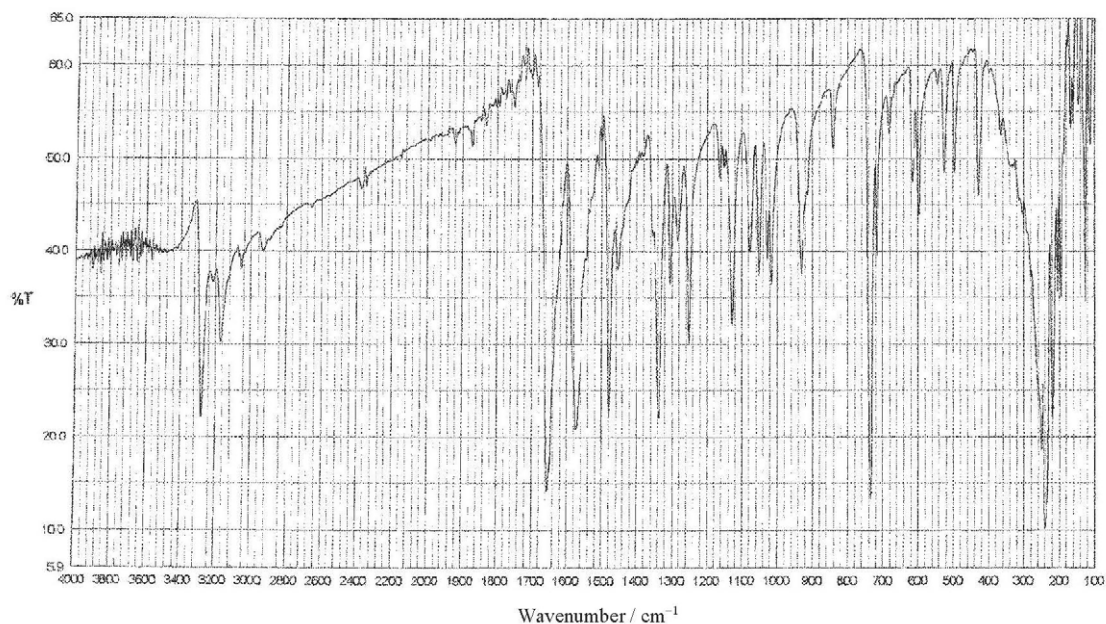


## Synthesis and Antitumor Evaluation of New Heterocycles Derived from 3-Methyl-2-benzothiazolinone Hydrazone

*Nabila M. Ibrahim,<sup>a</sup> Hisham A. A. Yosef,<sup>a</sup> Ewies F. Ewies,<sup>a</sup> Mohamed R. H. Mahran,<sup>\*,a</sup> Mamdouh M. Ali<sup>b</sup> and Abeer E. Mahmoud<sup>b</sup>*

<sup>a</sup>Department of Organometallic and Organometalloid Chemistry and <sup>b</sup>Biochemistry Department, National Research Centre, El-Buhouth St, 12622 Dokki, Cairo, Egypt



**Figure S1.** IR spectrum (KBr) of compound **1**.

\*e-mail: mohamed\_rh\_mahran@yahoo.com

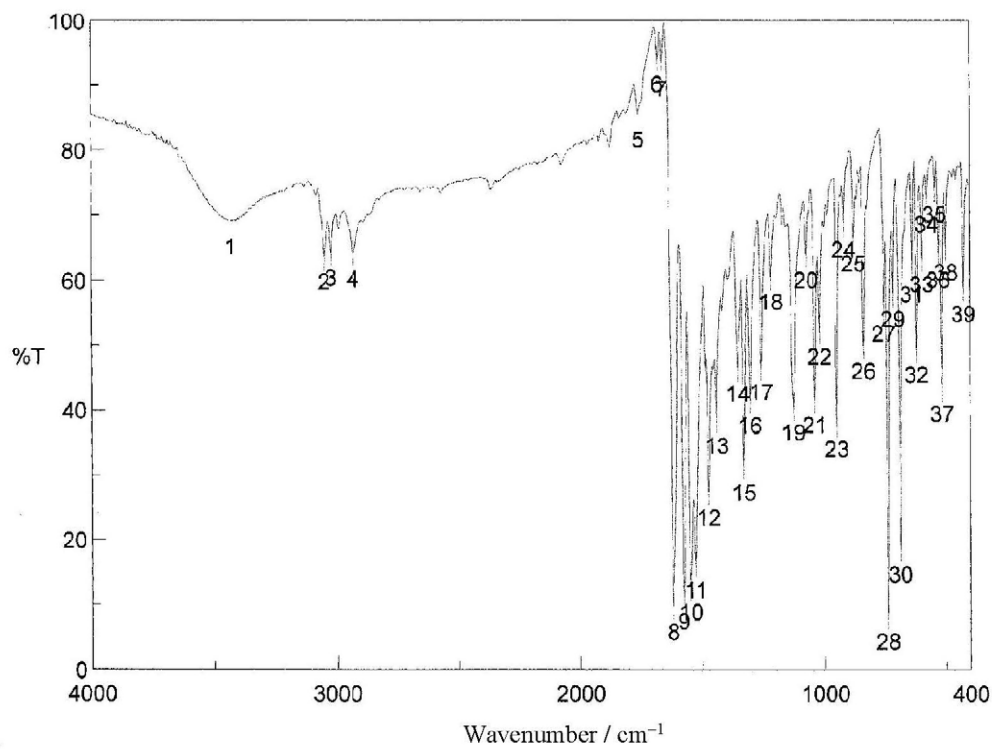


Figure S2. IR spectrum (KBr) of compound **3a**.

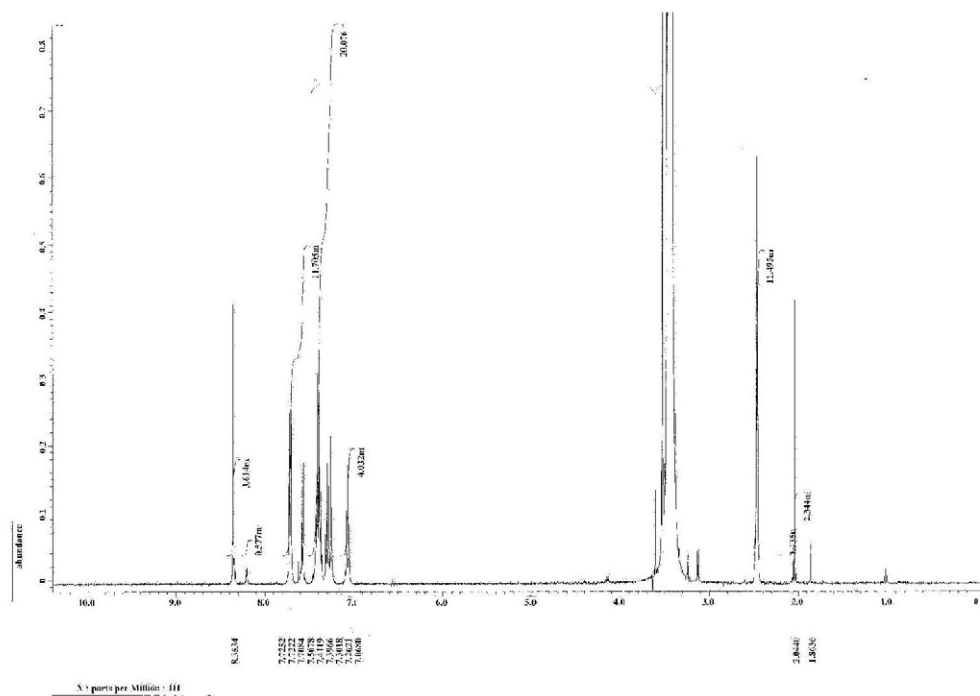


Figure S3. <sup>1</sup>H NMR spectrum (500 MHz, DMSO-*d*<sub>6</sub>) of compound **3a**.

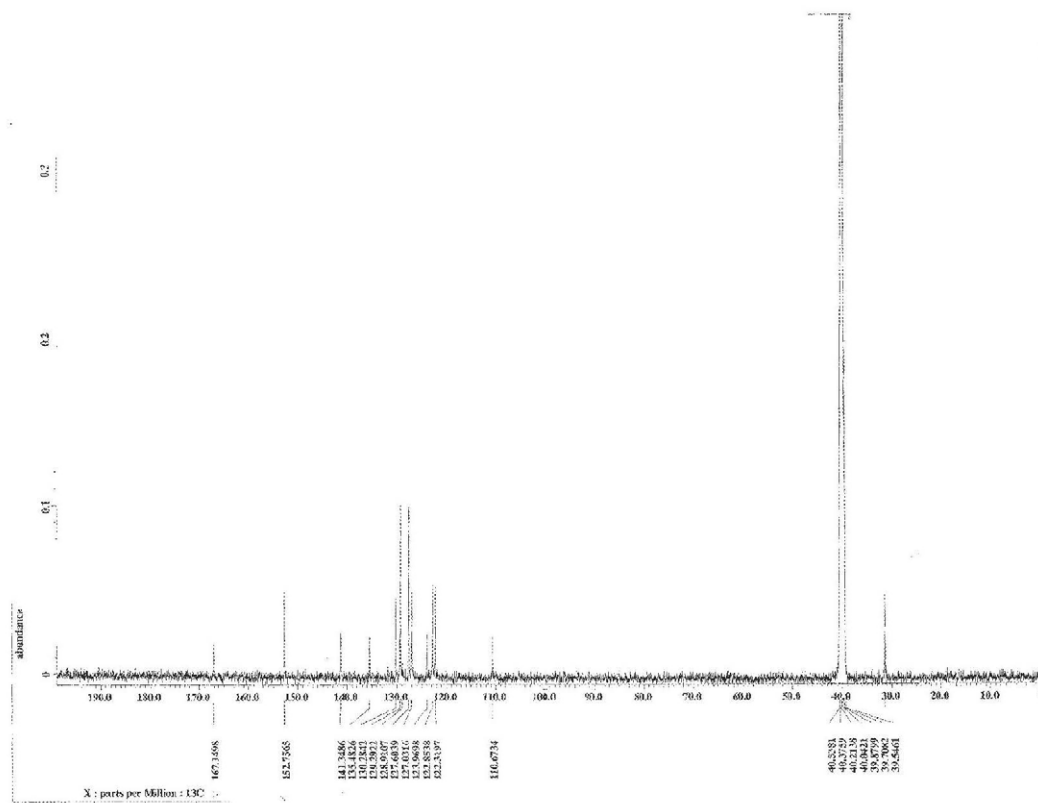


Figure S4.  $^{13}\text{C}$  NMR spectrum (125 MHz,  $\text{DMSO-}d_6$ ) of compound **3a**.

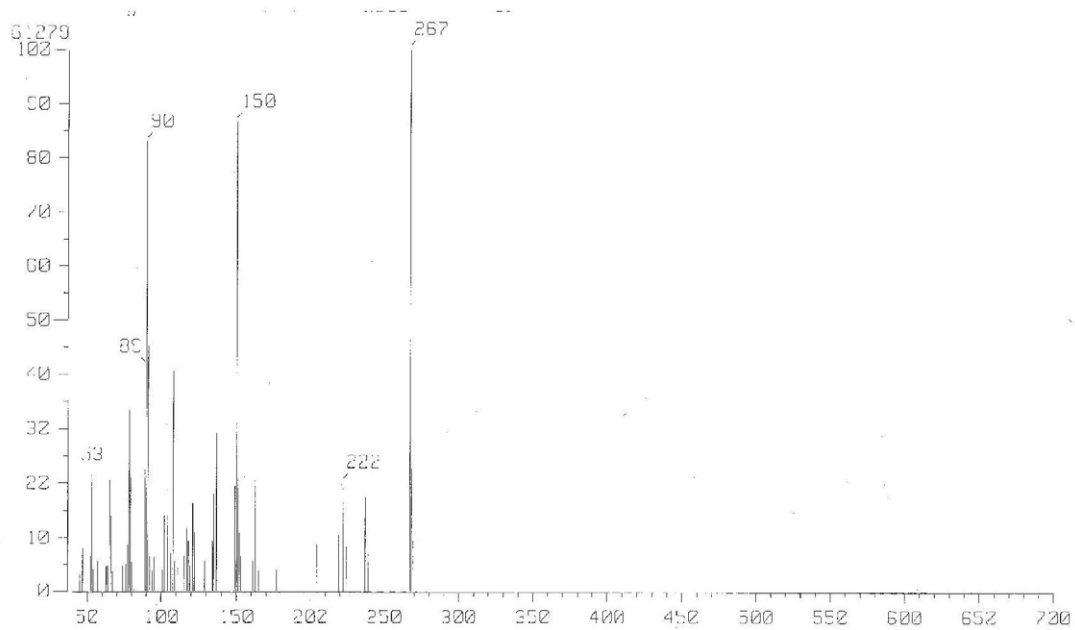


Figure S5. Mass spectrum of compound **3a**.



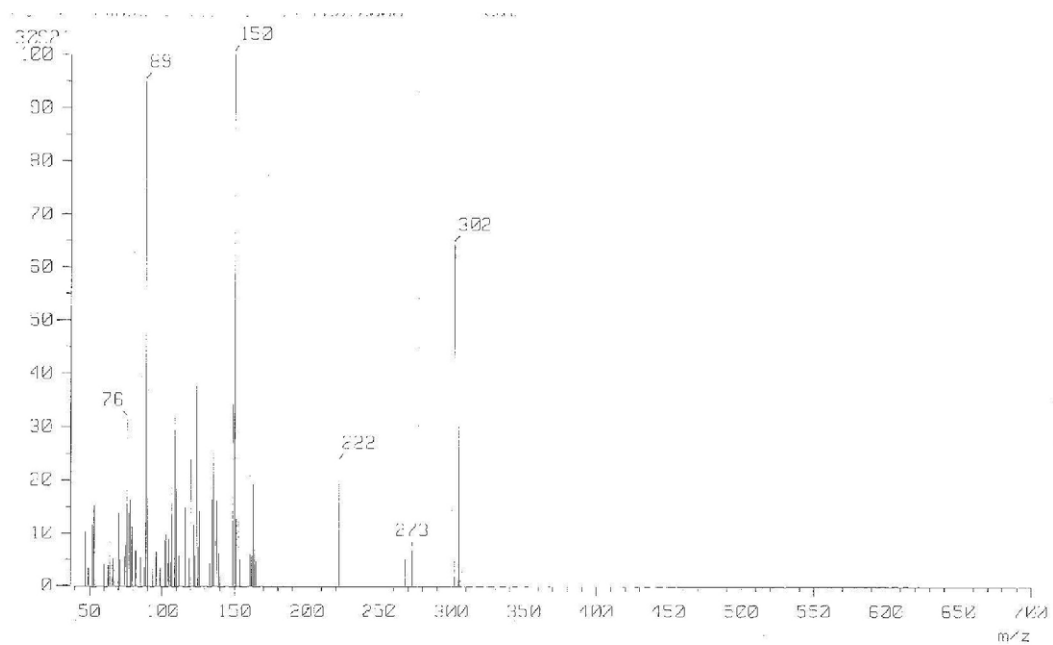


Figure S8. Mass spectrum of compound 3b.

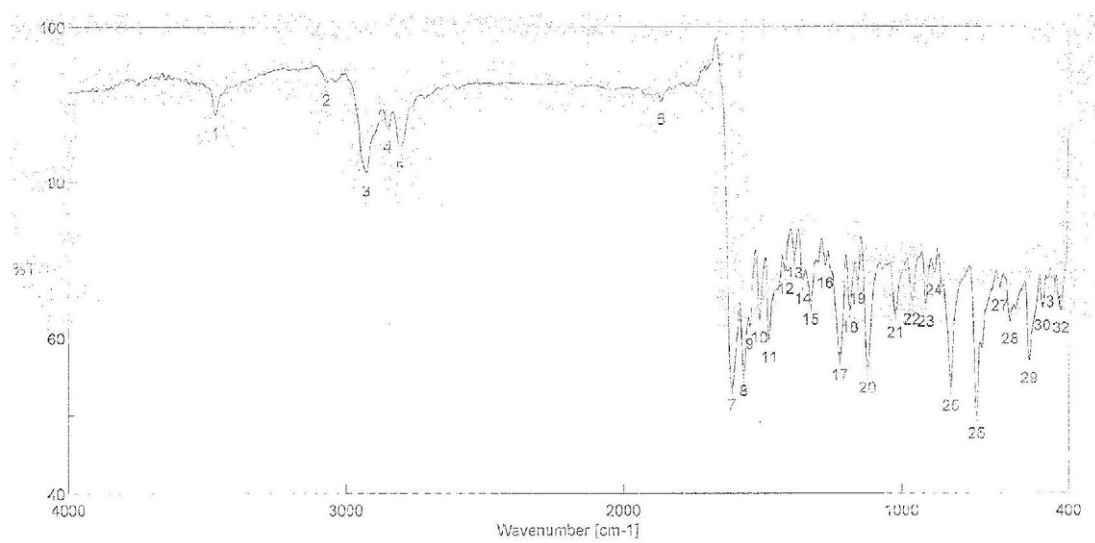


Figure S9. IR spectrum (KBr) of compound 3c.

