Electronic Supplementary Material (ESI) for New Journal of Chemistry.
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# Water-mediated and promoted eco-friendly one-pot synthesis of azaarene substituted isoxazoles

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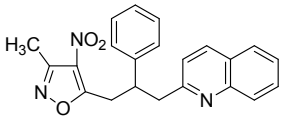
## Supporting Information

## Contents

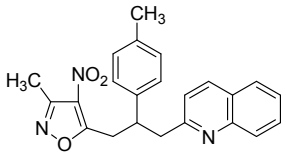
**General information:** All the melting points were determined on a Fisher-Johns melting point apparatus and are uncorrected. Analytical TLC was performed on Merck precoated 60 $F_{254}$ silica gel plates. Visualization was done by exposing to iodine vapour. IR spectra (KBr pellet) were recorded on a Perkin-Elmer BX series FT-IR spectrometer. $^1$H NMR spectra were recorded on a Varian Gemini 300 MHz spectrometer. $^{13}$C NMR spectra were recorded on a Bruker 75 MHz spectrometer. Chemical shift values are given in ppm ($\delta$) with tetramethyl silane as internal standard. High-resolution mass spectra (HRMS) were recorded on Q-TOF Micro mass spectrometer.

**3-Methyl-4-nitro-5-(2-phenyl-3-(quinolin-2-yl)propyl)isoxazole (3aa):**



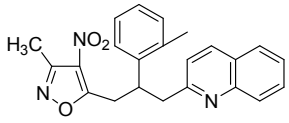

Yield: 90%, mp 140-142 $^o$C. IR (KBr): 2948, 2840, 1642, 1575, 1390, 1060 cm$^{-1}$. $^1$H NMR (300 MHz, $CDCl_3$) : $\delta$ 2.23 (s, 3H), 3.05-3.12 (m, 2H), 3.52-3.63 (m, 1H), 4.09-4.18 (m, 2H), 7.22-7.69 (m, 10H), 8.19 (d, $J$ = 8.6 Hz, 1H). $^{13}$C NMR (75 MHz, $CDCl_3$): δ 12.7, 32.9, 41.1, 43.9, 122.8, 123.3, 125.7, 126.0, 126.7, 127.2, 127.9, 128.0, 128.9, 129.2, 129.5, 130.5, 136.2, 144.7, 148.0, 156.2, 159.3, 161.5. HRMS (ESI-MS) calcd for $C_{22}H_{19}N_3NaO_3$ $(M + Na)^+$ 396.1324, found 396.1330.

**3-Methyl-4-nitro-5-(3-(quinolin-2-yl)-2-(*p*-tolyl)propyl)isoxazole (3ab):**




Yield: 85%, mp 136-138 $^o$C. IR (KBr): 2941, 2850, 1640, 1572, 1386, 1053 cm$^{-1}$. $^1$H NMR (300 MHz, $CDCl_3$) : $\delta$ 2.10 (s, 3H), 2.49 (s, 3H, $CH_3$), 3.03-3.15 (m, 2H), 3.68-3.79 (m, 1H), 4.02-4.12 (m, 2H), 7.22-7.55 (m, 9H), 8.16 (d, $J$ = 8.6 Hz, 1H). $^{13}$C NMR (75 MHz, $CDCl_3$): δ 11.7, 26.3, 32.0, 41.7, 43.6, 121.1, 122.8, 126.6, 126.7, 127.4, 127.8, 128.4, 128.9, 129.2, 129.5, 131.7, 134.5, 136.3, 144.0, 148.2, 156.1, 159.3, 160.9. HRMS (ESI-MS) calcd for $C_{23}H_{21}N_3NaO_3$ $(M + Na)^+$ 410.1481, found 410.1486.

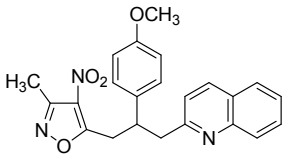
**3-Methyl-4-nitro-5-(3-(quinolin-2-yl)-2-(*o*-tolyl)propyl)isoxazole (3ac):**




Yield: 82%, mp 133-135 $^o$C. IR (KBr): 2952, 2845, 1647, 1570, 1382, 1065 cm$^{-1}$. $^1$H NMR (300 MHz, $CDCl_3$) : $\delta$ 2.08 (s, 3H), 2.40 (s, 3H), 3.04-3.12 (m, 2H), 3.48-3.62 (m, 1H), 4.00-4.14 (m, 2H),

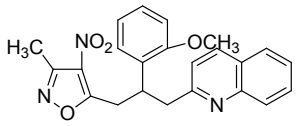
7.19-7.73 (m, 9H), 8.14 (d, $J$ = 8.6 Hz, 1H). $^{13}$C NMR (75 MHz, $CDCl_3$): δ 12.7, 25.4, 32.1, 41.0, 43.3, 122.9, 123.7, 126.4, 126.7, 127.2, 127.5, 128.5, 128.9, 129.6, 129.9, 130.4, 133.7, 137.3, 144.3, 148.4, 156.3, 159.5, 161.7. HRMS (ESI-MS) calcd for $C_{23}H_{21}N_3NaO_3$ $(M + Na)^+$ 410.1481, found 410.1481.

**5-(2-(4-Methoxyphenyl)-3-(quinolin-2-yl)propyl)-3-methyl-4-nitroisoxazole (3ad):**



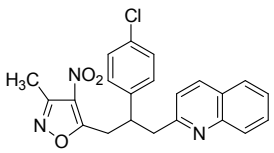

Yield: 90%, mp 137-139 °C. IR (KBr): 2946, 2851, 1640, 1573, 1380, 1060 cm$^{-1}$. $^1$H NMR (300 MHz, $CDCl_3$) : $\delta$ 2.11 (s, 3H), 3.02-3.13 (m, 2H), 3.51 (s, 3H, $OCH_3$), 3.65-3.70 (m, 1H), 4.01-4.12 (m, 2H), 7.25-7.76 (m, 9H), 8.17 (d, $J$ = 8.6 Hz, 1H). $^{13}$C NMR (75 MHz, $CDCl_3$): δ 12.0, 32.4, 41.2, 43.2, 60.4, 122.9, 123.7, 126.0, 126.9, 127.2, 127.8, 128.3, 128.5, 129.3, 129.9, 131.2, 137.3, 144.3, 149.1, 152.3, 156.2, 159.5, 161.3. HRMS (ESI-MS) calcd for $C_{23}H_{21}N_3NaO_4$ $(M + Na)^+$ 426.1430, found 426.1439.

**5-(2-(2-Methoxyphenyl)-3-(quinolin-2-yl)propyl)-3-methyl-4-nitroisoxazole (3ae):**




Yield: 85%, mp 130-132 °C. IR (KBr): 2940, 2843, 1644, 1570, 1381, 1058 cm$^{-1}$. $^1$H NMR (300 MHz, $CDCl_3$) : $\delta$ 2.07 (s, 3H), 3.00-3.15 (m, 2H), 3.57 (s, 3H, $OCH_3$), 3.63-3.69 (m, 1H), 4.03-4.08 (m, 2H), 7.18-7.73 (m, 9H), 8.20 (d, $J$ = 8.6 Hz, 1H). $^{13}$C NMR (75 MHz, $CDCl_3$): δ 11.7, 32.0, 41.5, 43.3, 60.1, 121.3, 123.7, 126.3, 126.7, 127.4, 127.8, 128.0, 128.6, 129.1, 129.7, 131.2, 136.6, 144.4, 148.6, 152.3, 156.2, 159.1, 161.1. HRMS (ESI-MS) calcd for $C_{23}H_{21}N_3NaO_4$ $(M + Na)^+$ 426.1430, found 426.1435.

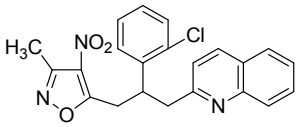
**5-(2-(4-Chlorophenyl)-3-(quinolin-2-yl)propyl)-3-methyl-4-nitroisoxazole (3af):**




Yield: 92%, mp 141-143 °C. IR (KBr): 2948, 2852, 1640, 1575, 1378, 1063 cm$^{-1}$. $^1$H NMR (300 MHz, $CDCl_3$) : $\delta$ 2.02 (s, 3H), 3.08-3.18 (m, 2H), 3.60-3.70 (m, 1H), 4.02-4.13 (m, 2H), 7.21-7.70 (m, 9H), 8.19 (d, $J$ = 8.6 Hz, 1H). $^{13}$C NMR (75 MHz, $CDCl_3$): δ 12.4, 32.3, 41.1, 43.6, 122.8, 123.9,

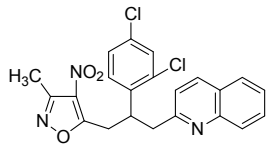
126.1, 126.8, 127.2, 127.5, 128.3, 128.6, 129.4, 129.6, 130.0, 132. 3, 136.9, 144.3, 149.3, 156.3, 159.4, 161.0. HRMS (ESI-MS) calcd for $C_{22}H_{18}ClN_3NaO_3$ $(M + Na)^+$ 430.0934, found 430.0941.

**5-(2-(2-Chlorophenyl)-3-(quinolin-2-yl)propyl)-3-methyl-4-nitroisoxazole (3ag):**



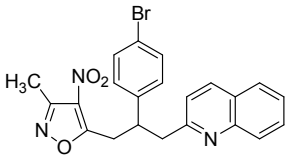
Yield: 75%, mp 144-146 $^oC$. IR (KBr): 2945, 2850, 1646, 1573, 1370, 1055 $cm^{-1}$. $^1H$ NMR (300 MHz, $CDCl_3$) : $\delta$ 2.09 (s, 3H), 3.06-3.18 (m, 2H), 3.61-3.68 (m, 1H), 4.05-4.14 (m, 2H), 7.20-7.75 (m, 9H), 8.16 (d, $J$ = 8.6 Hz, 1H). $^{13}C$ NMR (75 MHz, $CDCl_3$): δ 12.1, 32.3, 41.6, 43.1, 121.5, 123.2, 126.0, 126.7, 127.2, 127.5, 128.1, 128.8, 129.2, 129.7, 131.3, 134.2, 136.4, 144.5, 148.2, 156.1, 159.0, 161.7. HRMS (ESI-MS) calcd for $C_{22}H_{18}ClN_3NaO_3$ $(M + Na)^+$ 430.0934, found 430.0934.

**5-(2-(2,4-Dichlorophenyl)-3-(quinolin-2-yl)propyl)-3-methyl-4-nitroisoxazole (3ah):**



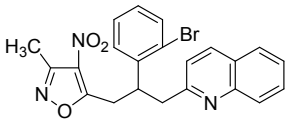
Yield: 72%, mp 149-151 $^oC$. IR (KBr): 2948, 2856, 1640, 1570, 1373, 1052 $cm^{-1}$. $^1H$ NMR (300 MHz, $CDCl_3$) : $\delta$ 2.19 (s, 3H), 3.06-3.14 (m, 2H), 3.60-3.68 (m, 1H), 4.08-4.17 (m, 2H), 7.23-7.72 (m, 8H), 8.21 (d, $J$ = 8.6 Hz, 1H). $^{13}C$ NMR (75 MHz, $CDCl_3$): δ 12.2, 32.9, 41.5, 43.4, 125.4, 126.2, 126.5, 127.3, 127.5, 128.0, 128.2, 129.8, 129.9, 131.3, 132.0, 134.5, 136.7, 144.8, 149.7, 156.4, 159.6, 161.5. HRMS (ESI-MS) calcd for $C_{22}H_{17}Cl_2N_3NaO_3$ $(M + Na)^+$ 464.0545, found 464.0545.

**5-(2-(4-Bromophenyl)-3-(quinolin-2-yl)propyl)-3-methyl-4-nitroisoxazole (3ai):**



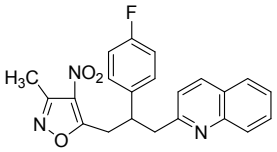
Yield: 90%, mp 153-155 $^oC$. IR (KBr): 2941, 2853, 1647, 1570, 1375, 1057 $cm^{-1}$. $^1H$ NMR (300 MHz, $CDCl_3$) : $\delta$ 2.12 (s, 3H), 3.05-3.15 (m, 2H), 3.62-3.68 (m, 1H), 4.02-4.11 (m, 2H), 7.22-7.73 (m, 9H), 8.23 (d, $J$ = 8.6 Hz, 1H). $^{13}C$ NMR (75 MHz, $CDCl_3$): δ 12.6, 32.9, 41.3, 43.6, 123.2, 124.7, 125.9, 126.3, 126.7, 127.2, 127.8, 128.3, 128.6, 129.4, 129.9, 130.6, 136.8, 144.4, 148.2, 156.1, 159.0, 160.6. HRMS (ESI-MS) calcd for $C_{22}H_{18}BrN_3NaO_3$ $(M + Na)^+$ 474.0429, found 474.0429.

**5-(2-(2-Bromophenyl)-3-(quinolin-2-yl)propyl)-3-methyl-4-nitroisoxazole (3aj):**



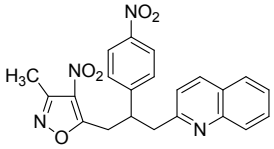
Yield: 82%, mp 150-152 $^{o}$C. IR (KBr): 2945, 2850, 1641, 1556, 1370, 1060 cm$^{-1}$. $^{1}$H NMR (300 MHz, $CDCl_3$) : $\delta$ 2.04 (s, 3H), 3.06-3.13 (m, 2H), 3.60-3.66 (m, 1H), 4.04-4.16 (m, 2H), 7.18-7.69 (m, 9H), 8.11 (d, $J$ = 8.6 Hz, 1H). $^{13}$C NMR (75 MHz, $CDCl_3$): δ 11.9, 32.3, 41.0, 43.5, 121.0, 123.4, 125.5, 126.1, 126.0, 127.1, 127.6, 128.3, 128.7, 129.2, 129.7, 131.0, 136.3, 144.1, 148.0, 156.4, 159.2, 161.6. HRMS (ESI-MS) calcd for $C_{22}H_{18}BrN_3NaO_3$ $(M + Na)^+$ 474.0429, found 474.0436.

**5-(2-(4-Fluorophenyl)-3-(quinolin-2-yl)propyl)-3-methyl-4-nitroisoxazole (3ak):**



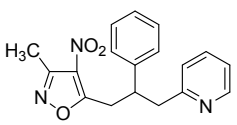
Yield: 85%, mp 143-145 $^{o}$C. IR (KBr): 2940, 2849, 1640, 1550, 1377, 1058 cm$^{-1}$. $^{1}$H NMR (300 MHz, $CDCl_3$) : $\delta$ 2.11 (s, 3H), 3.04-3.11 (m, 2H), 3.54-3.68 (m, 1H), 4.02-4.16 (m, 2H), 7.22-7.70 (m, 9H), 8.16 (d, $J$ = 8.6 Hz, 1H). $^{13}$C NMR (75 MHz, $CDCl_3$): δ 12.2, 32.7, 41.5, 43.5, 116.3, 122.9, 123.8, 125.9, 126.0, 126.7, 127.2, 127.9, 128.6, 129.0, 129.7, 130.2, 136.8, 144.4, 148.6, 156.1, 159.5, 160.6. HRMS (ESI-MS) calcd for $C_{22}H_{18}FN_3NaO_3$ $(M + Na)^+$ 414.1230, found 414.1230.

