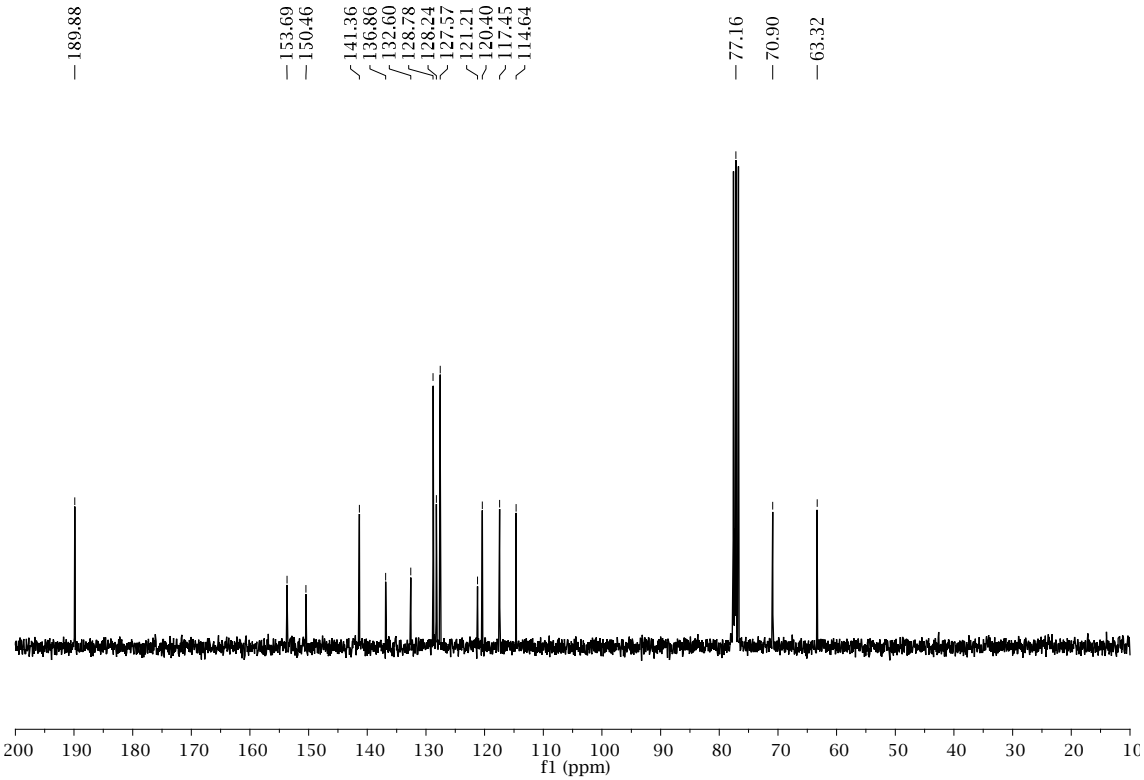

Figure S58. ^{13}C NMR (75 MHz) spectrum of **22** in $CDCl_3$.

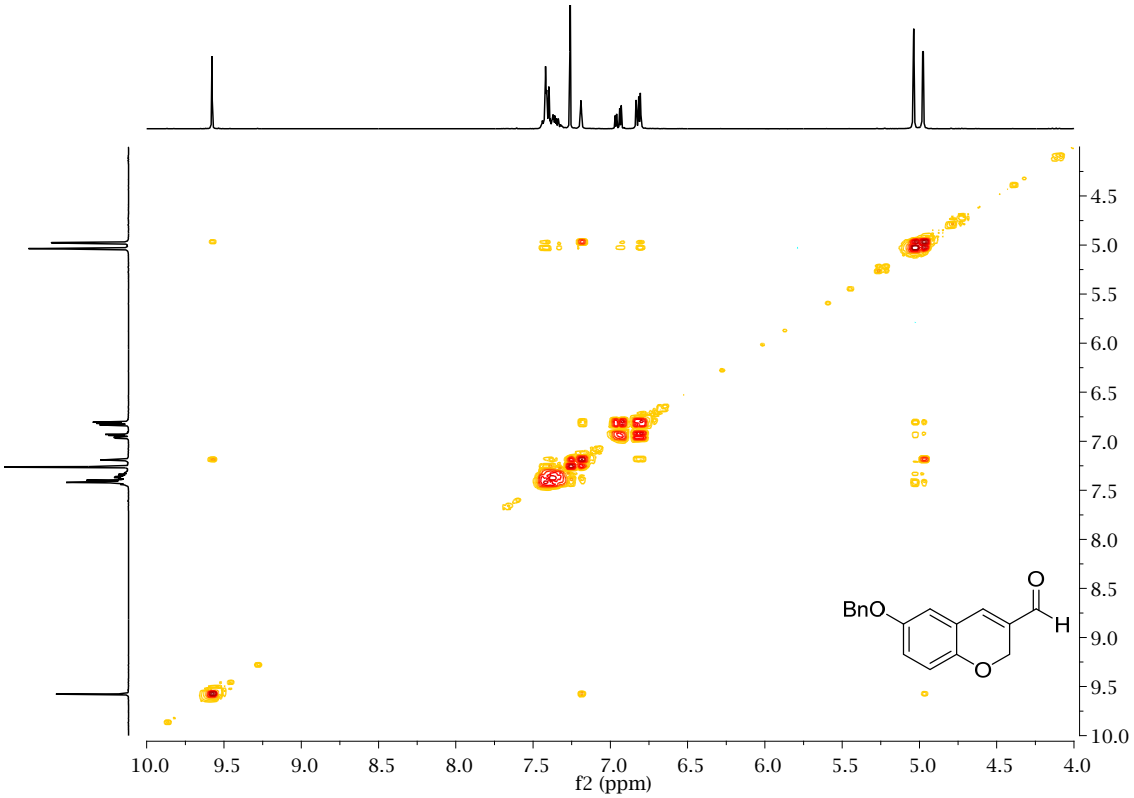

Figure S59. COSY spectrum of **22** in $CDCl_3$.

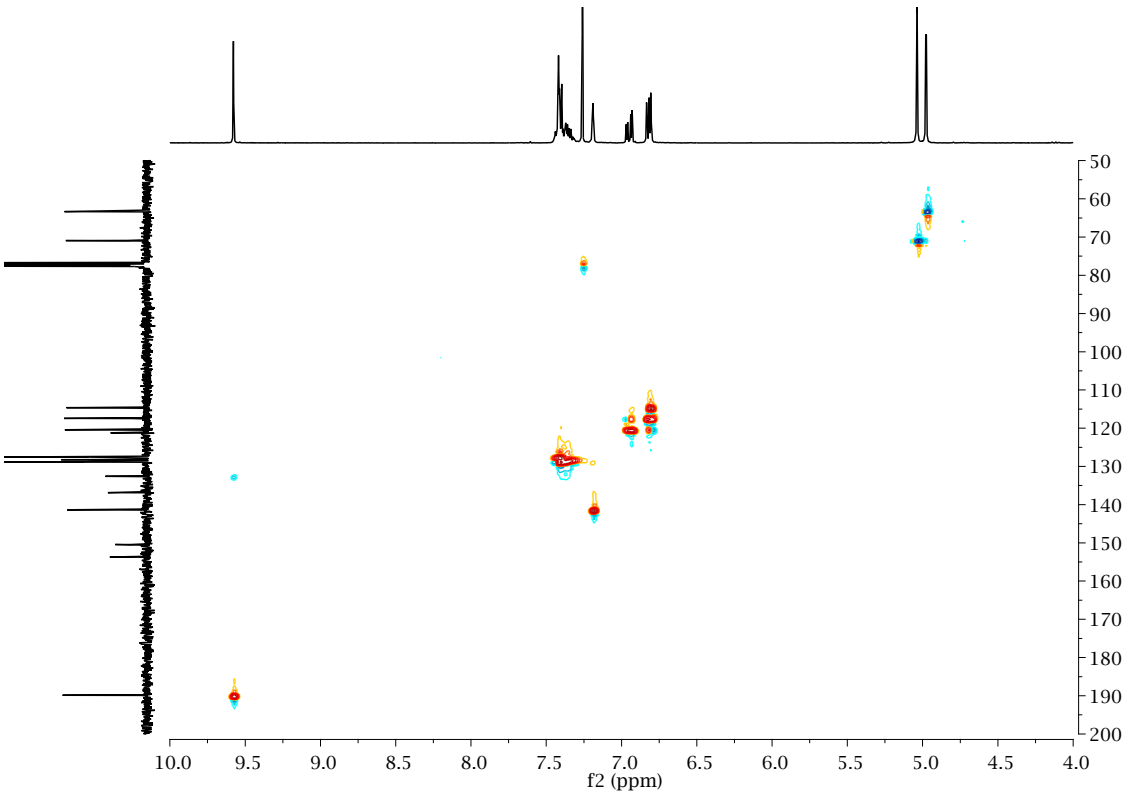

Figure S60. HSQC spectrum of **22** in $CDCl_3$.

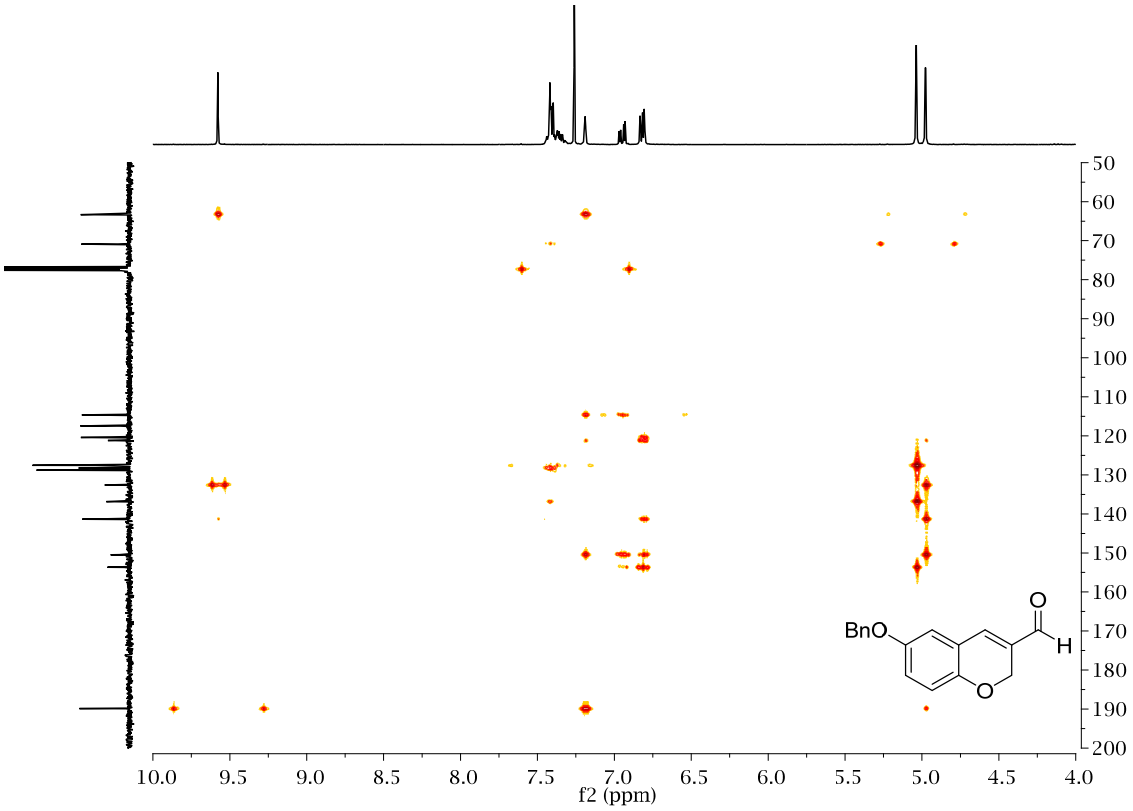

Figure S61. HMBC spectrum of **22** in $CDCl_3$.

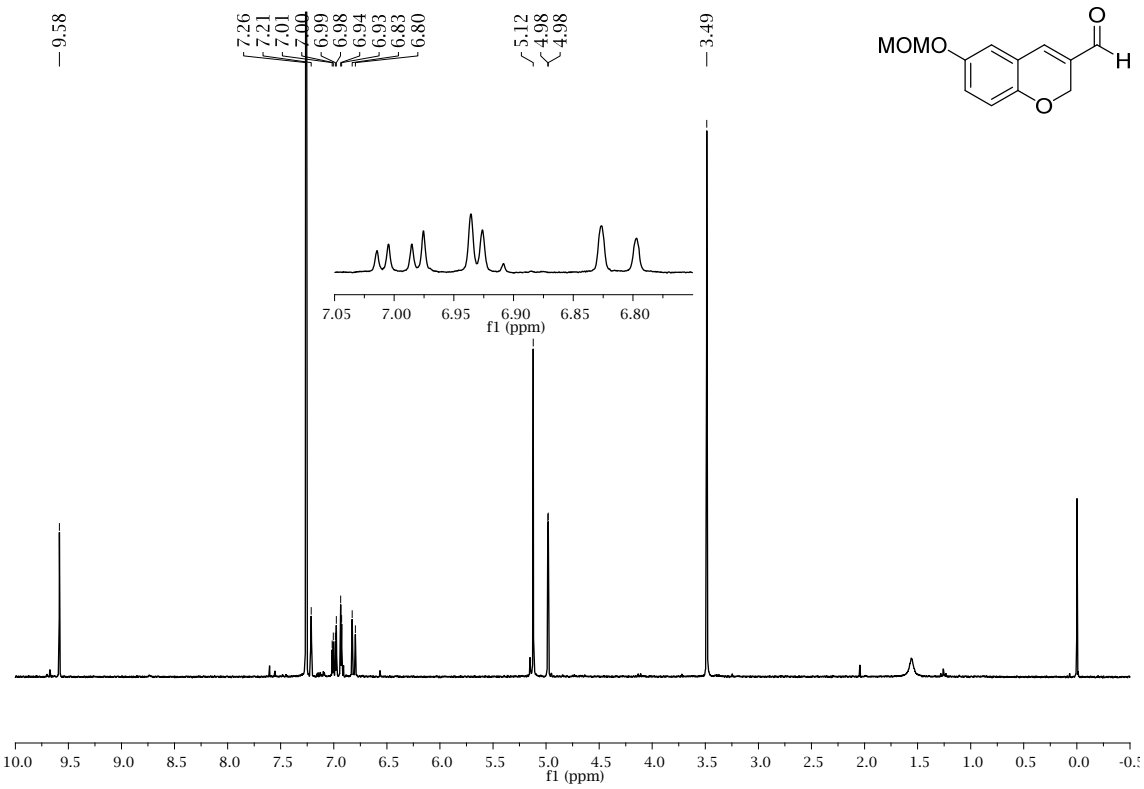

Figure S62. ^{1}H NMR (300 MHz) spectrum of **23** in $CDCl_3$.

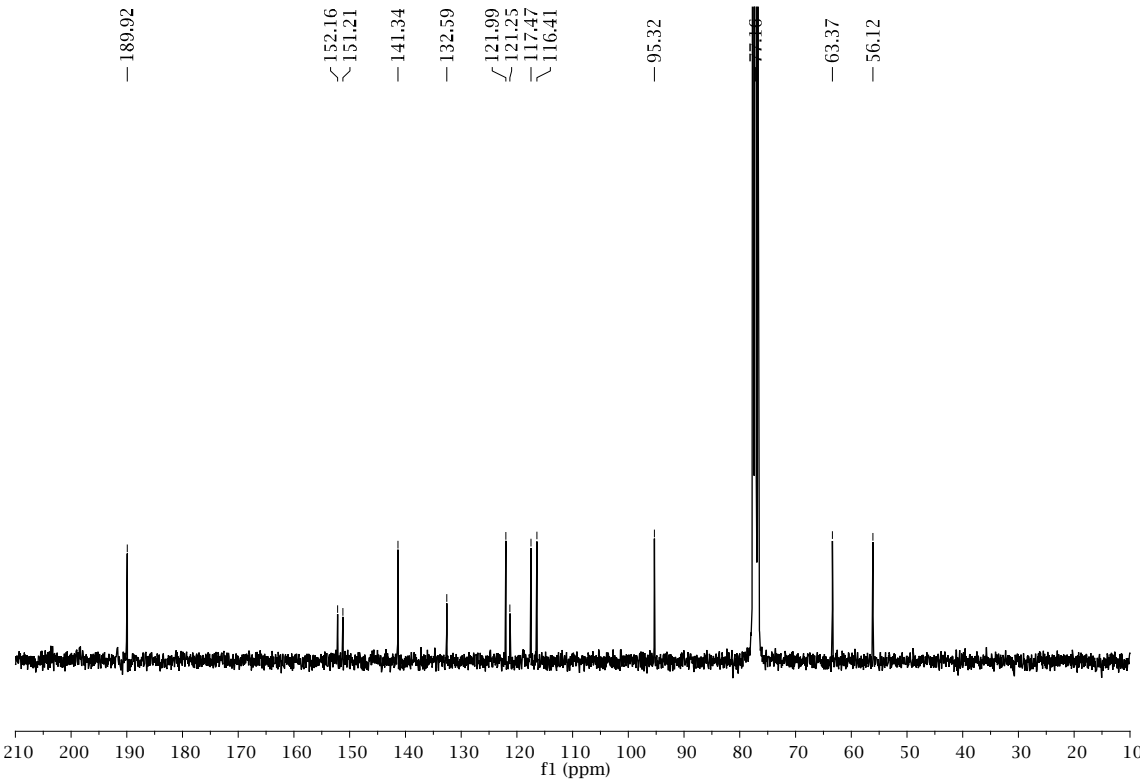

Figure S63. ^{13}C NMR (75 MHz) spectrum of **23** in $CDCl_3$.

