

## Supplementary Material

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

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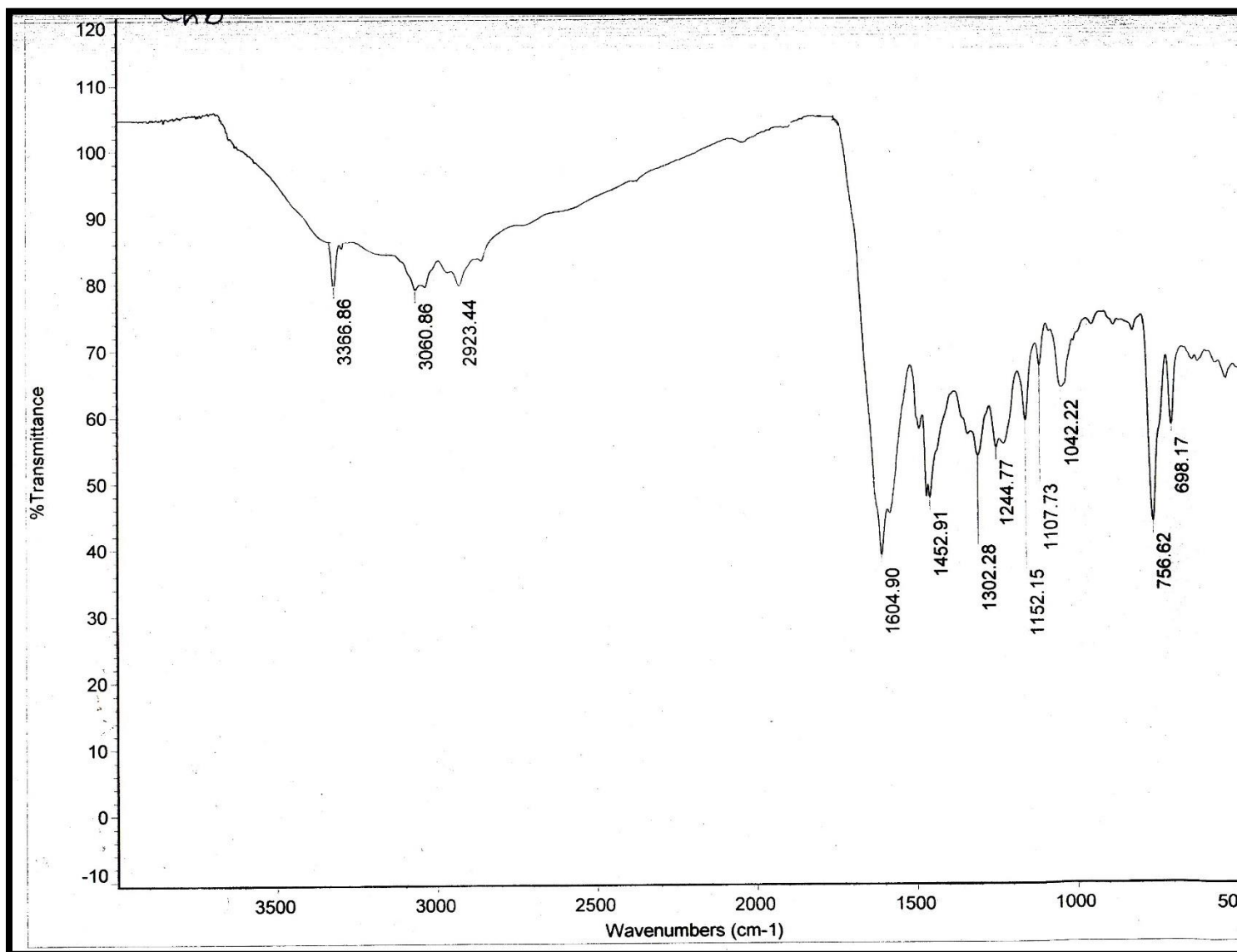


