Electronic Supplementary Material (ESI) for Organic Chemistry Frontiers.

Synthesis of Benzo[a]carbazoles via Cyanide-catalyzed Imino-Stetter Reaction/ Friedel-Crafts Reaction Sequence

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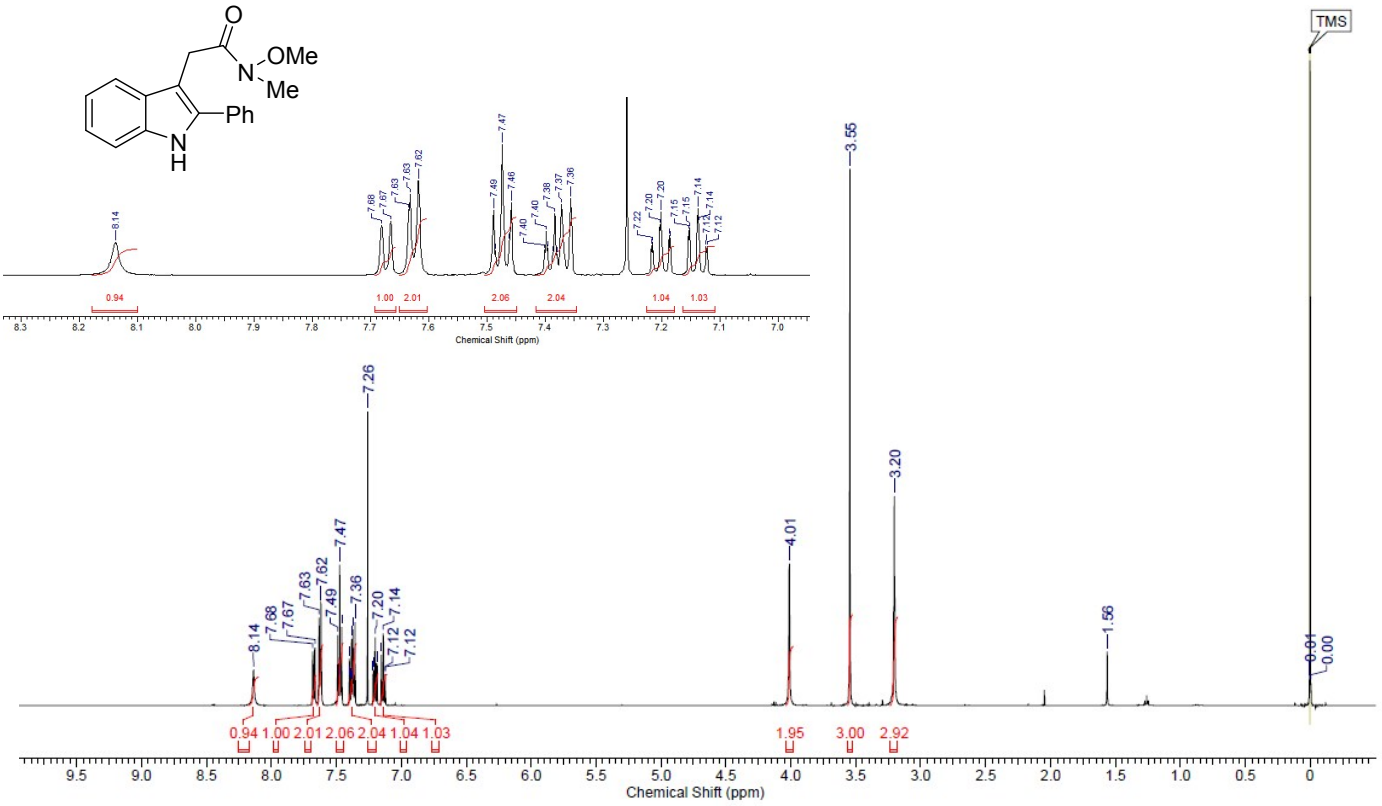
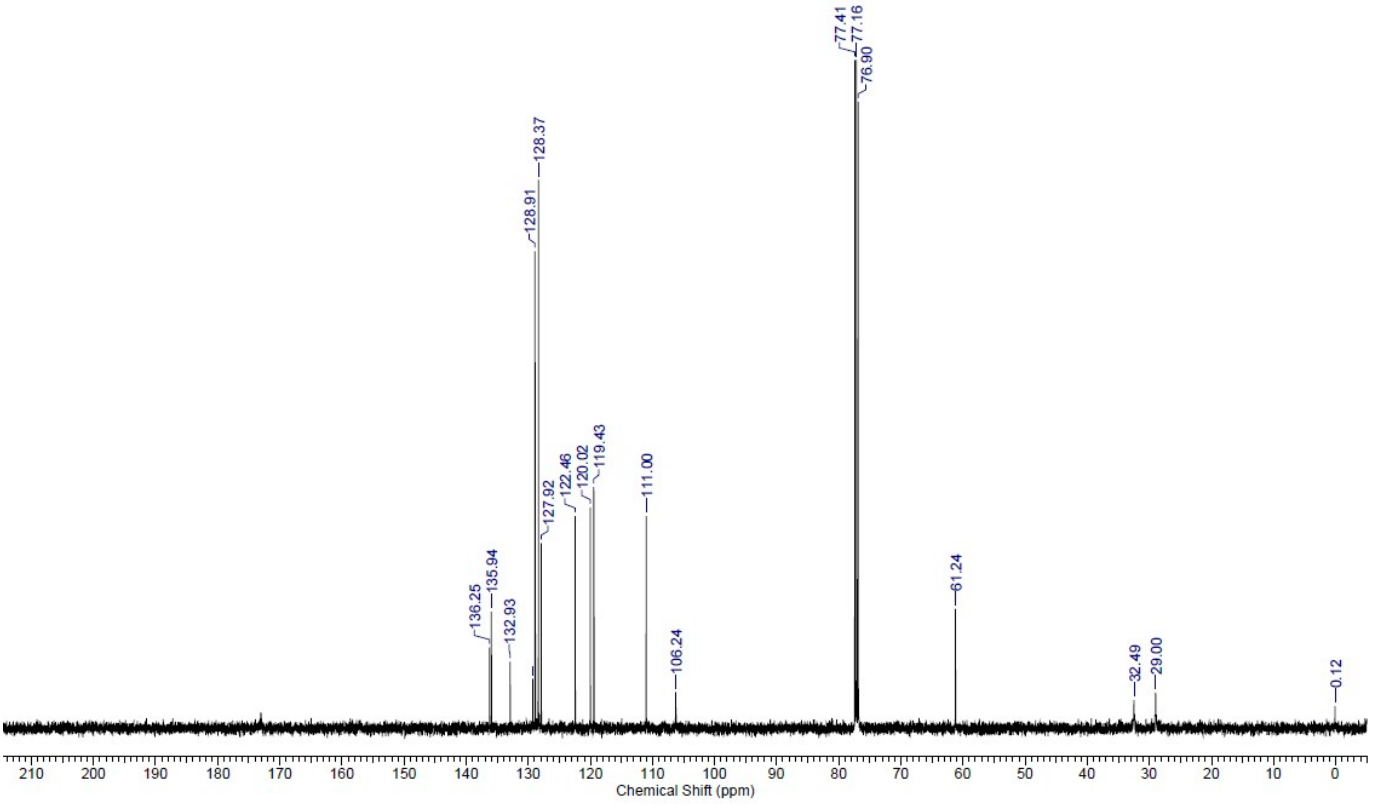
1. Spectroscopic Data of *N-Methoxy-N-methyl-2-(2-phenyl-1H-indol-3-yl)acetamide* **(3)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)



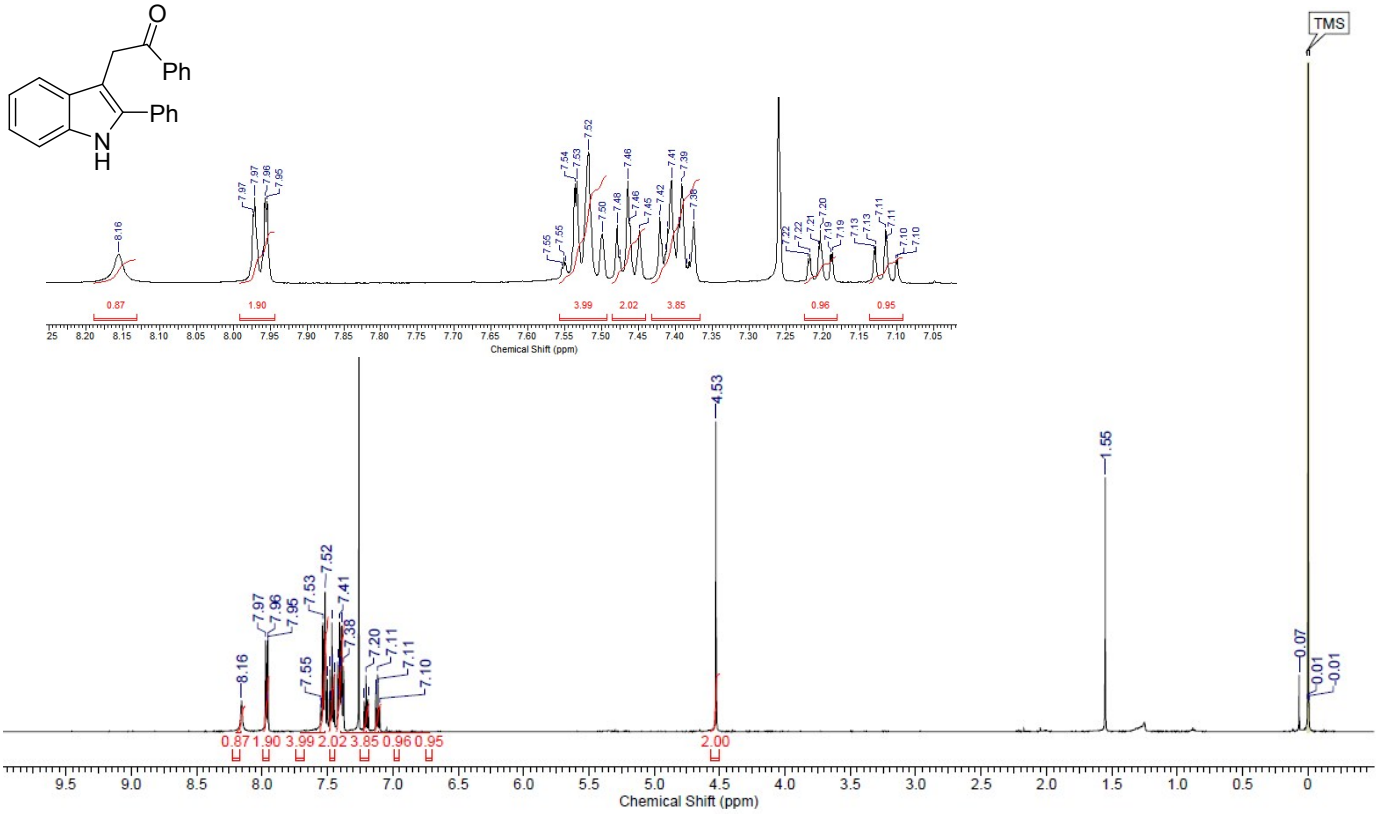
b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)



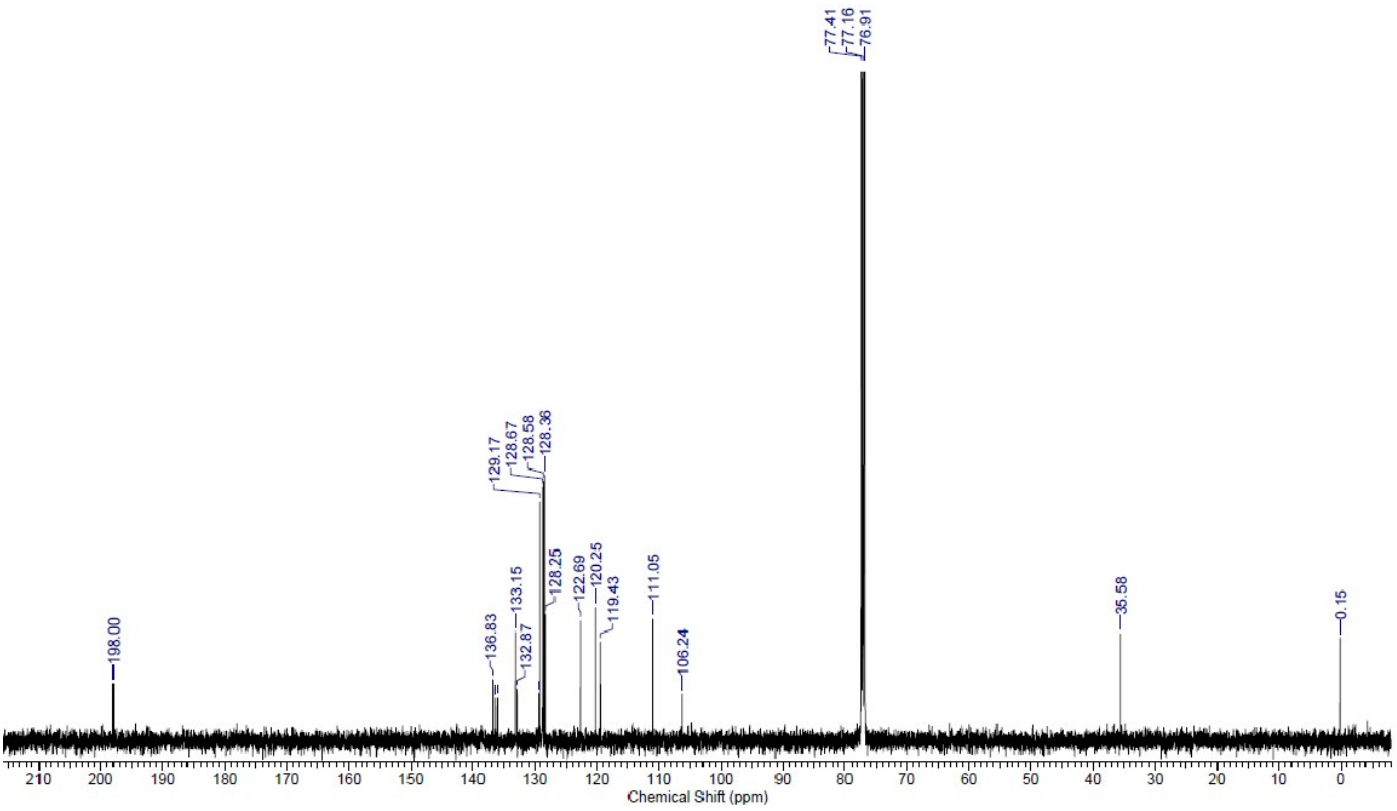
2. Spectroscopic Data of 2-Aryl-3-arenacylindole Derivatives (**2**)

2-1. NMR Spectra of *2-Phenyl-3-phenacylindole* **(2a)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

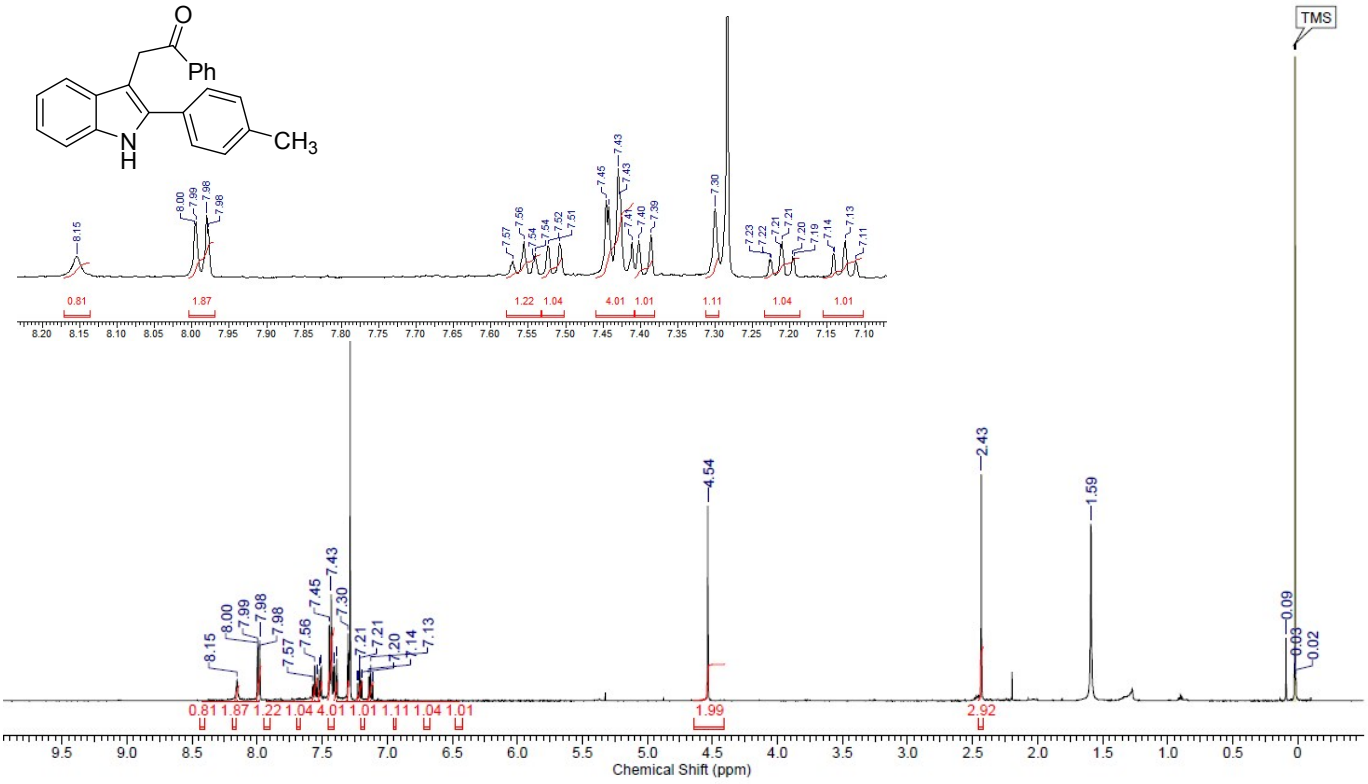


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

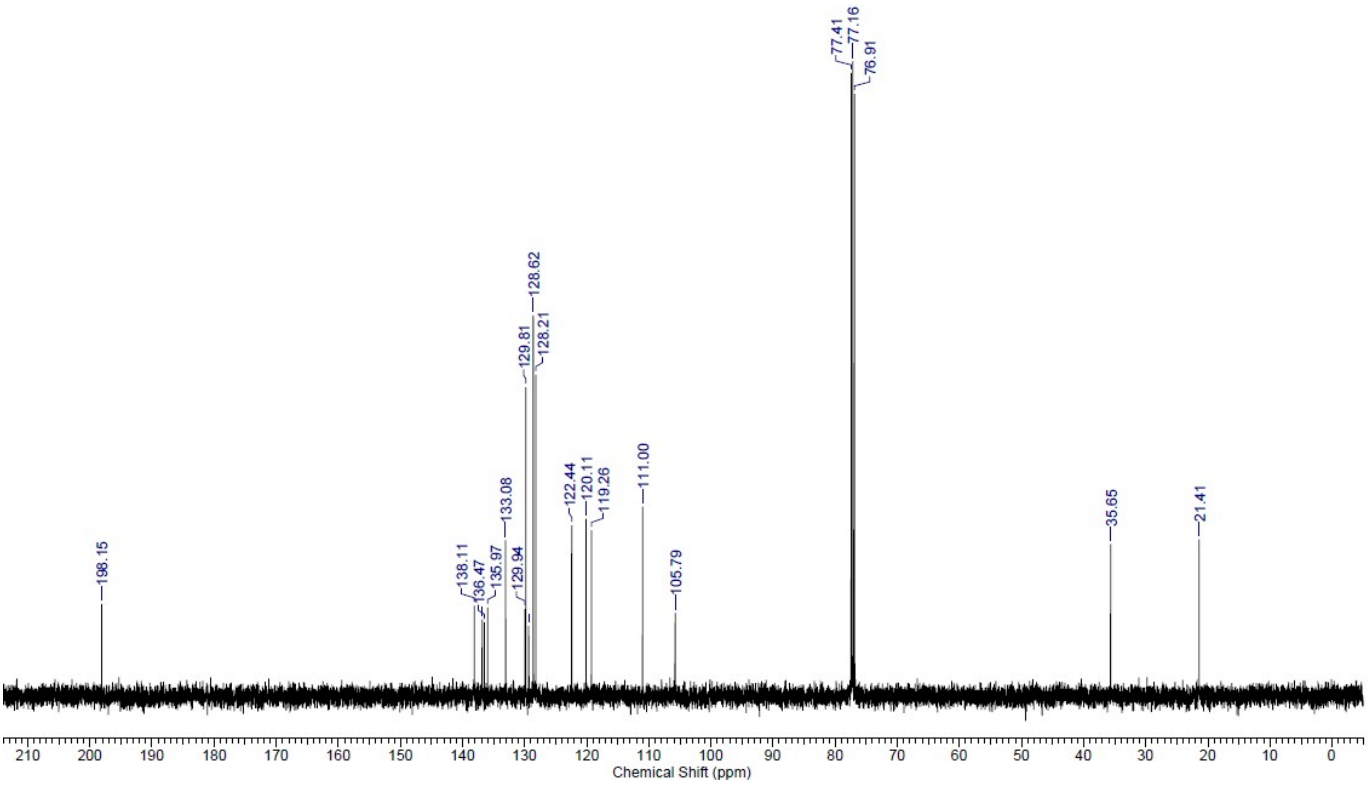


2-2. NMR Spectra of *2-(4-Methylphenyl)-3-phenacylindole* **(2b)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

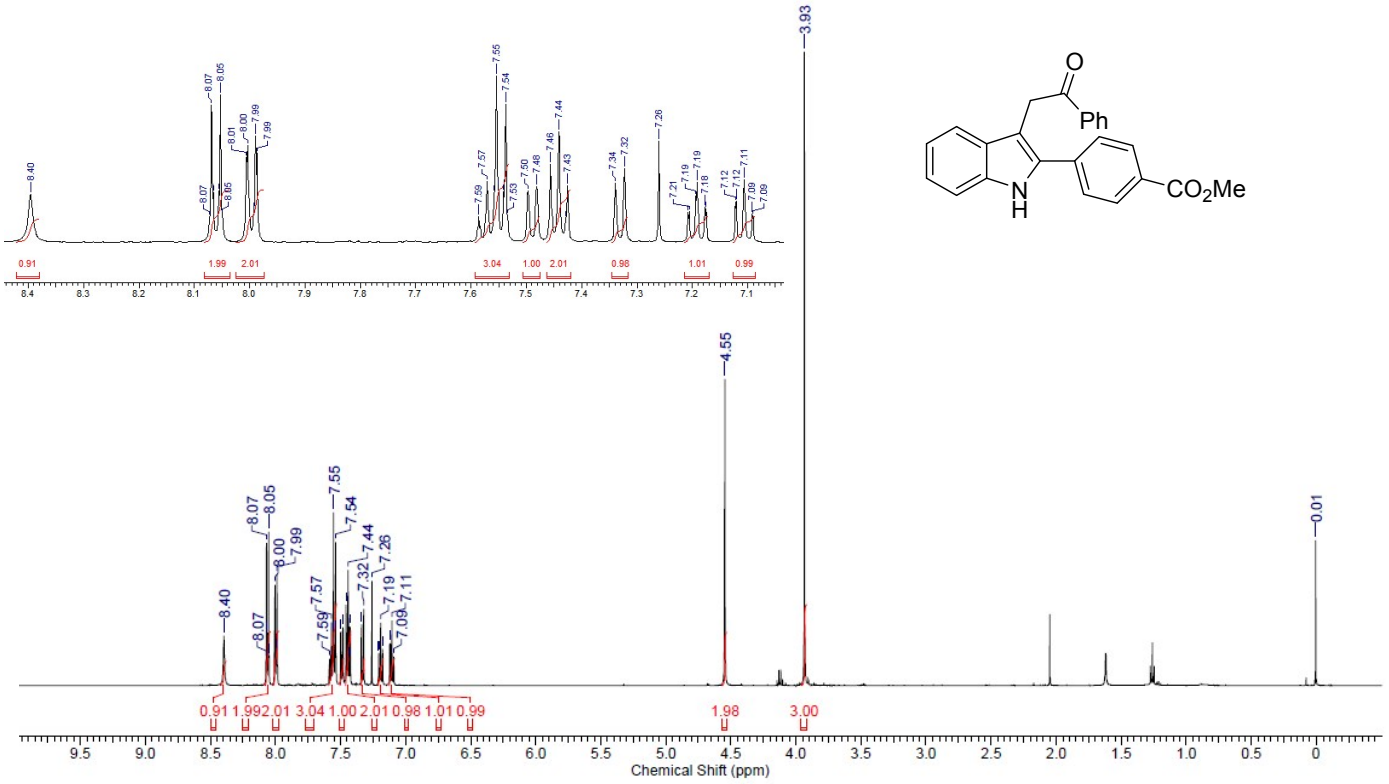


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

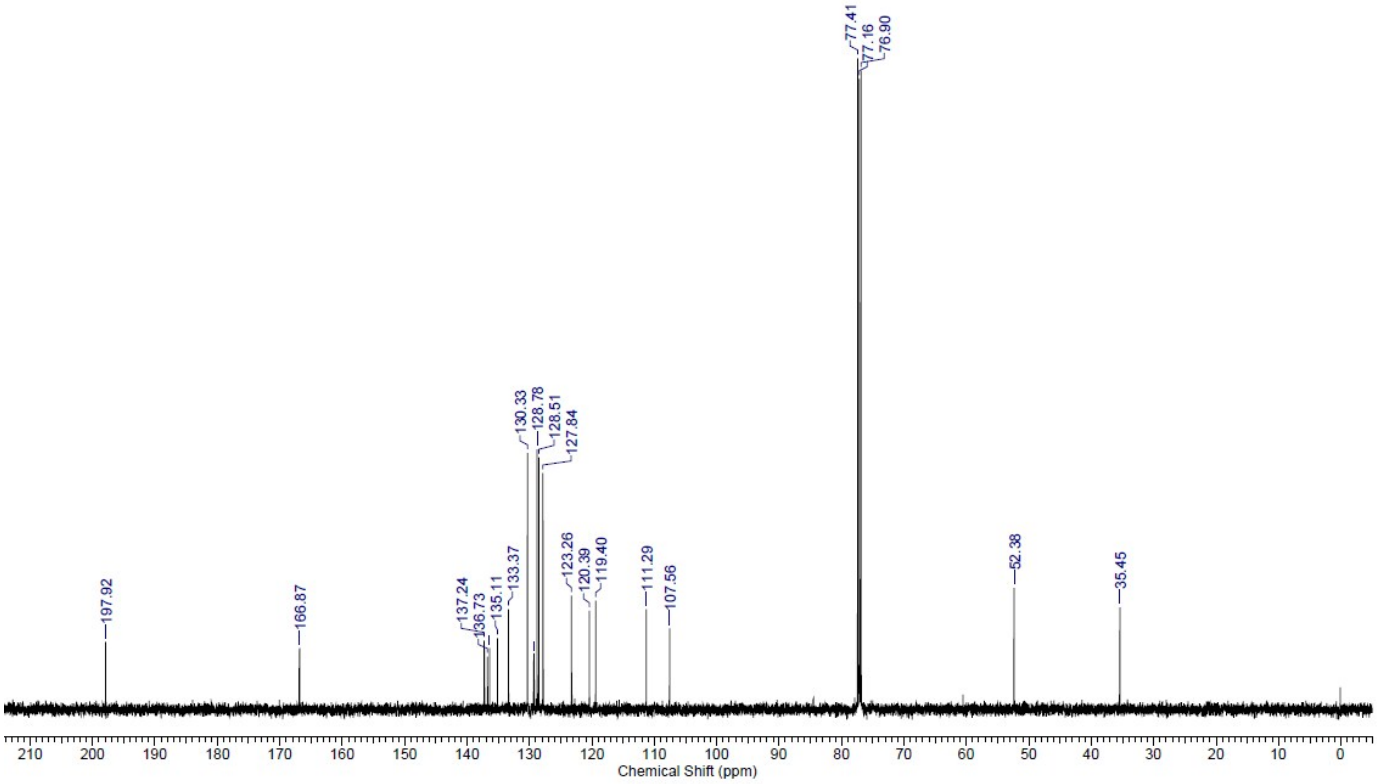


2-3. NMR Spectra of *2-(4-Methoxycarbonylphenyl)-3-phenacylindole* **(2c)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

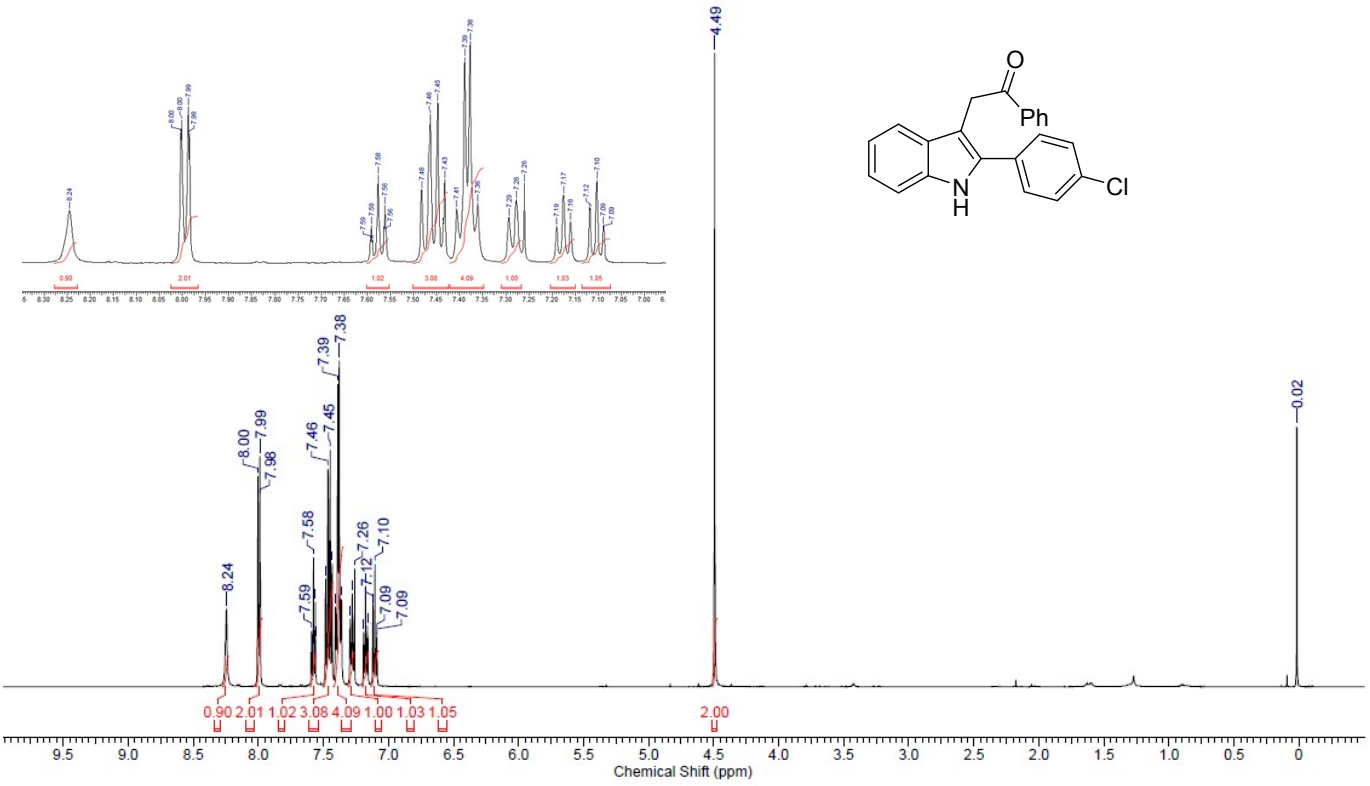


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

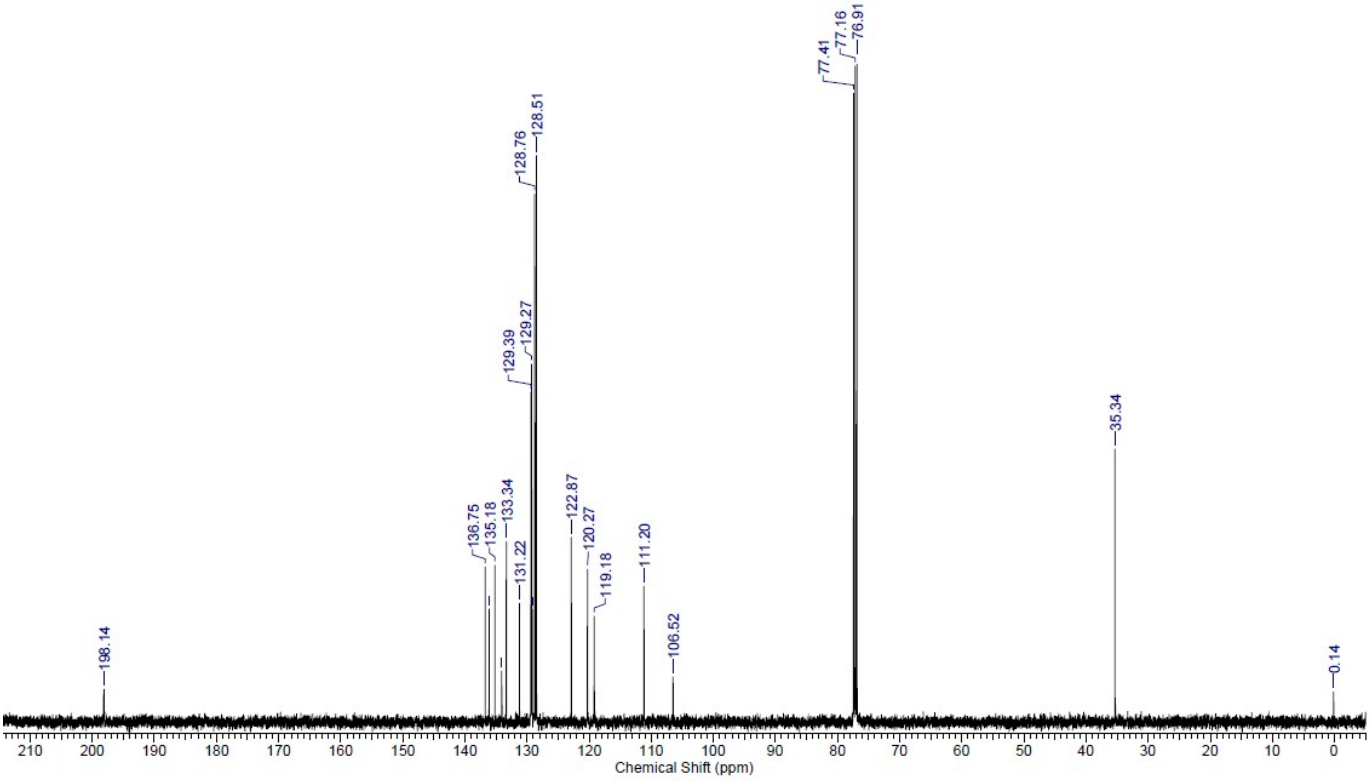


2-4. NMR Spectra of *2-(4-Chlorophenyl)-3-phenacylindole* **(2d)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