**3-Methyl-4-nitro-5-(2-(4-nitrophenyl)-3-(quinolin-2-yl)propyl)isoxazole (3al):**



Yield: 78%, mp 127-129 $^{o}$C. IR (KBr): 2948, 2850, 1644, 1555, 1370, 1055 cm$^{-1}$. $^{1}$H NMR (300 MHz, $CDCl_3$) : $\delta$ 2.10 (s, 3H), 3.06-3.17 (m, 2H), 3.61-3.70 (m, 1H), 4.05-4.16 (m, 2H), 7.20-7.70 (m, 9H), 8.19 (d, $J$ = 8.6 Hz, 1H). $^{13}$C NMR (75 MHz, $CDCl_3$): δ 12.0, 32.4, 41.1, 43.7, 122.7, 123.7, 124.9, 126.5, 126.8, 127.4, 127.6, 128.3, 129.4, 129.6, 130.3, 137.4, 141.3, 145.7, 147.9, 156.5, 159.2, 161.9. HRMS (ESI-MS) calcd for $C_{22}H_{18}N_4NaO_5$ $(M + Na)^+$ 441.1175, found 441.1182.

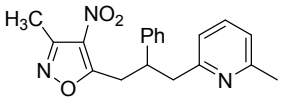
**3-Methyl-4-nitro-5-(2-phenyl-3-(pyridin-2-yl)propyl)isoxazole (3ba):**



Yield, 85%, mp 101-103 $^{o}$C. IR (KBr): 2945, 2848, 1640, 1570, 1380, 1056 cm$^{-1}$. $^{1}$H NMR (300 MHz, $CDCl_3$): $\delta$ 2.20 (s, 3H), 3.20-3.42 (m, 2H), 3.75-3.81 (m, 1H), 4.05-4.13 (m, 2H), 7.21-7.70 (m,

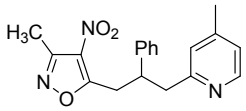
8H), 8.18 (d, $J$ = 8.6 Hz, 1H). $^{13}$C NMR (75 MHz, $CDCl_3$, δ ppm): $\delta$ 11.7, 33.6, 42.3, 44.5, 122.6, 123.7, 125.3, 126.0, 126.5, 128.3, 128.9, 130.3, 137.4, 145.9, 148.3, 156.6, 158.1, 162.4. HRMS (ESI-MS) calcd for $C_{18}H_{17}N_3NaO_3$ $(M + Na)^+$ 346.1168, found 346.1168.

**3-Methyl-5-(3-(6-methylpyridin-2-yl)-2-phenylpropyl)-4-nitroisoxazole (3ca):**



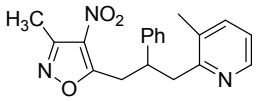

Yield, 80%, mp 106-108 °C. IR (KBr): 2952, 2845, 1647, 1565, 1385, 1060 $cm^{-1}$. $^1$H NMR (300 MHz, $CDCl_3$): $\delta$ 2.03 (s, 3H), 2.50 (s, 3H), 3.23-3.30 (m, 2H), 3.72-3.80 (m, 1H), 4.03-4.11 (m, 2H), 7.22-7.69 (m, 7H), 8.10 (d, $J$ = 8.6 Hz, 1H). $^{13}$C NMR (75 MHz, $CDCl_3$, δ ppm): $\delta$ 12.1, 24.1, 33.4, 42.7, 44.5, 122.9, 123.3, 125.7, 126.0, 126.5, 128.2, 128.4, 130.4, 136.7, 145.0, 148.7, 156.7, 159.5, 161.5. HRMS (ESI-MS) calcd for $C_{19}H_{19}N_3NaO_3$ $(M + Na)^+$ 360.1324, found 360.1334.

**3-Methyl-5-(3-(4-methylpyridin-2-yl)-2-phenylpropyl)-4-nitroisoxazole (3da):**



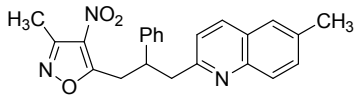

Yield, 82%, mp 100-102 °C. IR (KBr): 2950, 2855, 1642, 1561, 1380, 1055 $cm^{-1}$. $^1$H NMR (300 MHz, $CDCl_3$): $\delta$ 2.08 (s, 3H), 2.52 (s, 3H), 3.20-3.28 (m, 2H), 3.70-3.80 (m, 1H), 4.00-4.07 (m, 2H), 7.21-7.70 (m, 7H), 8.15 (d, $J$ = 8.6 Hz, 1H). $^{13}$C NMR (75 MHz, $CDCl_3$, δ ppm): $\delta$ 12.0, 24.3, 33.0, 42.5, 44.2, 121.0, 122.8, 125.2, 126.3, 126.8, 128.3, 128.7, 130.1, 136.5, 145.7, 148.2, 156.0, 158.4, 162.2. HRMS (ESI-MS) calcd for $C_{19}H_{19}N_3NaO_3$ $(M + Na)^+$ 360.1324, found 360.1329.

**3-Methyl-5-(3-(3-methylpyridin-2-yl)-2-phenylpropyl)-4-nitroisoxazole (3ea):**



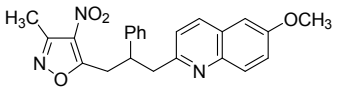

Yield, 75%, mp 107-109 °C. IR (KBr): 2948, 2851, 1643, 1566, 1384, 1050 $cm^{-1}$. $^1$H NMR (300 MHz, $CDCl_3$): $\delta$ 2.11 (s, 3H), 2.55 (s, 3H), 3.22-3.31 (m, 2H), 3.73-3.81 (m, 1H), 4.05-4.12 (m, 2H), 7.20-7.69 (m, 7H), 8.11 (d, $J$ = 8.6 Hz, 1H). $^{13}$C NMR (75 MHz, $CDCl_3$, δ ppm): $\delta$ 12.5, 24.9, 33.3, 42.2, 44.4, 121.1, 122.5, 125.1, 126.0, 126.6, 128.2, 128.8, 130.4, 136.8, 145.9, 148.0, 156.3, 158.1, 162.6. HRMS (ESI-MS) calcd for $C_{19}H_{19}N_3NaO_3$ $(M + Na)^+$ 360.1324, found 360.1334.

**3-Methyl-5-(3-(6-methylquinolin-2-yl)-2-phenylpropyl)-4-nitroisoxazole (3fa):**



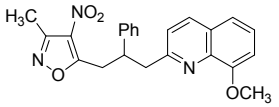
Yield: 80%, mp 118-120 °C. IR (KBr): 2949, 2856, 1642, 1570, 1380, 1059 $cm^{-1}$. $^1H$ NMR (300 MHz, $CDCl_3$) : $\delta$ 2.07 (s, 3H), 2.50 (s, 3H, $CH_3$), 3.04-3.16 (m, 2H), 3.52-3.68 (m, 1H), 4.04-4.17 (m, 2H), 7.19-7.71 (m, 9H), 8.15 (d, $J$ = 8.6 Hz, 1H). $^{13}C$ NMR (75 MHz, $CDCl_3$): δ 12.5, 26.9, 34.7, 41.3, 43.5, 122.9, 123.1, 126.6, 126.7, 127.4, 127.9, 128.5, 128.9, 129.5, 129.9, 131.7, 134.4, 136.0, 144.3, 148.2, 156.1, 159.8, 160.8. HRMS (ESI-MS) calcd for $C_{23}H_{21}N_3NaO_3$ $(M + Na)^+$ 410.1481, found 410.1481.

**5-(3-(6-Methoxyquinolin-2-yl)-2-phenylpropyl)-3-methyl-4-nitroisoxazole (3ga):**



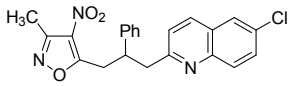

Yield: 78%, mp 123-125 °C. IR (KBr): 2952, 2846, 1645, 1570, 1375, 1054 $cm^{-1}$. $^1H$ NMR (300 MHz, $CDCl_3$) : $\delta$ 2.13 (s, 3H), 3.04-3.15 (m, 2H), 3.49 (s, 3H, $OCH_3$), 3.54-3.67 (m, 1H), 4.02-4.17 (m, 2H), 7.21-7.70 (m, 9H), 8.20 (d, $J$ = 8.6 Hz, 1H). $^{13}C$ NMR (75 MHz, $CDCl_3$): δ 11.8, 32.0, 41.4, 43.2, 60.6, 123.9, 125.1, 126.0, 126.6, 127.3, 127.6, 128.1, 128.6, 129.3, 129.9, 131.4, 139.8, 144.9, 149.7, 152.1, 156.1, 159.3, 161.8. HRMS (ESI-MS) calcd for $C_{23}H_{21}N_3NaO_4$ $(M + Na)^+$ 426.1430, found 426.1430.

**5-(3-(8-Methoxyquinolin-2-yl)-2-phenylpropyl)-3-methyl-4-nitroisoxazole (3ha):**



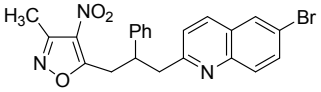

Yield: 75%, mp 119-121 °C. IR (KBr): 2948, 2851, 1640, 1580, 1372, 1061 $cm^{-1}$. $^1H$ NMR (300 MHz, $CDCl_3$) : $\delta$ 2.09 (s, 3H), 3.01-3.13 (m, 2H), 3.50 (s, 3H, $OCH_3$), 3.61-3.70 (m, 1H), 4.003-4.09 (m, 2H), 7.20-7.73 (m, 9H), 8.17 (d, $J$ = 8.6 Hz, 1H). $^{13}C$ NMR (75 MHz, $CDCl_3$): δ 12.4, 32.6, 41.9, 43.1, 60.7, 121.0, 123.3, 126.0, 126.7, 127.3, 127.9, 128.3, 128.8, 129.0, 129.9, 131.5, 136.0, 144.3, 148.2, 152.3, 156.8, 159.0, 161.1. HRMS (ESI-MS) calcd for $C_{23}H_{21}N_3NaO_4$ $(M + Na)^+$ 426.1430, found 426.1442.

**5-(3-(6-Chloroquinolin-2-yl)-2-phenylpropyl)-3-methyl-4-nitroisoxazole (3ia):**



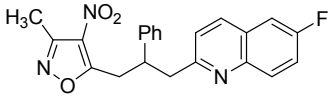

Yield: 90%, mp 129-131 °C. IR (KBr): 2945, 2850, 1644, 1570, 1371, 1058 $cm^{-1}$. $^1H$ NMR (300 MHz, $CDCl_3$) : $\delta$ 2.11 (s, 3H), 3.04-3.17 (m, 2H), 3.56-3.68 (m, 1H), 4.04-4.14 (m, 2H), 7.20-7.72 (m, 9H), 8.20 (d, $J$ = 8.6 Hz, 1H). $^{13}C$ NMR (75 MHz, $CDCl_3$): δ 11.8, 32.2, 41.3, 43.7, 122.6, 123.9, 126.2, 126.6, 127.4, 127.9, 128.1, 128.6, 129.4, 129.6, 130.3, 132.3, 136.9, 144.0, 148.3, 156.5, 159.3, 161.9. HRMS (ESI-MS) calcd for $C_{22}H_{18}ClN_3NaO_3$ $(M + Na)^+$ 430.0934, found 430.0934.

**5-(3-(6-Bromoquinolin-2-yl)-2-phenylpropyl)-3-methyl-4-nitroisoxazole (3ja):**



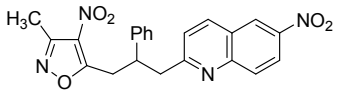
Yield: 85%, mp 135-137 °C. IR (KBr): 2948, 2850, 1645, 1576, 1369, 1063 $cm^{-1}$. $^1H$ NMR (300 MHz, $CDCl_3$) : $\delta$ 2.02 (s, 3H), 3.04-3.17 (m, 2H), 3.60-3.68 (m, 1H), 4.00-4.13 (m, 2H), 7.22-7.70 (m, 9H), 8.20 (d, $J$ = 8.6 Hz, 1H). $^{13}C$ NMR (75 MHz, $CDCl_3$): δ 11.6, 32.5, 41.2, 43.5, 122.0, 123.4, 125.8, 126.1, 126.9, 127.0, 127.9, 128.3, 128.5, 129.3, 129.8, 130.5, 136.5, 144.6, 148.4, 156.2, 159.1, 161.5. HRMS (ESI-MS) calcd for $C_{22}H_{18}BrN_3NaO_3$ $(M + Na)^+$ 474.0429, found 474.0439.

**5-(3-(6-Fluoroquinolin-2-yl)-2-phenylpropyl)-3-methyl-4-nitroisoxazole (3ka):**



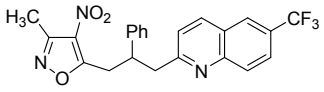
Yield: 75%, mp 126-128 °C. IR (KBr): 2951, 2854, 1646, 1557, 1370, 1056 $cm^{-1}$. $^1H$ NMR (300 MHz, $CDCl_3$) : $\delta$ 2.10 (s, 3H), 3.03-3.14 (m, 2H), 3.59-3.65 (m, 1H), 4.01-4.15 (m, 2H), 7.20-7.70 (m, 9H), 8.10 (d, $J$ = 8.6 Hz, 1H). $^{13}C$ NMR (75 MHz, $CDCl_3$): δ 12.6, 32.0, 41.0, 43.2, 116.7, 121.0, 123.6, 125.3, 126.3, 126.9, 127.1, 127.6, 128.2, 129.3, 129.8, 131.7, 136.4, 144.3, 148.4, 156.2, 159.0, 161.7. HRMS (ESI-MS) calcd for $C_{22}H_{18}FN_3NaO_3$ $(M + Na)^+$ 414.1230, found 414.1238.

**3-Methyl-4-nitro-5-(3-(6-nitroquinolin-2-yl)-2-phenylpropyl)isoxazole (3la):**



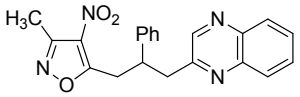
Yield: 80%, mp 115-117 °C. IR (KBr): 2945, 2849, 1640, 1570, 1375, 1062 $cm^{-1}$. $^1H$ NMR (300 MHz, $CDCl_3$) : $\delta$ 2.20 (s, 3H), 3.02-3.16 (m, 2H), 3.60-3.69 (m, 1H), 4.01-4.15 (m, 2H), 7.18-7.69 (m, 9H), 8.15 (d, $J$ = 8.6 Hz, 1H). $^{13}C$ NMR (75 MHz, $CDCl_3$): δ 11.9, 32.0, 41.3, 43.5, 122.2, 123.3, 125.0, 126.0, 126.5, 127.1, 127.8, 128.3, 129.2, 129.6, 130.3, 136.4, 141.0, 145.2, 148.9, 156.6, 159.4, 161.5. HRMS (ESI-MS) calcd for $C_{22}H_{18}N_4NaO_5$ $(M + Na)^+$ 441.1175, found 441.1187.