Figure 1. IR spectrum of compound 5

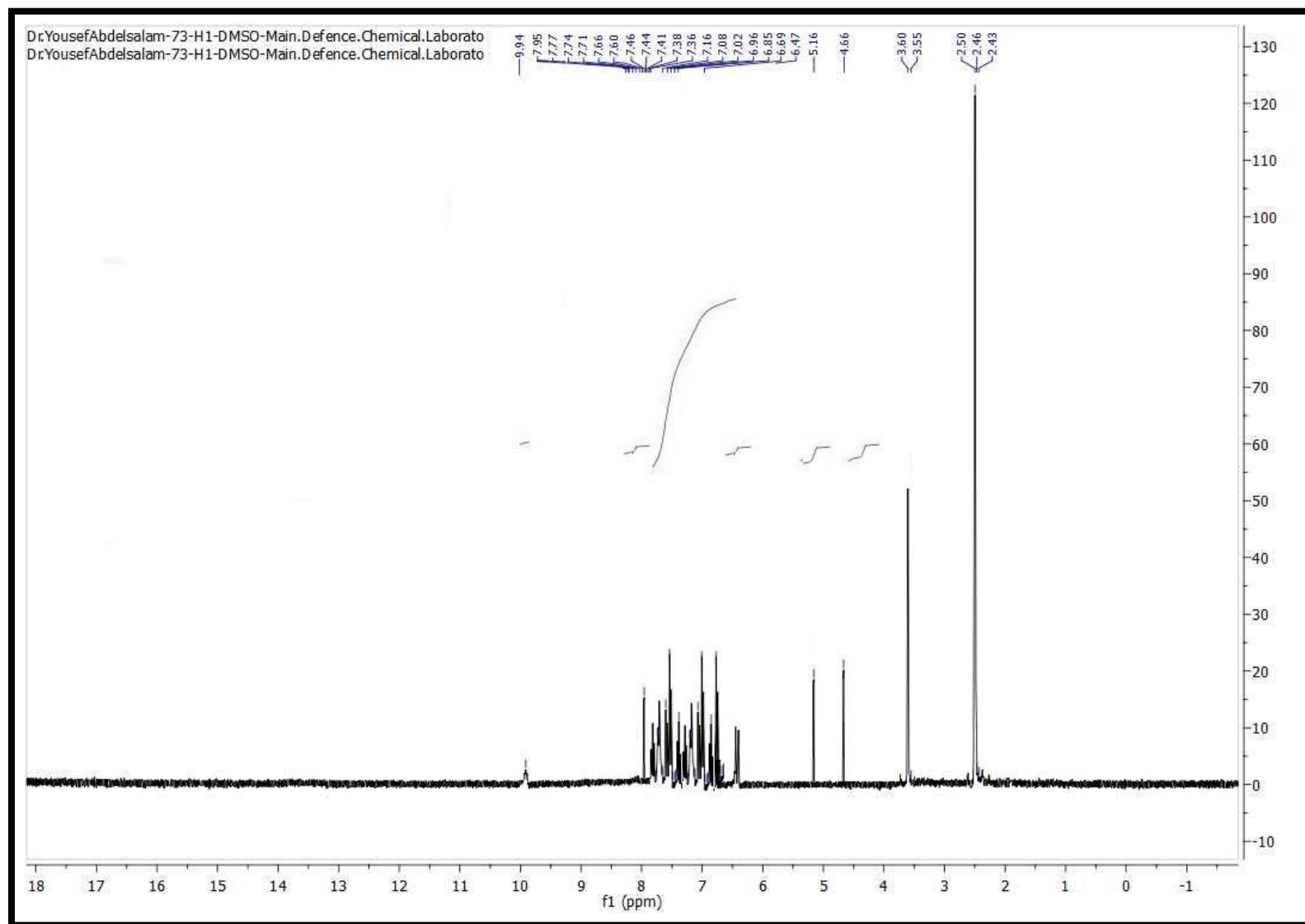


Figure 2.  $^1\text{H}$  NMR spectrum of compound 5

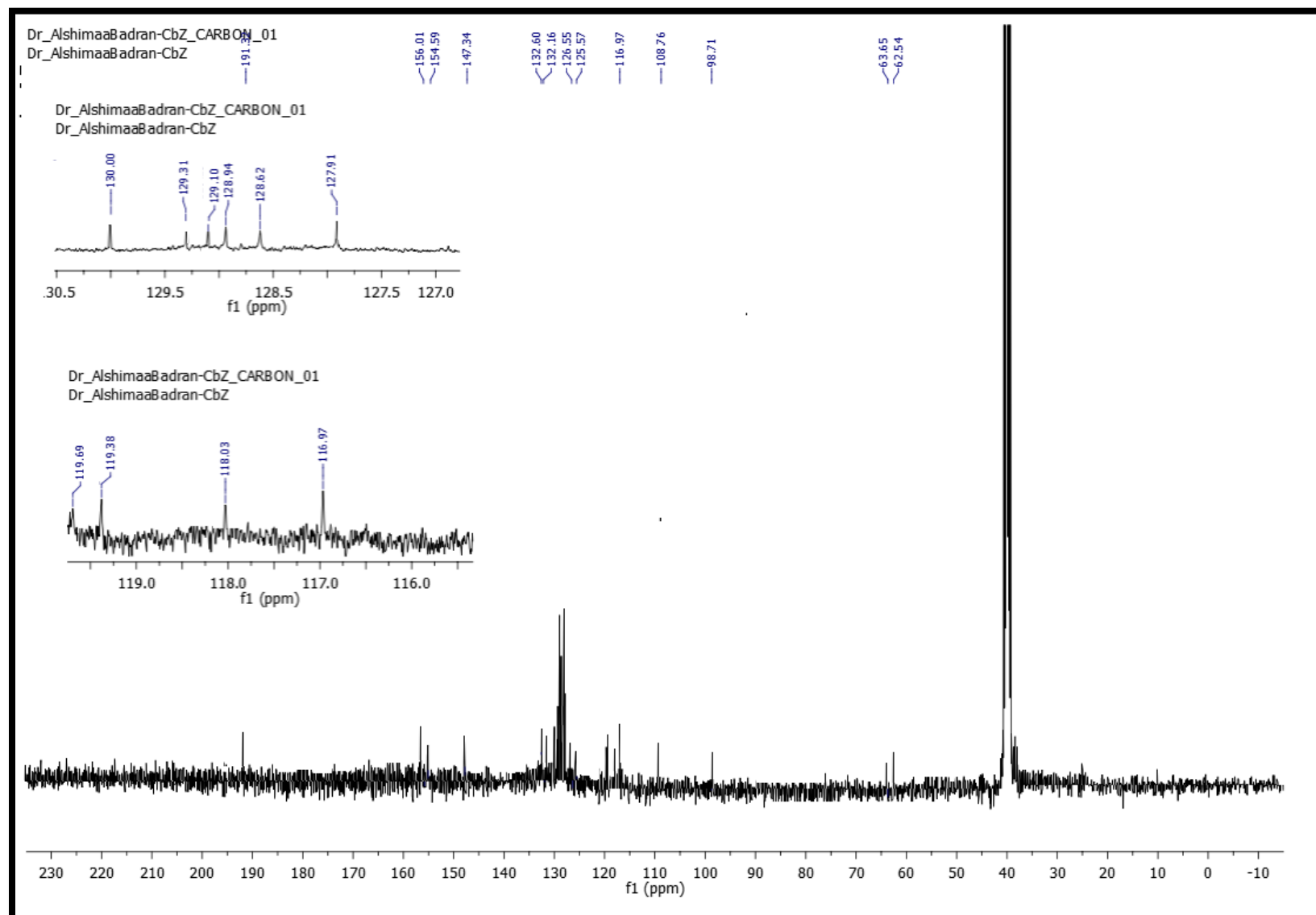


Figure 3.  $^{13}\text{C}$  NMR spectrum of compound 5



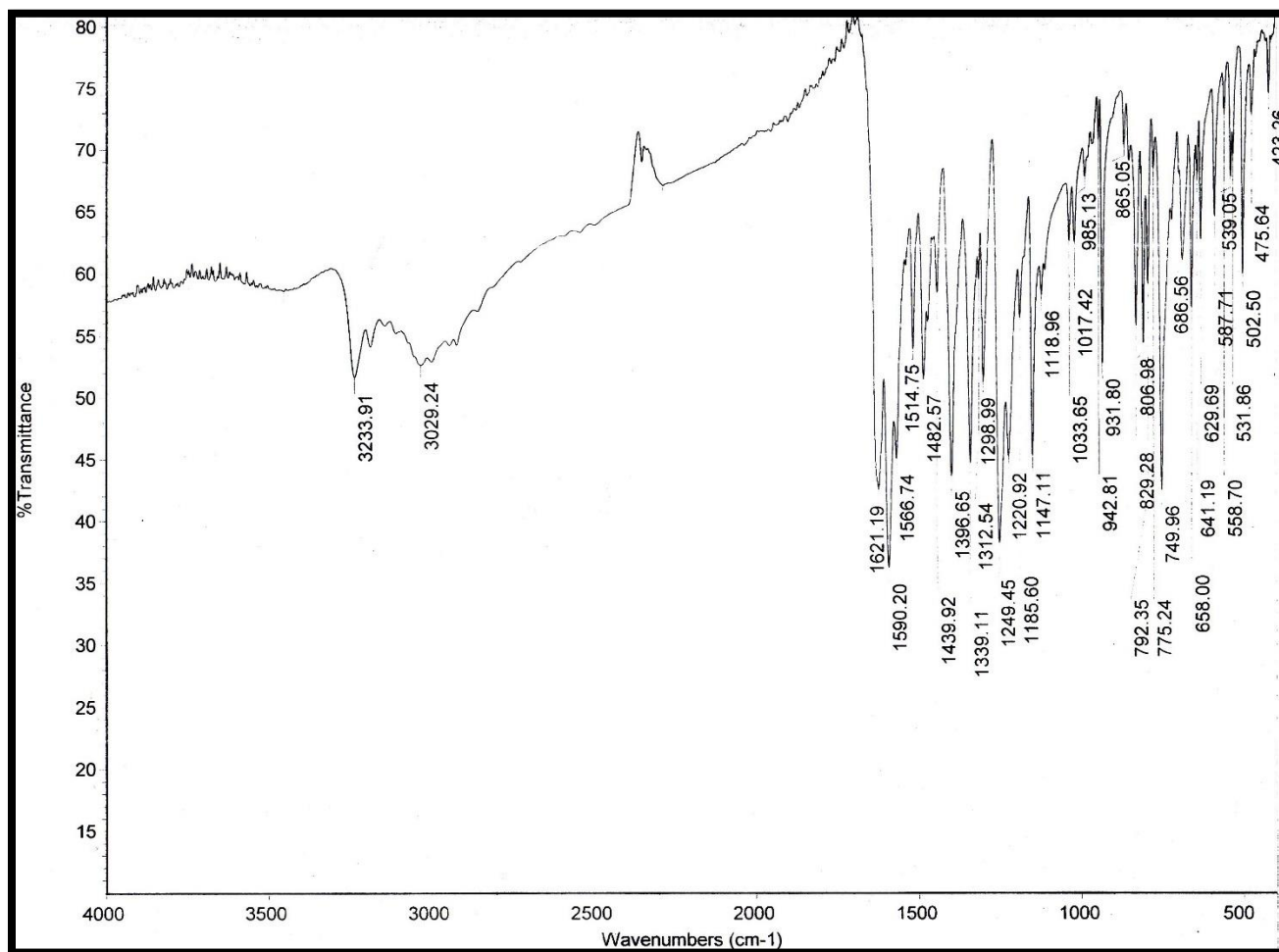
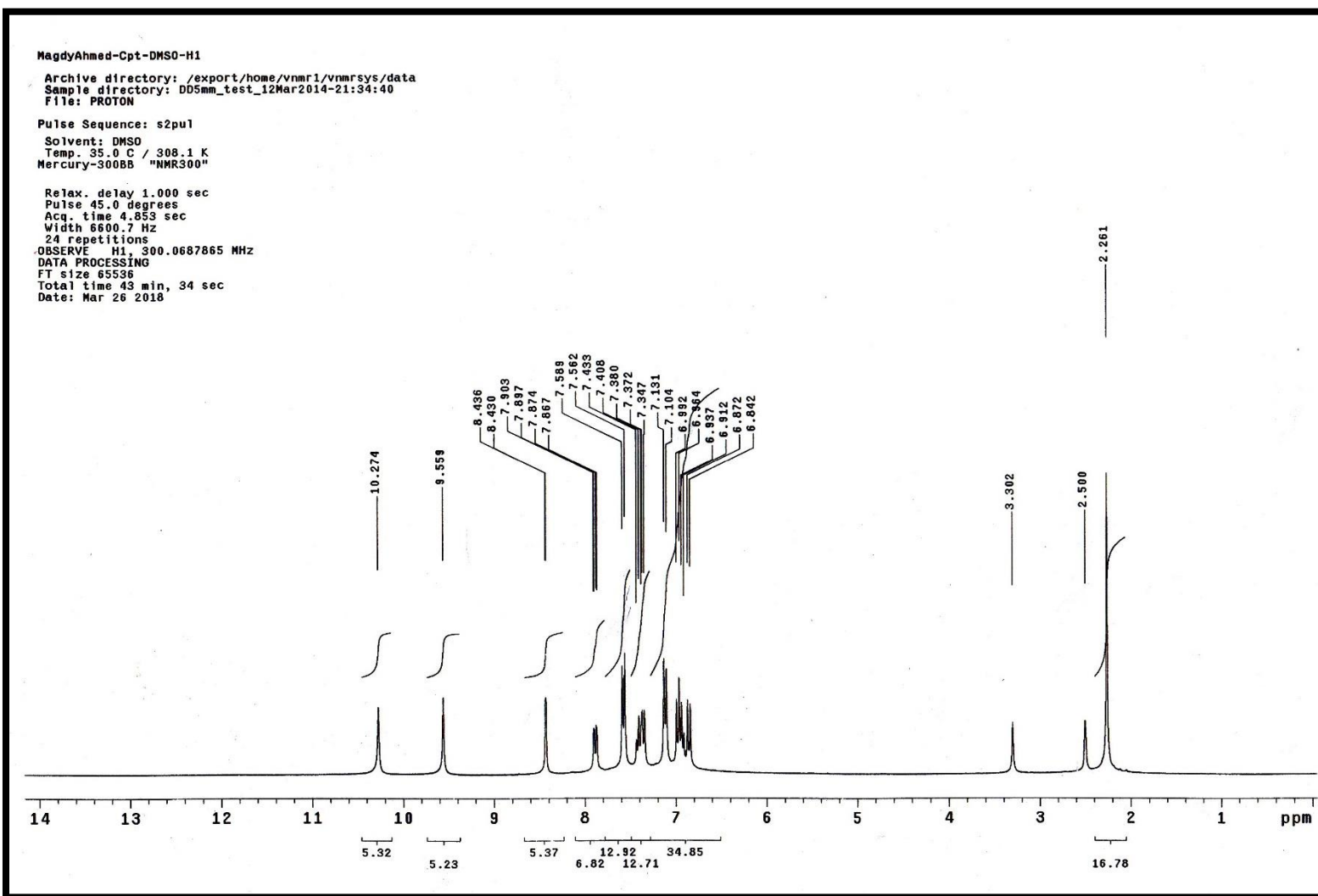
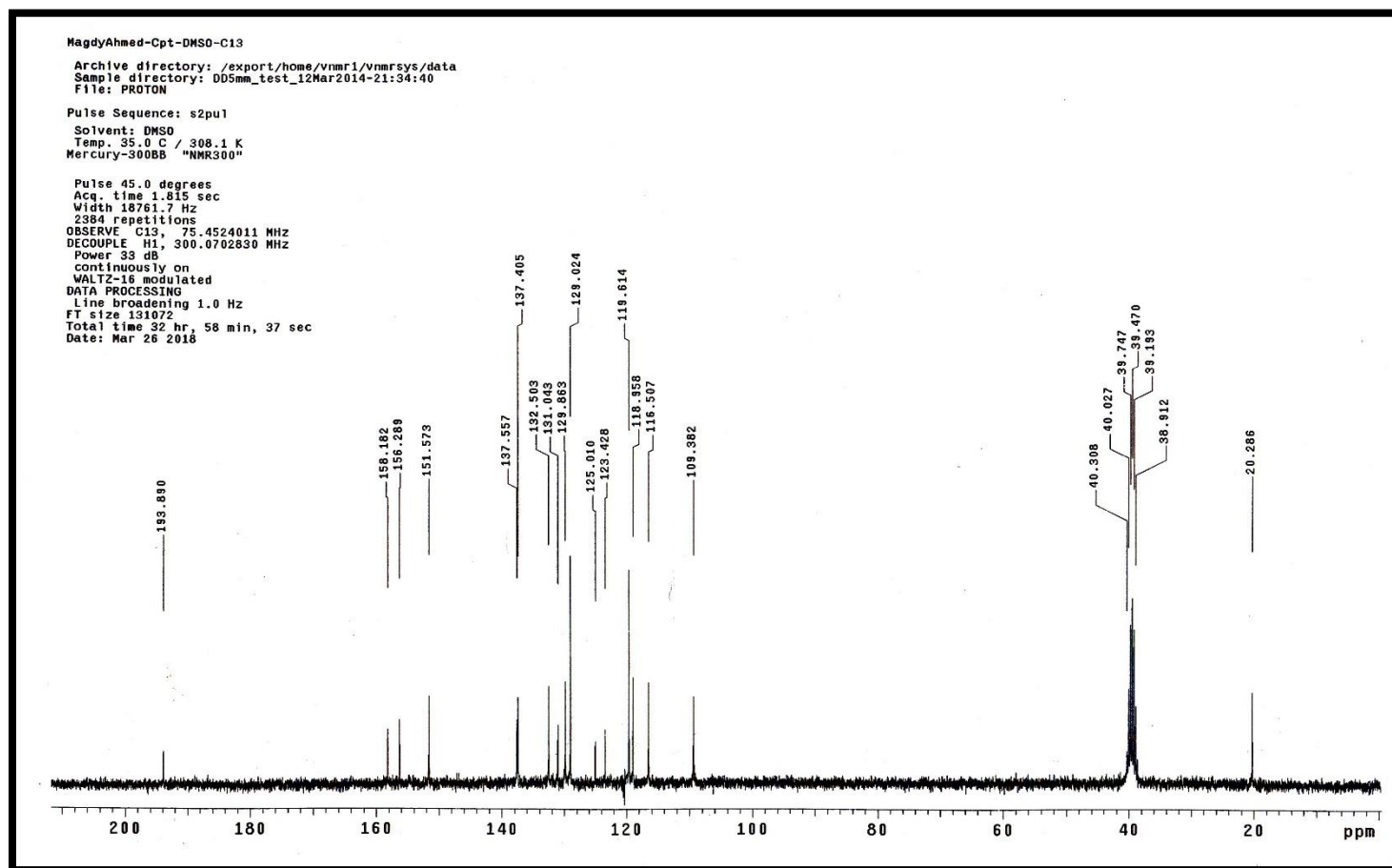


