

**SYNTHESIS, CHARACTERIZATION AND BIOLOGICAL SCREENING OF  
NEW *N*-SUBSTITUTED-7-CHLORO-4-HYDROXY-2-QUINOLONE-3-  
CARBOXAMIDES AS PROMISING ANTICANCER AGENTS**

**Aya "Mohammed kheir" Al-Zuheiri, Kamal Sweidan,\* Mohammed Kamal Harb,  
Sanaa K. Bardaweel, Mahmoud Sunjuk, Dima A. Sabbah**

Appendix A: NMR spectra

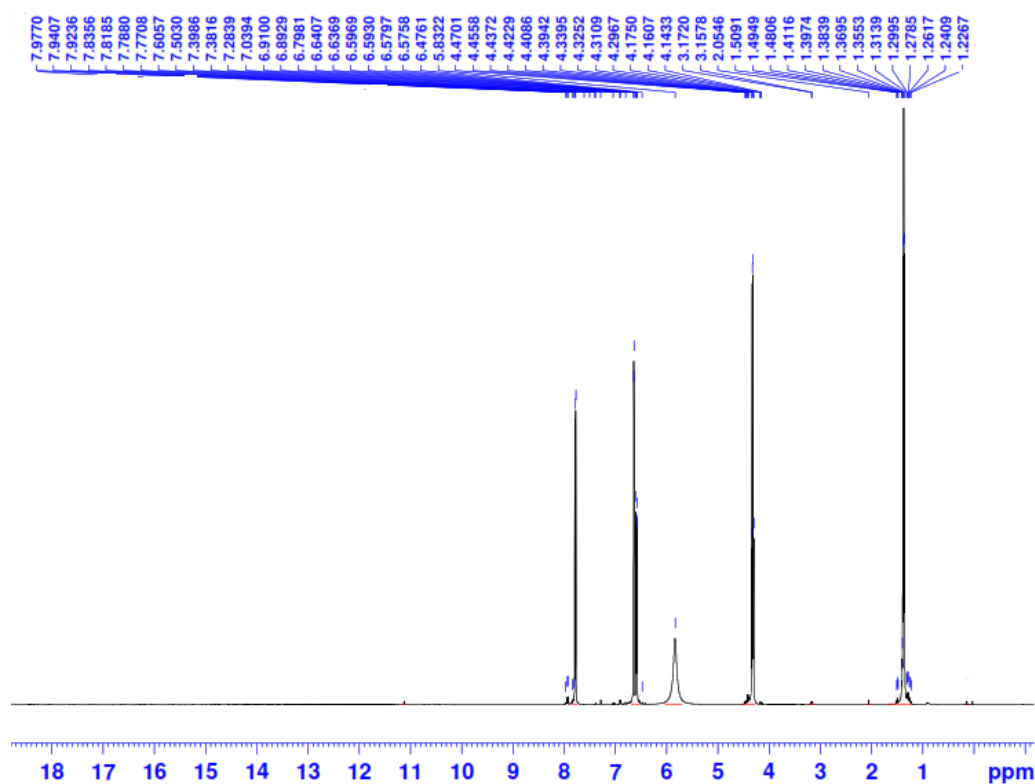


Figure A. 1. <sup>1</sup>H-NMR spectrum of compound 1

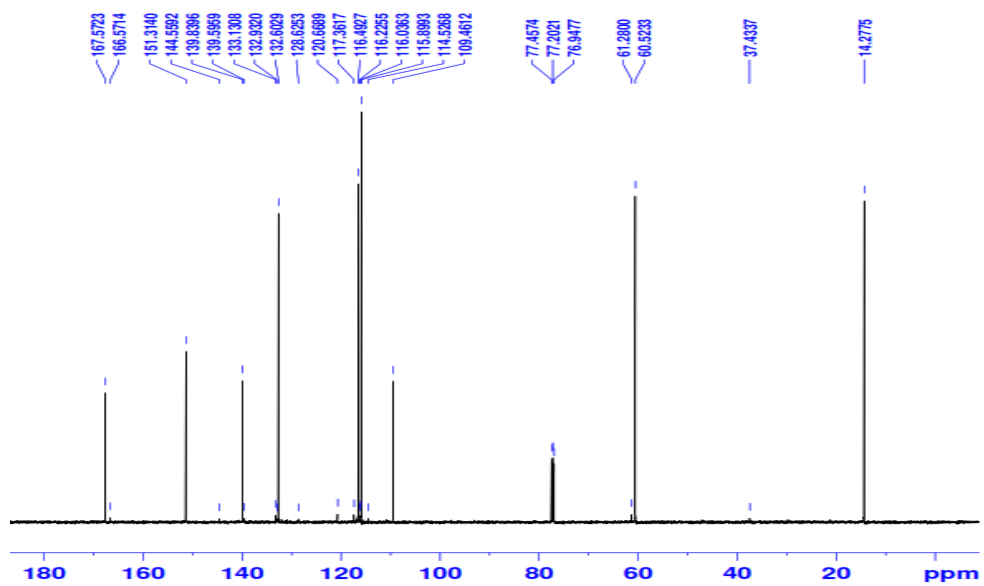


Figure A. 2. <sup>13</sup>C-NMR spectrum of compound 1

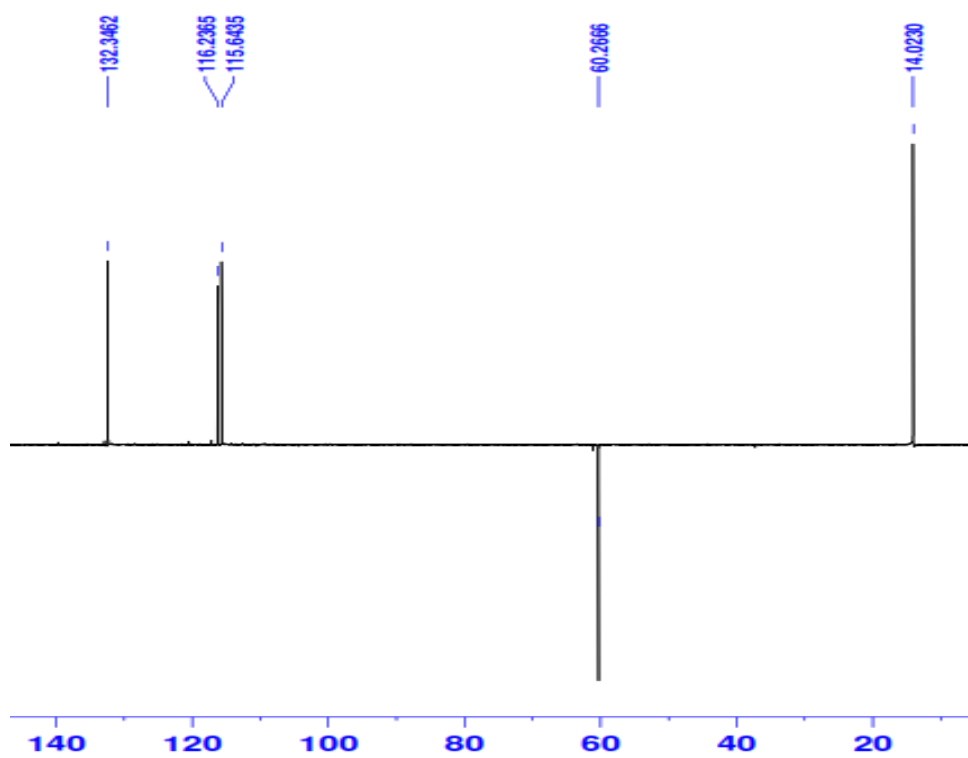


Figure A. 3. DEPT-135 spectrum of compound 1

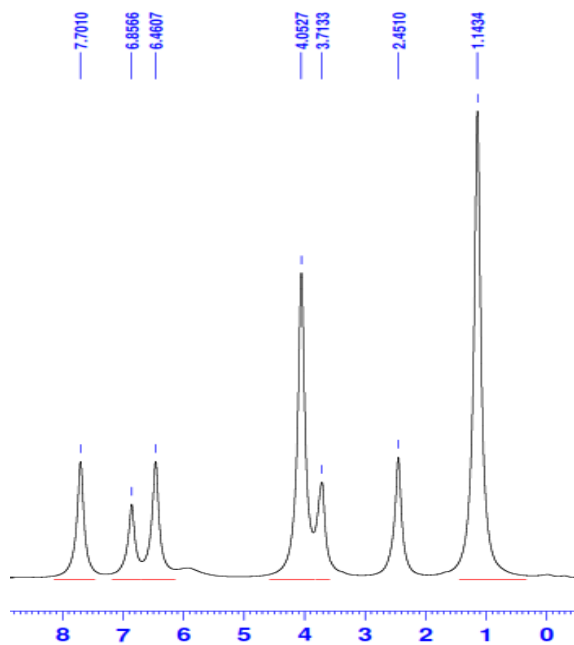


Figure A. 4. 1H-NMR spectrum of compound 2

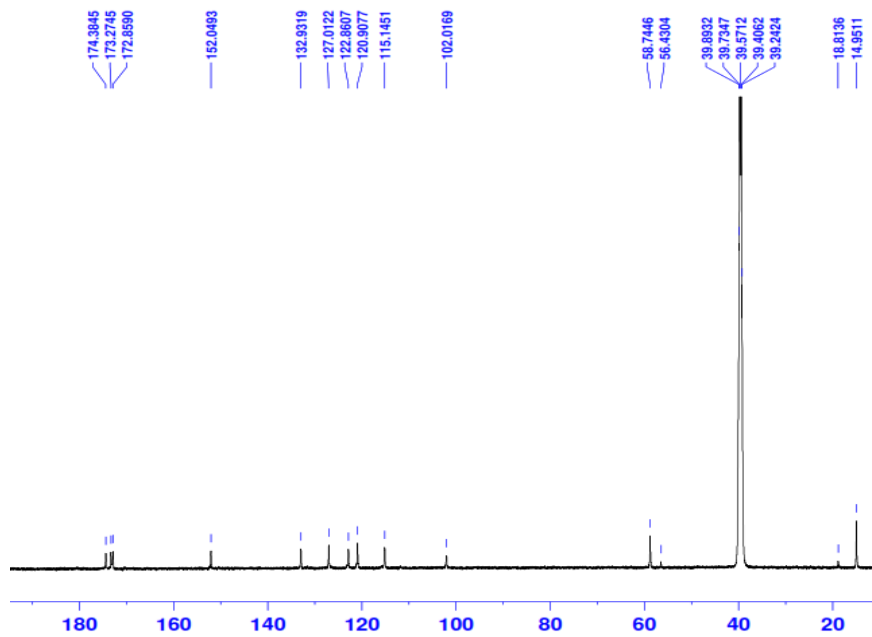


Figure A. 5. 13C-NMR spectrum of compound 2

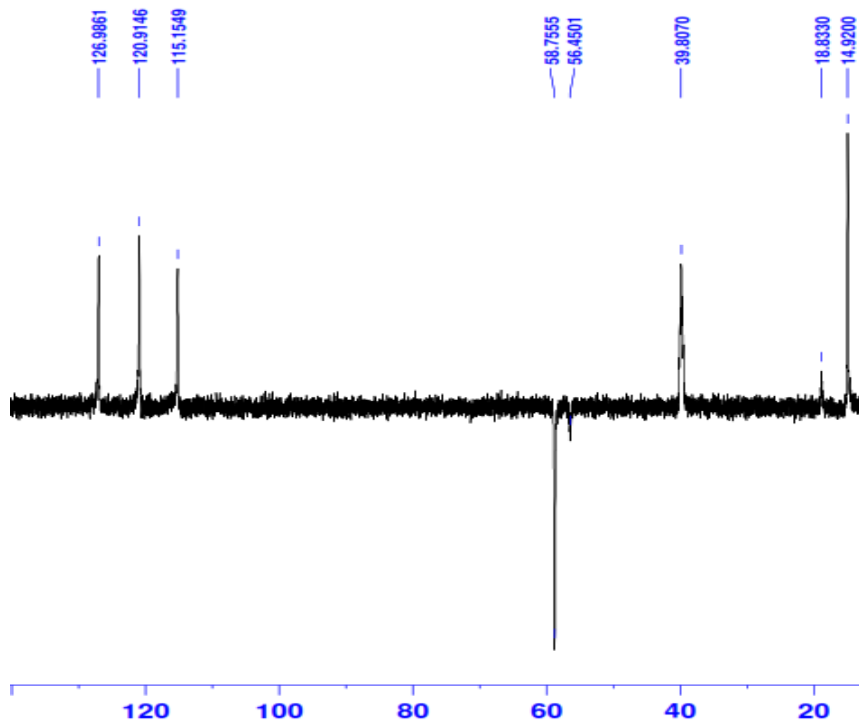


Figure A. 6. DEPT-135 spectrum of compound 2

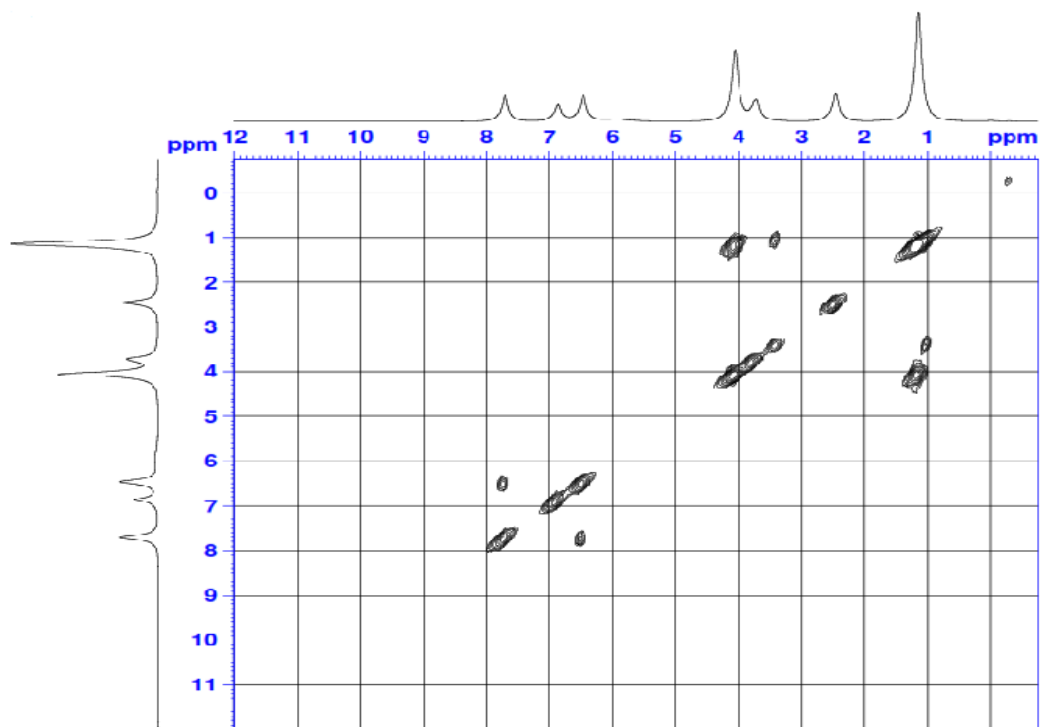


Figure A. 7. COSY spectrum of compound 2

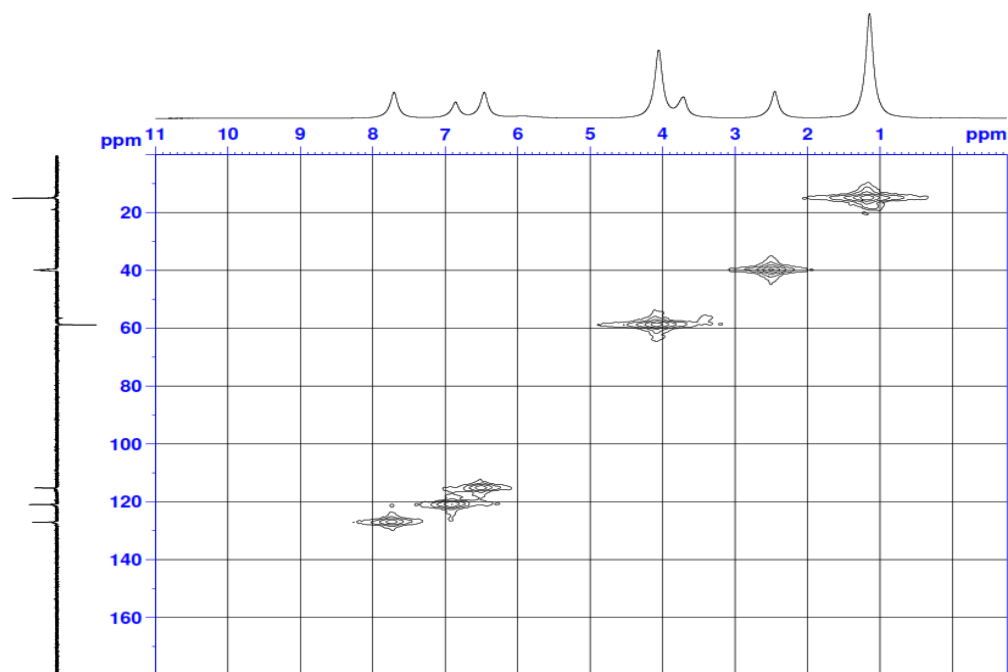


Figure A. 8. HMQC spectra of compound 2

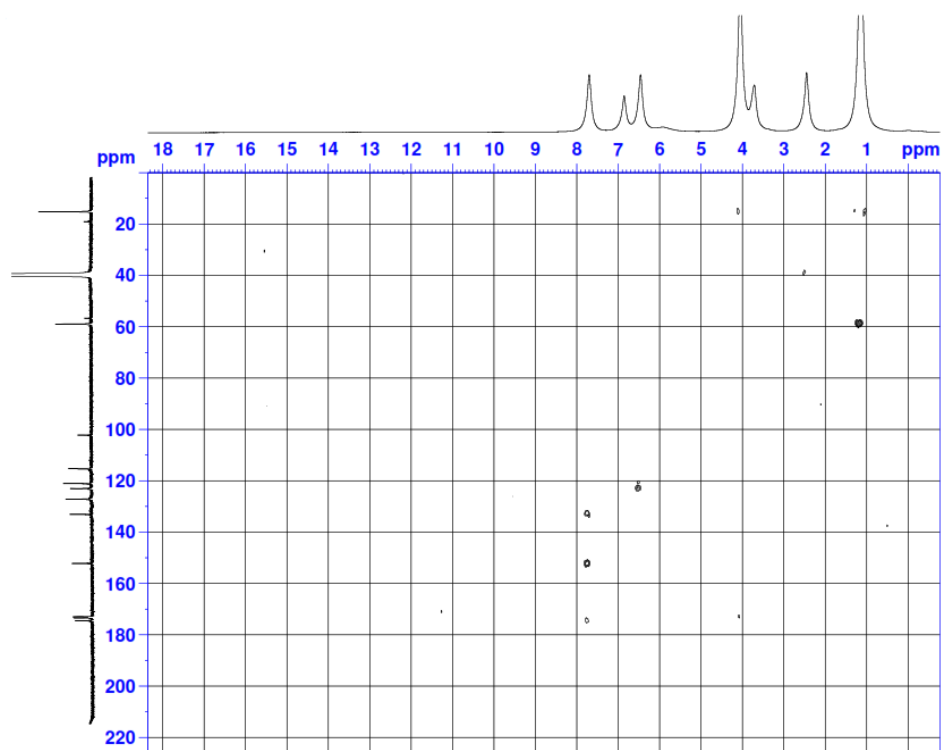


Figure A. 9. HMBC spectra of compound 2

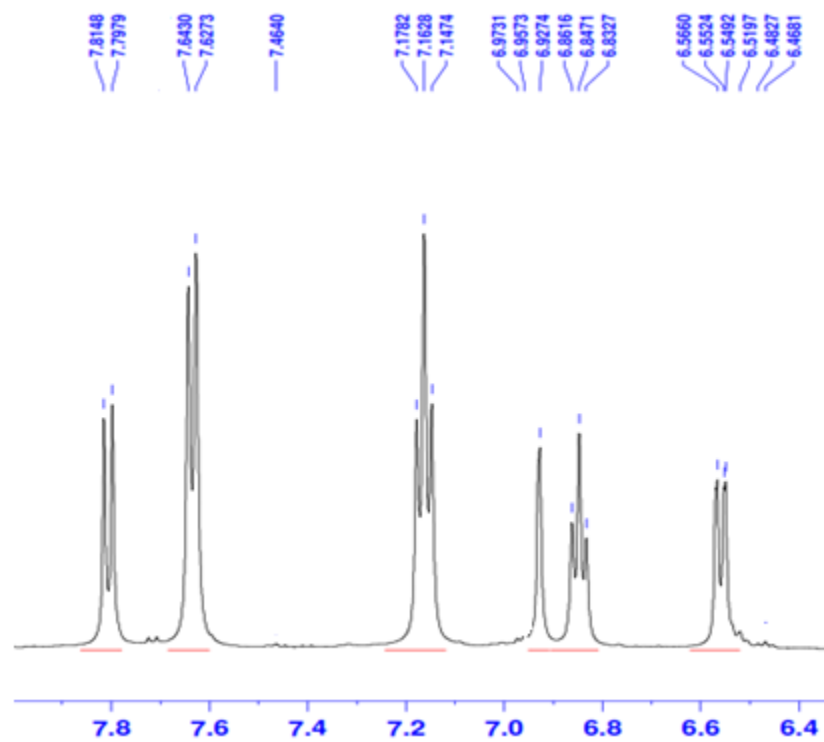


Figure A. 10. <sup>1</sup>H-NMR spectrum of compound 3

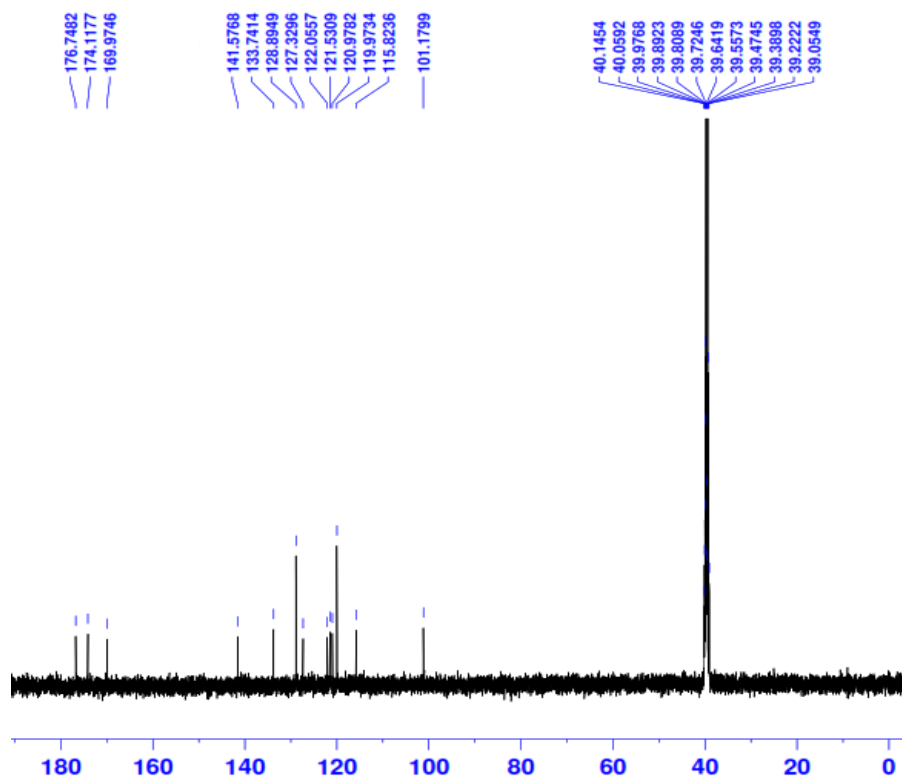


Figure A. 11. <sup>13</sup>C-NMR spectrum of compound 3

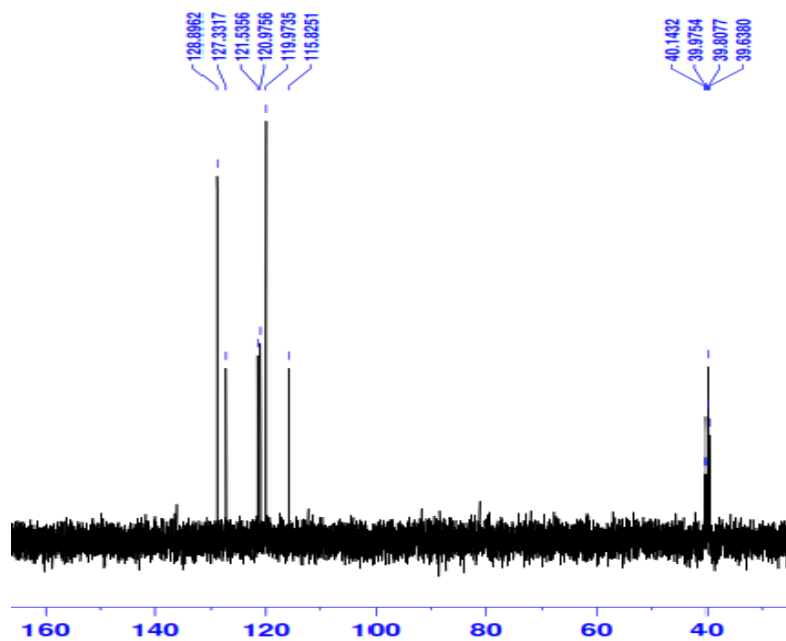


Figure A. 12. DEPT-135 spectrum of compound 3

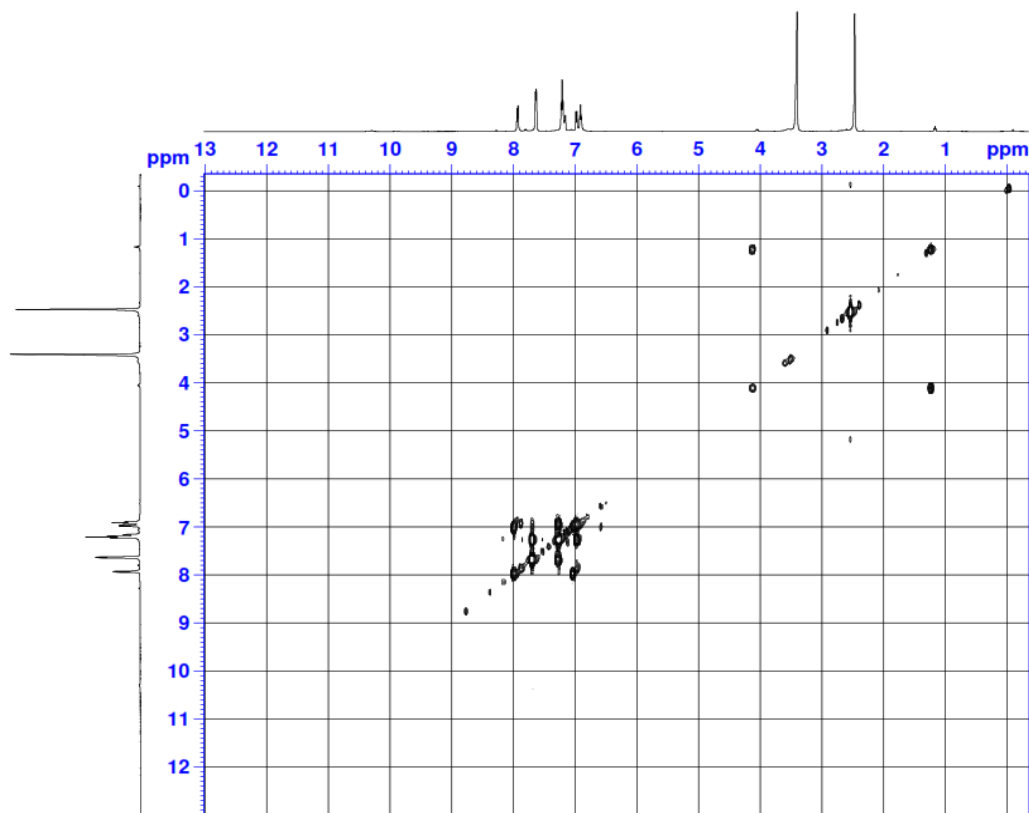


Figure A. 13. COSY spectrum of compound 3

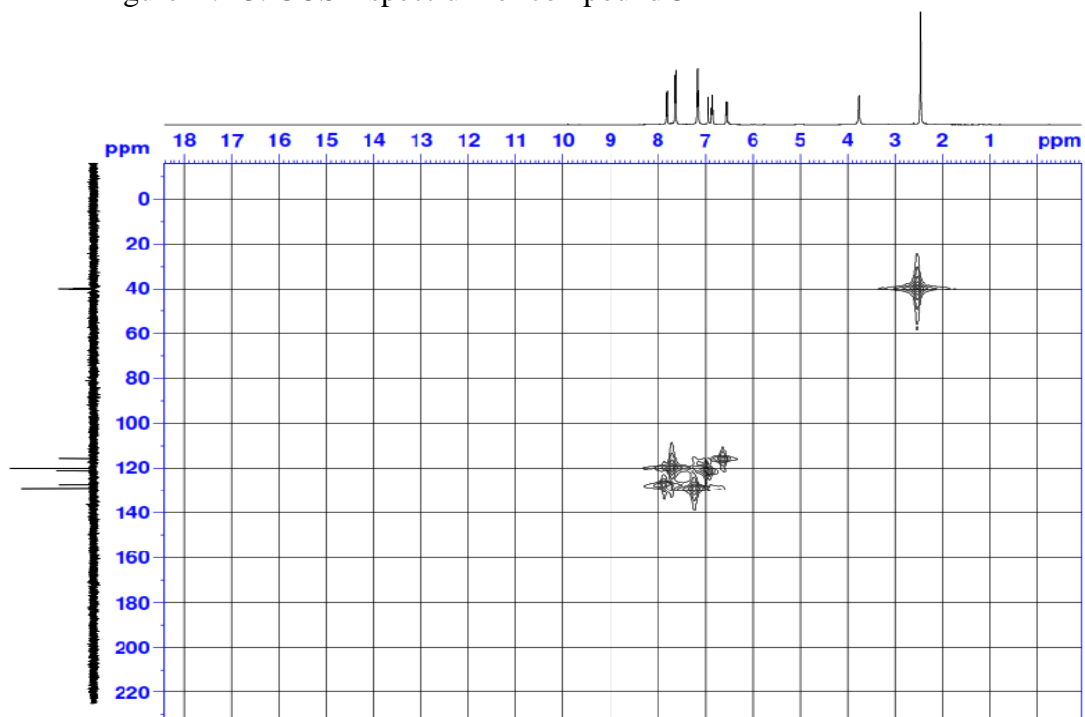


Figure A. 14. HMQC spectra of compound 3

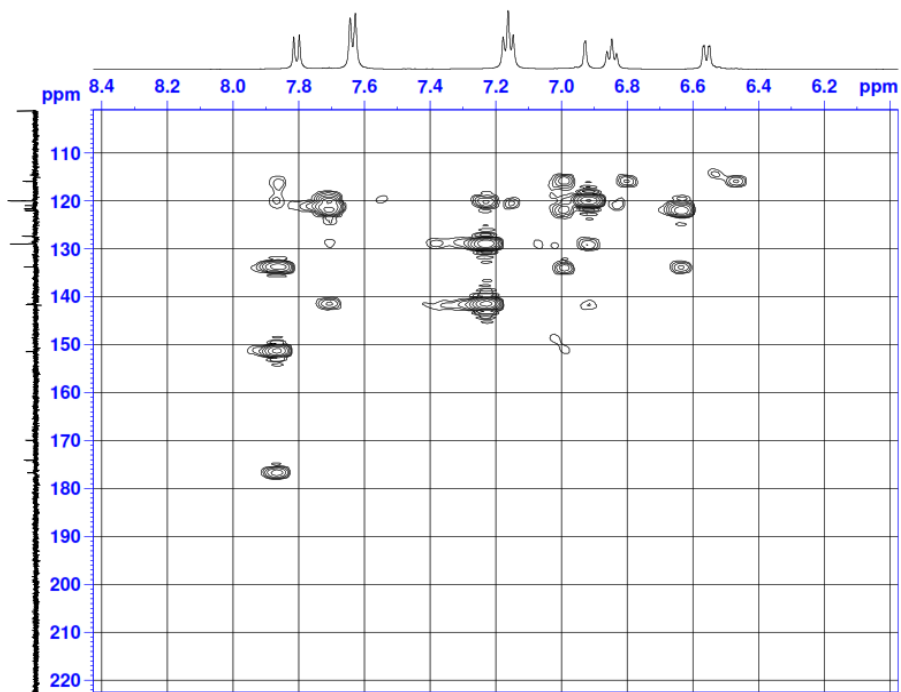
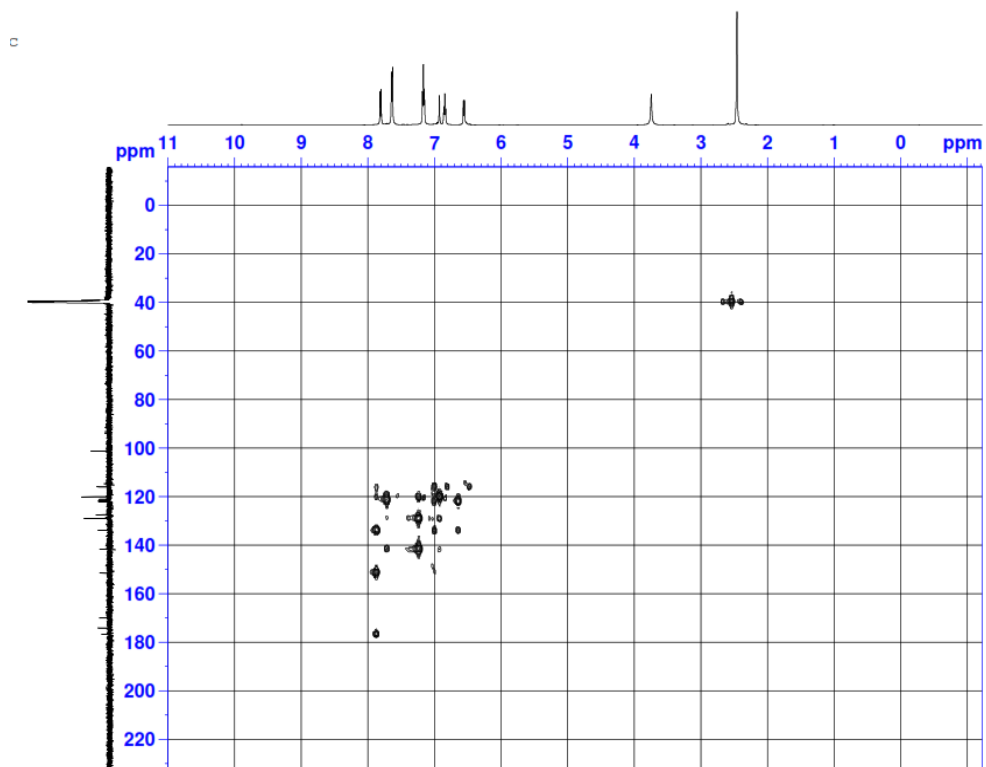