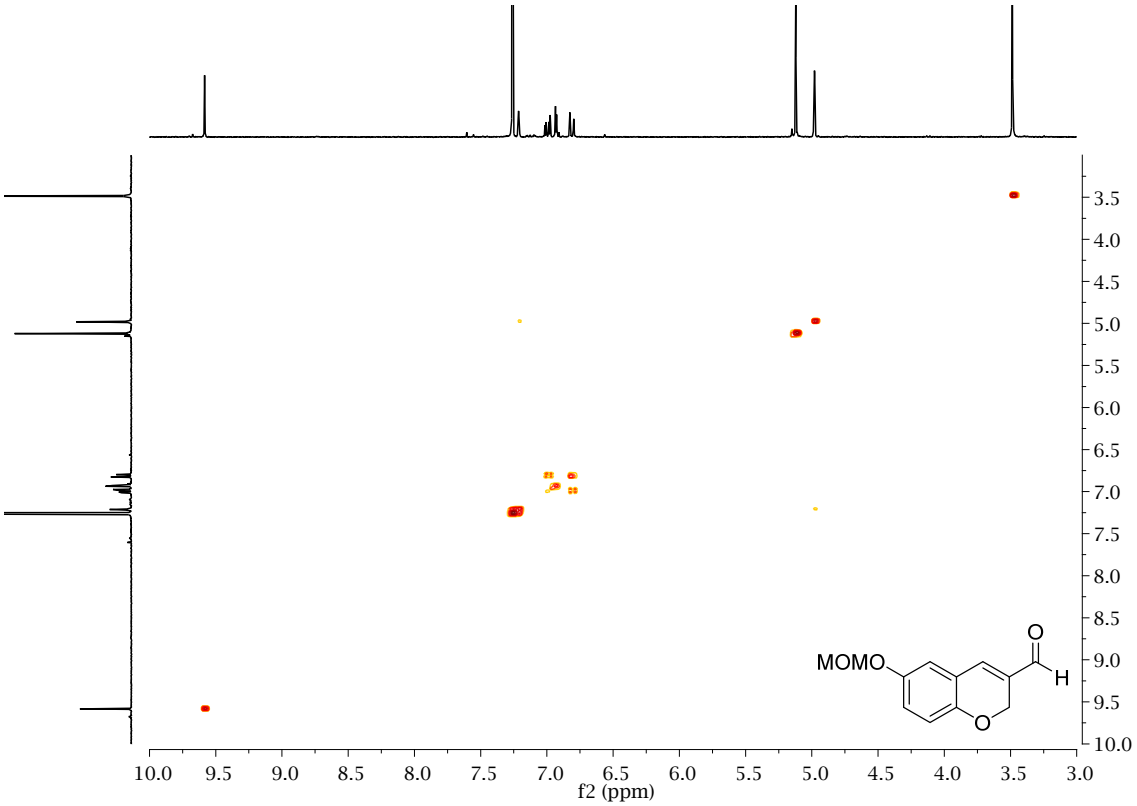

Figure S64. COSY spectrum of **23** in $CDCl_3$.

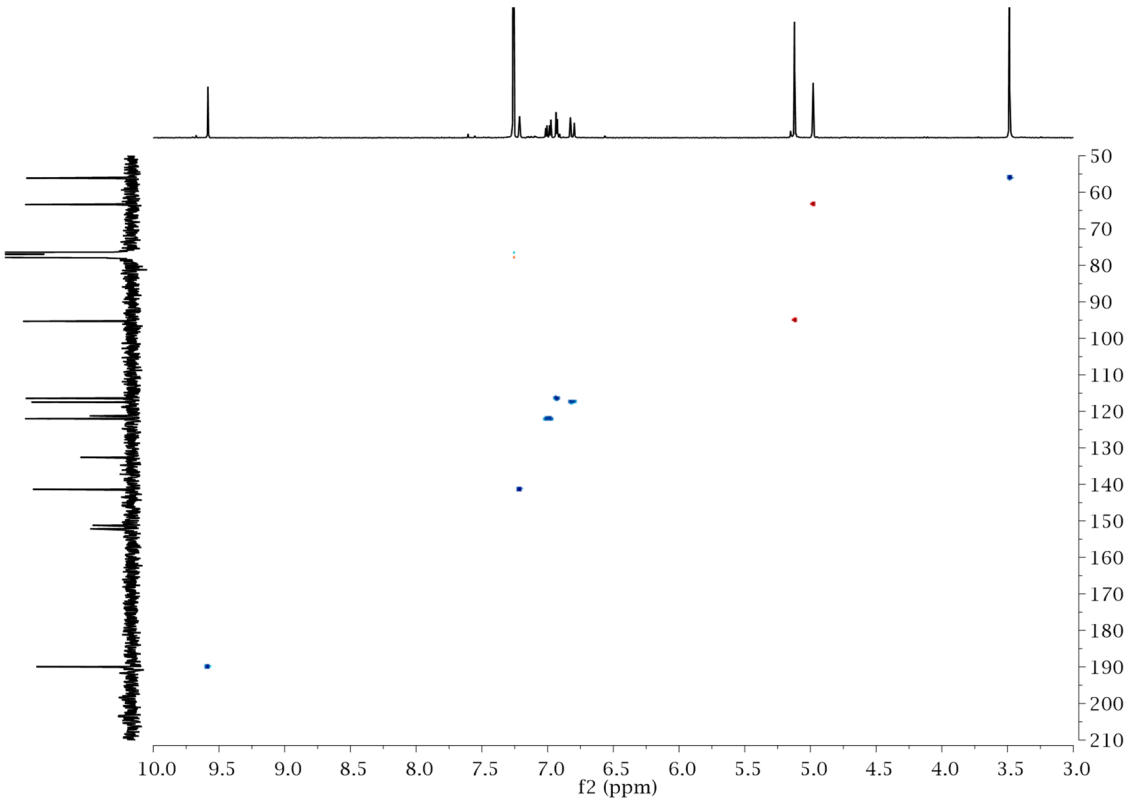

Figure S65. HSQC spectrum of **23** in $CDCl_3$.

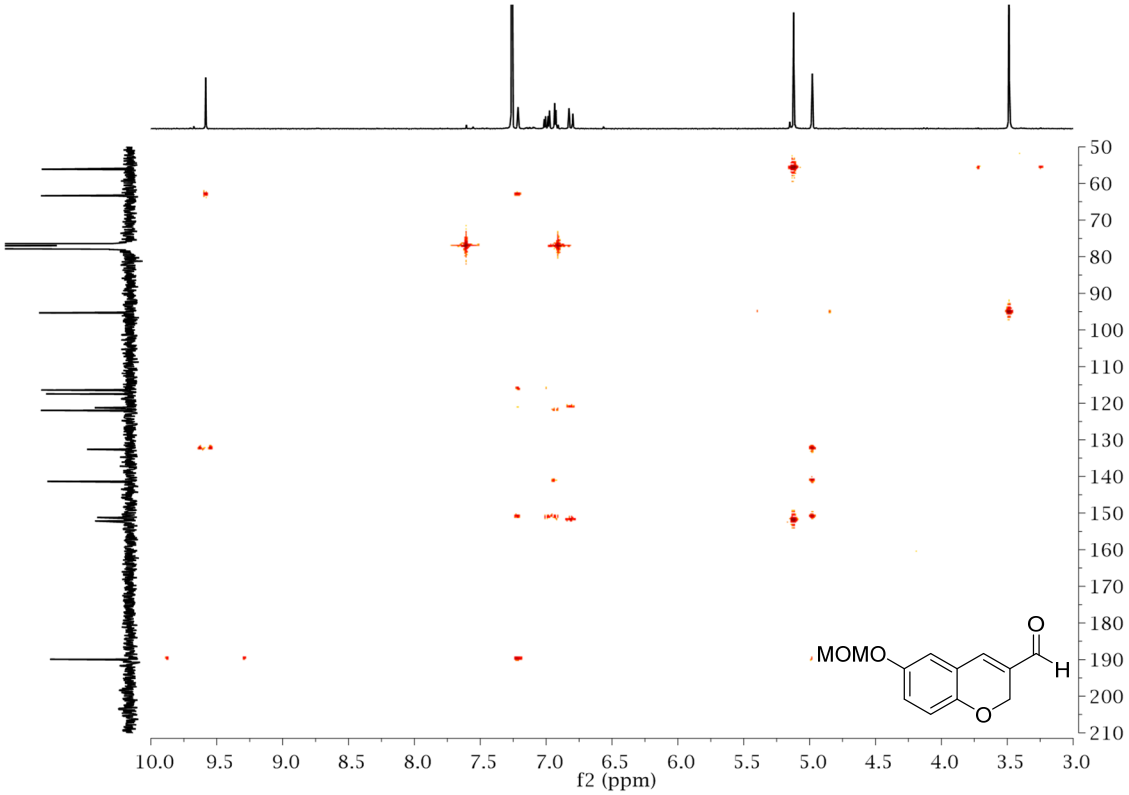

Figure S66. HMBC spectrum of **23** in $CDCl_3$.

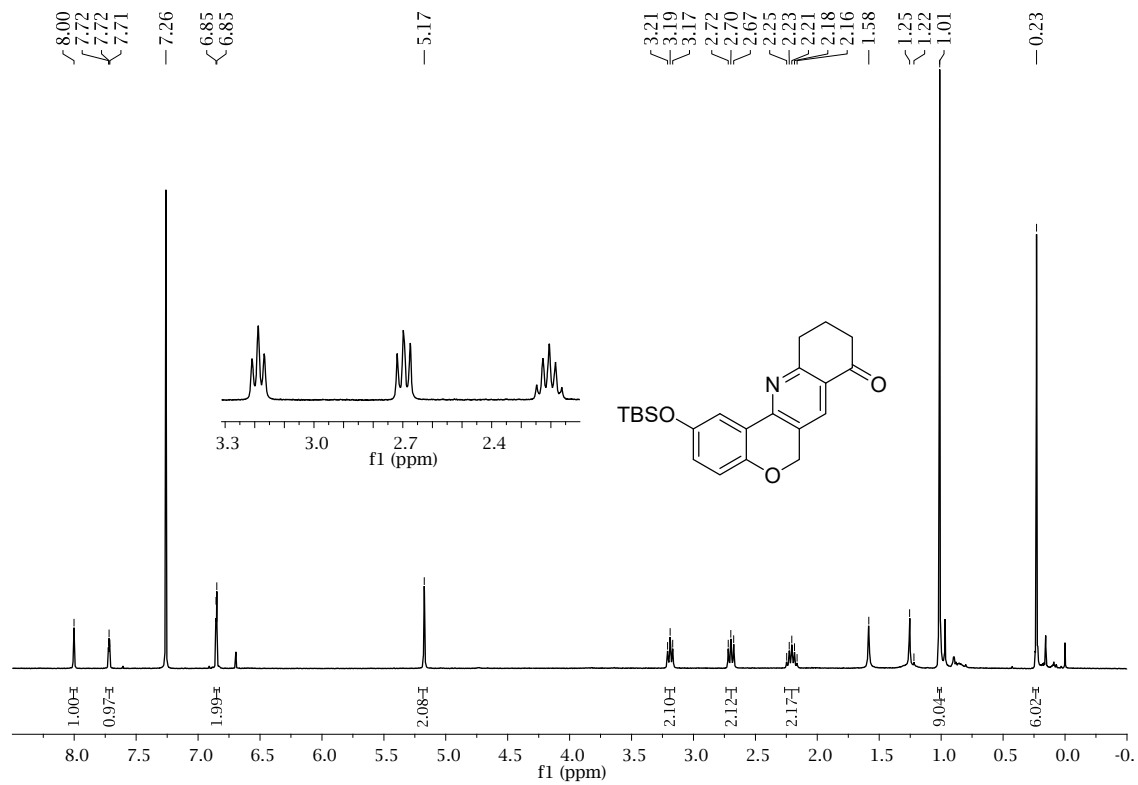

Figure S67. ^{1}H NMR (300 MHz) spectrum of **24** in $CDCl_3$.

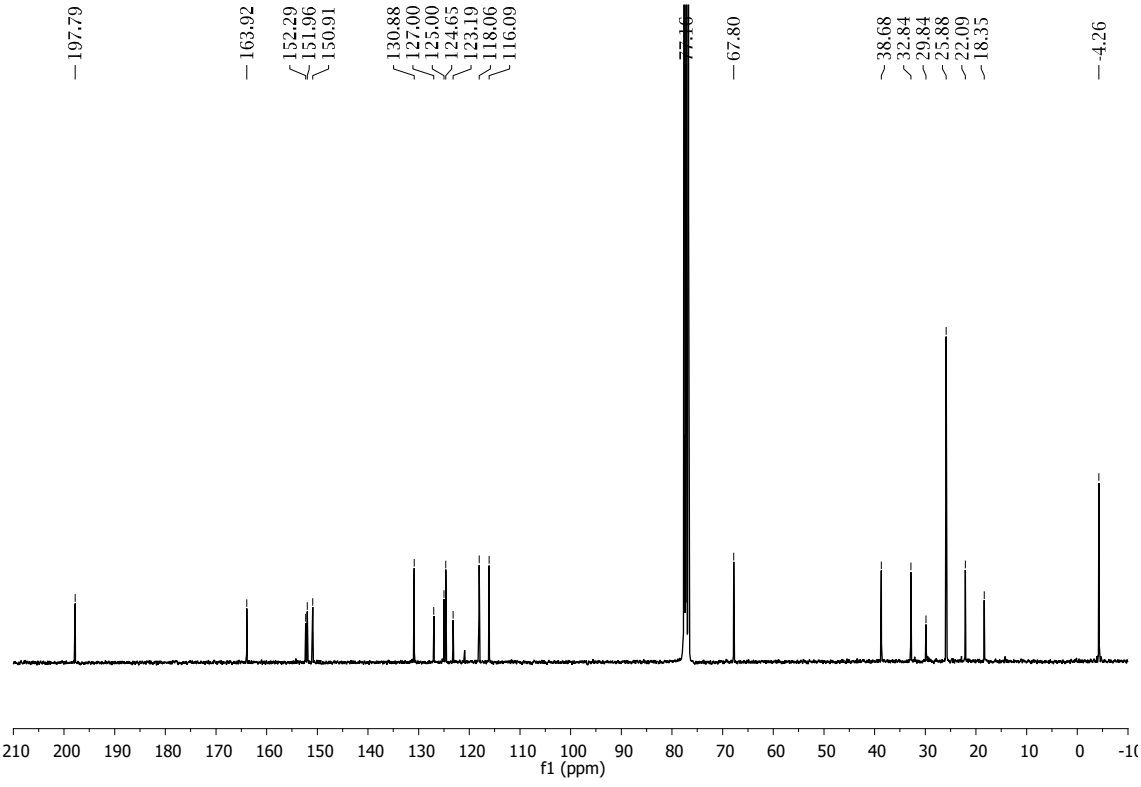

Figure S68. ^{13}C NMR (75 MHz) spectrum of **24** in $CDCl_3$.

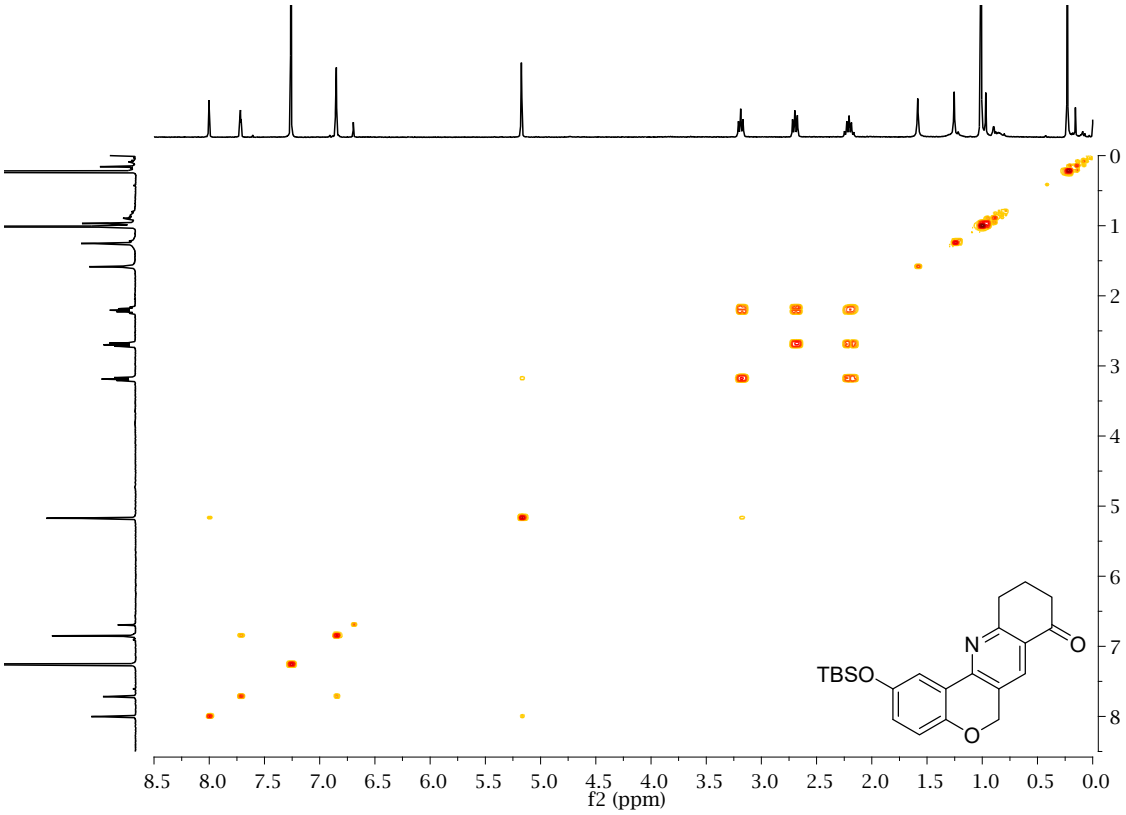

Figure S69. COSY spectrum of **24** in $CDCl_3$.