Figure 4. IR spectrum of compound 6

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

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

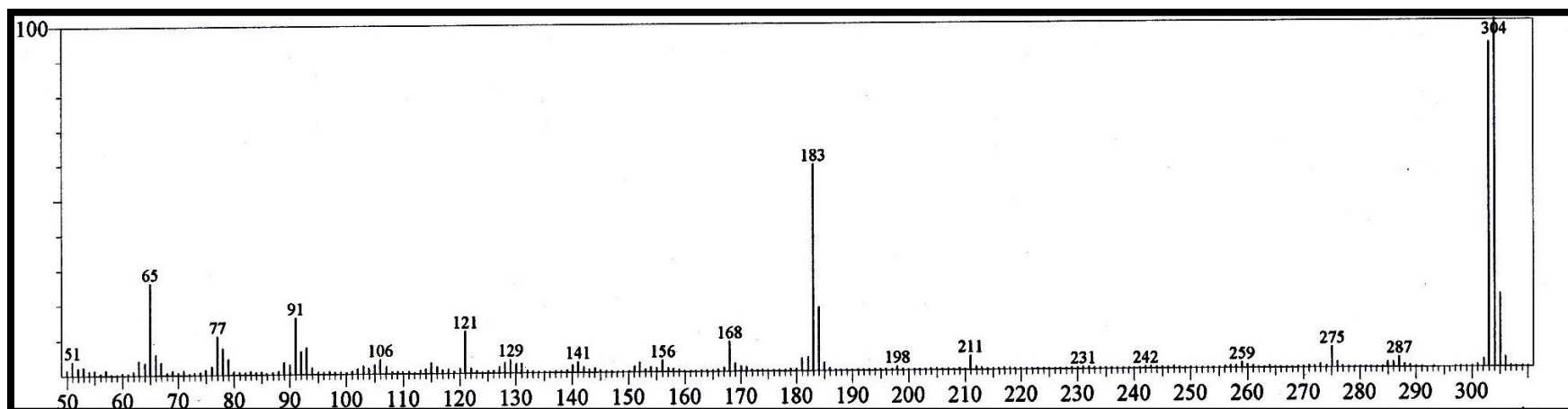


Figure 7. Mass spectrum of compound 6

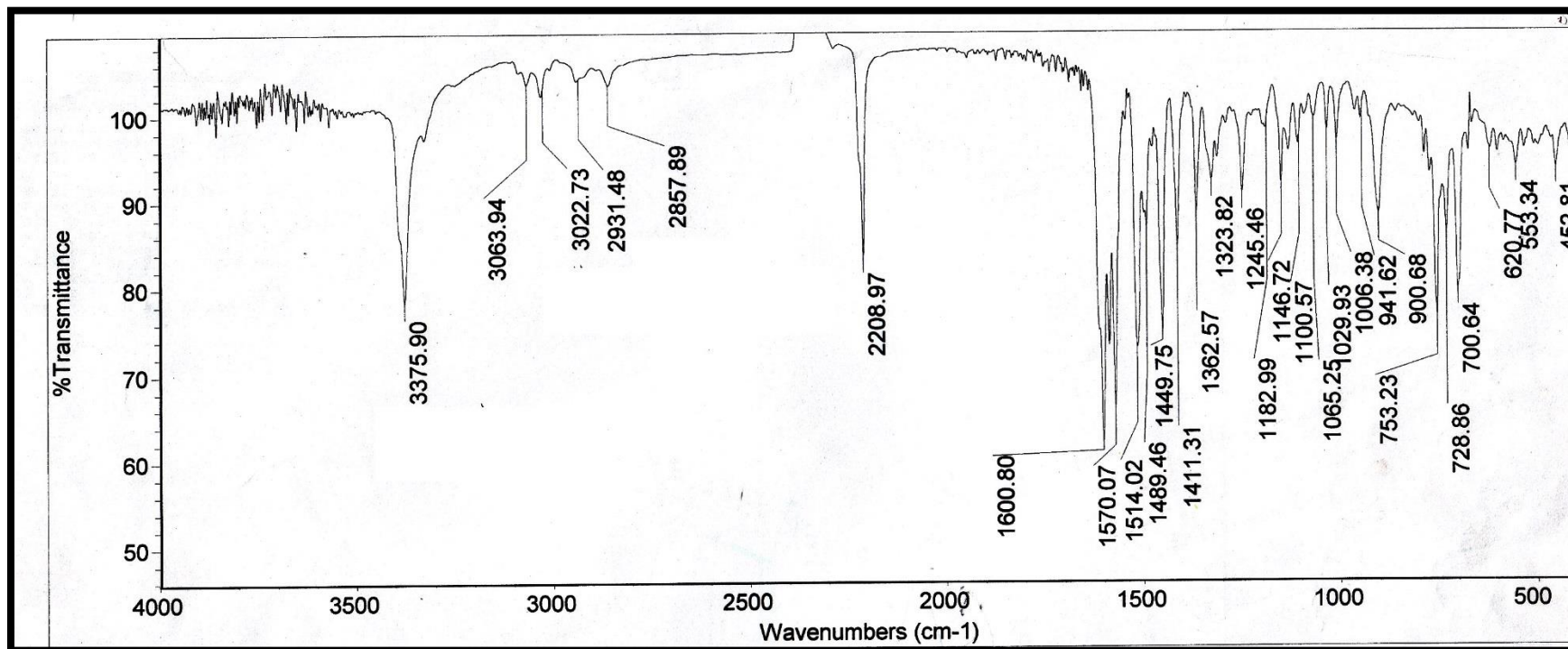


Figure 8. IR spectrum of compound 7

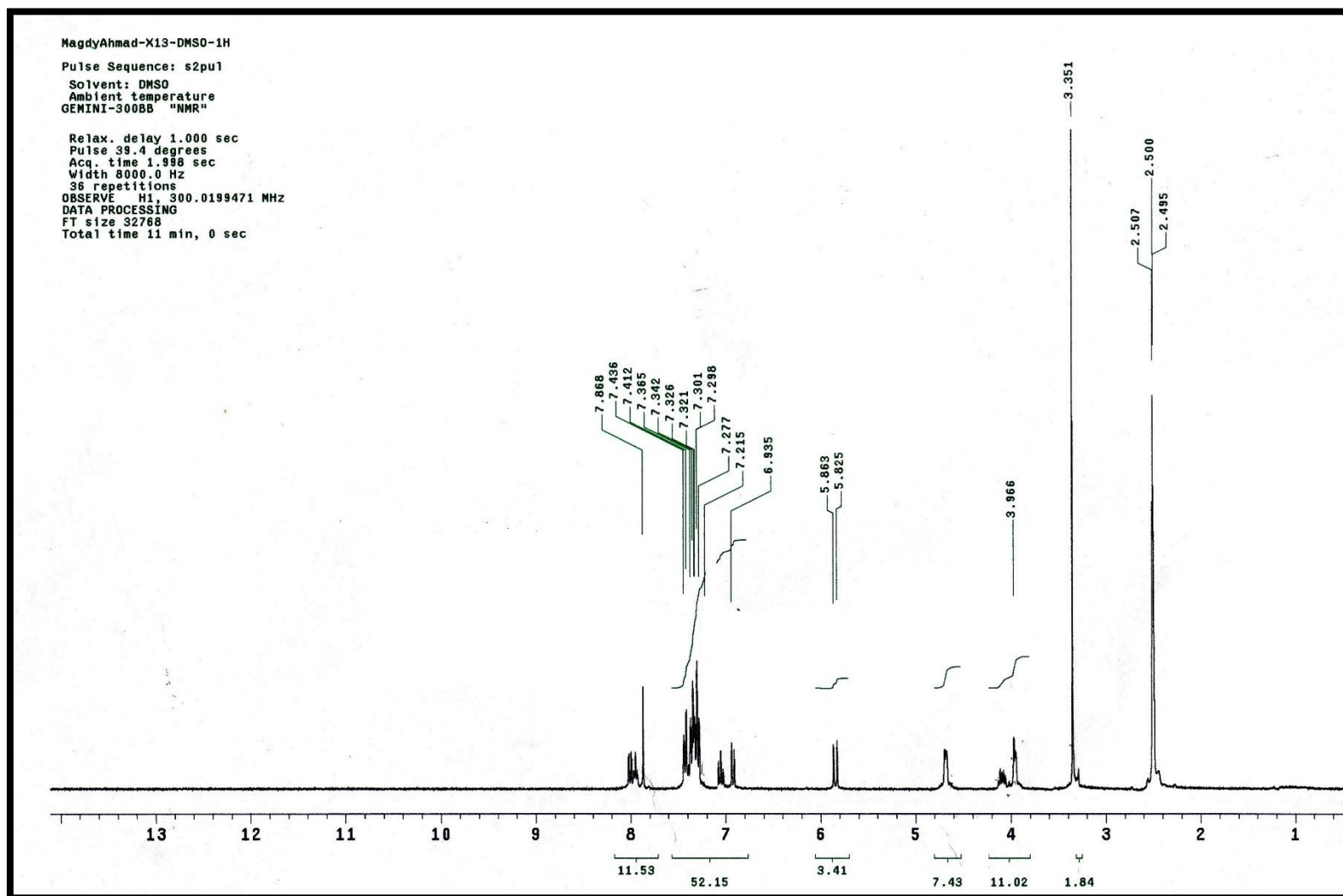
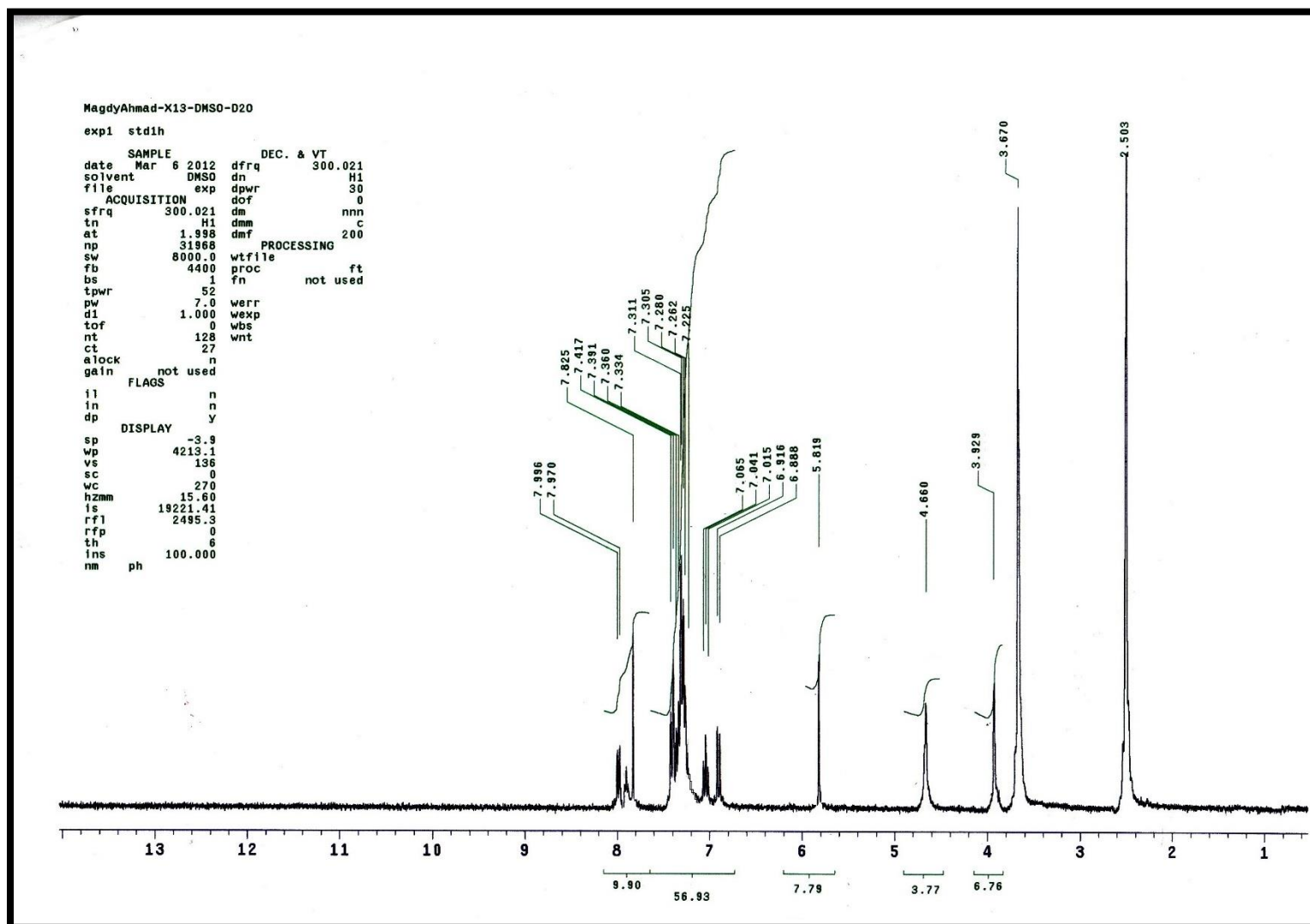
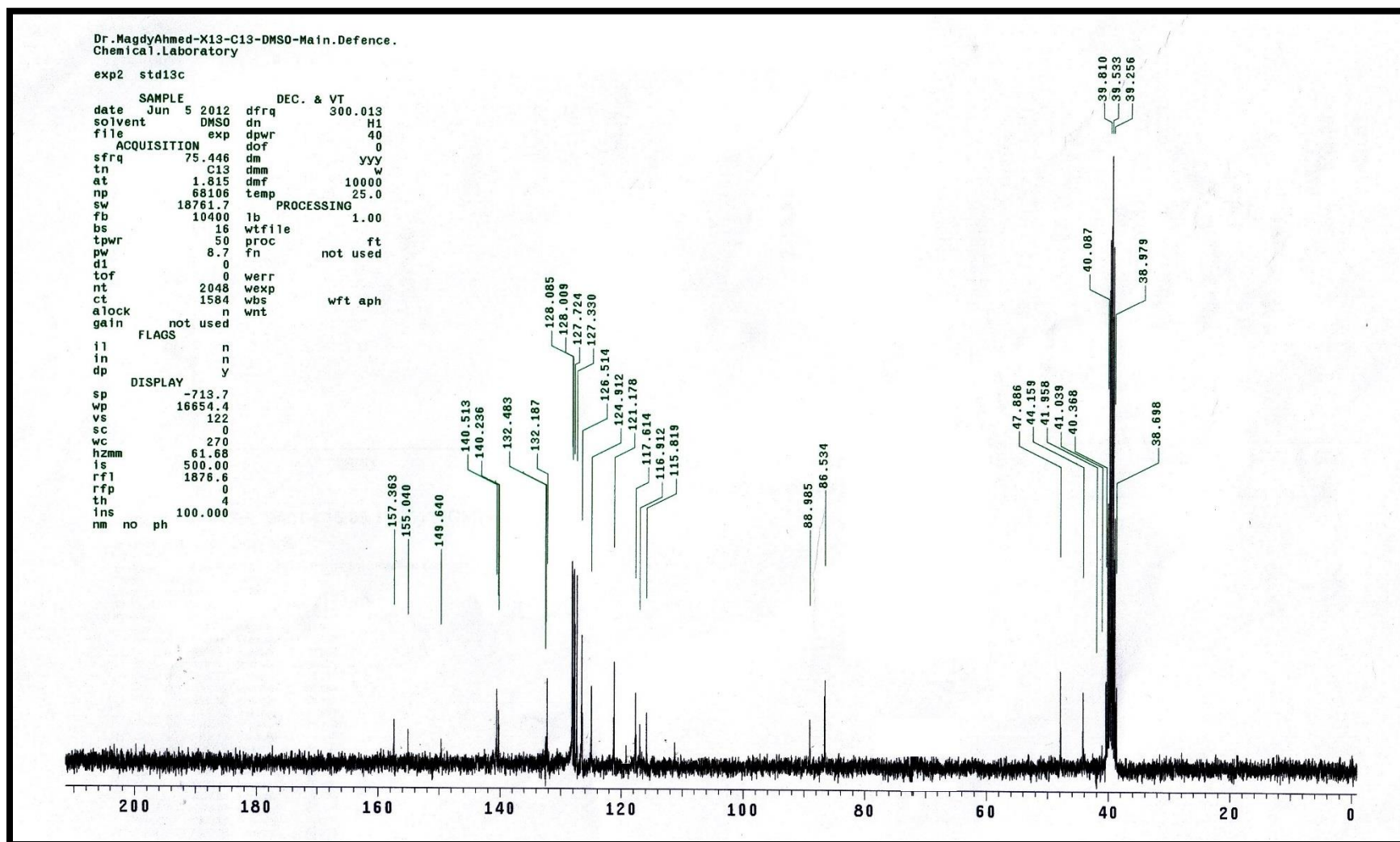


Figure 9.  $^1\text{H}$  NMR spectrum of compound 7 (DMSO)

