Appendix A

Synthesis of new phosphazine and triazole derivatives for treatment of Alzheimer's disease: modulating ROS/JNK and Wnt/β-catenin signaling pathways

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Experimental

Chemistry

All chemicals were supplied by either Fluka or Aldrich chemical companies and were used without further purification. All melting points are uncorrected and were taken in open capillary tubes using Electrothermal apparatus 9100. Elemental microanalyses were carried out at Microanalytical Unit, Central Services Laboratory, National Research Centre, Dokki, Giza, Egypt, using Vario Elementar and were found within ±0.4% of the theoretical values. **FT-IR** spectra were recorded with a Perkin-Elmer Frontier. Routine **NMR** spectra were recorded at room temperature on a Bruker Avance TM 300 or 400 spectrometer as solutions in dimethyl sulfoxide (DMSO) or in chloroform ($CDCl_3$). All chemical shifts are quoted in δ relative to the trace resonance of protonated chloroform (δ 7.25 ppm), $CDCl_3$ (δ 77.0 ppm) or dimethyl sulfoxide (δ 2.50 ppm), DMSO (δ 39.51 ppm) and external 85% aqueous H_3PO_4 (δ 0.0 ppm). The mass spectra were measured with a GC Finnigan MAT SSQ-7000 mass spectrometer. Follow up of the reactions and checking the purity of the compounds were made by Thin Layer Chromatography (TLC) on silica gel-precoated aluminum sheets (Type 60, F 254, Merck, Darmstadt, Germany) with eluent of petroleum ether (b.r. 60-80^{o}C)/ethyl acetate and the spots were detected by exposure to UV lamp at λ_{254} nanometer for a few seconds. The chemical names given for the prepared compounds are according to the IUPAC system. The reported yields are based upon pure materials isolated by column chromatography with eluent of petroleum ether (b.r. 60-80^{o}C)/ethyl acetate. Solvents were dried/purified according to conventional procedures.