Figure A. 15. HMBC spectra of compound 3

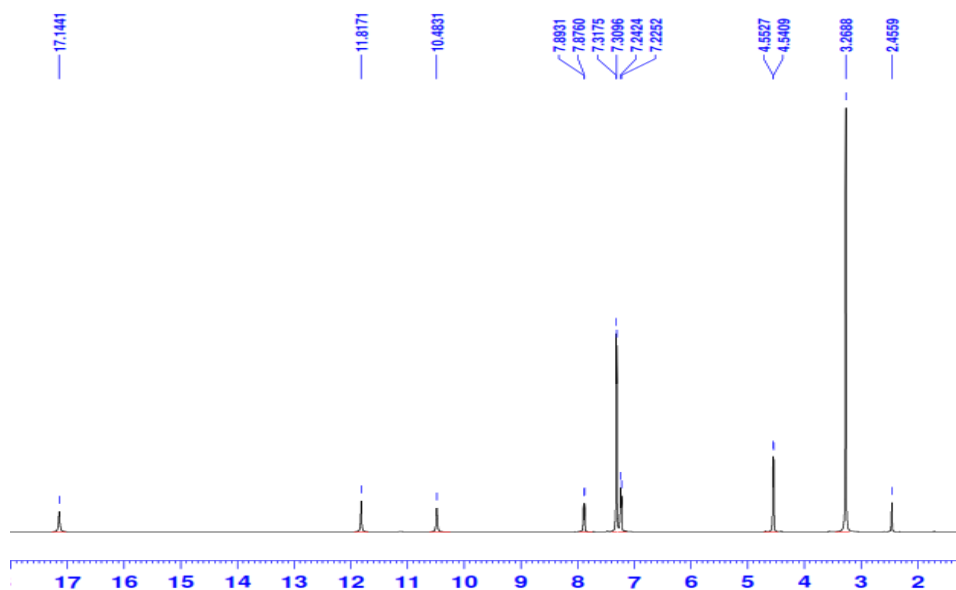


Figure A. 16. <sup>1</sup>H-NMR spectra of compound 4

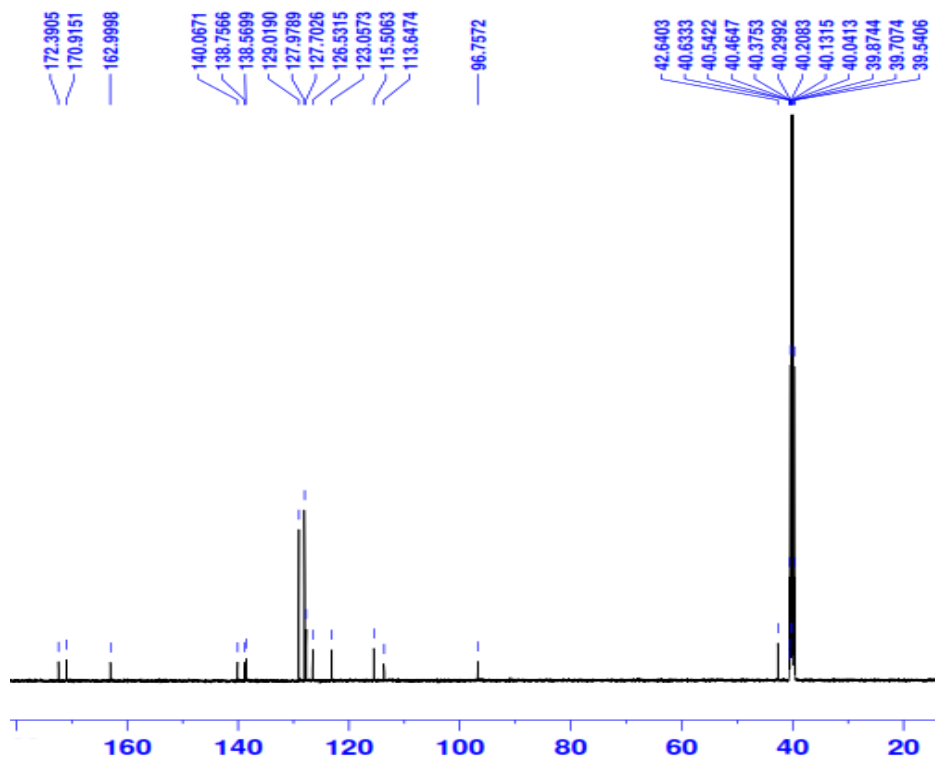


Figure A. 17. <sup>13</sup>C-NMR spectrum of compound 4

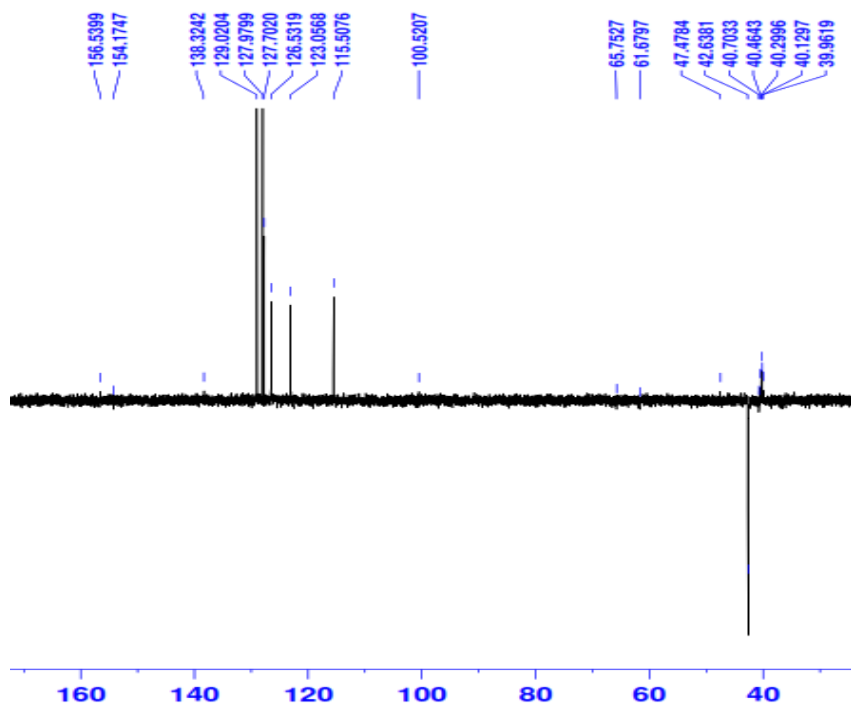


Figure A. 18. DEPT-135 spectrum of compound 4

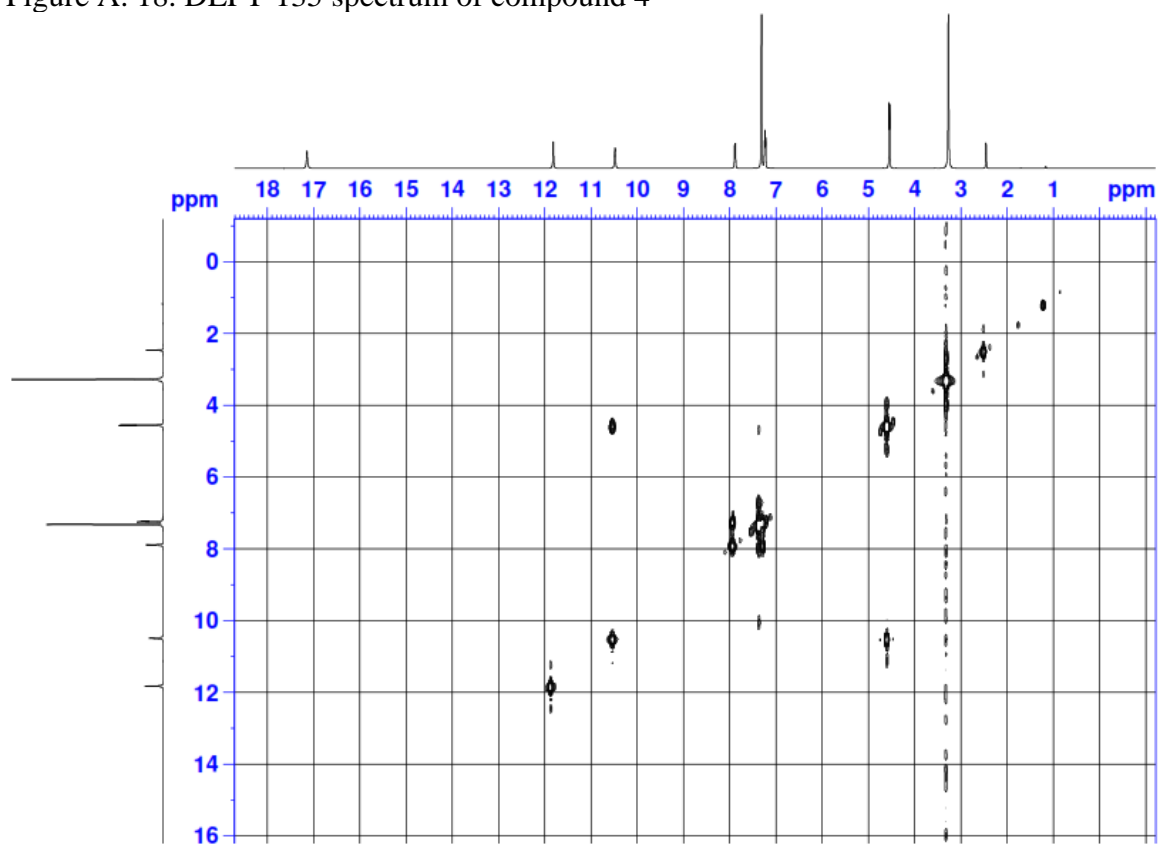


Figure A. 19. COSY spectrum of compound 4

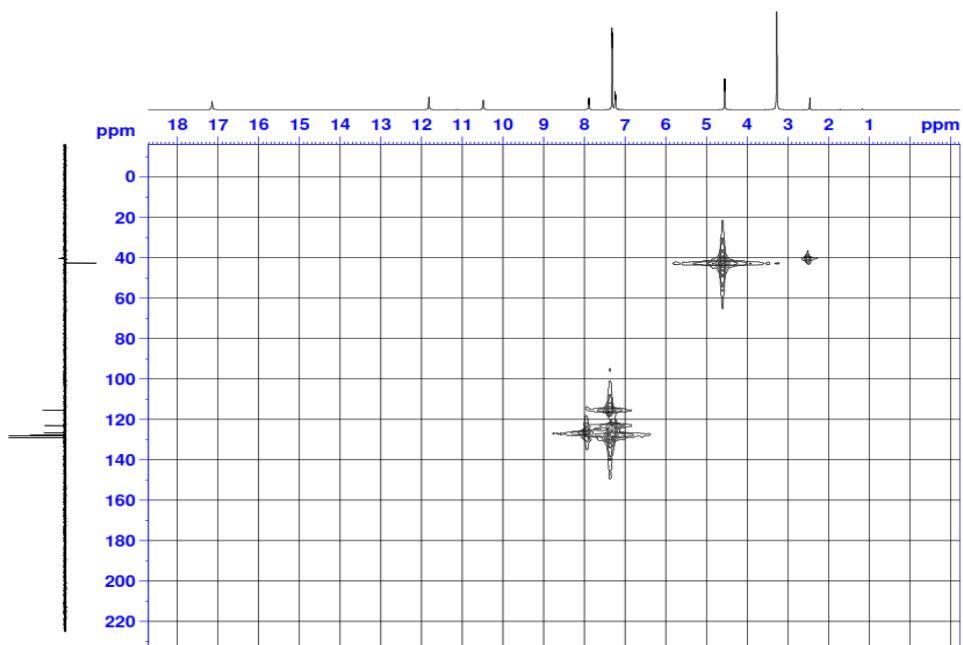


Figure A. 20. HMQC spectra of compound 4



Figure A. 21. HMBC spectra of compound 4

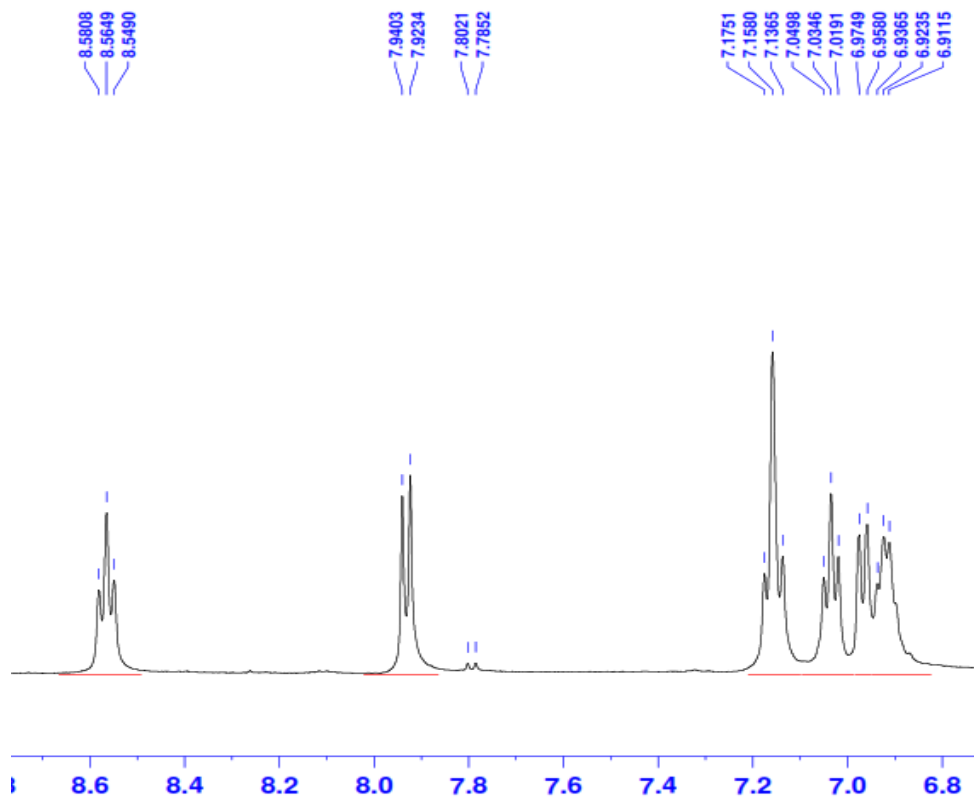
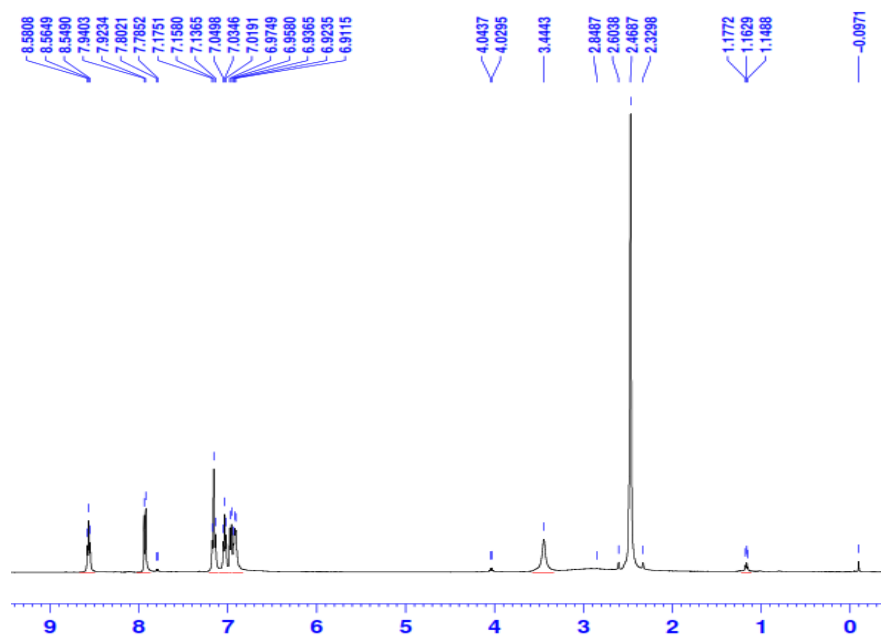


