

Supporting information

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Waste to Wealth: Agro-waste catalyzed green method synthesis of 5-aryl-1,2,4-triazolidine-3-thiones and 1,2,4-triazospiro-3-thiones

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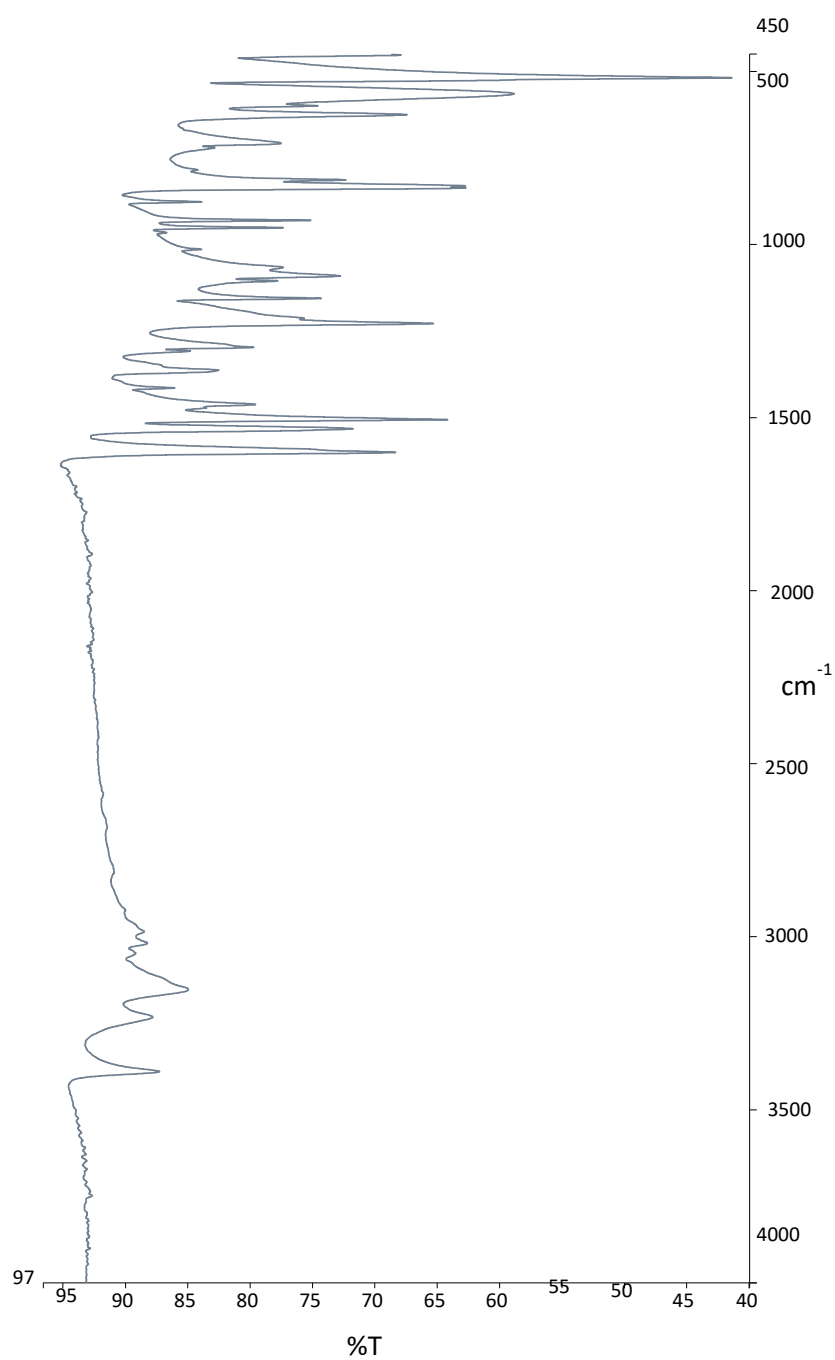


Figure S1: FT-IR Spectrum of 5-aryl-1,2,4-triazolidine-3-thiones (**3c**)

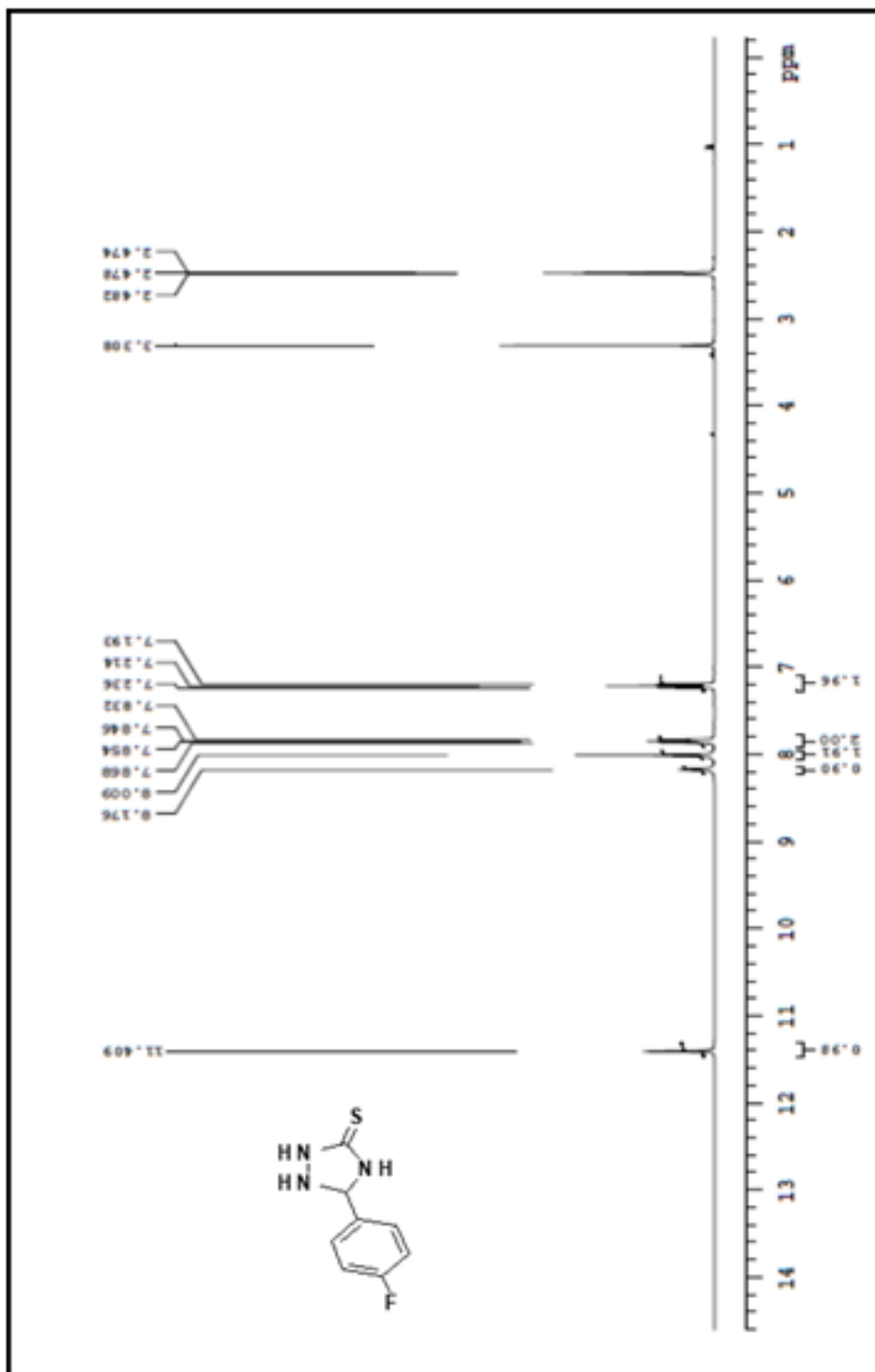


Figure S2: ¹H-NMR spectrum of 5-aryl-1,2,4-triazolidine-3-thiones (3c)