Experimental: Spectral Data

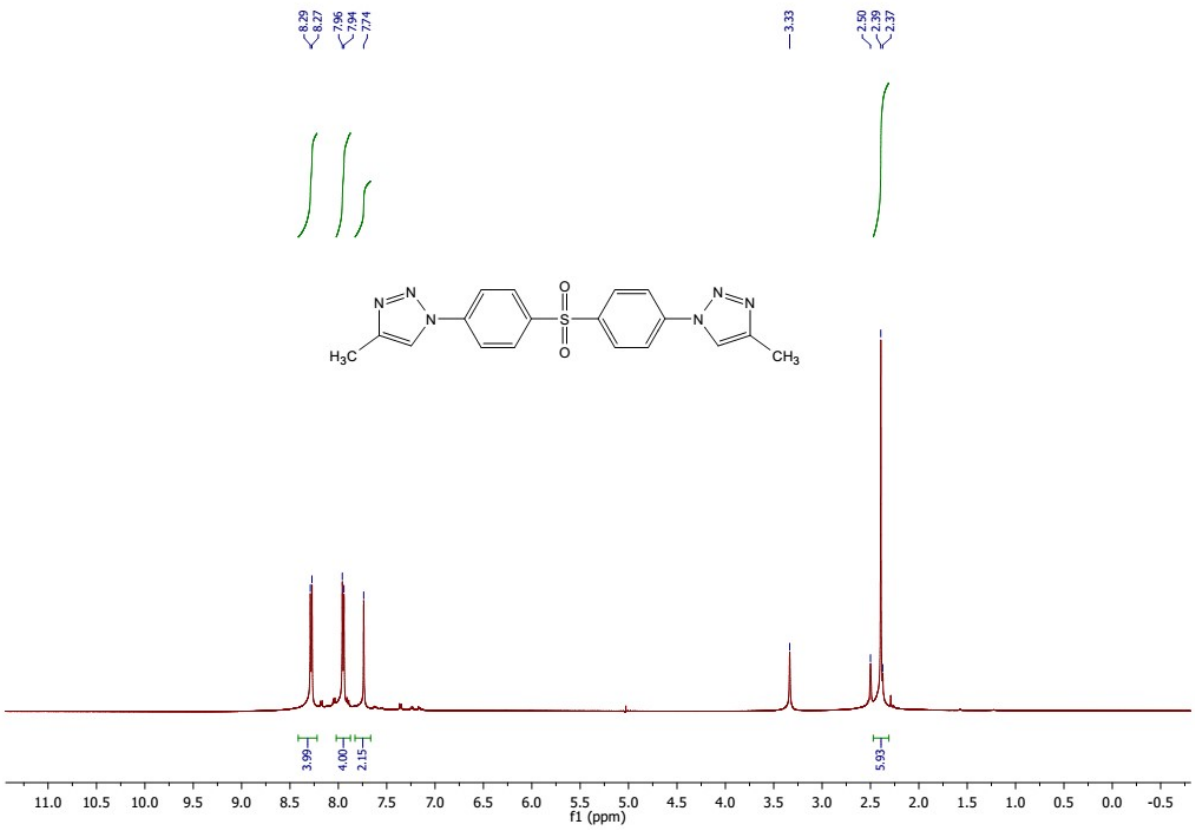


Figure : 1H NMR of compound 3a

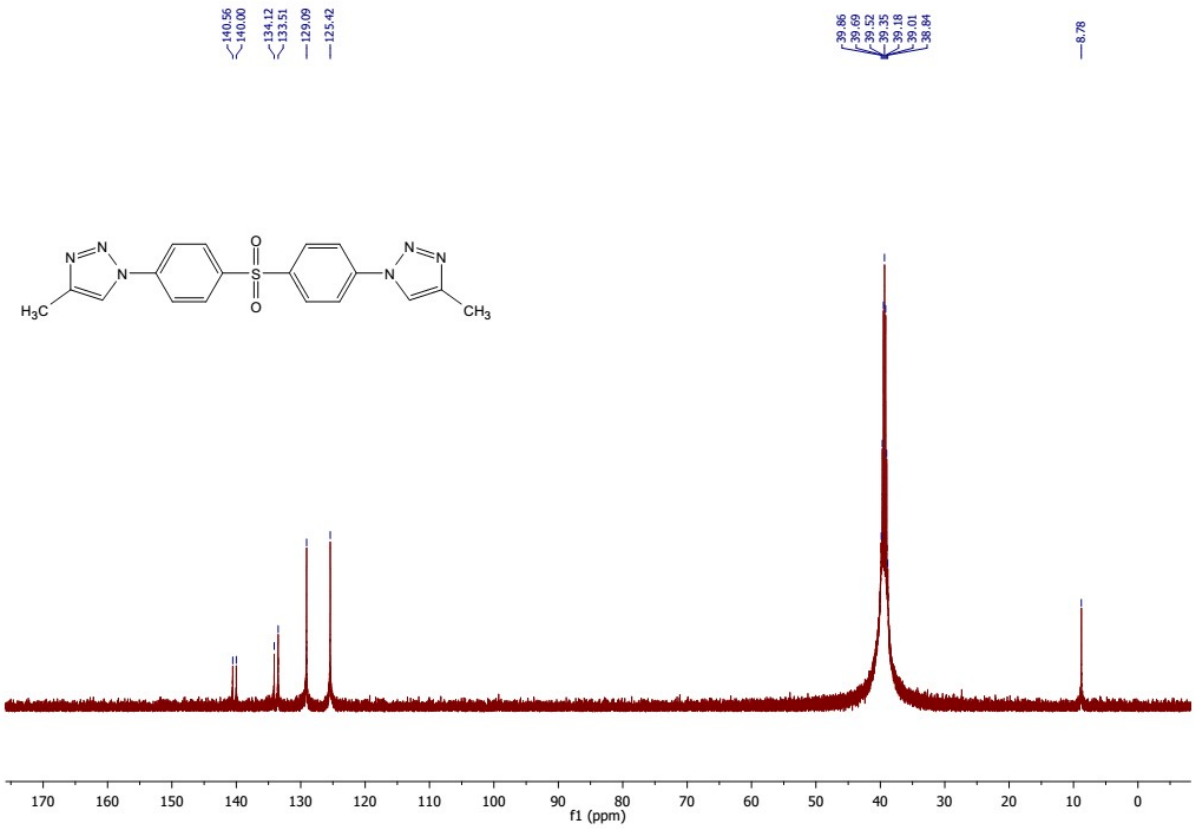


Figure : 13C NMR of compound 3a

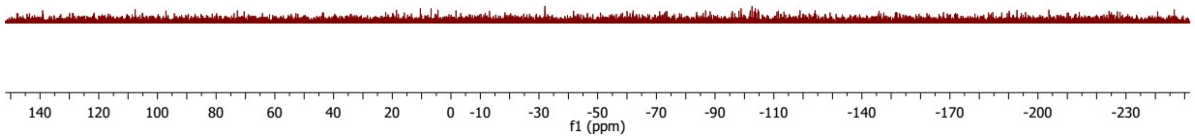


Figure : 13P NMR of compound 3a

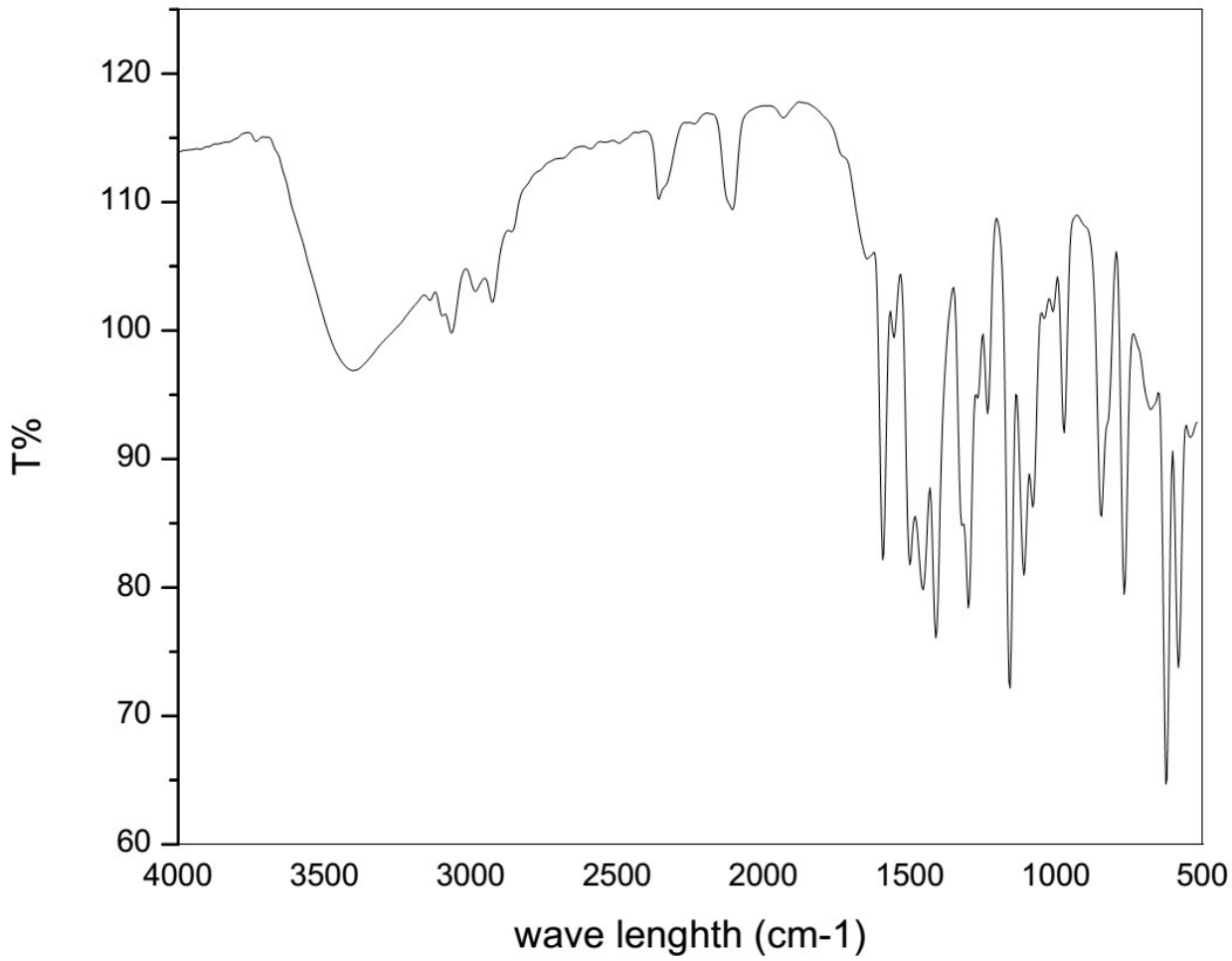


Figure : IR chart of compound 3a

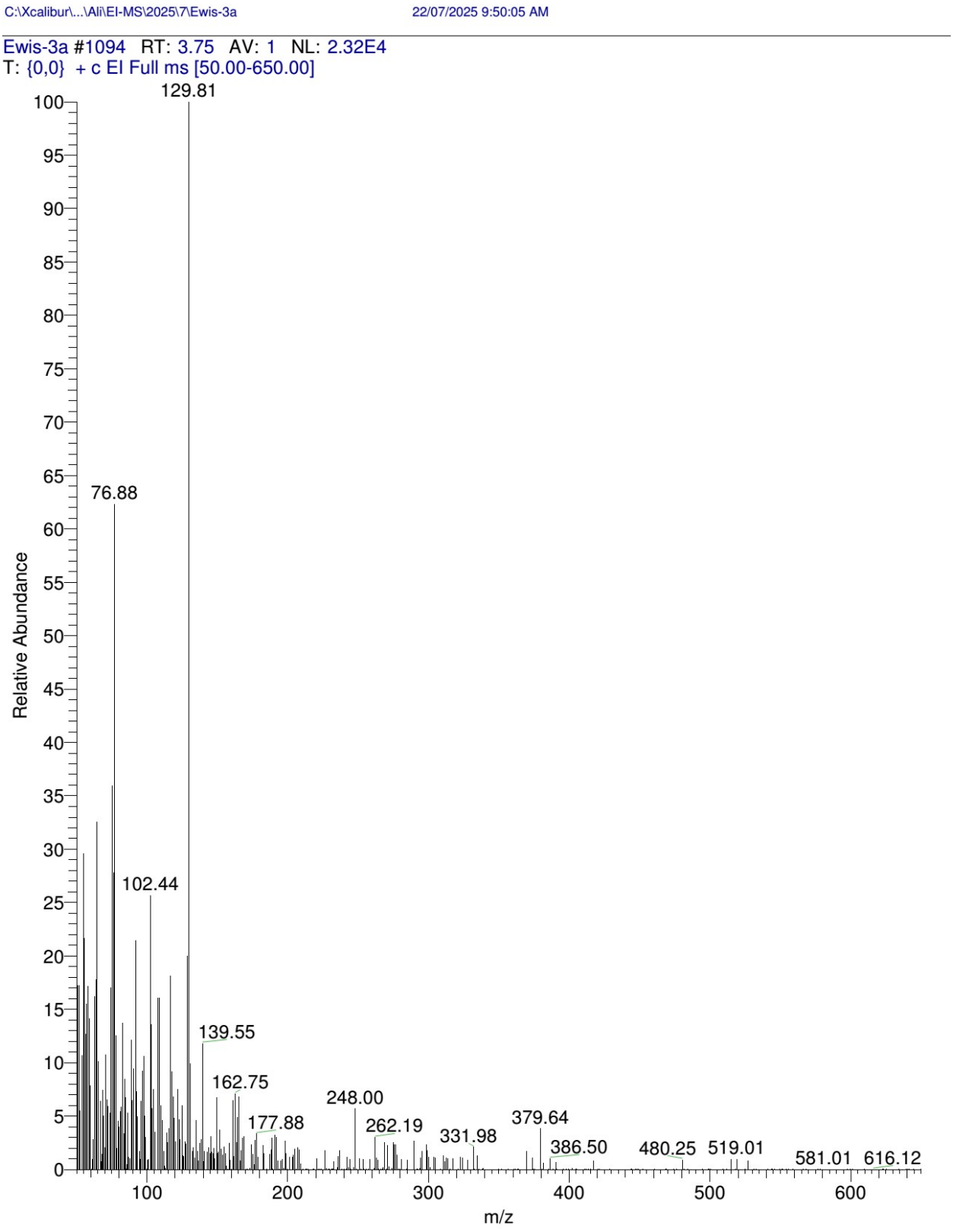


Figure : Mass spectrum of compound 3a

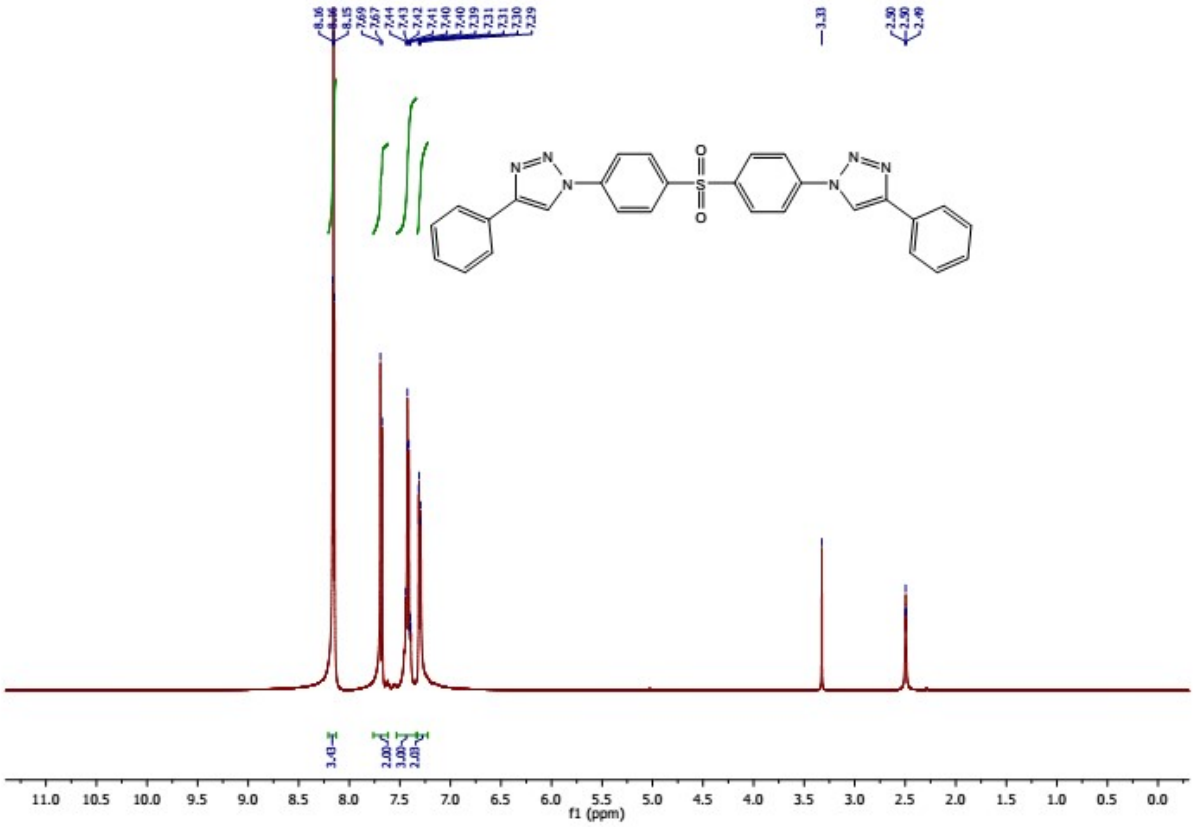


Figure : 1H NMR of compound 3b

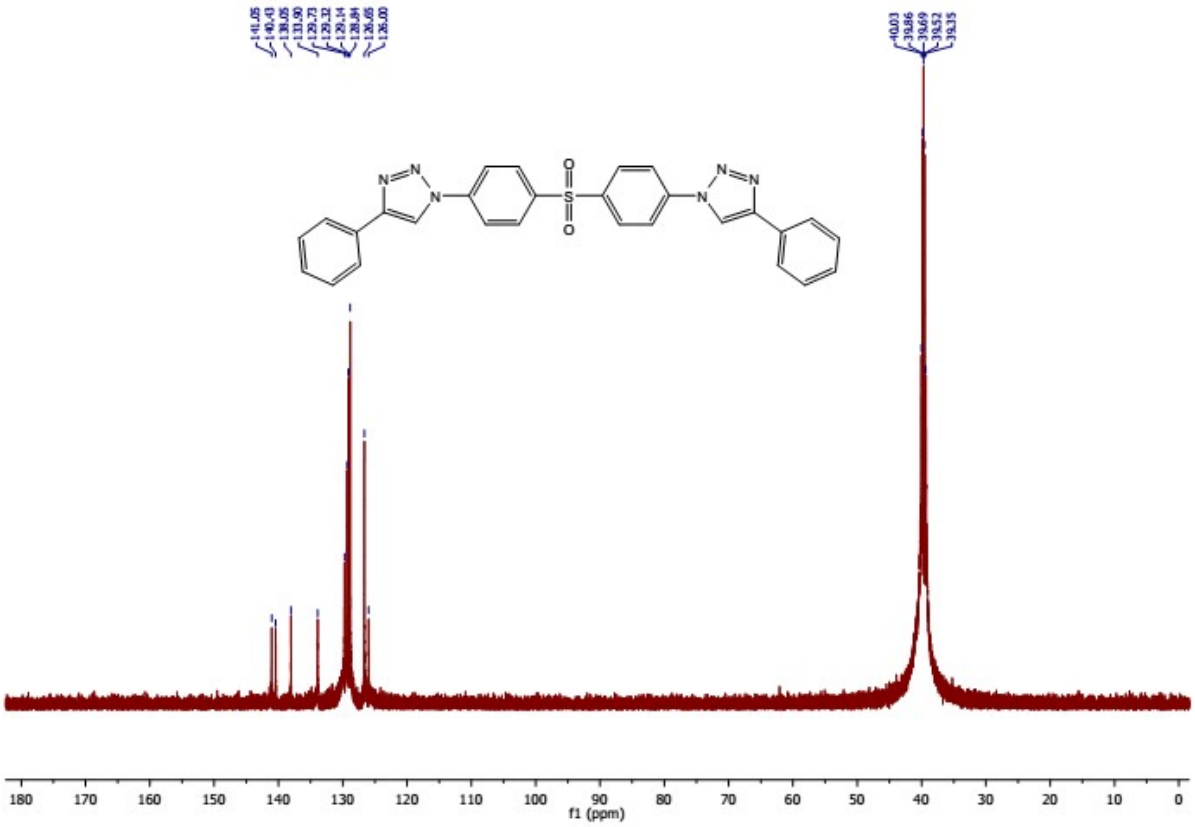


Figure : 13C NMR of compound 3b

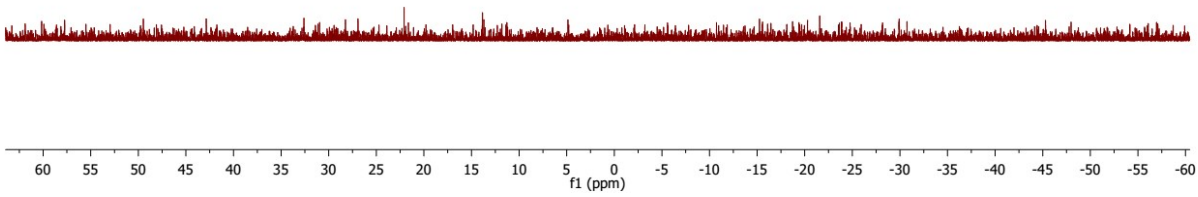
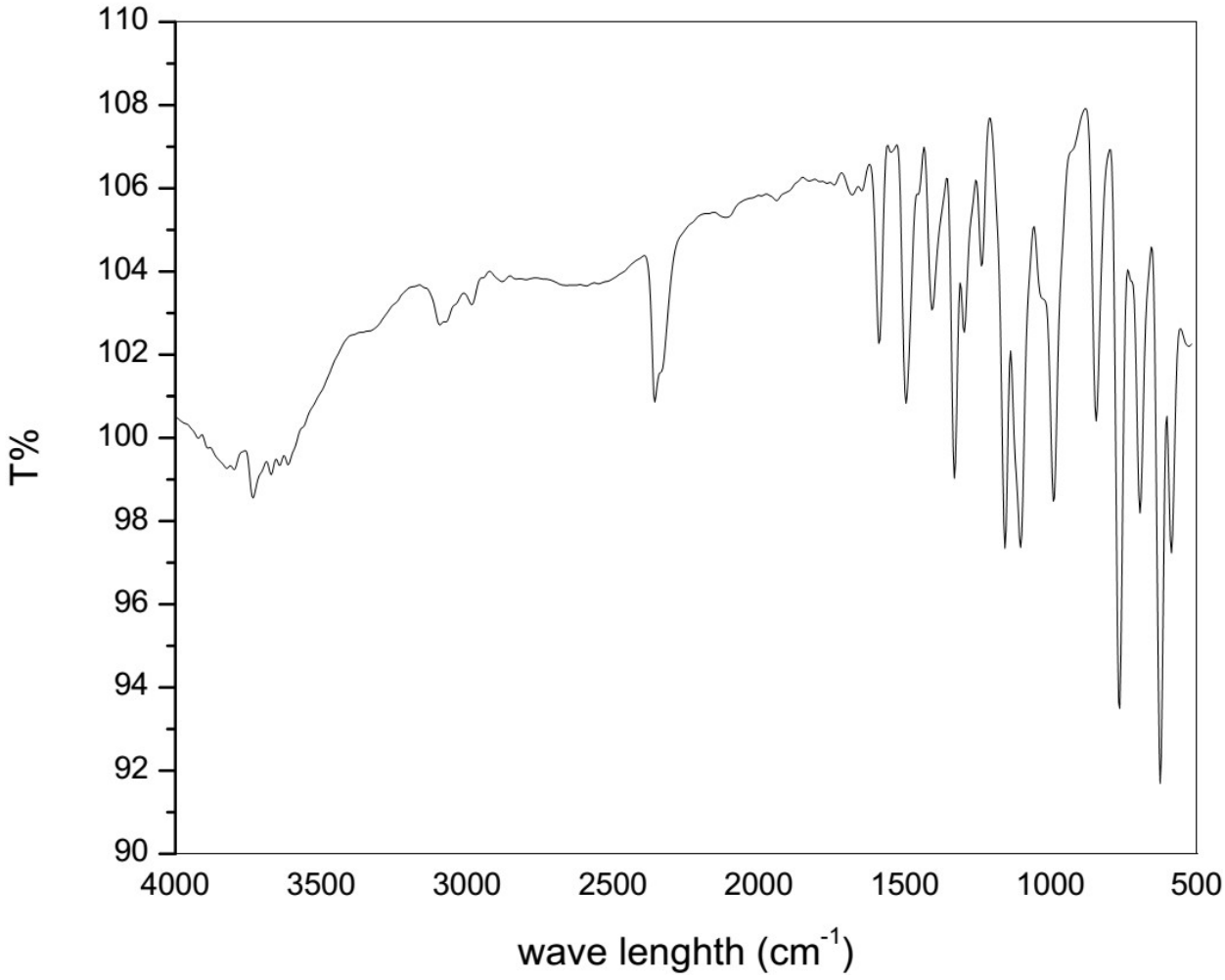


Figure : 13P NMR of compound 3b



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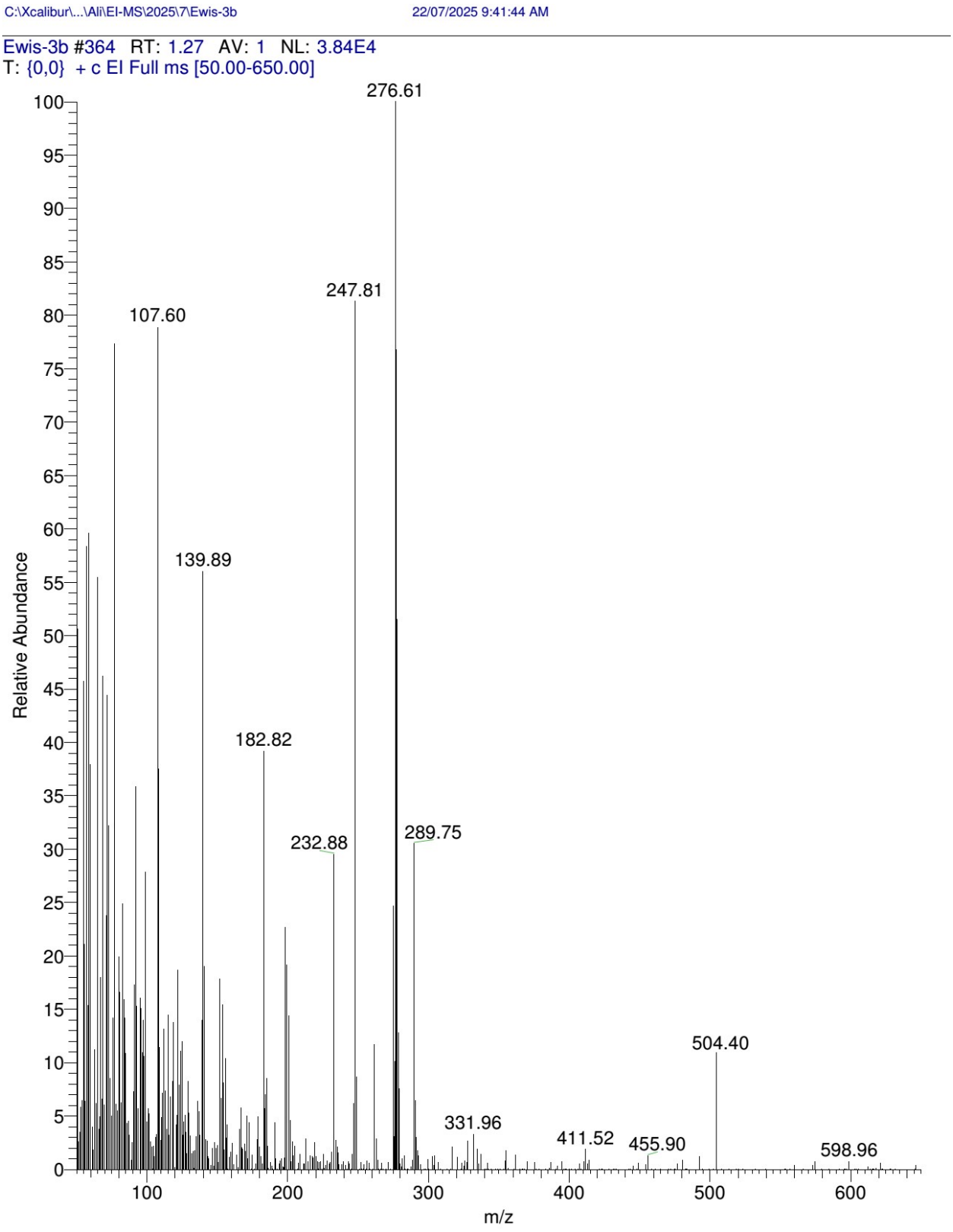