**3-Methyl-4-nitro-5-(2-phenyl-3-(6-(trifluoromethyl)quinolin-2-yl)propyl)isoxazole (3ma):**



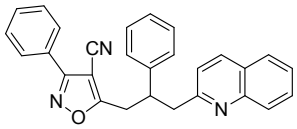
Yield: 72%, mp 111-113 °C. IR (KBr): 2950, 2852, 1640, 1573, 1378, 1060 $cm^{-1}$. $^1H$ NMR (300 MHz, $CDCl_3$) : $\delta$ 2.11 (s, 3H), 3.02-3.11 (m, 2H), 3.60-3.68 (m, 1H), 4.04-4.17 (m, 2H), 7.20-7.69 (m, 9H), 8.18 (d, $J$ = 8.6 Hz, 1H). $^{13}C$ NMR (75 MHz, $CDCl_3$): δ 12.0, 25.7, 32.2, 41.4, 43.6, 122.3, 123.7, 125.3, 126.2, 126.7, 127.1, 127.7, 128.1, 128.9, 129.4, 129.6, 130.3, 136.4, 144.2, 148.2, 156.3, 159.4, 161.5. HRMS (ESI-MS) calcd for $C_{23}H_{18}F_3N_3NaO_3$ $(M + Na)^+$ 464.1198, found 464.1198.

**3-Methyl-4-nitro-5-(2-phenyl-3-(quinoxalin-2-yl)propyl)isoxazole (3na):**



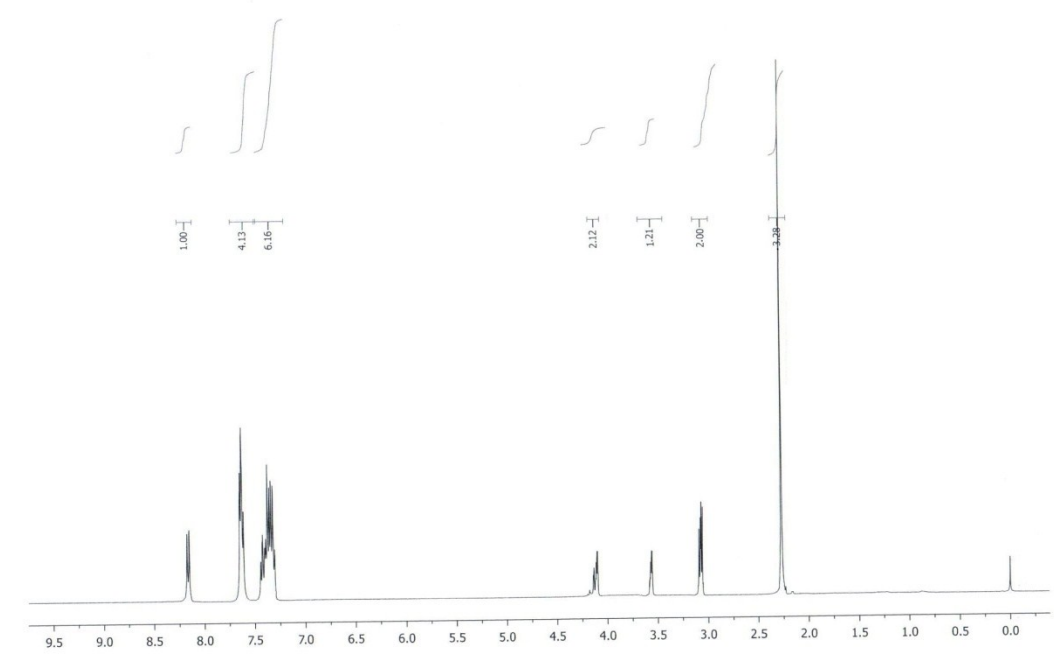

Yield: 52%, mp 150-152 °C. IR (KBr): 2945, 2843, 1640, 1570, 1380, 1055 $cm^{-1}$. $^1H$ NMR (300 MHz, $CDCl_3$) : $\delta$ 2.01 (s, 3H), 3.20-3.34 (m, 2H), 3.60-3.67 (m, 1H), 4.02-4.13 (m, 2H), 7.20-7.70 (m, 9H), 8.15 (d, $J$ = 8.6 Hz, 1H). $^{13}C$ NMR (75 MHz, $CDCl_3$): δ 12.2, 33.4, 41.1, 44.1, 125.7, 126.0, 126.5, 127.7, 128.2, 128.5, 128.9, 129.0, 129.8, 130.4, 136.7, 142.5, 145.7, 149.5, 156.7, 157.3, 159.5. HRMS (ESI-MS) calcd for $C_{22}H_{19}N_3NaO_3$ $(M + Na)^+$ 397.1277, found 397.1289.

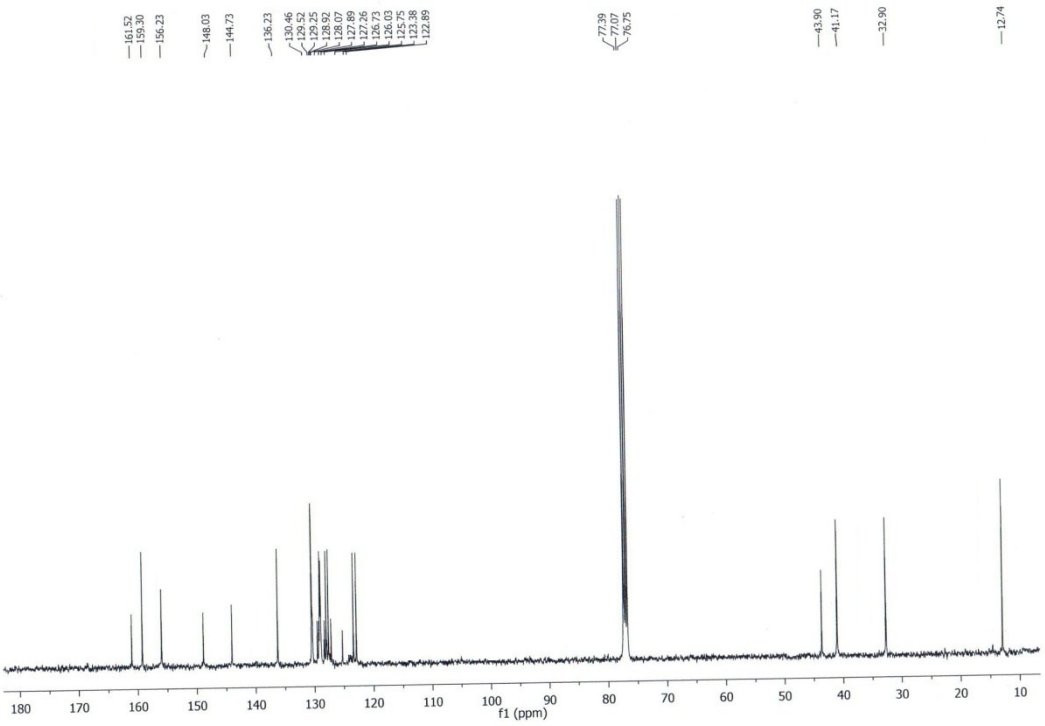
**3-Phenyl-5-(2-phenyl-3-(quinolin-2-yl)propyl)isoxazole-4-carbonitrile (5):**




Yield: 82%, mp 151-153 °C. IR (KBr): 2948, 2840, 2195, 1640, 1060 $cm^{-1}$. $^1H$ NMR (300 MHz, $CDCl_3$): $\delta$ 3.13-3.18 (m, 2H), 3.49-3.54 (m, 1H), 4.15-4.19 (m, 2H), 7.20-7.80 (m, 15H), 8.22 (d, $J$ = 8.5 Hz, 1H). HRMS (ESI-MS) calcd for $C_{28}H_{21}N_3NaO$ $(M + Na)^+$ 438.1582, found 438.1589.