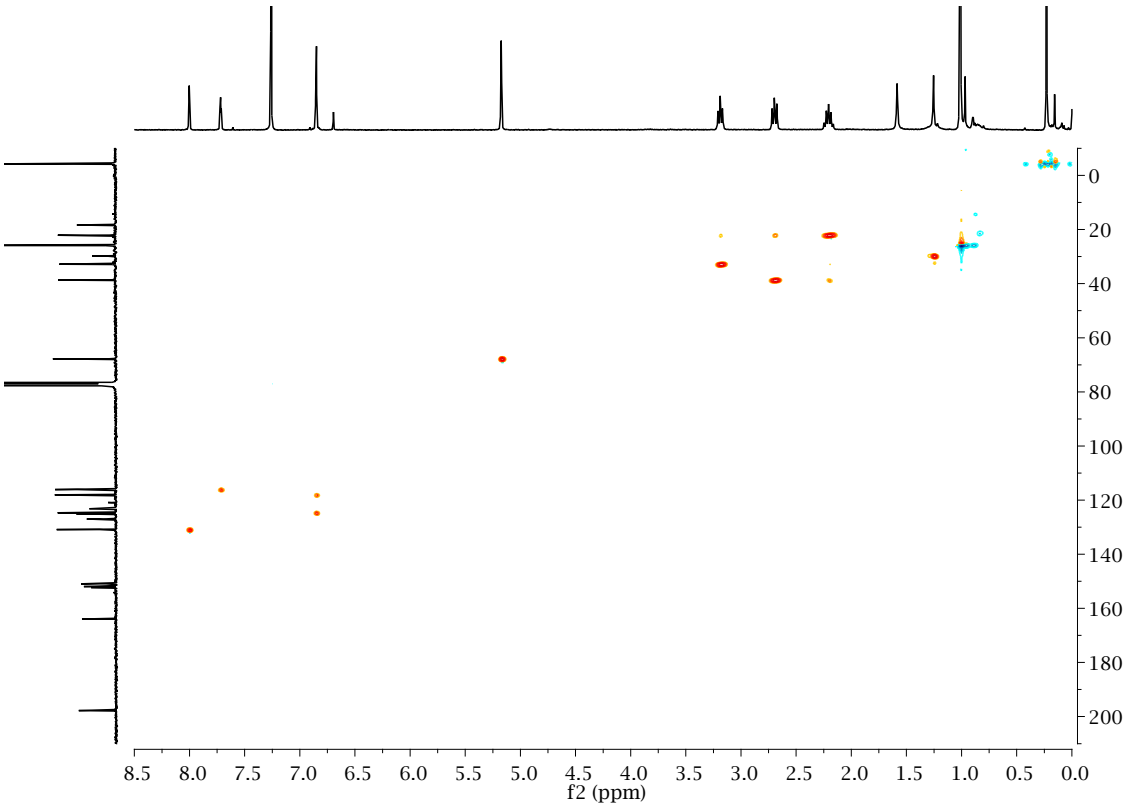

Figure S70. HSQC spectrum of **24** in $CDCl_3$.

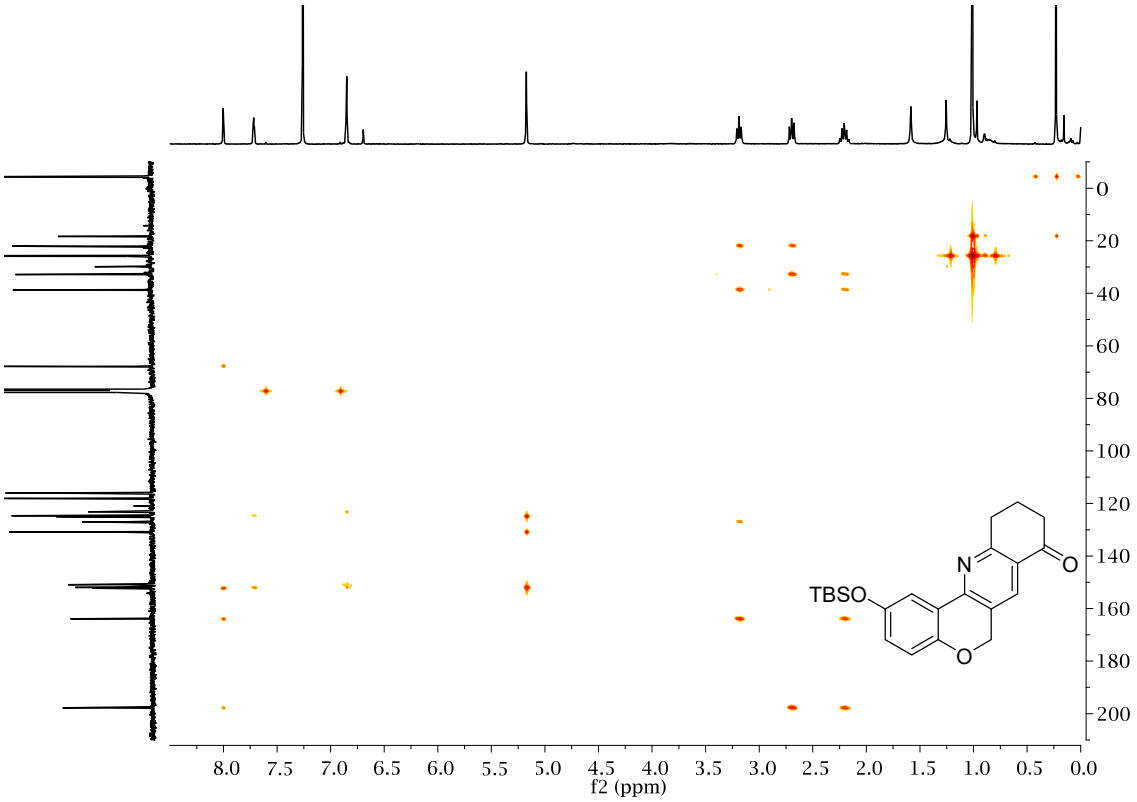

Figure S71. HMBC spectrum of **24** in $CDCl_3$.

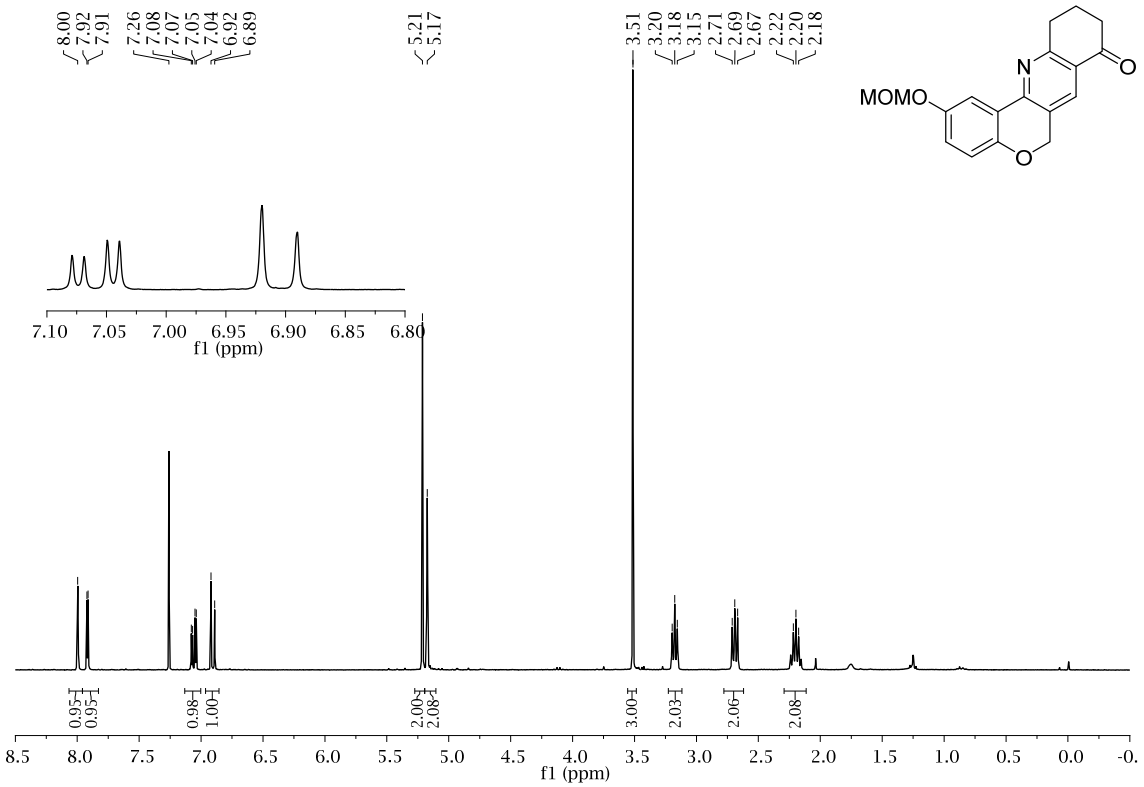

Figure S72. ^{1}H NMR (300 MHz) spectrum of **25** in $CDCl_3$.

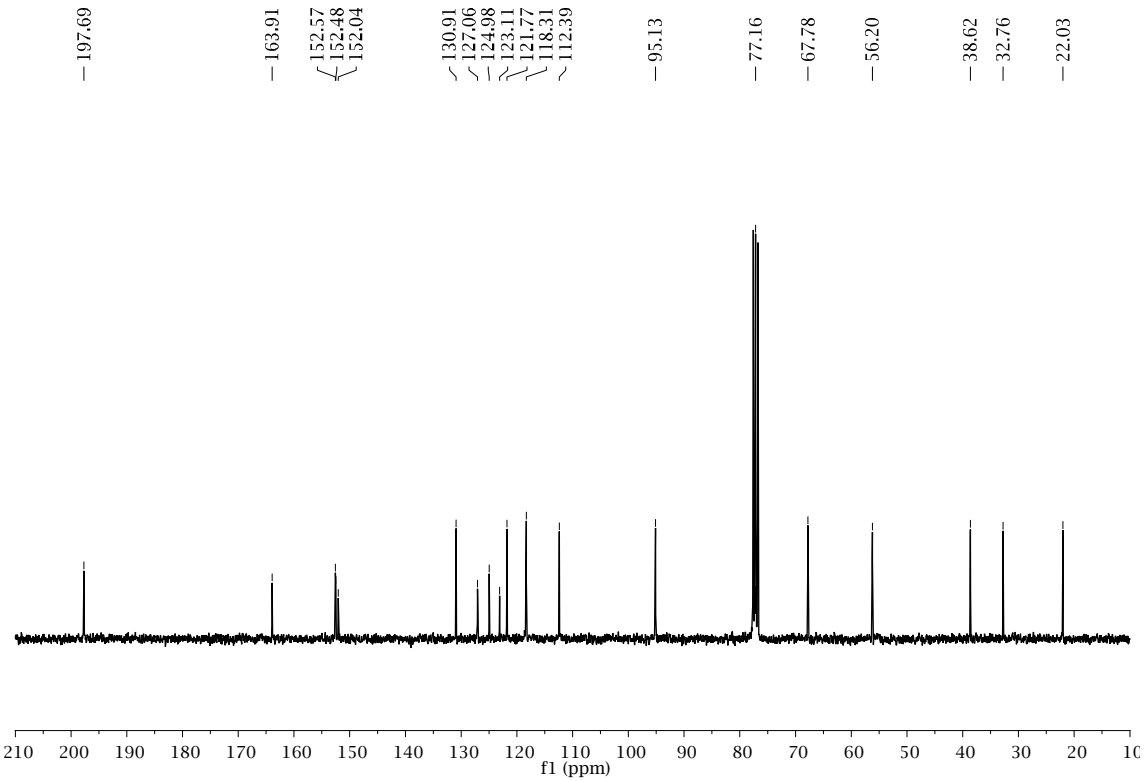

Figure 73. ^{13}C NMR (75 MHz) spectrum of **25** in $CDCl_3$.

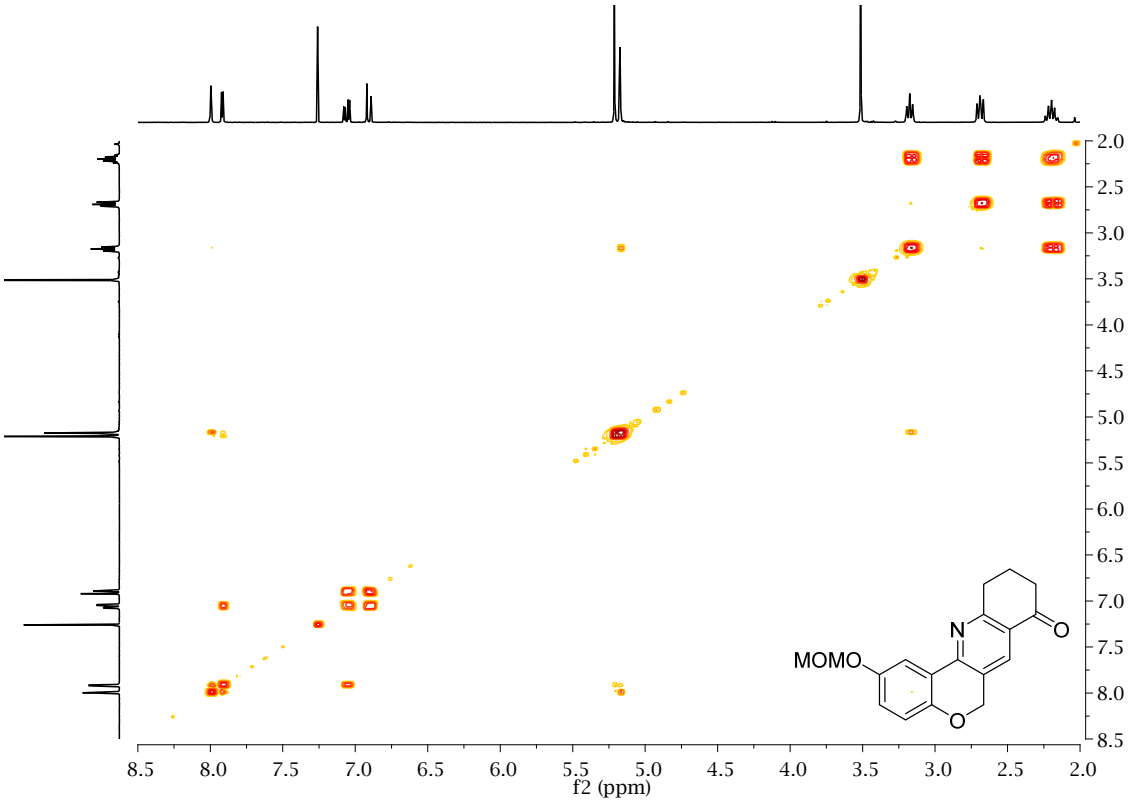

Figure S74. COSY spectrum of **25** in $CDCl_3$.

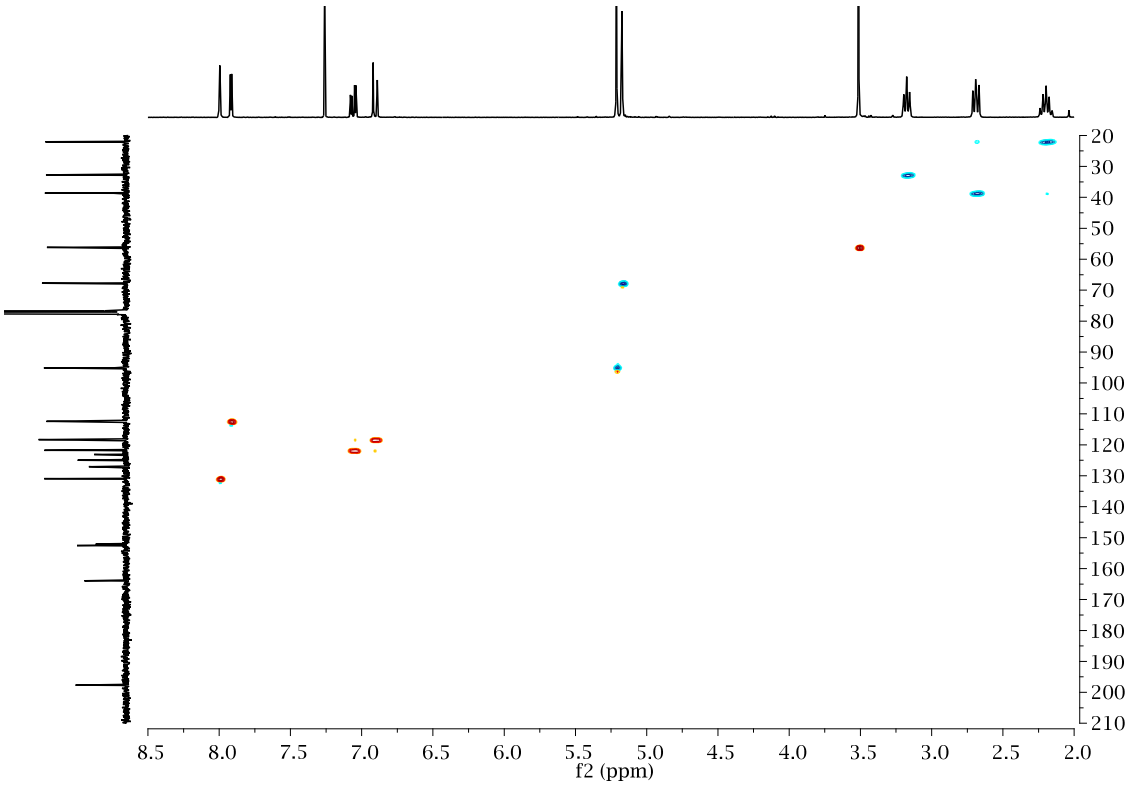

Figure S75. HSQC spectrum of **25** in $CDCl_3$.