Figure : Mass spectrum of compound 3b

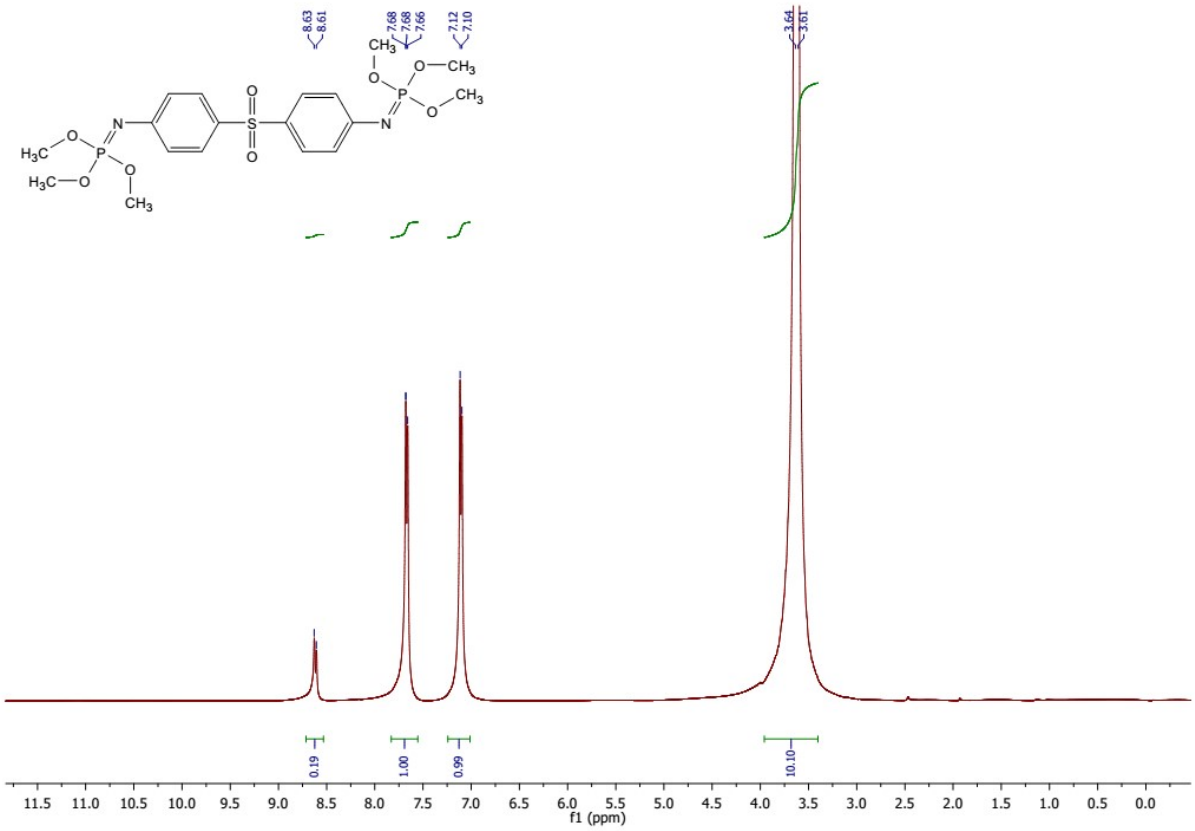


Figure : 1H NMR of compound 5a

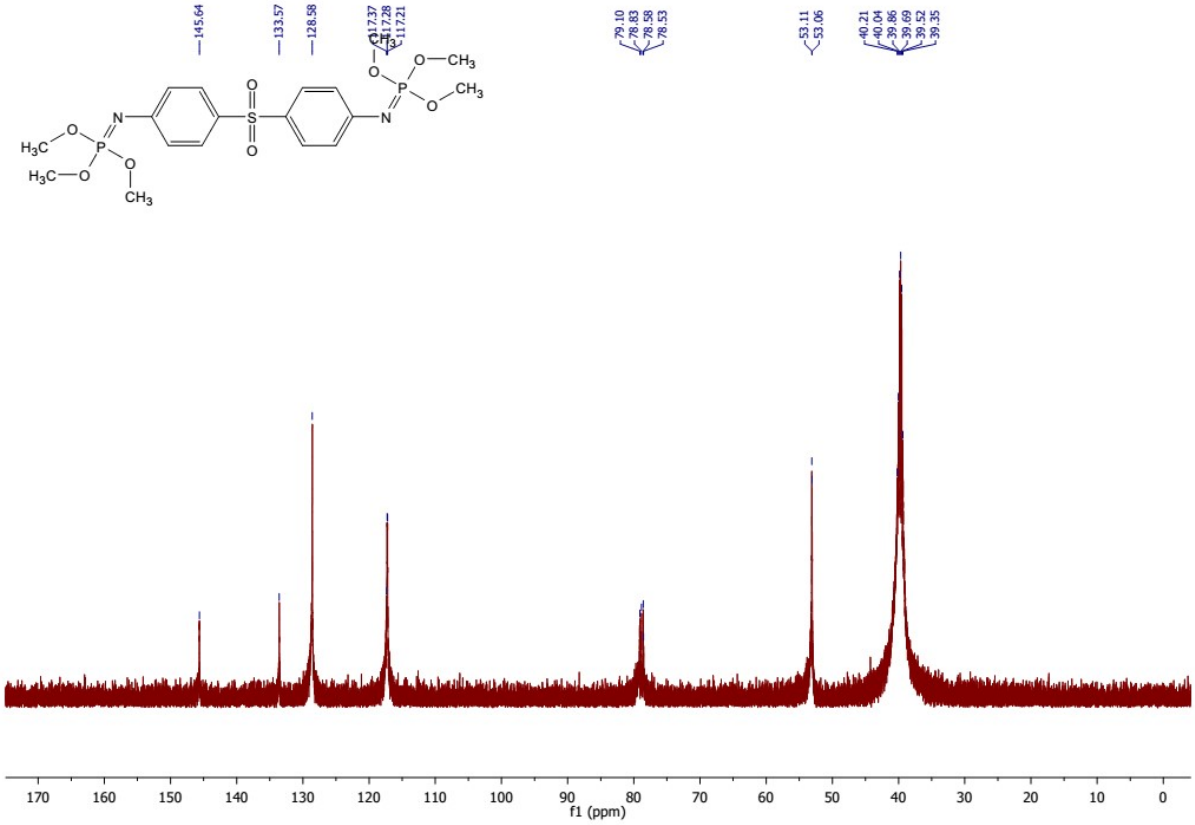


Figure : 13C NMR of compound 5a

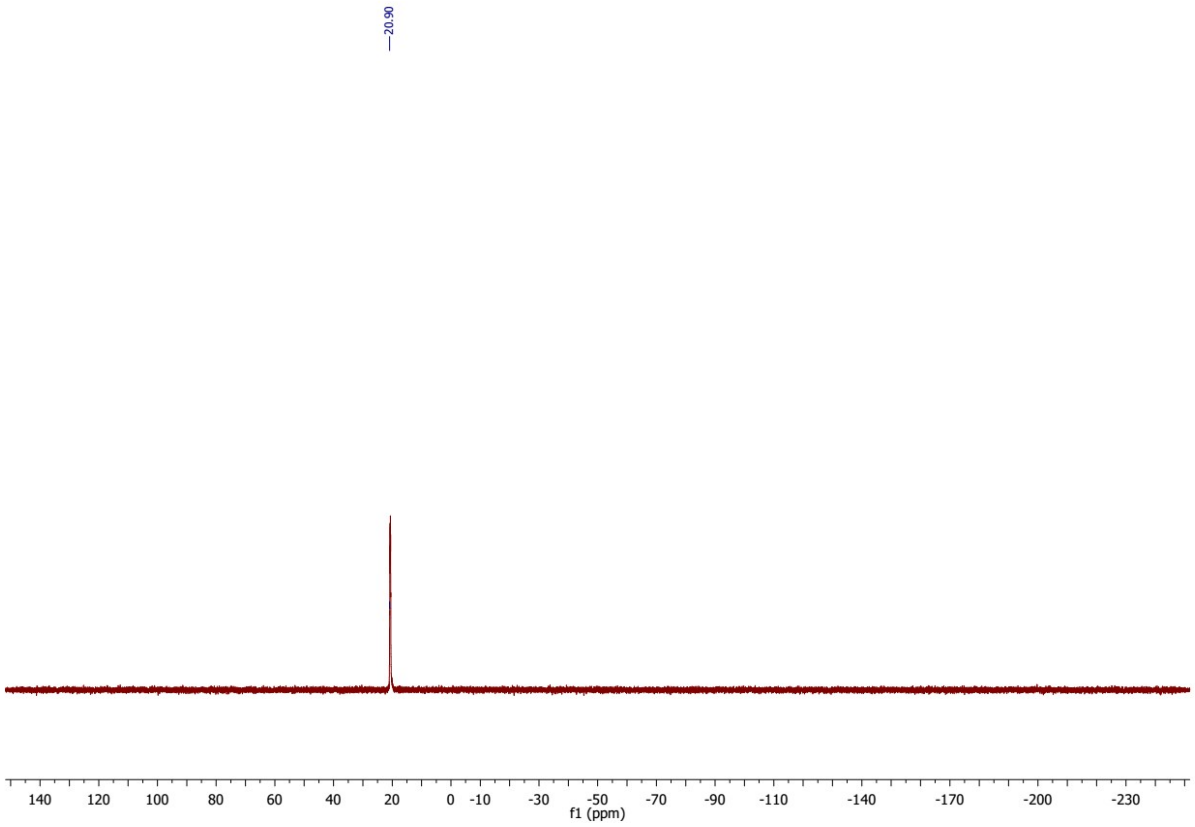


Figure : 13P NMR of compound 5a

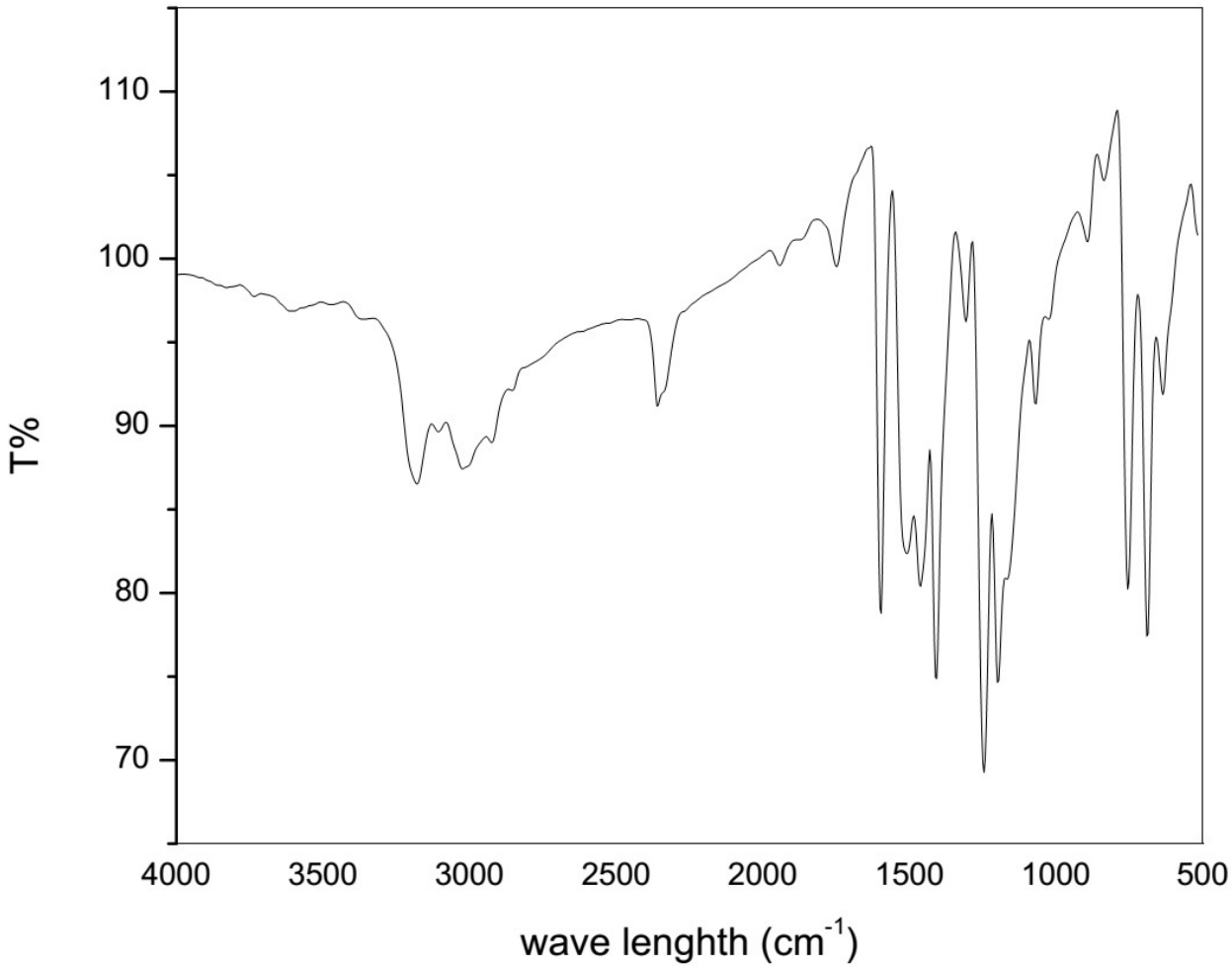


Figure : IR chart of compound 5a

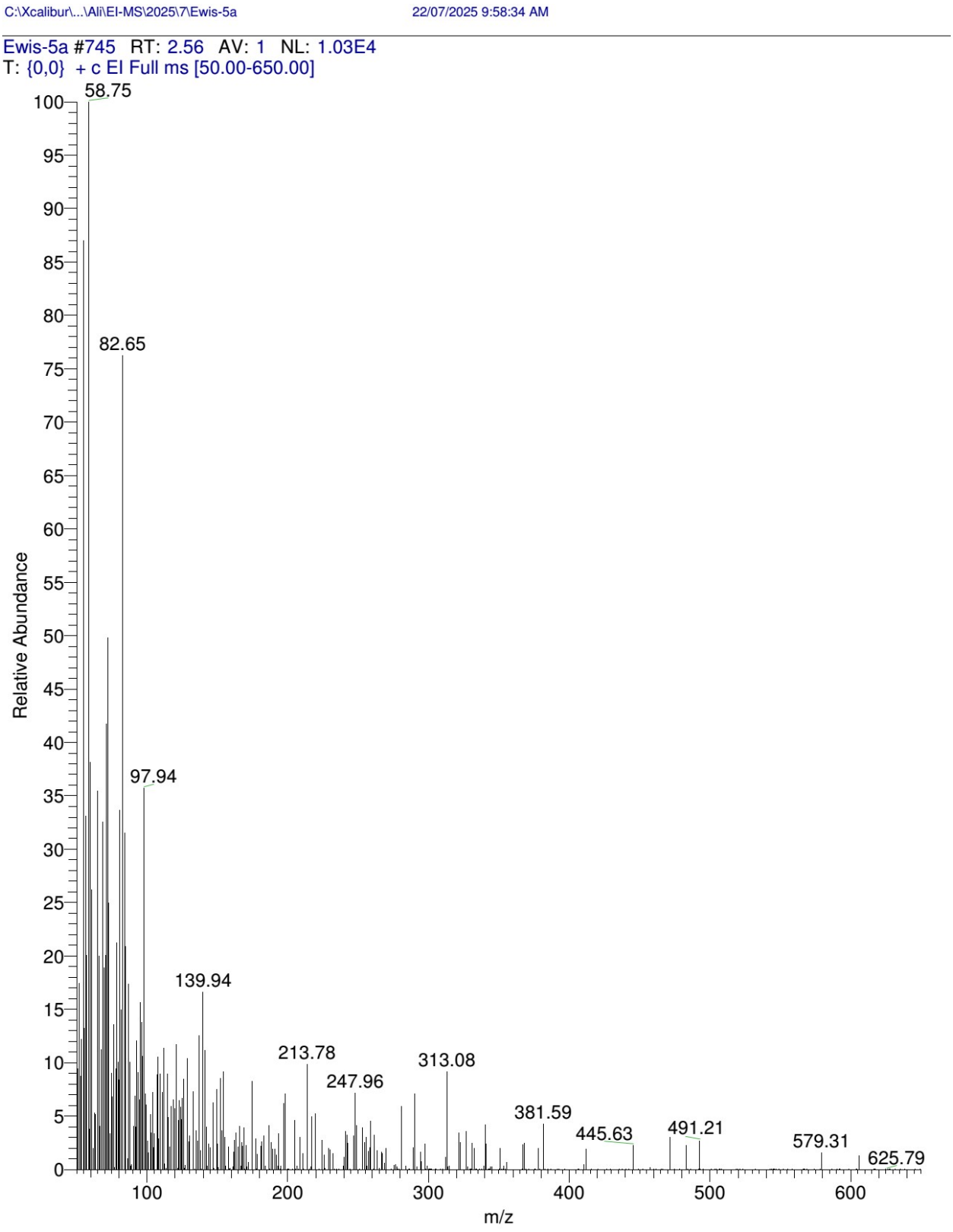
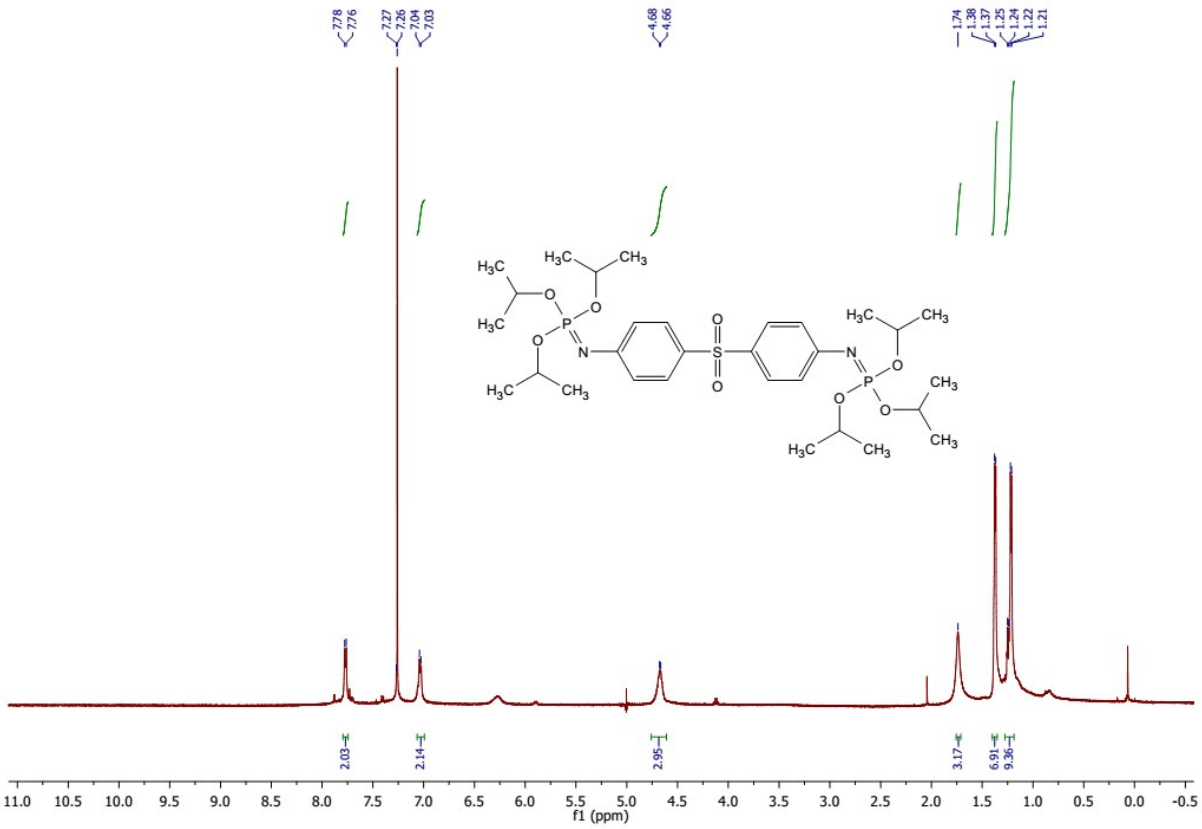