Figure A. 22.  $^1\text{H}$ -NMR spectra of compound 5

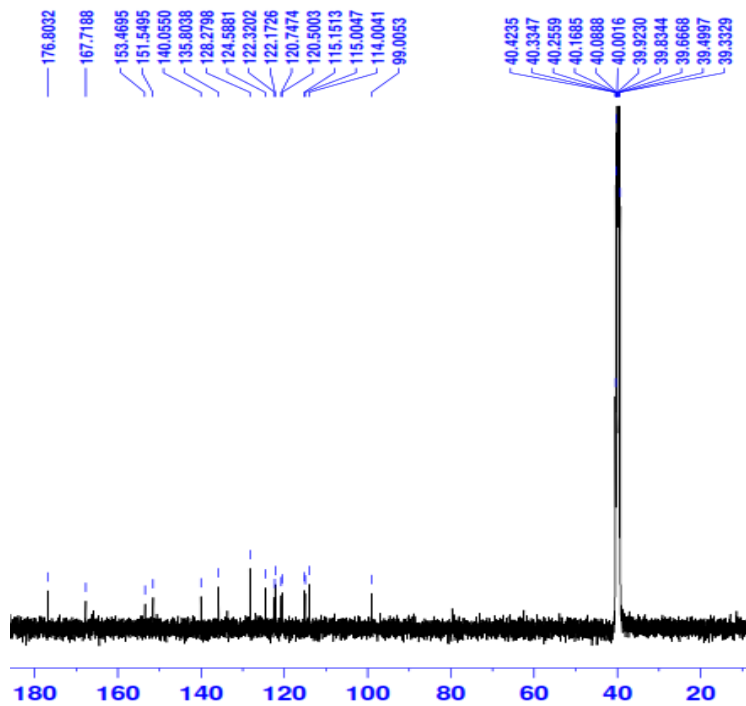


Figure A. 23. 13C-NMR spectrum of compound 5

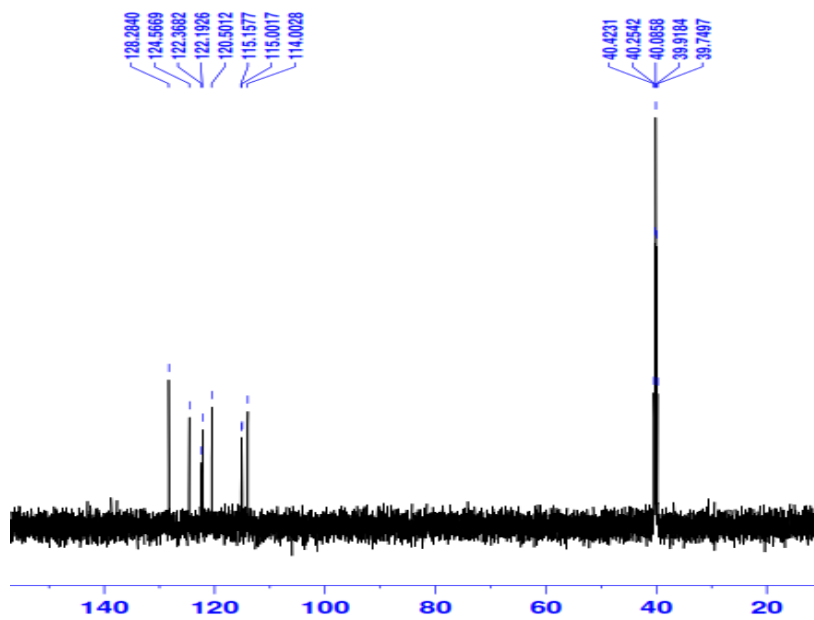


Figure A. 24. DEPT-135 spectrum of compound 5

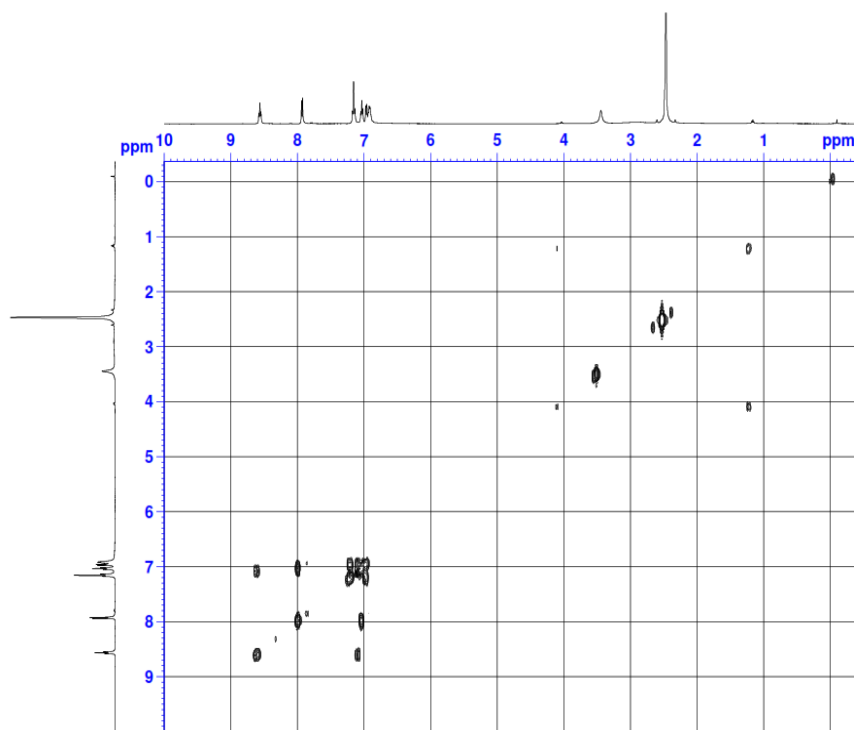


Figure A. 25. COSY spectrum of compound 5

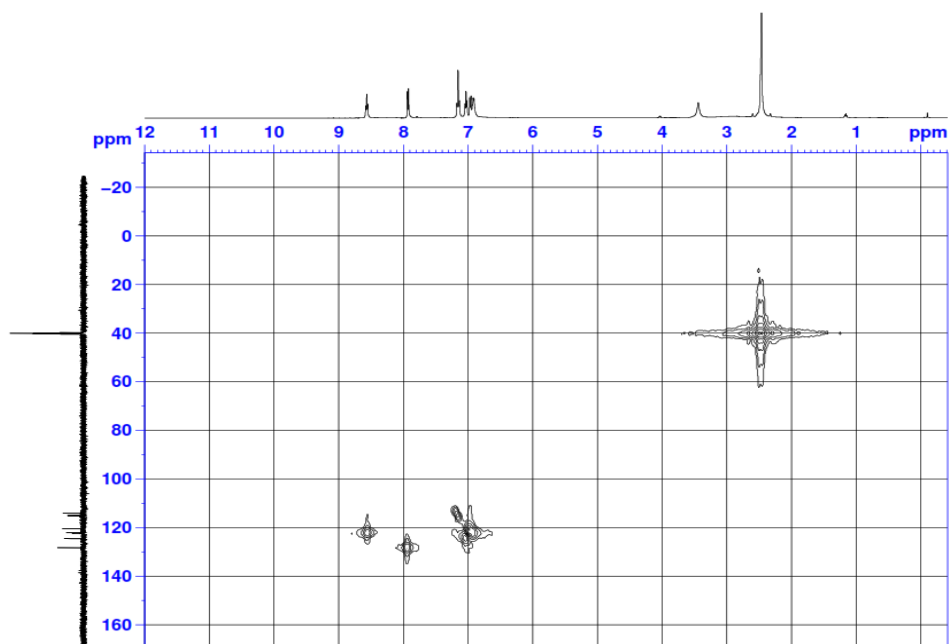


Figure A. 26. HMQC spectrum of compound 5

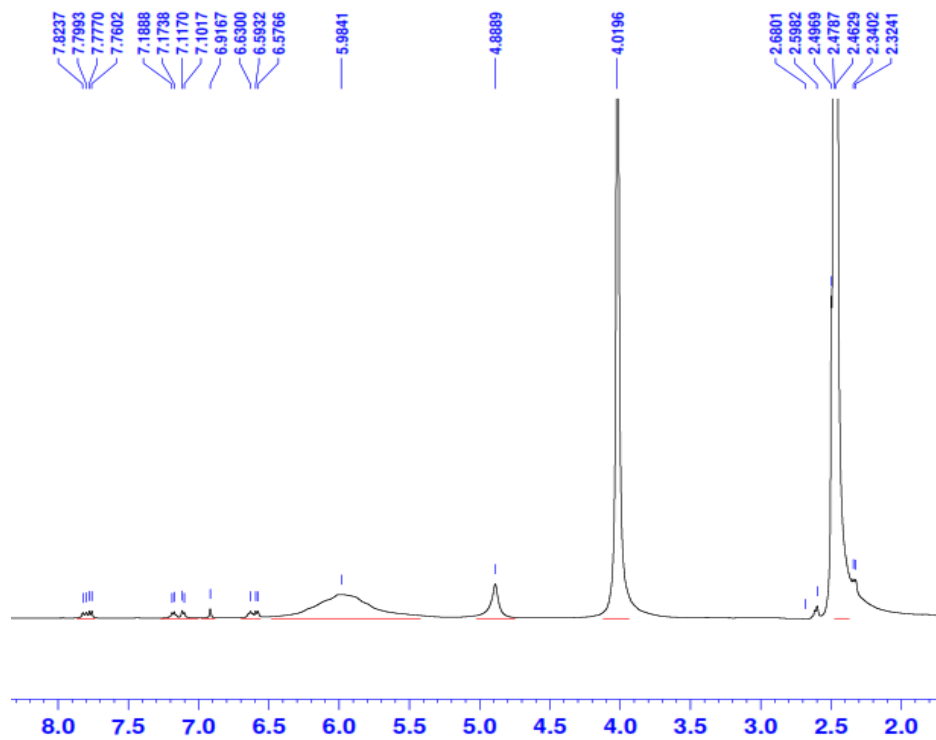


Figure A. 27. <sup>1</sup>H-NMR spectrum of compound 6

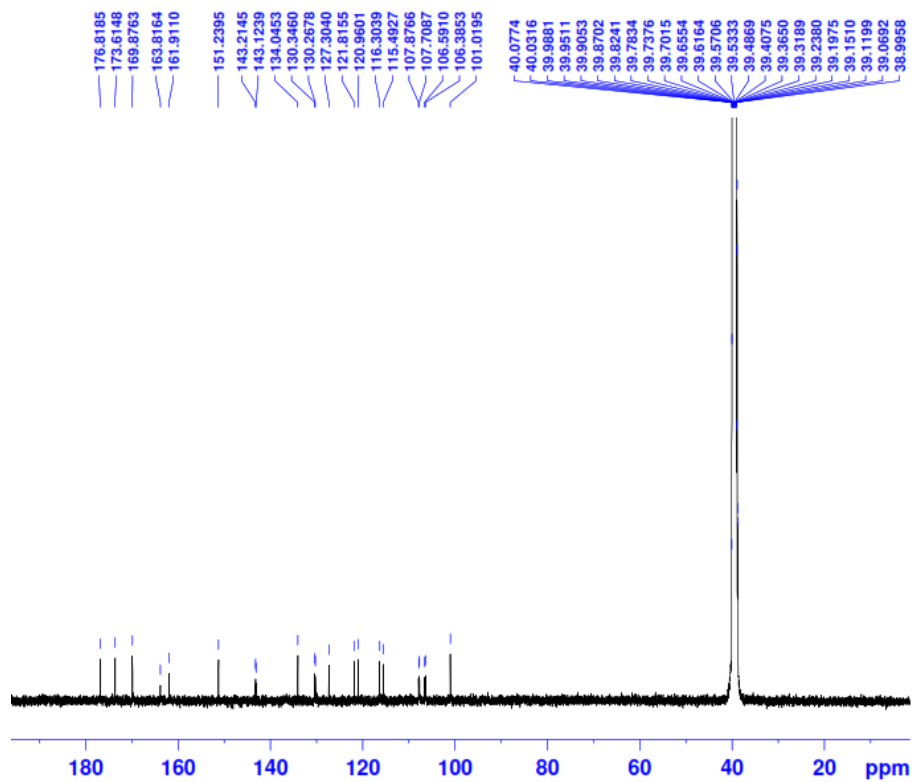


Figure A. 28.  $^{13}\text{C}$ -NMR spectrum of compound 6

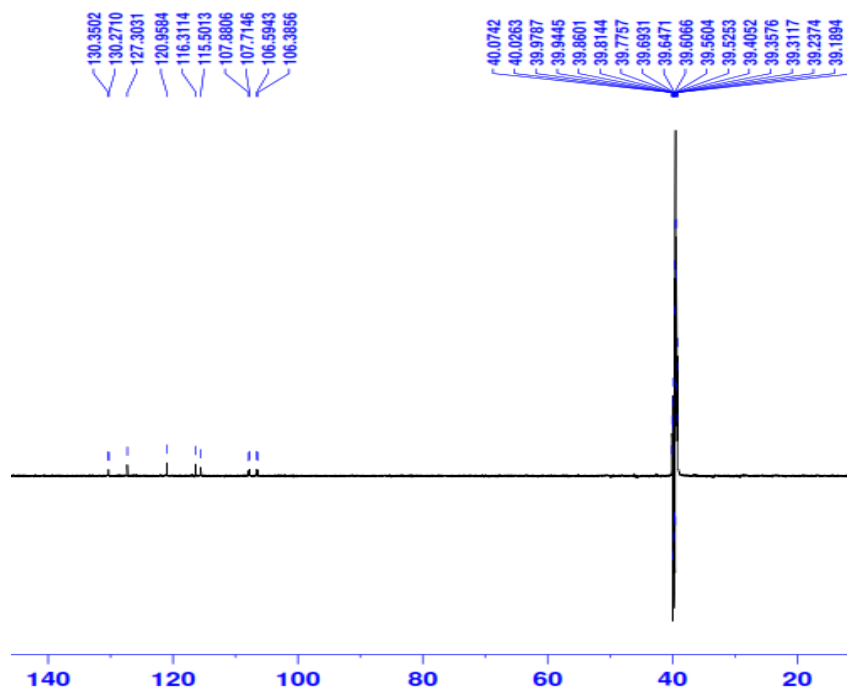


Figure A. 29. DEPT-135 spectrum of compound 6

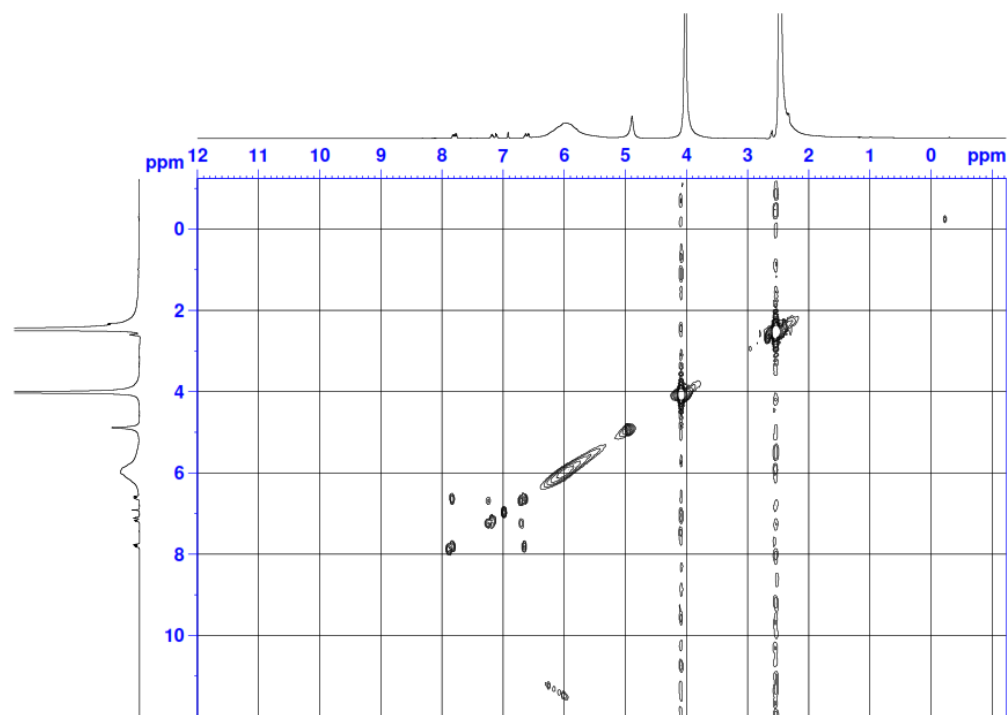


Figure A. 30. COSY spectrum of compound 6

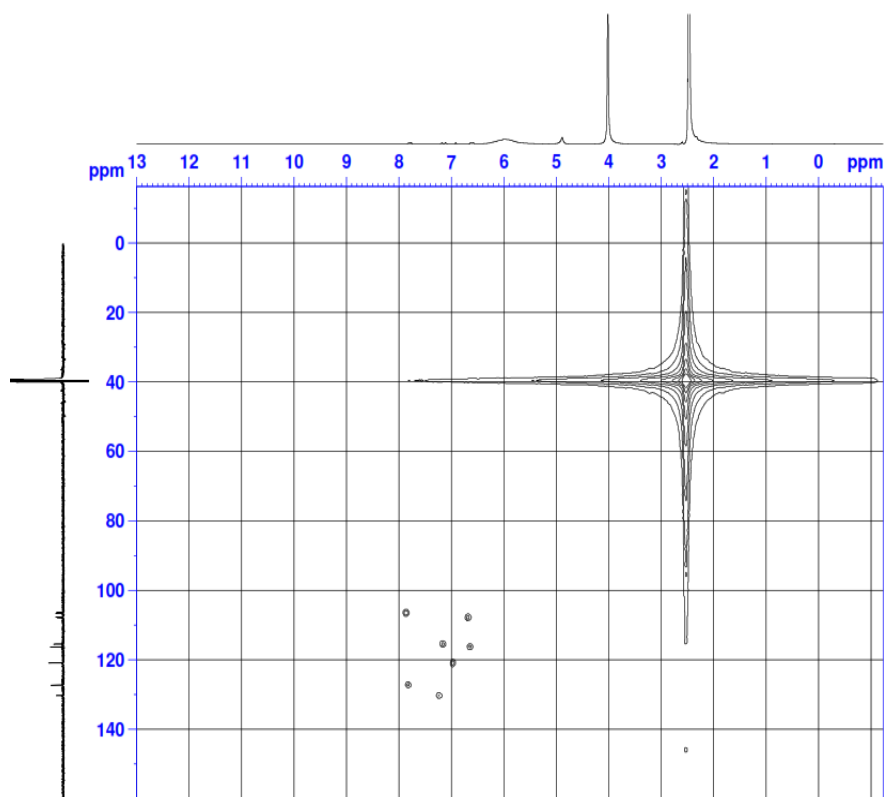


Figure A. 31. HMQC spectrum of compound 6

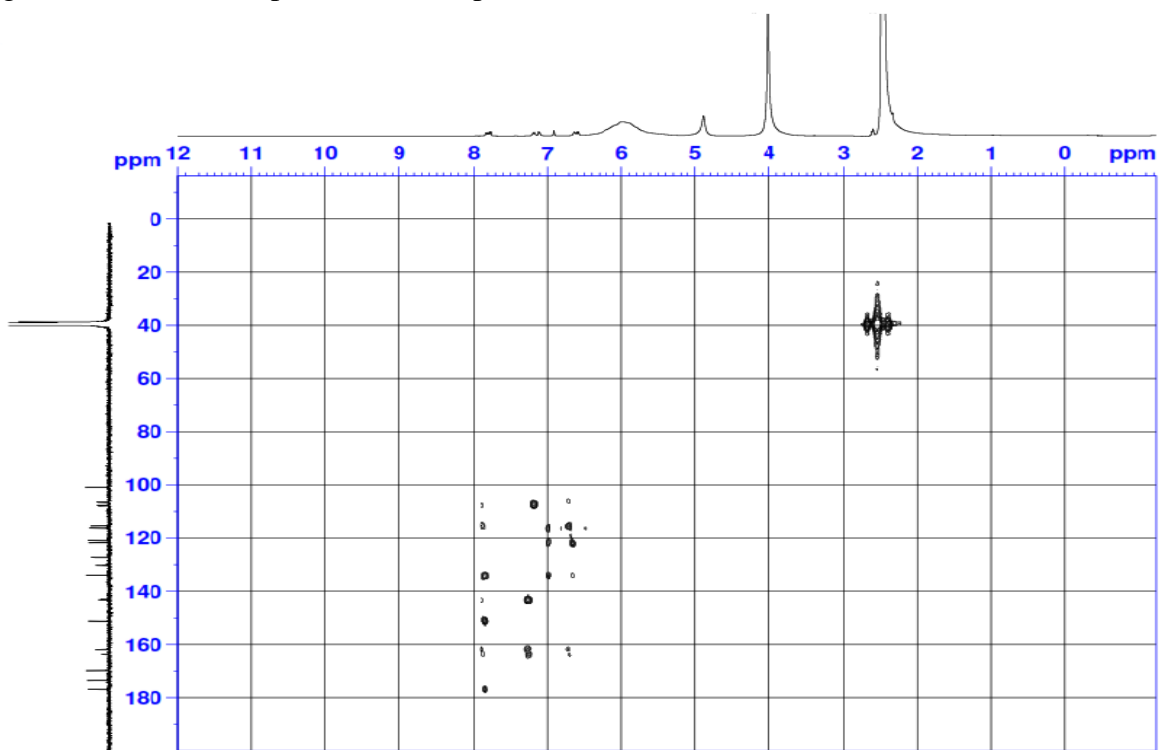


Figure A. 32. HMBC spectrum of compound 6

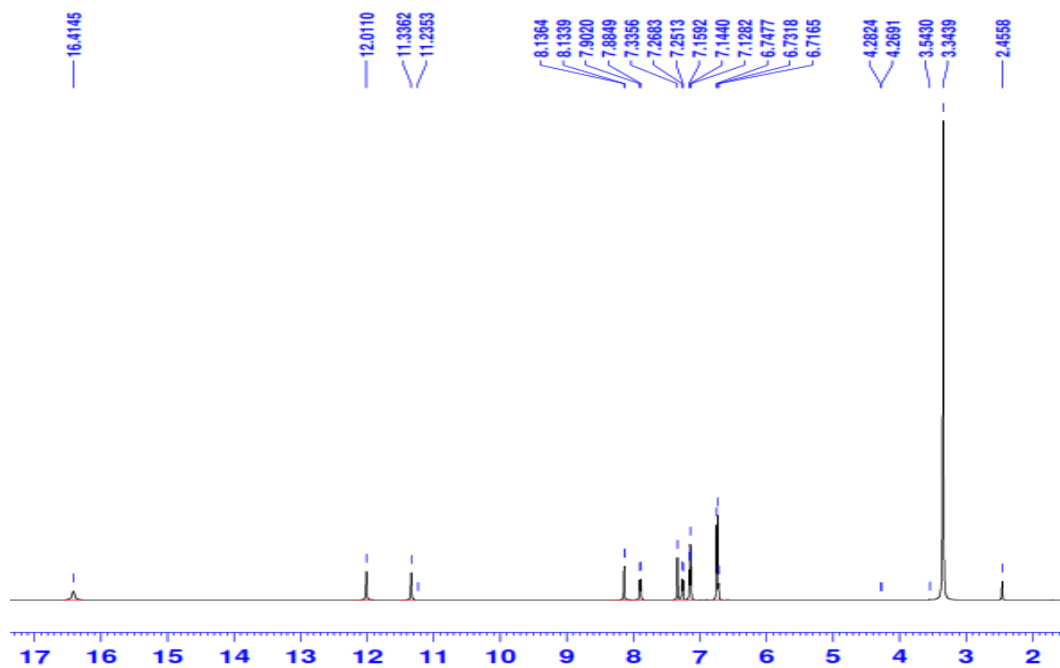


Figure A. 33. <sup>1</sup>H-NMR spectrum of compound 7

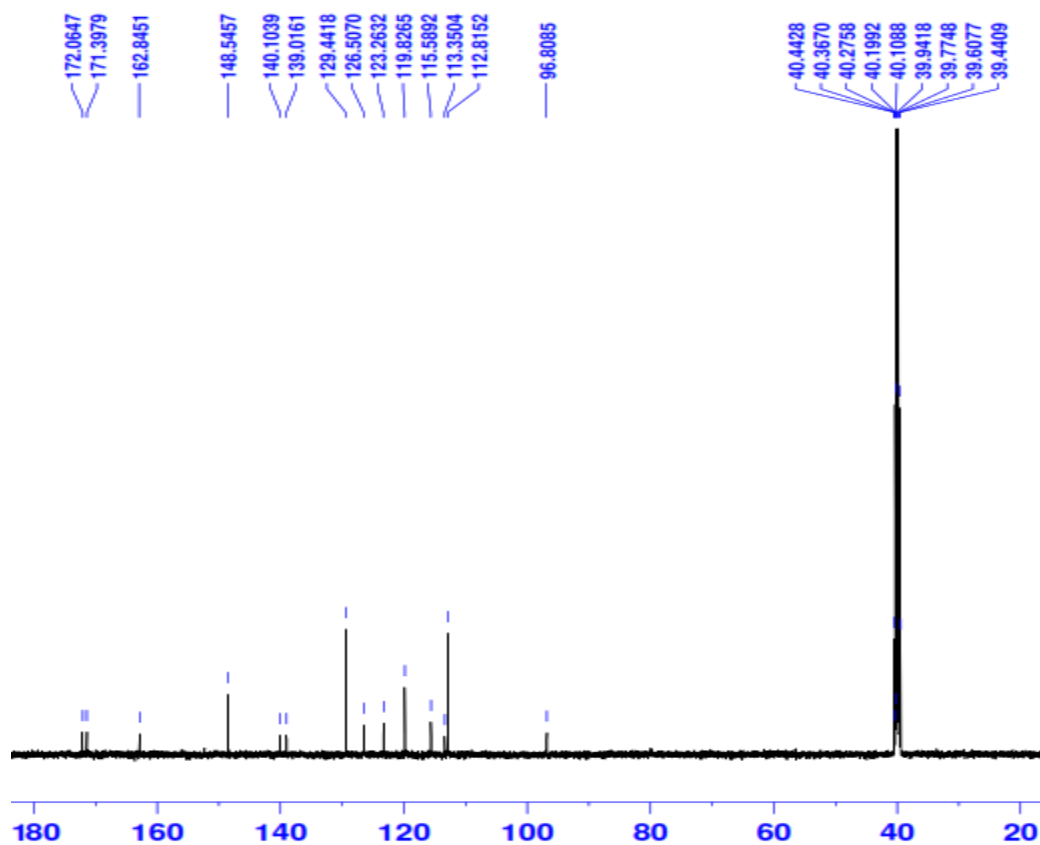


Figure A. 34. <sup>13</sup>C-NMR spectrum of compound 7

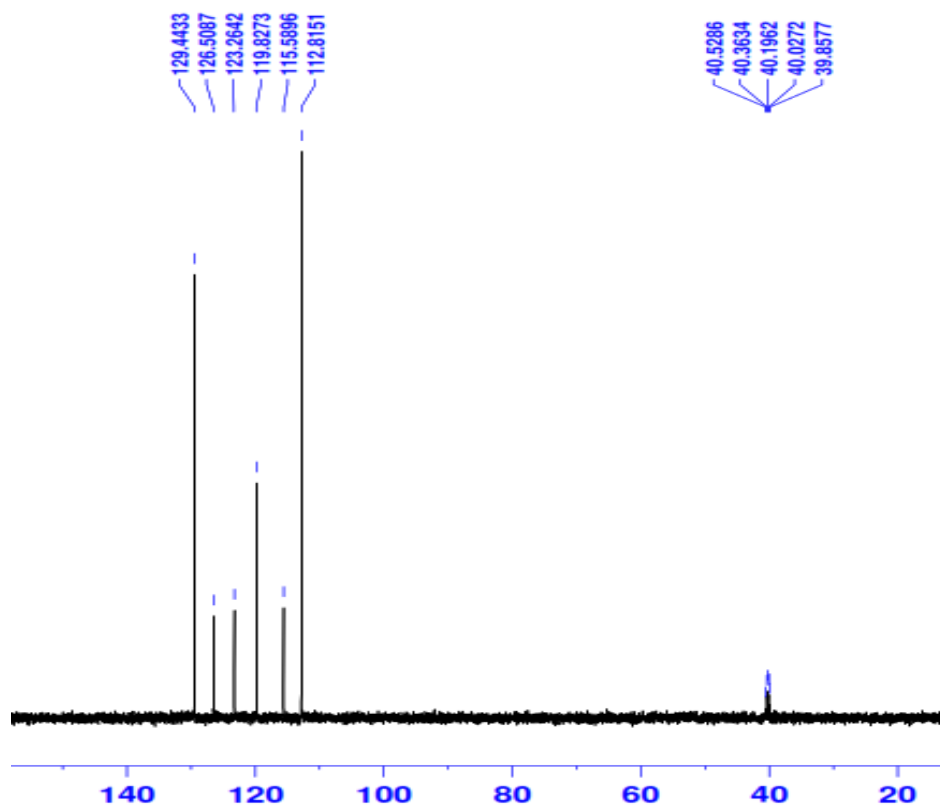


Figure A. 35. DEPT-135 spectrum of compound 7

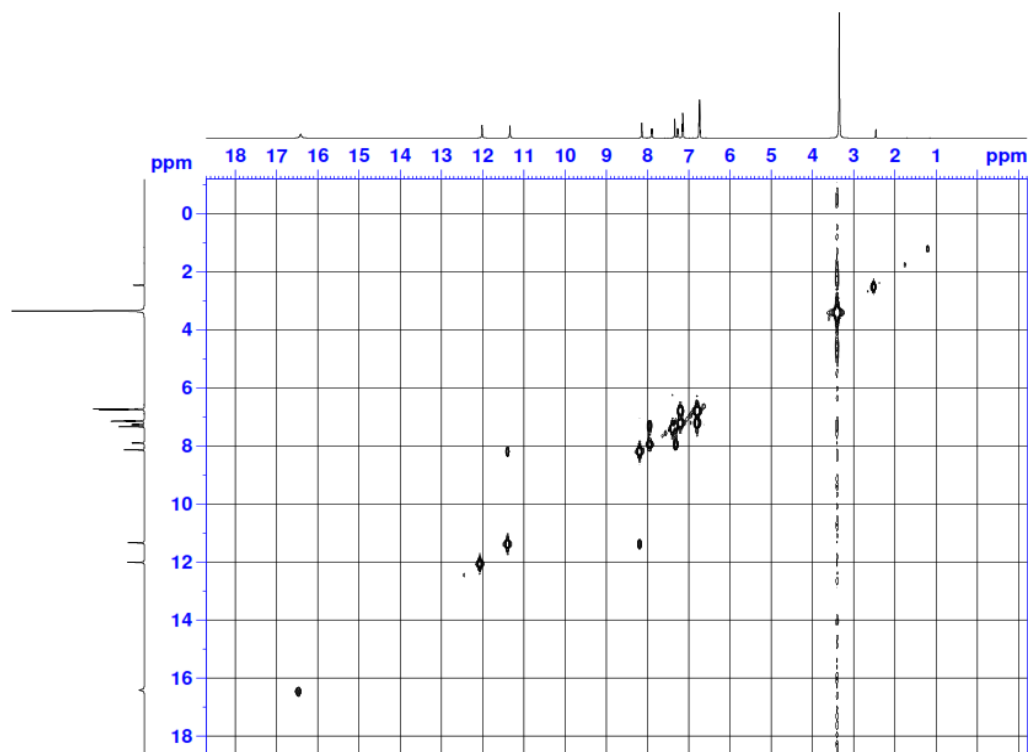