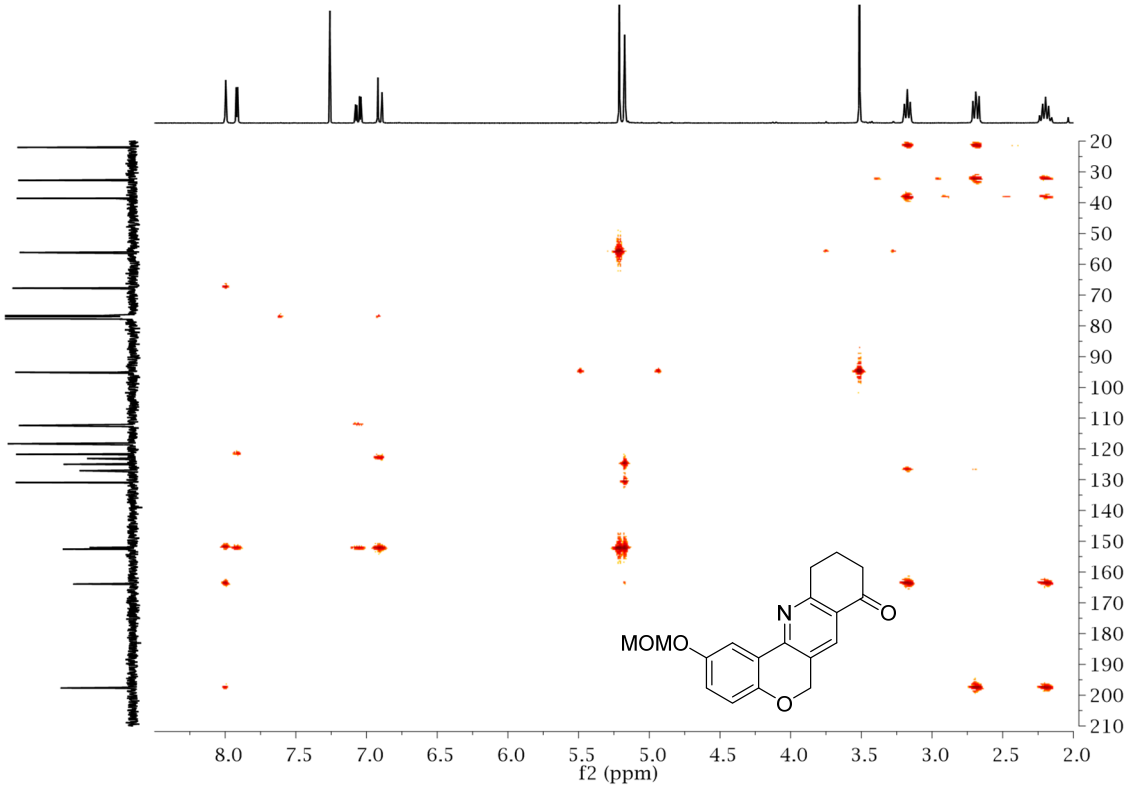

Figure S76. HMBC spectrum of **25** in $CDCl_3$.

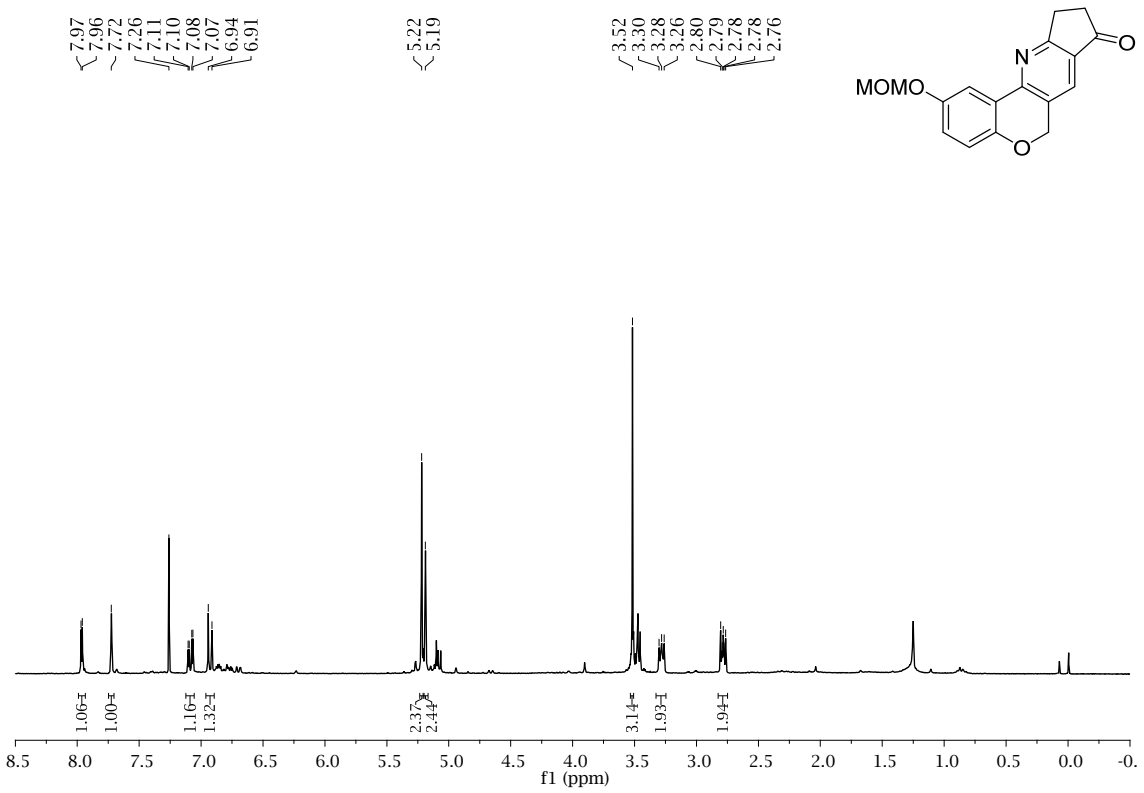

Figure S77. ^{1}H NMR (300 MHz) spectrum of **26** in $CDCl_3$.

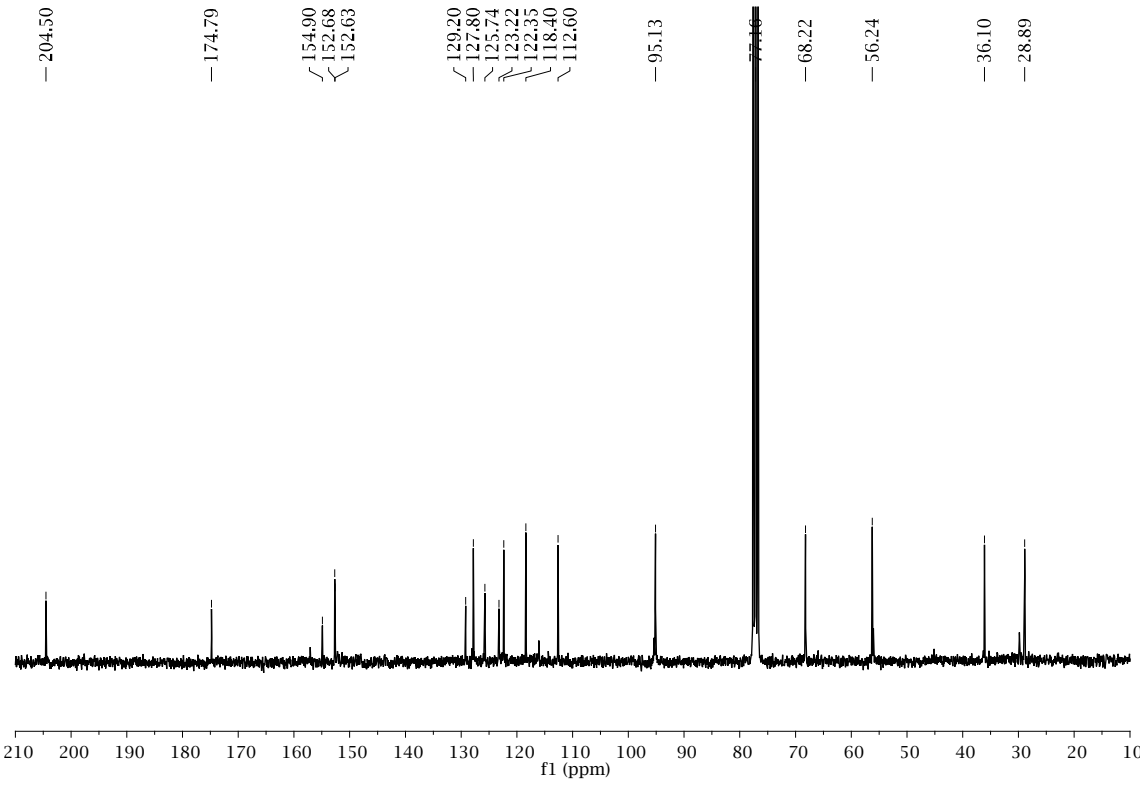

Figure S78. ^{13}C NMR (75 MHz) spectrum of **26** in $CDCl_3$.

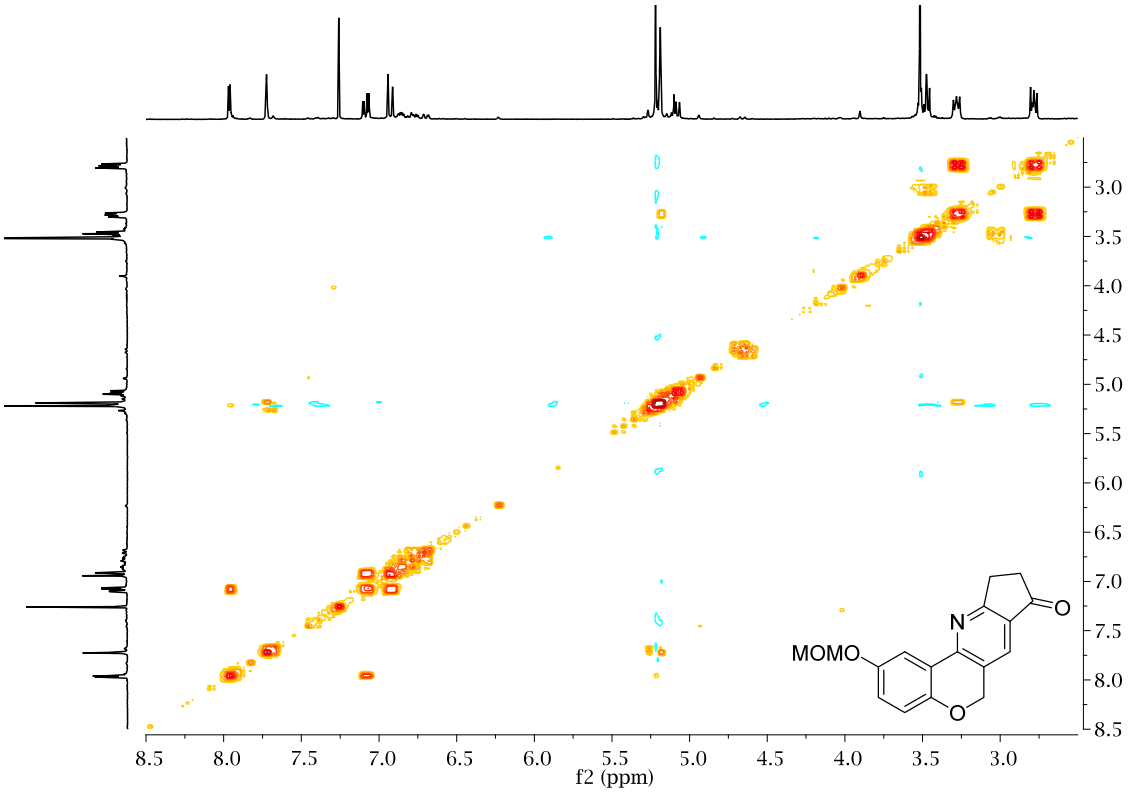

Figure S79. COSY spectrum of **26** in $CDCl_3$.

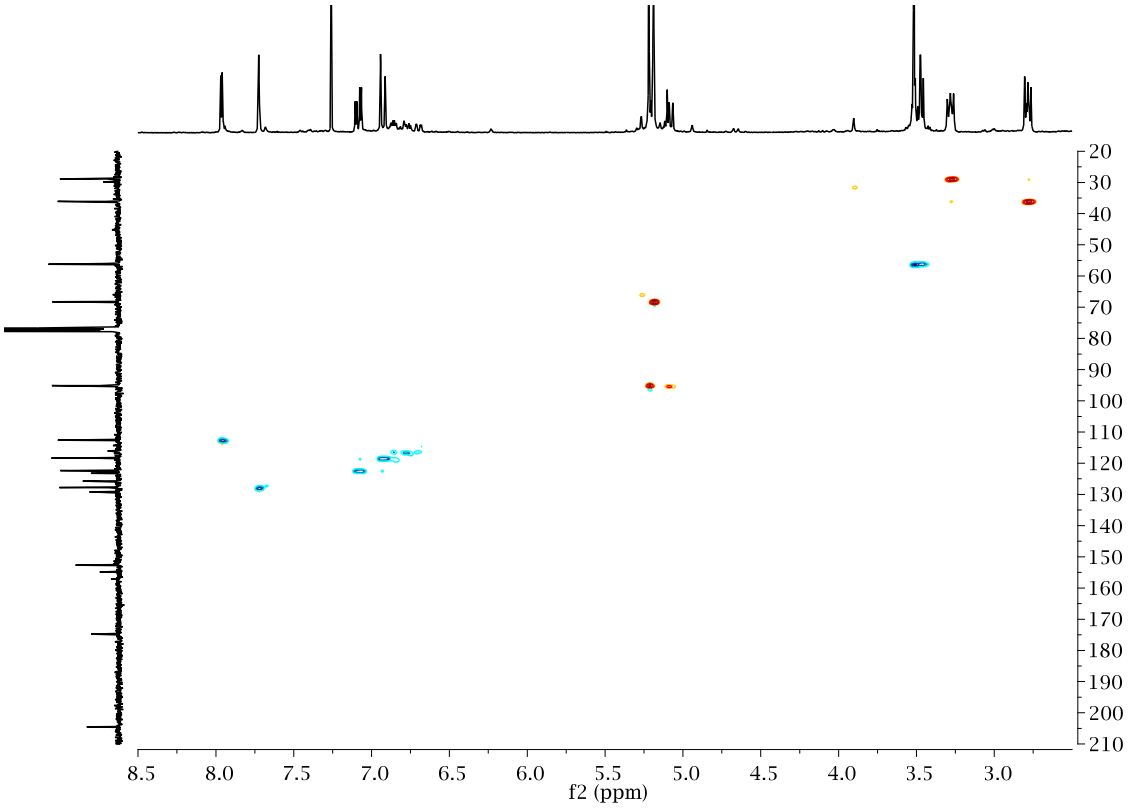

Figure S80. HSQC spectrum of **26** in $CDCl_3$.

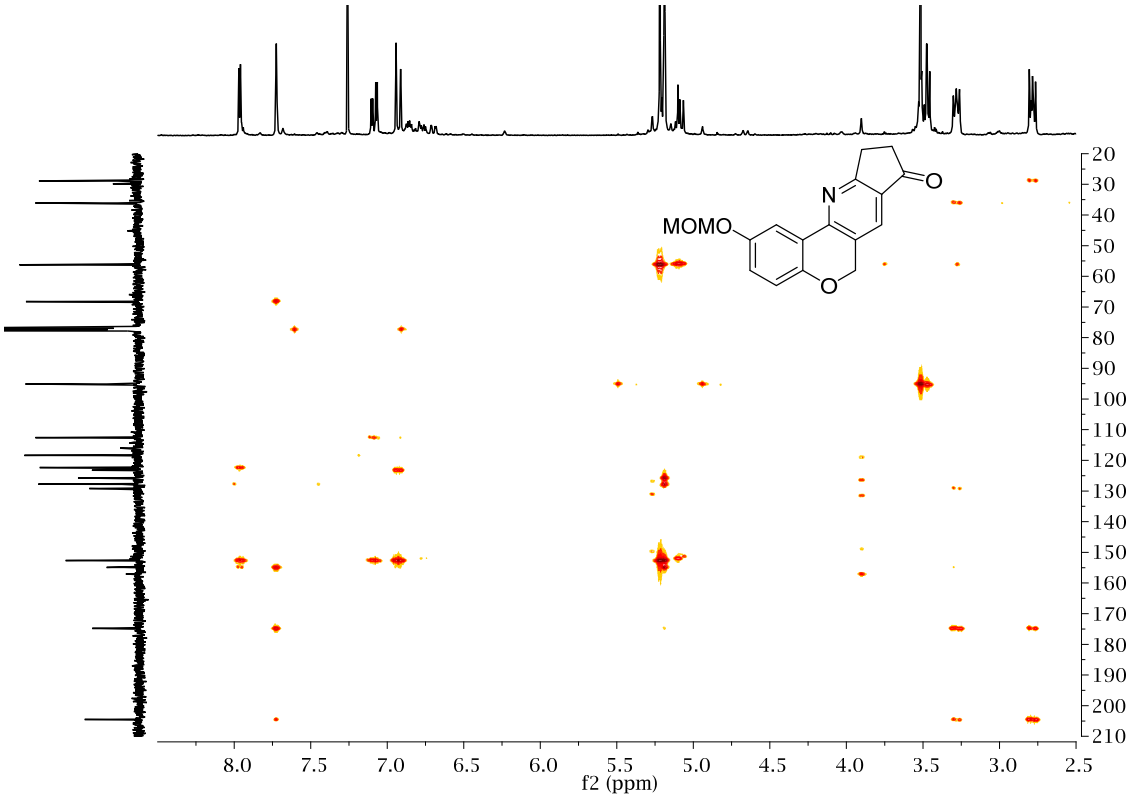

Figure S81. HMBC spectrum of **26** in $CDCl_3$.