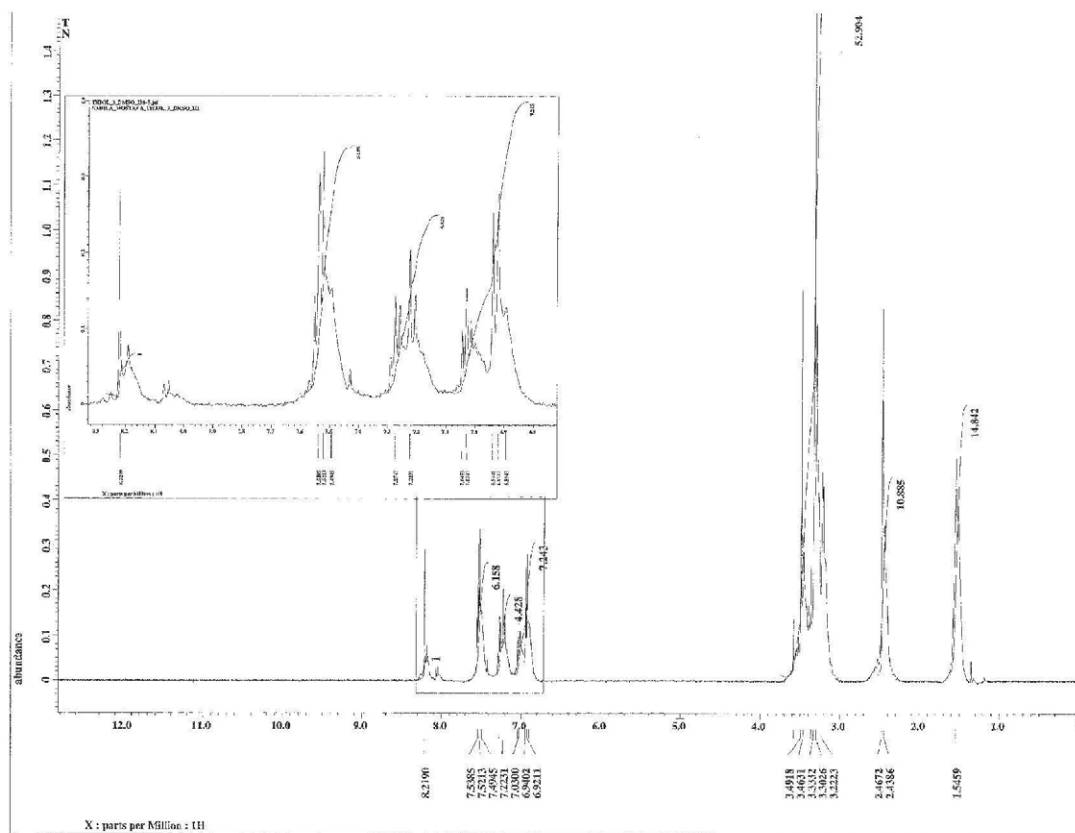


Figure S10.  $^1\text{H}$  NMR spectrum (500 MHz,  $\text{DMSO}-d_6$ ) of compound **3c**.

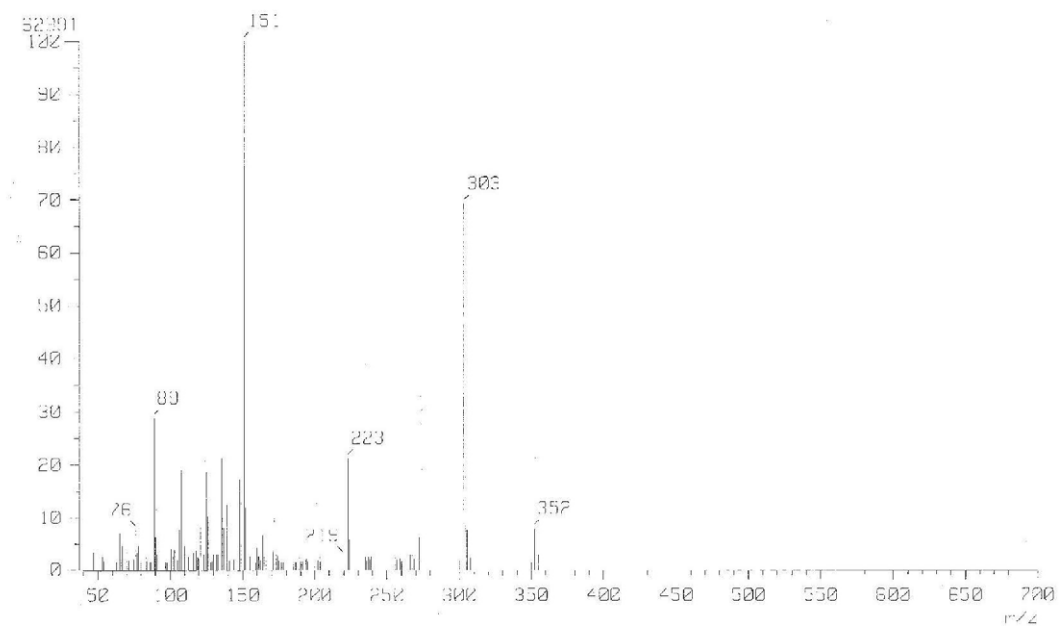


Figure S11. Mass spectrum of compound **3c**.

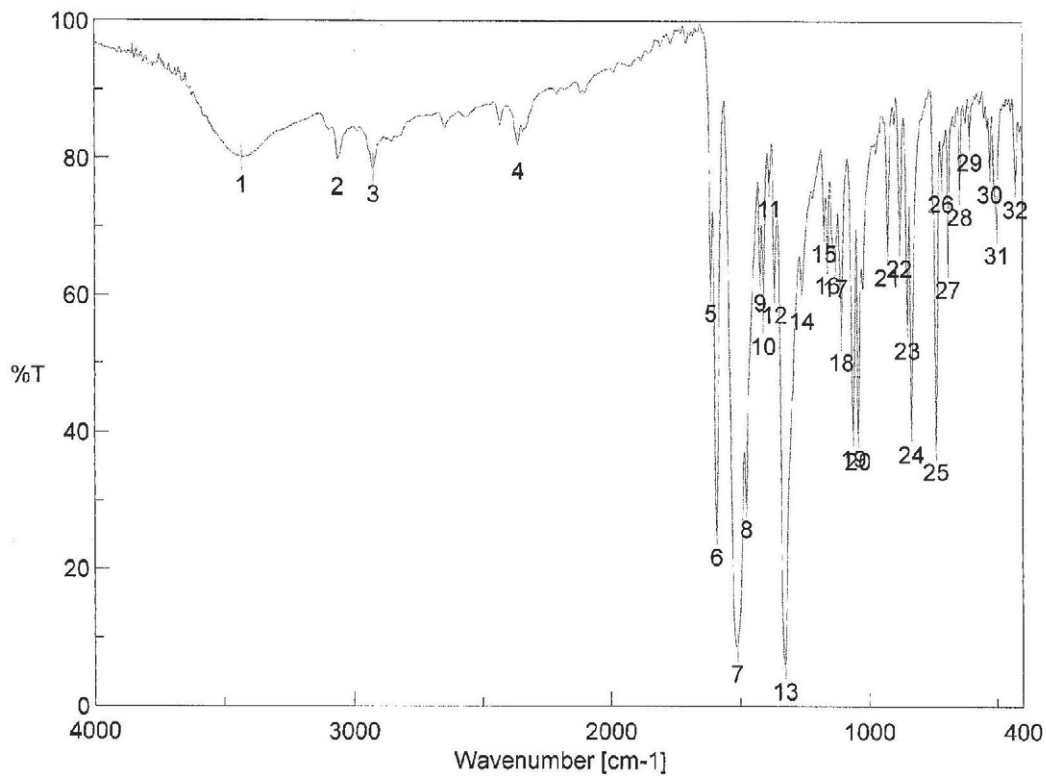


Figure S12. IR spectrum (KBr) of compound 3d.

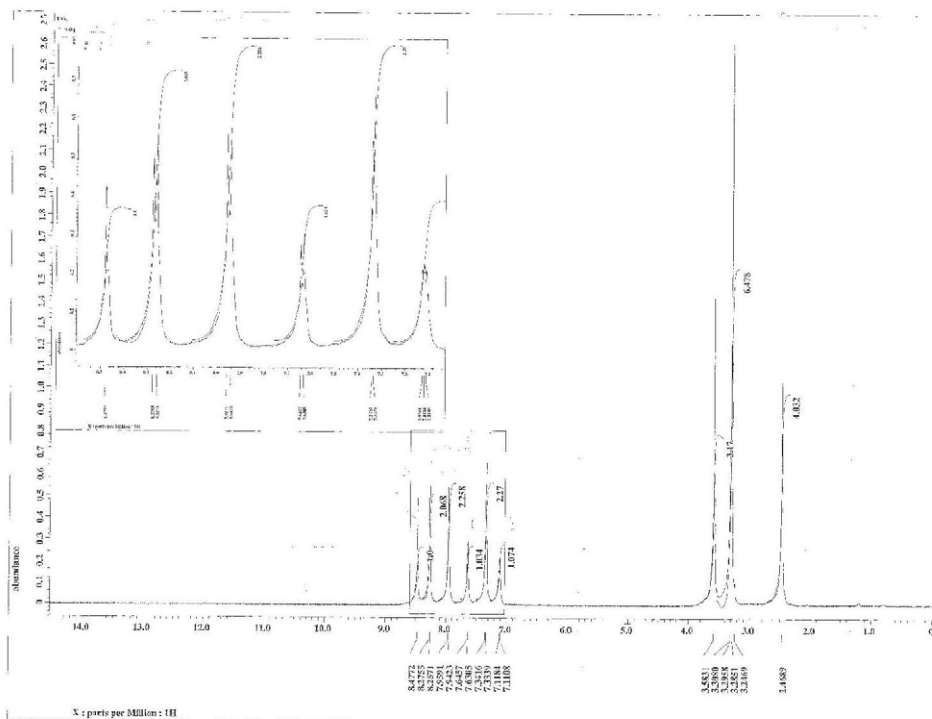


Figure S13. <sup>1</sup>H NMR spectrum (500 MHz, DMSO-*d*<sub>6</sub>) of compound 3d.

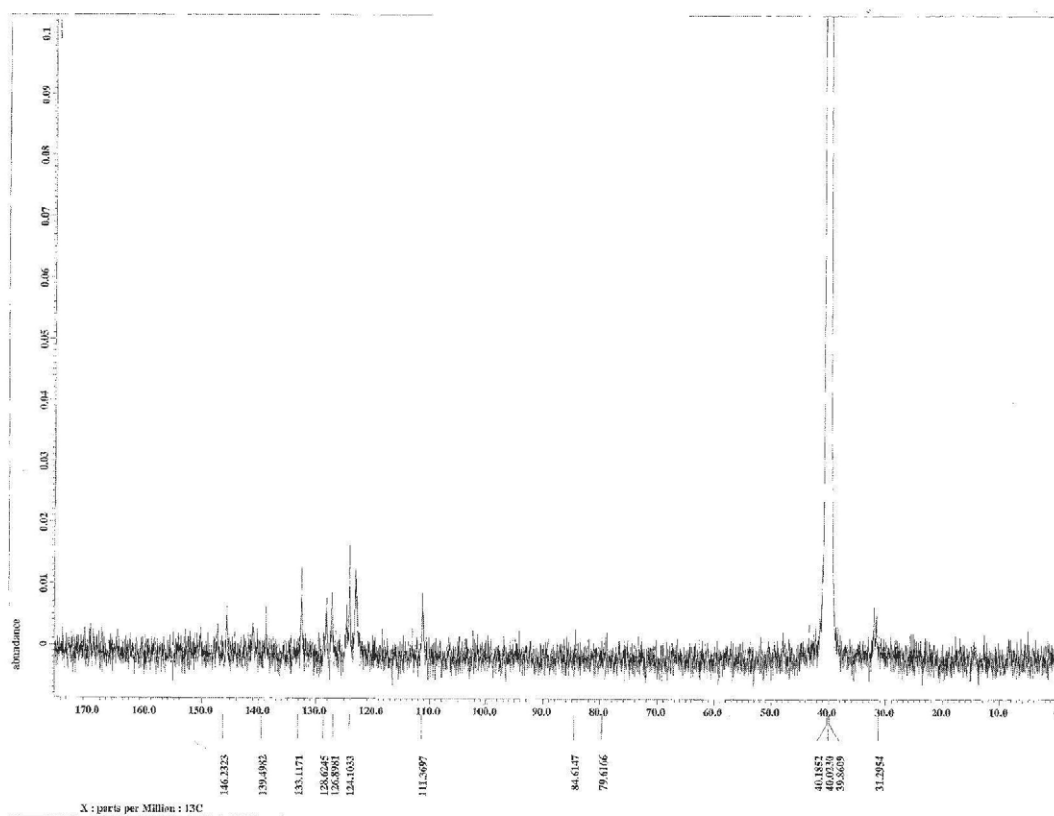


Figure S14.  $^{13}\text{C}$  NMR spectrum (125 MHz,  $\text{DMSO-}d_6$ ) of compound **3d**.

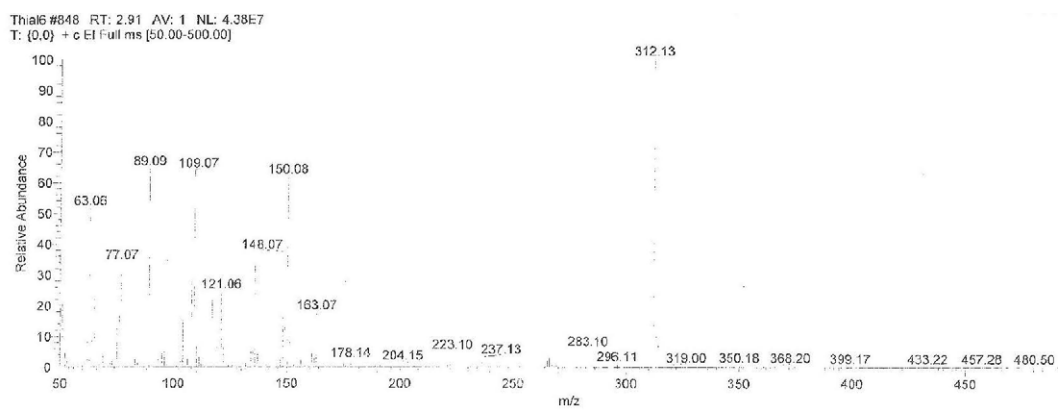


Figure S15. Mass spectrum of compound **3d**.