Figure : Mass spectrum of compound 5a



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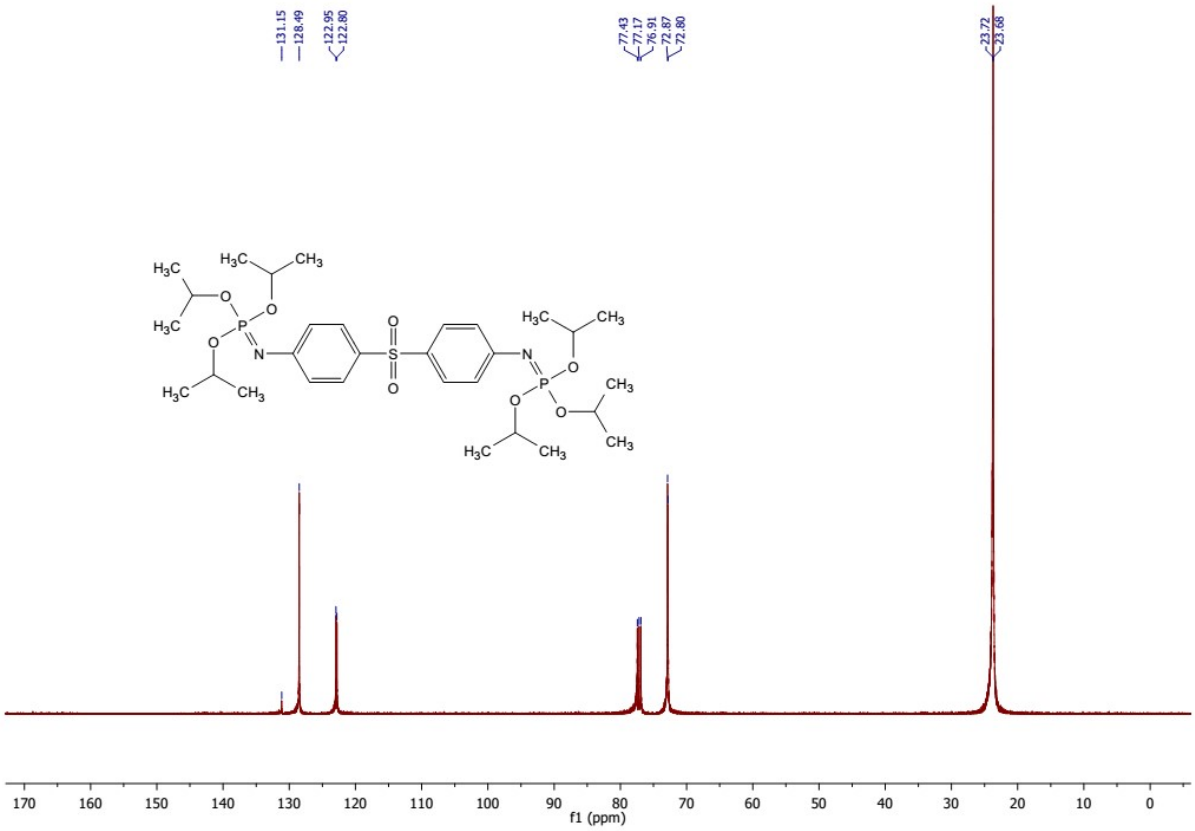

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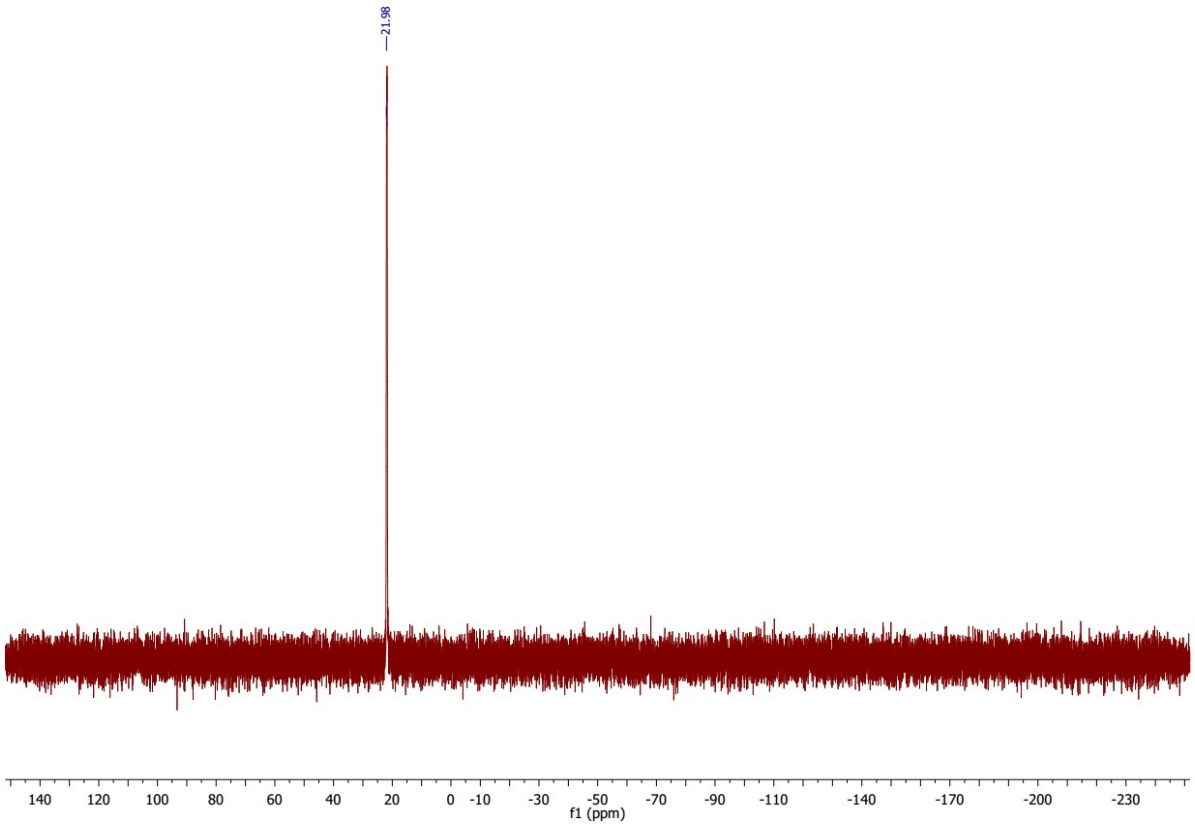


Figure : 13P NMR of compound 5b

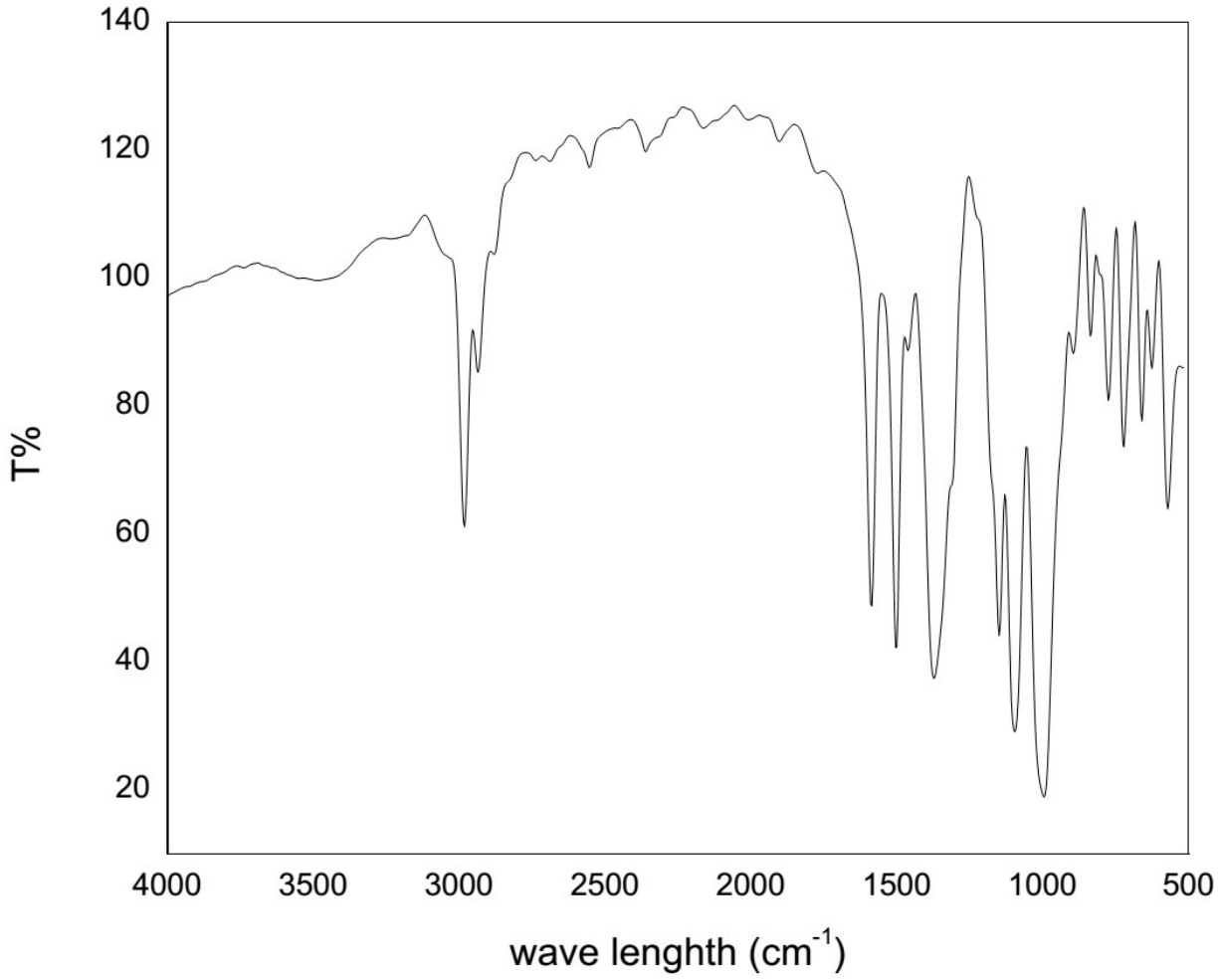


Figure : IR of compound 5b

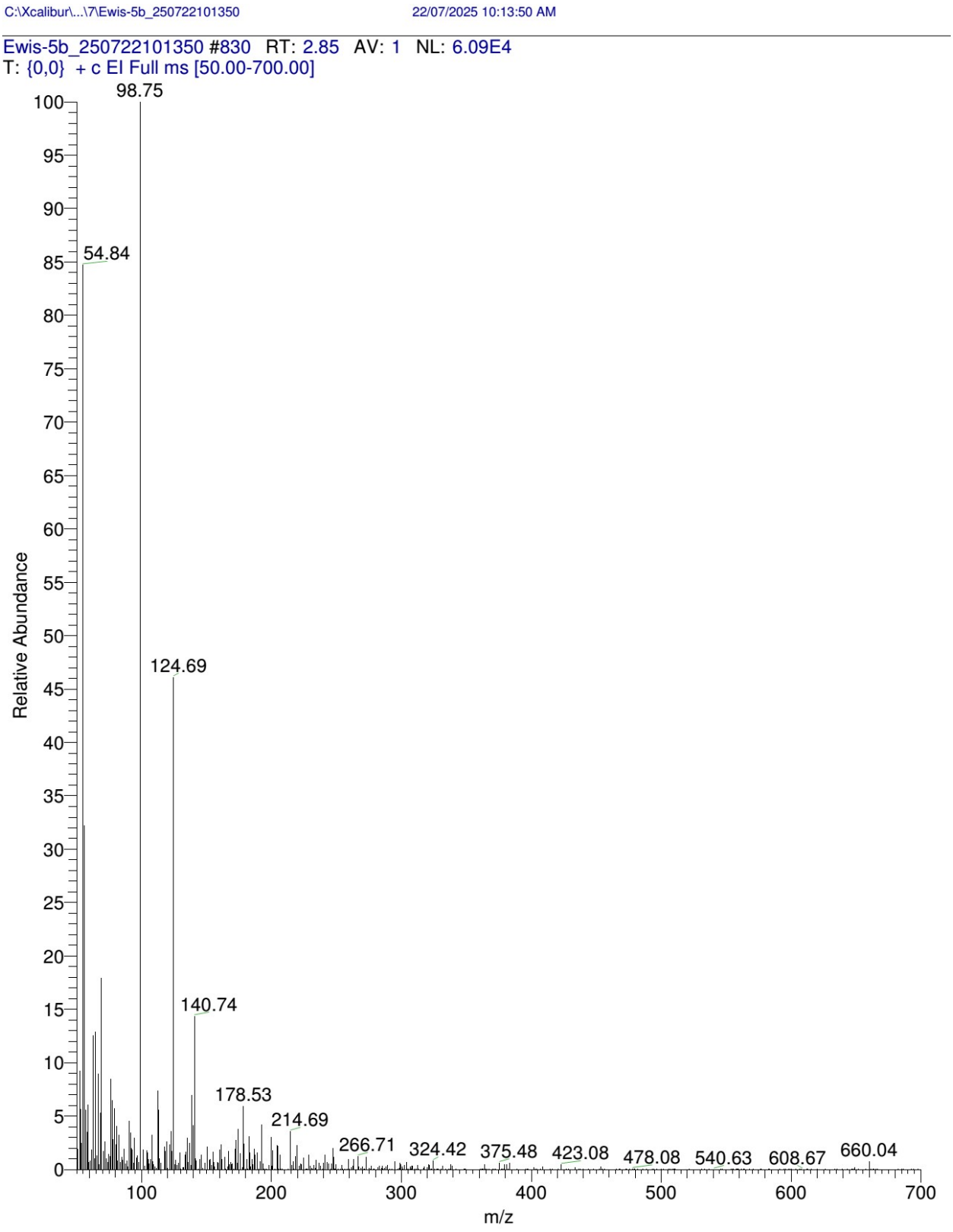


Figure : mass spectrum of compound 5b

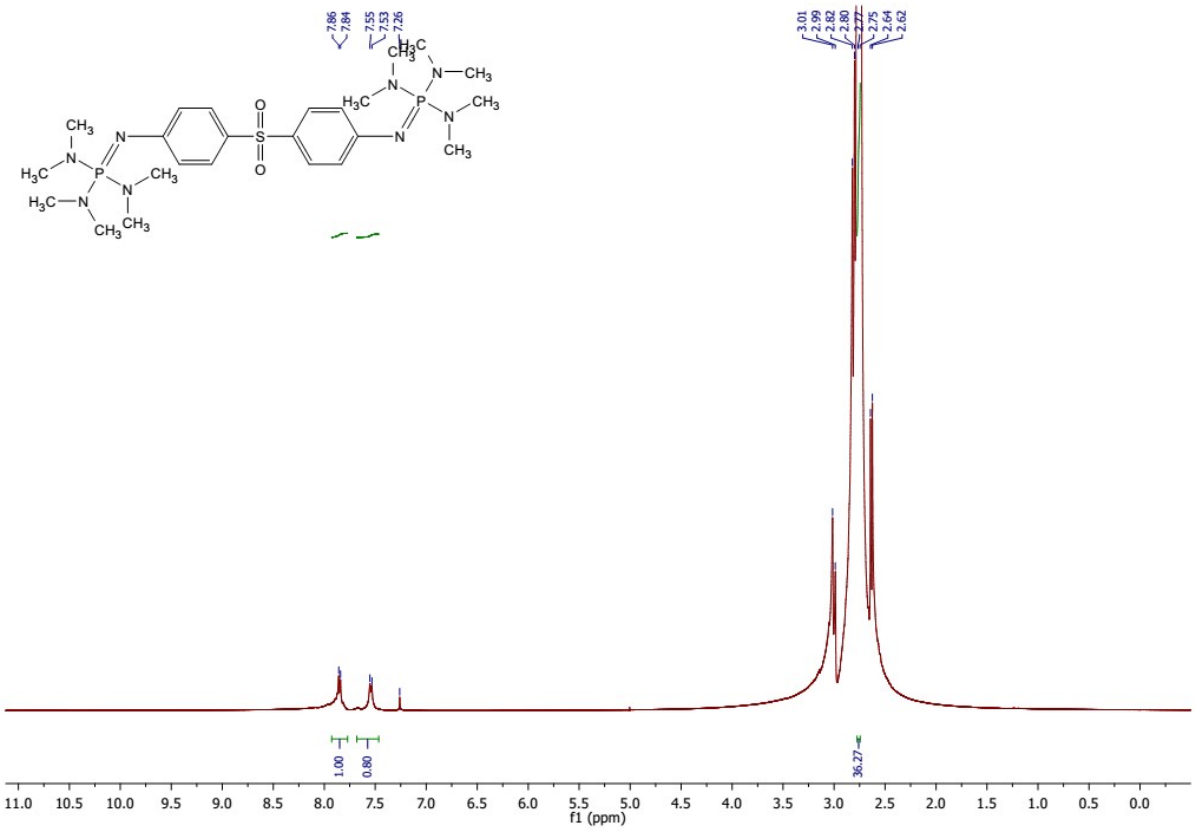
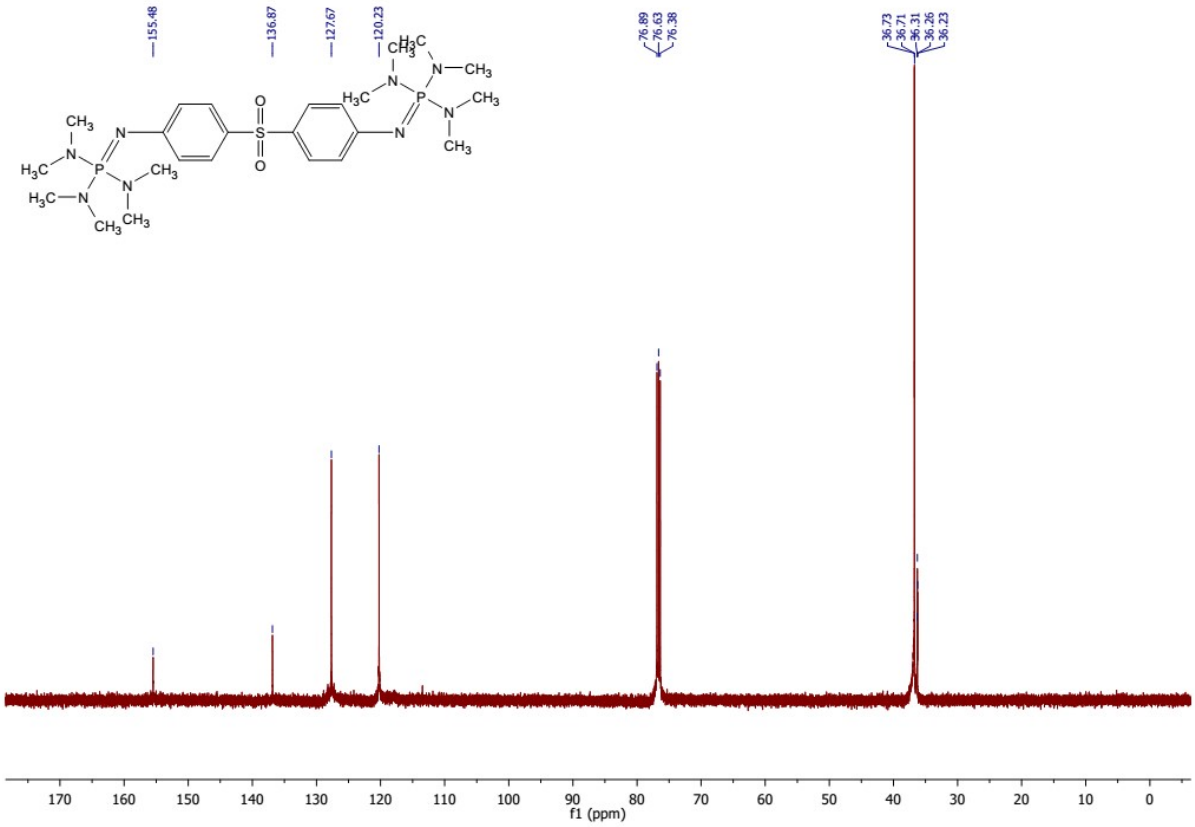