Figure A. 36. COSY spectrum of compound 7

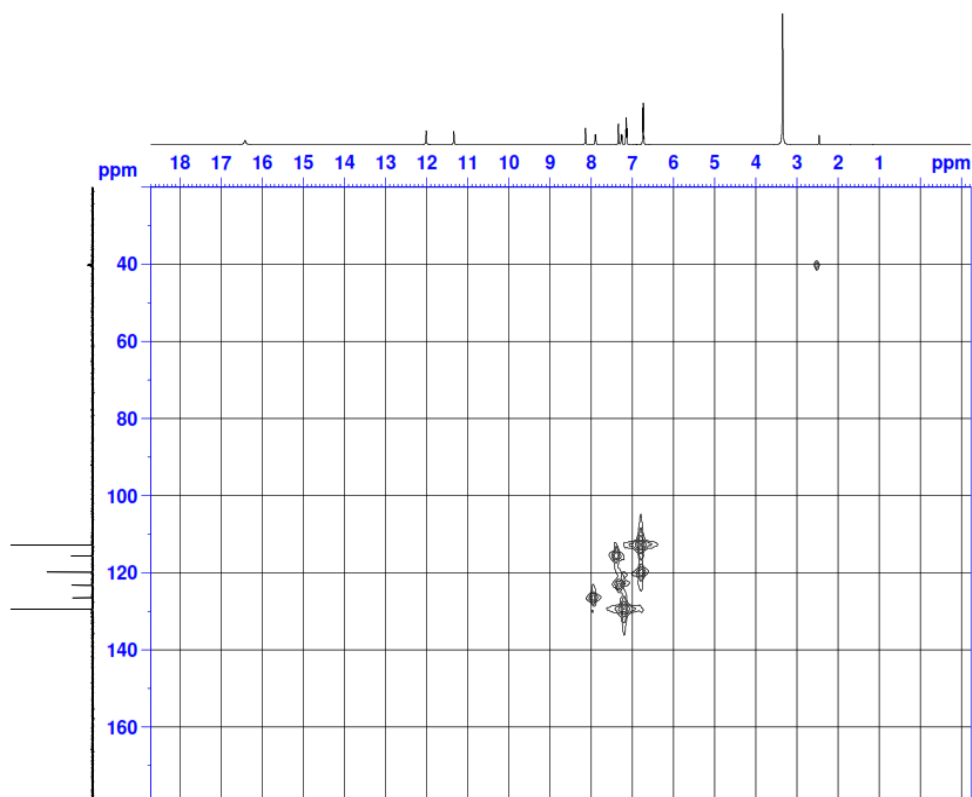


Figure A. 37. HMQC spectrum of compound 7

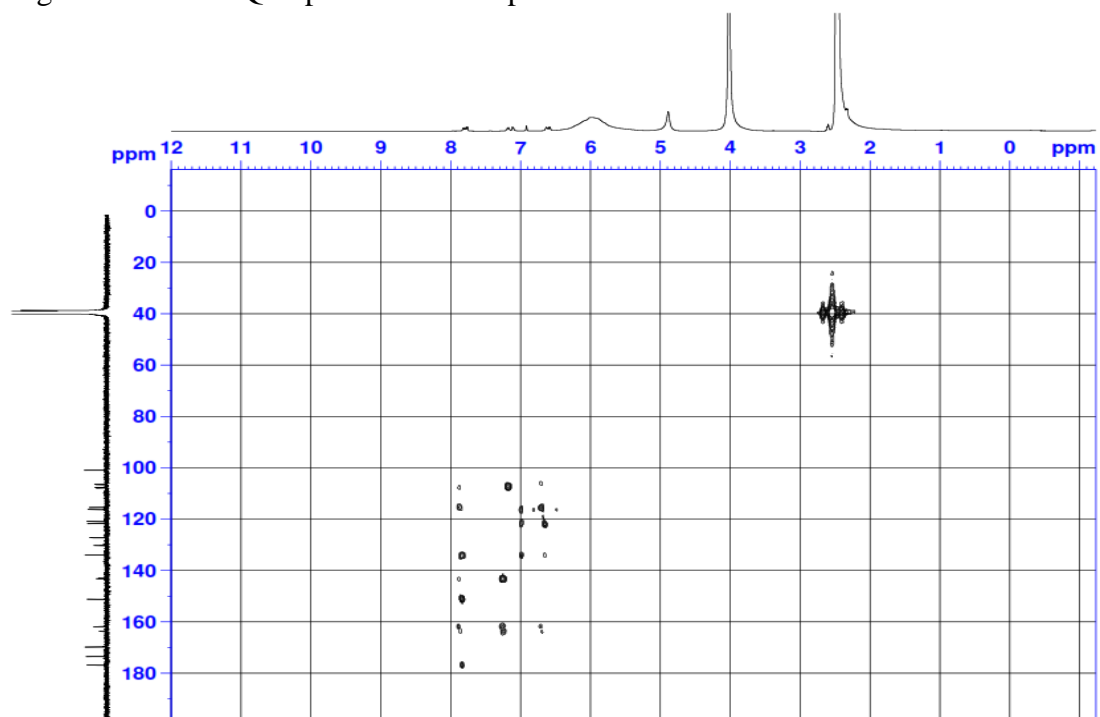


Figure A. 38. HMBC spectrum of compound 7

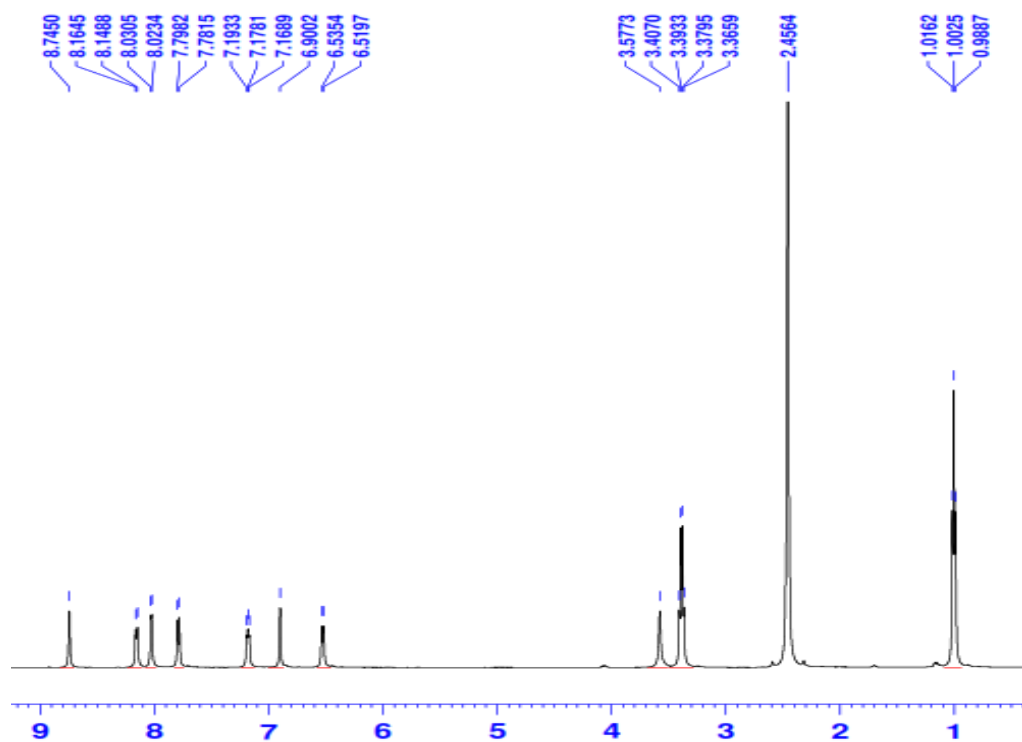


Figure A. 39. <sup>1</sup>H-NMR spectrum of compound 8

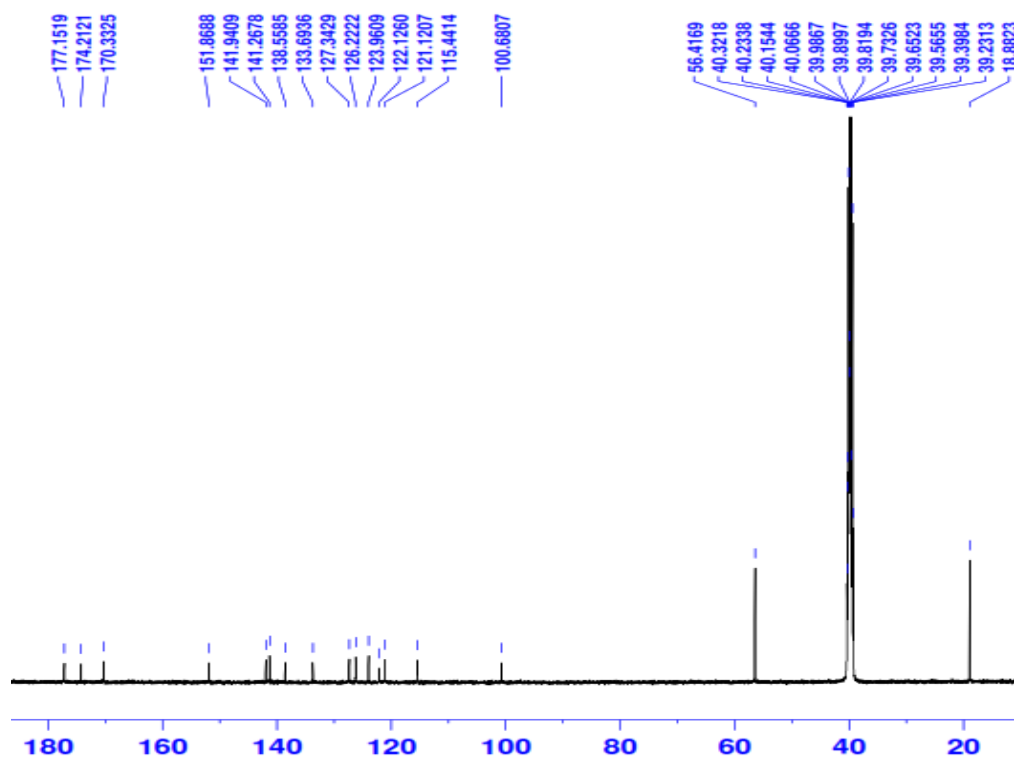


Figure A. 40. <sup>13</sup>C-NMR spectrum of compound 8

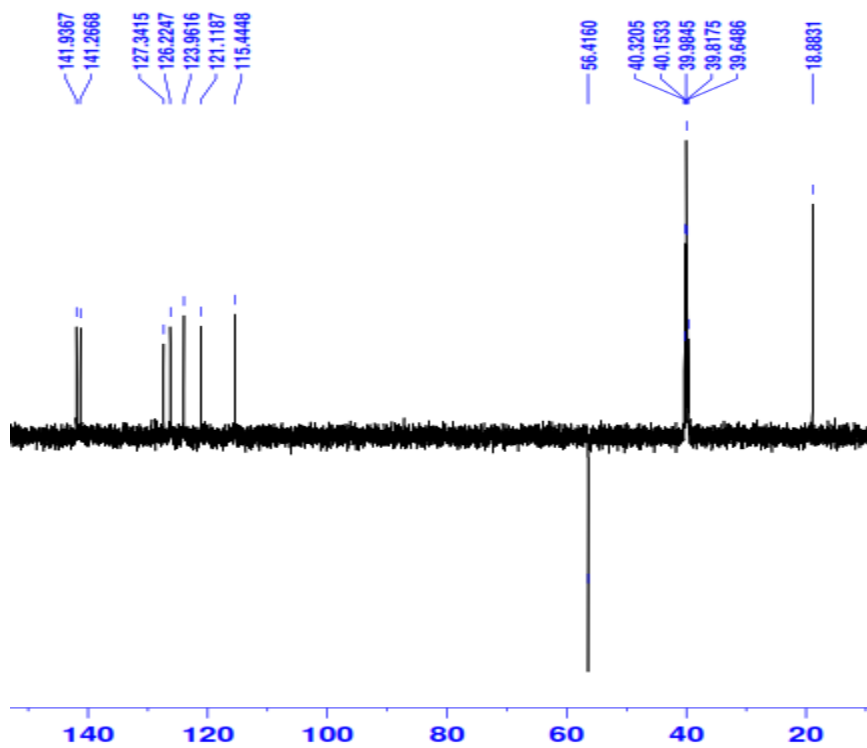


Figure A. 41. DEPT-135 spectra of compound 8

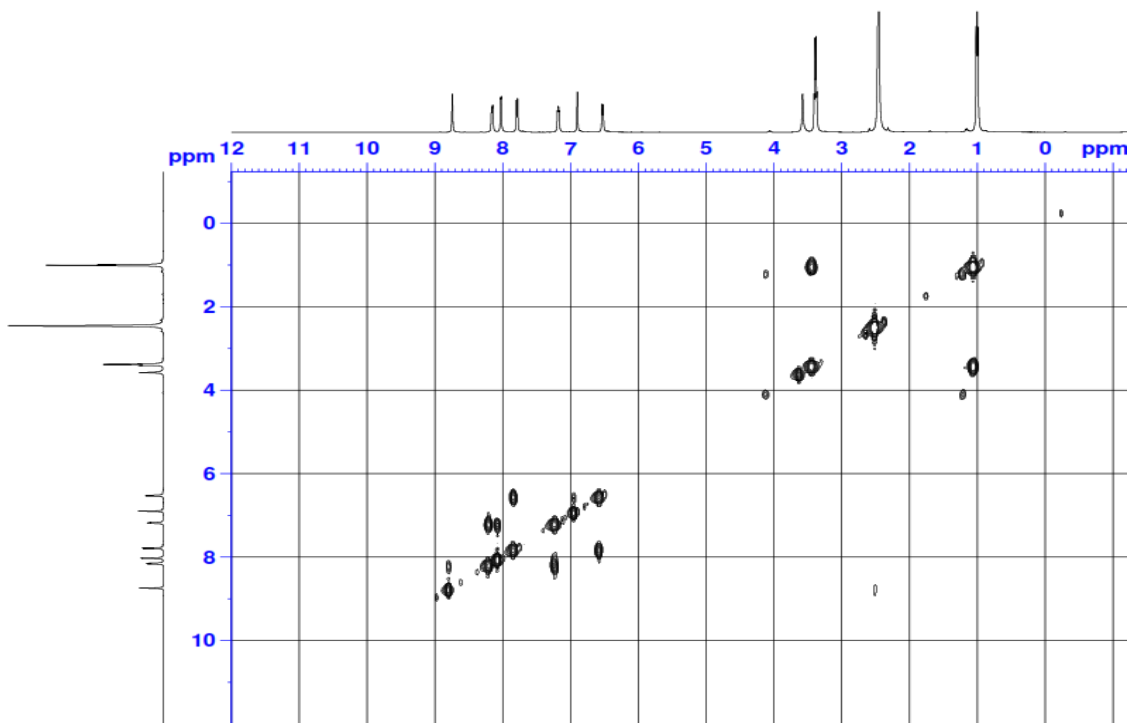


Figure A. 42. COSY spectrum of compound 8

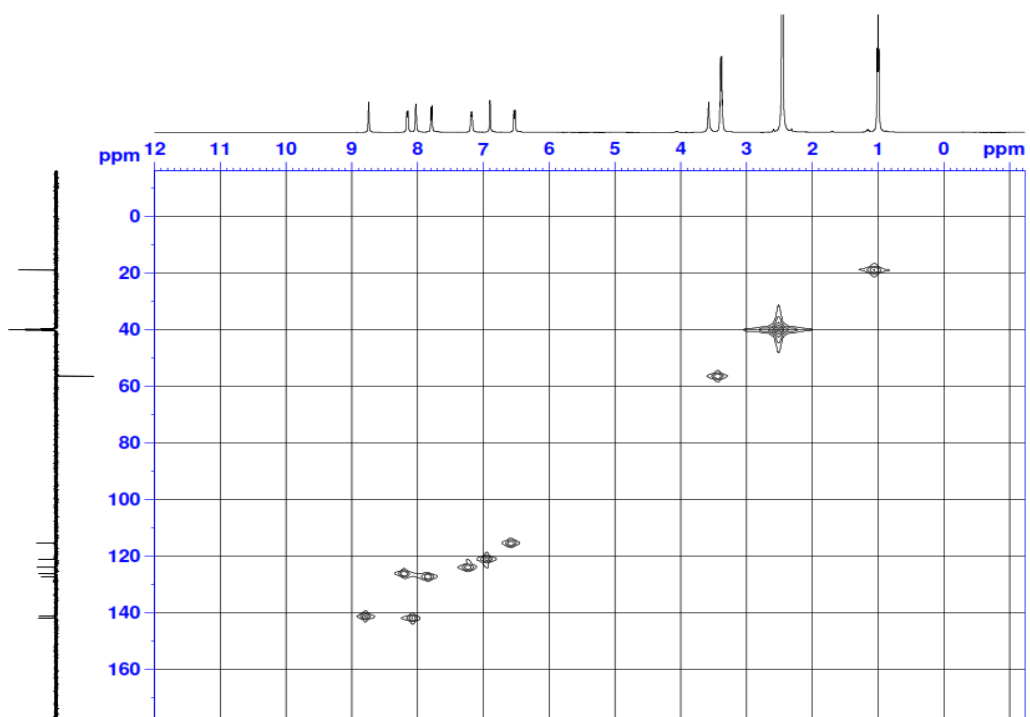


Figure A. 43. HMQC spectrum of compound 8

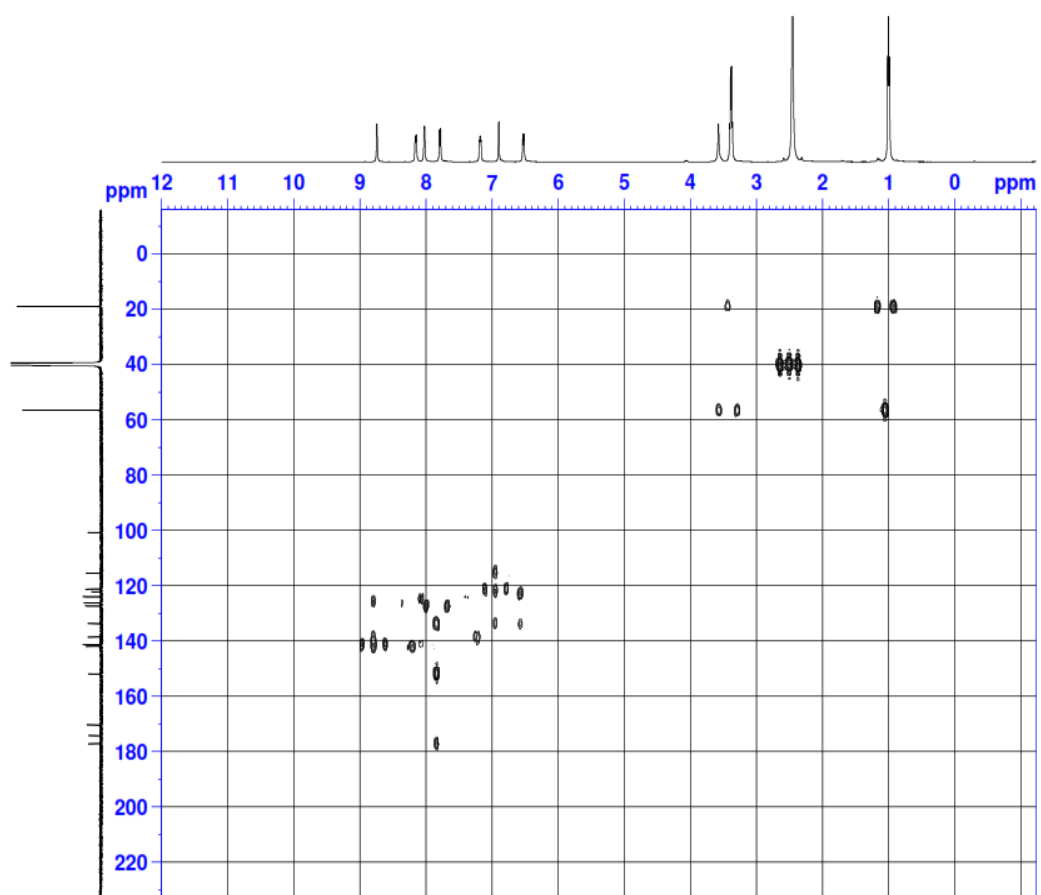


Figure A. 44. HMBC spectrum of compound 8

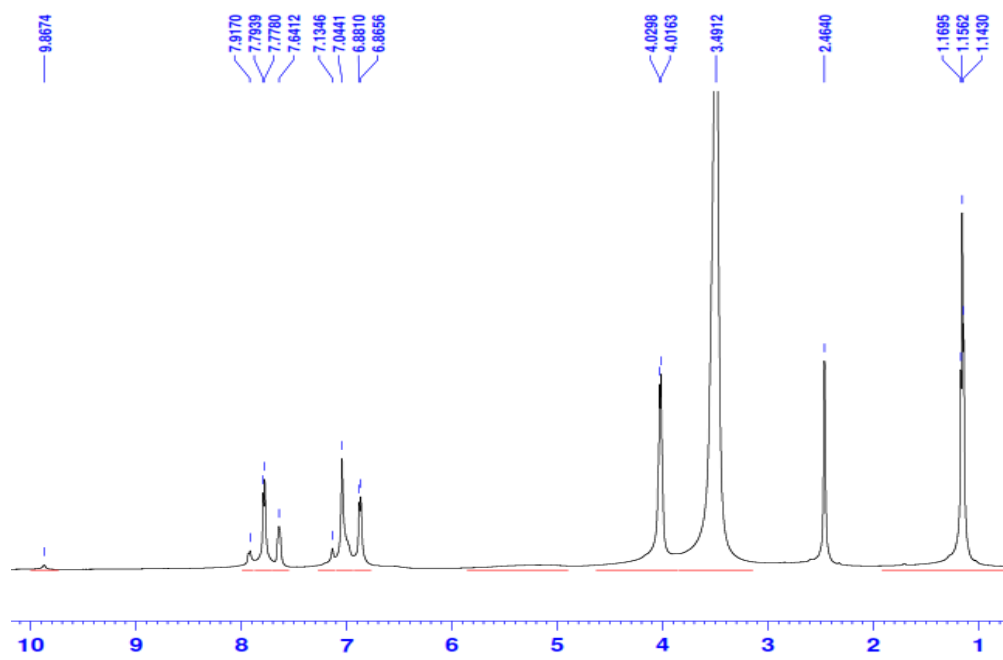


Figure A. 45. <sup>1</sup>H-NMR spectrum of compound 9

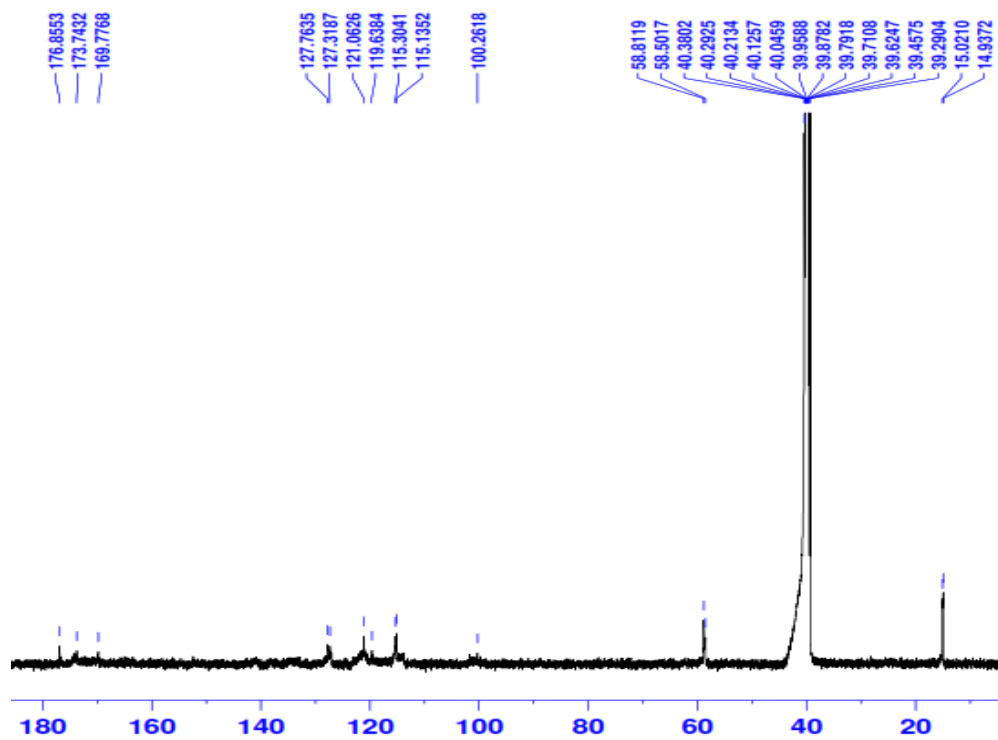


Figure A. 46. <sup>13</sup>C-NMR spectrum of compound 9

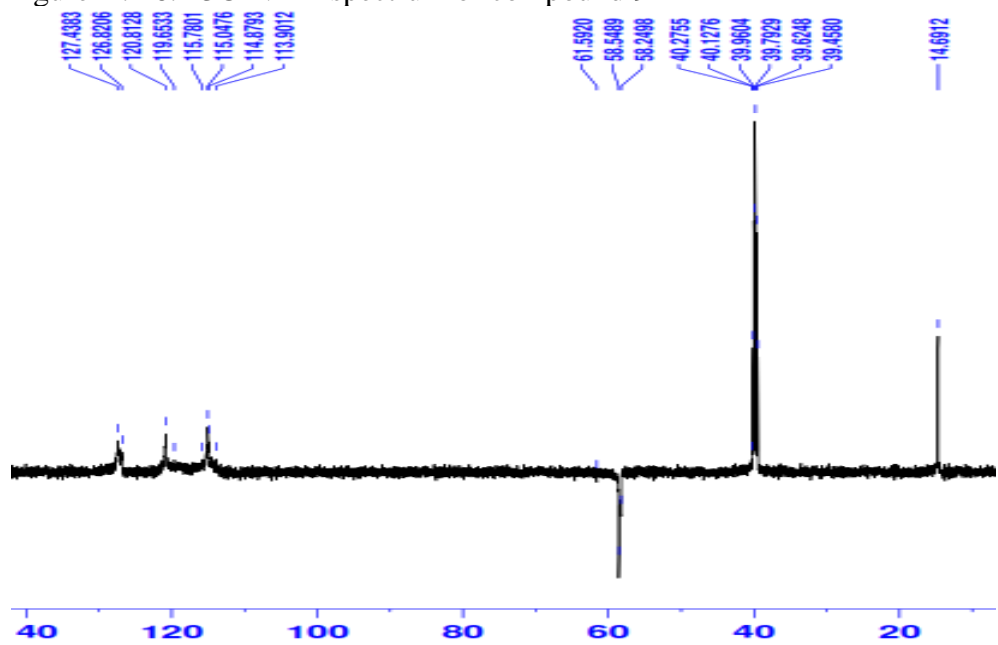


Figure A. 47. DEPT-135 spectra of compound 9

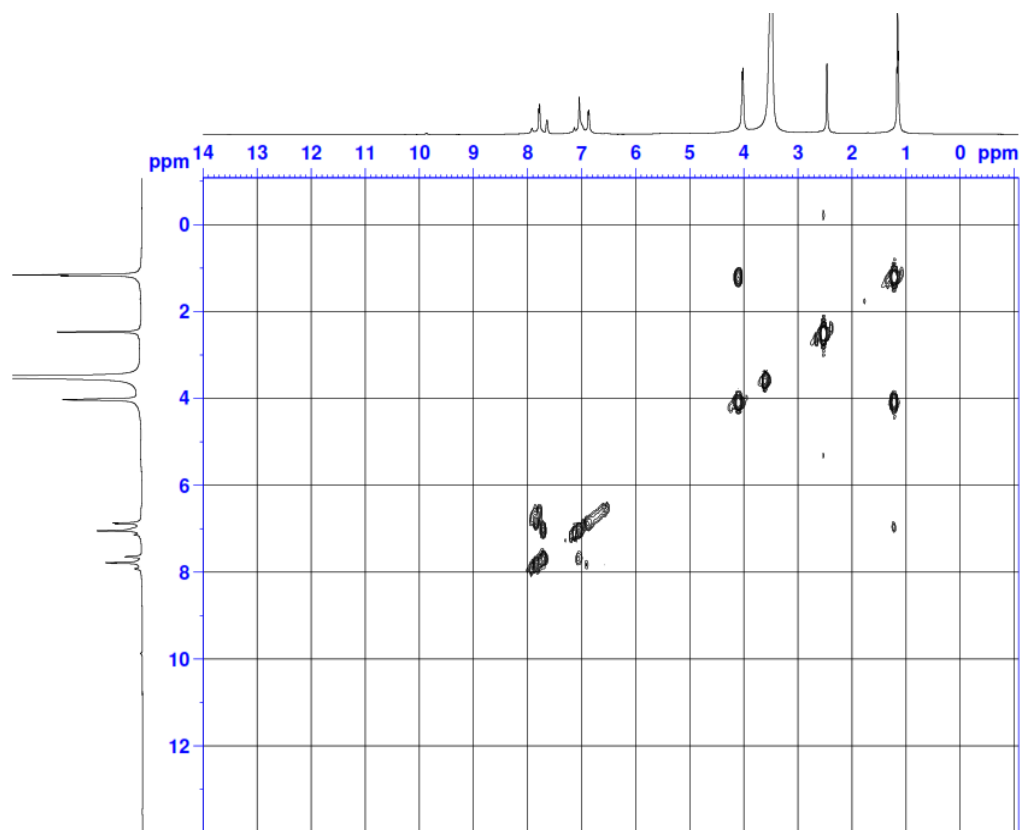


Figure A. 48. COSY spectrum of compound 9

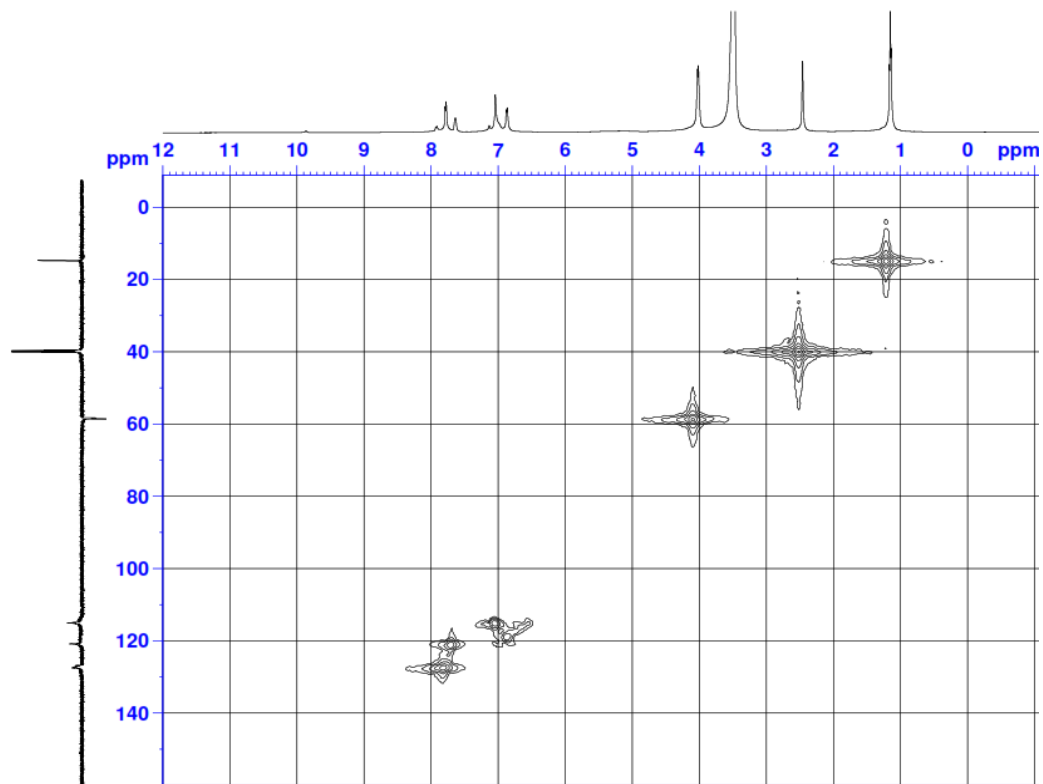


Figure A. 49. HMBC spectrum of compound 9

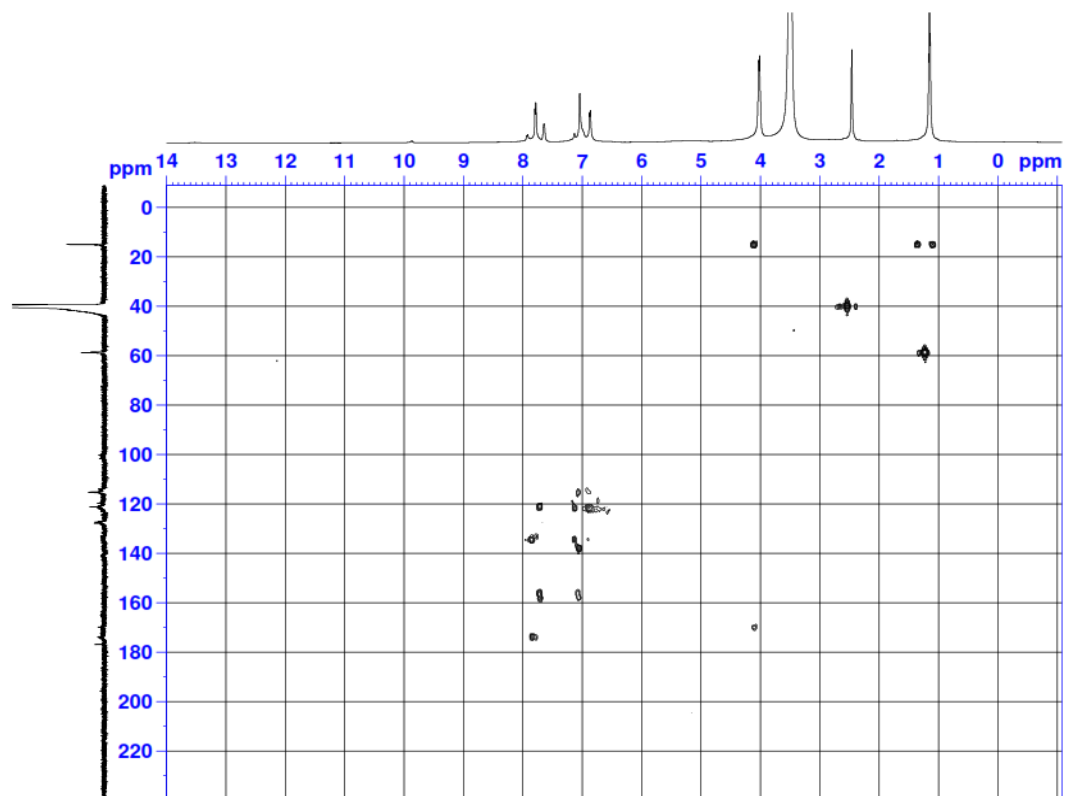


Figure A. 50. HMBC spectrum of compound 9

