

## Supplementary Material

### Cascade reactions between 2-substituted-3-(4-oxo-4H-chromen-3-yl)acrylonitriles with benzylamine and *p*-toluidine

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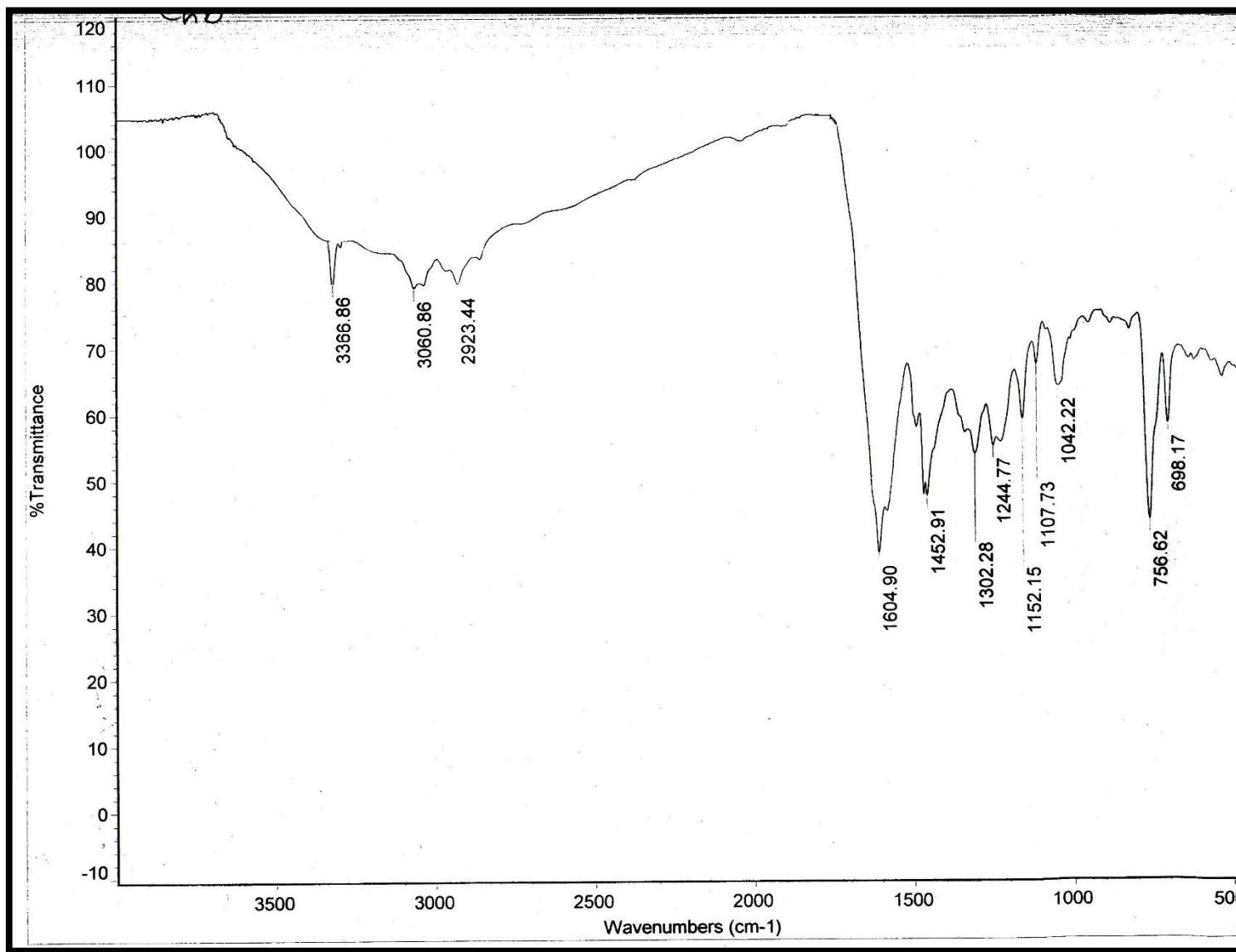
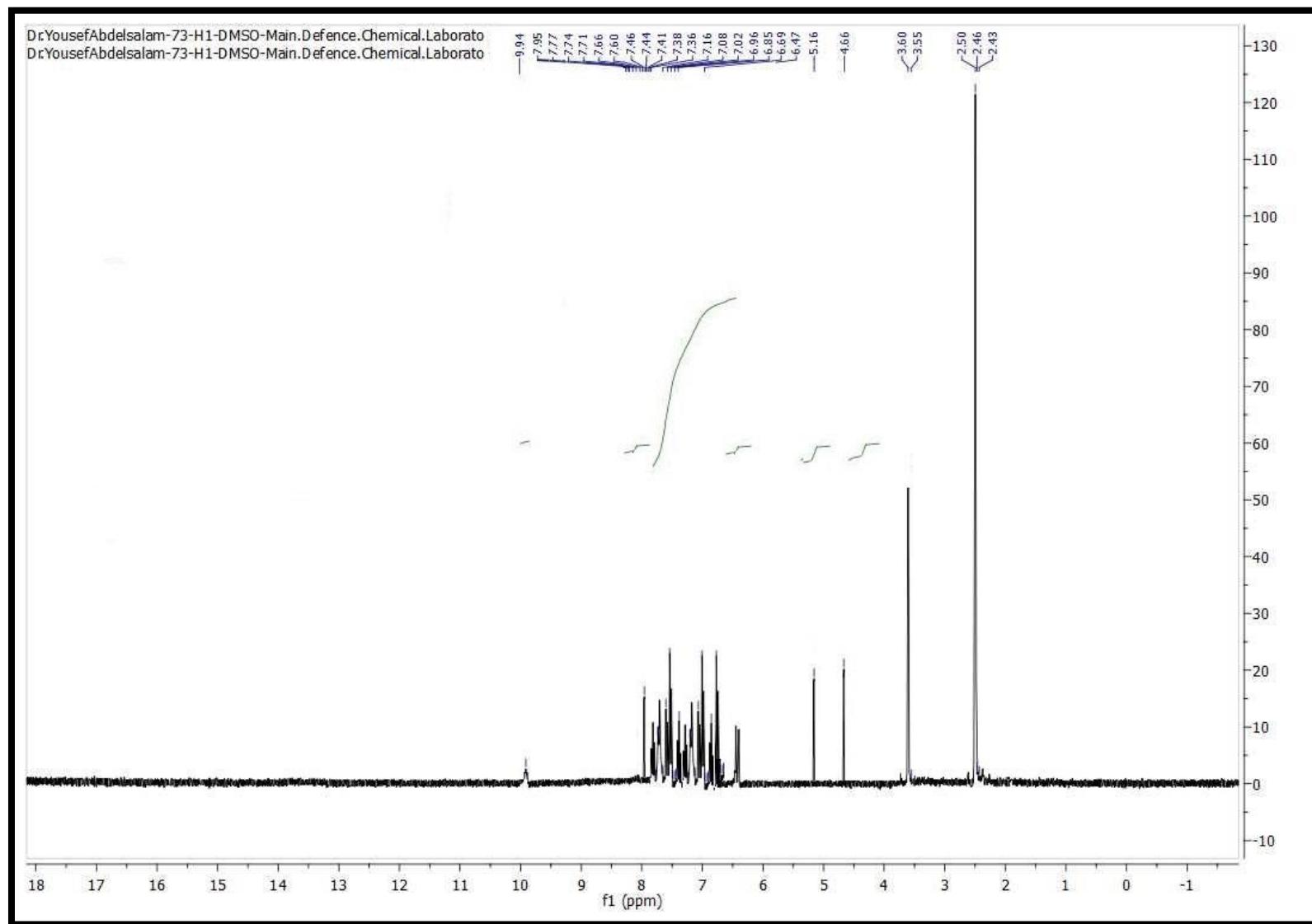