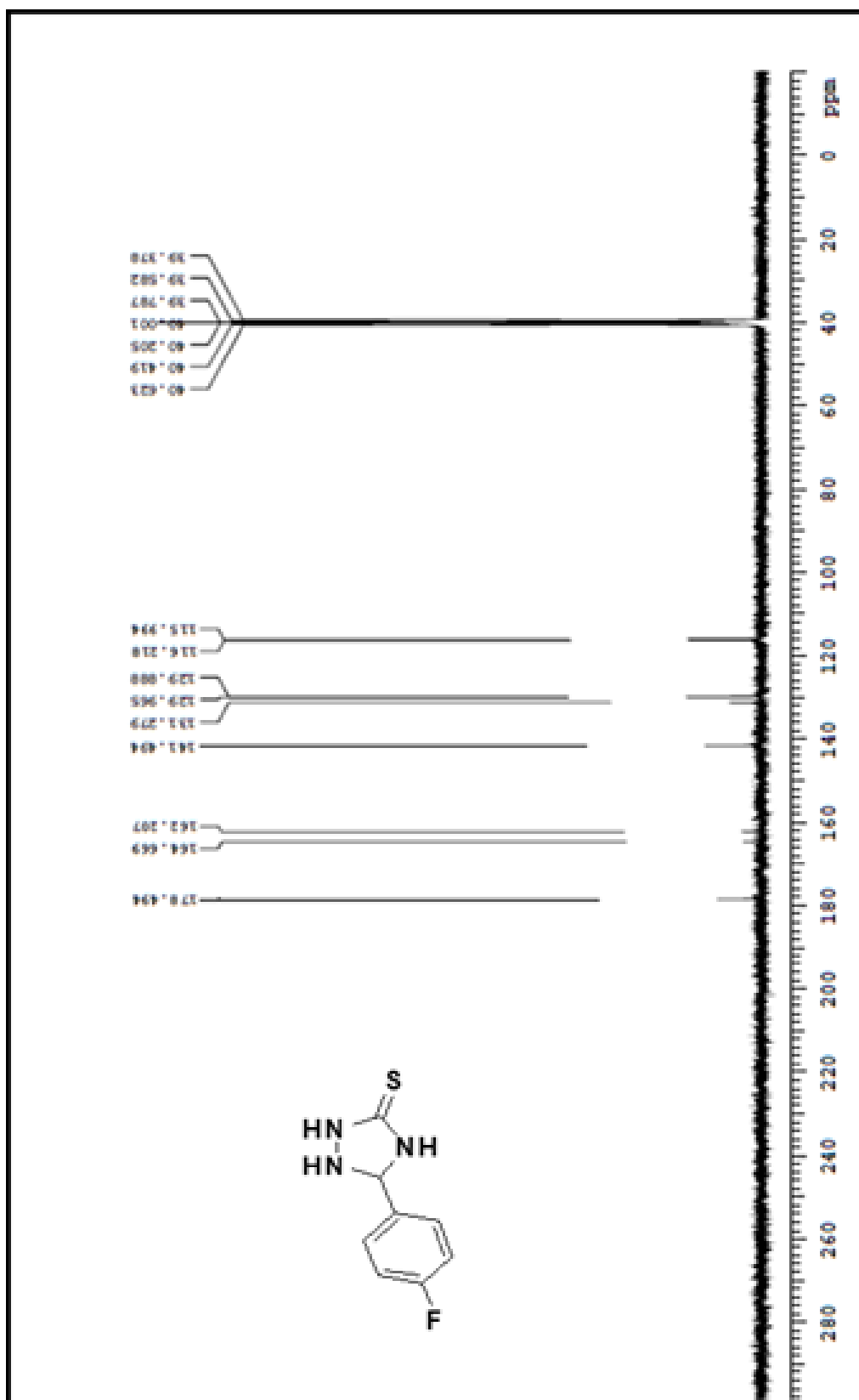


Figure S3: ¹³C-NMR Spectrum of 5-aryl-1,2,4-triazolidine-3-thiones (3c)

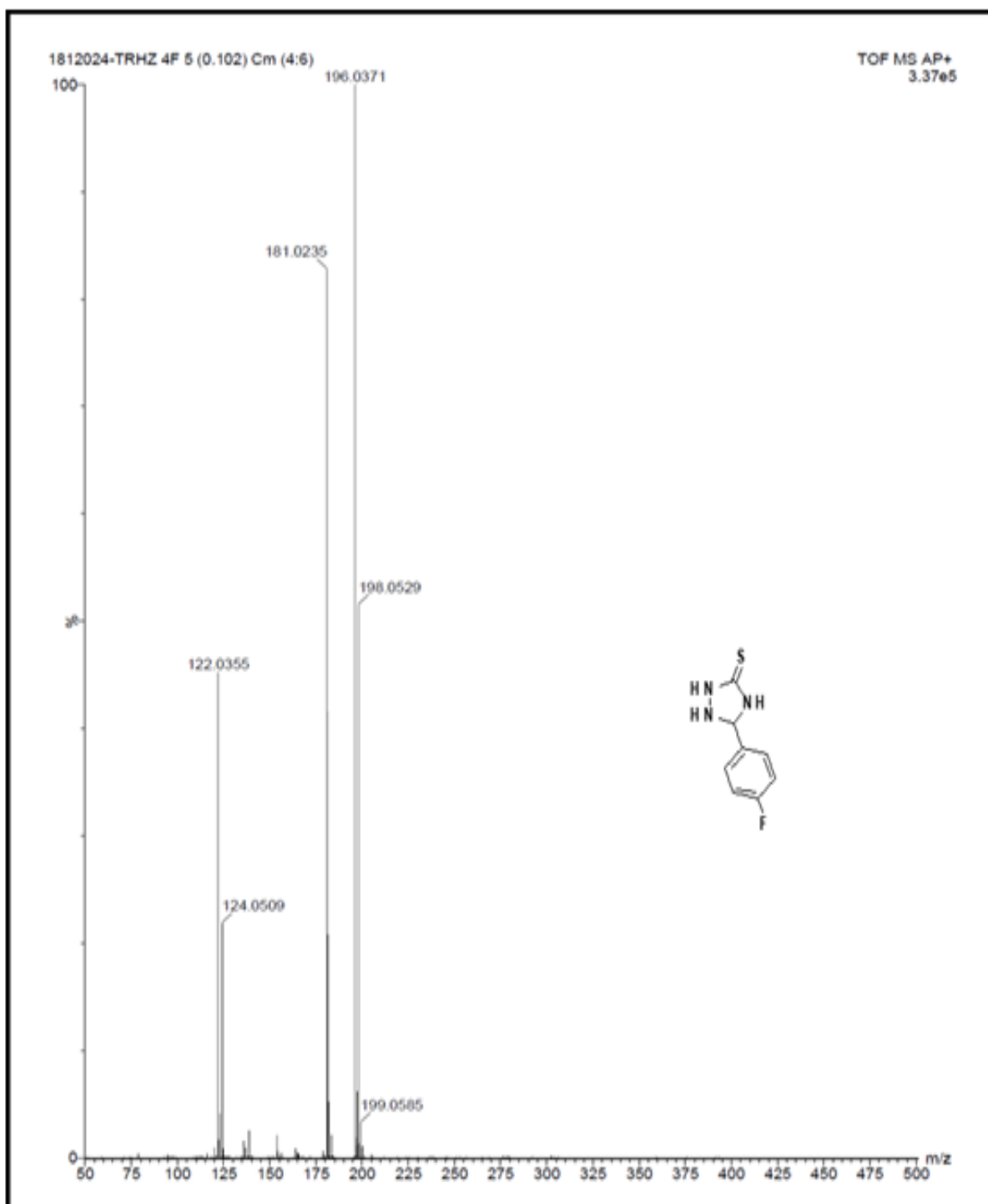


Figure S4: HR-MS(ESI) Spectrum of 5-aryl-1,2,4-triazolidine-3-thiones (**3c**)

