Supporting Information

Regioselective Copper-Catalyzed Thiolation of Imidazo[1,2-a]pyridines: An Efficient C−H Functionalization Strategy for C−S Bond Formation

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List of Contents

A. General method

^{1}H and ^{13}C NMR spectra were recorded with a Brüker Advance 400 spectrometer. The chemical shifts were referenced to signals at 7.26 and 77.0 ppm, respectively. The following abbreviations were used to explain the multiplicities: s = singlet, d = doublet, t = triplet, q = quartet, m = multiplet. Mass spectra were recorded on a Shimadzu GCMS-QP5050A spectrometer at an ionization voltage of 70 eV equipped with a DB-WAX capillary column (internal diameter: 0.25 mm, length: 30 m). Elemental analyses were performed with a Vario EL elemental analyzer. GC-MS was obtained using electron ionization. All reagents and solvents were obtained from commercial sources and used without further purification. TLC was performed using commercially prepared 100-400 mesh silica gel plates (GF_{254}), and visualization was effected at 254 nm.

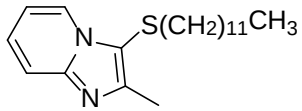
B. General Procedure

Synthesis of 3aa according to the following procedure:

Under oxygen atmosphere, a reaction tube was charged with 2-methylimidazo[1,2-a] pyridine (**1a** 0.5 mmol) and dodecane-1-thiol (**2a** 1.5 mmol), CuI (5 mol%), and DMSO (3 mL). The mixture was stirred at 100 ℃ for 20 h. After reaction completion, as monitored by TLC and GC-MS analysis, the solvent was then removed and the crude product was separated by column chromatography (eluted with petroleum ether : ethyl acetate=4：1) to give a pure sample of **3aa**.

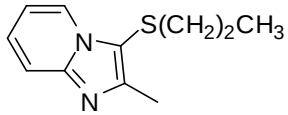
C. Analytical data

3-(dodecylthio)-2-methylimidazo[1,2-a]pyridine(3aa)



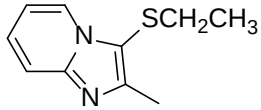
Yellow oil; IR (KBr): 3045, 2985, 2890, 1547, 1463, 1371, 721; ^{1}H NMR (400 MHz,$CDCl_3$) δ 8.36 (d, *J* = 6.4 Hz, 1H), 7.56 (d, *J* = 8.8 Hz, 1H), 7.23 (t, *J* = 7.6 Hz, 1H), 6.86 (t, *J* = 6.8 Hz, 1H), 2.55-2.60 (m, 5H), 1.44-1.52 (m, 2H), 1.23-1.36 (m, 18H), 0.88 (t, *J* = 6.4 Hz, 3H).^{13}C NMR (100MHz, $CDCl_3$) δ 149.8, 125.2, 124.2, 120.8, 116.9, 112.1, 35.5, 31.9, 29.8, 29.6, 29.5, 29.4, 29.3, 29.2, 29.18, 28.5, 22.6, 14.1. ESI-MS m/z (%)333 (100) $[M+H]^+$; Anal. Calcd for $C_{20}H_{32}N_2S$ C, 72.23; H, 9.70; N, 8.42; Found: C, 71.89; H, 9.75; N, 8.46;

2-methyl-3-(propylthio)imidazo[1,2-a]pyridine (3ab)



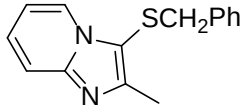
Yellow oil; IR (KBr): 3063, 2986, 2893, 1553, 1465, 1372, 739; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.36 (d, *J* = 6.4 Hz, 1H), 7.54 (d, *J* = 8.8 Hz, 1H), 7.23 (t, *J* = 8.0 Hz, 1H), 6.86 (t, *J* = 6.8 Hz, 1H), 2.55-2.58 (m, 5H), 1.48-1.54 (m, 2H), 0.96 (t, *J* = 7.2 Hz, 3H).^{13}C NMR (100MHz, $CDCl_3$) δ 150.0, 146.2, 125.2, 124.1, 116.8, 112.1, 110.7, 37.4 , 23.2 , 14.0, 13.1. ESI-MS m/z (%) 221 (100) $[M+H]^+$; Anal. Calcd for $C_{12}H_{16}N_2S$ C, 65.41; H, 7.32; N, 12.71; Found:C, 65.10; H, 7.35; N, 12.77;

3-(ethylthio)-2-methylimidazo[1,2-a]pyridine(3ac)



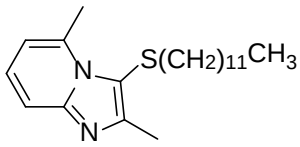
Yellow oil; IR (KBr): 3024, 2986, 2928, 1565, 1466, 1374, 760;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.38 (d, *J* = 6.6 Hz, 1H), 7.56 (d, *J* = 8.8 Hz, 1H), 7.25 (t, *J* = 7.8 Hz, 1H), 6.88 (t, *J* = 6.8 Hz, 1H), 2.63 (q, *J* = 7.2 Hz, 2H), 2.56 (s, 3H), 1.16 (t, *J* = 7.2 Hz, 3H).^{13}C NMR (100MHz, $CDCl_3$) δ 149.9, 146.1, 125.6, 124.2, 116.7, 112.3, 110.4, 29.5, 15.0, 13.8. MS (EI) m/z: 192.0. Anal. Calcd for $C_{10}H_{12}N_2S$ C, 62.46; H, 6.29; N, 14.57; Found: C, 62.15; H, 6.32; N, 14.64;

3-(benzylthio)-2-methylimidazo[1,2-a]pyridine(3ad)



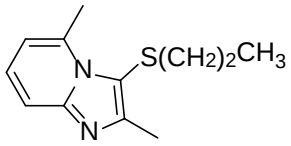
Yellow oil; IR (KBr): 3046, 3021, 2991, 2983, 1568, 1498, 775;^{1}H NMR (400 MHz,$CDCl_3$) δ 8.07 (d, *J* = 6.5 Hz, 1H), 7.53 (d, *J* = 8.9 Hz, 1H), 7.13-7.22 (m, 4H), 6.92 (d, *J* = 6.8 Hz, 2H), 6.73 (t, *J* = 6.8 Hz, 1H), 3.75 (s, 2H), 2.26 (s, 3H).^{13}C NMR (100 MHz, $CDCl_3$) *δ* 150.9, 143.4, 137.7, 132.2, 128.7, 128.5, 127.2, 125.6, 124.0, 116.6, 112.1, 40.1, 13.5. ESI-MS m/z (%) 255 (100) $[M+H]^+$; Anal. Calcd for $C_{15}H_{14}N_2S$ C, 70.83; H, 5.55; N, 11.01; Found:C, 70.48; H, 5.58; N, 11.06.

3-(dodecylthio)-2,5-dimethylimidazo[1,2-a]pyridine(3ba)



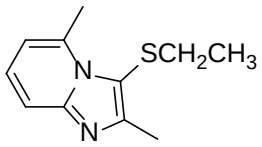
Yellow oil; IR (KBr): 3056, 2969, 2988, 1580, 1464, 1378, 720; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.22 (d, *J* = 6.8 Hz, 1H), 7.00 (d, *J* = 6.8 Hz, 1H), 6.77 (d, *J* = 6.8 Hz, 1H), 2.54-2.56 (m, 8H), 1.45-1.49 (m, 2H), 1.23- 1.35 (m, 18H), 0.87 (t, *J* = 6.4 Hz, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 149.2, 146.4, 126.5, 124.2, 122.0, 112.0, 111.0, 35.4, 31.8, 29.8,29.6, 29.5, 29.4 29.3, 29.1, 28.5, 22.6, 16.7, 14.1, 14.0. ESI-MS m/z (%) 247 (100) $[M+H]^+$; Anal. Calcd for $C_{21}H_{34}N_2S$ C, 72.78; H, 9.89; N, 8.08; Found: C, 72.43; H, 9.94; N, 8.12;

2,5-dimethyl-3-(propylthio)imidazo[1,2-a]pyridine(3bb)



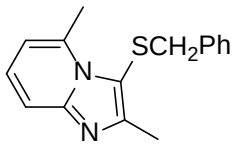
Yellow oil; IR (KBr): 2973, 2886, 1583, 1461, 1368, 730; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.43 (d, *J* = 8.8 Hz, 1H), 7.10 (t, *J* = 7.8 Hz, 1H), 6.52 (d, *J* = 6.8 Hz, 1H), 3.09 (s, 3H), 2.55-2.61 (m, 5H), 1.53-1.59 (m, 2H), 0.98 (t, *J* = 7.2 Hz, 3H). ^{13}C NMR (100MHz, $CDCl_3$) δ 151.6, 147.6, 137.8, 125.5, 115.1, 114.1, 112.1, 42.0, 22.3, 20.9, 14.3, 13.4. ESI-MS m/z (%) 221 (100) $[M+H]^+$; Anal. Calcd for $C_{12}H_{16}N_2S$ C, 65.41; H, 7.32; N, 12.71; Found:C, 65.10; H, 7.35; N, 12.77.

3-(ethylthio)-2,5-dimethylimidazo[1,2-a]pyridine(3bc)



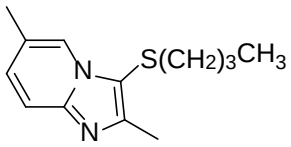
Yellow oil; IR (KBr): 2987, 2890, 1471, 1369, 780; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.42 (d, *J* = 8.8 Hz, 1H), 7.09 (t, *J* = 7.8 Hz, 1H), 6.50 (d, *J* = 6.8 Hz, 1H), 3.06 (s, 3H), 2.64 (q, *J* = 7.3 Hz, 2H), 2.55 (s, 3H), 1.17 (t, *J* = 7.3 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 152.0, 147.7, 137.8, 125.4, 115.1, 114.0, 111.5, 33.7, 20.9, 14.3, 13.9. ESI-MS m/z (%) 207 (100) $[M+H]^+$; Anal. Calcd for $C_{11}H_{14}N_2S$ C, 64.04; H, 6.84; N, 13.58; Found:C, 63.72; H, 6.87; N, 13.64;

3-(benzylthio)-2,5-dimethylimidazo[1,2-a]pyridine(3bd）



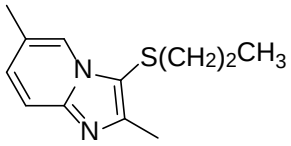
Yellow oil; IR (KBr): 3070, 3022, 2992, 2885, 1606, 1578, 1470, 1375, 784; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.43 (d, *J* = 8.8 Hz, 1H), 7.16 -7.07 (m, 4H), 6.87 (d, *J* = 6.0 Hz, 2H), 6.45 (d, *J* = 6.6 Hz, 1H), 3.75 (s, 2H), 2.87 (s, 3H), 2.24 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 152.9, 137.9, 137.0, 128.9, 128.8, 128.6, 128.5, 127.2, 125.6, 115.1, 114.0, 44.2, 21.0, 13.8. ESI-MS m/z (%) 269 (100) $[M+H]^+$; Anal. Calcd for $C_{16}H_{16}N_2S$ C, 71.61; H, 6.01; N, 10.44. Found:C, 71.29; H, 6.04; N, 10.49.

3-(butylthio)-2,6-dimethylimidazo[1,2-a]pyridine(3ca)



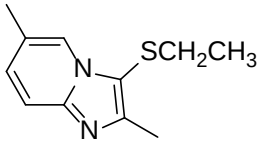
Yellow oil; IR (KBr): 3035, 2983, 2899, 1468, 1372, 728; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.13 (s, 1H), 7.43 (d, *J* = 8.8 Hz, 1H), 7.06 (d, *J* = 8.8 Hz, 1H), 2.58 (t, *J* = 6.8 Hz, 2H), 2.53 (s, 3H), 2.35 (s, 3H), 1.54 -1.36 (m, 4H), 0.87 (t, *J* = 6.9 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 149.6, 145.2, 128.2, 121.9, 121.8, 116.1, 35.0, 31.7, 21.6, 18.2, 13.9, 13.5. ESI-MS m/z (%) 235 (100) $[M+H]^+$; Anal. Calcd for $C_{13}H_{18}N_2S$ C, 66.62; H, 7.74; N, 11.95; Found:C, 66.31; H, 7.77; N, 12.01.

2,6-dimethyl-3-(propylthio)imidazo[1,2-a]pyridine(3cb)



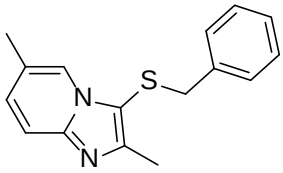
Yellow oil; IR (KBr): 2974, 2885, 1564, 1466, 1371, 739;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.14 (s, 1H), 7.44 (d, *J* = 9.0 Hz, 1H), 7.07 (d, *J* = 9.0 Hz, 1H), 2.54-2.57 (m, 5H), 2.37 (s, 3H), 1.51 (t, *J* = 7.2 Hz, 2H), 0.98 (t, *J* = 7.2 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) *δ* 149.7, 145.2, 128.2, 122.0, 121.9, 121.7, 116.1, 110.1, 37.4, 23.1, 18.3, 13.9, 13.1. ESI-MS m/z (%) 221 (100) $[M+H]^+$; Anal. Calcd for $C_{12}H_{16}N_2S$ C, 65.41; H, 7.32; N, 12.71; Found: C, 65.11; H, 7.35; N, 12.76;

3-(ethylthio)-2,6-dimethylimidazo[1,2-a]pyridine(3cc)



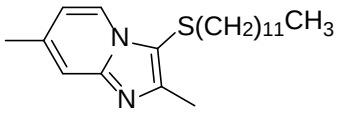
Yellow oil; IR (KBr): 2986, 1561, 1467, 1374, 779; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.15 (s, 1H), 7.45 (d, *J* = 9.0 Hz, 1H), 7.07 (d, *J* = 8.9 Hz, 1H), 2.58- 2.60 (m, 2H), 2.53 (s, 3H), 2.36 (s, 3H), 1.16 (t, *J* = 7.2 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 150.0 , 145.3 , 128.3, 122.0, 121.8, 116.1, 29.4, 18.2, 14.9, 13.9. ESI-MS m/z (%) 207 (100) $[M+H]^+$; Anal. Calcd for $C_{11}H_{14}N_2S$ C, 64.04; H, 6.84; N, 13.58; Found: C, 63.80; H, 6.87; N, 13.65.

3-(benzylthio)-2,6-dimethylimidazo[1,2-a]pyridine(3cd)



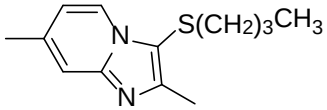
Yellow oil; IR (KBr): 3068, 3035, 2968, 1623, 1583, 1463, 1370, 773; ^{1}H NMR (400 MHz,$CDCl_3$) δ 7.74 (s, 1H), 7.39 (d, *J* = 9.0 Hz, 1H), 7.11-7.17 (t, *J* = 6.8 Hz, 3H), 7.01 (d, *J* = 9.0 Hz, 1H), 6.91 (d, *J* = 7.3 Hz, 2H), 3.72 (s, 2H), 2.23 (s, 6H).^{13}C NMR (100 MHz, $CDCl_3$) δ 150.7, 145.3, 138.0, 128.7, 128.5, 128.4, 127.1, 121.9 , 121.6, 115.9, 40.3, 18.1, 13.4. ESI-MS m/z (%) 269 (100) $[M+H]^+$; Anal. Calcd for $C_{16}H_{16}N_2S$ C, 71.61; H, 6.01; N, 10.44; Found: C, 71.30; H, 6.04; N, 10.48.

3-(dodecylthio)-2,7-dimethylimidazo[1,2-a]pyridine(3da)



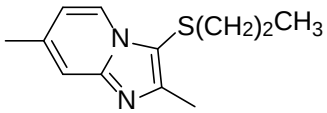
White solid; m.p. 40.2℃. IR (KBr): 2974, 2896, 1550, 1463, 1369, 723;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.11 (s, 1H), 7.40 (d, *J* = 6.4 Hz, 1H), 7.04 (m, *J* = 6.4 Hz, 1H), 2.52 – 2.56 (m, 5H), 2.34 (s, 3H), 1.23-1.46 (m, 20H), 0.87 (t, *J* = 7.2 Hz, 3H).^{13}C NMR (100MHz, $CDCl_3$) δ 149.6, 145.1, 128.1, 121.9, 121.7, 116.1, 110.1, 35.3, 31.8, 29.7, 29.6, 29.5, 29.4, 29.3, 29.2, 28.5 22.6, 18.2, 14.0, 13.9. ESI-MS m/z (%) 347 (100) $[M+H]^+$; Anal. Calcd for $C_{21}H_{34}N_2S$ C, 72.78; H, 9.89; N, 8.08; Found: C, 72.43; H, 9.94; N, 8.12

3-(butylthio)-2,7-dimethylimidazo[1,2-a]pyridine(3db)



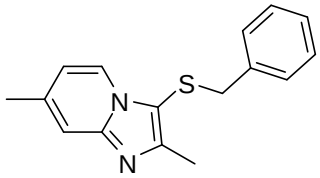
Yellow oil; IR (KBr): 3034, 2981, 1564, 1465, 1372, 727; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.21 (d, *J* = 6.4 Hz, 1H), 7.30 (s, 1H), 6.69 (d, *J* = 6.4 Hz, 1H), 2.52-2.55 (m, 5H), 2.39 (s, 3H), 1.50-1.30 (m, 4H), 0.86 (t, *J* = 8.8, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 149.3, 146.3, 136.5, 123.3, 115.2, 114.7, 109.9, 35.1, 31.7, 21.6, 21.1, 13.7, 13.5. ESI-MS m/z (%) 235 (100) $[M+H]^+$; Anal. Calcd for $C_{13}H_{18}N_2S$ C, 66.62; H, 7.74; N, 11.95; Found:C, 66.30; H, 7.78; N, 12.01;

2,7-dimethyl-3-(propylthio)imidazo[1,2-a]pyridine(3dc)



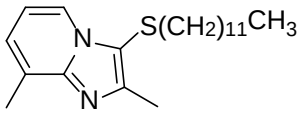
Yellow oil; IR (KBr): 3036, 2976, 1558, 1466, 734; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.20 (d, *J* = 6.4 Hz, 1H), 7.29 (s, 1H), 6.67 (d, *J* = 6.4 Hz, 1H), 2.51-2.54 (m, 5H), 2.38 (s, 3H), 1.46-1.51 (m, 2H), 0.95 (t, *J* = 7.2 Hz, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 149.6, 146.5, 136.2, 123.2, 115.3, 114.6, 109.7, 37.5, 23.0, 21.1, 13.8, 13.0. ESI-MS m/z (%) 221 (100) $[M+H]^+$; Anal. Calcd for $C_{12}H_{16}N_2S$ C, 65.41; H, 7.32; N, 12.71; Found: C, 65.08; H, 7.35; N, 12.76;

3-(benzylthio)-2,7-dimethylimidazo[1,2-a]pyridine(3dd)



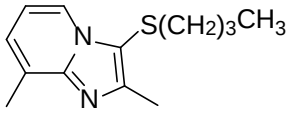
Yellow oil; IR (KBr): 3068, 3037, 2976, 1607, 1564, 734; ^{1}H NMR (400 MHz,$CDCl_3$) δ 7.91 (d, *J* = 6.8 Hz, 1H), 7.27 (s, 1H), 7.07-7.17 (m, 3H), 6.89 (d, *J* = 6.8 Hz, 2H), 6.53 (d, *J* = 6.8 Hz, 1H), 3.69 (s, 2H), 2.36 (s, 3H), 2.18 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 150.8, 146.7, 137.8, 136.6, 128.7, 128.4, 127.1, 123.2, 115.3, 114.6, 40.1, 21.2, 13.5. ESI-MS m/z (%) 269 (100) $[M+H]^+$; Anal. Calcd for $C_{16}H_{16}N_2S$ C, 71.61; H, 6.01; N, 10.44; Found:C, 71.27; H, 6.04; N, 10.49;

3-(dodecylthio)-2,8-dimethylimidazo[1,2-a]pyridine(3ea)



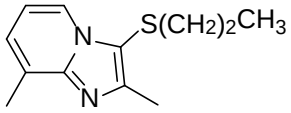
Yellow oil; IR (KBr): 2987, 2890, 1570, 1466, 1374, 725; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.23 (d, *J* = 6.8 Hz, 1H), 7.02 (d, *J* = 6.8 Hz, 1H), 6.77 (t, *J* = 6.8 Hz, 1H), 2.54-2.60 (m, 8H), 1.45-1.50(m, 2H), 1.22-1.43 (m, 18H), 0.88 (t, *J* = 6.4 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 149.2, 146.4, 126.5, 124.3, 122.0, 112.1, 111.1, 35.4, 31.8, 29.8, 29.6, 29.5, 29.4, 29.3, 29.1, 28.5, 22.6, 16.7, 14.1, 14.0. ESI-MS m/z (%) 347 (100) $[M+H]^+$; Anal. Calcd for $C_{21}H_{34}N_2S$ C, 72.78; H, 9.89; N, 8.08; Found:C, 72.42; H, 9.92; N, 8.11;

3-(butylthio)-2,8-dimethylimidazo[1,2-a]pyridine(3eb)



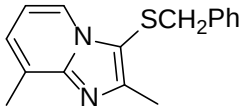
Yellow oil; IR (KBr): 2987, 1564, 1462, 1368, 729; ^{1}H NMR (400 MHz,$CDCl_3$) δ 8.22 (d, *J* = 6.0 Hz, 1H), 7.00 (d, *J* = 6.0 Hz, 1H), 6.76 (t, *J* = 6.0 Hz, 1H), 2.50-2.75 (m, 8H), 1.45-1.37 (m, 4H), 0.86 (t, *J* = 6.0 Hz, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 149.1, 146.3, 126.4, 124.2, 121.9, 112.1, 111.0, 35.0, 31.8, 21.6, 16.7, 13.9, 13.5. ESI-MS m/z (%) 235 (100) $[M+H]^+$; Anal. Calcd for $C_{13}H_{18}N_2S$ C, 66.62; H, 7.74; N, 11.95; Found: C, 66.30; H, 7.76; N, 11.99;

2,8-dimethyl-3-(propylthio)imidazo[1,2-a]pyridine(3ec)



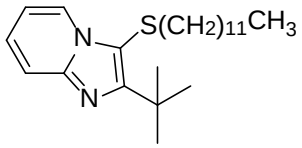
Yellow oil; IR (KBr): 2979, 1569, 1462, 1370, 736; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.24 (d, *J* = 6.4 Hz, 1H), 7.02 (d, *J* = 6.4 Hz, 1H), 6.78 (t, *J* = 6.4 Hz, 1H), 2.53-2.59 (m, 8H), 1.45-1.54 (m, 2H), 0.95 (t, *J* = 7.2 Hz, 3H). ^{13}C NMR (100MHz, $CDCl_3$) δ 149.3, 146.4, 126.6, 124.2, 122.0, 112.1, 110.2, 37.4, 23.1, 16.7, 14.0, 13.1. ESI-MS m/z (%) 221 (100) $[M+H]^+$; Anal. Calcd for $C_{12}H_{16}N_2S$ C, 65.41; H, 7.32; N, 12.71; Found: C, 65.18; H, 7.36; N, 12.78;

3-(benzylthio)-2,8-dimethylimidazo[1,2-a]pyridine(3ed)



Yellow oil; IR (KBr): 3074, 2975, 1616, 1571, 781; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.94 (d, *J* = 6.8 Hz, 1H), 7.14 (d, *J* = 6.8 Hz, 3H), 6.97 (d, *J* = 6.8 Hz, 1H), 6.91 (d, *J* = 6.8 Hz, 2H),6.62(t, 1H), 3.72 (s, 2H), 2.58 (s, 3H), 2.26 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 150.3, 146.5, 137.8, 128.7, 128.4, 127.1, 126.4, 124.6, 121.9, 112.0, 40.1, 16.7, 13.5. ESI-MS m/z (%) 269 (100) $[M+H]^+$; Anal. Calcd for $C_{16}H_{16}N_2S$ C, 71.61; H, 6.01; N, 10.44; Found: C, 71.91; H, 5.99; N, 10.39;

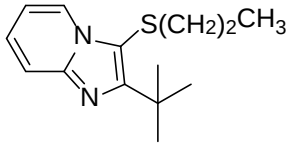
2-(tert-butyl)-3-(dodecylthio)imidazo[1,2-a]pyridine(3fa)



Yellow oil; IR (KBr): 2980, 2873, 1536, 1465, 1395, 1372, 1367, 720; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.41 (d, *J* = 6.8 Hz, 1H), 7.60 (d, *J* = 8.8 Hz, 1H), 7.16 (t, *J* = 7.6 Hz, 1H), 6.81 (t, *J* = 6.6 Hz, 1H), 2.64 (t, *J* = 7.2 Hz, 2H), 1.58-1.62 (m, 11H), 1.25-1.38 (m, 18H), 0.87 (t, *J* = 6.0 Hz, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 160.1, 144.8, 124.6, 123.5, 117.2, 111.9, 109.2, 36.2, 33.8,

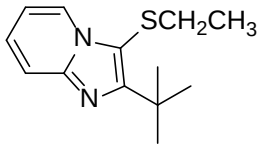
31.8, 30.6, 29.6, 29.5, 29.4, 29.3, 29.2, 29.1, 28.8, 22.6, 14.0. ESI-MS m/z (%) 375 (100) $[M+H]^+$; Anal. Calcd for $C_{23}H_{38}N_2S$ C, 73.74; H, 10.22; N, 7.48; Found: C, 73.40; H, 10.27; N, 7.51;

2-(tert-butyl)-3-(propylthio)imidazo[1,2-a]pyridine(3fb)



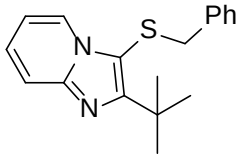
Yellow oil; IR (KBr): 2985, 2872, 1464, 1395, 1373, 1369, 726; ^{1}H NMR (400 MHz,$CDCl_3$) δ 8.41 (d, *J* = 6.8 Hz, 1H), 7.59 (d, *J* = 8.8 Hz, 1H), 7.15 (t, *J* = 7.6 Hz, 1H), 6.80 (t, *J* = 6.4 Hz, 1H), 2.61 (t, *J* = 7.4 Hz, 2H), 1.58-1.65 (m, 11H), 0.98 (t, *J* = 7.2 Hz, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 160.0, 144.7, 124.6, 123.5, 117.1, 111.9, 109.0, 38.1, 33.8, 30.6, 22.7, 13.4. ESI-MS m/z (%) 249 (100) $[M+H]^+$; Anal. Calcd for $C_{14}H_{20}N_2S$ C, 67.70; H, 8.12; N, 11.28; Found: C, 67.38; H, 8.16; N, 11.33;

2-(tert-butyl)-3-(ethylthio)imidazo[1,2-a]pyridine(3fc)



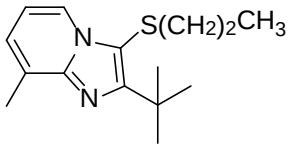
Yellow oil; IR (KBr): 2975, 2884, 1466, 1394, 1373, 1367, 741;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.43 (d, *J* = 6.6 Hz, 1H), 7.60 (d, *J* = 8.8 Hz, 1H), 7.18 (t, *J* = 7.6 Hz, 1H), 6.82 (t, *J* = 6.4 Hz, 1H), 2.68 (q, *J* = 7.0 Hz, 2H), 1.57 (s, 9H), 1.21 (t, *J* = 7.4 Hz, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 160.3, 144.9, 124.8, 123.6, 117.1, 112.0, 108.8, 33.9, 30.7, 30.1, 14.3. ESI-MS m/z (%) 235 (100) $[M+H]^+$; Anal. Calcd for $C_{13}H_{18}N_2S$ C, 66.62; H, 7.74; N, 11.95; Found: C, 66.32; H, 7.76; N, 12.00;

3-(benzylthio)-2-(tert-butyl)imidazo[1,2-a]pyridine(3fd)



White solid; m.p. 89.7℃. IR (KBr): 3053, 2987, 2869, 1609, 1556, 1465, 1394, 1369, 790; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.98 (d, *J* = 6.8 Hz, 1H), 7.55 (d, *J* = 8.8 Hz, 1H), 7.00-7.13 (m, 5H), 6.58 (t, *J* = 6.6 Hz, 1H), 3.79 (s, 2H), 1.54 (s, 9H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 161.0, 145.1, 137.3, 128.7, 128.6, 127.3, 125.1, 123.5, 116.9, 111.8, 108.1, 41.1, 34.0, 30.7. ESI-MS m/z (%) 297 (100) $[M+H]^+$; $C_{18}H_{20}N_2S$ C, 72.93; H, 6.80; N, 9.45; Found:C, 72.57; H, 6.83; N, 9.49;

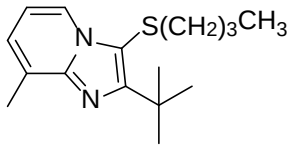
2-(tert-butyl)-8-methyl-3-(propylthio)imidazo[1,2-a]pyridine(3ga)



Yellow oil; IR (KBr): 2974, 2873, 1465, 1396, 1372, 744;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.27 (d, *J* = 6.8 Hz, 1H), 6.93 (d, *J* = 6.8 Hz, 1H), 6.70 (t, *J* = 6.8 Hz, 1H), 2.58-2.61 (m, 5H), 1.57-1.63 (m, 11H), 0.98 (t, *J* = 7.2 Hz, 3H).^{13}C NMR (100 MHz,$CDCl_3$)δ 159.7, 145.2, 127.2, 123.6, 123.1, 121.5, 112.0, 109.2, 38.4, 34.0, 30.9, 23.0, 16.7, 13.64 . ESI-MS m/z (%) 263 (100)

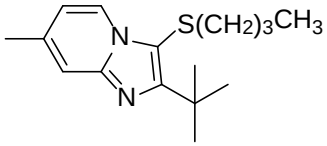
$[M+H]^+$; Anal. Calcd for $C_{15}H_{22}N_2S$ C, 68.66; H, 8.45; N, 10.68; Found: C, 68.32; H, 8.49; N, 10.73;

2-(tert-butyl)-3-(butylthio)-8-methylimidazo[1,2-a]pyridine(3gb)



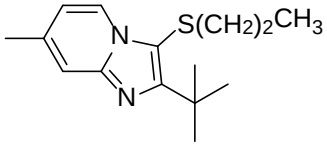
Yellow oil; IR (KBr): 3022, 2992, 2880, 1467, 1396, 1375, 1367, 729; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.88 (d, *J* = 6.8 Hz, 1H), 7.30 (s, 1H), 6.85 (d, *J* = 6.8 Hz, 1H), 6.58 (d, *J* = 6.8 Hz, 1H), 2.59 (s, 3H), 1.41 (s, 9H).^{13}C NMR (100 MHz, $CDCl_3$) δ 156.5, 145.4, 127.0, 123.2, 122.5, 111.4, 107.1, 32.3, 30.3, 17.3. ESI-MS m/z (%) 277 (100) $[M+H]^+$; Anal. Calcd for $C_{16}H_{24}N_2S$ C, 69.52; H, 8.75; N, 10.13; Found:C, 69.28; H, 8.79; N, 10.18;

2-(tert-butyl)-3-(butylthio)-7-methylimidazo[1,2-a]pyridine(3gc)



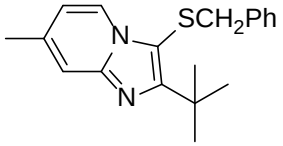
Yellow oil; IR (KBr): 2980, 2873, 1536, 1465, 1395, 1372, 1367, 730; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.28 (d, *J* = 6.7 Hz, 1H), 7.37 (s, 1H), 6.65 (d, *J* = 6.4 Hz, 1H), 2.60 (t, *J* = 7.2 Hz, 2H), 2.36 (s, 3H), 1.56-1.61 (m, 11H), 1.40 (q, *J* = 7.2 Hz, 3H), 0.88 (t, *J* = 7.2 Hz, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 159.8, 145.2, 135.7, 122.8, 115.7, 114.5, 108.3, 36.0, 33.8, 31.4, 30.6, 30.1, 21.9, 21.0, 13.5. ESI-MS m/z (%) 277 (100) $[M+H]^+$; Anal. Calcd for $C_{16}H_{24}N_2S$ C, 69.52; H, 8.75; N, 10.13; Found:C, 69.40; H, 8.78; N, 10.17;

2-(tert-butyl)-7-methyl-3-(propylthio)imidazo[1,2-a]pyridine(3gd)



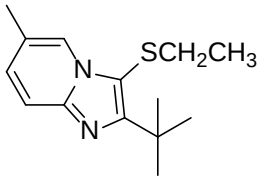
Yellow oil; IR (KBr): 2873, 1465, 1372, 1366, 740; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.30 (d, *J* = 6.8 Hz, 1H), 7.38 (s, 1H), 6.68 (d, *J* = 6.6 Hz, 1H), 2.61 (t, *J* = 7.2 Hz, 2H), 2.38 (s, 3H), 1.55-1.63 (m, 11H), 1.00 (t, *J* = 7.2 Hz, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 159.8, 145.2, 136.0, 122.9, 115.7, 114.7, 108.4, 38.4, 33.8, 30.7, 22.9, 21.1, 13.5. ESI-MS m/z (%) 263 (100) $[M+H]^+$; Anal. Calcd for $C_{15}H_{22}N_2S$ C, 68.66; H, 8.45; N, 10.68; Found: C, 68.43; H, 8.47; N, 10.73;

3-(benzylthio)-2-(tert-butyl)-7-methylimidazo[1,2-a]pyridine(3ha)



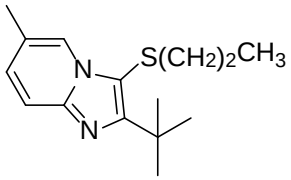
Yellow oil; IR (KBr): 3046, 2986, 2894, 1625, 1573, 1464, 1396, 1363;^{1}H NMR (400 MHz, $CDCl_3$) δ 7.85 (d, *J* = 5.7 Hz, 1H), 7.31 (s, 1H), 6.99- 7.12 (m, 5H), 6.41 (d, *J* = 6.2 Hz, 1H), 3.76 (s, 2H), 2.31 (s, 3H), 1.52 (s, 9H).^{13}C NMR (100 MHz, $CDCl_3$) δ 160.8, 145.4, 137.3, 136.1, 128.7, 128.6, 127.2, 122.7, 115.6, 114.3, 107.2, 41.2, 33.9, 30.7, 21.1. MS (EI) m/z: 310.15. Anal. Calcd for $C_{19}H_{22}N_2S$ C, 73.51; H, 7.14; N, 9.02; Found: C, 73.15; H, 7.17; N, 9.06;

2-(tert-butyl)-3-(ethylthio)-6-methylimidazo[1,2-a]pyridine(3hb)



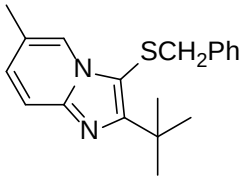
Yellow oil; IR (KBr): 3032, 2974, 2880, 1578, 1465, 1394, 1375, 1364, 785;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.21 (s, 1H), 7.50 (d, *J* = 8.8 Hz, 1H), 7.02 (d, *J* = 8.8 Hz, 1H), 2.68 (q, *J* = 7.2 Hz, 2H), 2.33 (s, 3H), 1.56 (s, 9H), 1.21 (t, *J* = 7.4 Hz, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 160.0, 143.9, 127.8, 121.6, 121.4, 116.4, 108.3, 33.8, 30.6, 29.9, 18.2, 14.2. ESI-MS m/z (%) 249 (100) $[M+H]^+$; Anal. Calcd for $C_{14}H_{20}N_2S$ C, 67.70; H, 8.12; N, 11.28; Found: C, 67.38; H, 8.16; N, 11.33;

2-(tert-butyl)-6-methyl-3-(propylthio)imidazo[1,2-a]pyridine(3hc)



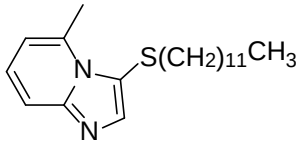
Yellow oil; IR (KBr): 2979, 2880, 1578, 1465, 1394, 1375, 1364, 744; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.22 (s, 1H), 7.57 (d, *J* = 8.8 Hz, 1H), 7.09 (d, *J* = 8.8 Hz, 1H), 2.63 (t, *J* = 7.4 Hz, 2H), 2.38 (s, 3H), 1.60-1.64 (m, 2H), 1.56 (s, 9H), 1.02 (t, *J* = 7.2 Hz, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 158.6, 143.4, 128.7, 122.5, 121.6, 116.3, 109.2, 38.2, 33.8, 30.6, 22.8, 18.4, 13.5. ESI-MS m/z (%) 263 (100) $[M+H]^+$; Anal. Calcd for $C_{15}H_{22}N_2S$ C, 68.66; H, 8.45; N, 10.68; Found: C, 68.34; H, 8.47; N, 10.72;

3-(benzylthio)-2-(tert-butyl)-6-methylimidazo[1,2-a]pyridine(3hd)