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



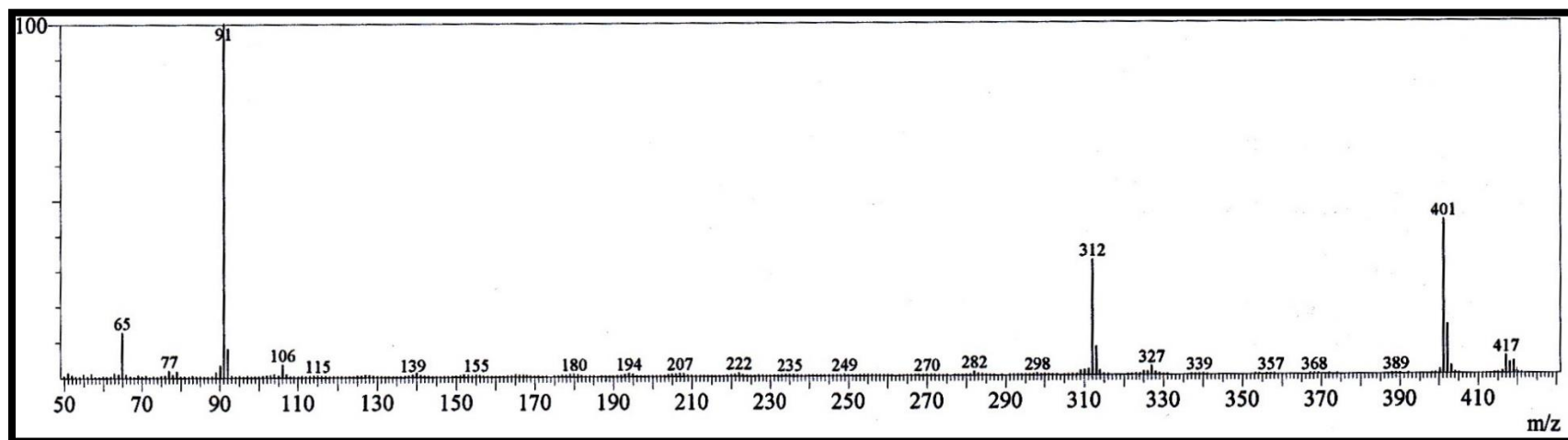


Figure 12. Mass spectrum of compound 7

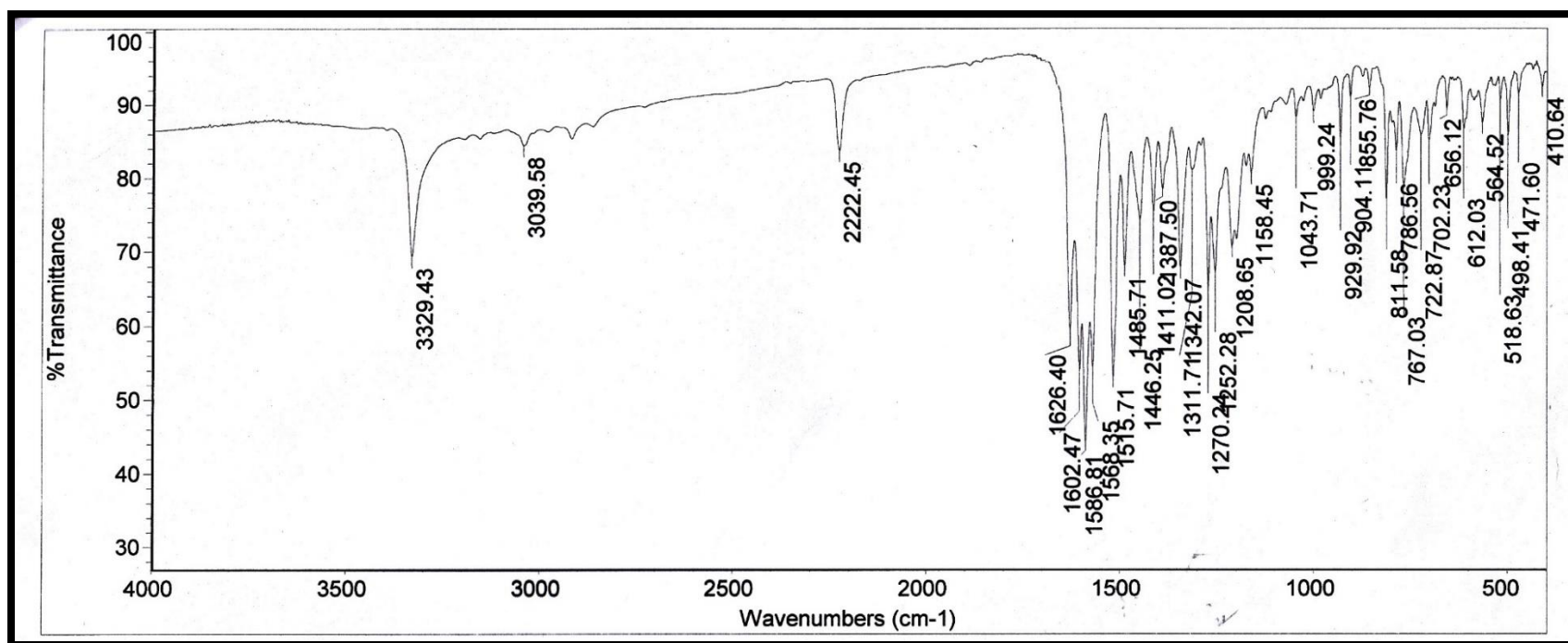


Figure 13. IR spectrum of compound 8

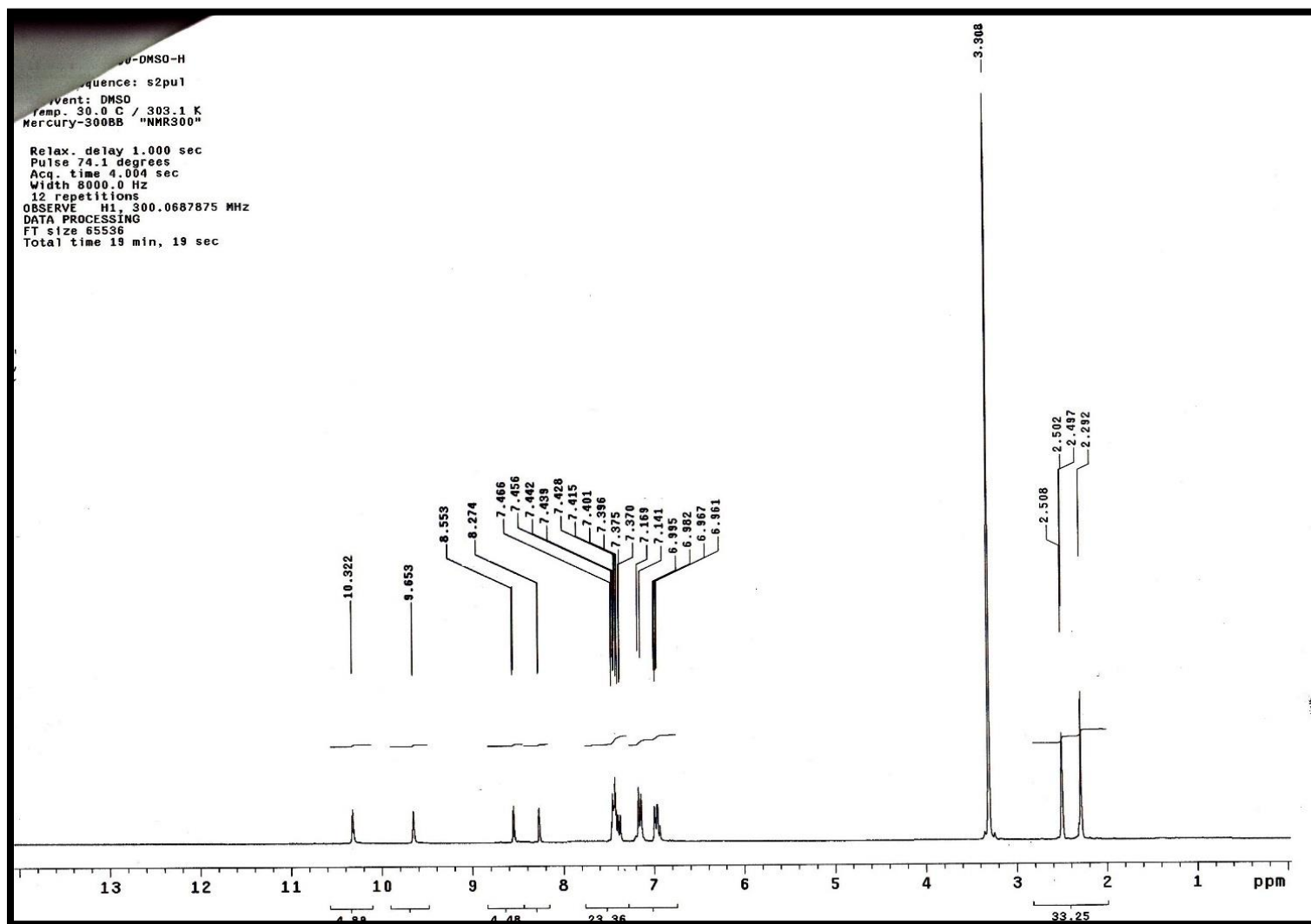
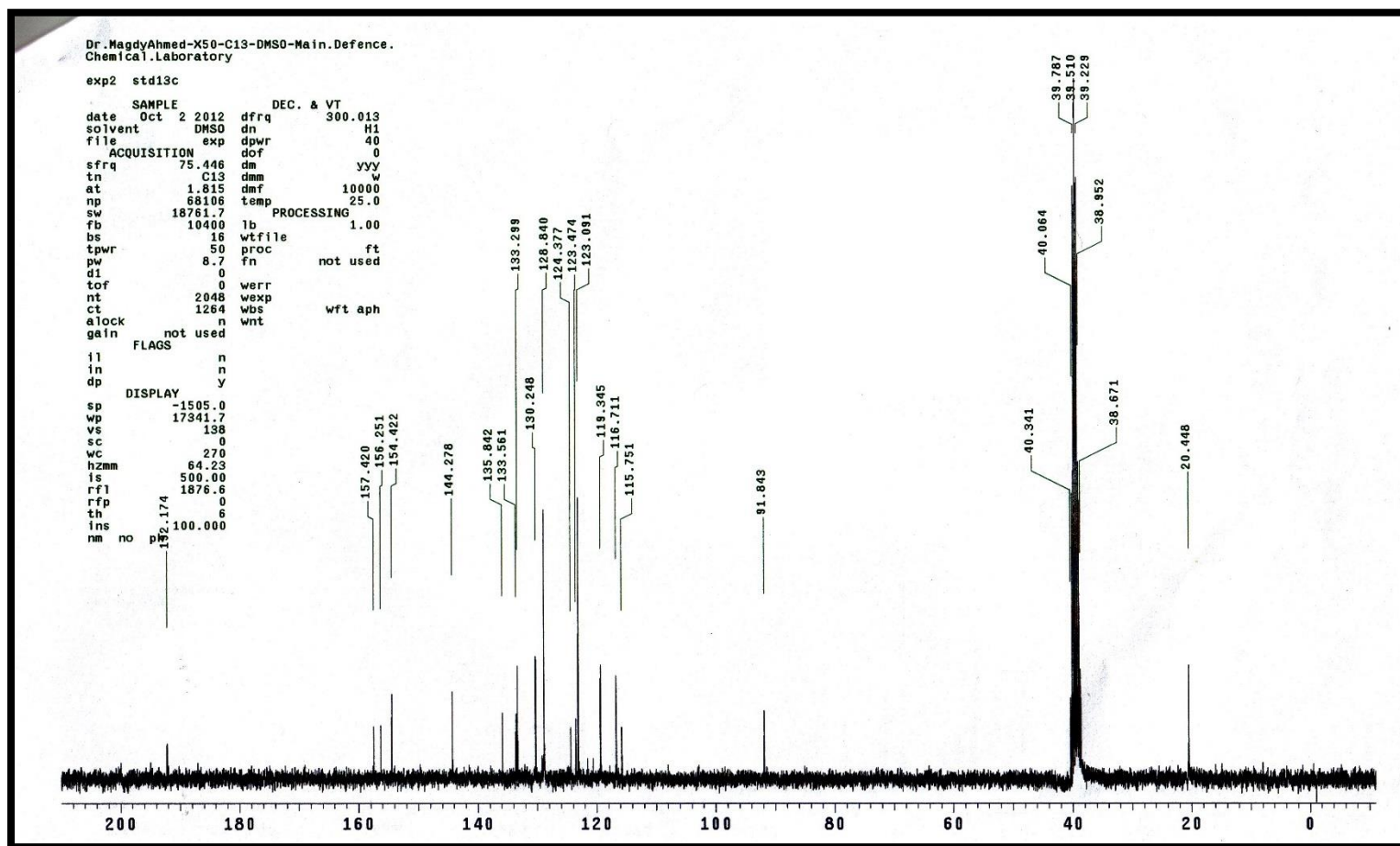