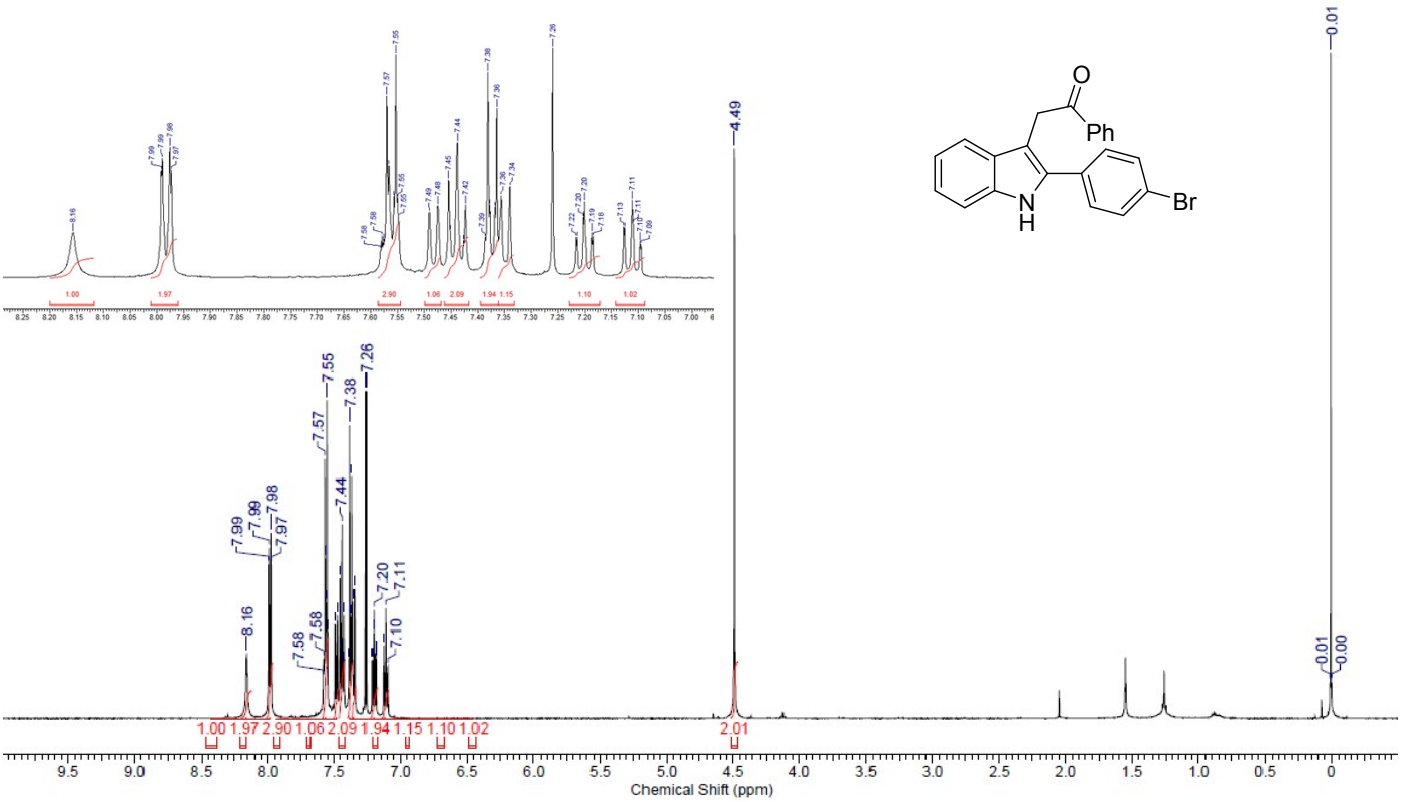


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

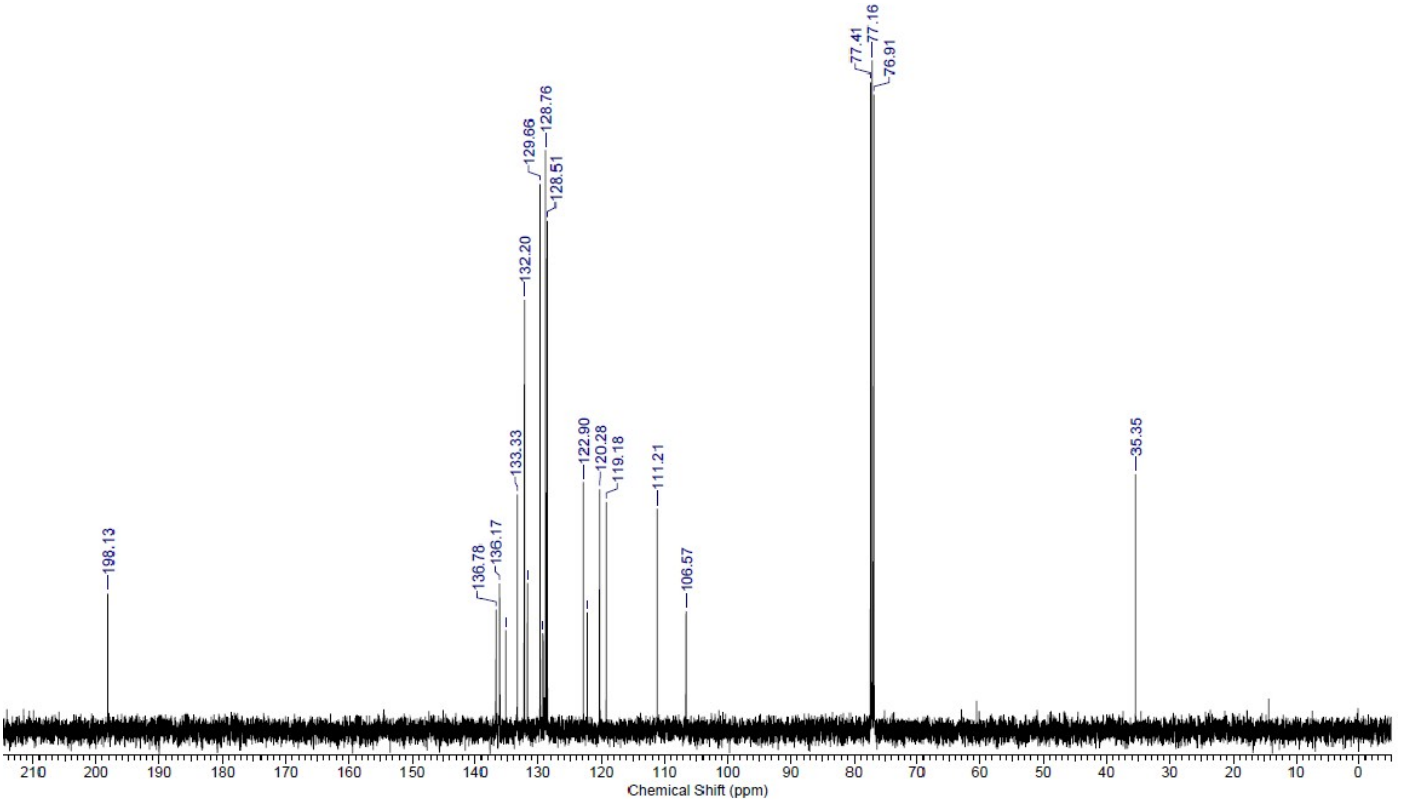


2-5. NMR Spectra of *2-(4-Bromophenyl)-3-phenacylindole* **(2e)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

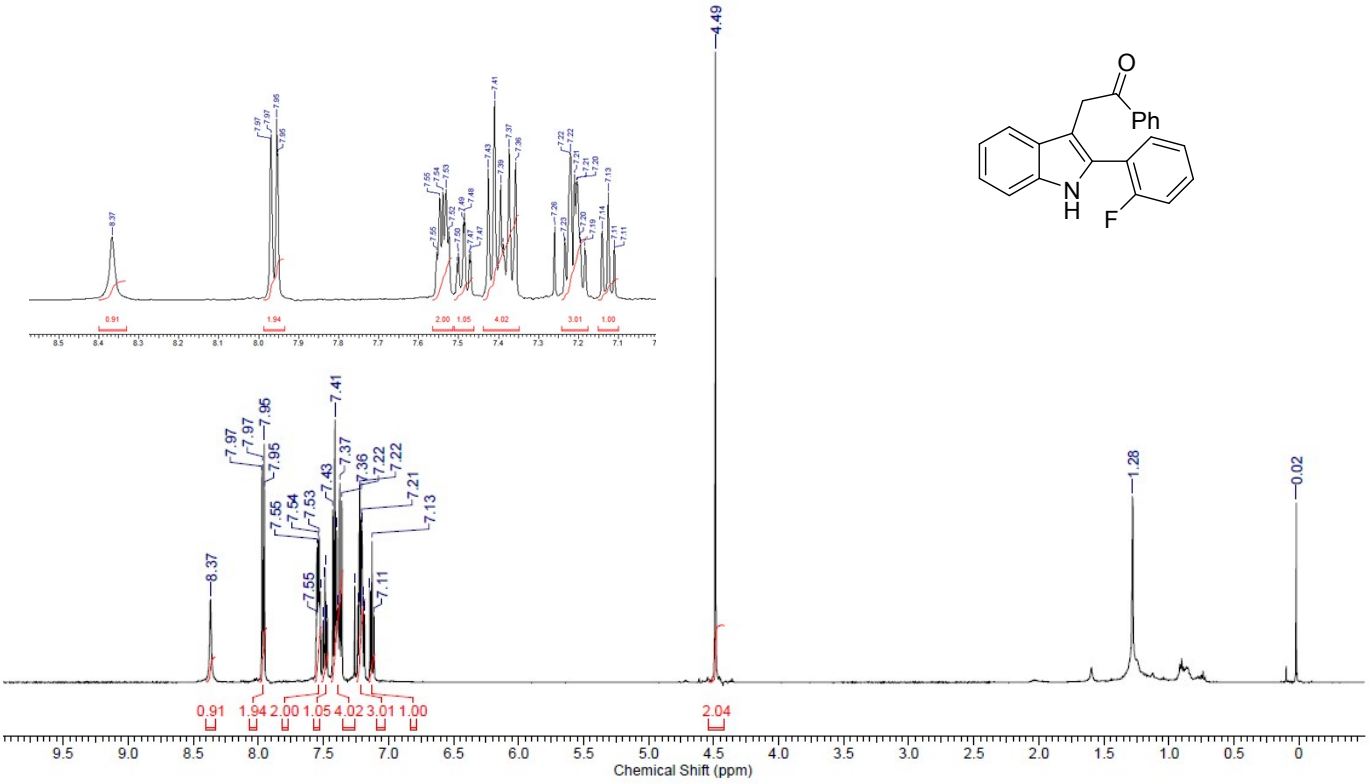


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

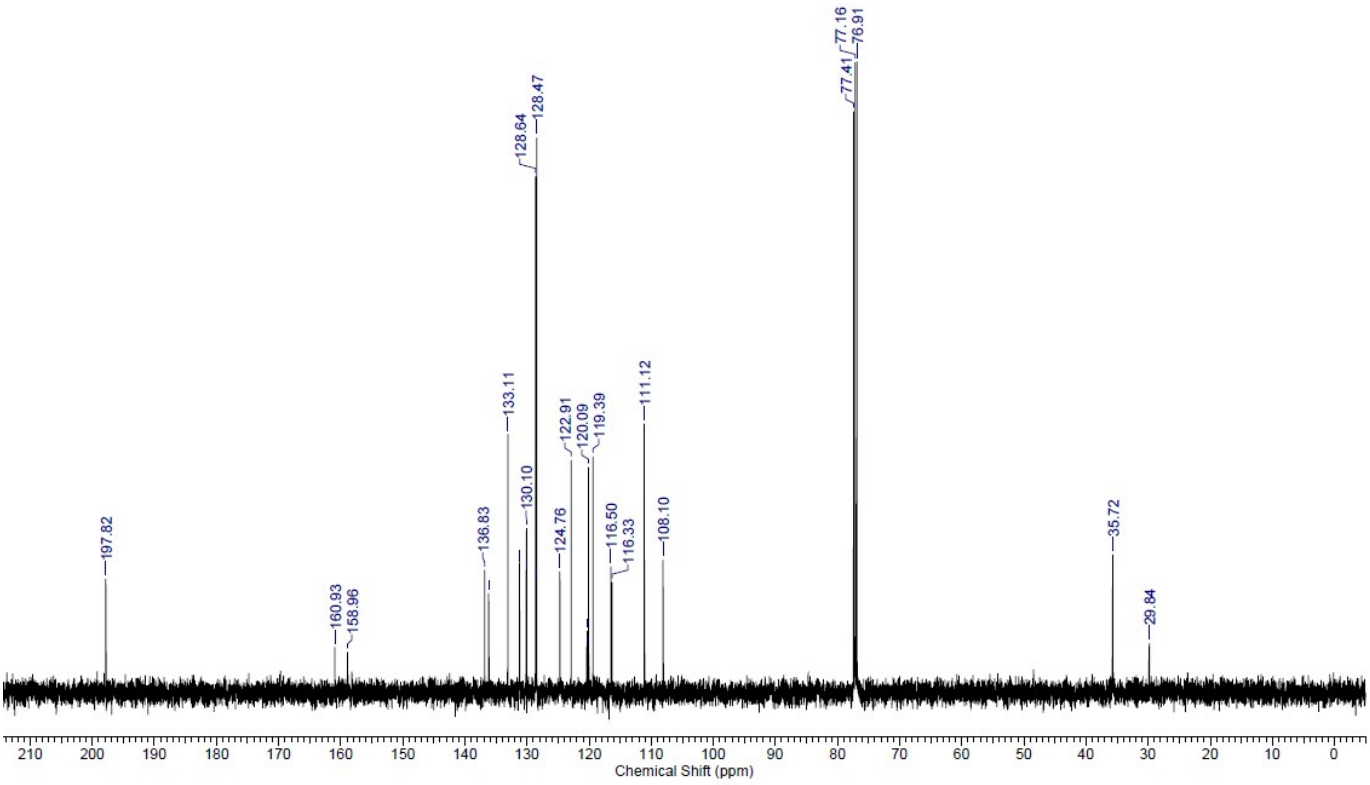


2-6. NMR Spectra of *2-(2-Fluorophenyl)-3-phenacylindole* **(2f)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

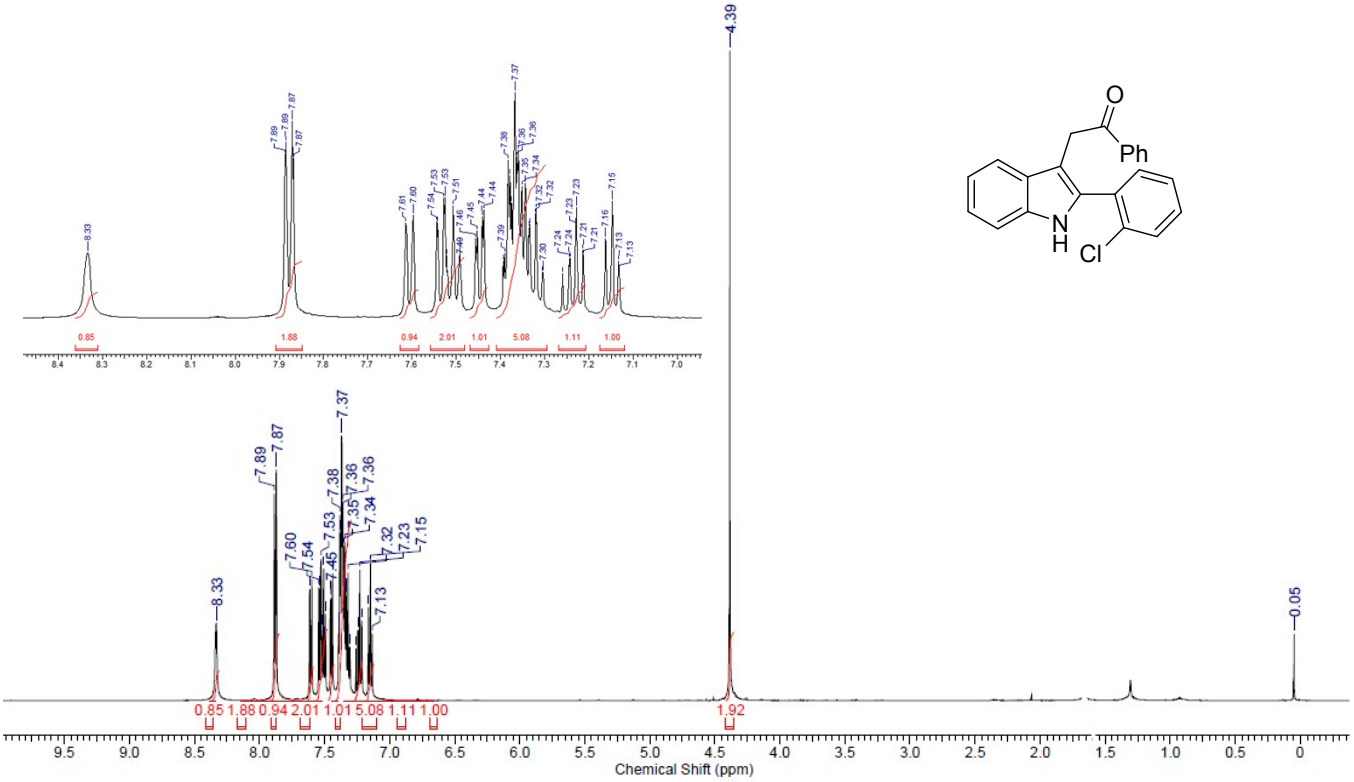


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

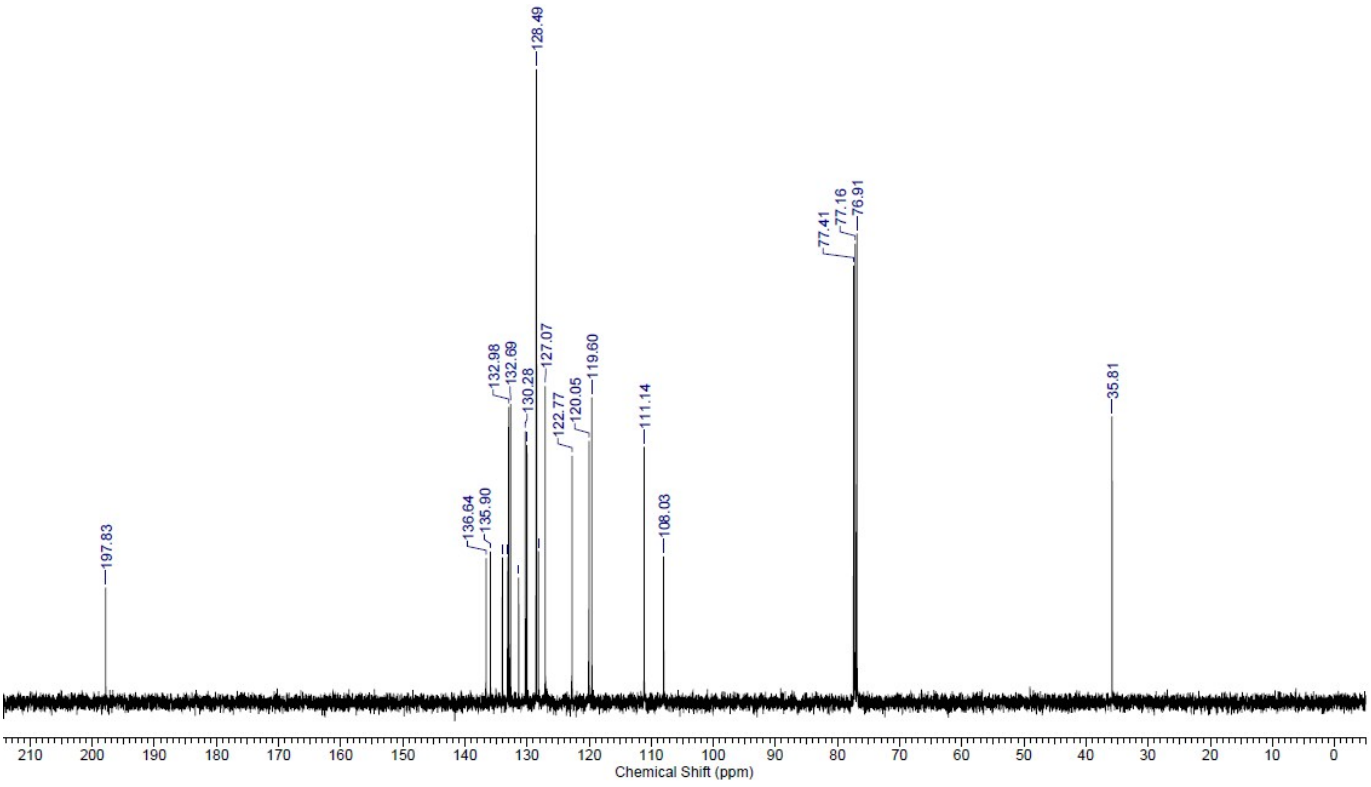


2-7. NMR Spectra of *2-(2-Chlorophenyl)-3-phenacylindole* **(2g)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

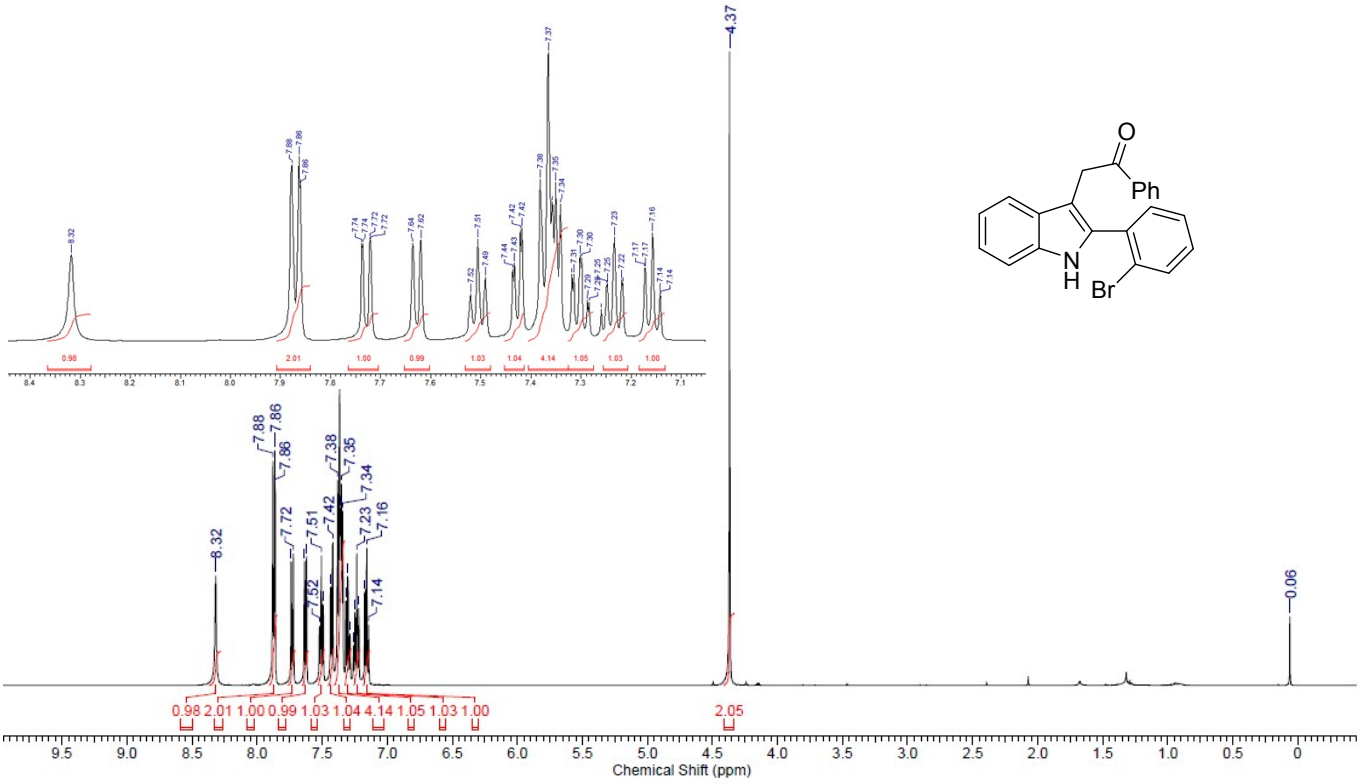


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

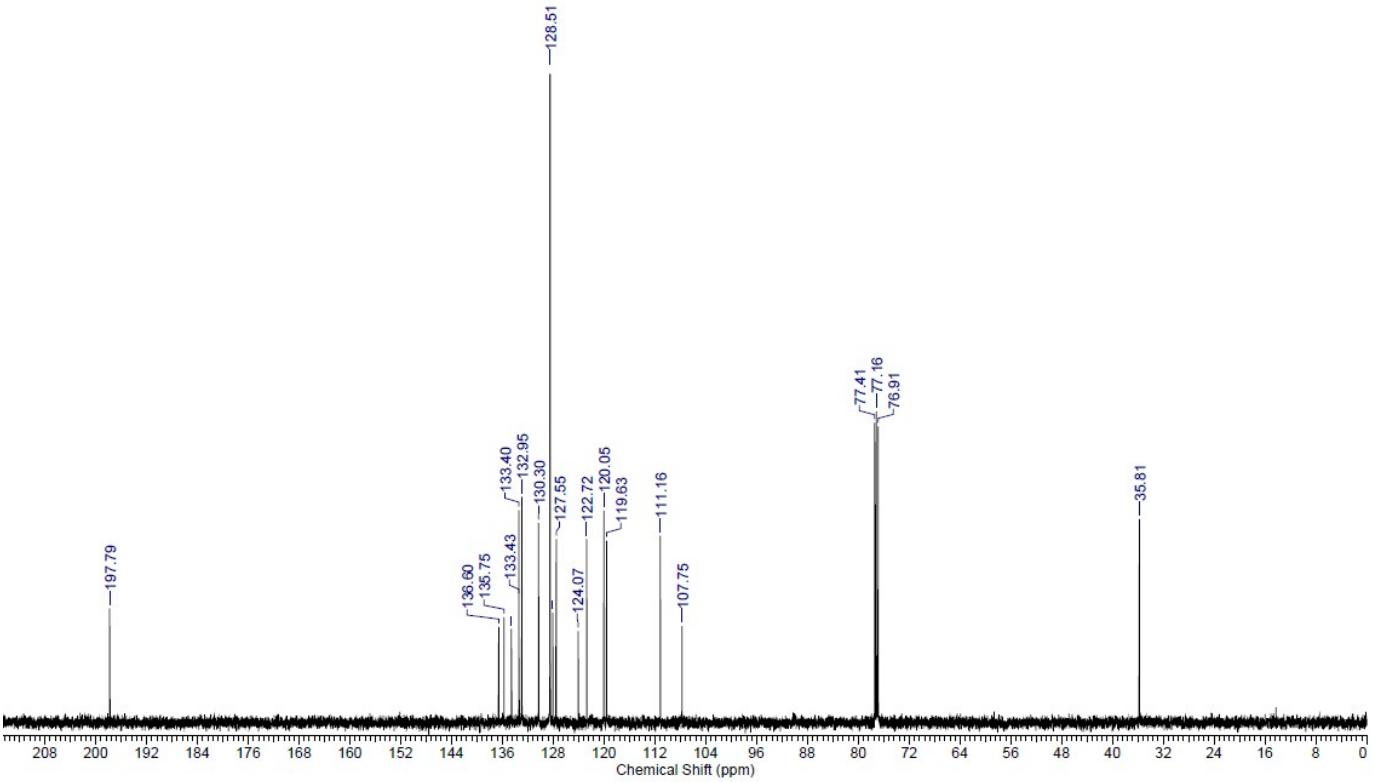


2-8. NMR Spectra of *2-(2-Bromophenyl)-3-phenacylindole* **(2h)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

