Electronic Supplementary Material (ESI) for Green Chemistry

Sulfonic acid supported on hydroxyapatite-encapsulated-γ-Fe_2O_3 nanocrystallites as a magnetically separable catalyst for one-pot reductive amination of carbonyl compounds

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Supporting Information

General Information. All solvents and chemicals were obtained commercially and were used as received. X-ray diffraction analysis was carried out using a PANalytical X'Pert Pro X-ray diffractometer. Surface morphology and particle size were studied using a Hitachi S-4800 SEM instrument. Transmission electron microscope (TEM) observation was performed using Hitachi H-600 microscope at 80 KV. Melting points were determined using an X-4 apparatus and are uncorrected. IR spectra were recorded using a Bruker-TENSOR 27 spectrometer instrument. NMR spectra were taken with a Bruker DRX-500 spectrometer at 500 MHz (^{1}H) and 125 MHz (^{13}C) using $CDCl_3$ as the solvent with TMS as internal standard. Elemental analyses were obtained on a Vario EL III CHNOS elemental analyzer.

Figure S1. The XRD pattern of γ-Fe_2O_3@HAP-SO_3H nanoparticles before use (A) and after reuse five time (B)

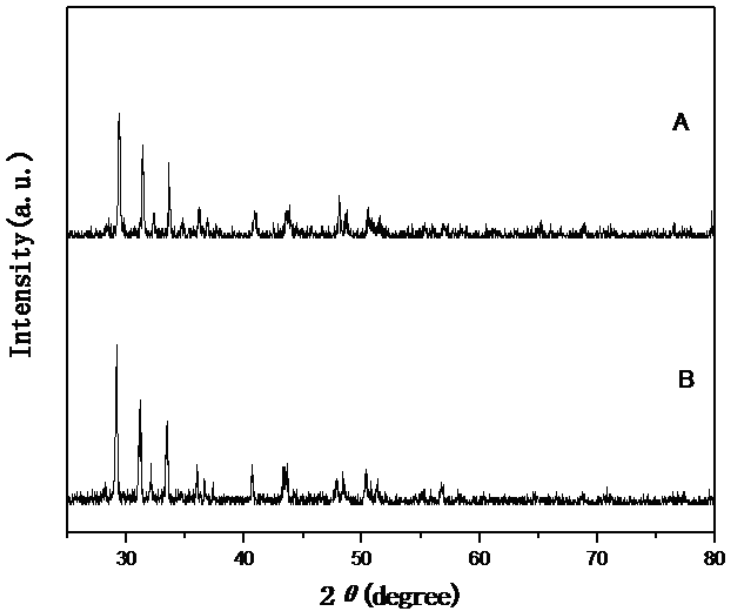
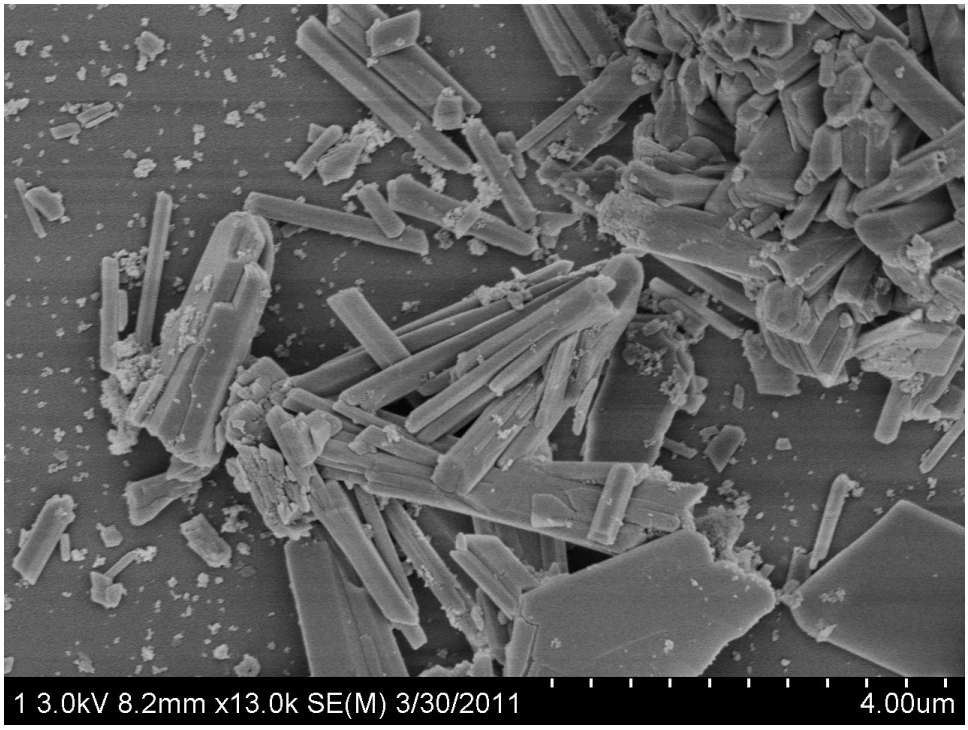


Figure S2. The SEM morphology of γ-Fe_2O_3@HAP-SO_3H nanoparticles before use (a) and after reuse five time (b)

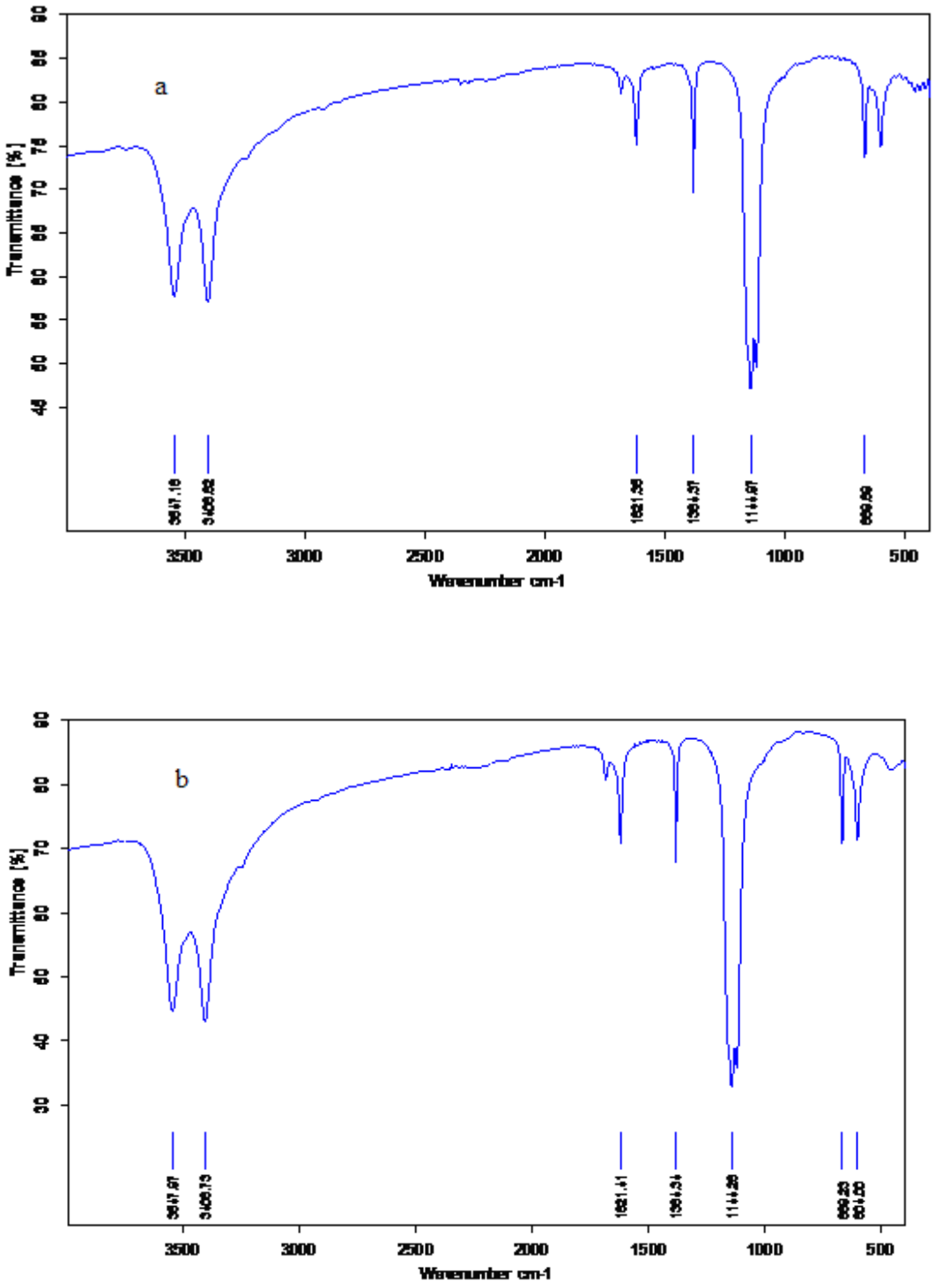
(a)



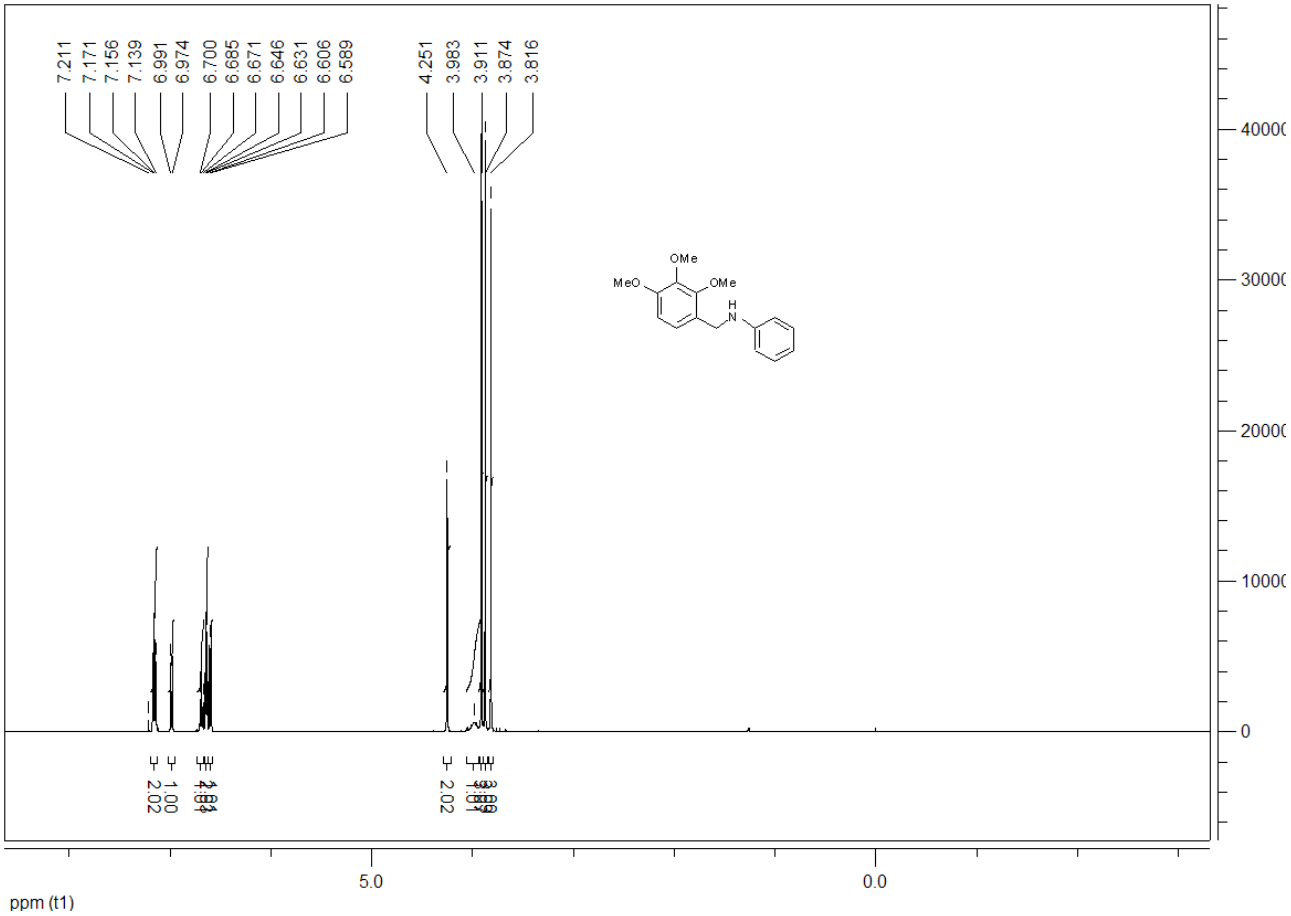
(b)