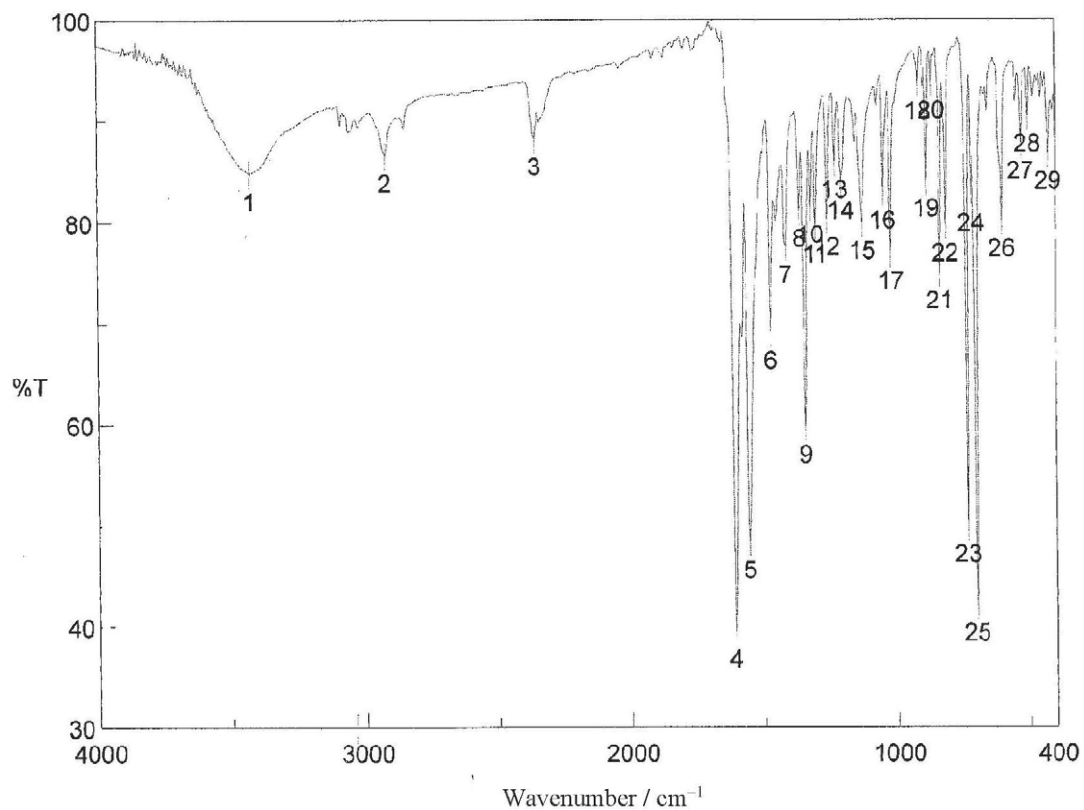


Figure S16. IR spectrum (KBr) of compound **3e**.

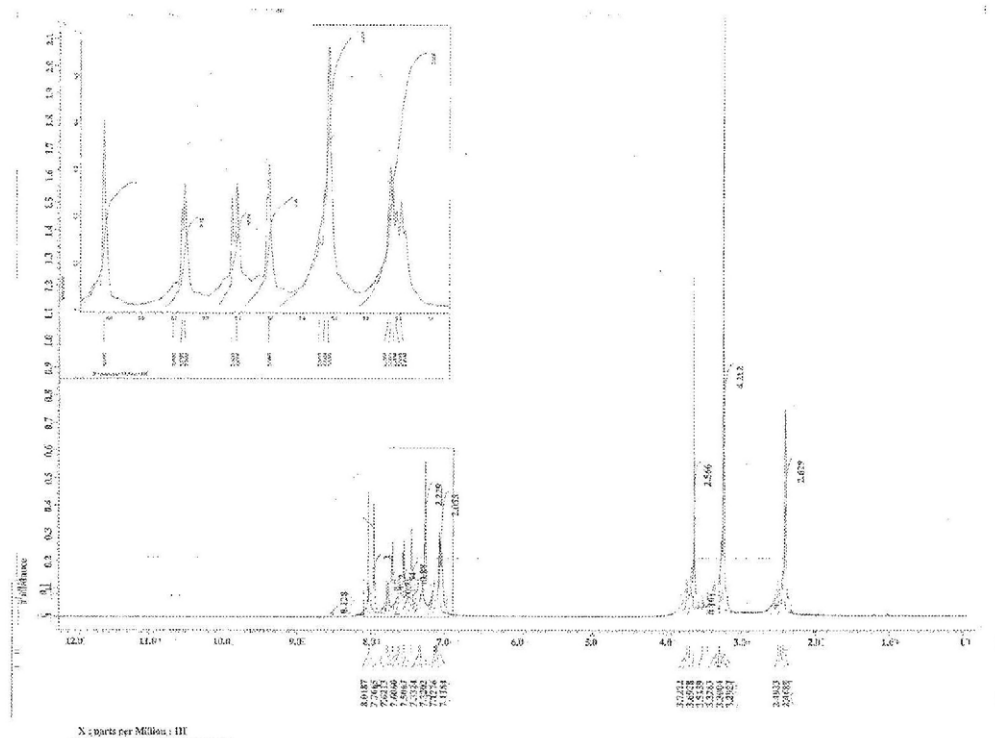


Figure S17.  $^1\text{H}$  NMR spectrum (500 MHz,  $\text{DMSO-}d_6$ ) of compound **3e**.

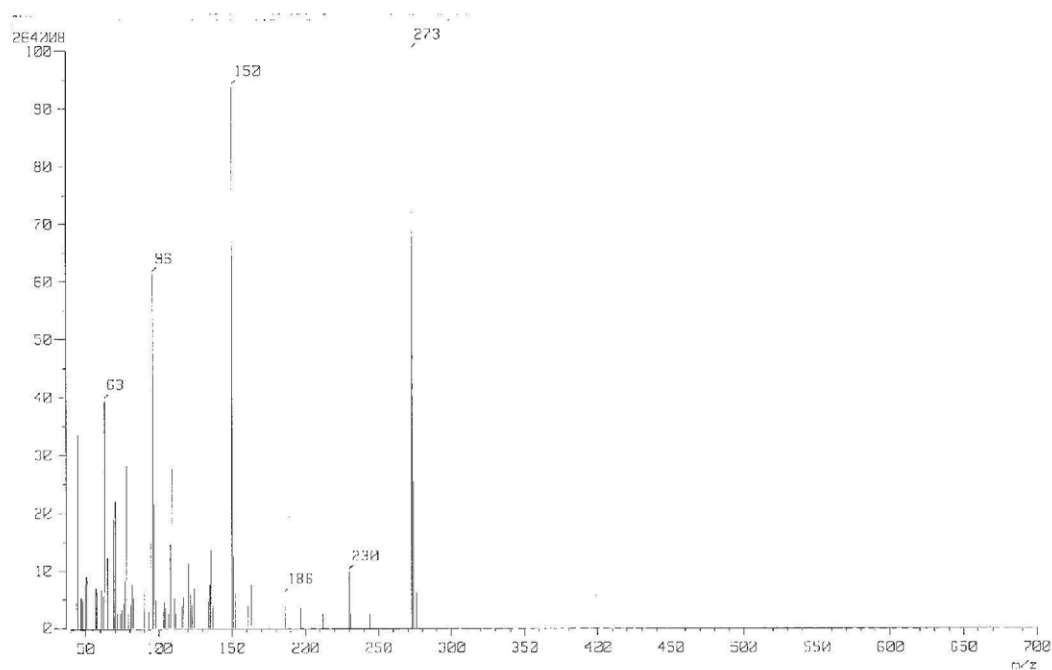


Figure S18. Mass spectrum of compound 3e.

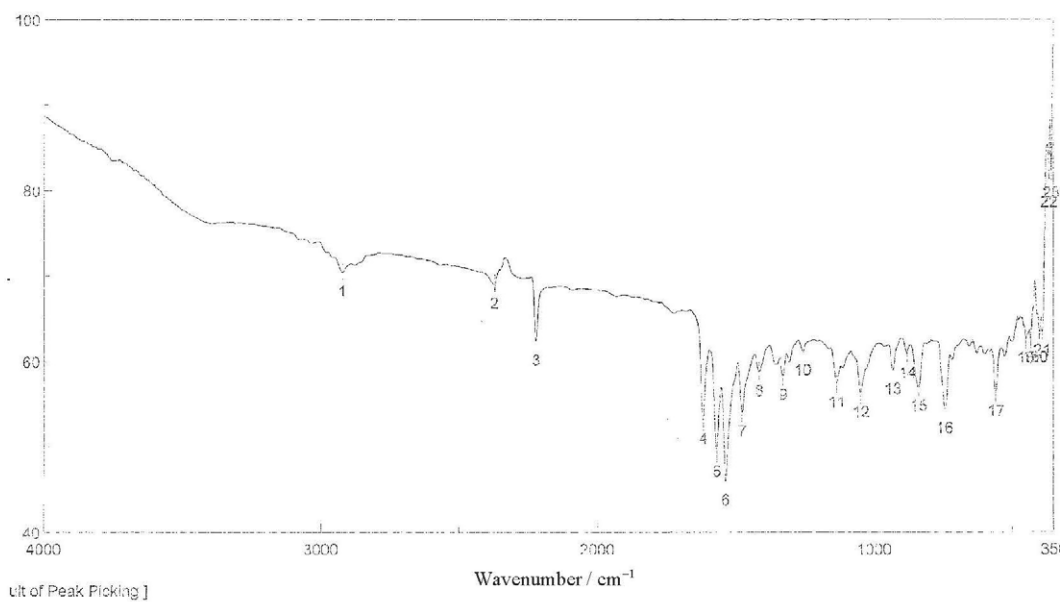


Figure S19. IR spectrum (KBr) of compound 3f.

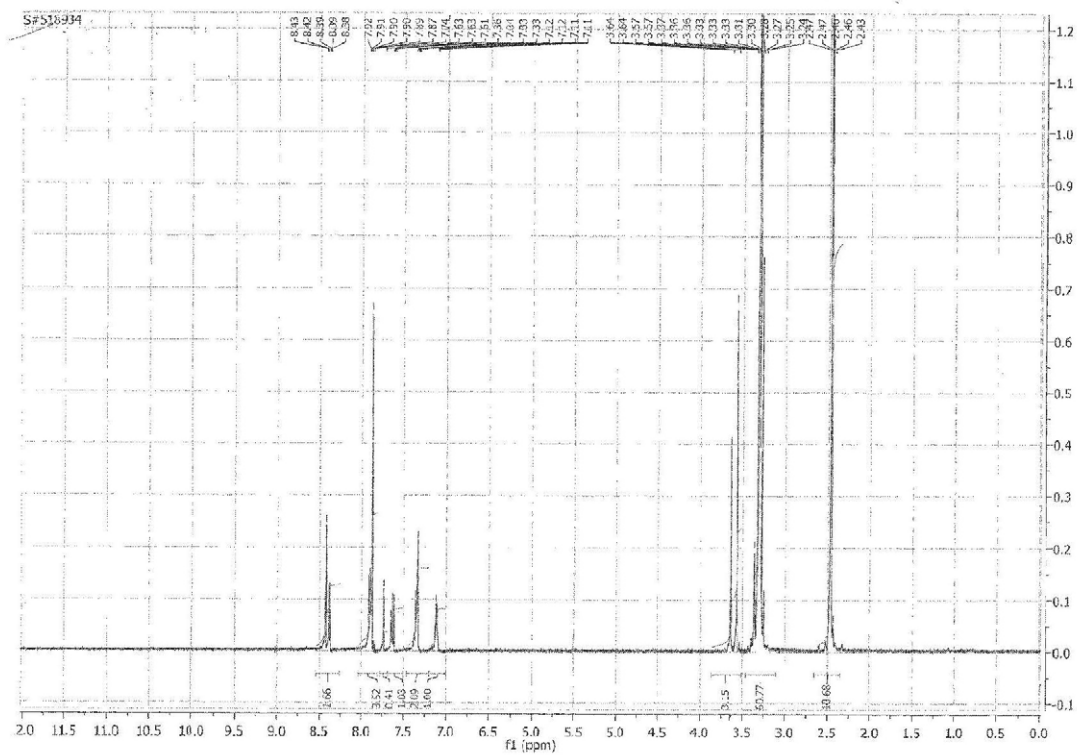


Figure S20.  $^1\text{H}$  NMR spectrum (500 MHz,  $\text{DMSO}-d_6$ ) of compound **3f**.

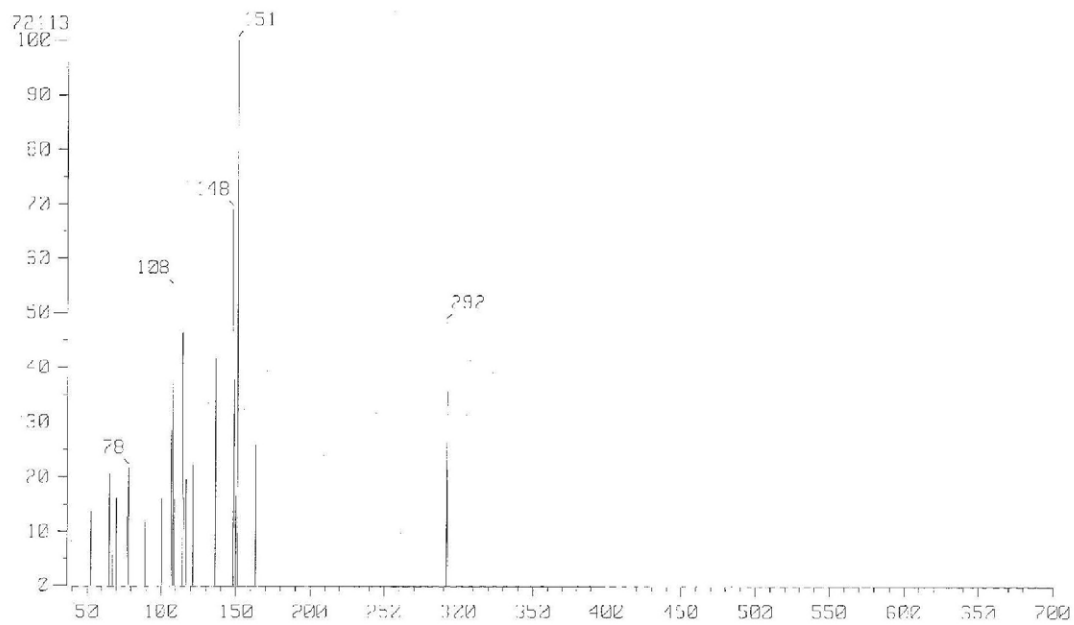


Figure S21. Mass spectrum of compound **3f**.

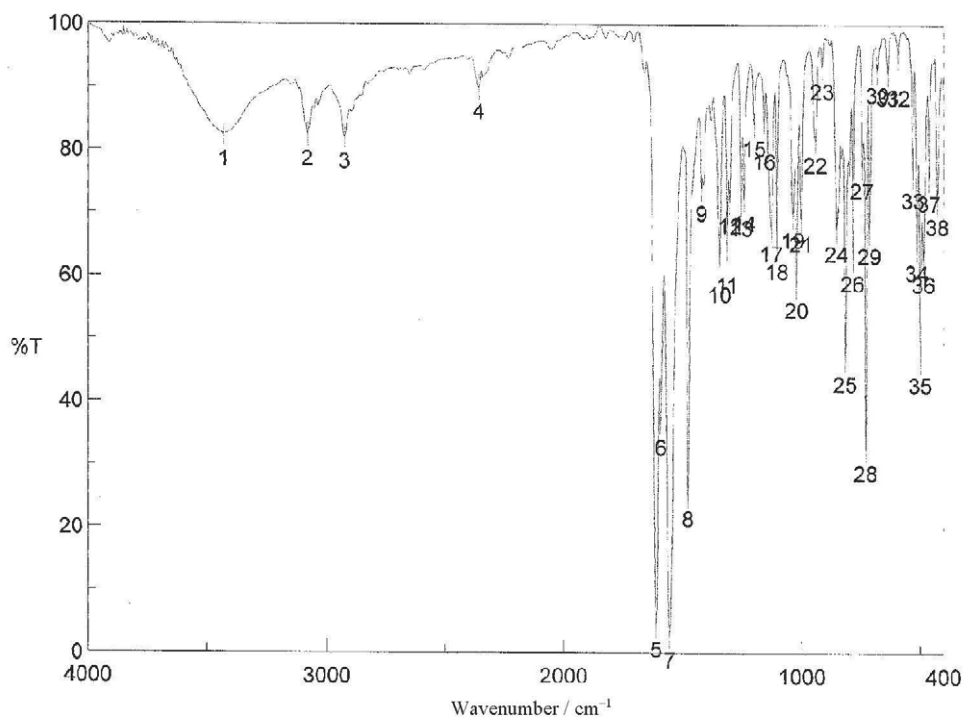


Figure S22. IR spectrum (KBr) of compound **3g**.