Figure 14.  $^1\text{H}$  NMR spectrum of compound 8

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

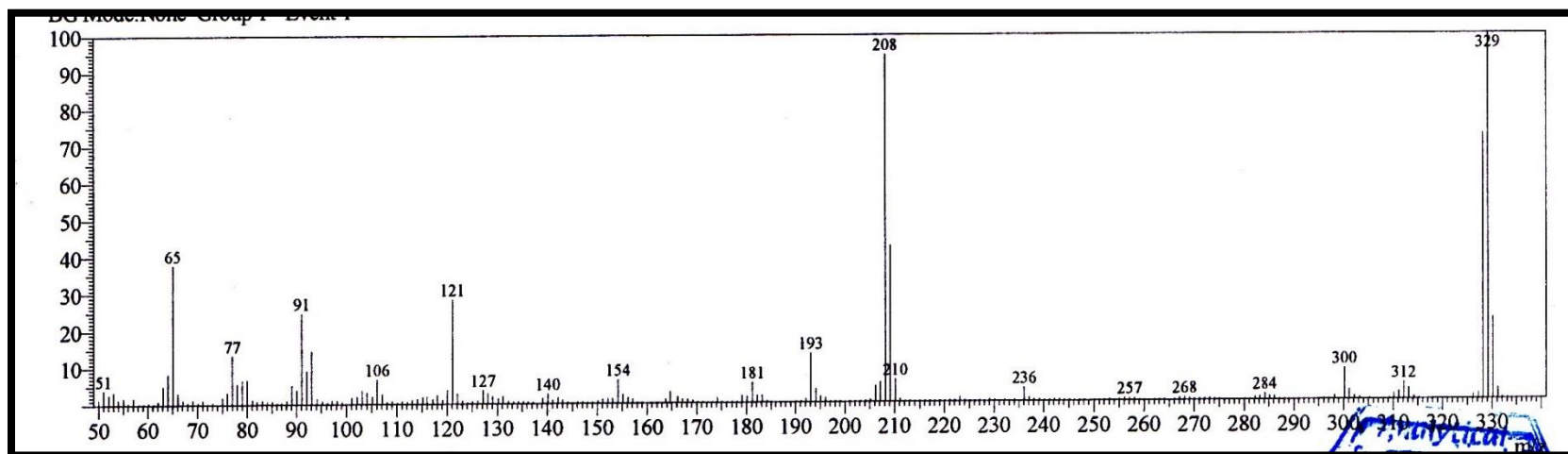


Figure 16. Mass spectrum of compound 8

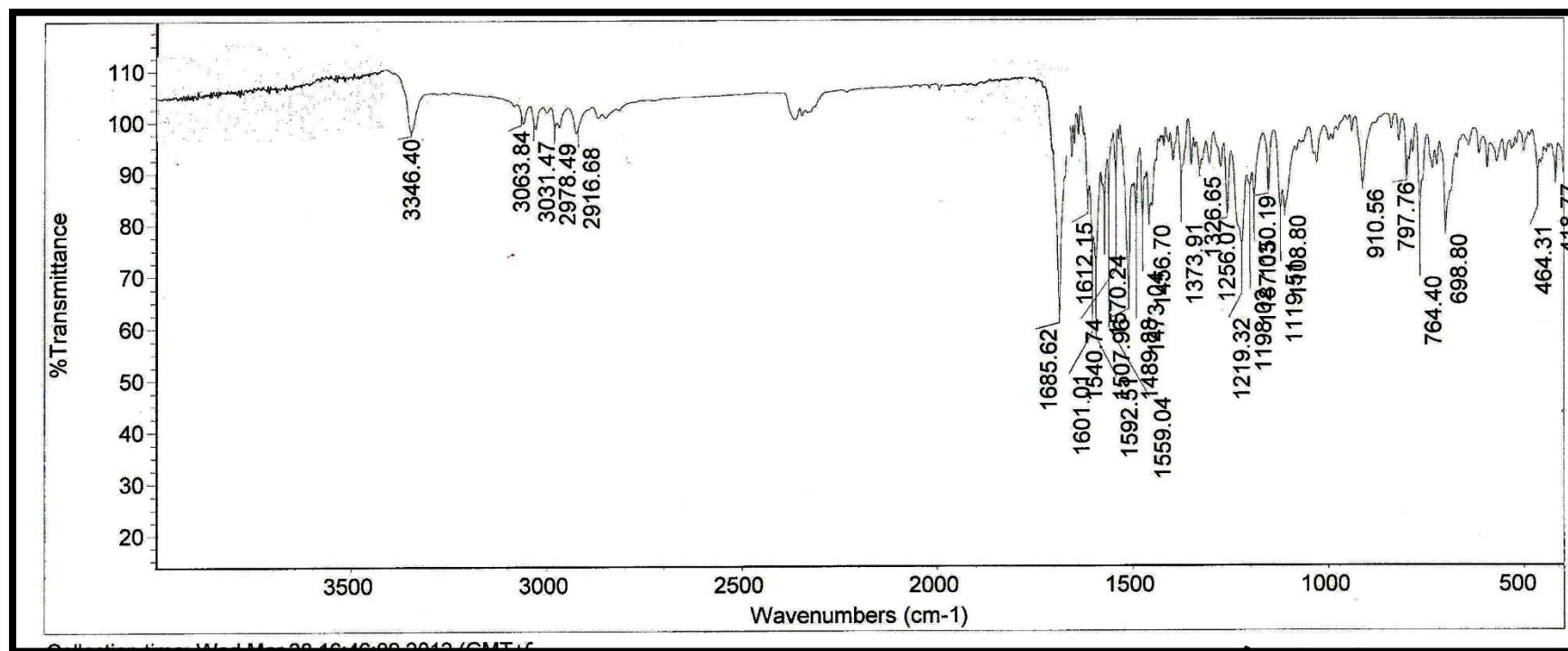


Figure 17. IR spectrum of compound 9

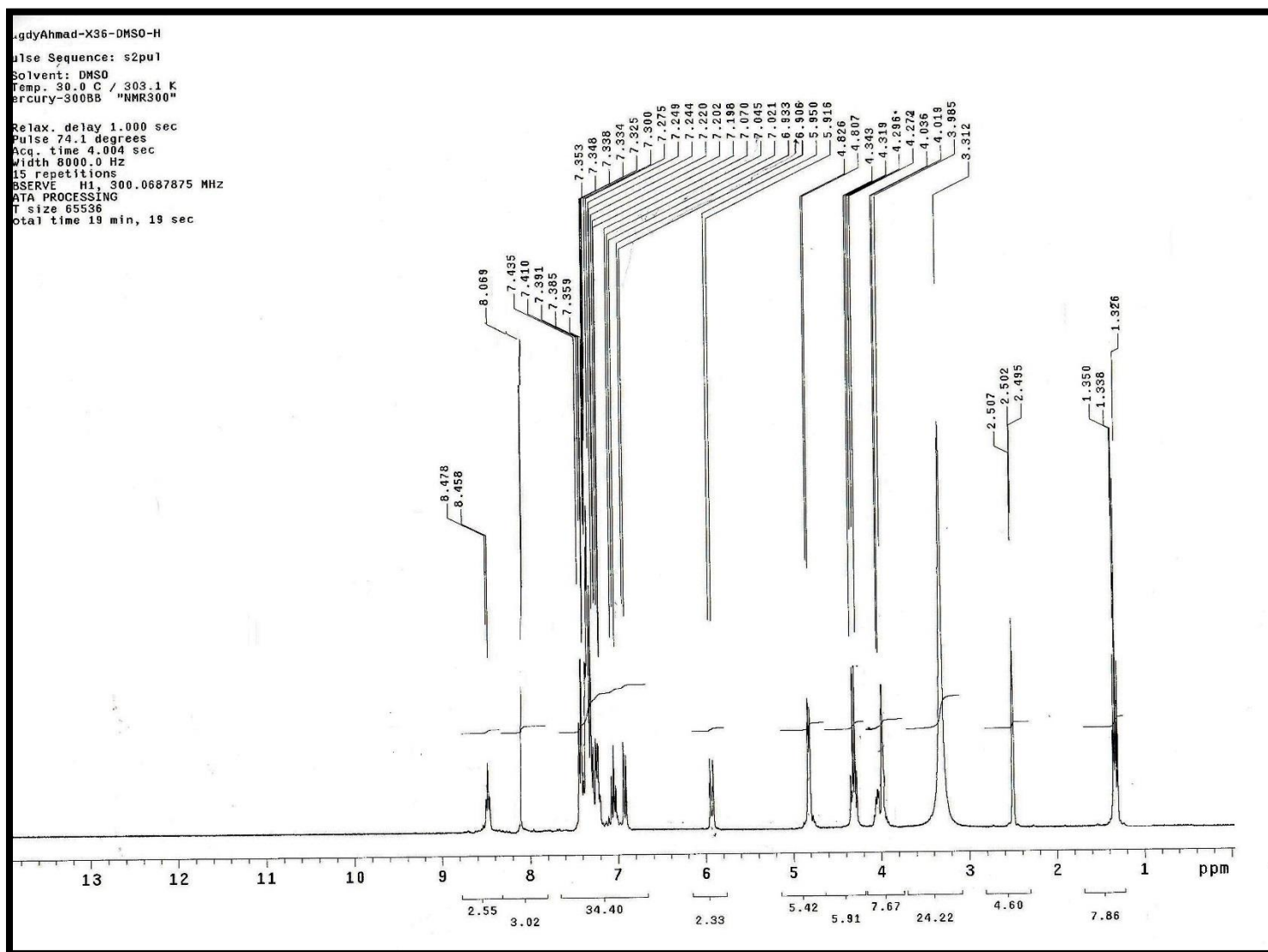


Figure 18.  $^1\text{H}$  NMR spectrum of compound 9 (DMSO)

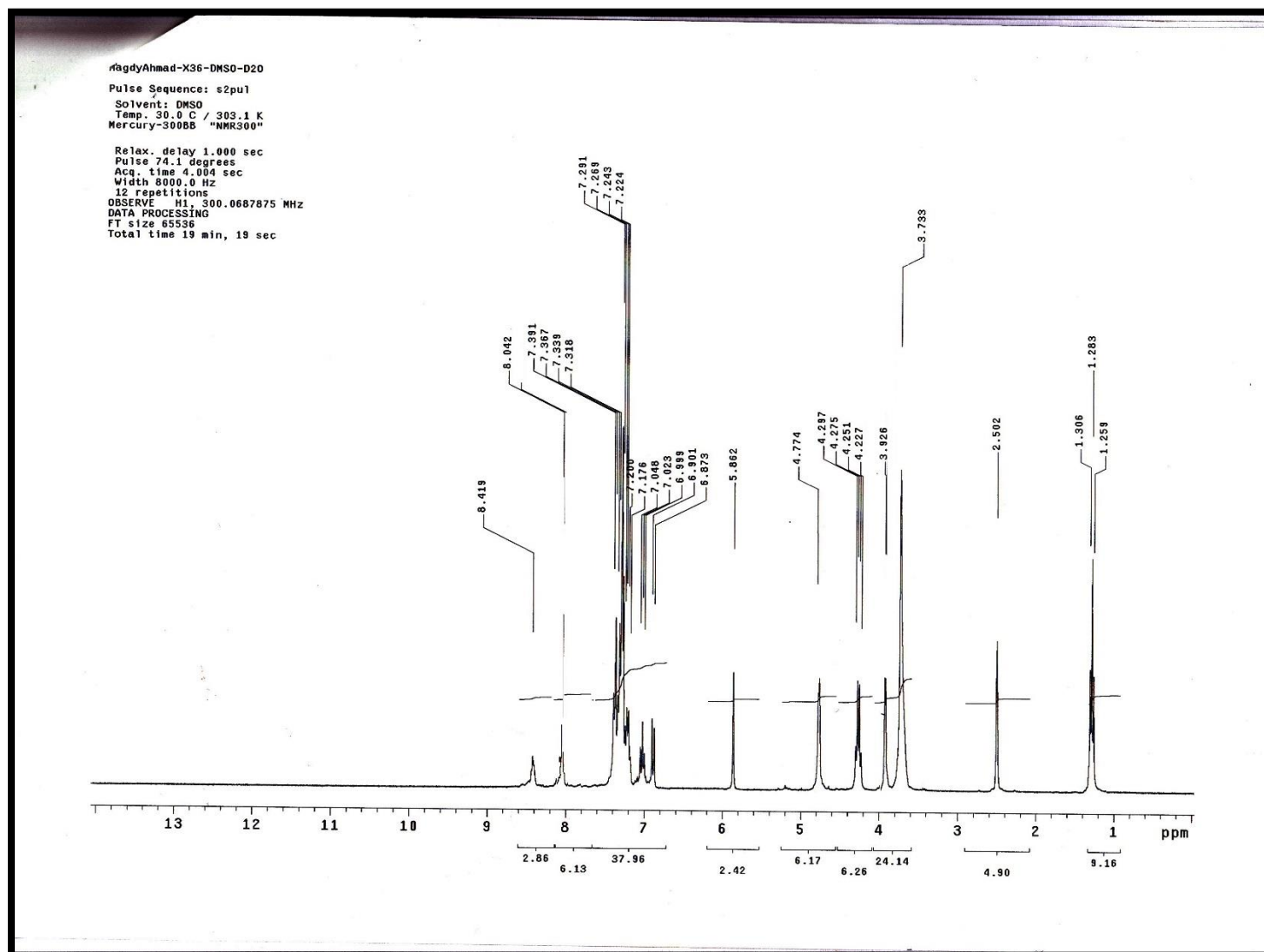


Figure 19.  $^1\text{H}$  NMR spectrum of compound 9 (DMSO+  $\text{D}_2\text{O}$ )