Figure 1. IR spectrum of compound 5



**Figure 2.**  $^1\text{H}$  NMR spectrum of compound 5

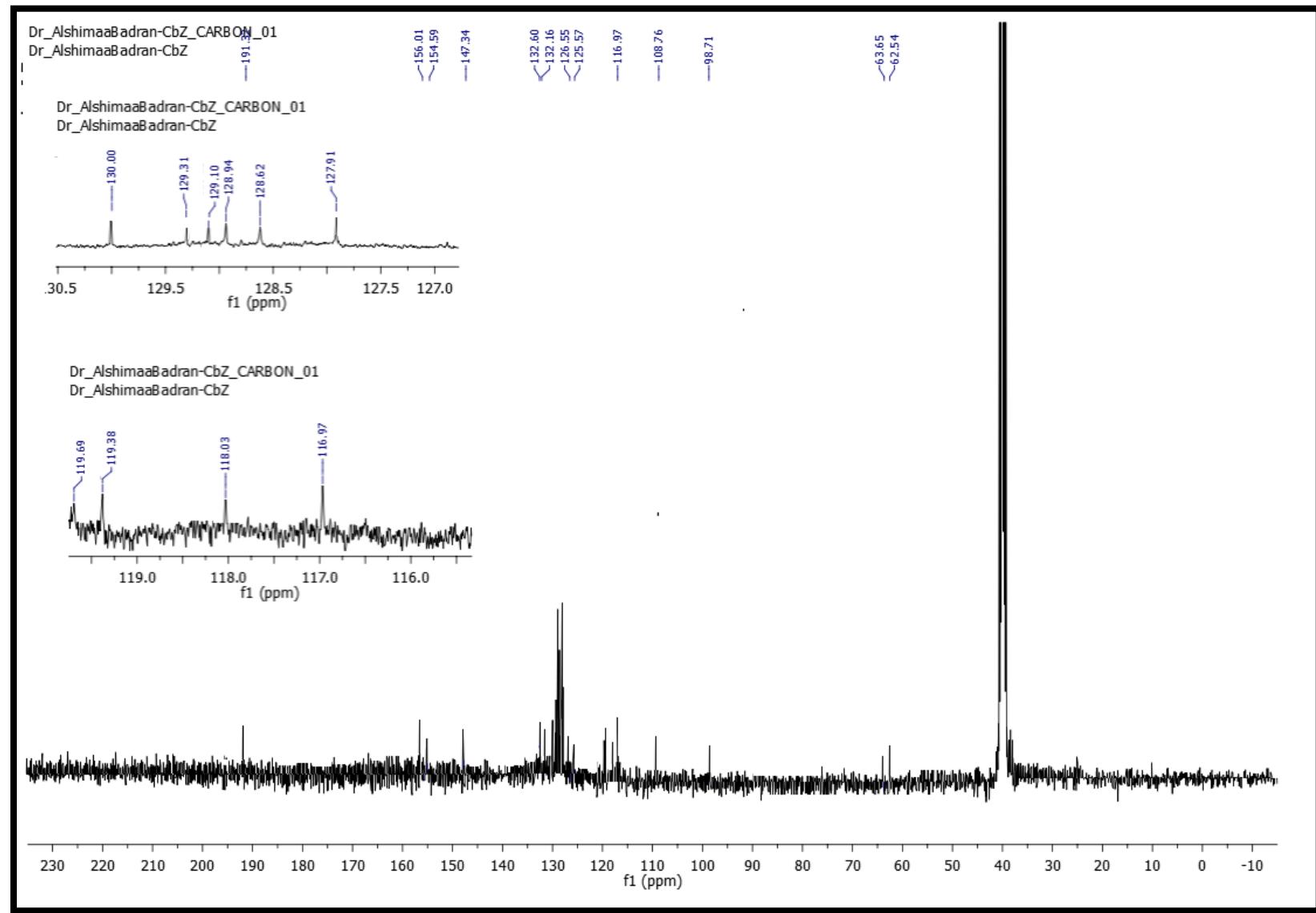


Figure 3.  $^{13}\text{C}$  NMR spectrum of compound 5

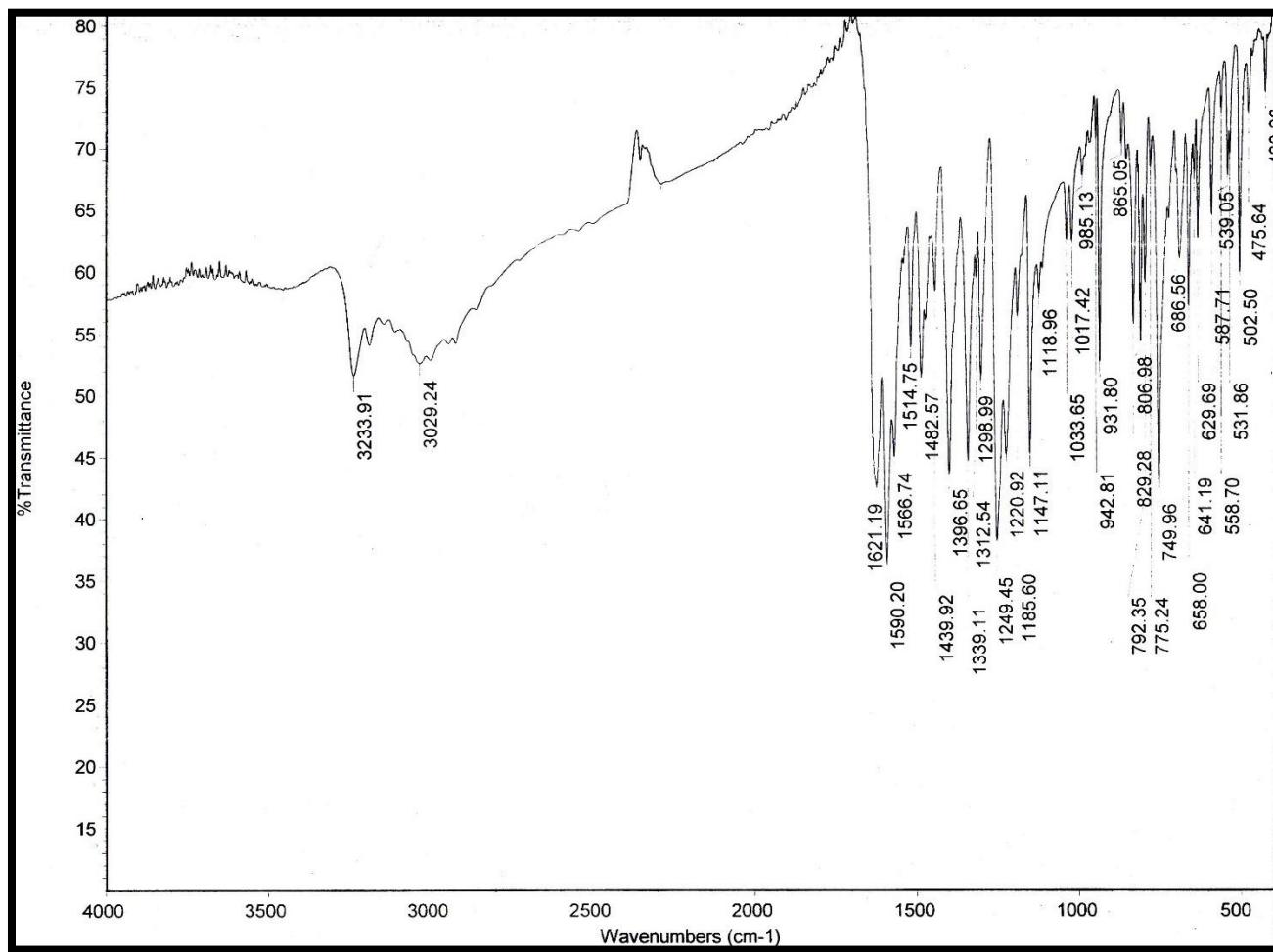
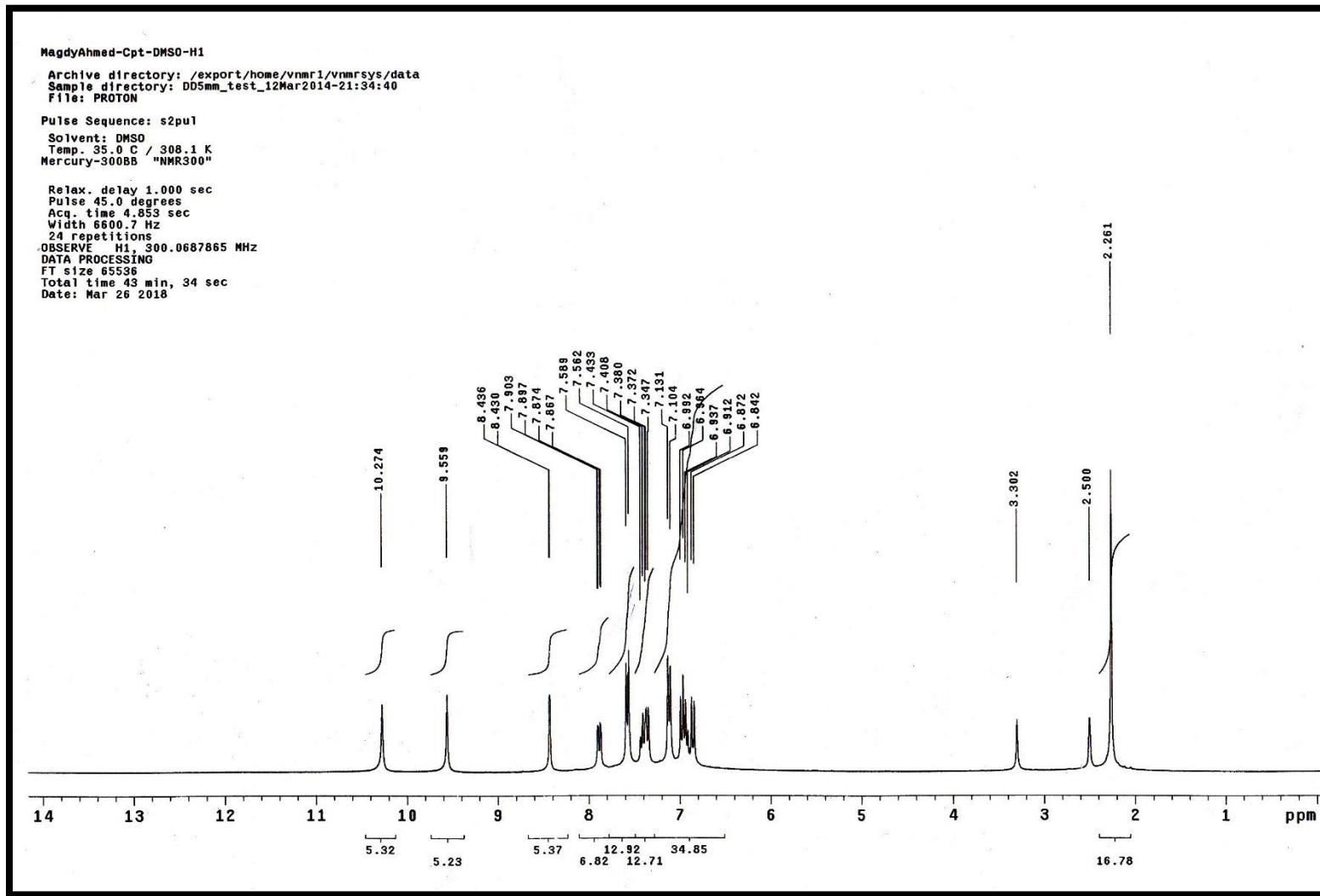