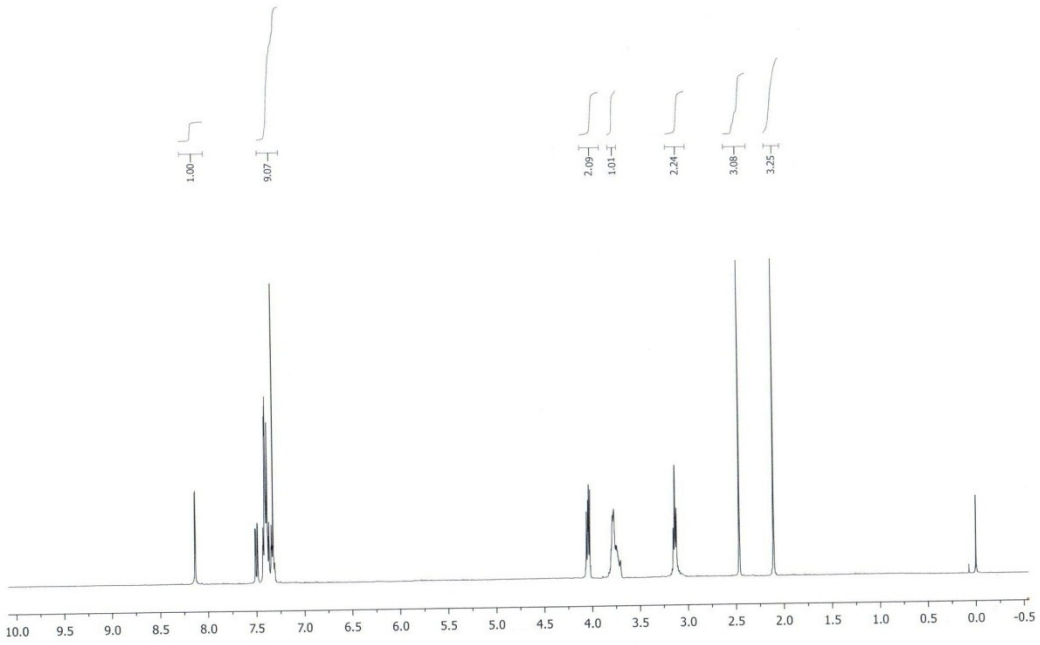
**H NMR of compound 3aa**



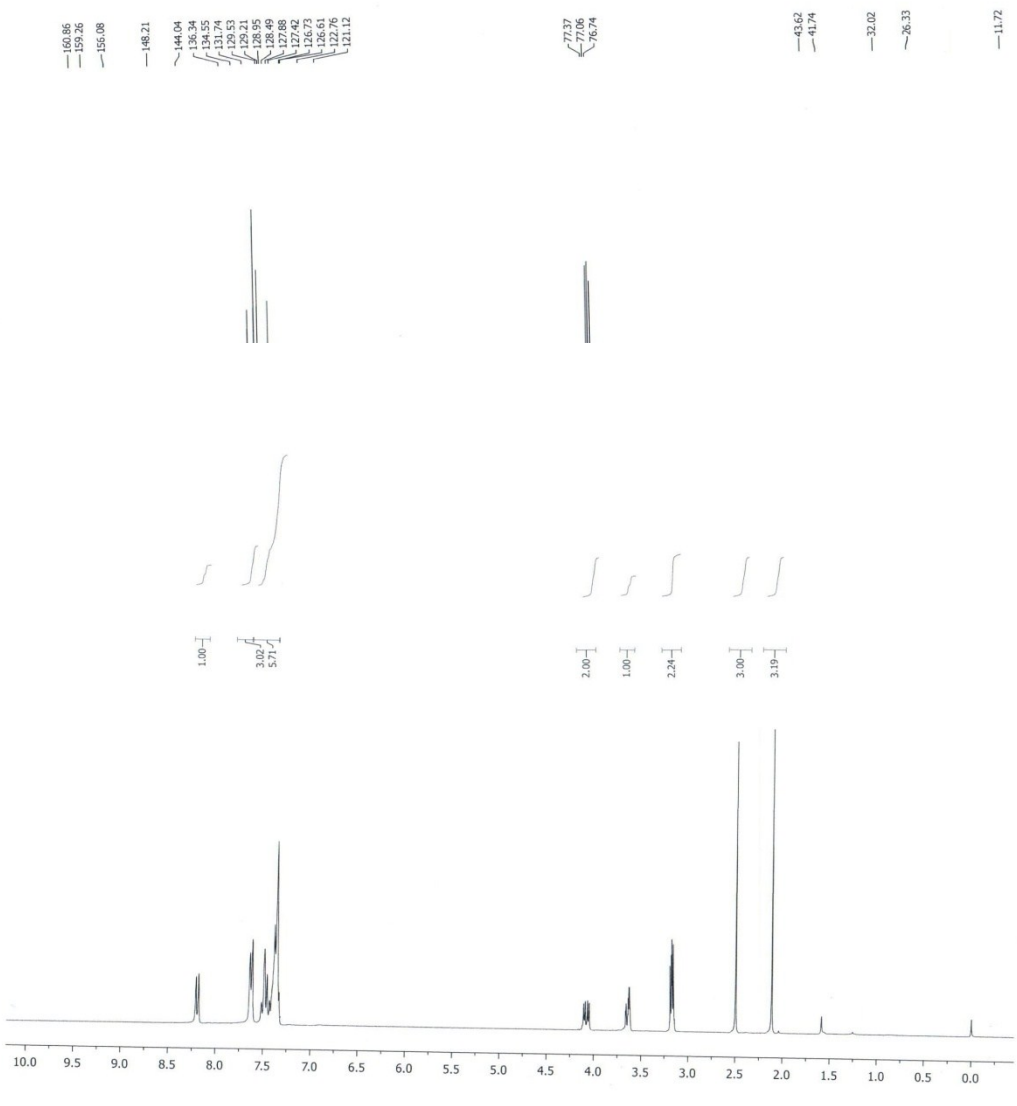




**$^{13}$C NMR of compound 3aa**

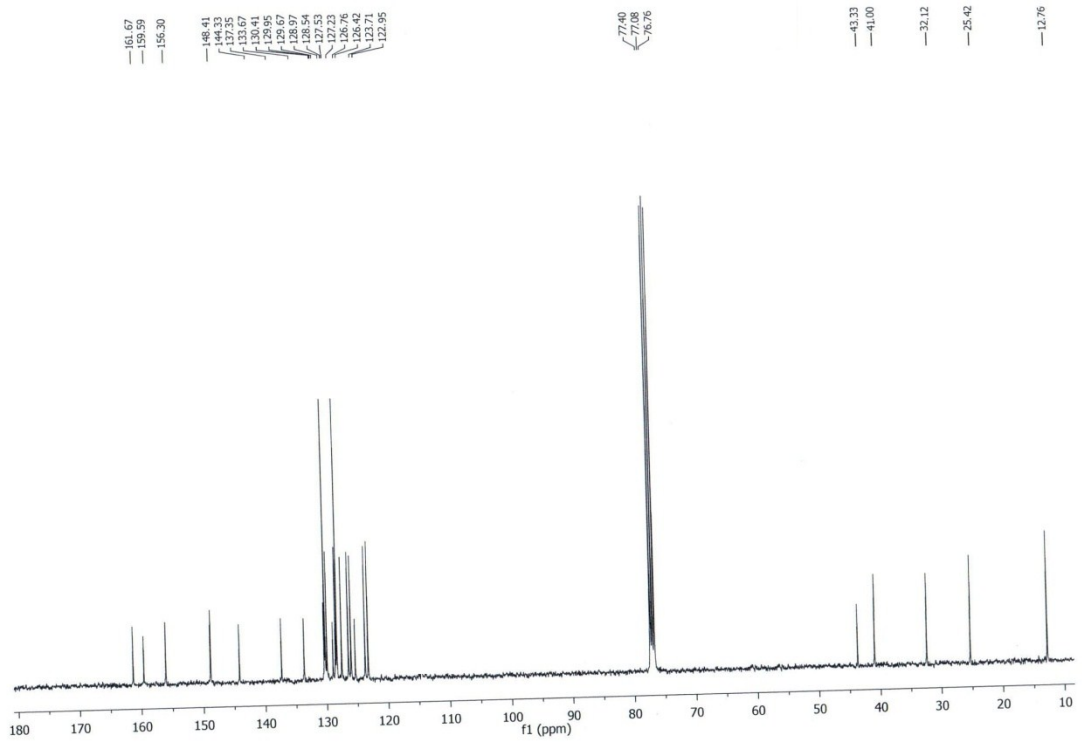
**$^{1}$H NMR of compound 3ab**



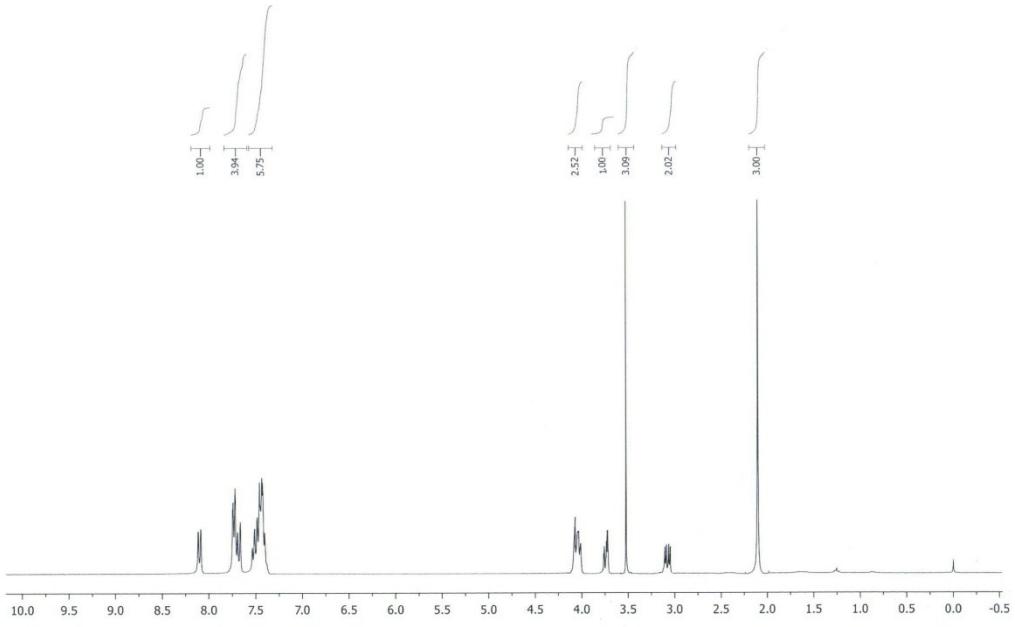

## $^{13}$C NMR of compound 3ab



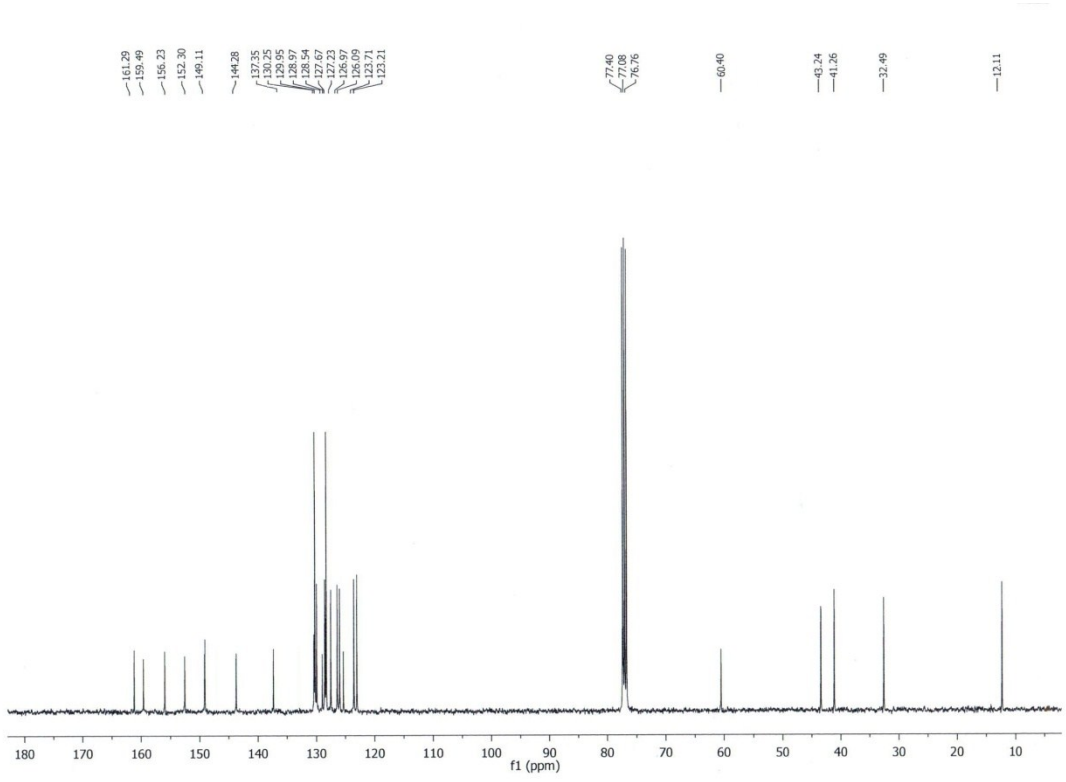
**$^{1}$H NMR of compound 3ac**



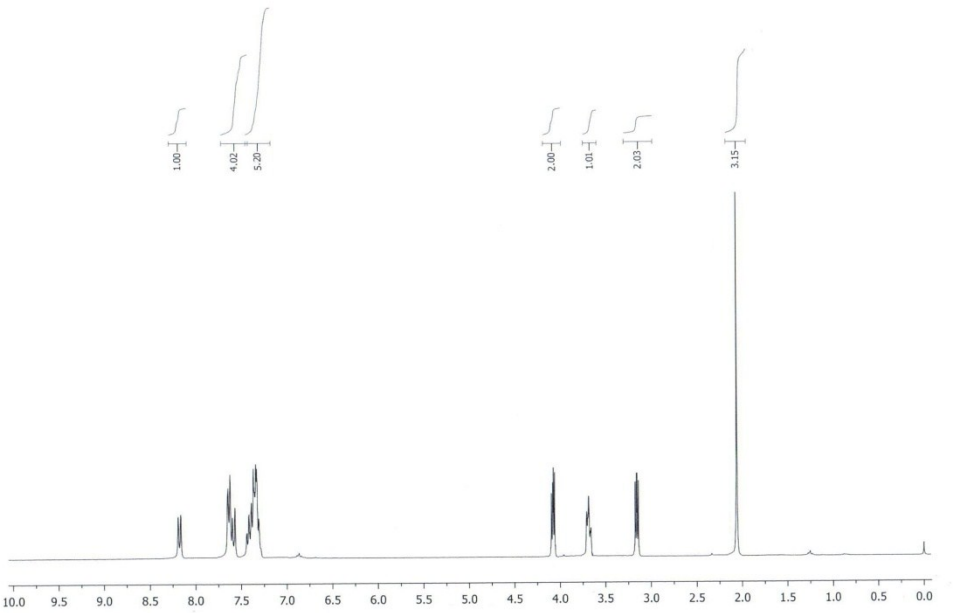

**$^{13}$C NMR of compound 3ac**



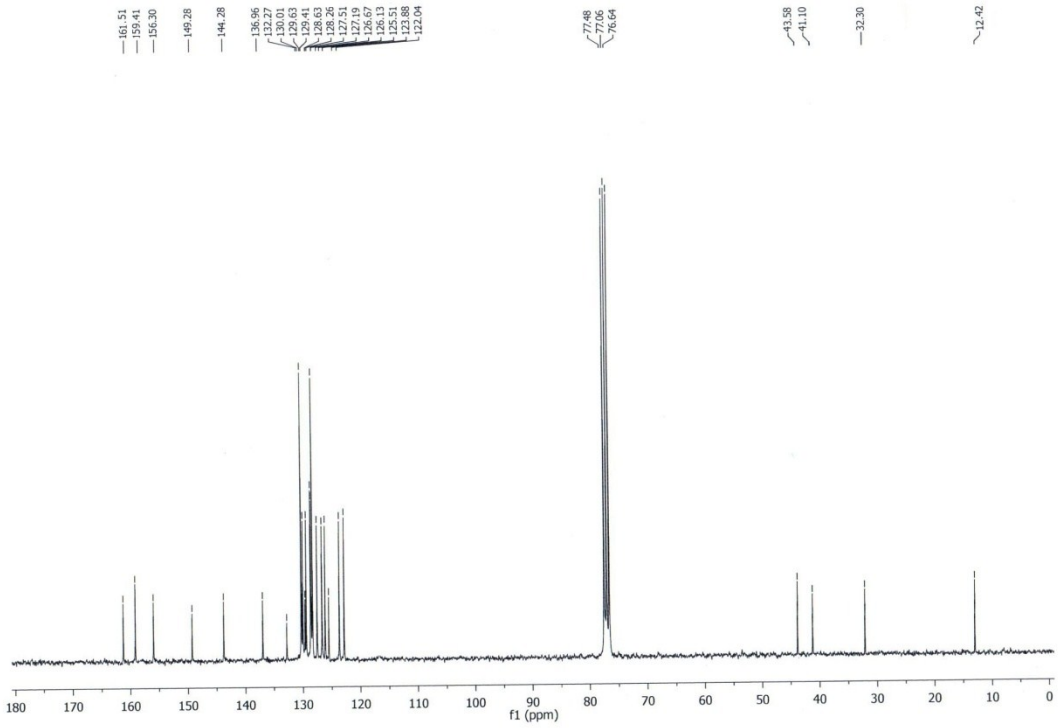

**$^{1}$H NMR of compound 3ad**



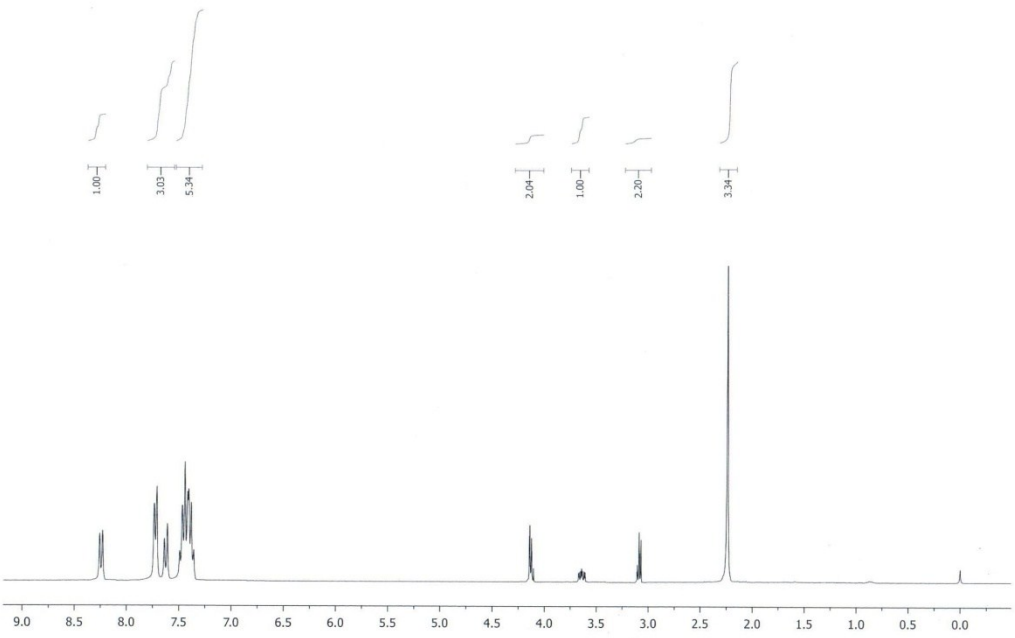