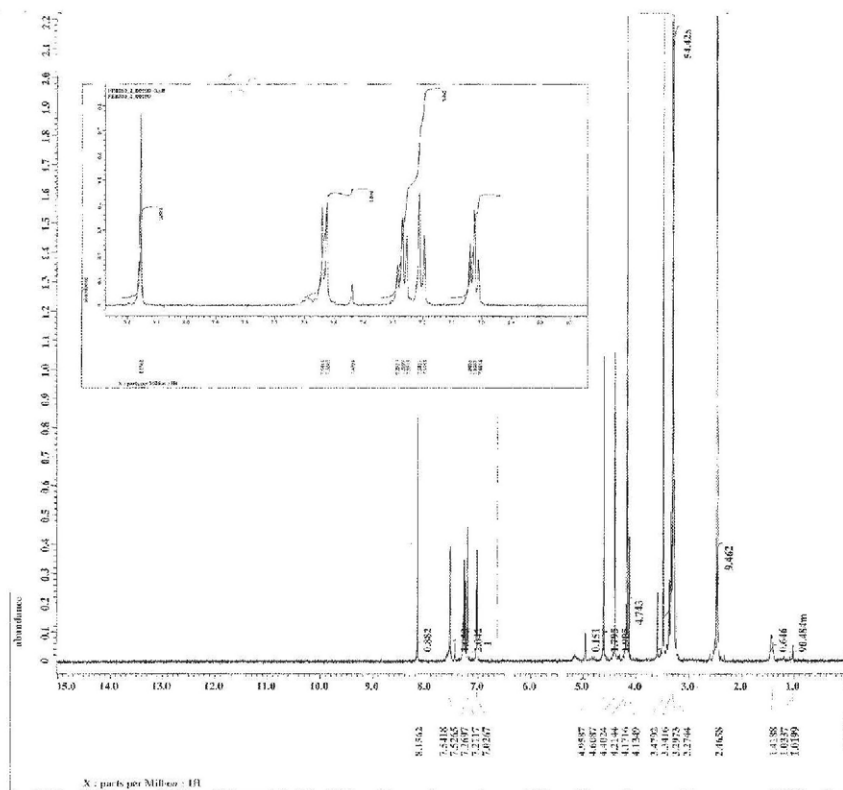


Figure S23. <sup>1</sup>H NMR spectrum (500 MHz, DMSO-*d*<sub>6</sub>) of compound **3g**.

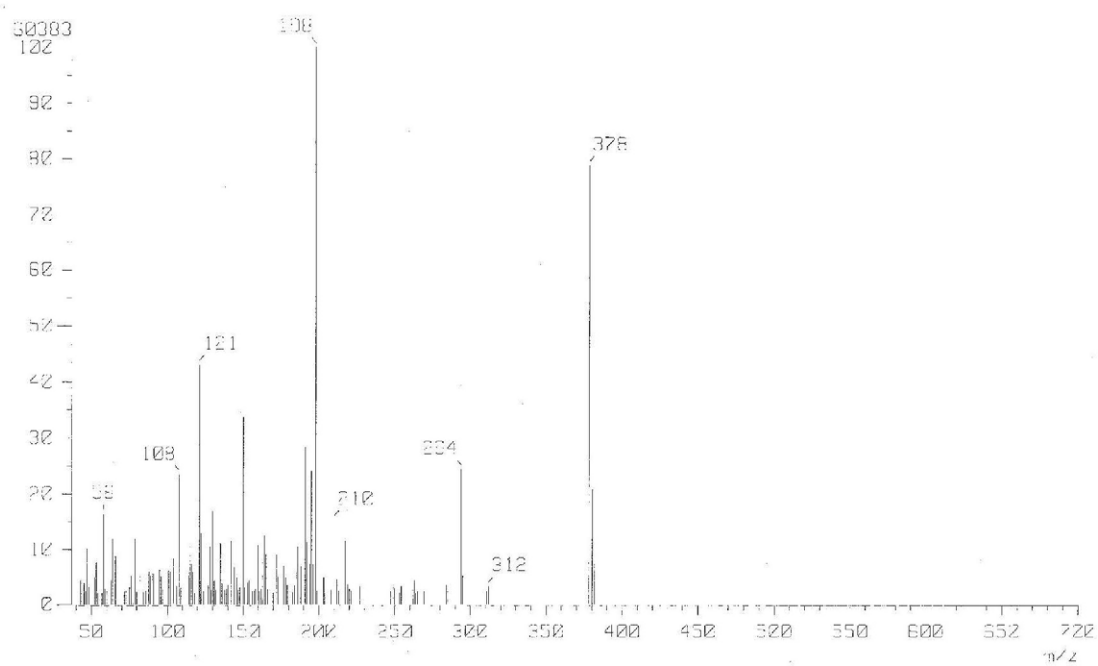


Figure S24. Mass spectrum of compound 3g.

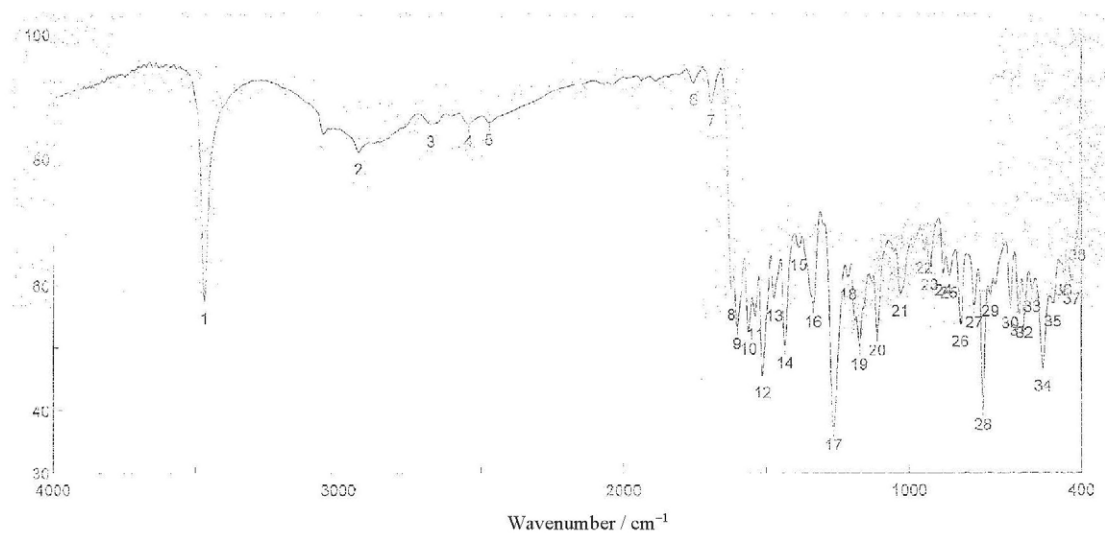


Figure S25. IR spectrum (KBr) of compound 3h.



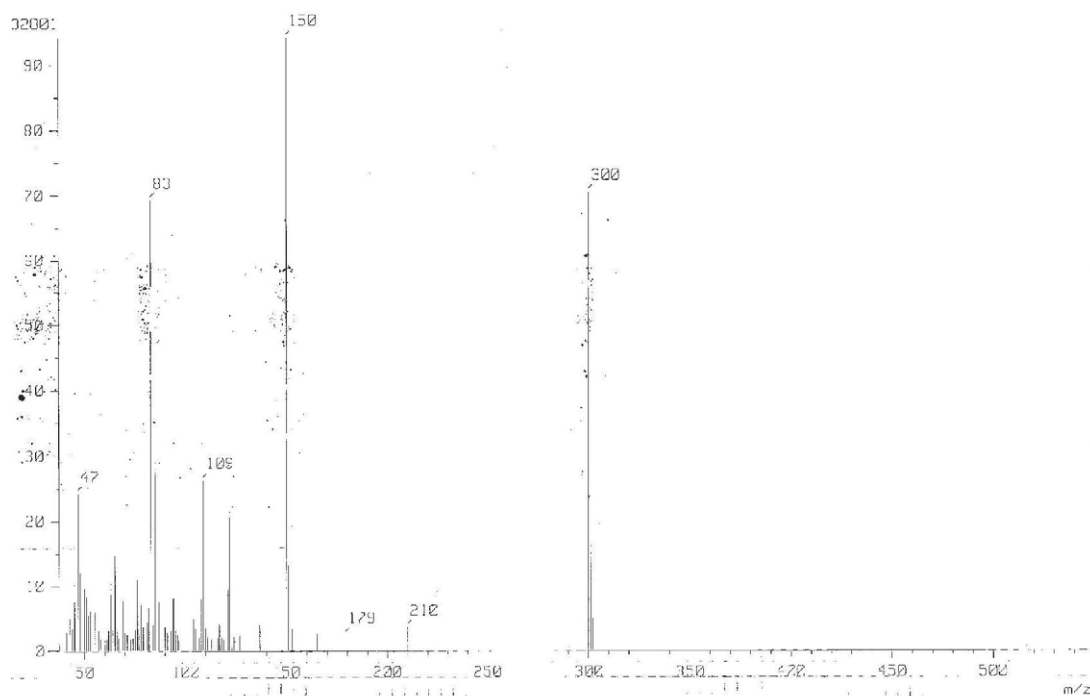


Figure S28. Mass spectrum of compound 3h.

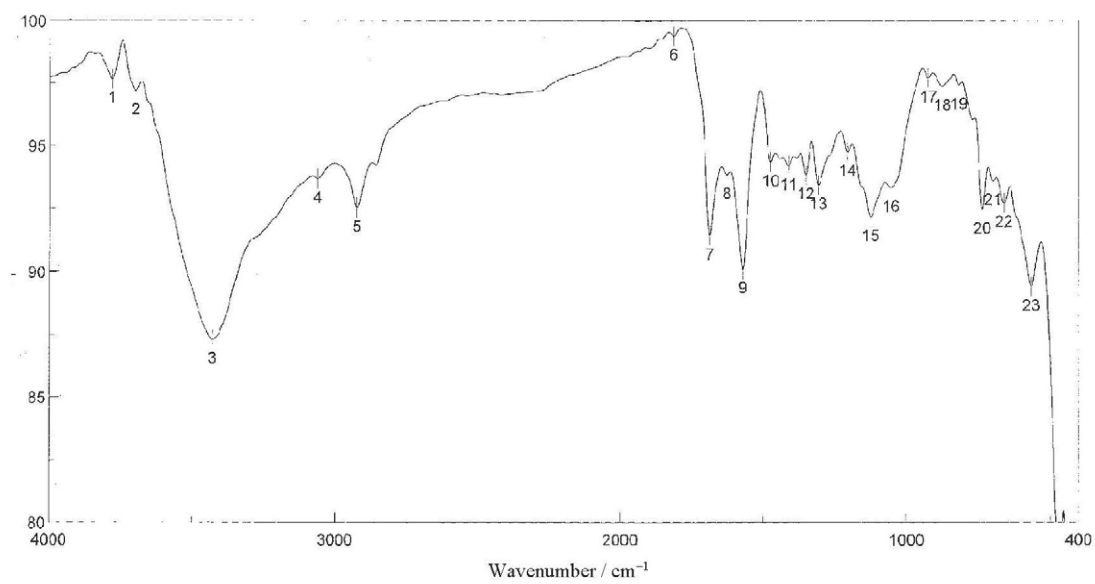


Figure S29. IR spectrum (KBr) of compound 4a.

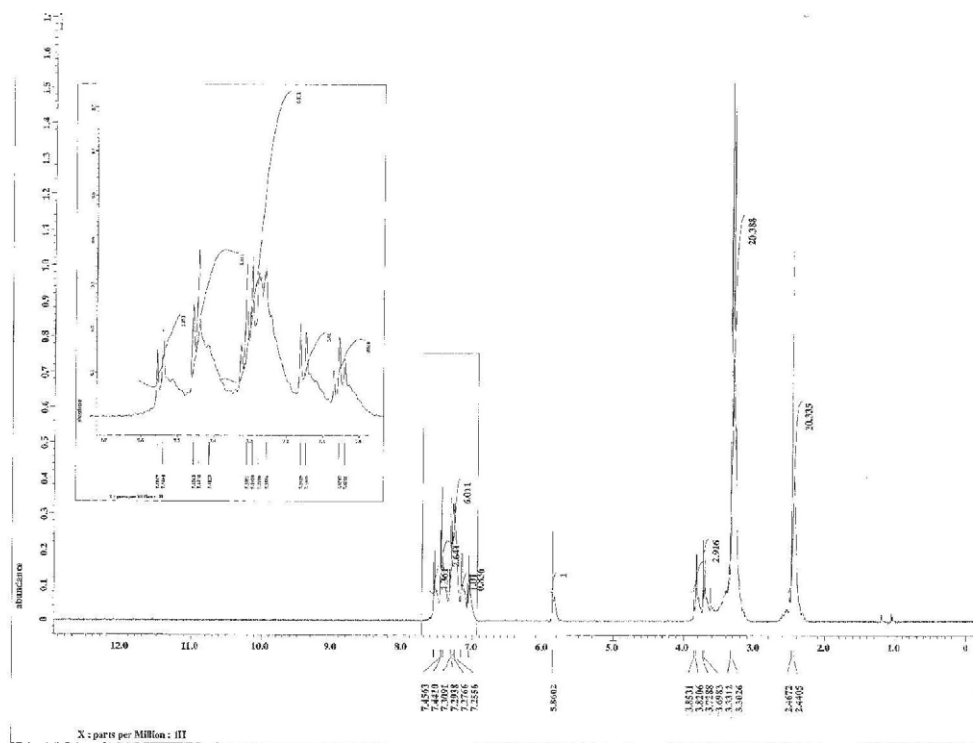


Figure S30. <sup>1</sup>H NMR spectrum (500 MHz, DMSO-*d*<sub>6</sub>) of compound **4a**.

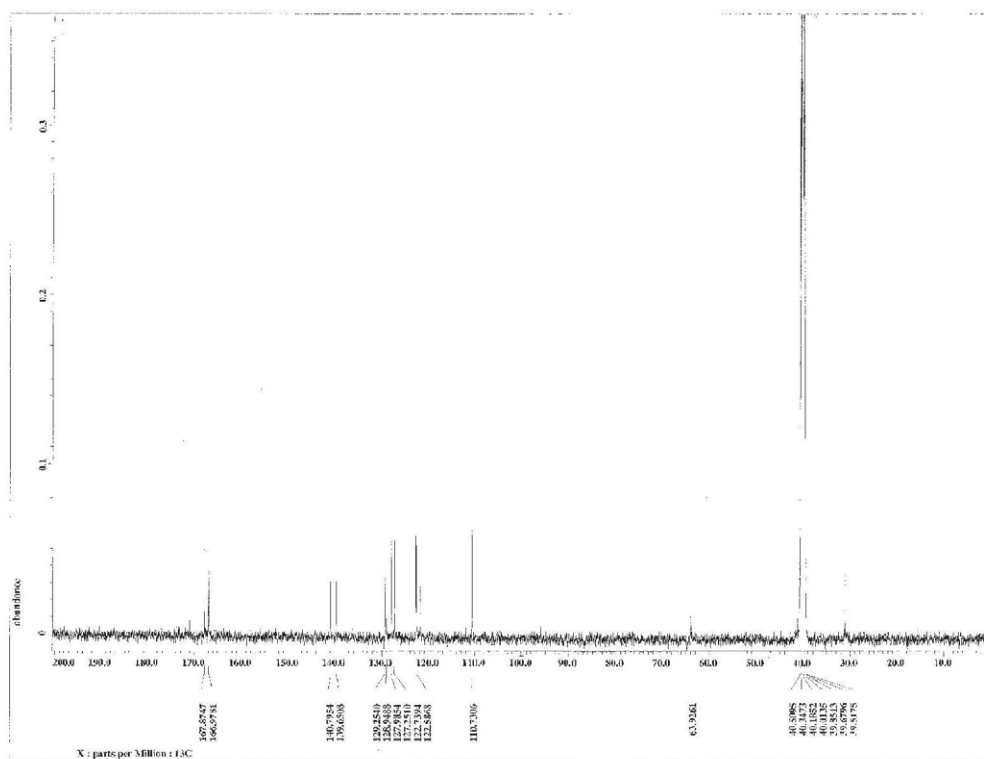


Figure S31. <sup>13</sup>C NMR spectrum (125 MHz, DMSO-*d*<sub>6</sub>) of compound **4a**.