Yellow oil; IR (KBr): 3054, 2990, 2984, 1664, 1538, 1465, 1394, 1365; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.63 (s, 1H), 7.42 (d, *J* = 8.8 Hz, 1H), 7.11 (d, *J* = 4.6 Hz, 3H), 6.98 (d, *J* = 4.4 Hz, 2H), 6.92 (d, *J* = 9.0 Hz, 1H), 3.77 (s, 2H), 2.11 (s, 3H), 1.54 (s, 9H).^{13}C NMR (100 MHz, $CDCl_3$) δ 160.8, 144.0, 137.7, 128.7, 128.4, 128.0, 127.2, 121.5, 121.3, 116.2, 107.6, 41.5, 33.9, 30.7, 18.1. ESI-MS m/z (%) 311 (100) $[M+H]^+$; Anal. Calcd for $C_{19}H_{22}N_2S$ C, 73.51; H, 7.14; N, 9.02; Found:C, 73.30; H, 7.17; N, 9.06;

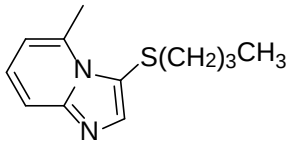
3-(dodecylthio)-5-methylimidazo[1,2-a]pyridine(4aa)



Yellow oil; IR (KBr): 2980, 2887, 1538, 1465, 1375, 725;^{1}H NMR (400 MHz, $CDCl_3$) δ 7.72 (s, 1H), 7.50 (d, *J* = 8.8 Hz, 1H), 7.10 (t, *J* = 7.6 Hz, 1H), 6.53 (d, *J* = 6.8 Hz, 1H), 3.08 (s, 3H), 2.64 (t, *J* = 7.2 Hz, 2H), 1.55 (m, *J* = 7.2 Hz, 2H), 1.24 (m, 18H), 0.87 (t, *J* = 6.5 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ143.7, 138.0,125.4, 116.3,115.0,114.2, 40.2, 31.8, 29.5, 29.5, 29.4,

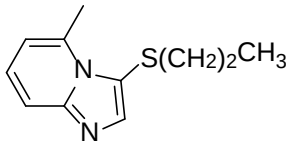
29.3, 29.1, 28.7, 28.5, 22.6, 20.8, 14.0. ESI-MS m/z (%) 333 (100) $[M+H]^+$; Anal. Calcd for $C_{20}H_{32}N_2S$ C, 72.24; H, 9.70; N, 8.42; Found:C, 71.87; H, 9.74; N, 8.46;

3-(butylthio)-5-methylimidazo[1,2-a]pyridine(4ab)



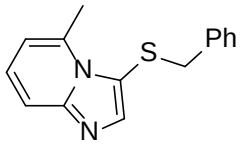
IR (KBr): 2962, 2873, 2850, 1536, 1465, 730;^{1}H NMR (400 MHz, $CDCl_3$) δ 7.73 (s, 1H), 7.51 (d, *J* = 8.8 Hz, 1H), 7.12 (t, *J* = 7.6 Hz, 1H), 6.54 (d, *J* = 6.4 Hz, 1H), 3.08 (s, 3H), 2.65 (t, *J* = 7.2 Hz, 2H), 1.46 (m, 7.2 Hz, 4H), 0.89 (t, *J* = 7.2 Hz, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 143.7, 138.1, 125.5, 116.3, 114.3, 39.9, 30.8, 21.6, 20.8, 13.5. ESI-MS m/z (%) 221 (100) $[M+H]^+$; Anal. Calcd for $C_{12}H_{16}N_2S$ C, 65.42; H, 7.32; N, 12.71; Found: C, 65.31; H, 7.35; N, 12.77

5-methyl-3-(propylthio)imidazo[1,2-a]pyridine(4ac)



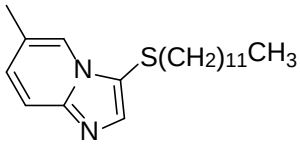
Yellow oil; IR (KBr): 2964, 2869, 2850, 1538, 1466, 1373, 738;^{1}H NMR (400 MHz, $CDCl_3$) δ 7.72 (s, 1H), 7.50 (d, *J* = 8.8 Hz, 1H), 7.11 (t, *J* = 7.8 Hz, 1H), 6.54 (d, *J* = 6.4 Hz, 1H), 3.08 (s, 3H), 2.62 (t, *J* = 7.2 Hz, 2H), 1.57 (m, 2H), 0.98 (t, *J* = 7.2 Hz, 3H). ^{13}C NMR (100MHz, $CDCl_3$) δ 149.3, 143.8, 138.1, 125.5, 116.3, 114.9, 114.3, 42.0, 22.0, 20.8, 13.0. ESI-MS m/z (%) 207 (100) $[M+H]^+$; Anal. Calcd for $C_{11}H_{14}N_2S$ C, 64.04; H, 6.84; N, 13.58; Found:C, 63.82; H, 6.87; N, 13.65;

3-(benzylthio)-5-methylimidazo[1,2-a]pyridine(4ad)



Yellow oil; IR (KBr): 3037, 2978, 2856, 1607, 1538, 1449;^{1}H NMR (400 MHz, $CDCl_3$) δ 7.56 (s, 1H), 7.49 (d, *J* = 8.8 Hz, 1H), 7.06 – 7.20(m, 4H), 6.93 (m, 2H), 6.46 (d, *J* = 6.8 Hz, 1H), 3.83 (s, 2H), 2.83 (s, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 144.3, 138.2, 136.9, 129.4, 128.7, 128.6, 128.5, 127.3, 125.8, 116.2, 114.3, 45.7, 21.0. ESI-MS m/z (%) 255 (100) $[M+H]^+$; MS (EI) m/z:254.09.Anal. Calcd for $C_{15}H_{14}N_2S$ C, 70.83; H, 5.55; N, 11.01; Found:C, 70.48; H, 5.57; N, 11.01;

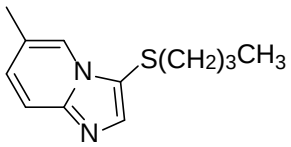
3-(dodecylthio)-6-methylimidazo[1,2-a]pyridine(4ba)



White solid; m.p. 155.7℃; IR (KBr): 2984, 2883, 2857, 1465, 1375, 722; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.20 (s, 1H), 7.73 (s, 1H), 7.53 (d, *J* = 8.4 Hz, 1H), 7.08 (d, *J* = 8.4 Hz, 1H), 2.59 (t, *J* = 7.2 Hz, 2H), 2.36 (s, 3H), 1.50 (m, 2H), 1.24-1.36 (m, 18H), 0.87 (t, *J* = 6.0 Hz, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 140.8, 128.1, 122.3, 121.8, 117.2, 35.6, 31.8, 29.6, 29.5, 29.5, 29.4, 29.2, 29.1, 28.3, 22.6, 18.2, 14.0. ESI-MS m/z (%) 333 (100) $[M+H]^+$; Anal. Calcd for $C_{20}H_{32}N_2S$ C,

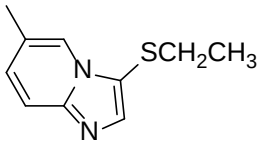
72.24; H, 9.70; N, 8.42; Found: C, 71.89; H, 9.74; N, 8.46;

3-(butylthio)-6-methylimidazo[1,2-a]pyridine(4bb)



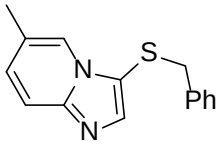
Yellow oil; IR (KBr): 2975, 2879, 1486, 1463, 1374, 735;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.18 (s, 1H), 7.71 (s, 1H), 7.51 (d, *J* = 9.0 Hz, 1H), 7.05 (d, *J* = 8.8 Hz, 1H), 2.58 (t, *J* = 6.8 Hz, 2H), 2.34 (s, 3H), 1.56 – 1.32 (m, 4H), 0.85 (t, *J* = 6.8 Hz, 3H). ^{13}C NMR (100MHz, $CDCl_3$) δ 146.2, 140.6, 128.1, 122.2, 121.6, 117.0, 113.2, 35.2, 31.5, 21.3, 18.1, 13.4. ESI-MS m/z (%) 221 (100) $[M+H]^+$; Anal. Calcd for $C_{12}H_{16}N_2S$ C, 65.42; H, 7.32; N, 12.71; Found:C, 65.71; H, 7.30; N, 12.66;

3-(ethylthio)-6-methylimidazo[1,2-a]pyridine(4bc）



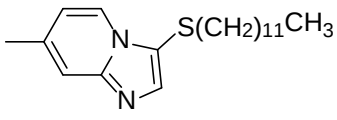
Yellow oil; IR (KBr): 2981, 2850, 1529, 1464, 1375, 770; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.22 (s, 1H), 7.73 (s, 1H), 7.55 (d, *J* = 9.2 Hz, 1H), 7.12 (d, *J* = 9.2 Hz, 1H), 2.64 (q, *J* = 7.2 Hz, 2H), 2.39 (s, 3H), 1.20 (t, *J* = 7.2 Hz, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 146.5, 141.1, 128.3, 122.4, 121.8, 117.1, 112.9, 29.6, 18.2, 14.9. ESI-MS m/z (%) 193 (100) $[M+H]^+$; Anal. Calcd for $C_{10}H_{12}N_2S$ C, 62.47; H, 6.29; N, 14.57; Found: C, 62.16; H, 6.32; N, 14.64;

3-(benzylthio)-6-methylimidazo[1,2-a]pyridine（4bd)



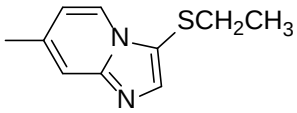
White solid; m.p.112.6℃; 3038, 2986, 2876, 1637, 1544, 1487; IR (KBr): ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.70 (s, 1H), 7.60 (s, 1H), 7.48 (d, *J* = 9.2 Hz, 1H), 7.10-7.19 (m, 3H), 6.97-7.03 (m, 3H), 3.79 (s, 2H), 2.20 (s, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 141.4, 138.0, 128.7, 128.5, 128.4, 127.3, 122.0, 121.8, 117.0, 41.8, 18.1. ESI-MS m/z (%) 255 (100) $[M+H]^+$; Anal. Calcd for $C_{15}H_{14}N_2S$ C, 70.83; H, 5.55; N, 11.01; Found: C, 70.49; H, 5.58; N, 11.07;

3-(dodecylthio)-7-methylimidazo[1,2-a]pyridine(4ca)



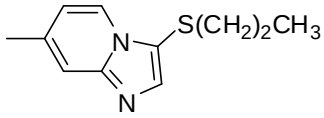
Yellow oil; IR (KBr): 2985, 2877, 2854, 1542, 1467, 1372, 723;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.30 (d, *J* = 6.8 Hz, 1H), 7.70 (s, 1H), 7.40 (s, 1H), 6.75 (d, *J* = 6.8 Hz, 1H), 2.59 (t, *J* = 7.3 Hz, 2H), 2.42 (s, 3H), 1.57 – 1.45 (m, 2H), 1.37 – 1.22 (m, 18H), 0.88 (t, *J* = 6.3 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 140.8, 136.3, 123.3, 116.4, 115.3, 35.9, 31.9, 29.7, 29.6, 29.5, 29.4, 29.3, 29.1, 28.4, 22.6, 21.2, 14.1. ESI-MS m/z (%) 333 (100) $[M+H]^+$; Anal. Calcd for $C_{20}H_{32}N_2S$ C, 72.24; H, 9.70; N, 8.42; Found: C, 72.90; H, 9.74; N, 8.46;

3-(ethylthio)-7-methylimidazo[1,2-a]pyridine



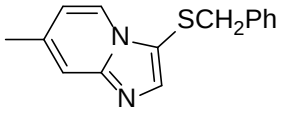
Yellow oil; IR (KBr): 2978, 2858, 1545, 1465, 1372, 774;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.31 (d, *J* = 4.8 Hz, 1H), 7.74 (s, 1H), 7.39 (s, 1H), 6.72 (d, *J* = 6.8 Hz, 1H), 2.61 (q, *J* = 7.2 Hz, 2H), 2.39 (s, 3H), 1.16 (t, *J* = 7.2 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 140.9, 136.3, 125.0, 123.3, 116.3, 115.7, 115.2, 29.8, 21.1, 14.9. ESI-MS m/z (%) 193 (100) $[M+H]^+$; Anal. Calcd for $C_{10}H_{12}N_2S$ C, 62.46; H, 6.29; N, 14.57; Found:C, 62.17; H, 6.32; N, 14.64;

7-methyl-3-(propylthio)imidazo[1,2-a]pyridine(4cc)



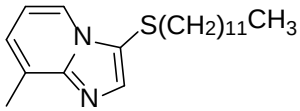
Yellow oil; IR (KBr): 2967, 2874, 1523, 1466, 1375, 740;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.30 (d, *J* = 6.4 Hz, 1H), 7.72 (s, 1H), 7.39 (s, 1H), 6.74 (d, *J* = 6.4 Hz, 1H), 2.56 (t, *J* = 6.4 Hz, 2H), 2.41 (s, 3H), 1.48-1.55 (m, 2H), 0.96 (m, *J* = 6.4 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 140.8, 136.3, 123.3, 116.4, 115.3, 37.8, 22.9, 21.2, 12.9. ESI-MS m/z (%) 207 (100) $[M+H]^+$; Anal. Calcd for $C_{11}H_{14}N_2S$ C, 64.04; H, 6.84; N, 13.58; Found: C, 63.73; H, 6.88; N, 13.64;

3-(benzylthio)-7-methylimidazo[1,2-a]pyridine(4cd)



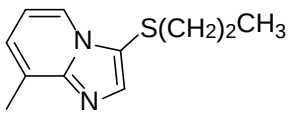
Yellow oil; IR (KBr): 3042, 2968, 2866, 1616, 1534, 1498;^{1}H NMR (400 MHz, $CDCl_3$) δ 7.90 (d, *J* = 6.4 Hz, 1H), 7.58 (s, 1H), 7.35 (s, 1H), 7.14-7.16 (m, 3H), 6.98 (d, *J* = 5.2 Hz, 2H), 6.54 (d, *J* = 6.8 Hz, 1H), 3.78 (s, 2H), 2.36 (s, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 141.3, 137.8, 136.7, 128.6, 128.5, 127.3, 123.2, 116.2, 115.1, 41.6, 21.2. ESI-MS m/z (%) 255 (100) $[M+H]^+$; Anal. Calcd for $C_{15}H_{14}N_2S$ C, 70.83; H, 5.55; N, 11.01; S, 12.60;Found: C, 70.53; H, 5.58; N, 11.06;

3-(dodecylthio)-8-methylimidazo[1,2-a]pyridine(4da)



Yellow oil; IR (KBr): 2962, 2932, 2855, 1493, 1463, 1376, 720;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.30 (d, *J* = 3.2 Hz, 1H), 7.80 (s, 1H), 7.05 (d, *J* = 6.0 Hz, 1H), 6.83 (t, *J* = 6.4 Hz, 1H), 2.58-2.64 (m, 5H), 1.47-1.56 (m, 2H), 1.23-1.35 (m, 18H), 0.87 (t, *J* = 6.8 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 140.2, 127.6, 124.3, 122.0, 112.7, 35.8, 31.8, 29.7, 29.6, 29.5, 29.4, 29.3, 29.1, 28.4, 22.6, 16.8, 14.0. ESI-MS m/z (%) 333 (100) $[M+H]^+$; Anal. Calcd for $C_{20}H_{32}N_2S$ C, 72.24; H, 9.70; N, 8.42; Found: C, 71.91; H, 9.74; N, 8.46;

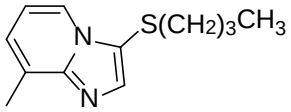
8-methyl-3-(propylthio)imidazo[1,2-a]pyridine(4db)



Yellow oil; IR (KBr): 2958, 2931, 1540, 1466, 734; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.30 (d, *J* = 6.0 Hz, 1H), 7.76 (s, 1H), 7.04 (d, *J* = 6.4 Hz, 1H), 6.82 (t, *J* = 6.0 Hz, 1H), 2.56-2.61 (m, 5H), 1.50-1.54 (m, 2H), 0.94 (t, *J* = 6.8 Hz, 3H).^{13}C NMR (100 MHz,$CDCl_3$) δ 147.5, 140.1, 127.6,

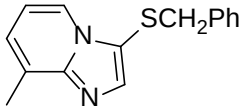
124.1, 121.9, 114.2, 112.7, 37.6, 22.9, 16.6, 12.9. ESI-MS m/z (%) 207 (100) $[M+H]^+$; Anal. Calcd for $C_{11}H_{14}N_2S$ C, 64.04; H, 6.84; N, 13.58; Found: C, 63.75; H, 6.87; N, 13.64;

3-(butylthio)-8-methylimidazo[1,2-a]pyridine(4dc)



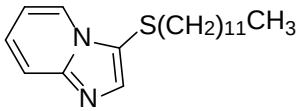
Yellow oil; IR (KBr): 2971, 2849, 1523, 1486, 1463, 1369, 733;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.29 (d, *J* = 6.0 Hz, 1H), 7.76 (s, 1H), 7.03 (d, *J* = 6.4 Hz, 1H), 6.81 (t, *J* = 6.4 Hz, 1H), 2.57-2.61 (m, 5H), 1.35-1.50 (m, 4H), 0.86 (t, *J* = 6.8 Hz, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 147.6, 140.1, 127.6, 124.1, 121.9, 114.2, 112.6, 35.4, 31.6, 21.4, 16.5, 13.5. ESI-MS m/z (%) 221(100) $[M+H]^+$; Anal. Calcd for $C_{12}H_{16}N_2S$ C, 65.42; H, 7.32; N, 12.71; Found: C, 65.10; H, 7.35; N, 12.77;

3-(benzylthio)-8-methylimidazo[1,2-a]pyridine(4dd)



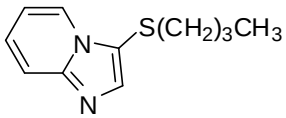
Yellow oil; IR (KBr): 3043, 2968, 2853, 1604, 1558;^{1}H NMR (400 MHz, $CDCl_3$) δ 7.93 (d, *J* = 6.8 Hz, 1H), 7.63 (s, 1H), 7.15-7.27 (m, 3H), 6.99-7.01 (d, 3H), 6.65 (t, *J* = 6.8 Hz, 1H), 3.80 (s, 2H), 2.60 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 147.6, 140.6, 137.7, 128.6, 128.5, 127.4, 127.3, 124.5, 121.8, 113.7, 112.5, 41.5, 16.6. ESI-MS m/z (%) 255(100) $[M+H]^+$; Anal. Calcd for $C_{15}H_{14}N_2S$ C 70.83; H, 5.55; N, 11.01; S, 12.60;Found: C, 70.48; H, 5.55; N, 11.06; S, 12.66

3-(dodecylthio)imidazo[1,2-a]pyridine(4ea)



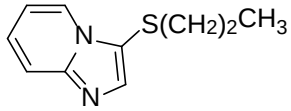
Yellow oil; IR (KBr): 2965, 2934, 2858, 1526, 1487, 1465, 1375, 722;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.41 (d, *J* = 6.4 Hz, 1H), 7.77 (s, 1H), 7.61 (d, *J* = 8.8 Hz, 1H), 7.21 (t, *J* = 7.2 Hz, 1H), 6.87 (t, *J* = 6.8 Hz, 1H), 2.57 (t, *J* = 7.2 Hz, 2H), 1.44-1.51 (m, 2H), 1.20-1.32 (m, 18H), 0.84 (t, *J* = 6.8 Hz, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 141.0, 125.1, 124.20, 118.0, 112.6, 35.8, 31.8, 29.7, 29.6, 29.5, 29.4, 29.3, 29.1, 28.4, 22.6, 14.0. ESI-MS m/z (%) 319 (100) $[M+H]^+$; Anal. Calcd for $C_{19}H_{30}N_2S$ C, 71.65; H, 9.49; N, 8.79; Found:C, 71.31; H, 9.53; N, 8.73;

3-(butylthio)imidazo[1,2-a]pyridine(4eb)



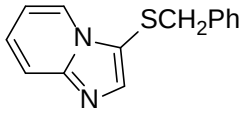
Yellow oil; IR (KBr): 2961, 2935, 2847, 1573, 1463, 1368, 735;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.43 (d, *J* = 6.8 Hz, 1H), 7.77 (s, 1H), 7.64 (d, *J* = 9.2 Hz, 1H), 7.24 (t, *J* = 8.0 Hz, 1H), 6.92 (t, *J* = 6.8 Hz, 1H), 2.61 (t, *J* = 7.2 Hz, 2H), 1.36-1.52 (m, 4H), 0.87 (t, *J* = 7.2 Hz, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 147.3, 140.8, 125.2, 124.1, 117.9, 114.0, 112.7, 35.4, 31.7, 21.5, 13.56; ESI-MS m/z (%) 207 (100) $[M+H]^+$; Anal. Calcd for $C_{11}H_{14}N_2S$ C, 64.04; H, 6.84; N, 13.58; Found: C, 63.74; H, 6.87; N, 13.64;

3-(propylthio)imidazo[1,2-a]pyridine(4ec)



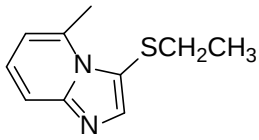
Yellow oil; IR (KBr): 2965, 2853, 1547, 1470, 1372, 742;^{1}H NMR (400 MHz,$CDCl_3$) δ 8.48 (s, 1H), 7.89 (s, 1H), 7.65 (s, 1H), 7.25 (s, 1H), 6.91 (t, *J* = 5.6 Hz, 1H), 2.59 (t, *J* = 6.4 Hz, 2H), 1.55 (q, J = 6.8 Hz, 2H), 0.96 (t, *J* = 6.0 Hz, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 141.0, 128.4, 125.1, 124.3, 117.9, 112.6, 37.7, 23.0, 12.9. ESI-MS m/z (%) 193 (100) $[M+H]^+$; Anal. Calcd for $C_{10}H_{12}N_2S$ C, 62.47; H, 6.29; N, 14.57; Found: C, 62.16; H, 6.31; N, 14.64;

3-(benzylthio)imidazo[1,2-a]pyridine(4ed)



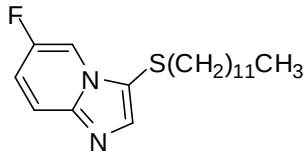
Yellow oil; IR (KBr): 3048, 2933, 1625, 1478, 745, 692;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.06 (s, 1H), 7.58-7.76 (m, 2H), 7.17 (t, *J* = 5.2 Hz, 4H), 6.96 (d, *J* = 6.0 Hz, 2H), 6.69 (t, *J* = 6.4 Hz, 1H), 3.79 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 141.6, 137.7, 128.6, 128.5, 128.3, 127.3, 127.0, 125.3, 124.1, 117.7, 112.4, 41.5. ESI-MS m/z (%) 241 (100) $[M+H]^+$; Anal. Calcd for $C_{14}H_{12}N_2S$ C, 69.97; H, 5.03; N, 11.66; Found: C, 69.63; H, 5.05; N, 11.71;

3-(ethylthio)-5-methylimidazo[1,2-a]pyridine(4ee)



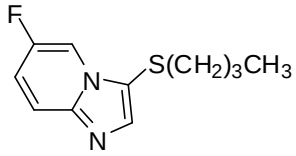
Yellow oil; IR (KBr): 2960, 2935, 1465, 773; ^{1}H NMR (400 MHz, $CDCl_3$) : δ 8.24 (d, *J* = 5.2 Hz, 1H), 7.58 (s, 1H), 7.15 (d, *J* = 4.8 Hz, 1H), 6.54 (d, *J* = 6.0 Hz, 1H), 3.06 (s, 3H), 2.66 (q, *J* = 7.2 Hz, 2H), 1.19 (t, *J* = 7.2 Hz, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 143.8, 138.7, 125.3, 116.4, 114.3, 33.8, 21.1, 13.9. ESI-MS m/z (%) 193 (100) $[M+H]^+$; Anal. Calcd for $C_{10}H_{12}N_2S$ C, 62.47; H, 6.29; N, 14.57; Found: C, 62.38; H, 6.31; N, 14.63;

3-(dodecylthio)-6-fluoroimidazo[1,2-a]pyridine(4fa)



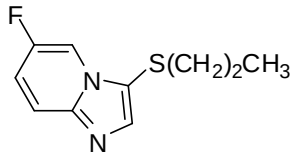
Yellow oil; IR (KBr): 2967, 2929, 2857, 1517, 1469, 1376, 724;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.42 (s, 1H), 7.85-8.11 (m, 1H), 7.64 (s, 1H), 7.19 (s, 1H), 2.62 (t, *J* = 7.2 Hz, 2H), 1.48-1.55 (m, 2H), 1.24-1.38 (m, 18H), 0.88 (t, *J* = 6.0 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 155.0 (*J* = 236.0 Hz), 152.2, 118.6, 118.5, 117.2(*J* = 25.0 Hz) 111.4 (*J* = 44 Hz), 35.7, 31.8, 29.7, 29.6, 29.5, 29.4, 29.3, 29.1, 28.3, 22.6, 14.0. ESI-MS m/z (%) 337 (100) $[M+H]^+$; Anal. Calcd for $C_{19}H_{29}FN_2S$ C, 67.82; H, 8.69; N, 8.32; Found: C, 67.50; H, 8.73; N, 8.36;

3-(butylthio)-6-fluoroimidazo[1,2-a]pyridine(4fb)



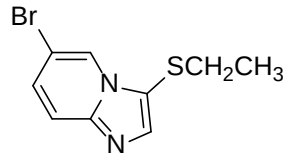
Yellow oil; IR (KBr): ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.37 (s, 1H), 7.82 (s, 1H), 7.60-7.62 (m, 1H), 7. 16-7.20 (m, 1H), 2.63 (t, *J* = 7.2 Hz, 2H), 1.37 – 1.56 (m, 4H), 0.88 (t, *J* = 7.2 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 155.0 (*J* = 237.0 Hz), 152.5, 142.1, 118.5, 118.5, 117.3 (*J* = 26.0 Hz), 111.4 (*J* = 42.0 Hz), 35.4, 31.8, 21.5, 13.5. ESI-MS m/z (%) 225 (100) $[M+H]^+$; Anal. Calcd for $C_{11}H_{13}FN_2S$ C, 58.90; H, 5.84; N, 12.49; C, 58.74; H, 5.86; N, 12.54;

6-fluoro-3-(propylthio)imidazo[1,2-a]pyridine(4fc)



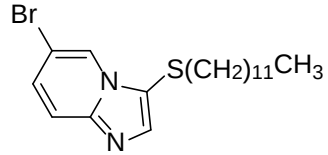
Yellow oil; IR (KBr): 2968, 2854, 1542, 1459, 1367, 737; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.42 – 8.19 (m, 1H), 7.95-8.02 (m, 1H), 7.64 (s, 1H), 7.20 (s, 1H), 2.61 (q, *J* = 7.2 Hz, 2H), 1.52-1.58(m, 2H), 0.97 (t, *J* = 7.2 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 155.0 (*J* = 232.0 Hz),152.6,142.1, 118.6 (*J* = 9.0 Hz),118.5,117.3 (*J* = 25.0 Hz),117.0,111.4 (*J* = 31.0 Hz),114.0, 37.7, 23.1, 12.9. ESI-MS m/z (%) 193 (100) $[M+H]^+$; Anal. Calcd for $C_{10}H_{11}FN_2S$ C, 57.12; H, 5.27; N, 13.32; Found: C, 56.89; H, 5.29; N, 13.38;

6-bromo-3-(ethylthio)imidazo[1,2-a]pyridine(4ga)



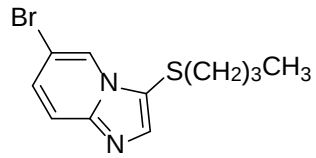
Yellow oil; IR (KBr): 2957, 2845, 1486, 1372, 775;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.56 (s, 1H), 7.77 (s, 1H), 7.53 (d, *J* = 9.2 Hz, 1H), 7.31 (d, *J* = 9.2 Hz, 1H), 2.66 (q, *J* = 7.2 Hz, 2H), 1.20 (t, *J* = 7.2 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 145.8, 141.7, 128.6, 124.4, 118.6, 114.3, 107.8, 29.8, 14.9. ESI-MS m/z (%) 256 (100) $[M+H]^+$; Anal. Calcd for $C_9H_9BrN_2S$ C, 42.04; H, 3.53; N, 10.89; Found: C, 41.90; H, 3.55; N, 10.94;

6-bromo-3-(dodecylthio)imidazo[1,2-a]pyridine(4gb)



Yellow oil; IR (KBr): 2961, 2927, 2857, 1492, 1464, 1375, 774; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.55 (s, 1H), 7.75 (s, 1H), 7.53 (d, *J* = 9.2 Hz, 1H), 7.31 (d, *J* = 9.2 Hz, 1H), 2.62 (t, *J* = 7.2 Hz, 2H), 1.48-1.55 (m, 2H), 1.24-1.37 (m, 18H), 0.88 (t, *J* = 6.4 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 141.5, 128.6, 124.4, 118.6, 107.8, 35.9, 31.8, 29.7, 29.6, 29.5, 29.4, 29.3, 29.1, 28.3, 22.6, 14.0. ESI-MS m/z (%) 397 (100) $[M+H]^+$; Anal. Calcd for $C_{19}H_{29}BrN_2S$ C 57.42; H, 7.36; N, 7.05; Found:C, 57.20; H, 7.39; N, 7.08;

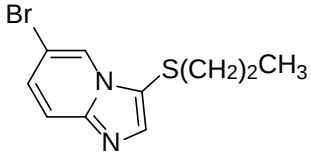
6-bromo-3-(butylthio)imidazo[1,2-a]pyridine(4gc)



Yellow oil; 2956, 2852, 1532, 1466, 1368, 736;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.54 (s, 1H), 7.75 (s, 1H), 7.53 (d, *J* = 9.4 Hz, 1H), 7.31 (d, *J* = 9.4 Hz, 1H), 2.62 (t, *J* = 7.2 Hz, 2H), 1.35-1.53

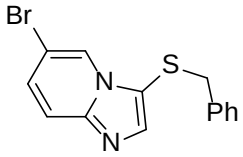
(m, 4H), 0.88 (t, *J* = 7.2 Hz, 3H).^{13}C NMR (100 MHz, $CDCl_3$) δ 145.7, 141.5, 128.6, 124.4, 118.6, 114.7, 107.8, 35.5, 31.7, 21.5, 13.6. ESI-MS m/z (%) 285 (100) $[M+H]^+$; Anal. Calcd for $C_{11}H_{13}BrN_2S$ C, 46.33; H, 4.59; N, 9.82; S, 11.24;Found: C, 46.11; H, 4.61; N, 9.86;

6-bromo-3-(propylthio)imidazo[1,2-a]pyridine(4gd)



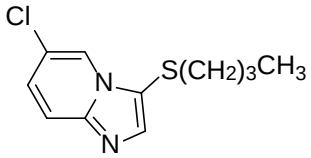
Yellow oil; IR (KBr): 2948, 2854, 1542, 1470, 1368, 733;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.55 (s, 1H), 7.76 (s, 1H), 7.54 (d, *J* = 9.2 Hz, 1H), 7.32 (d, *J* = 9.2 Hz, 1H), 2.62 (t, *J* = 7.2 Hz, 2H), 1.50-1.59 (m, 2H), 0.99 (t, *J* = 7.2 Hz, 3H).^{13}C NMR (100MHz, $CDCl_3$) δ 141.5, 128.7, 124.4, 118.6, 107.8, 37.8, 23.0, 12.99. ESI-MS m/z (%) 271 (100) $[M+H]^+$; Anal. Calcd for $C_{10}H_{11}BrN_2S$ C, 44.29; H, 4.09; N, 10.33; Found: C, 44.07; H, 4.11; N, 10.38;

3-(benzylthio)-6-bromoimidazo[1,2-a]pyridine(4ge)



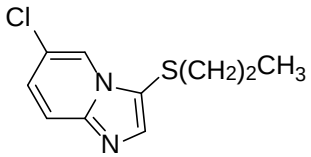
Yellow oil; 3052, 2935, 1608, 1526, 744, 690;^{1}H NMR (400 MHz, $CDCl_3$) δ 7.94 (s, 1H), 7.66 (s, 1H), 7.43 (d, *J* = 9.2 Hz, 1H), 7.10-7.19 (m, 4H), 6.92-6.94 (m, 2H), 3.78 (s, 2H).^{13}C NMR (100 MHz, $CDCl_3$) δ 142.2, 137.6, 128.8, 128.6, 128.5, 127.7, 124.4, 118.2, 107.4, 41.9. ESI-MS m/z (%) 319 (100) $[M+H]^+$; Anal. Calcd for $C_{14}H_{11}BrN_2S$ C, 52.68; H, 3.47; N, 8.78; Found: C, 52.42; H, 3.49; N, 8.82;

3-(butylthio)-6-chloroimidazo[1,2-a]pyridine(4ha)



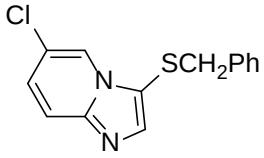
Yellow oil; IR (KBr): 2949, 2856, 1524, 1469, 1368, 736;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.50 (s, 1H), 7.77- 7.89 (m, 2H), 7.33 (d, *J* = 7.2 Hz, 1H), 2.65 (t, *J* = 7.2 Hz, 2H), 1.36-1.58 (m, 4H), 0.89 (t, *J* = 7.2 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 145.7, 141.7, 126.6, 122.2, 121.4, 118.4, 35.5, 31.7, 21.5, 13.5. ESI-MS m/z (%) 241 (100) $[M+H]^+$; Anal. Calcd for $C_{11}H_{13}ClN_2S$ C, 54.88; H, 5.44; N, 11.64; Found: C, 54.51; H, 5.46; N, 11.69;

6-chloro-3-(propylthio)imidazo[1,2-a]pyridine(4hb)



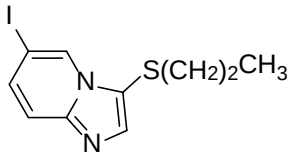
Yellow oil; IR (KBr): 2953, 2855, 1546, 1470, 1371, 742;^{1}H NMR (400 MHz, $CDCl_3$) δ 8.50 (s, 1H), 7.81-7.98 (m, 2H), 7.39 (d, *J* = 9.2 Hz, 1H), 2.64 (t, *J* = 7.2 Hz, 2H), 1.51-1.61 (m, 2H), 1.00 (t, *J* = 7.2 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 144.5, 139.0, 128.6, 126.9, 122.7, 122.3, 118.0, 37.8, 23.0, 12.9. ESI-MS m/z (%) 227 (100) $[M+H]^+$;Anal. Calcd for $C_{10}H_{11}ClN_2S$ C, 52.98; H, 4.89; N, 12.36; Found: C, 54.00; H, 4.87; N, 12.30;

3-(benzylthio)-6-chloroimidazo[1,2-a]pyridine(4hc)



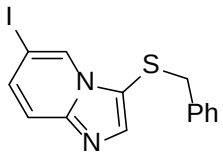
Yellow oil; IR (KBr): 3049, 2930, 2846, 1615, 1554, 744, 690; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.89 (s, 1H), 7.71 (s, 1H), 7.51 (d, *J* = 9.2 Hz, 1H), 7.13-7.19 (m, 4H), 6.95 (d, *J* = 6.8 Hz, 2H), 3.80 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 142.3, 137.6, 128.6, 127.6, 126.8, 122.2, 121.0, 118.0, 41.9. ESI-MS m/z (%) 275 (100) $[M+H]^+$; Anal. Calcd for $C_{14}H_{11}ClN_2S$ C, 61.20; H, 4.04; N, 10.20; Found: C, 61.49; H, 4.06; N, 10.25;

6-iodo-3-(propylthio)imidazo[1,2-a]pyridine(4ia)



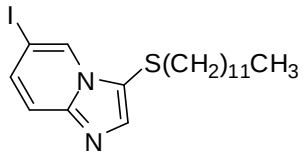
Yellow oil; IR (KBr): 2957, 2931, 1547, 747; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.66 (s, 1H), 7.70 (s, 1H), 7.42 (s, 2H), 2.60 (t, *J* = 7.2 Hz, 2H), 1.51-1.57 (m, 2H), 0.99 (t, *J* = 7.2 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 145.9, 141.1, 133.1, 129.3, 119.0, 114.3, 76.0, 37.8, 23.0, 12.9. ESI-MS m/z (%)319 (100) $[M+H]^+$;Anal. Calcd for $C_{10}H_{11}IN_2S$ C, 37.75; H, 3.48; N, 8.80; Found: C, 37.64; H, 3.49; N, 8.76;

3-(benzylthio)-6-iodoimidazo[1,2-a]pyridine(4ib)



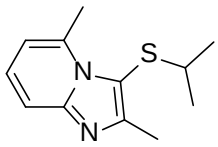
Yellow oil; IR (KBr): 3053, 2938, 2852, 1622, 1572, 750, 694; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.00 (s, 1H), 7.60 (s, 1H), 7.28-7.33 (m, 2H), 7.10-7.19 (m, 3H), 6.91-6.93 (m, 2H), 3.78 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 145.9, 141.7, 137.6, 133.3, 129.2, 128.6, 128.5, 127.8, 118.5, 113.6, 75.8, 42.1. ESI-MS m/z (%) 367 (100) $[M+H]^+$;Anal. Calcd for $C_{14}H_{11}IN_2S$ C, 45.92; H, 3.03; N, 7.65; Found: C, 45.70; H, 3.01; N, 7.68;

3-(dodecylthio)-6-iodoimidazo[1,2-a]pyridine(4ic)