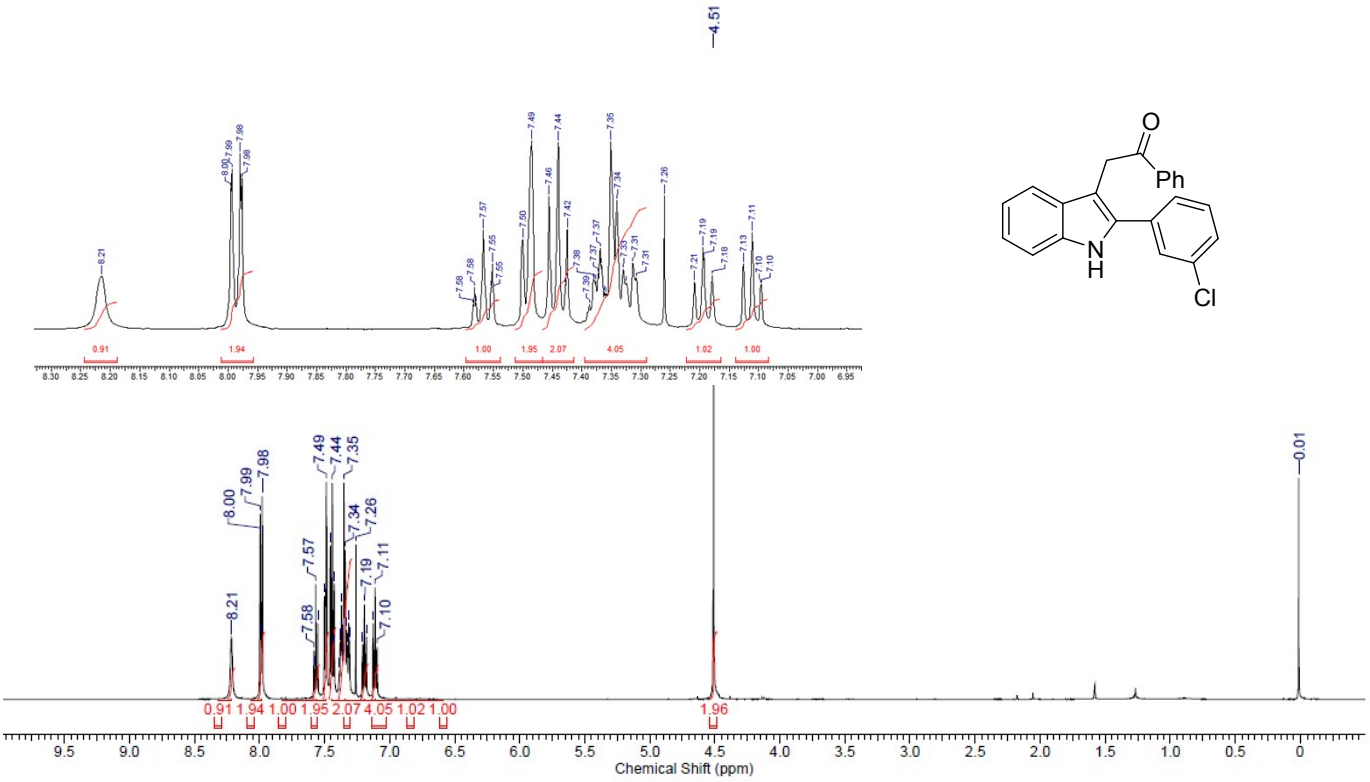


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

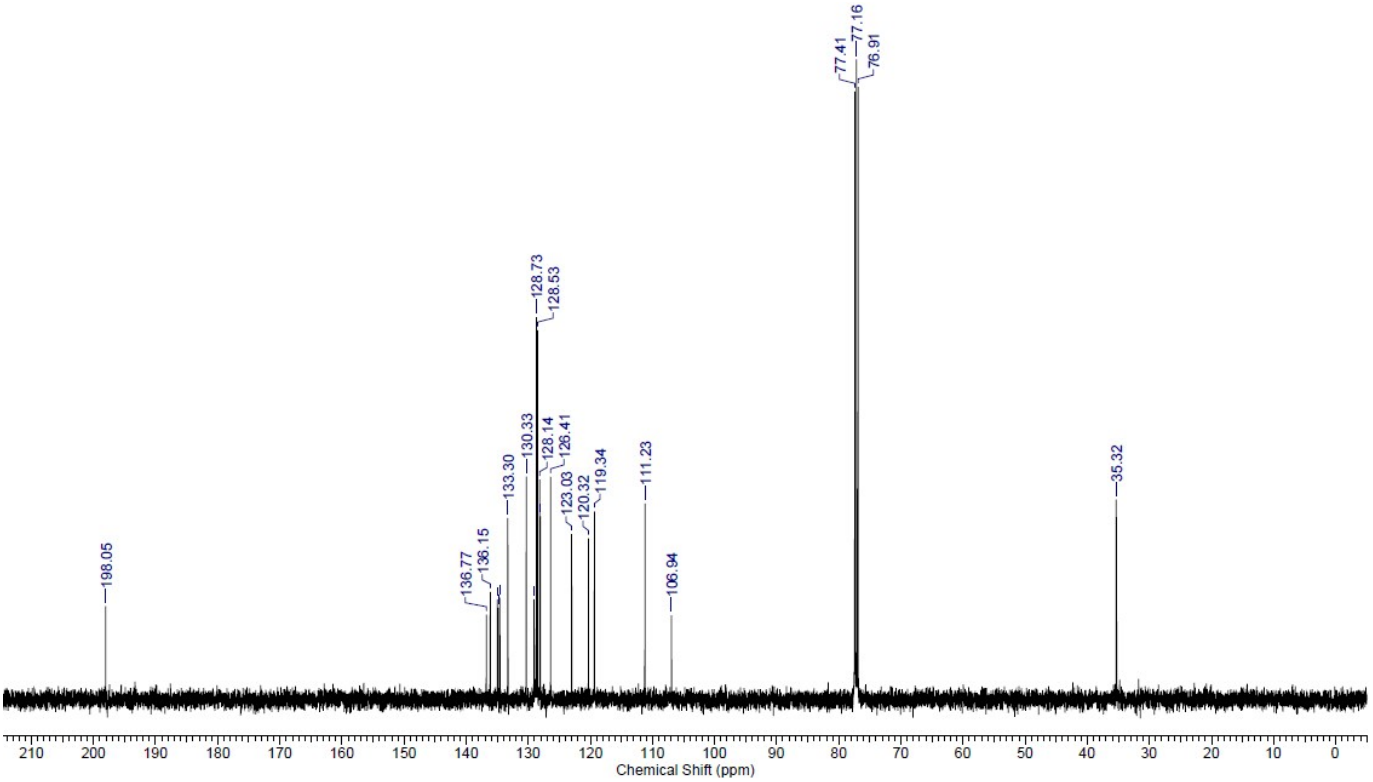


2-9. NMR Spectra of *2-(3-Chlorophenyl)-3-phenacylindole* **(2i)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

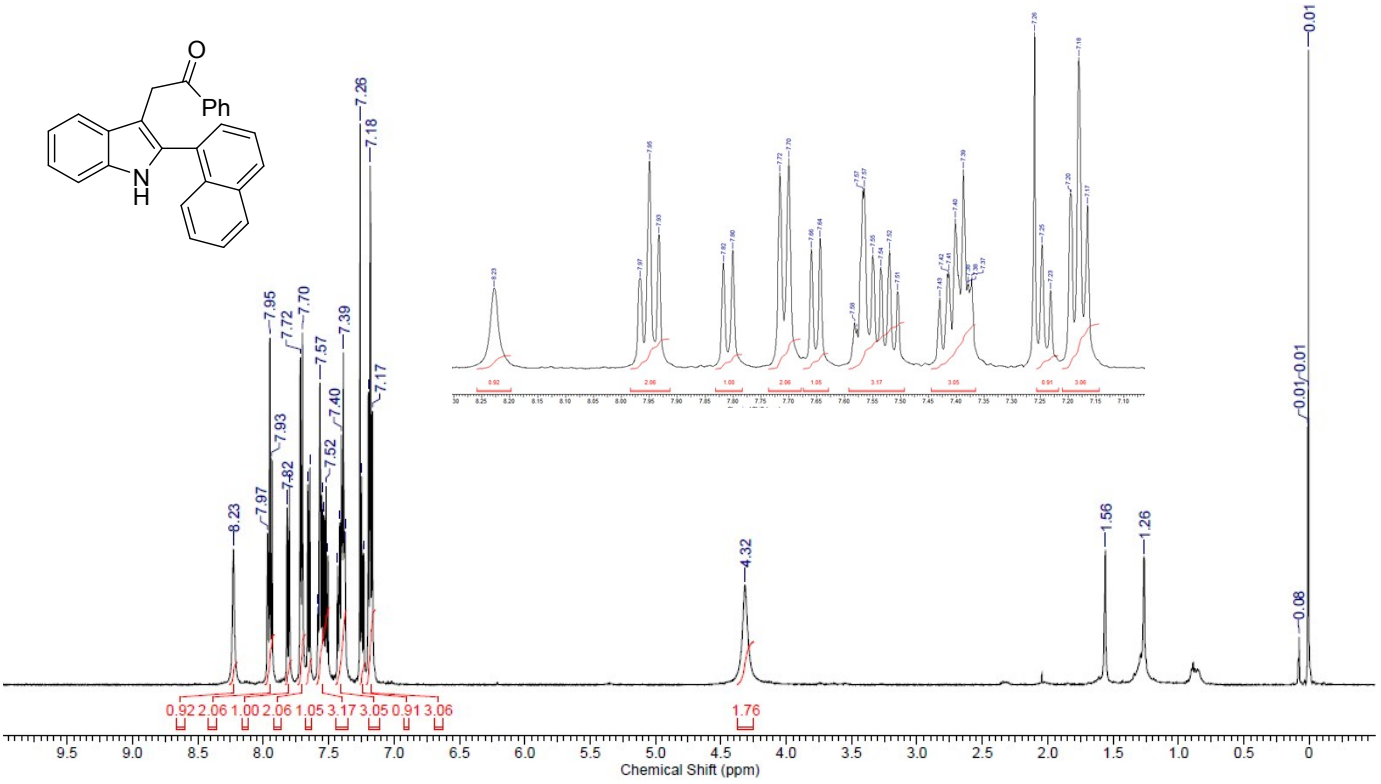


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

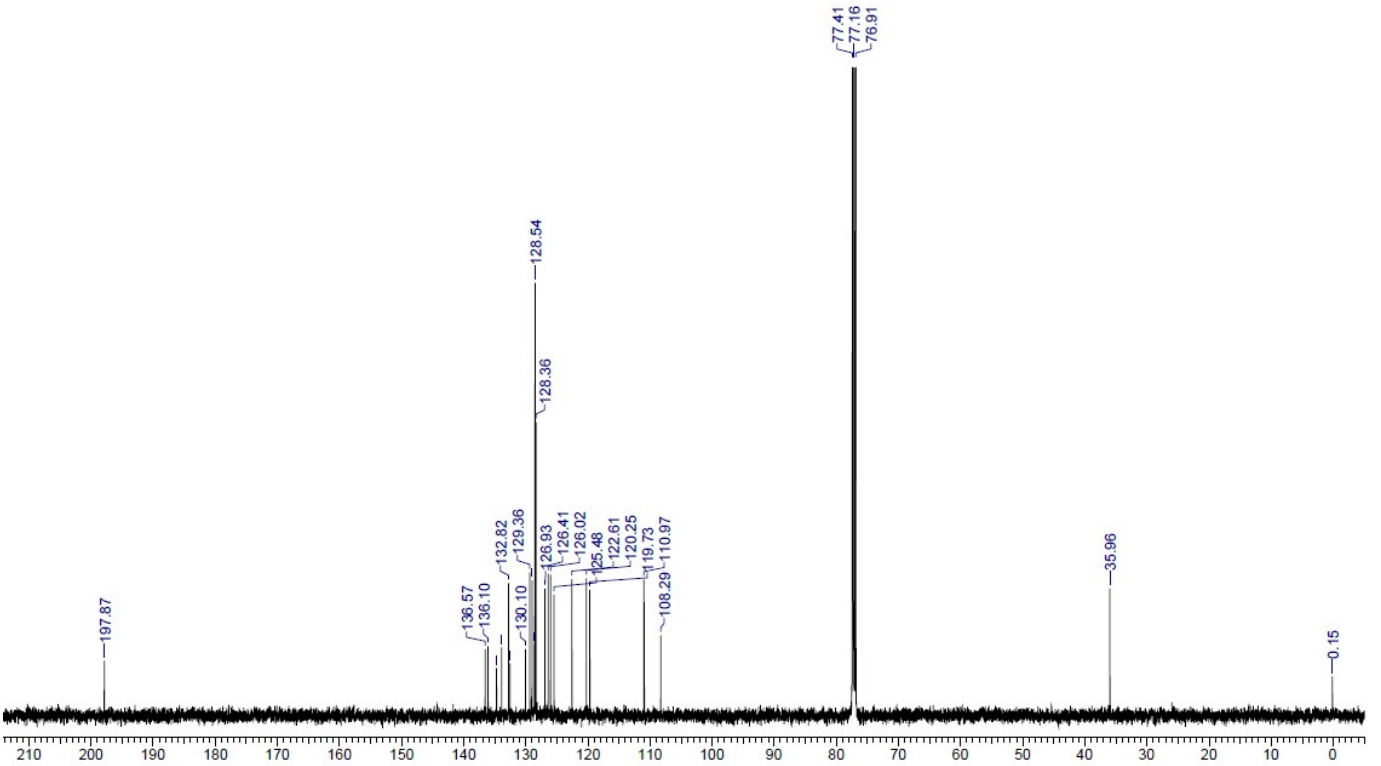


2-10. NMR Spectra of *2-(Naphthalen-1-yl)-3-phenacylindole* **(2j)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

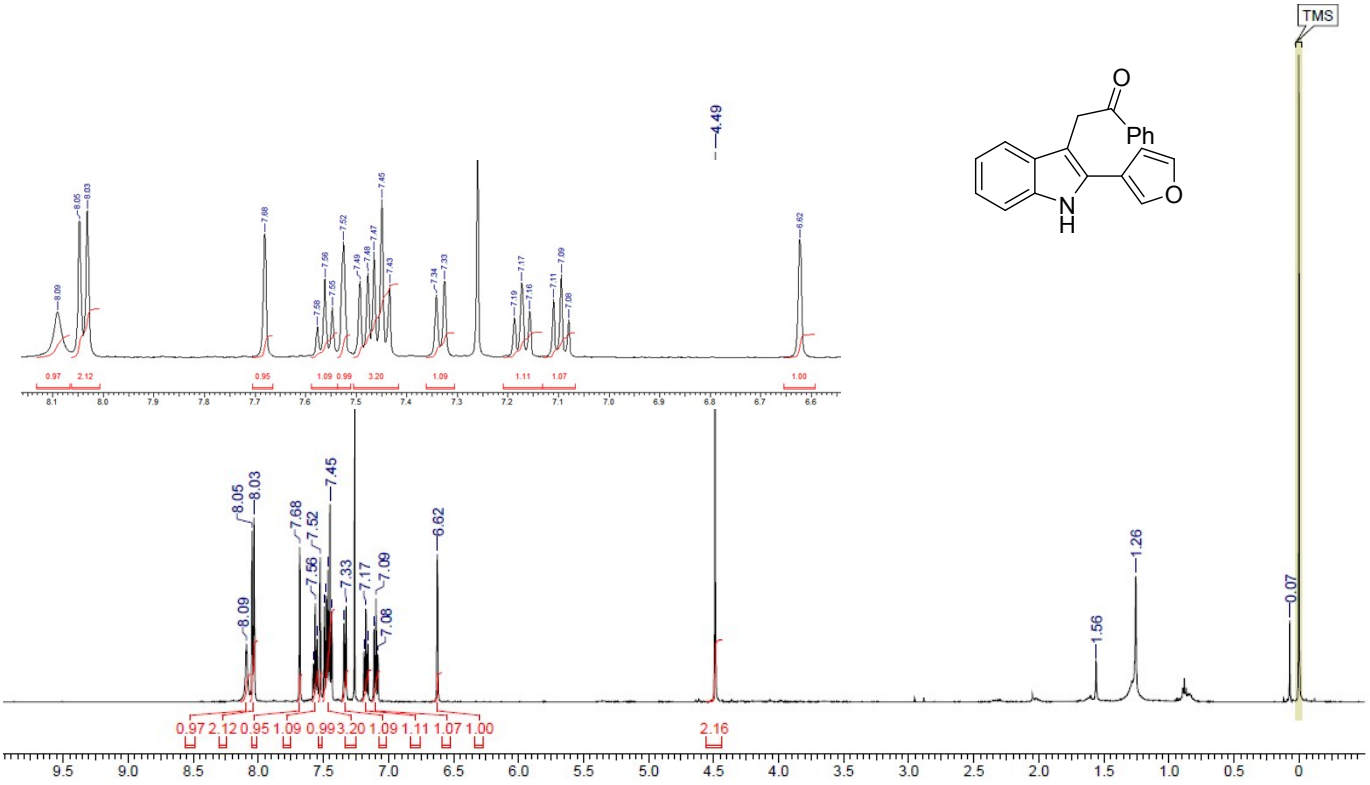


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

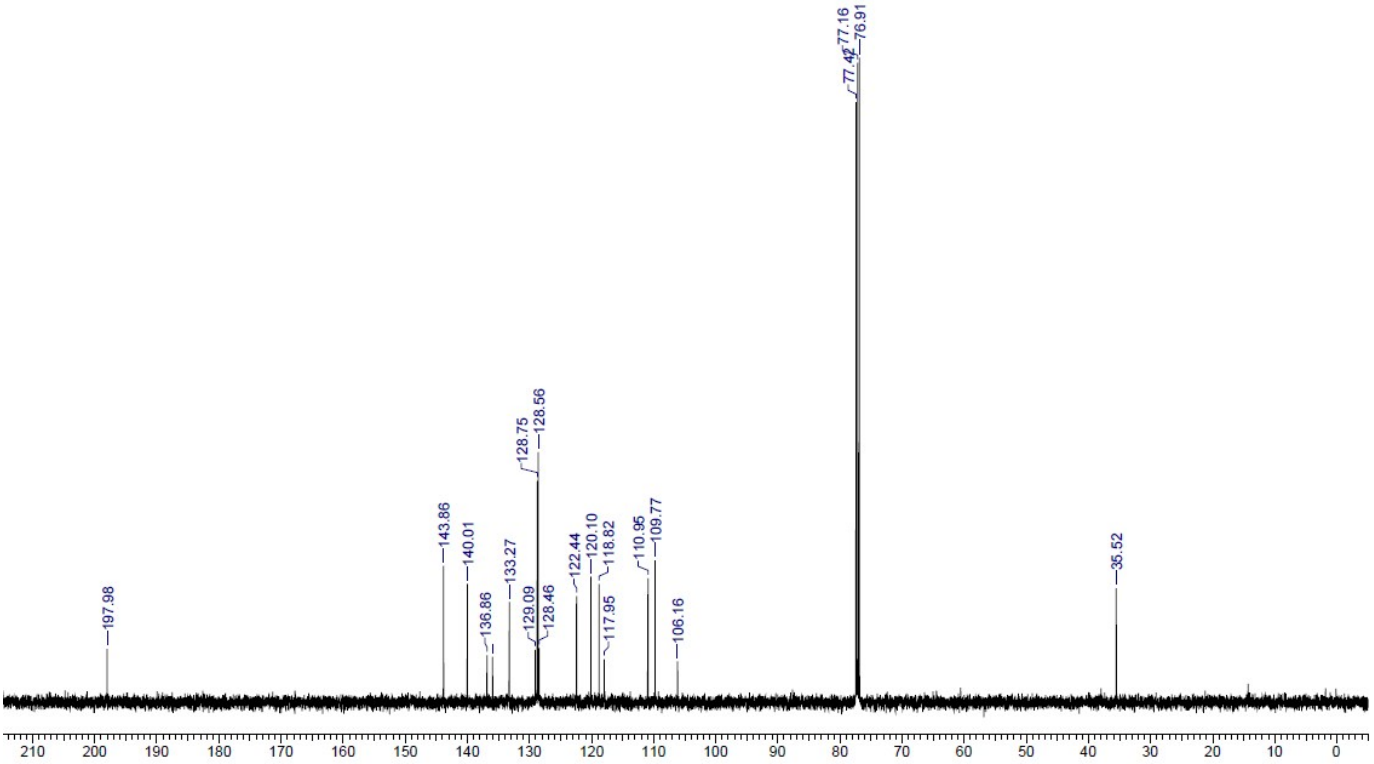


2-11. NMR Spectra of *2-(Furan-3-yl)-3-phenacylindole* **(2k)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

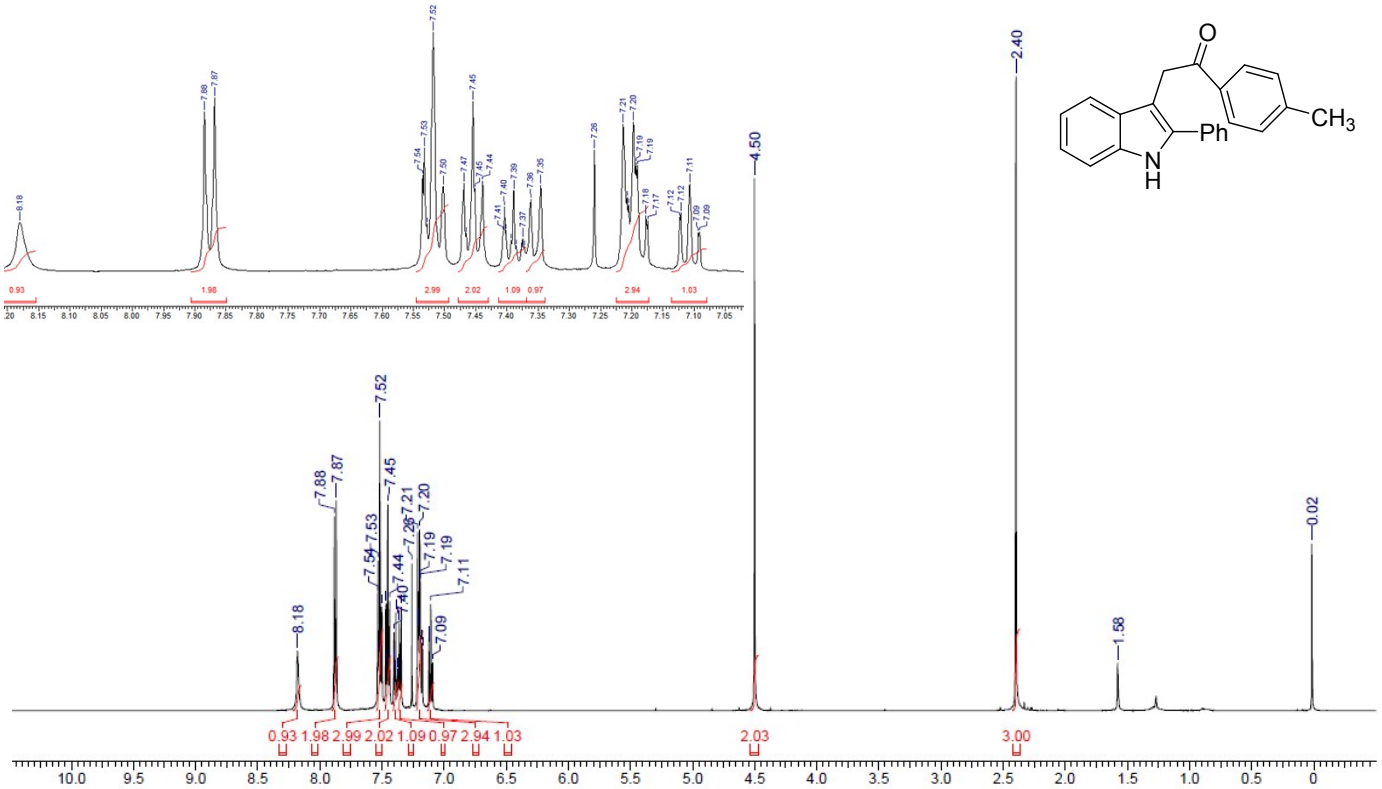


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

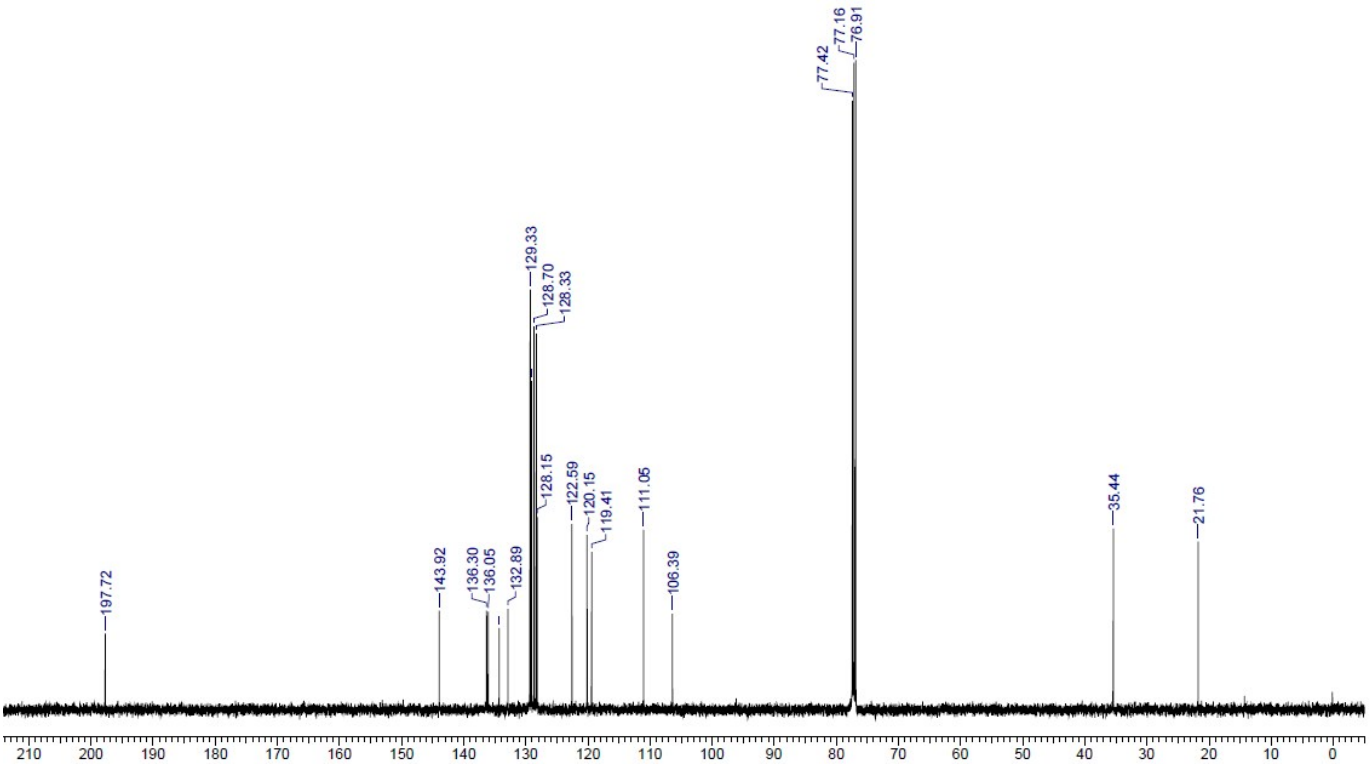


2-12. NMR Spectra of *3-(4-Methylphenacyl)-2-phenylindole* **(2l)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

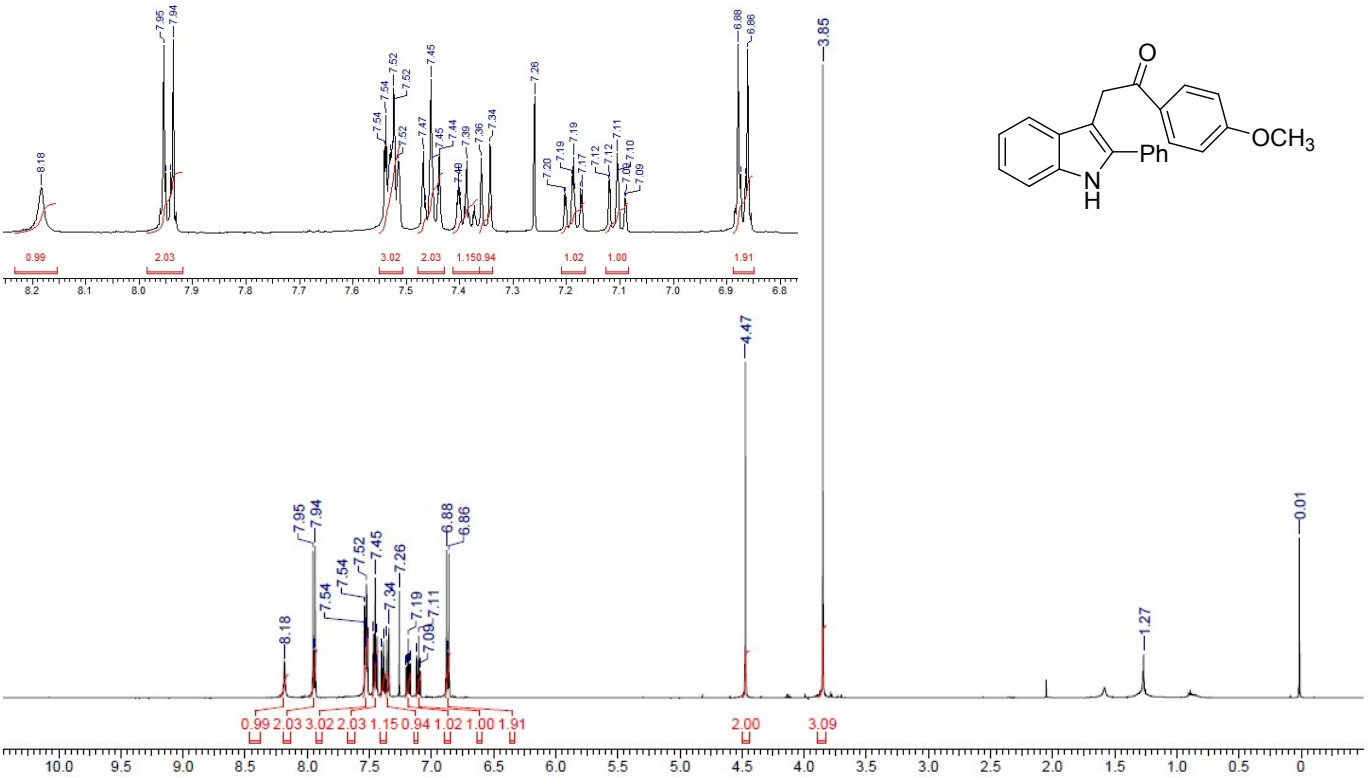


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

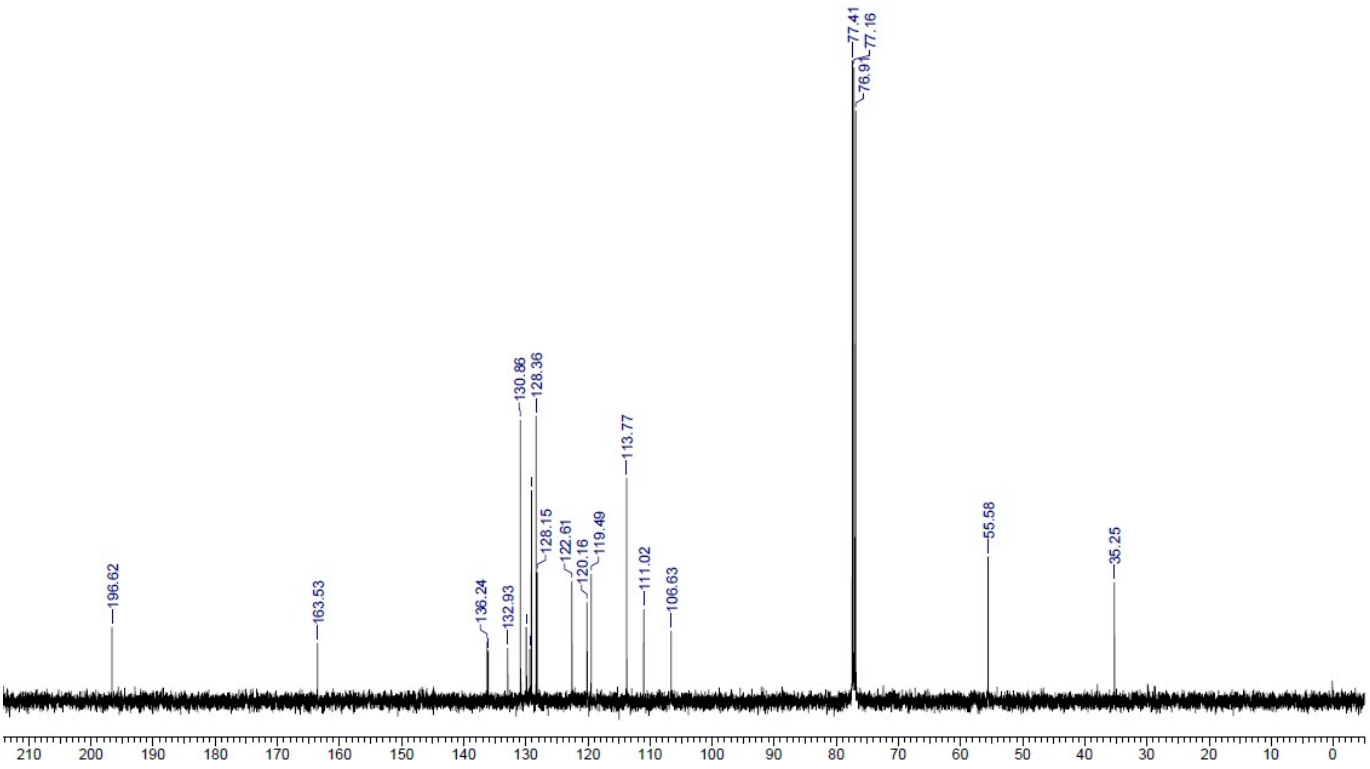


2-13. NMR Spectra of *3-(4-Methoxyphenacyl)-2-phenylindole* **(2m)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