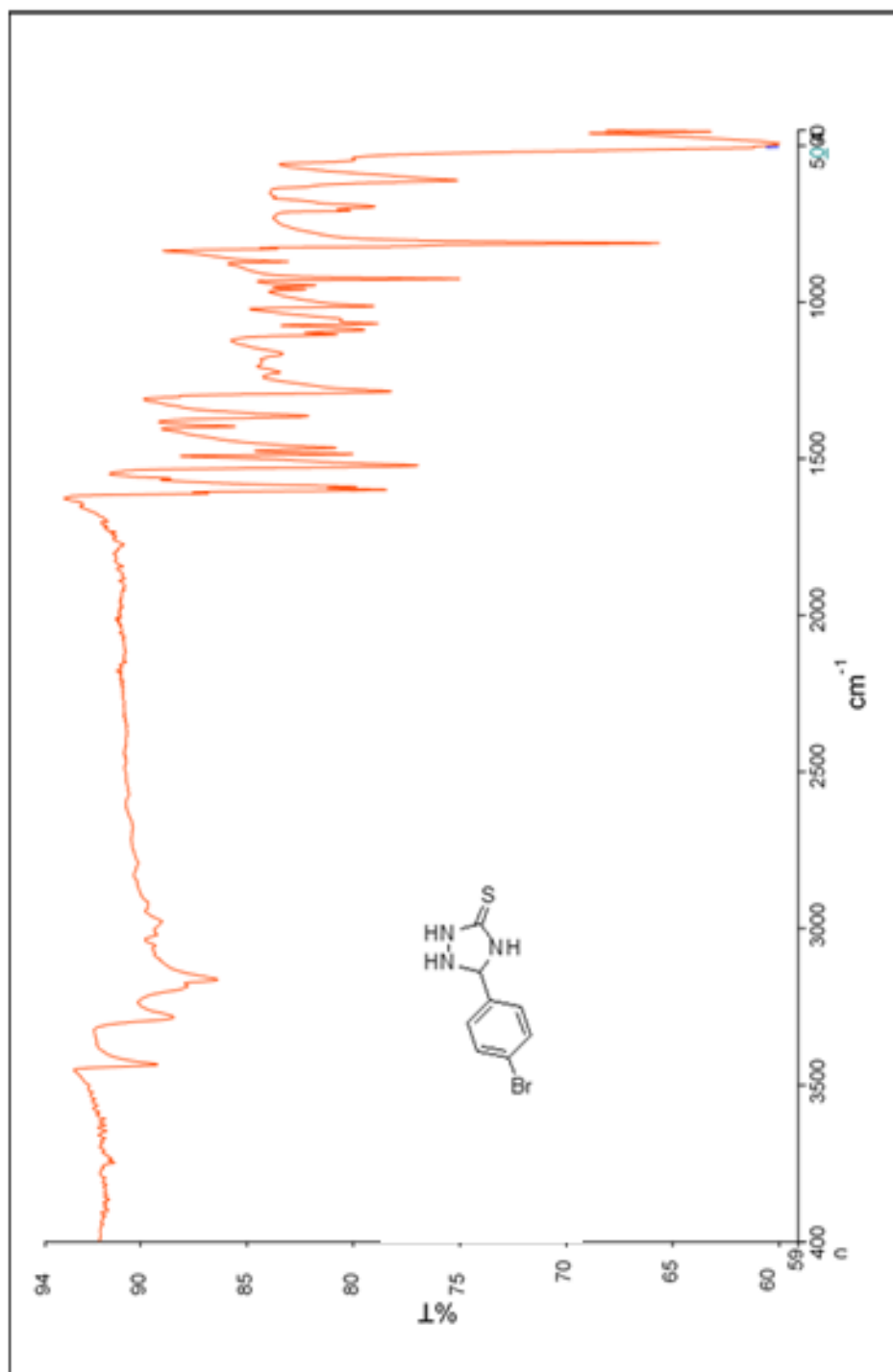


Figure S5: FT-IR Spectrum of 5-aryl-1,2,4-triazolidine-3-thiones (**3d**)

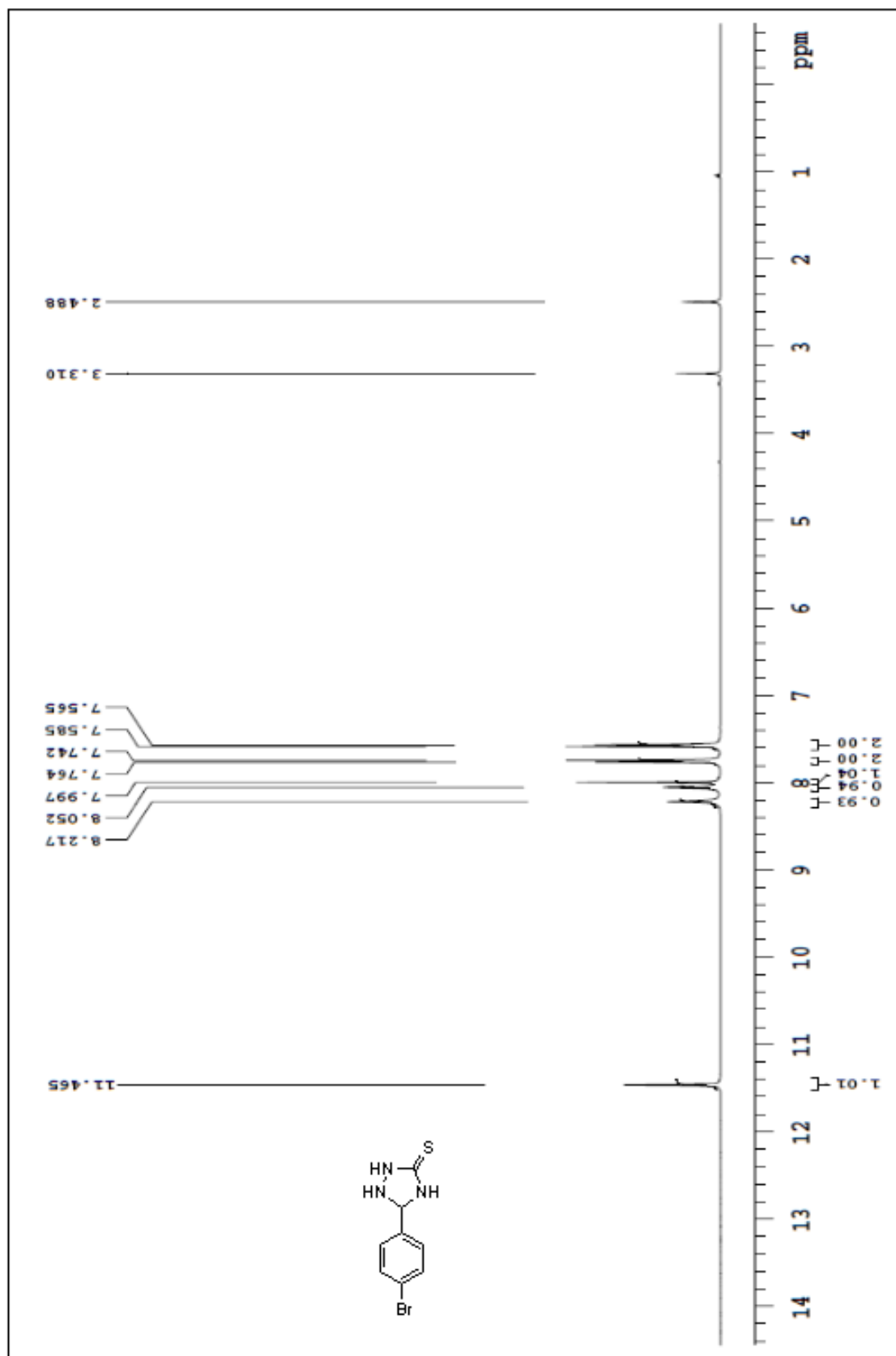


Figure S6: ¹H-NMR Spectrum of 5-aryl-1,2,4-triazolidine-3-thiones (3d)