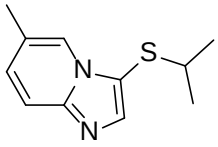
Yellow oil; IR (KBr): 2958, 2932, 2854, 1531, 724; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.66 (s, 1H), 7.70 (s, 1H), 7.42 (s, 1H), 7.27 (s, 1H), 2.60 (t, *J* = 7.2 Hz, 2H), 1.47-1.55 (m, 2H), 1.24-1.37(m,18H), 0.99 (t, *J* = 7.2 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 145.6, 141.2, 133.2, 129.4, 119.0, 114.4, 76.0, 36.0, 31.9, 29.7, 29.6, 29.5, 29.4, 29.3, 29.1, 28.3, 22.6, 14.1. ESI-MS m/z (%) 445 (100) $[M+H]^+$; Anal. Calcd for $C_{19}H_{29}IN_2S$ C, 51.35; H, 6.58; N, 6.30; Found: C, 51.11; H, 6.61; N, 6.33;

3-(isopropylthio)-2,5-dimethylimidazo[1,2-a]pyridine(5a)



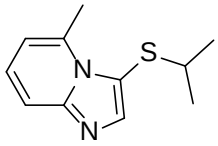
Yellow oil; IR (KBr): 2954, 1534, 1467, 1386, 1368; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.43 (d, *J* = 8.8 Hz, 1H), 7.10 (t, *J* = 7.8 Hz, 1H), 6.51 (d, *J* = 6.8 Hz, 1H), 3.06 (s, 3H), 2.96-3.03 (m, 1H), 2.55 (s, 3H), 1.20 (d, *J* = 6.8 Hz, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 152.2, 147.7, 137.8, 125.5, 115.1, 114.1, 112.0, 43.1, 22.2, 21.2, 14.5. ESI-MS m/z (%) 221(100) $[M+H]^+$;Anal. Calcd for $C_{12}H_{16}N_2S$ C, 65.42; H, 7.32; N, 12.71; Found: C, 65.13; H, 7.35; N, 12.76;

3-(isopropylthio)-6-methylimidazo[1,2-a]pyridine(5b)



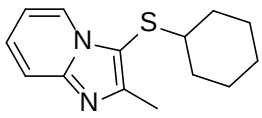
Yellow oil; IR (KBr): 2950, 1528, 1465, 1385, 1369; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.35 (s, 1H), 7.77 (s, 1H), 7.38 (d, *J* = 6.8 Hz, 1H), 6.71 (d, *J* = 5.6 Hz, 1H), 3.03 -3.06 (m, 1H), 2.39 (s, 3H), 1.20 (d, *J* = 5.6 Hz, 6H).^{13}C NMR (100 MHz, $CDCl_3$) δ 141.6, 136.2, 123.5, 116.3, 115.1, 39.8, 23.1, 21.1. ESI-MS m/z (%) 207 (100) $[M+H]^+$; Anal. Calcd for $C_{11}H_{14}N_2S$ C, 64.04; H, 6.84; N, 13.58; Found: C, 64.31; H, 6.82; N, 13.52;

3-(isopropylthio)-5-methylimidazo[1,2-a]pyridine(5c)



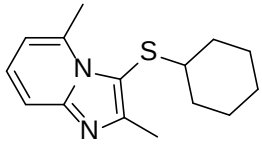
Yellow oil; IR (KBr): 2947, 1546, 1470, 1388, 1365; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.74 (s, 1H), 7.52 (d, *J* = 8.8 Hz, 1H), 7.13 (t, *J* = 7.6 Hz, 1H), 6.55 (d, *J* = 6.8 Hz, 1H), 3.07 (s, 3H), 2.94-3.01(m, 1H), 1.22 (d, *J* = 6.8 Hz, 6H). ^{13}C NMR (100 MHz,$CDCl_3$) δ 144.4, 138.1, 125.6, 116.3, 114.4, 42.6, 22.3, 21.3. ESI-MS m/z (%) 207 (100) $[M+H]^+$; Anal. Calcd for $C_{11}H_{14}N_2S$ C, 64.04; H, 6.84; N, 13.58; Found:C, 63.73; H, 6.87; N, 13.63;

3-(cyclohexylthio)-2-methylimidazo[1,2-a]pyridine(5d)



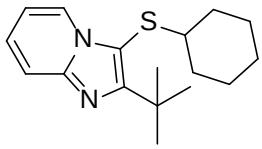
Yellow oil; IR (KBr): 2956, 2933, 2849, 1552, 1486; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.40 (d, *J* = 6.8 Hz, 1H), 7.54 (d, *J* = 8.8 Hz, 1H), 7.22 (t, *J* = 7.8 Hz, 1H), 6.85 (t, *J* = 6.8 Hz, 1H), 2.77-2.82(m, 1H), 2.55 (s, 3H), 1.55-1.88 (m, 5H), 1.13-1.36 (m, 5H).^{13}C NMR (100 MHz, $CDCl_3$)δ 150.5, 146.3, 125.3, 124.4, 116.7, 112.1, 48.4, 33.6, 26.0, 25.4, 14.2. ESI-MS m/z (%) 245 (100) $[M+H]^+$; Anal. Calcd for $C_{14}H_{18}N_2S$ C, 68.25; H, 7.36; N, 11.37; Found: C, 67.92; H, 7.39; N, 11.42;

3-(cyclohexylthio)-2,5-dimethylimidazo[1,2-a]pyridine(5e)



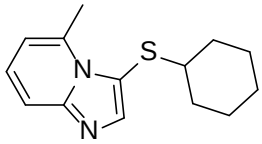
Yellow oil; IR (KBr): 2961, 2932, 2852, 1540, 1474; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.43 (d, *J* = 8.8 Hz, 1H), 7.10 (t, *J* = 7.6 Hz, 1H), 6.51 (d, *J* = 6.8 Hz, 1H), 3.07 (s, 3H), 2.68-2.74 (m, 1H), 2.55 (s, 3H), 1.59-1.84 (m, 5H), 1.23-1.38 (m, 5H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 152.1, 147.7, 137.9, 125.5, 115.1, 114.2, 111.4, 51.5, 32.7, 26.0, 25.6, 21.3, 14.6. ESI-MS m/z (%) 261 (100) $[M+H]^+$;Anal. Calcd for $C_{15}H_{20}N_2S$ C, 69.19; H, 7.74; N, 10.76; Found: C, 68.94; H, 7.78; N, 10.81;

2-(tert-butyl)-3-(cyclohexylthio)imidazo[1,2-a]pyridine(5f)



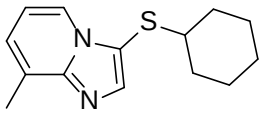
Yellow oil; IR (KBr): 2955, 2939, 2855, 1552, 1465, 1394, 1368; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.48 (d, *J* = 6.8 Hz, 1H), 7.60 (d, *J* = 8.8 Hz, 1H), 7.20 (t, *J* = 7.6 Hz, 1H), 6.83 (t, *J* = 6.8 Hz, 1H), 2.84-2.90 (m, 1H), 1.72-1.84 (m, 4H), 1.56 (s, 9H), 1.21-1.46 (m, 6H).^{13}C NMR (100 MHz,$CDCl_3$) δ 160.4, 145.0, 124.9, 124.1, 117.0, 111.9, 108.7, 49.5, 34.1, 33.6, 30.9, 26.2, 25.5. ESI-MS m/z (%) 289 (100) $[M+H]^+$; Anal. Calcd for $C_{17}H_{24}N_2S$ C, 70.79; H, 8.39; N, 9.71; Found:C, 70.44; H, 8.43; N, 9.75;

3-(cyclohexylthio)-5-methylimidazo[1,2-a]pyridine(5g)



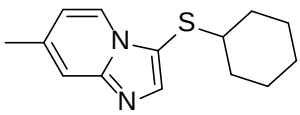
Yellow oil; IR (KBr): 2952, 2926, 2851, 1526, 1478; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.71 (s, 1H), 7.51 (d, *J* = 8.8 Hz, 1H), 7.13 (t, *J* = 8.0 Hz, 1H), 6.55 (d, *J* = 6.8 Hz, 1H), 3.07 (s, 3H), 2.67-2.74 (m, 1H), 1.59-1.89 (m, 5H), 1.19-1.34 (m, 5H). ^{13}C NMR (100 MHz, $CDCl_3$) *δ* 149.3, 144.3, 138.1, 125.5, 116.3, 114.4, 114.0, 50.7, 32.6, 25.9, 25.5, 21.4. ESI-MS m/z (%) 247 (100) $[M+H]^+$; Anal. Calcd for $C_{14}H_{18}N_2S$ C, 68.25; H, 7.36; N, 11.37; Found:C, 67.95; H, 7.39; N, 11.43;

3-(cyclohexylthio)-8-methylimidazo[1,2-a]pyridine(5h)



Yellow oil; IR (KBr): 2935, 2857, 1478; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.34 (d, *J* = 6.6 Hz, 1H), 7.74 (s, 1H), 7.04 (d, *J* = 6.8 Hz, 1H), 6.81 (t, *J* = 6.8 Hz, 1H), 2.73-2.79 (m, 1H), 2.62 (s, 3H), 1.54-1.89 (m, 5H), 1.14-1.33 (m, 5H). ^{13}C NMR (100 MHz,$CDCl_3$) δ 147.7, 141.0, 127.5, 124.14, 122.2, 113.3, 112.6, 48.1, 33.5, 26.0, 25.3, 16.6. ESI-MS m/z (%) 247 (100) $[M+H]^+$; Anal. Calcd for $C_{14}H_{18}N_2S$ C, 68.25; H, 7.36; N, 11.37; Found:C, 67.96; H, 7.38; N, 11.42;

3-(cyclohexylthio)-7-methylimidazo[1,2-a]pyridine(5i)

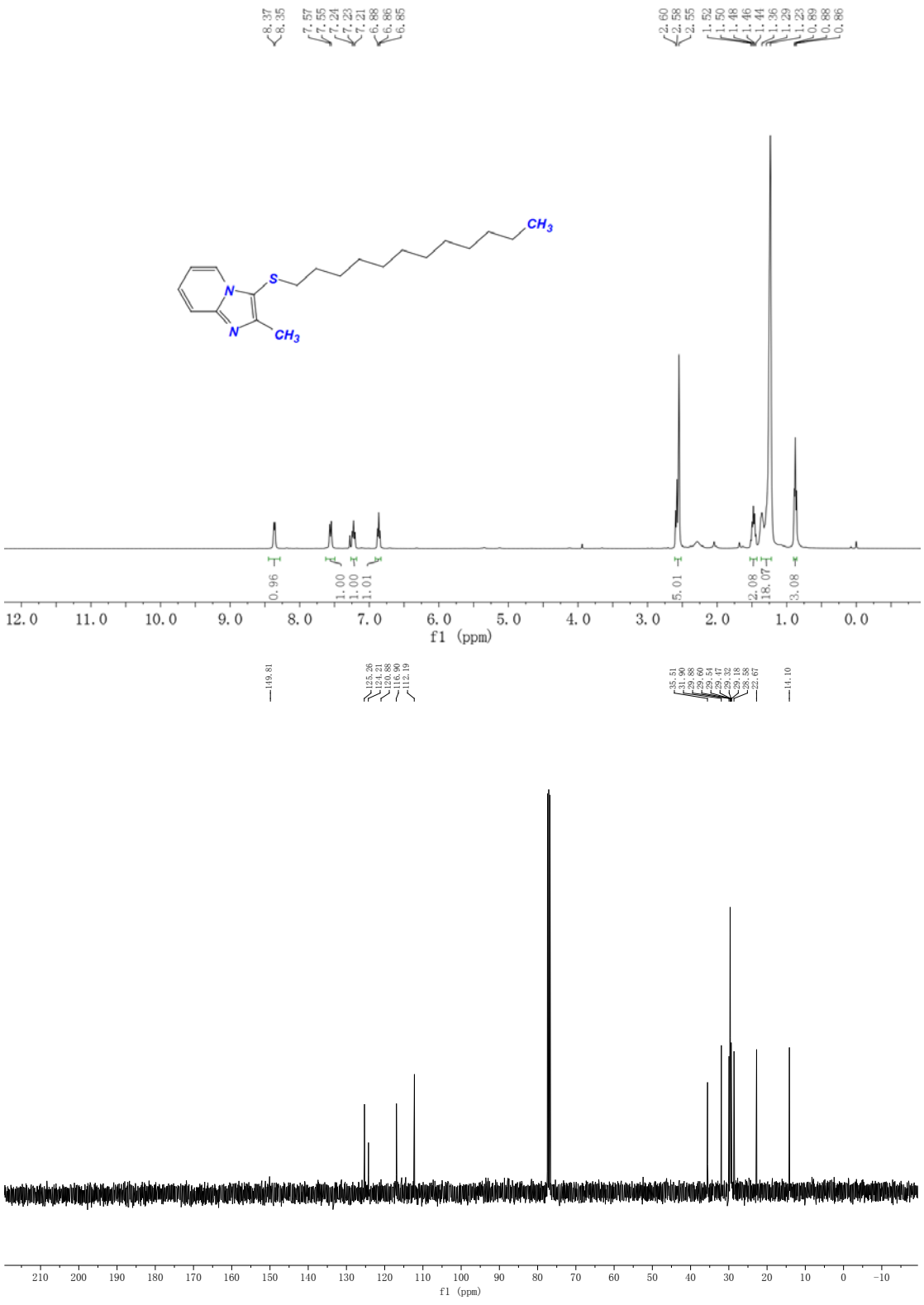


Yellow oil; IR (KBr): 2951, 2938, 2854, 1524; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.47 (s, 1H), 8.01 (s, 1H), 7.44 (s, 1H), 6.73 (1, *J* = 6.8 Hz, 1H), 2.72-2.77 (m, 1H), 2.40 (s, 3H), 1.54-1.88 (m, 5H), 1.08-1.32 (m, 5H). ^{13}C NMR (100 MHz,$CDCl_3$) δ 141.2, 136.2, 124.0, 116.3, 115.3, 48.2,

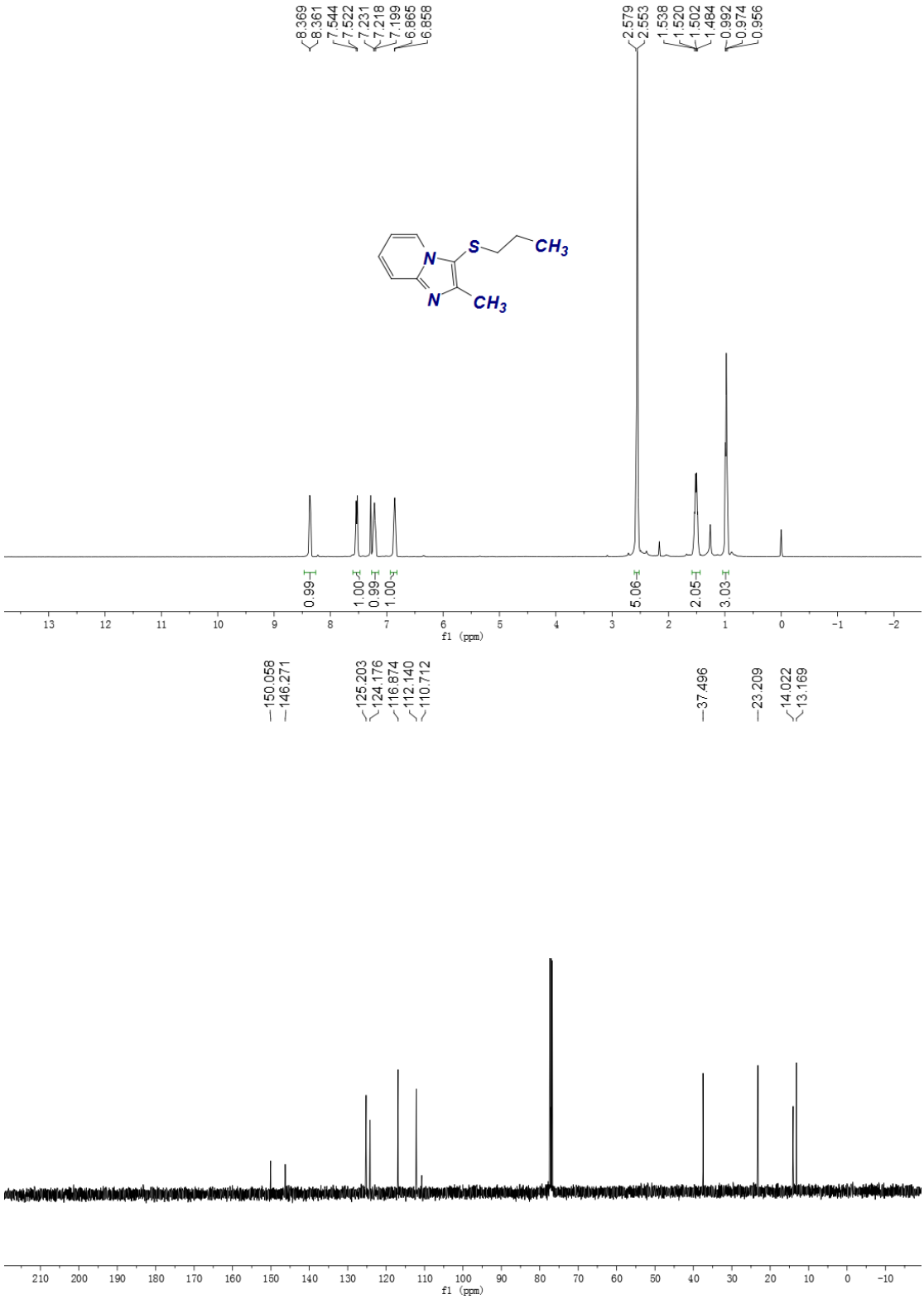
33.4, 29.7, 26.0, 25.3, 21.2. ESI-MS m/z (%) 247 (100) $[M+H]^+$; Anal. Calcd for $C_{14}H_{18}N_2S$ C, 68.25; H, 7.36; N, 11.37; Found:C, 68.91; H, 7.39; N, 11.44;

D. NMR spectra

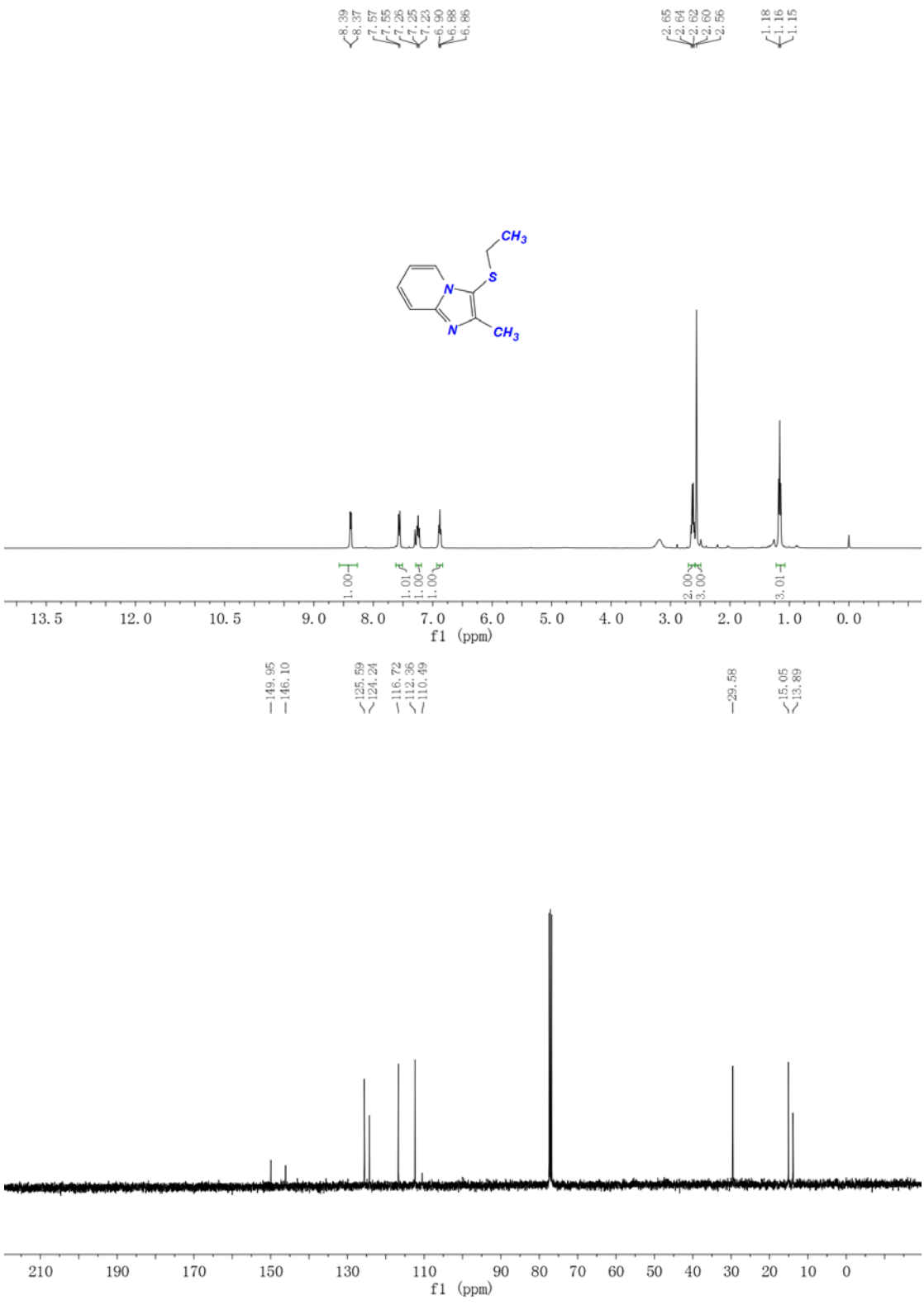
3-(dodecylthio)-2-methylimidazo[1,2-a]pyridine(3aa)



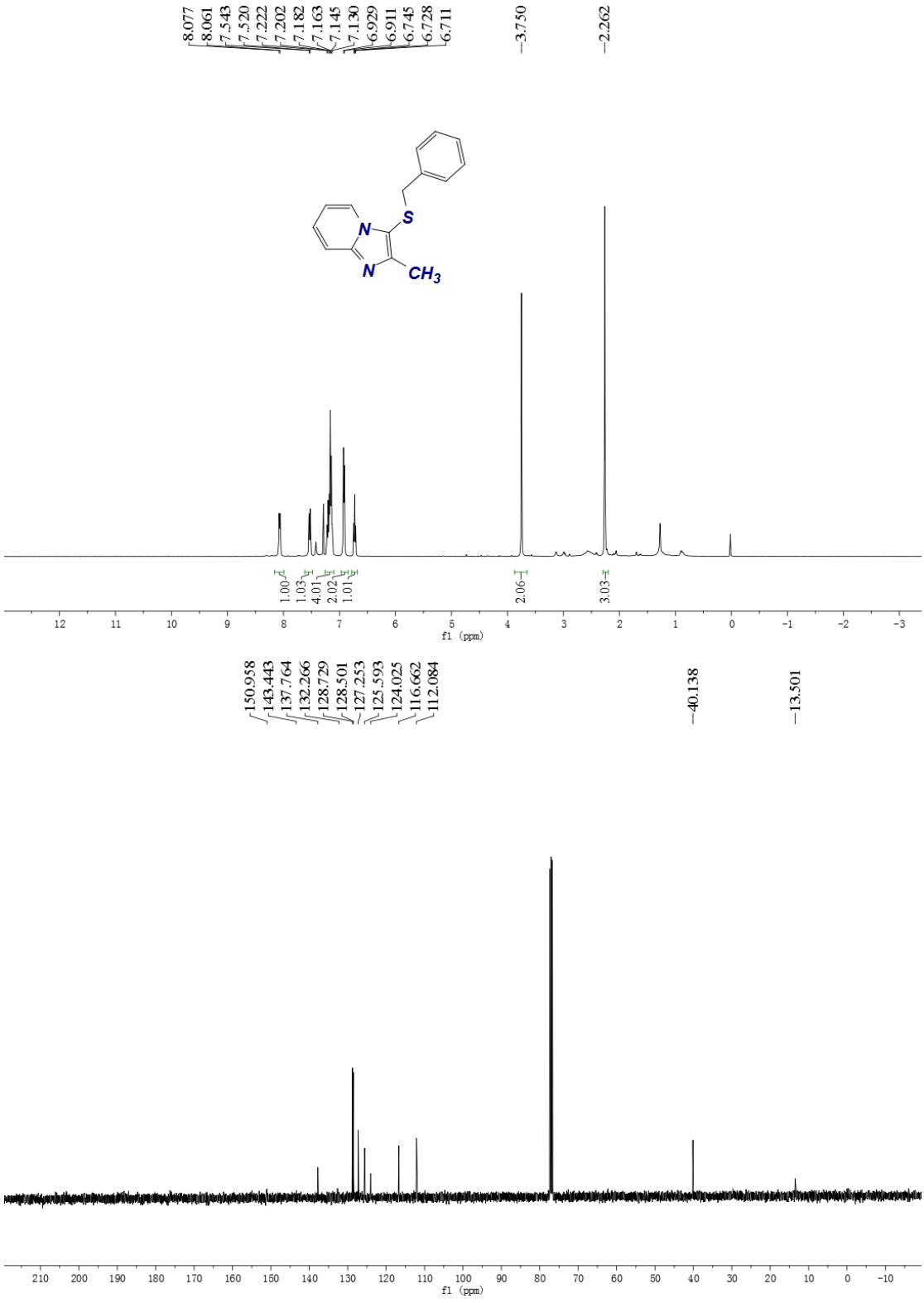
3-(butylthio)-2-methylimidazo[1,2-a]pyridine(3ab)



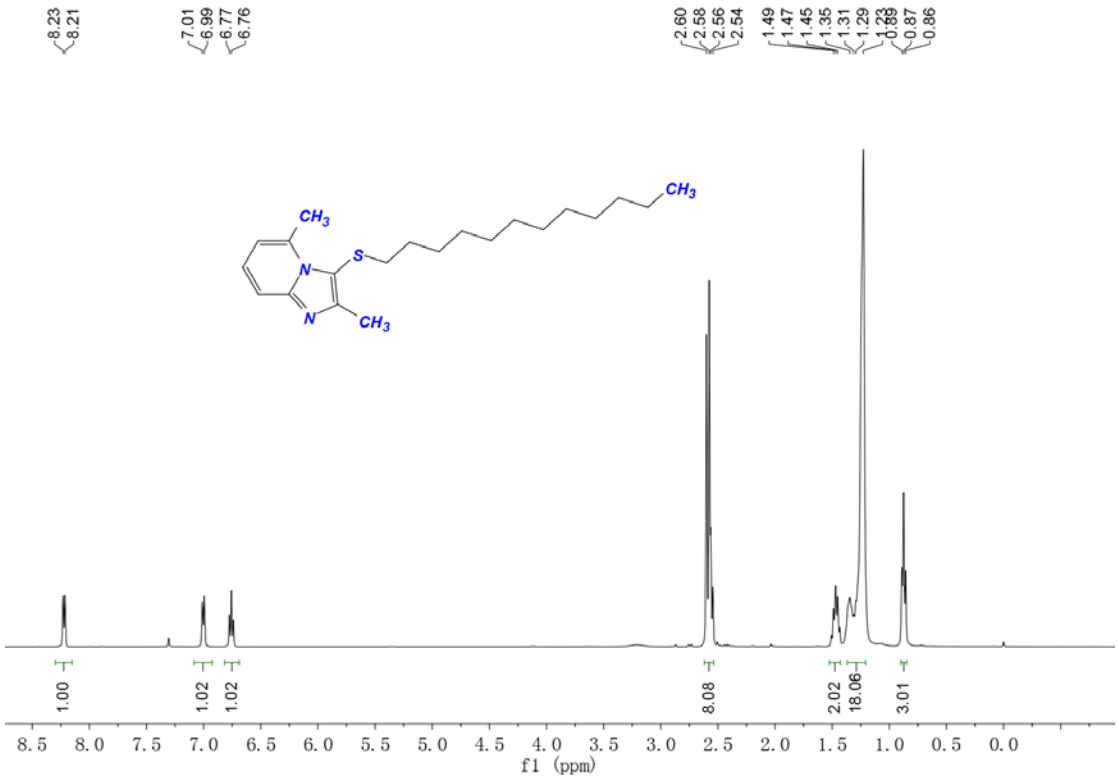
3-(ethylthio)-2-methylimidazo[1,2-a]pyridine(3ac)

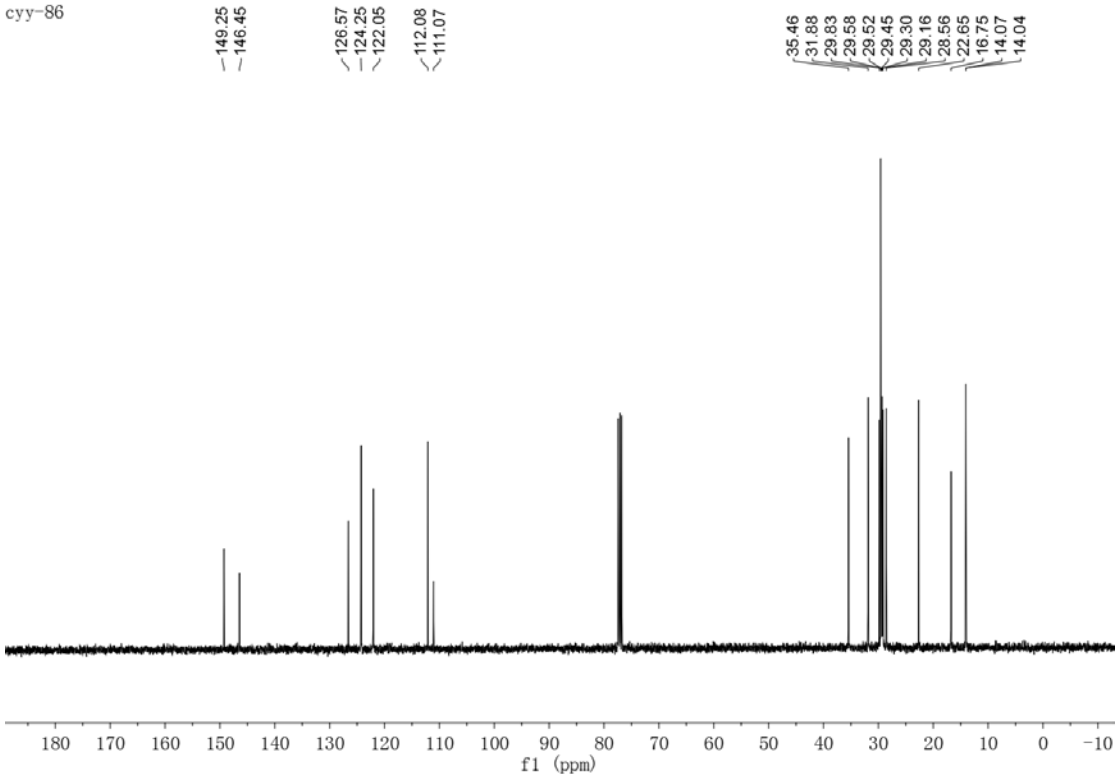


3-(benzylthio)-2-methylimidazo[1,2-a]pyridine(3ad)

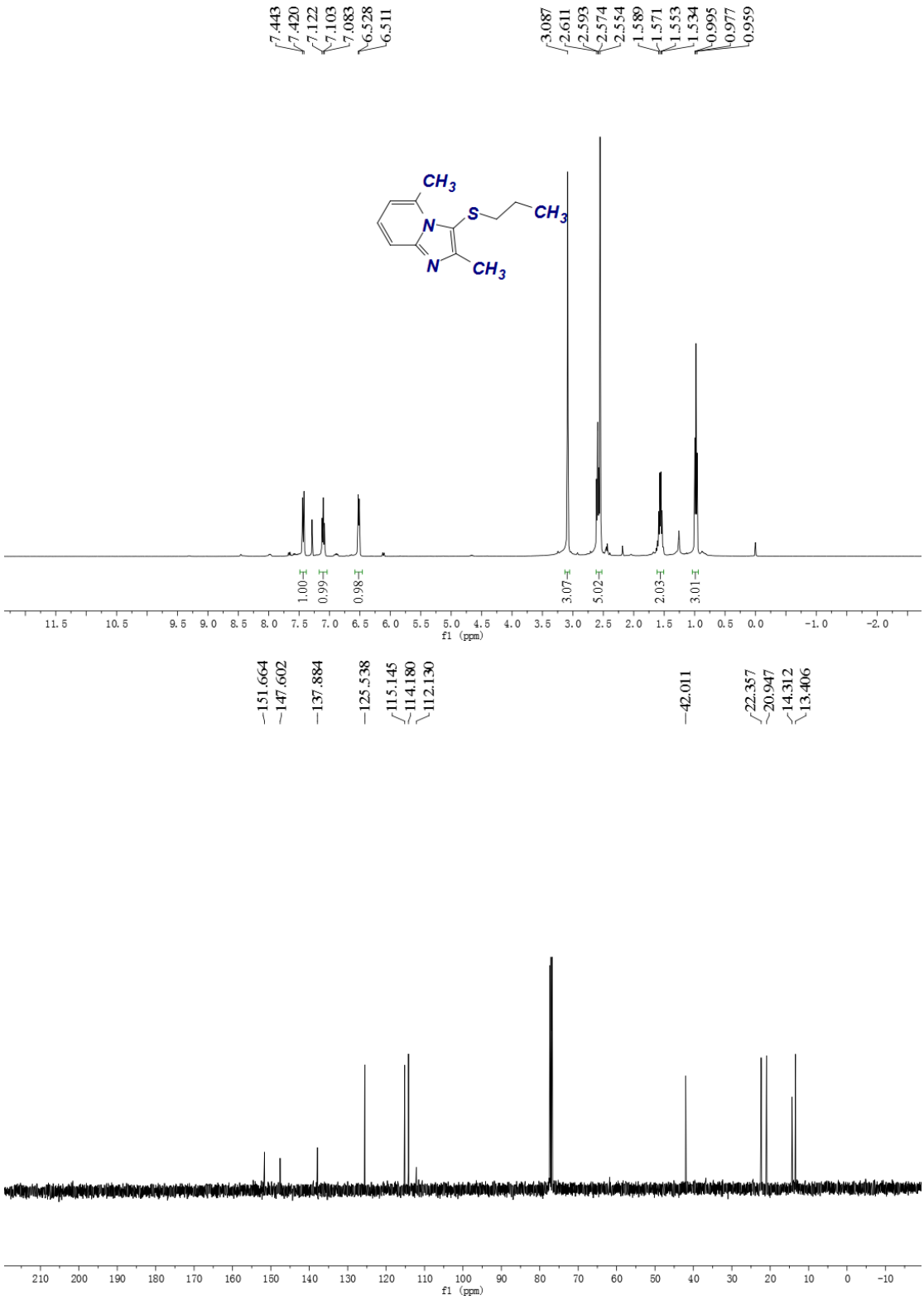


3-(dodecylthio)-2,5-dimethylimidazo[1,2-a]pyridine(3ba)