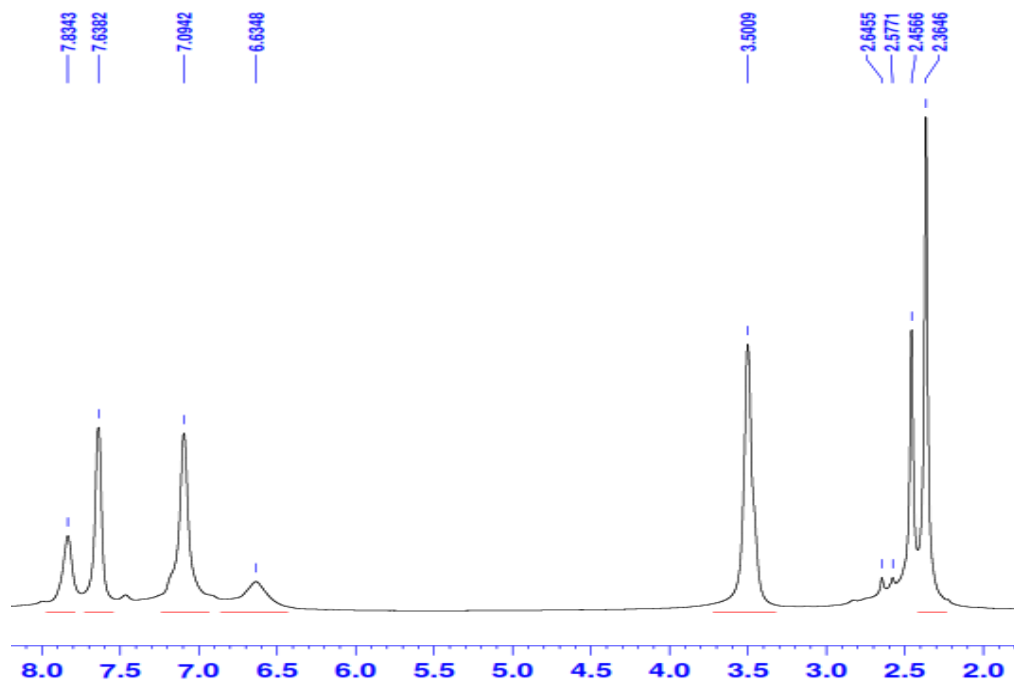


Figure A. 51. <sup>1</sup>H-NMR spectrum of compound 10

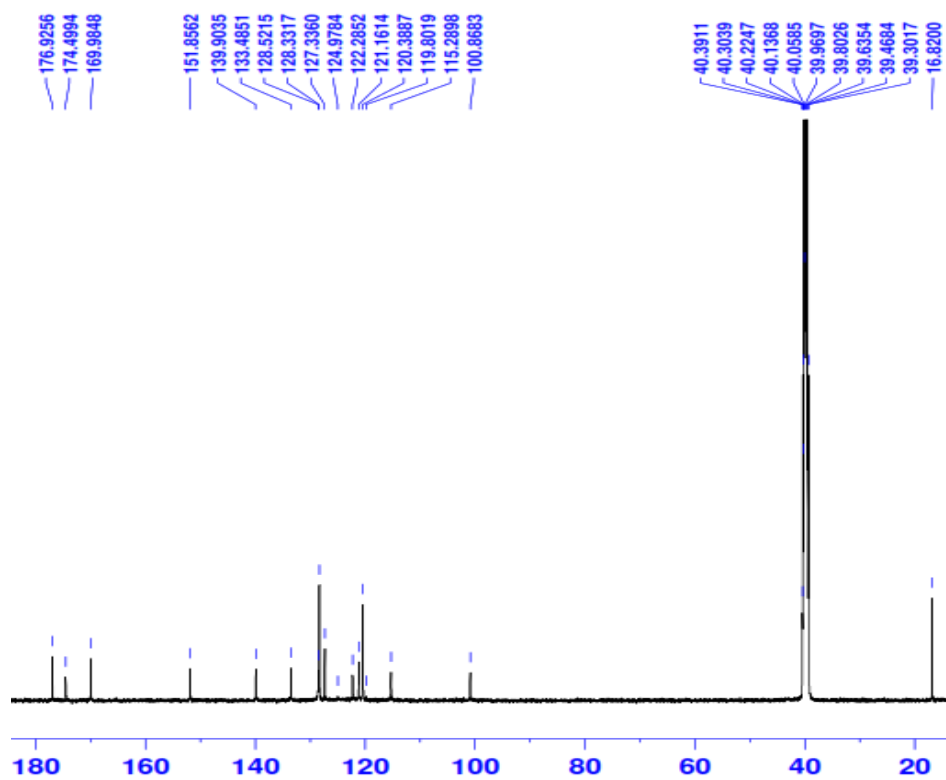


Figure A. 52. <sup>13</sup>C-NMR spectrum of compound 10

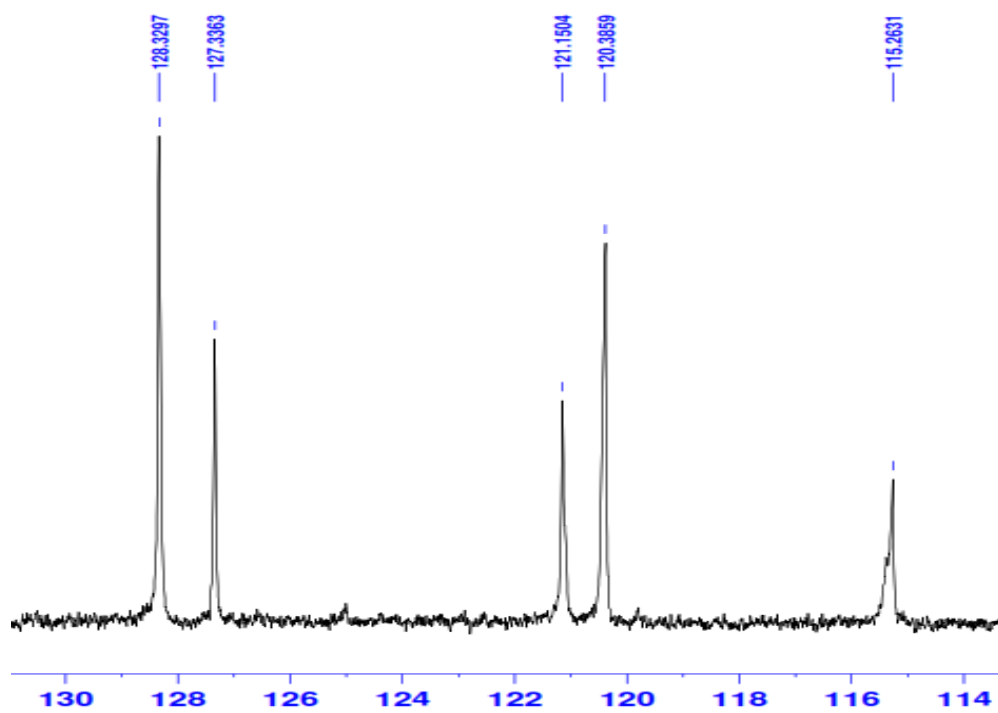


Figure A. 53. DEPT-135 spectrum of compound 10

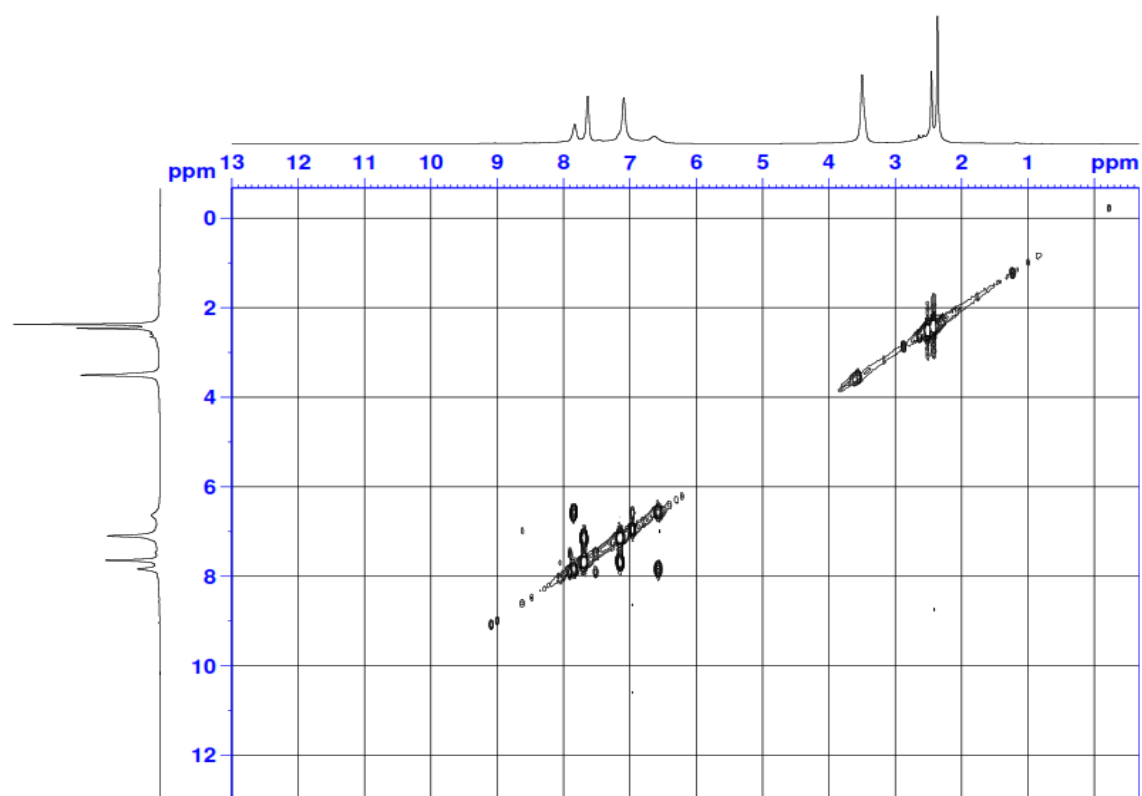


Figure A. 54. COSY spectrum of compound 10

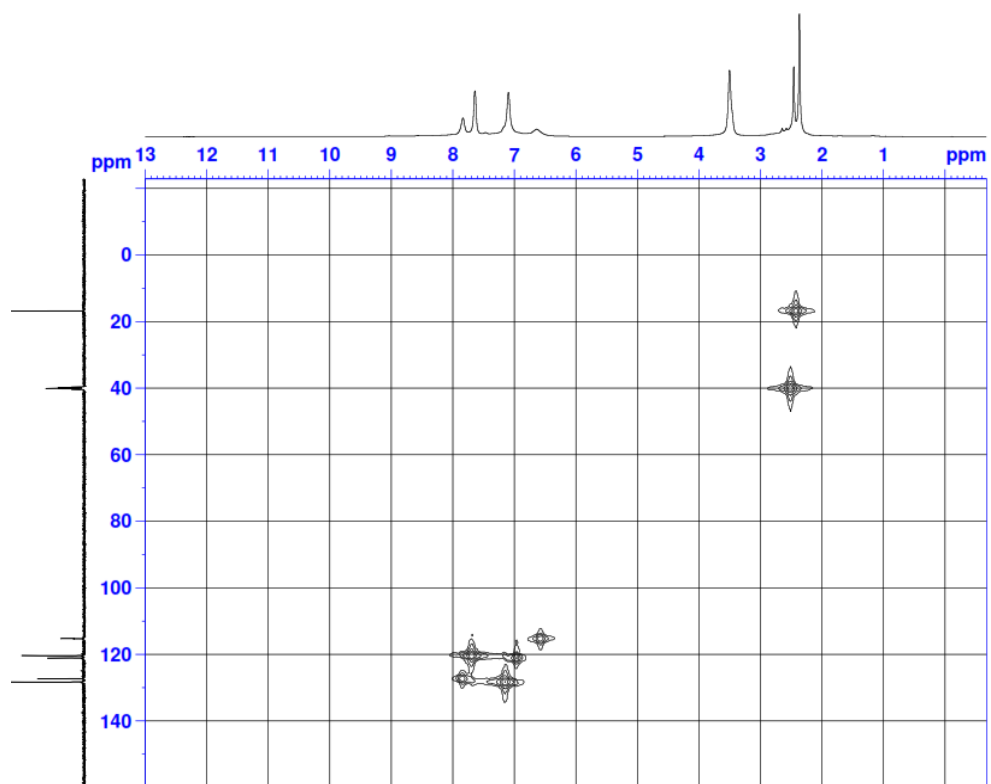


Figure A. 55. HMQC spectrum of compound 10

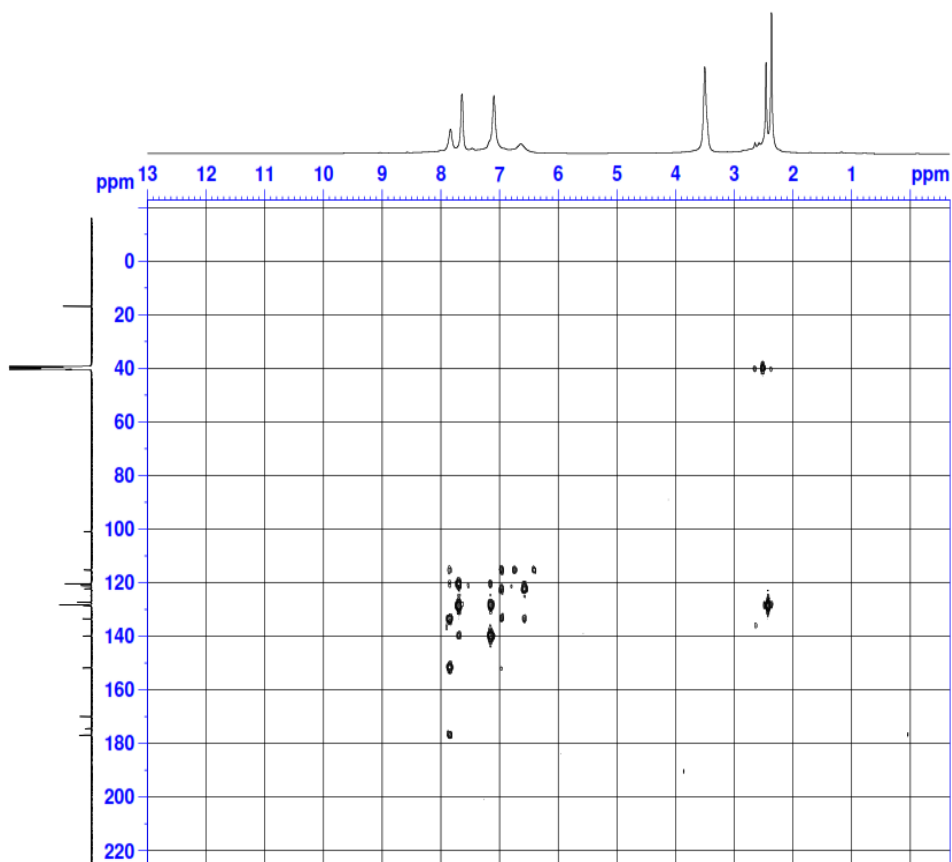


Figure A. 56. HMBC spectrum of compound 10

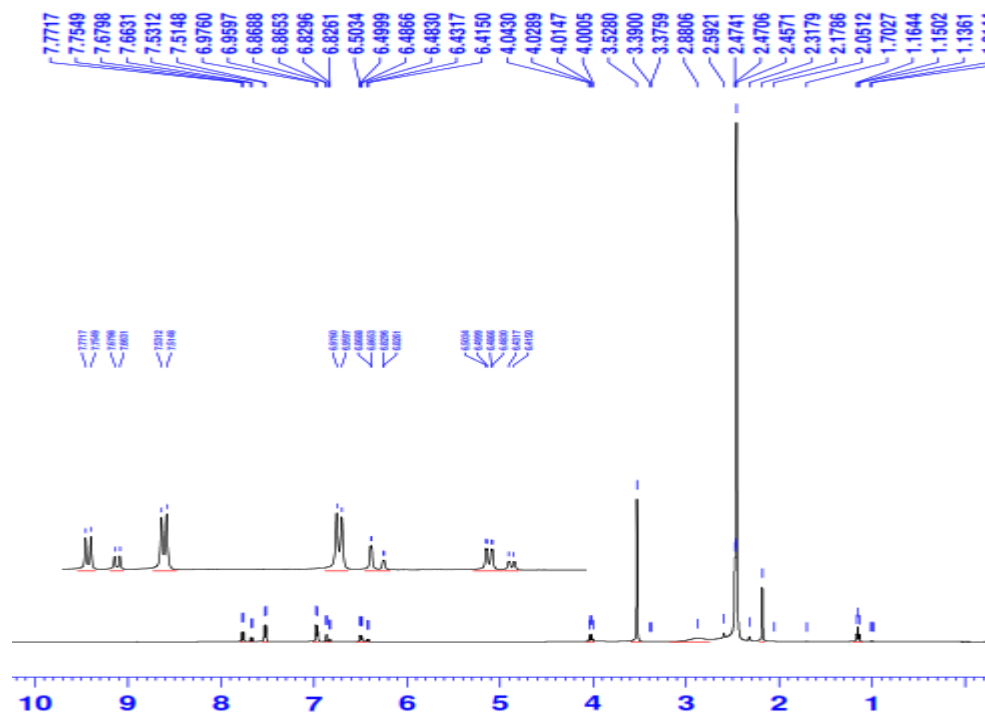


Figure A. 57. <sup>1</sup>H-NMR spectrum of compound 11

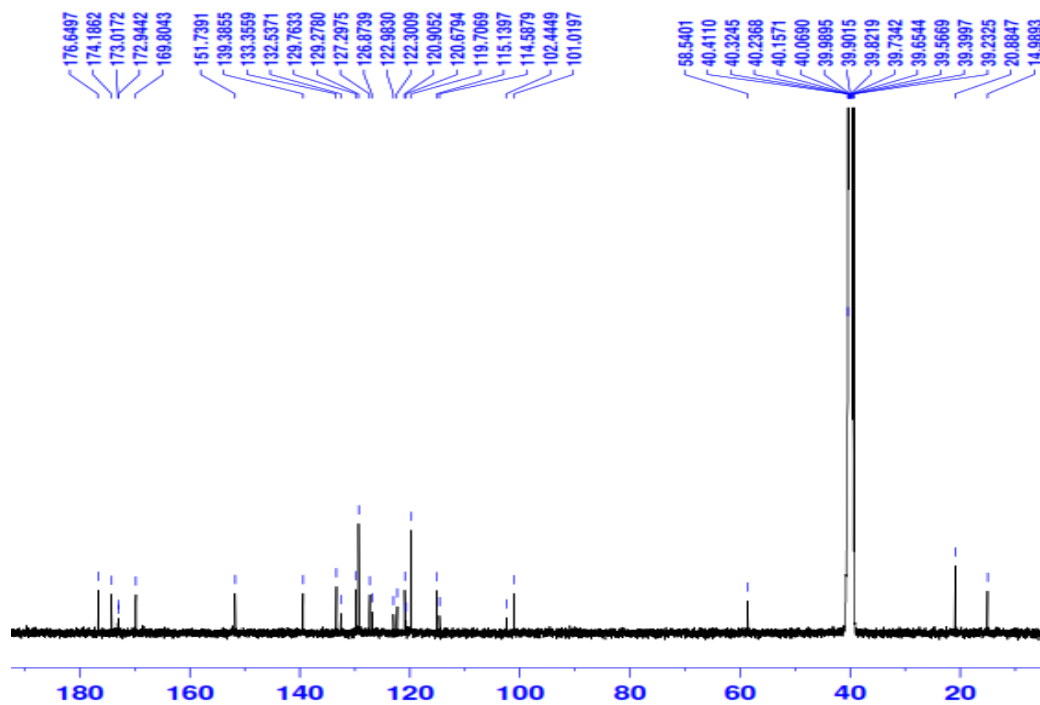


Figure A. 58. <sup>13</sup>C-NMR spectrum of compound 11

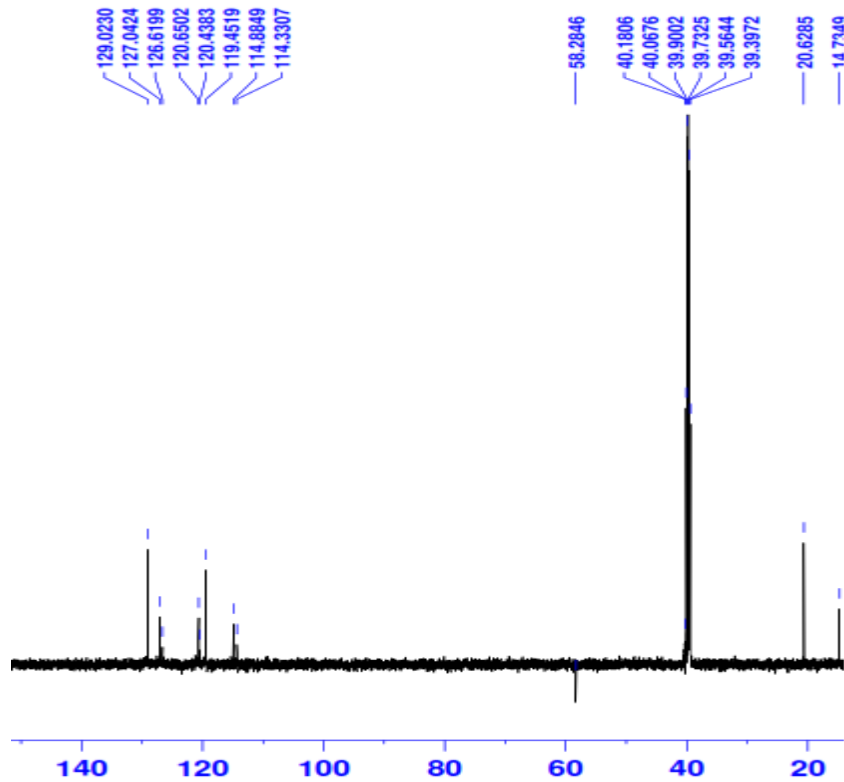


Figure A. 59 DEPT-135 spectrum of compound 11

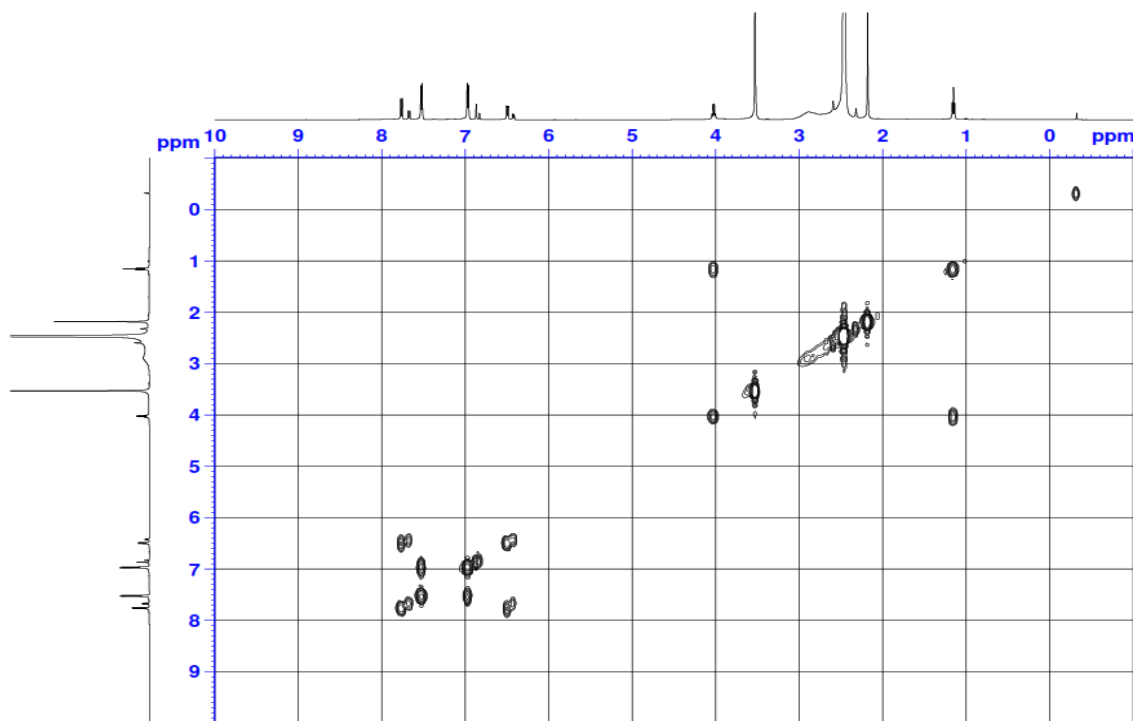


Figure A. 60. COSY spectrum of compound 11

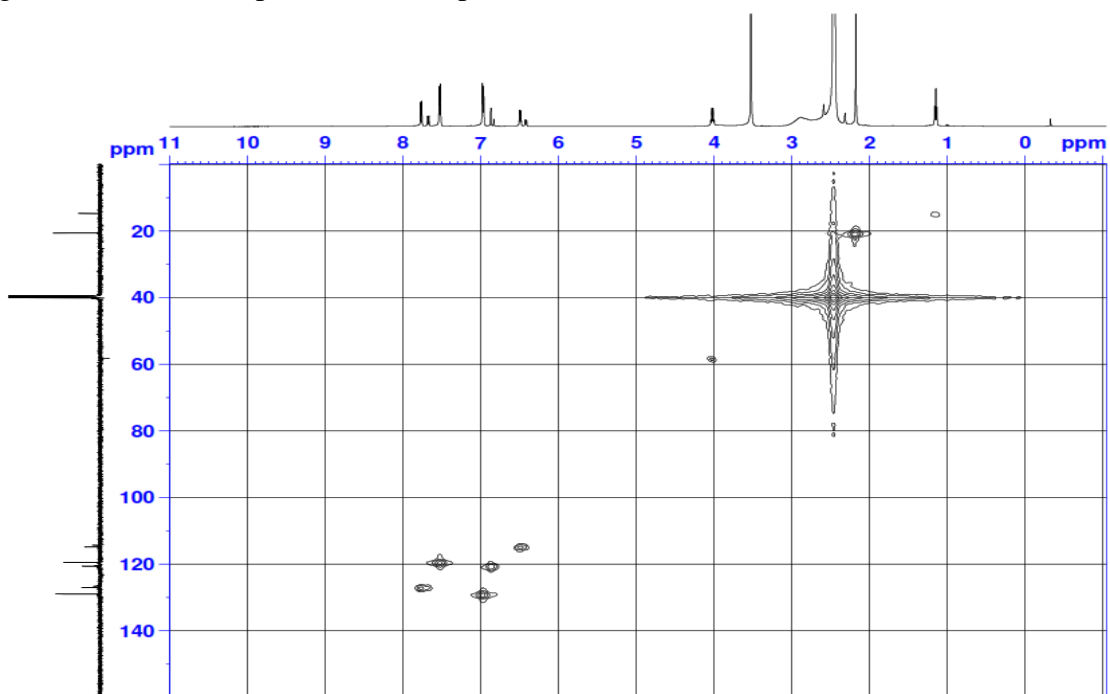


Figure A. 61. HMQC spectrum of compound 11

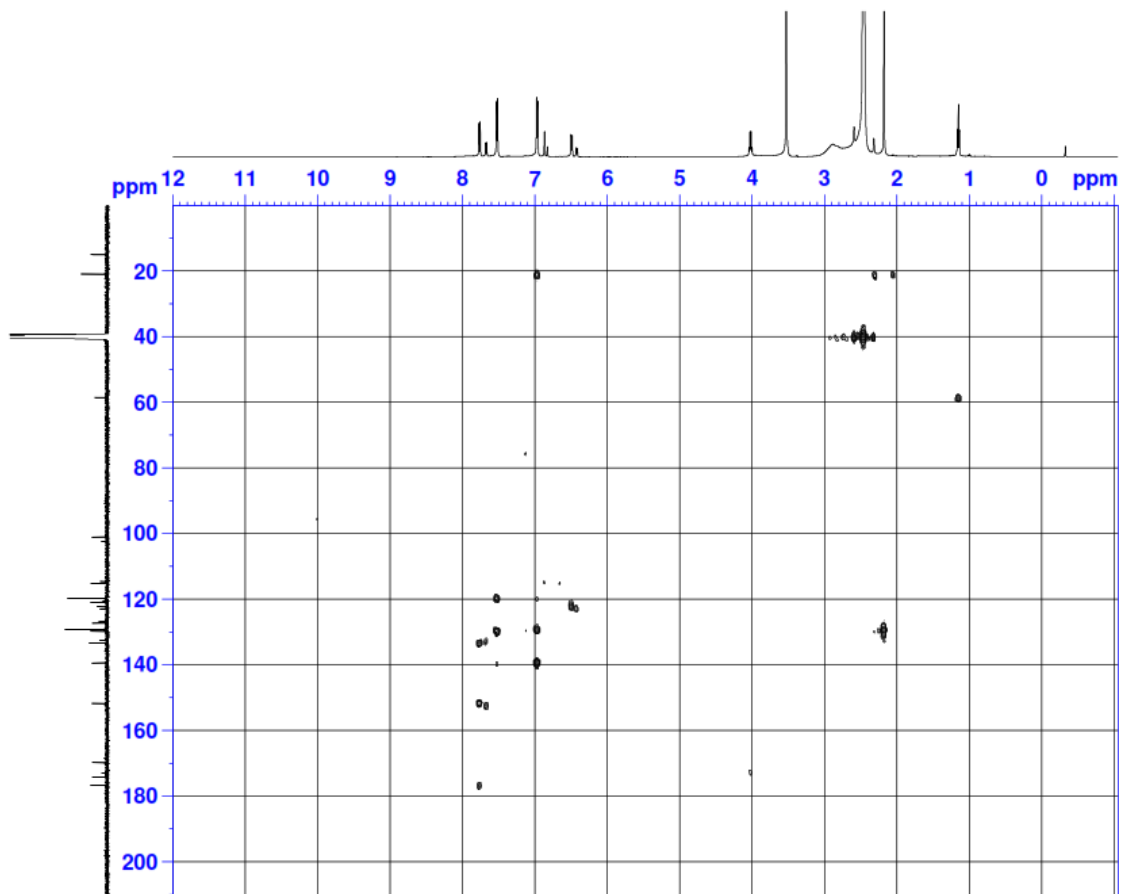


Figure A. 62. HMBC spectrum of compound 11

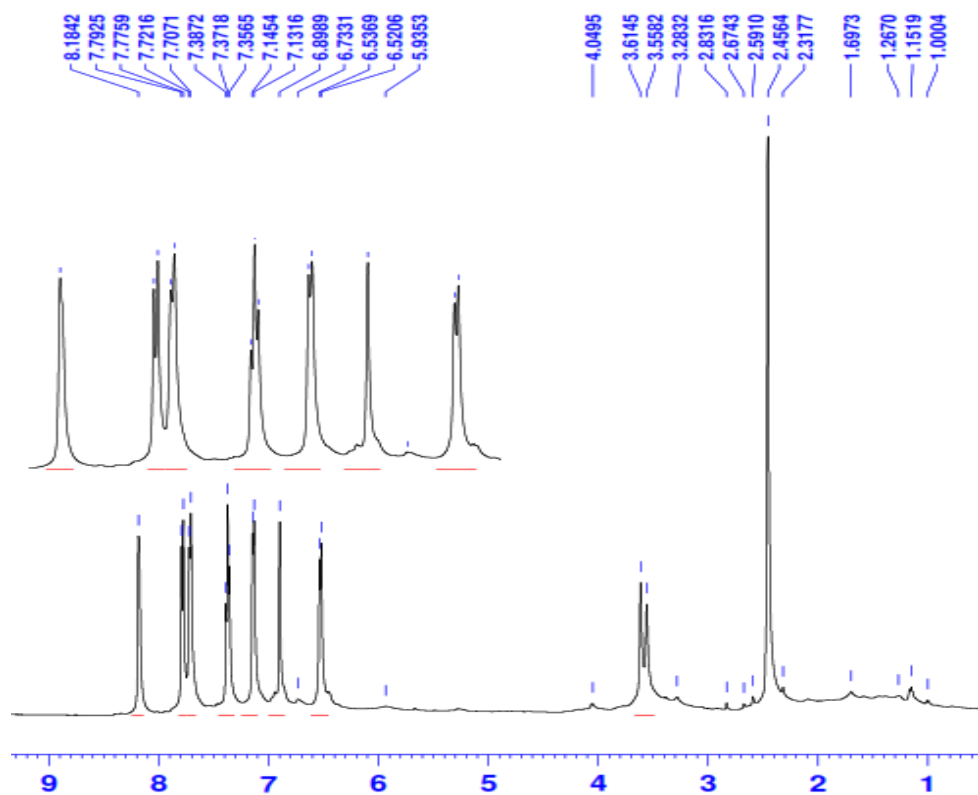


Figure A. 63.  $^1\text{H-NMR}$  spectrum of compound 12

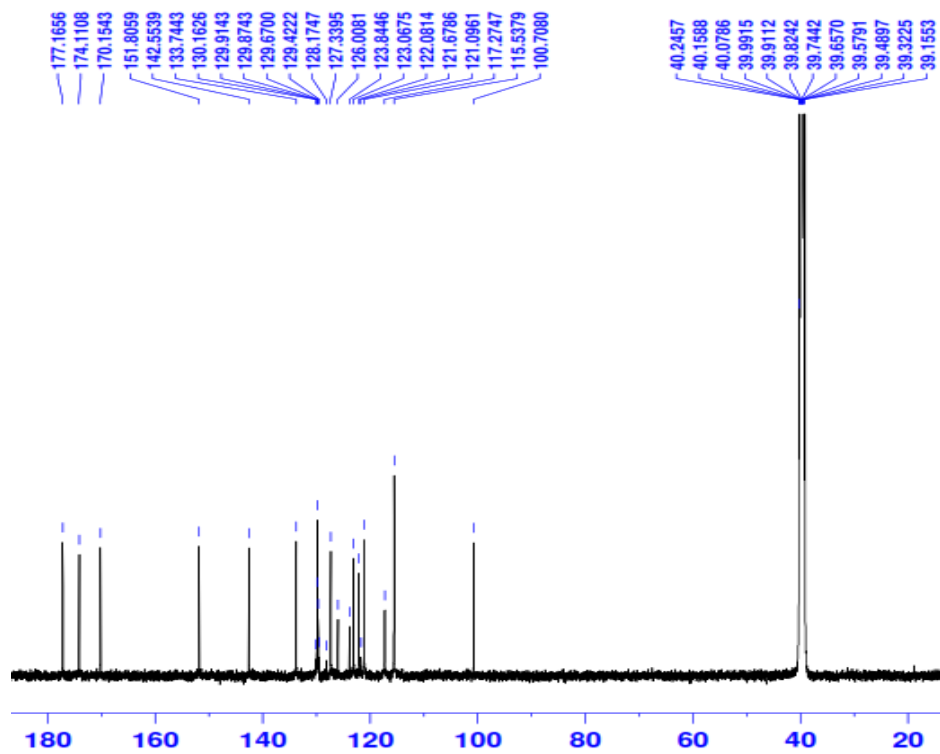


Figure A. 64.  $^{13}\text{C-NMR}$  spectrum of compound 12