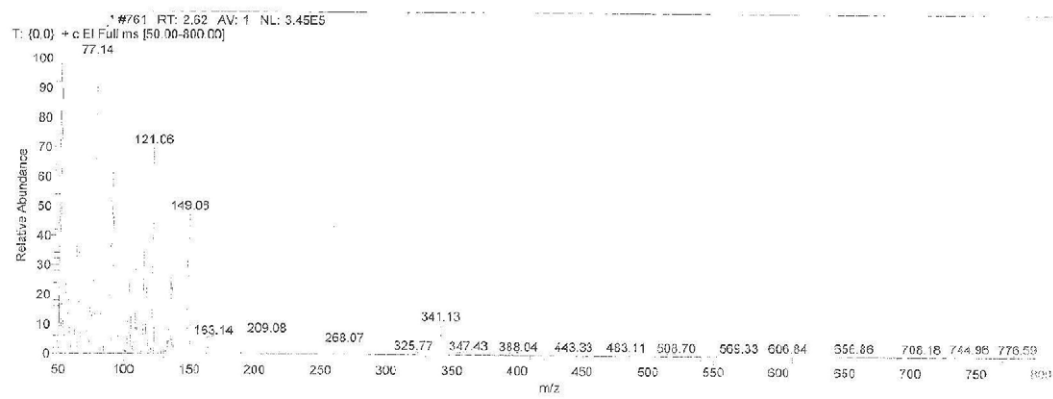


Figure S32. Mass spectrum of compound 4a.

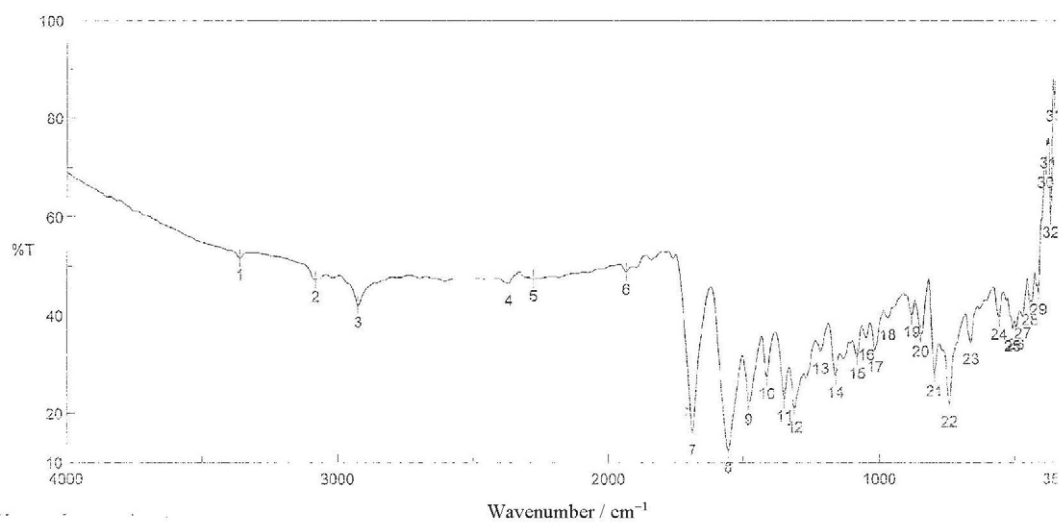


Figure S33. IR spectrum (KBr) of compound 4b.

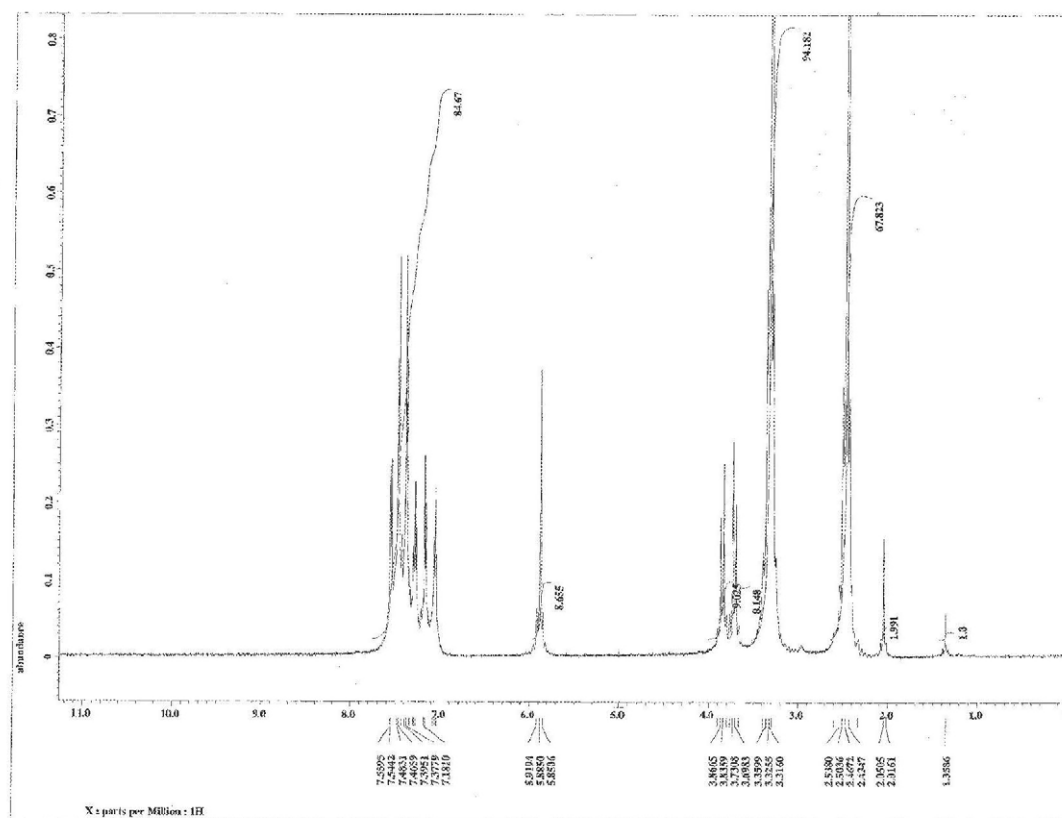


Figure S34. <sup>1</sup>H NMR spectrum (500 MHz, DMSO-*d*<sub>6</sub>) of compound **4b**.

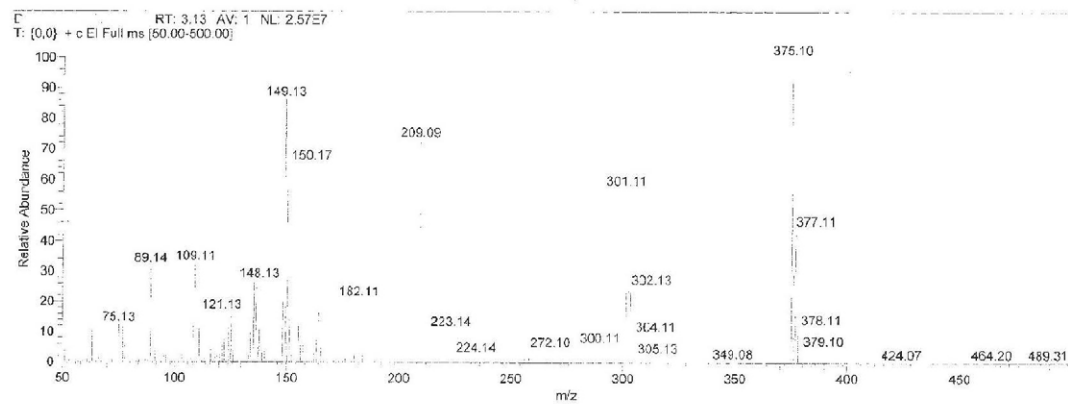


Figure S35. Mass spectrum of compound **4b**.

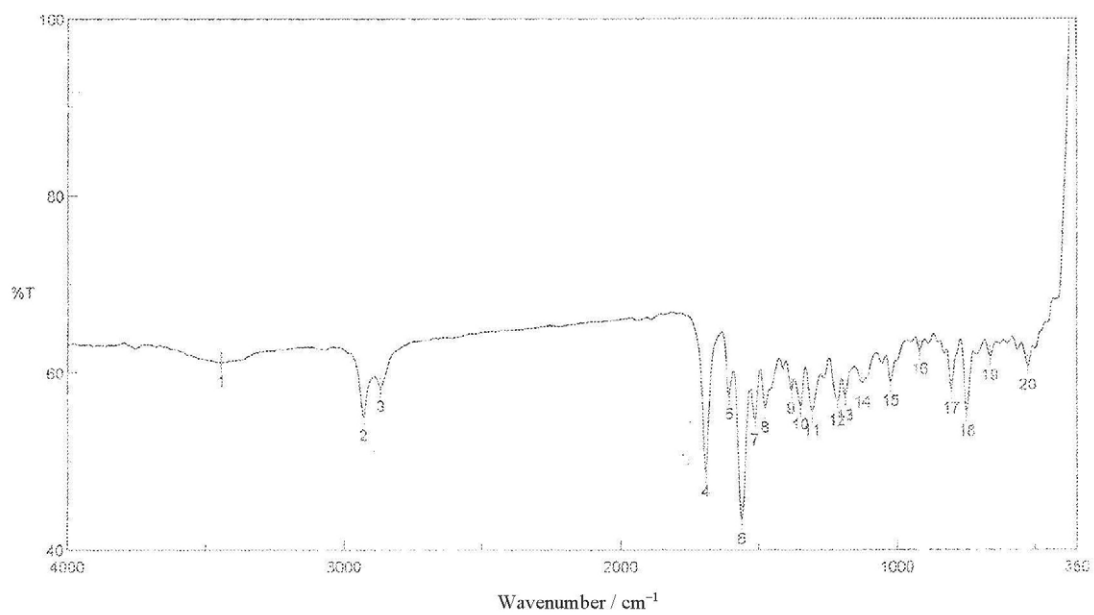


Figure S36. IR spectrum (KBr) of compound 4c.

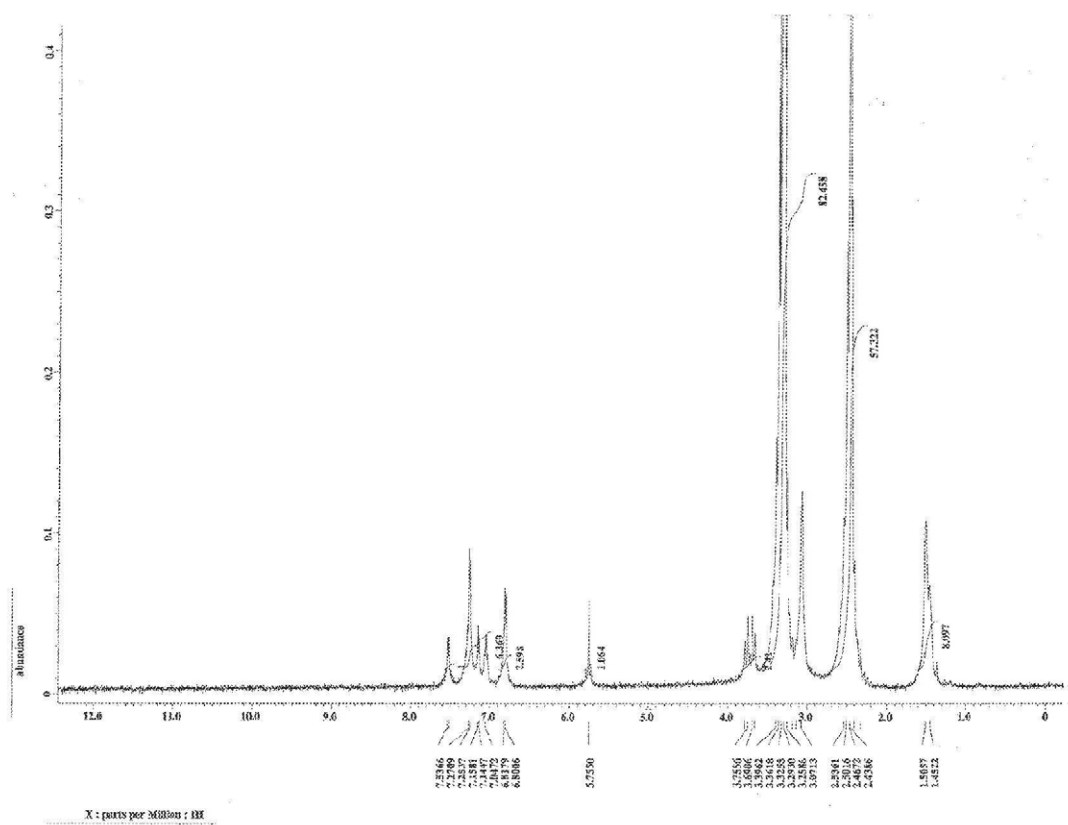


Figure S37. <sup>1</sup>H NMR spectrum (500 MHz, DMSO-*d*<sub>6</sub>) of compound 4c.

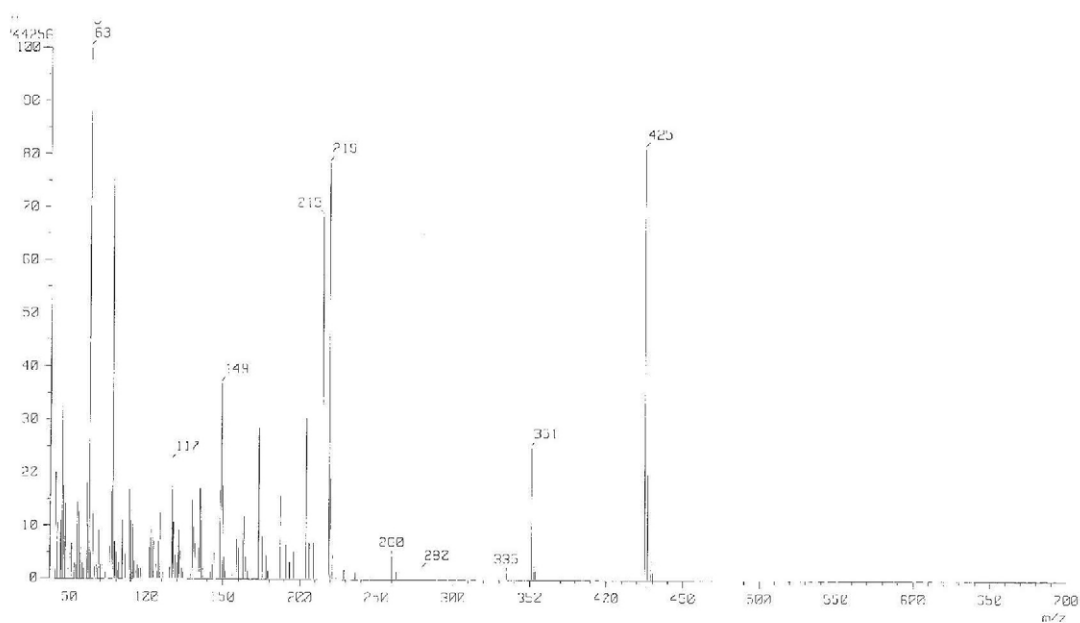


Figure S38. Mass spectrum of compound 4c.

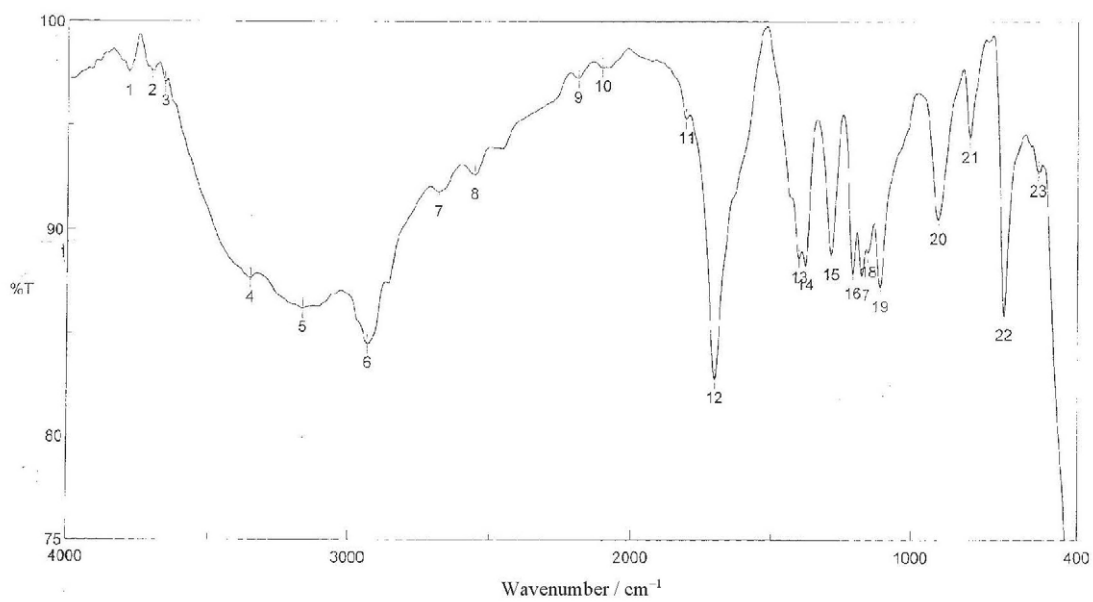


Figure S39. IR spectrum (KBr) of compound 4d.