Figure 4. IR spectrum of compound 6

Figure 5.  $^1\text{H}$  NMR spectrum of compound 6

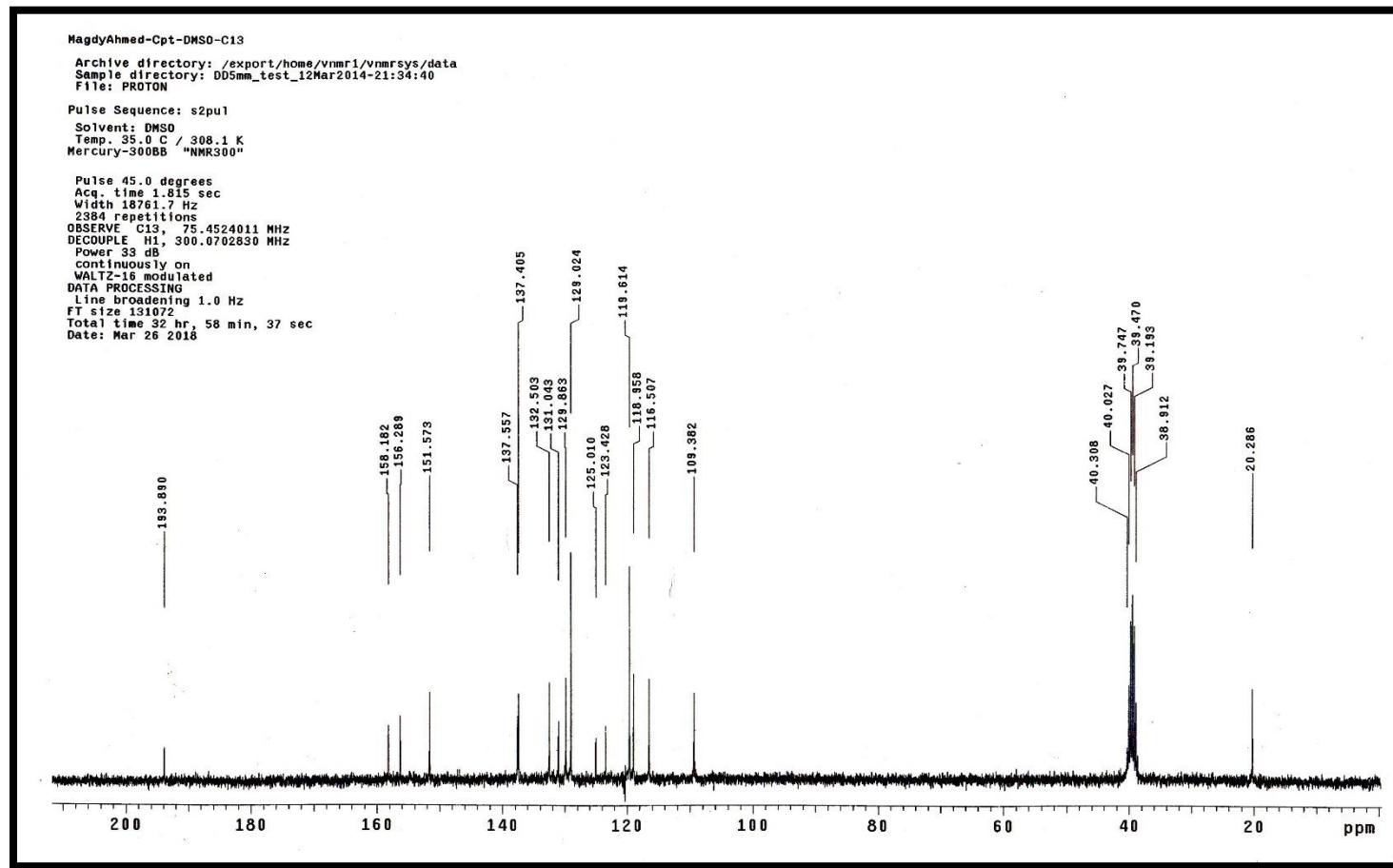


Figure 6.  $^{13}\text{C}$  NMR spectrum of compound 6

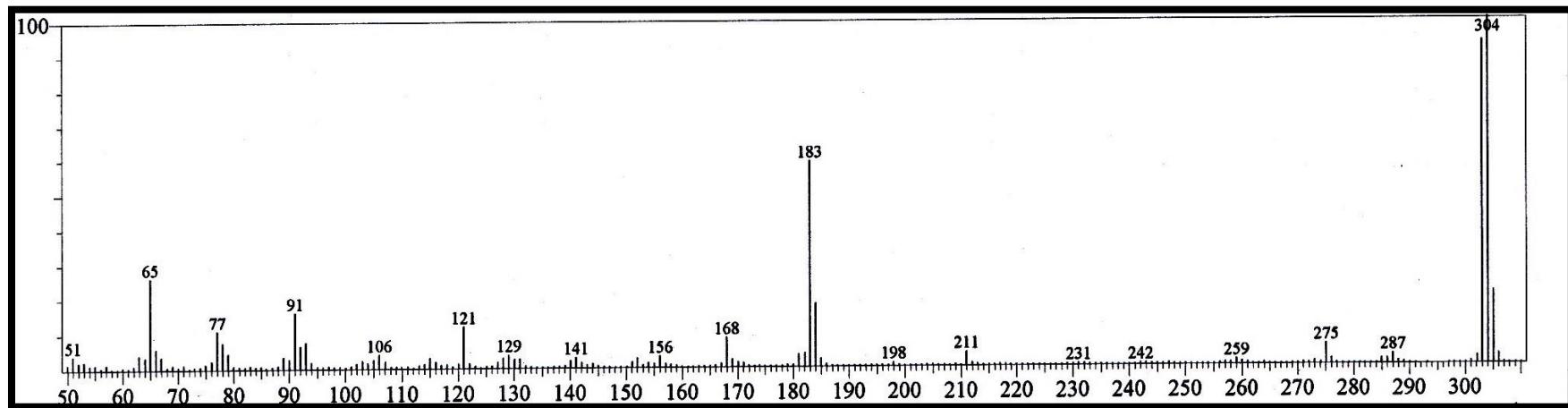


Figure 7. Mass spectrum of compound 6

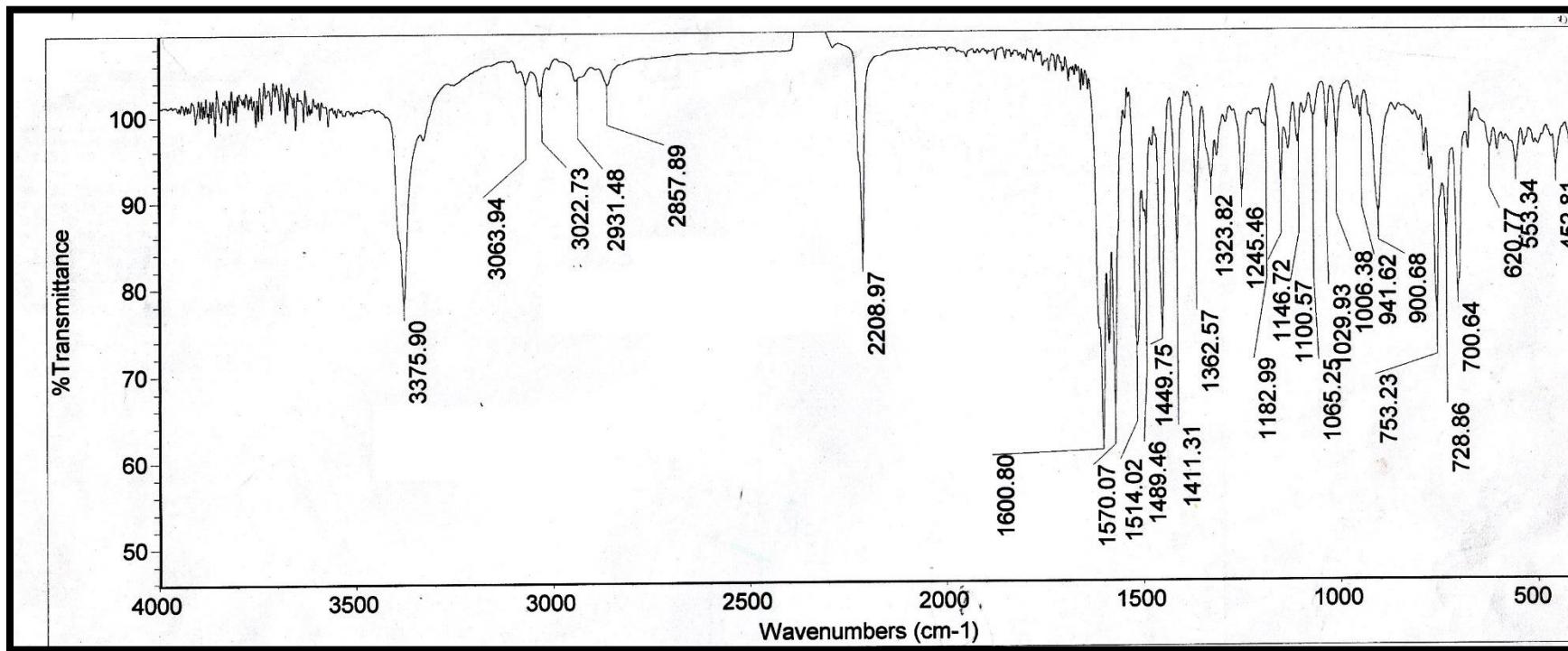


Figure 8. IR spectrum of compound 7

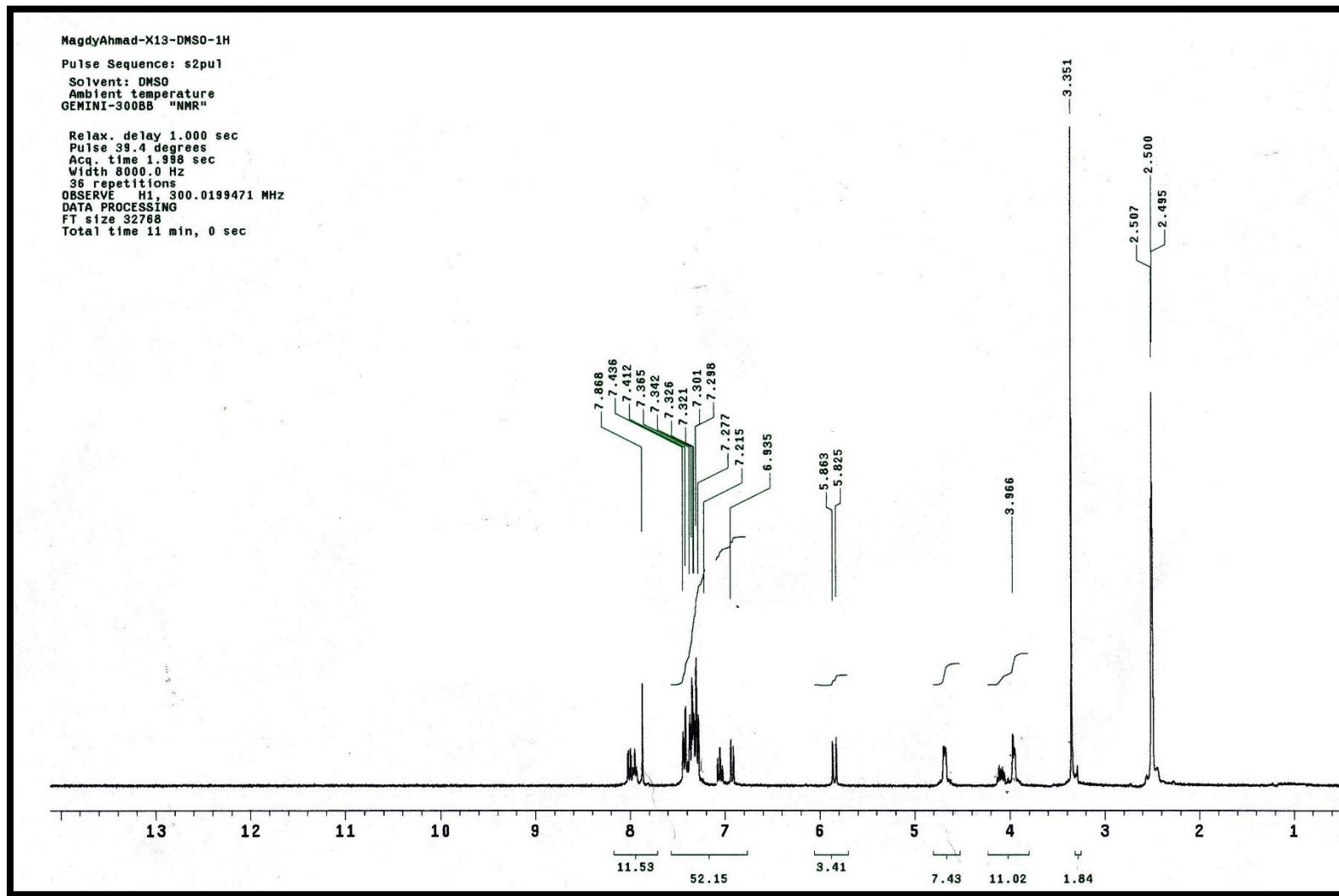


Figure 9.  $^1\text{H}$  NMR spectrum of compound 7 (DMSO)

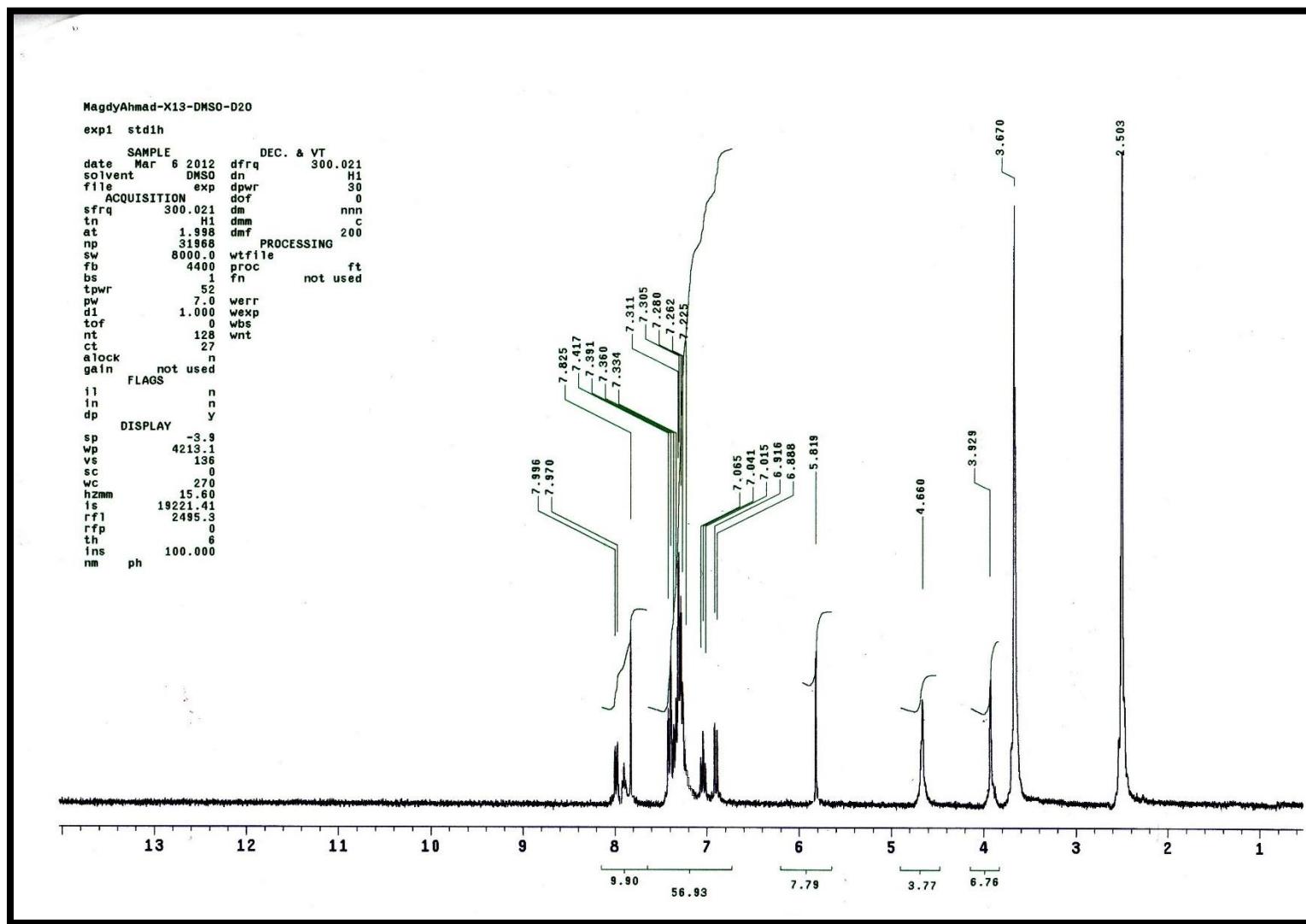


Figure 10.  $^1\text{H}$  NMR spectrum of compound 7 (DMSO+  $\text{D}_2\text{O}$ )