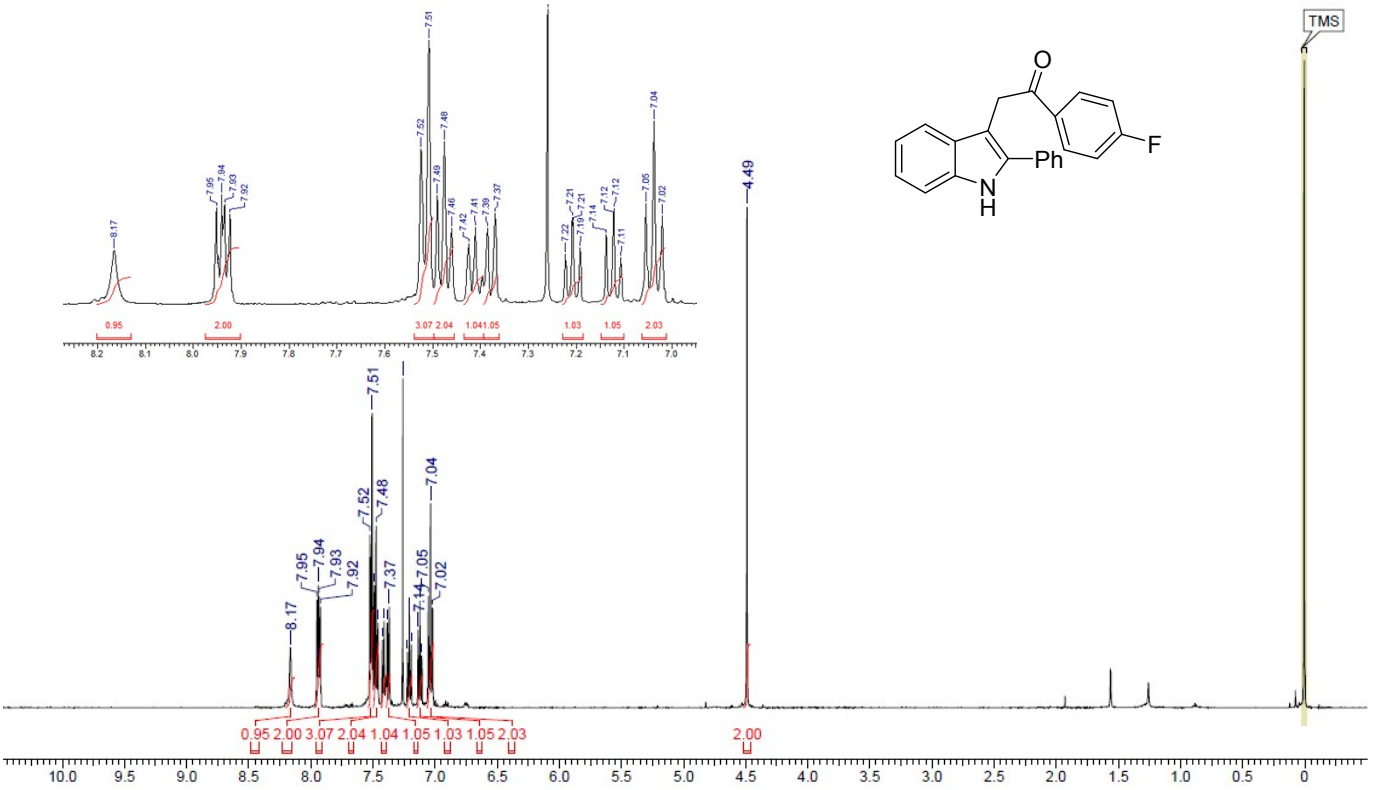


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

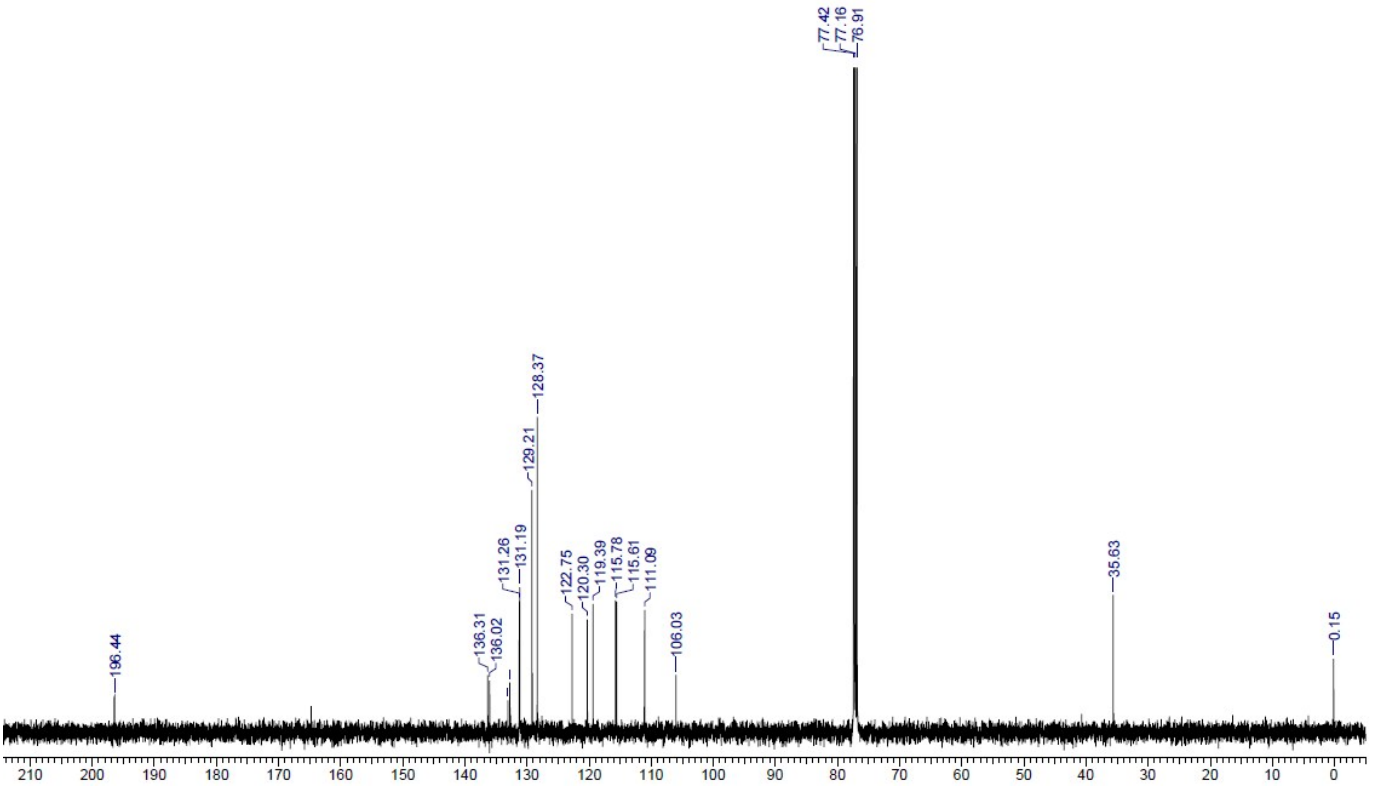


2-14. NMR Spectra of *3-(4-Fluorophenacyl)-2-phenylindole* **(2n)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

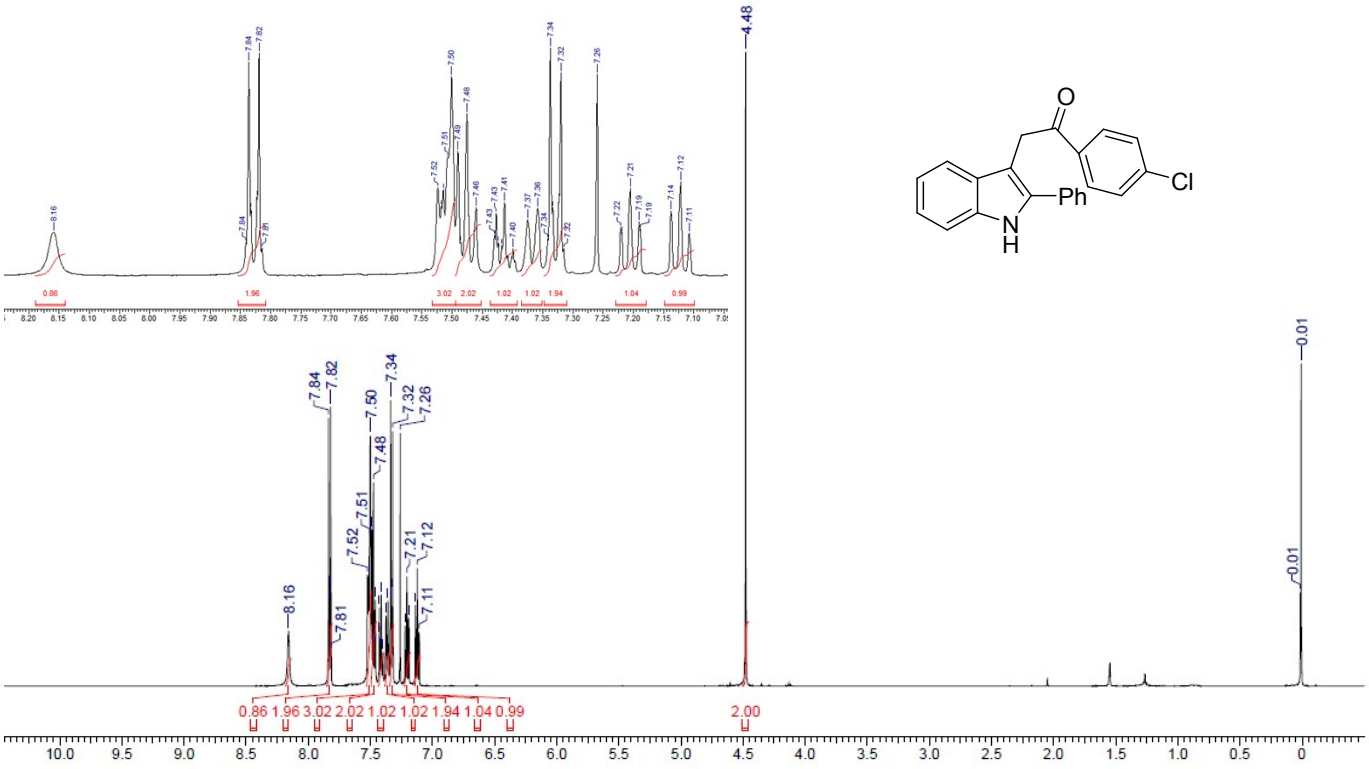


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

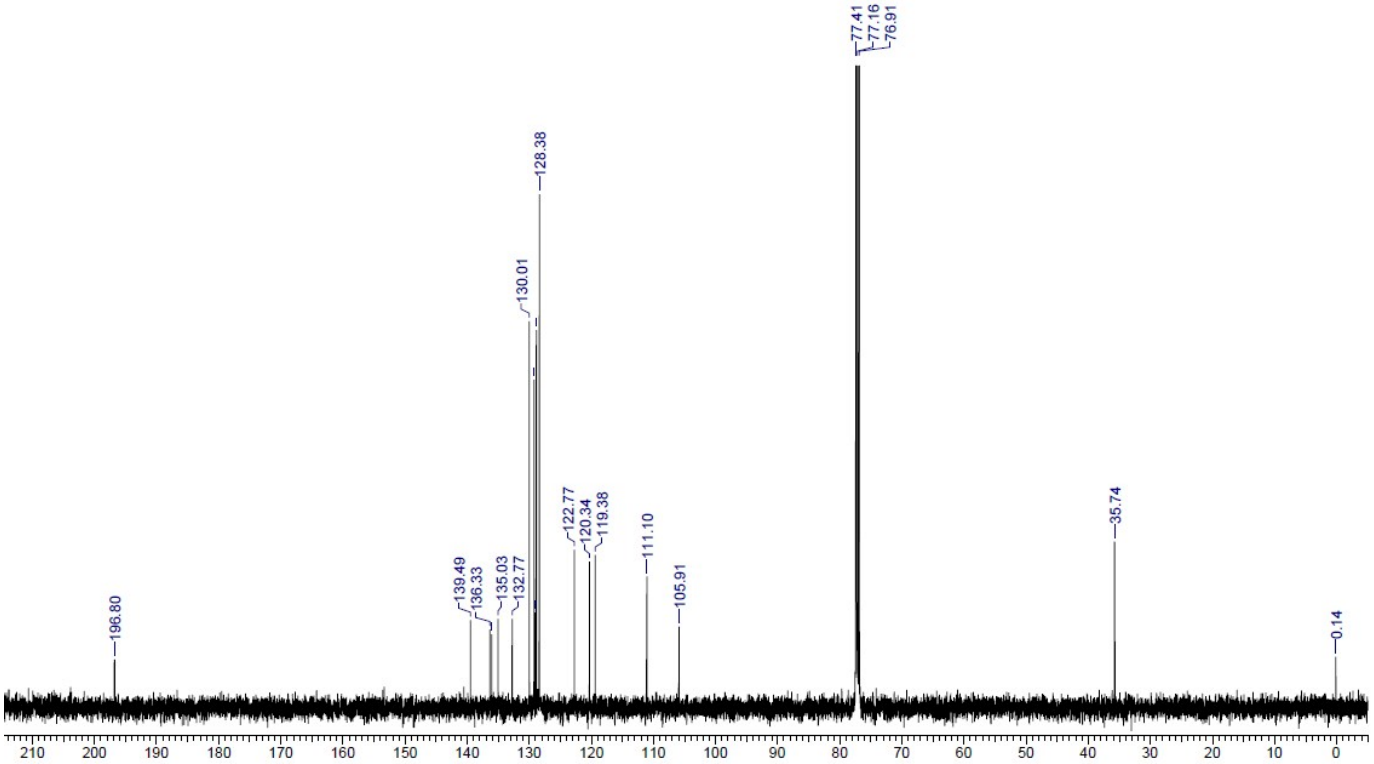


2-15. NMR Spectra of *3-(4-Chlorophenacyl)-2-phenylindole* **(2o)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

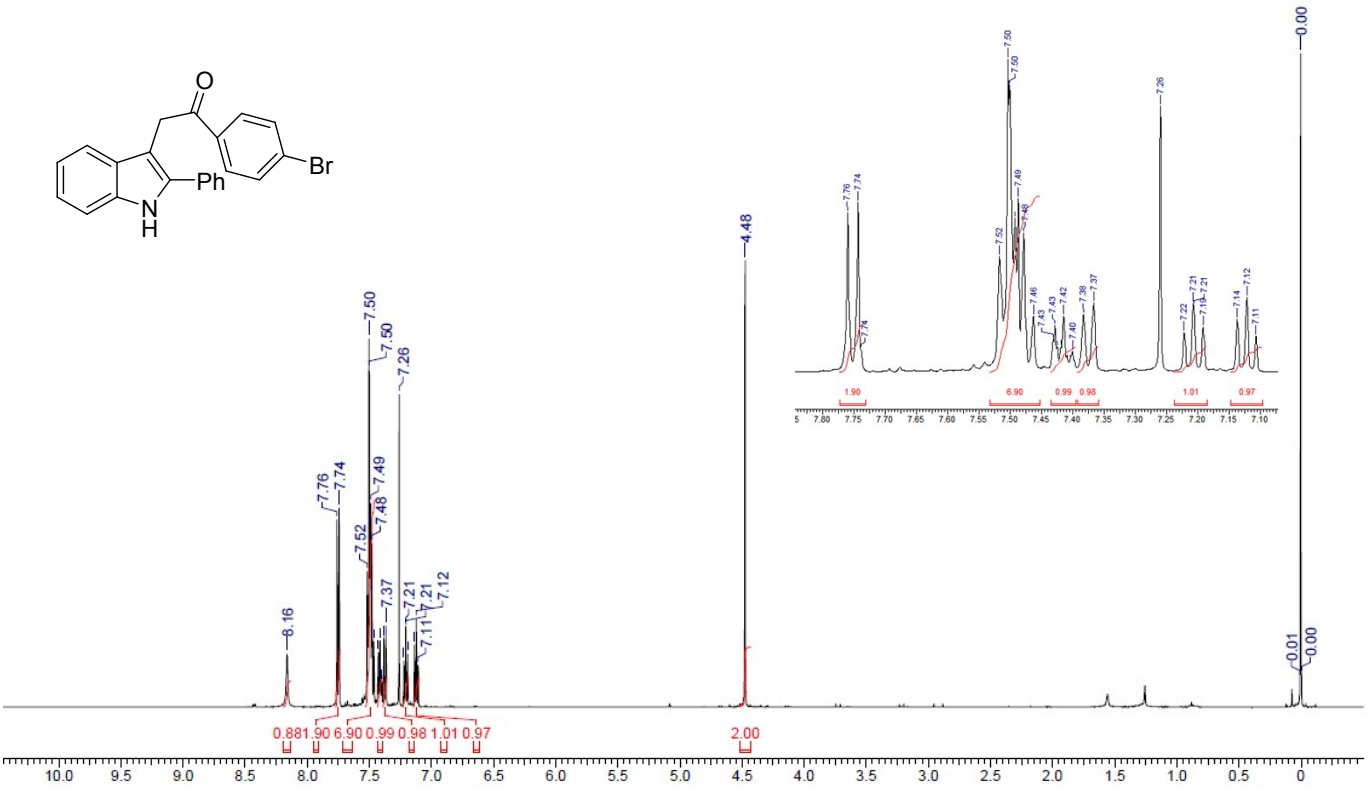


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

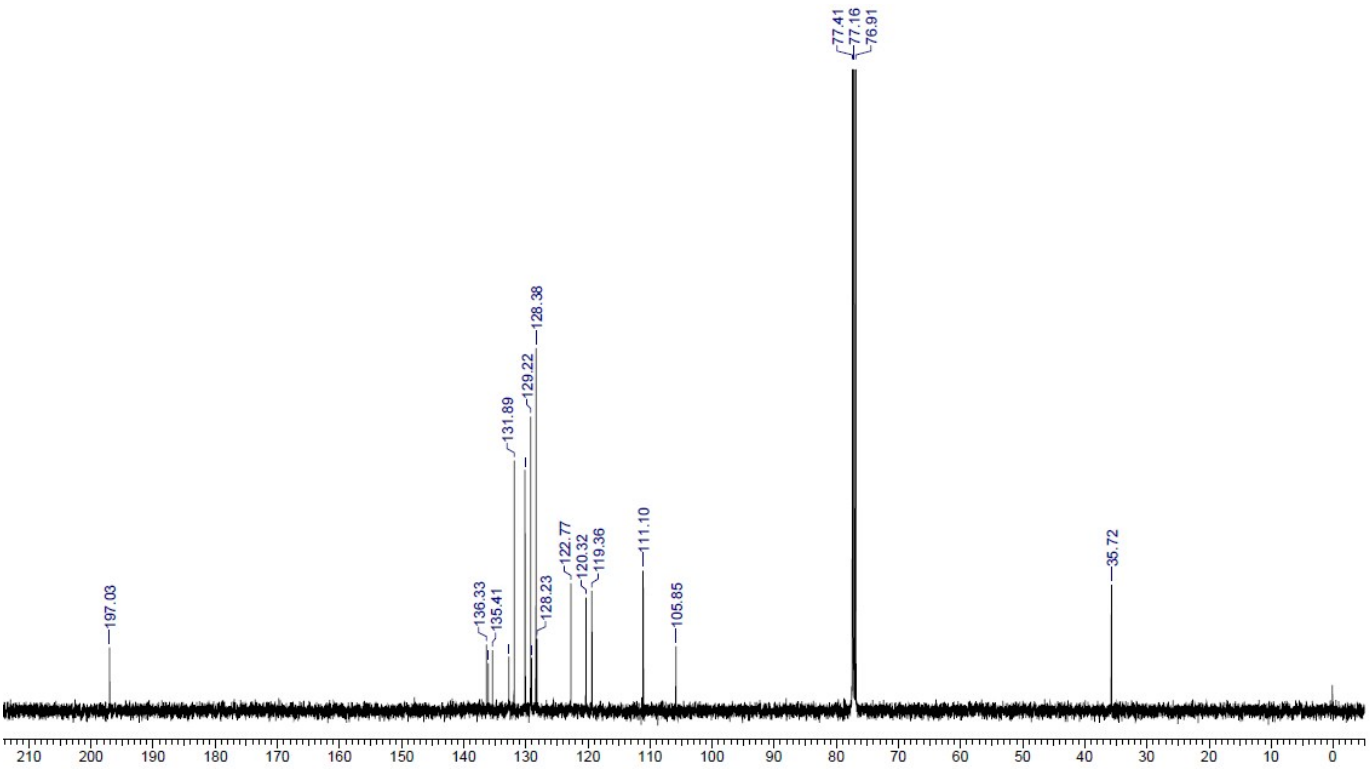


2-16. NMR Spectra of *3-(4-Bromophenacyl)-2-phenylindole* **(2p)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

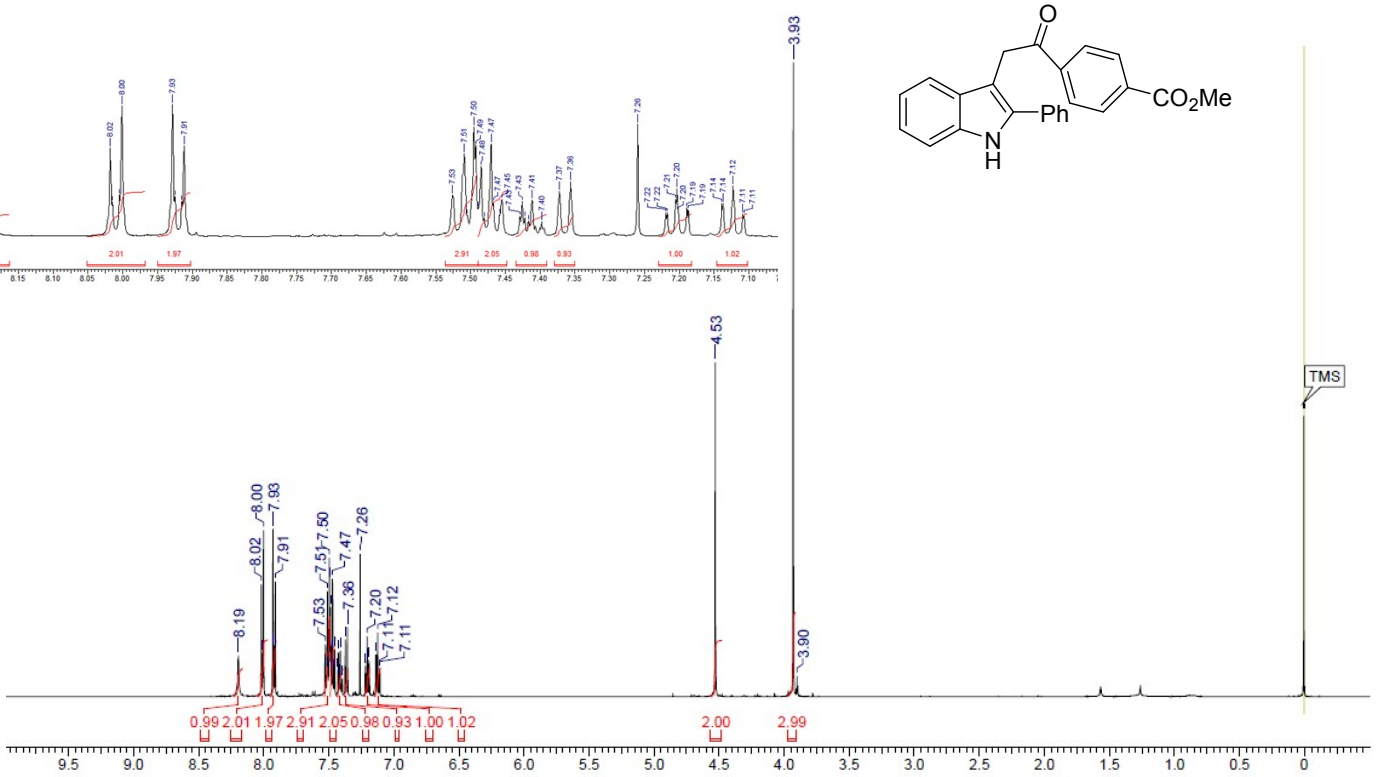


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

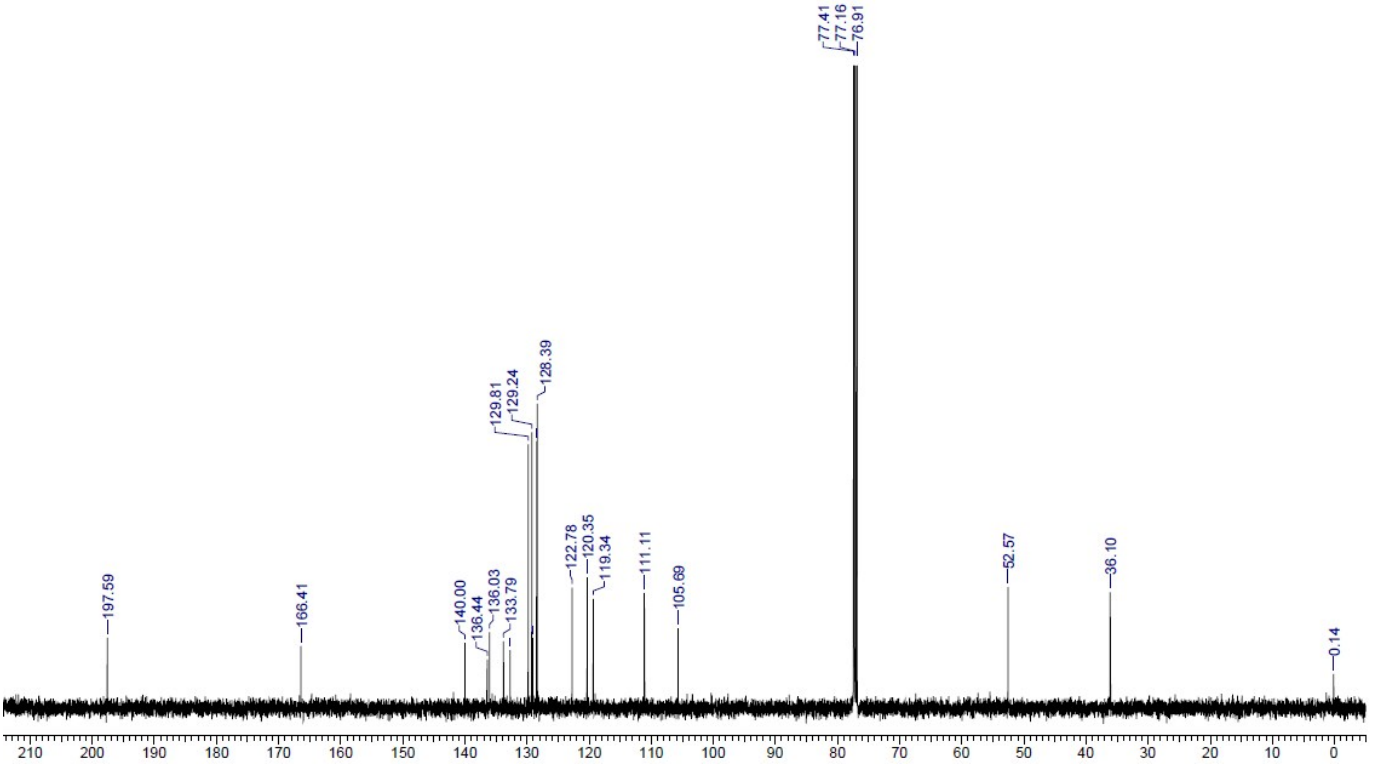


2-17. NMR Spectra of *3-(4-Methoxycarbonylphenacyl)-2-phenylindole* **(2q)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

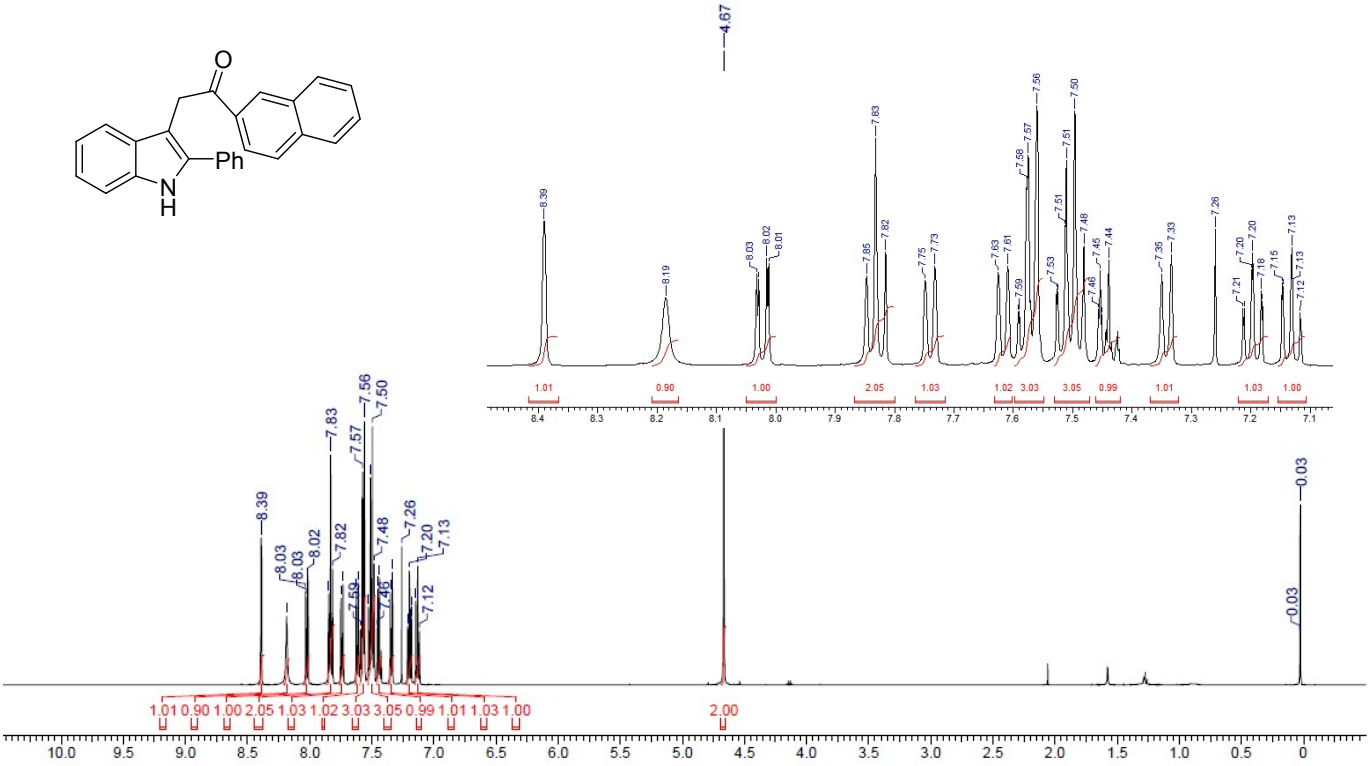


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

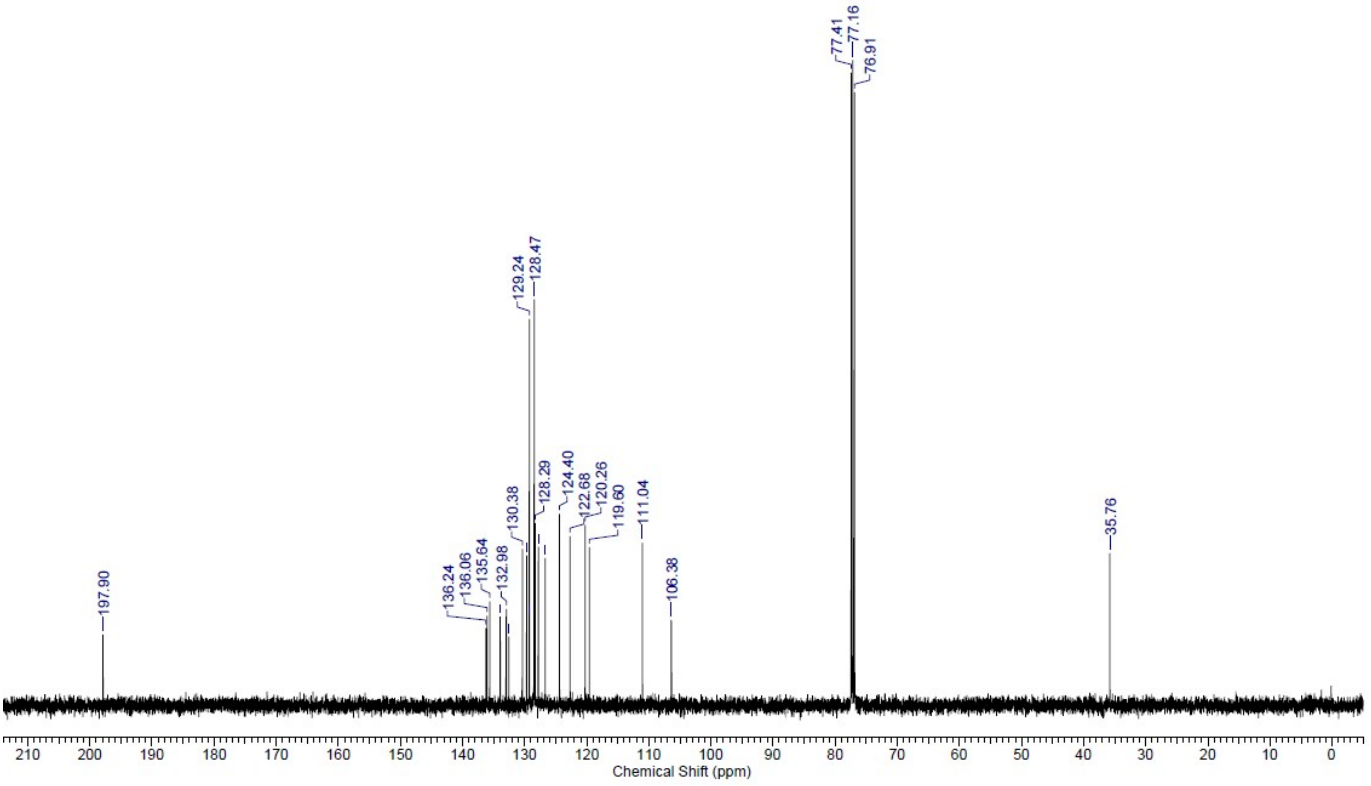


2-18. NMR Spectra of *3-(2-Naphthylacyl)-2-phenylindole* **(2r)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