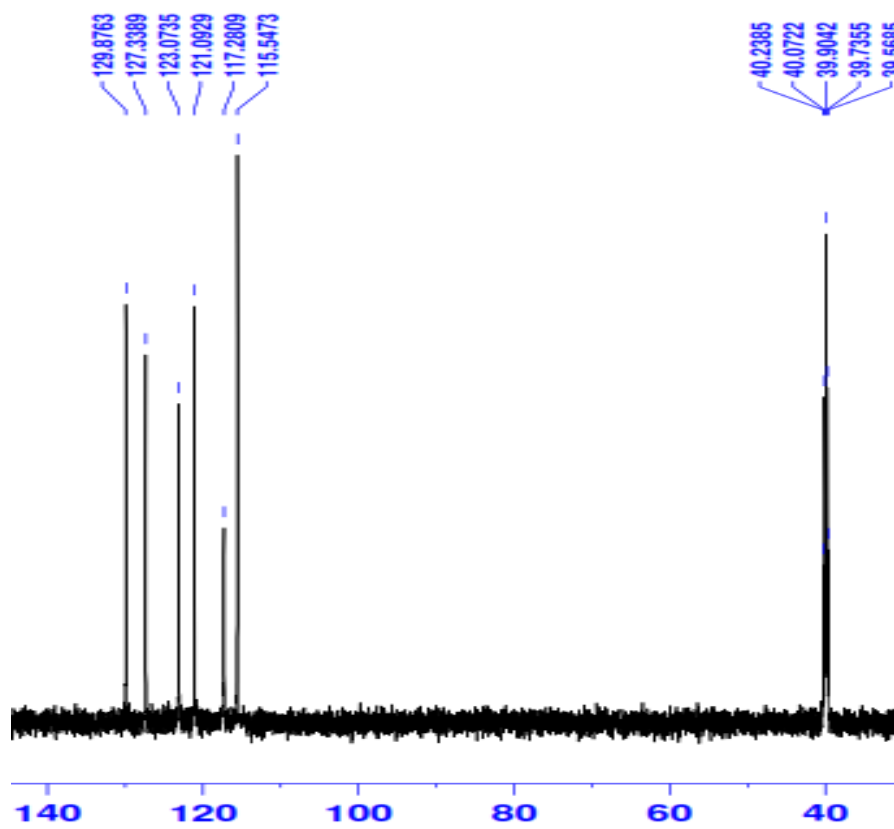


Figure A. 65. DEPT-135 spectrum of compound 12

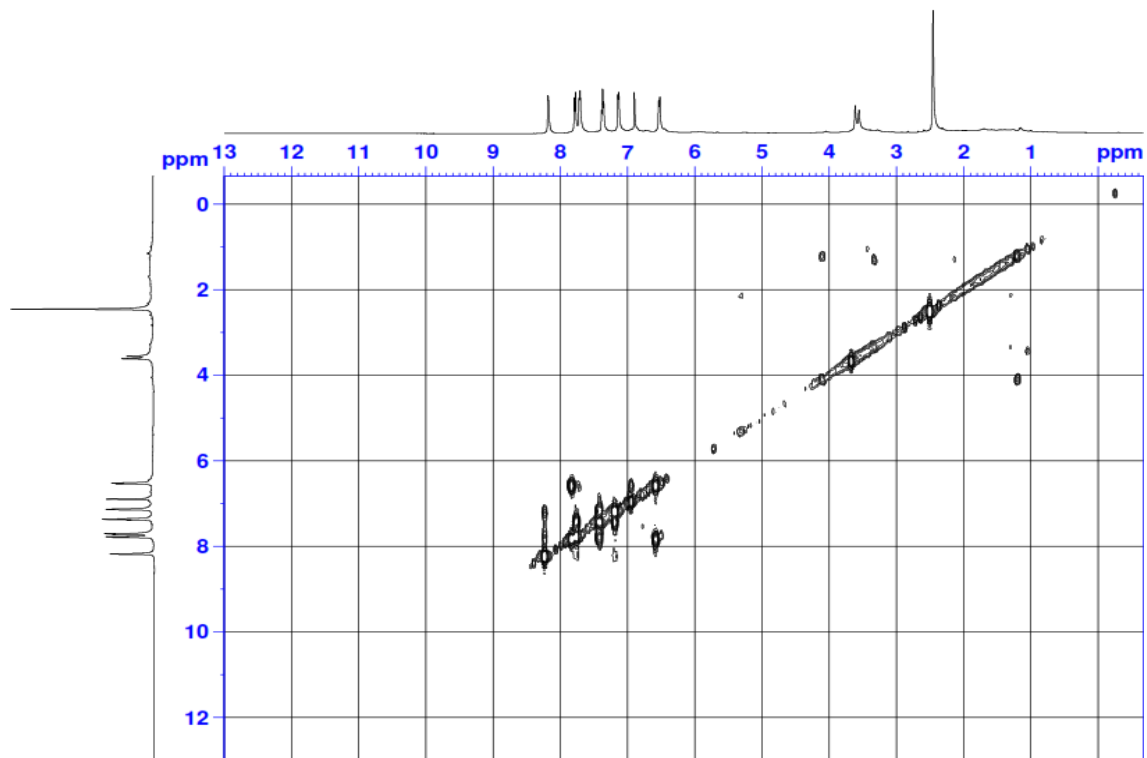


Figure A. 66. COSY spectrum of compound 12

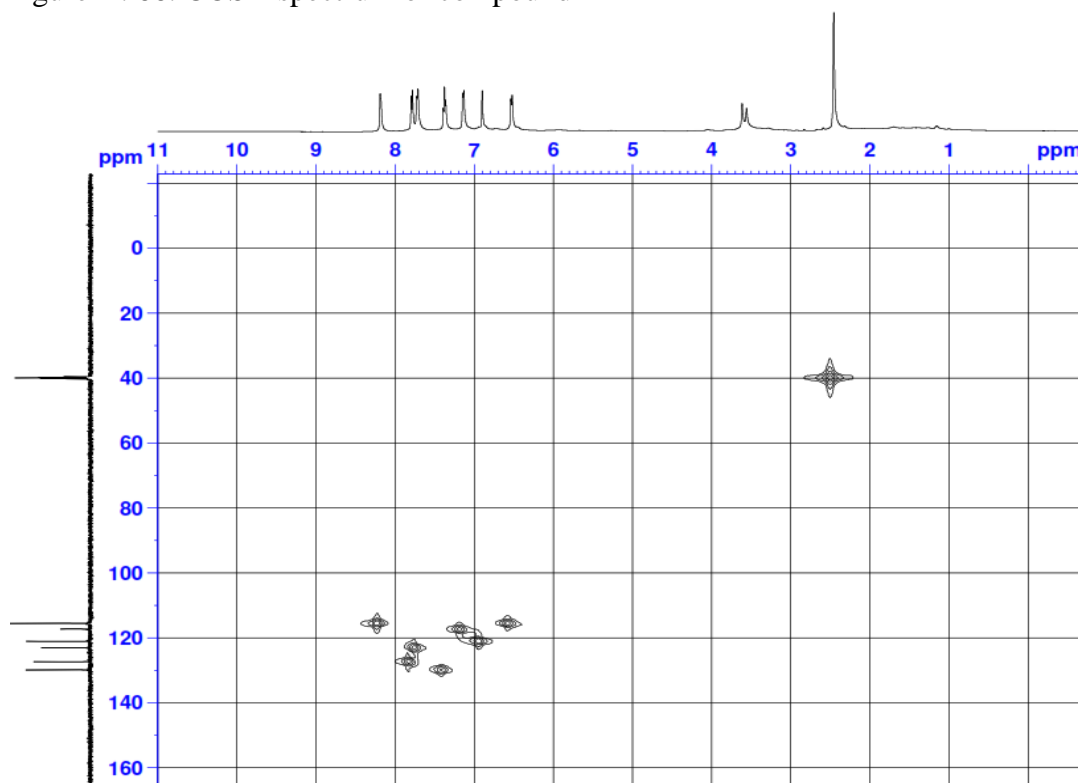


Figure A. 67. HMBC spectrum of compound 12

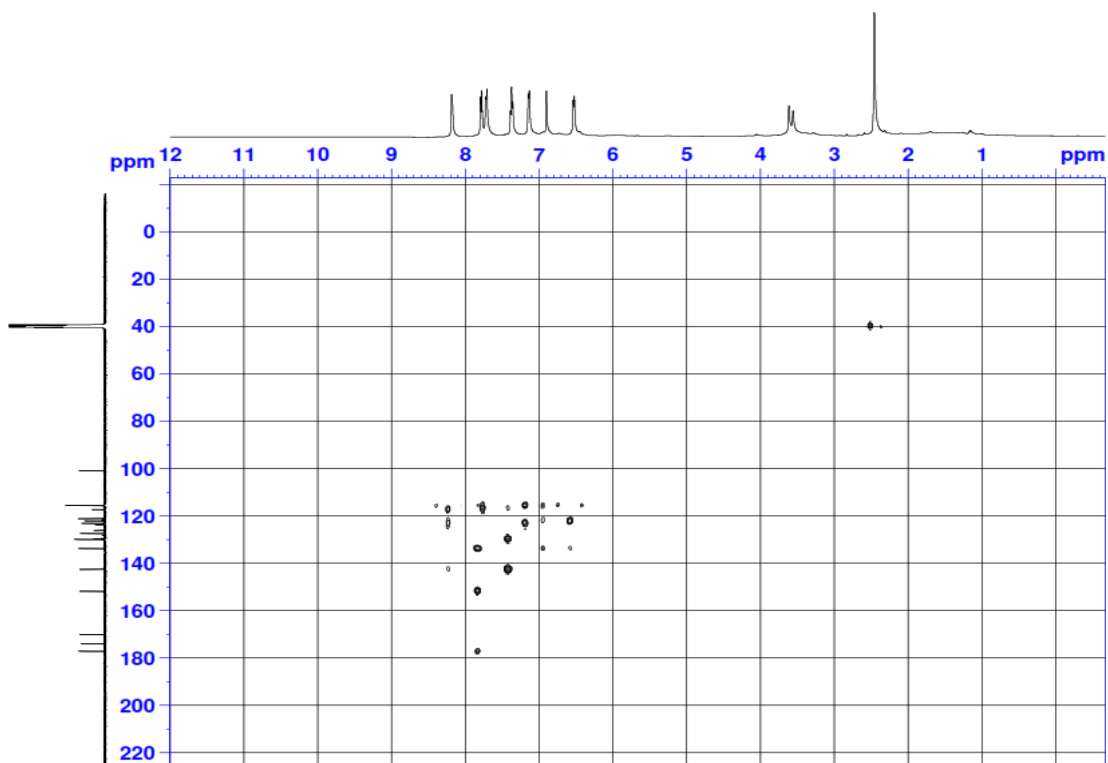


Figure A. 68. HMBC spectrum of compound 12

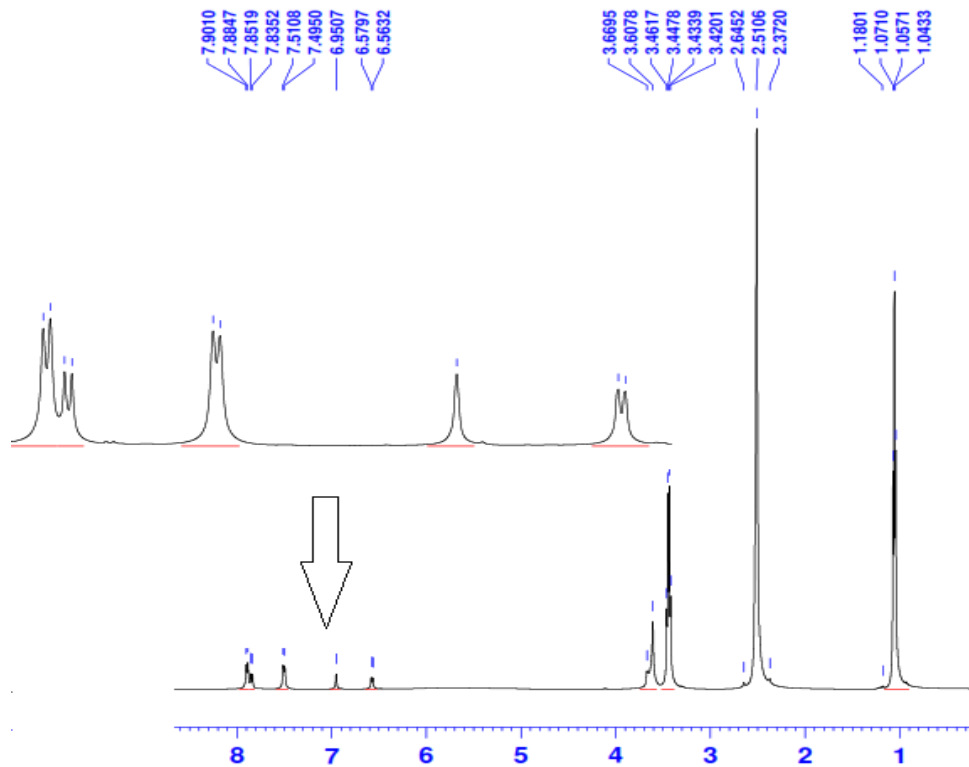


Figure A. 69.  $^1\text{H}$ -NMR spectrum of compound 13

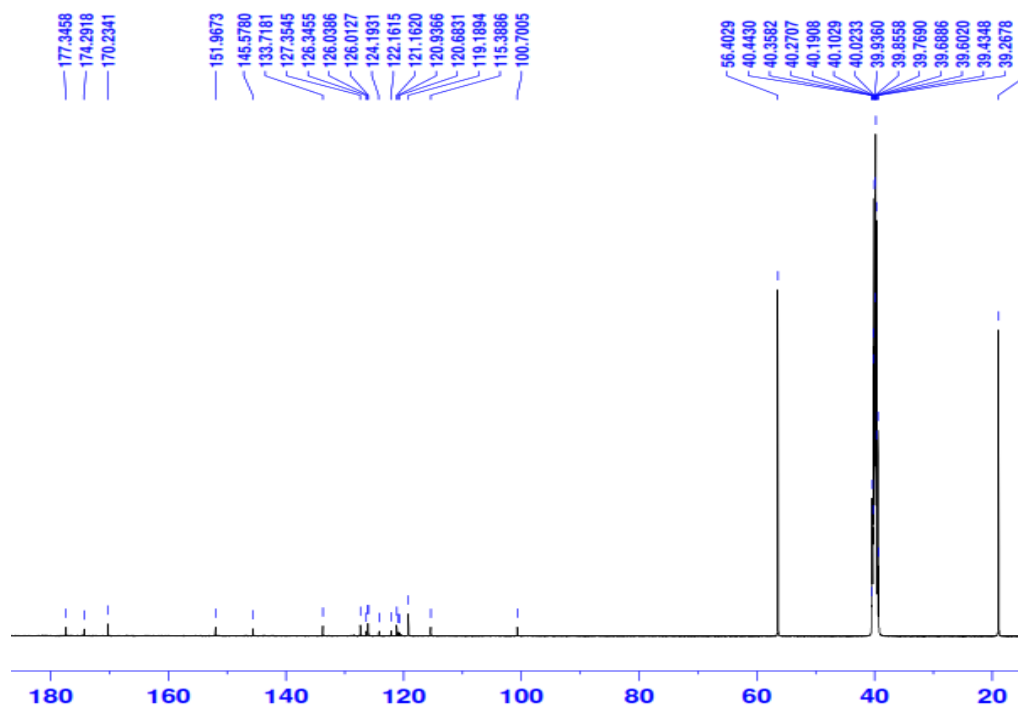


Figure A. 70. <sup>13</sup>C-NMR spectrum of compound 13

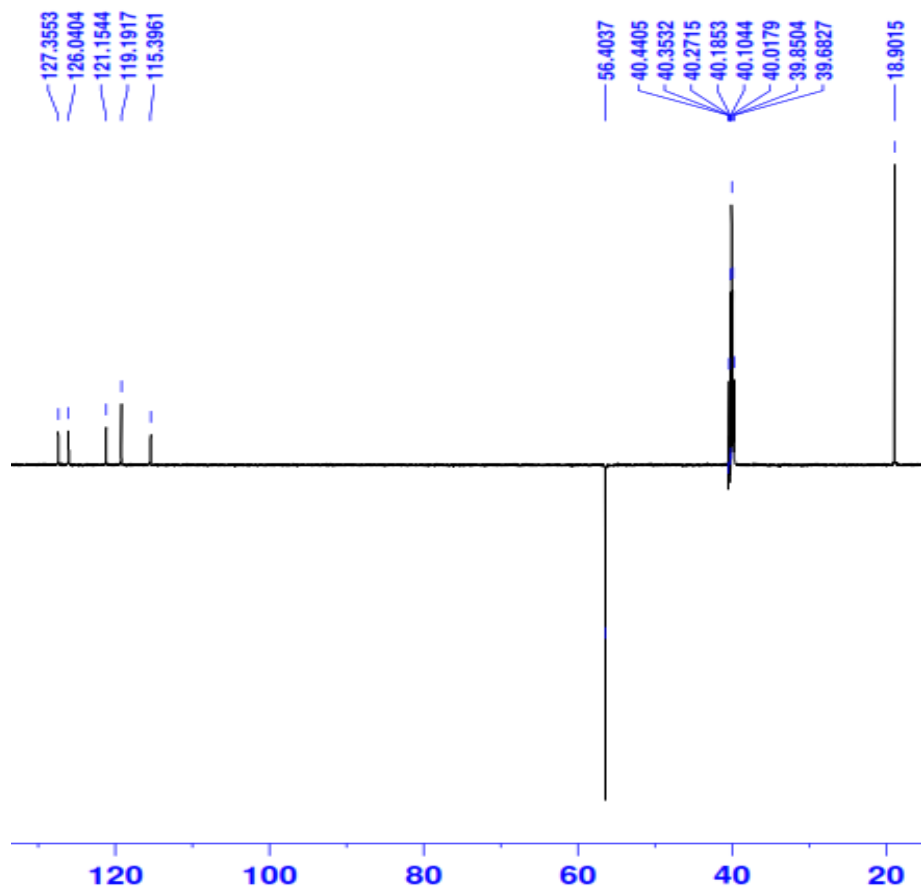


Figure A. 71. DEPT-135 spectrum of compound 13

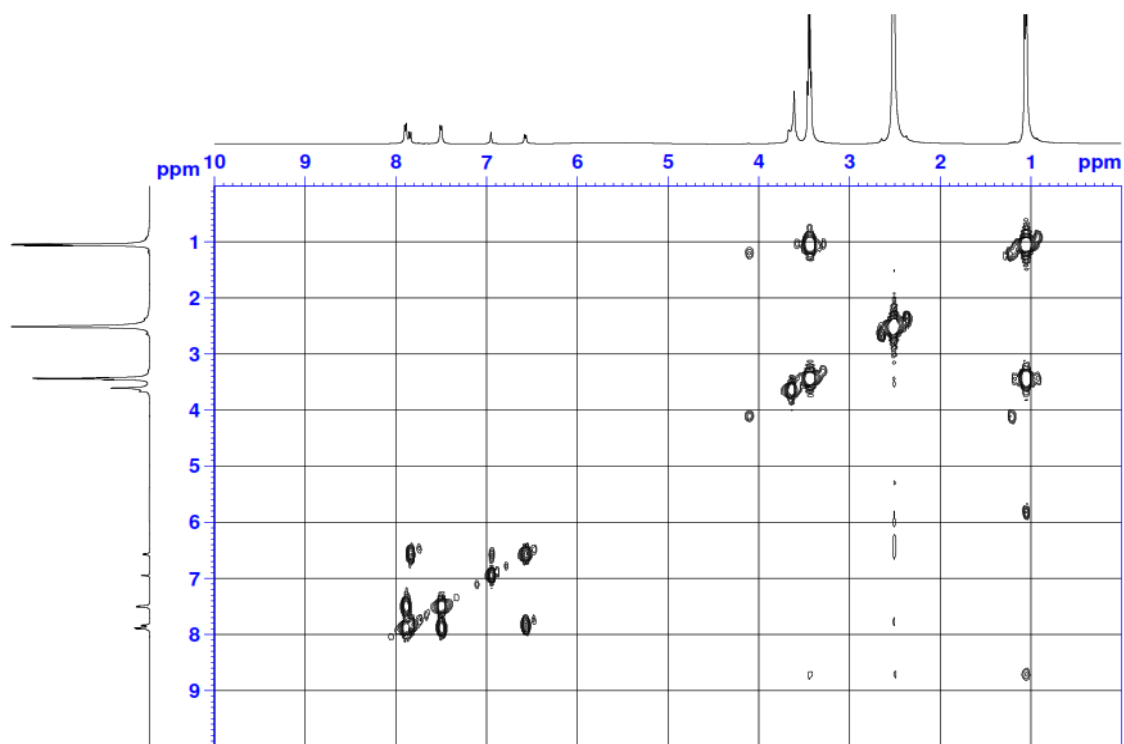


Figure A. 72. COSY spectrum of compound 13

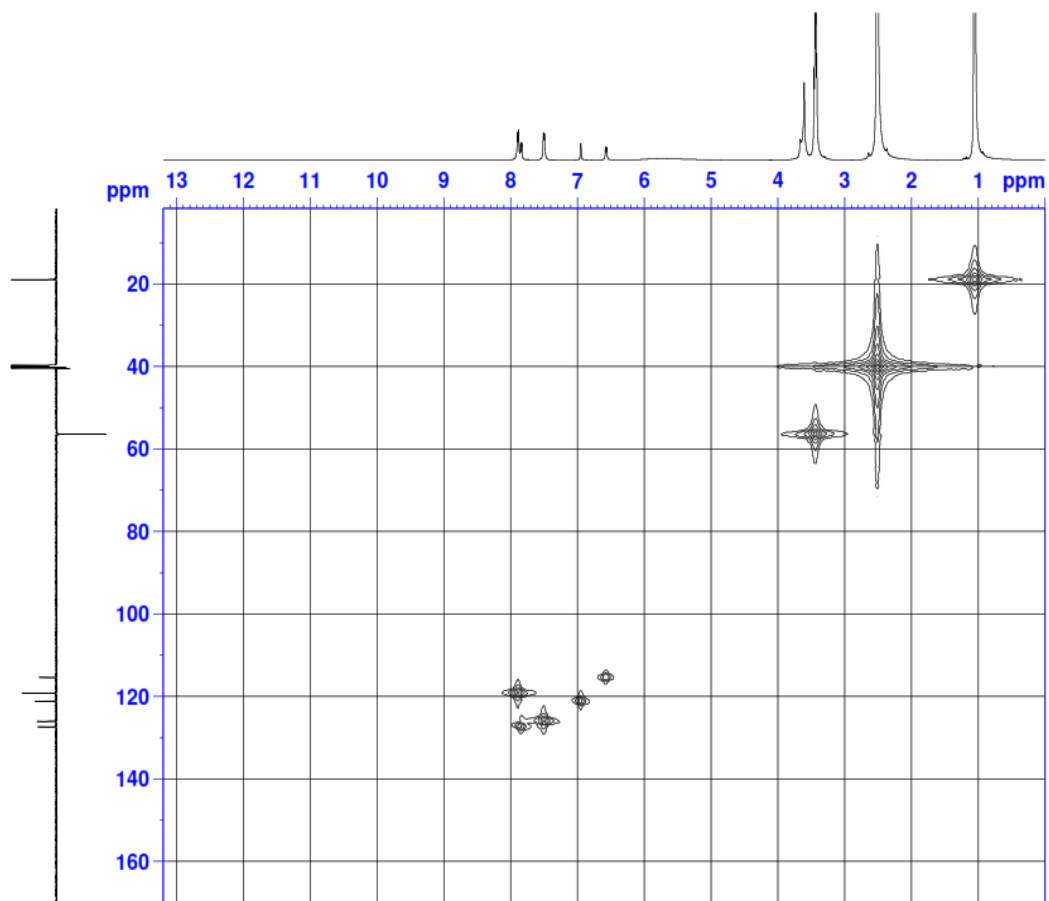


Figure A. 73. HMQC spectrum of compound 13

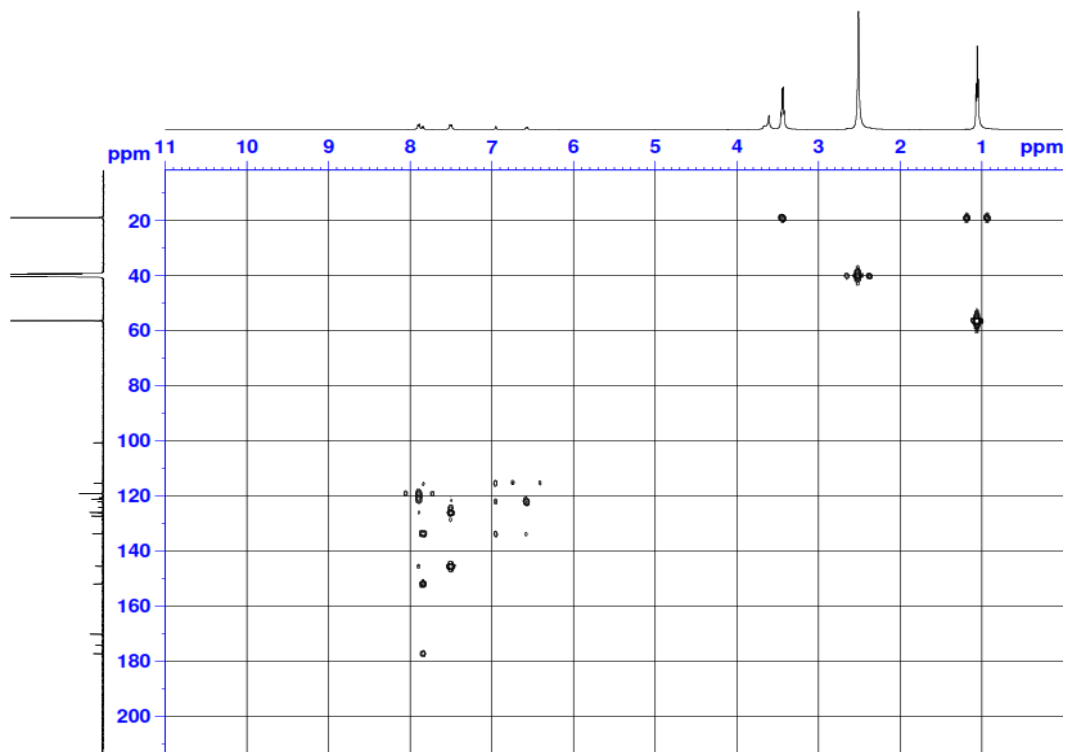


Figure A. 74. HMBC spectrum of compound 13

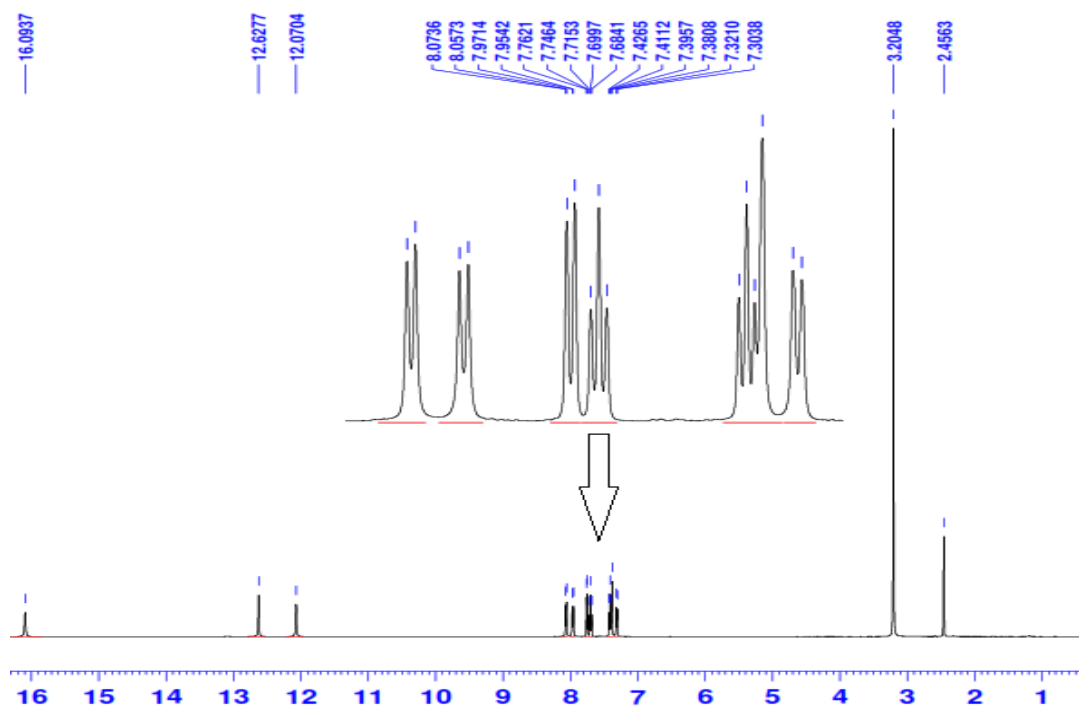


Figure A. 75. <sup>1</sup>H-NMR spectrum of compound 14

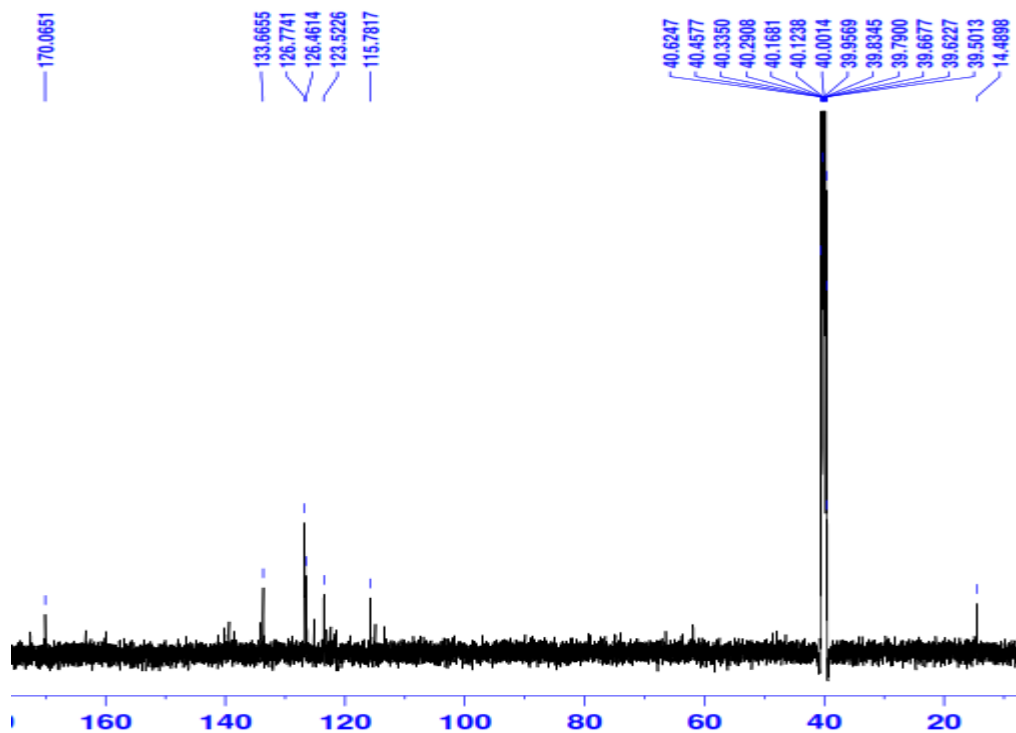


Figure A. 76. <sup>13</sup>C-NMR spectrum of compound 14

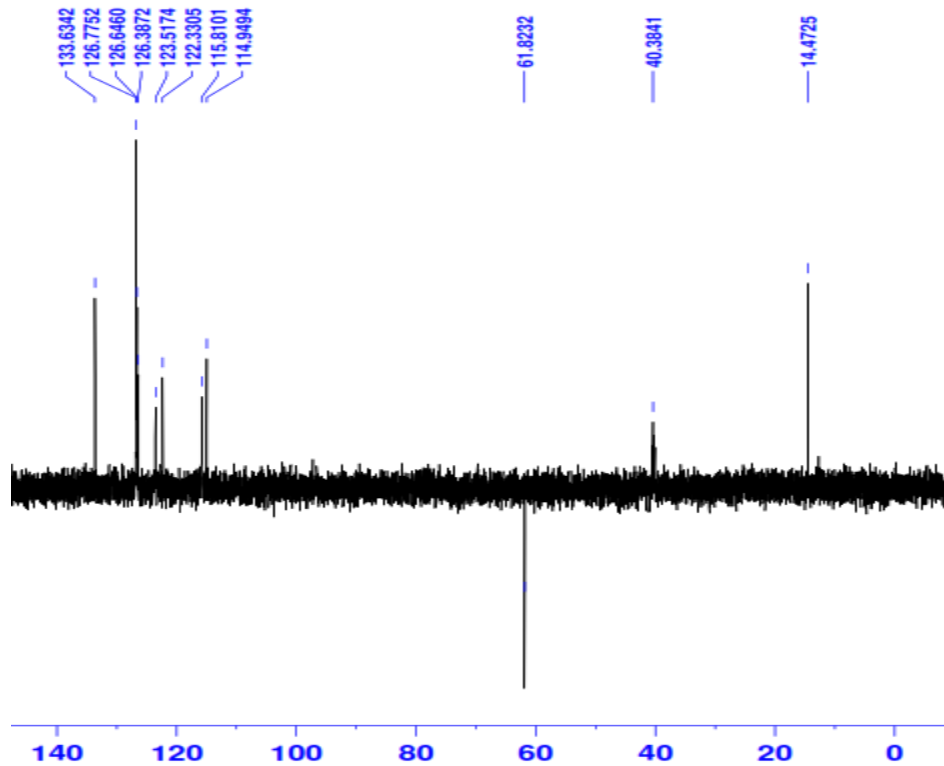


Figure A. 77. DEPT-135 spectrum of compound 14

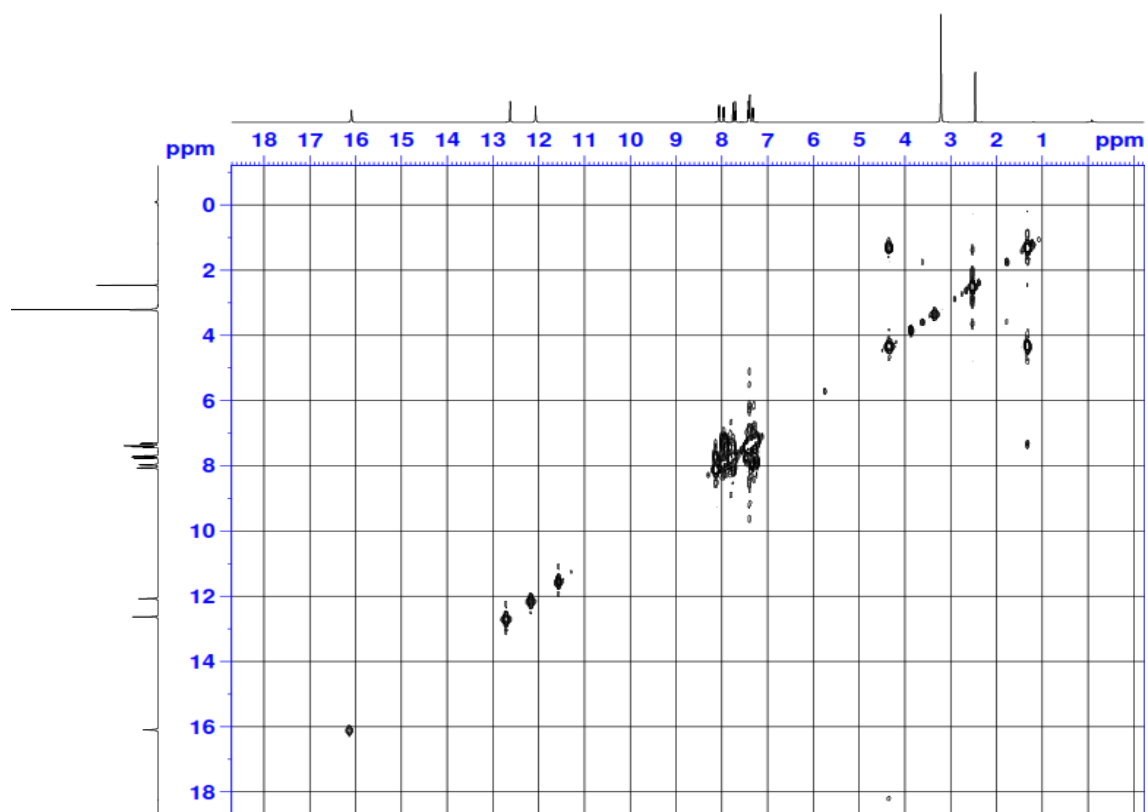


Figure A. 78. COSY spectrum of compound 14