**$^{13}$C NMR of compound 3ad**



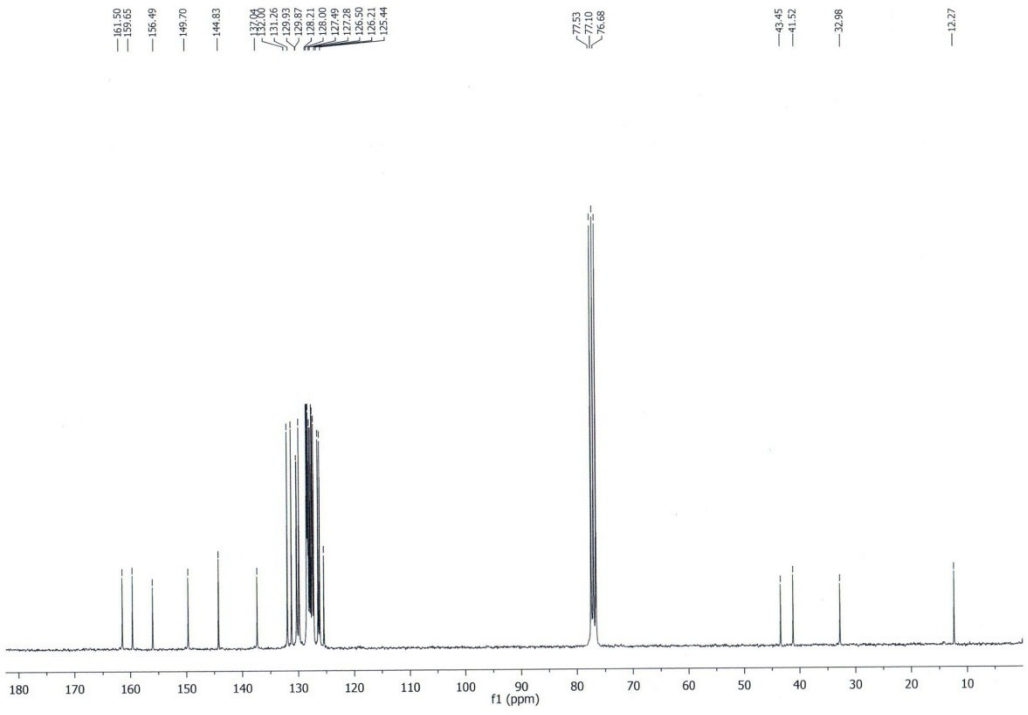

**$^{1}$H NMR of compound 3af**



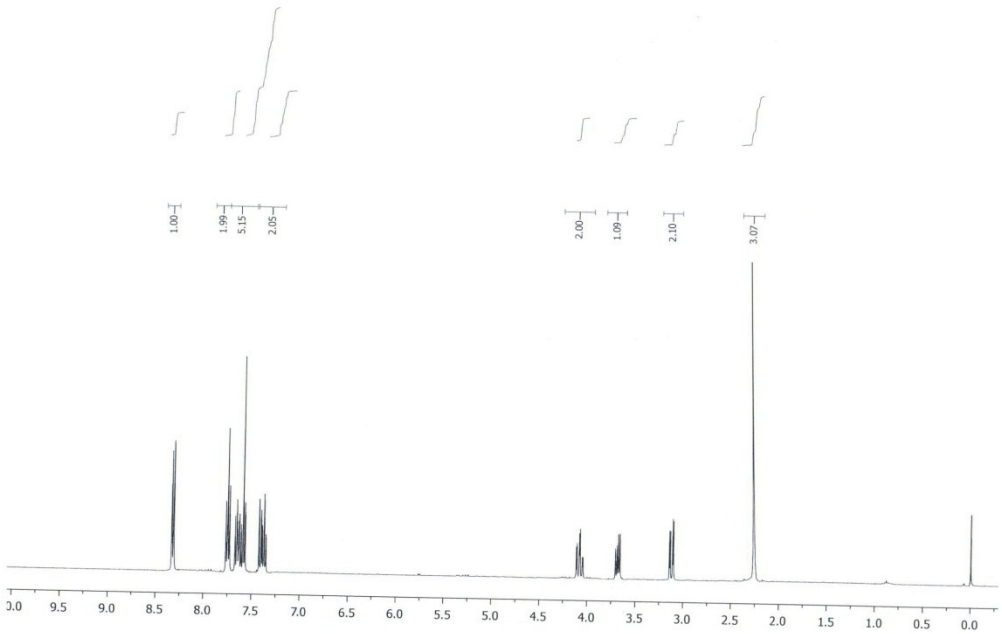

**$^{13}$C NMR of compound 3af**



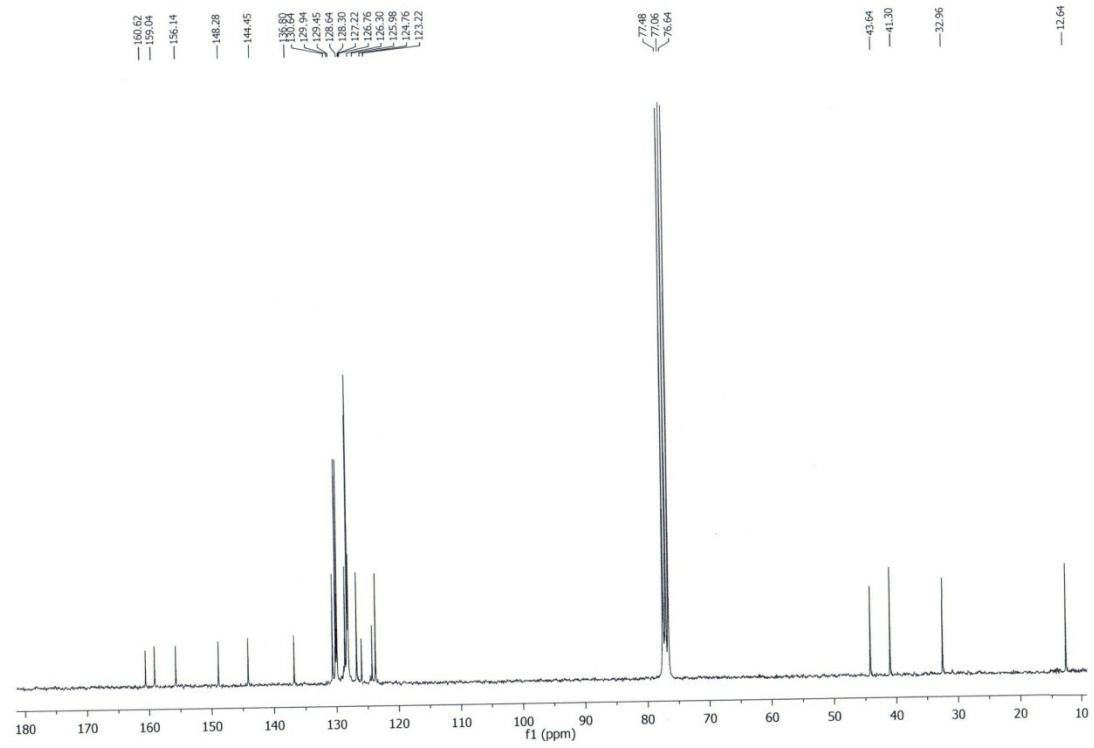

**$^{1}$H NMR of compound 3ah**



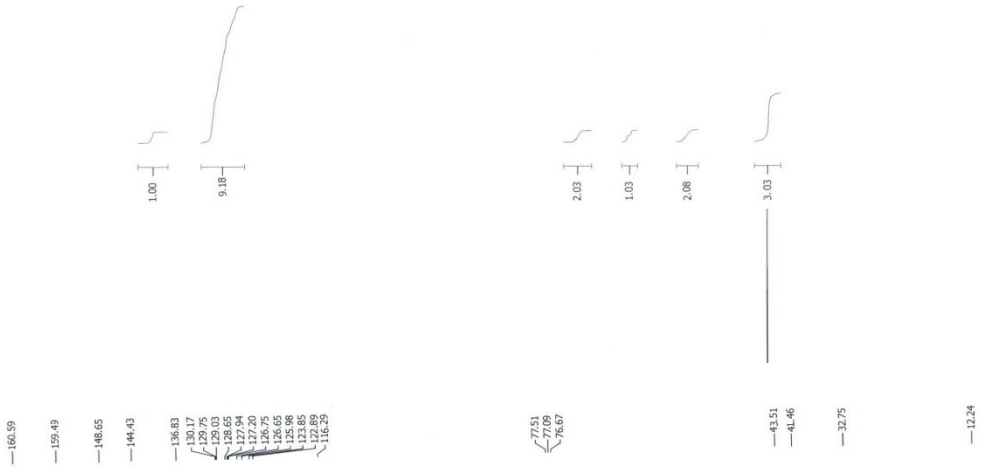

**$^{13}$C NMR of compound 3ah**



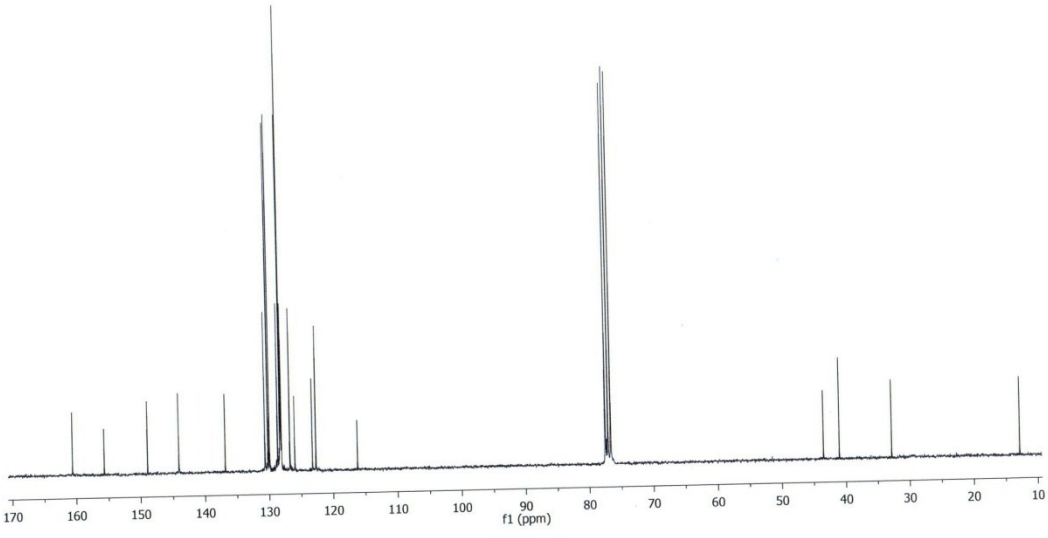

**$^{1}$H NMR of compound 3ai**



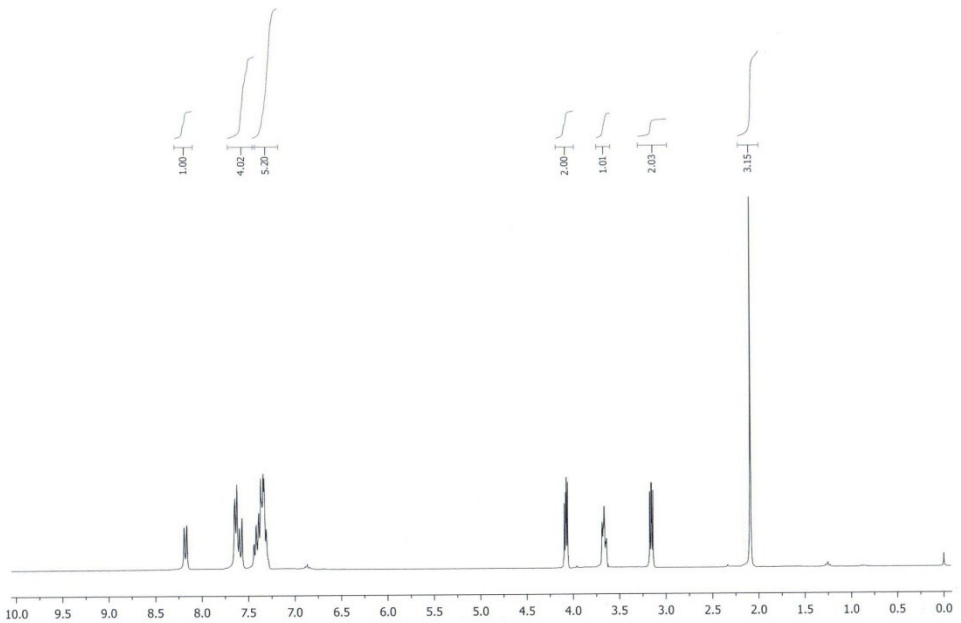
**$^{13}$C NMR of compound 3ai**



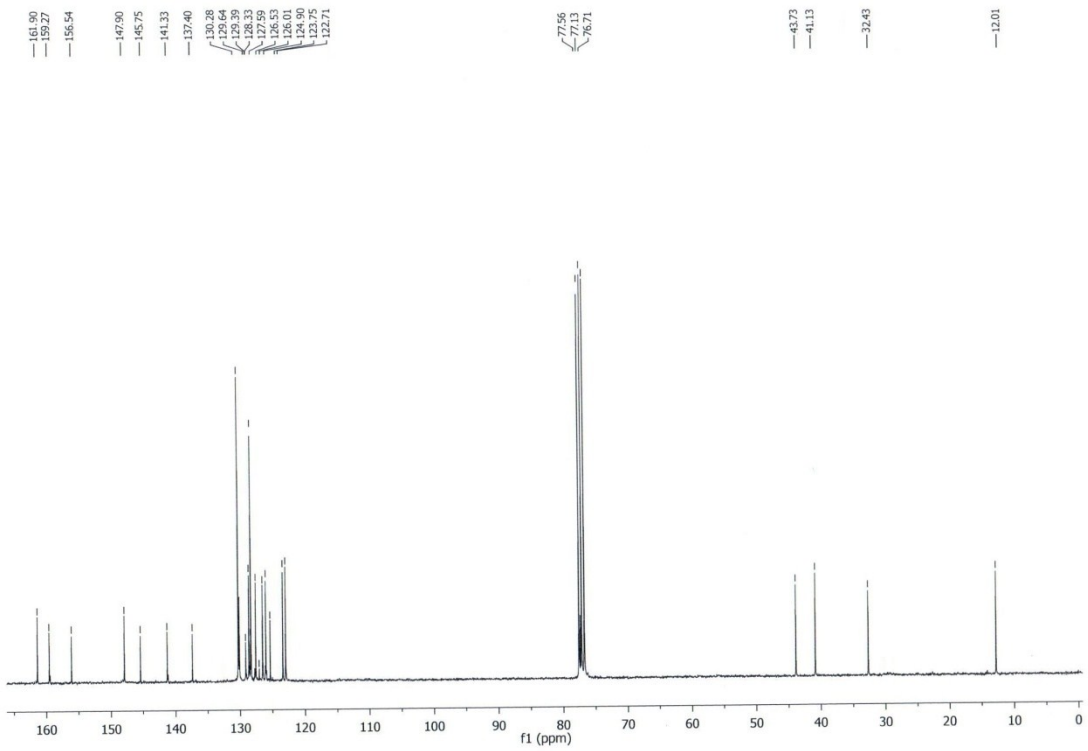