Figure : 1H NMR of compound 5c



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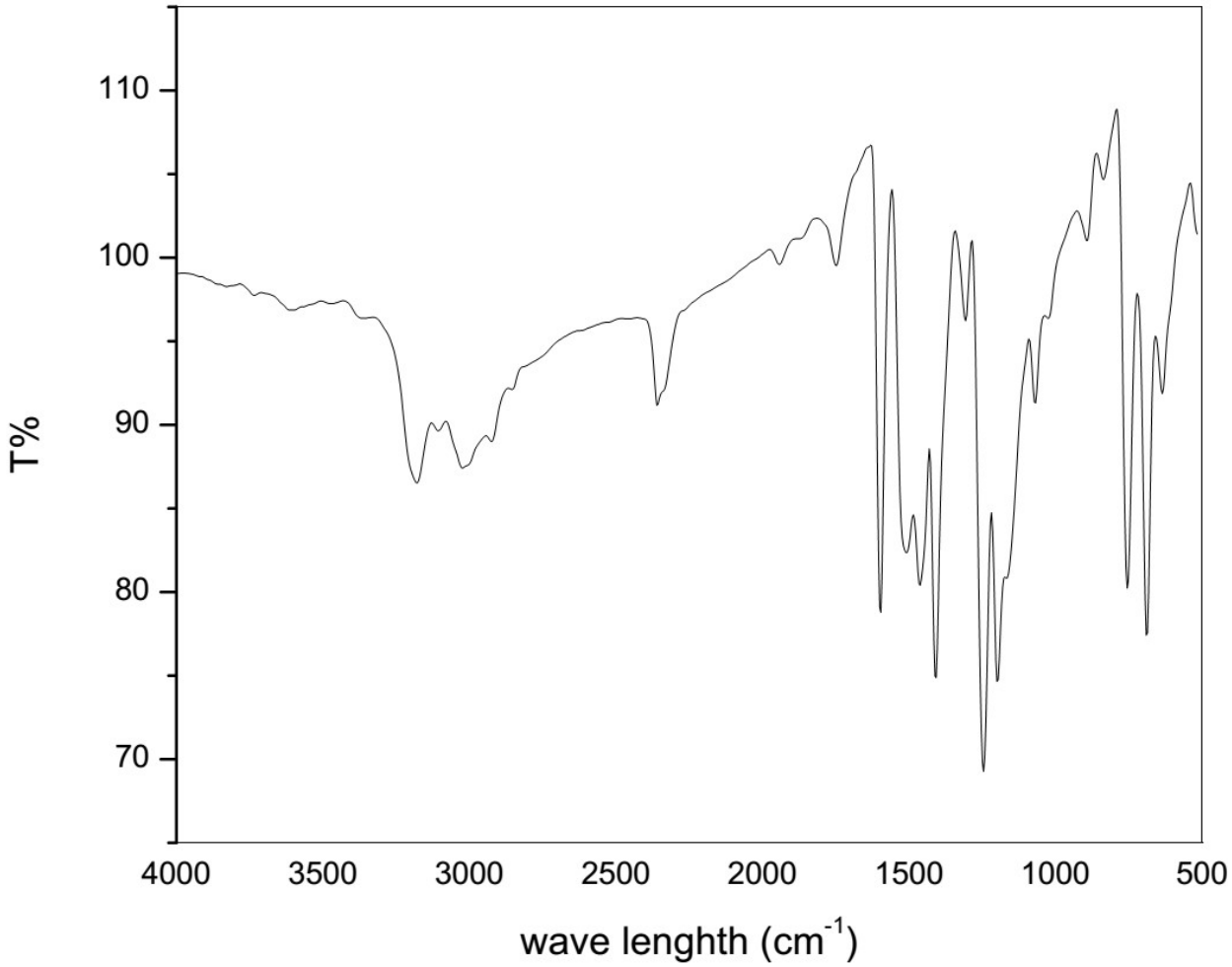