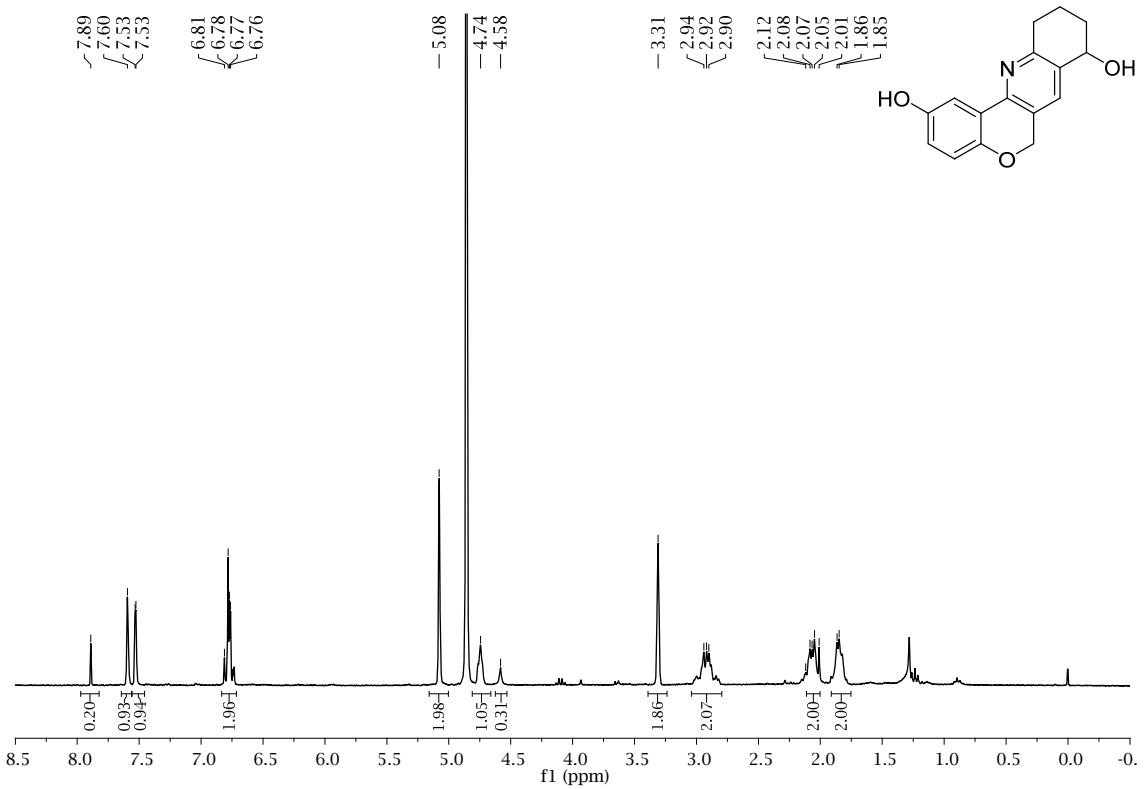

Figure S82. ^{1}H NMR (300 MHz) spectrum of **28** in MeOH-d_4.

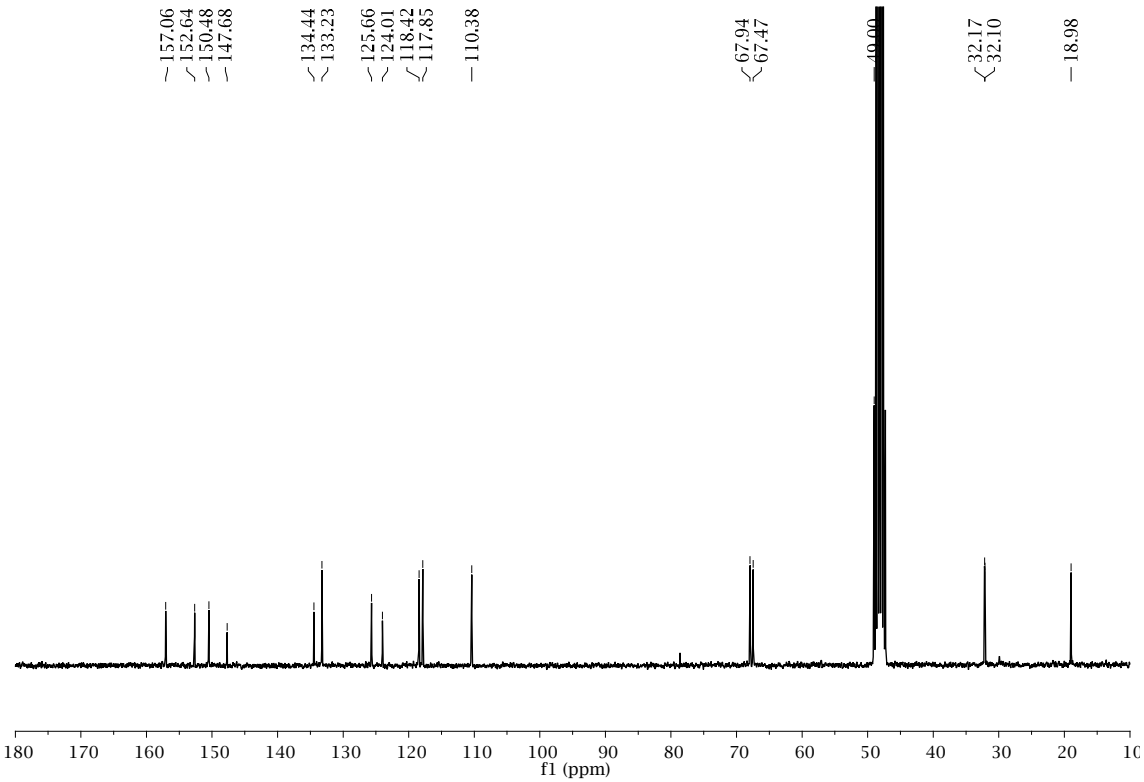

Figure S83. ^{13}C NMR (75 MHz) spectrum of **28** in MeOH-d_4.

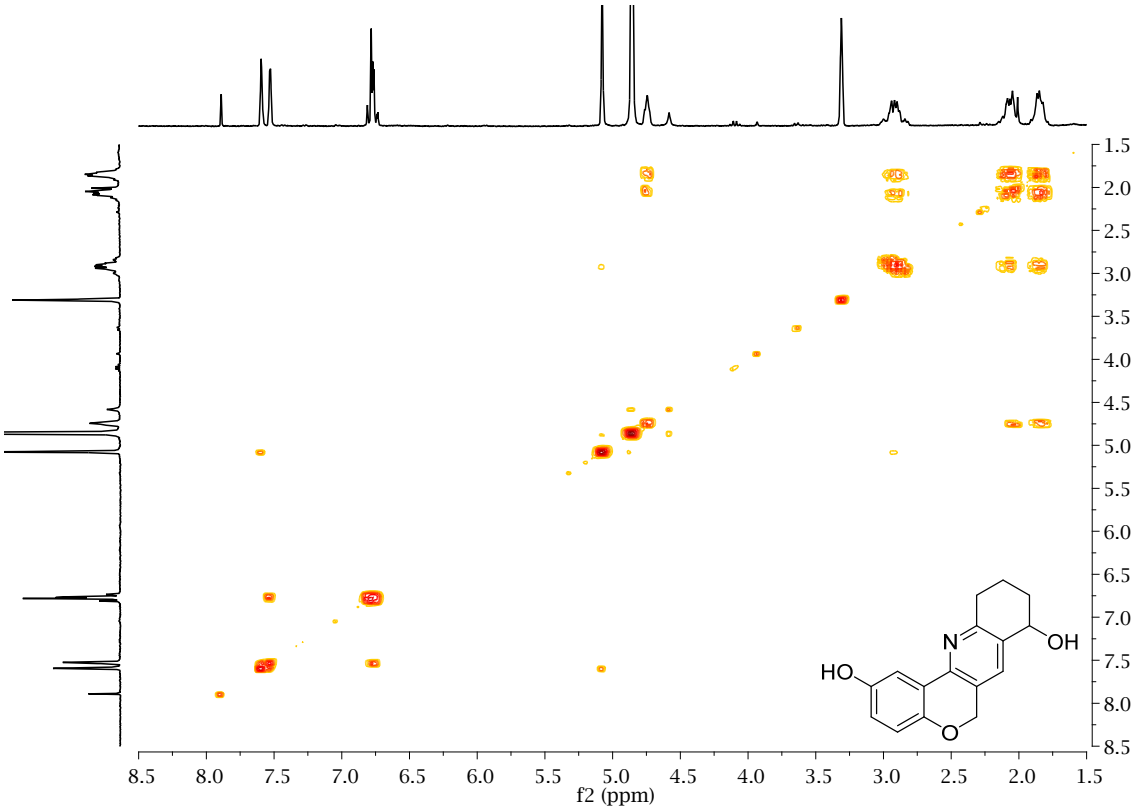

Figure S84. COSY spectrum of **28** in MeOH-*d*4.

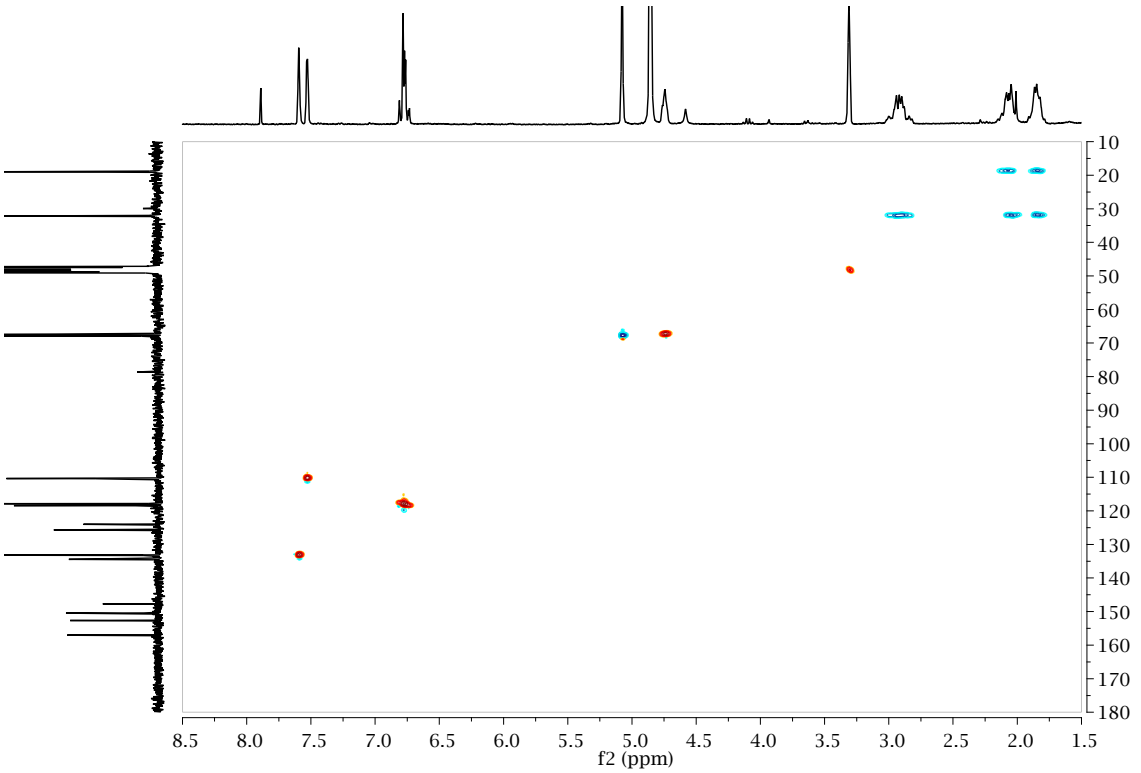

Figure S85. HSQC spectrum of **28** in MeOH-*d*4.

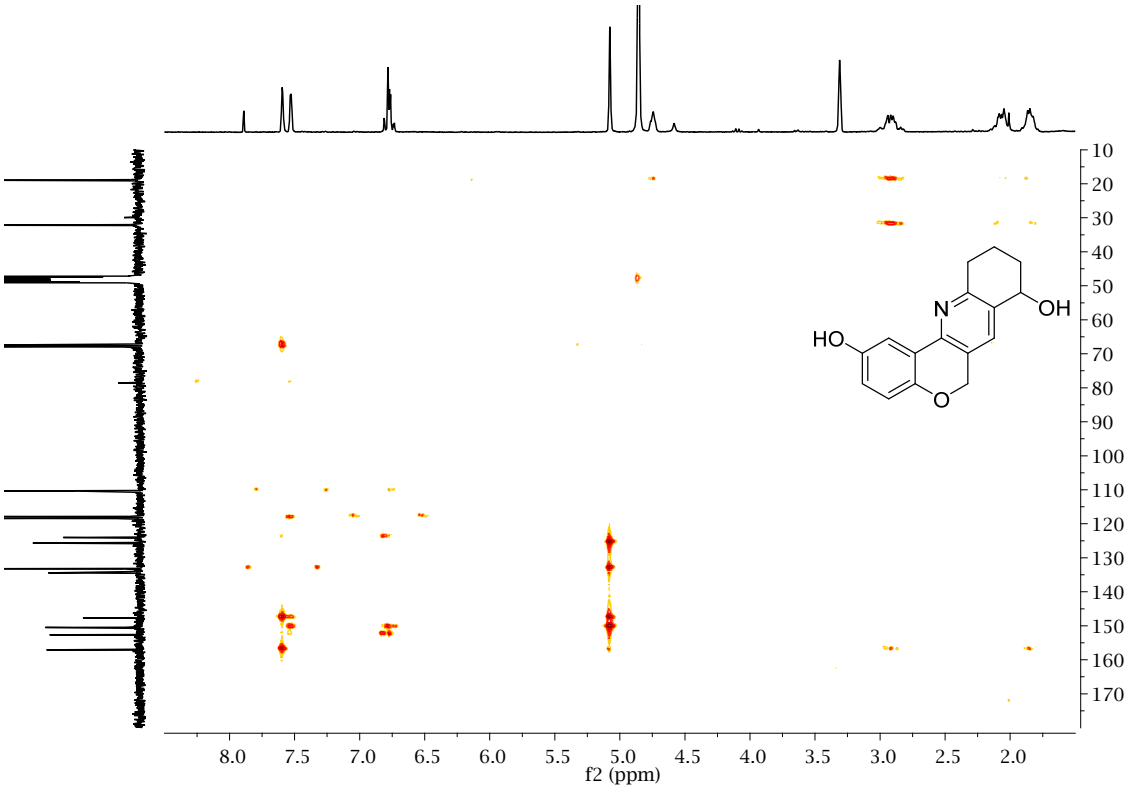

Figure S86. HMBC spectrum of **28** in MeOH-d_4.

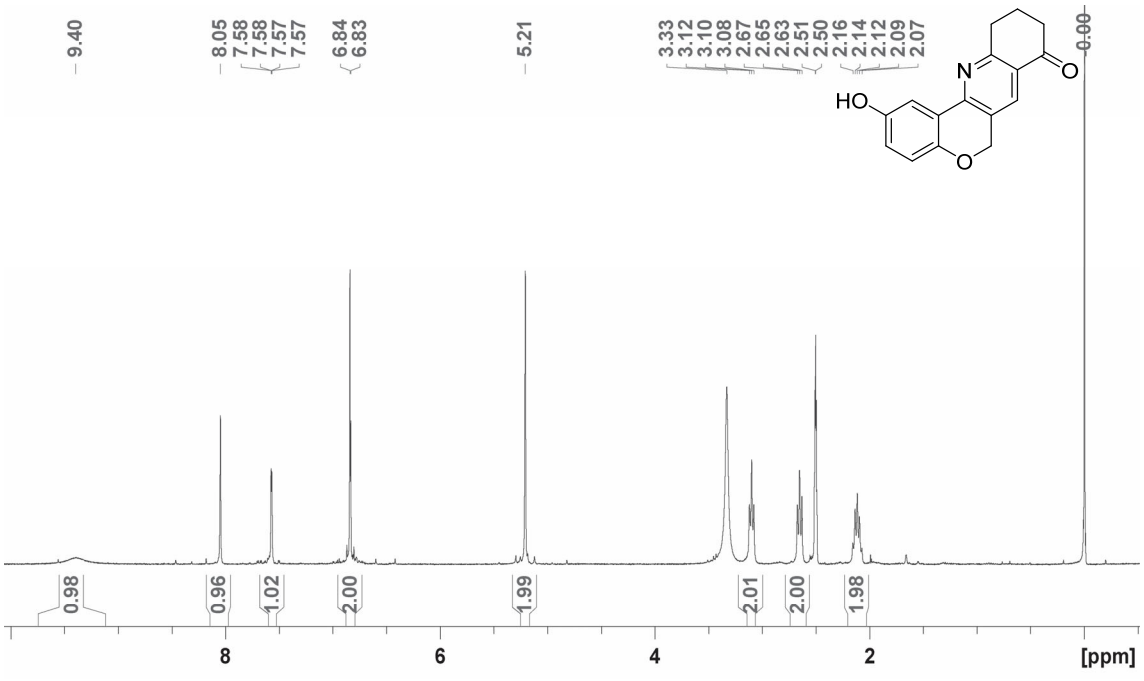

Figure S87. ^{1}H NMR (300 MHz) spectrum of **29** in DMSO-d_6.

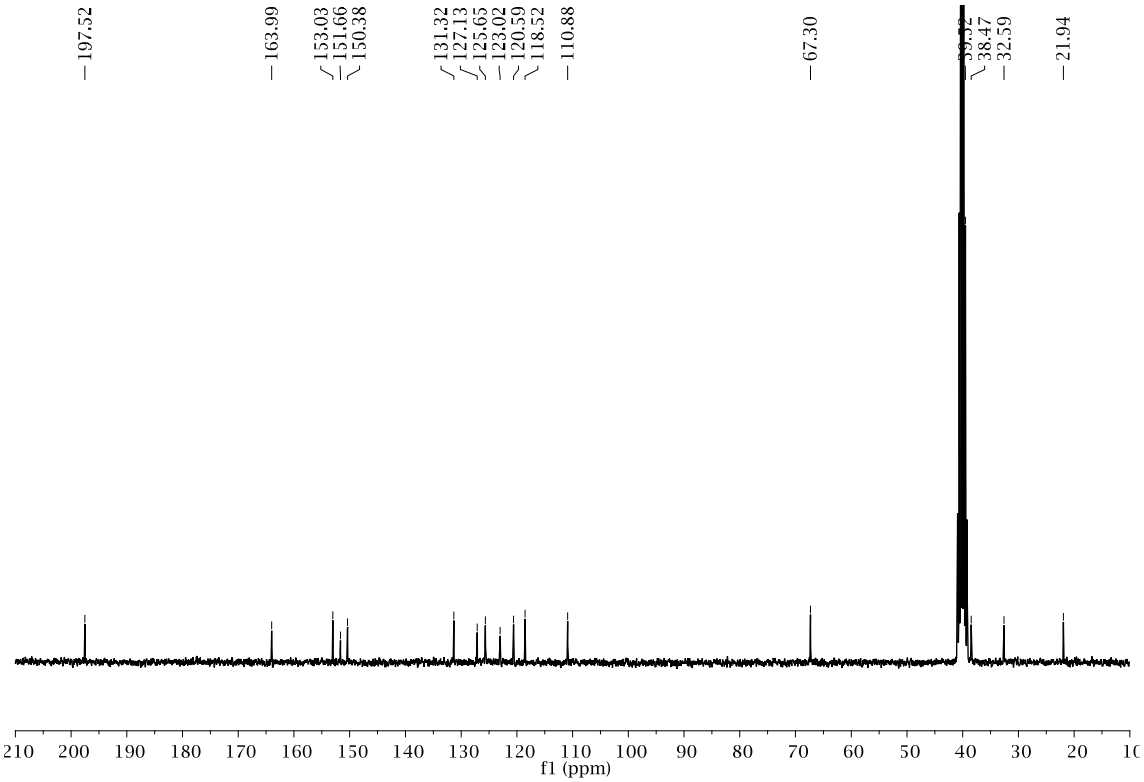

Figure S88. ^{13}C NMR (75 MHz) spectrum of **29** in DMSO-d_6.