**$^{1}$H NMR of compound 3ak**



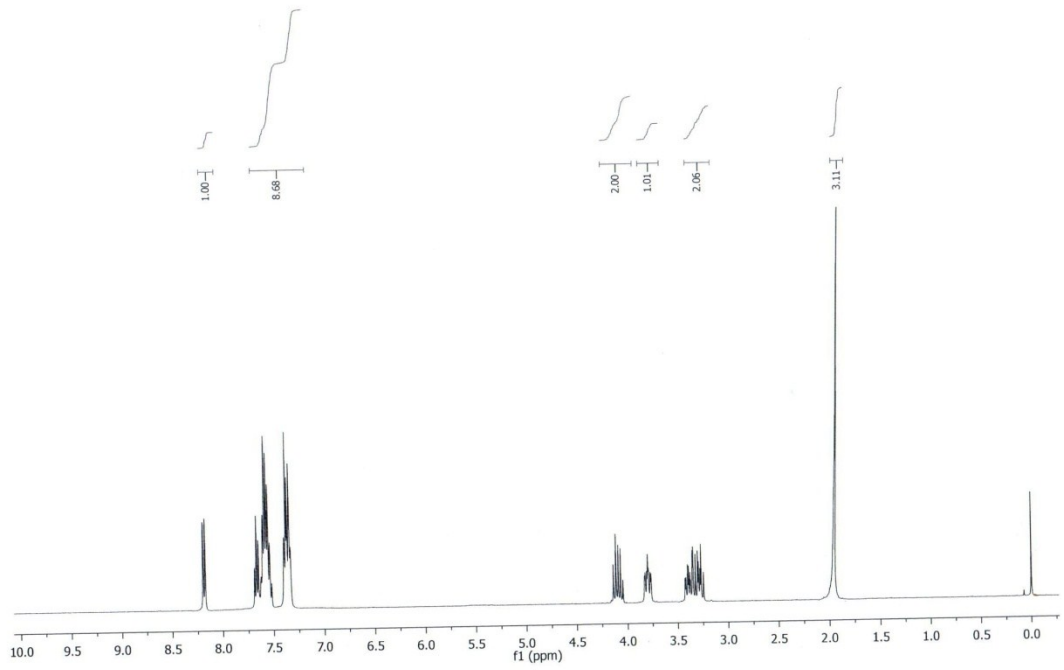
**$^{13}$C NMR of compound 3ak**



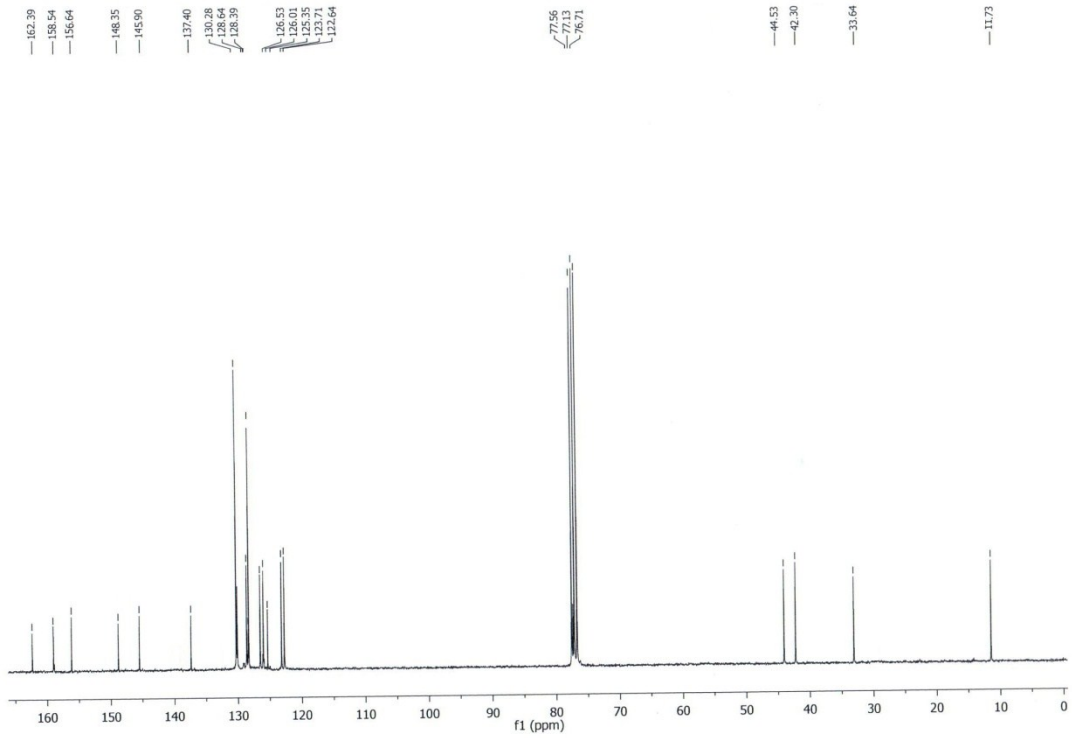
**$^{1}$H NMR of compound 3al**



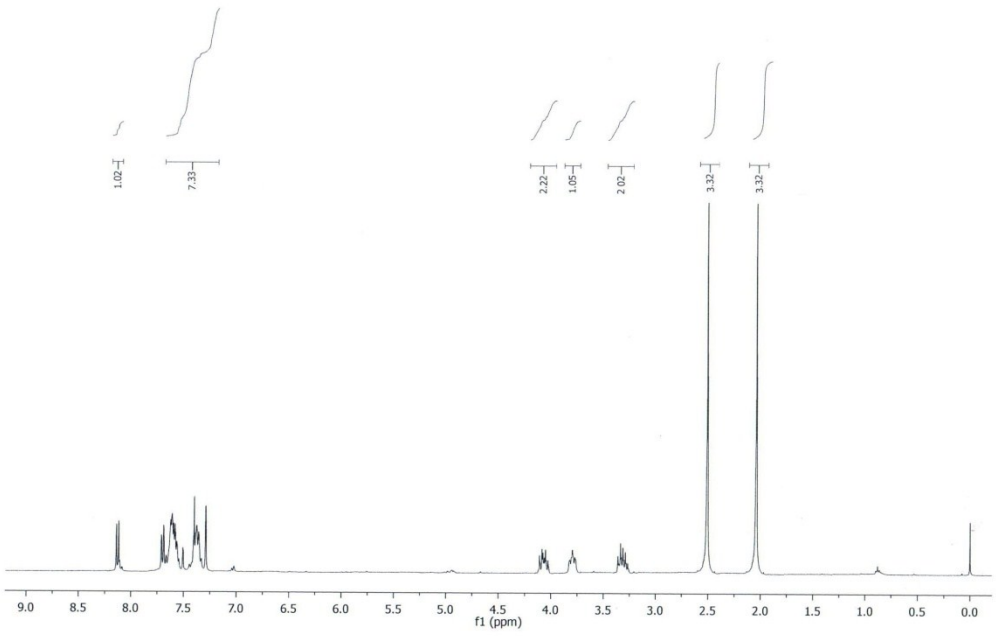

**$^{13}$C NMR of compound 3al**



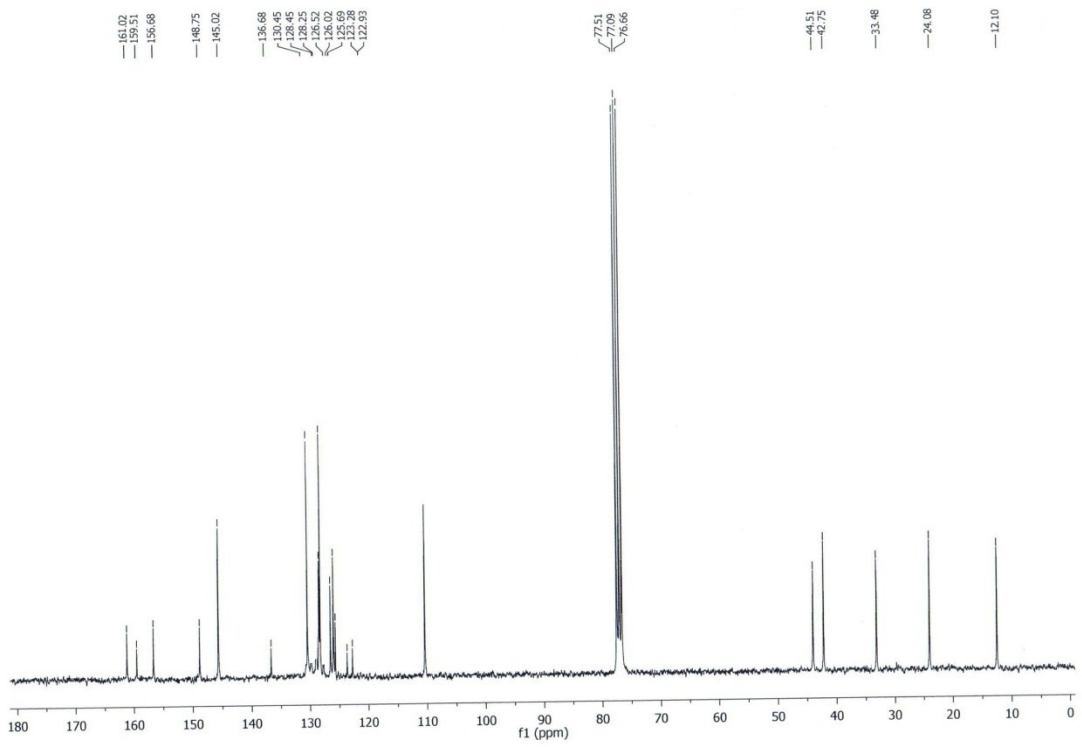
**$^{1}$H NMR of compound 3ba**



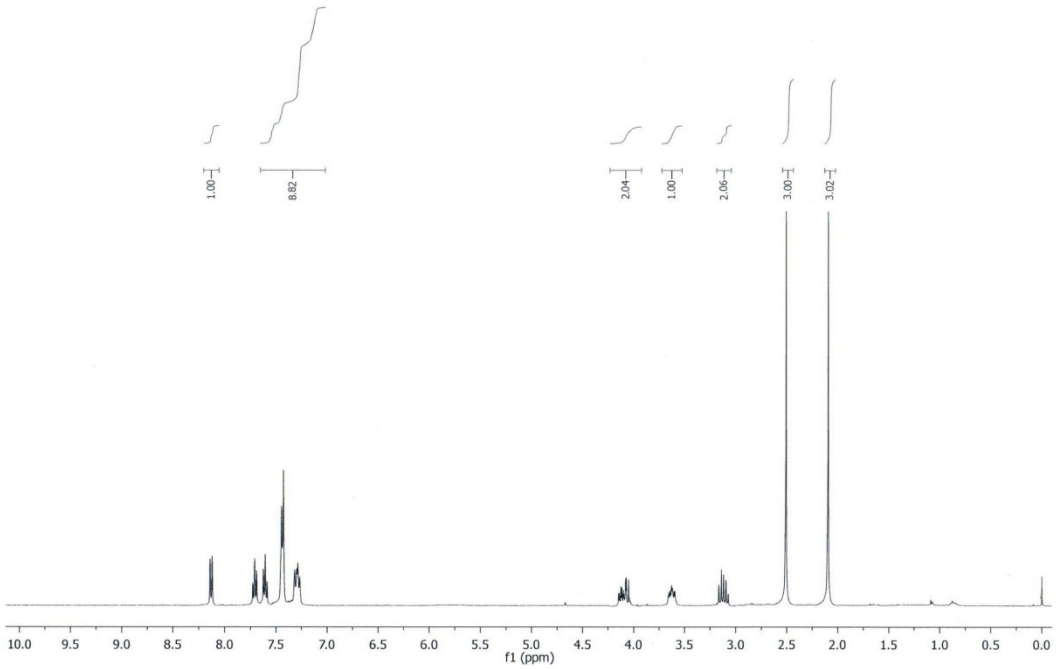

**$^{13}$C NMR of compound 3ba**



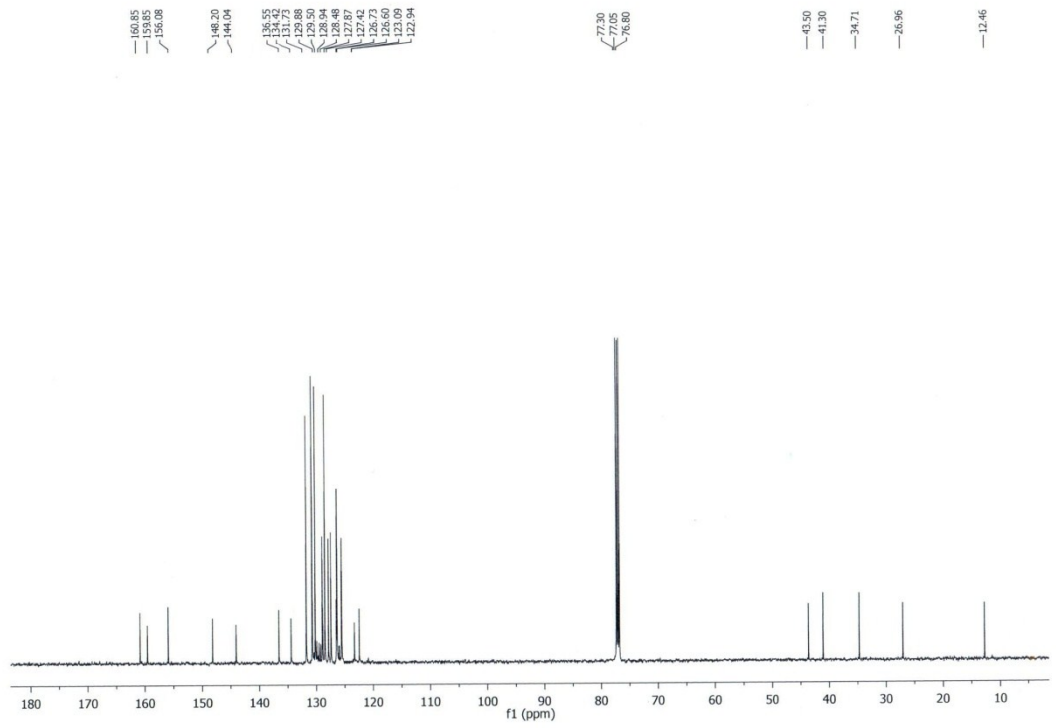
**$^{1}$H NMR of compound 3ca**



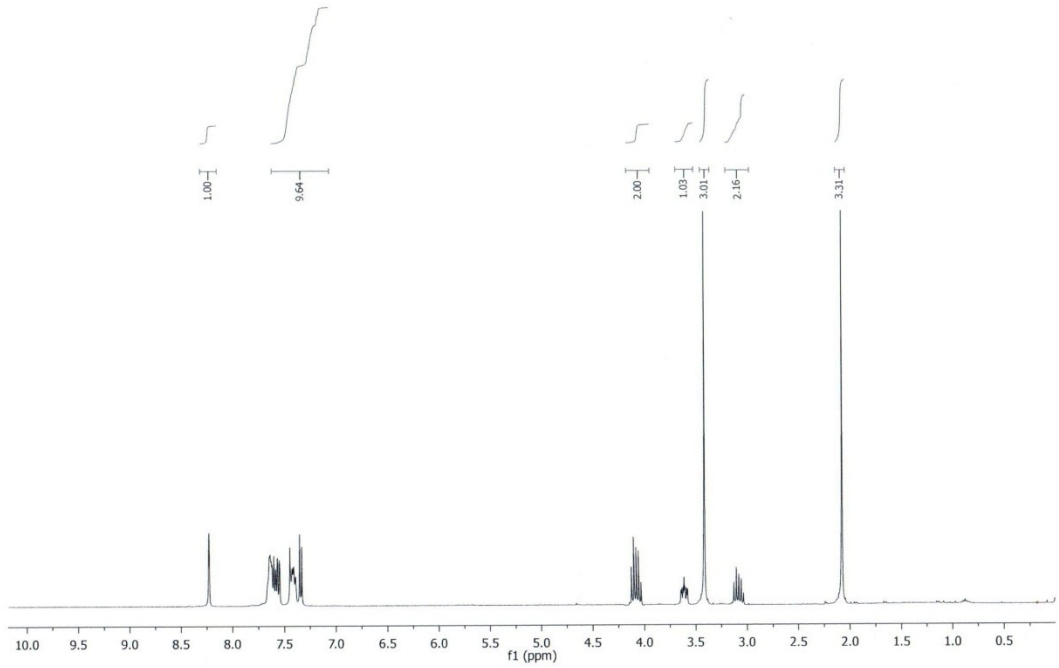