Figure : IR chart of compound 5c

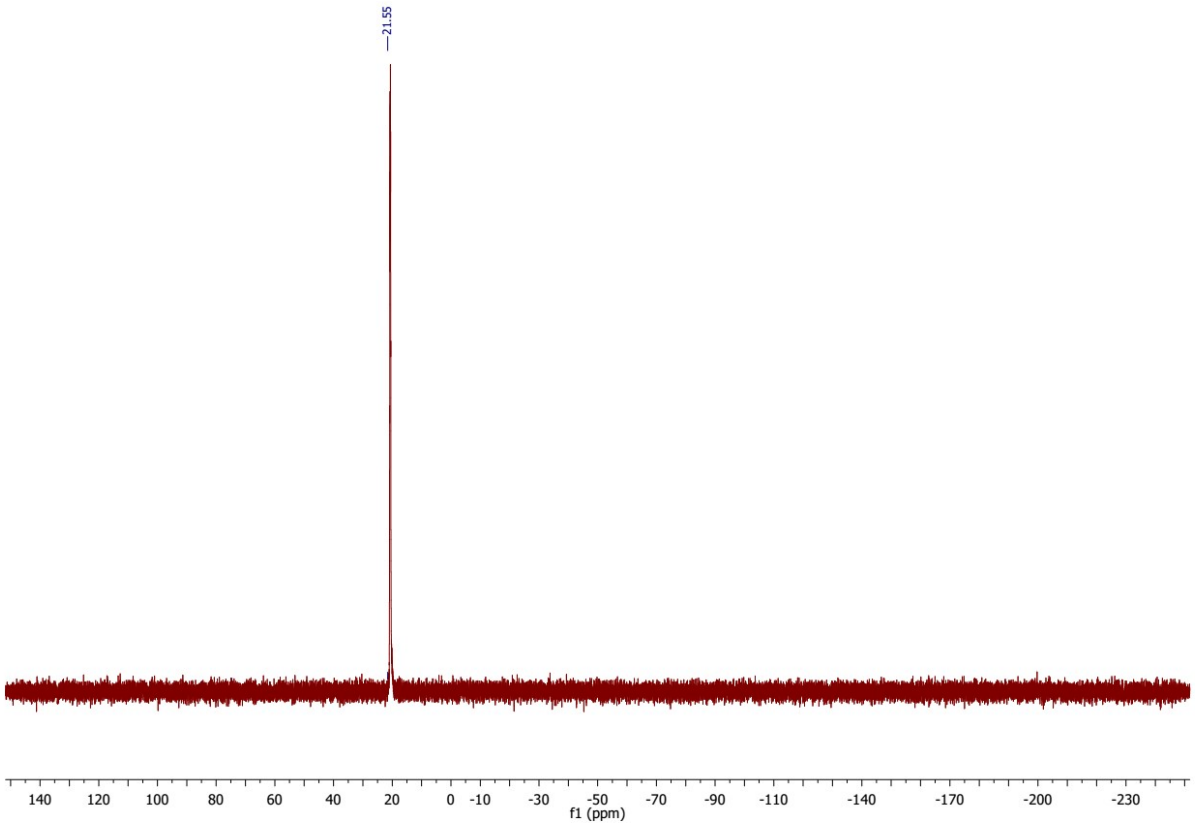

Figure : 13P NMR of compound 5c

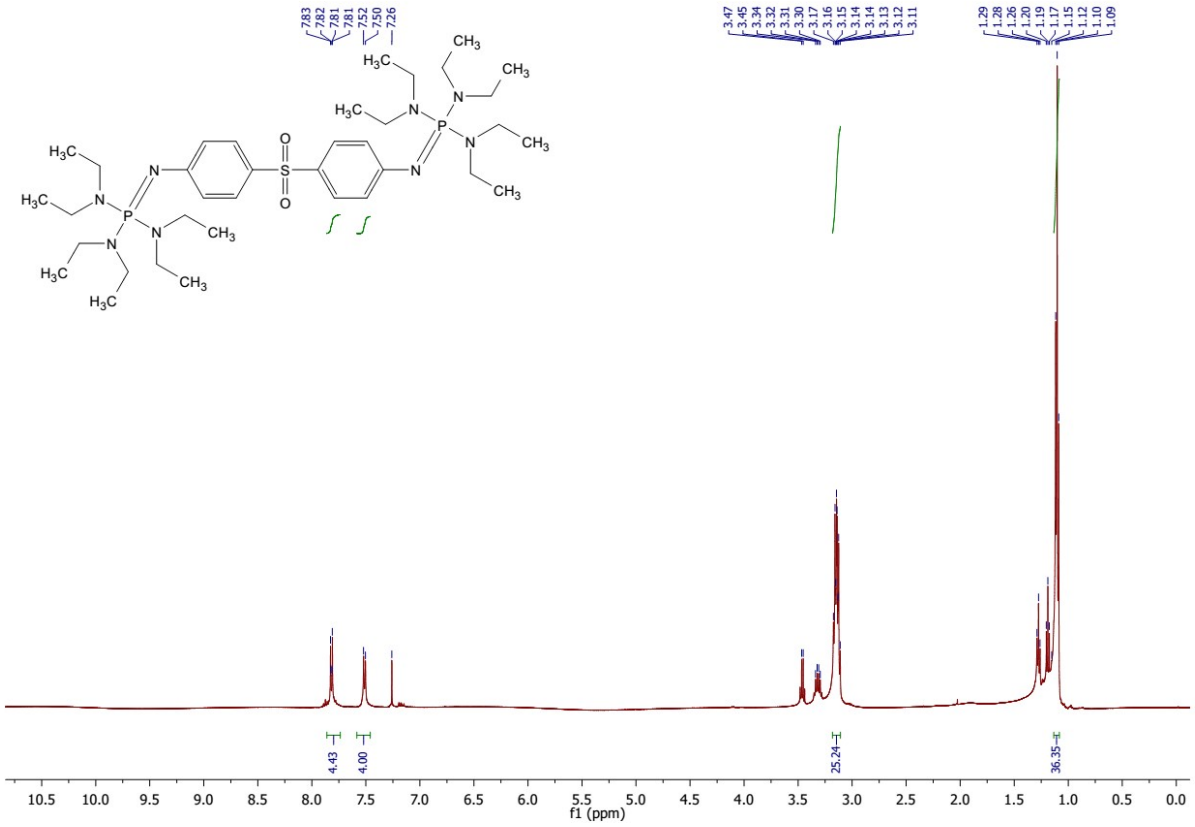

Figure : 1H NMR of compound 5d

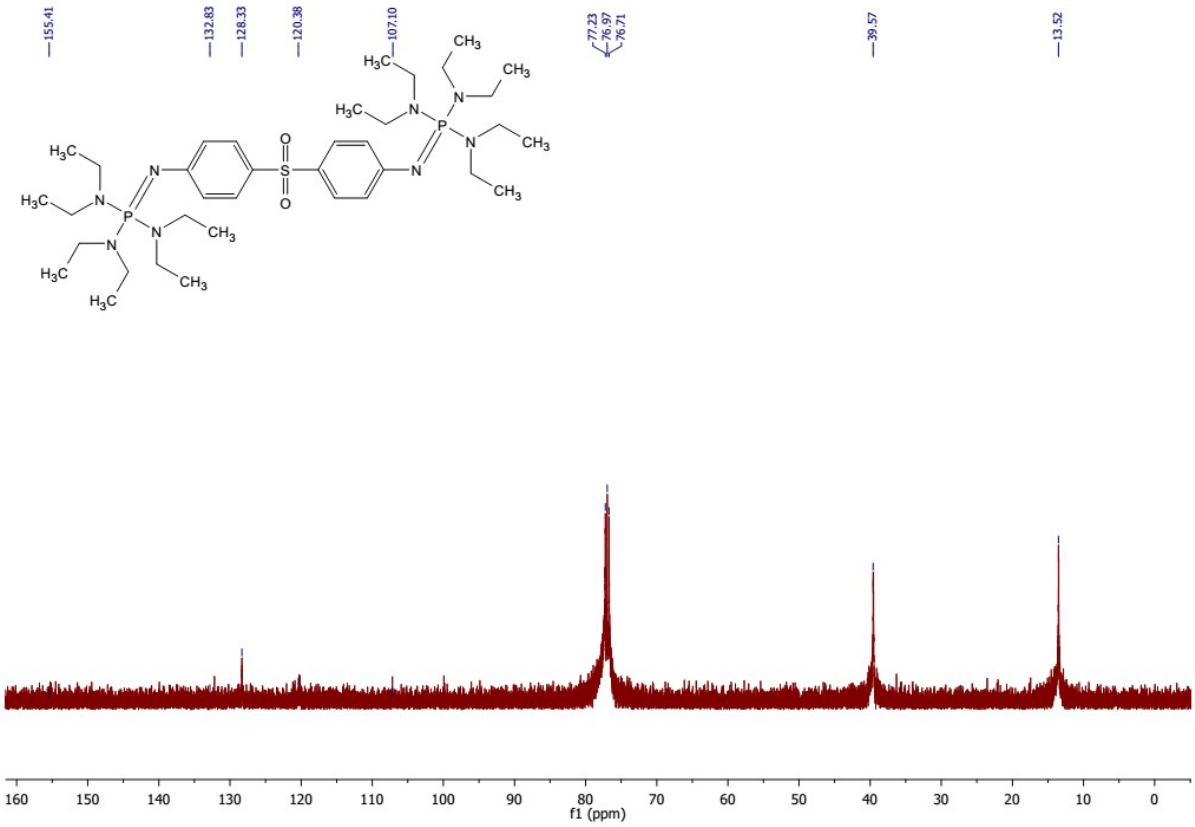

Figure : 13C NMR of compound 5d

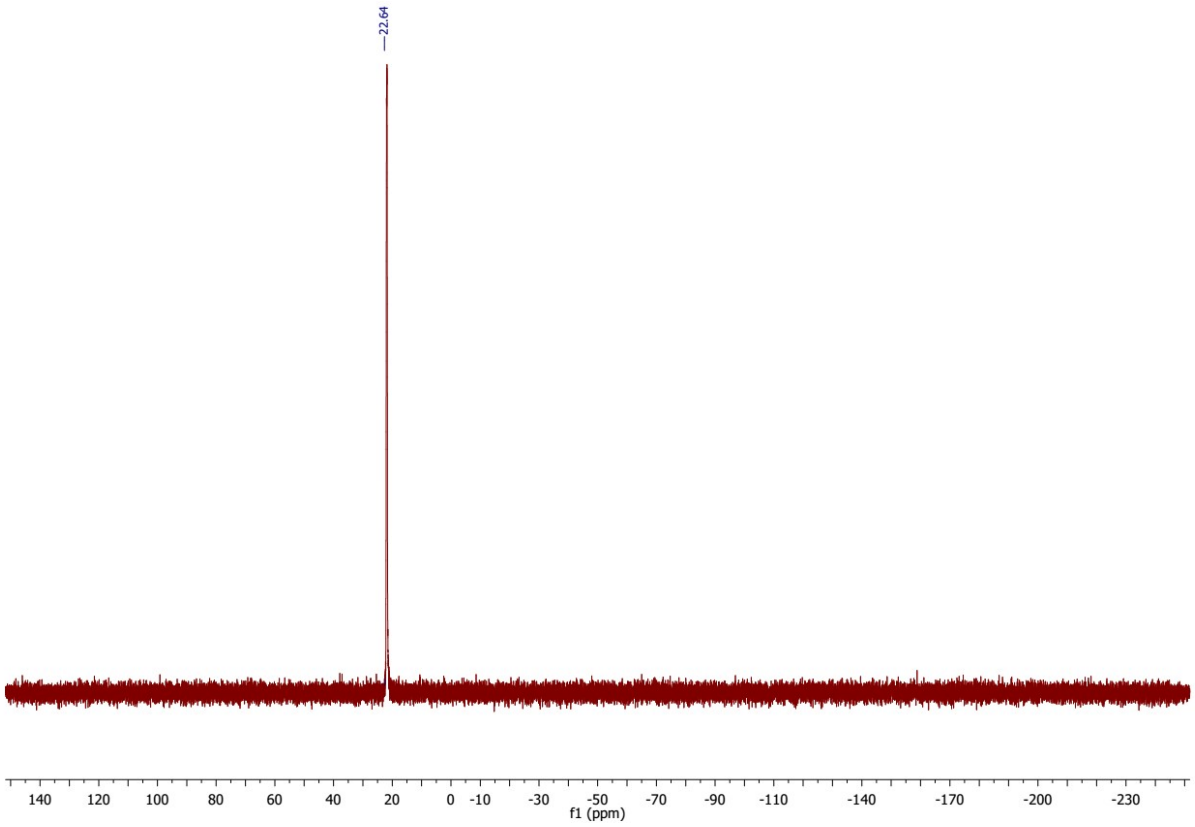

Figure : 13P NMR of compound 5d

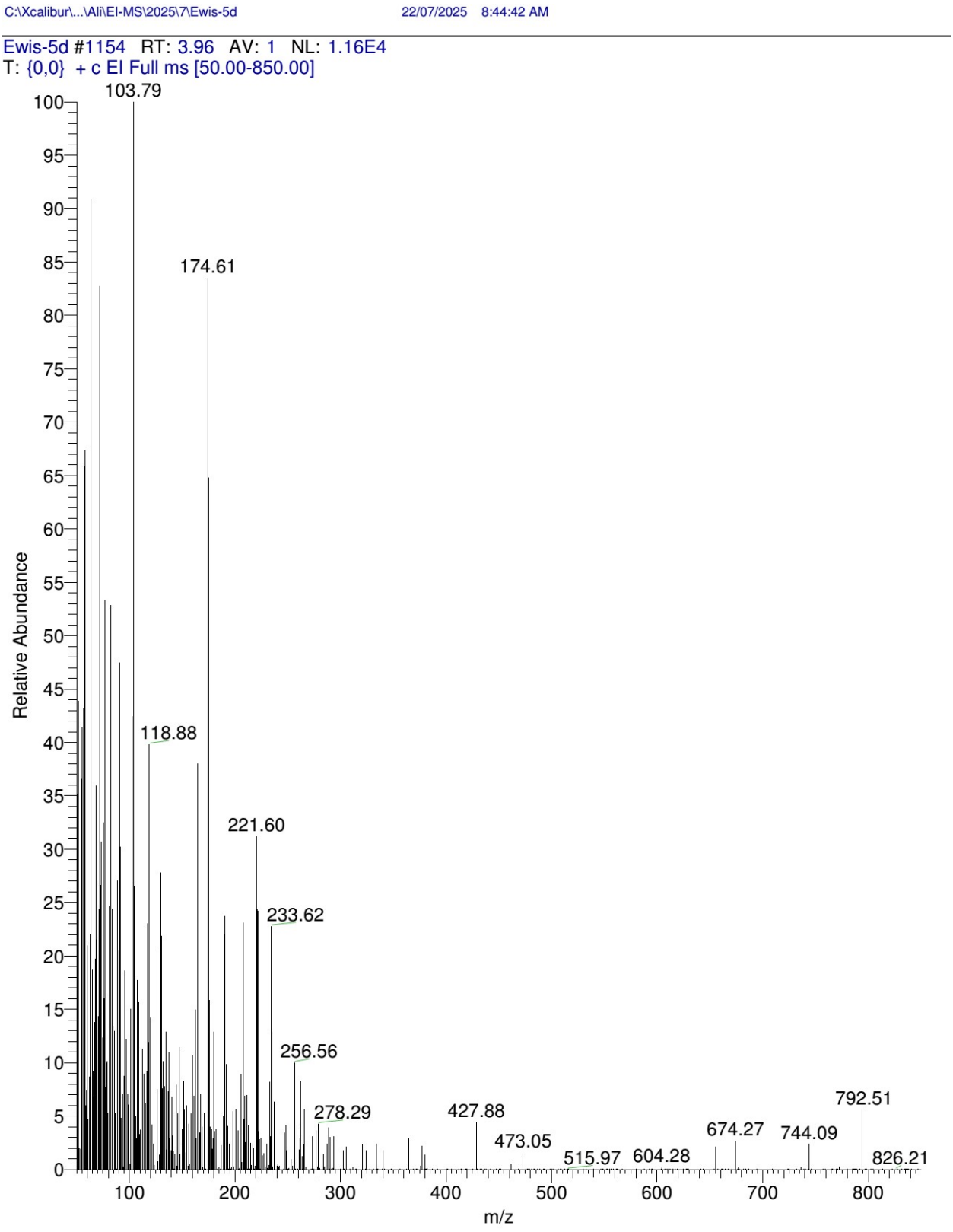

Figure : Mass spectrum of compound 5d

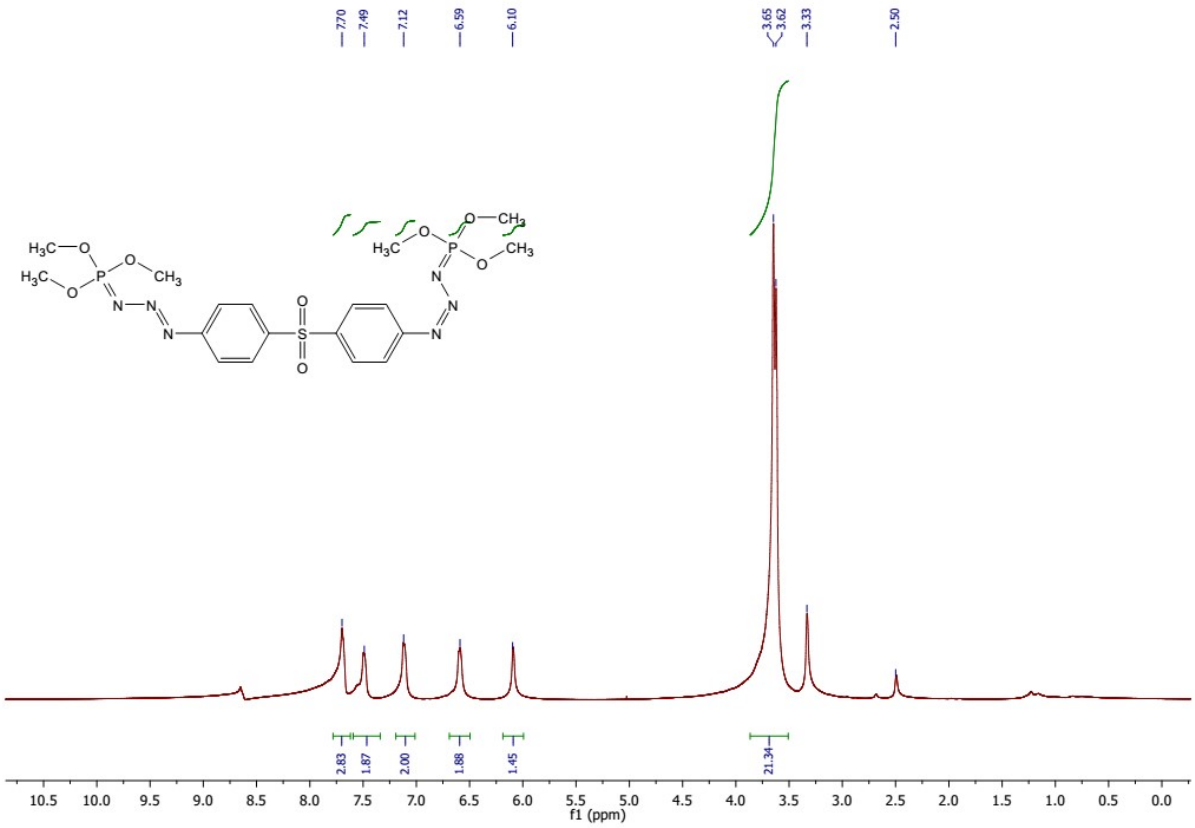

Figure : 1H NMR of compound 6a