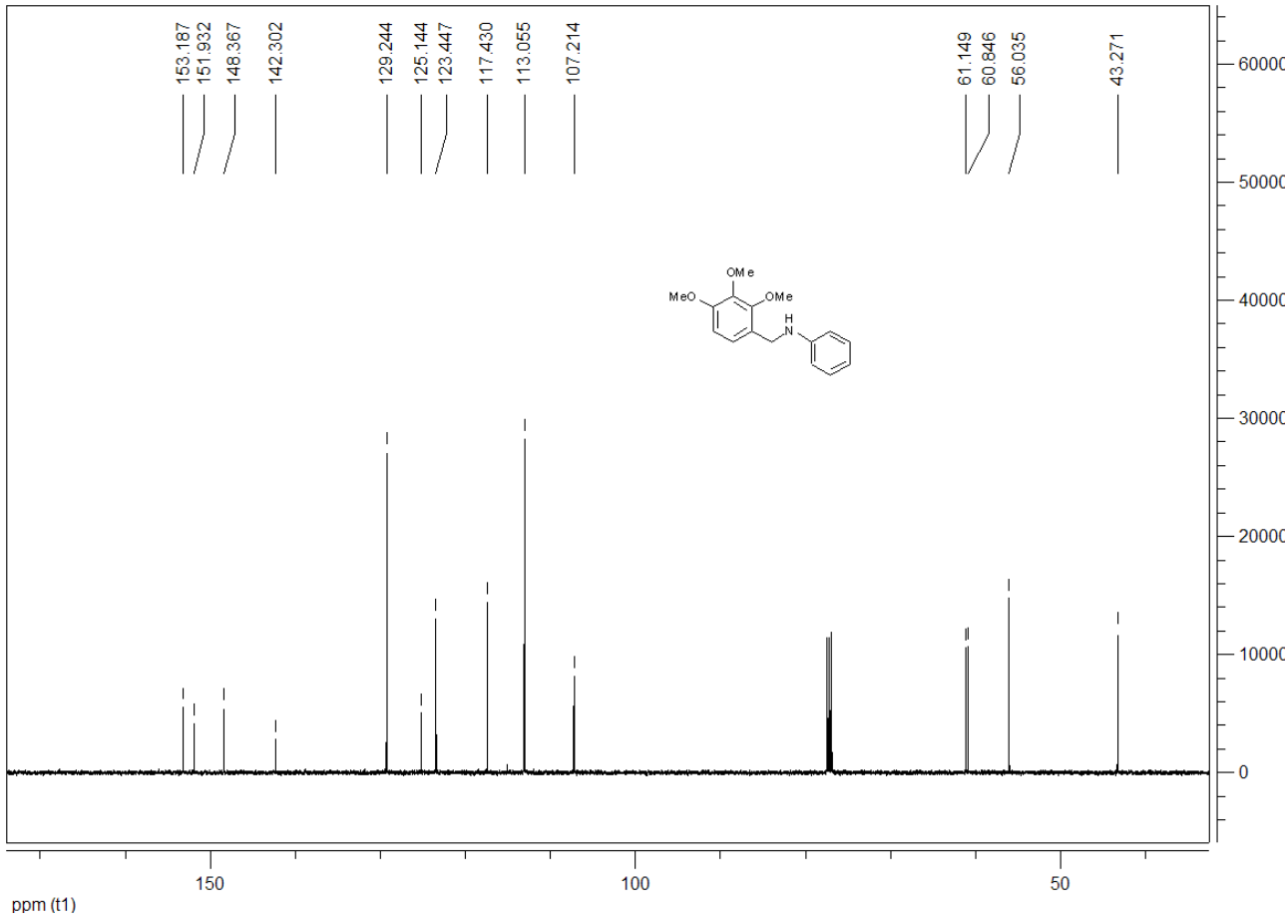
Figure S3. The TEM image of γ-Fe_2O_3@HAP-SO_3H nanoparticles

Figure S4. IR spectrum of nano-γ-Fe_2O_3@HAP-SO_3H before use (a) and after reuse five time (b)

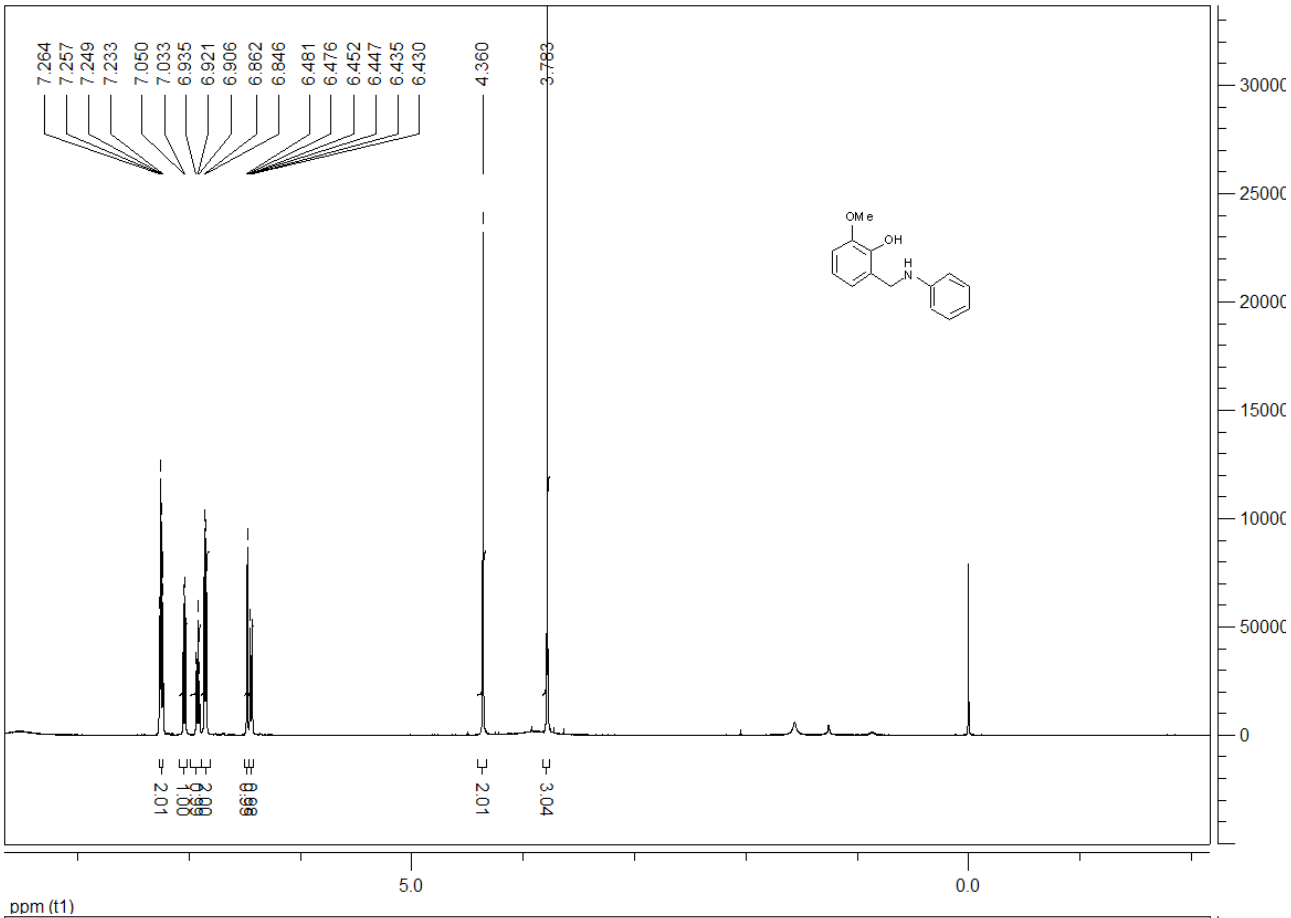


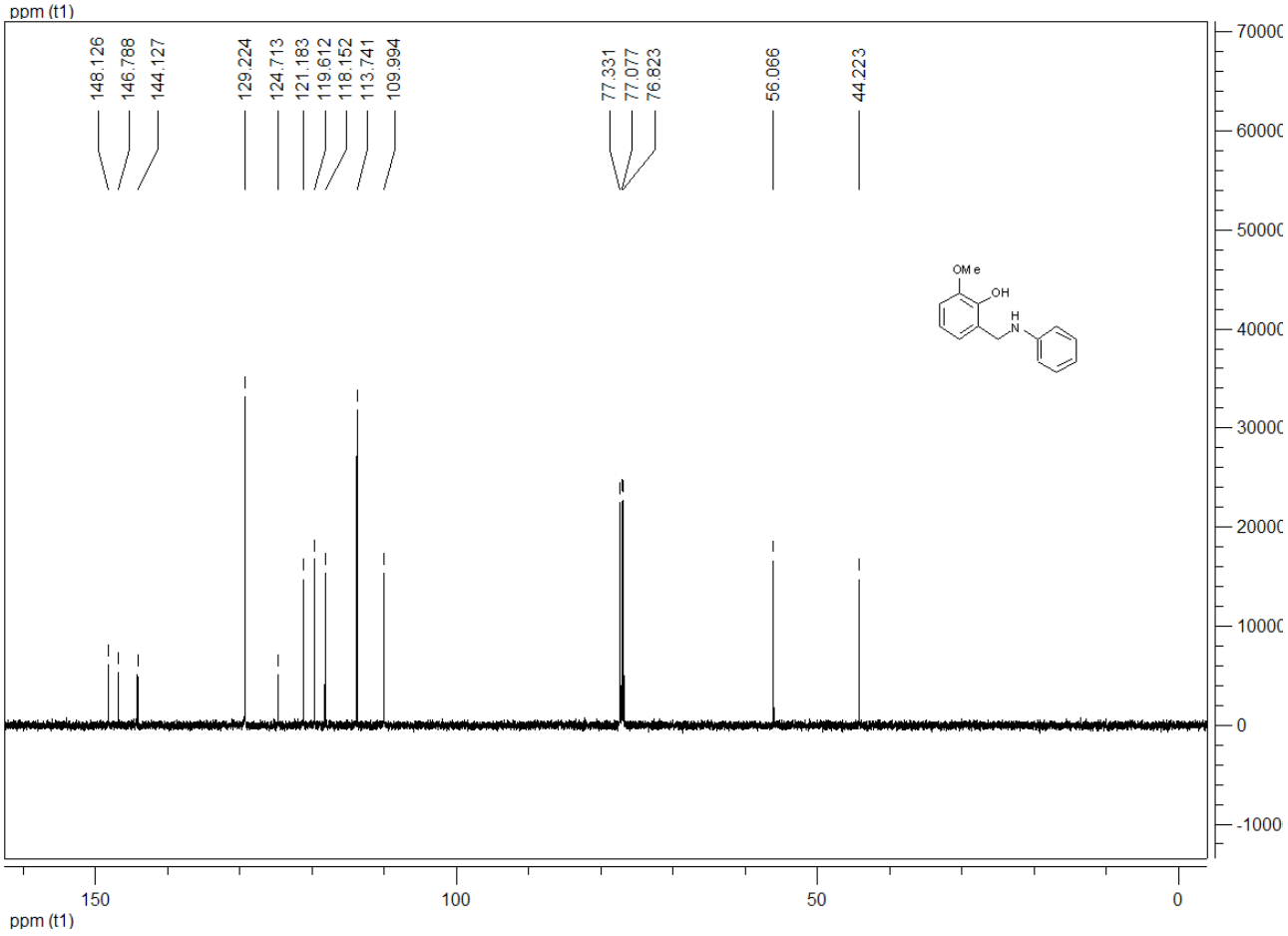
^{1}H NMR and ^{13}C NMR of compound **3f**