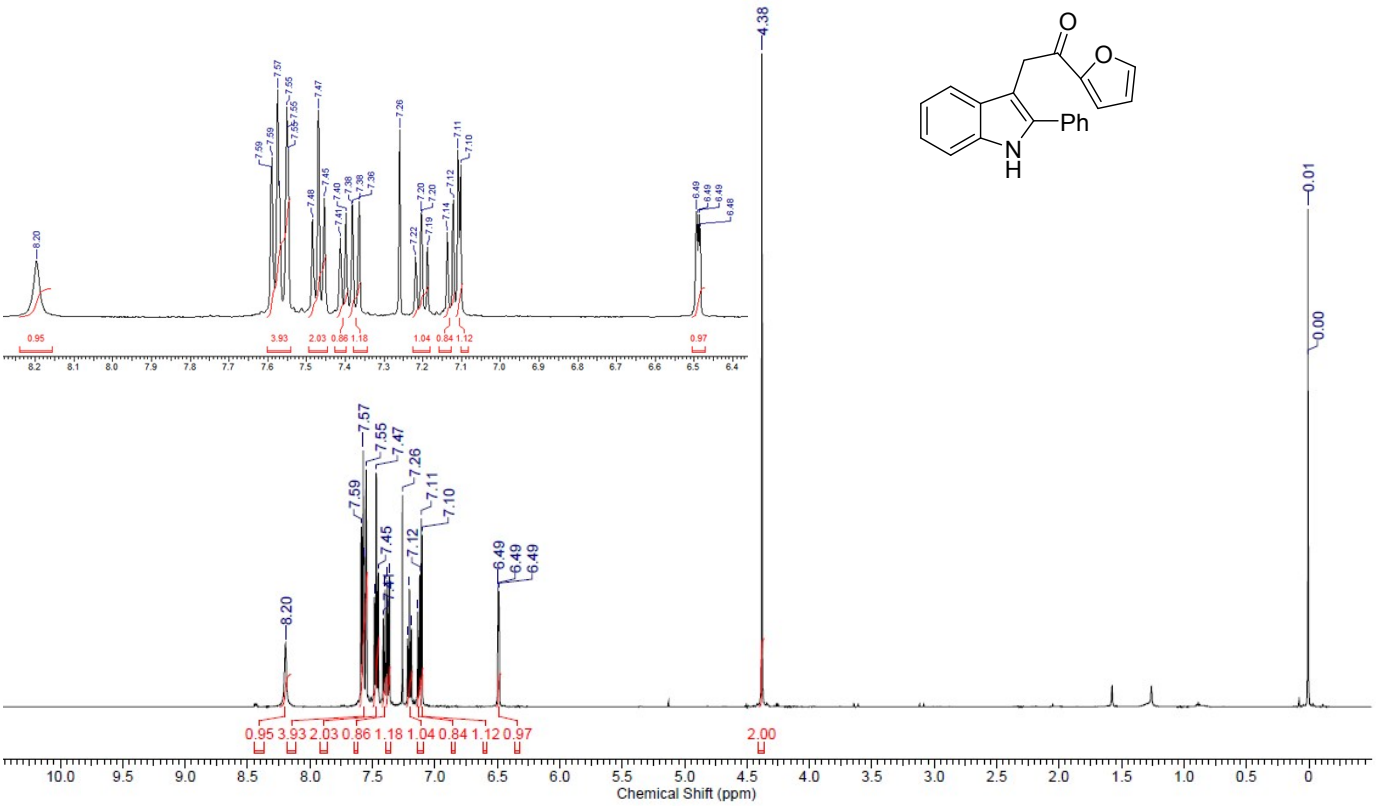


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

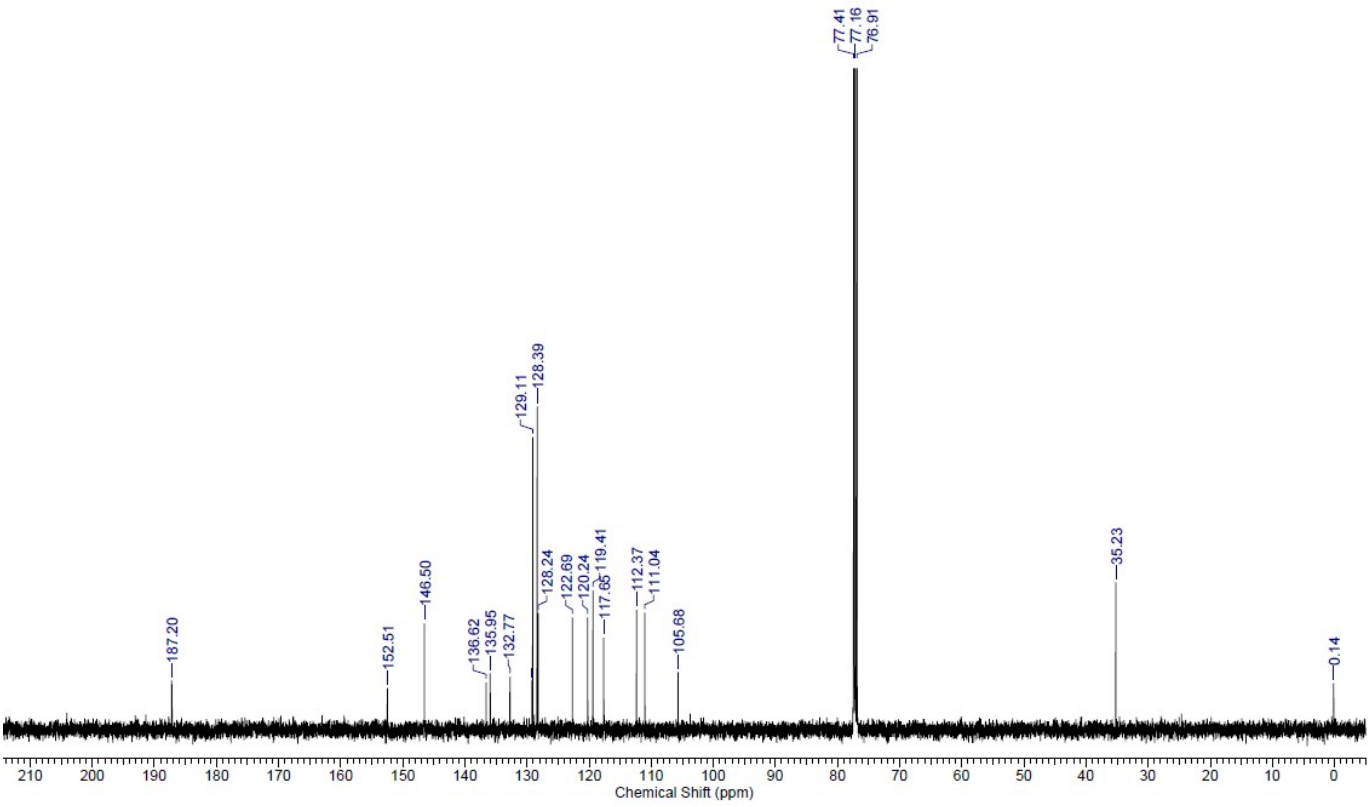


2-19. NMR Spectra of *3-(2-Furanylacyl)-2-phenylindole* **(2s)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

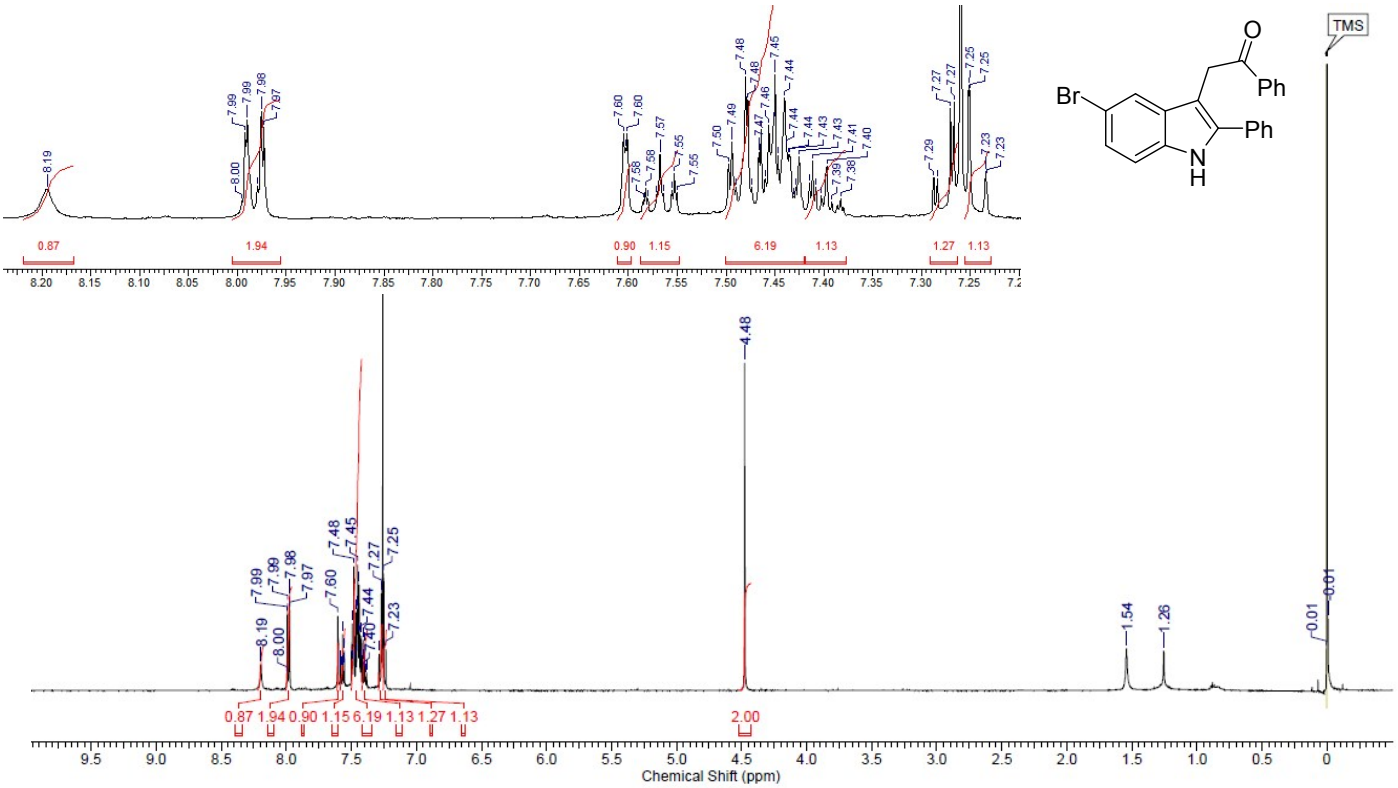


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

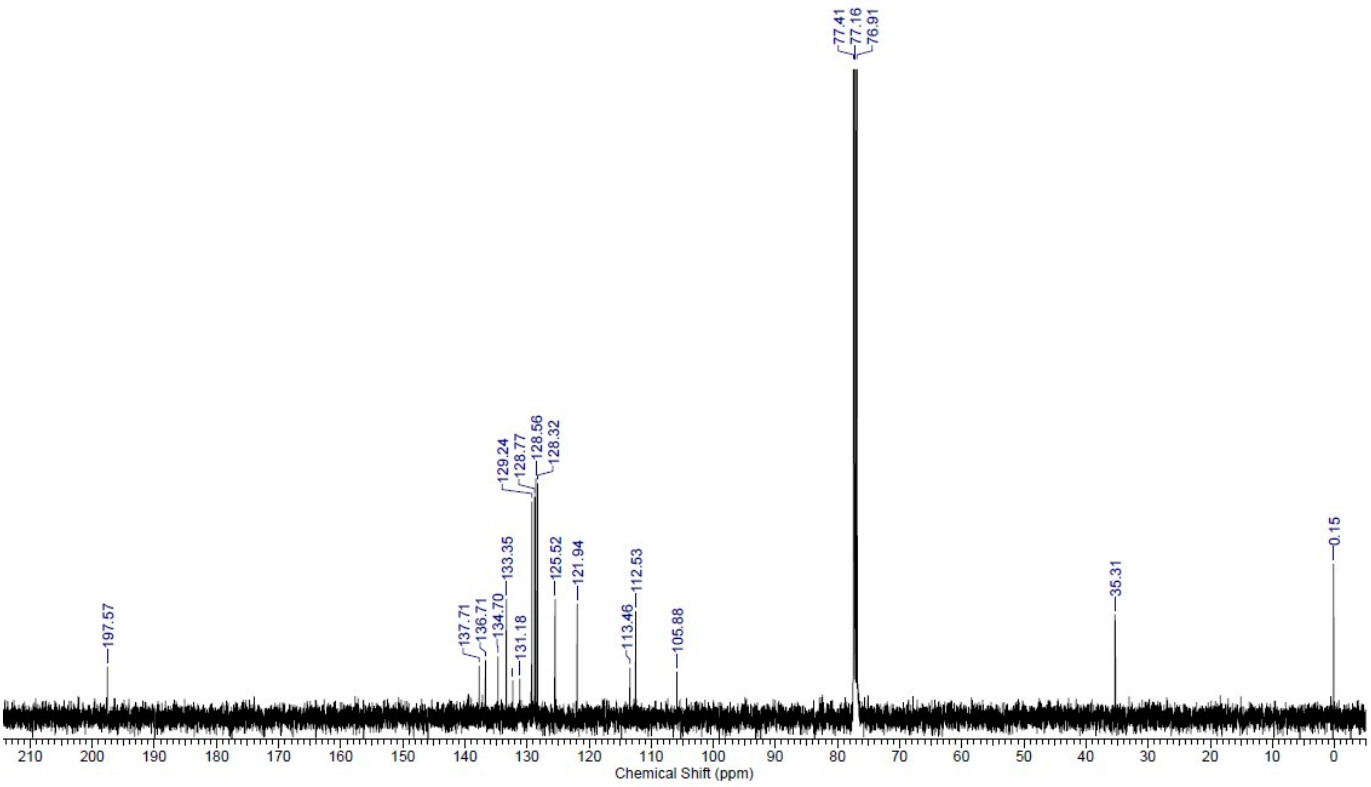


2-20. NMR Spectra of *5-Bromo-3-phenacyl-2-phenylindole* **(2t)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)



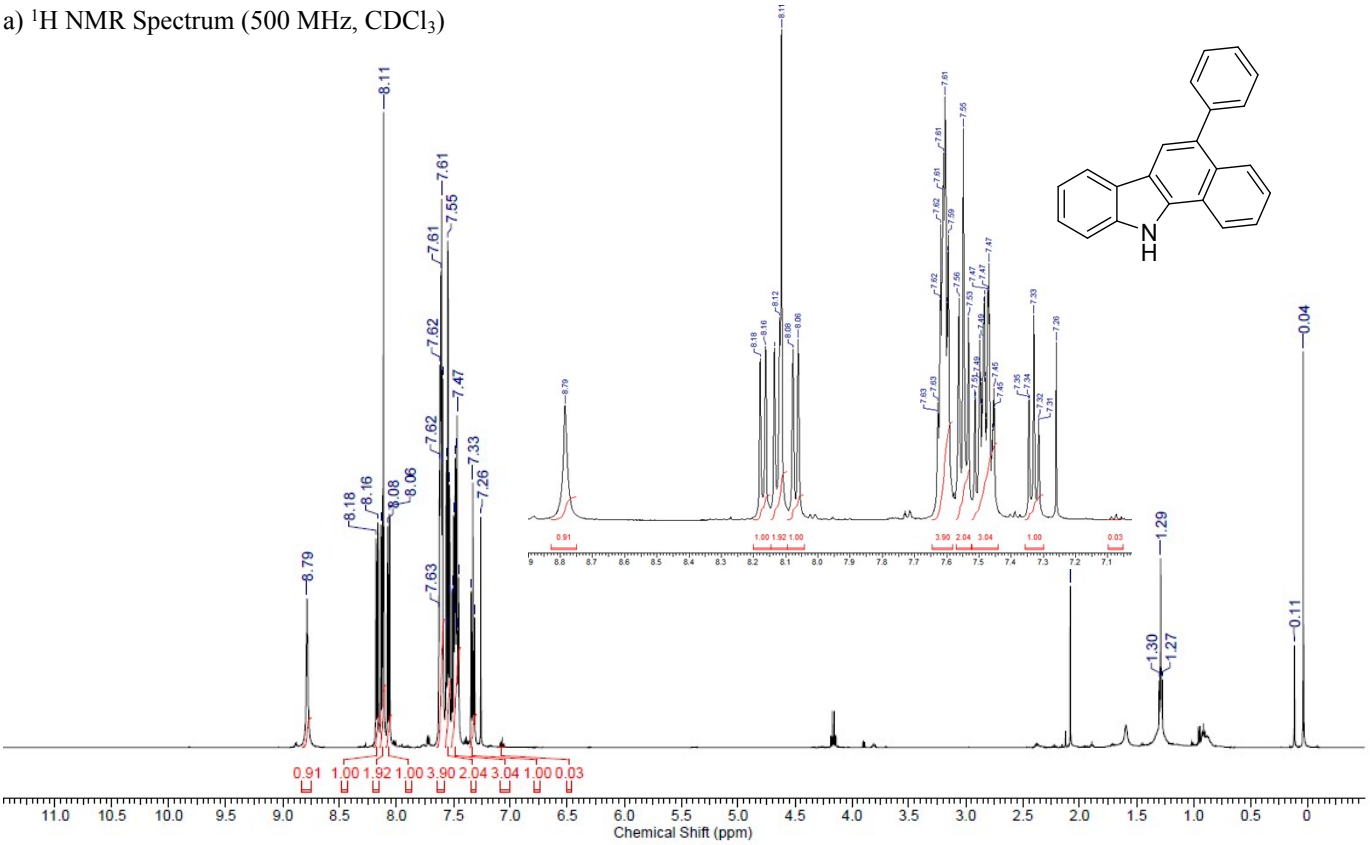
b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)



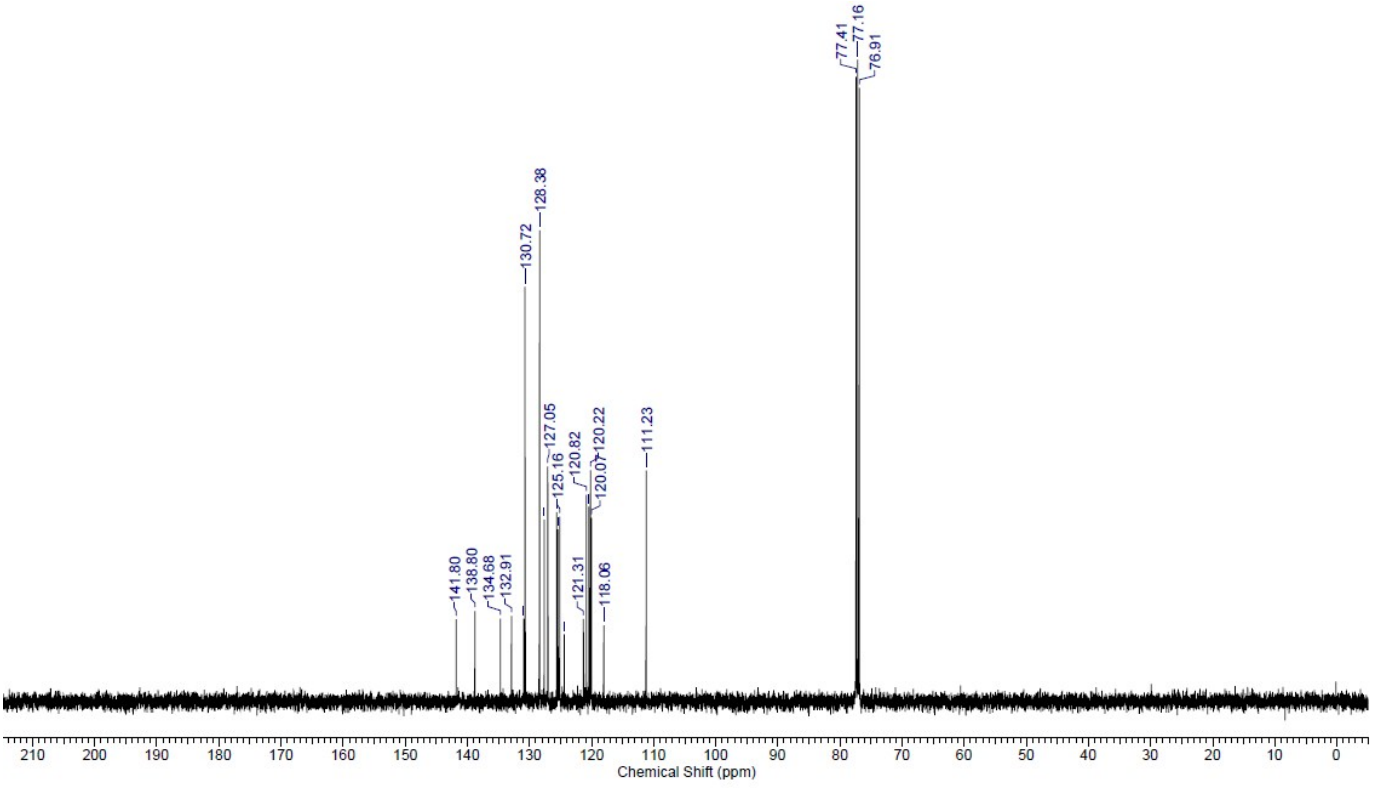
3. Spectroscopic Data of Benzo[a]carbazoles (**1**)

3-1. NMR Spectra of 6-*Phenyl-11H-benzo[a]carbazole* **(1a)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

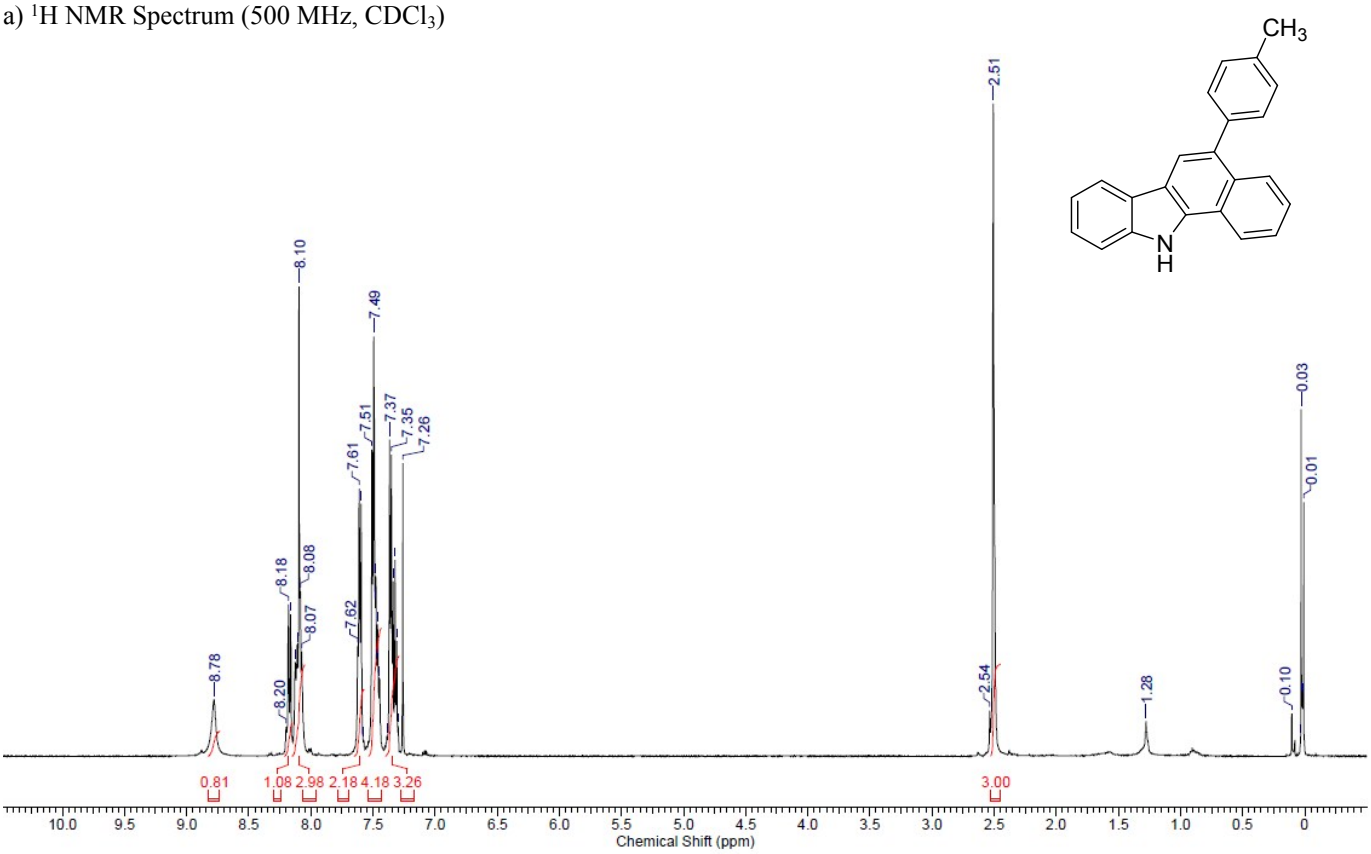


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

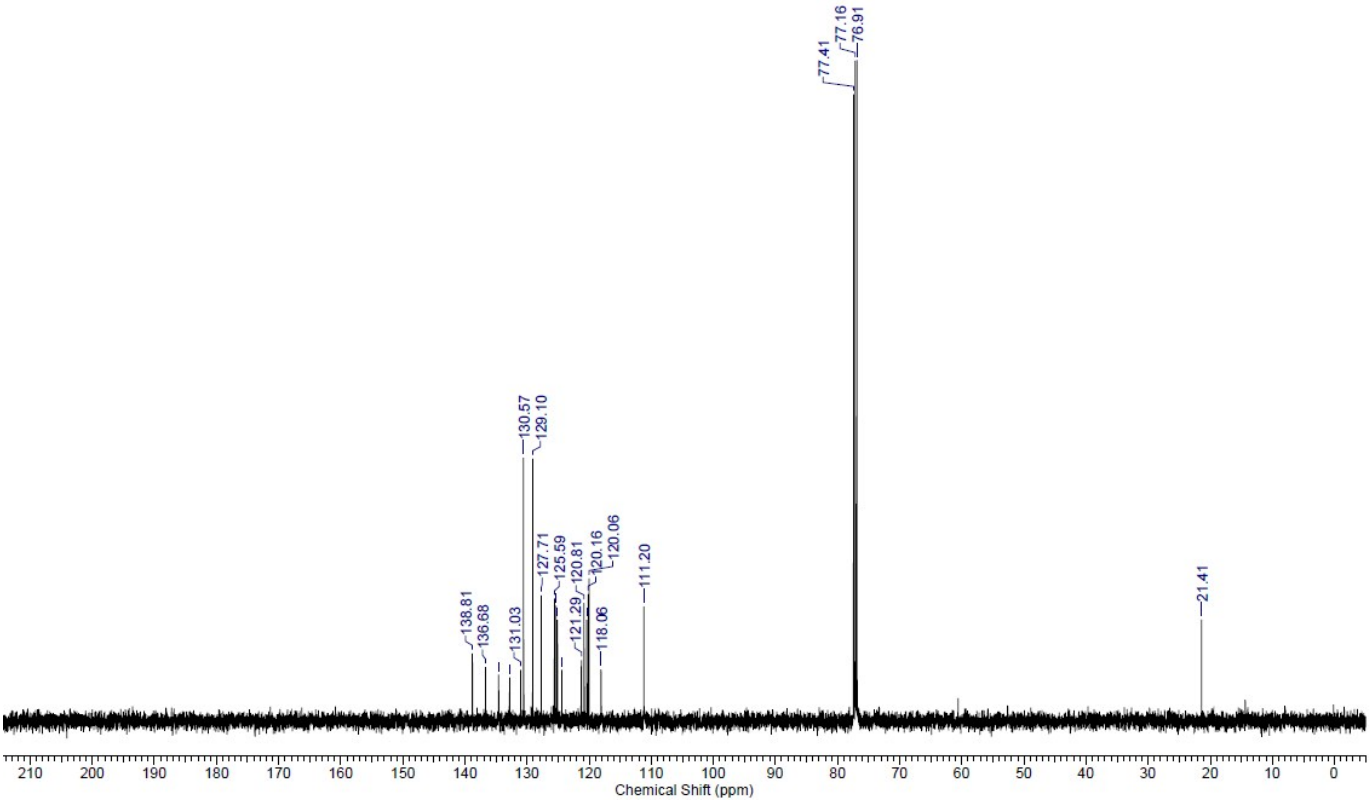


3-2. NMR Spectra of *6-(4-Methylphenyl)-11H-benzo[a]carbazole* **(1b)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