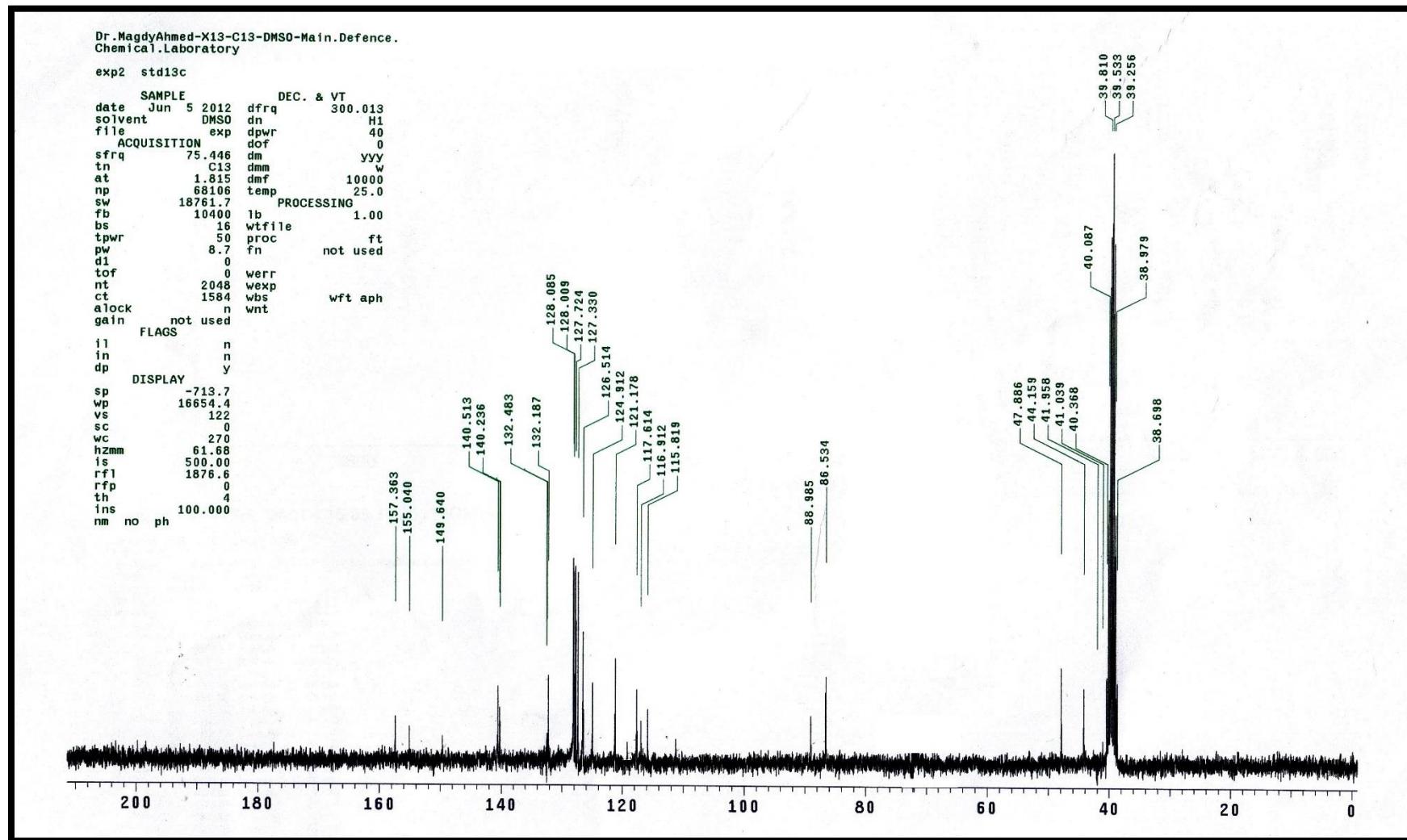


Figure 11.  $^{13}\text{C}$  NMR spectrum of compound 7

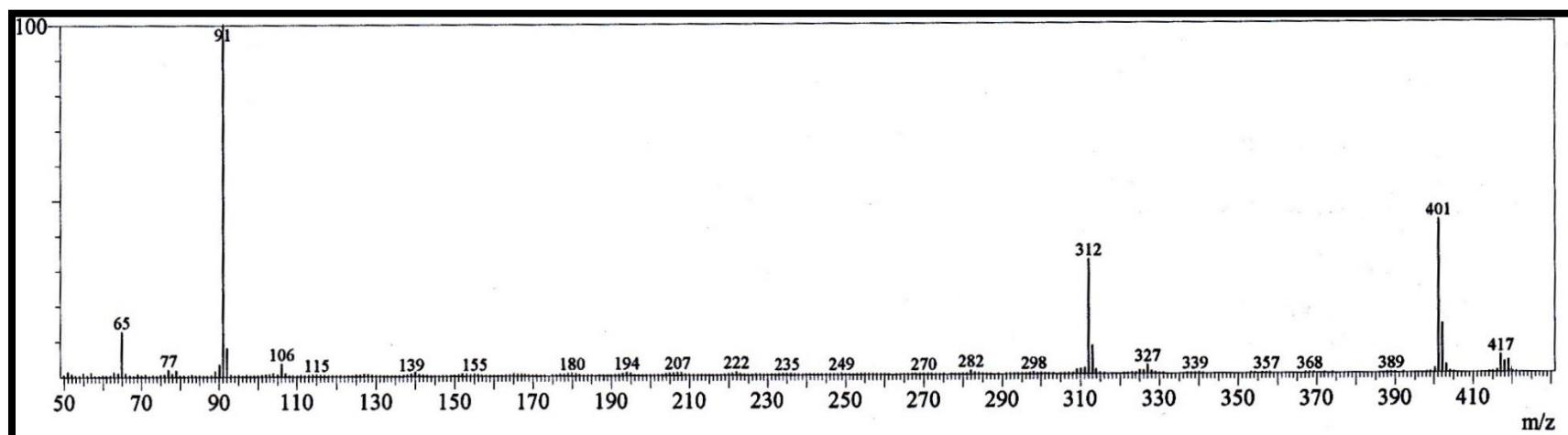


Figure 12. Mass spectrum of compound 7

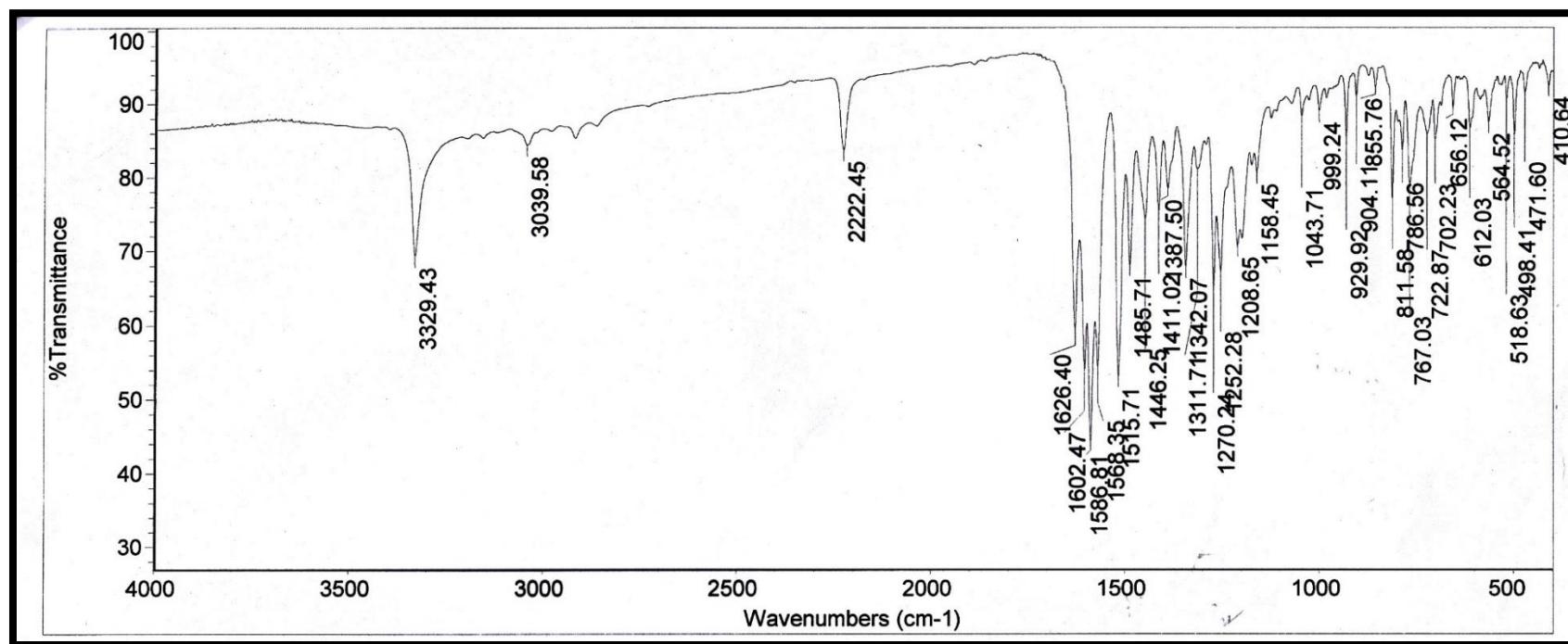


Figure 13. IR spectrum of compound 8

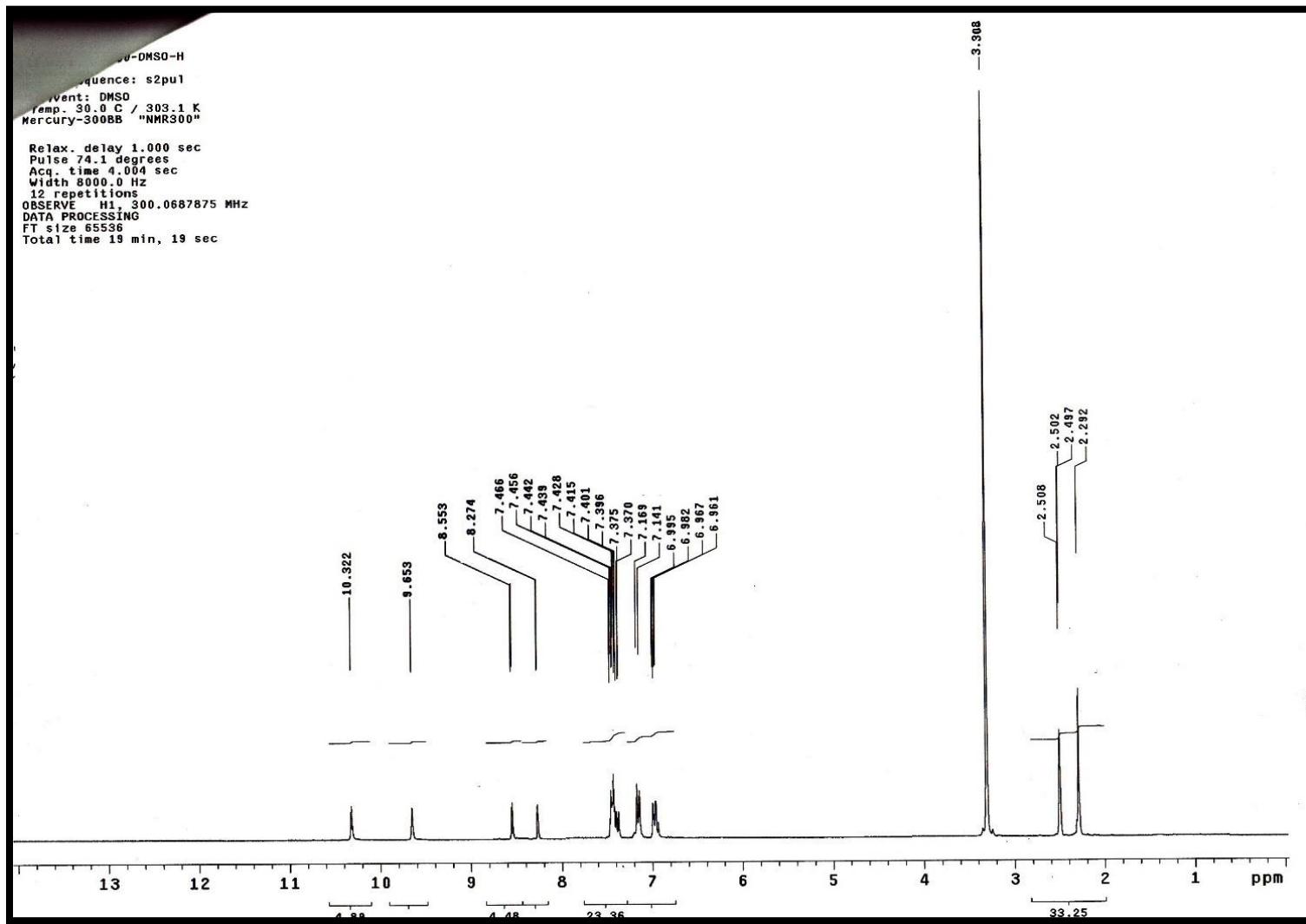


Figure 14. <sup>1</sup>H NMR spectrum of compound 8

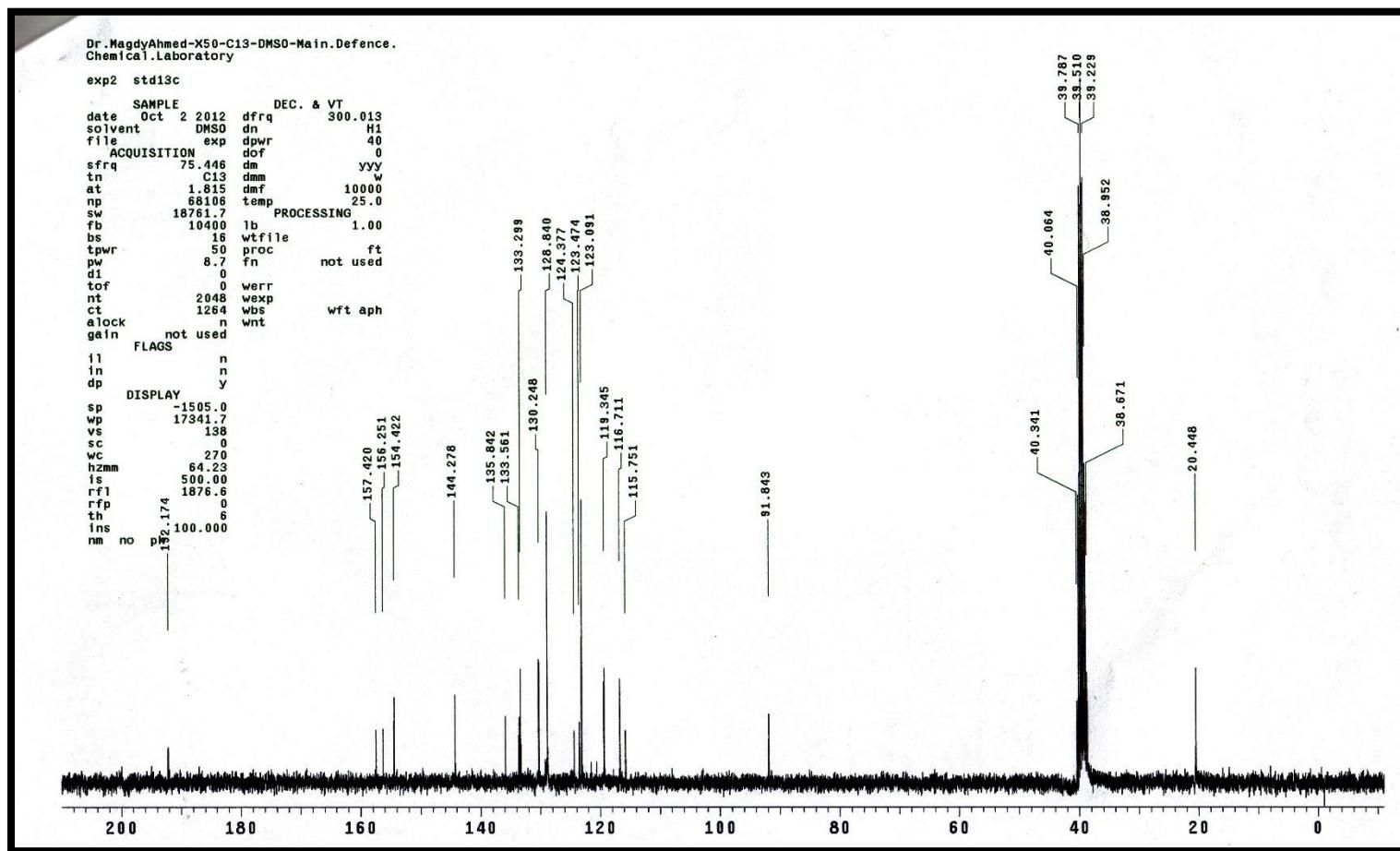


Figure 15.  $^{13}\text{C}$  NMR spectrum of compound 8