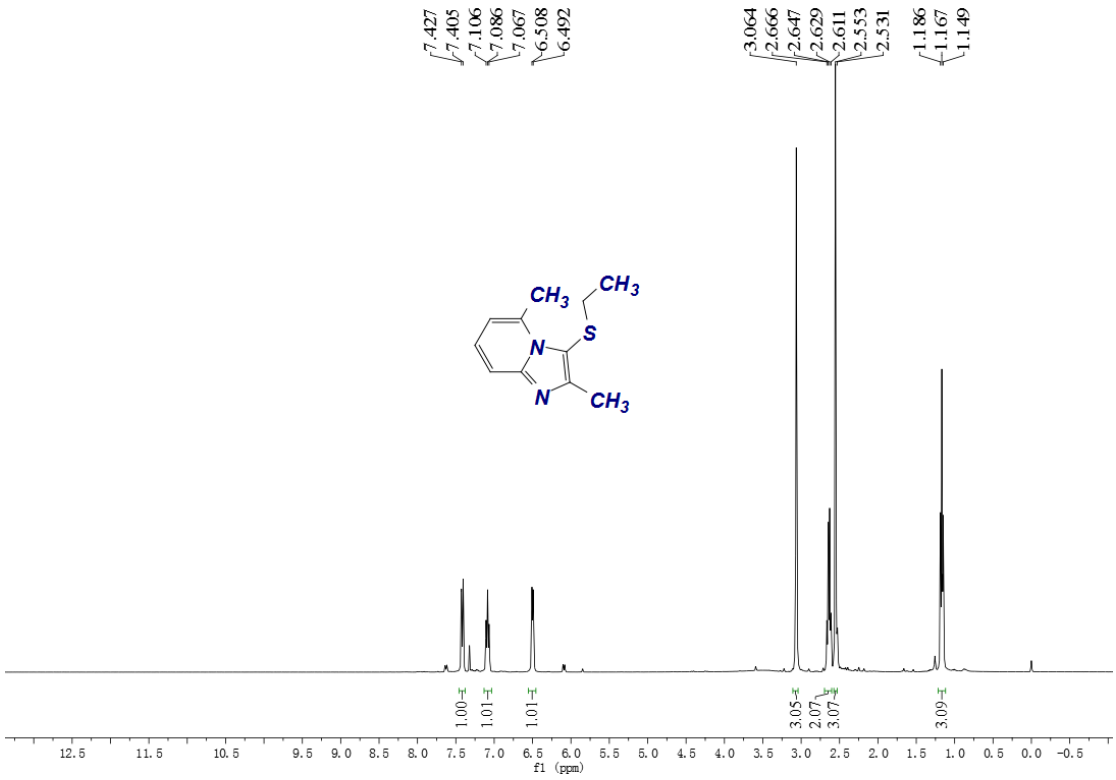


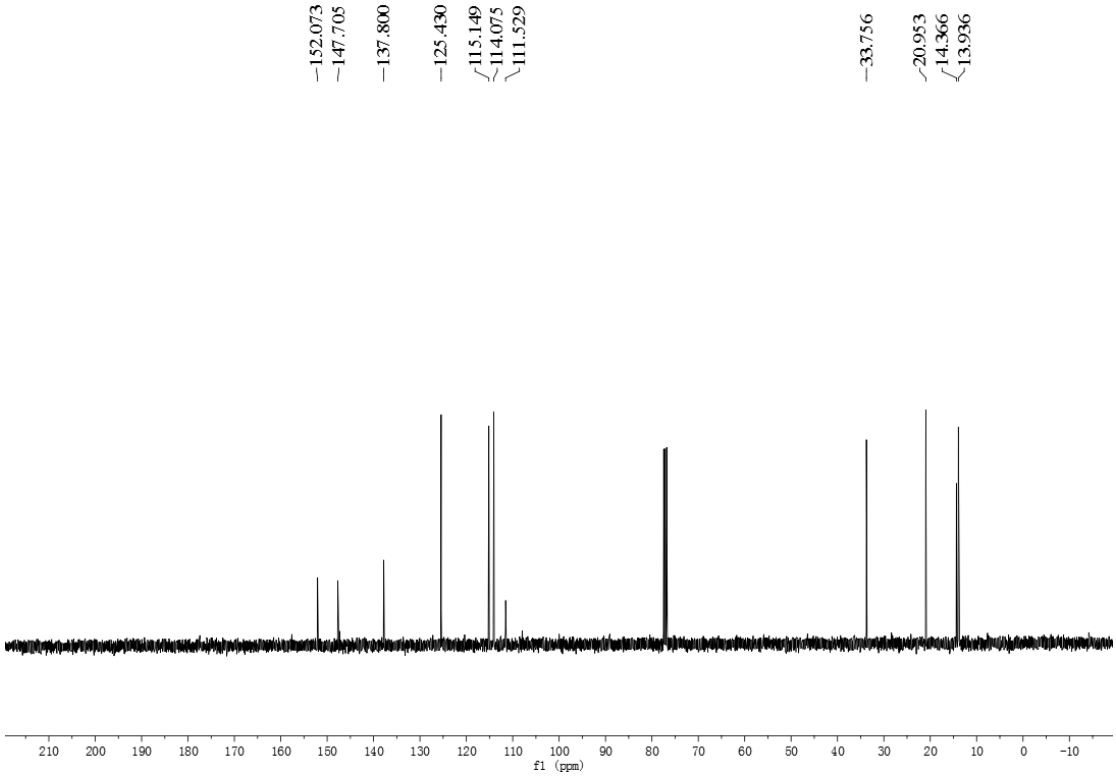


2,5-dimethyl-3-(propylthio)imidazo[1,2-a]pyridine(3bb)

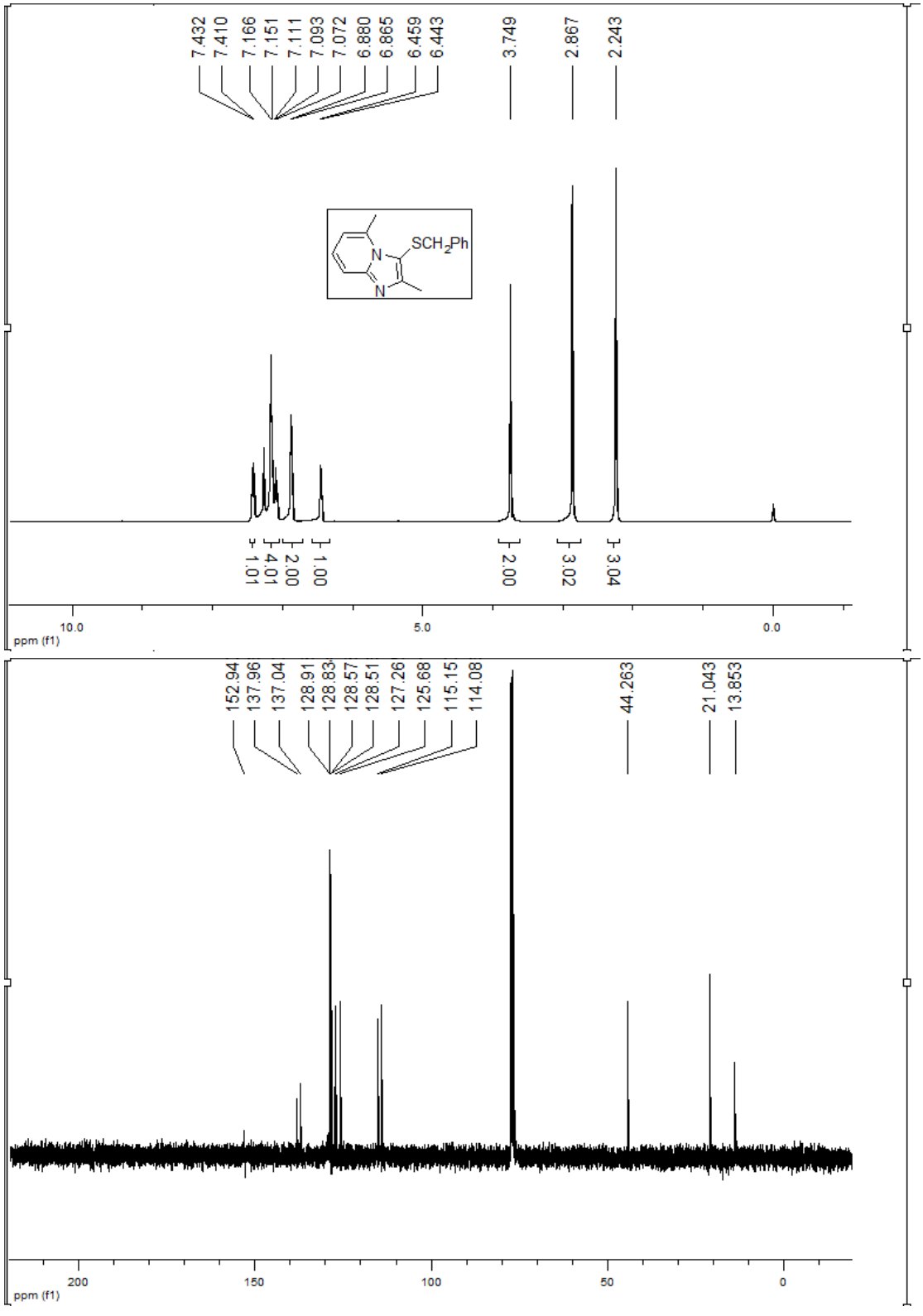


3-(ethylthio)-2,5-dimethylimidazo[1,2-a]pyridine(3bc)

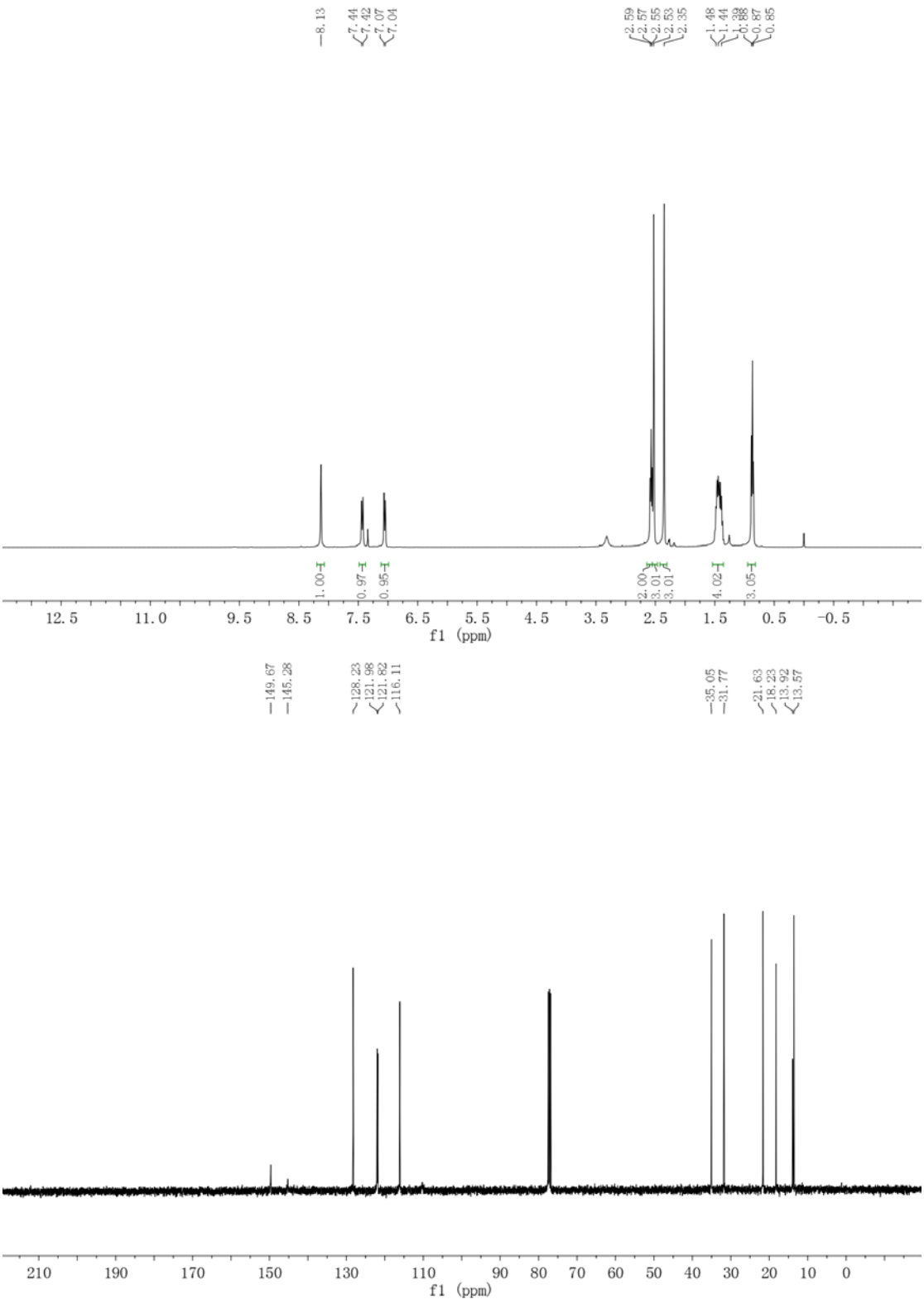

7.427
7.405
7.106
7.086
7.067
6.508
6.492
3.064
2.666
2.647
2.629
2.611
2.553
2.531
1.186
1.167
1.149
CH3
CH3
S
N
N
CH3
1.00
1.01
1.01
3.05
2.07
3.07
3.09
f1 (ppm)


152.073
147.705
137.800
125.430
115.149
114.075
111.529
33.756
20.953
14.366
13.936
f1 (ppm)

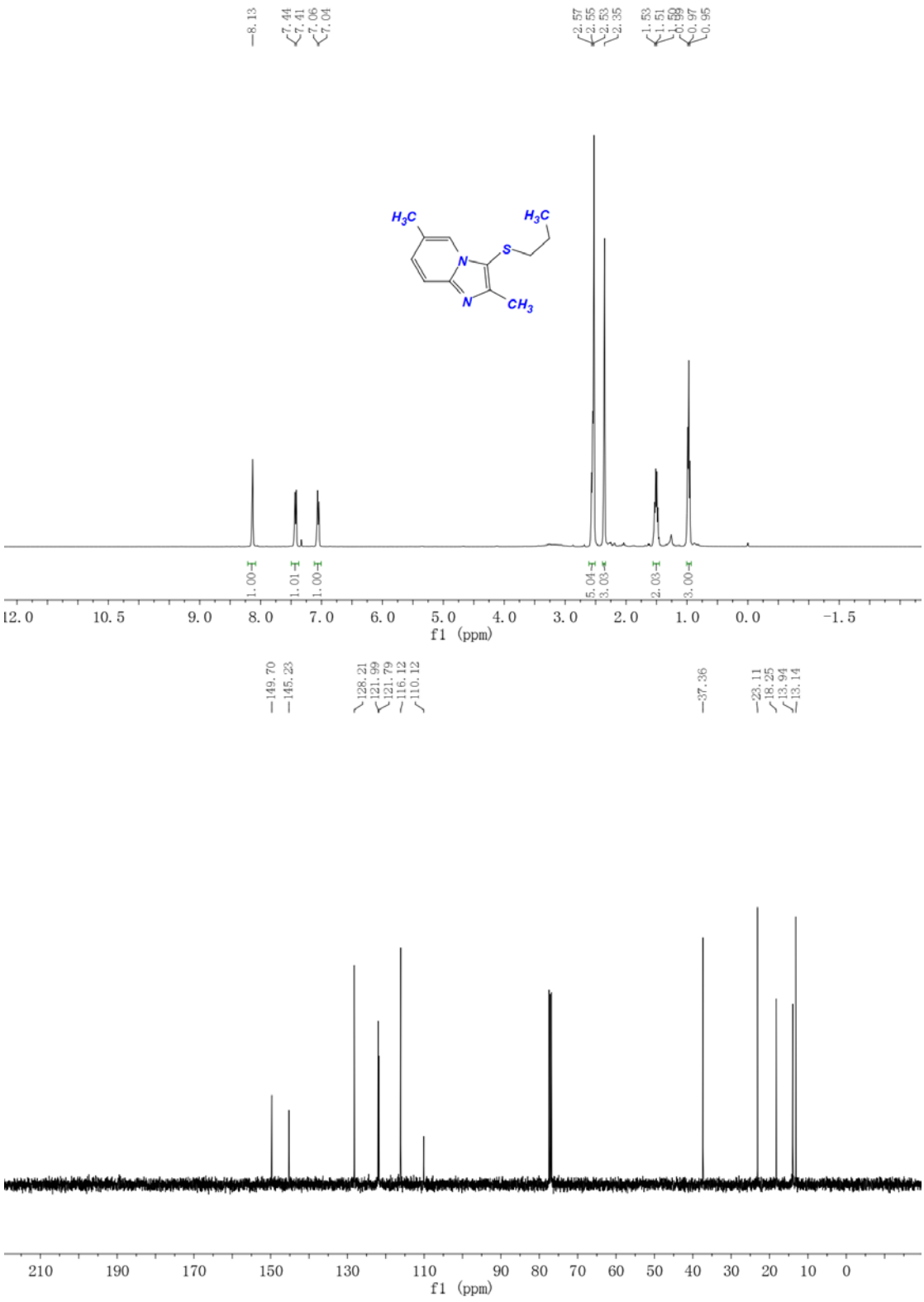
3-(benzylthio)-2,5-dimethylimidazo[1,2-a]pyridine(3bd）



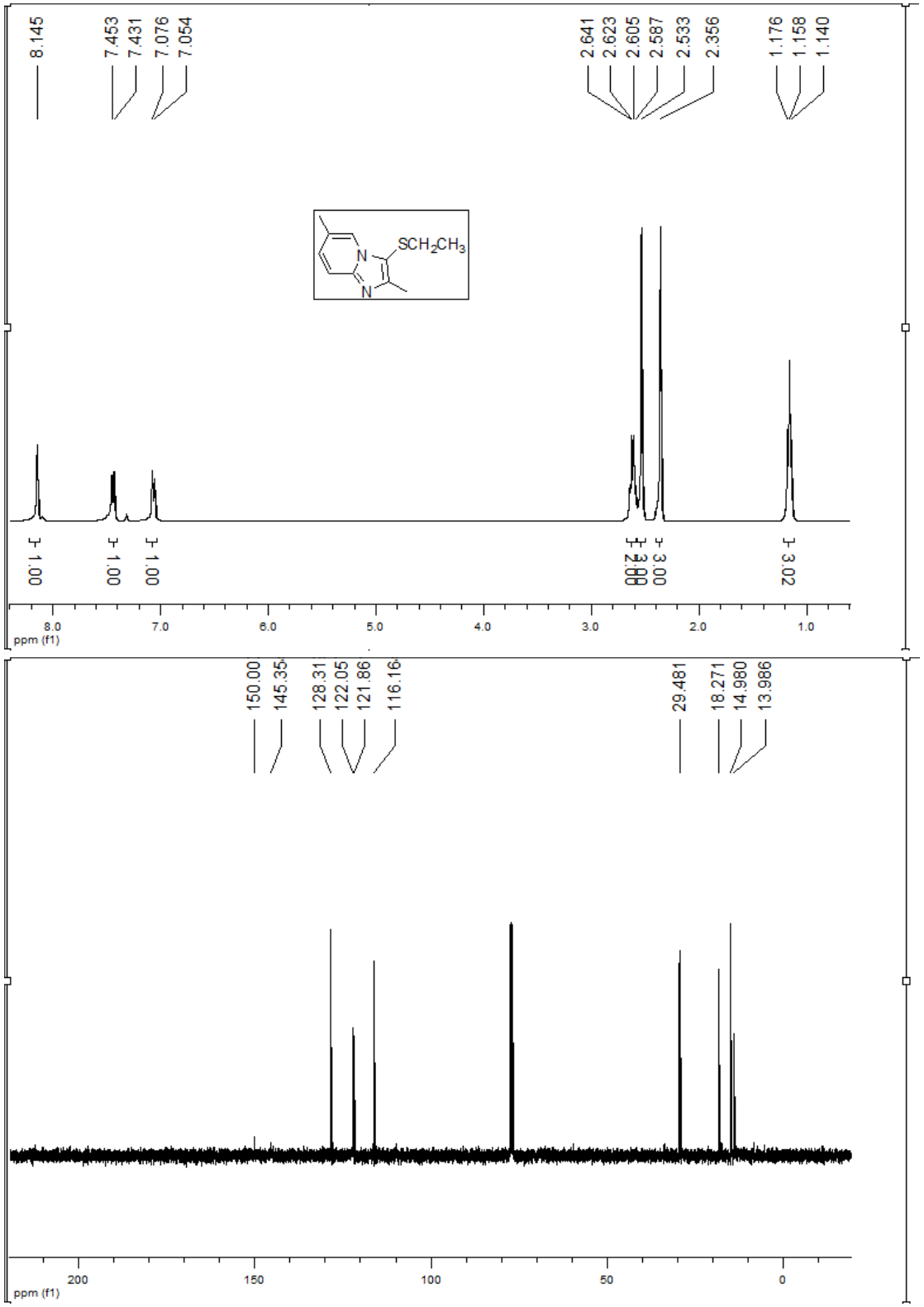
3-(butylthio)-2,6-dimethylimidazo[1,2-a]pyridine(3ca)



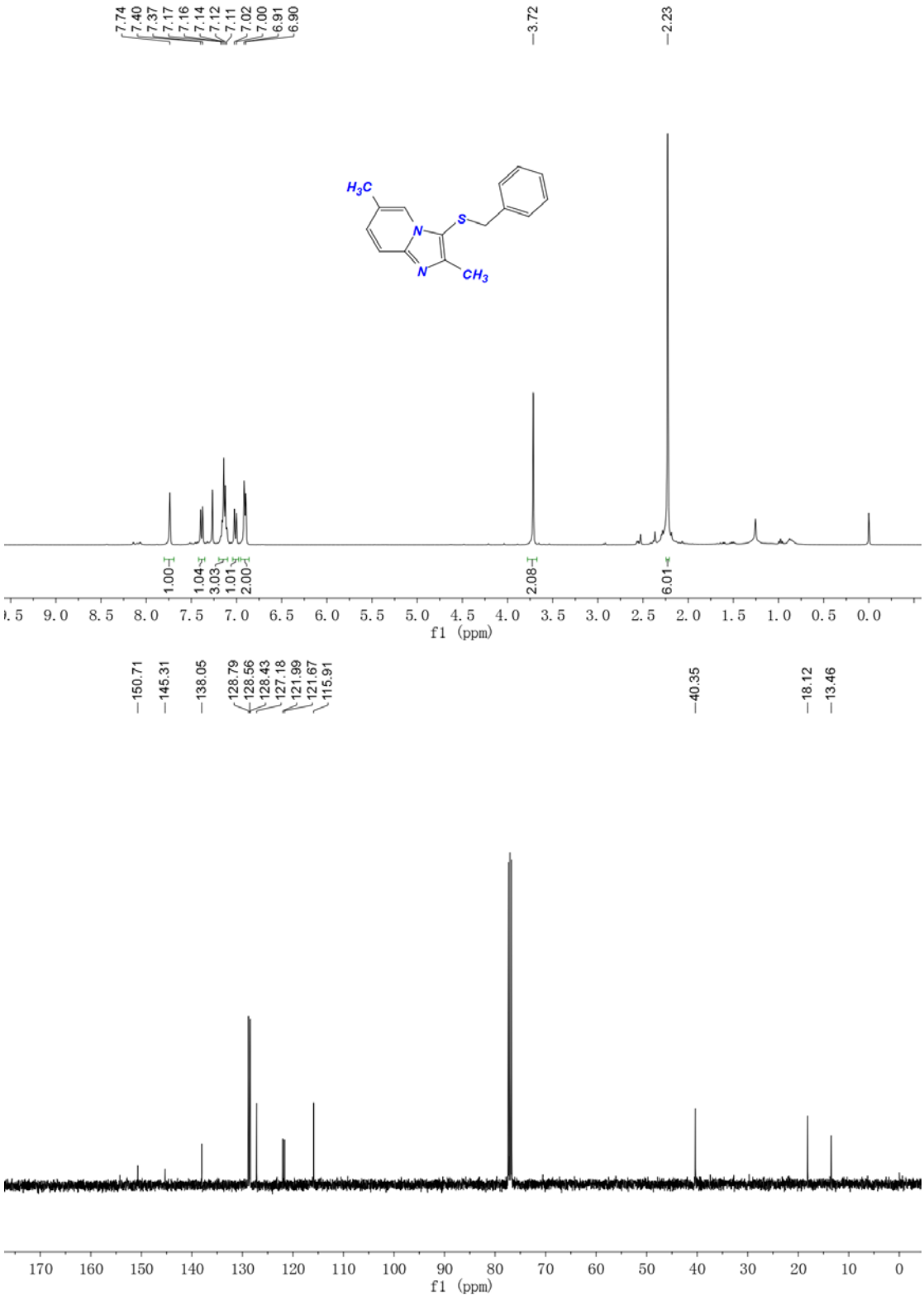
2,6-dimethyl-3-(propylthio)imidazo[1,2-a]pyridine(3cb)



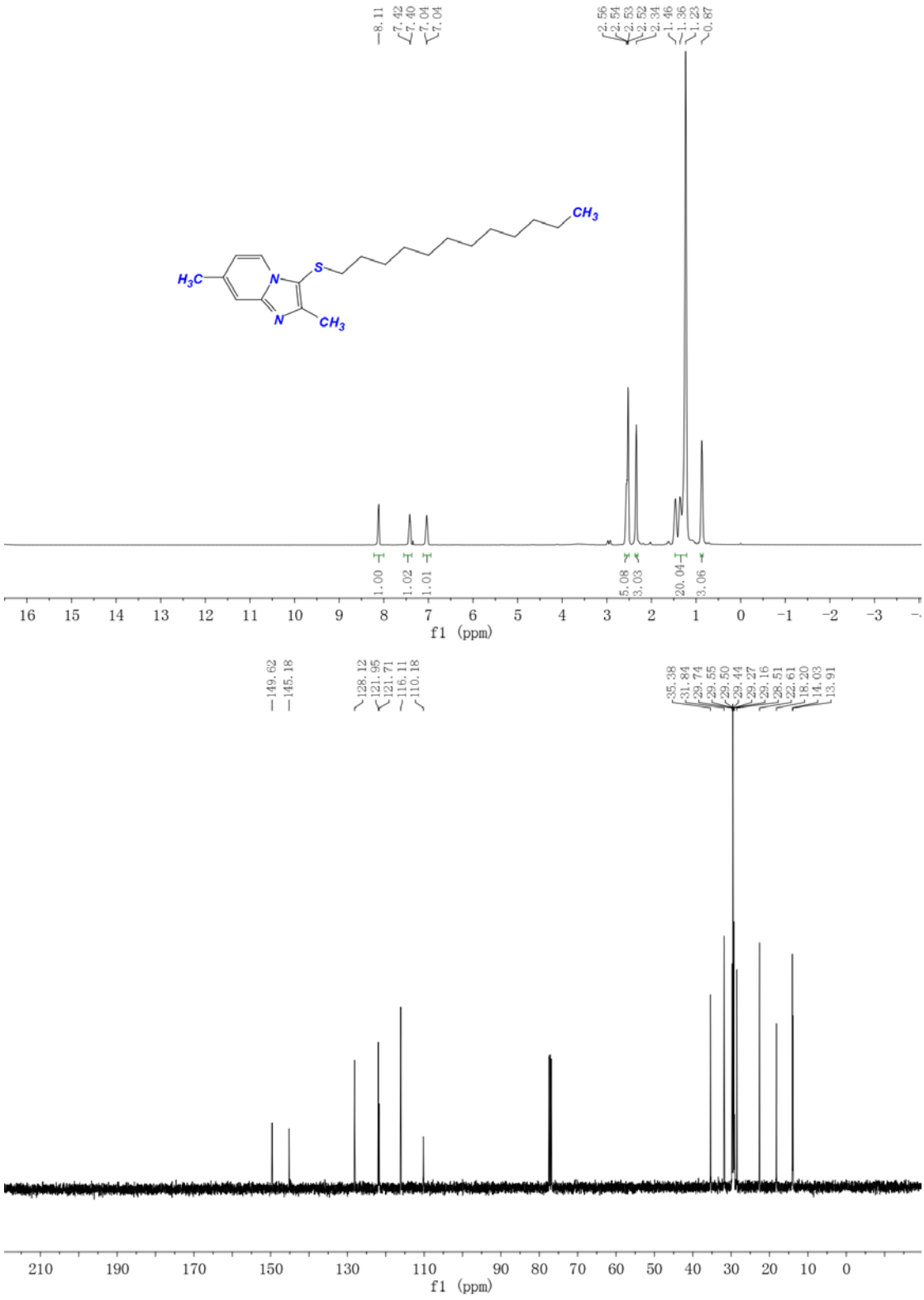
3-(ethylthio)-2,6-dimethylimidazo[1,2-a]pyridine(3cc)



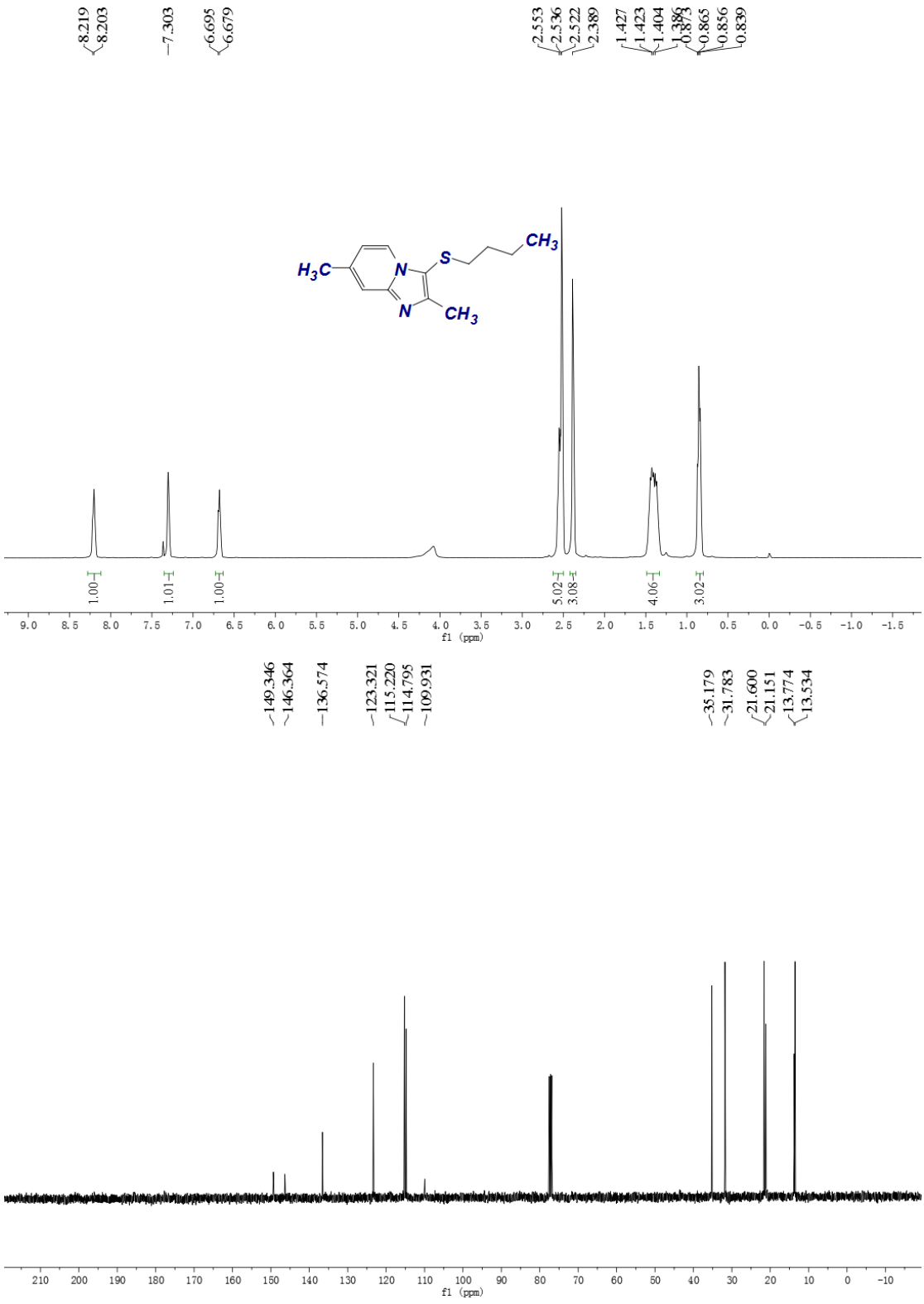
3-(benzylthio)-2,6-dimethylimidazo[1,2-a]pyridine(3cd)



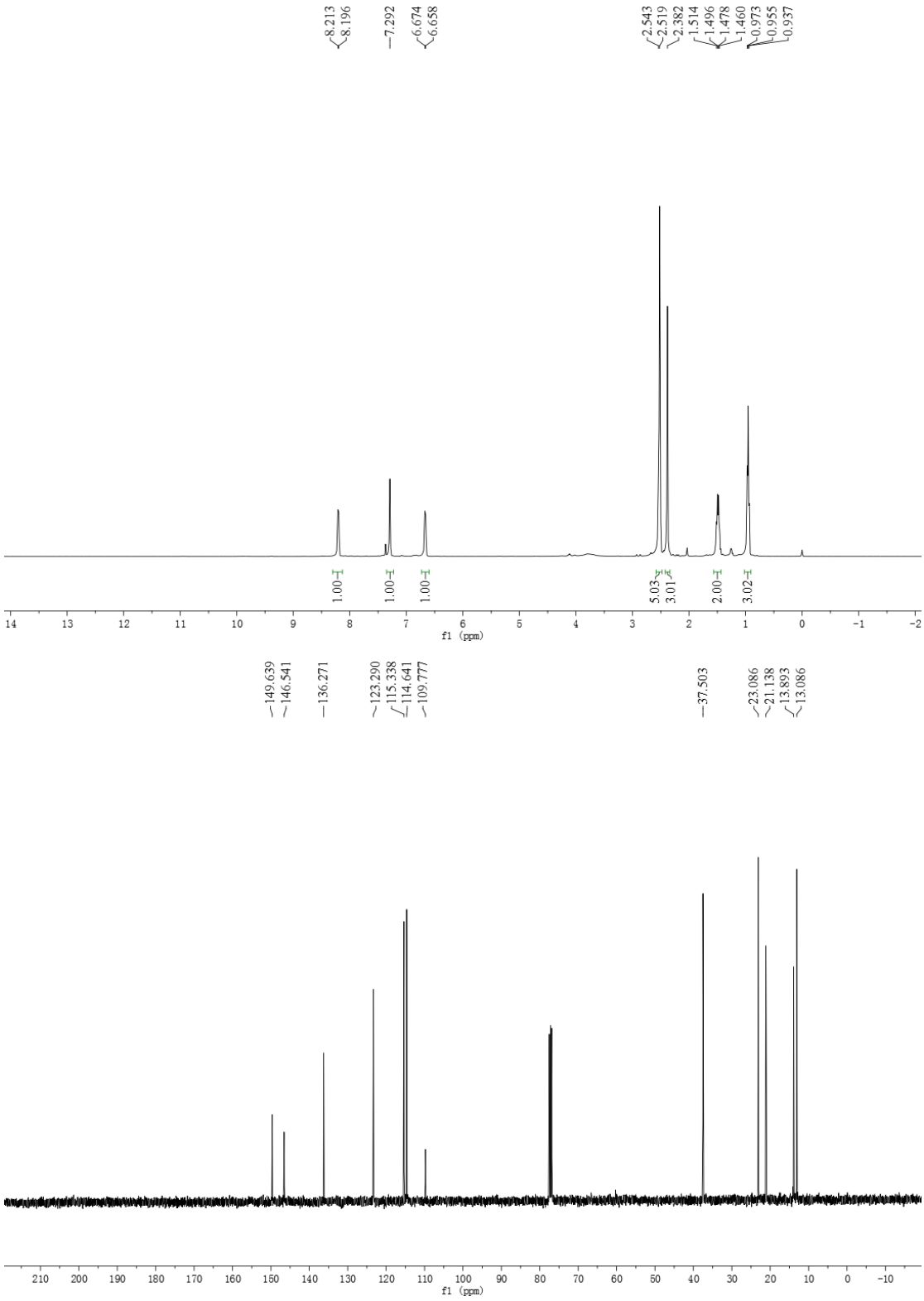
3-(dodecylthio)-2,7-dimethylimidazo[1,2-a]pyridine(3da)



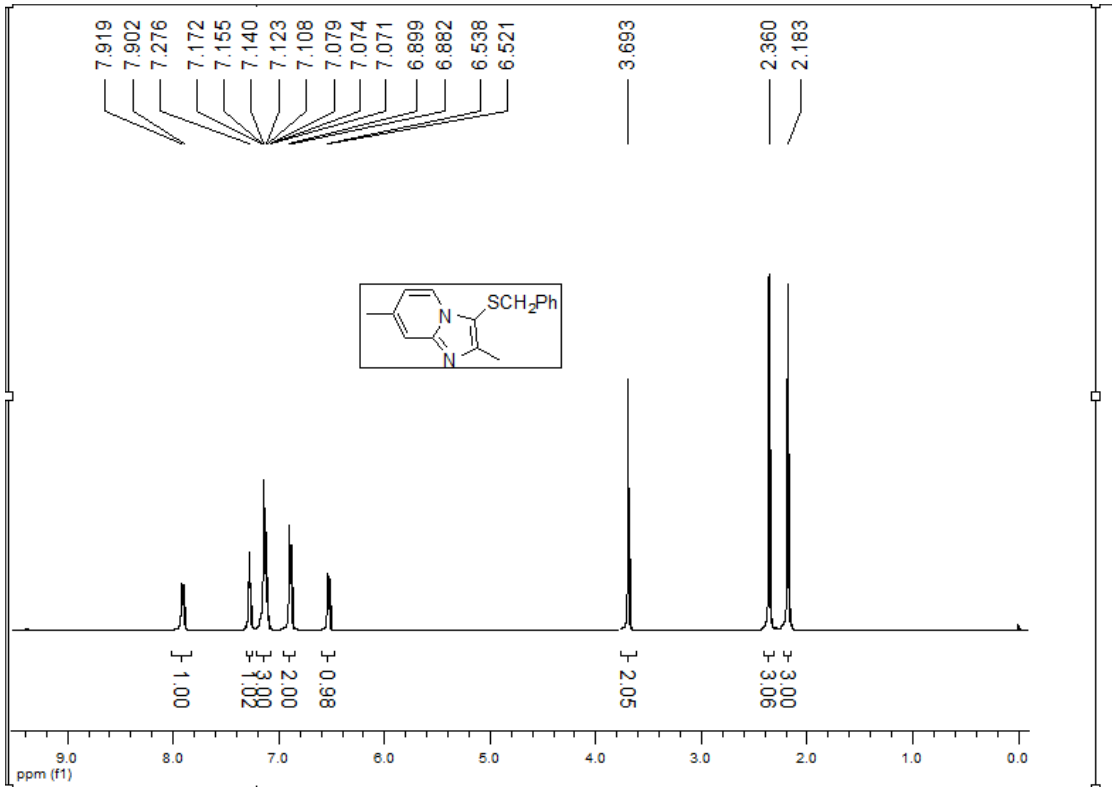
3-(butylthio)-2,7-dimethylimidazo[1,2-a]pyridine(3db)