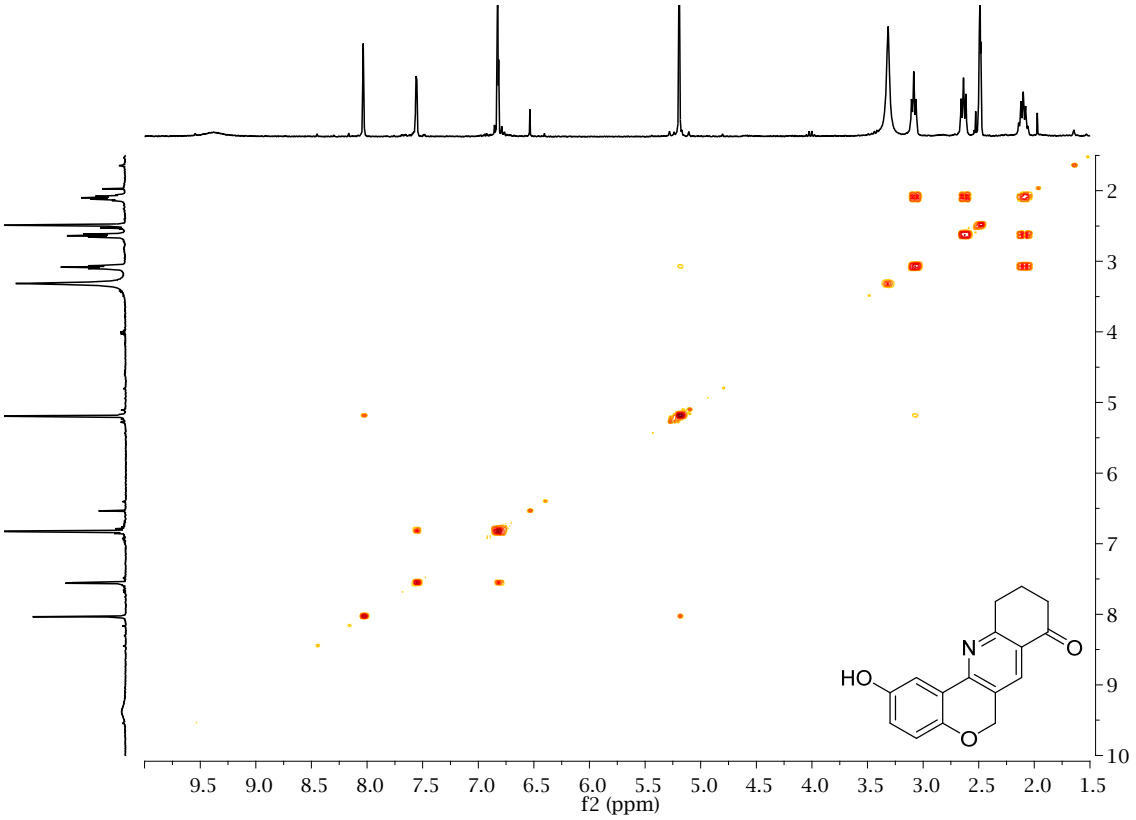

Figure S89. COSY spectrum of **29** in DMSO-d_6.

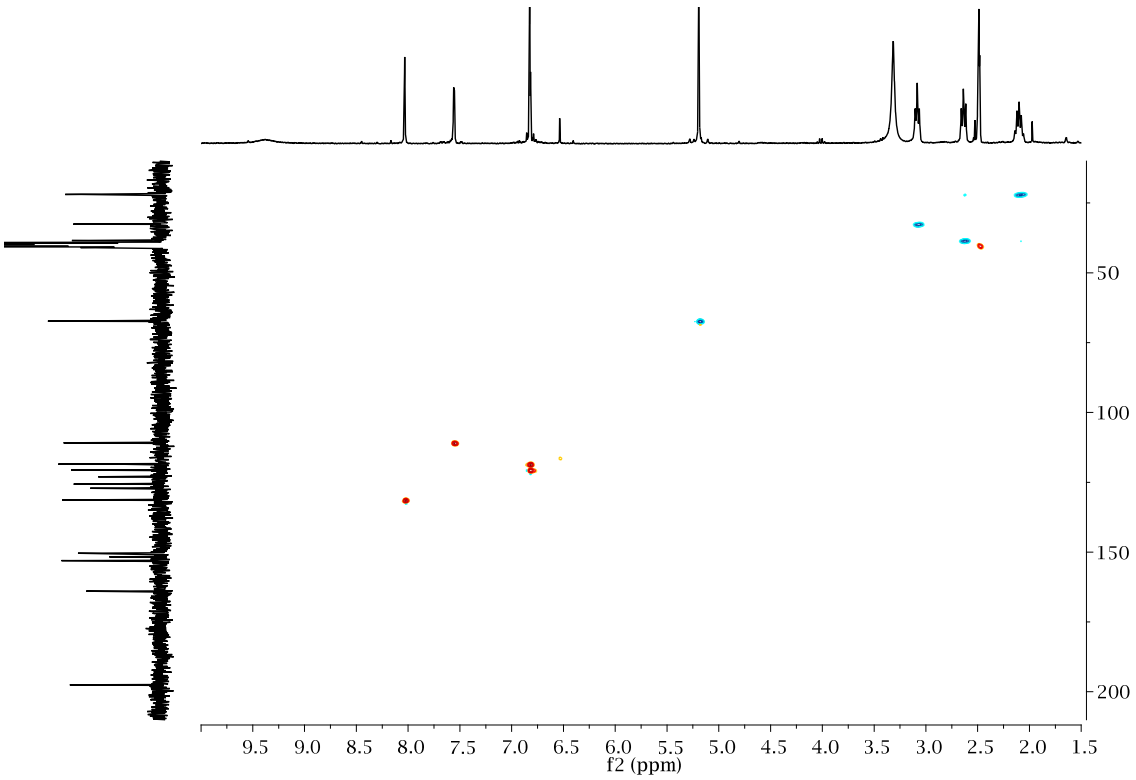

Figure S90. HSQC spectrum of **29** in DMSO-d_6.

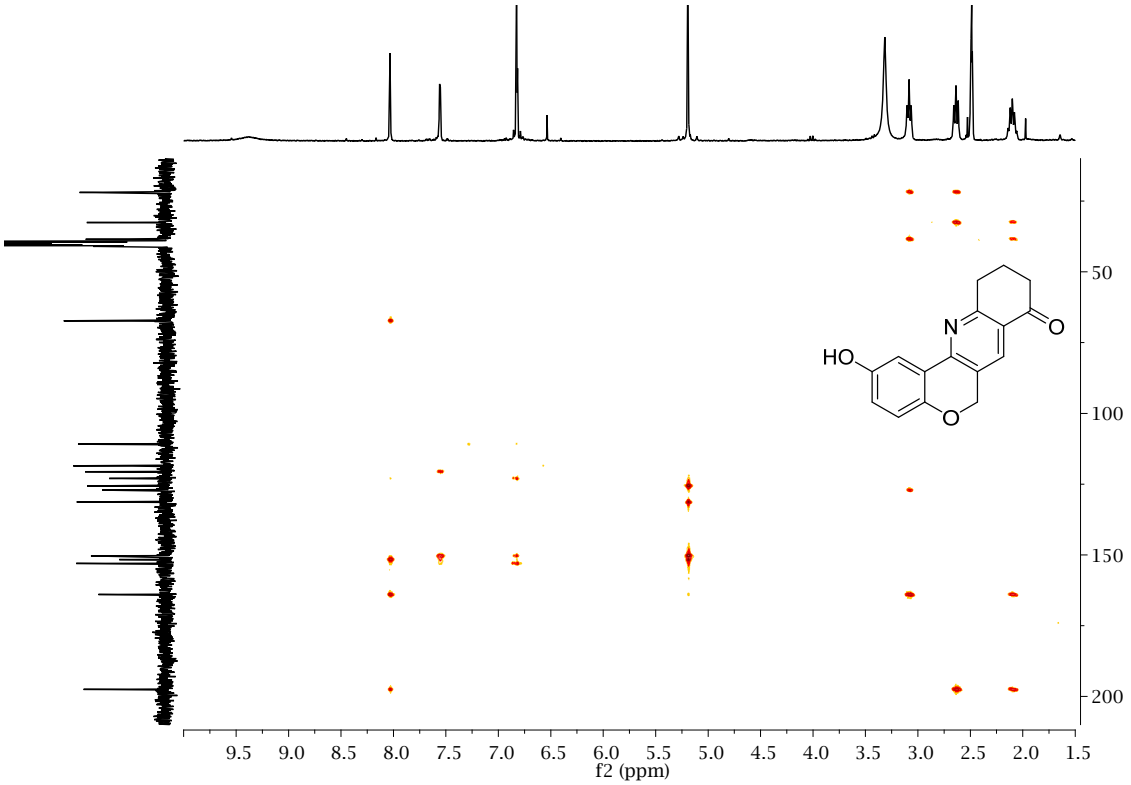

Figure S91. HMBC spectrum of **29** in DMSO-d_6.

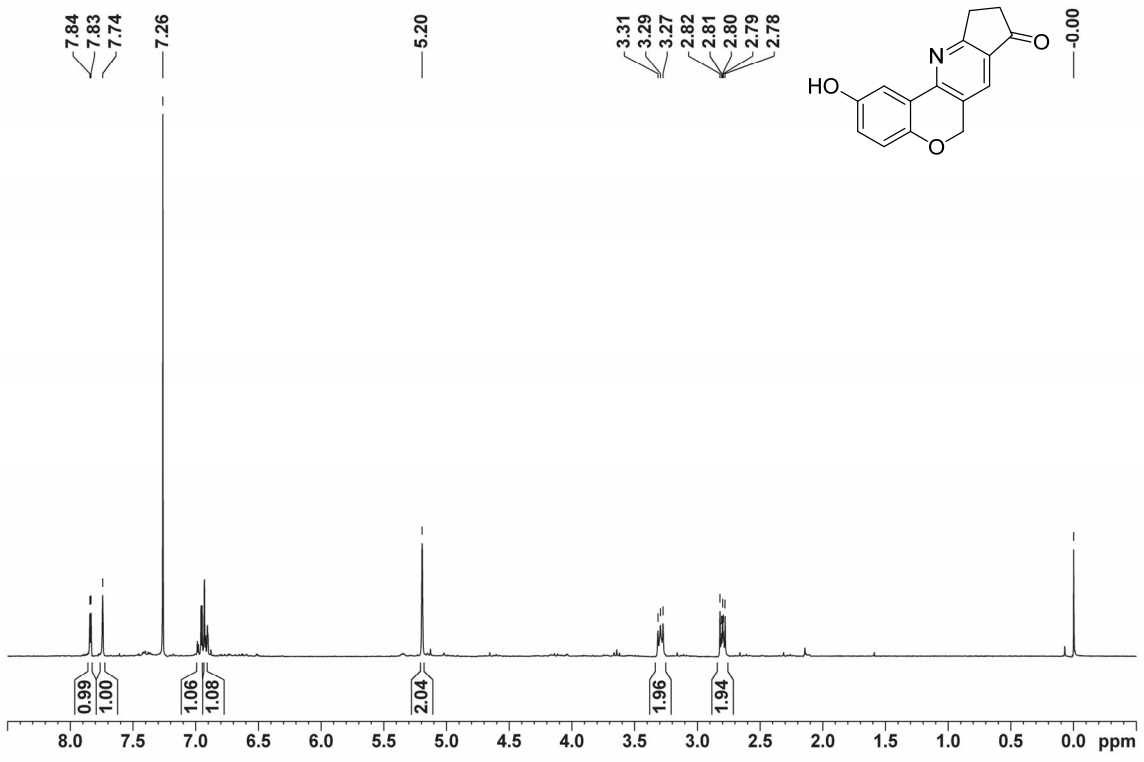

Figure S92. ^{1}H NMR (300 MHz) spectrum of **30** in $CDCl_3$.

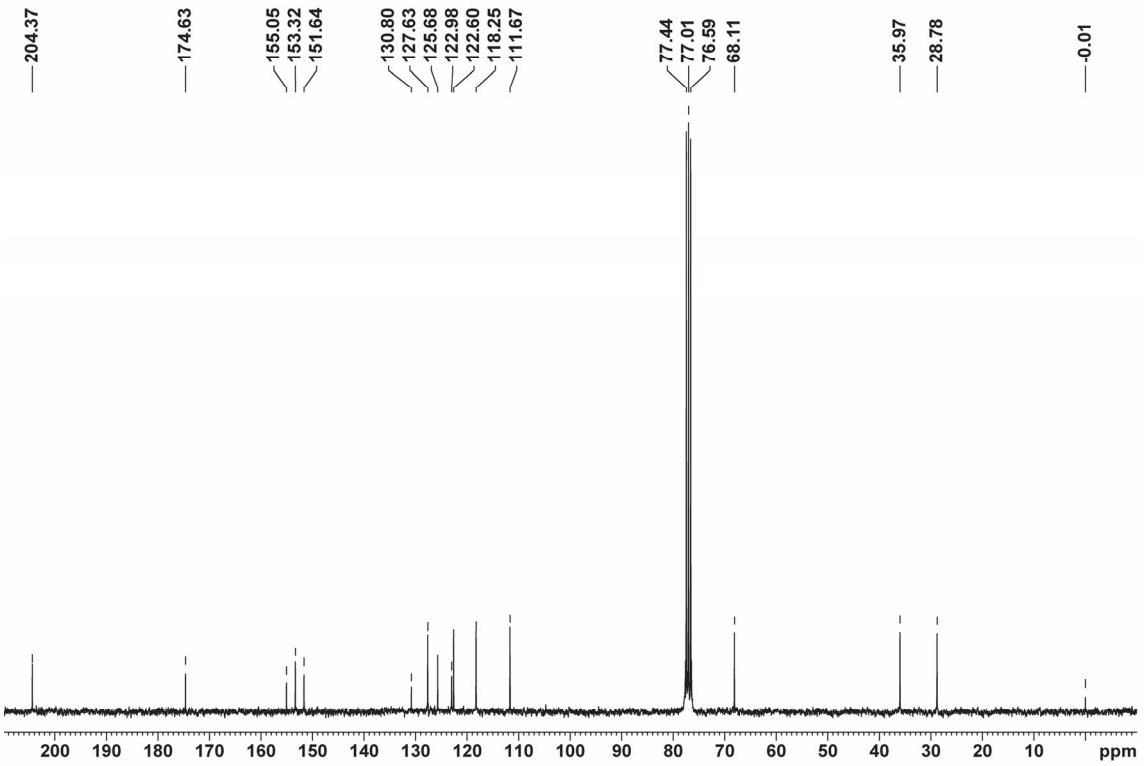

Figure S93. ^{13}C NMR (75 MHz) spectrum of **30** in $CDCl_3$.

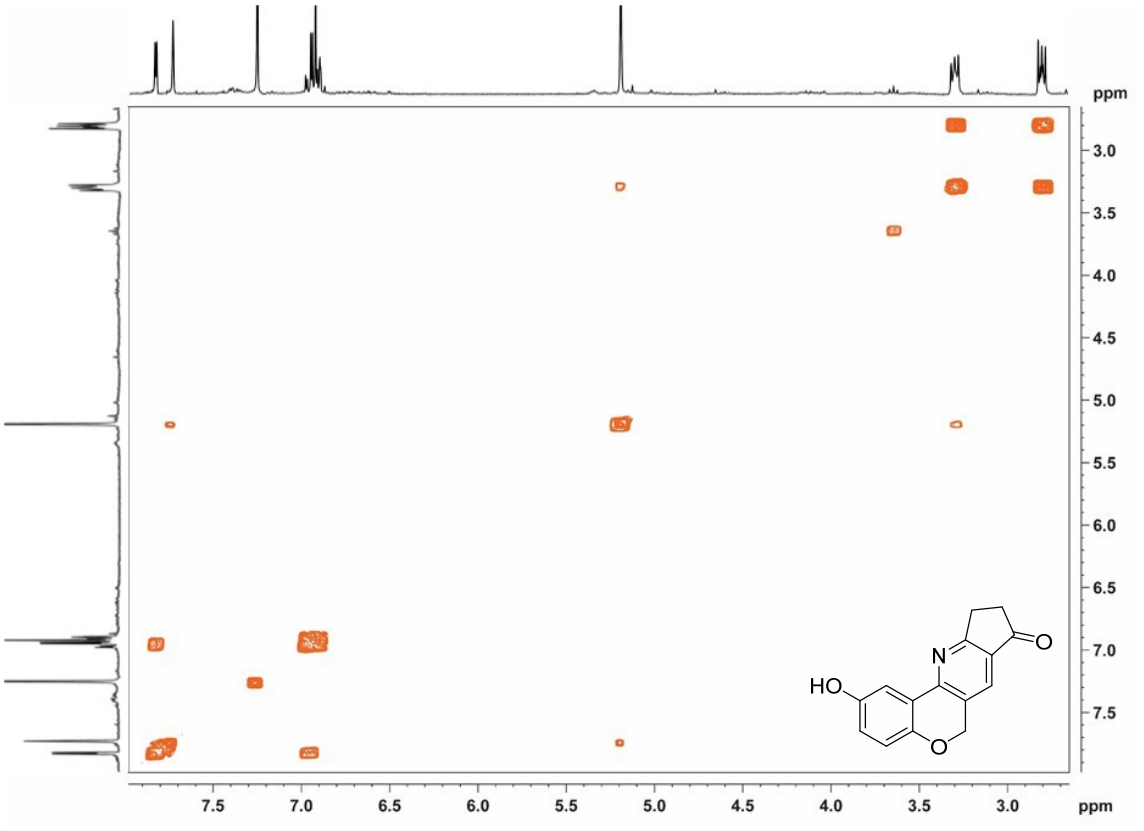

Figure S94. COSY spectrum of **30** in $CDCl_3$.