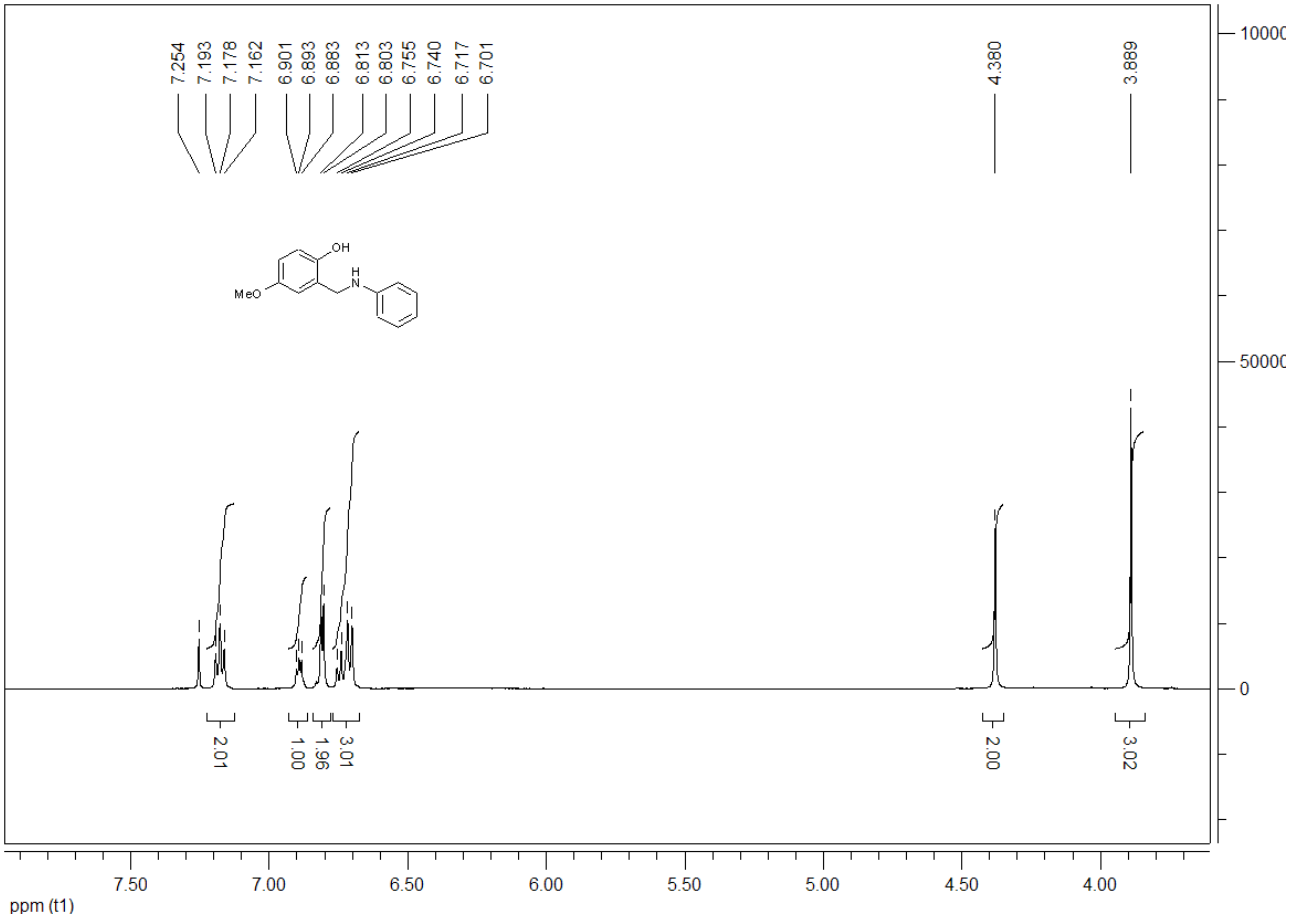


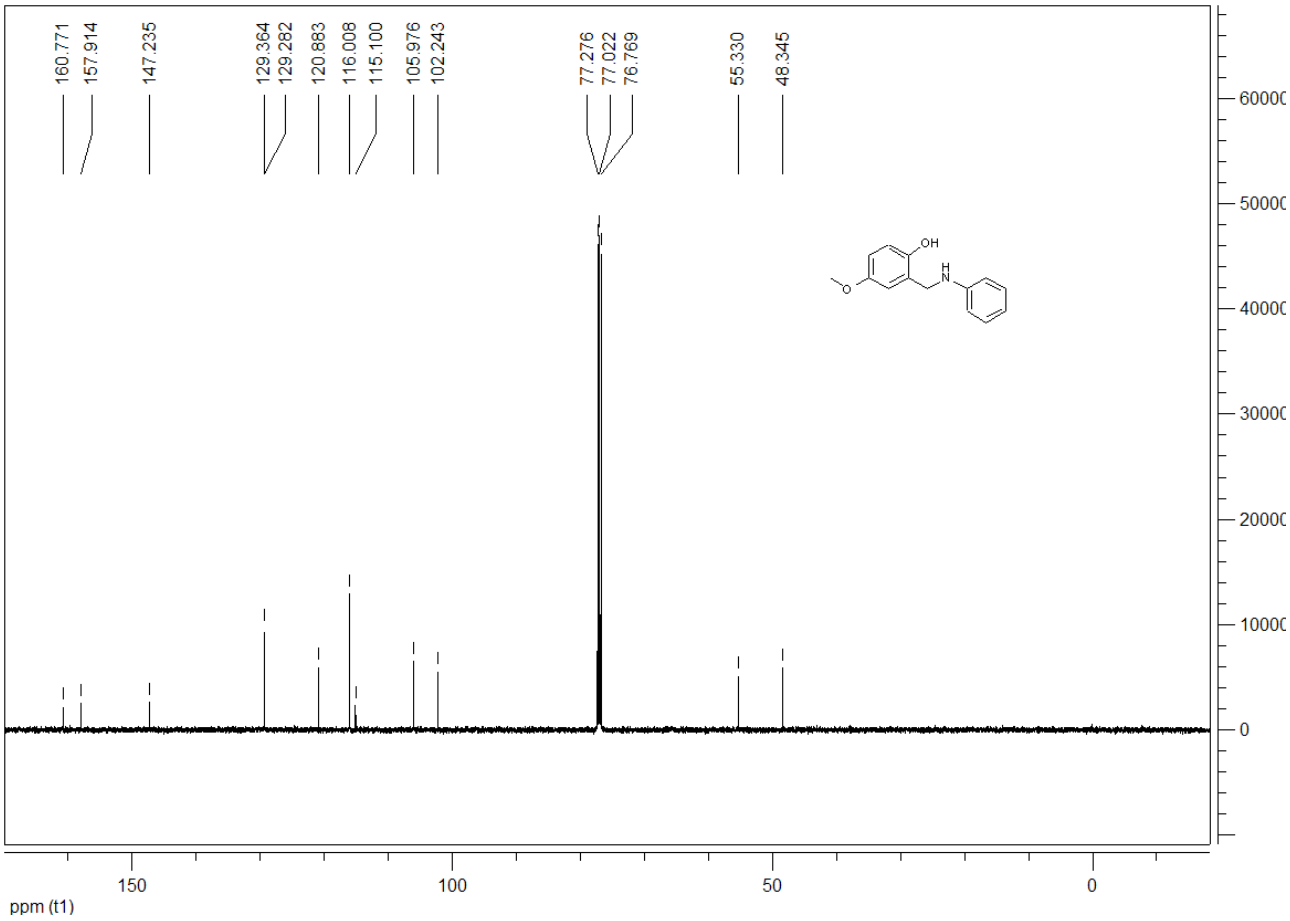
^{1}H NMR and ^{13}C NMR of compound **3h**