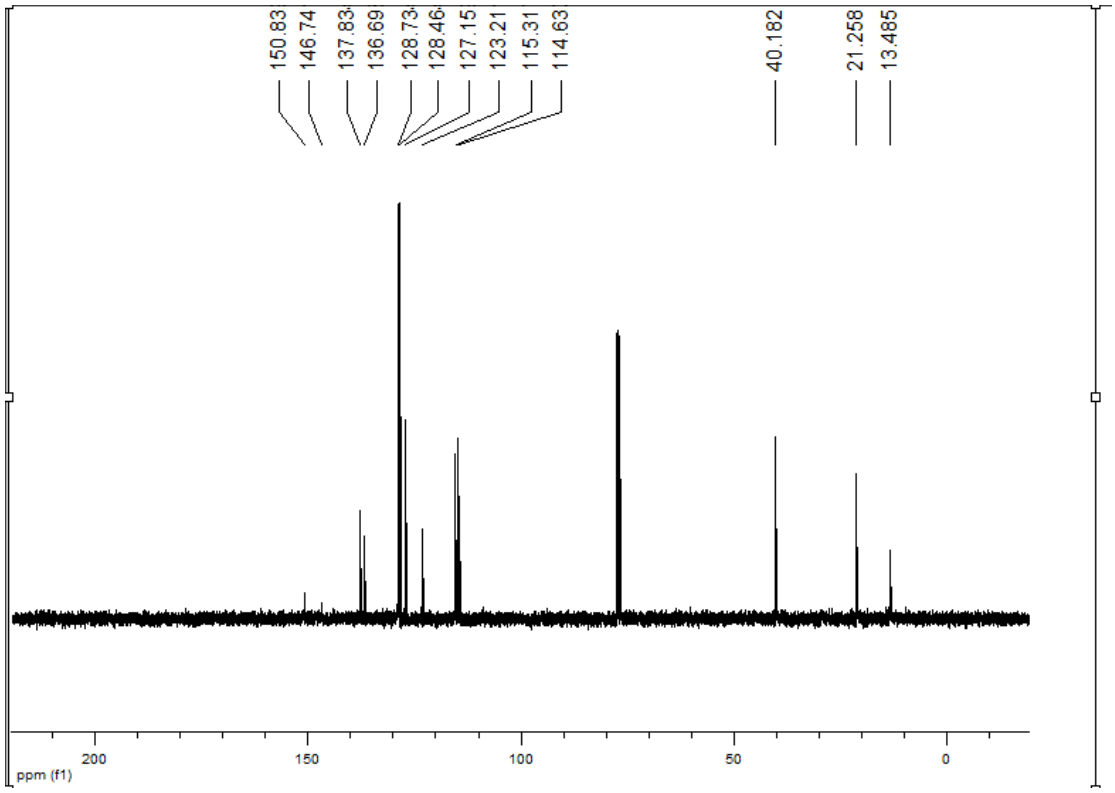


2,7-dimethyl-3-(propylthio)imidazo[1,2-a]pyridine(3dc)



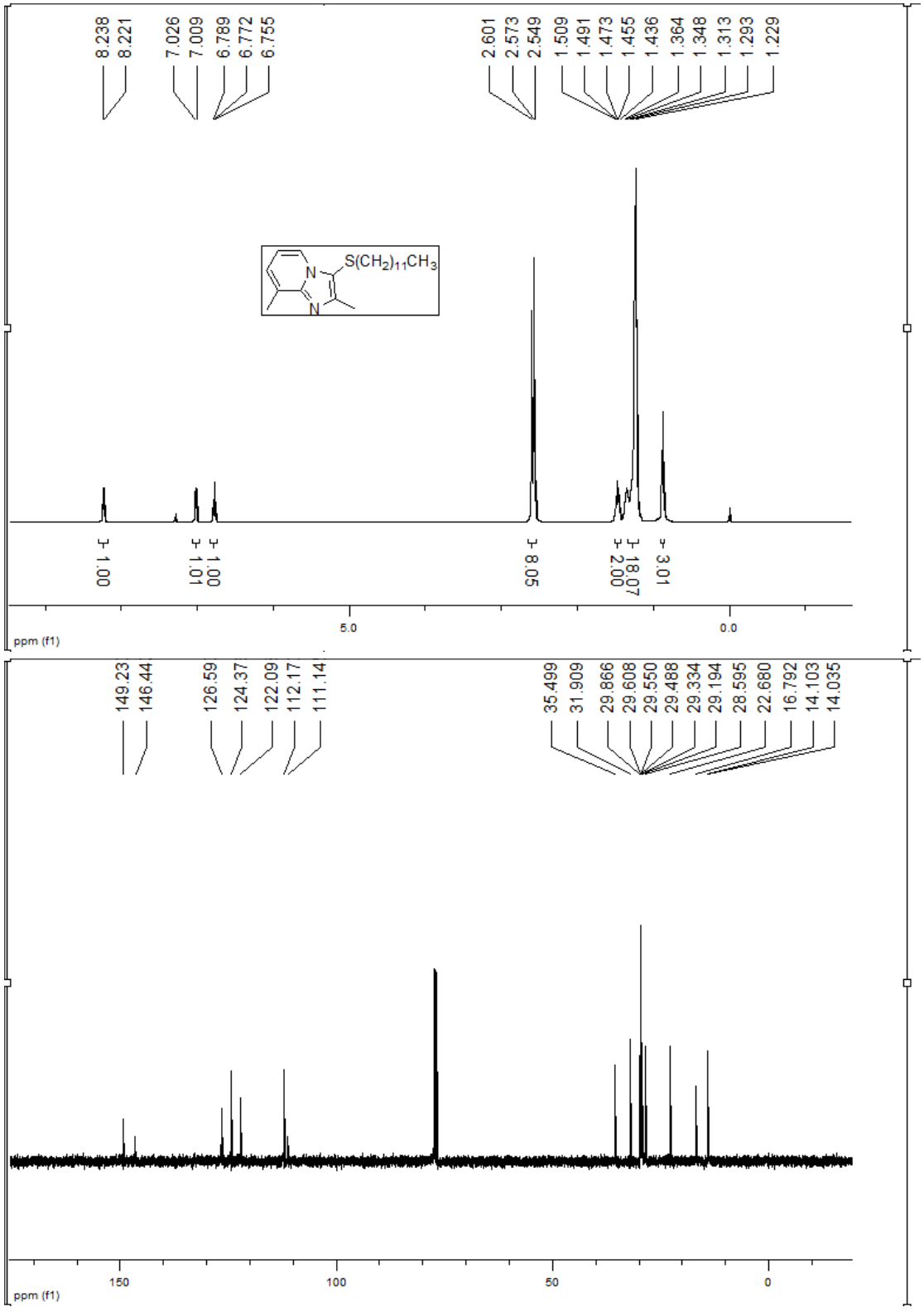
3-(benzylthio)-2,7-dimethylimidazo[1,2-a]pyridine(3dd)



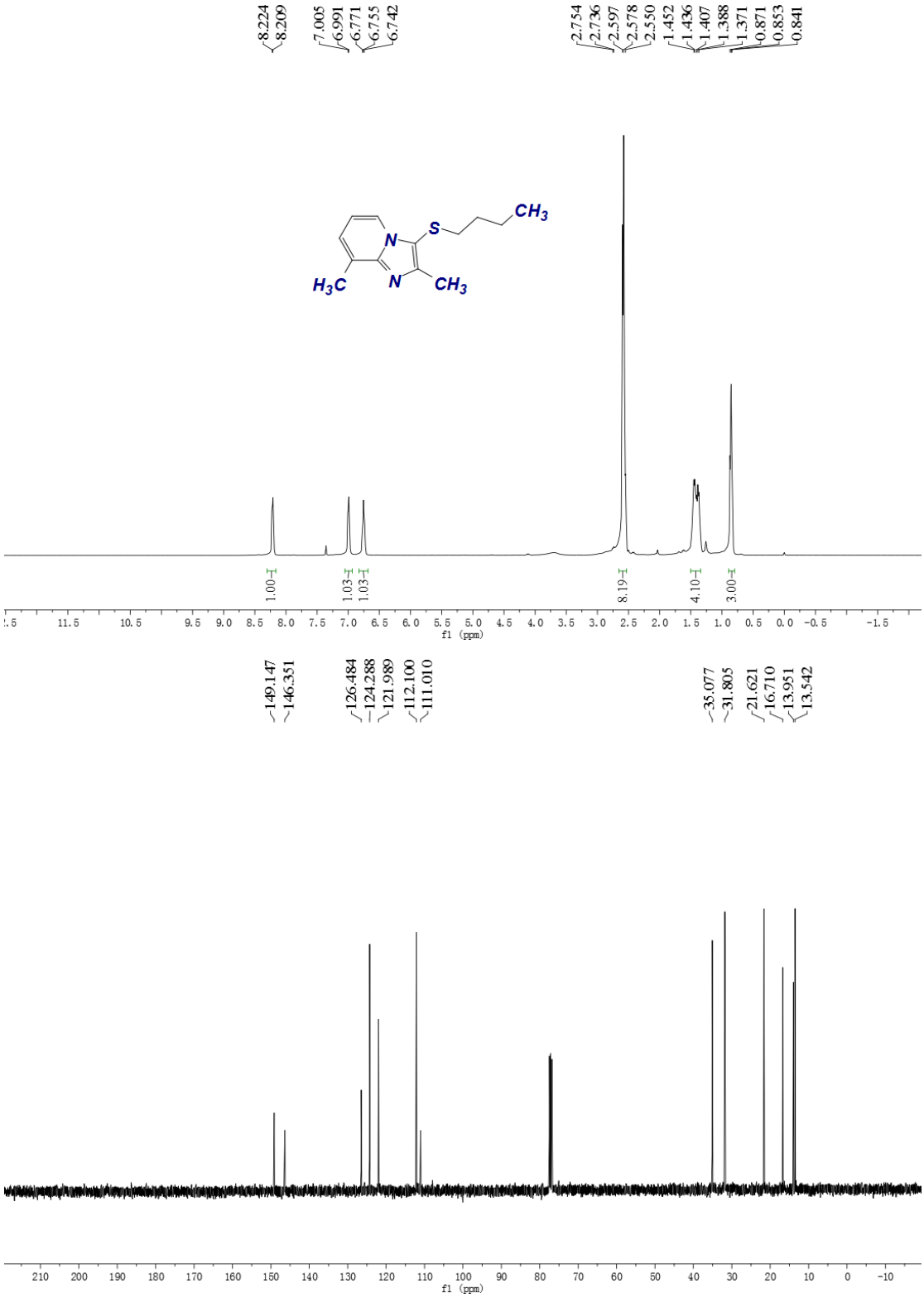


DD

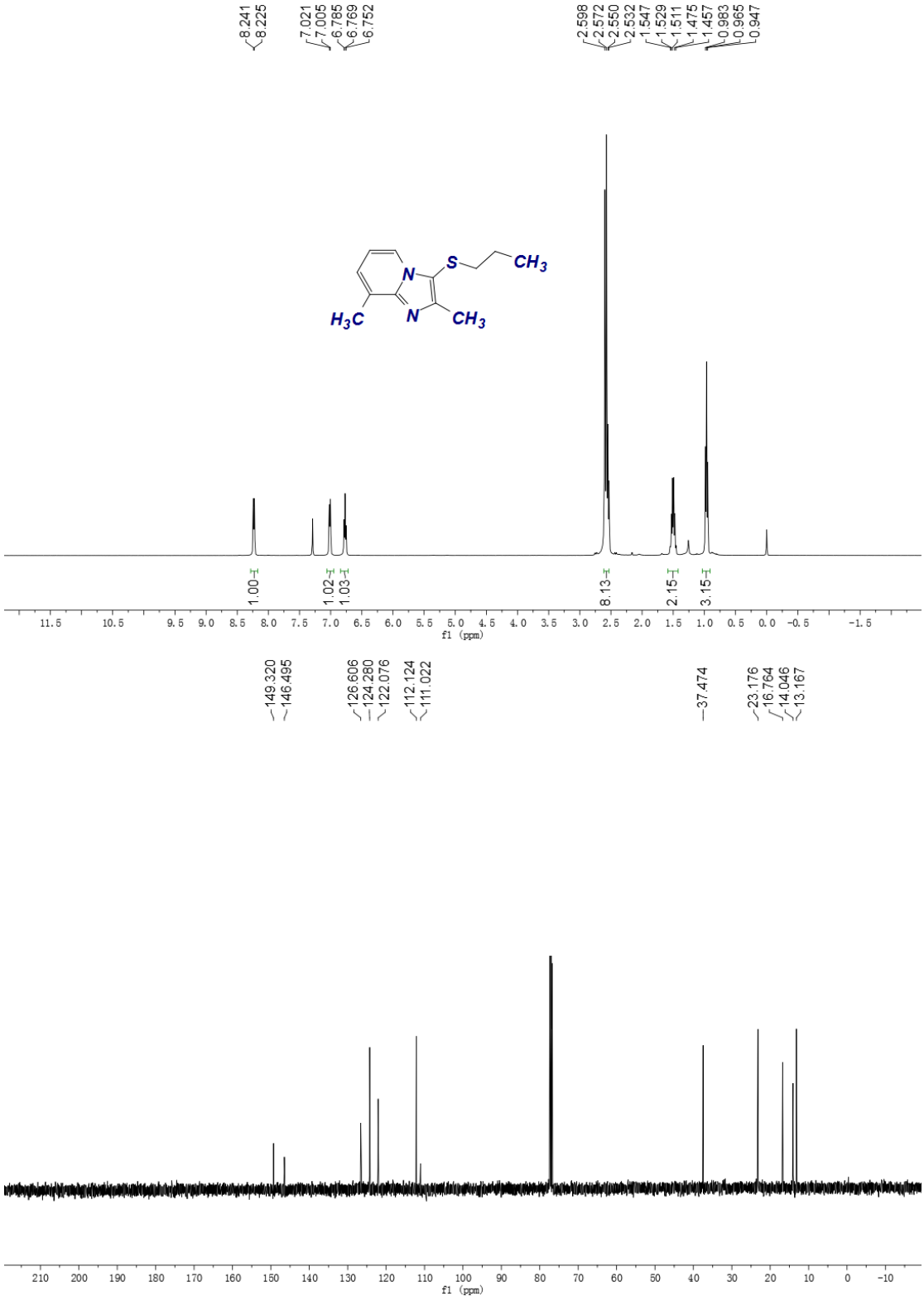
3-(dodecylthio)-2,8-dimethylimidazo[1,2-a]pyridine(3ea)



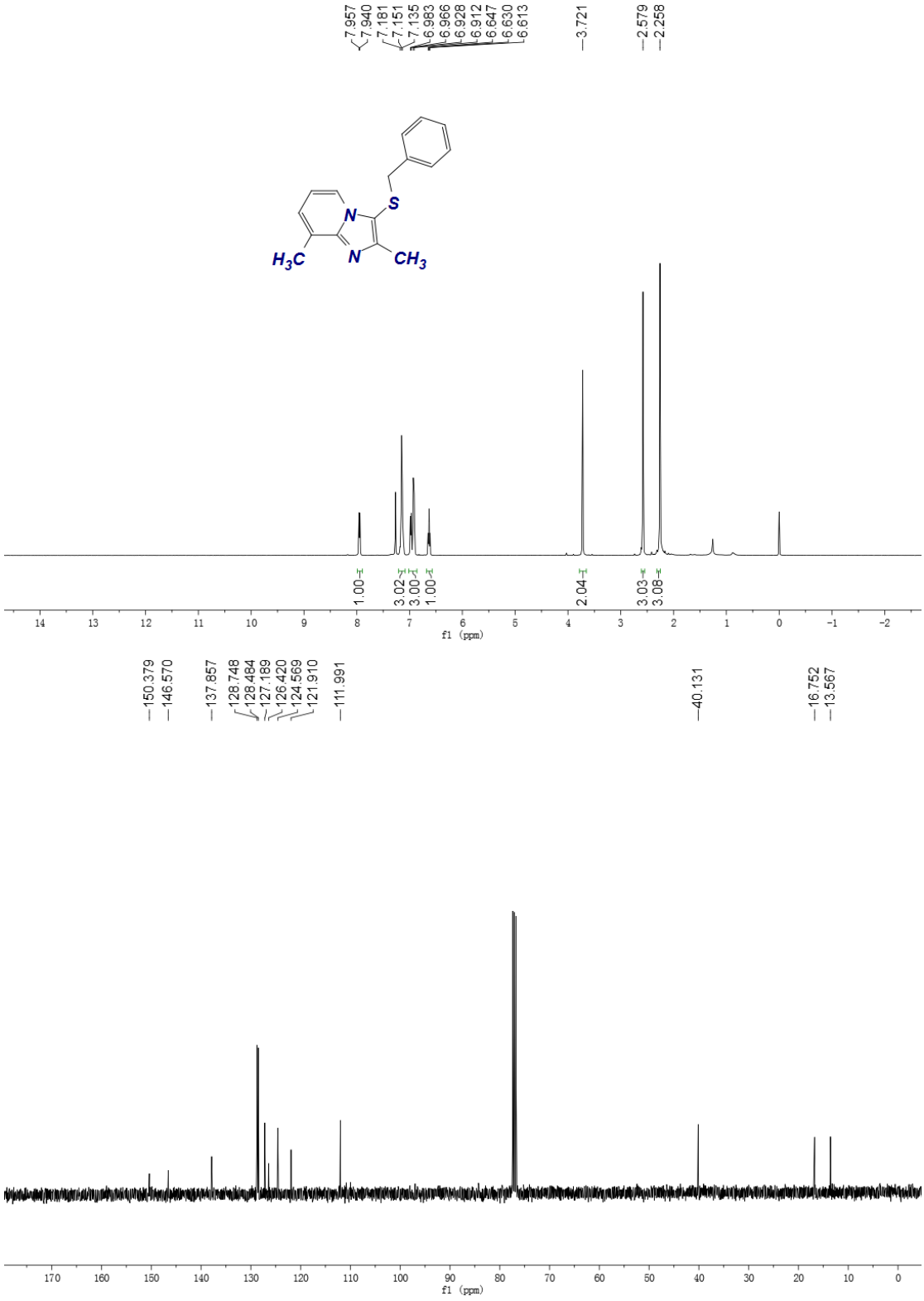
3-(butylthio)-2,8-dimethylimidazo[1,2-a]pyridine(3eb)



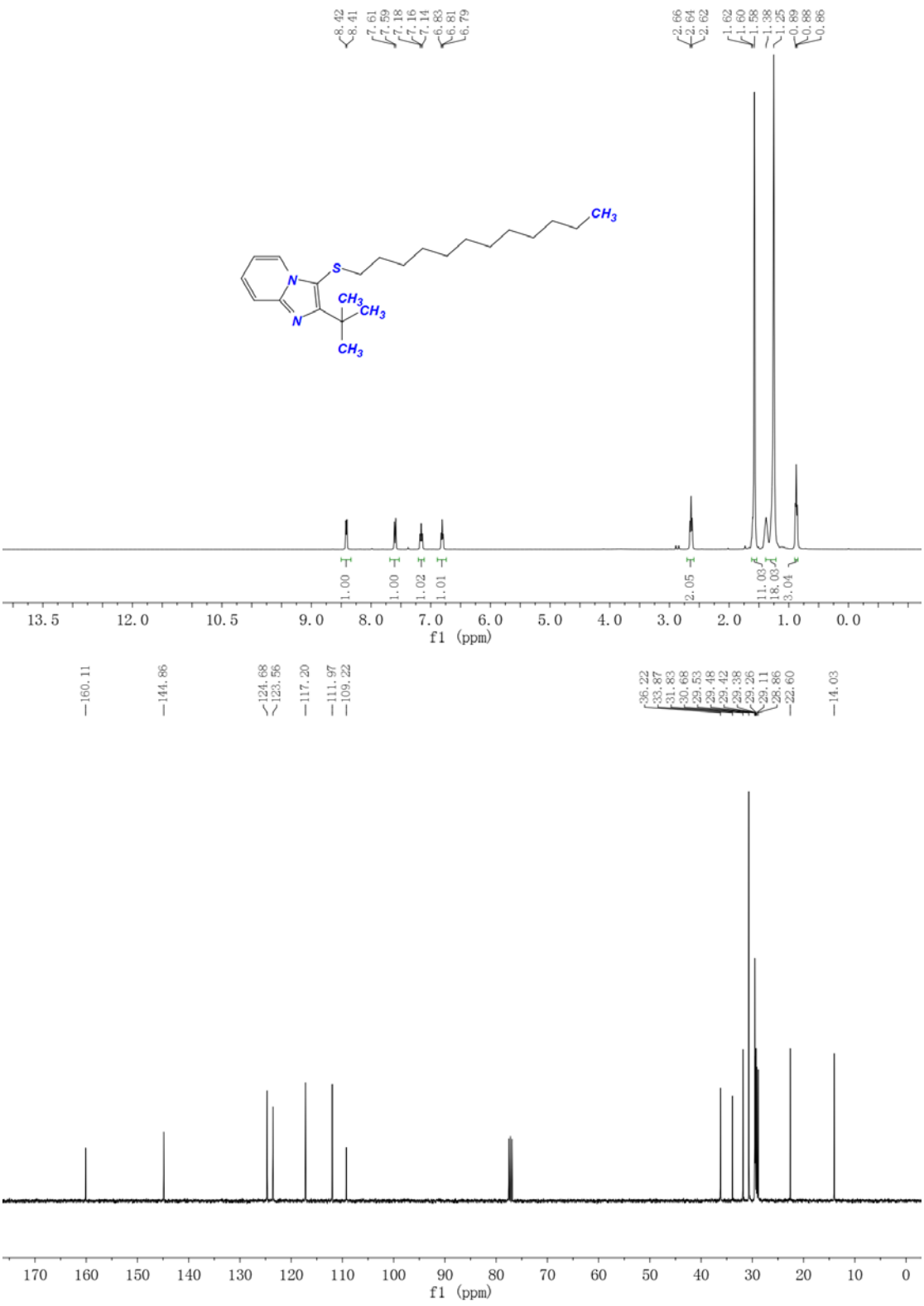
2,8-dimethyl-3-(propylthio)imidazo[1,2-a]pyridine(3ec)



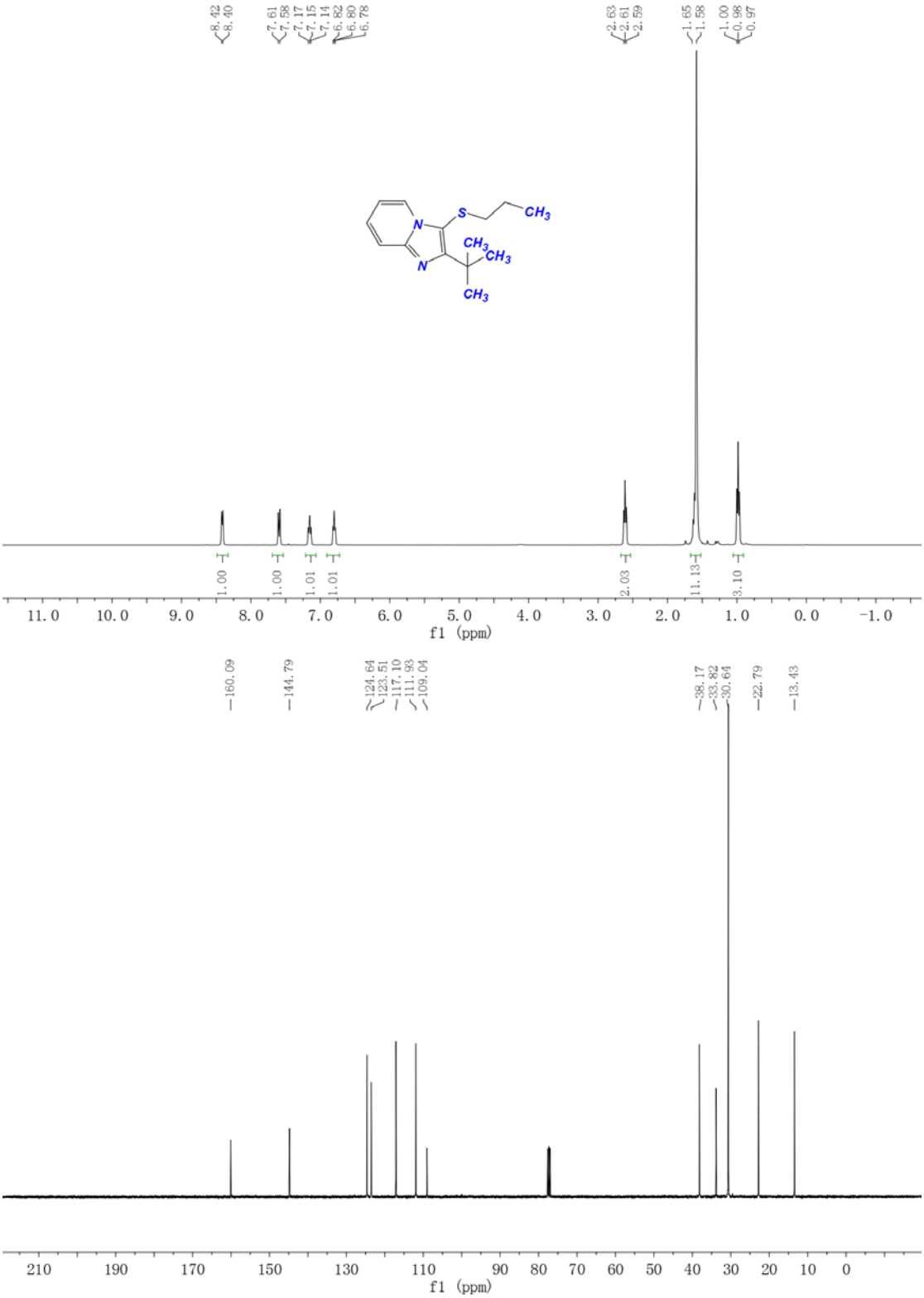
3-(benzylthio)-2,8-dimethylimidazo[1,2-a]pyridine(3ed)



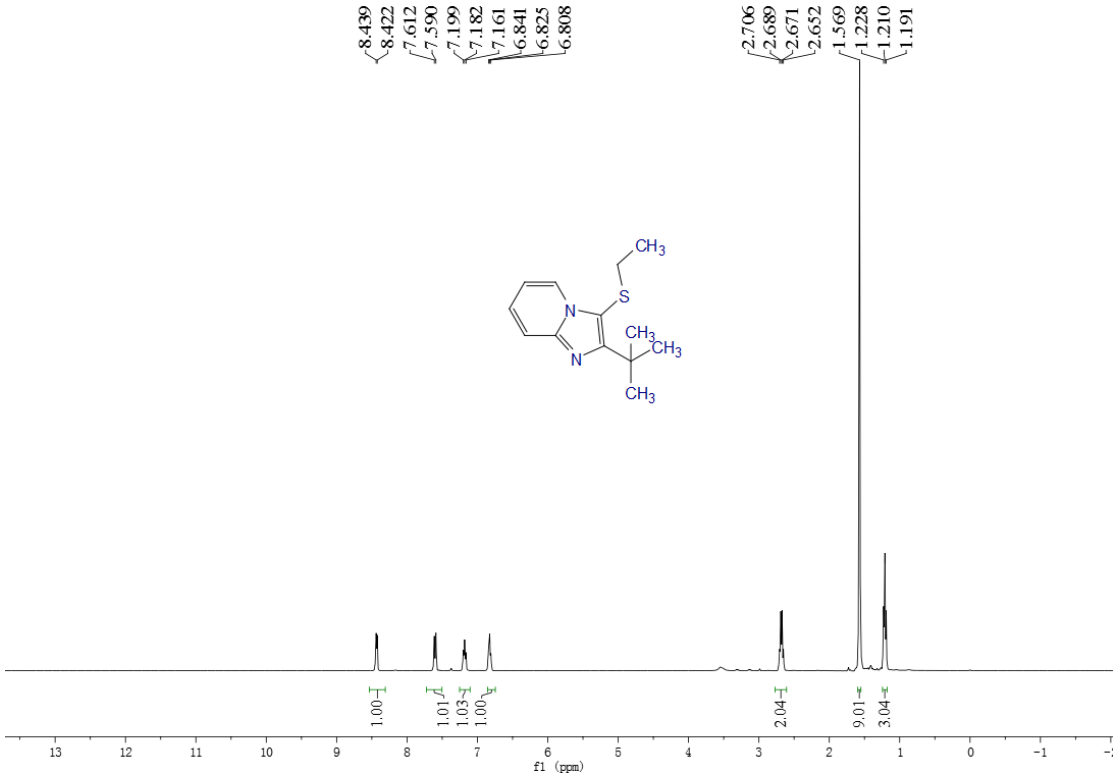
2-(tert-butyl)-3-(dodecylthio)imidazo[1,2-a]pyridine(3fa)

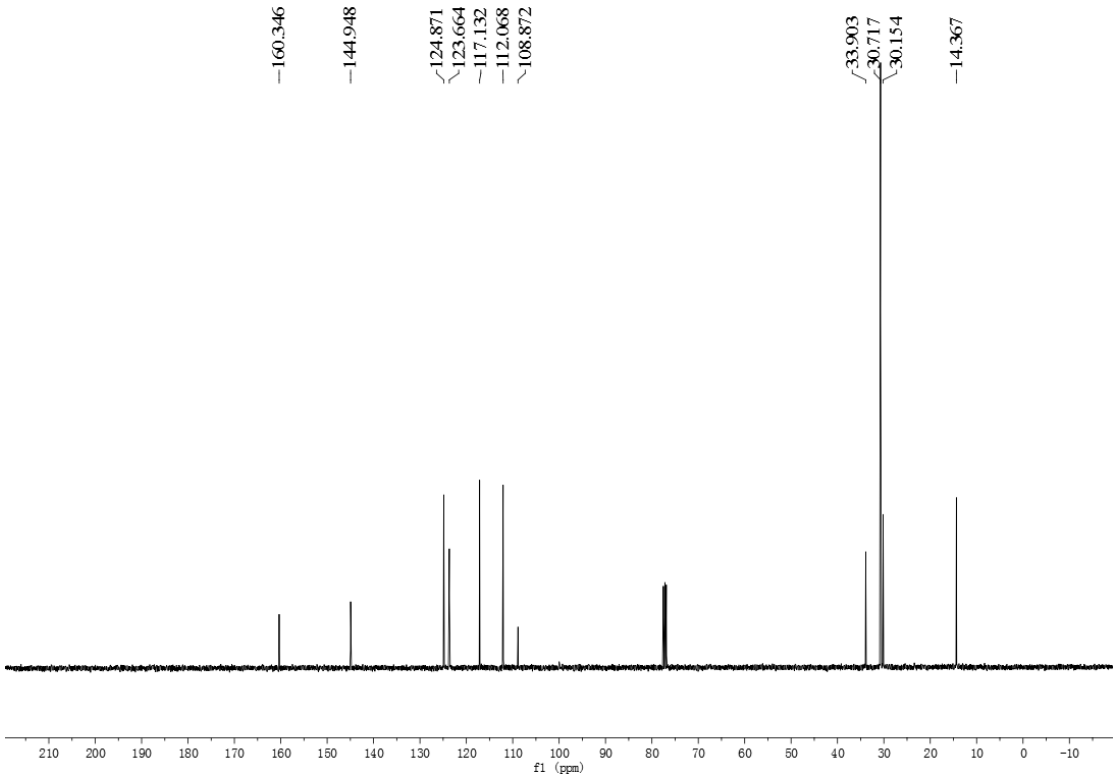


2-(tert-butyl)-3-(propylthio)imidazo[1,2-a]pyridine(3fb)

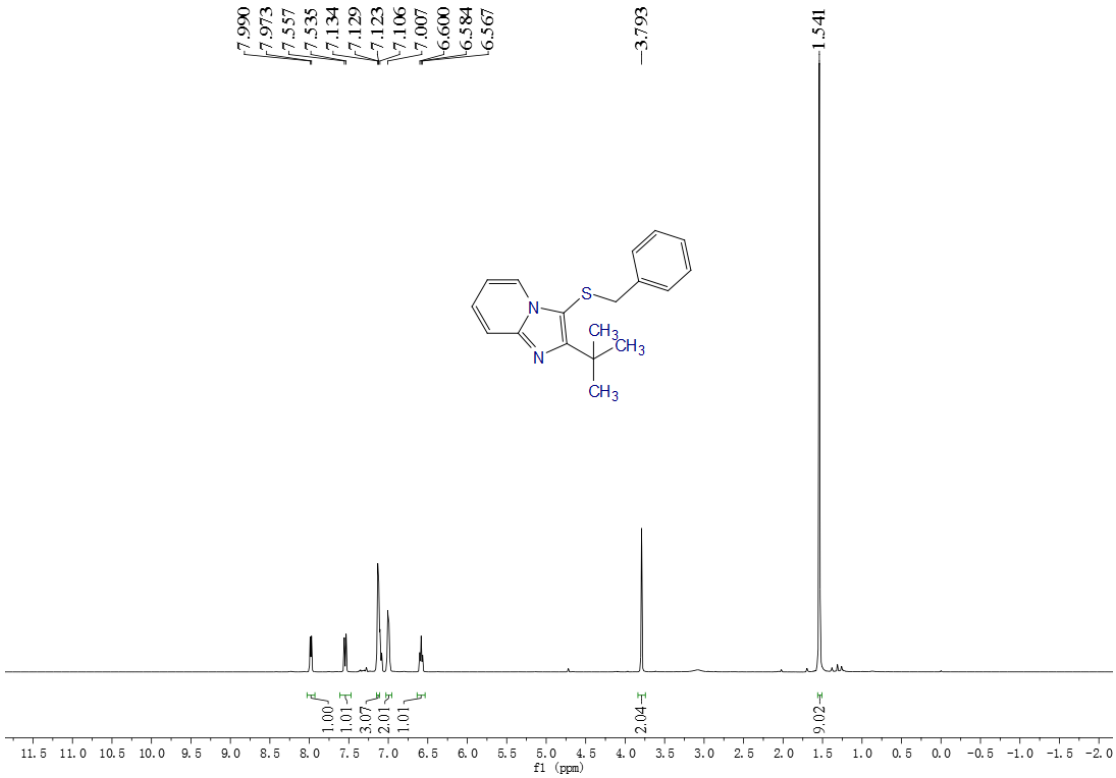


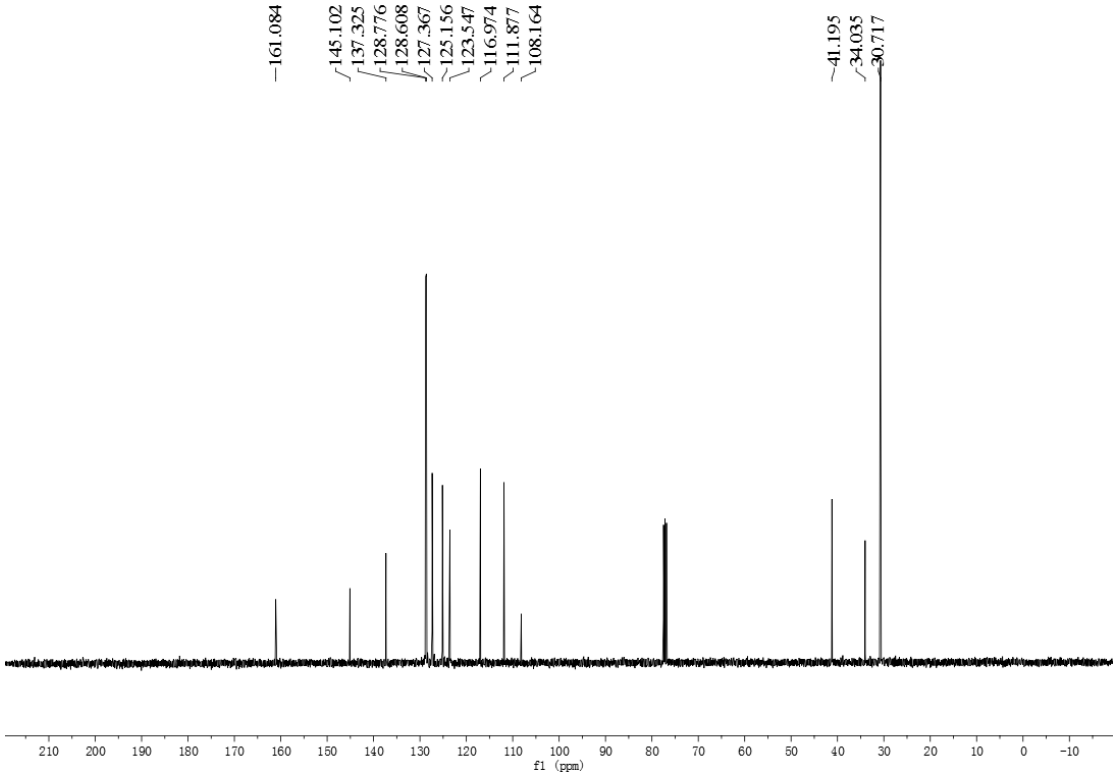
2-(tert-butyl)-3-(ethylthio)imidazo[1,2-a]pyridine(3fc)