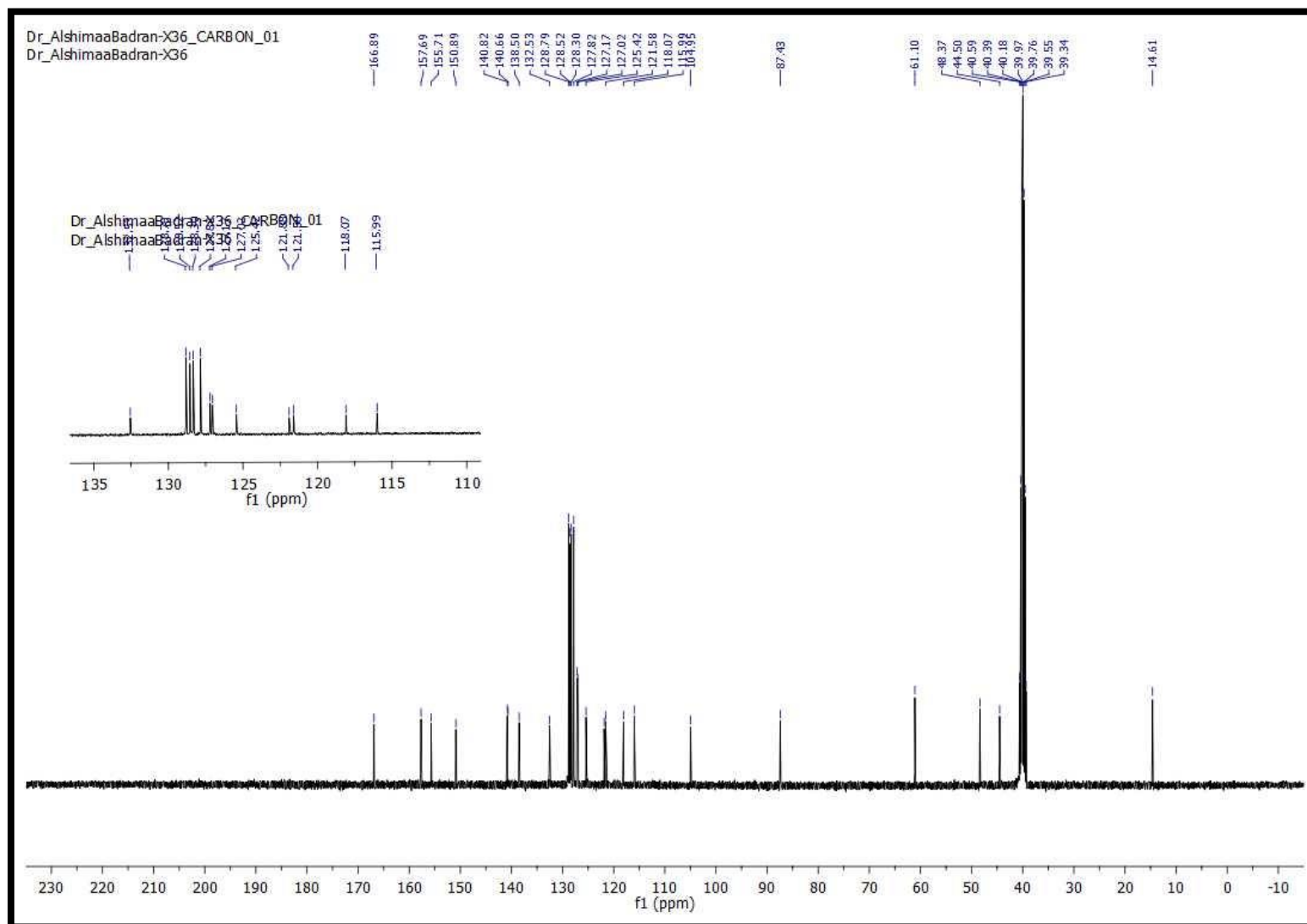


Figure 20.  $^{13}\text{C}$  NMR spectrum of compound 9



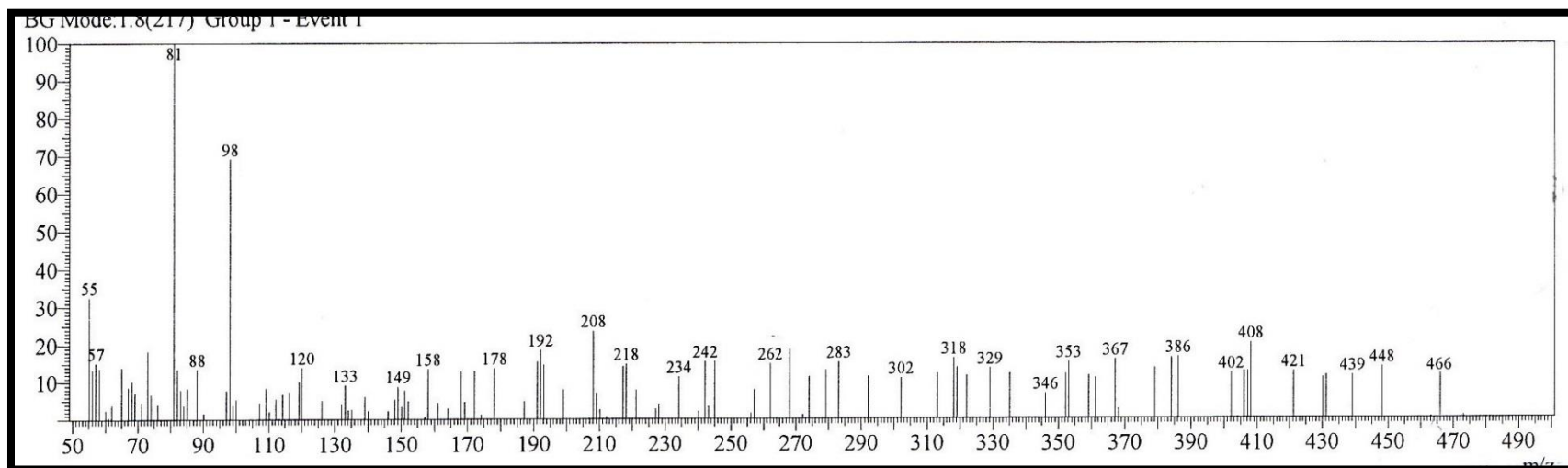


Figure 21. Mass spectrum of compound 9

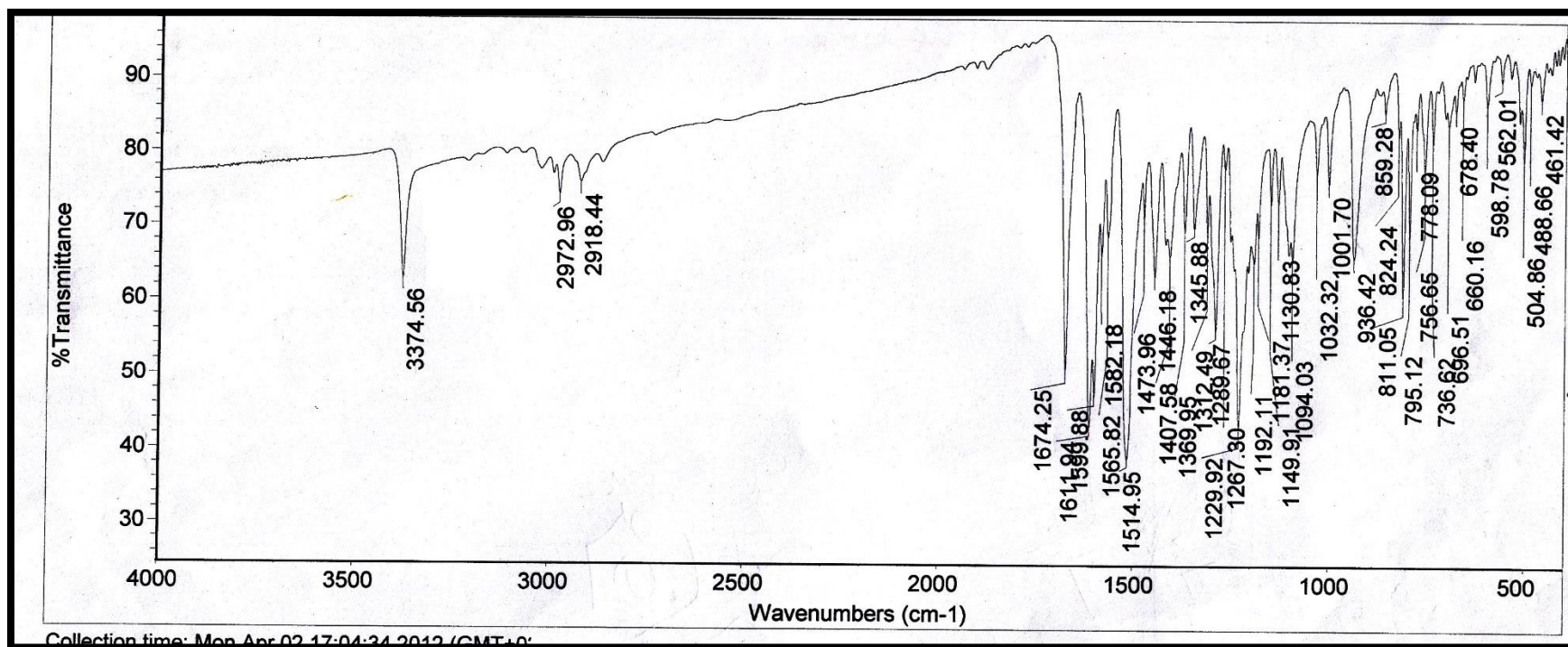


Figure 22. IR spectrum of compound 10

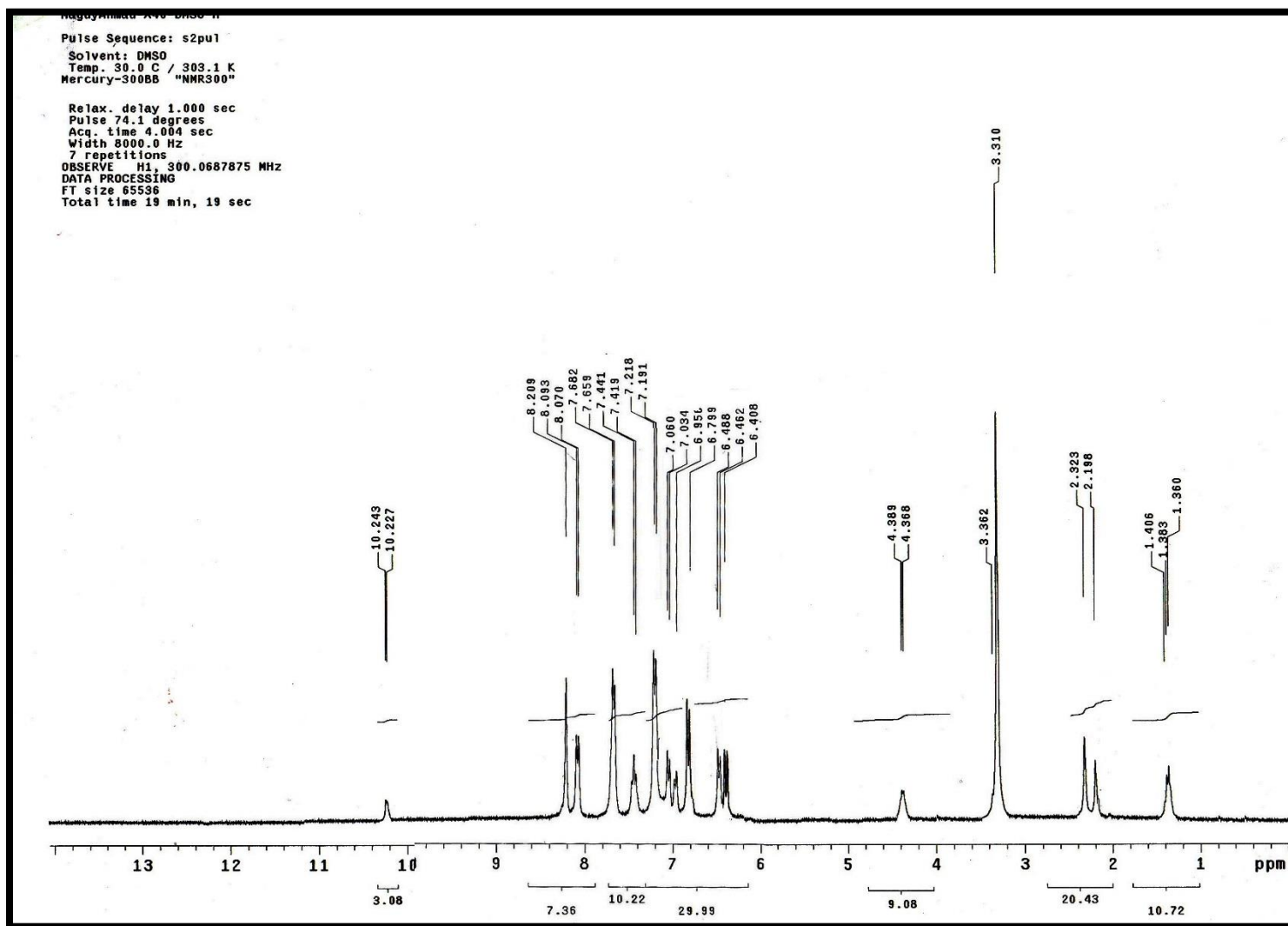


Figure 23.  $^1\text{H}$  NMR spectrum of compound 10 (DMSO)

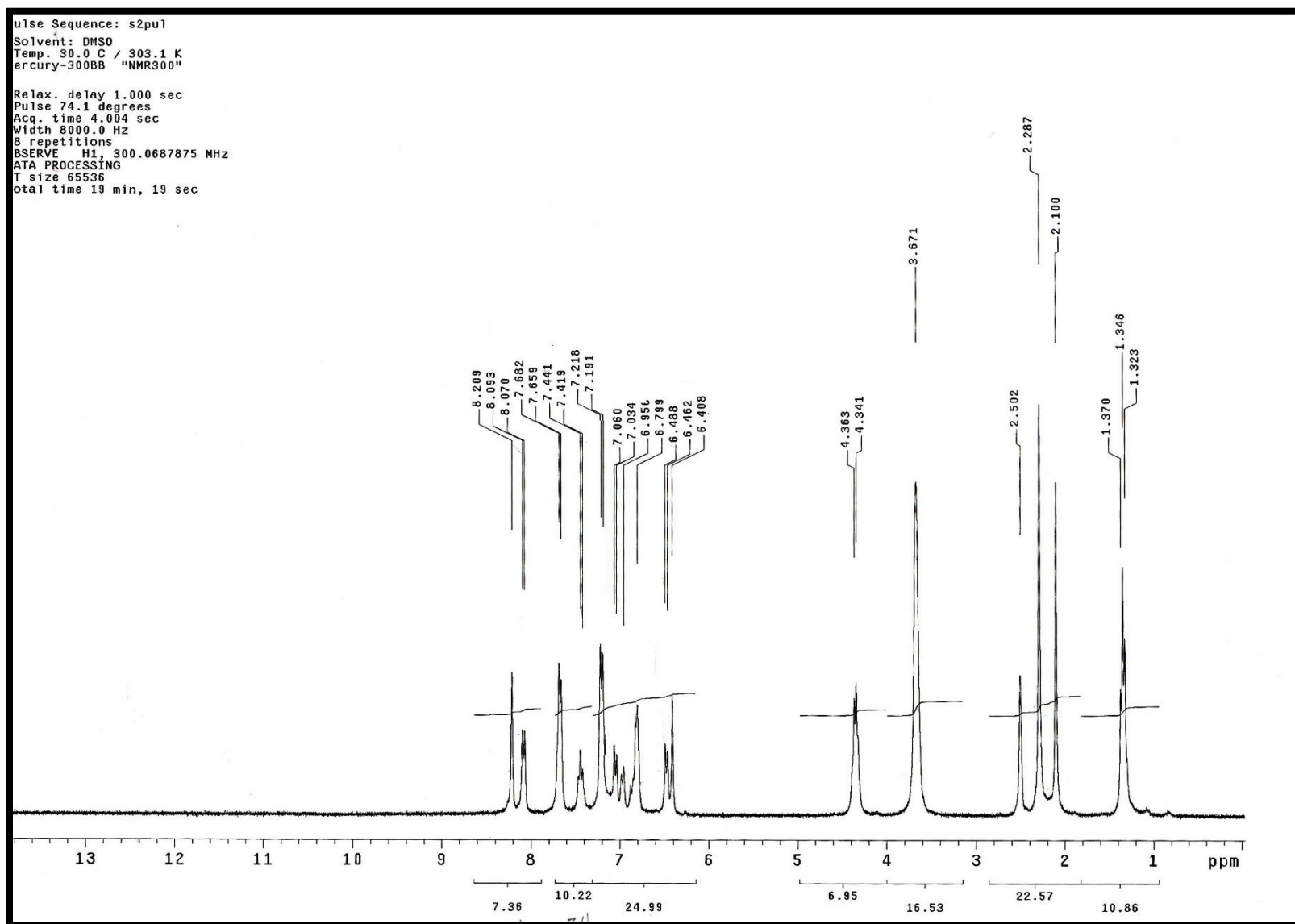


Figure 24.  $^1\text{H}$  NMR spectrum of compound 10 (DMSO +  $\text{D}_2\text{O}$ )