**$^{13}$C NMR of compound 3ca**



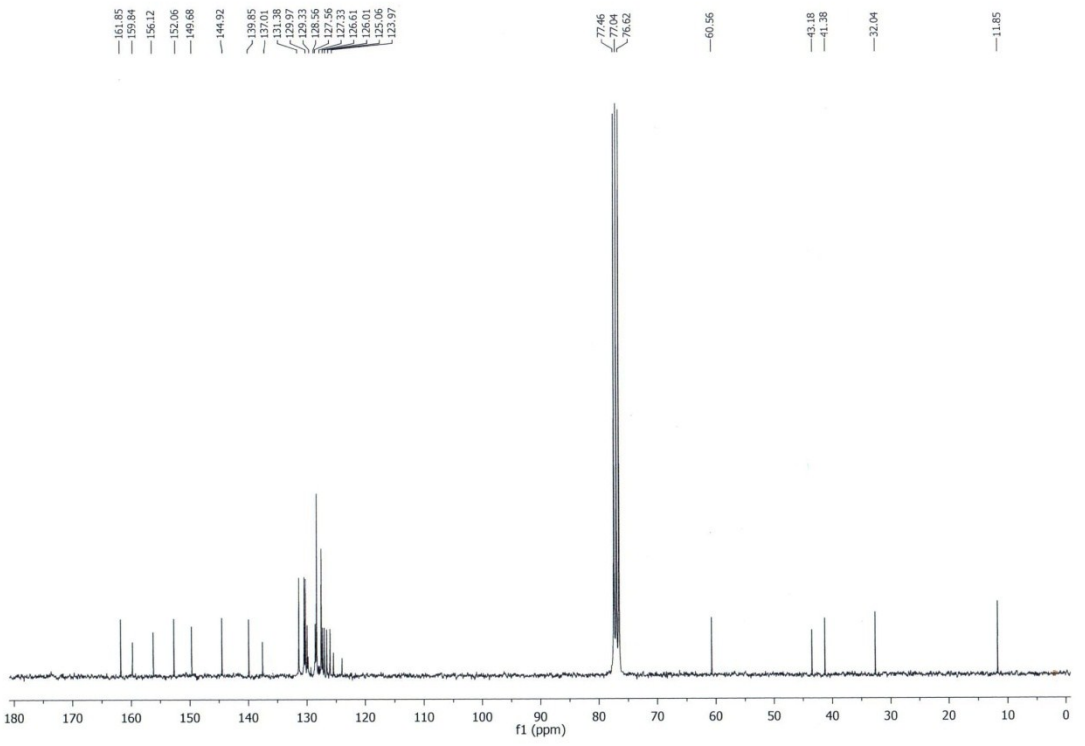

**$^{1}$H NMR of compound 3fa**



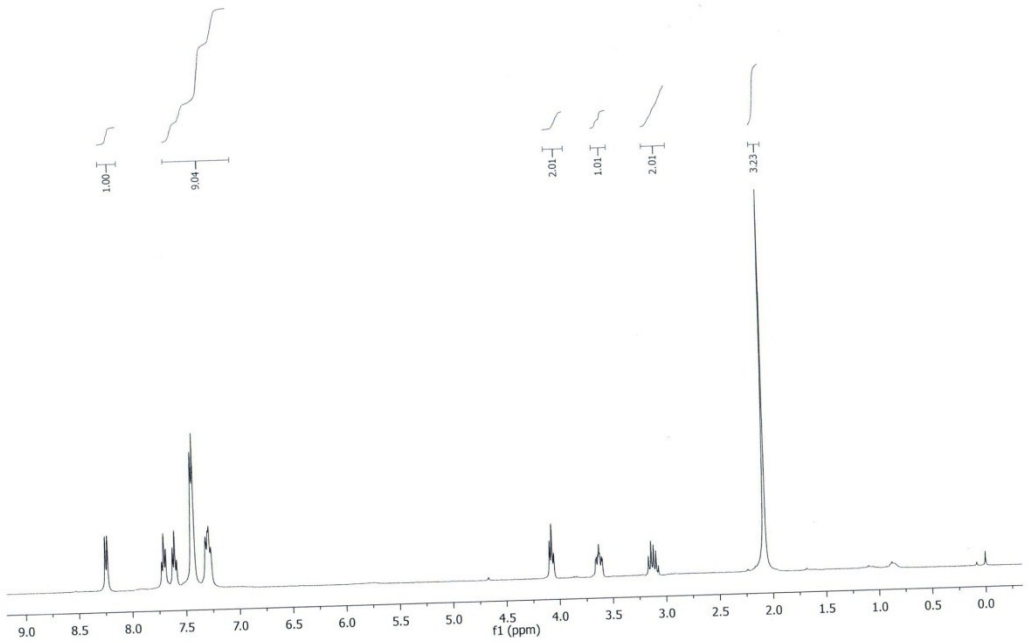

**$^{13}$C NMR of compound 3fa**



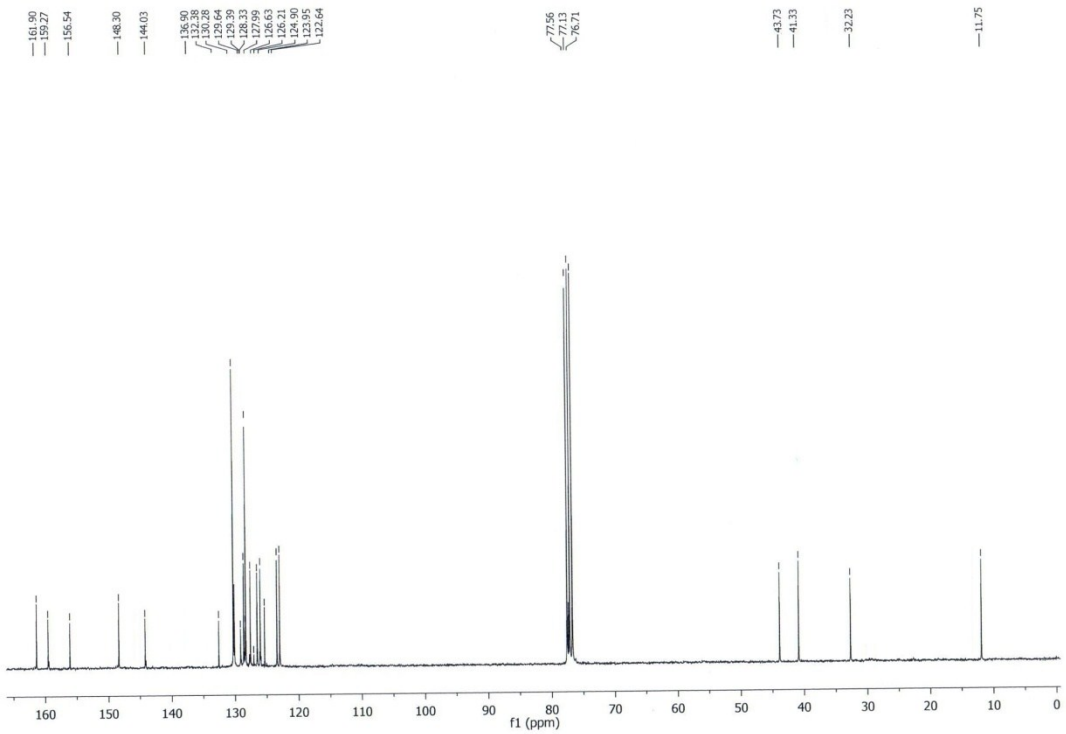

**$^{1}$H NMR of compound 3ga**



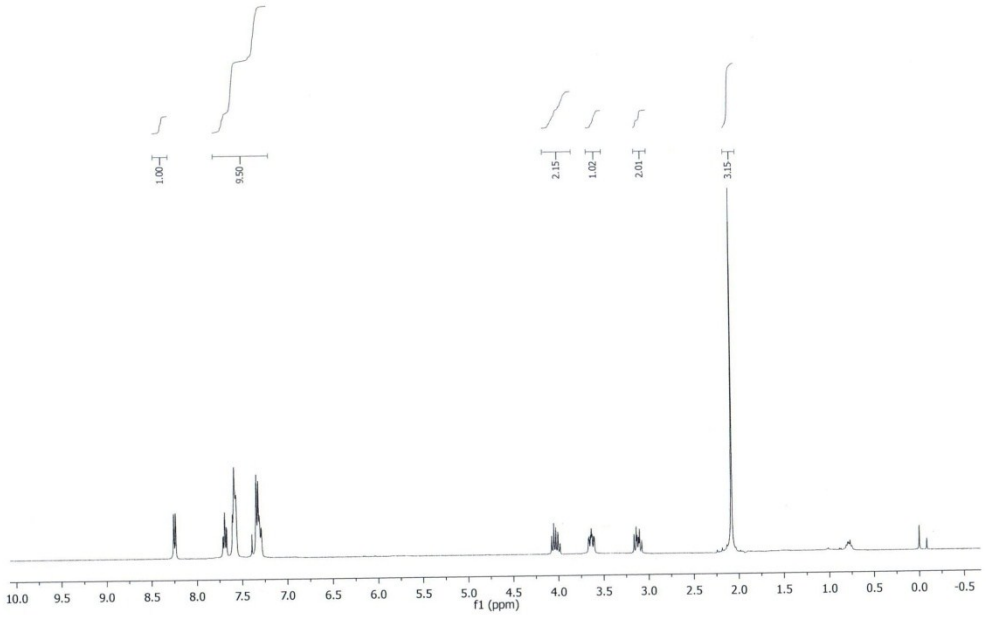

**$^{13}$C NMR of compound 3ga**



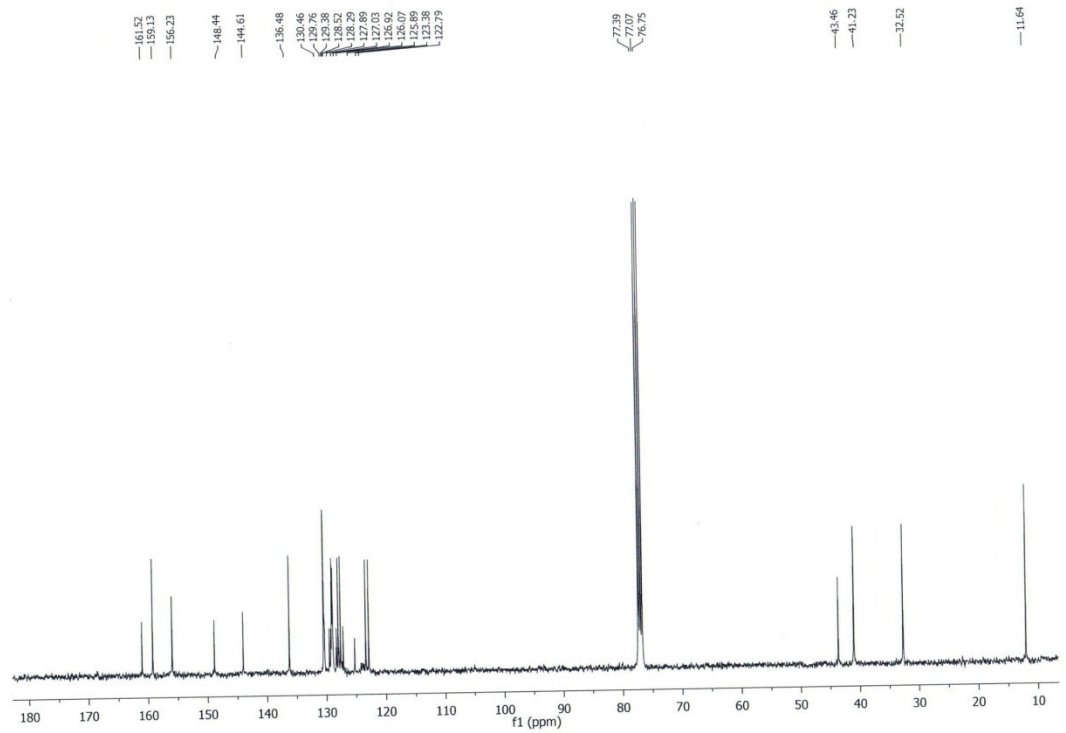

**$^{1}$H NMR of compound 3ia**



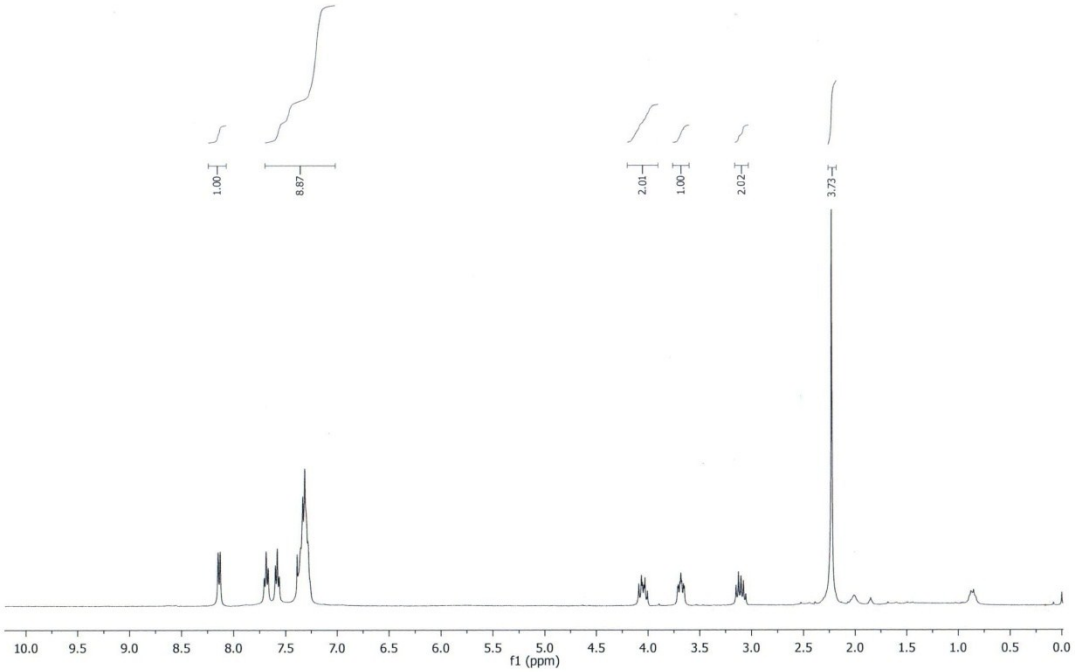

**$^{13}$C NMR of compound 3ia**



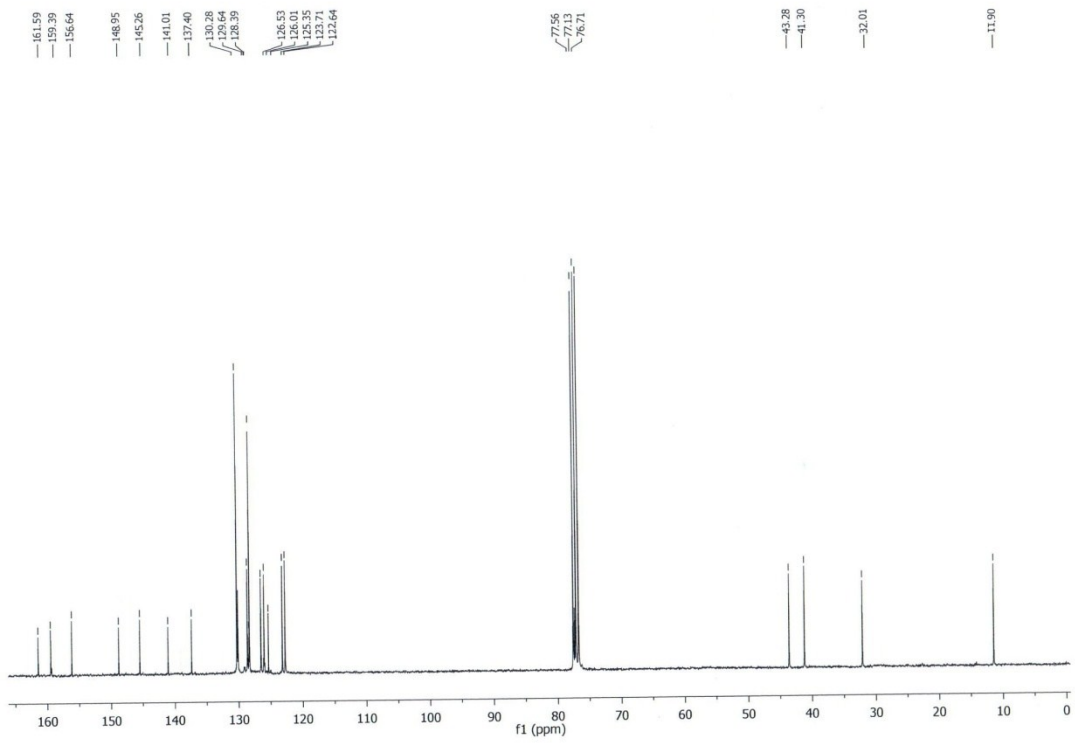