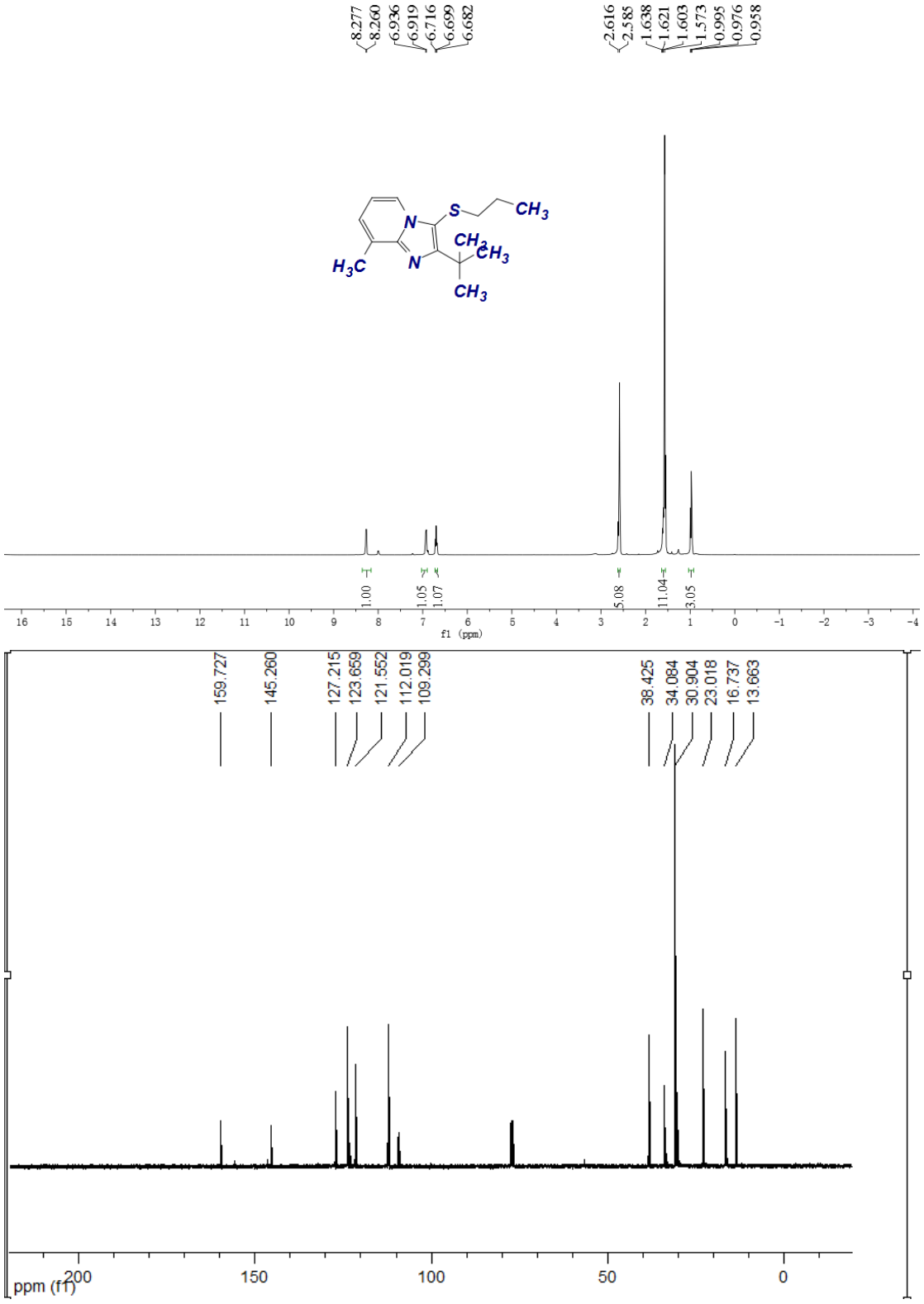


3-(benzylthio)-2-(tert-butyl)imidazo[1,2-a]pyridine(3fd)

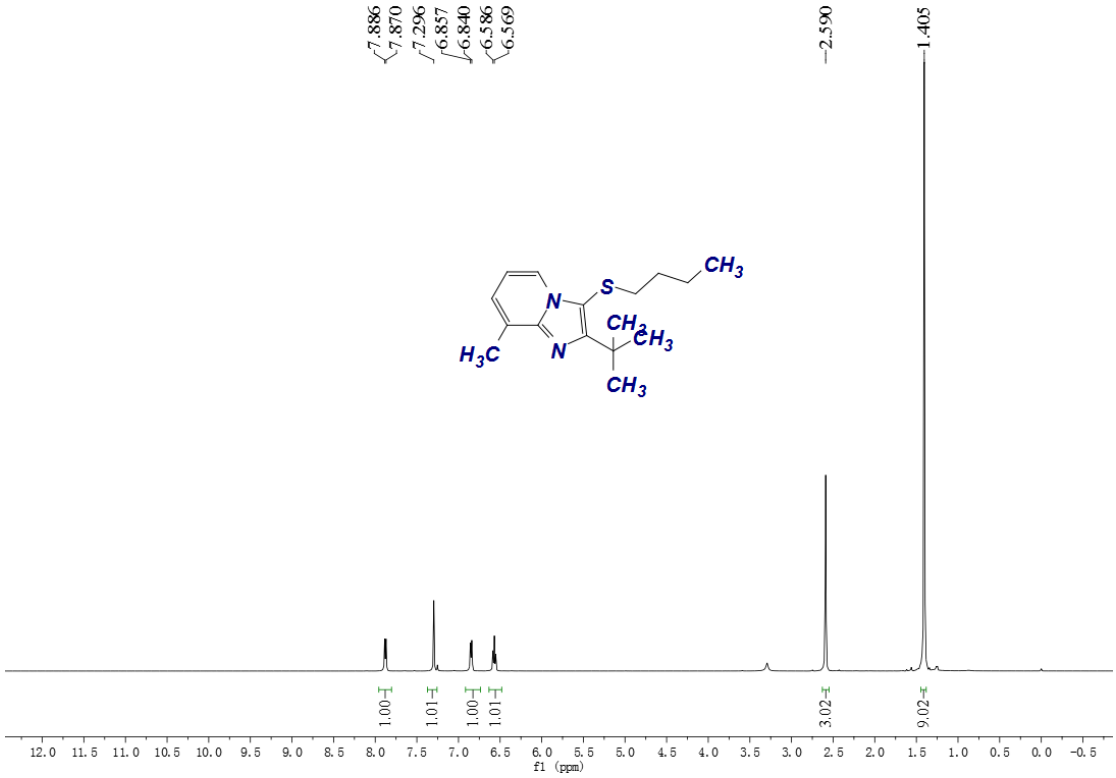


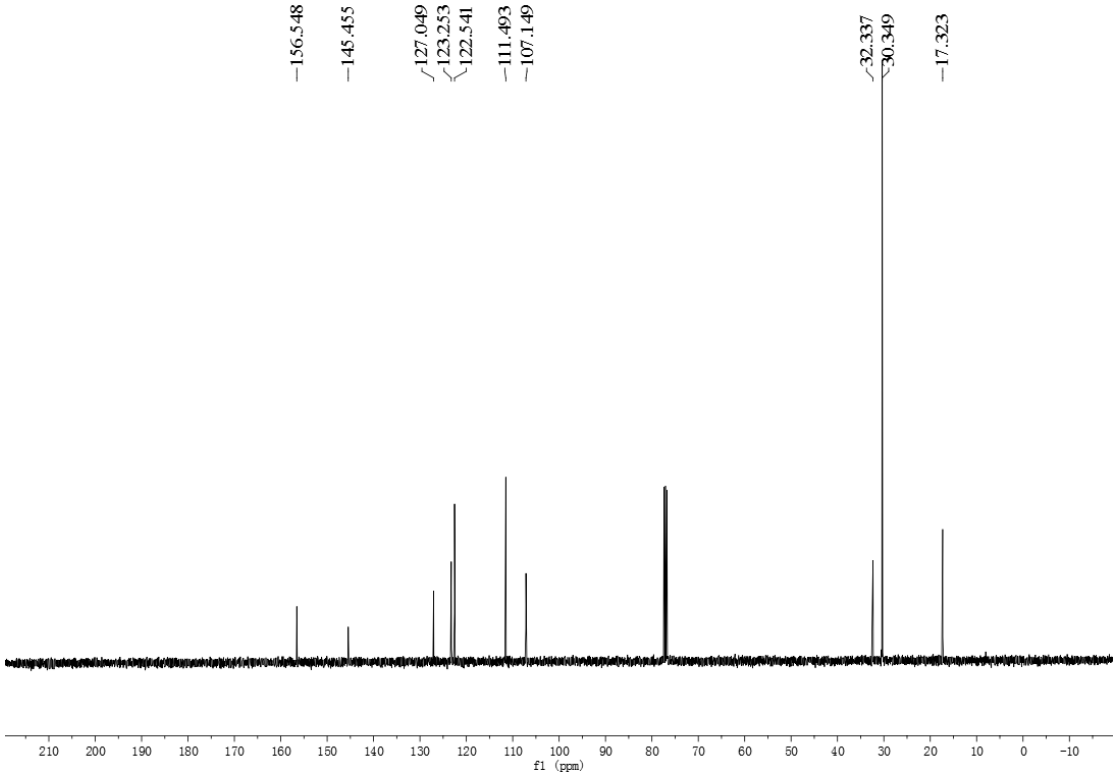


2-(tert-butyl)-8-methyl-3-(propylthio)imidazo[1,2-a]pyridine(3ga)

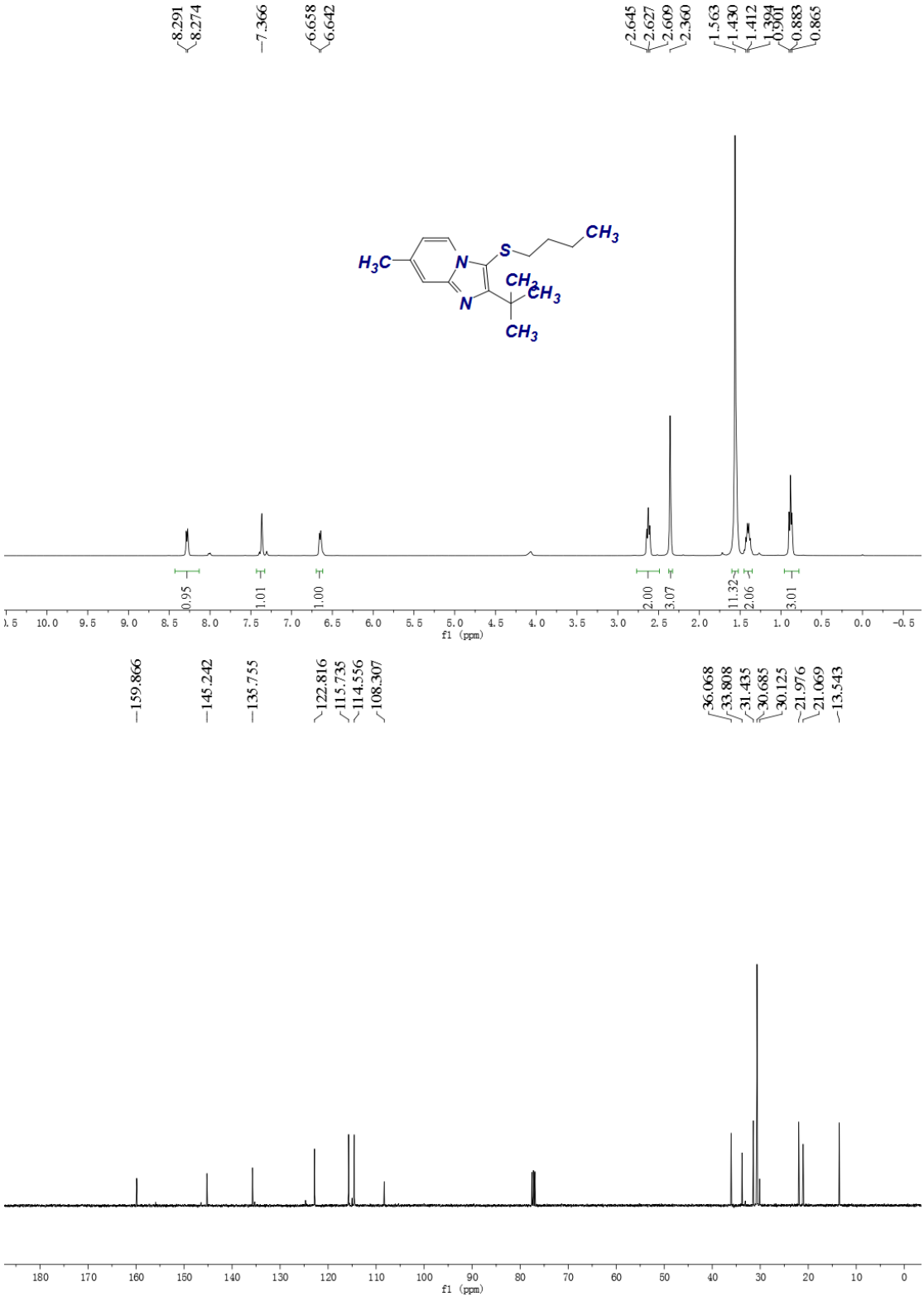


2-(tert-butyl)-3-(butylthio)-8-methylimidazo[1,2-a]pyridine(3gb)

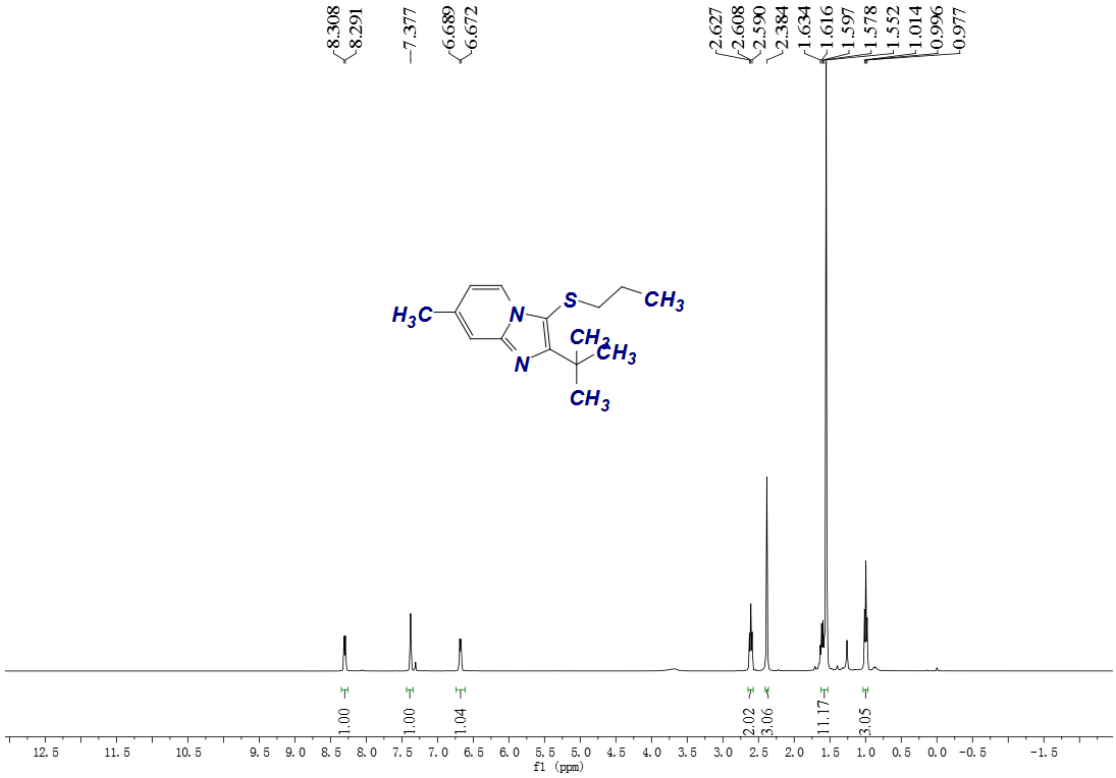


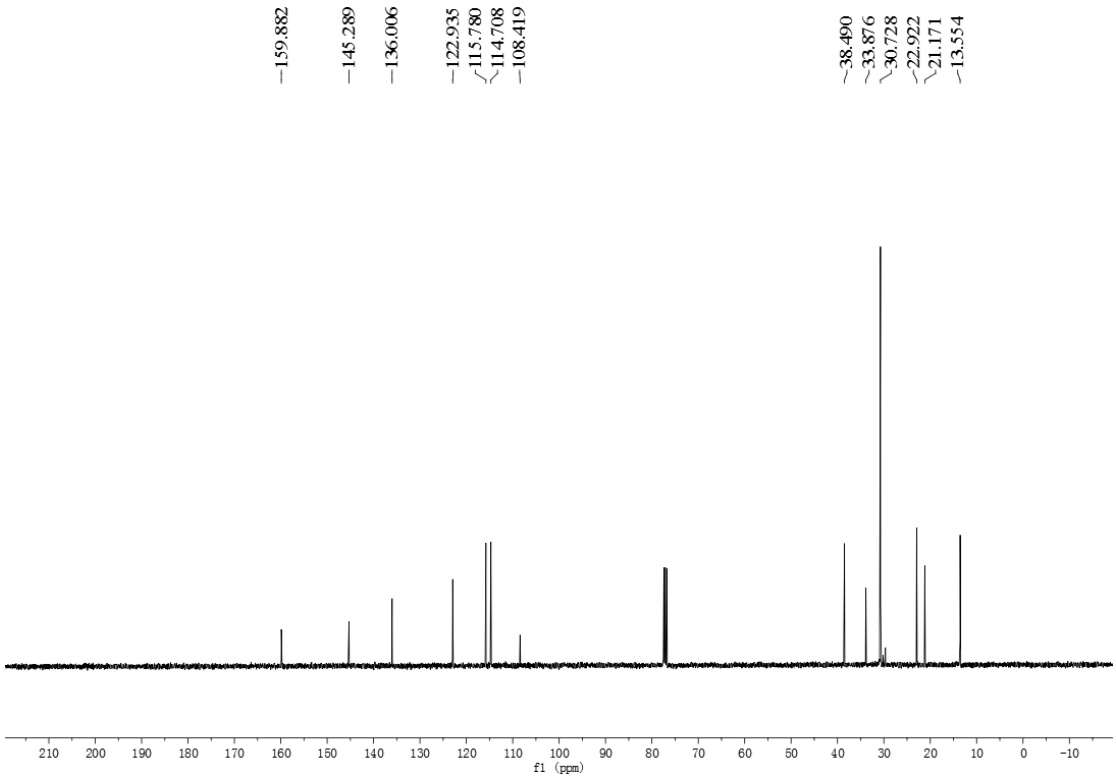


2-(tert-butyl)-3-(butylthio)-7-methylimidazo[1,2-a]pyridine(3gc)

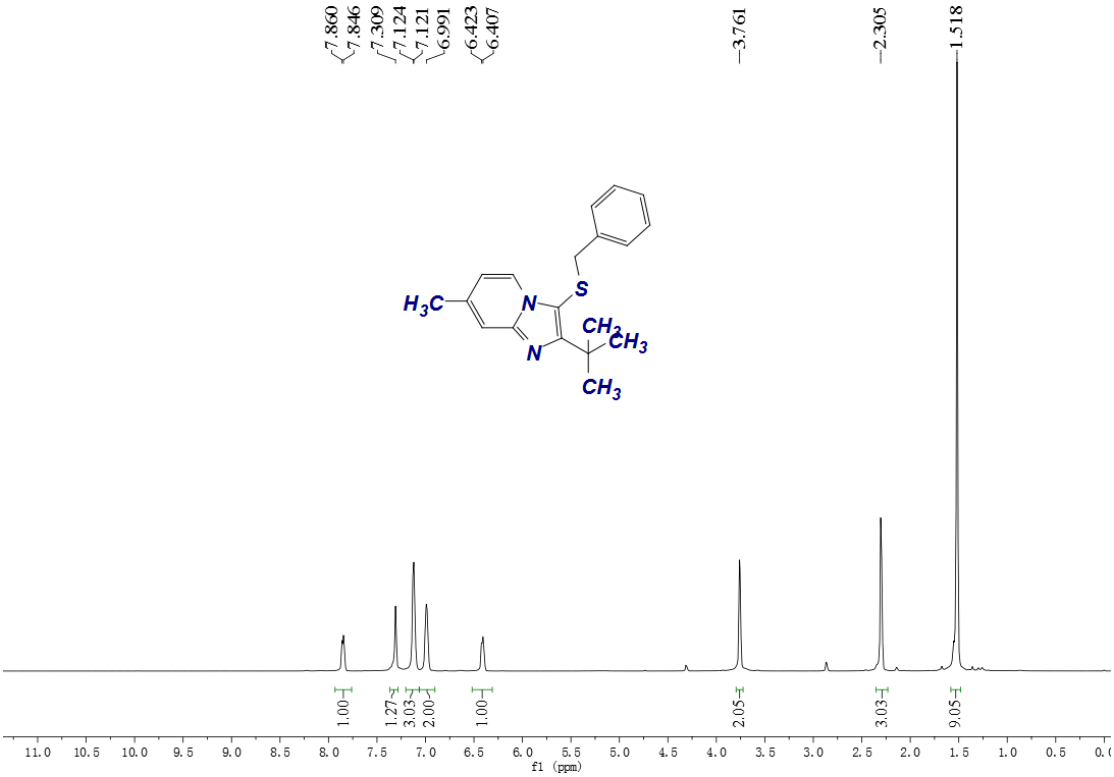


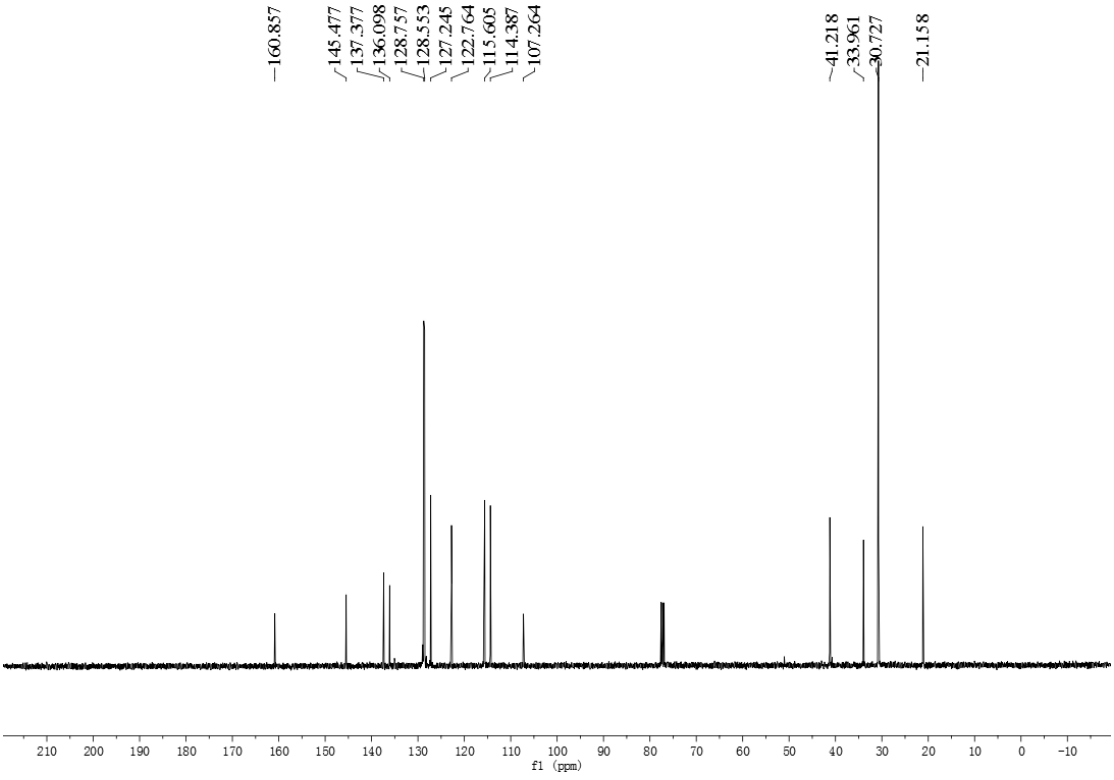
2-(tert-butyl)-7-methyl-3-(propylthio)imidazo[1,2-a]pyridine(3gd)



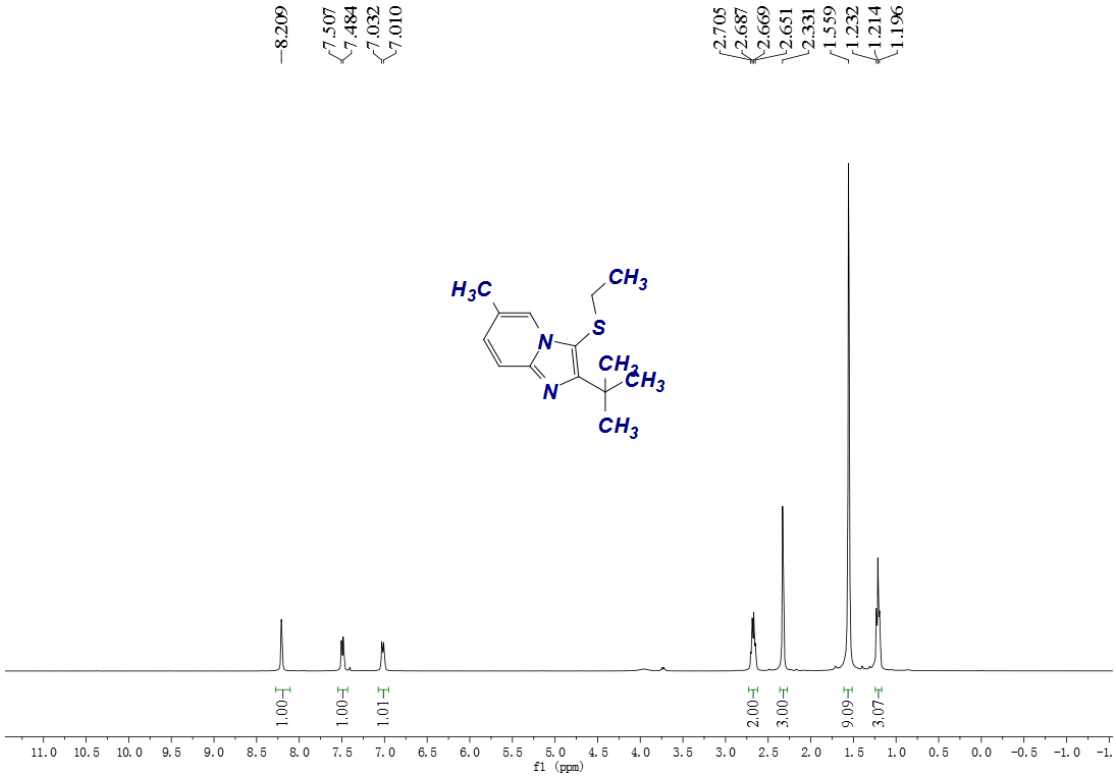


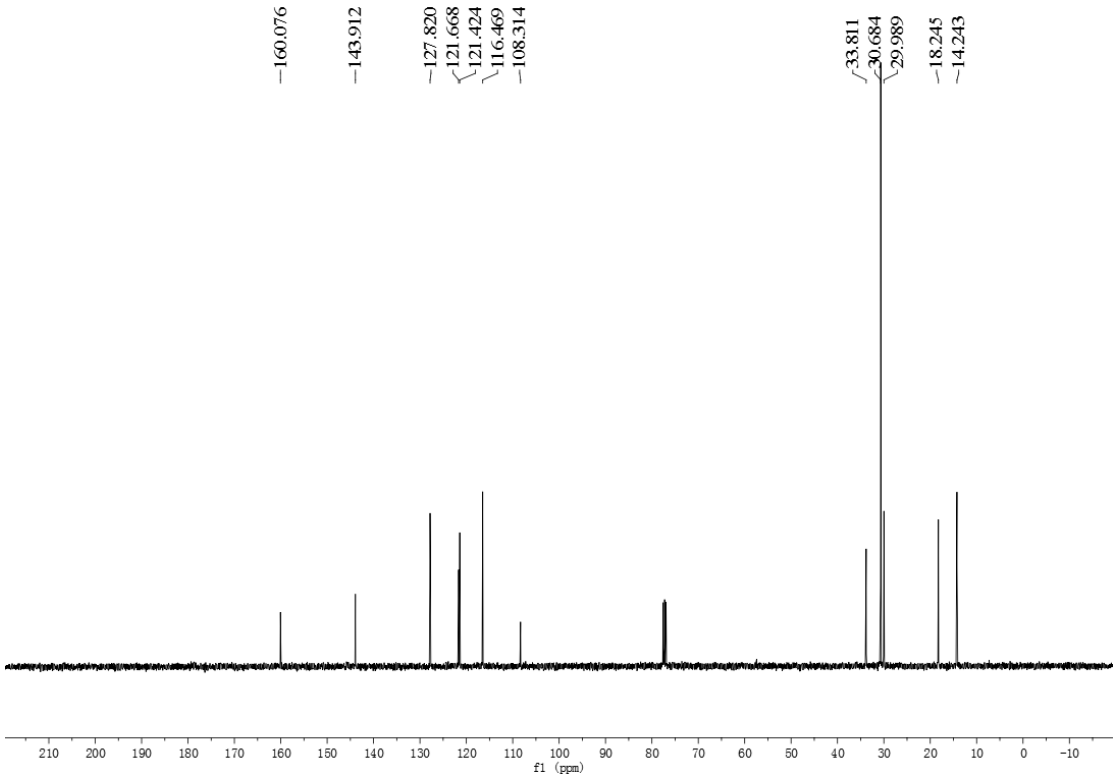
3-(benzylthio)-2-(tert-butyl)-7-methylimidazo[1,2-a]pyridine(3ha)





2-(tert-butyl)-3-(ethylthio)-6-methylimidazo[1,2-a]pyridine(3hb)





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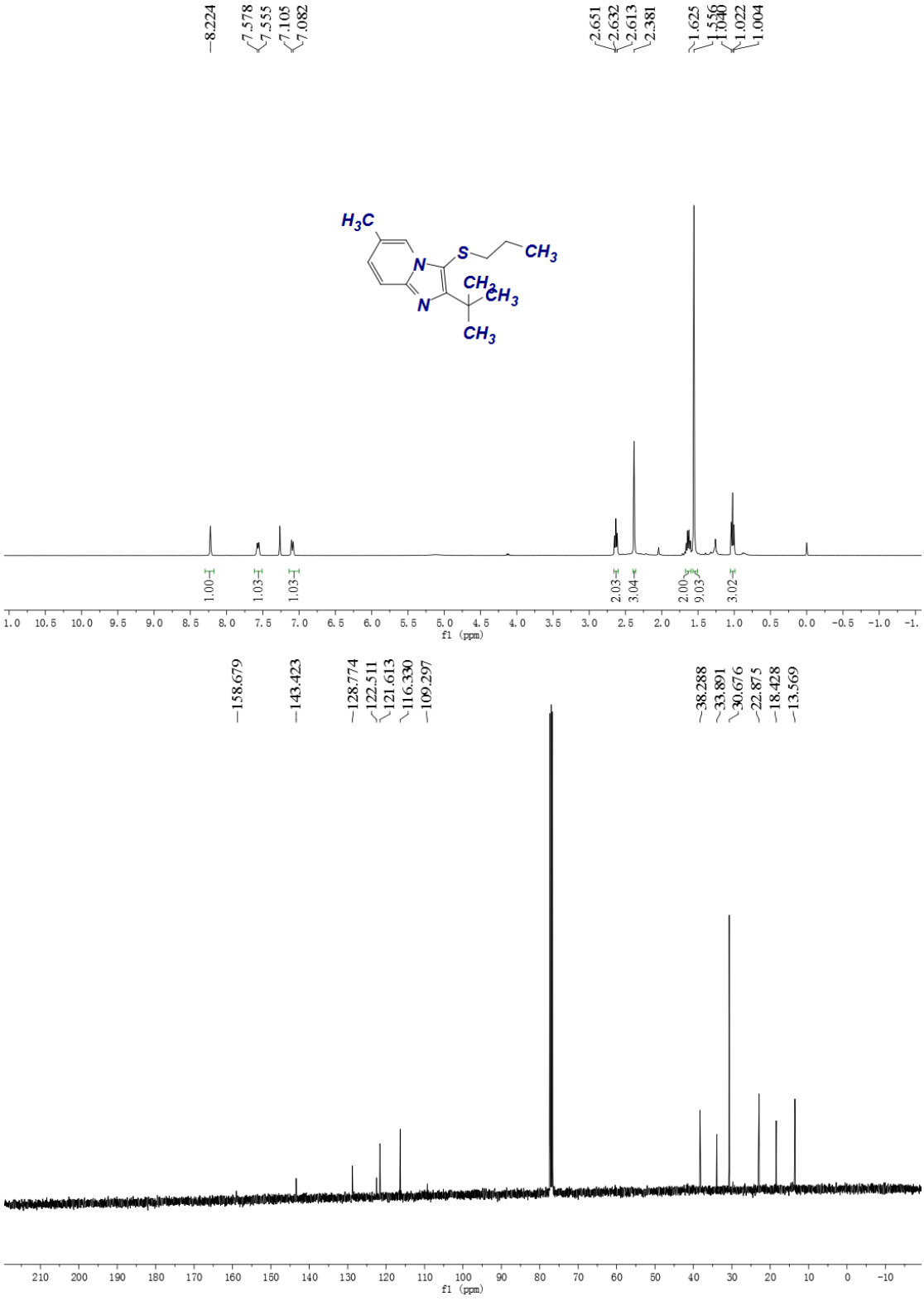
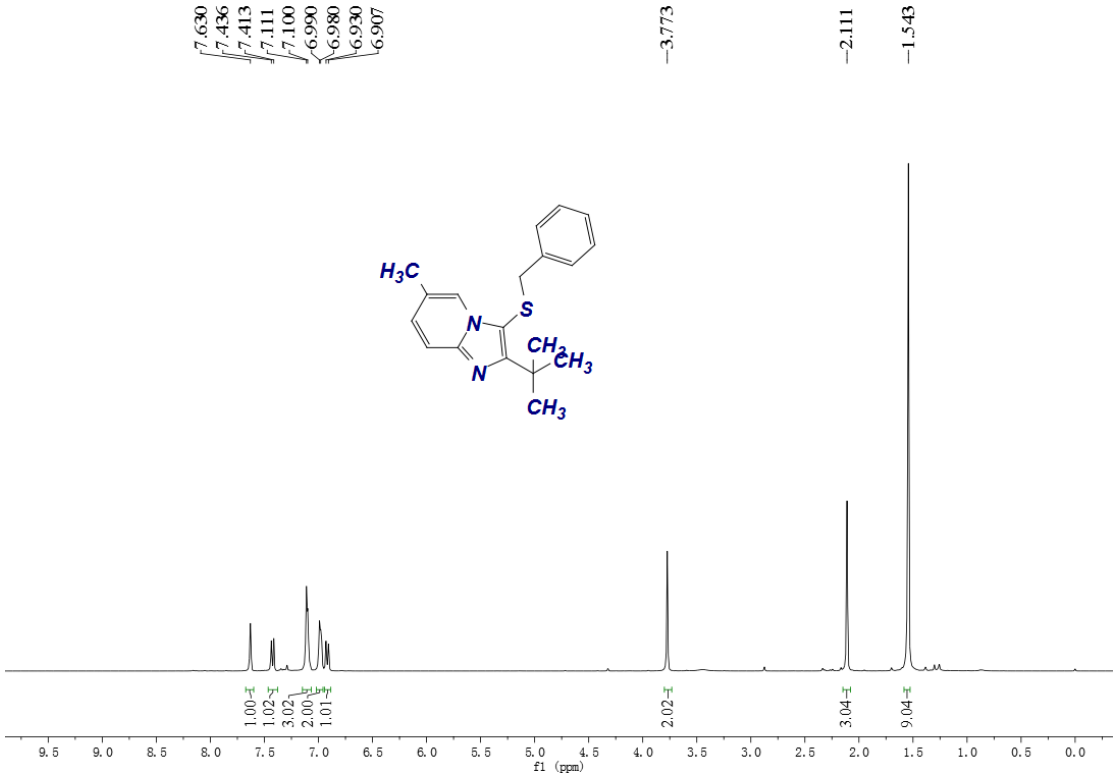
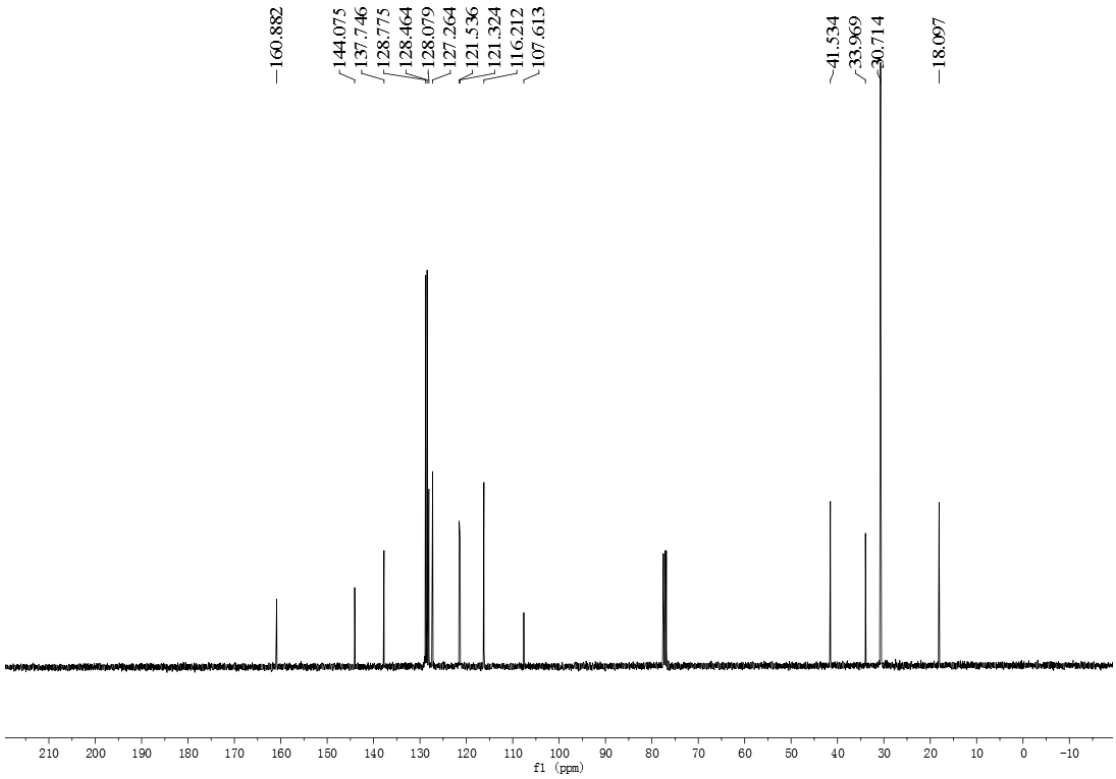
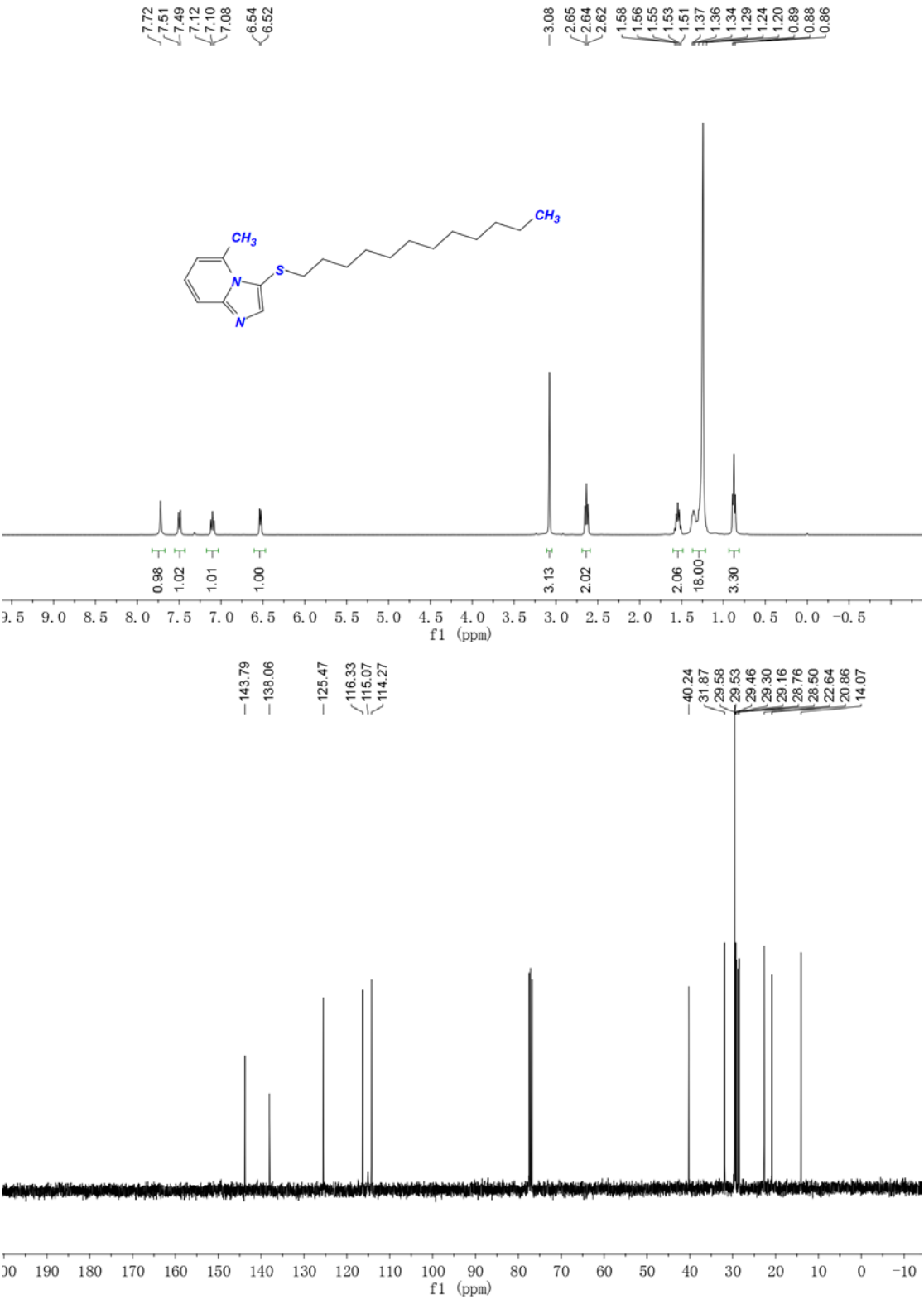