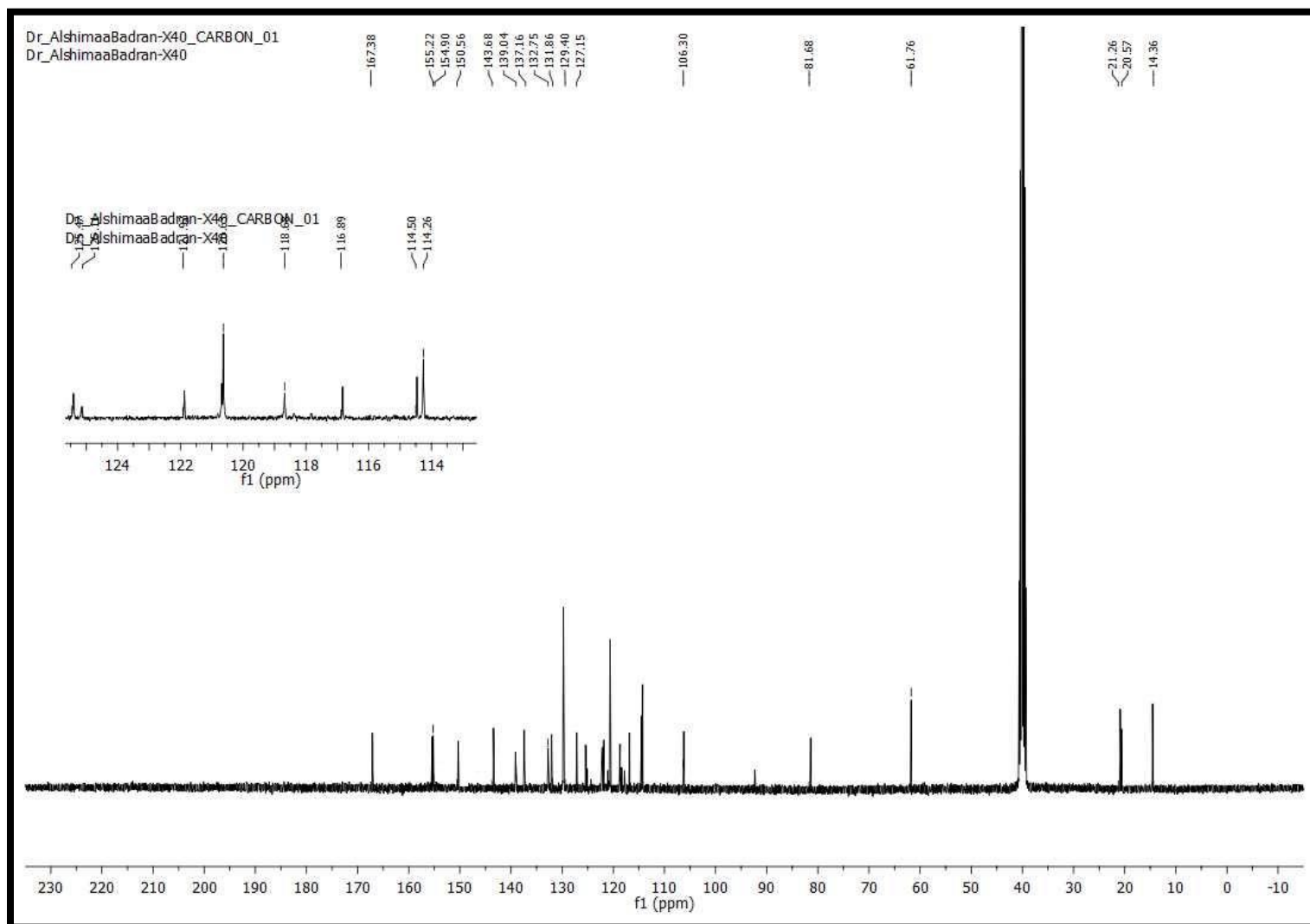


Figure 25.  $^{13}\text{C}$  NMR spectrum of compound 10

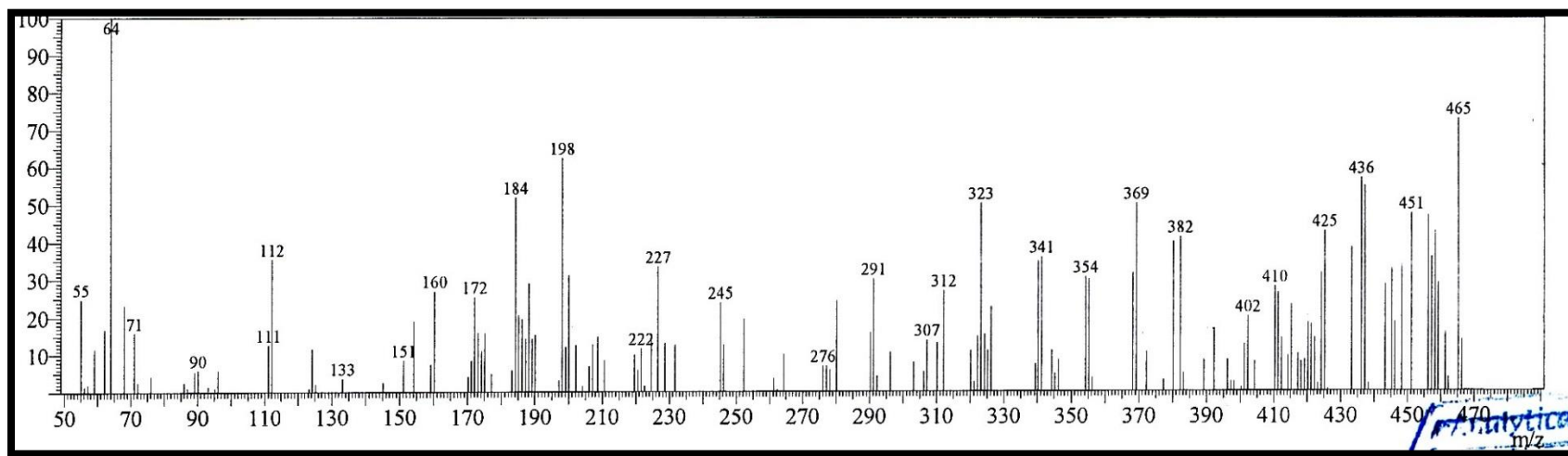


Figure 26. Mass spectrum of compound 10

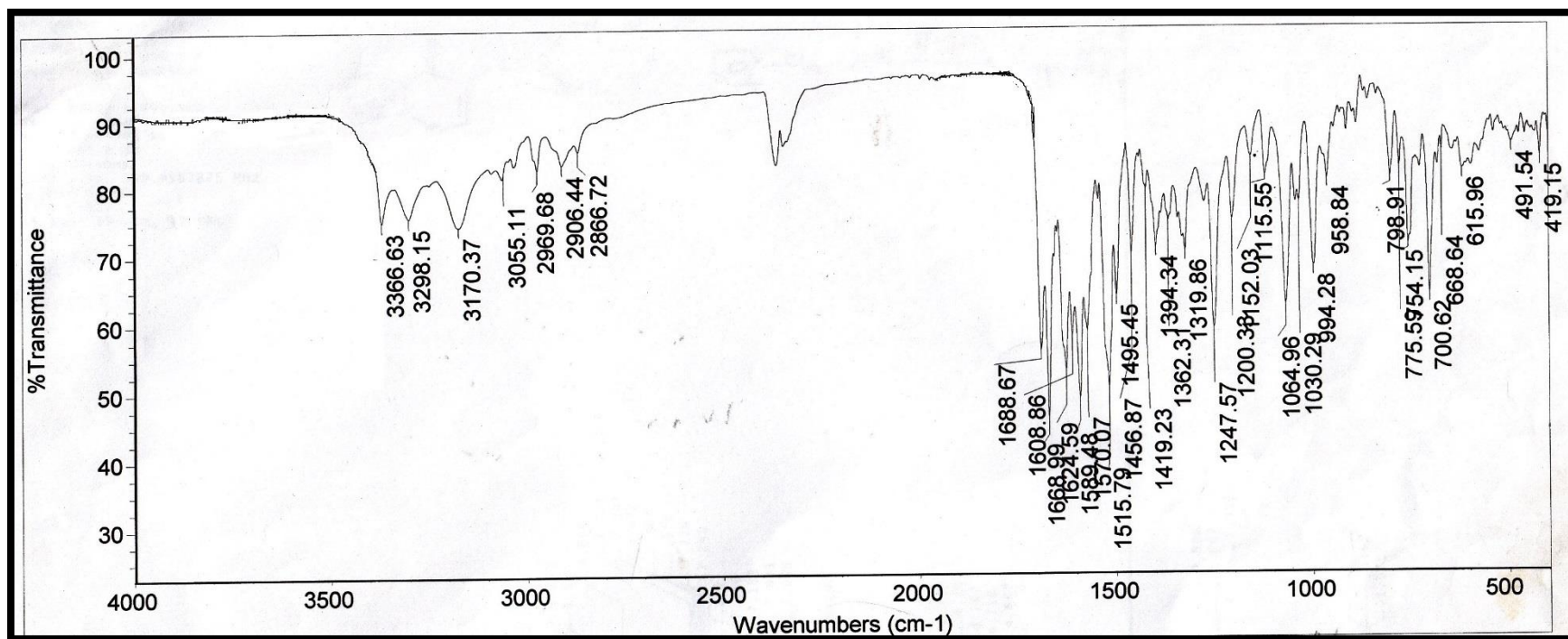


Figure 27. IR spectrum of compound 11



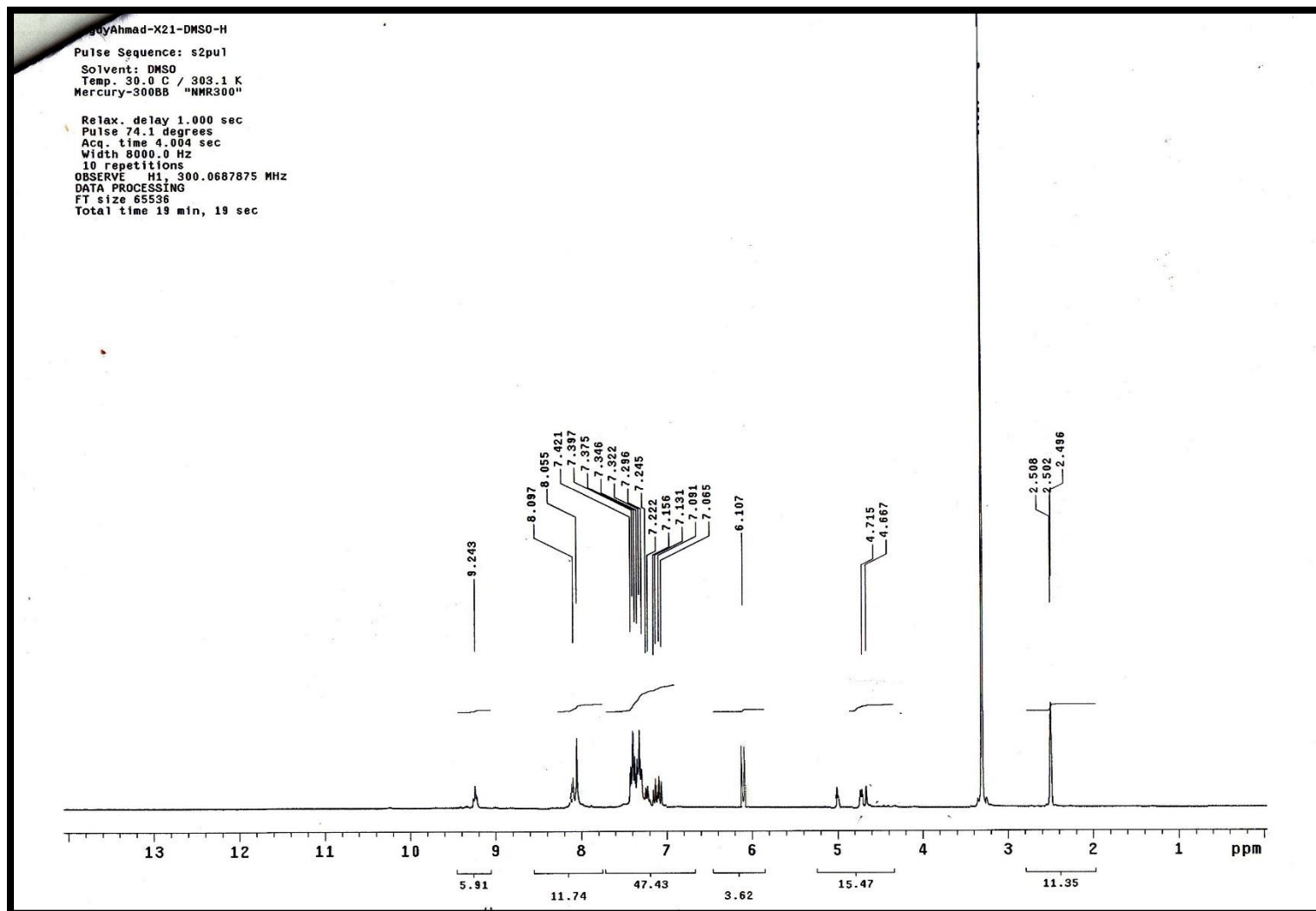


Figure 28.  $^1\text{H}$  NMR spectrum of compound 11



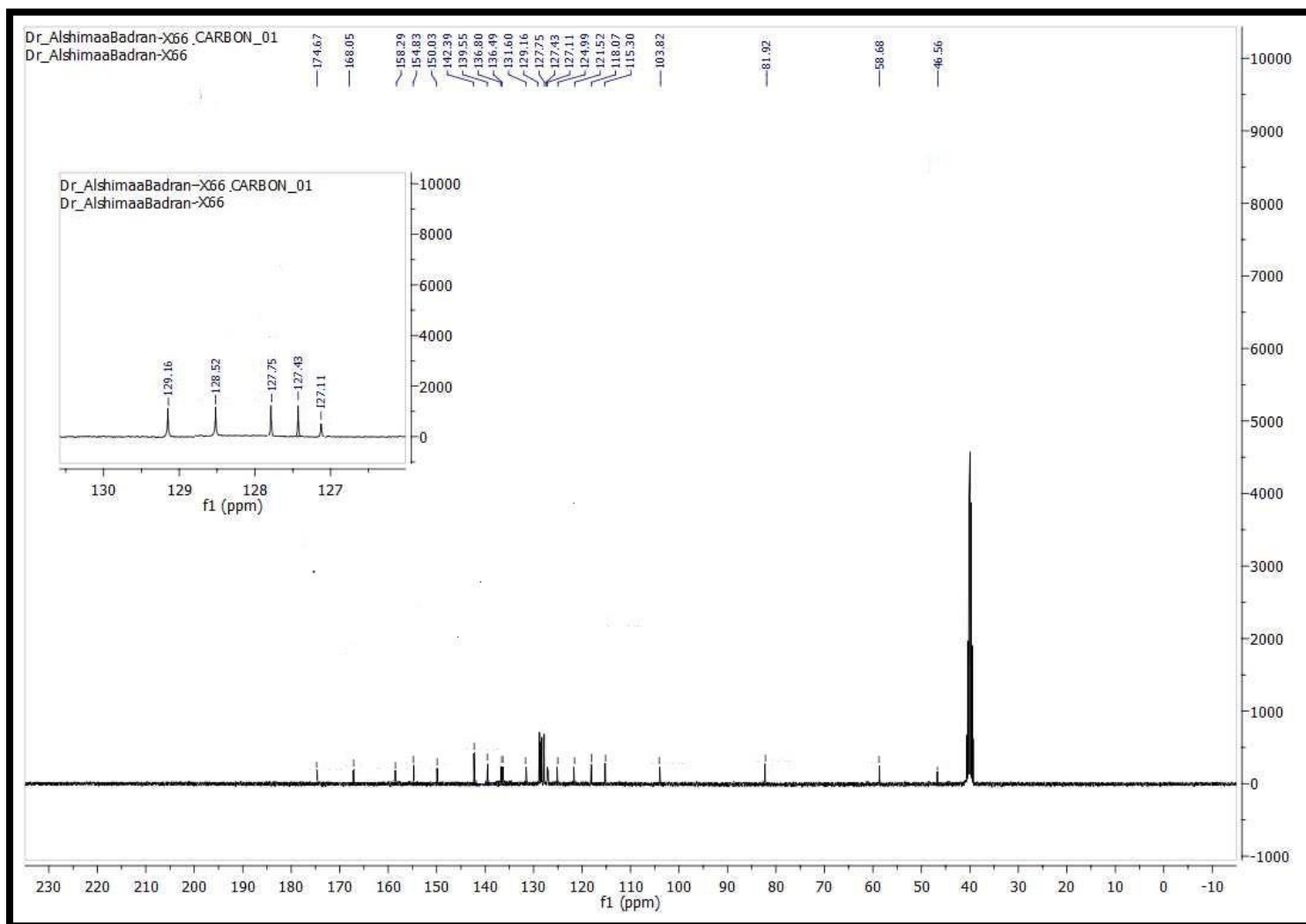