**$^{1}$H NMR of compound 3ja**




**$^{13}$C NMR of compound 3ja**

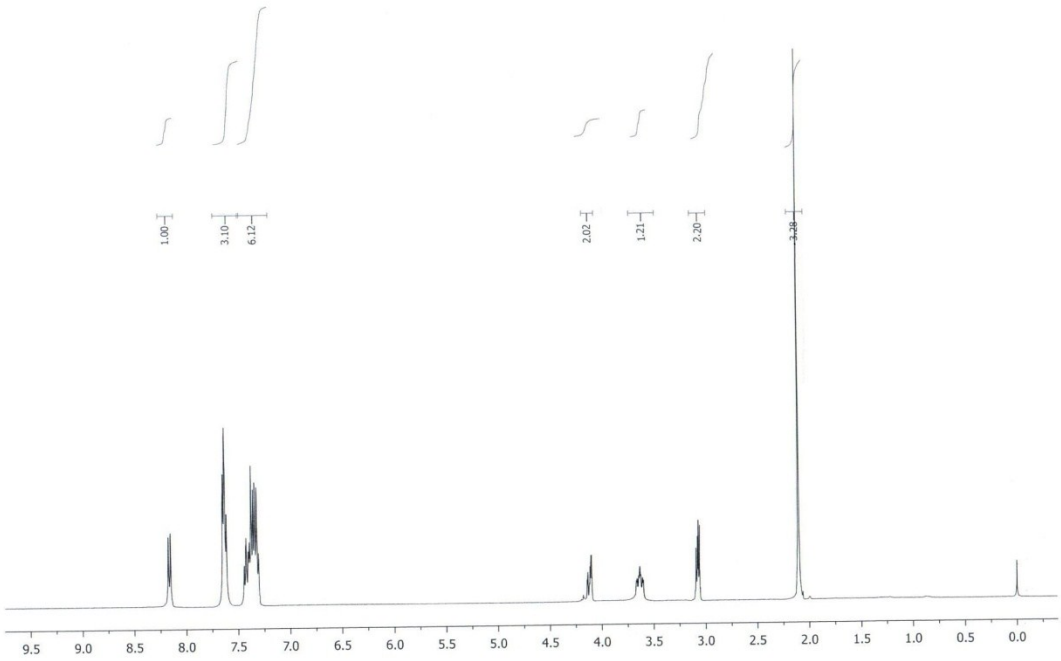


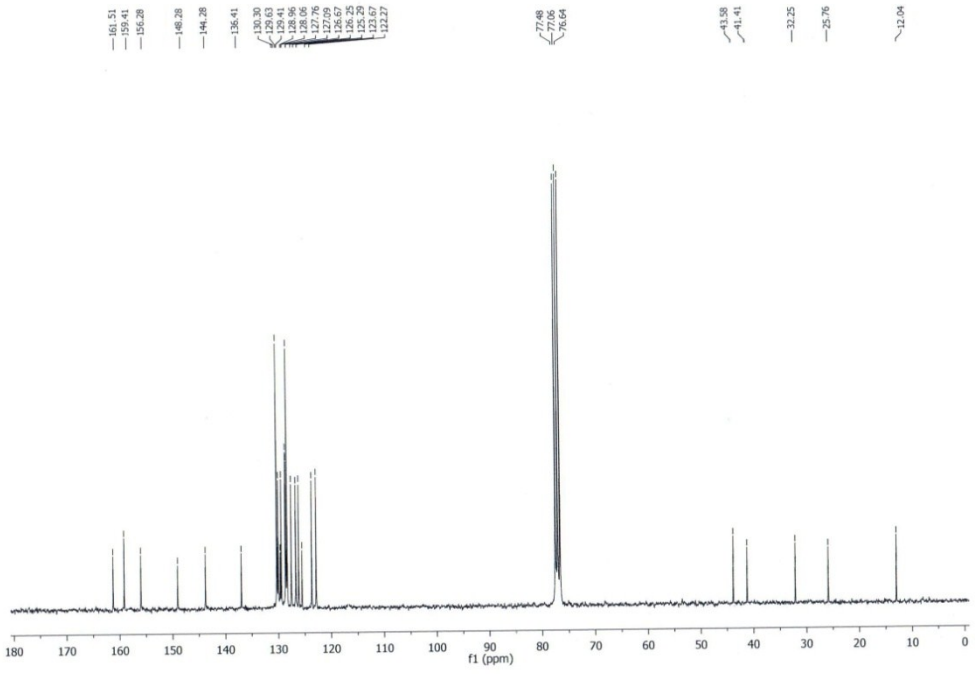

**$^{1}$H NMR of compound 3la**



**$^{13}$C NMR of compound 3la**

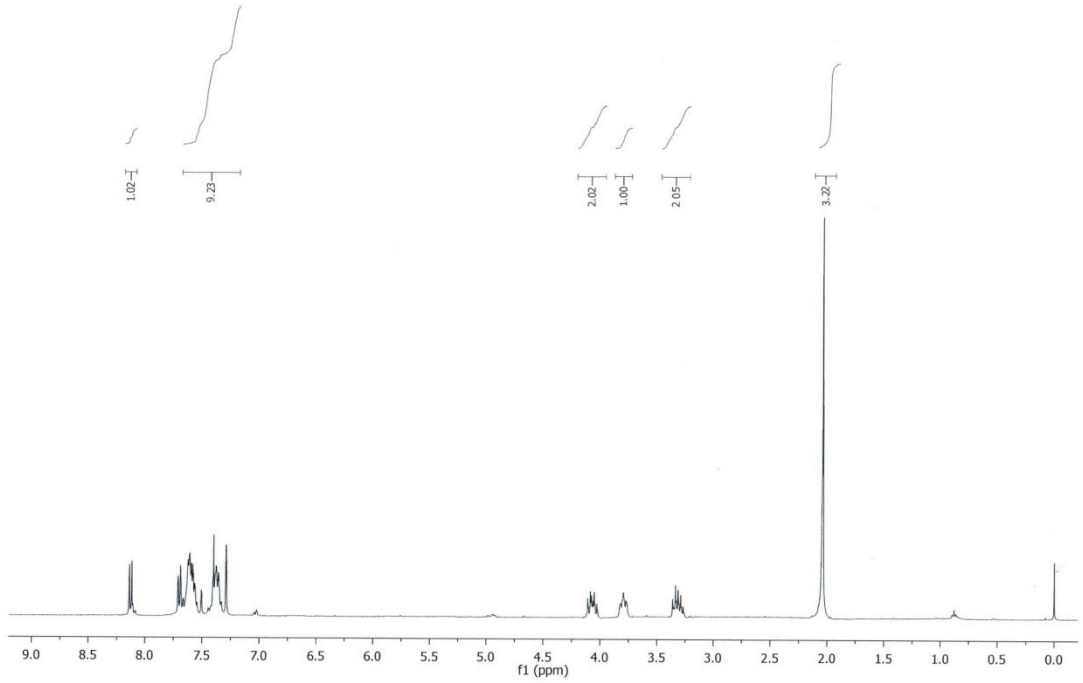
**$^{1}$H NMR of compound 3ma**

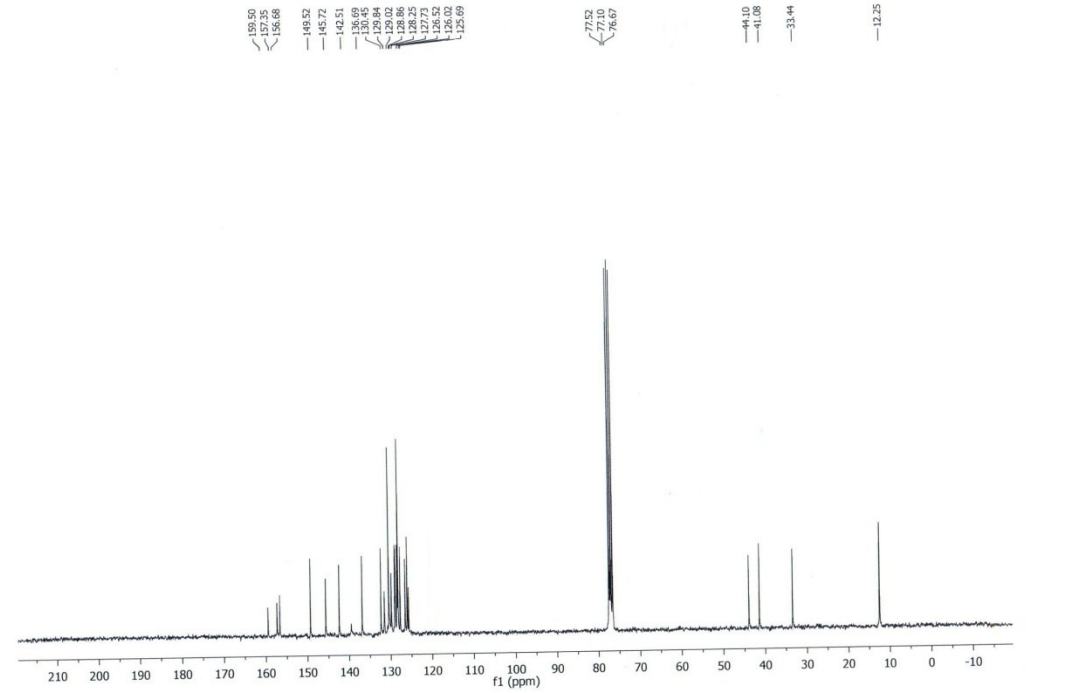


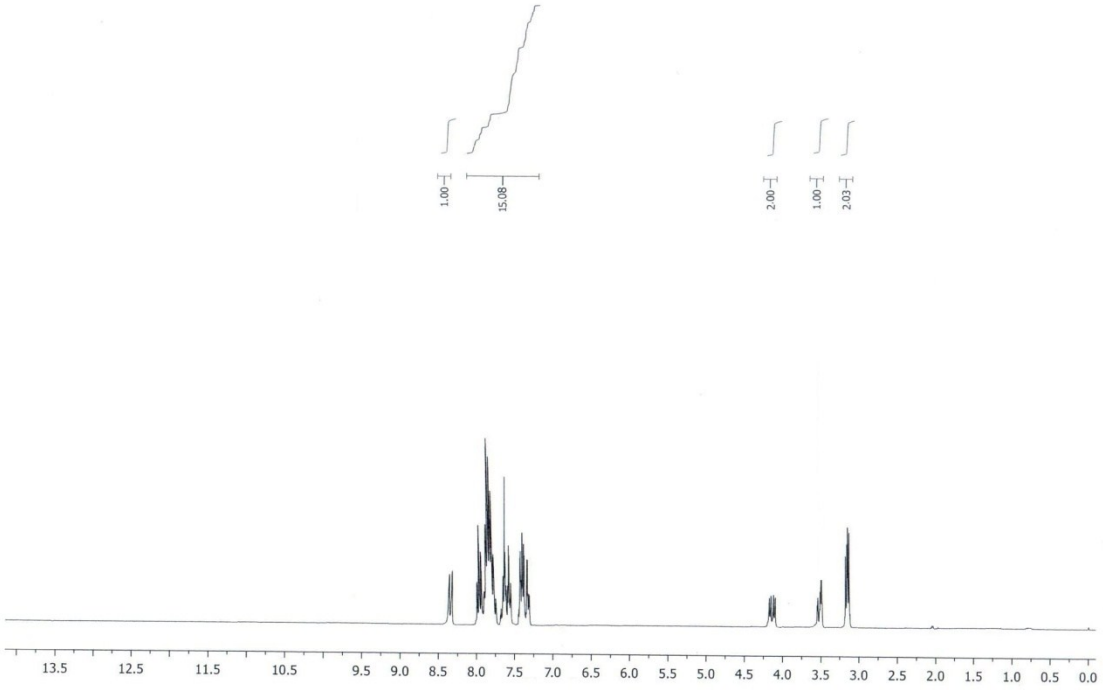

**$^{13}$C NMR of compound 3ma**

**$^{1}$H NMR of compound 3na**




**$^{13}$C NMR of compound 3na**




**$^{1}$H NMR of compound 5**