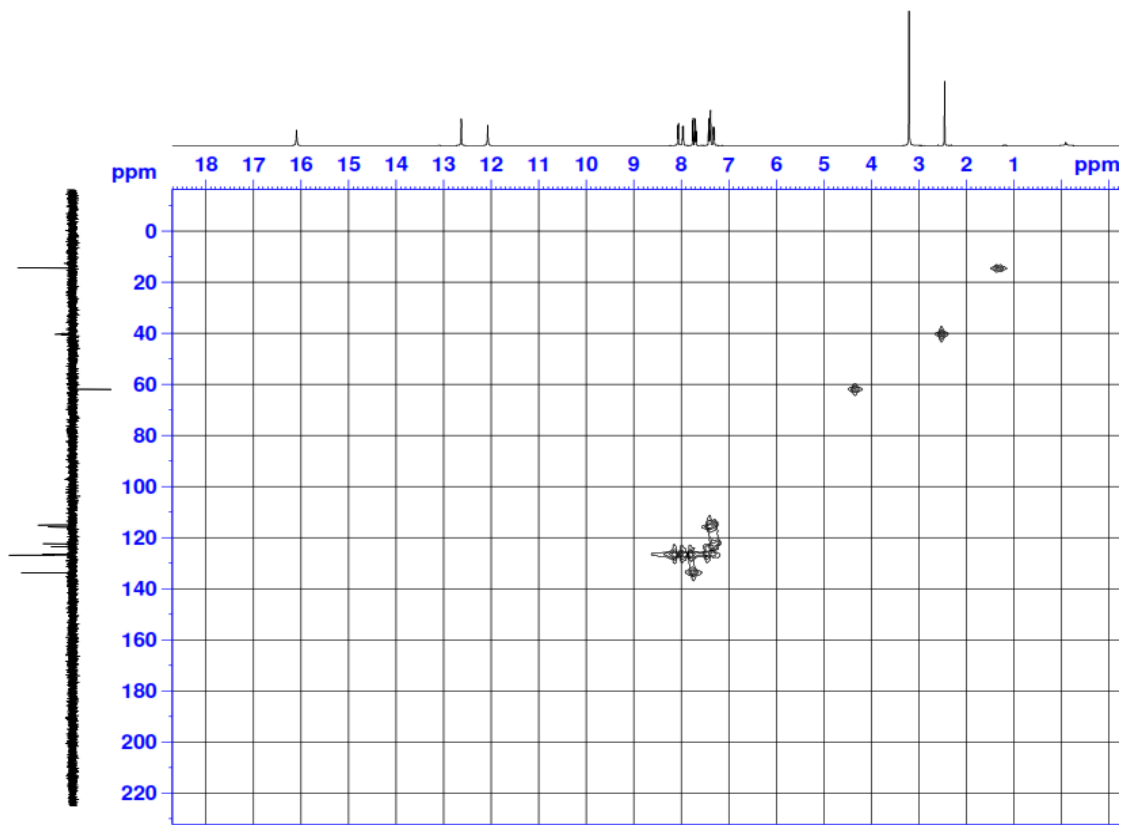


Figure A. 79. HMQC spectrum of compound 14

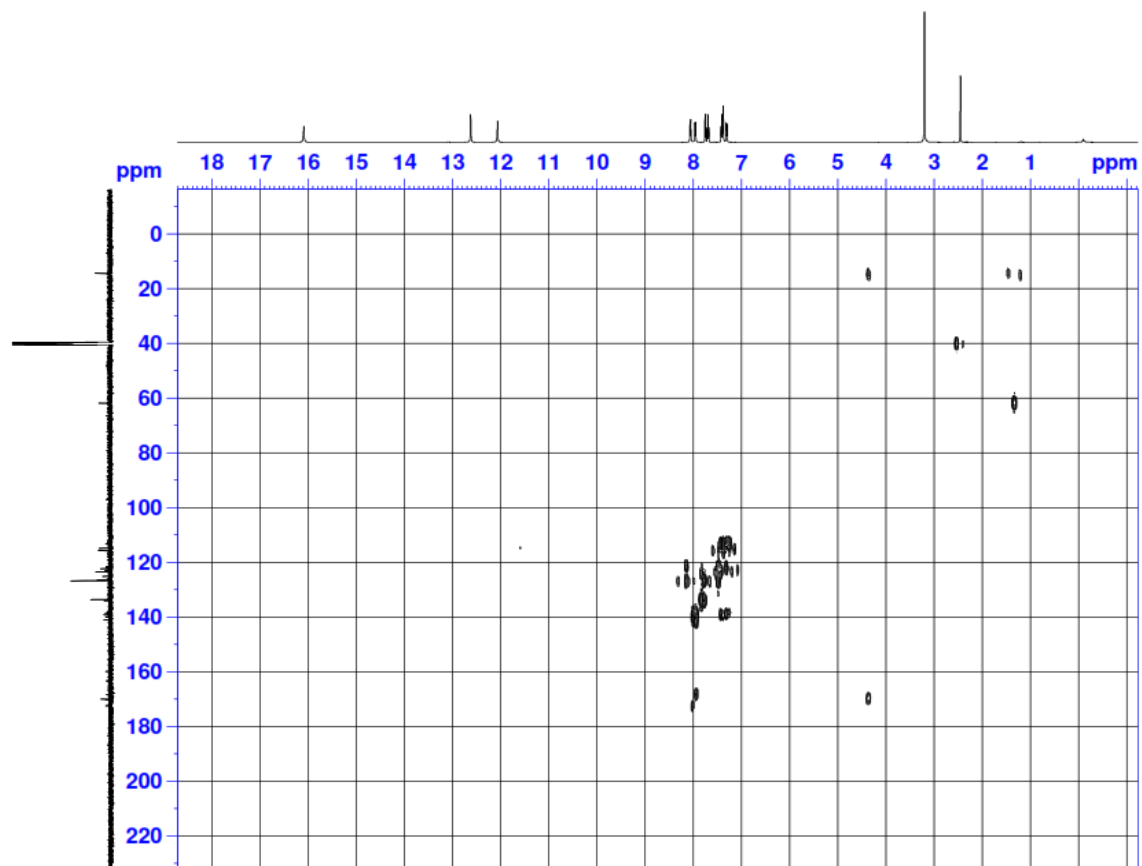


Figure A. 80. HMBC spectrum of compound 14

## Appendix B: IR spectra

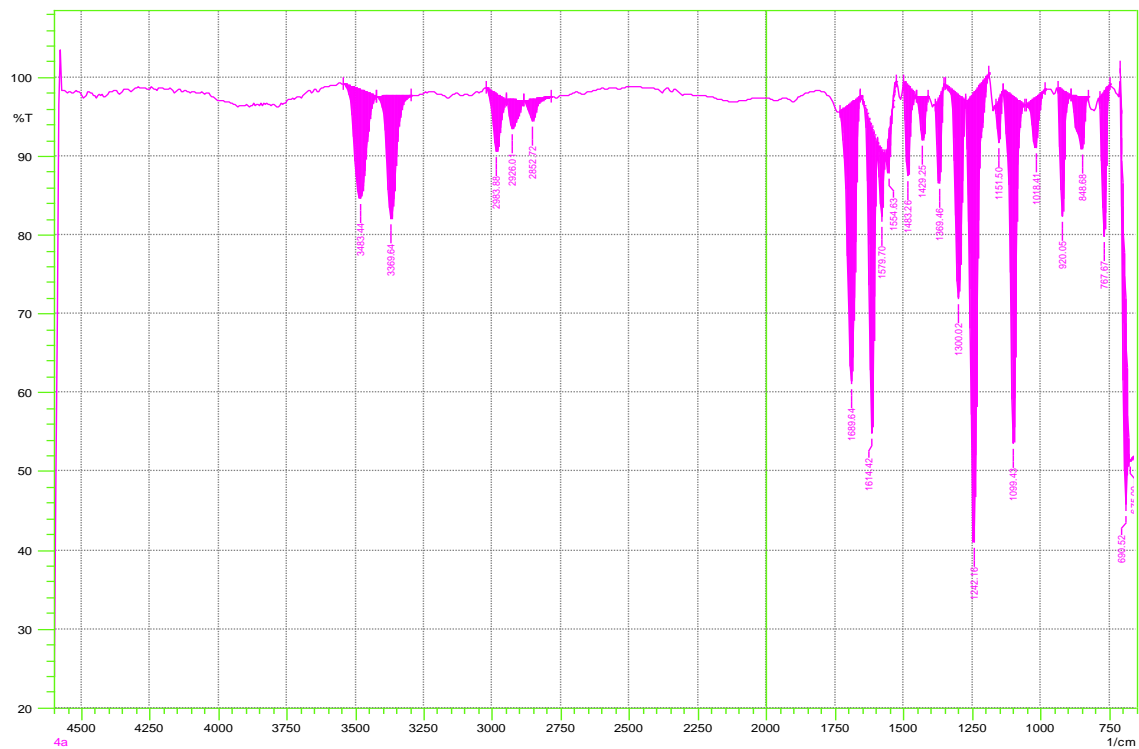


Figure B. 2. IR spectrum of compound 1

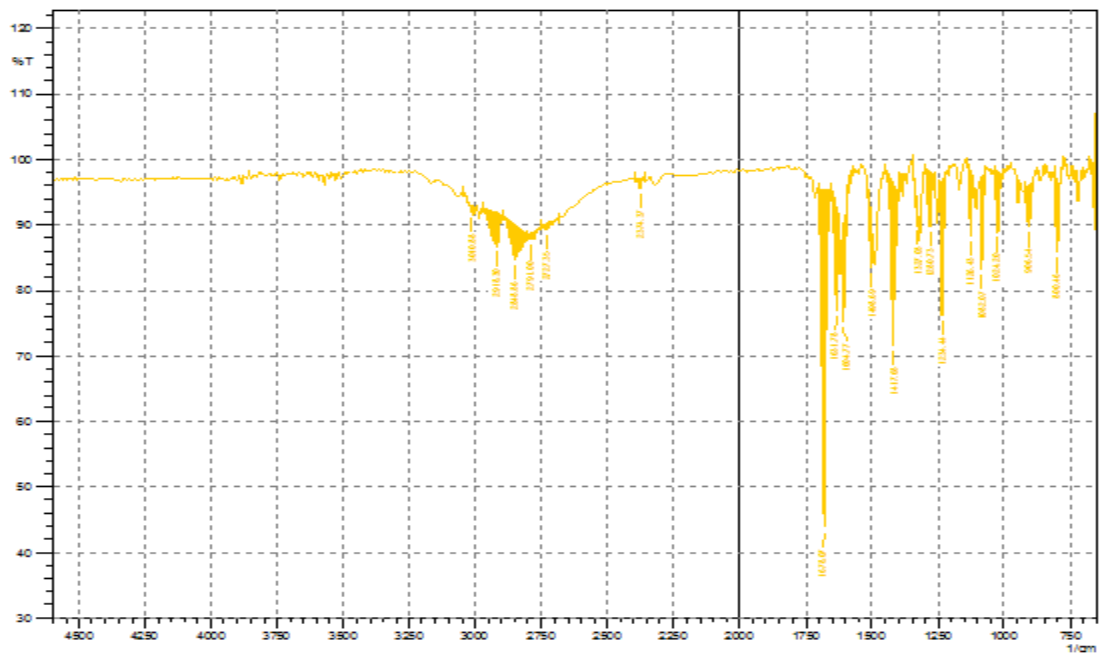


Figure B. 2. IR spectrum of compound 2

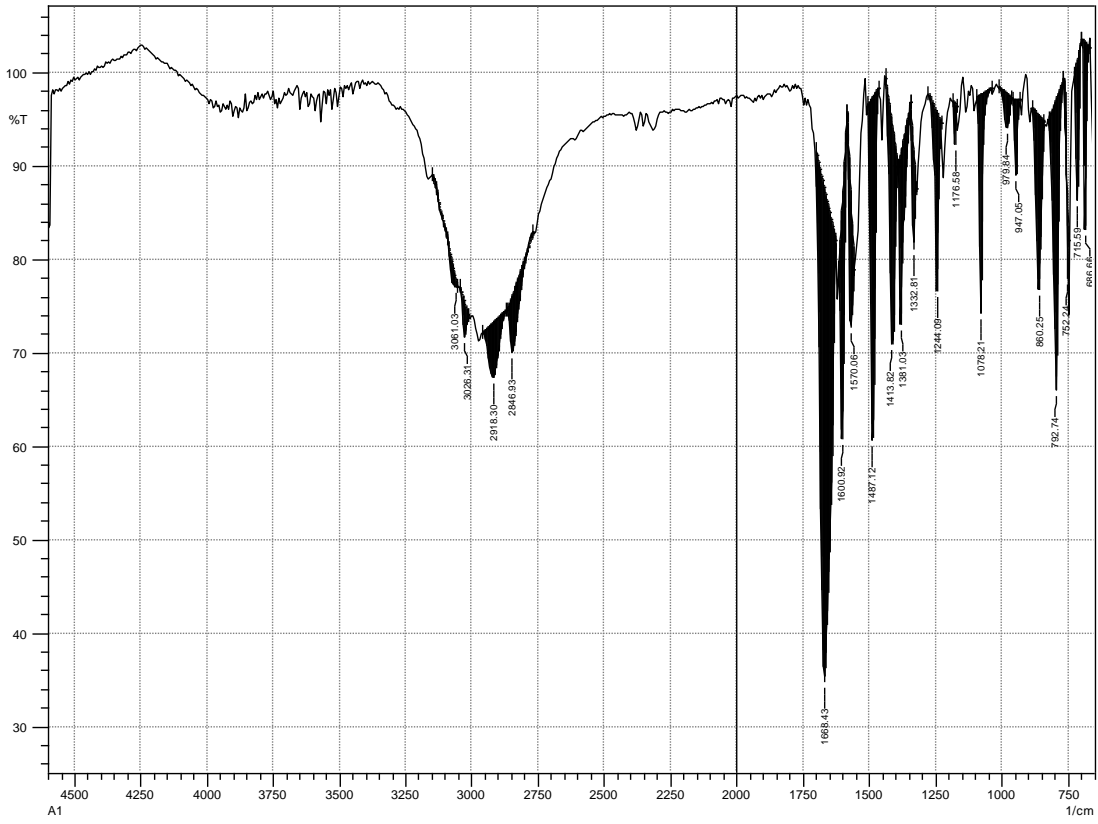


Figure B. 3. IR spectrum of compound 3

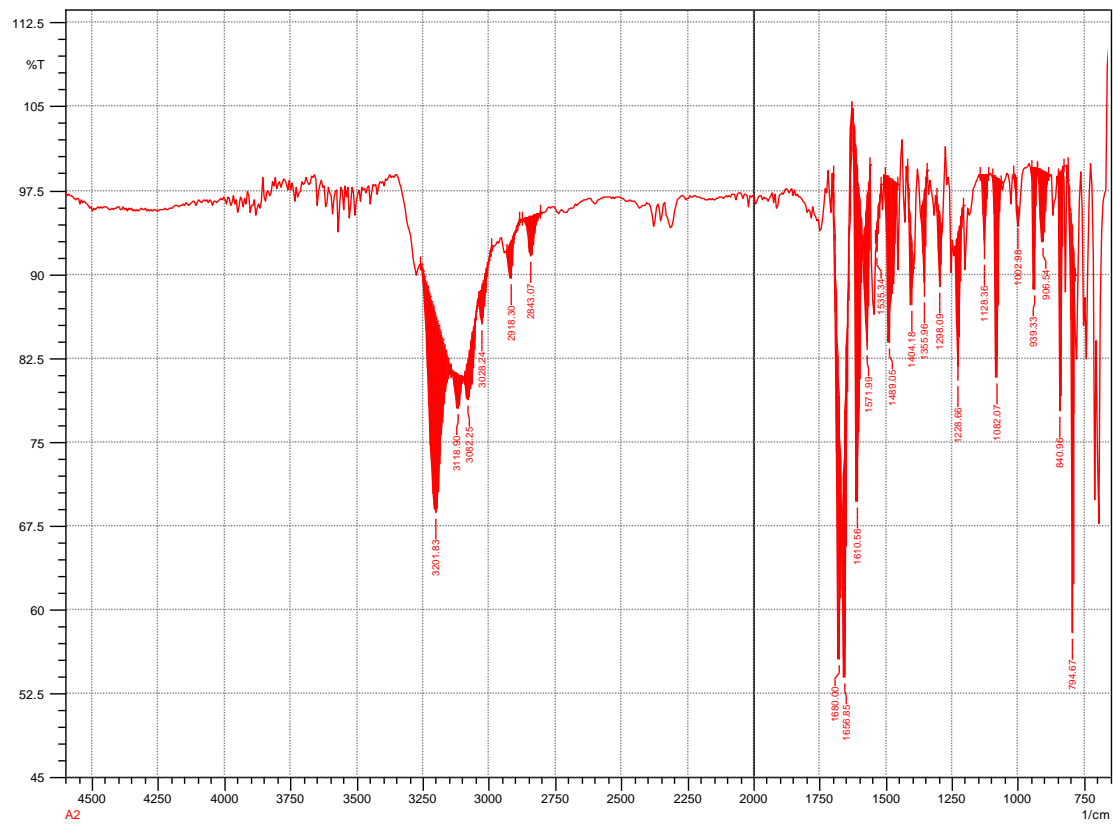


Figure B. 4. IR spectrum of compound 4

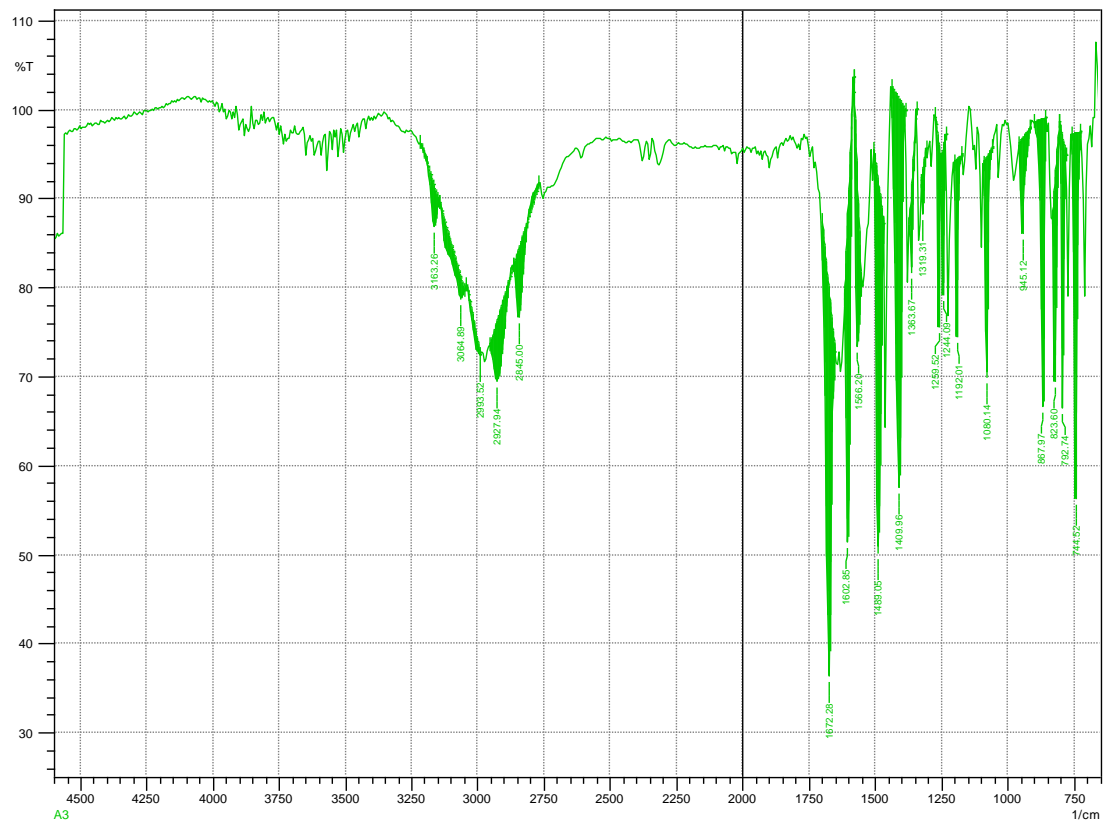


Figure B. 5. IR spectrum of compound 5

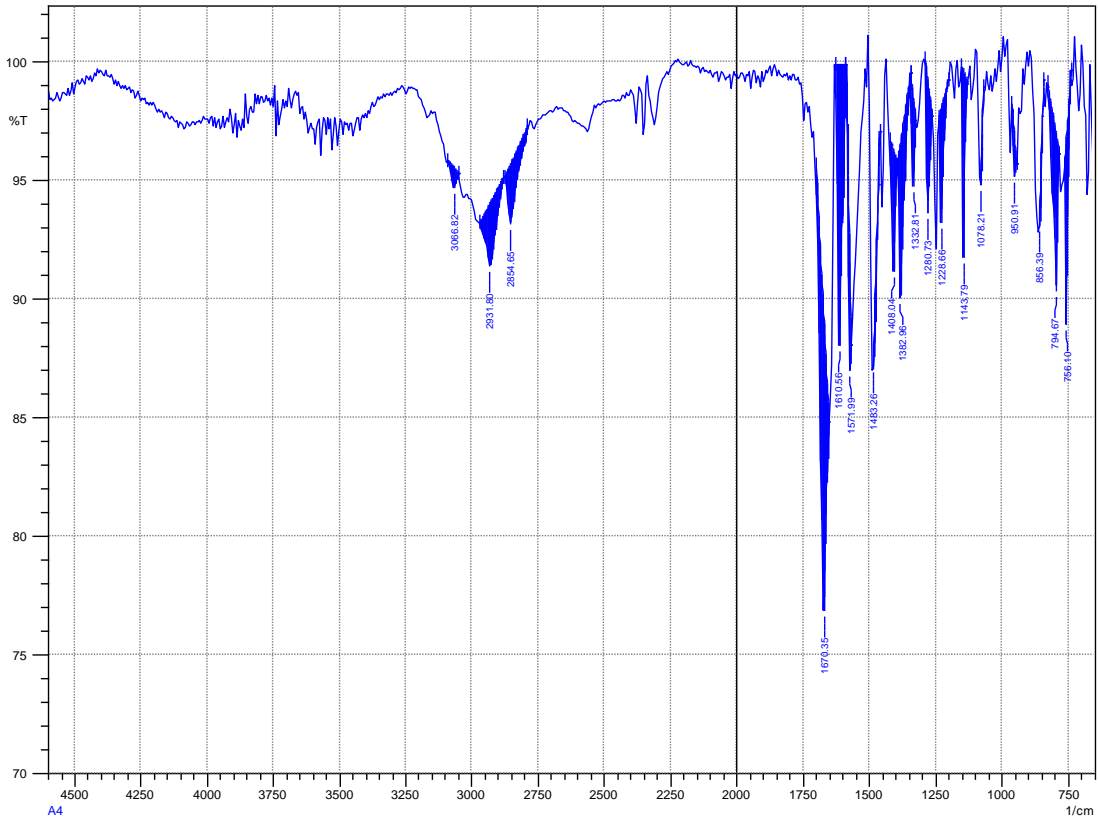


Figure B. 6. IR spectrum of compound 6

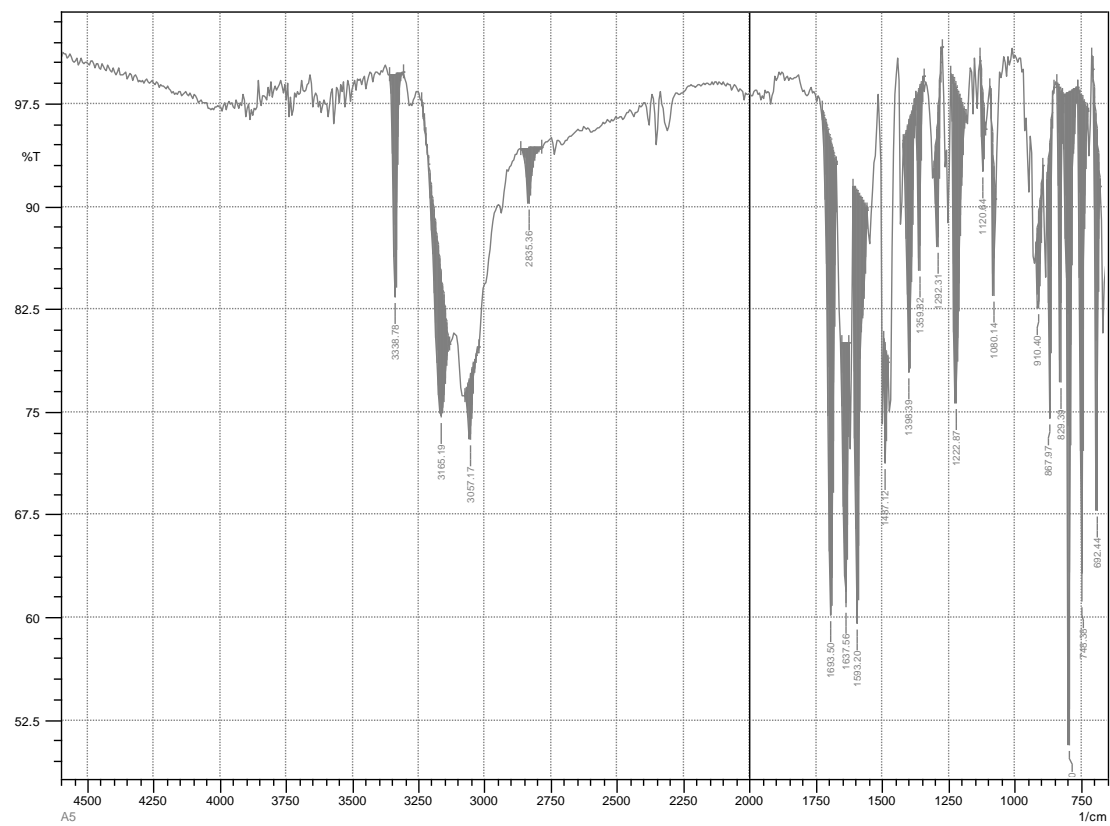


Figure B. 7. IR spectrum of compound 7

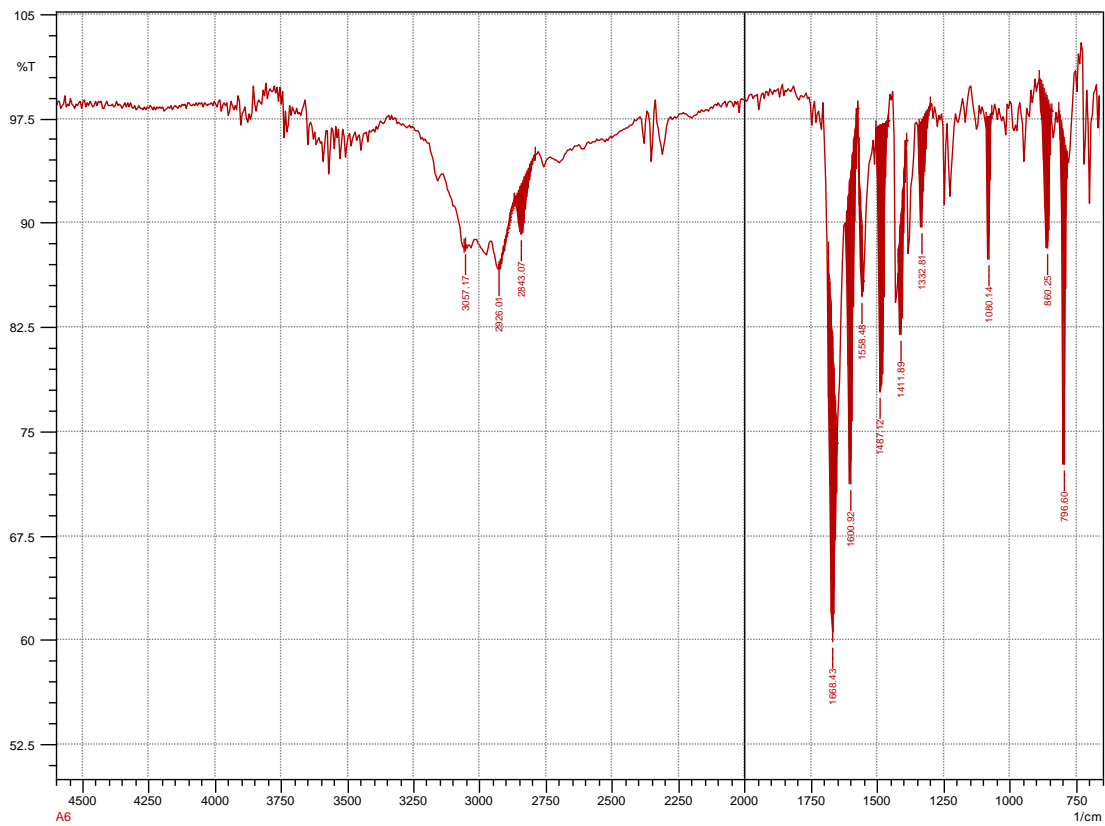


Figure B. 8. IR spectrum of compound 8

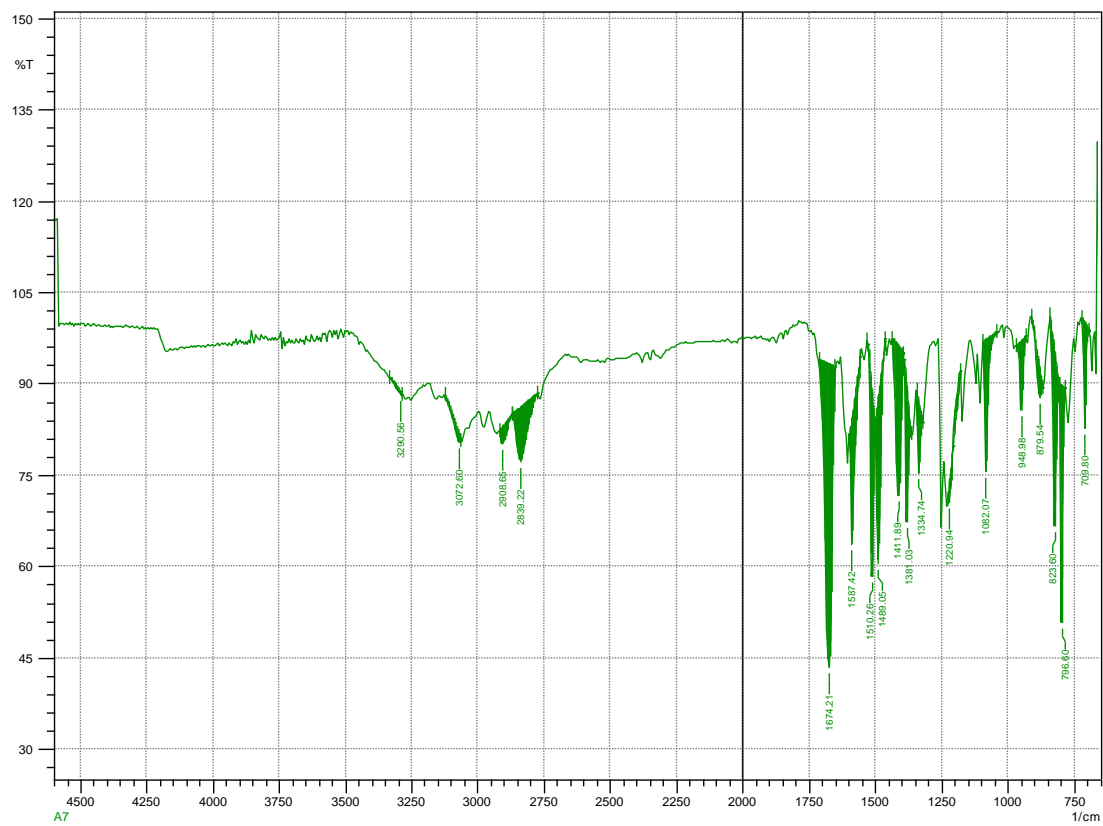


Figure B. 9. IR spectrum of compound 9

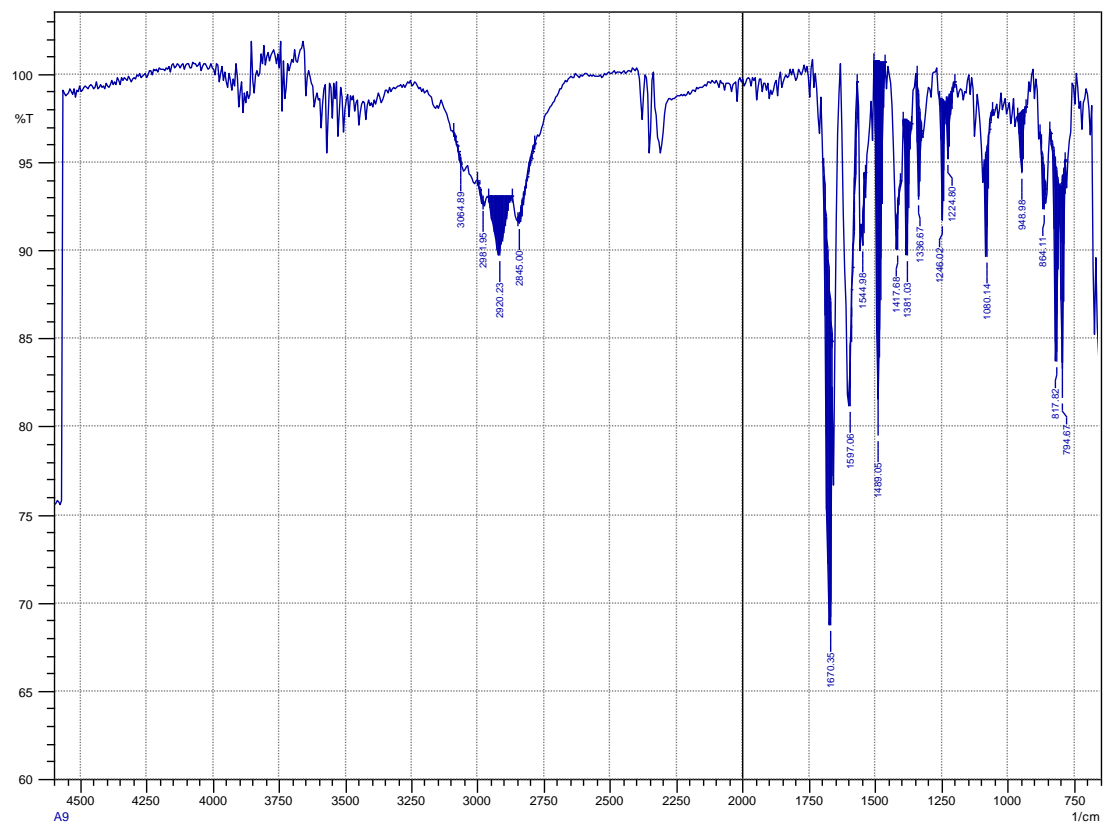


Figure B. 10. IR spectrum of compound 10

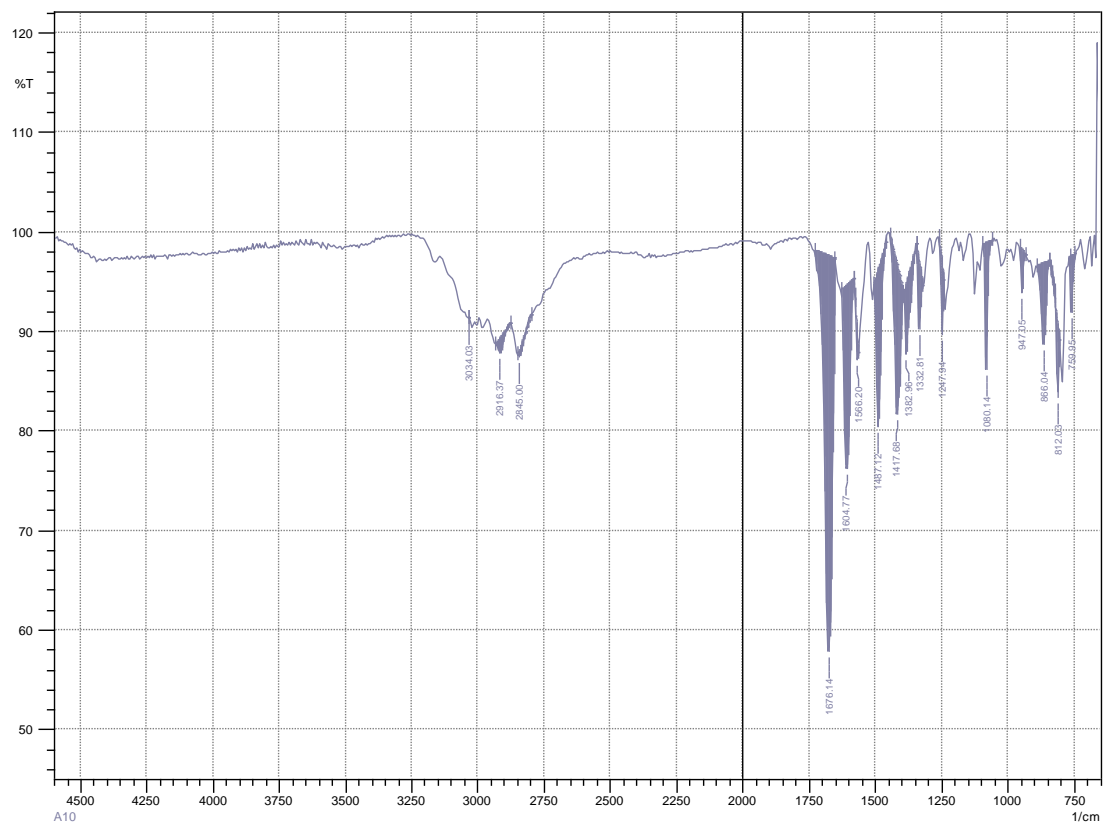


Figure B. 11. IR spectrum of compound 11

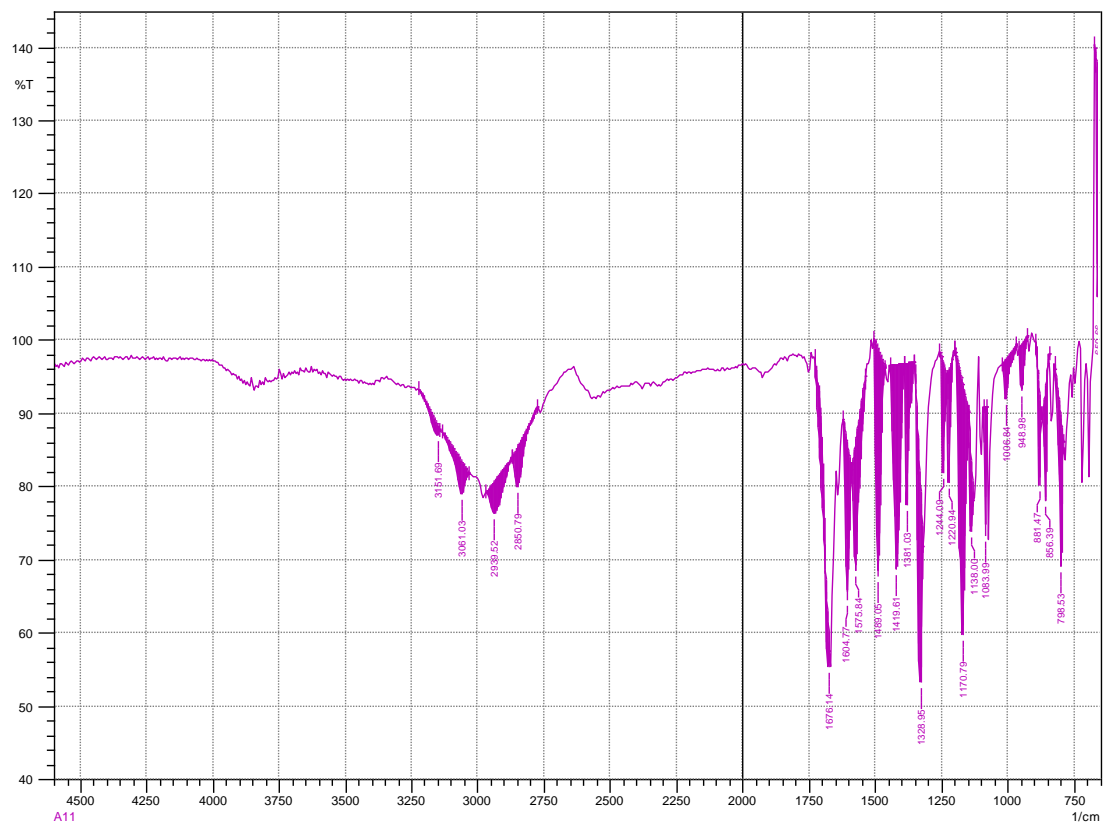


Figure B. 12. IR spectrum of compound 12

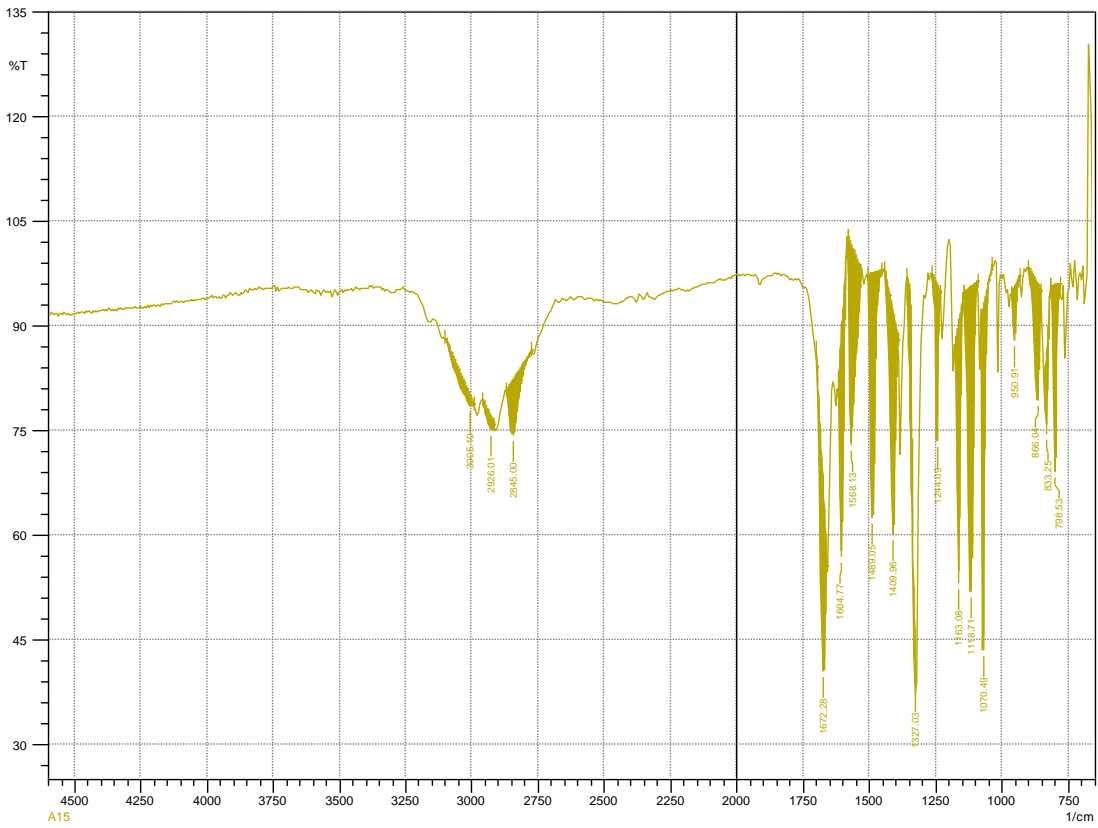


Figure B. 13. IR spectrum of compound 13