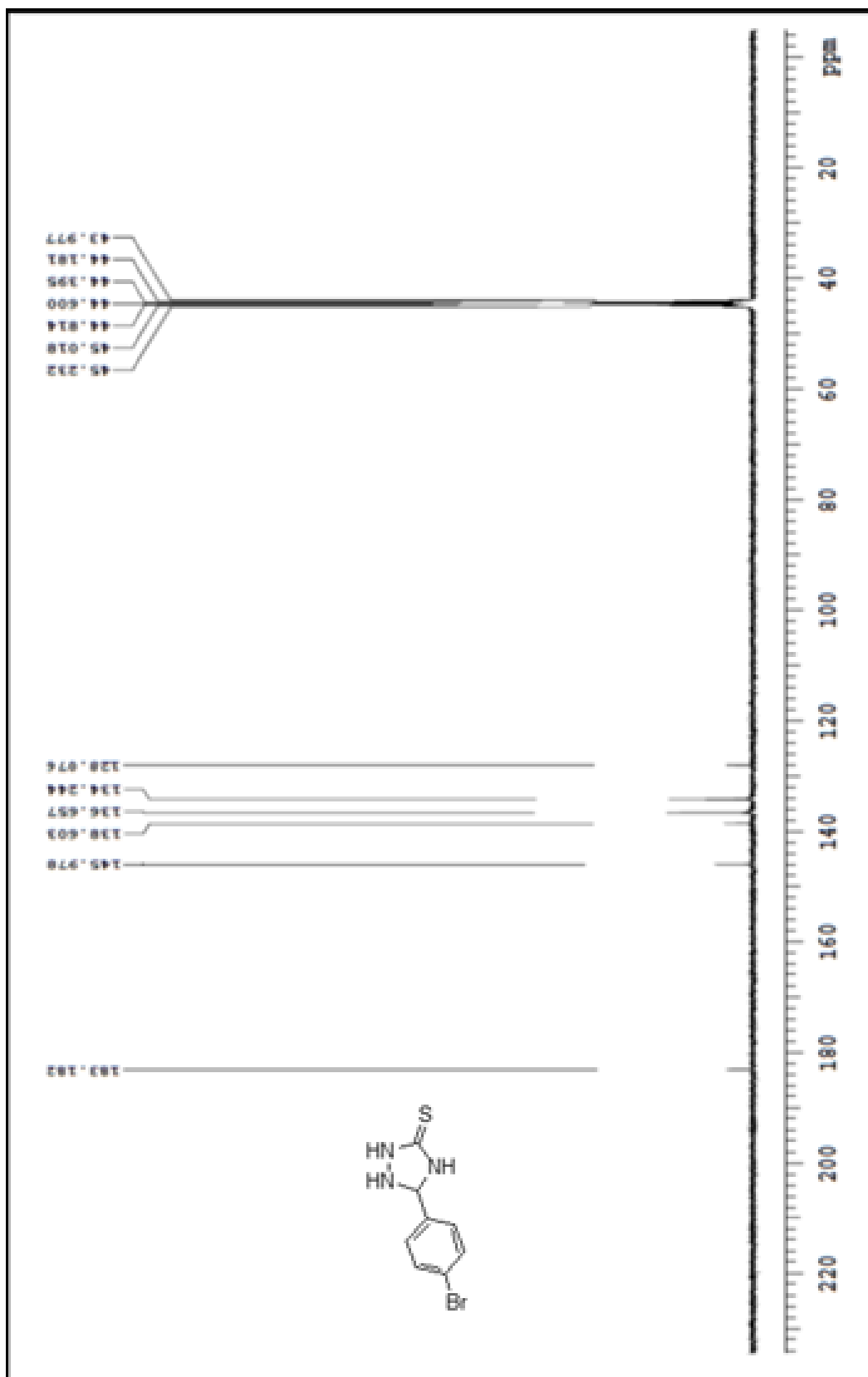


Figure S7: ^{13}C -NMR Spectrum of 5-aryl-1,2,4-triazolidine-3-thiones (**3d**)