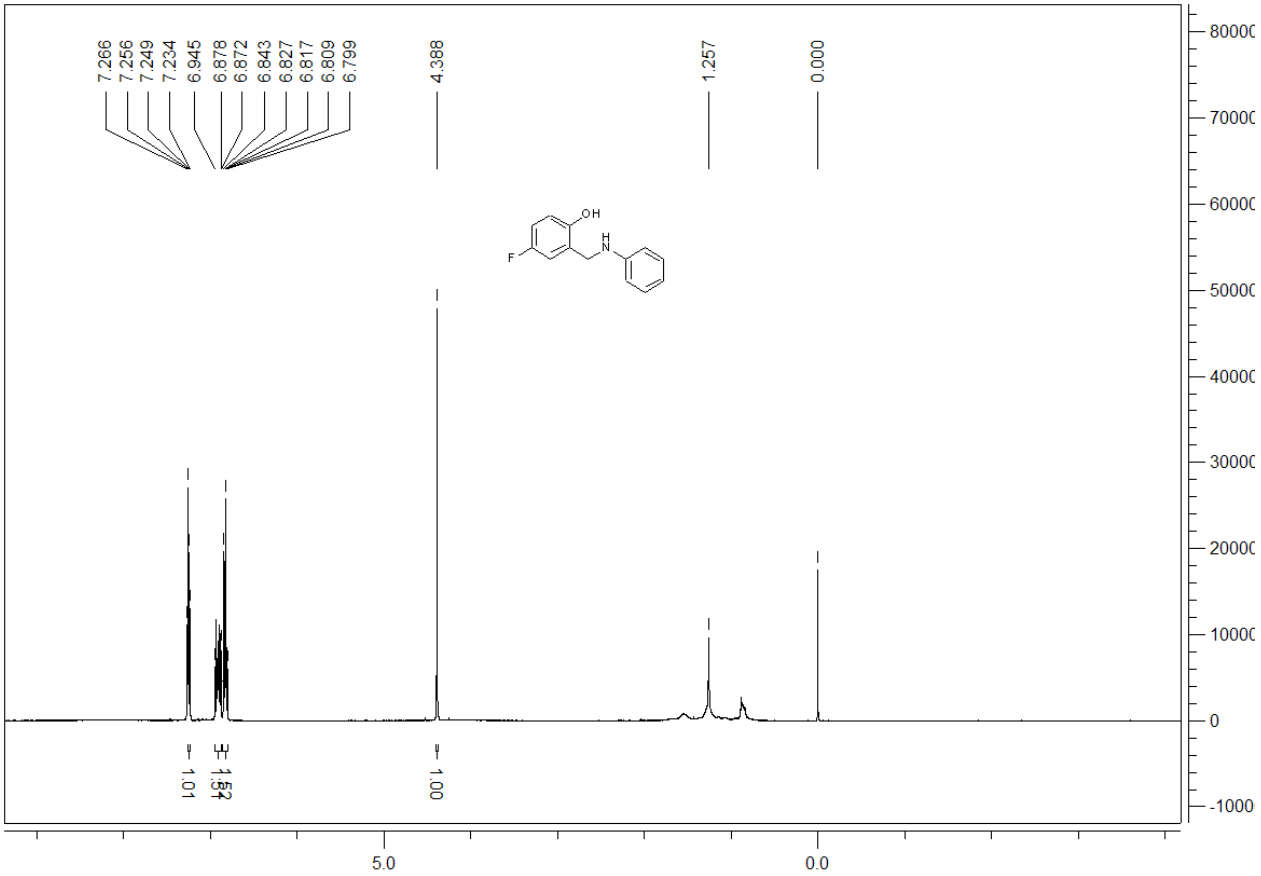


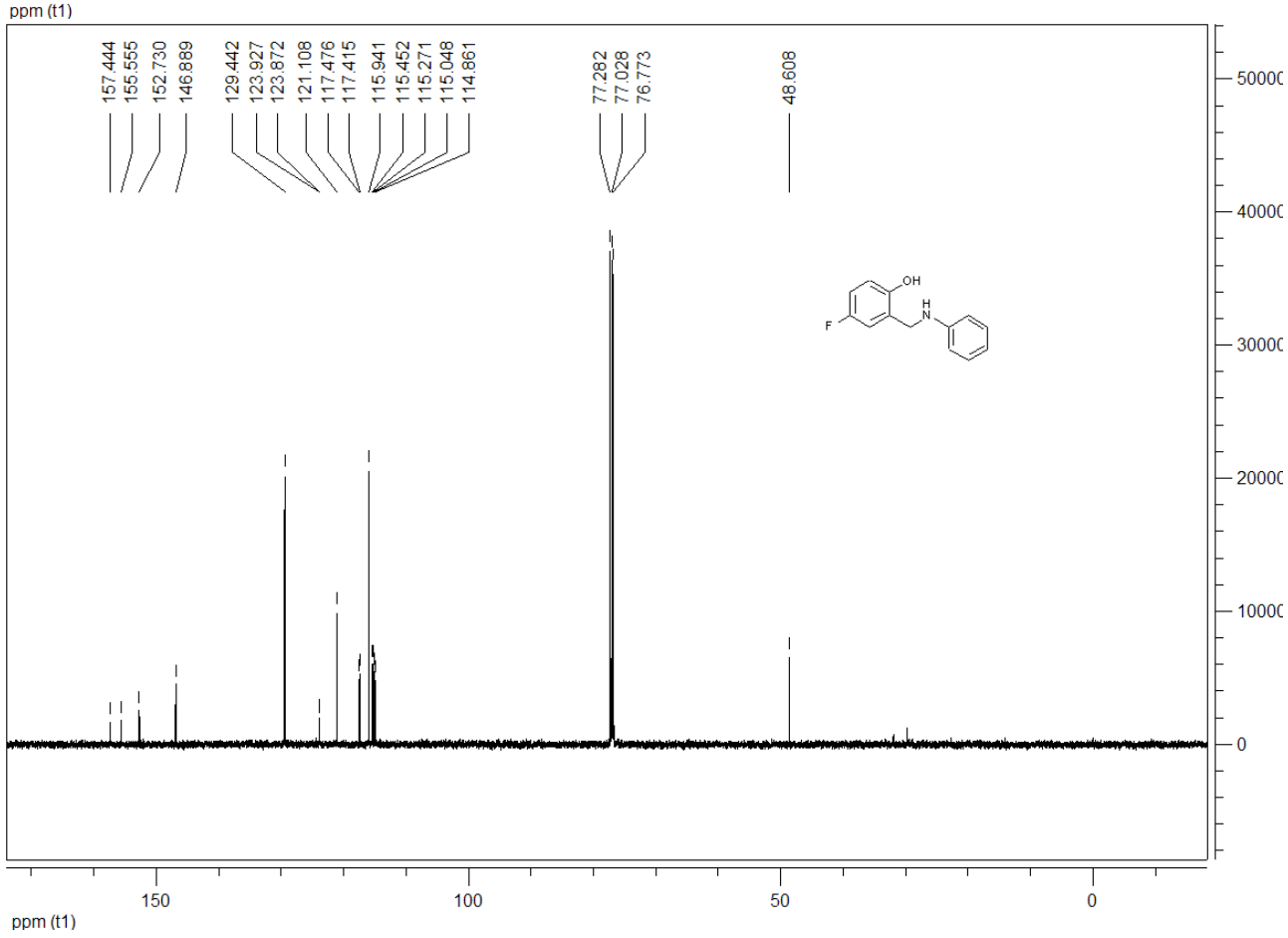
^{1}H NMR and ^{13}C NMR of compound **3i**