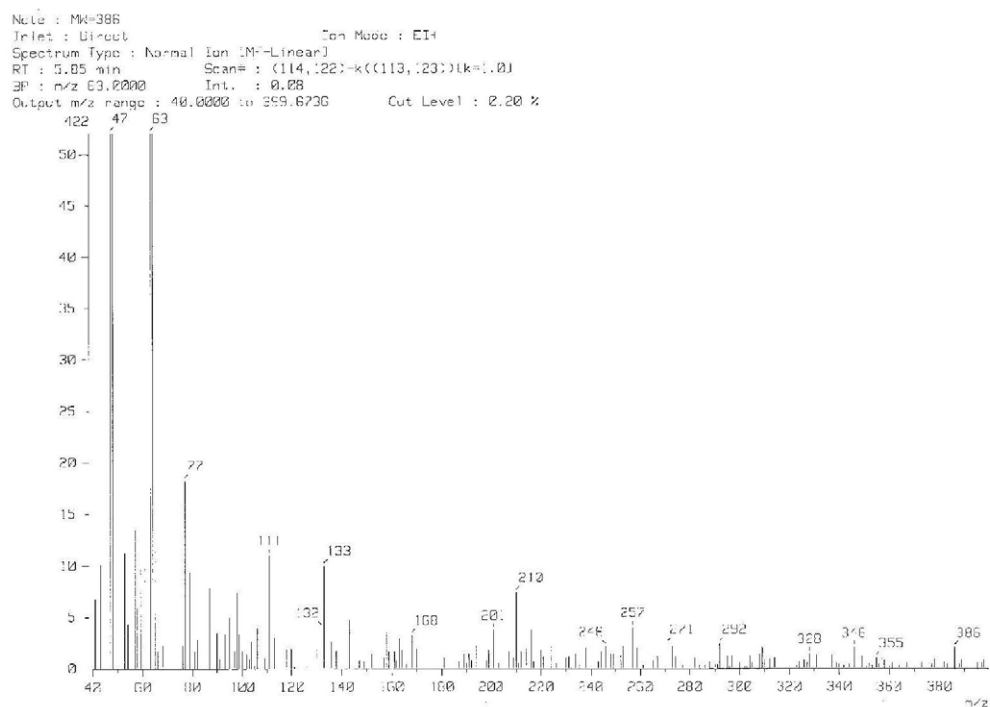


Figure S40. Mass spectrum of compound **4d**.

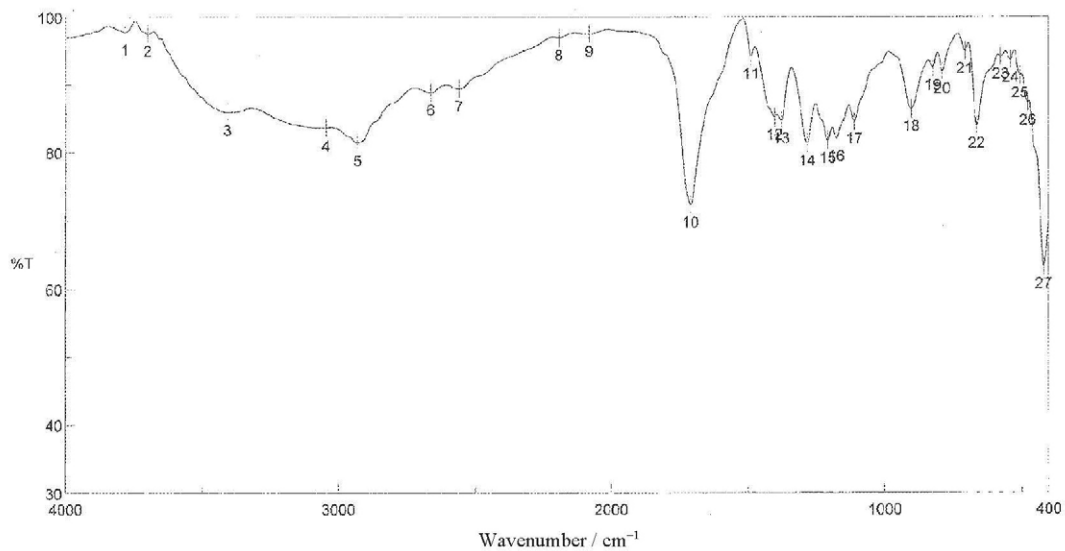


Figure S41. IR spectrum (KBr) of compound **4e**.

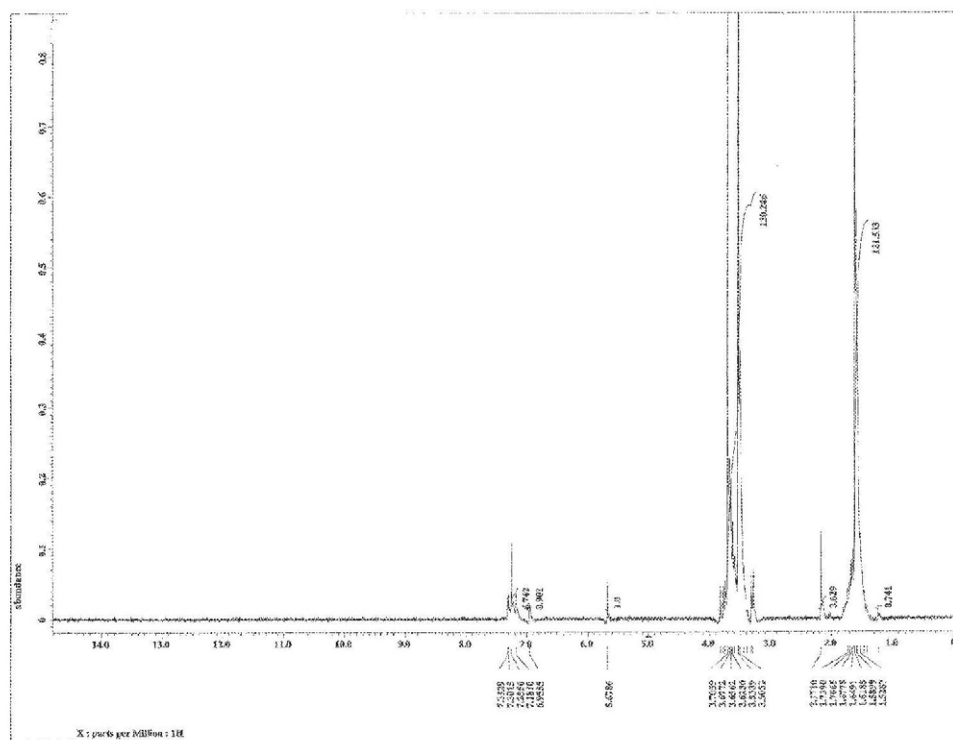


Figure S42. <sup>1</sup>H NMR spectrum (500 MHz, CDCl<sub>3</sub>) of compound 4e.

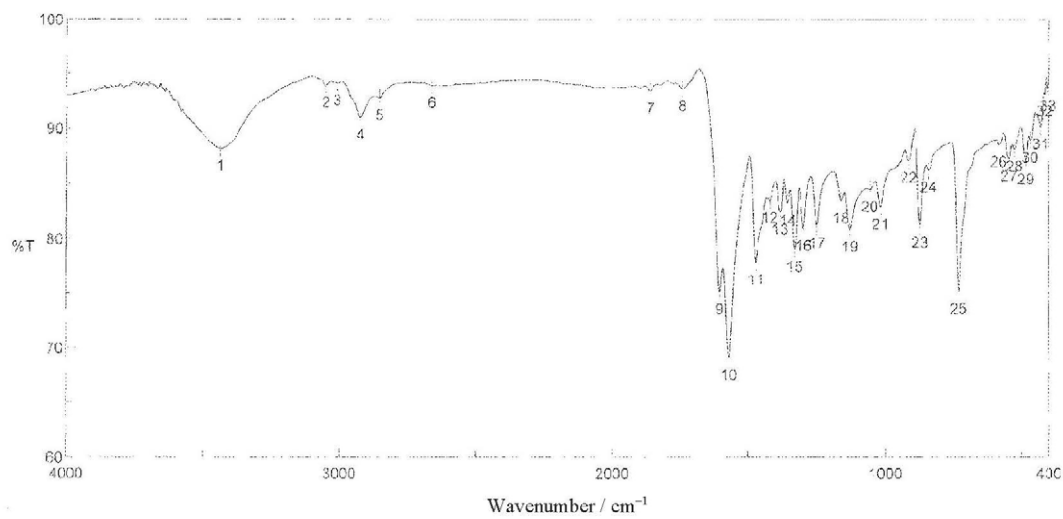


Figure S43. IR spectrum (KBr) of compound 5.

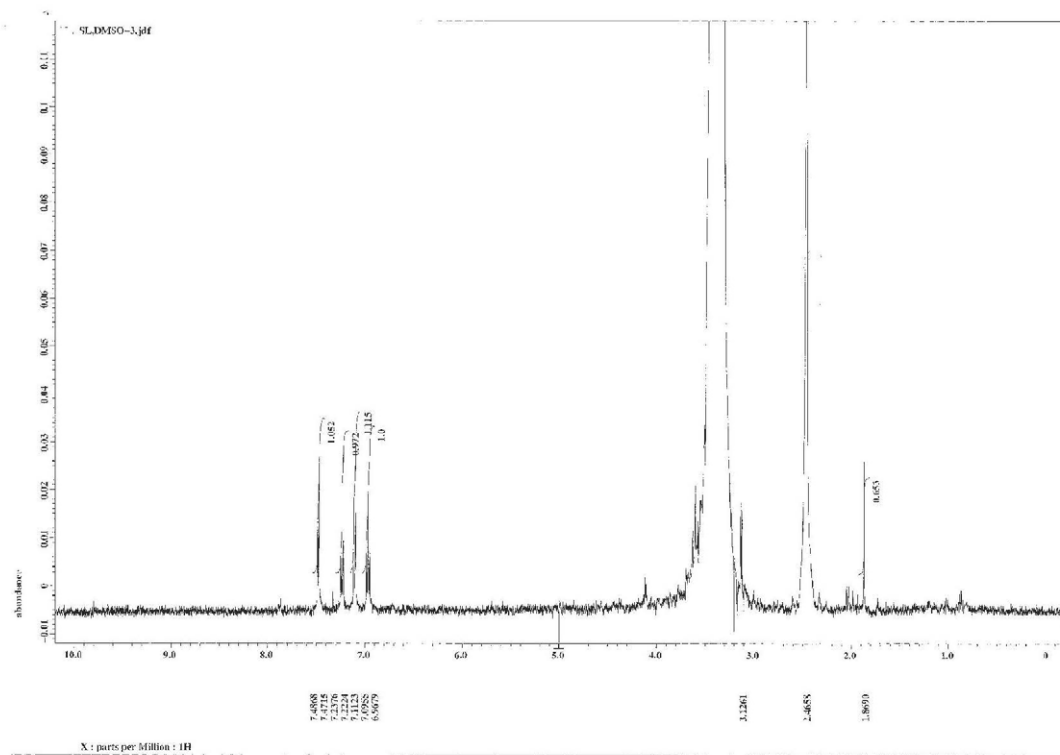


Figure S44.  $^1\text{H}$  NMR spectrum (500 MHz,  $\text{DMSO}-d_6$ ) of compound 5.

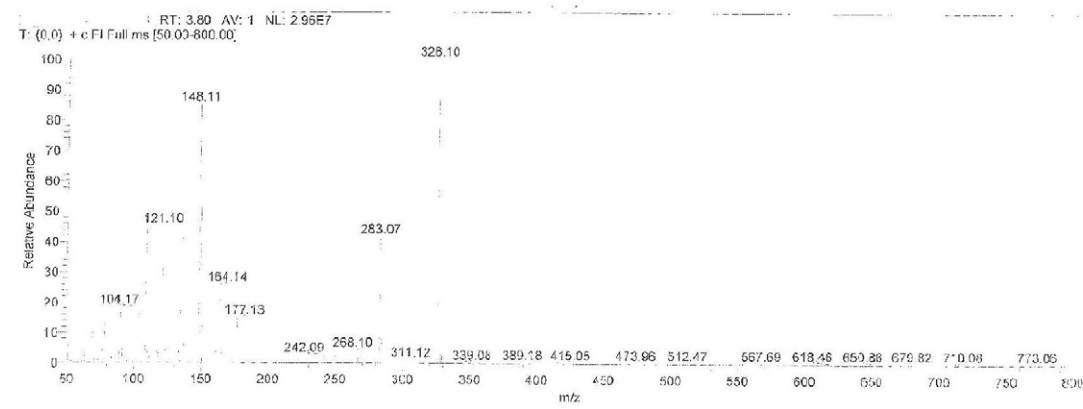


Figure S45. Mass spectrum of compound 5.

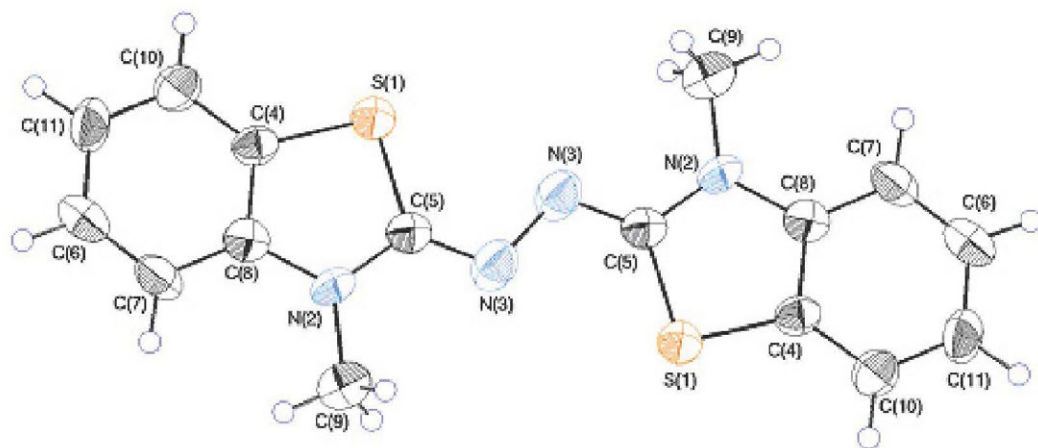


Figure S46. ORTEP overview of compound 5.

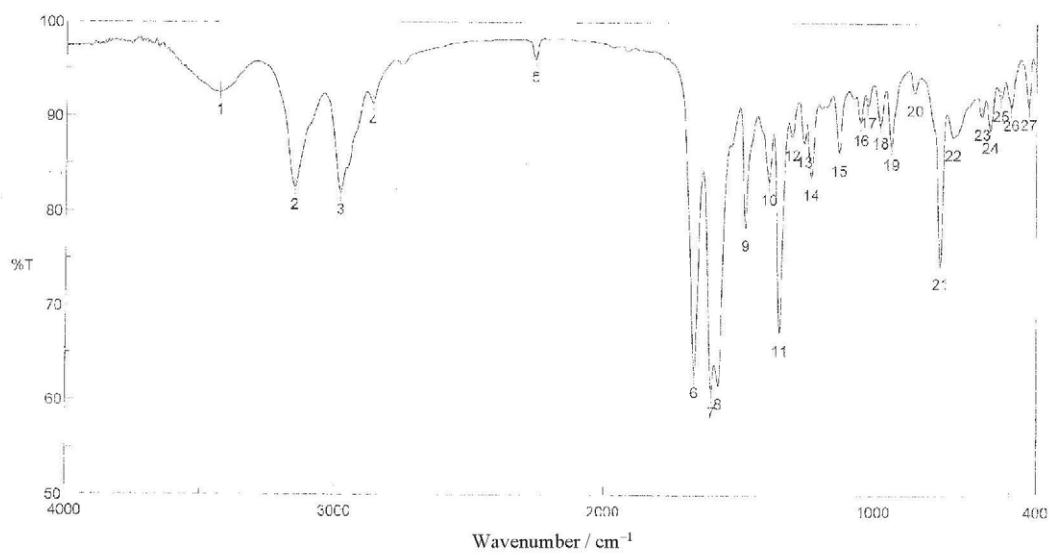


Figure S47. IR spectrum (KBr) of compound 6.