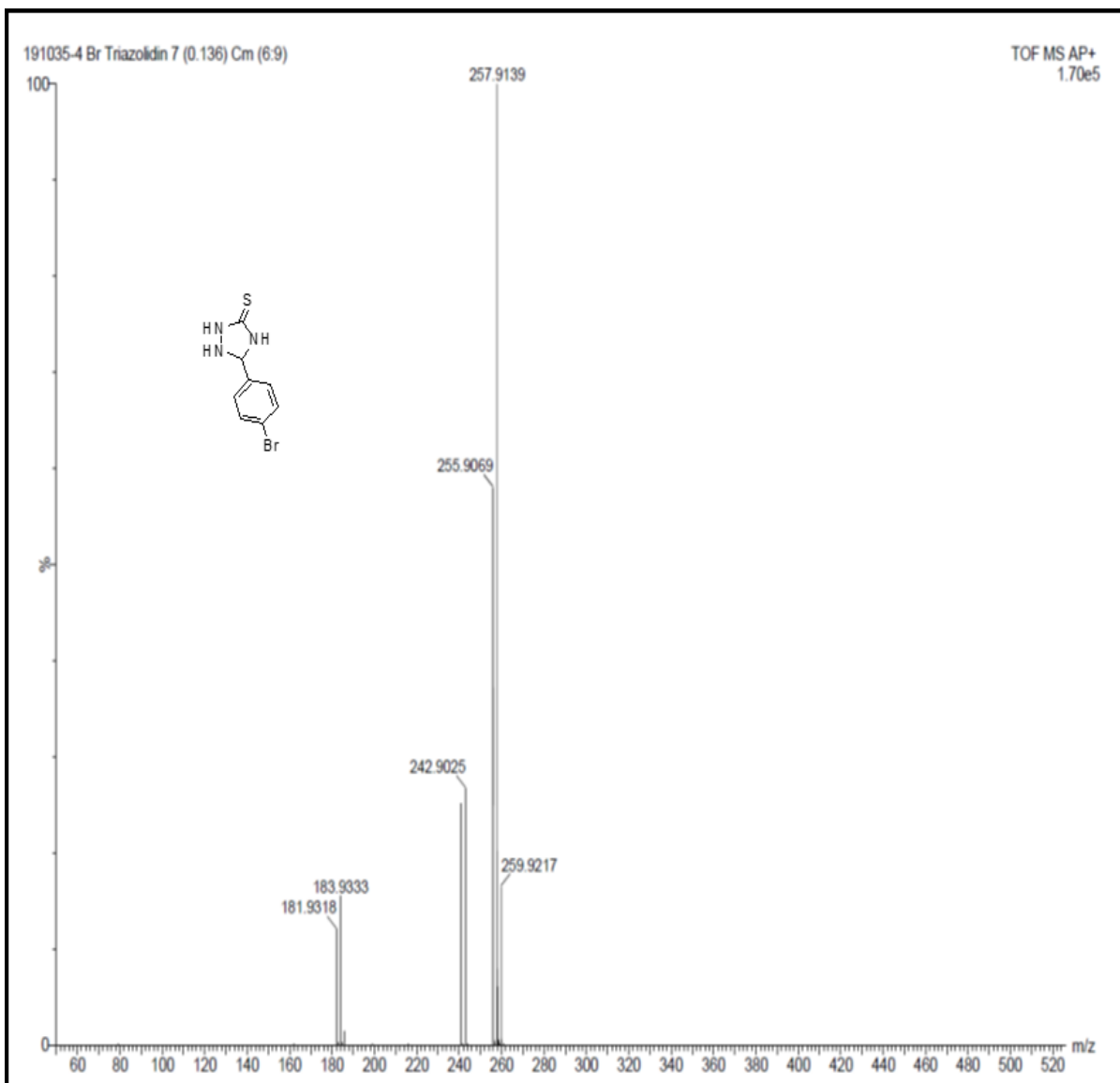


Figure S8: HR-MS(ESI) Spectrum of *5-aryl-1,2,4-triazolidine-3-thiones (3d)*

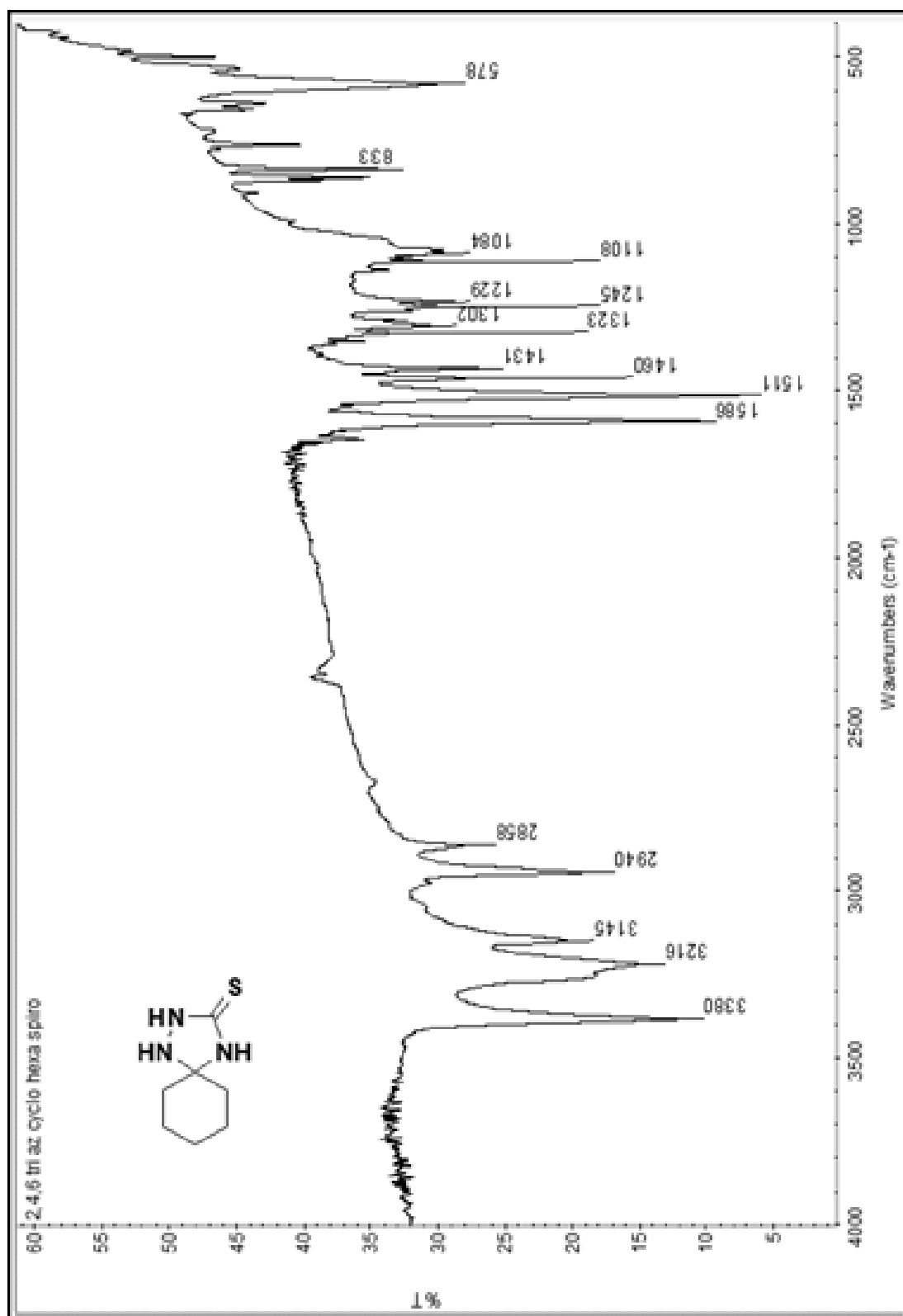


Figure S9: FT-IR Spectrum of 5-aryl-1,2,4-triazolidine-3-thiones (**5a**)

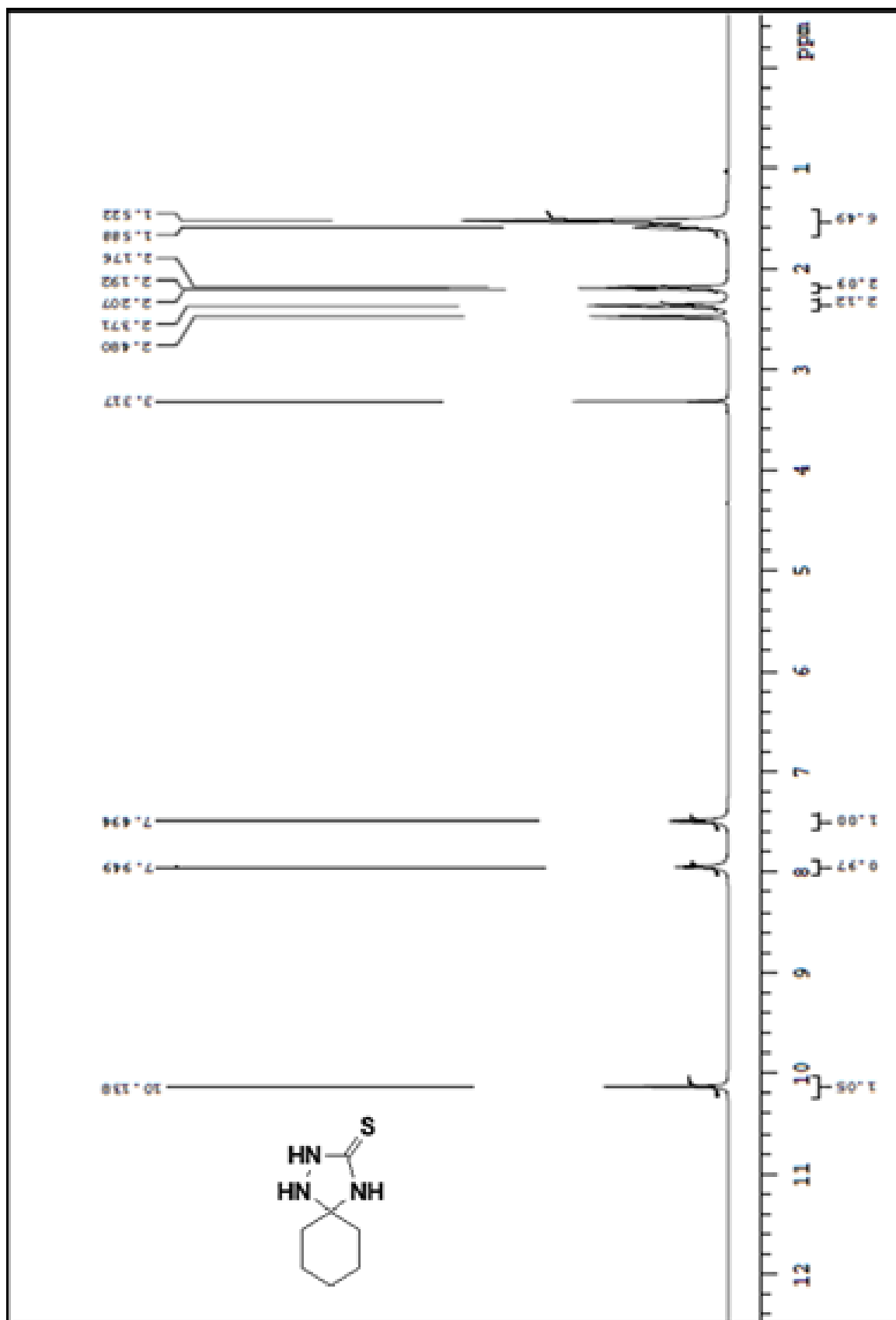


Figure S10: $^1\text{H-NMR}$ Spectrum of 5-aryl-1,2,4-triazolidine-3-thiones (5a)