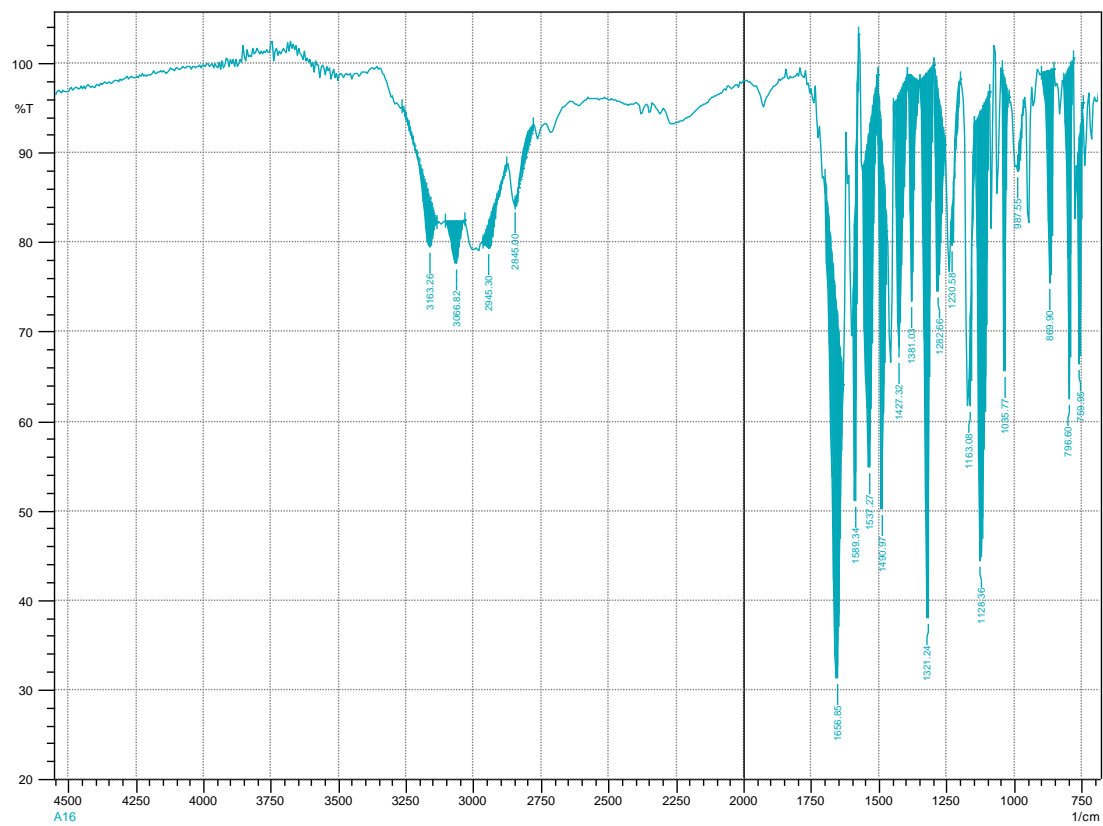


Figure B. 14. IR spectrum of compound 14

## Appendix C: Mass Spectra

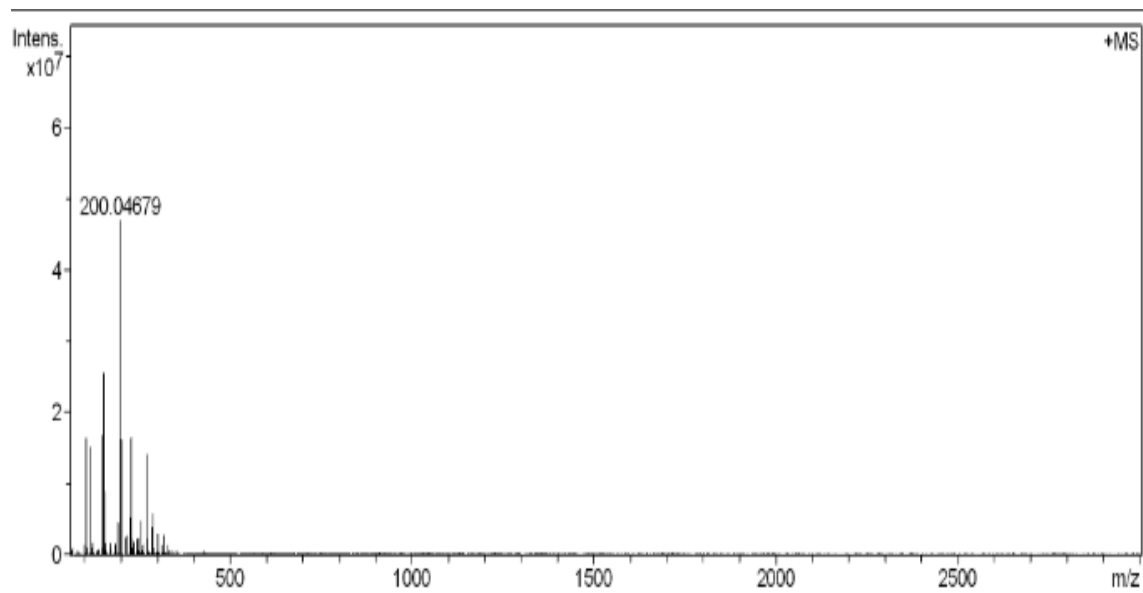


Figure C. 1. Mass spectrum of compound 1

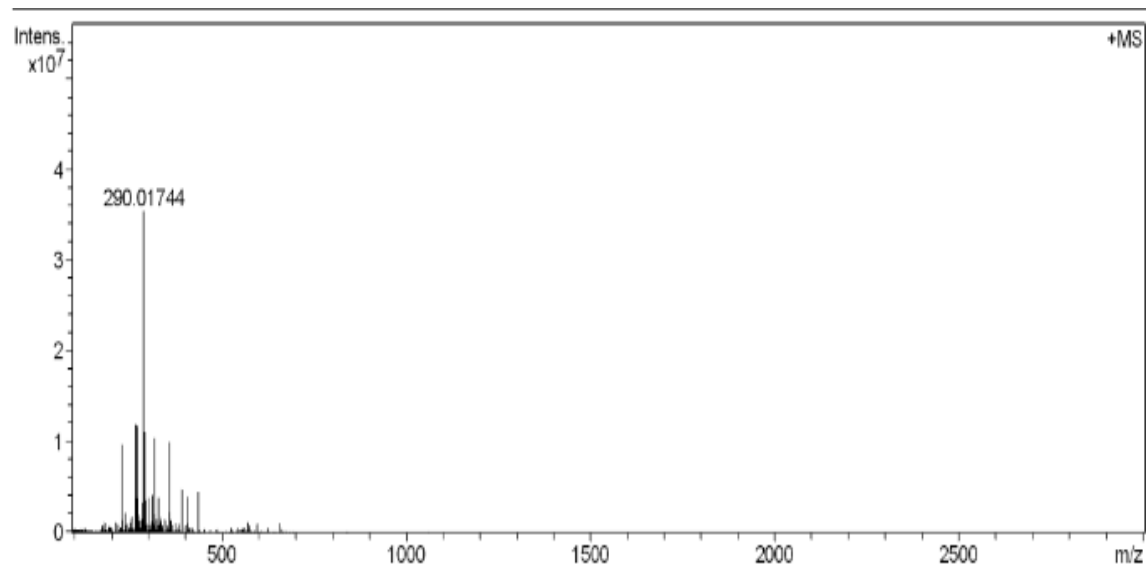


Figure C. 2. Mass spectrum of compound 2

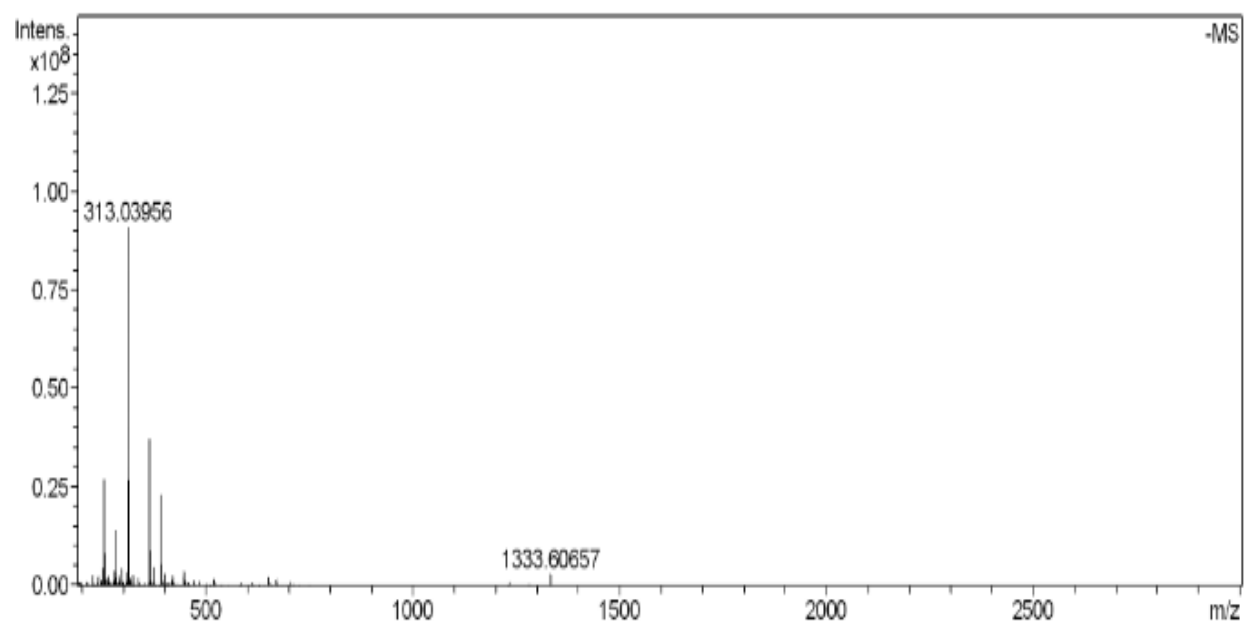


Figure C. 3. Mass spectrum of compound 3

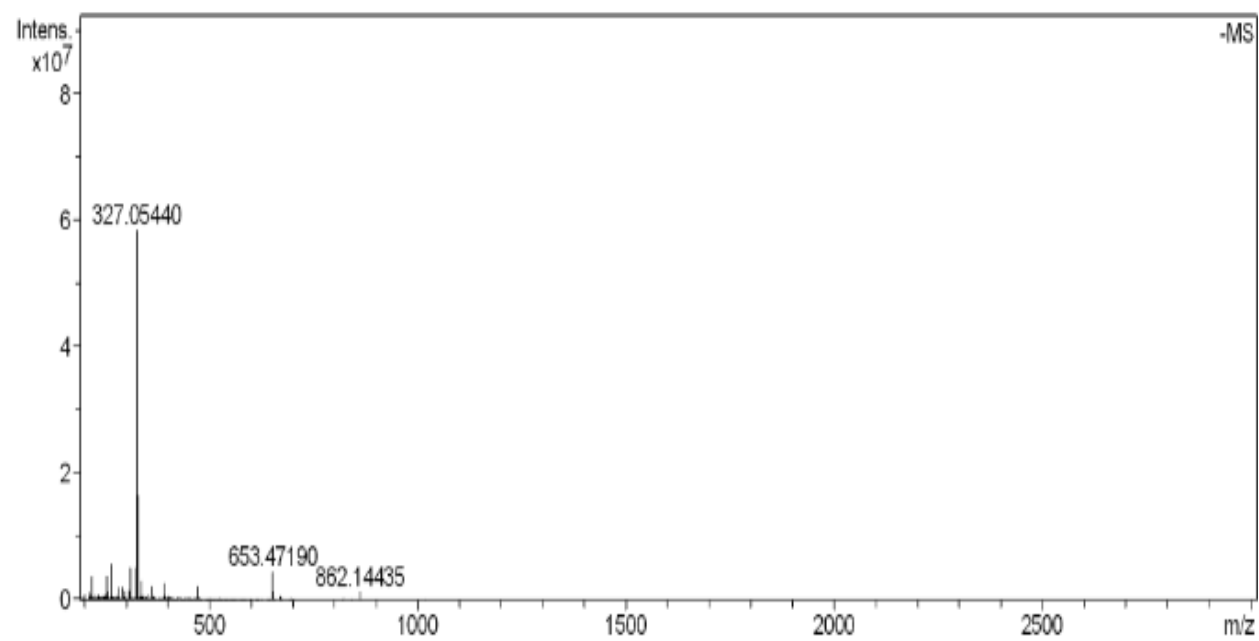


Figure C. 4. Mass spectrum of compound 4

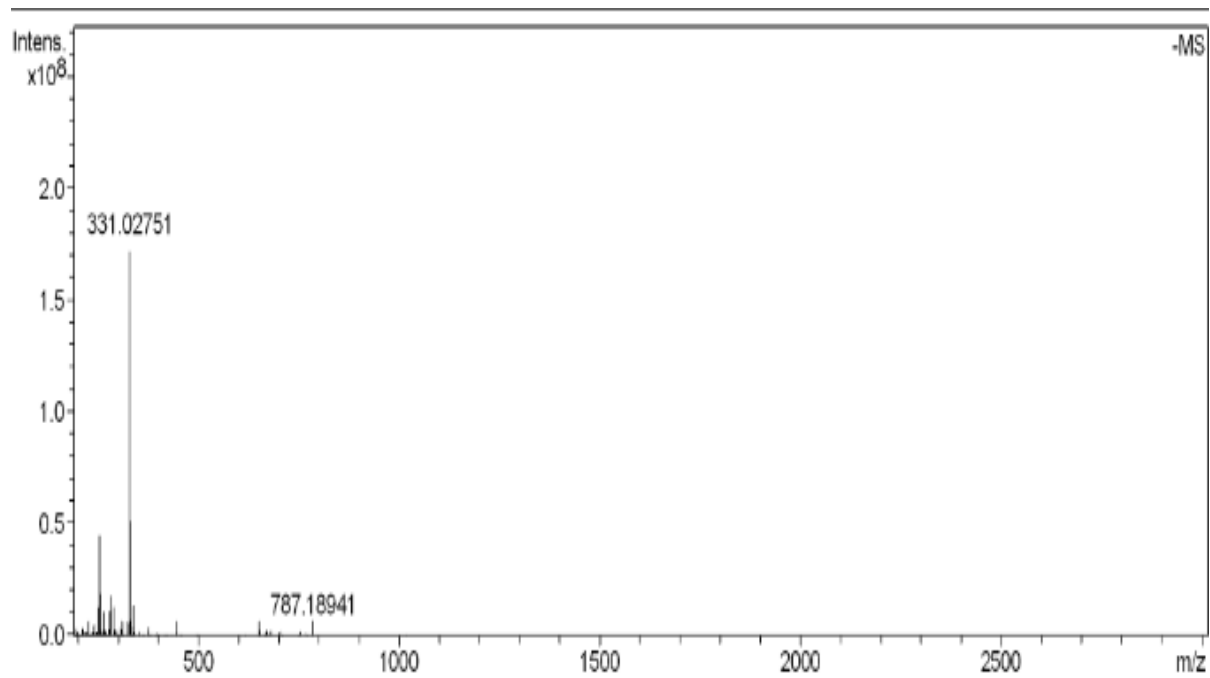


Figure C. 5. Mass spectrum of compound 5

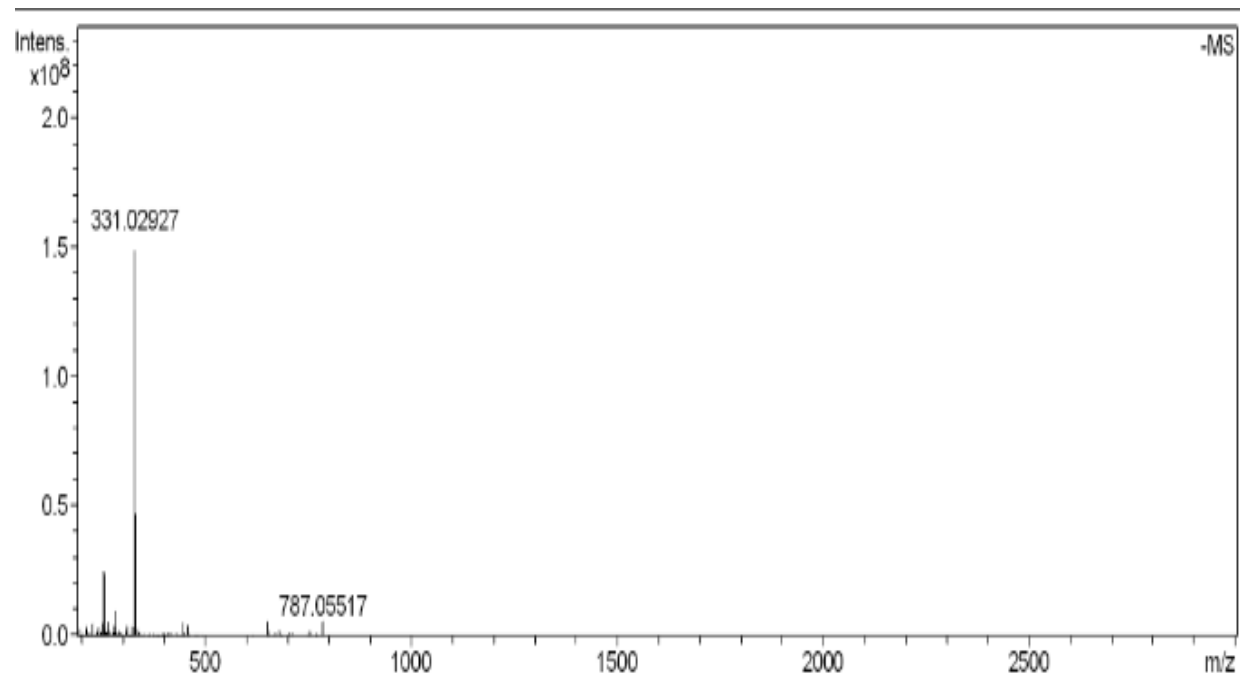


Figure C. 6. Mass spectrum of compound 6

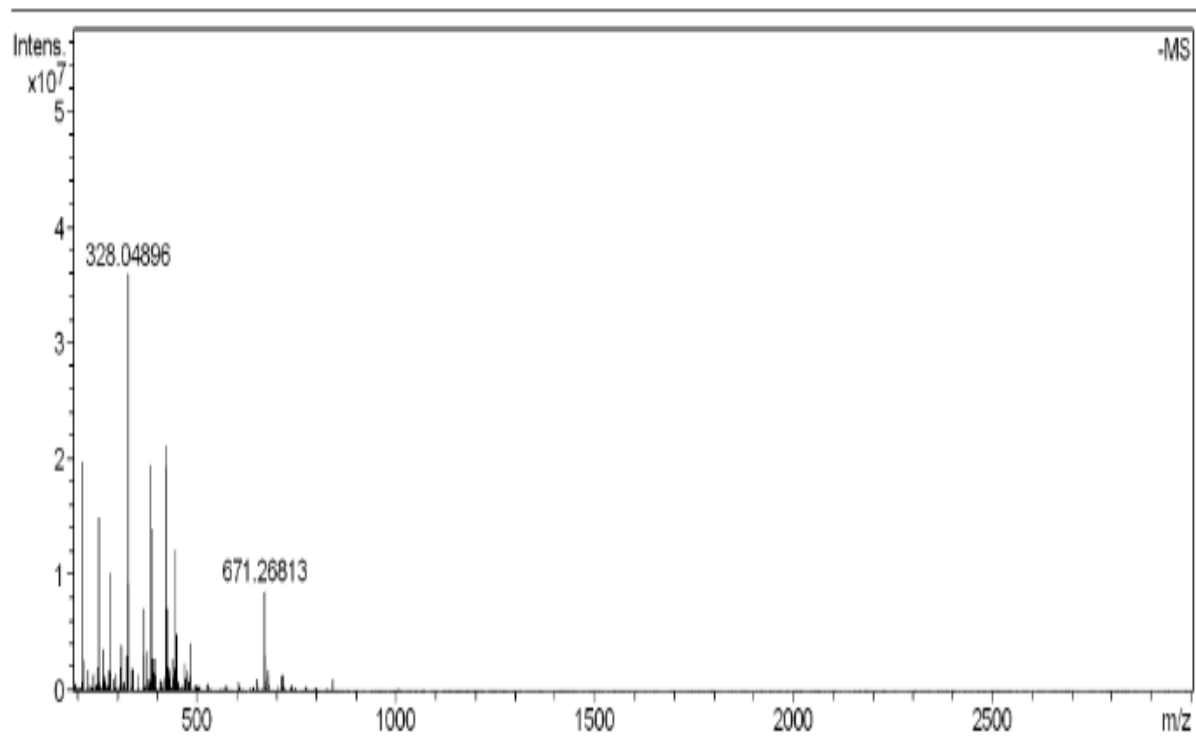


Figure C. 7. Mass spectrum of compound 7

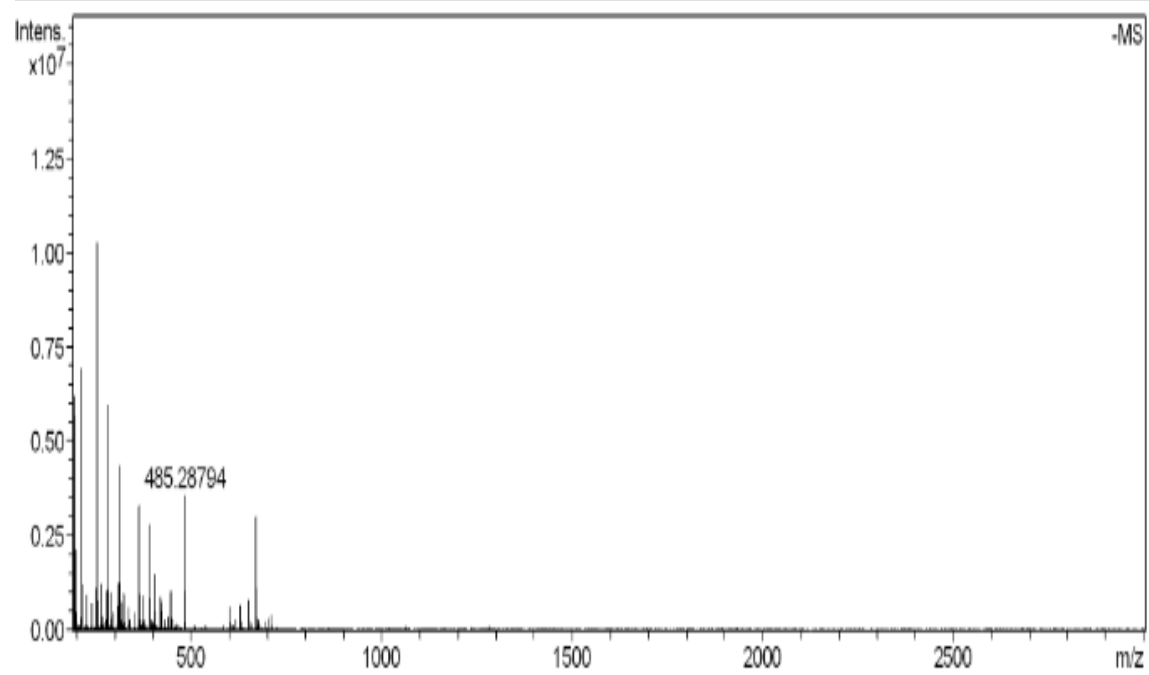


Figure C. 8. Mass spectrum of compound 8

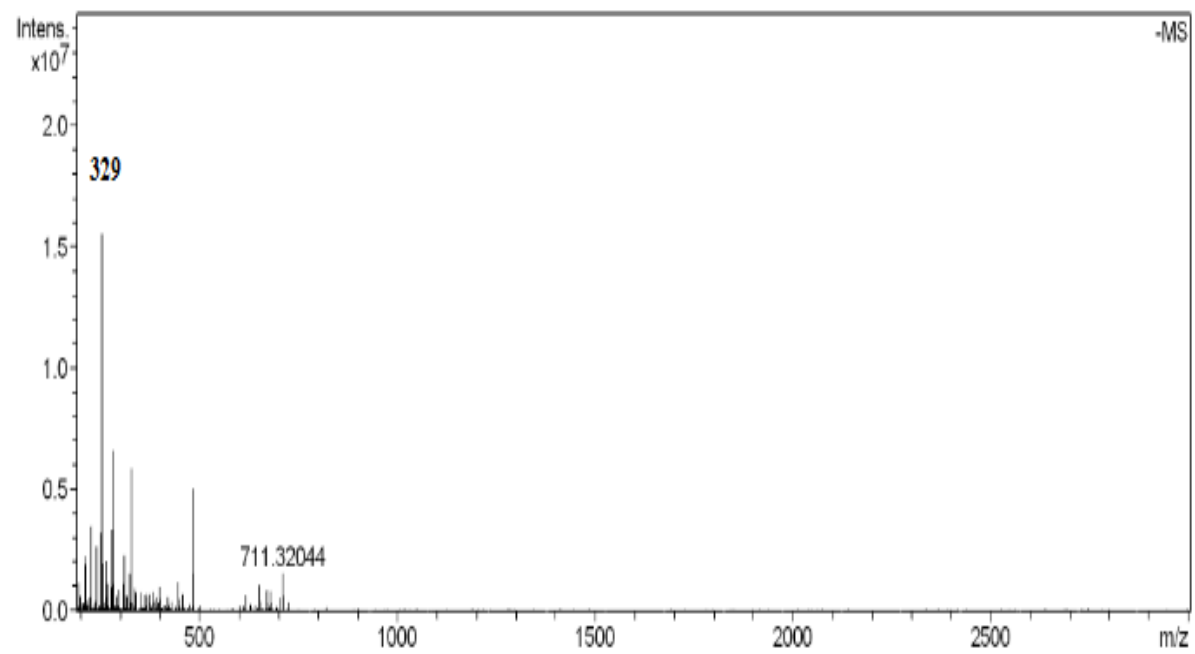


Figure C. 9. Mass spectrum of compound 9

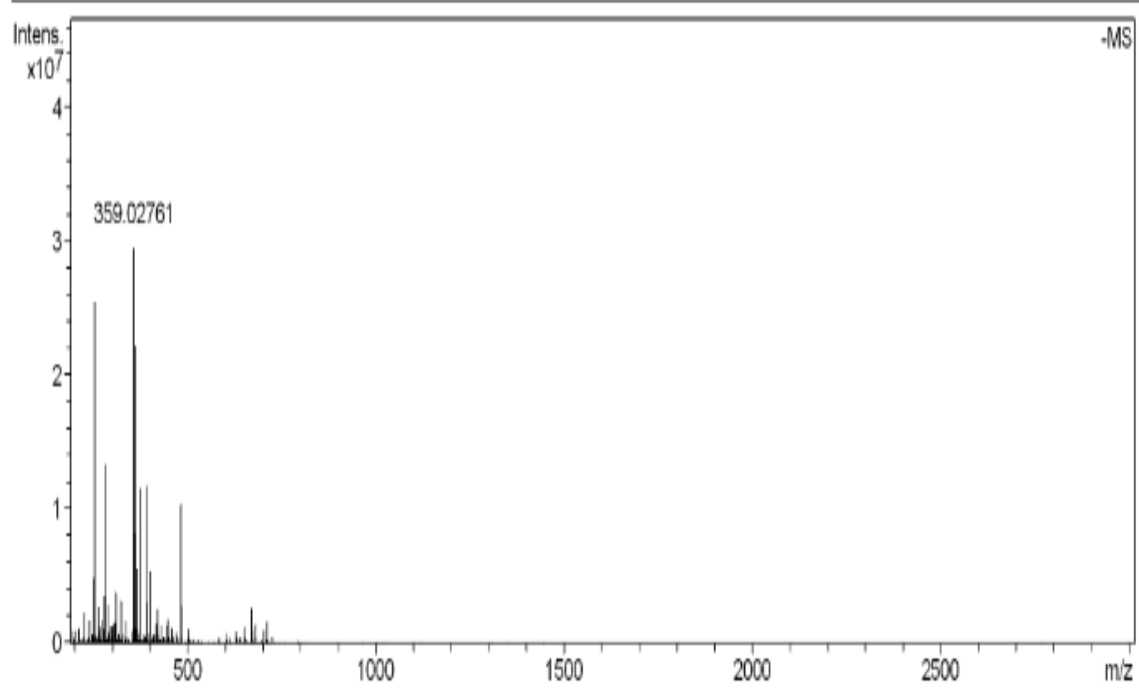


Figure C. 10. Mass spectrum of compound 10

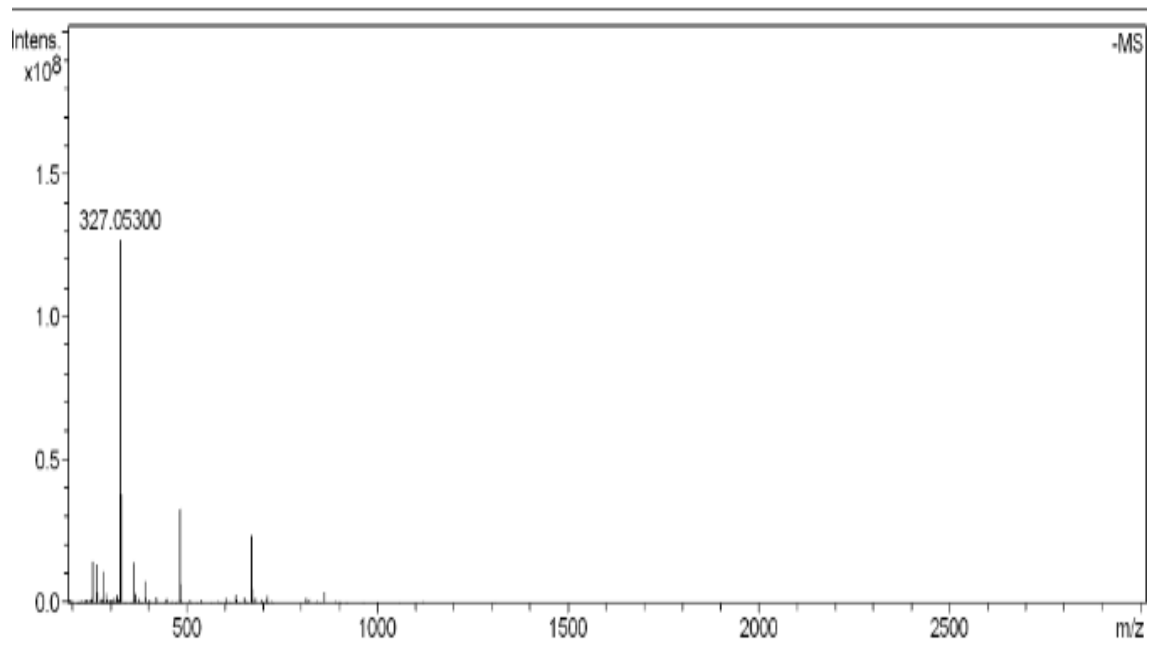


Figure C. 11. Mass spectrum of compound 11

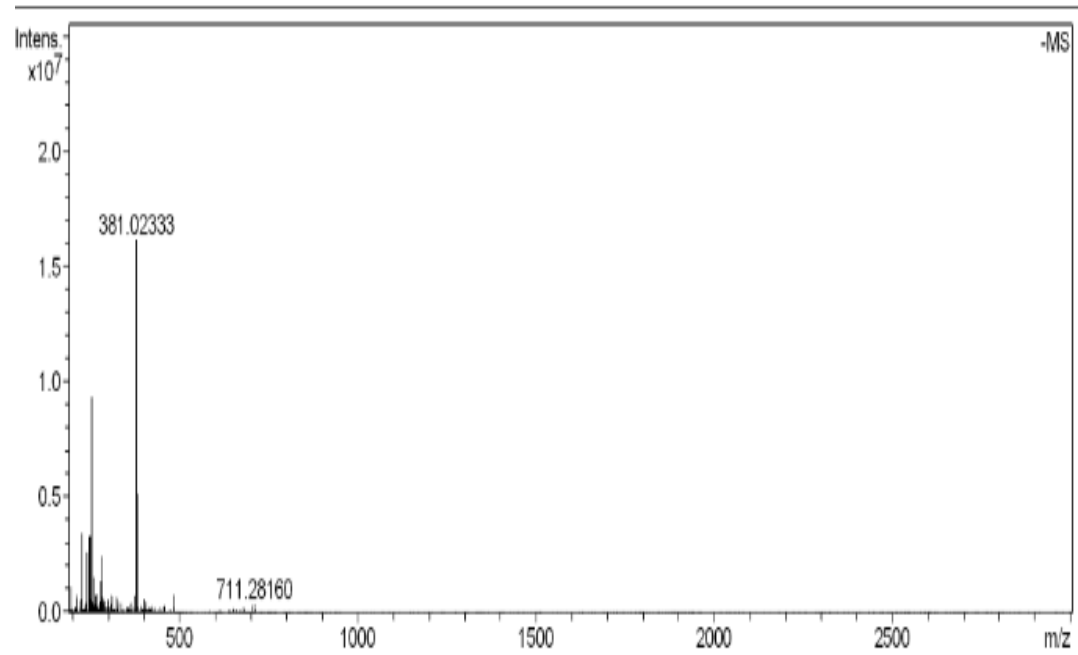


Figure C. 12. Mass spectrum of compound 12

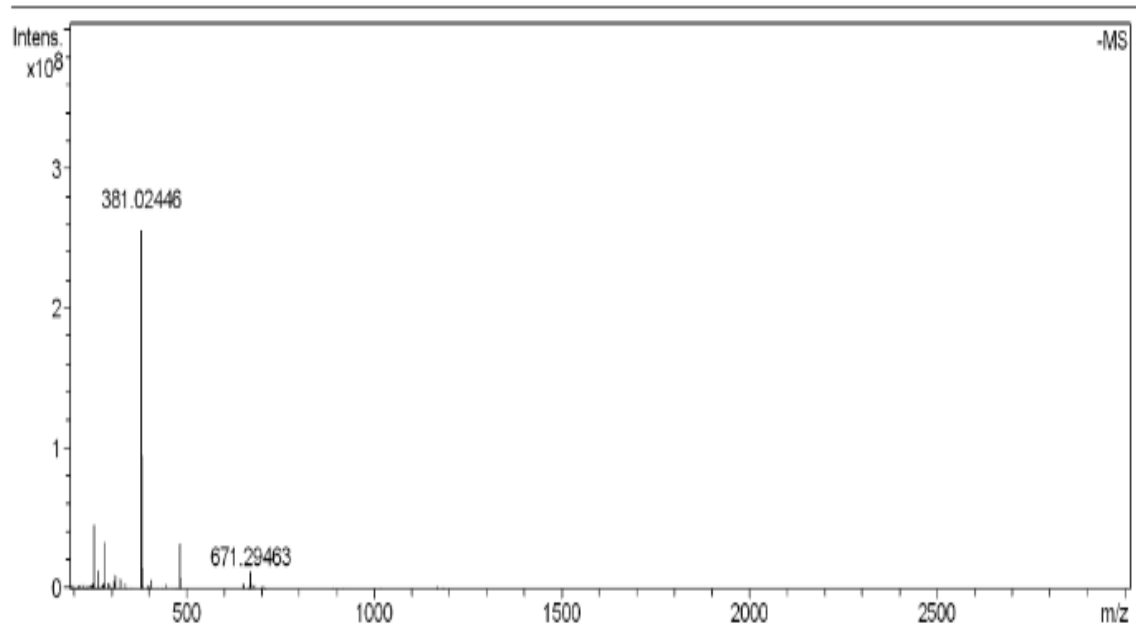


Figure C. 14. Mass spectrum of compound 13

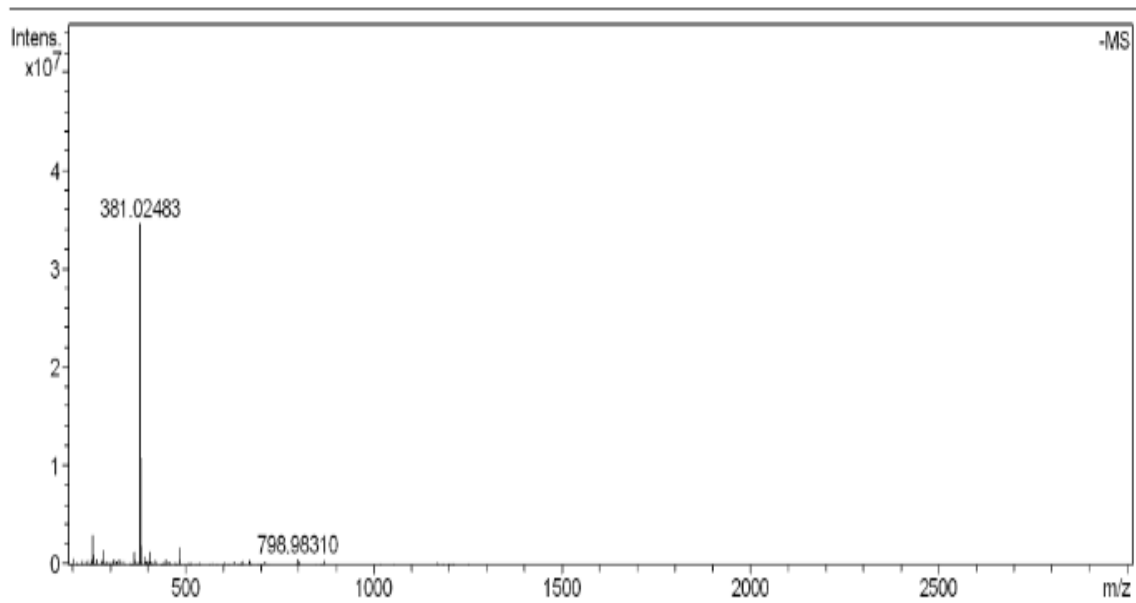


Figure C. 15. Mass spectrum of compound 14