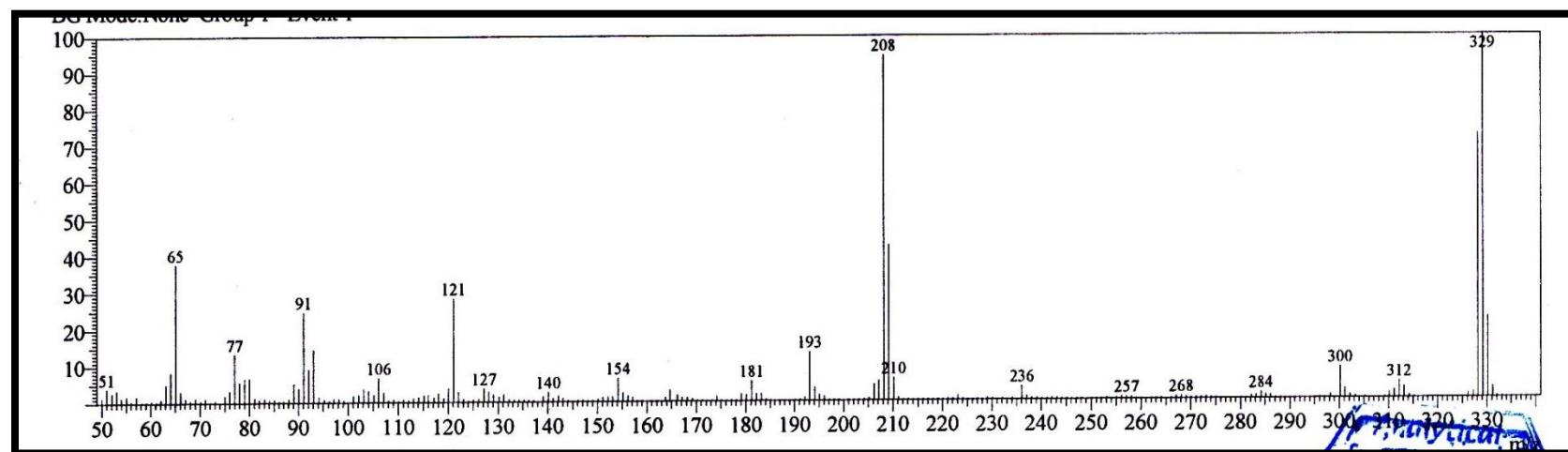


Figure 16. Mass spectrum of compound 8

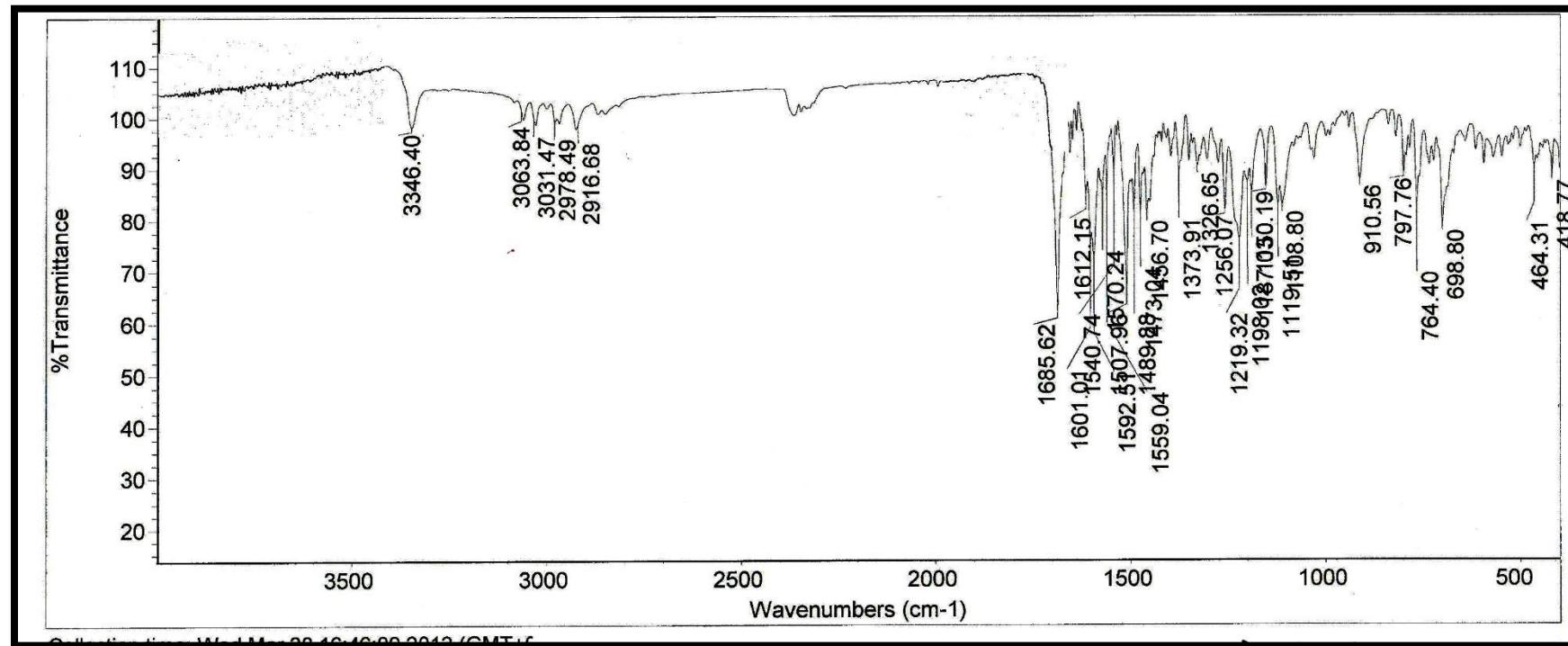
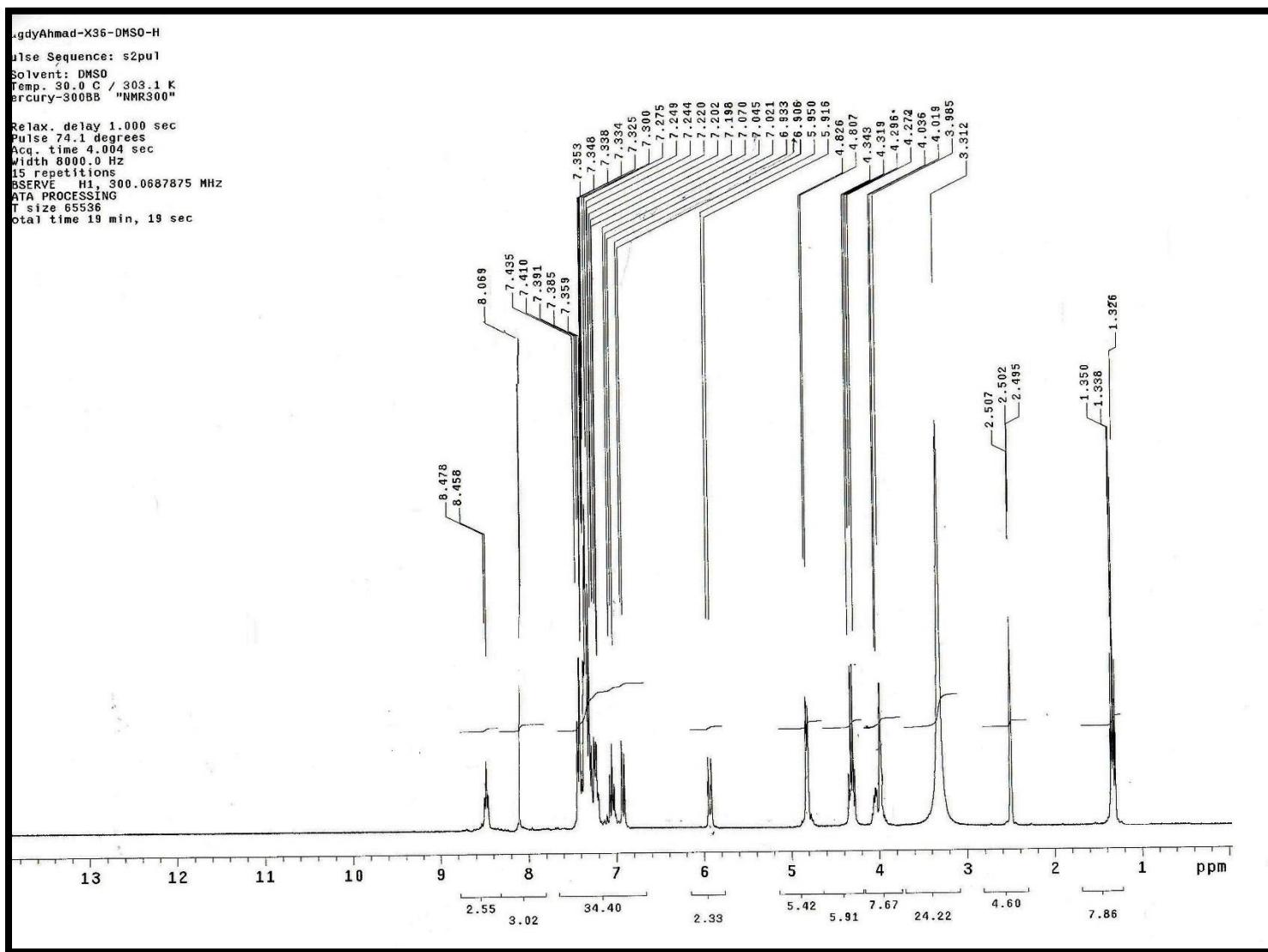


Figure 17. IR spectrum of compound 9



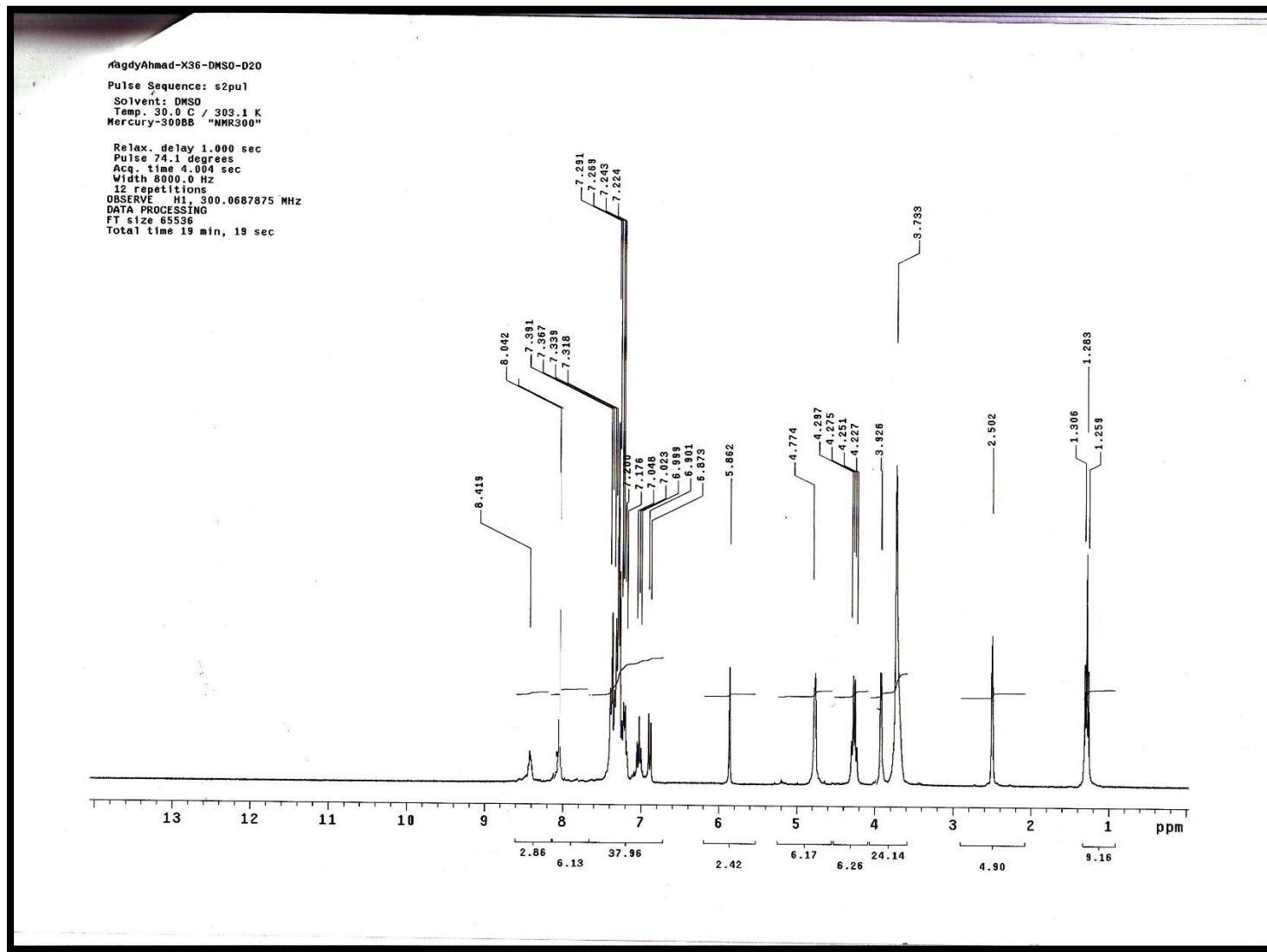


Figure 19. <sup>1</sup>H NMR spectrum of compound 9 (DMSO+ D<sub>2</sub>O)

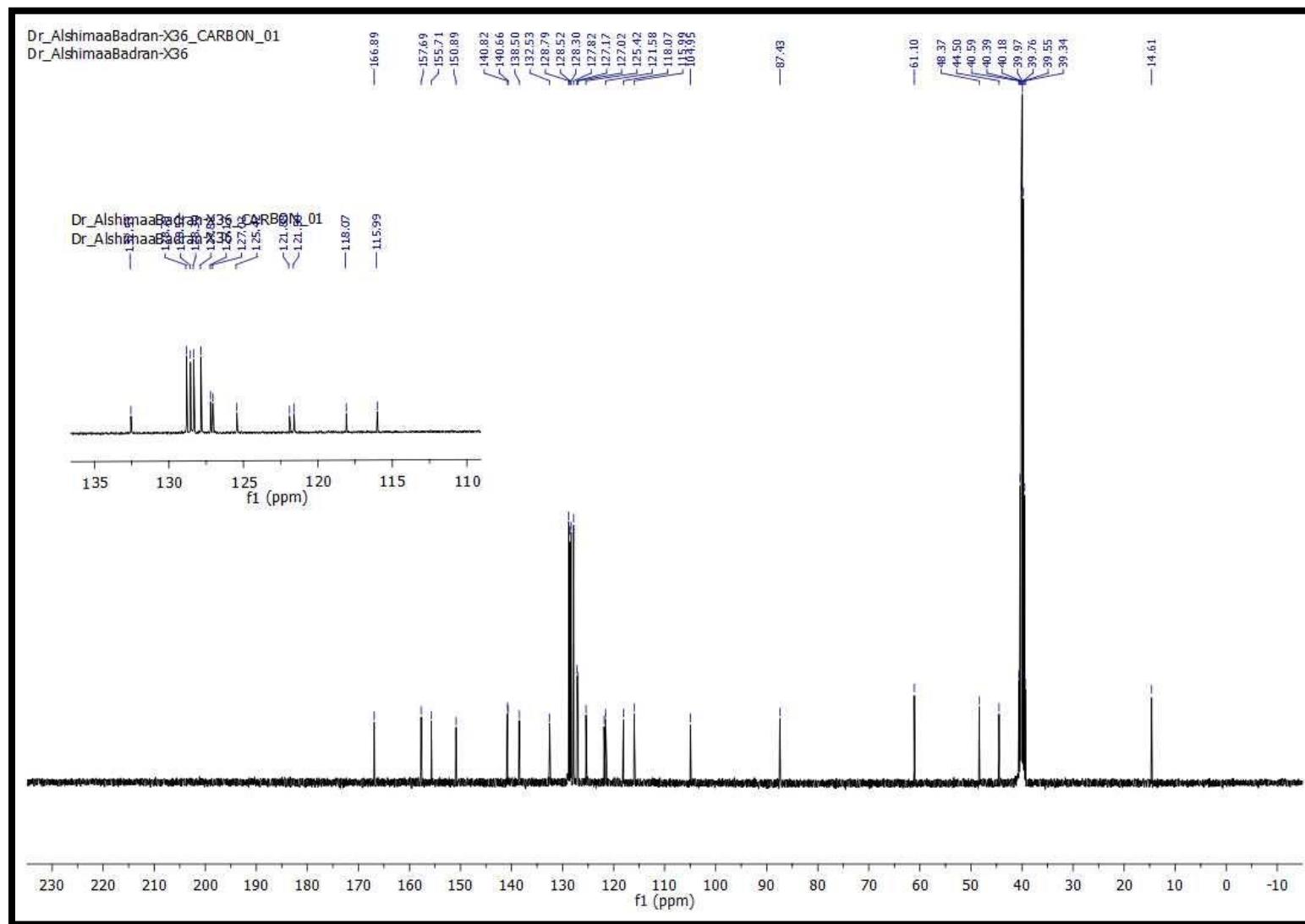
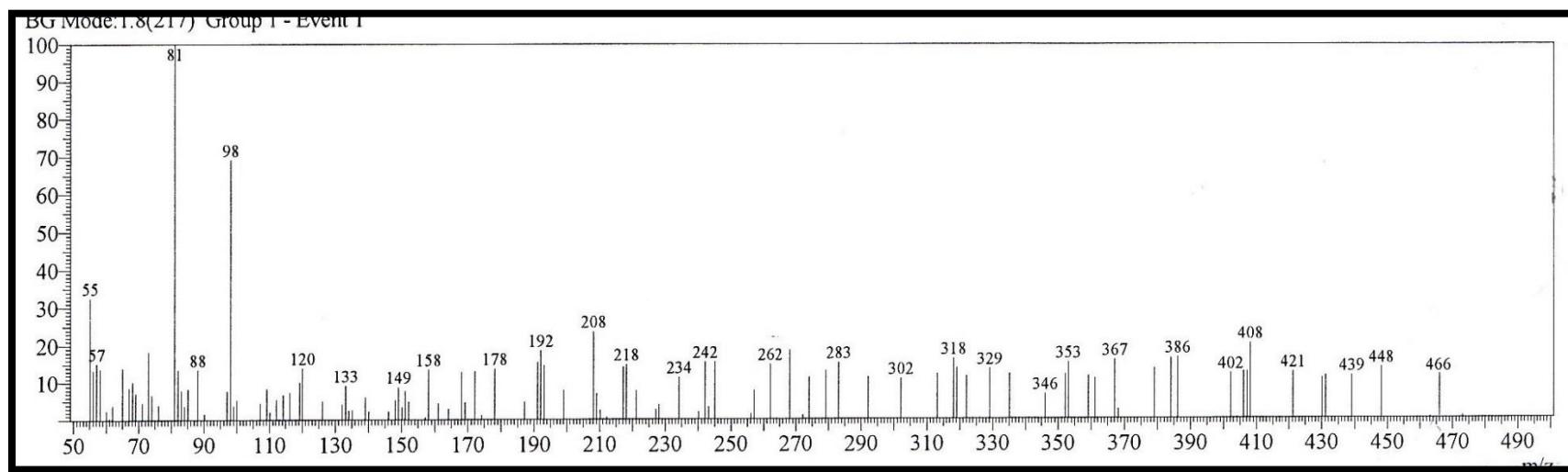