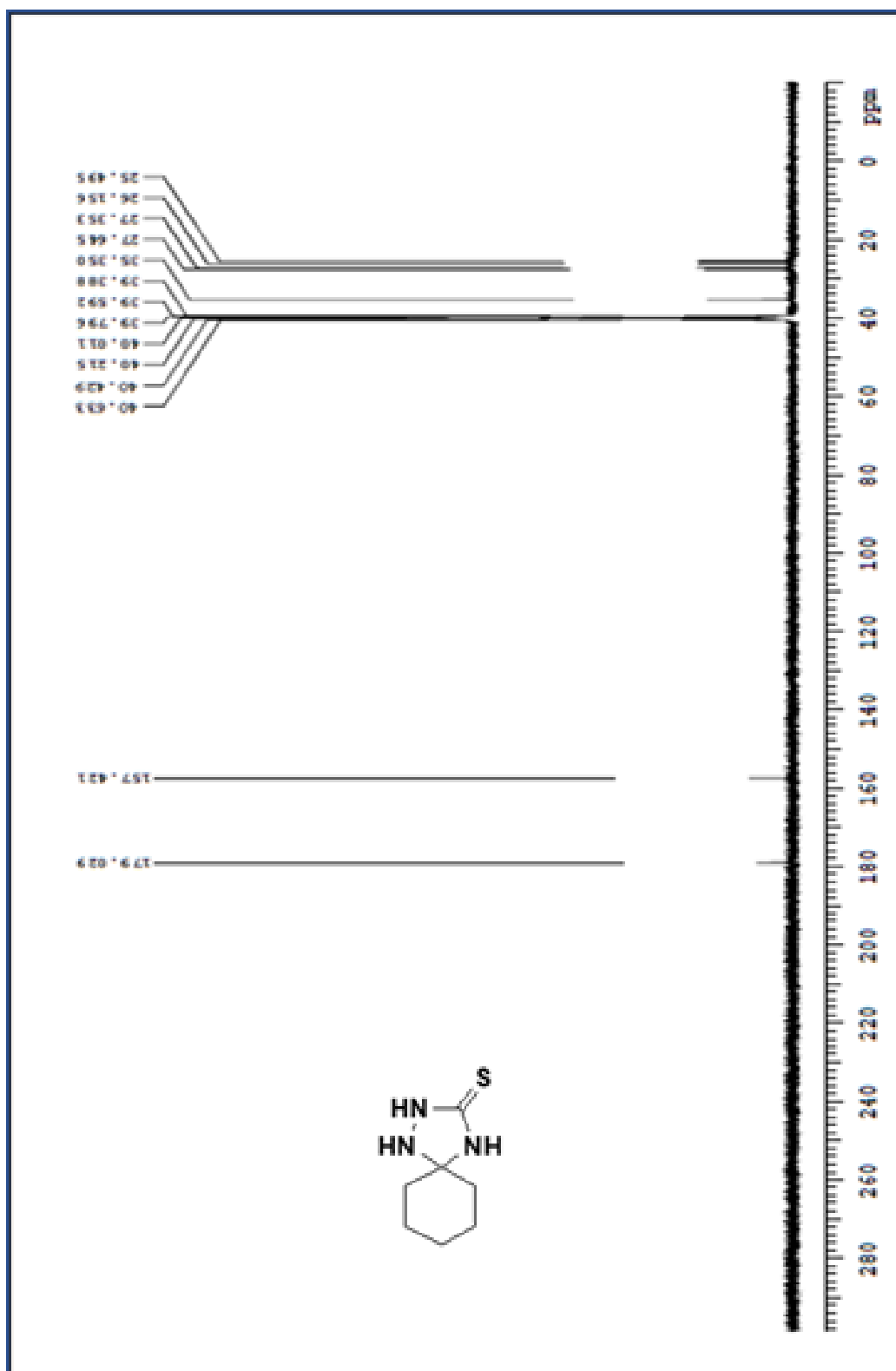


Figure S11: ^{13}C -NMR Spectrum of 5-aryl-1,2,4-triazolidine-3-thiones (5a)

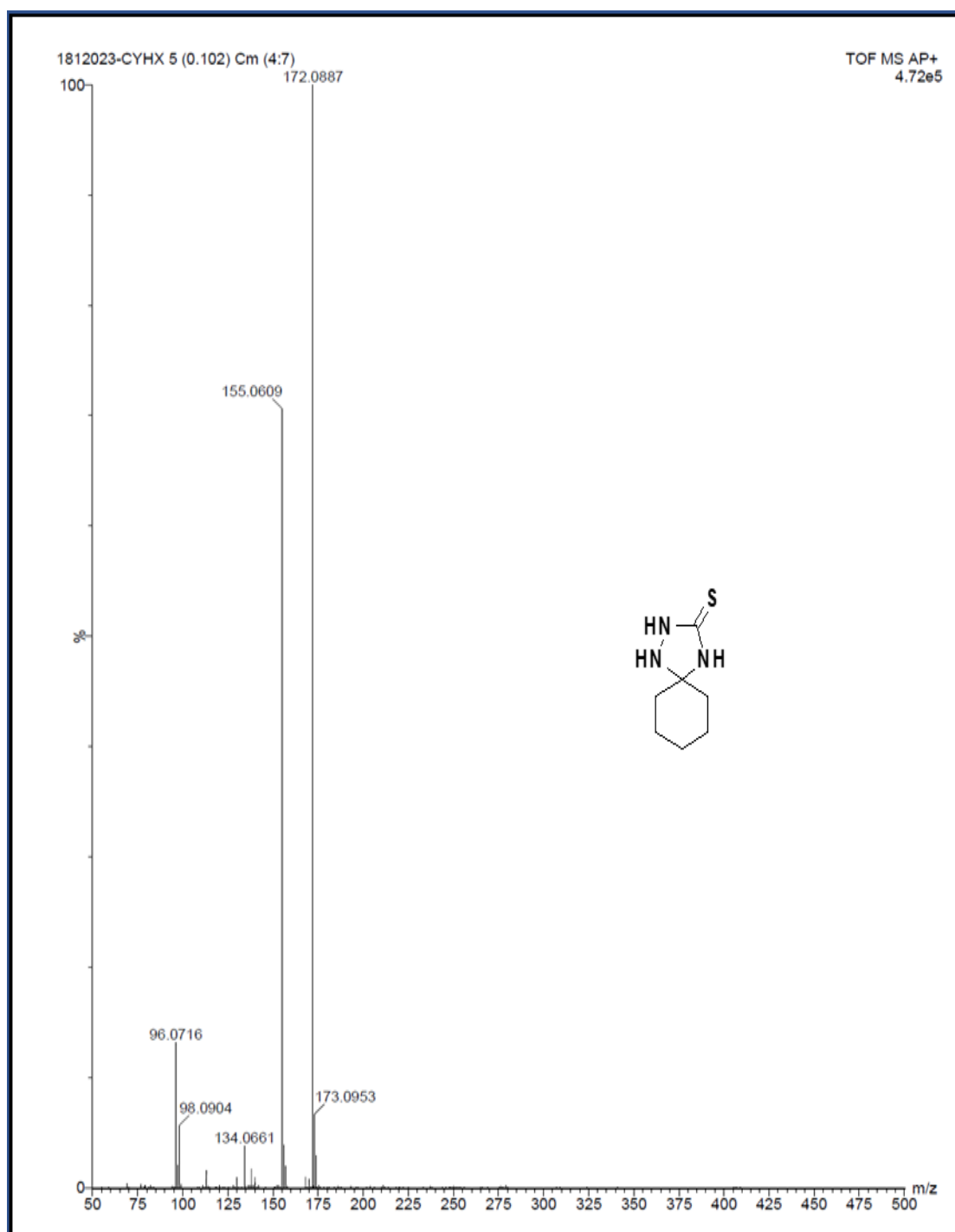


Figure S12: HR-MS Spectrum of 5-aryl-1,2,4-triazolidine-3-thiones (**5a**)