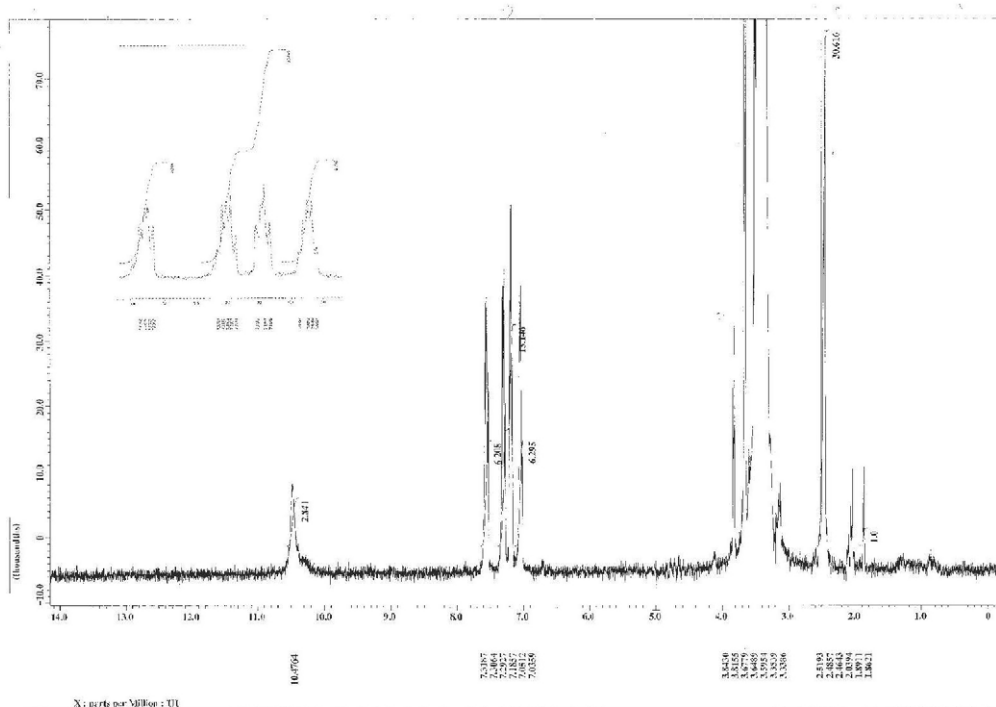


Figure S48.  $^1\text{H}$  NMR spectrum (500 MHz,  $\text{DMSO}-d_6$ ) of compound 6.

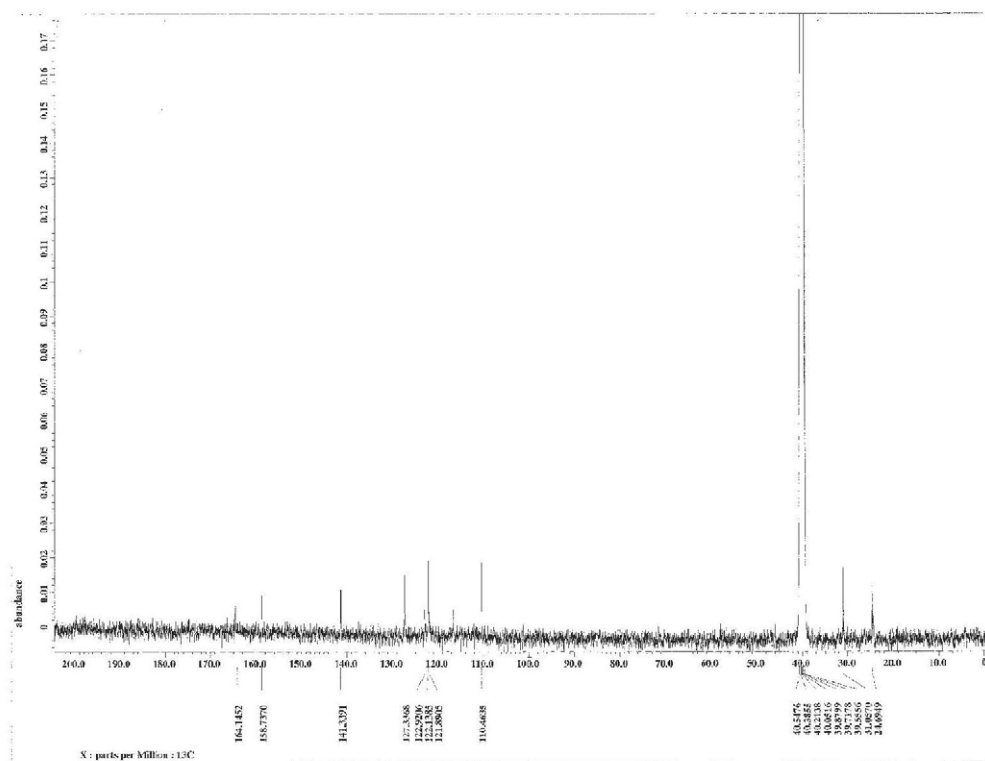


Figure S49.  $^{13}\text{C}$  NMR spectrum (125 MHz,  $\text{DMSO}-d_6$ ) of compound 6.

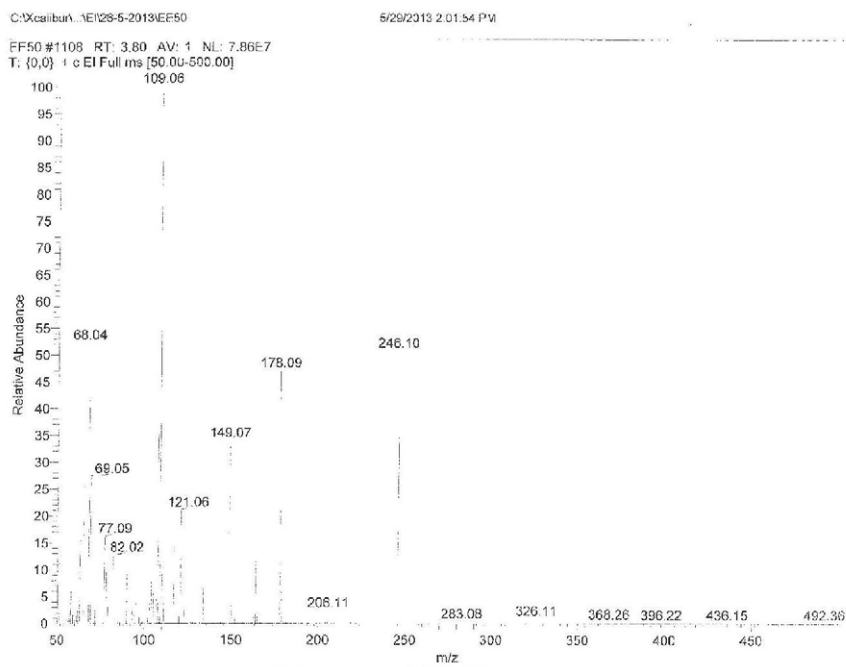


Figure S50. Mass spectrum of compound 6.

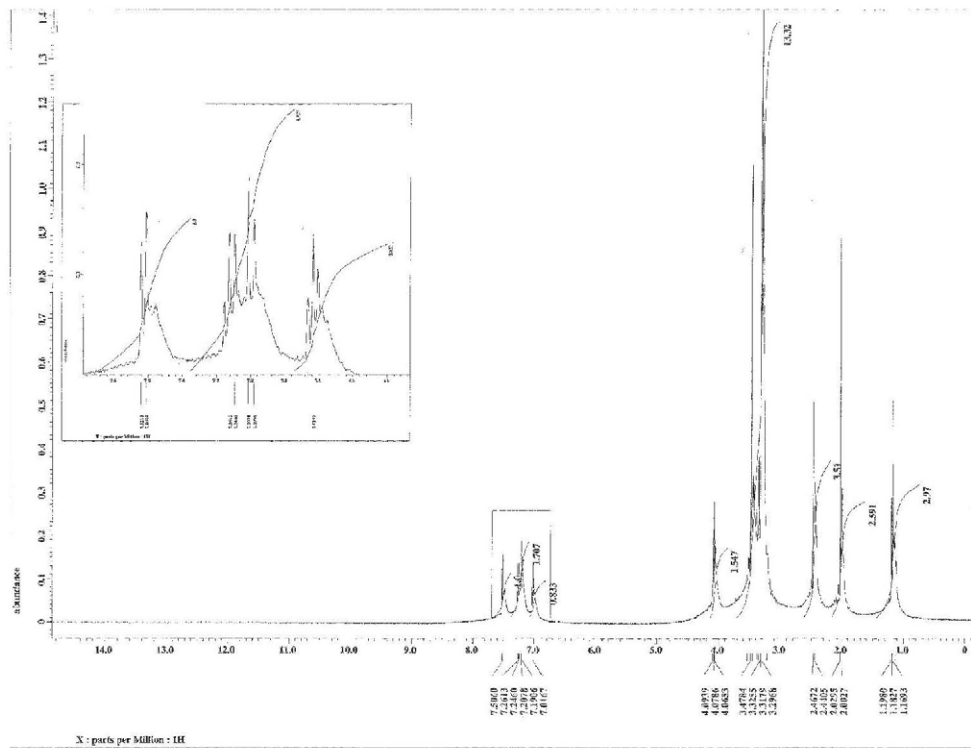


Figure S51. <sup>1</sup>H NMR spectrum (500 MHz, DMSO-*d*<sub>6</sub>) of compound 7.

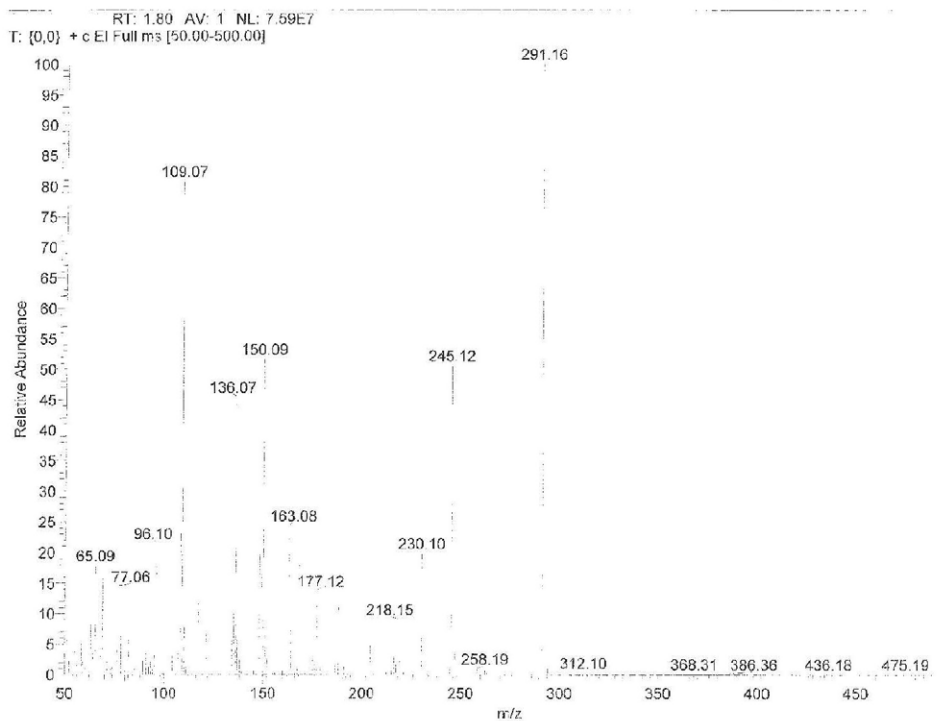


Figure S52. Mass spectrum of compound 7.

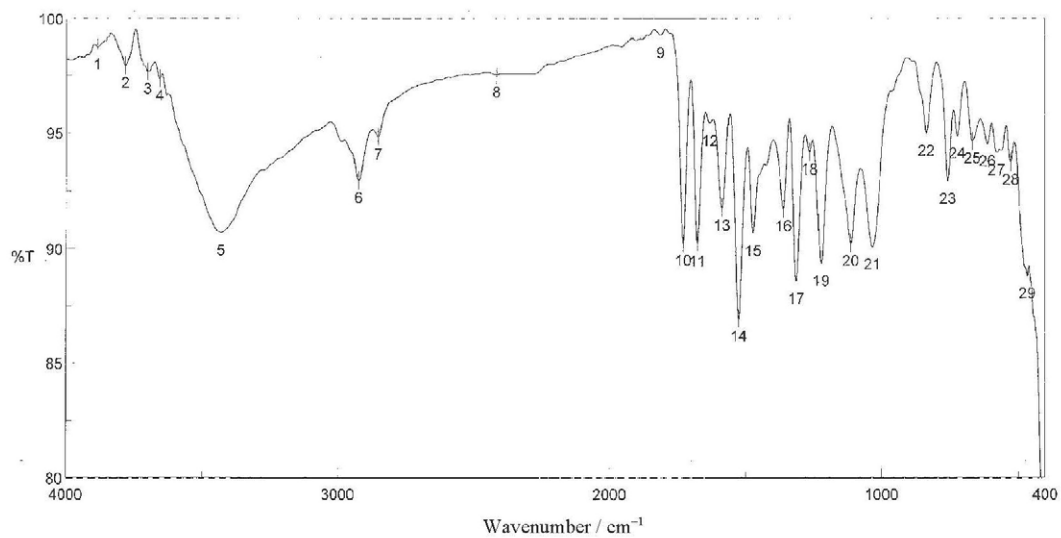


Figure S53. IR spectrum (KBr) of compound 8.

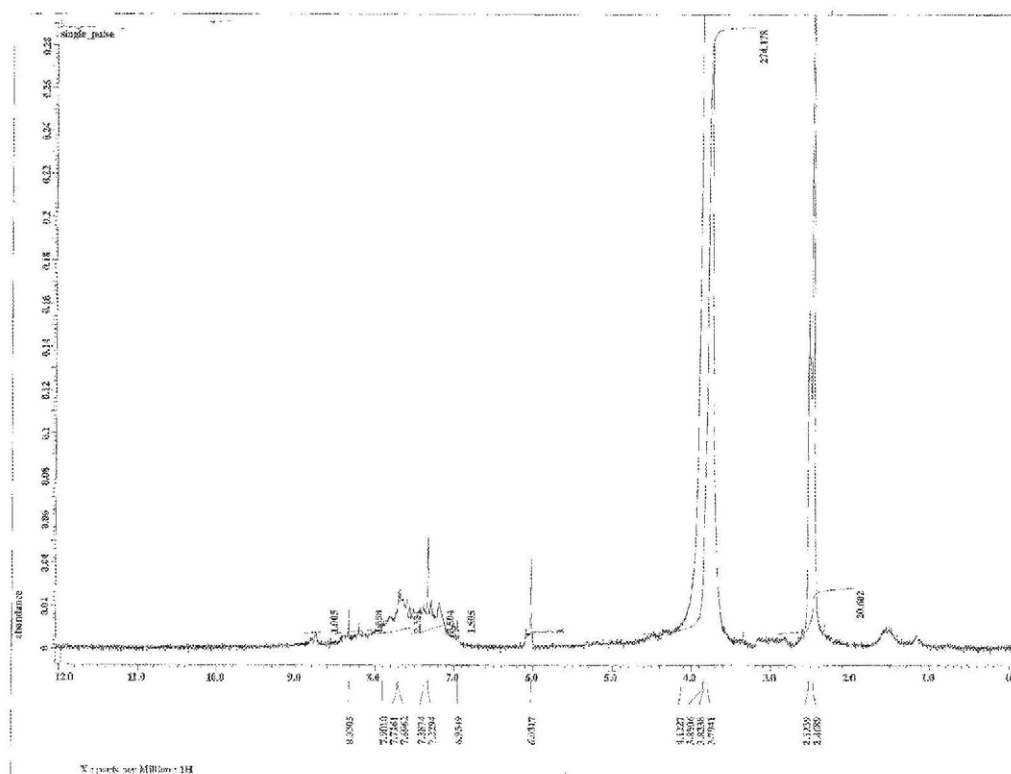


Figure S54.  $^1\text{H}$  NMR spectrum (500 MHz,  $\text{DMSO}-d_6$ ) of compound **8**.