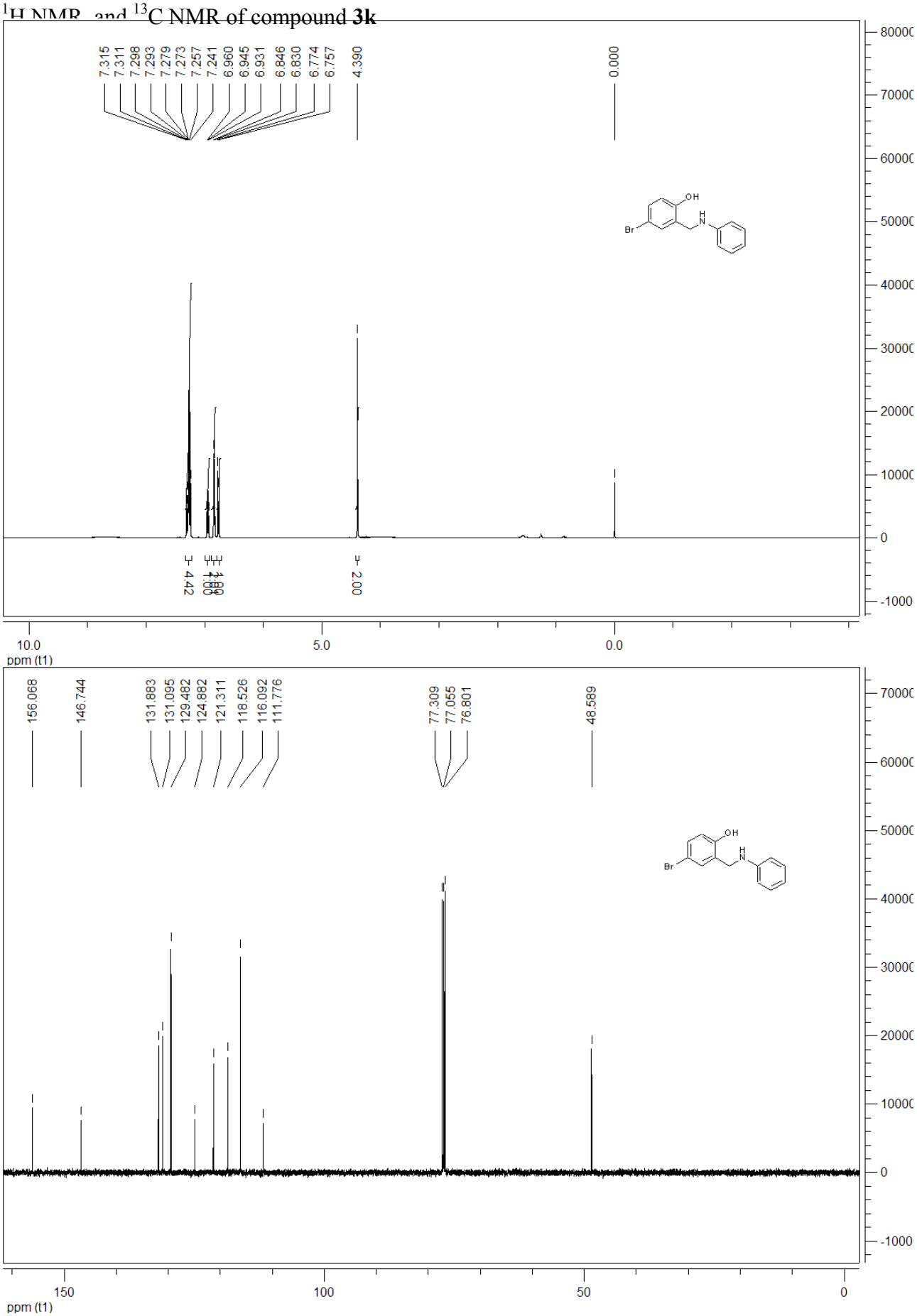


^{1}H NMR and ^{13}C NMR of compound **3j**

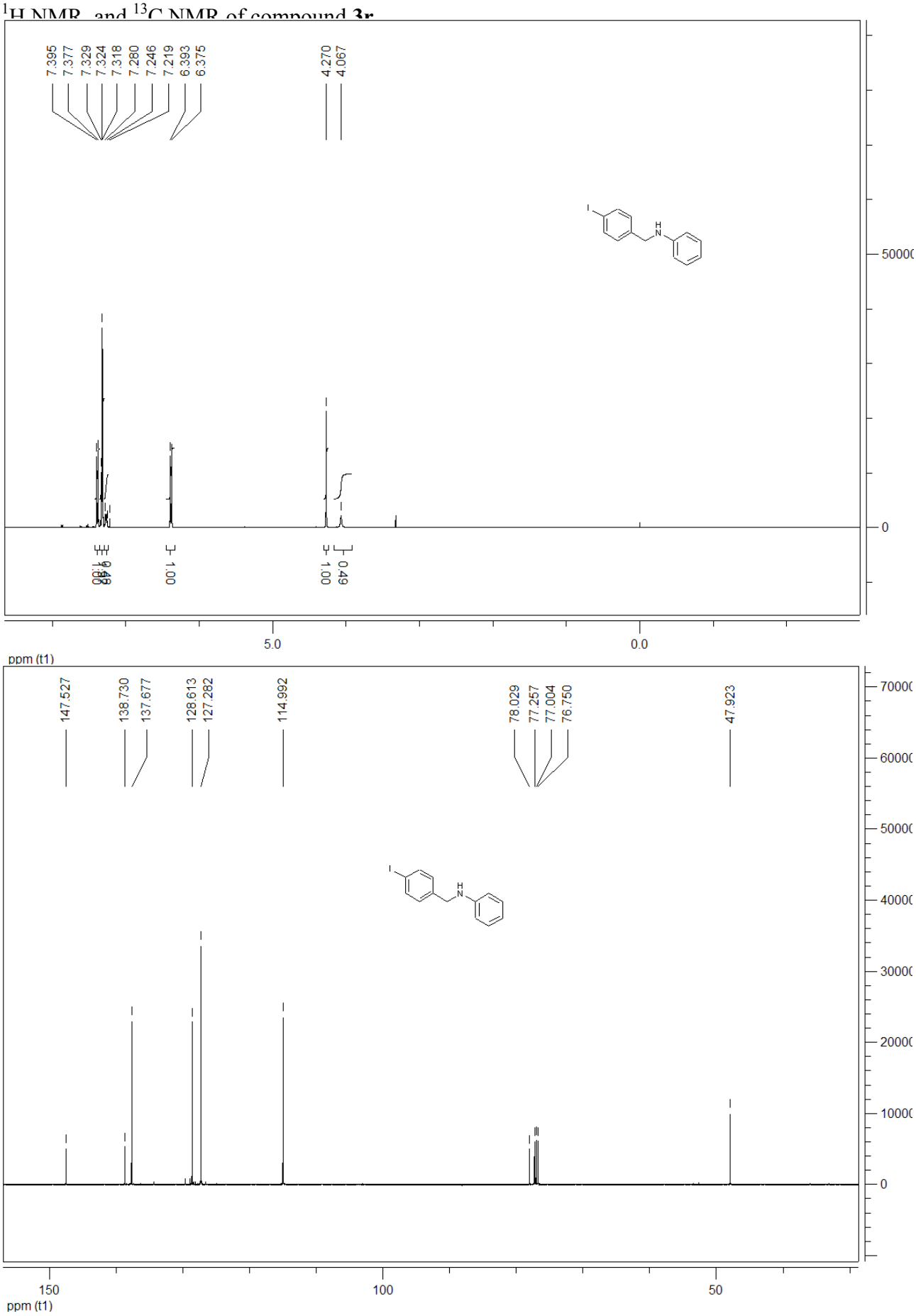




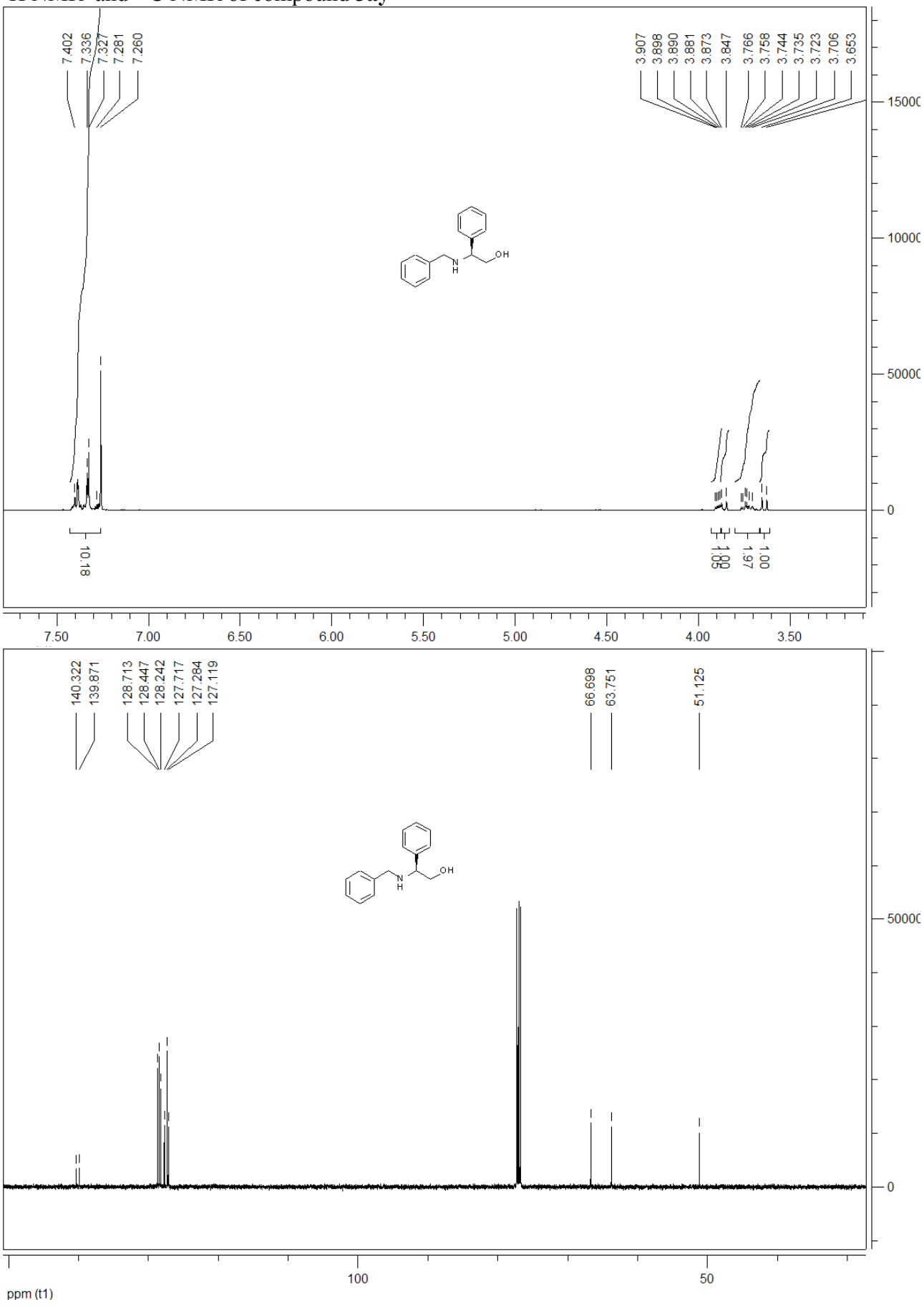
^{1}H NMR and ^{13}C NMR of compound **3k**



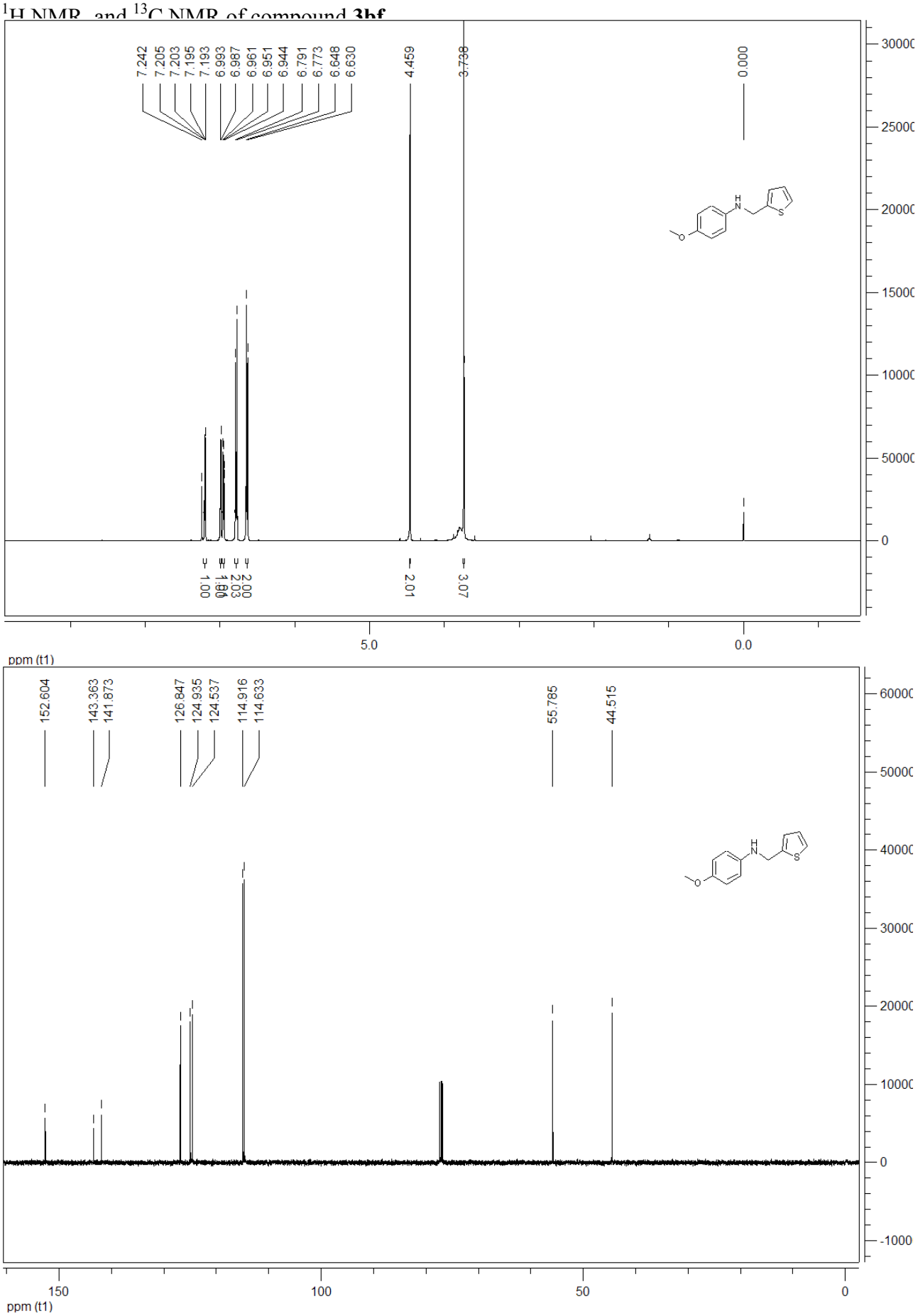
^{1}H NMR and ^{13}C NMR of compound **3r**



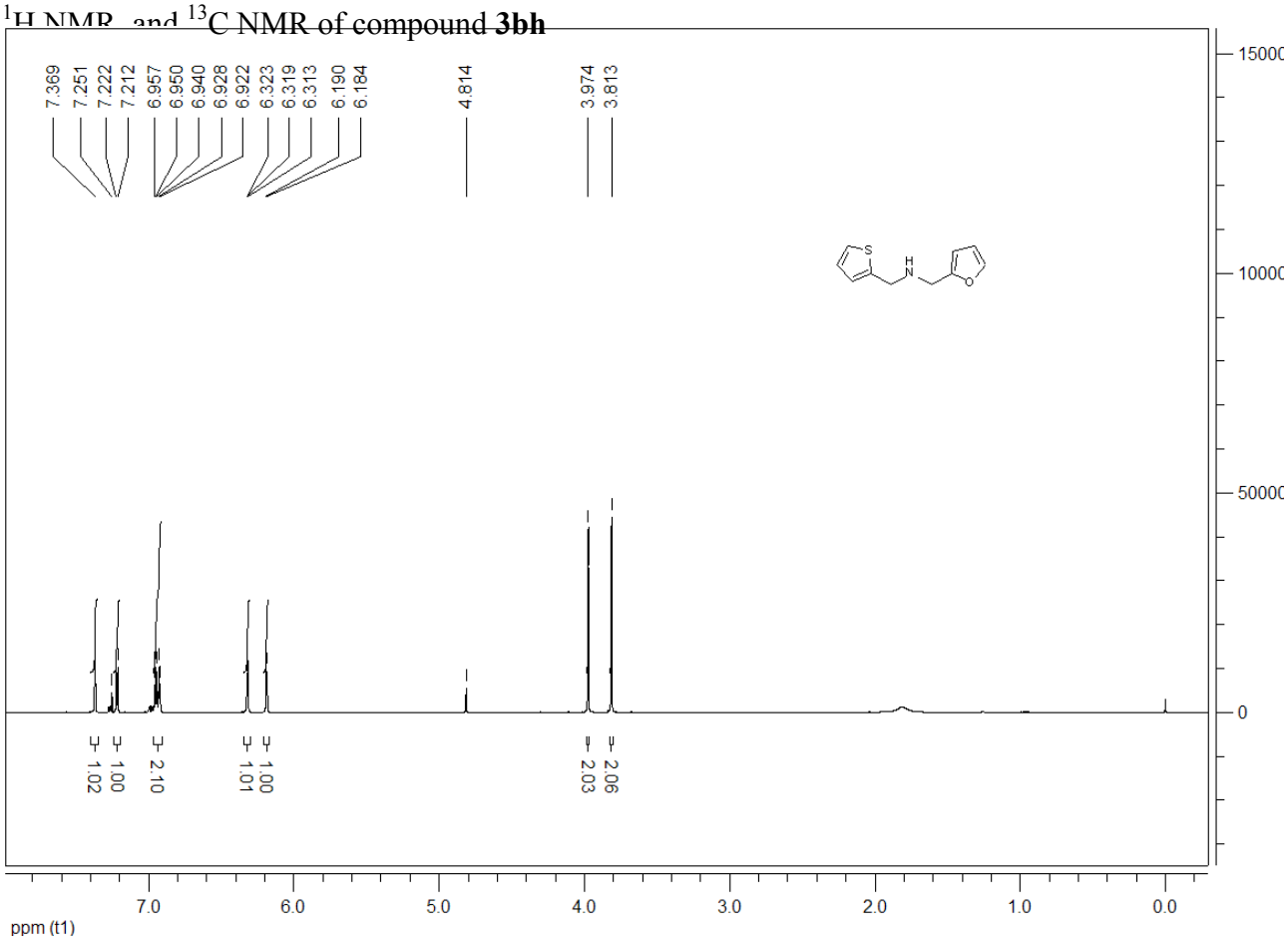
^{1}H NMR and ^{13}C NMR of compound **3ay**