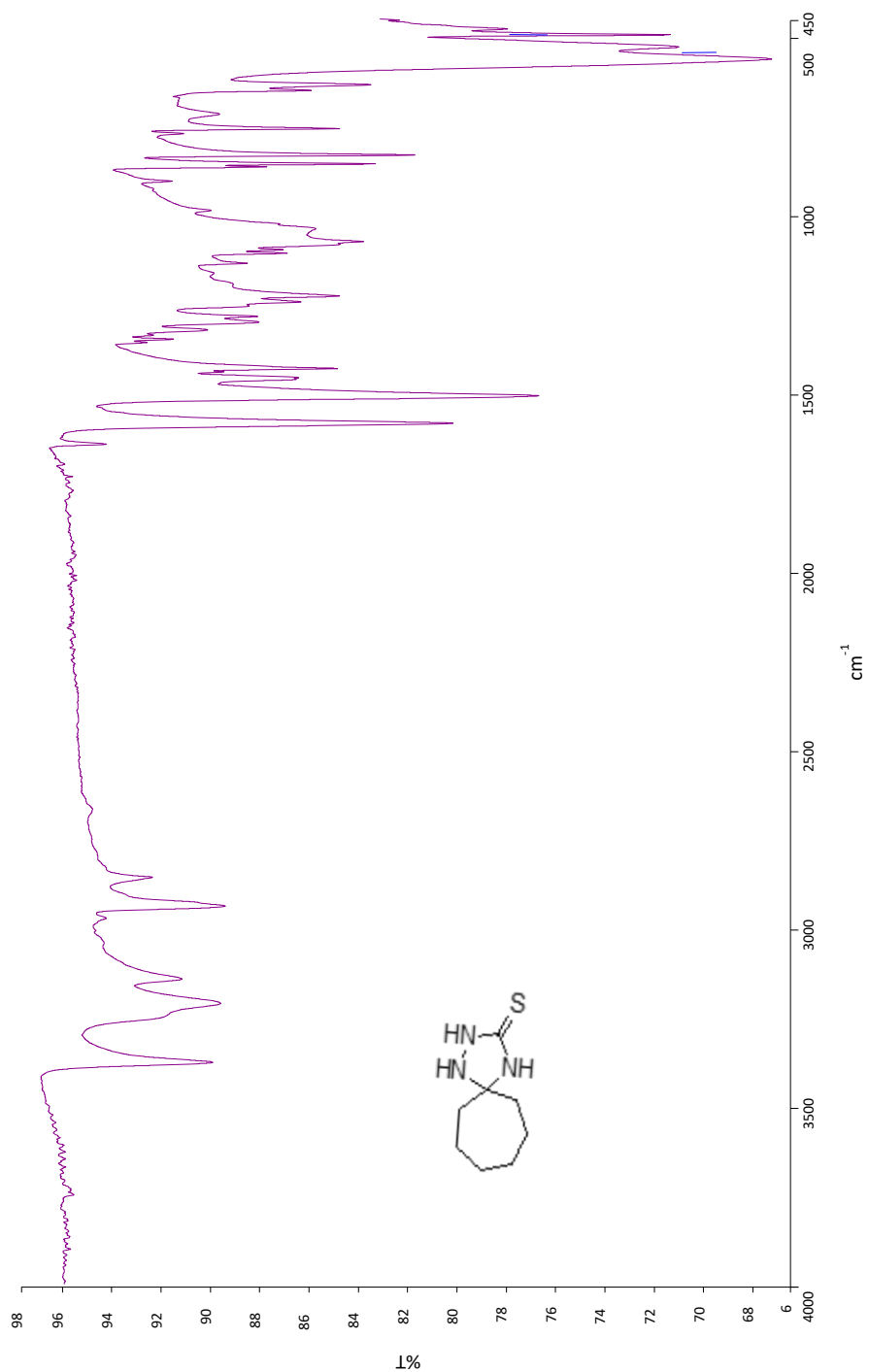


Figure S13: FT-IR Spectrum of *1,2,4-Triazospiroheptane-3-thione (5b)*

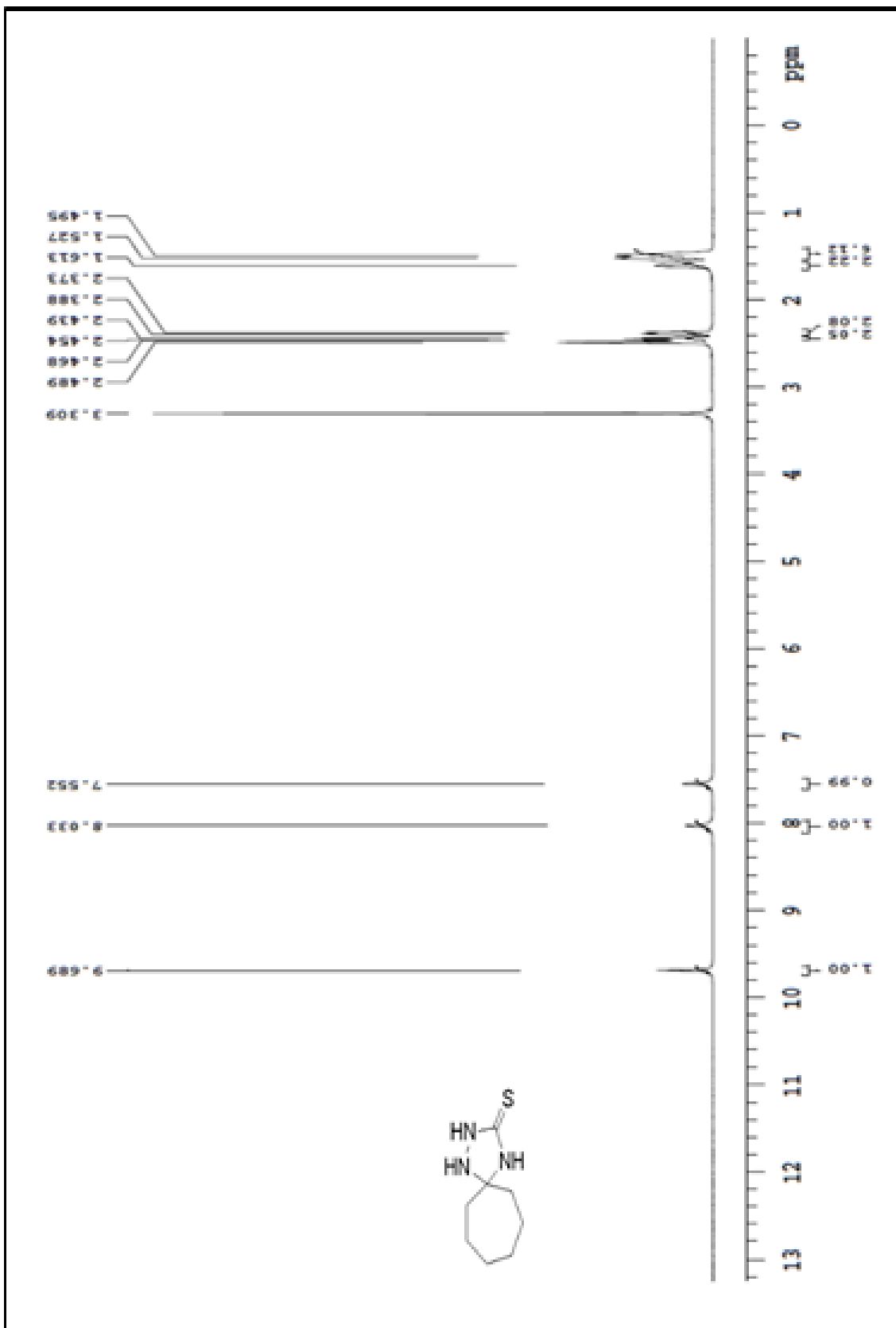


Figure S14: ¹H-NMR Spectrum of 1,2,4-Triazospiroheptane-3-thione (5b)