3-(benzylthio)-2-(tert-butyl)-6-methylimidazo[1,2-a]pyridine(3hd)

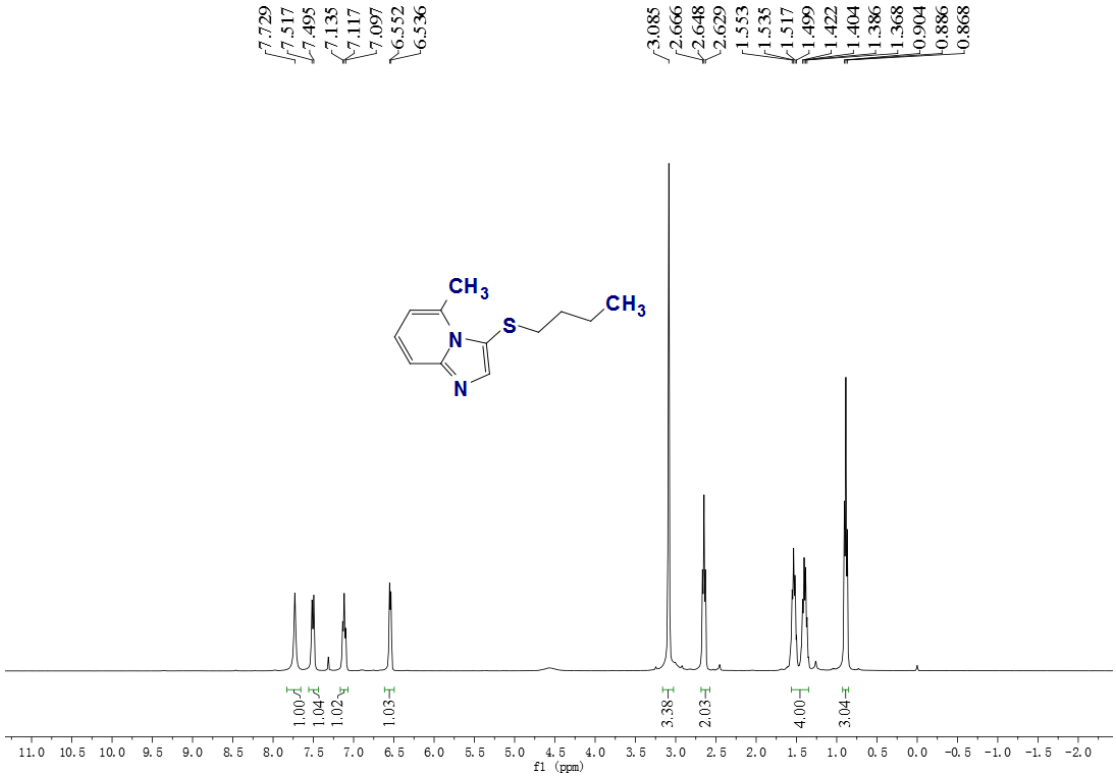


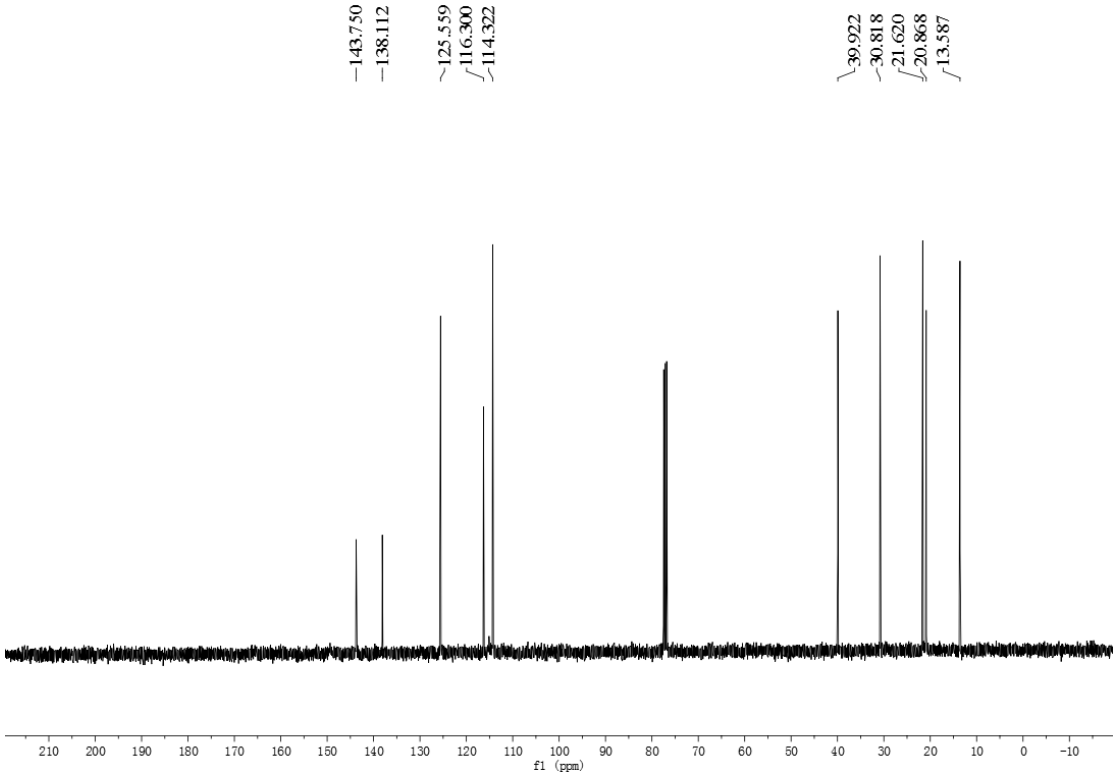


3-(dodecylthio)-5-methylimidazo[1,2-a]pyridine(4aa)

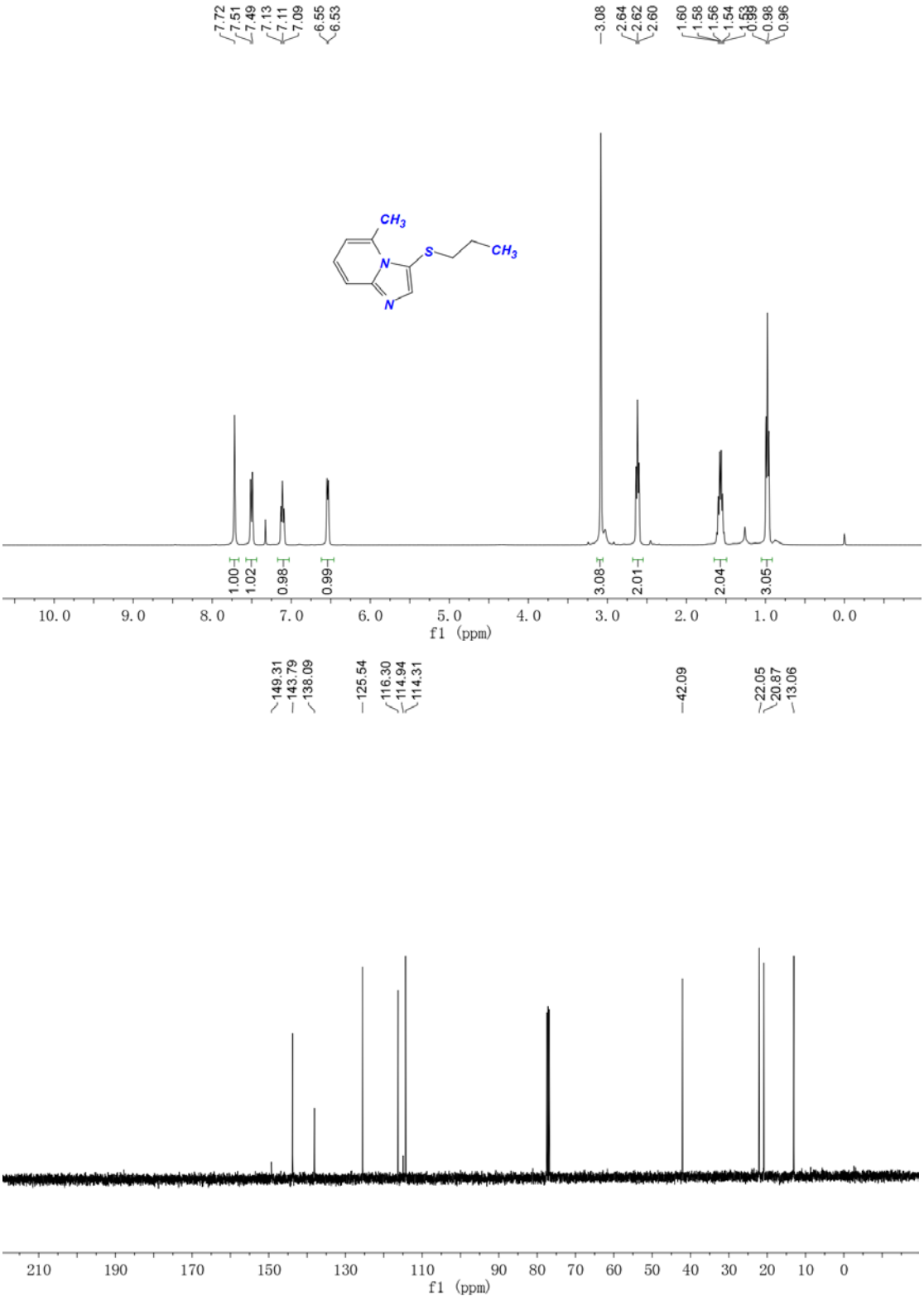


3-(butylthio)-5-methylimidazo[1,2-a]pyridine(4ab)

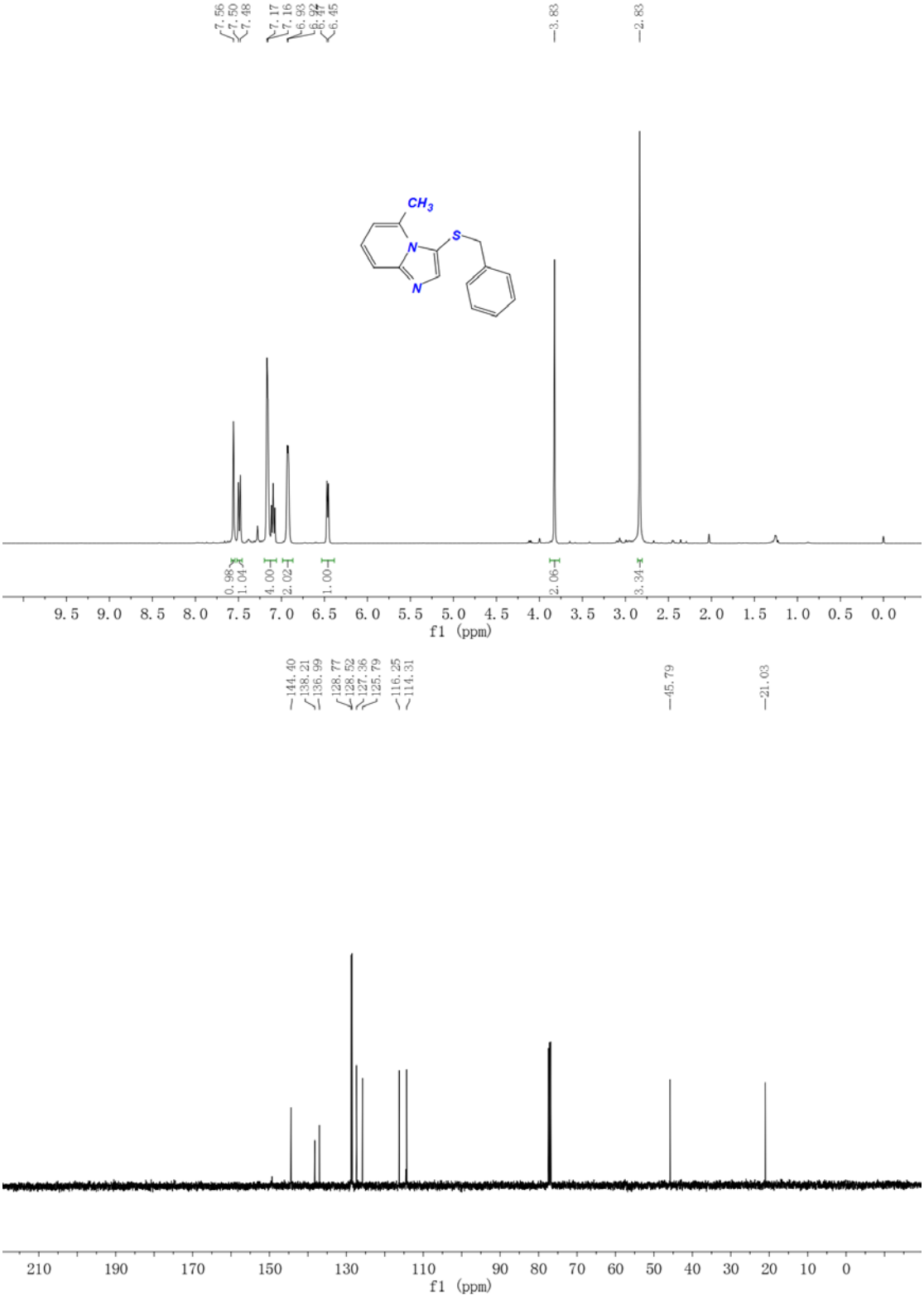




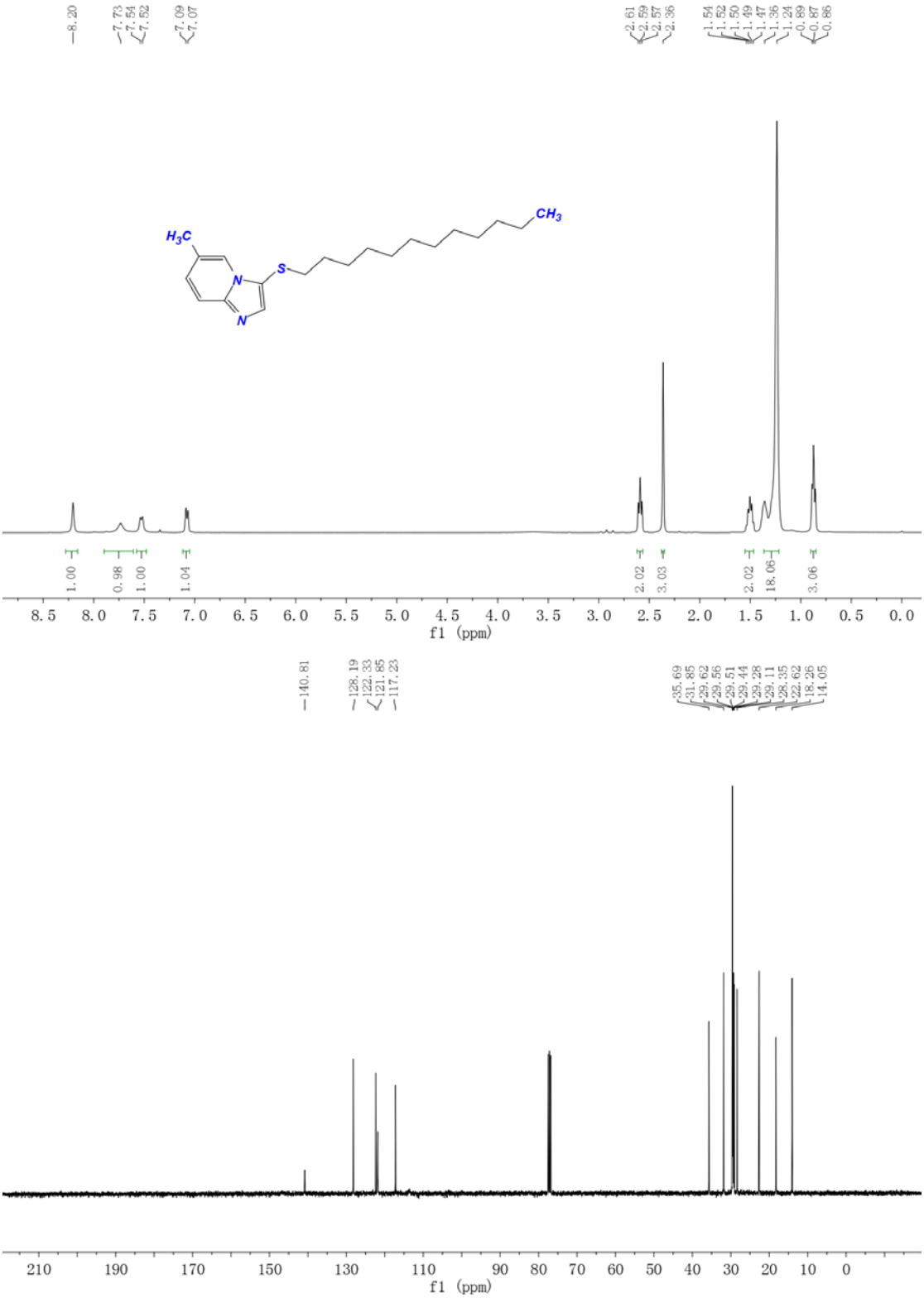
5-methyl-3-(propylthio)imidazo[1,2-a]pyridine(4ac)



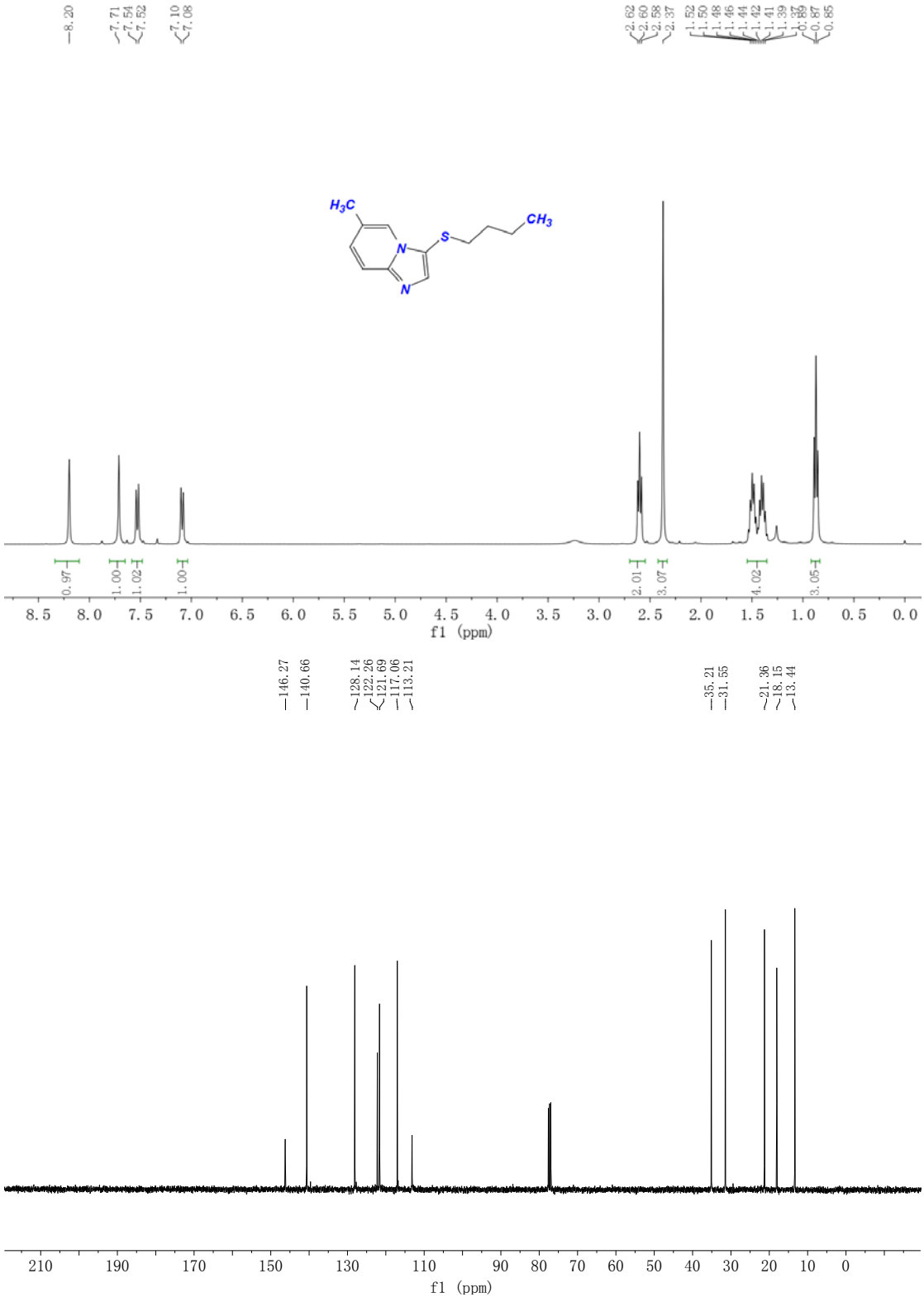
3-(benzylthio)-5-methylimidazo[1,2-a]pyridine(4ad)



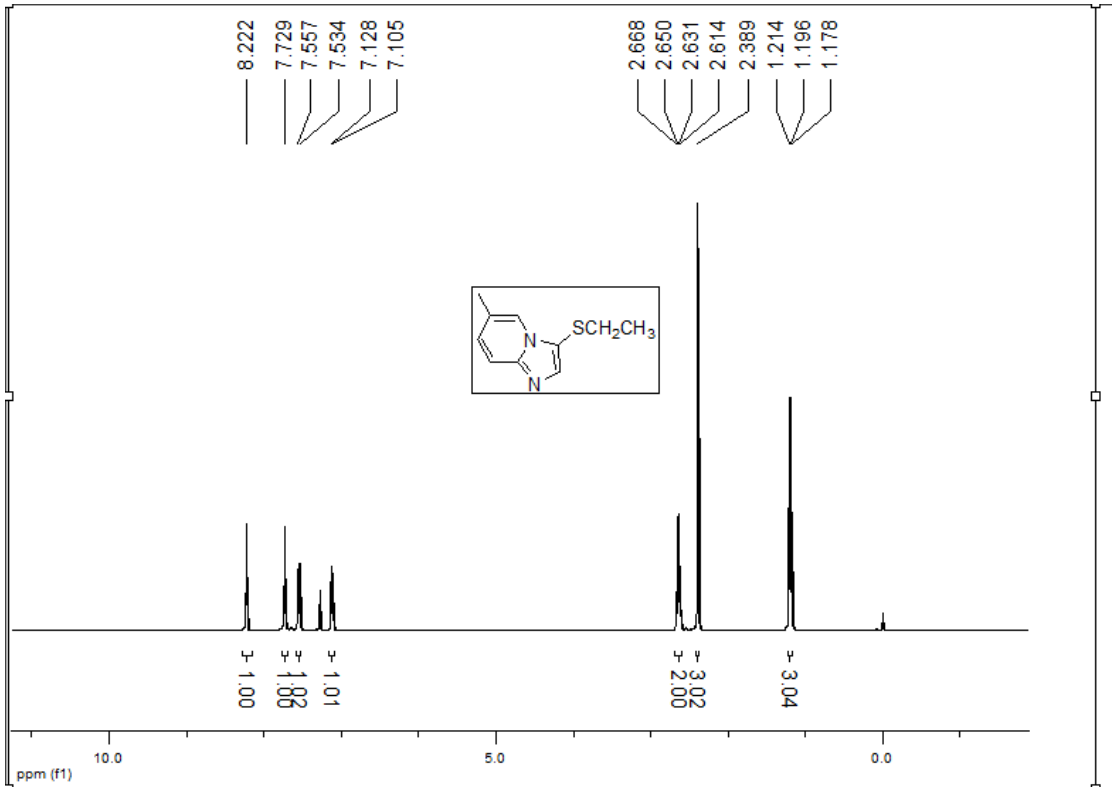
3-(dodecylthio)-6-methylimidazo[1,2-a]pyridine(4ba)

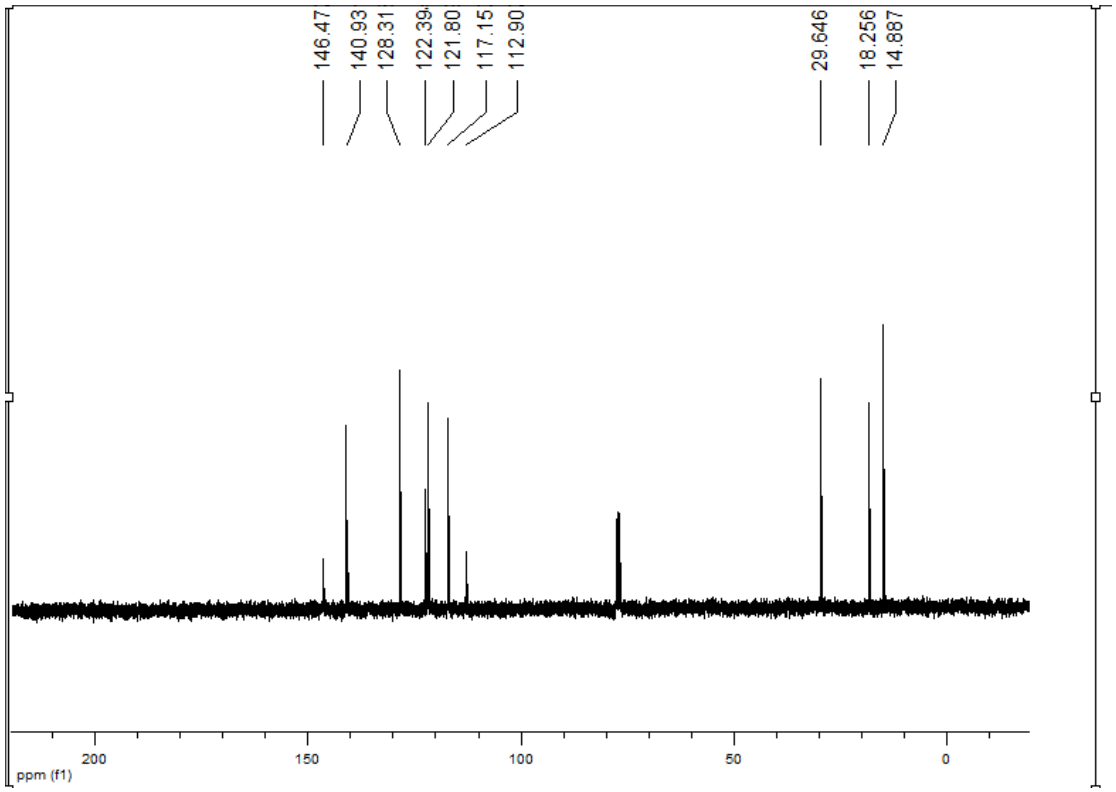


3-(butylthio)-6-methylimidazo[1,2-a]pyridine(4bb)