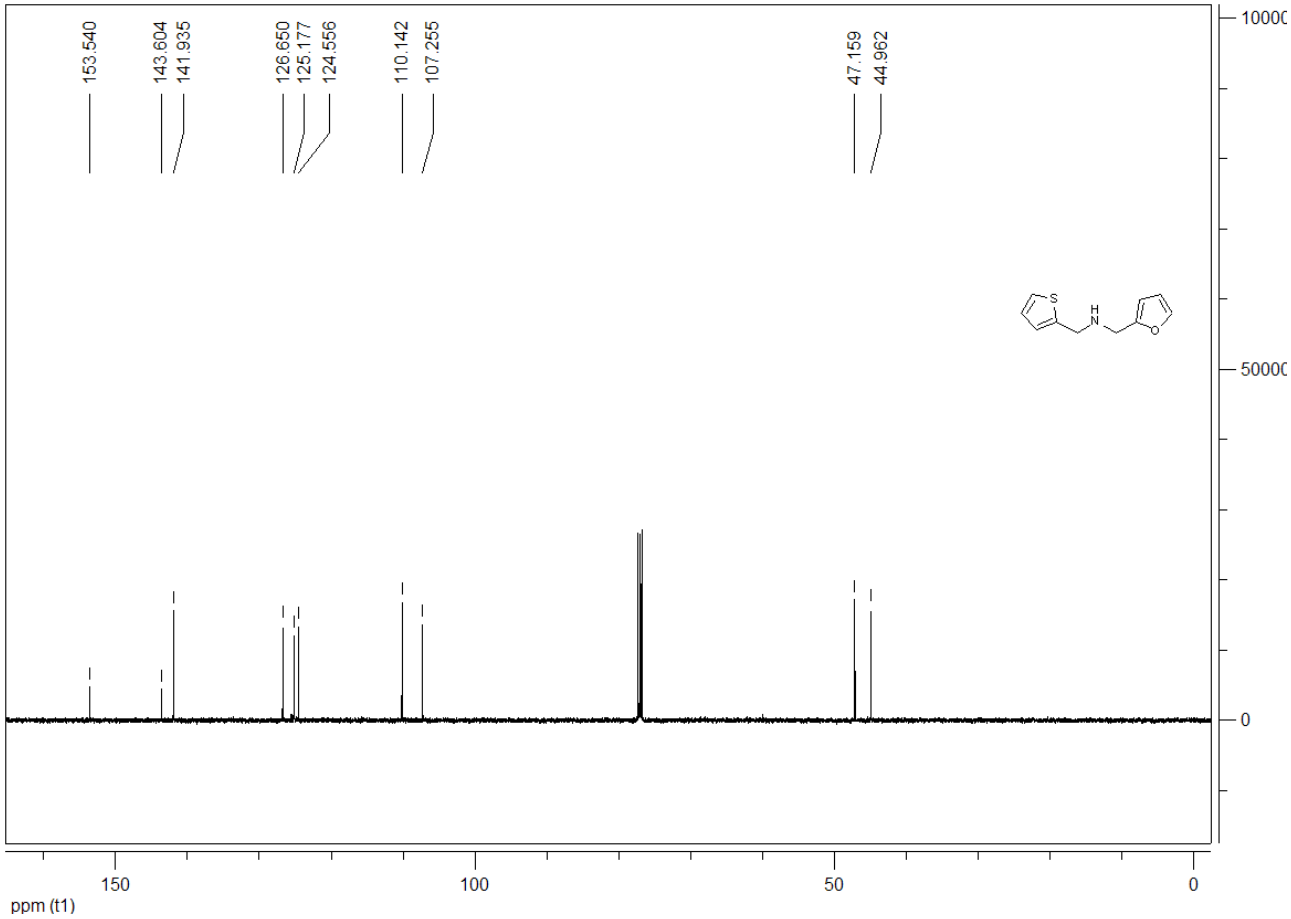


^{1}H NMR and ^{13}C NMR of compound **3bf**

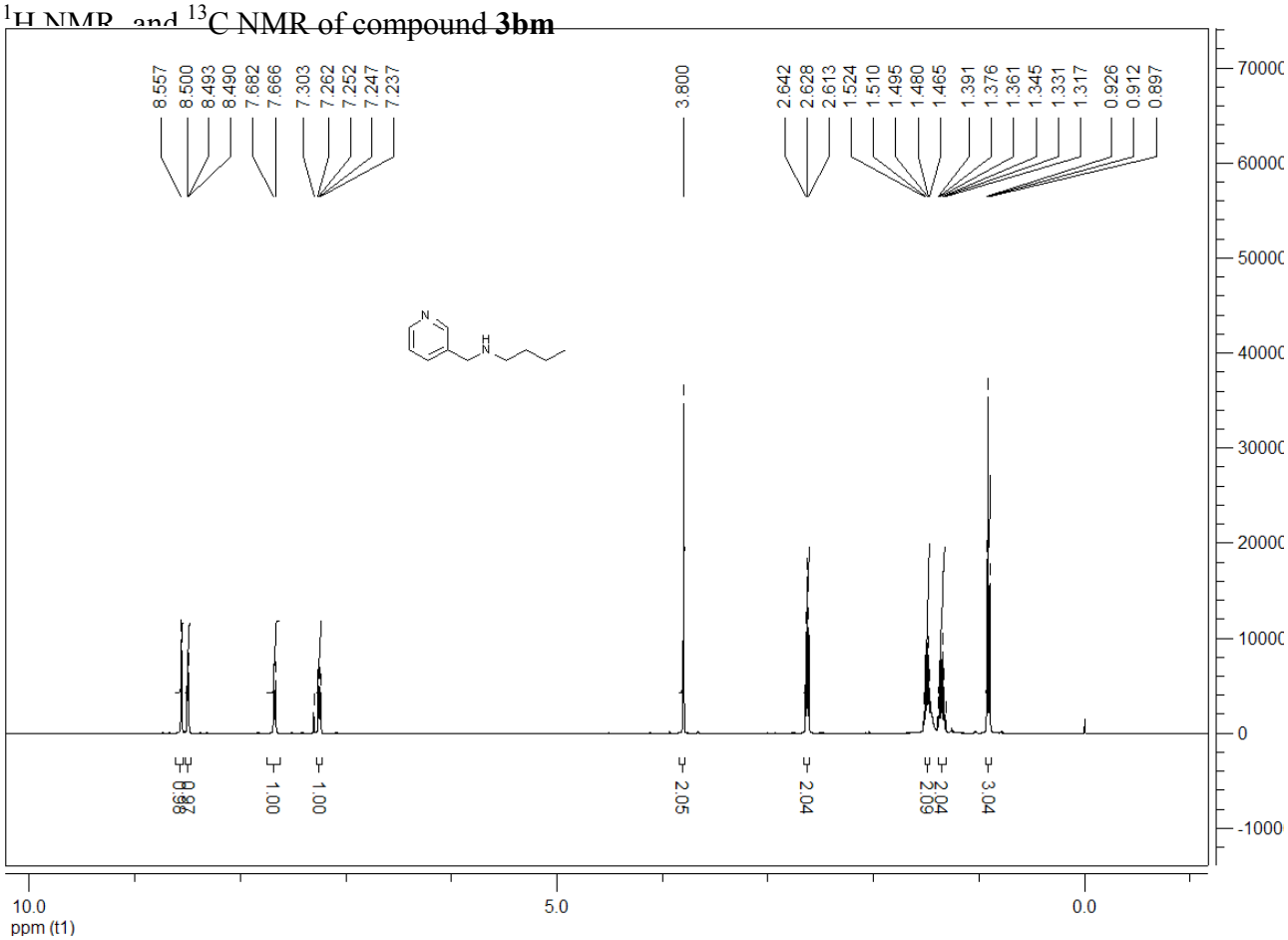


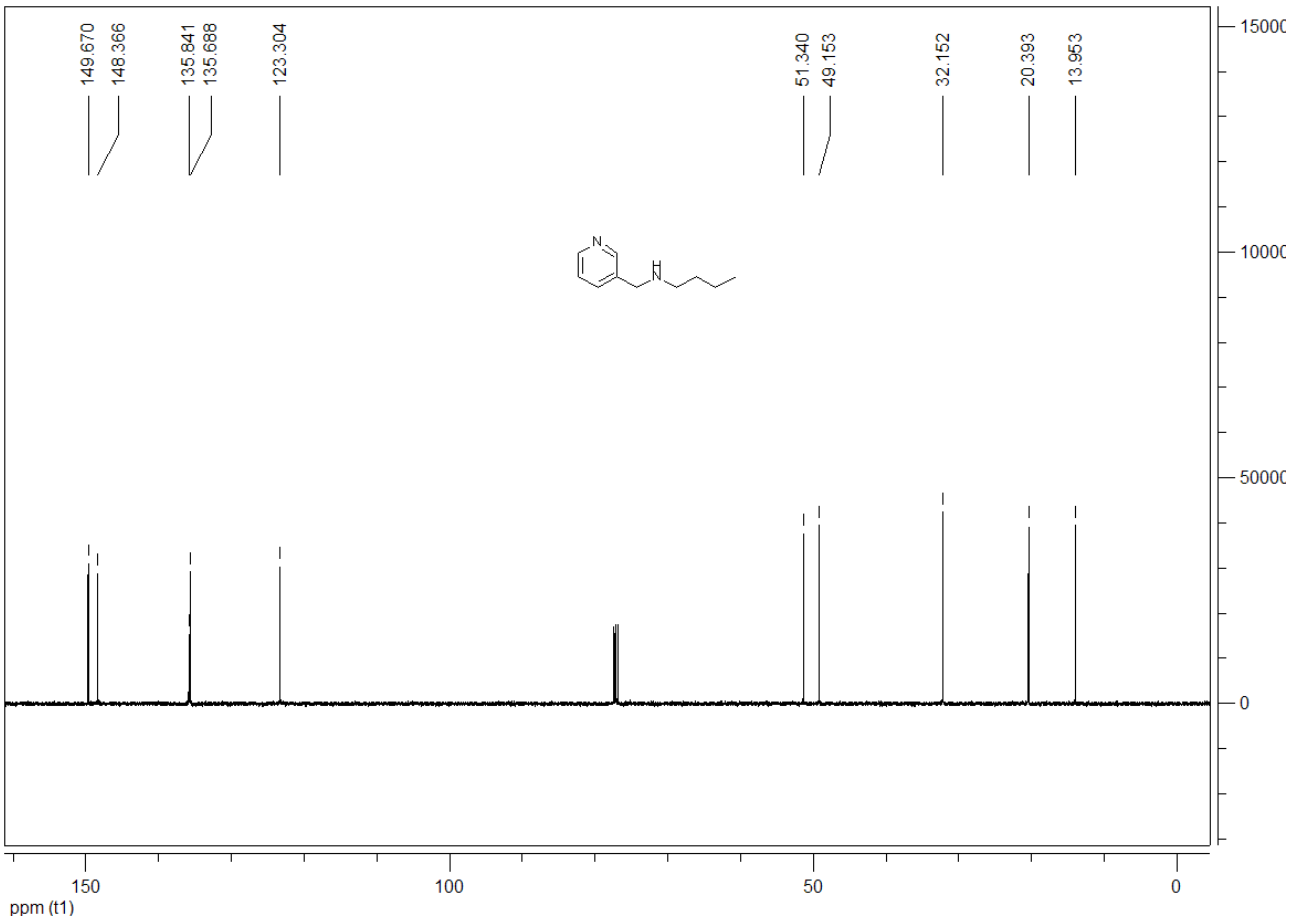
^{1}H NMR and ^{13}C NMR of compound **3bh**