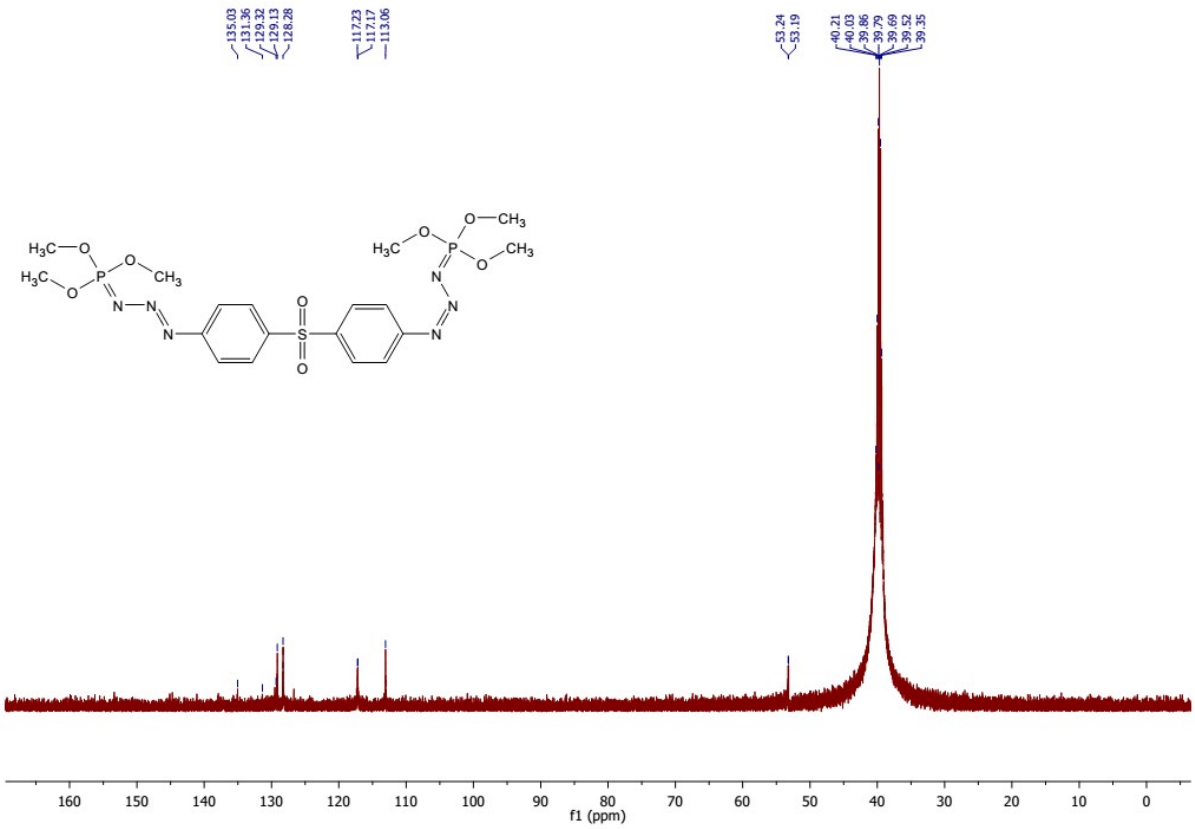

Figure : 13C NMR of compound 6a

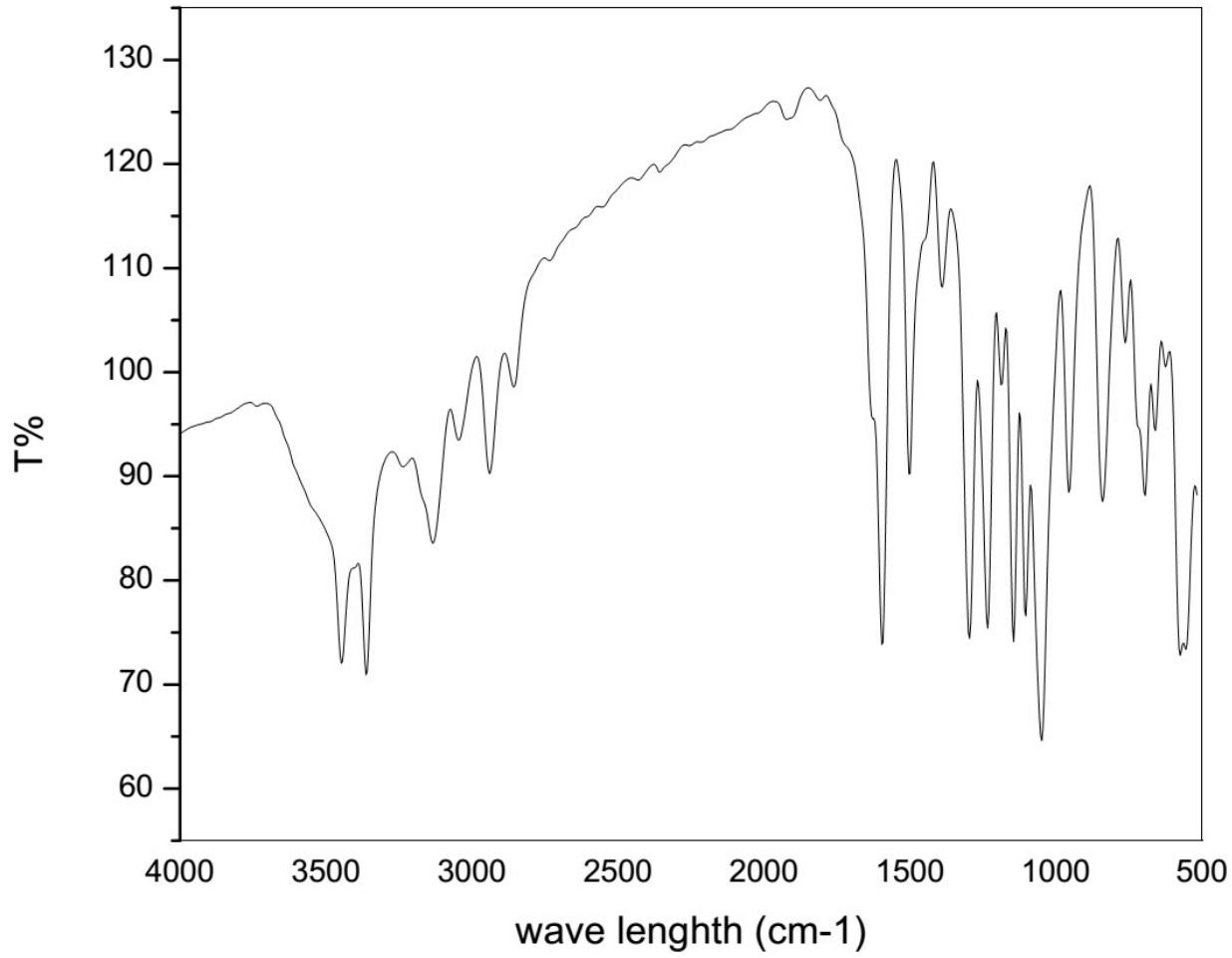

Figure : IR chart of compound 6a

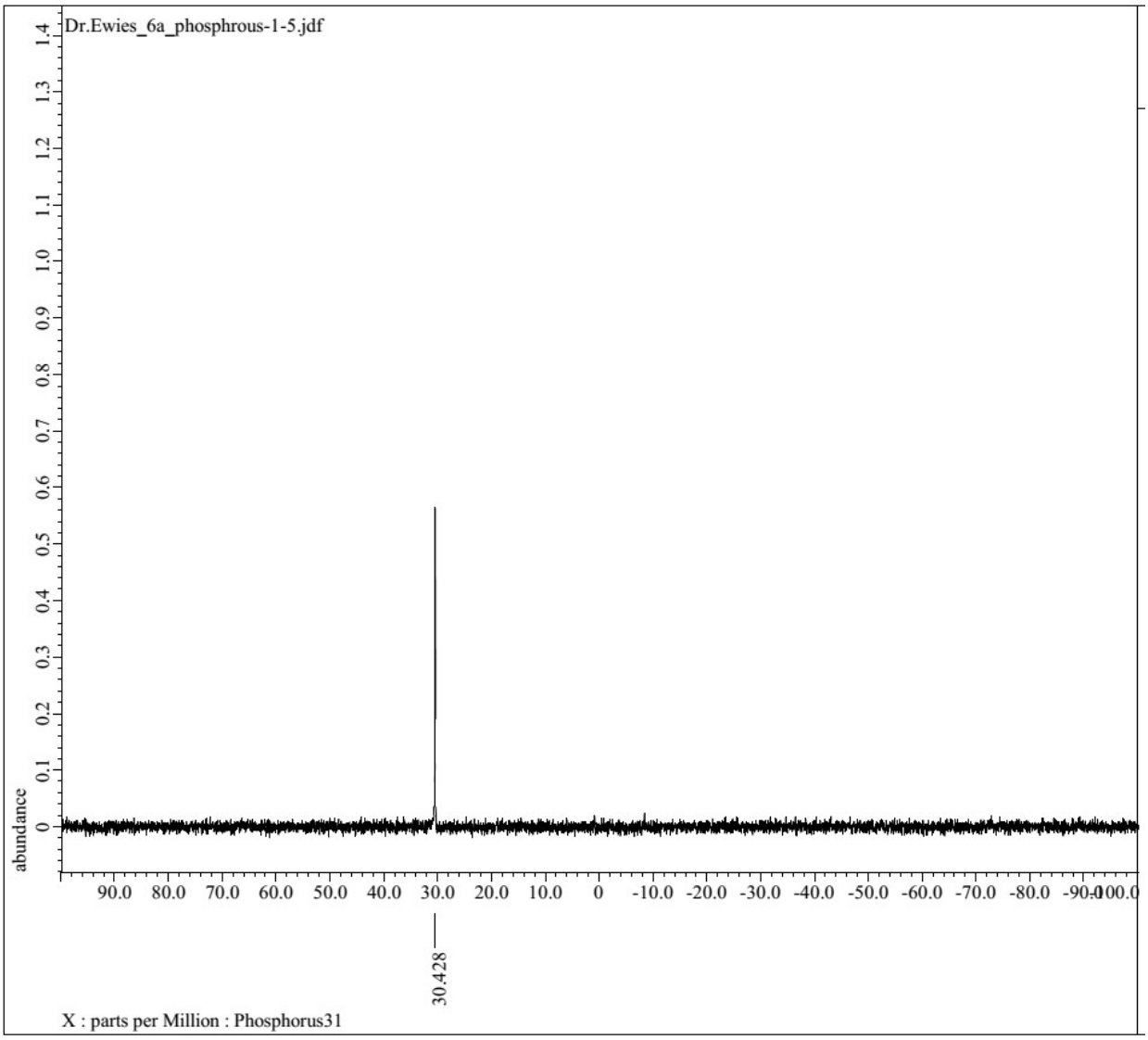

Figure : 31P NMR of compound 6a

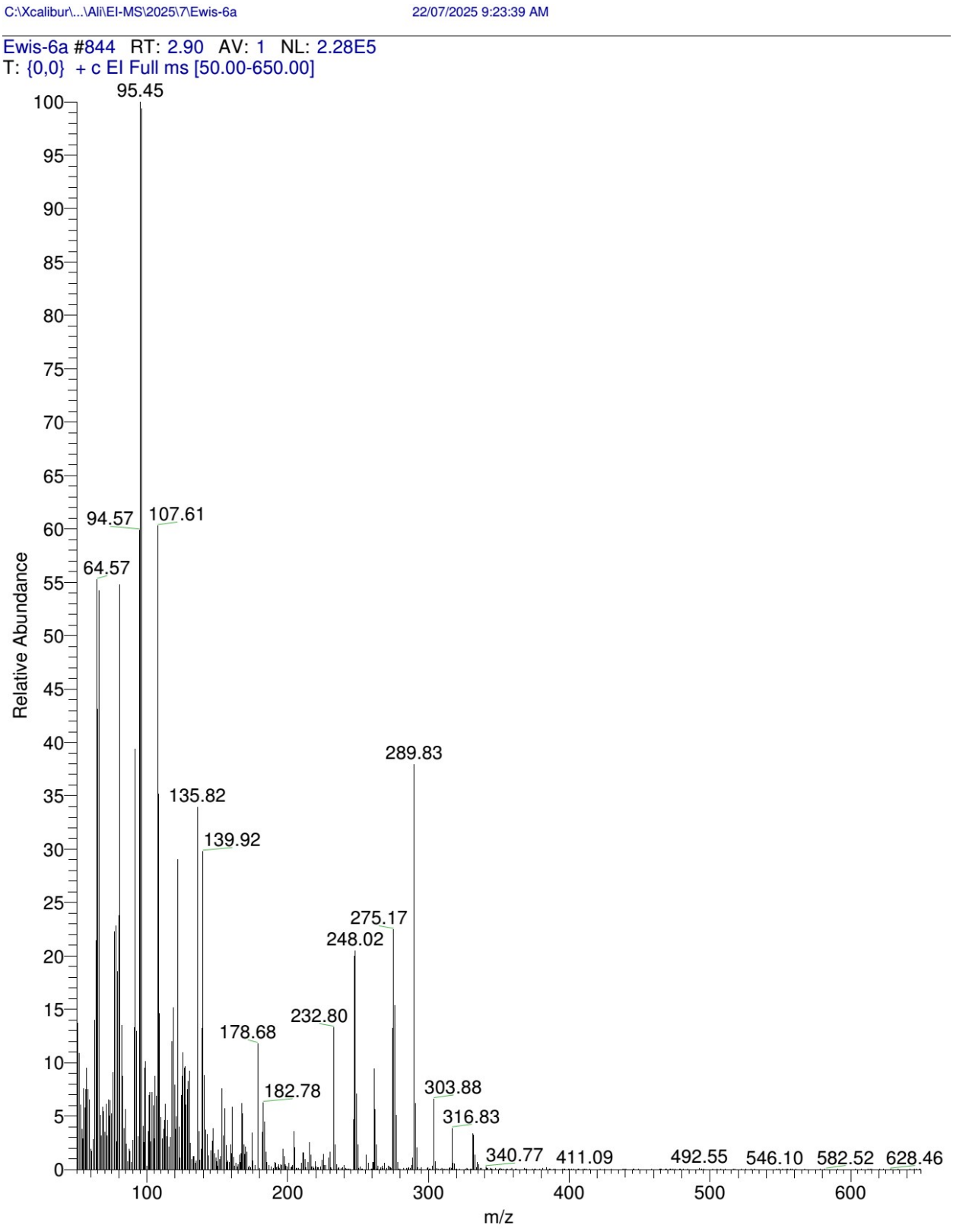

Figure : Mass spectrum of compound 6a

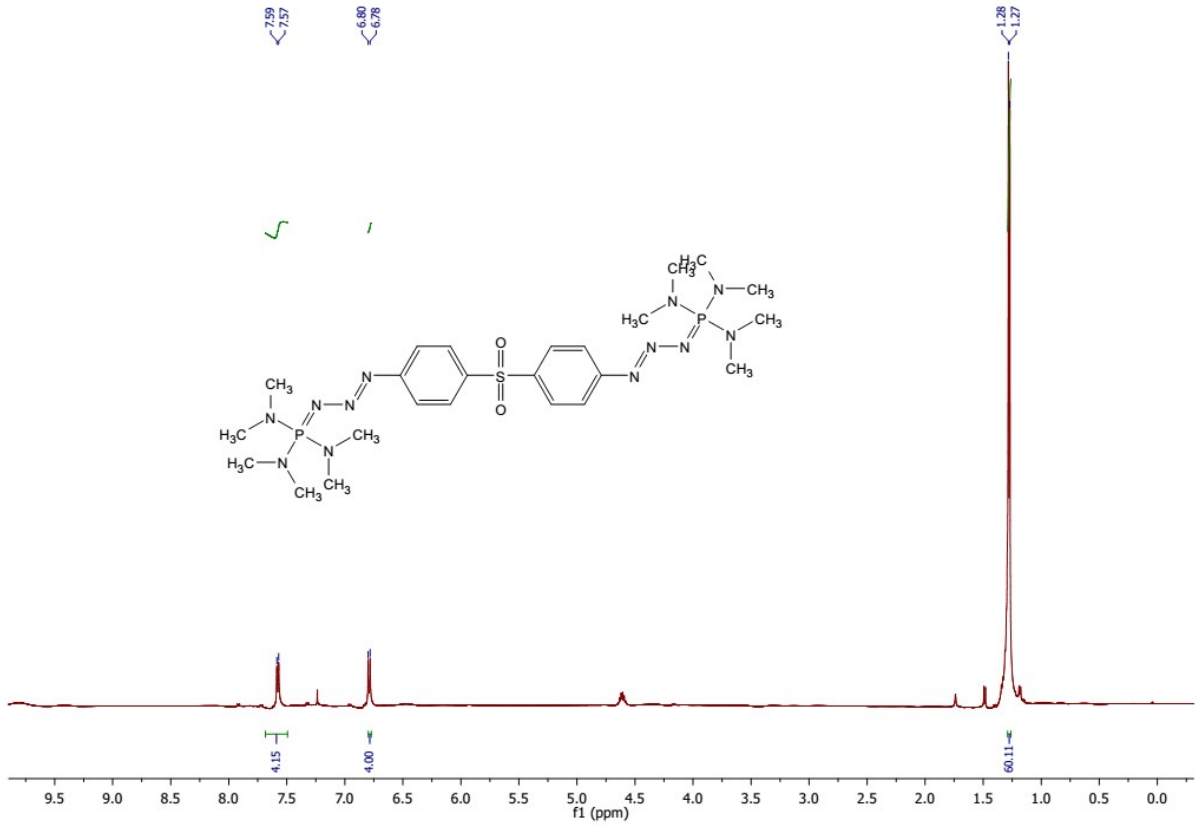

Figure : 1H NMR of compound 6b

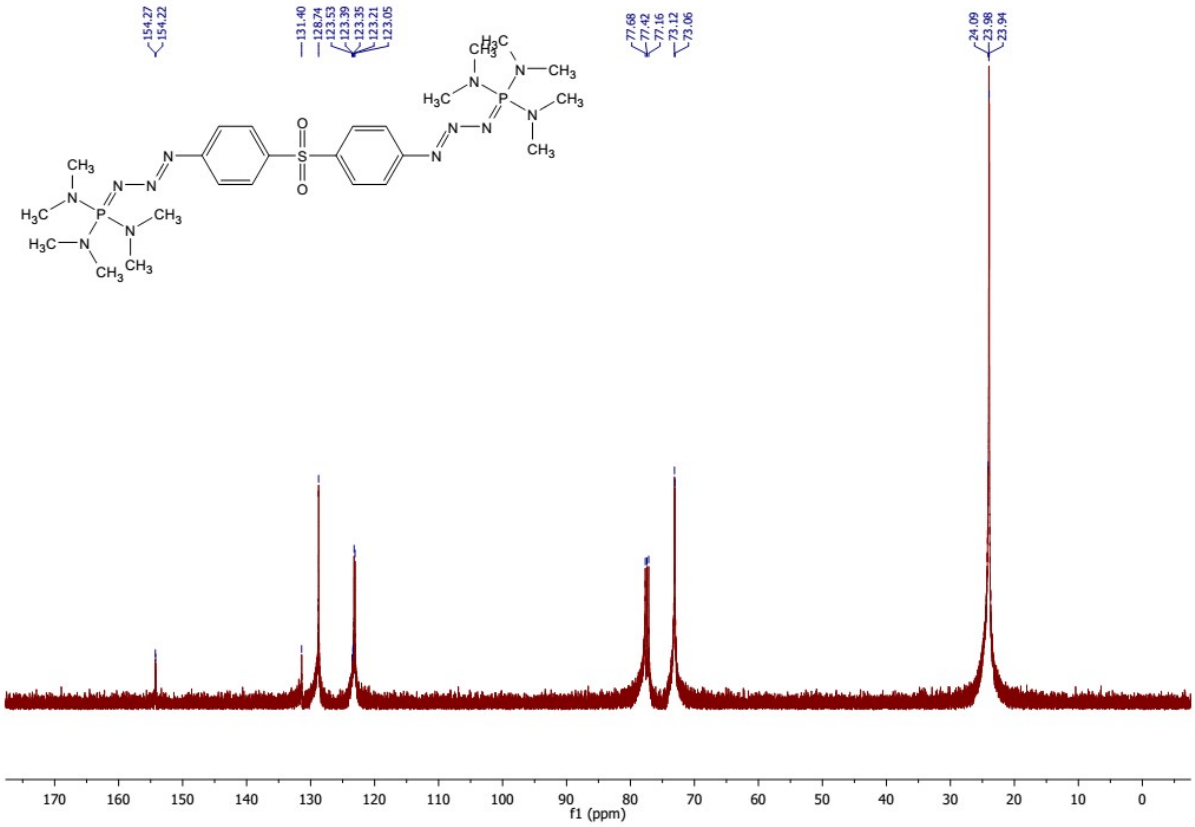

Figure : 13C NMR of compound 6b

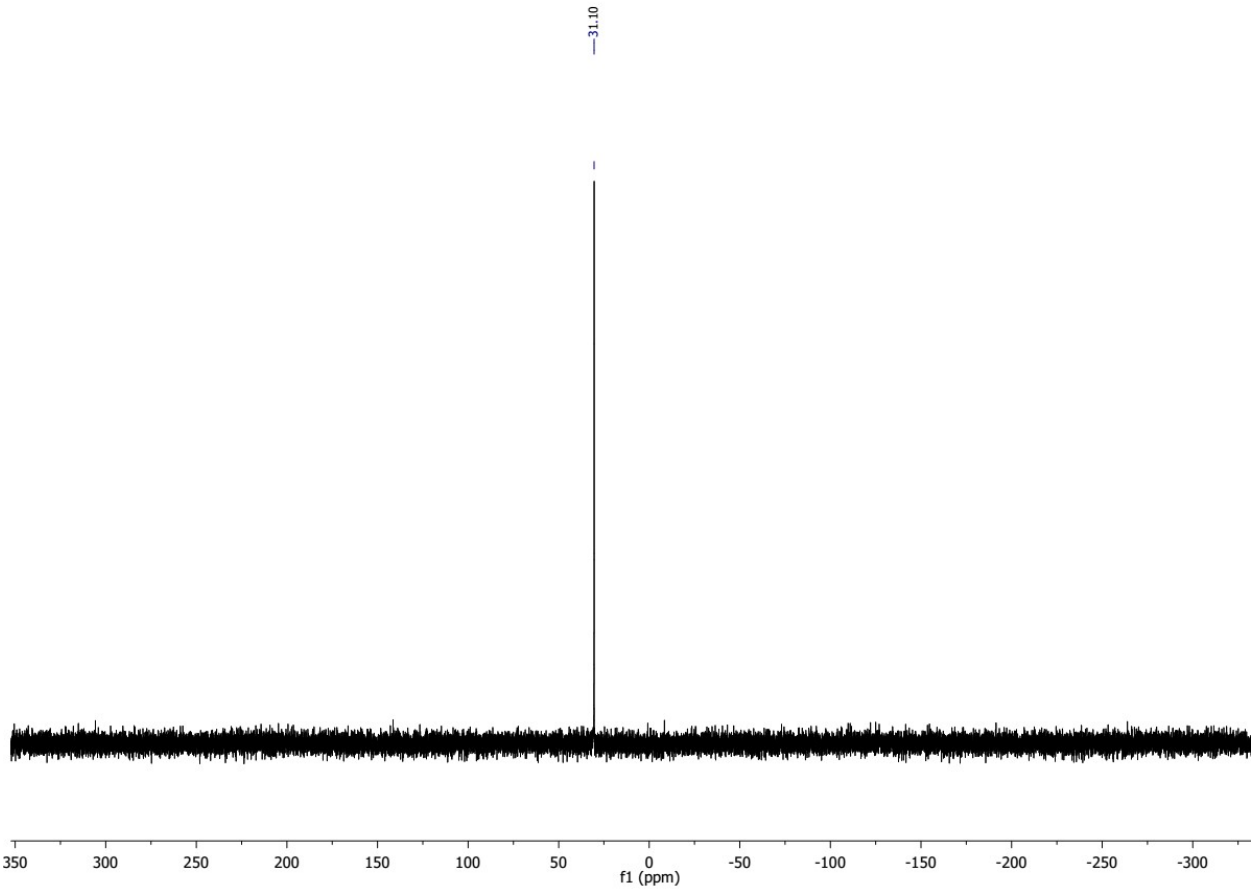

Figure : 31P NMR of compound 6b