Figure 20. <sup>13</sup>C NMR spectrum of compound 9



**Figure 21. Mass spectrum of compound 9**

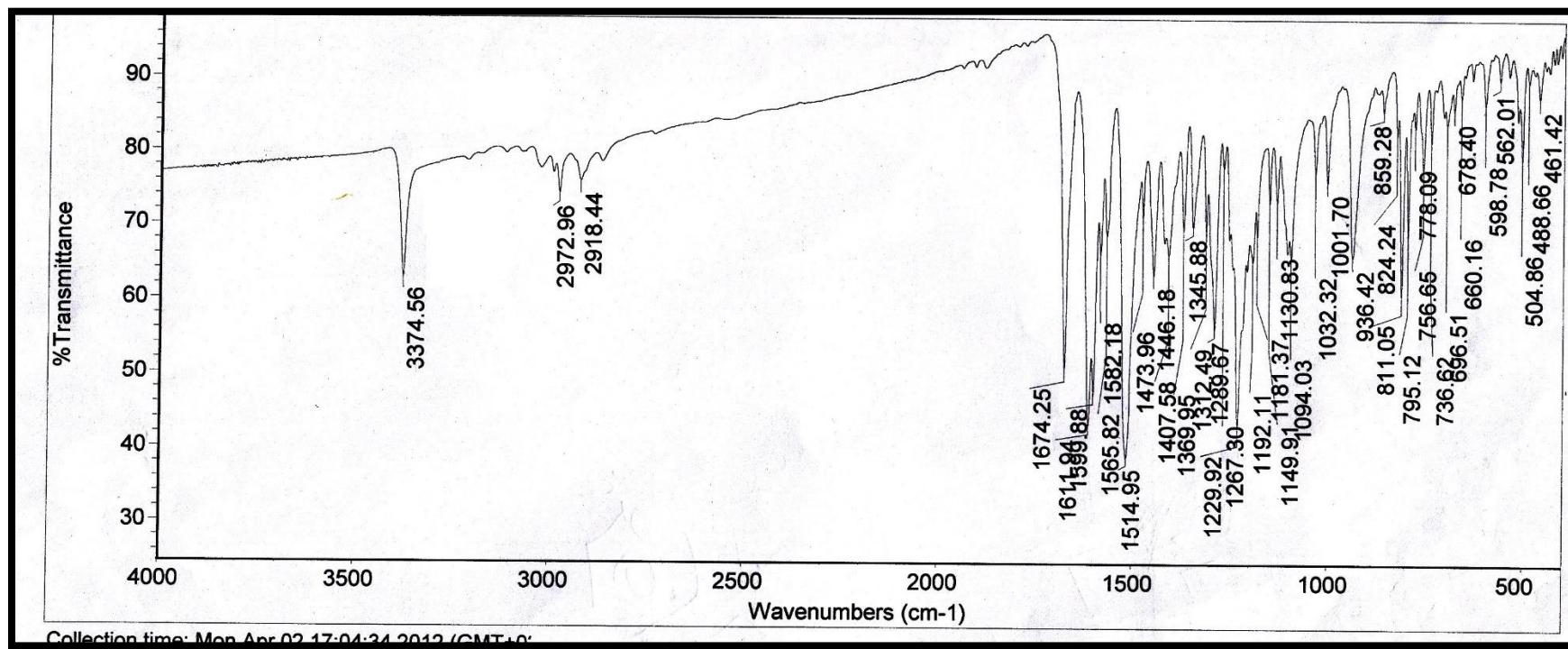


Figure 22. IR spectrum of compound 10

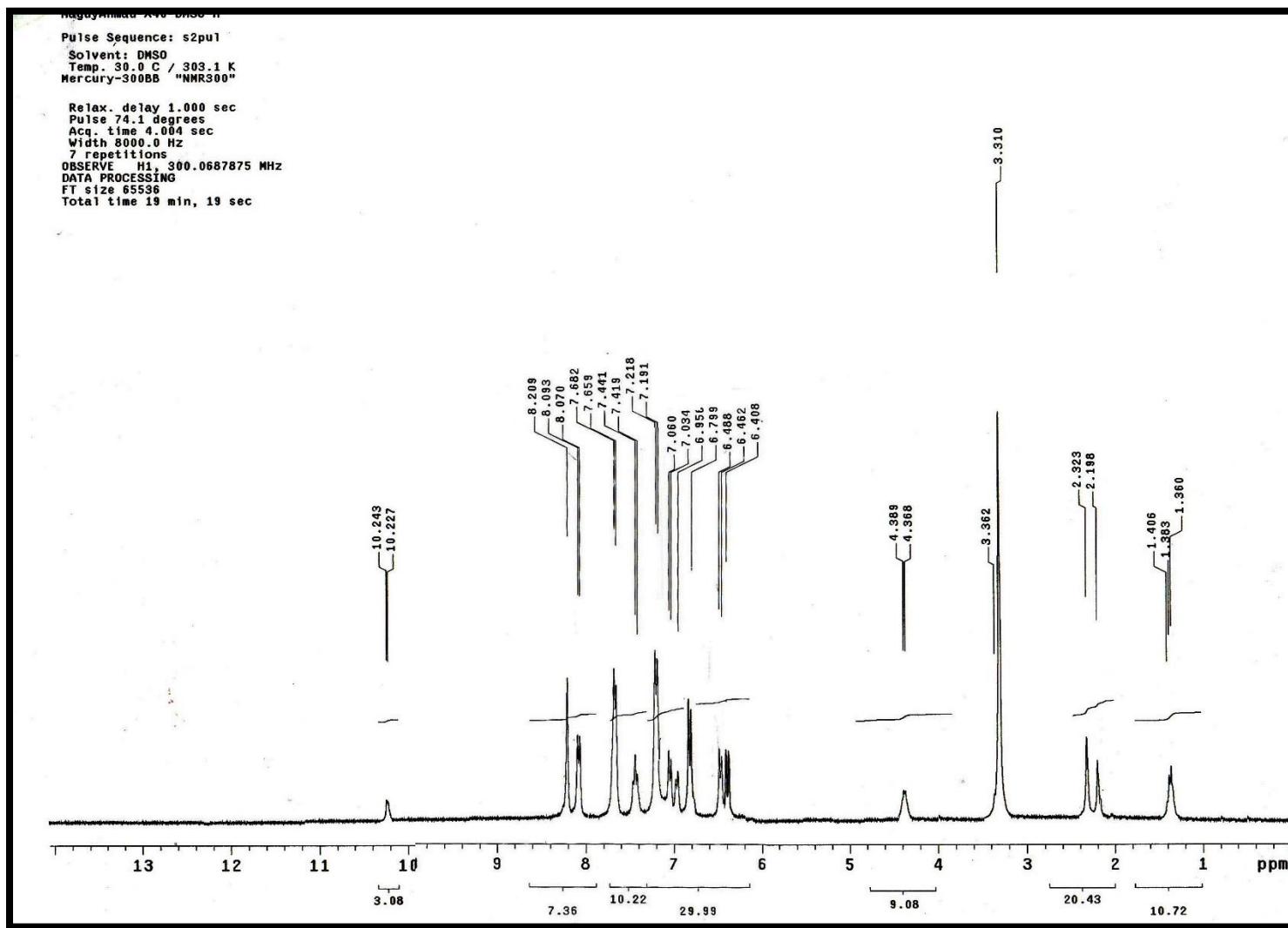
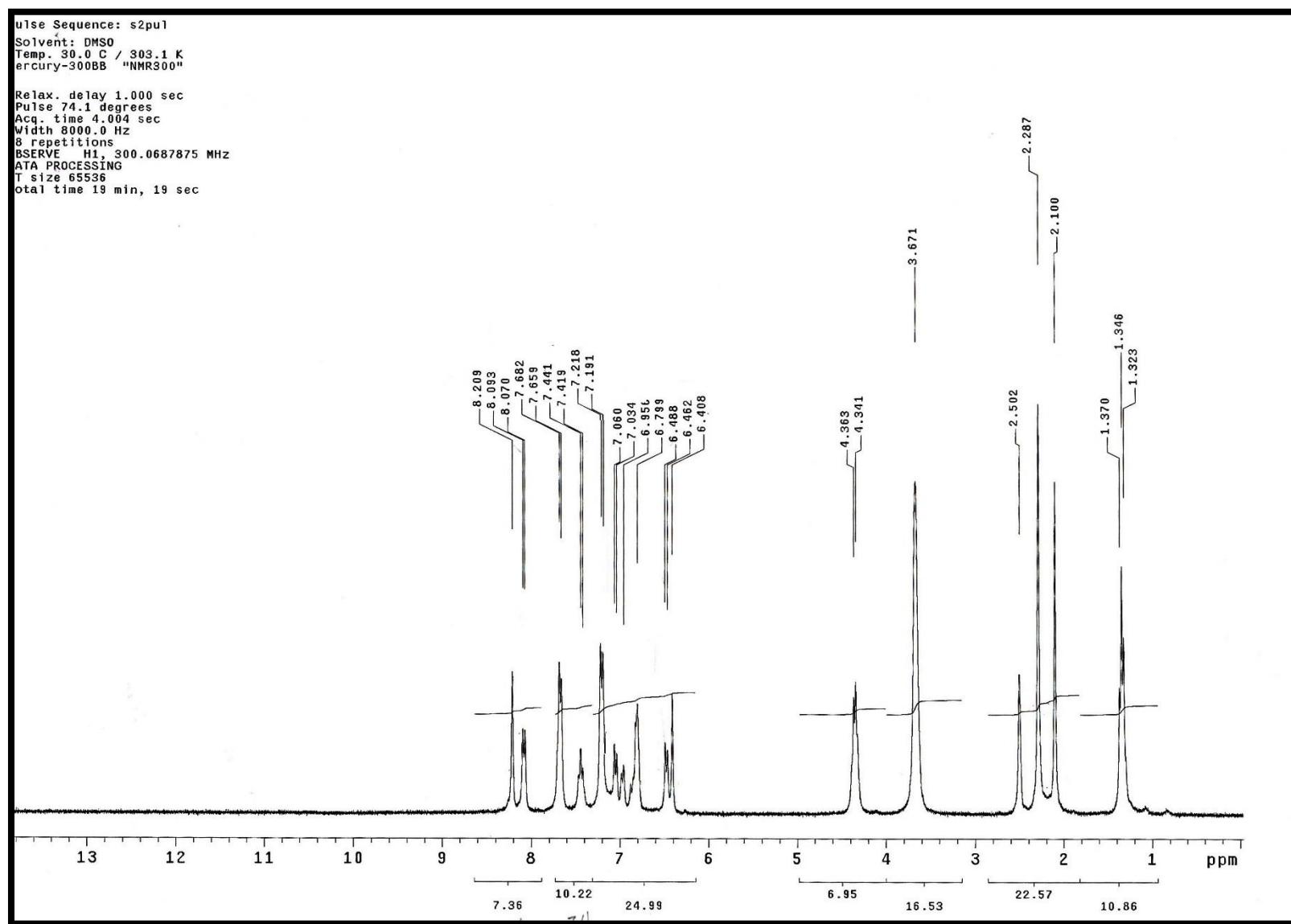


Figure 23.  $^1\text{H}$  NMR spectrum of compound 10 (DMSO)