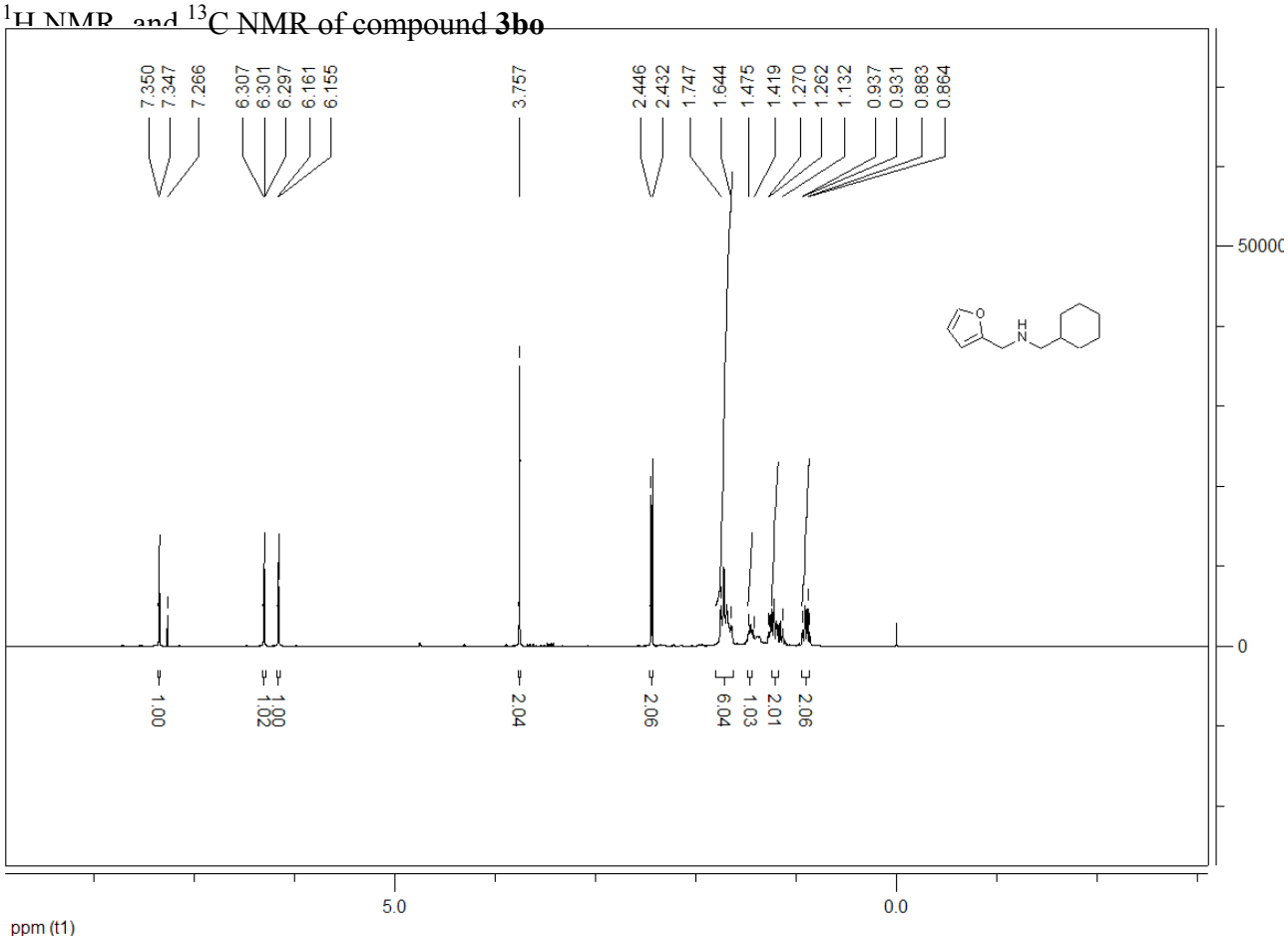


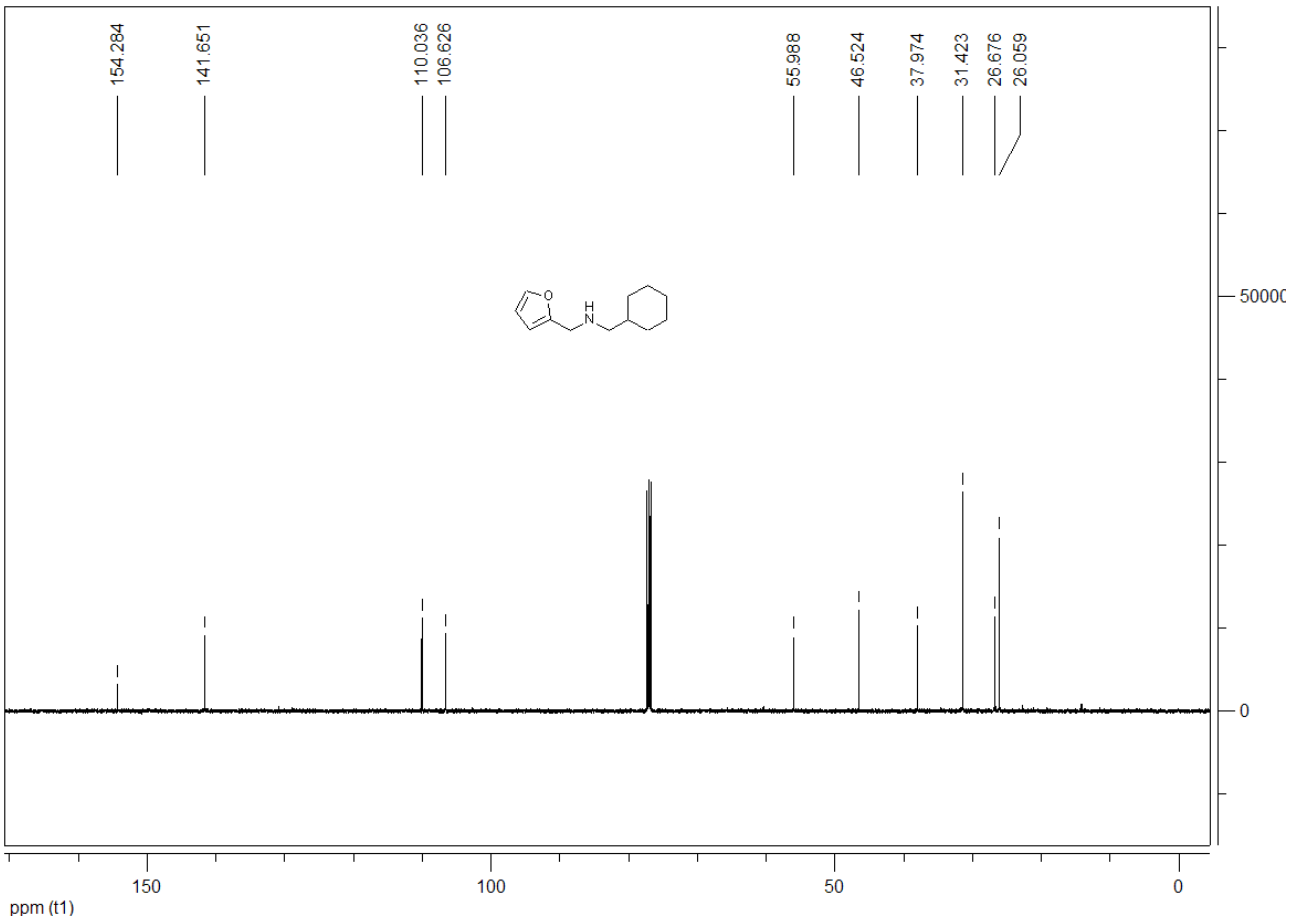
^{1}H NMR and ^{13}C NMR of compound **3bm**