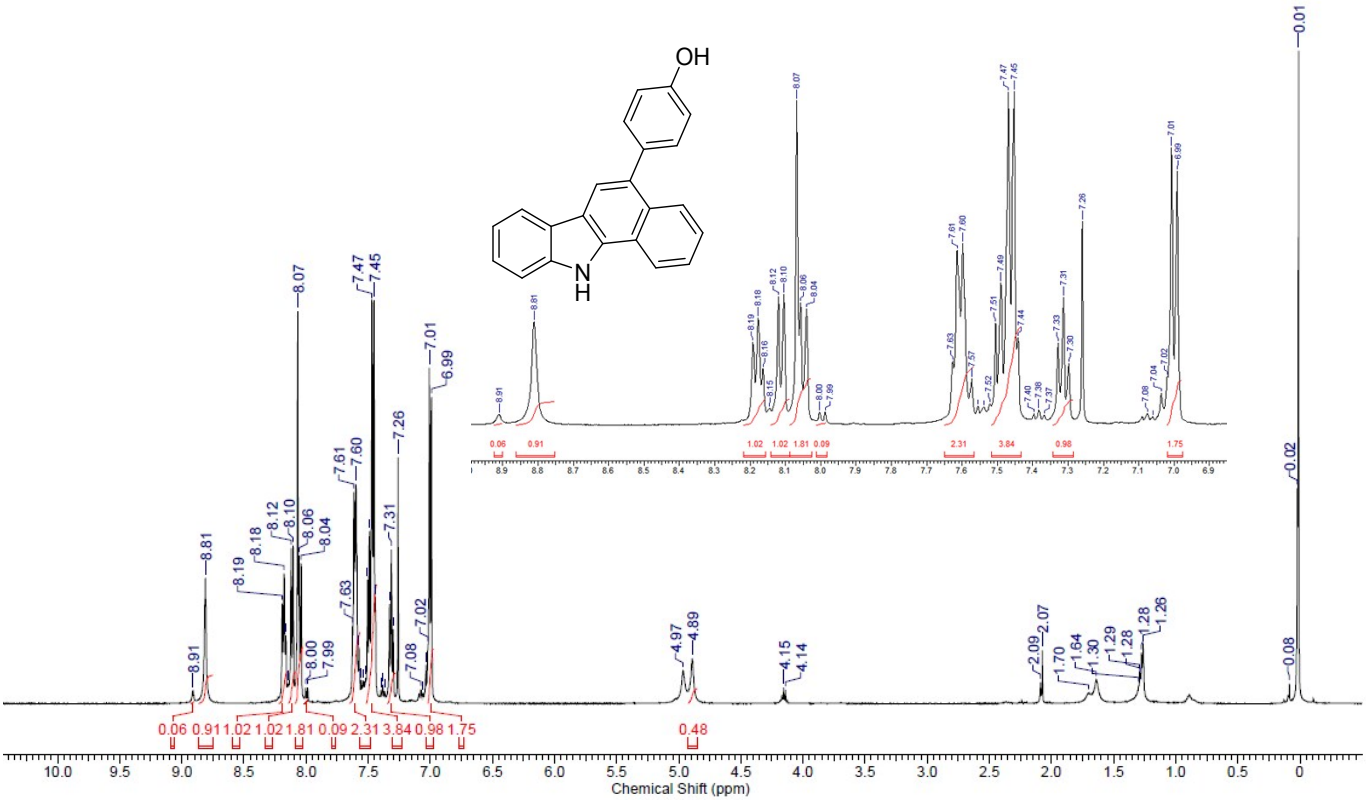


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

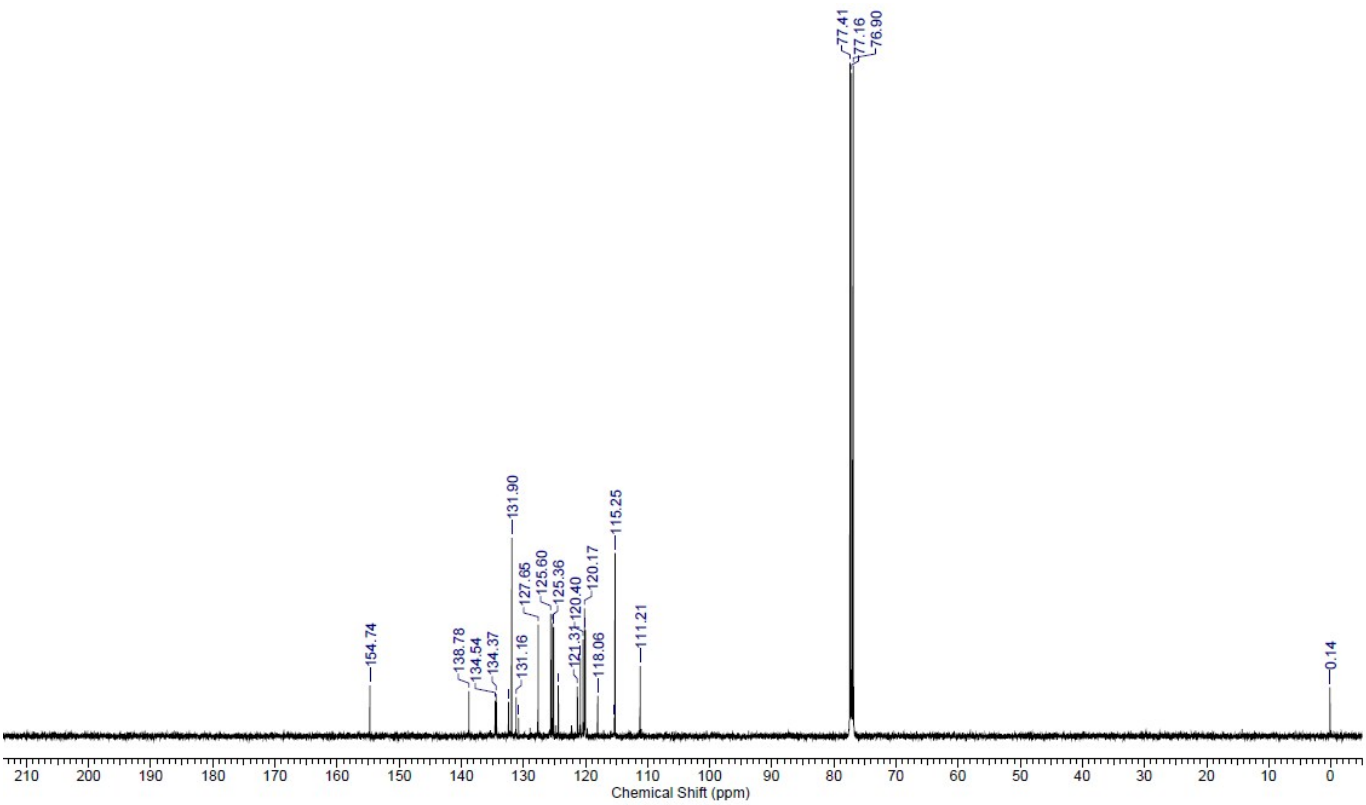


3-3. NMR Spectra of *6-(4-Hydroxyphenyl)-11H-benzo[a]carbazole* **(1c)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

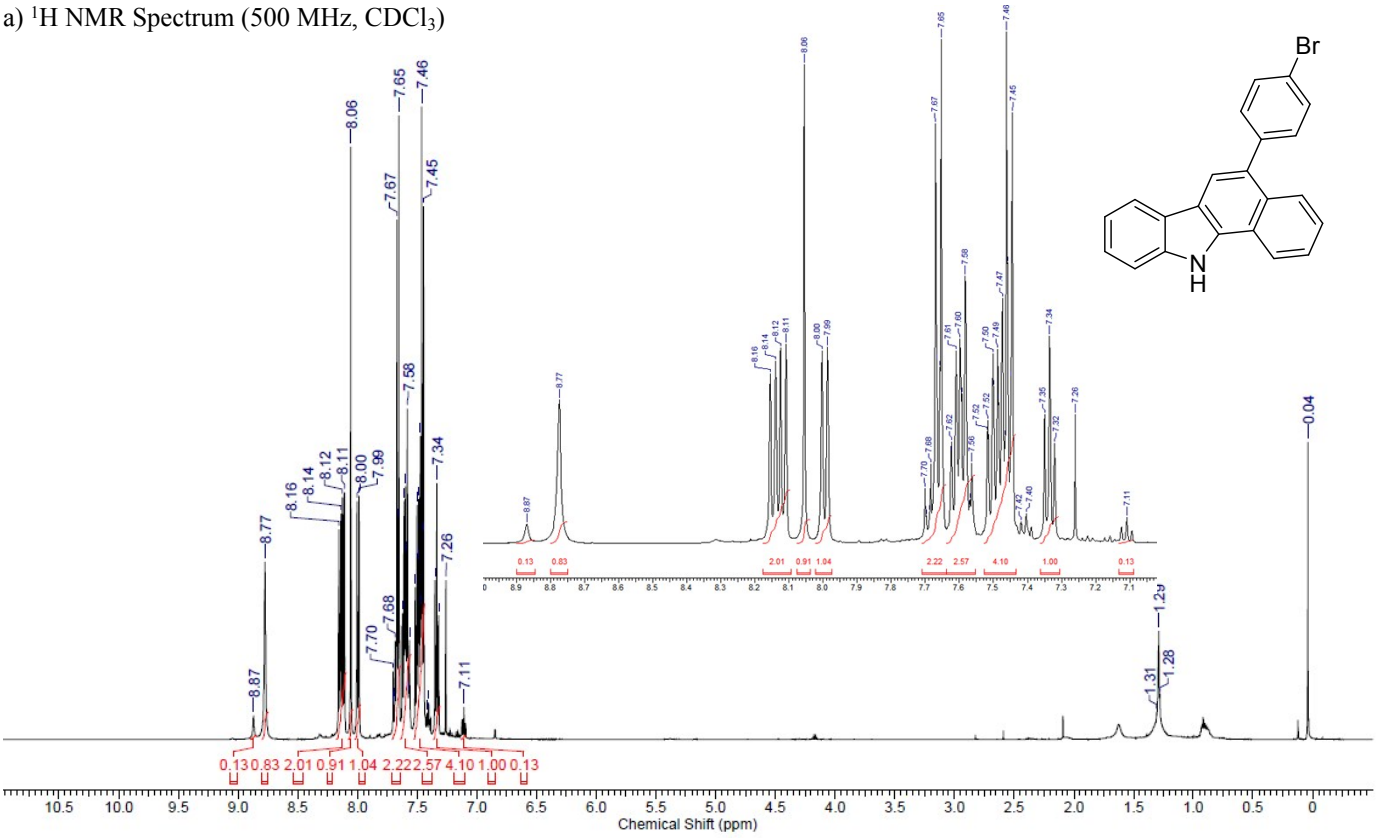


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

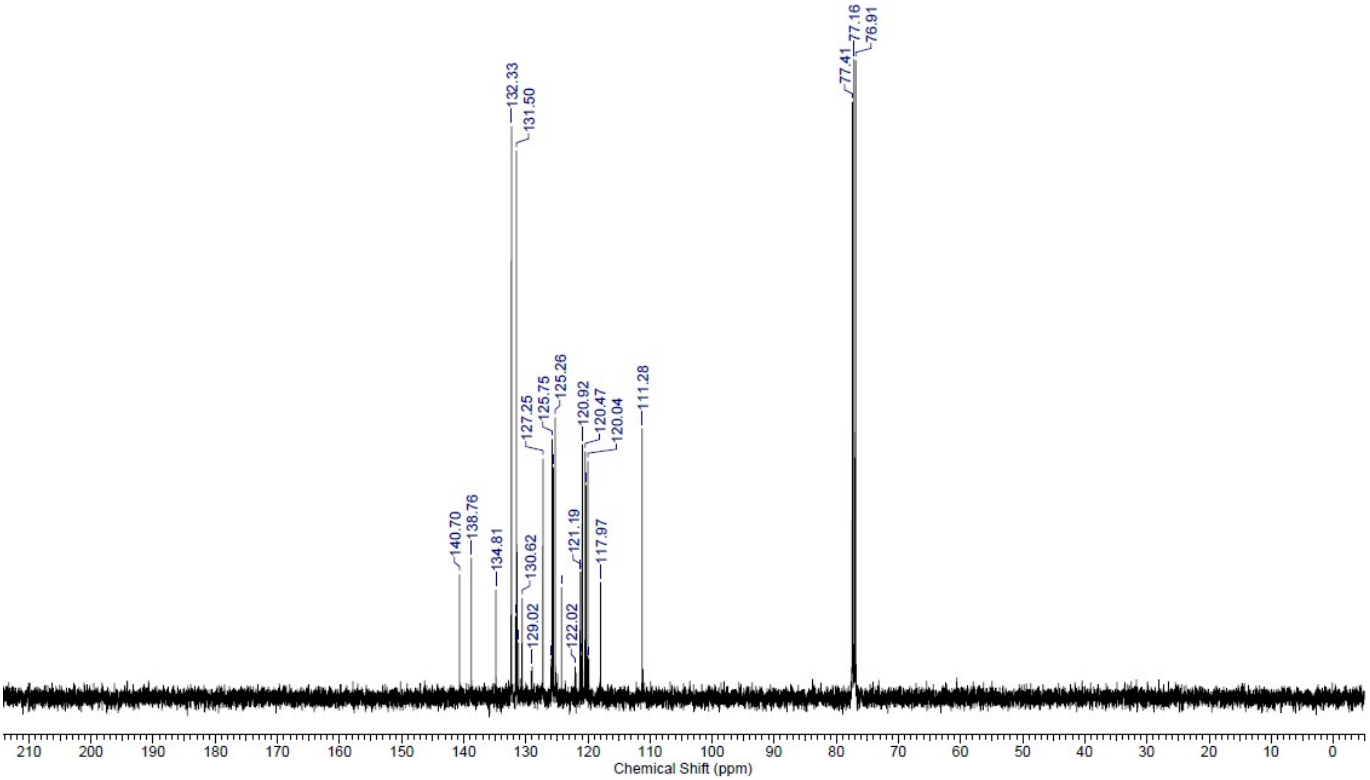


3-4. NMR Spectra of *6-(4-Bromophenyl)-11H-benzo[a]carbazole* **(1d)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

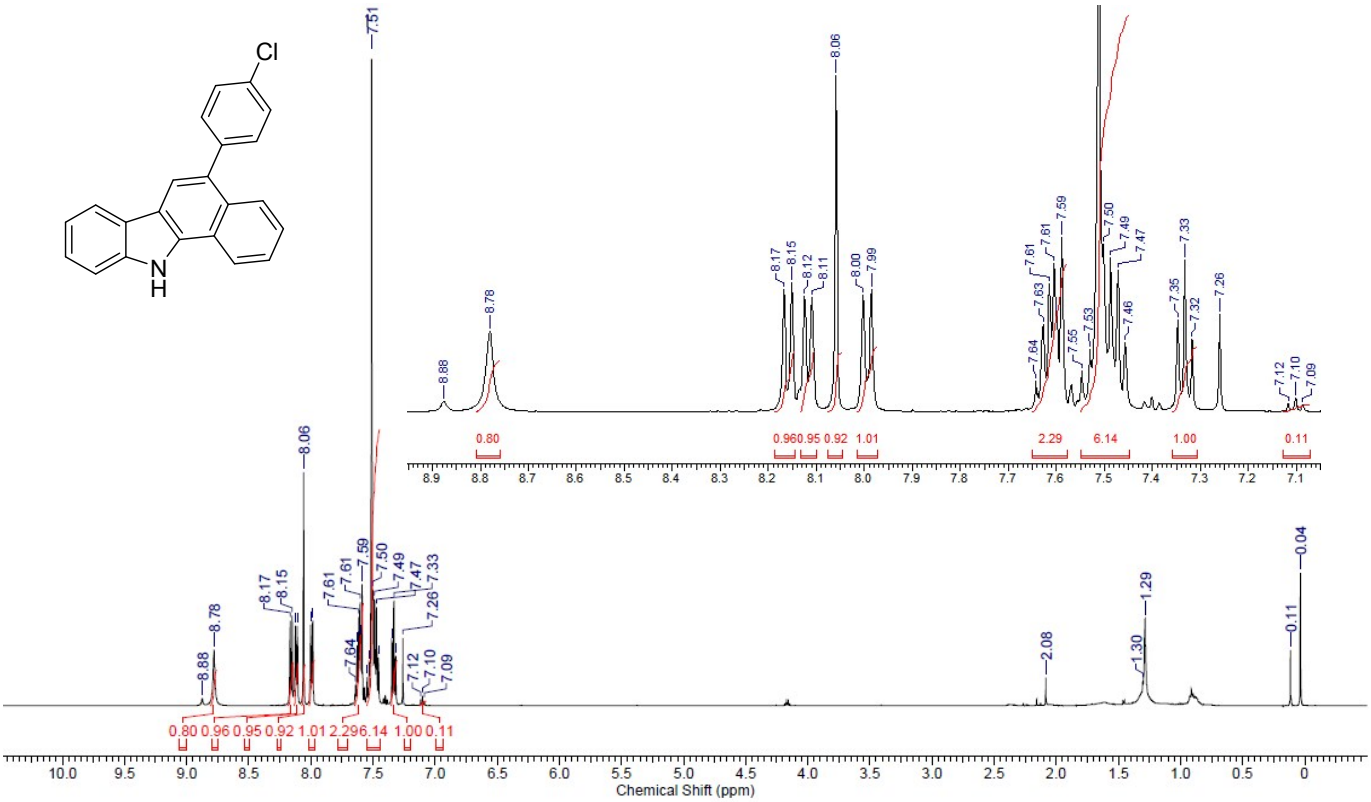


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

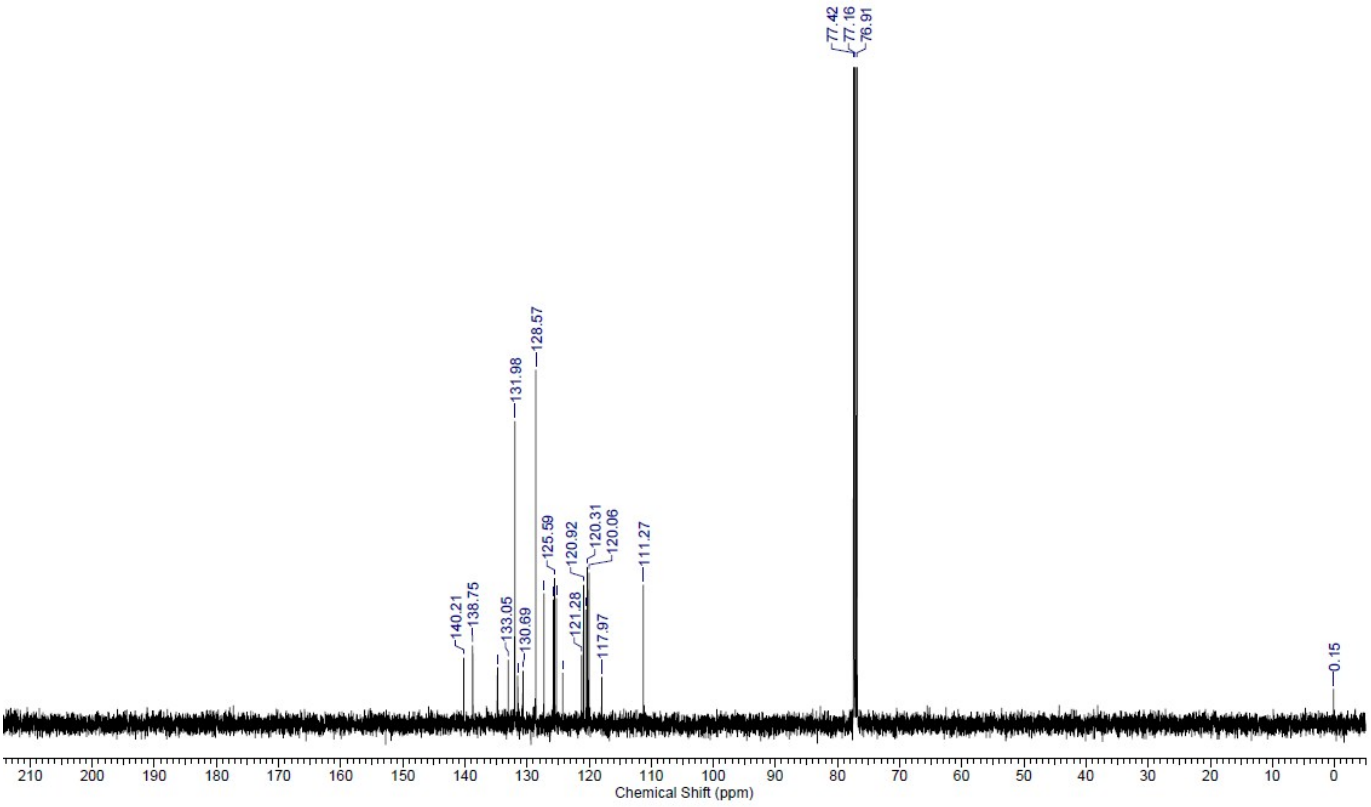


3-5. NMR Spectra of *6-(4-Chlorophenyl)-11H-benzo[a]carbazole* **(1e)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

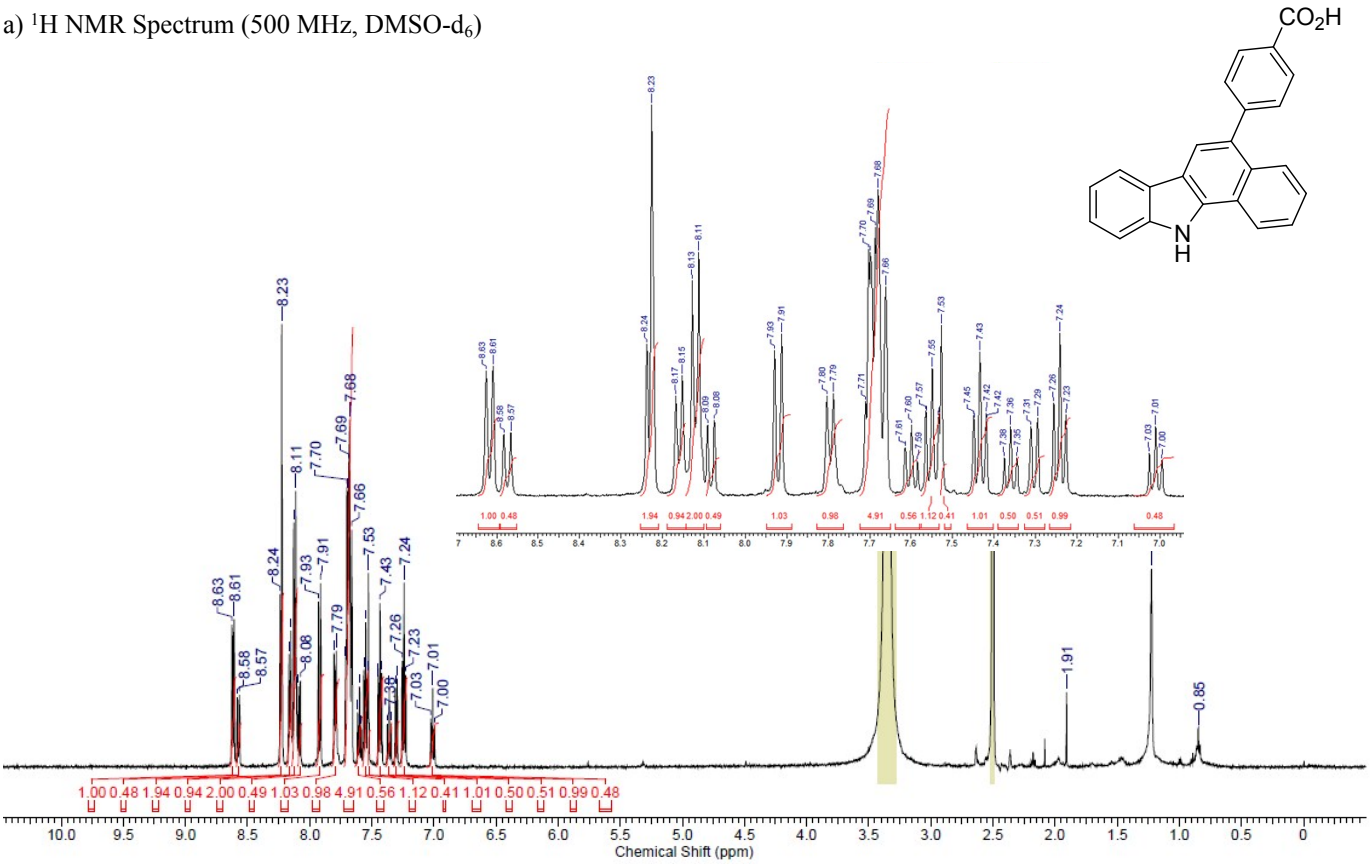


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

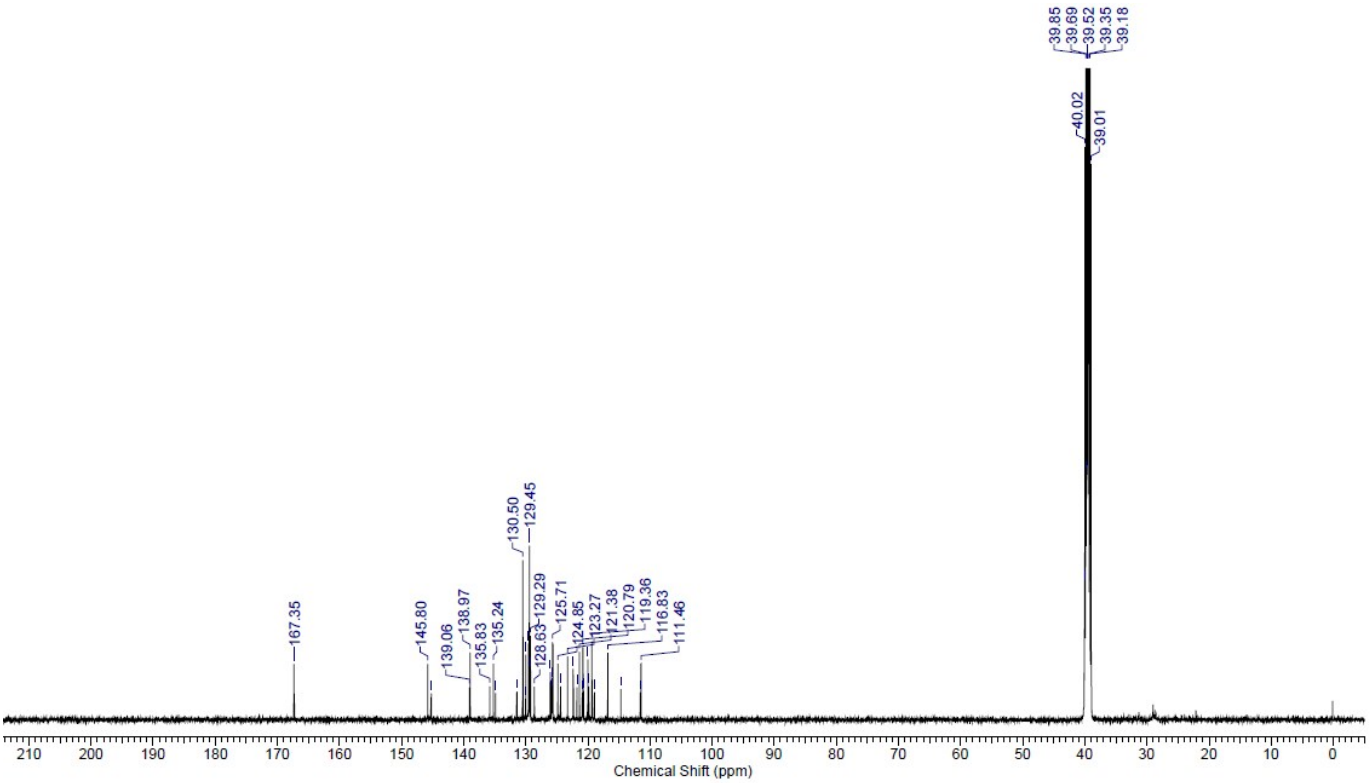


3-6. NMR Spectra of *4-(11H-Benzo[a]carbazol-6-yl)benzoic acid* **(1f)**

a) ^{1}H NMR Spectrum (500 MHz, DMSO-d_6)

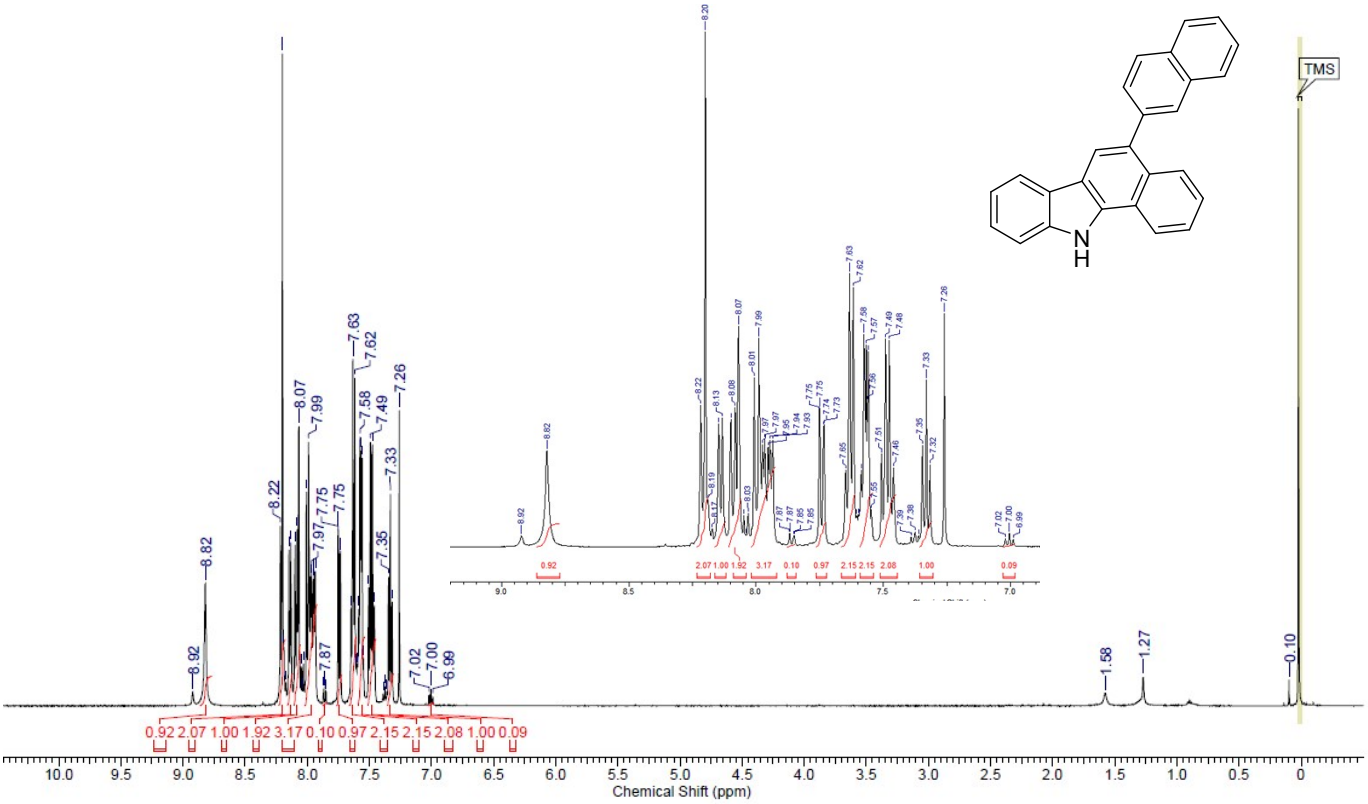


b) ^{13}C NMR Spectrum (125 MHz, DMSO-d_6)

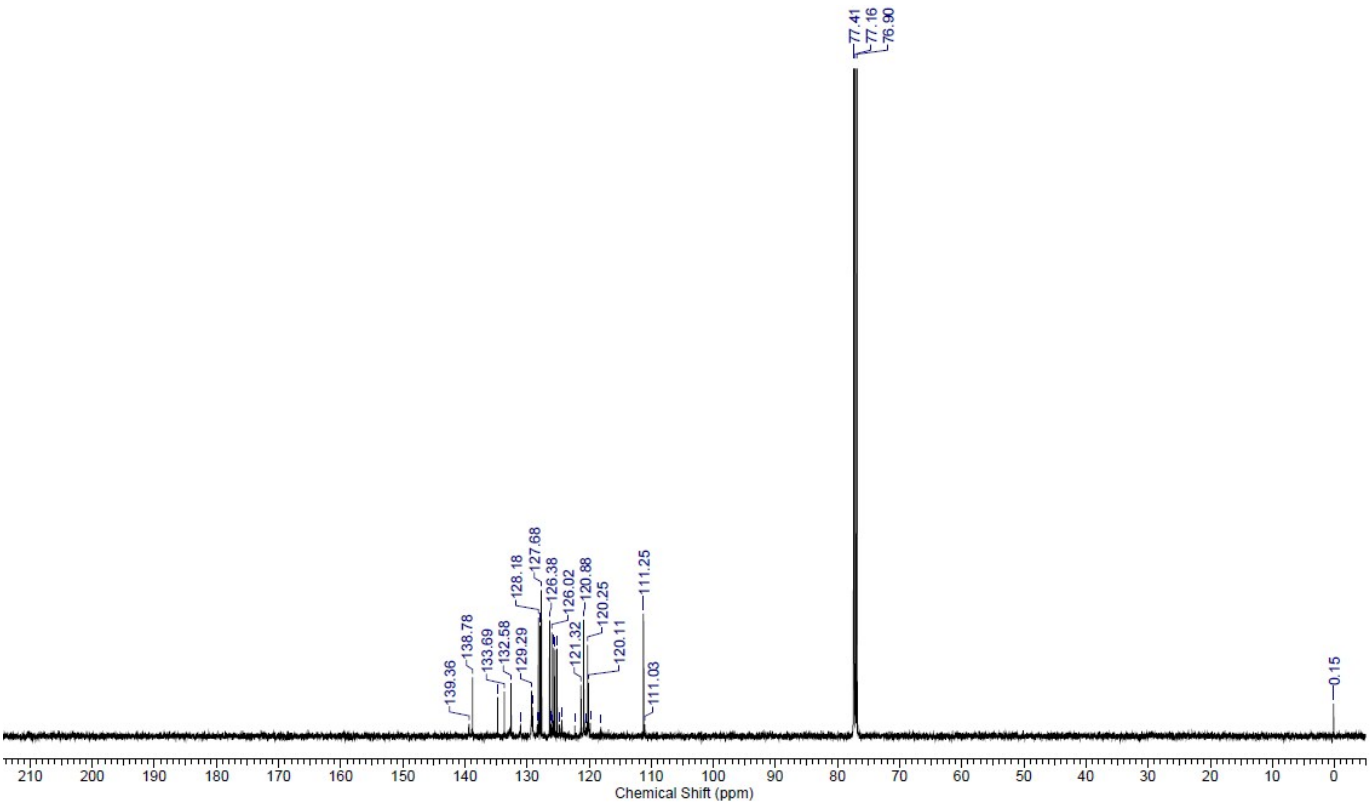


3-7. NMR Spectra of *6-(Naphthalen-2-yl)-11H-benzo[a]carbazole* **(1g)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