Figure 29.  $^{13}\text{C}$  NMR spectrum of compound 11

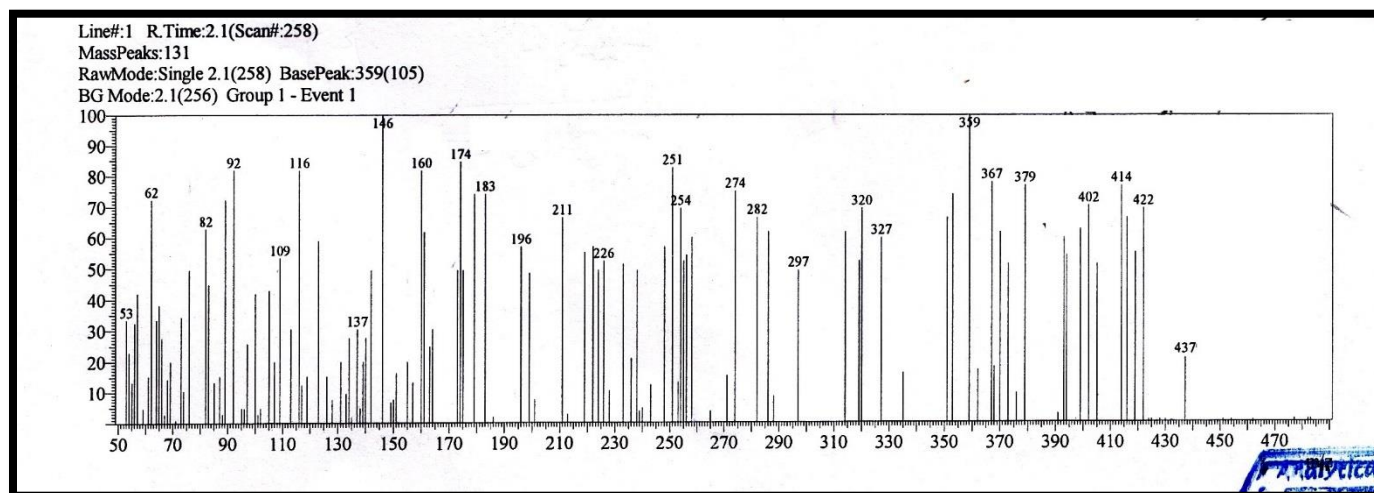


Figure 30. Mass spectrum of compound 11

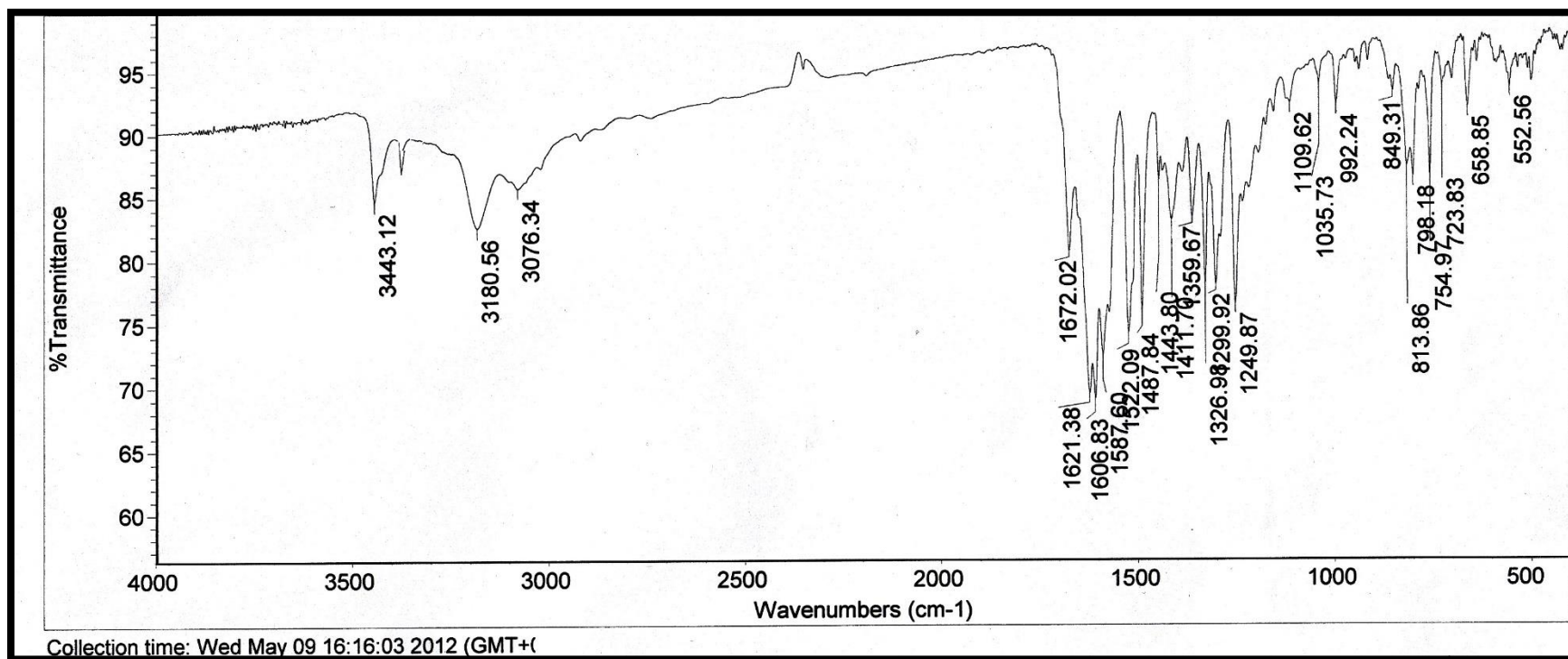
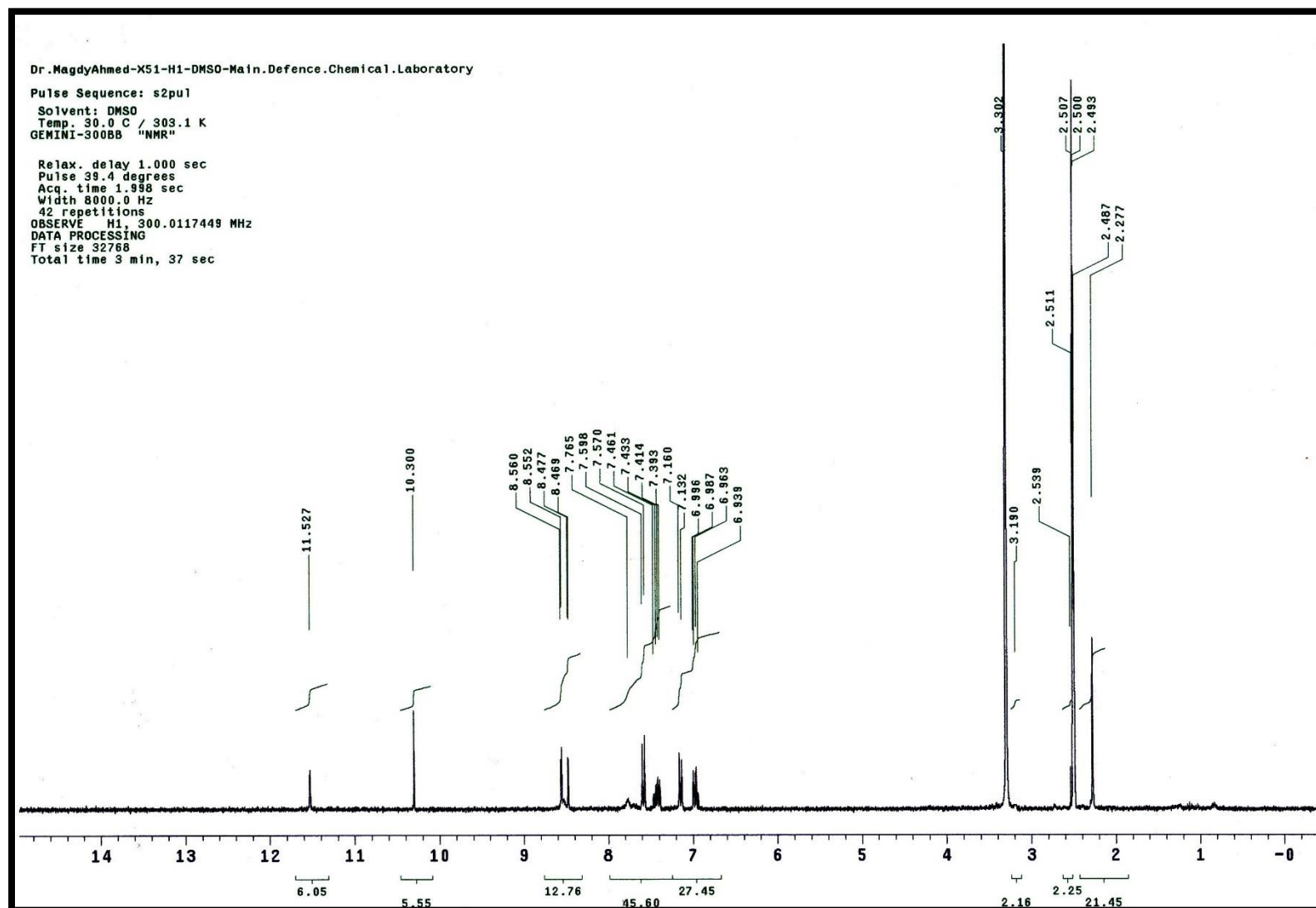
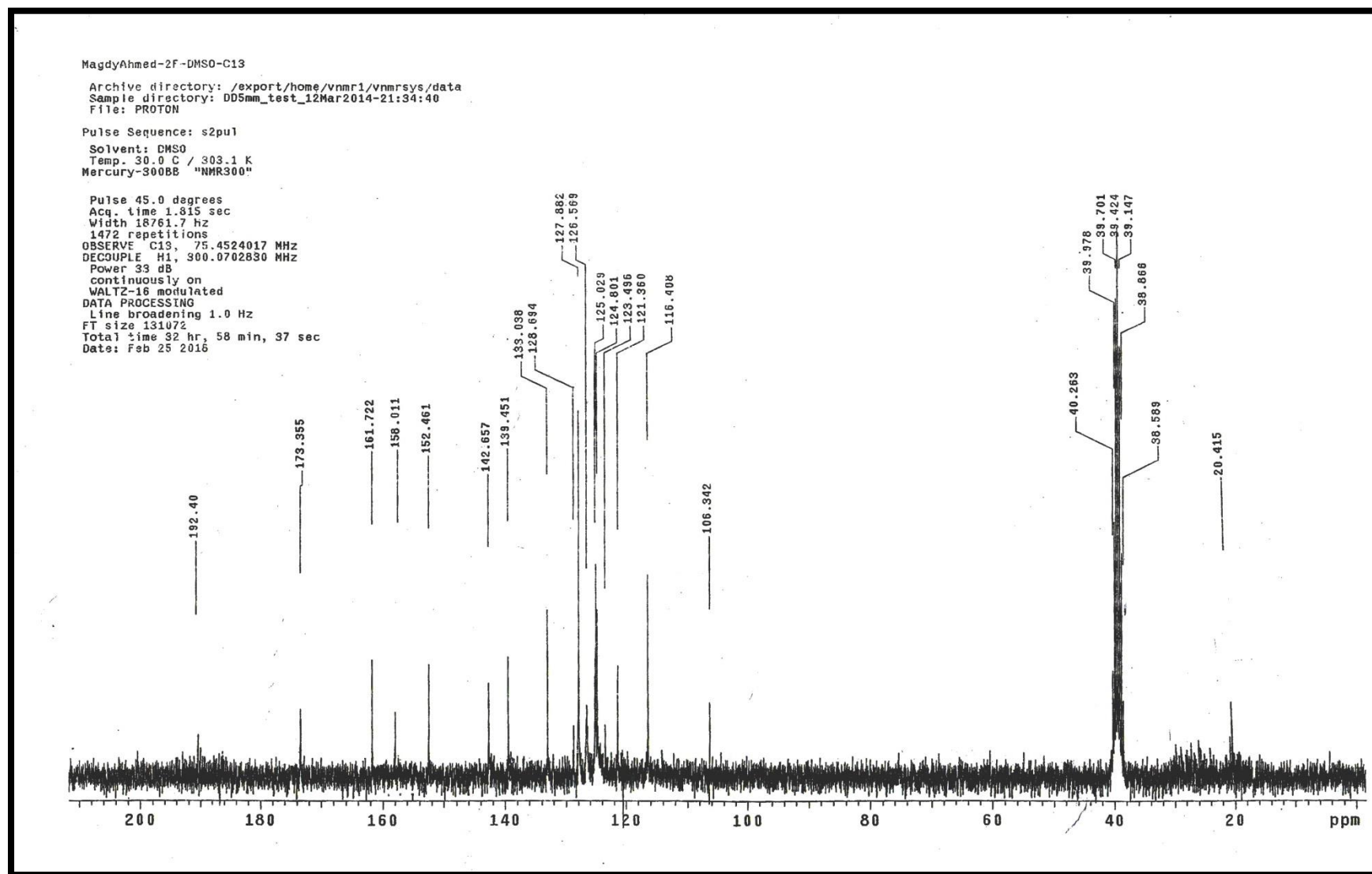


Figure 31. IR spectrum of compound 12

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

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