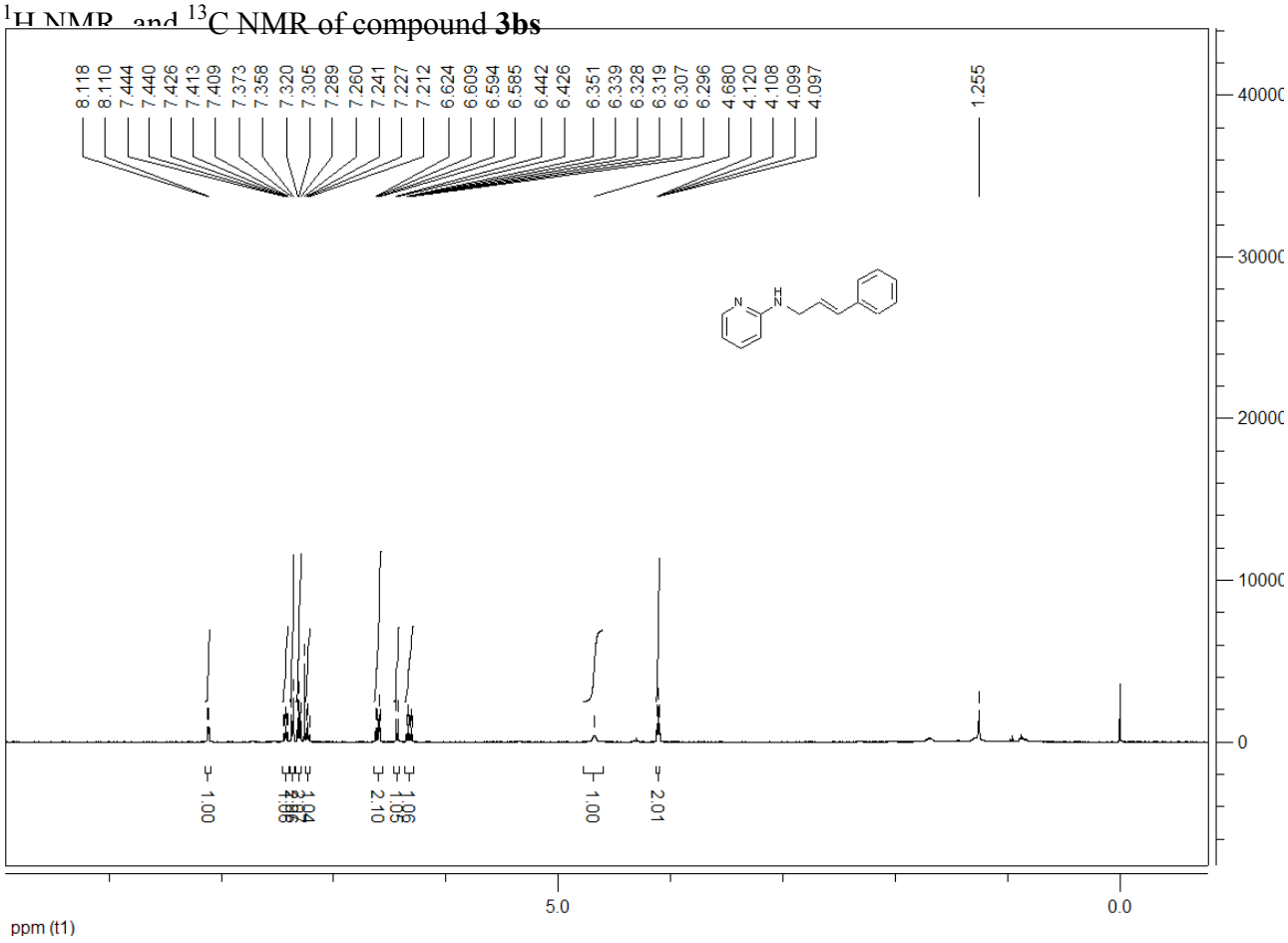


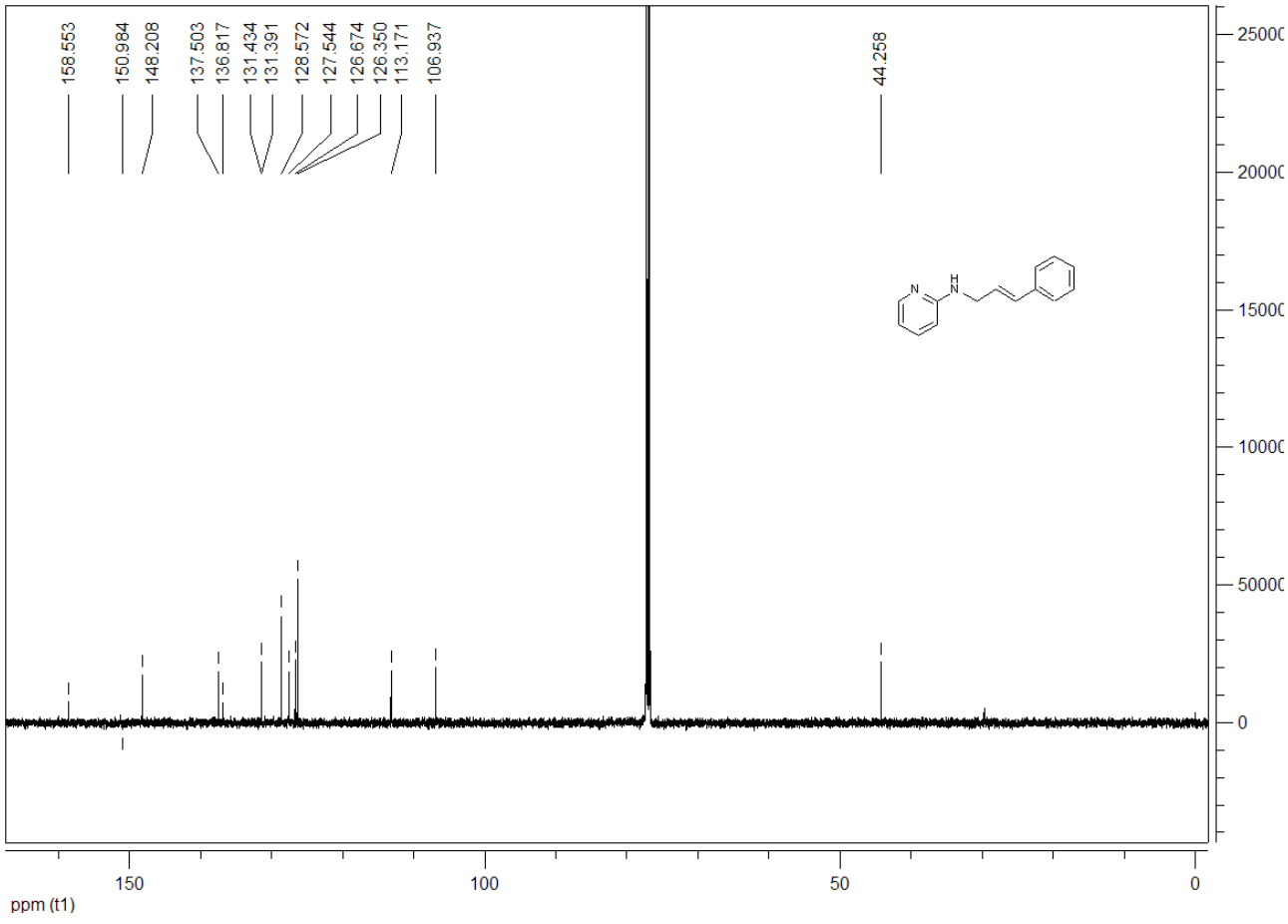
^{1}H NMR and ^{13}C NMR of compound **3bo**



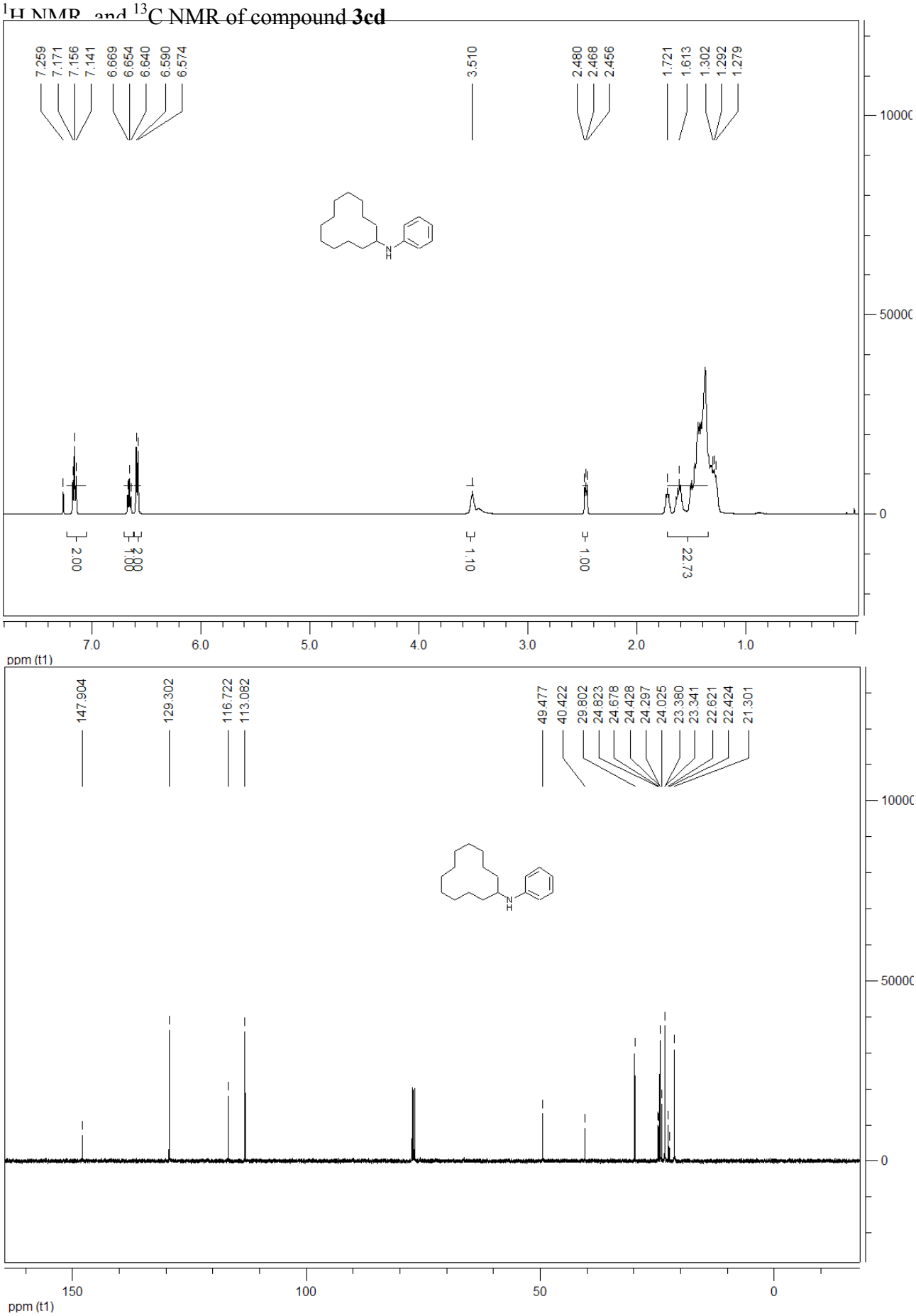


^{1}H NMR and ^{13}C NMR of compound **3bs**

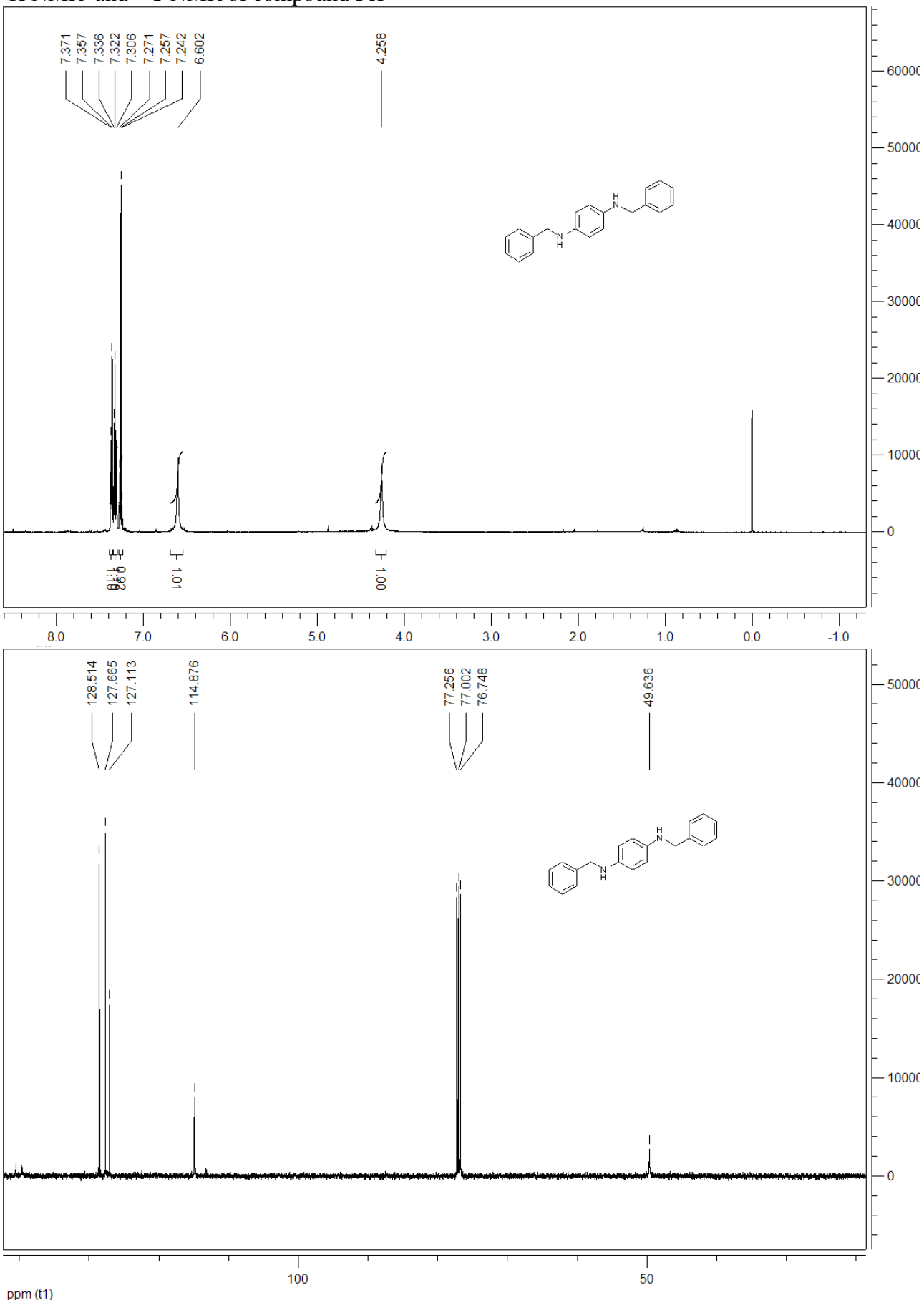




^{1}H NMR and ^{13}C NMR of compound **3cd**



^{1}H NMR and ^{13}C NMR of compound **3cf**



^{1}H NMR and ^{13}C NMR of compound **3cg**