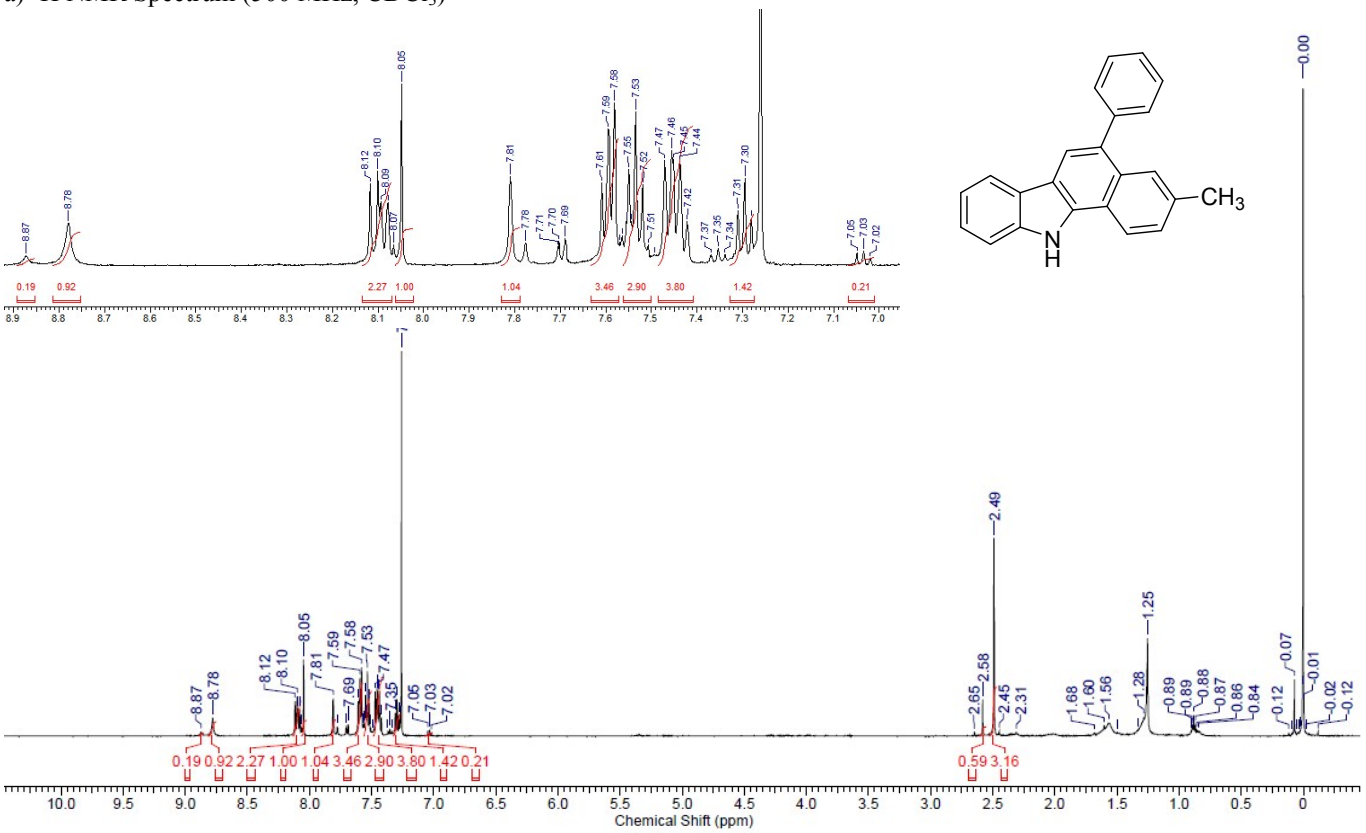


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

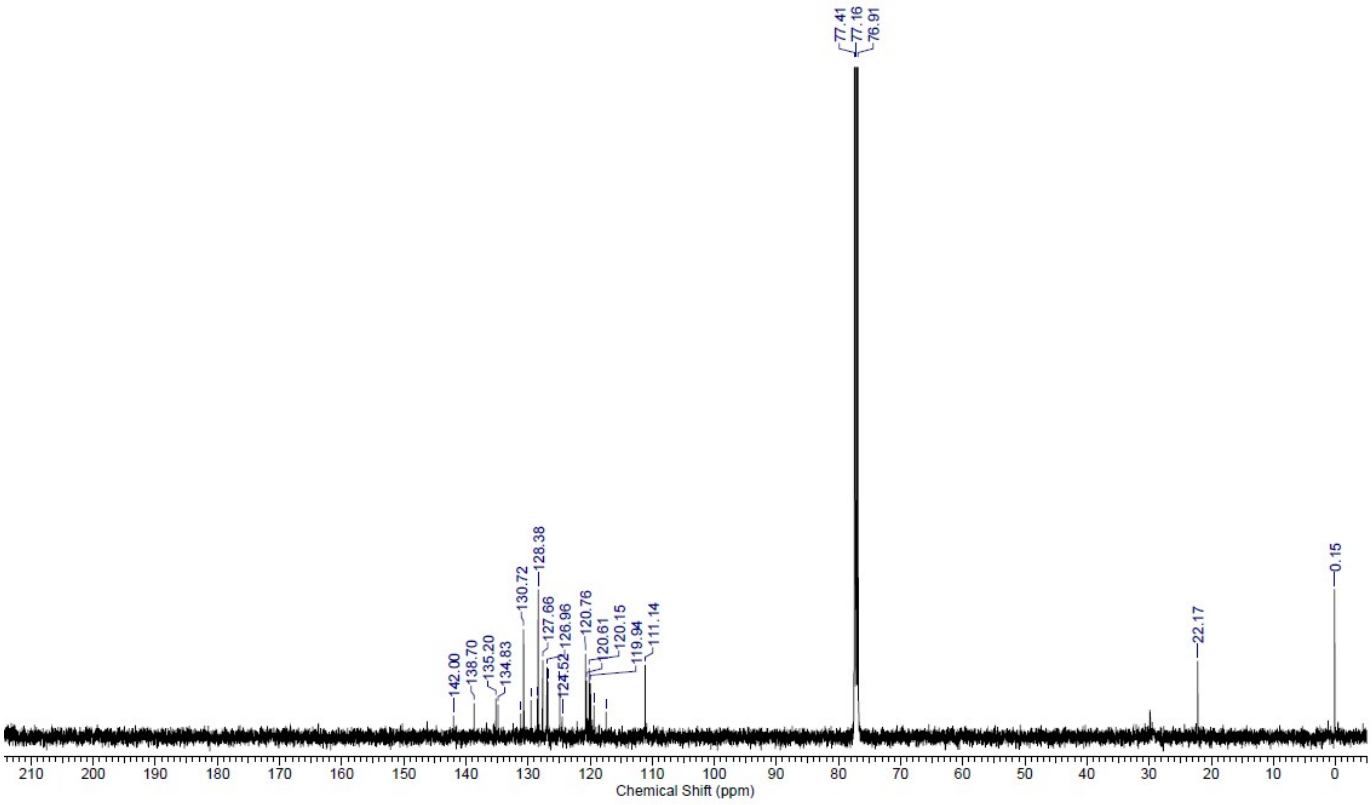


3-8. NMR Spectra of *8-Methyl-6-phenyl-11H-benzo[a]carbazole* **(1h)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

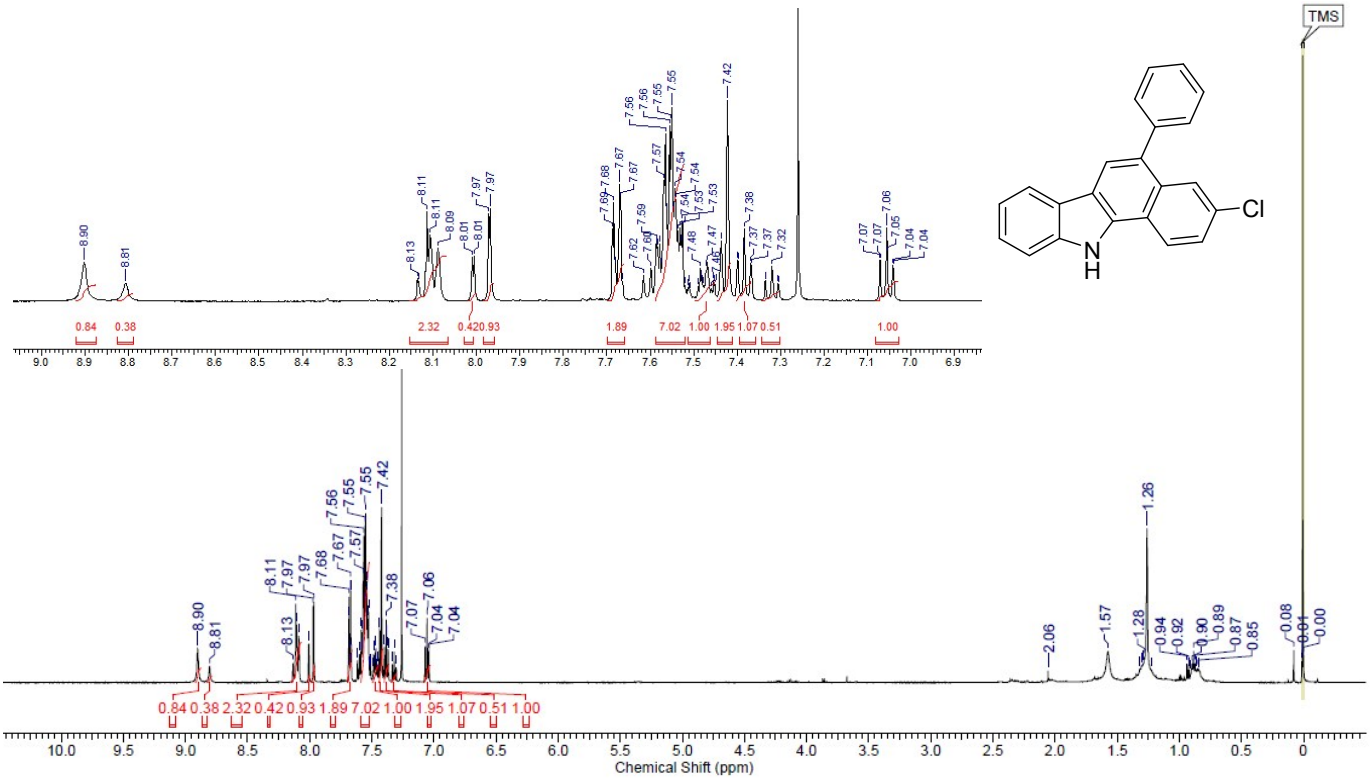


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

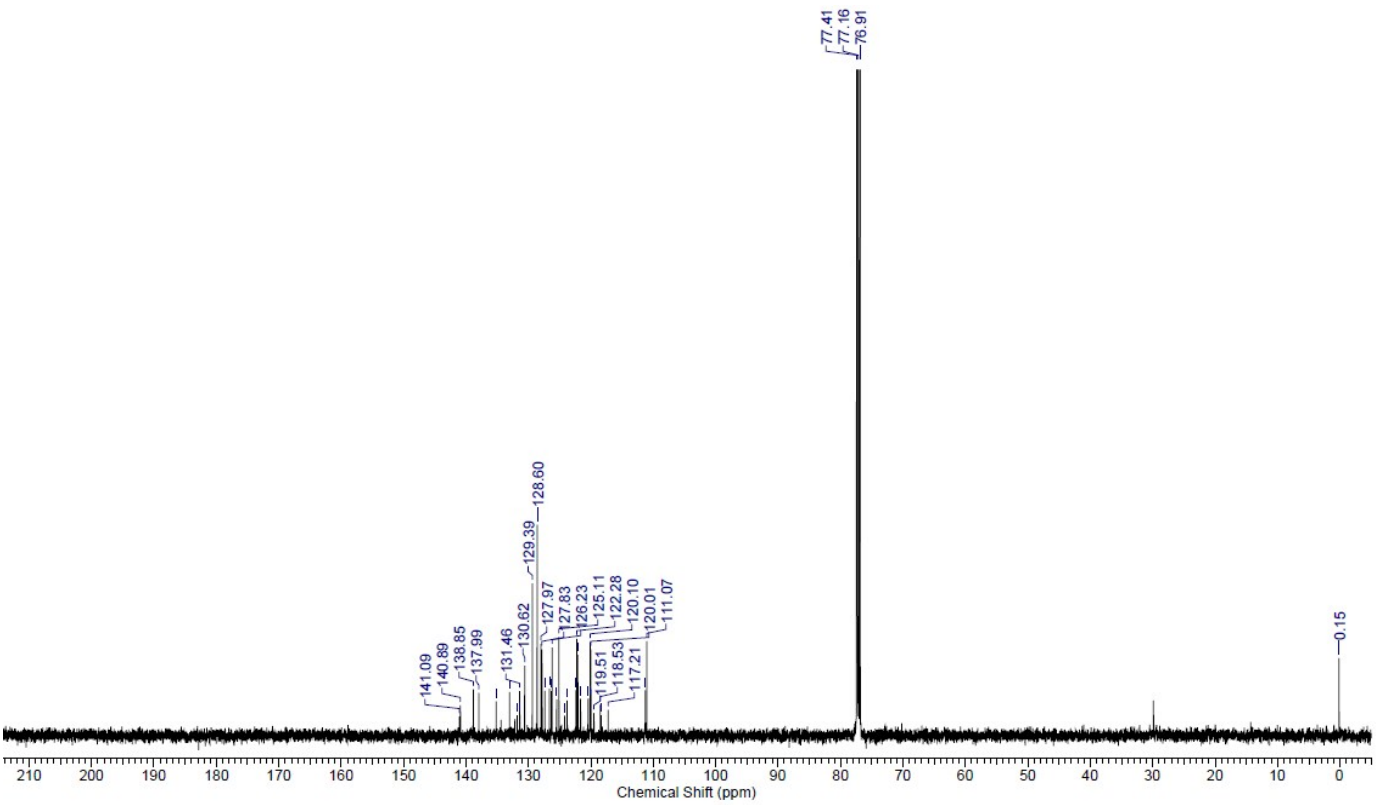


3-9. NMR Spectra of *8-Chloro-6-phenyl-11H-benzo[a]carbazole* **(1i)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

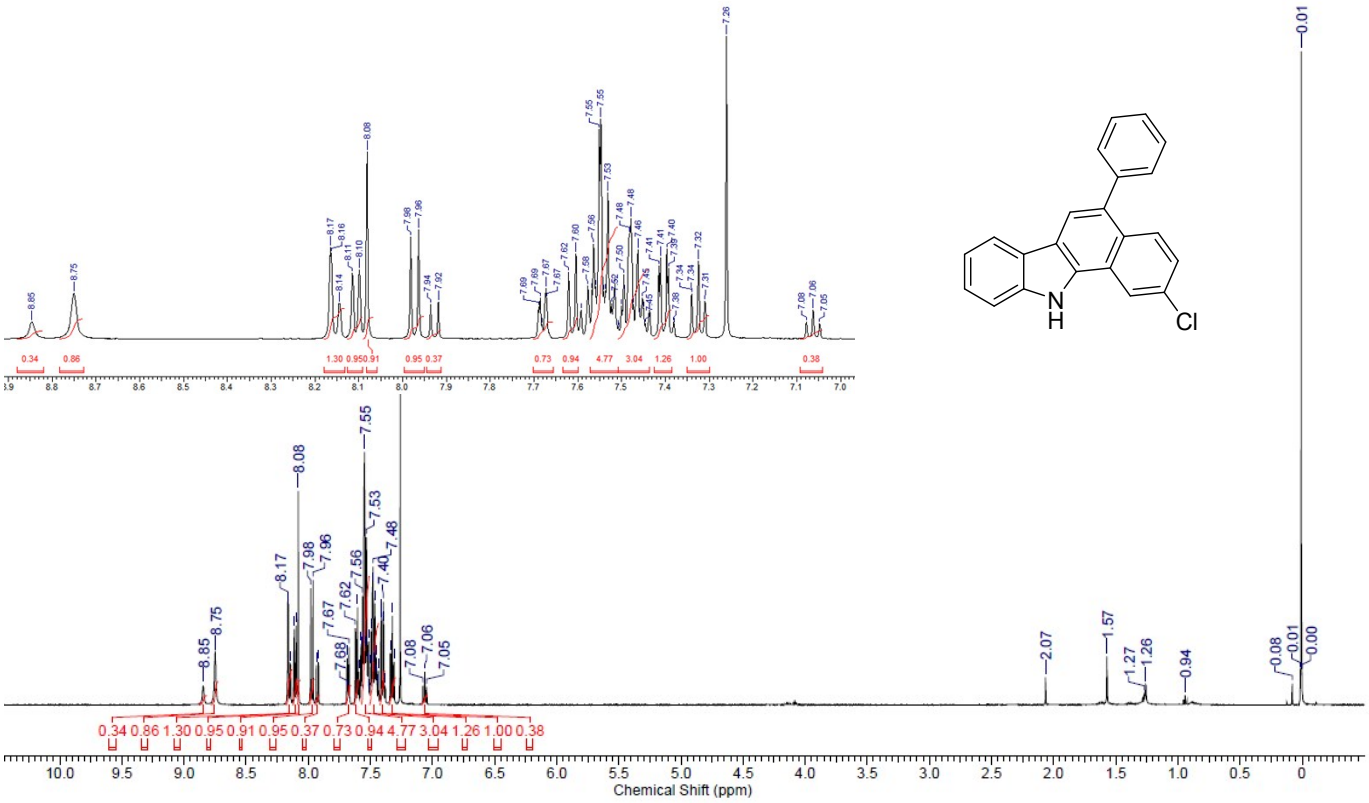


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

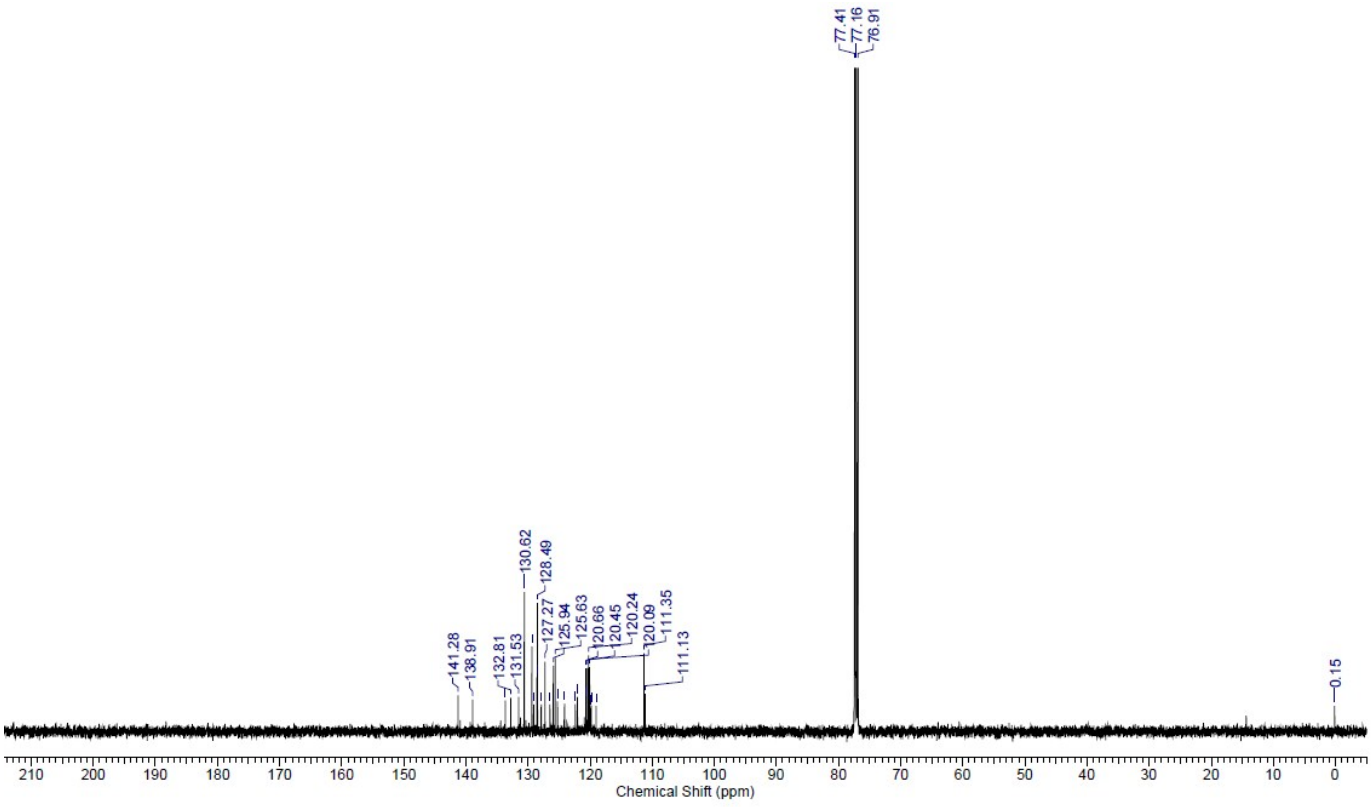


3-10. NMR Spectra of *9-Chloro-6-phenyl-11H-benzo[a]carbazole* **(1ja)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

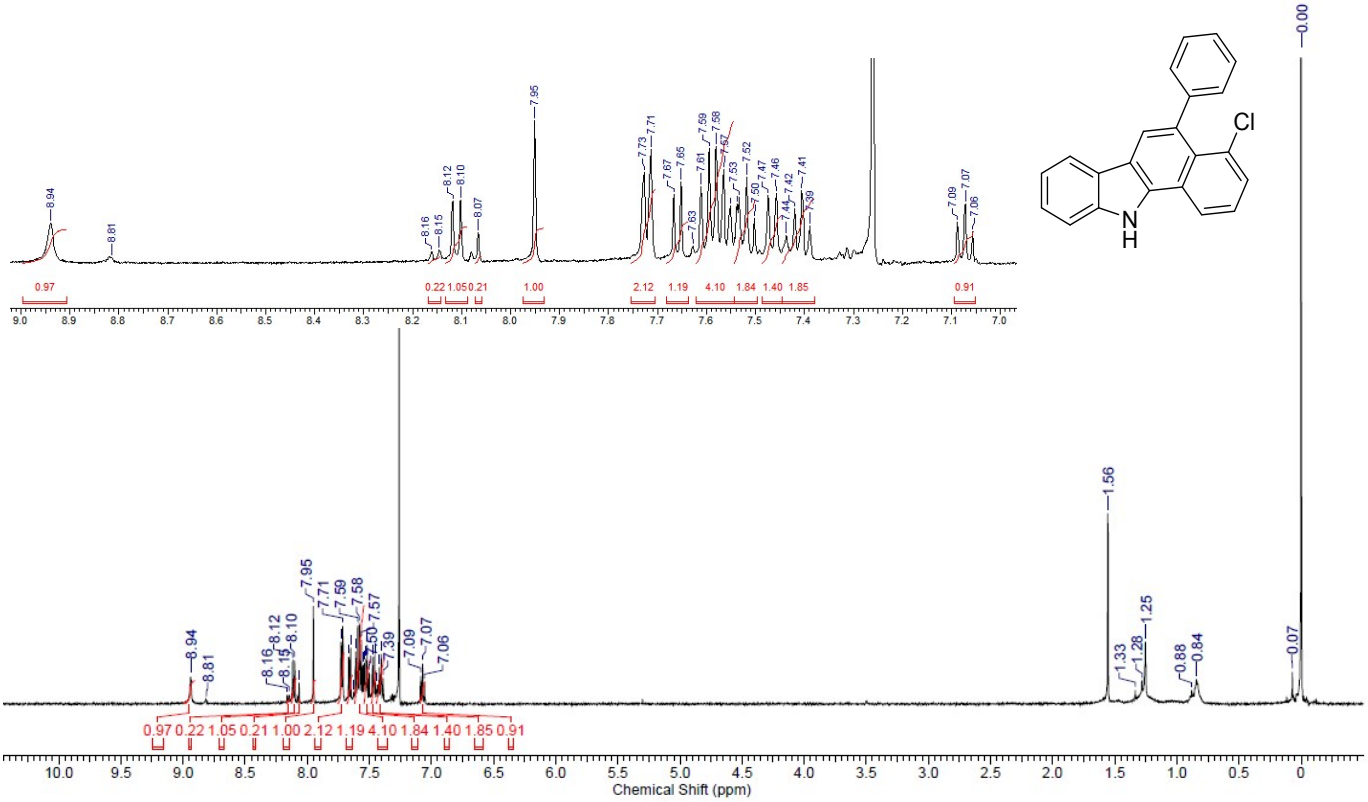


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

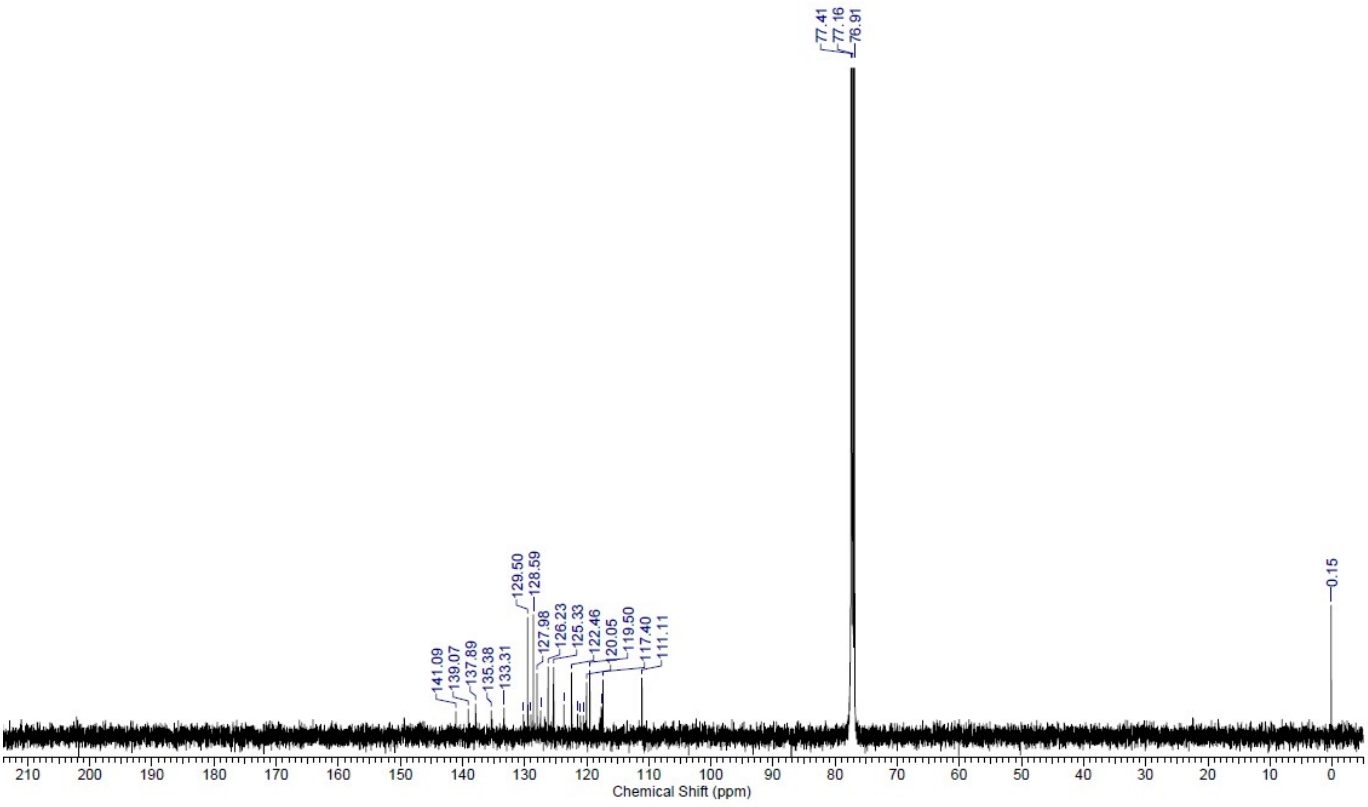


3-11. NMR Spectra of *7-Chloro-6-phenyl-11H-benzo[a]carbazole* **(1jb)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

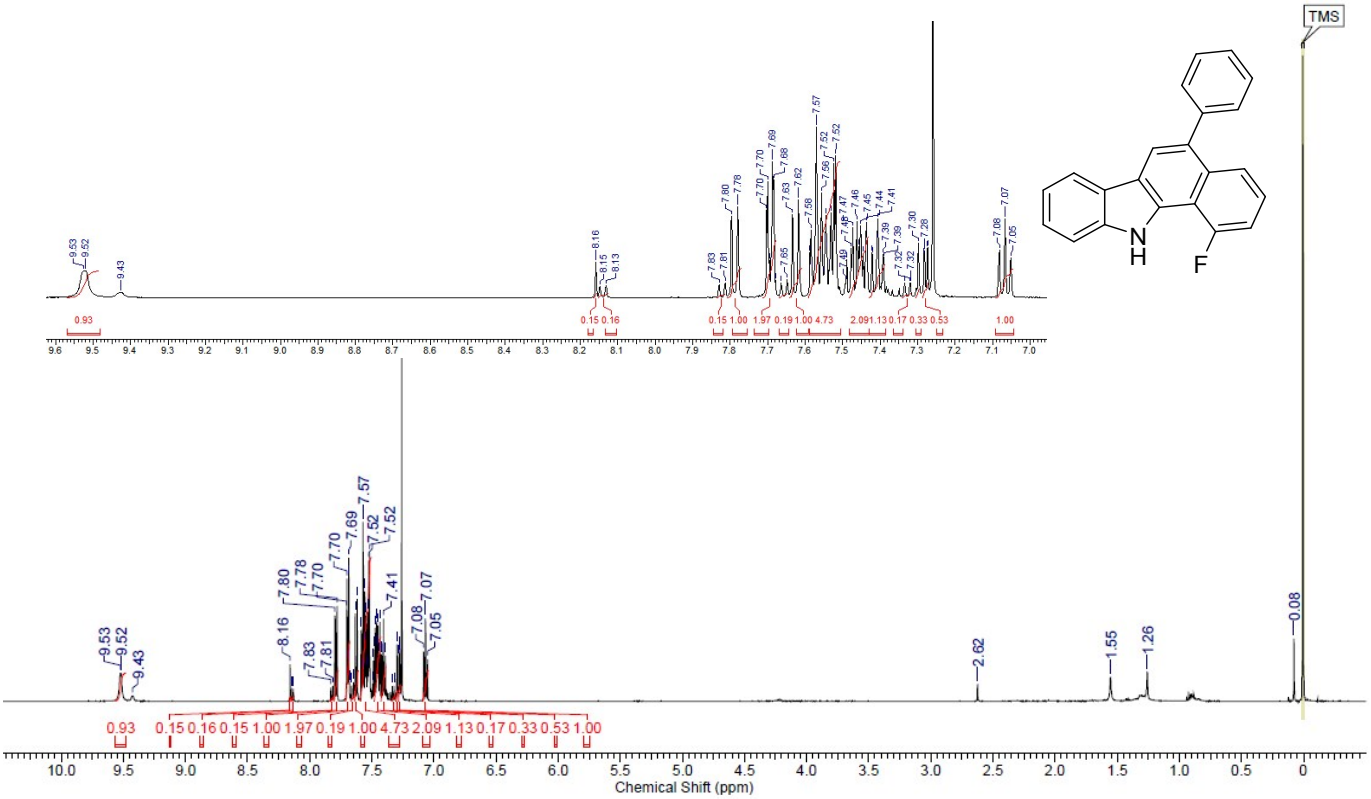


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

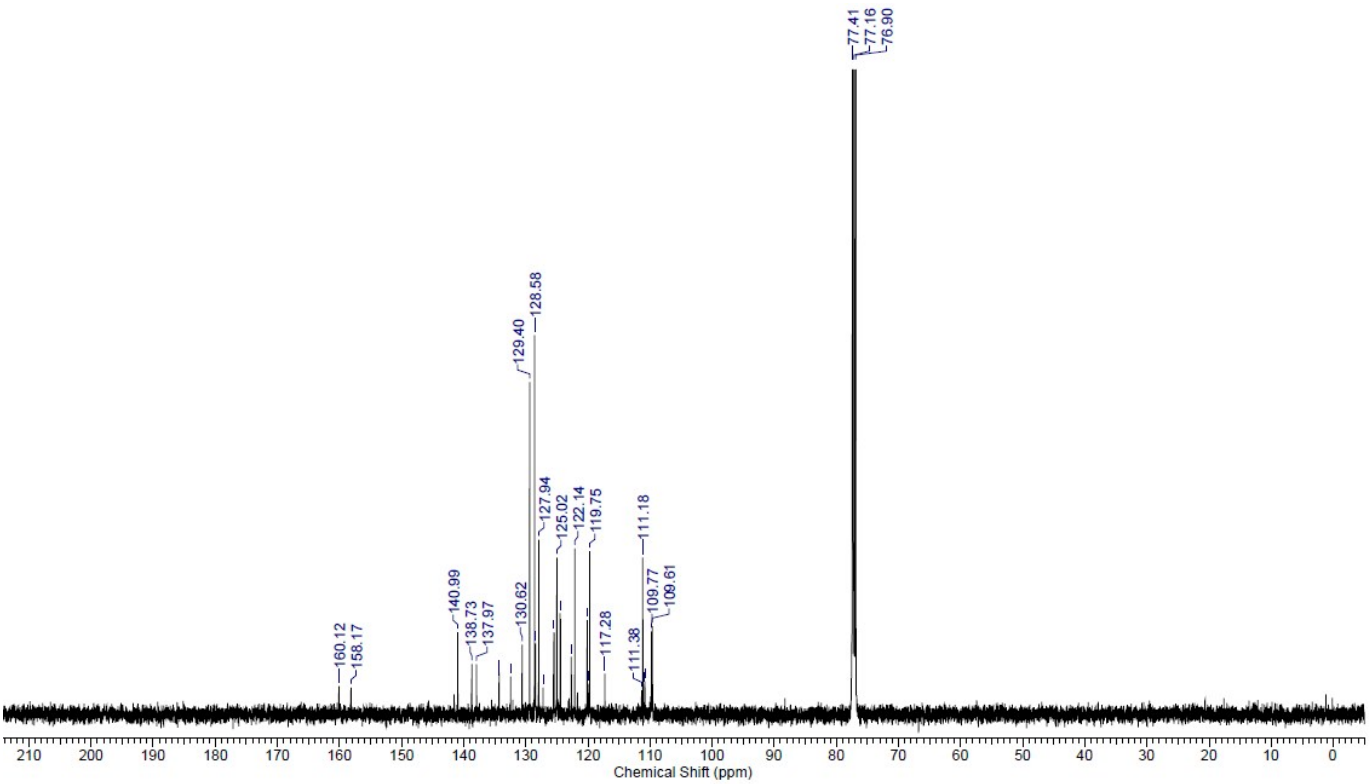


3-12. NMR Spectra of *10-Fluoro-6-phenyl-11H-benzo[a]carbazole* **(1k)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