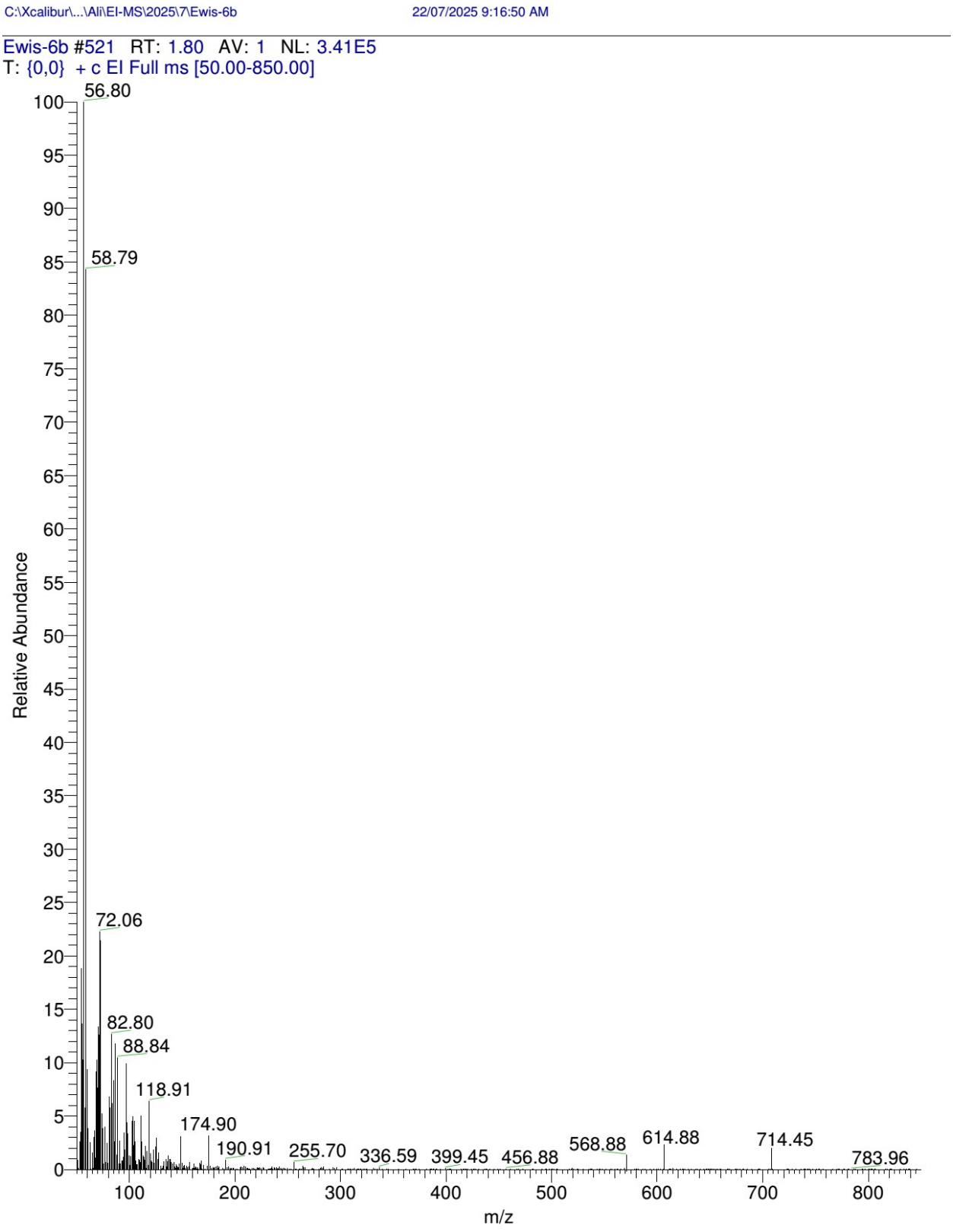

Figure : Mass spectrum of compound 6b

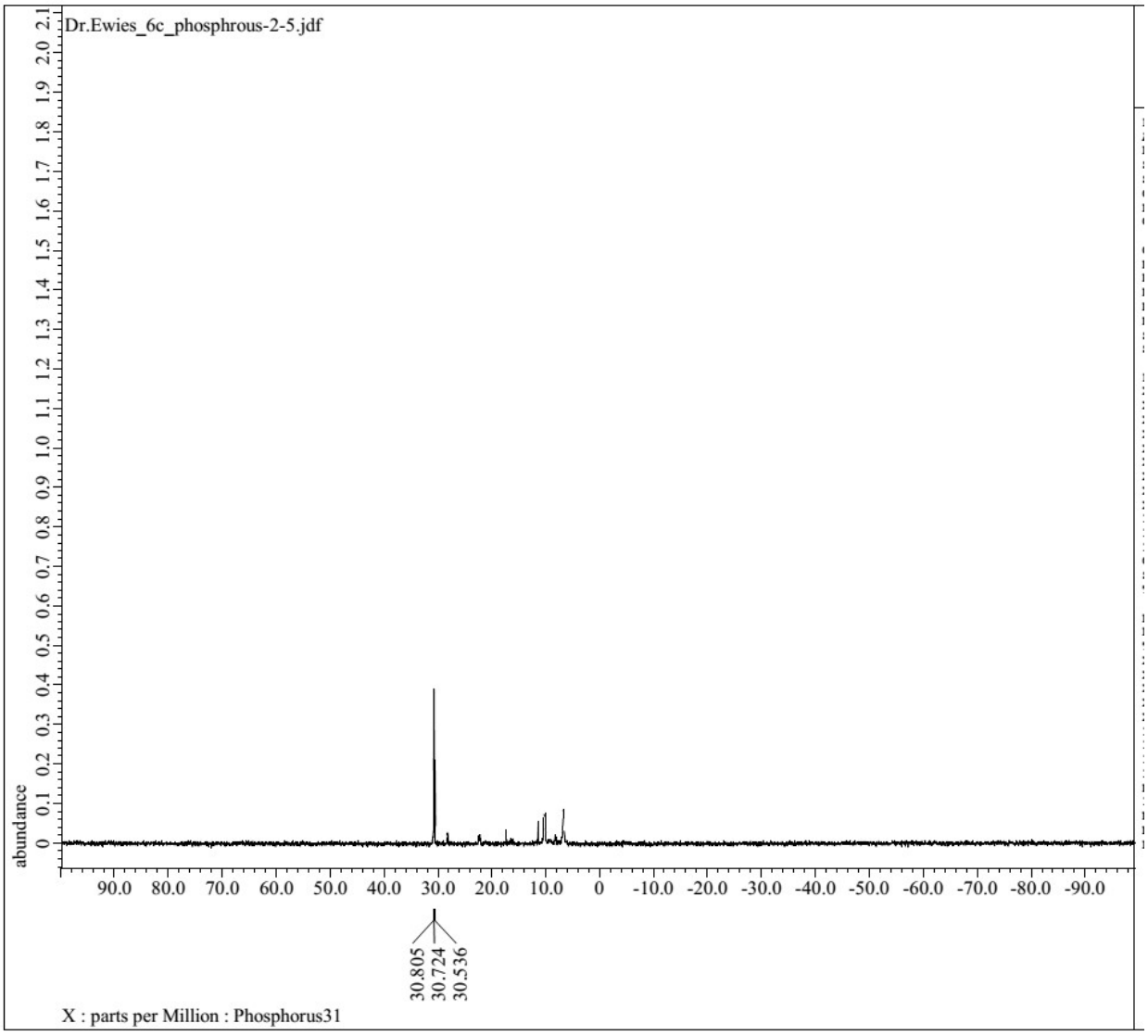

Figure : 31P NMR of compound 6c

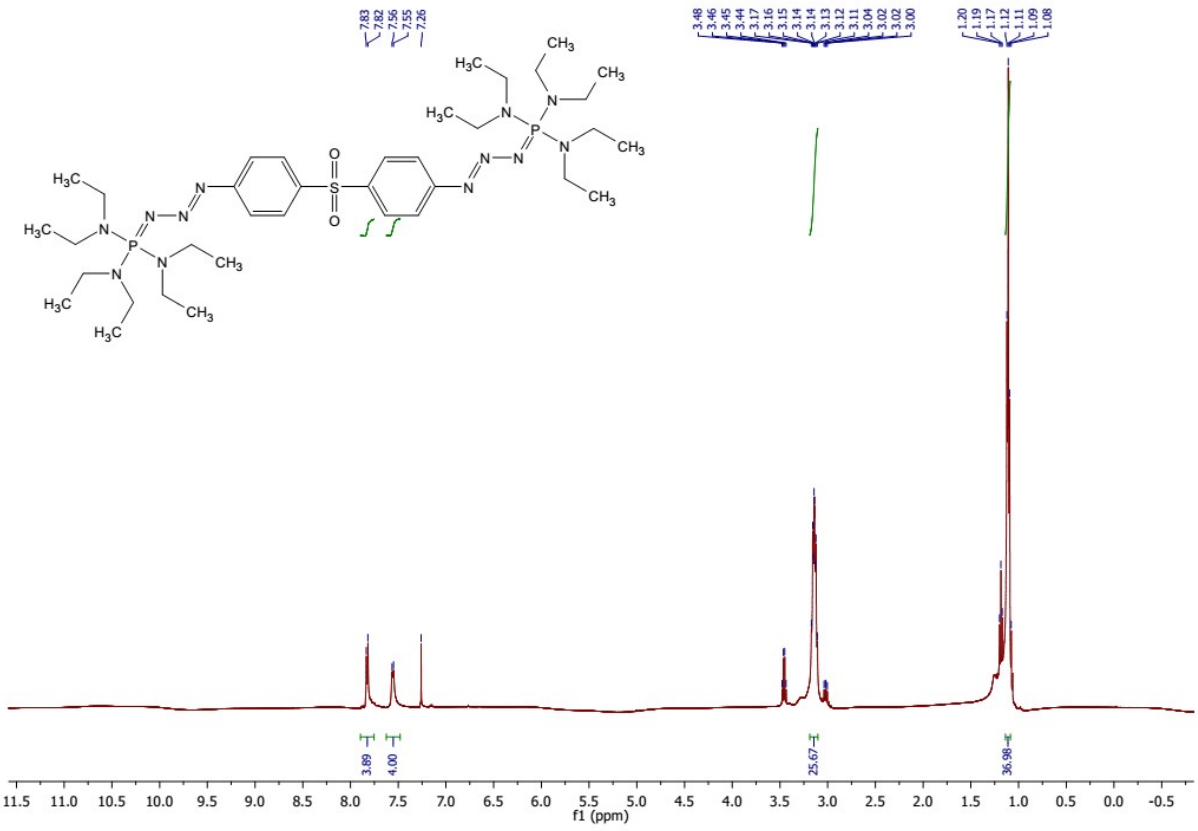

Figure : 1H NMR of compound 6d

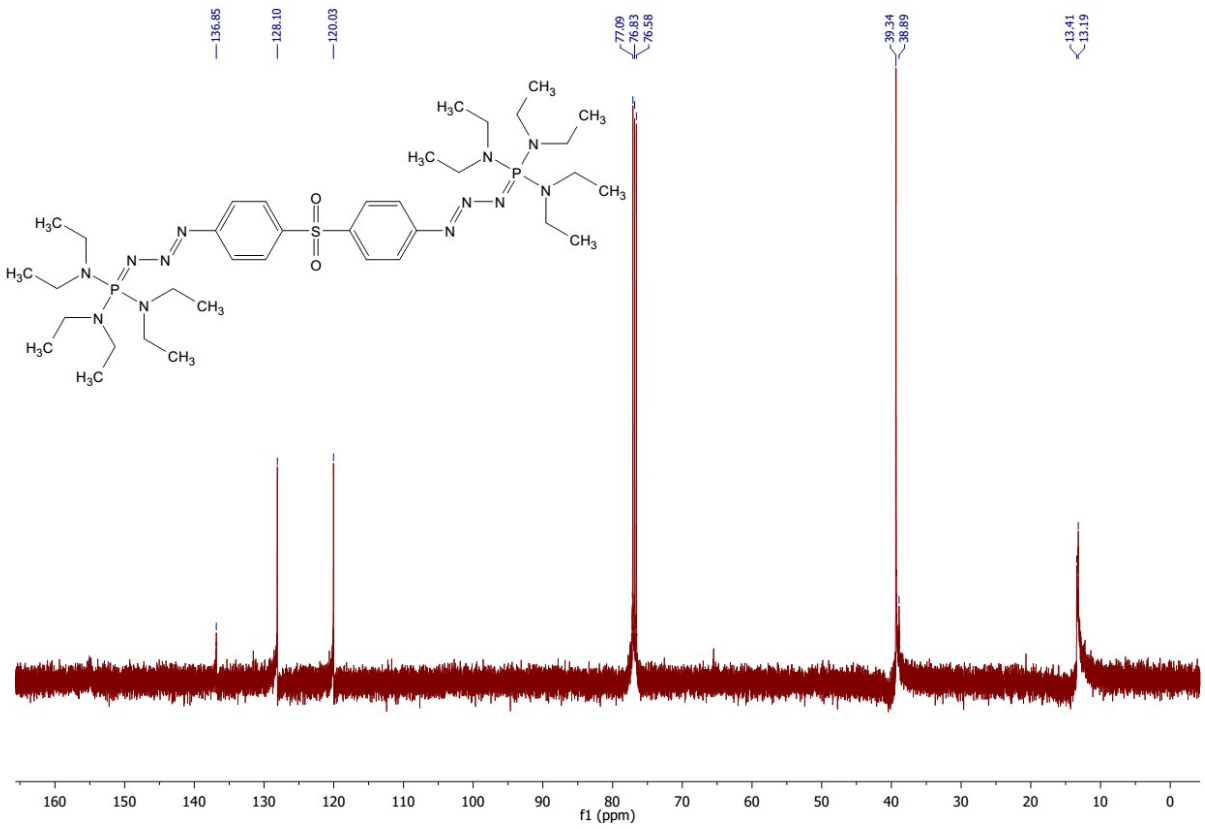

Figure : 13C NMR of compound 6d

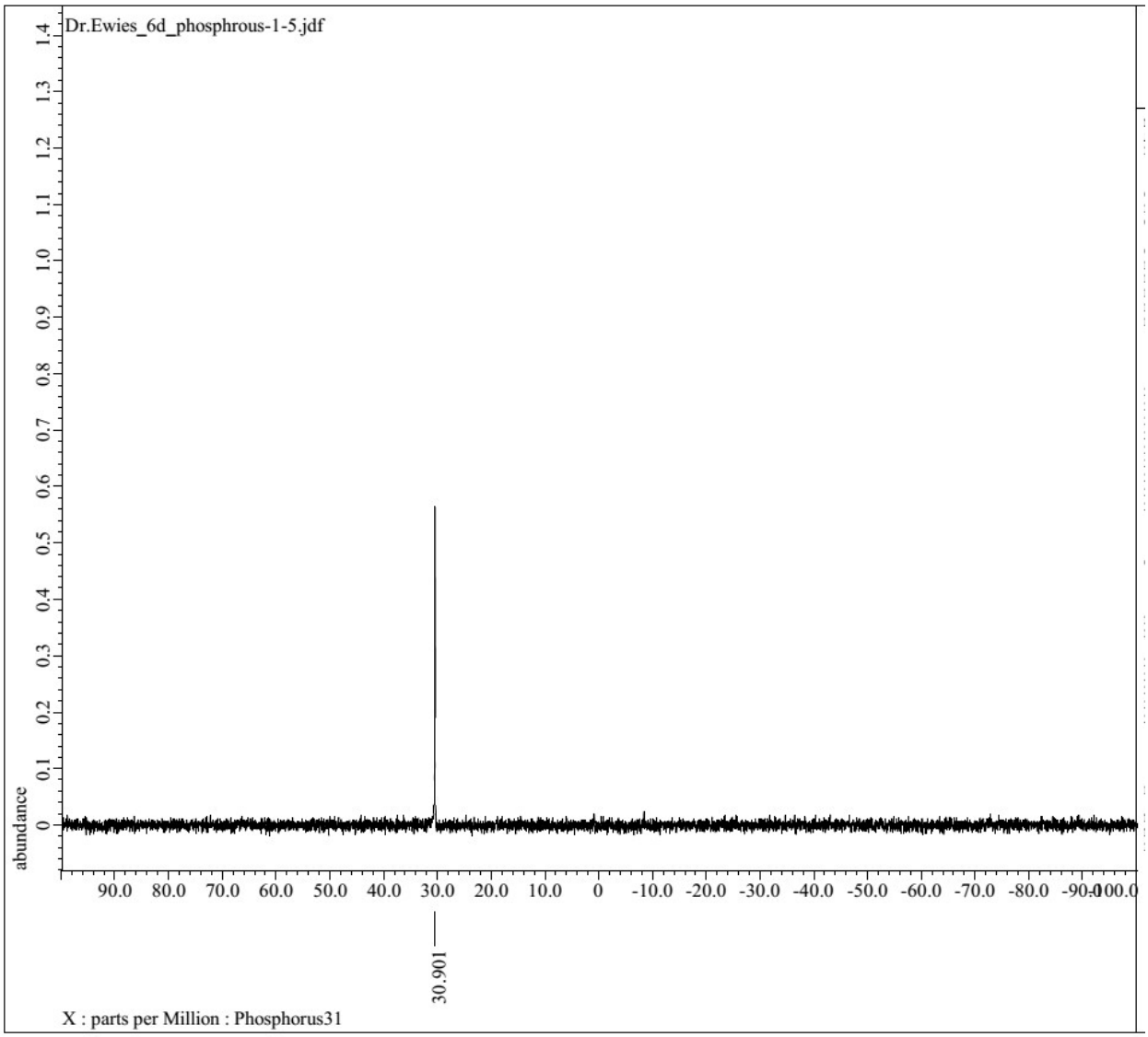

Figure : 31P NMR of compound 6d

Figure : IR chart of compound 6d

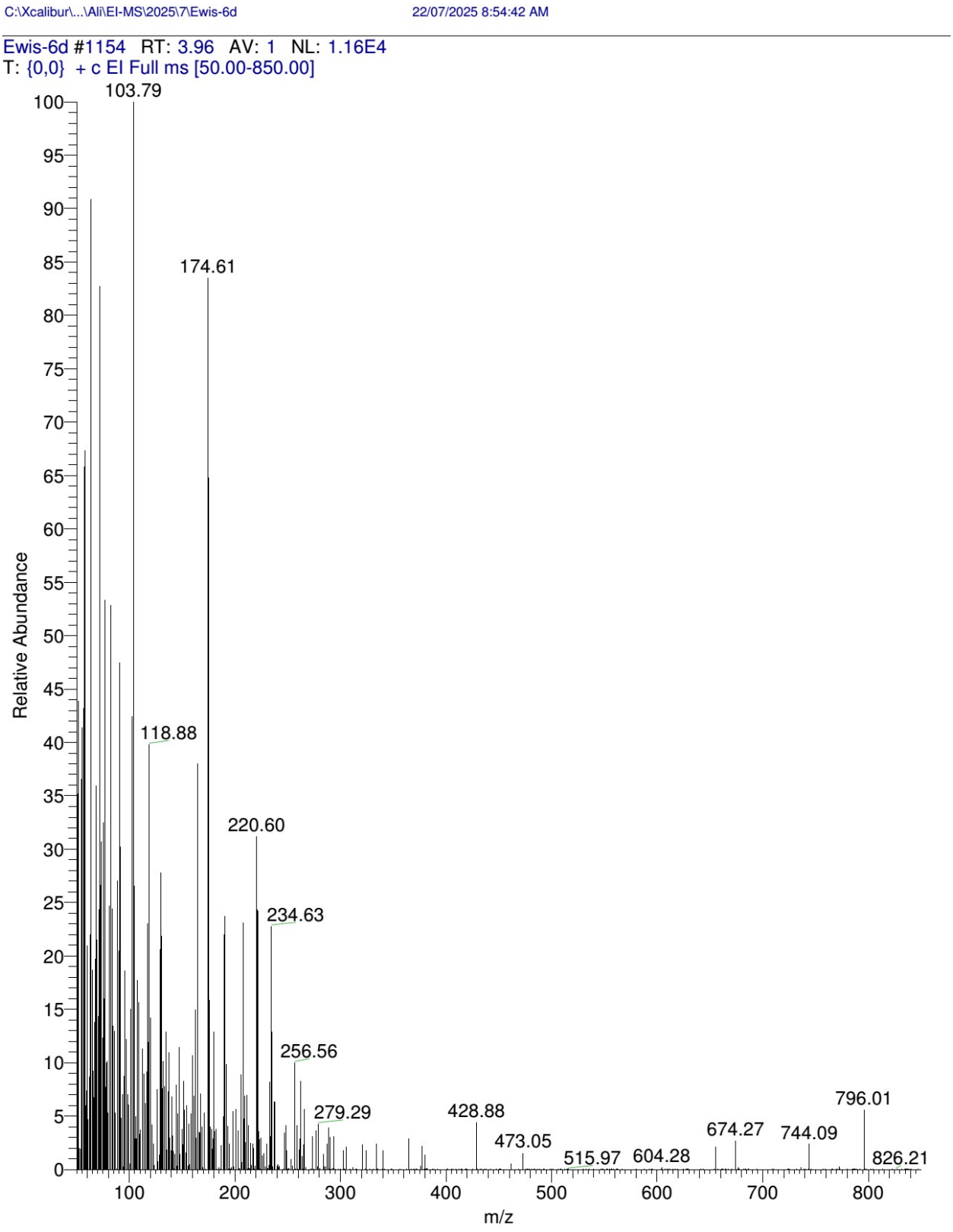

Figure : mass spectrum of compound 6d