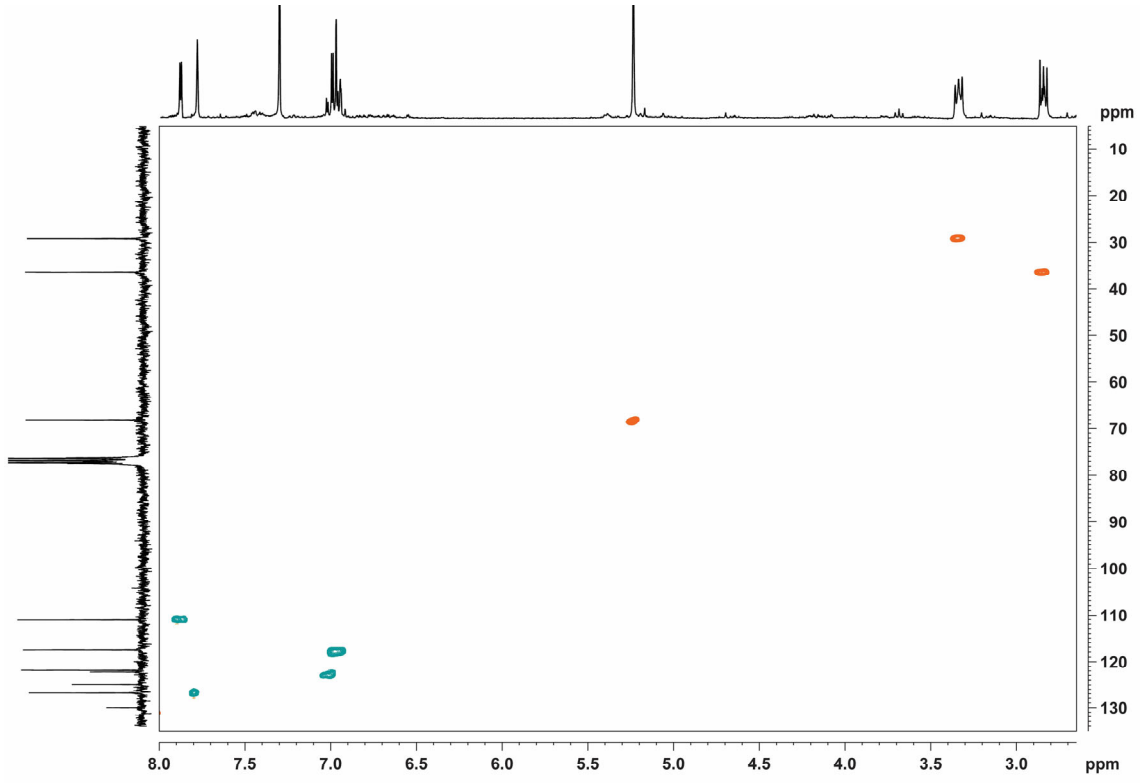

Figure S95. HSQC spectrum of **30** in $CDCl_3$.

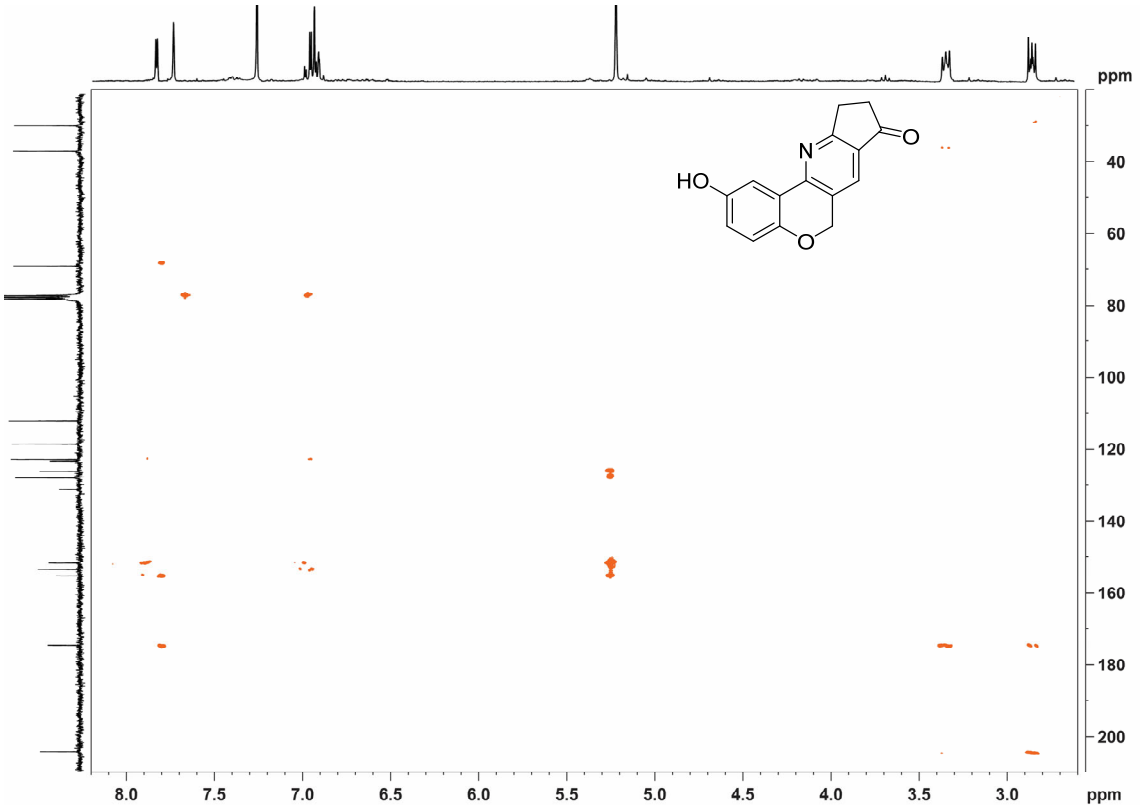

Figure S96. HMBC spectrum of **30** in $CDCl_3$.

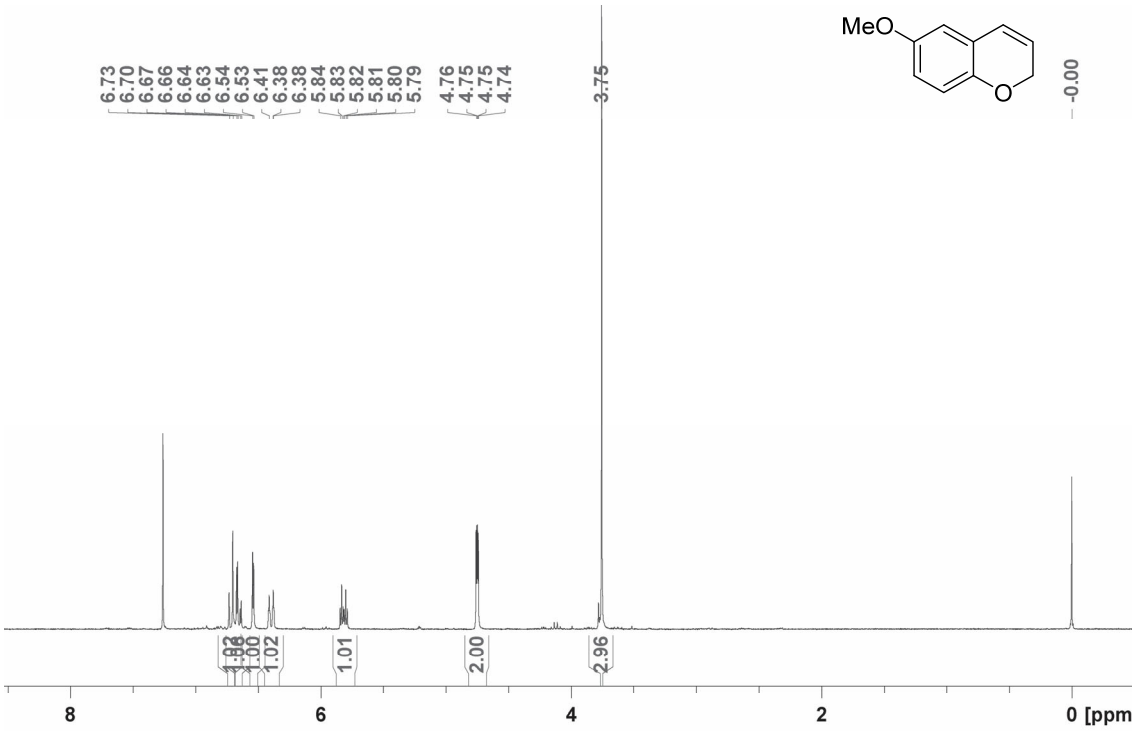

Figure S97. ^{1}H NMR (300 MHz) spectrum of **31** in $CDCl_3$.

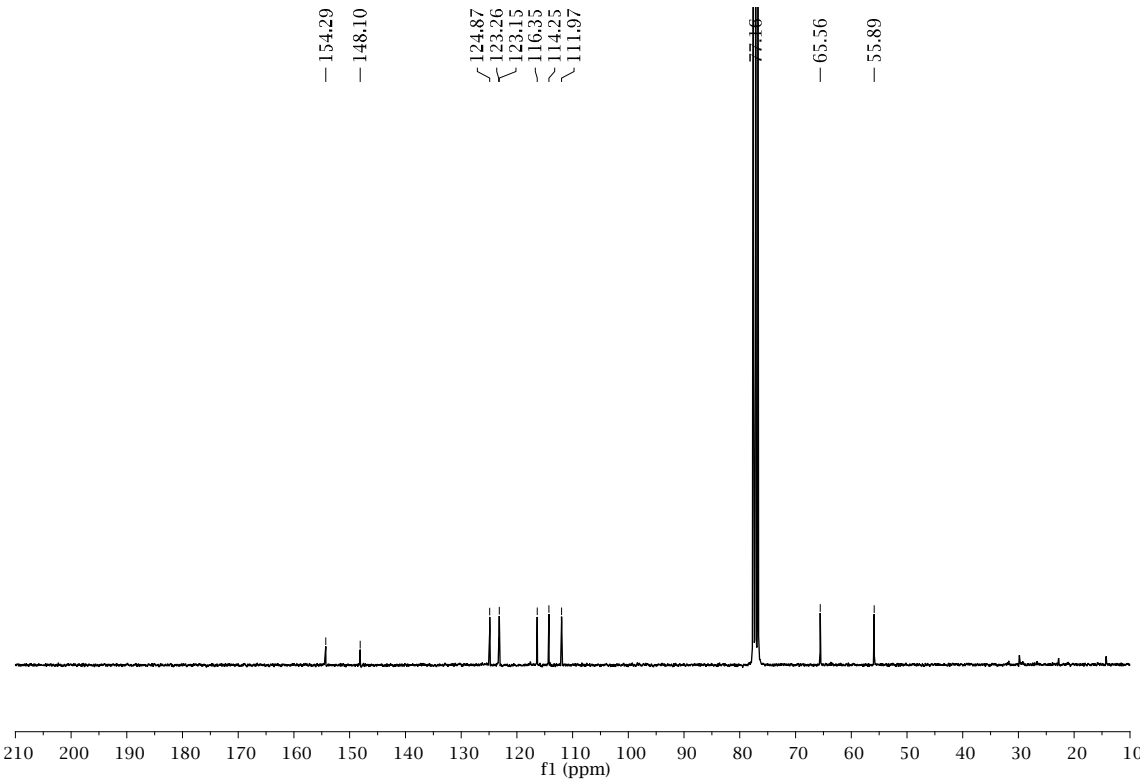

Figure S98. ^{13}C NMR (75 MHz) spectrum of **31** in $CDCl_3$.

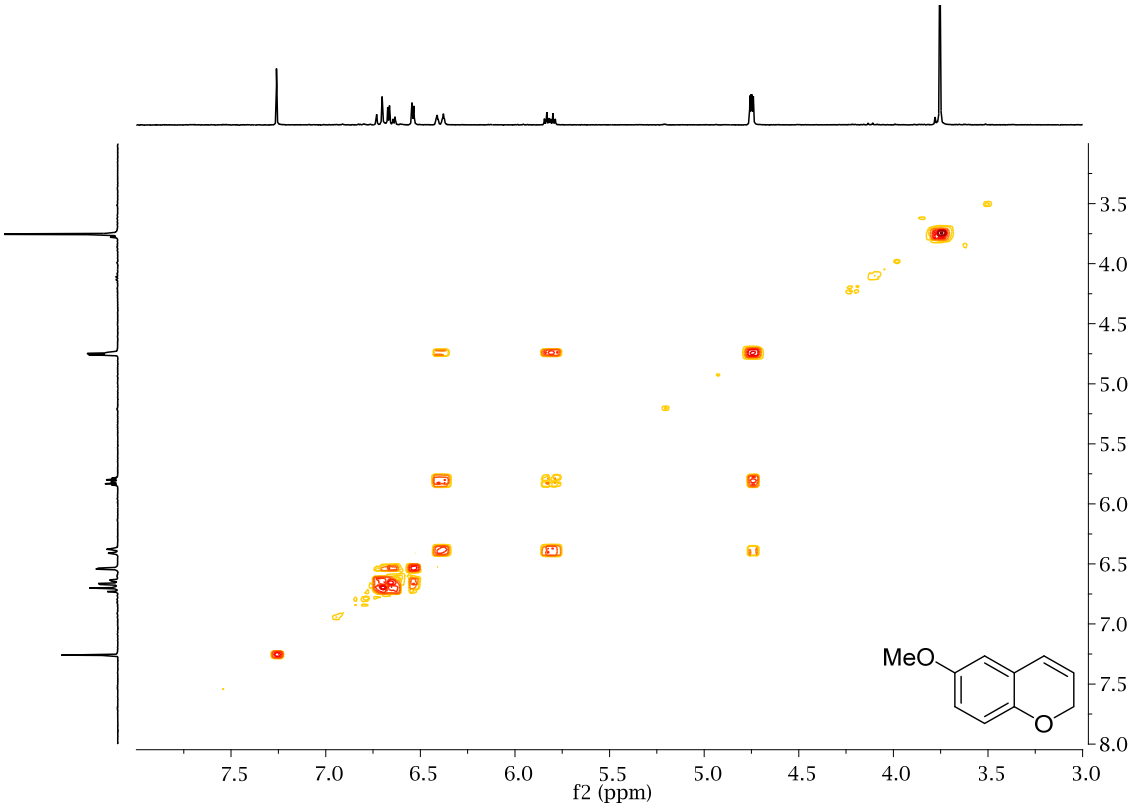

Figure S99. COSY spectrum of **31** in $CDCl_3$.

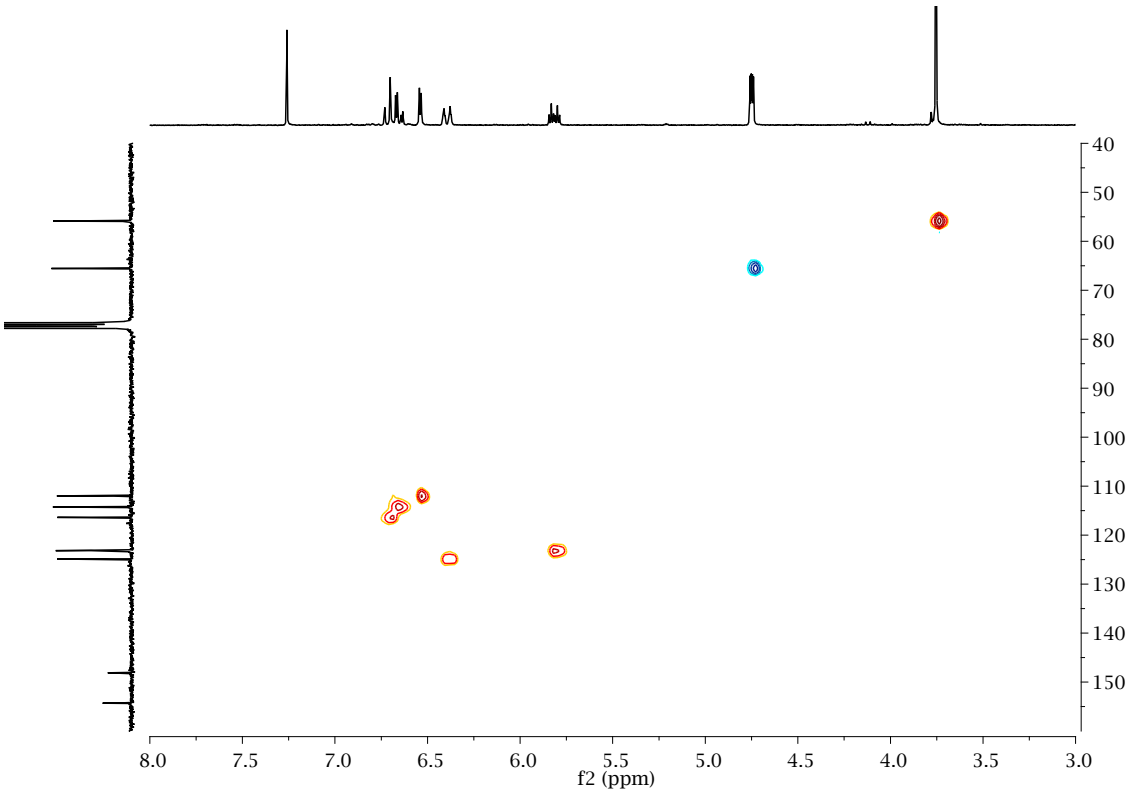

Figure S100. HSQC spectrum of **31** in $CDCl_3$.