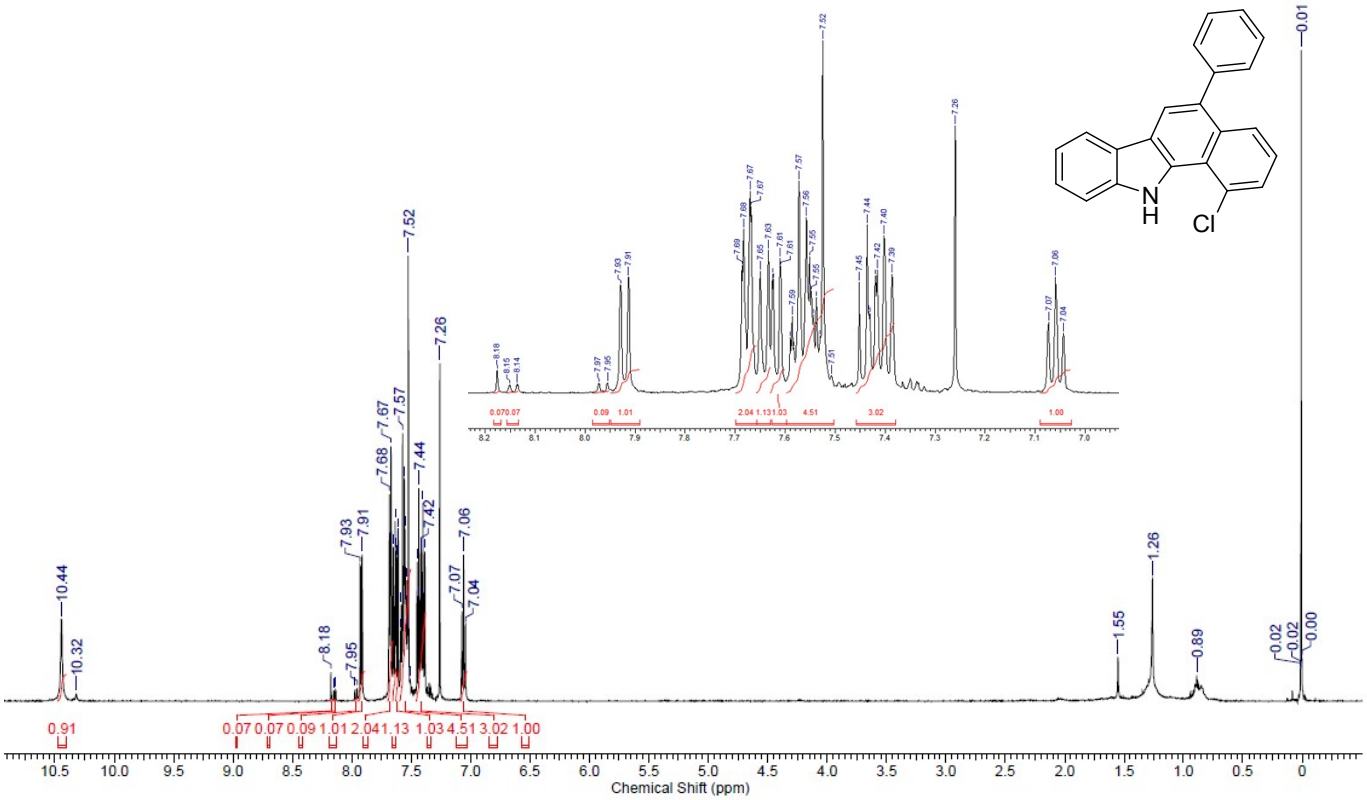


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

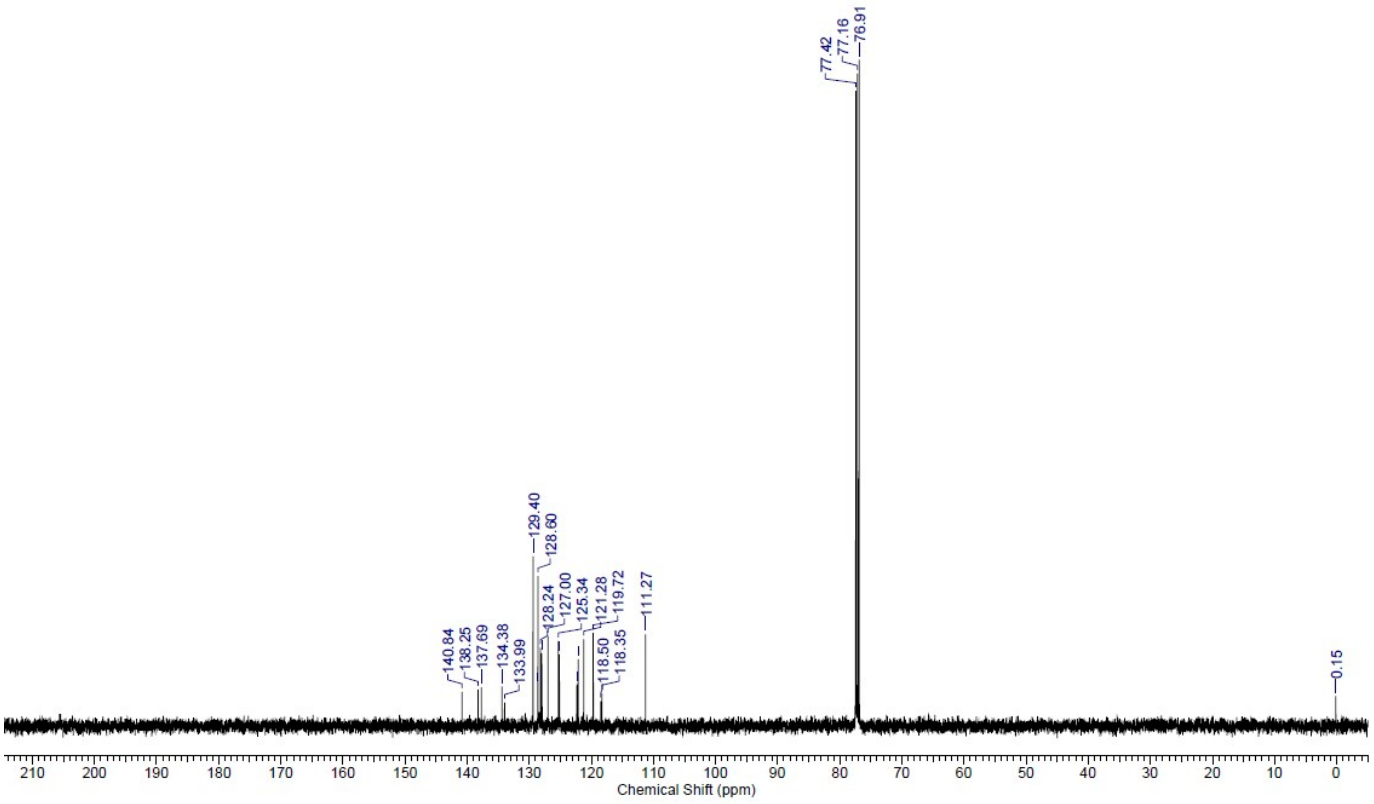


3-13. NMR Spectra of *10-Chloro-6-phenyl-11H-benzo[a]carbazole* **(1l)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

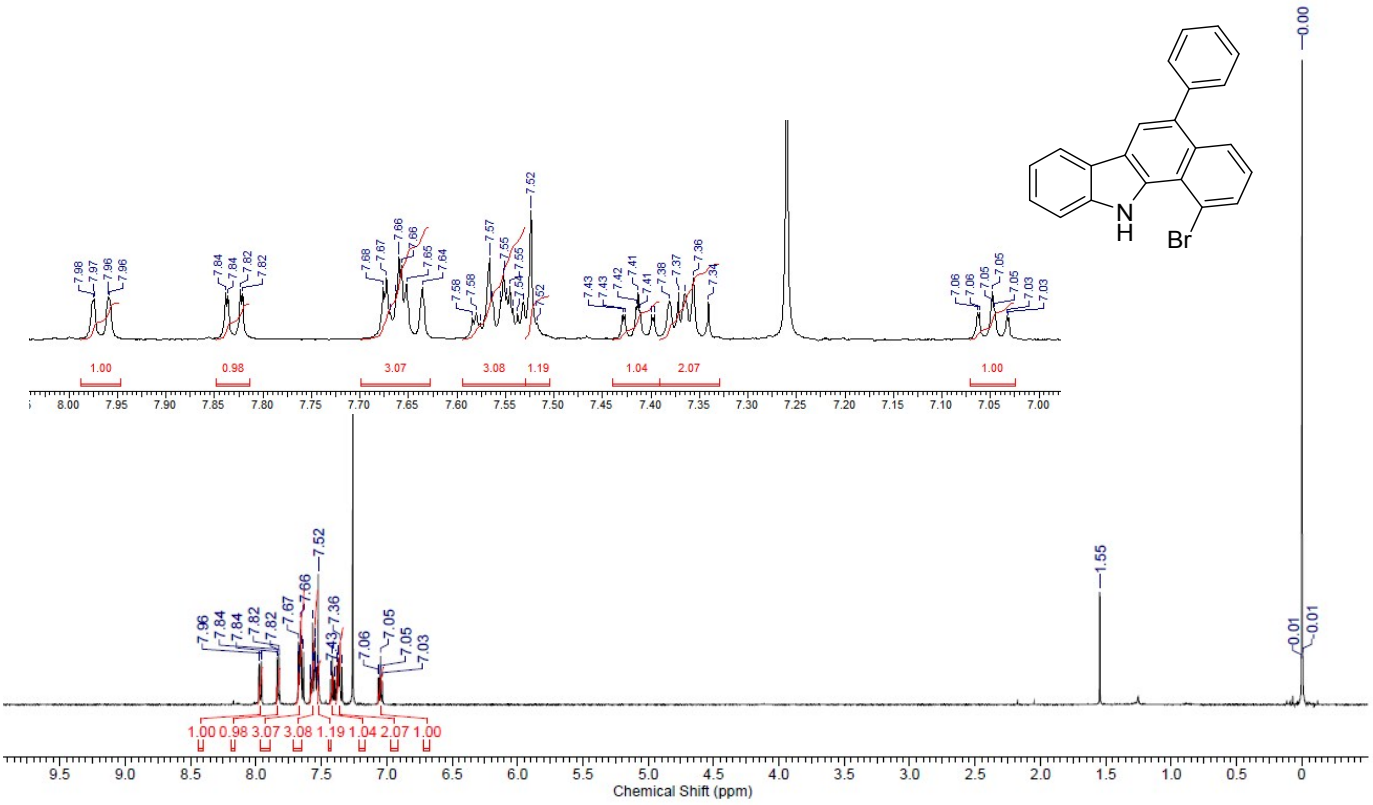


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

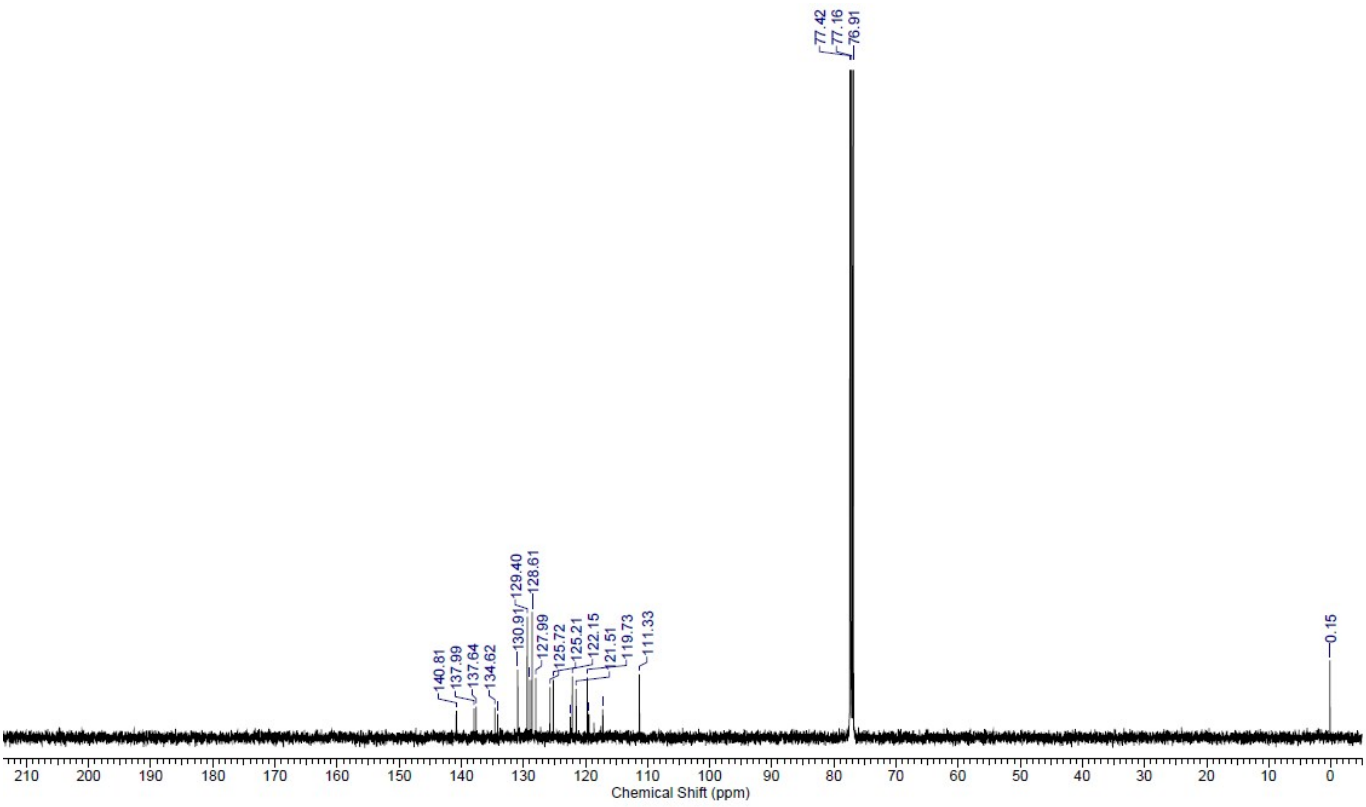


3-14. NMR Spectra of *10-Bromo-6-phenyl-11H-benzo[a]carbazole* **(1m)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)



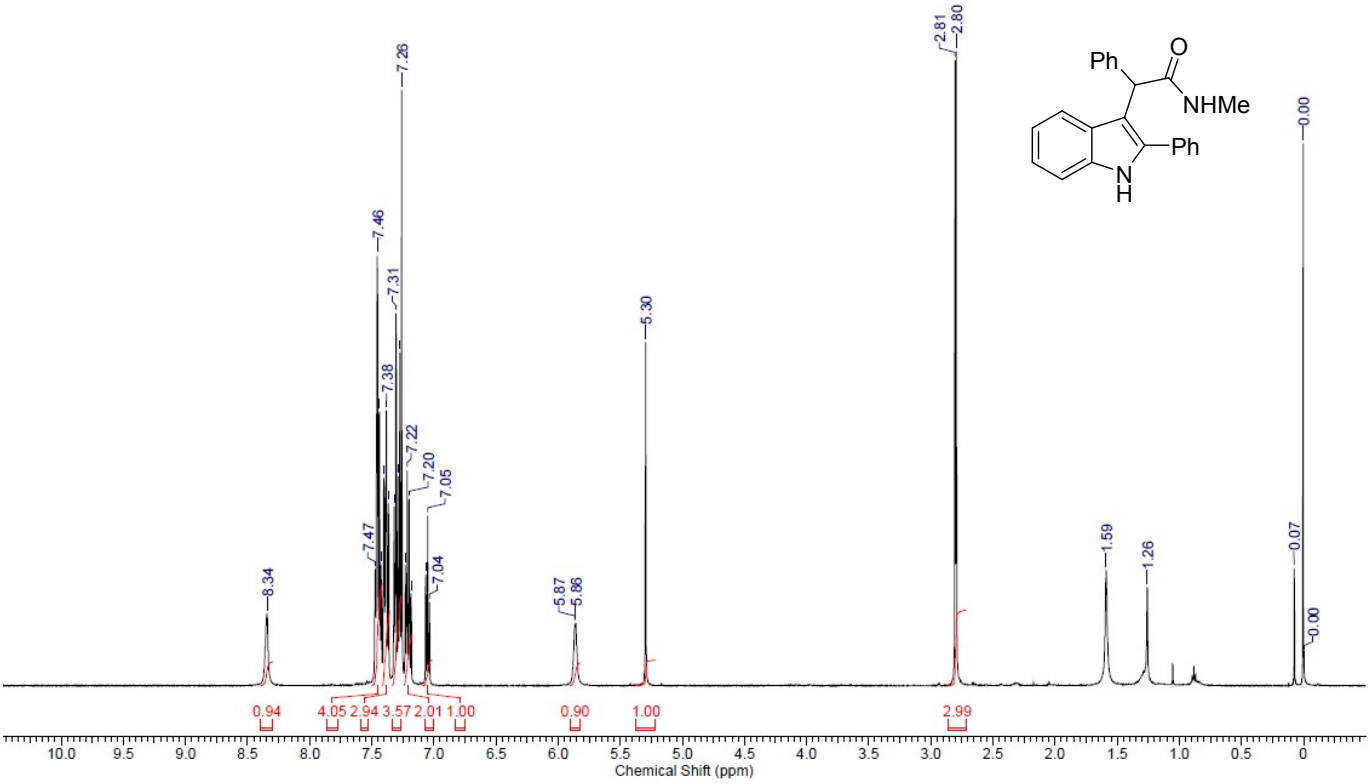
b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)



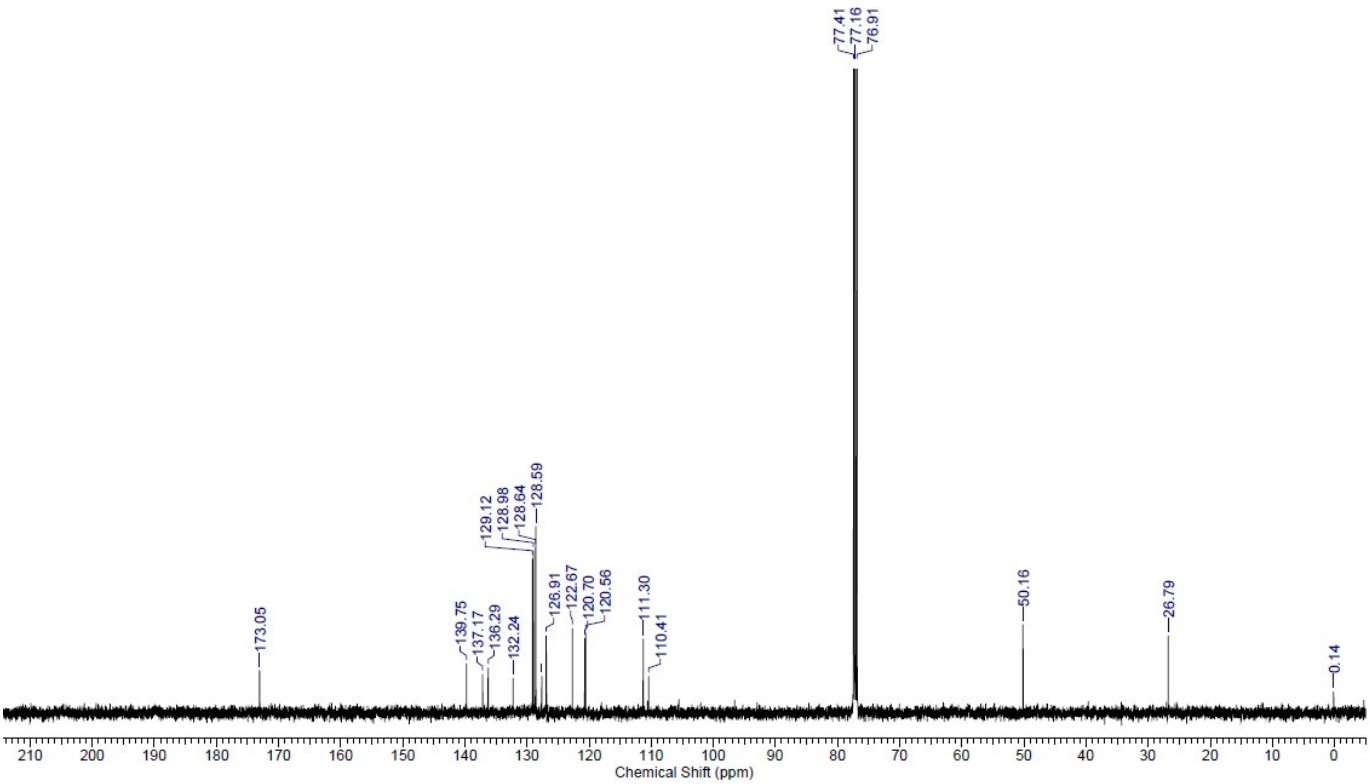
4. Spectroscopic Data of Acetamide Derivatives (**9**)

4-1. NMR Spectra of *N-Methyl-2-phenyl-2-(2-phenyl-1H-indol-3-yl)acetamide* **(9a)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

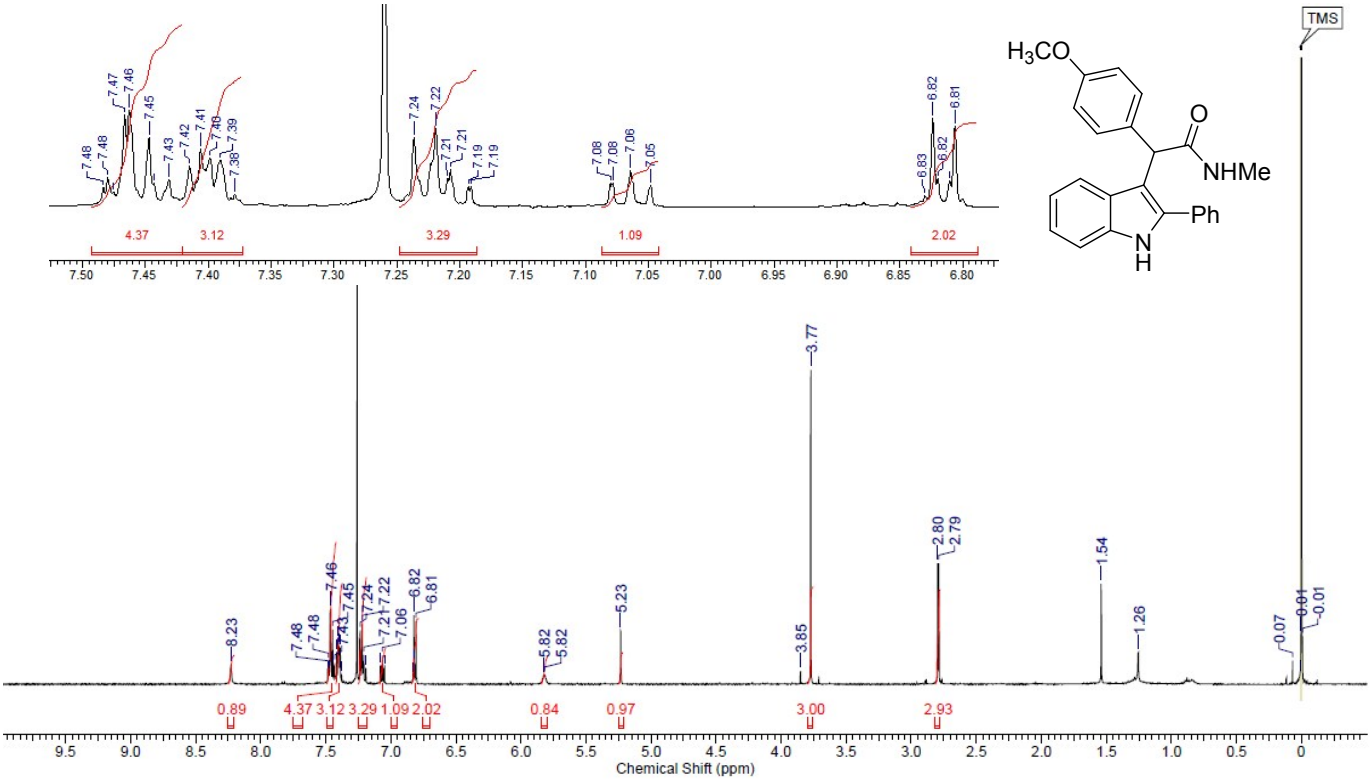


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)

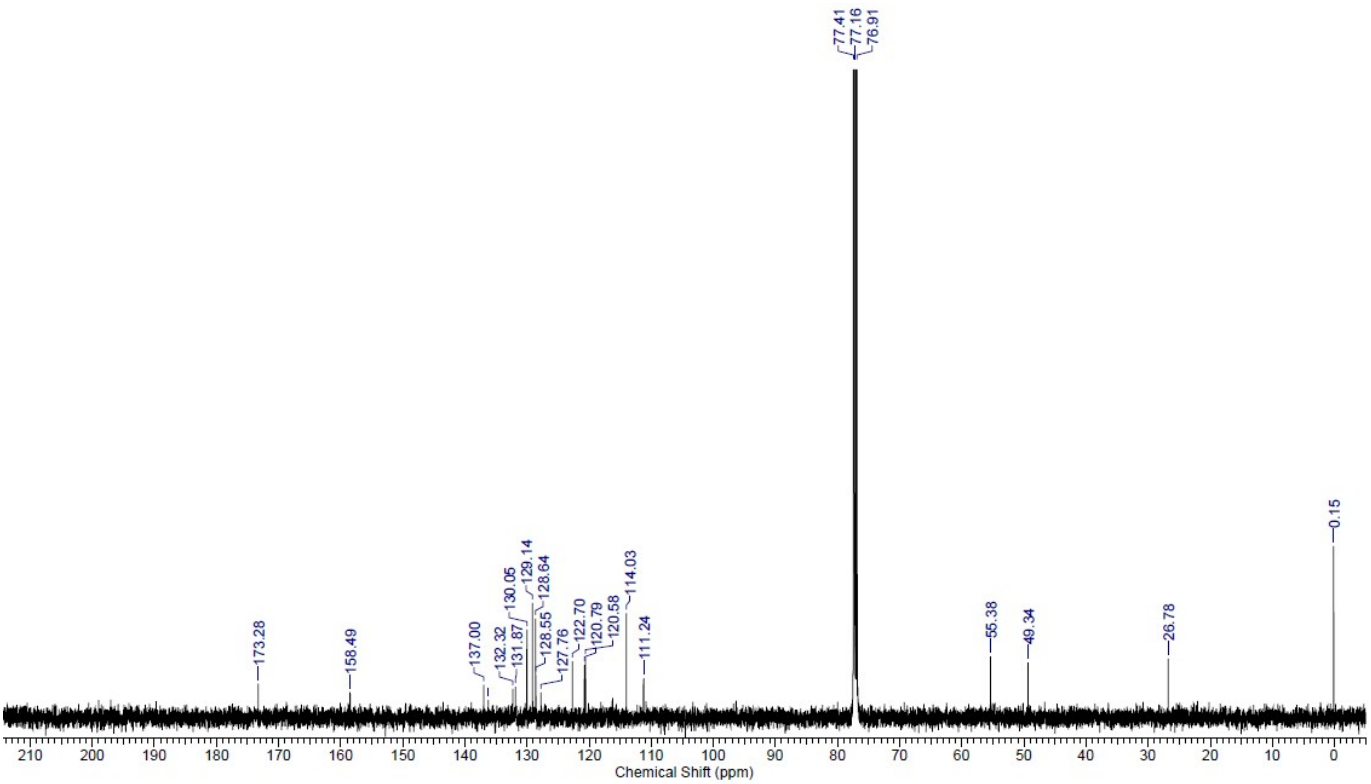


4.2. NMR Spectra of *2-(4-Methoxyphenyl)-N-methyl-2-(2-phenyl-1H-indol-3-yl)acetamide* **(9m)**

a) ^{1}H NMR Spectrum (500 MHz, $CDCl_3$)

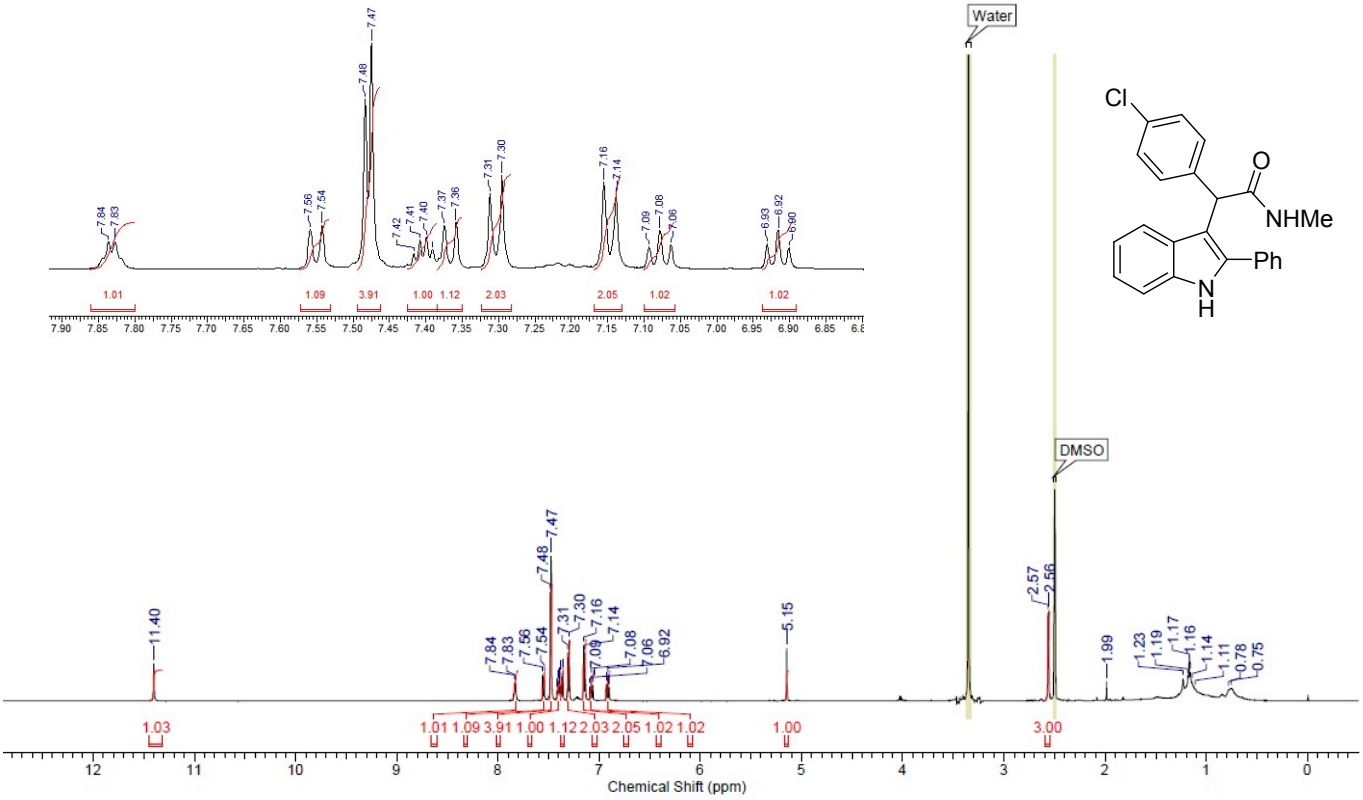


b) ^{13}C NMR Spectrum (125 MHz, $CDCl_3$)



4-3. NMR Spectra of *2-(4-Chlorophenyl)-N-methyl-2-(2-phenyl-1H-indol-3-yl)acetamide* **(9o)**

a) ^{1}H NMR Spectrum (500 MHz, DMSO-d_6)



b) ^{13}C NMR Spectrum (125 MHz, DMSO-d_6)