**Figure 24.**  $^1\text{H}$  NMR spectrum of compound 10 (DMSO + D<sub>2</sub>O)

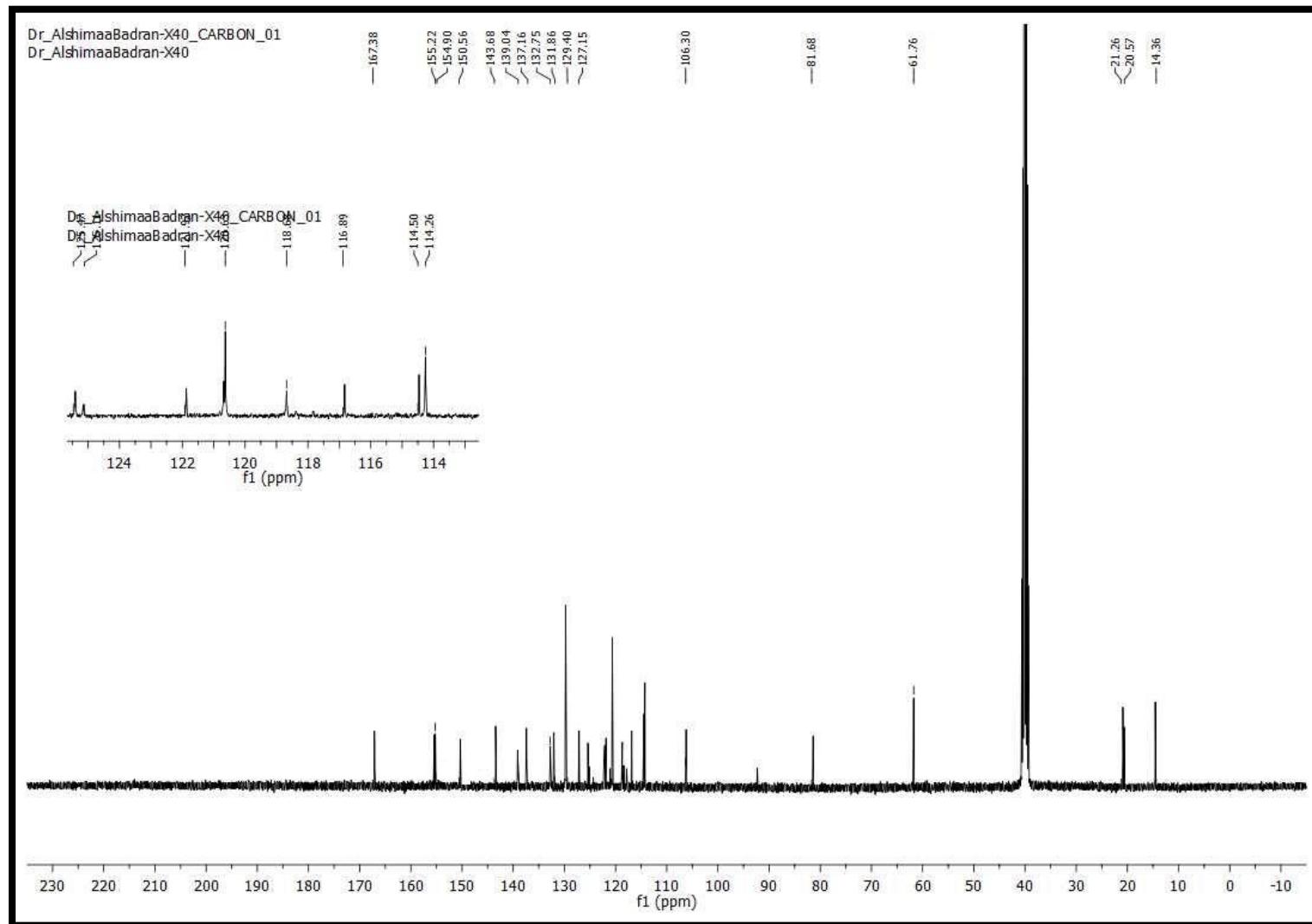


Figure 25. <sup>13</sup>C NMR spectrum of compound 10

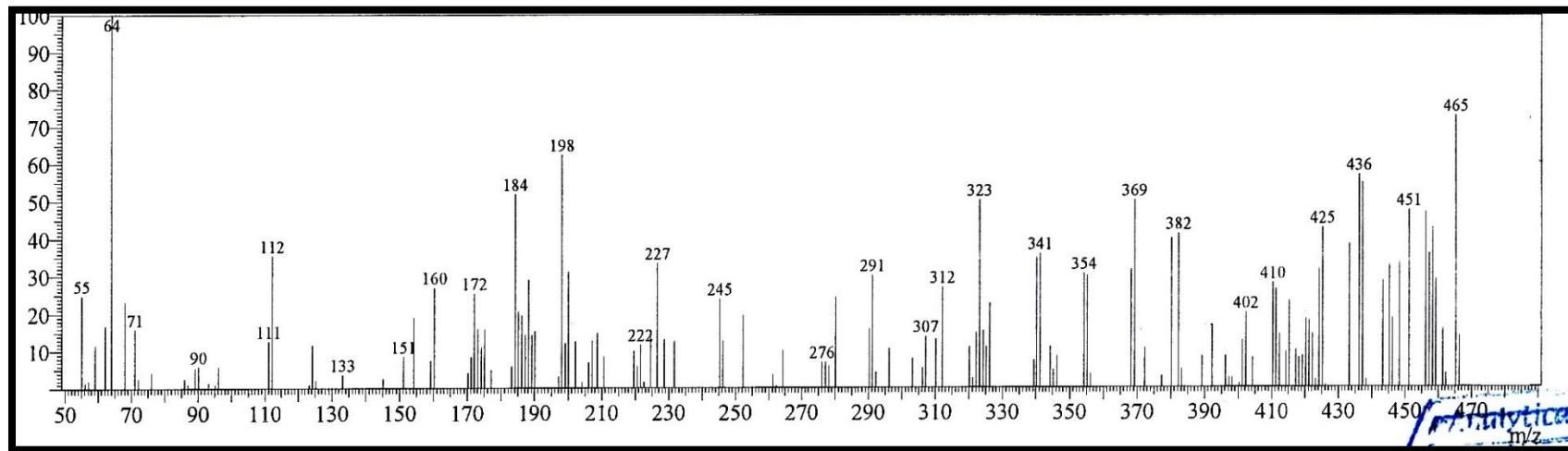


Figure 26. Mass spectrum of compound 10

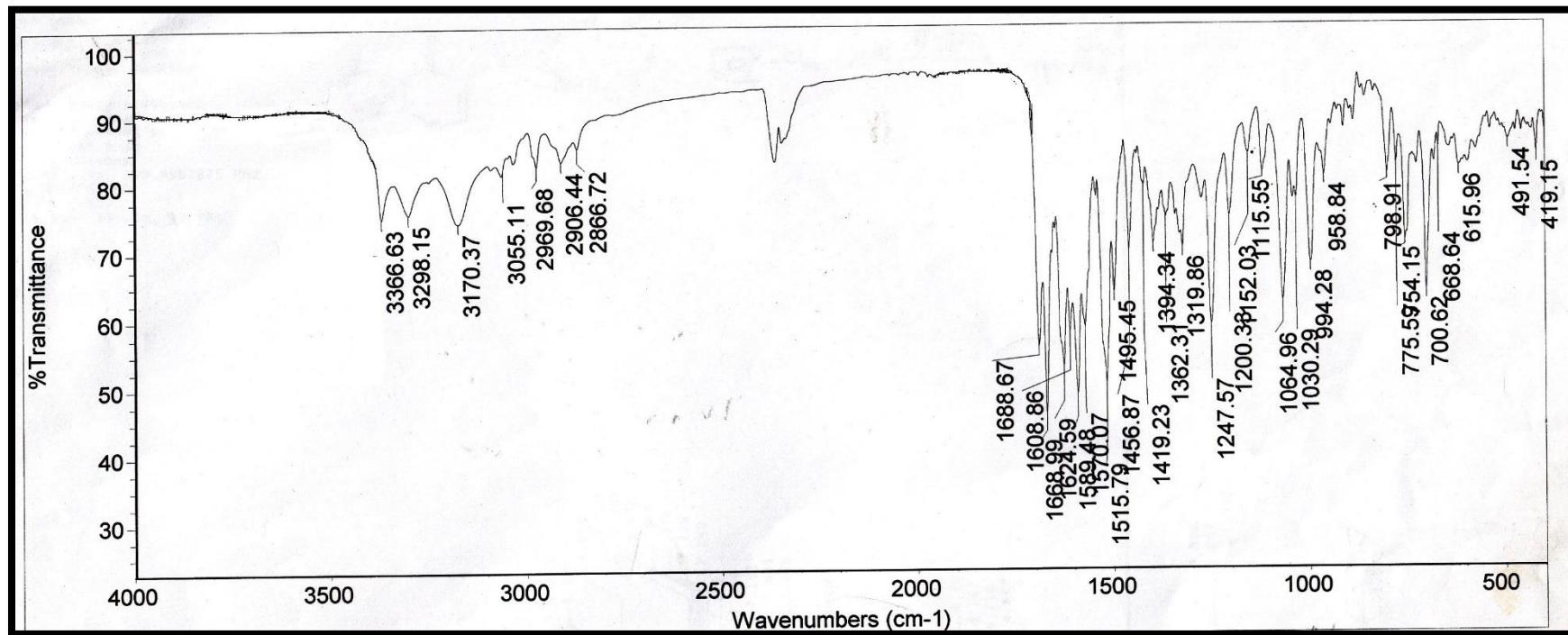


Figure 27. IR spectrum of compound 11

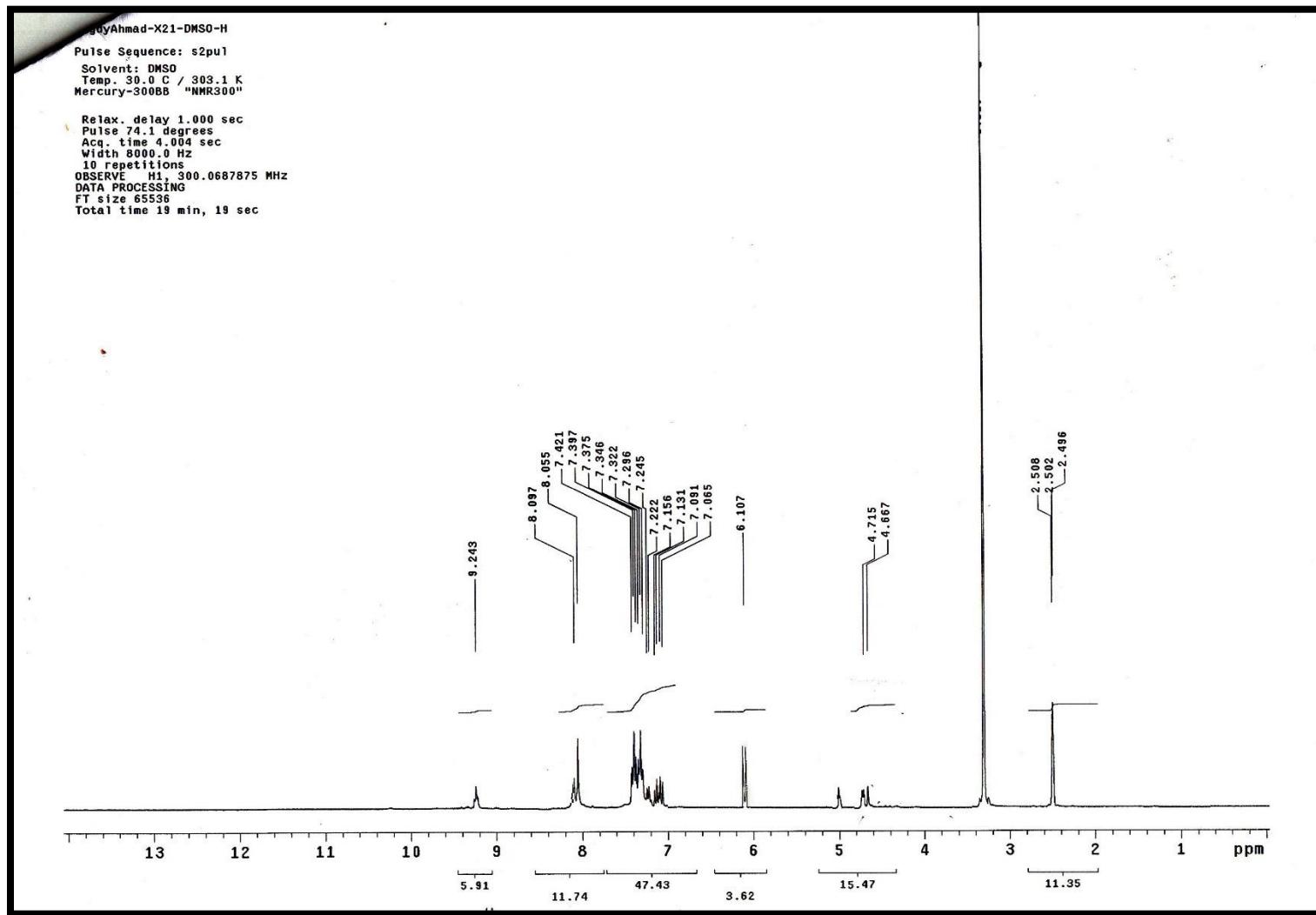


Figure 28.  $^1\text{H}$  NMR spectrum of compound 11