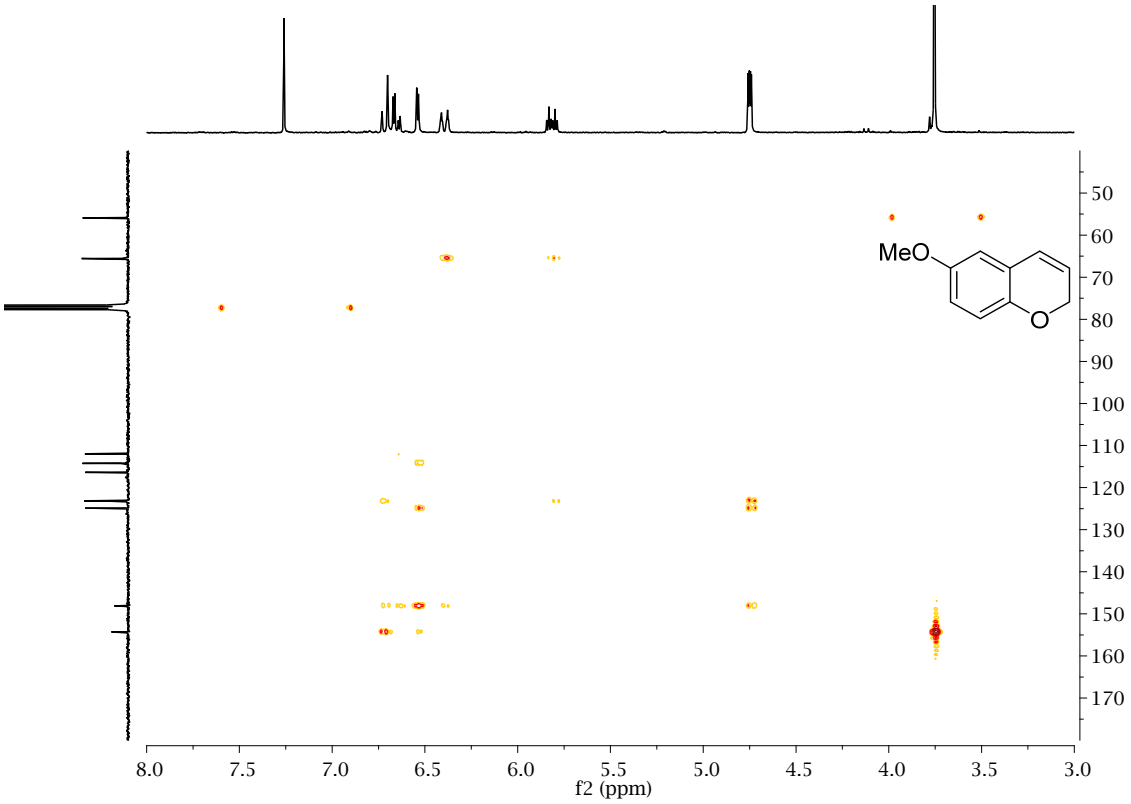

Figure S101. HMBC spectrum of **31** in $CDCl_3$.

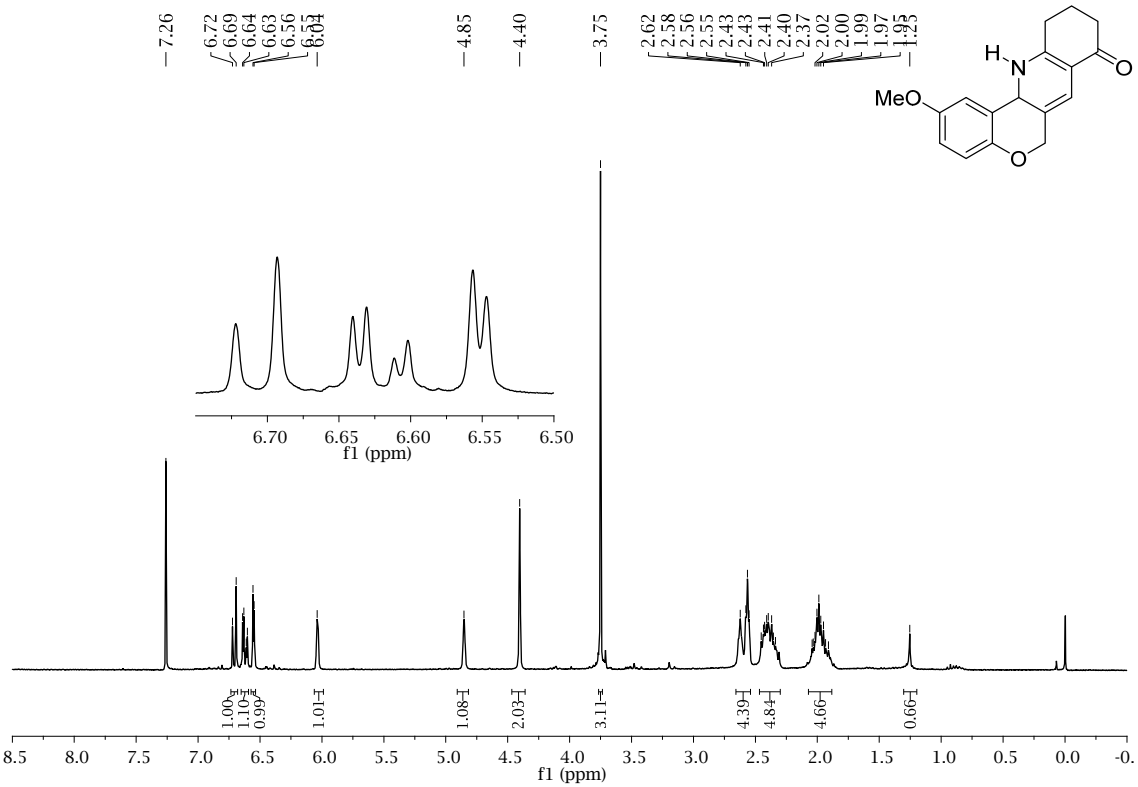

Figure S102. ^{1}H NMR (300 MHz) spectrum of **13a** in $CDCl_3$.

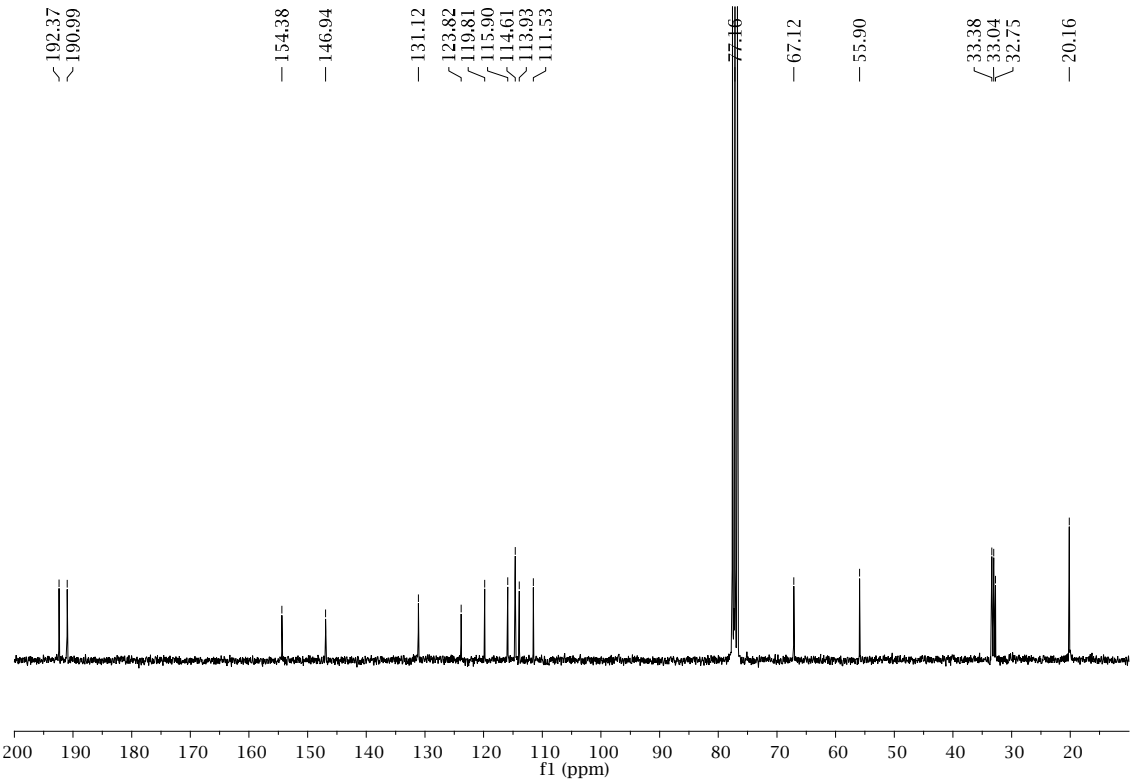

Figure S103. ^{13}C NMR (75 MHz) spectrum of **13a** in $CDCl_3$.

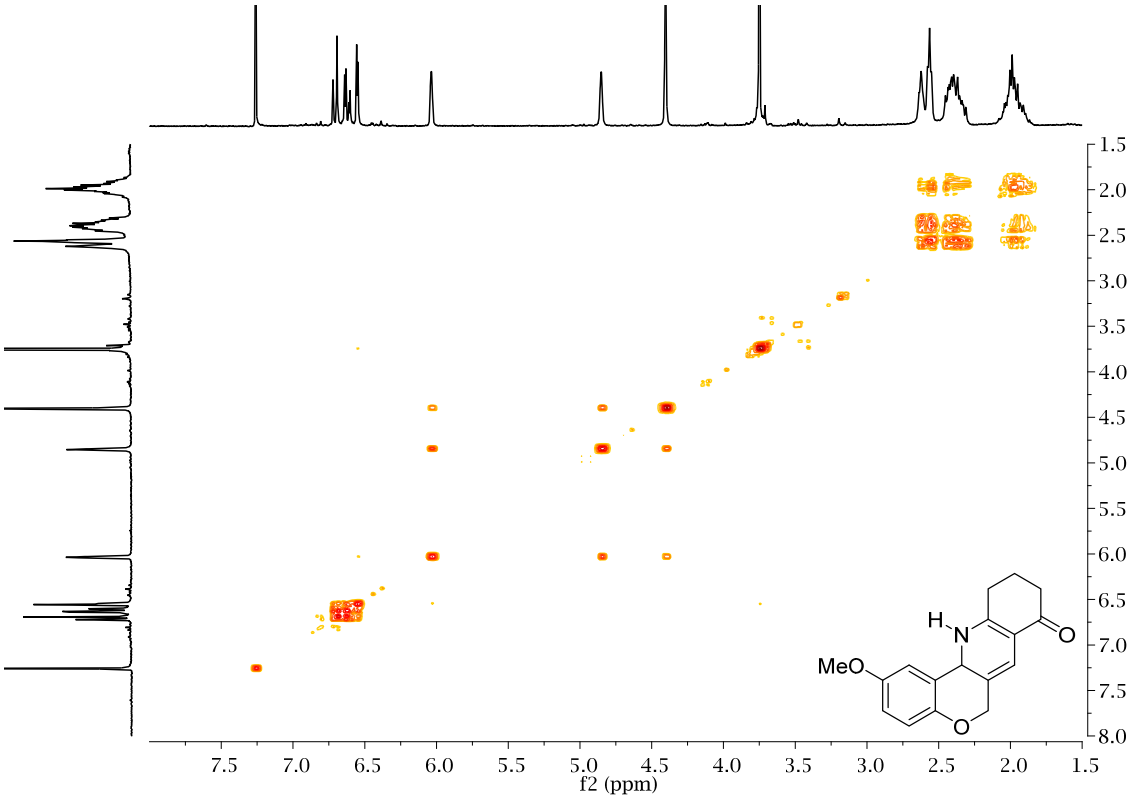

Figure S104. COSY spectrum of **13a** in $CDCl_3$.

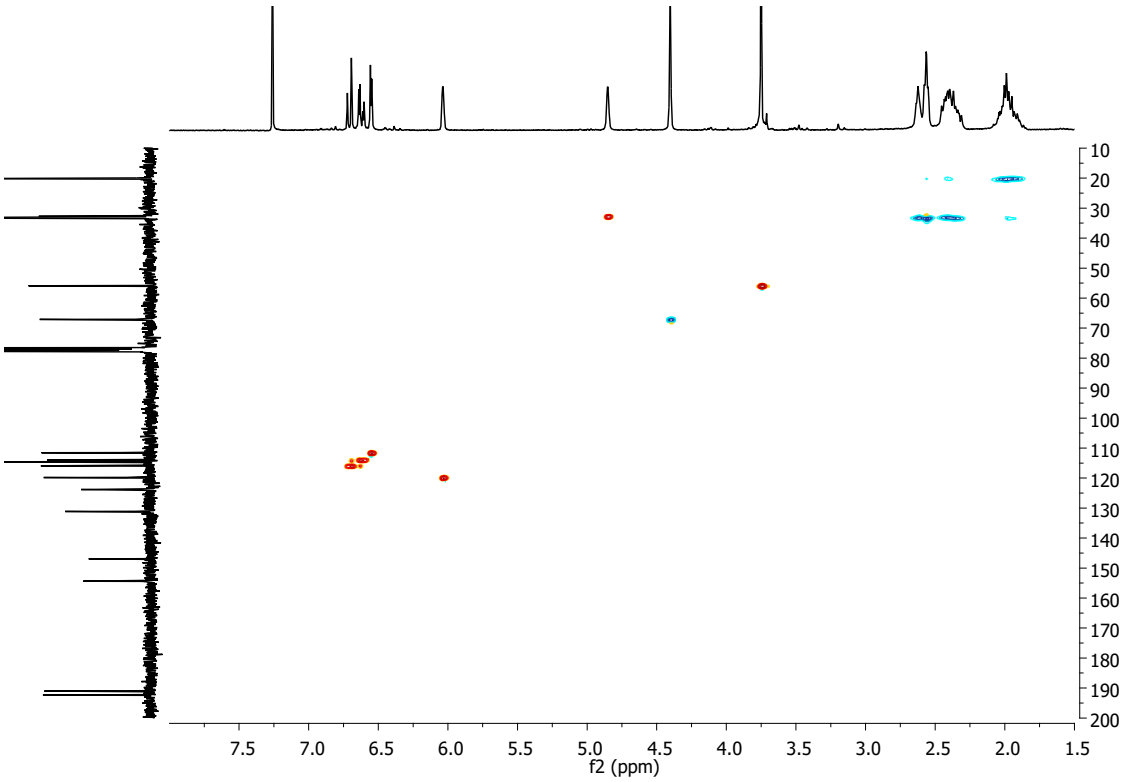

Figure S105. HSQC spectrum of **13a** in $CDCl_3$.

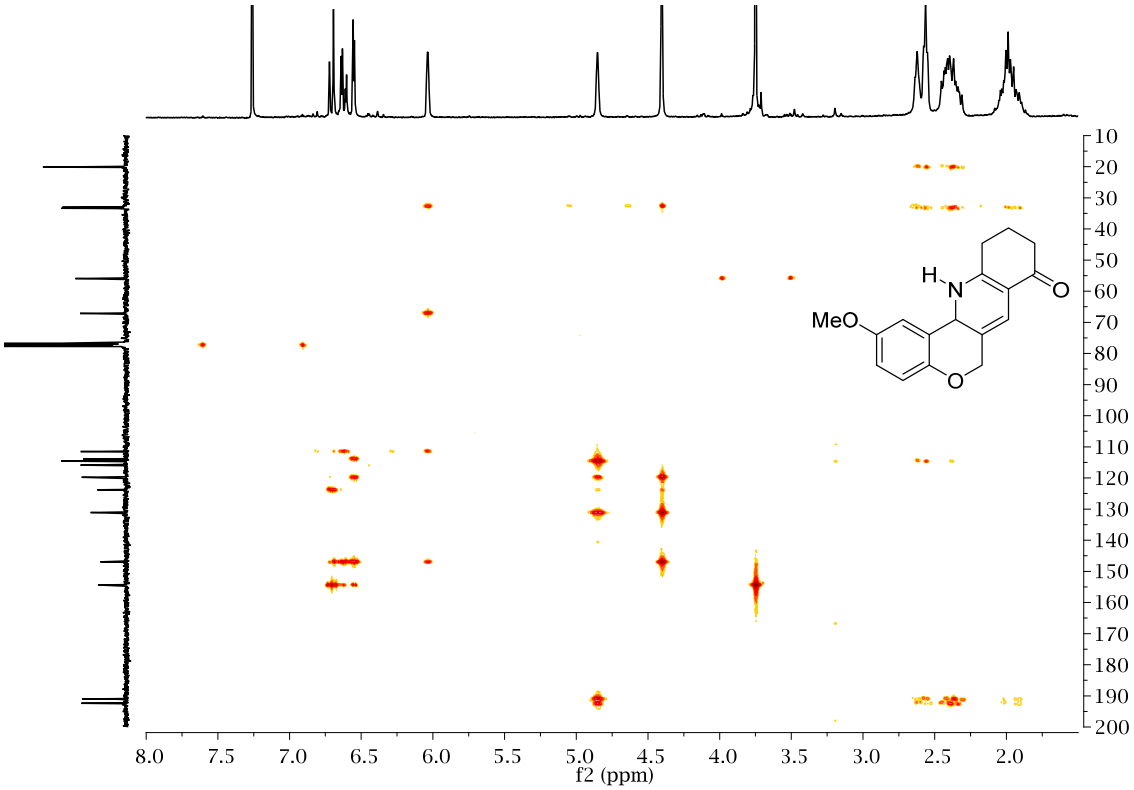

Figure S106. HMBC spectrum of **13a** in $CDCl_3$.