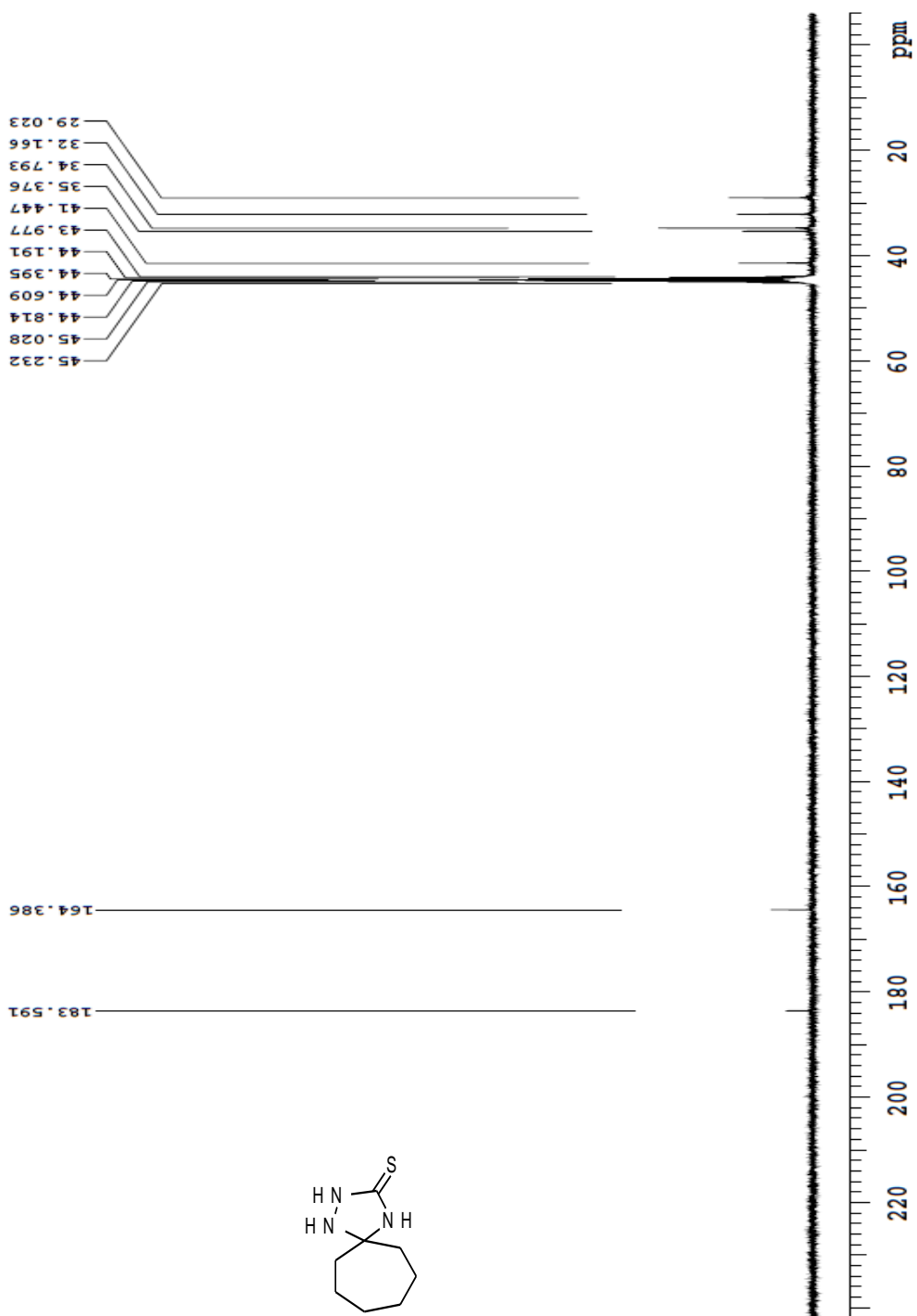


Figure S15: ^{13}C -NMR Spectrum of *1,2,4-Triazospiroheptane-3-thione* (**5b**)

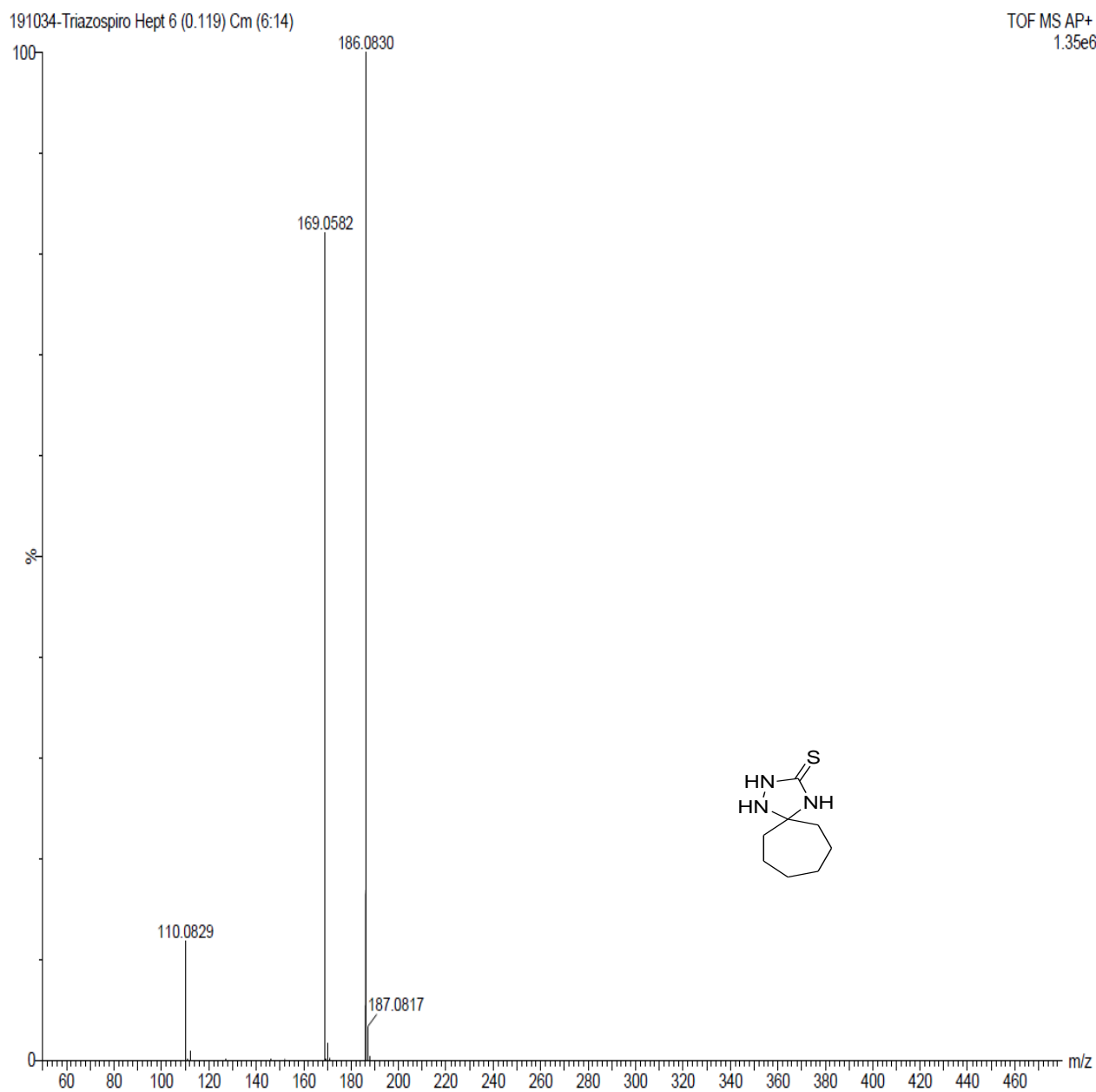


Figure S16: HR-MS Spectrum of *1,2,4-Triazospiroheptane-3-thione (5b)*