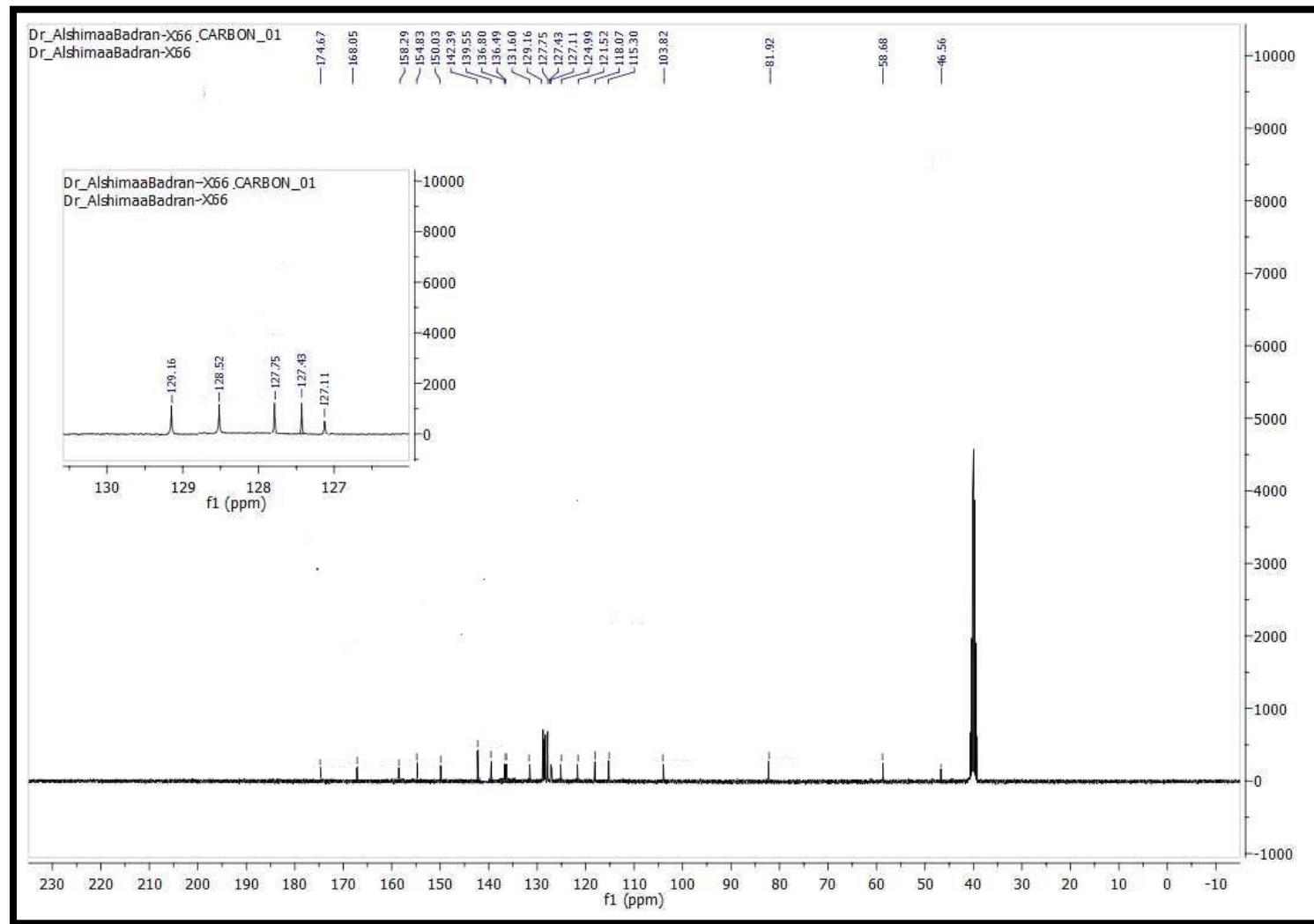


Figure 29. <sup>13</sup>C NMR spectrum of compound 11

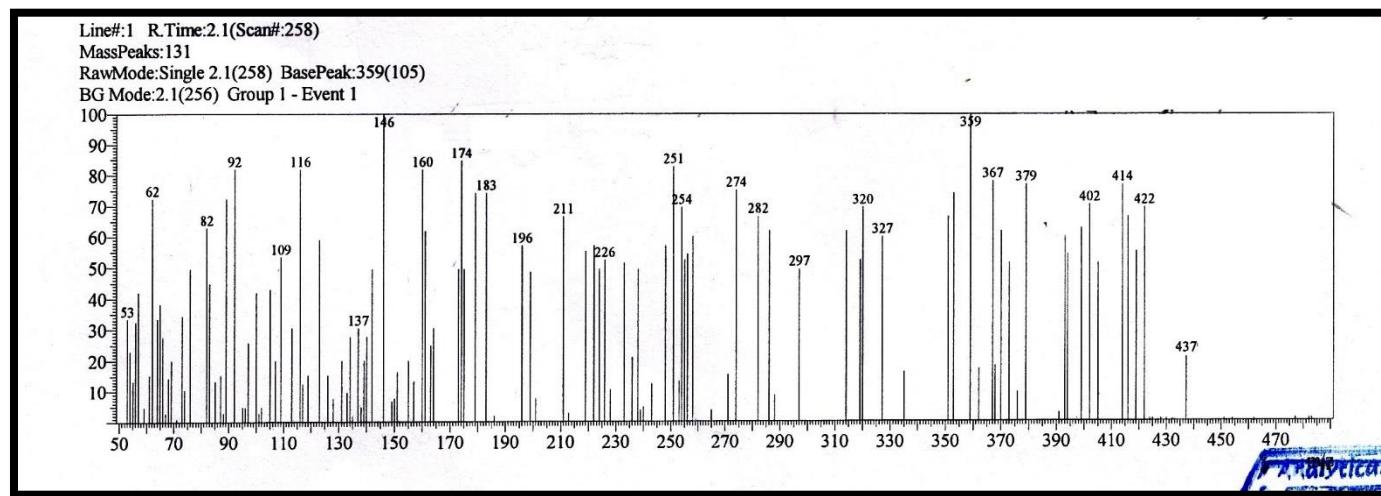


Figure 30. Mass spectrum of compound 11

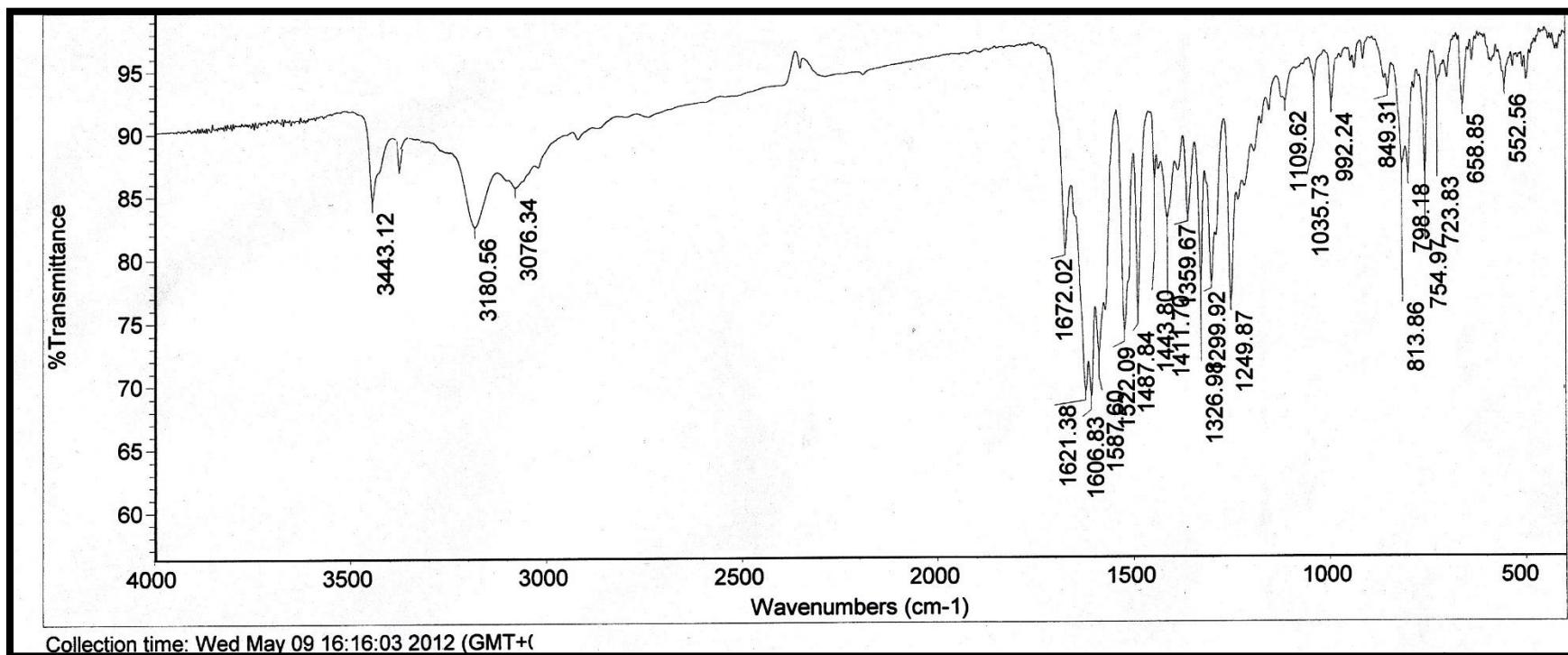


Figure 31. IR spectrum of compound 12

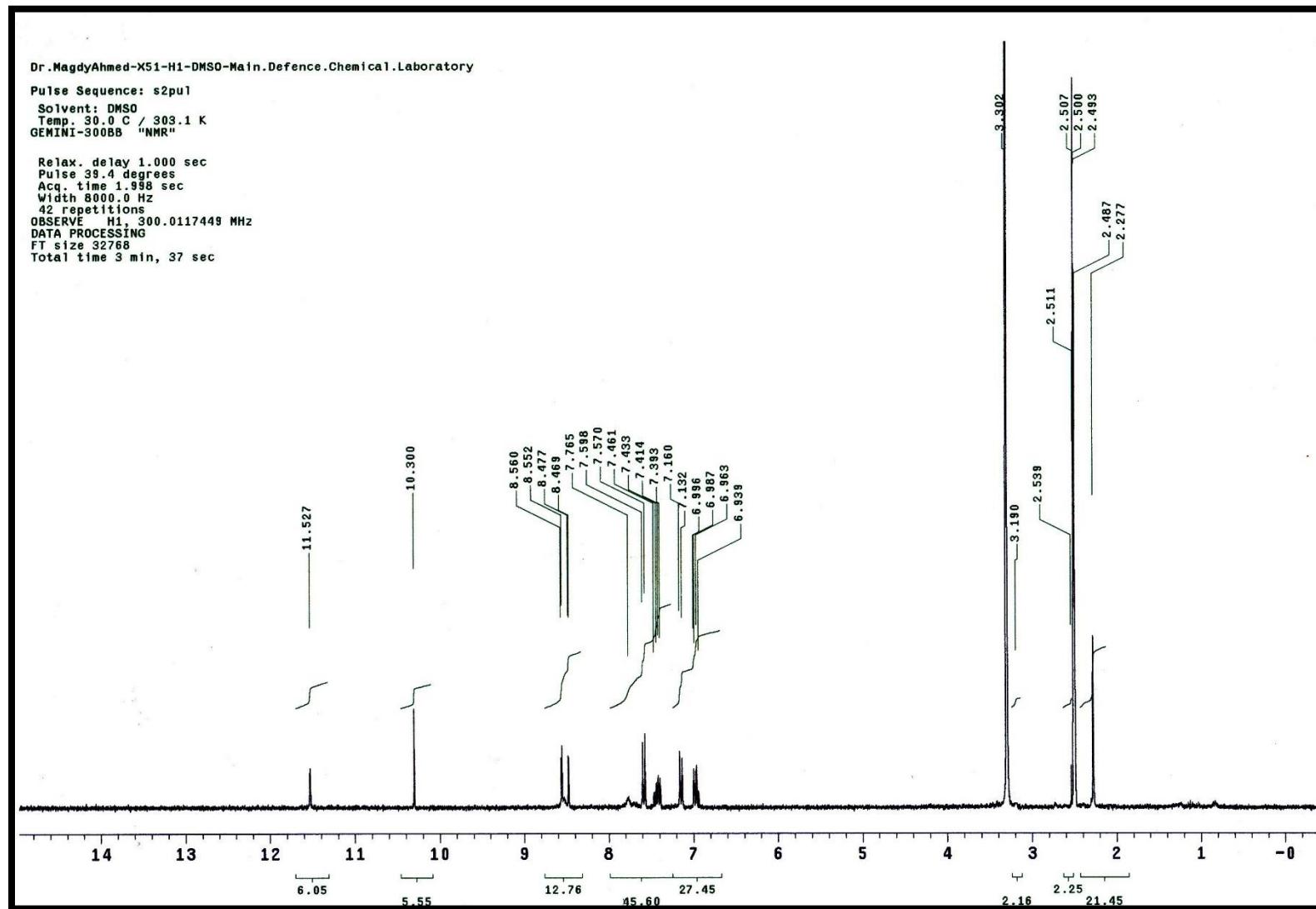


Figure 32.  $^1\text{H}$  NMR spectrum of compound 12

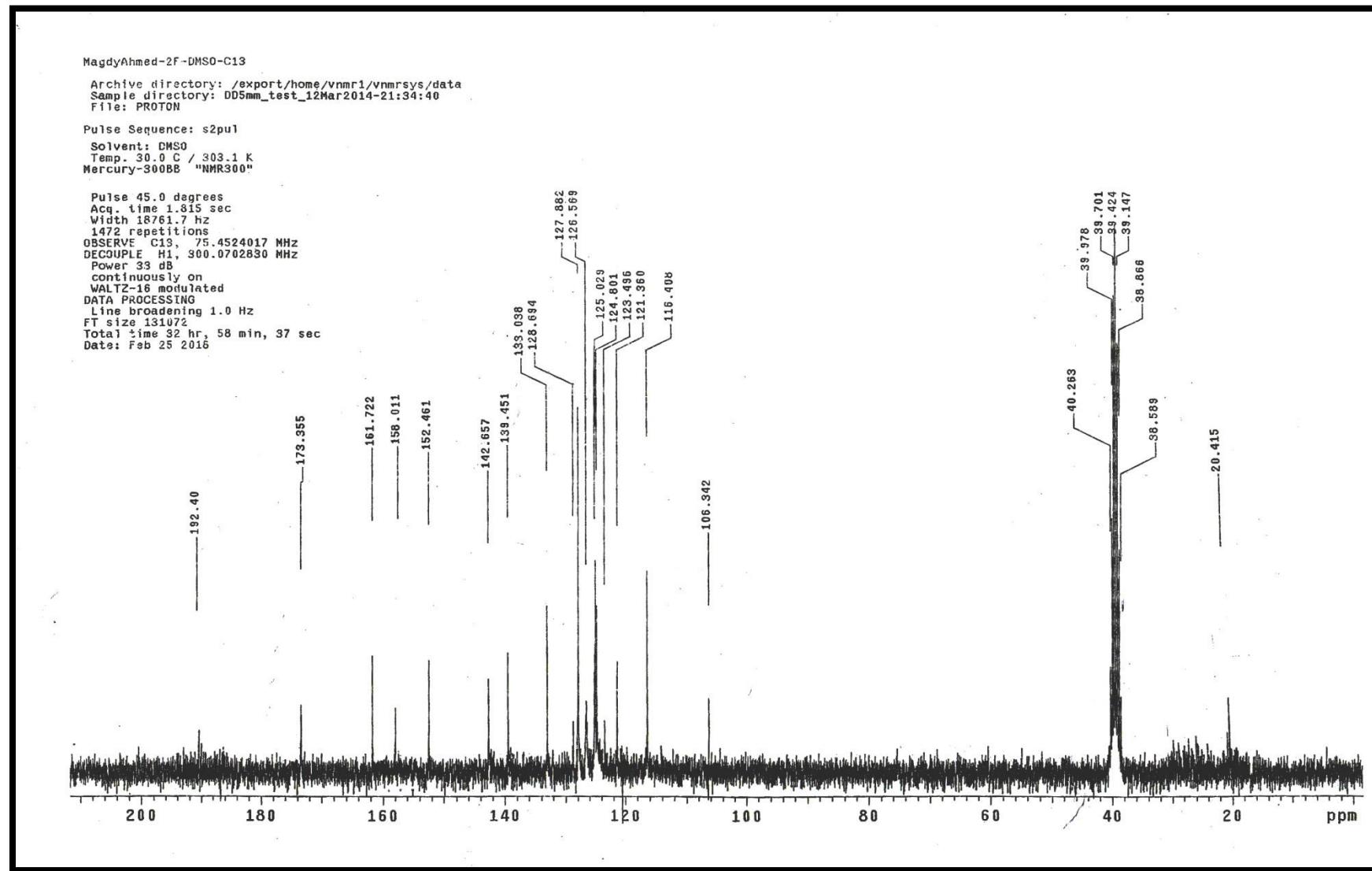


Figure 33.  $^{13}\text{C}$  NMR spectrum of compound 12