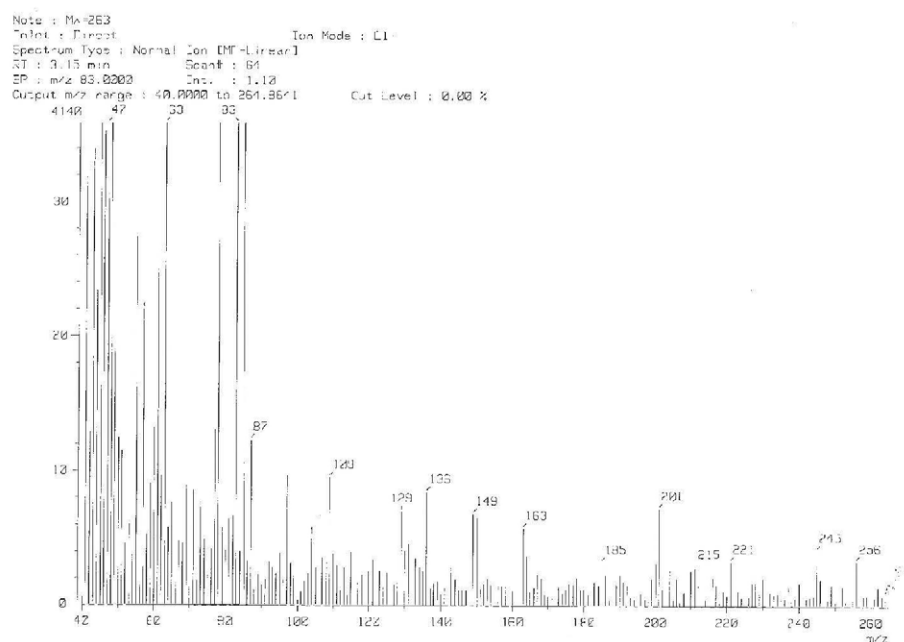
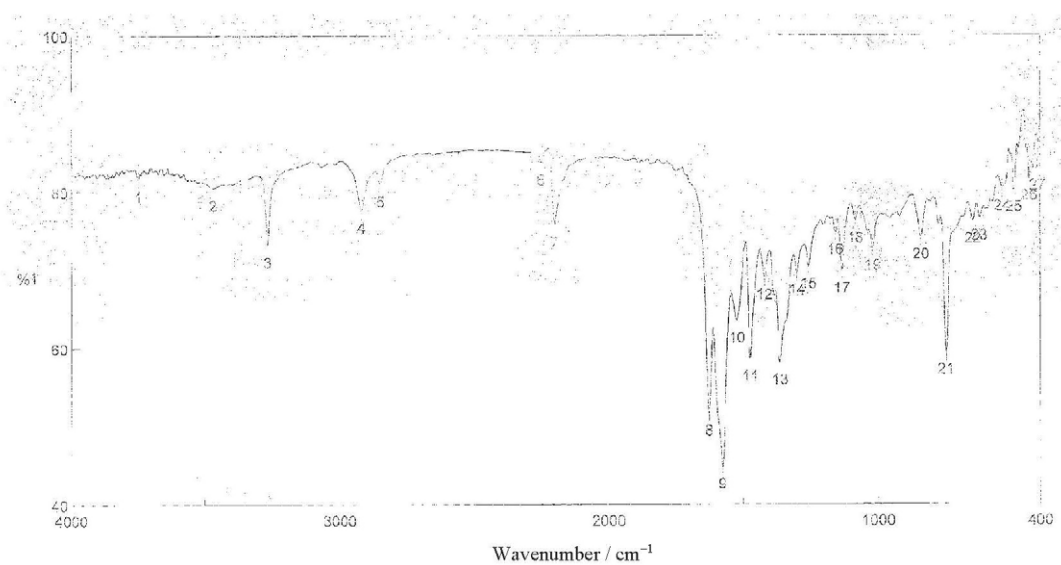
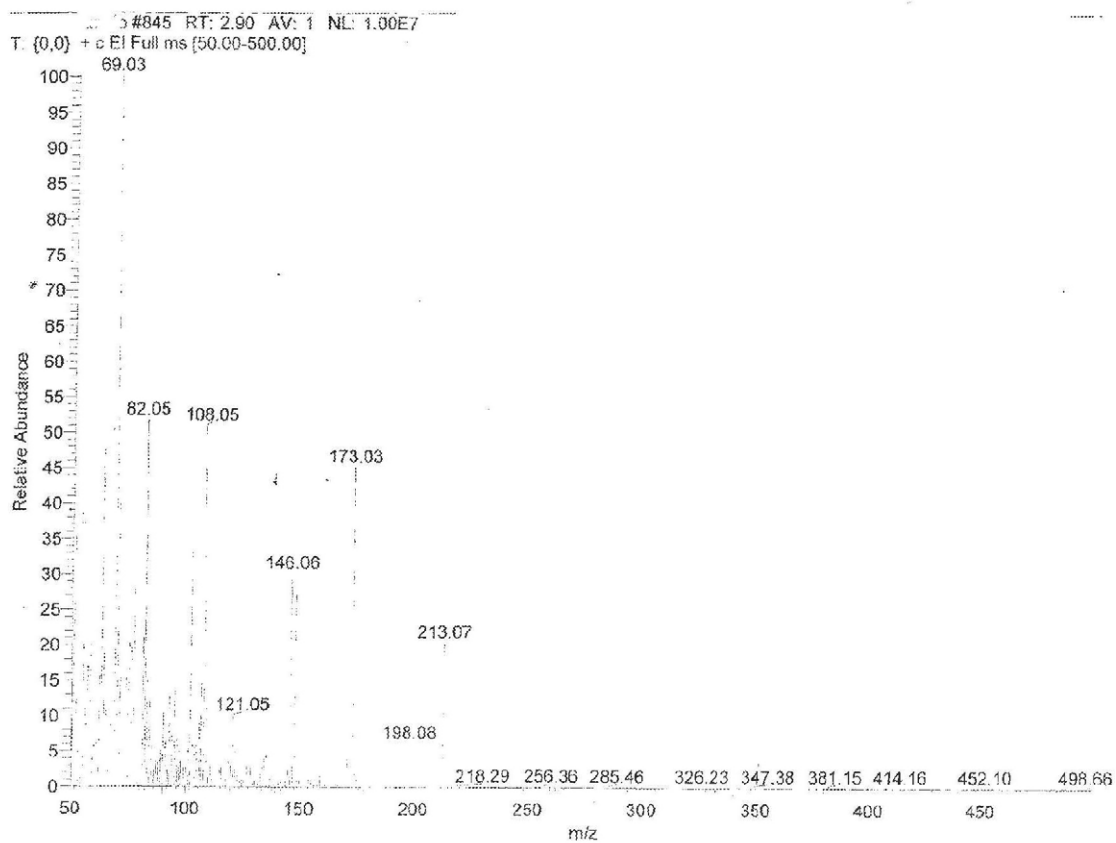


Figure S55. Mass spectrum of compound **8**.

**Figure S56.** IR spectrum (KBr) of compound **9**.**Figure S57.** Mass spectrum of compound **9**.

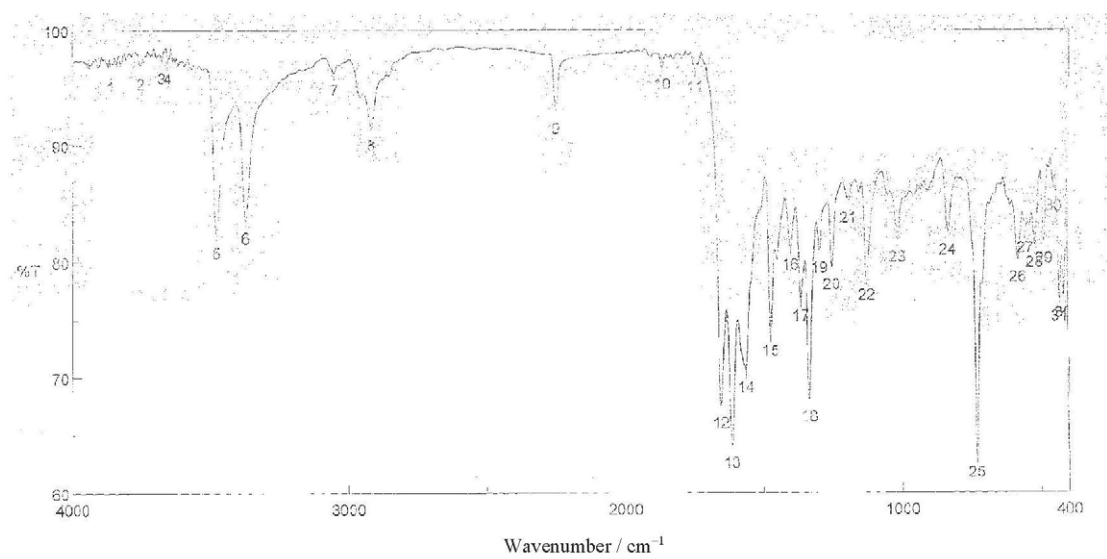


Figure S58. IR spectrum (KBr) of compound 10.

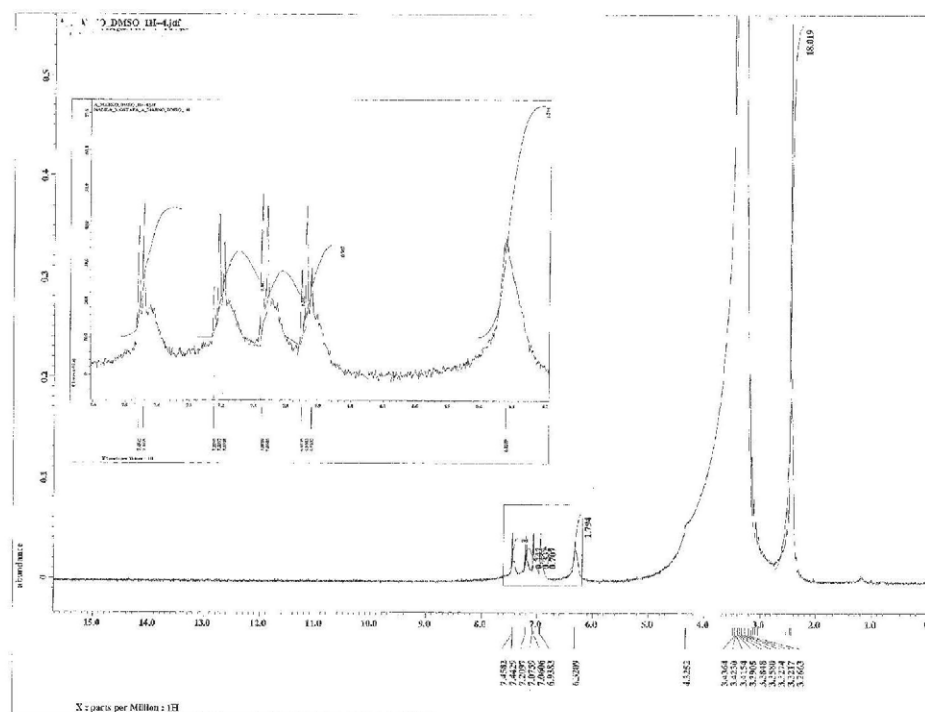


Figure S59. <sup>1</sup>H NMR spectrum (500 MHz, DMSO-*d*<sub>6</sub>) of compound 10.

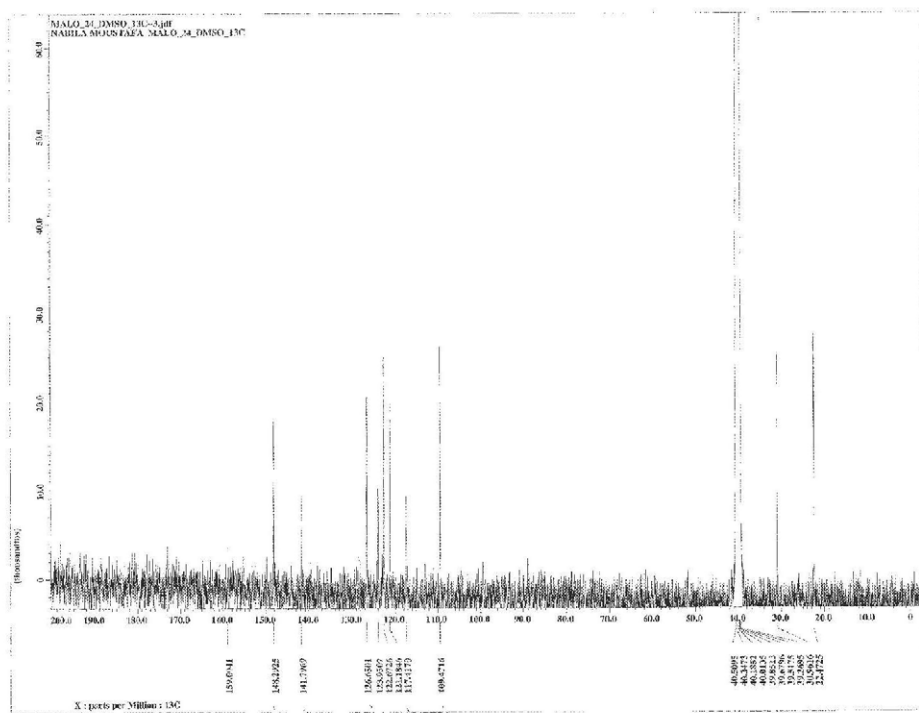


Figure S60. <sup>13</sup>C NMR spectrum (125 MHz, DMSO-*d*<sub>6</sub>) of compound 10.

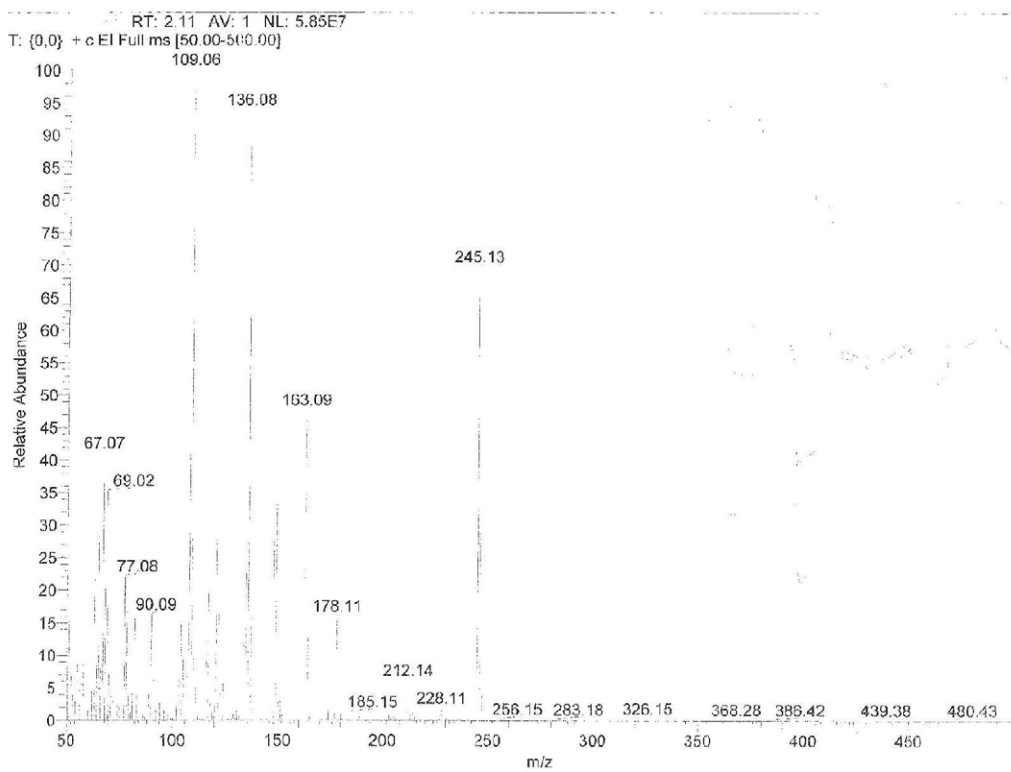


Figure S61. Mass spectrum of compound 10.