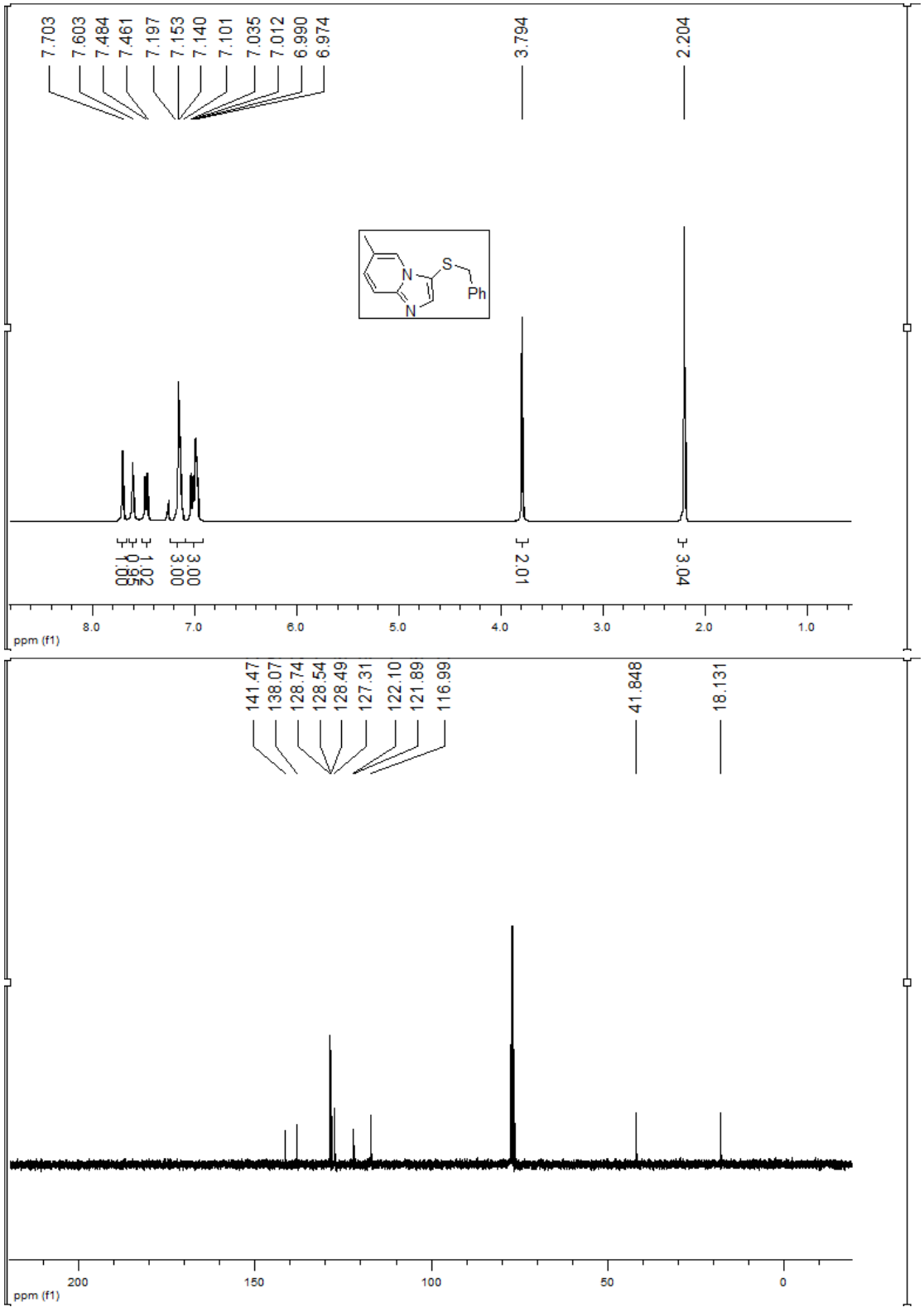


3-(ethylthio)-6-methylimidazo[1,2-a]pyridine(4bc）

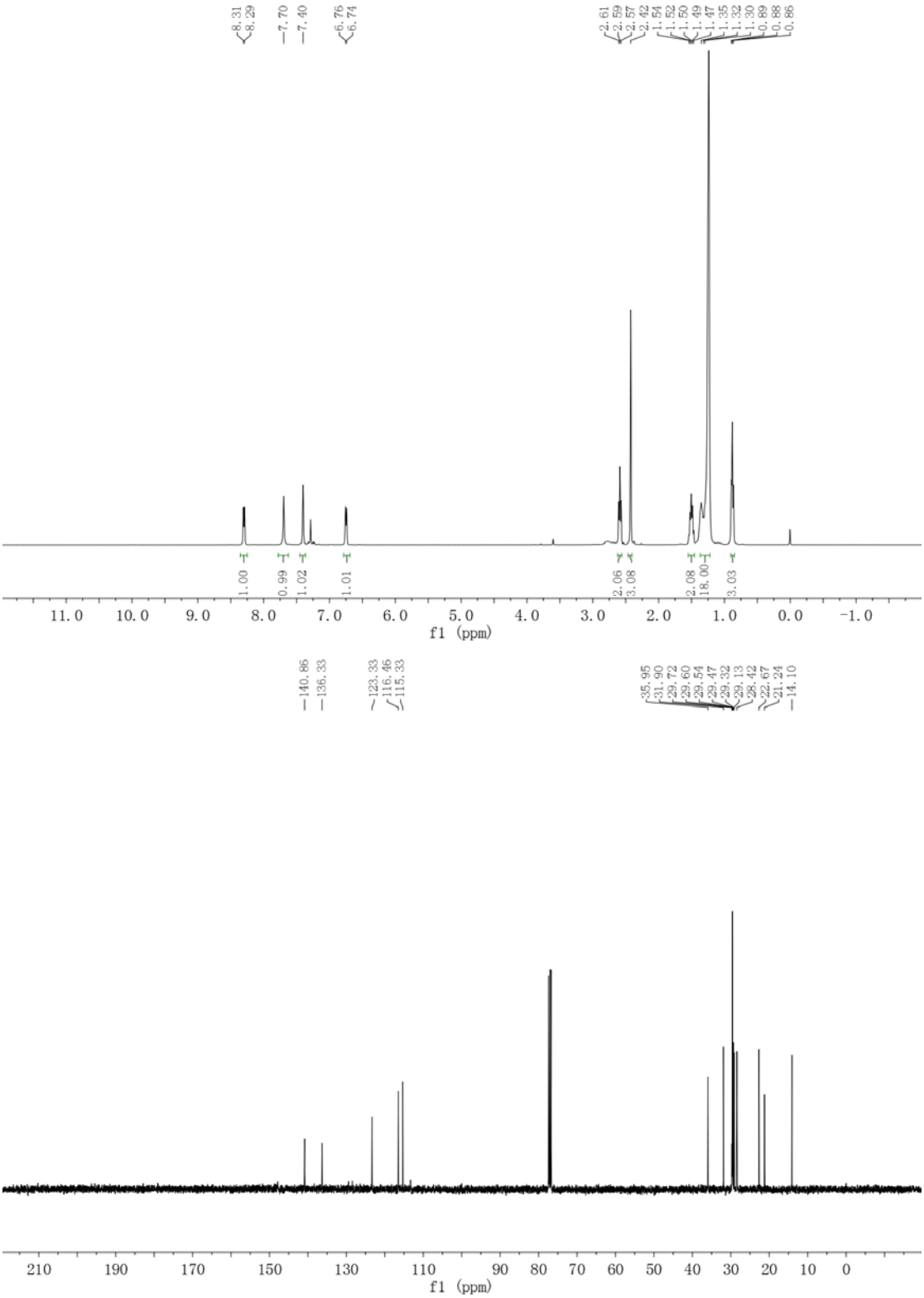




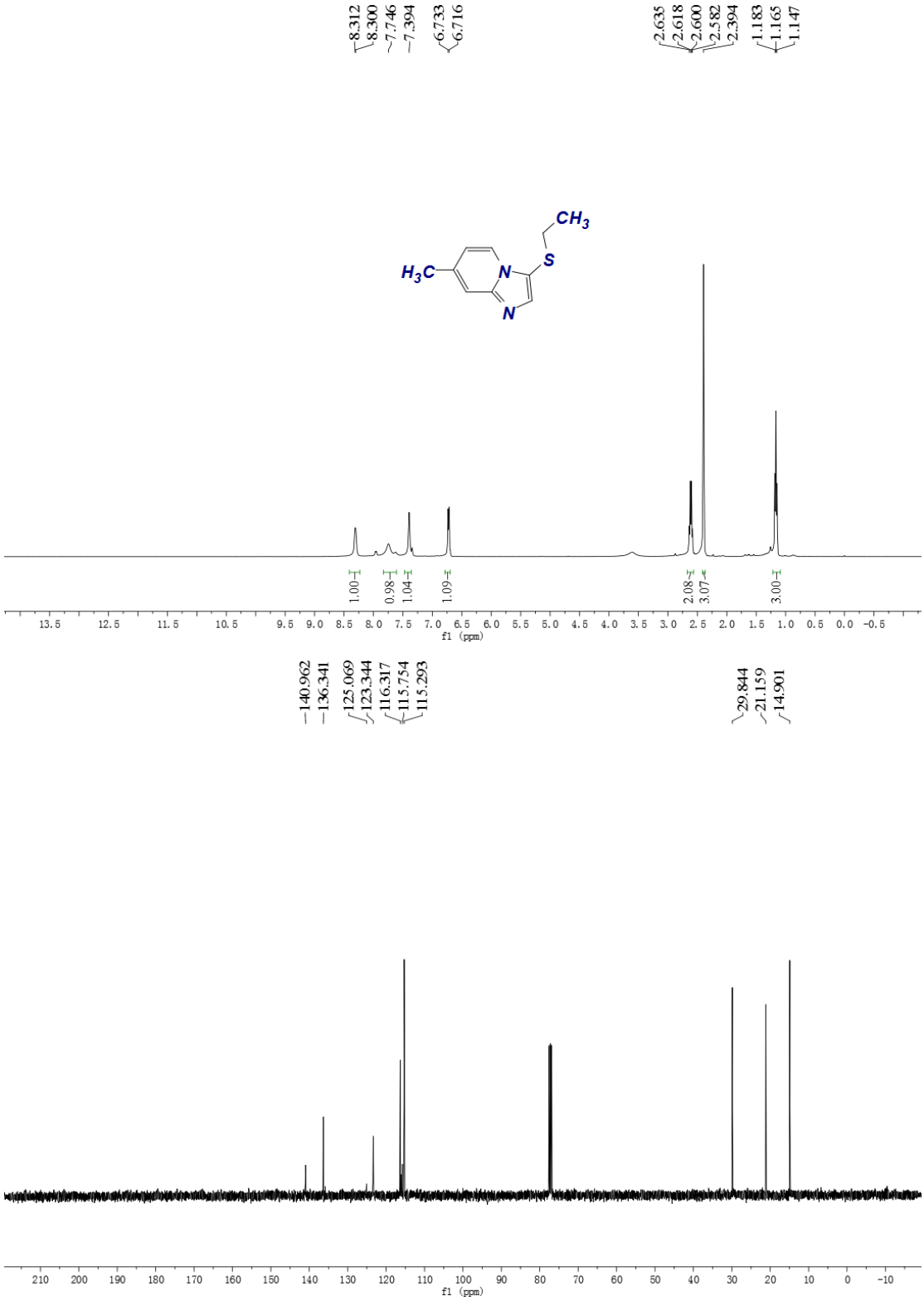
3-(benzylthio)-6-methylimidazo[1,2-a]pyridine（4bd)



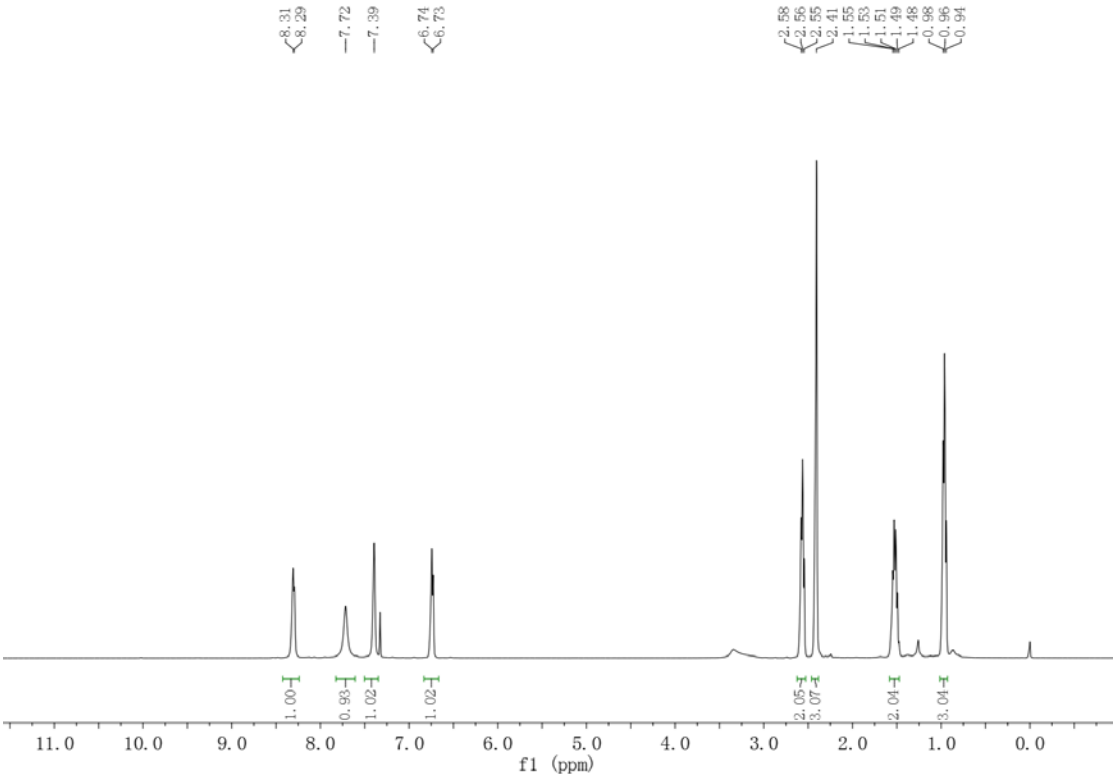
3-(dodecylthio)-7-methylimidazo[1,2-a]pyridine(4ca)

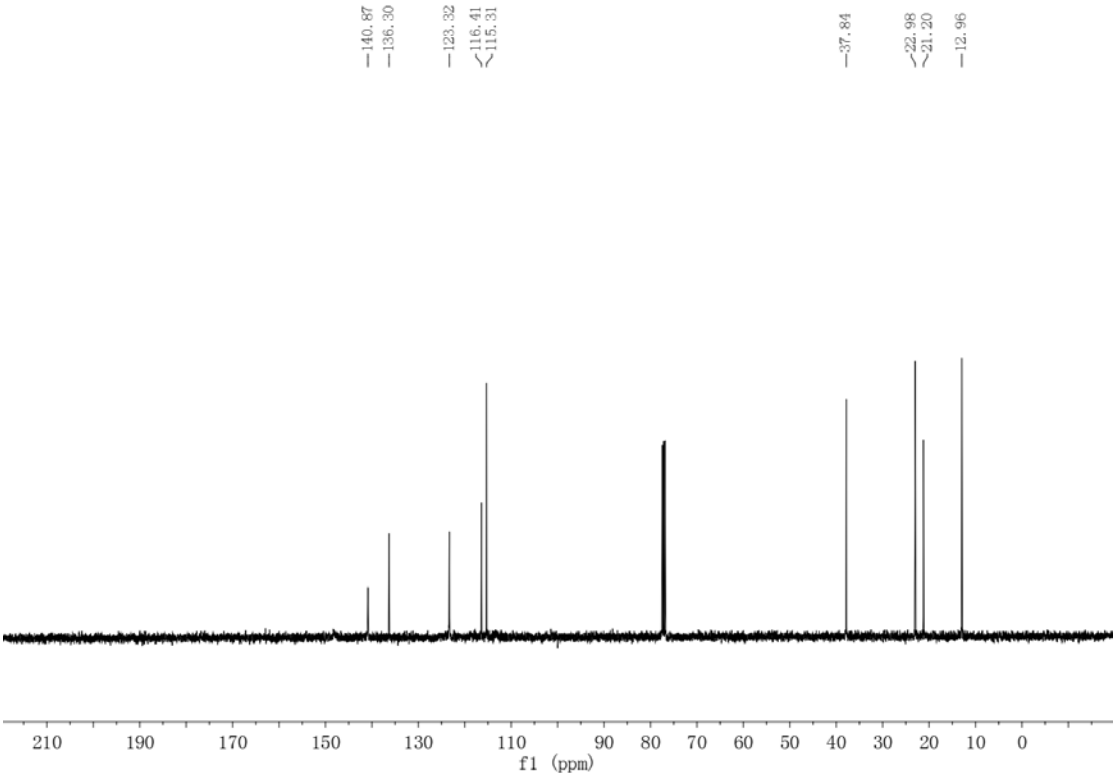


3-(ethylthio)-7-methylimidazo[1,2-a]pyridine (4cb)

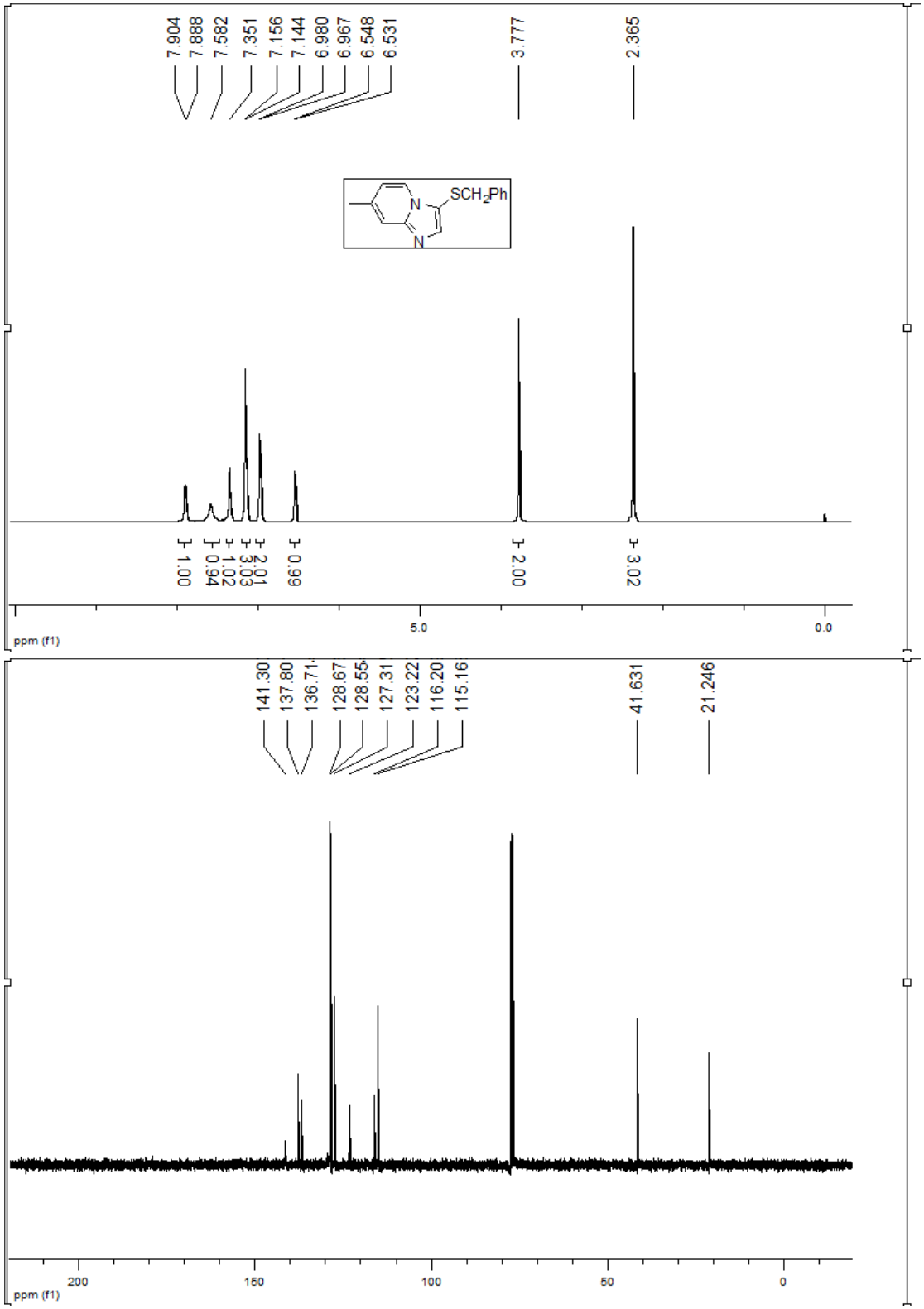


7-methyl-3-(propylthio)imidazo[1,2-a]pyridine(4cc)

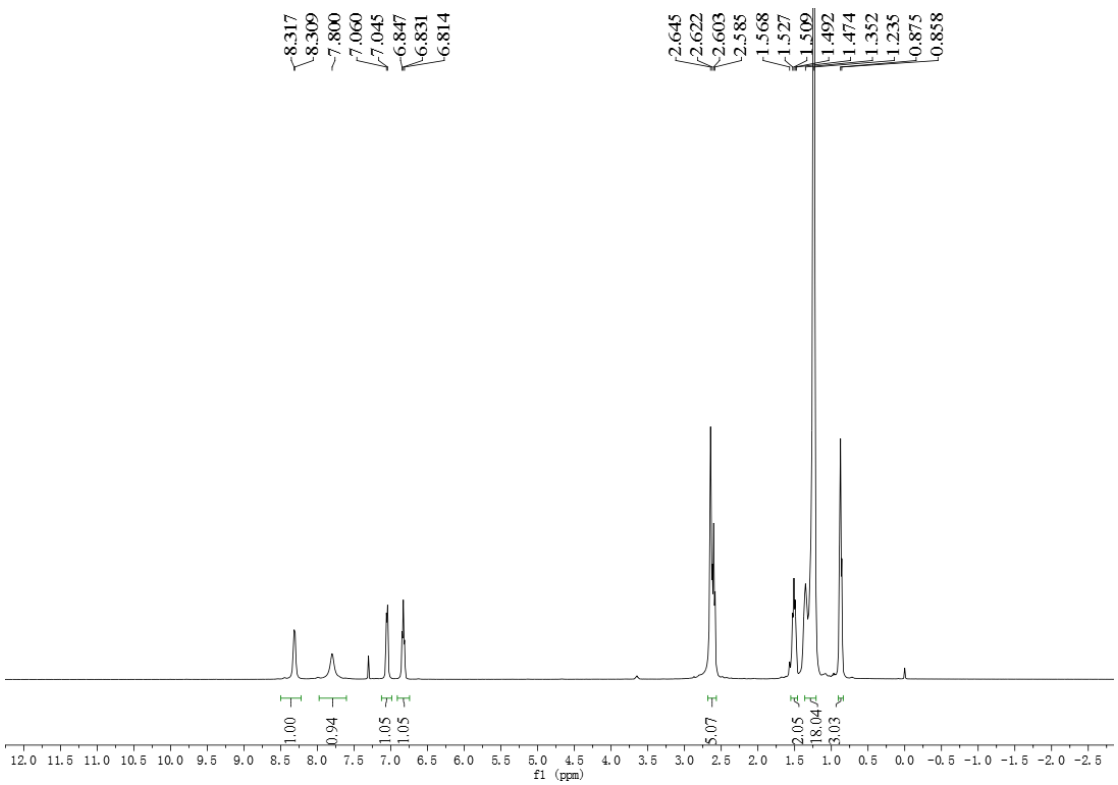


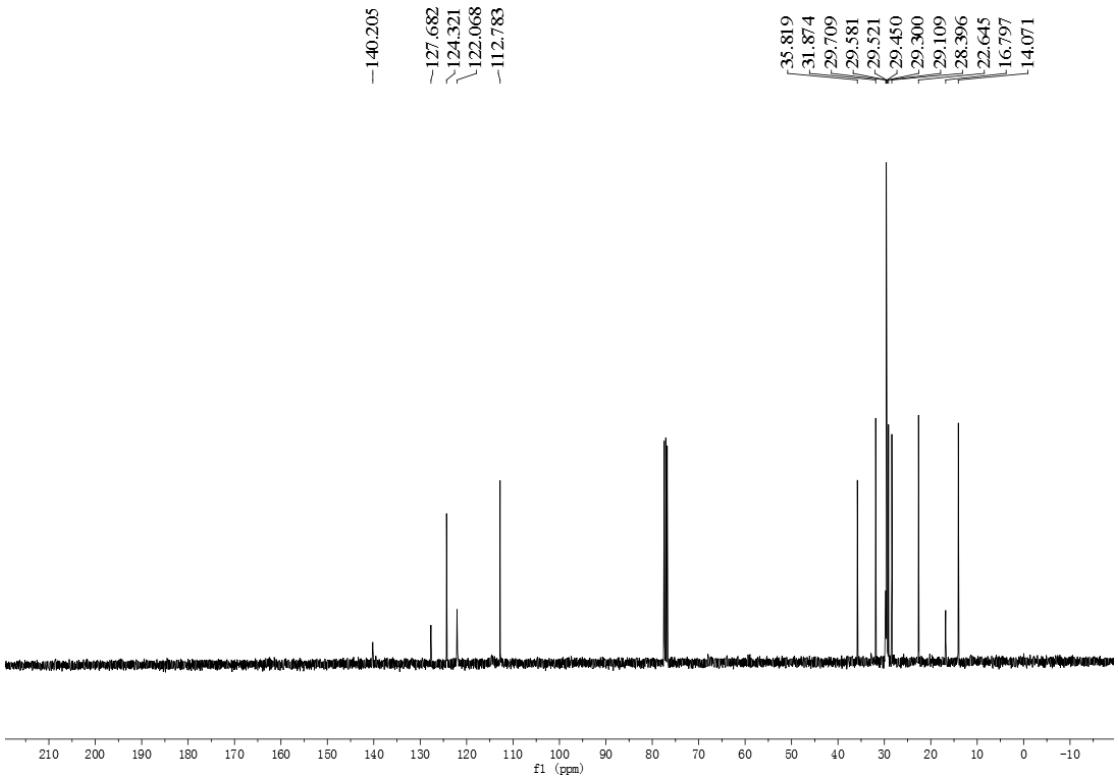


3-(benzylthio)-7-methylimidazo[1,2-a]pyridine(4cd)

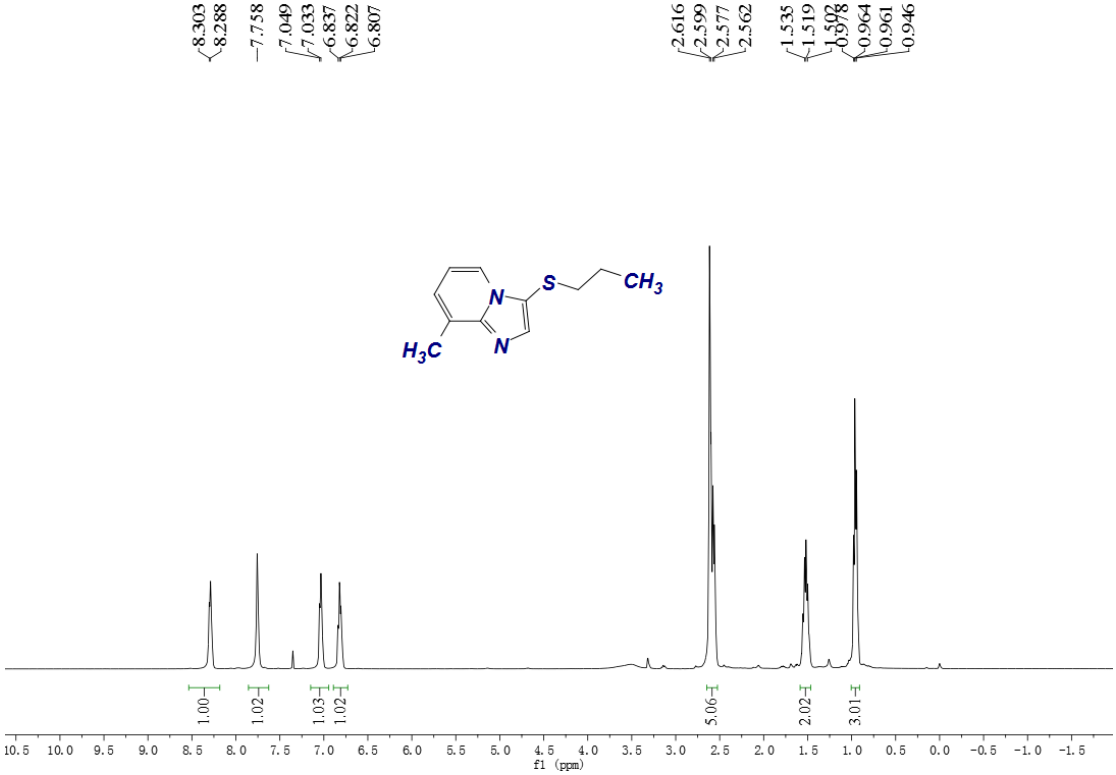


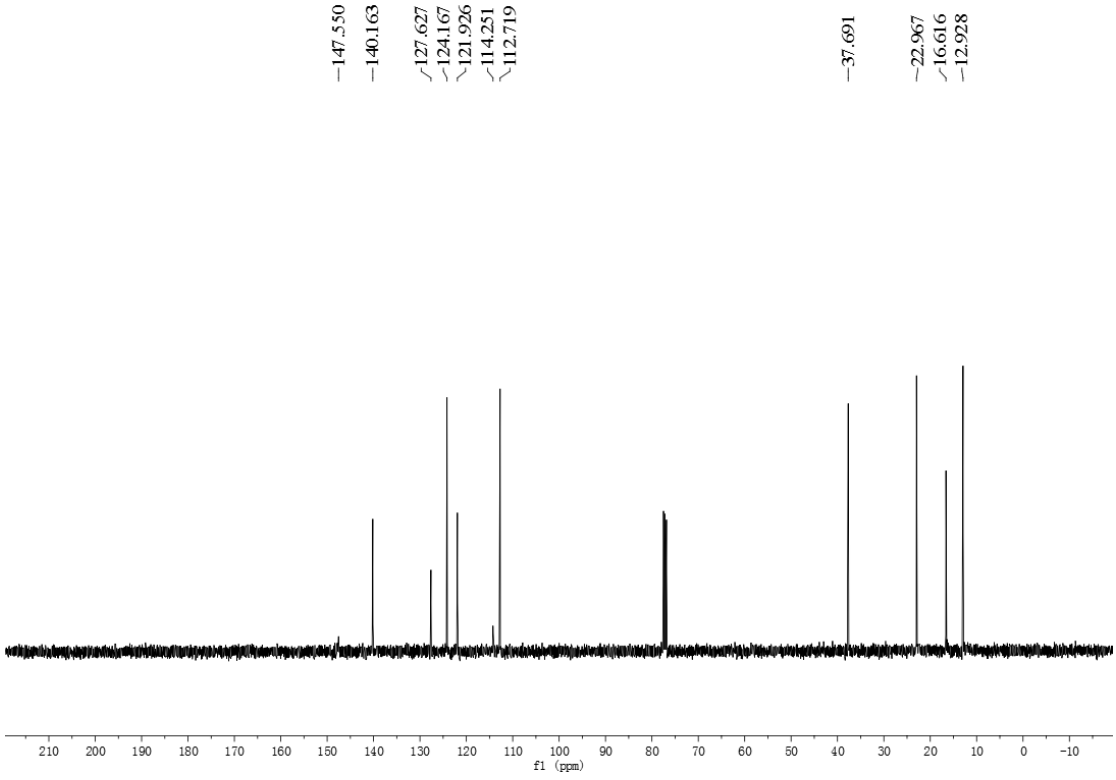
3-(dodecylthio)-8-methylimidazo[1,2-a]pyridine(4da)



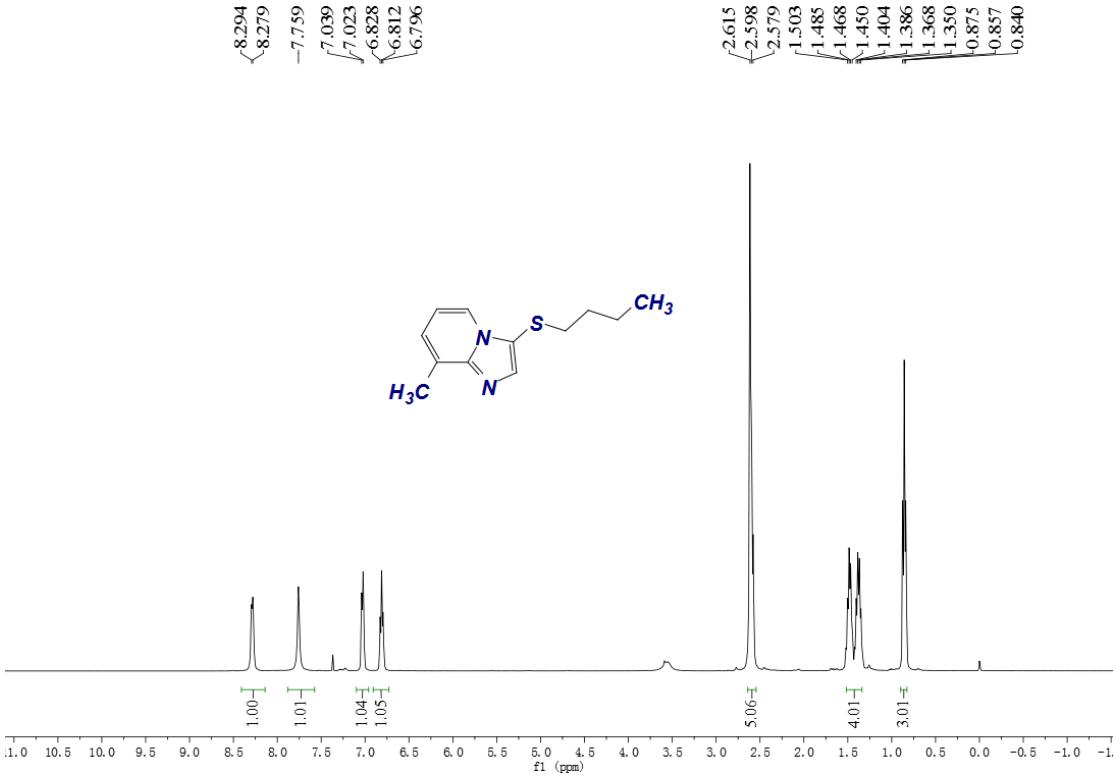


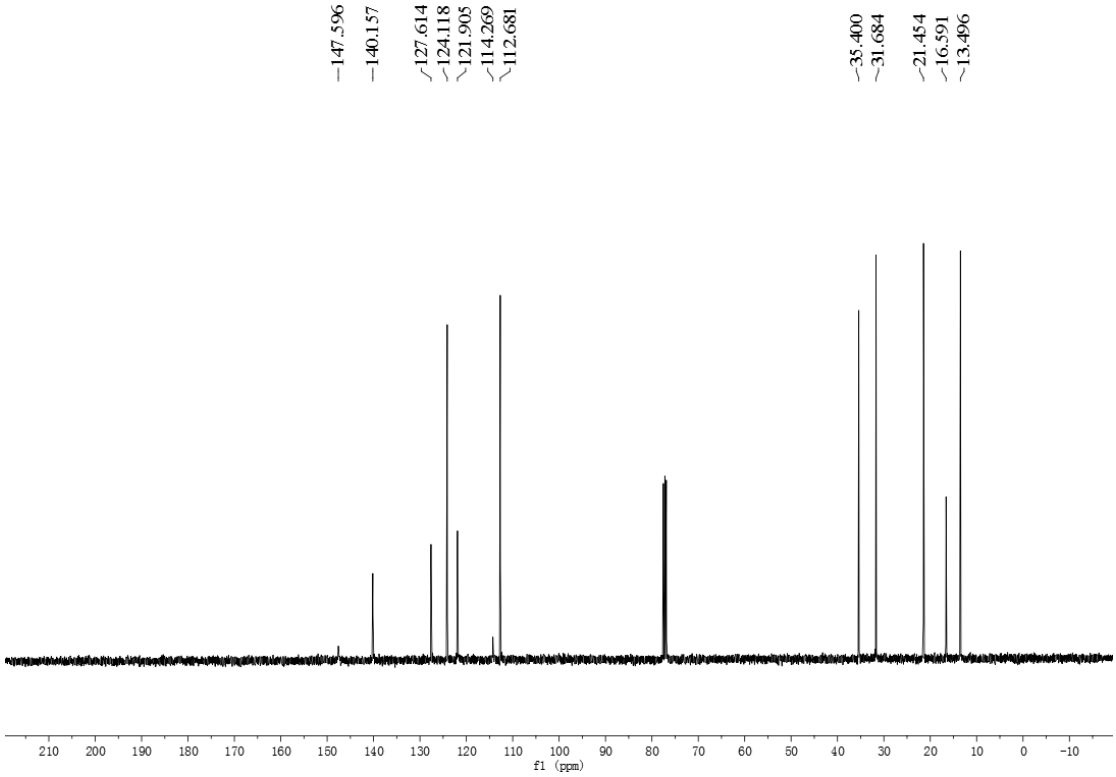
8-methyl-3-(propylthio)imidazo[1,2-a]pyridine(4db)



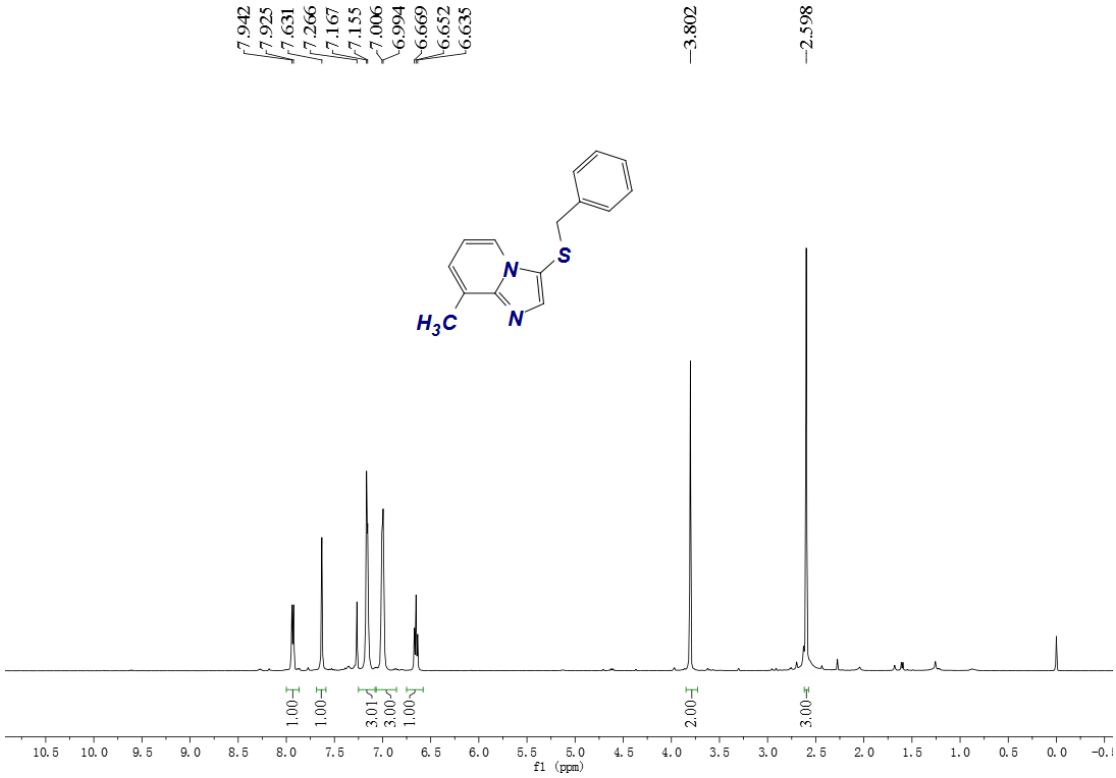


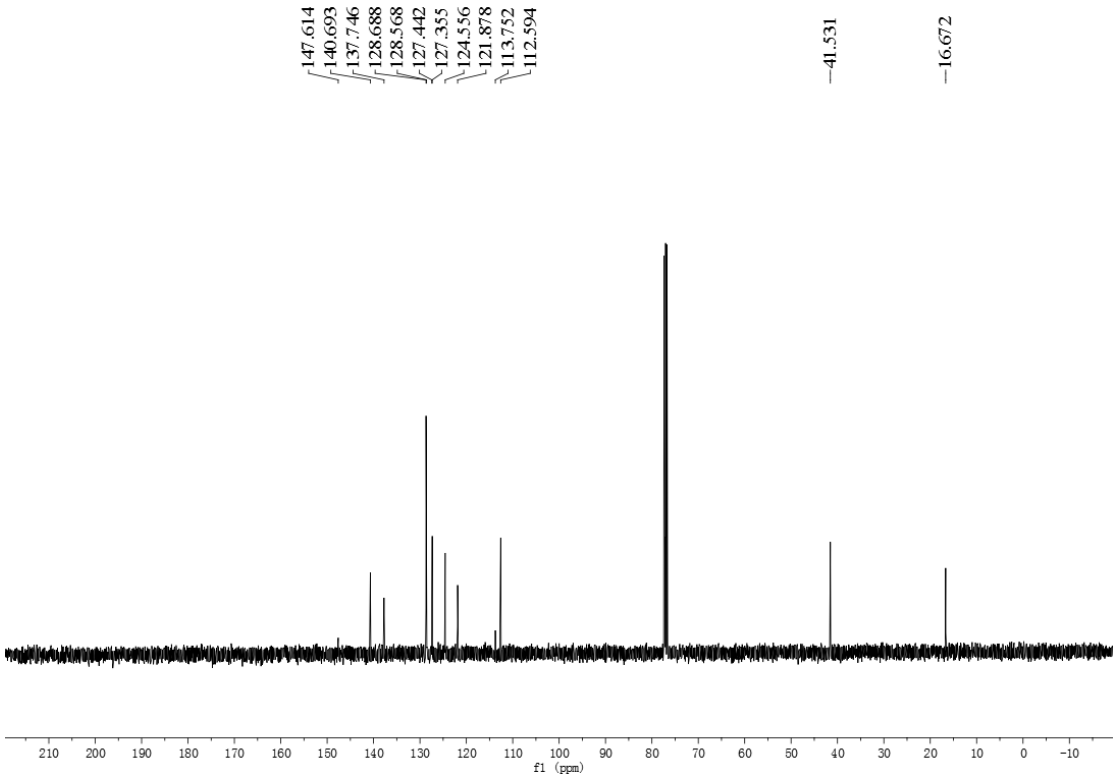
3-(butylthio)-8-methylimidazo[1,2-a]pyridine(4dc)



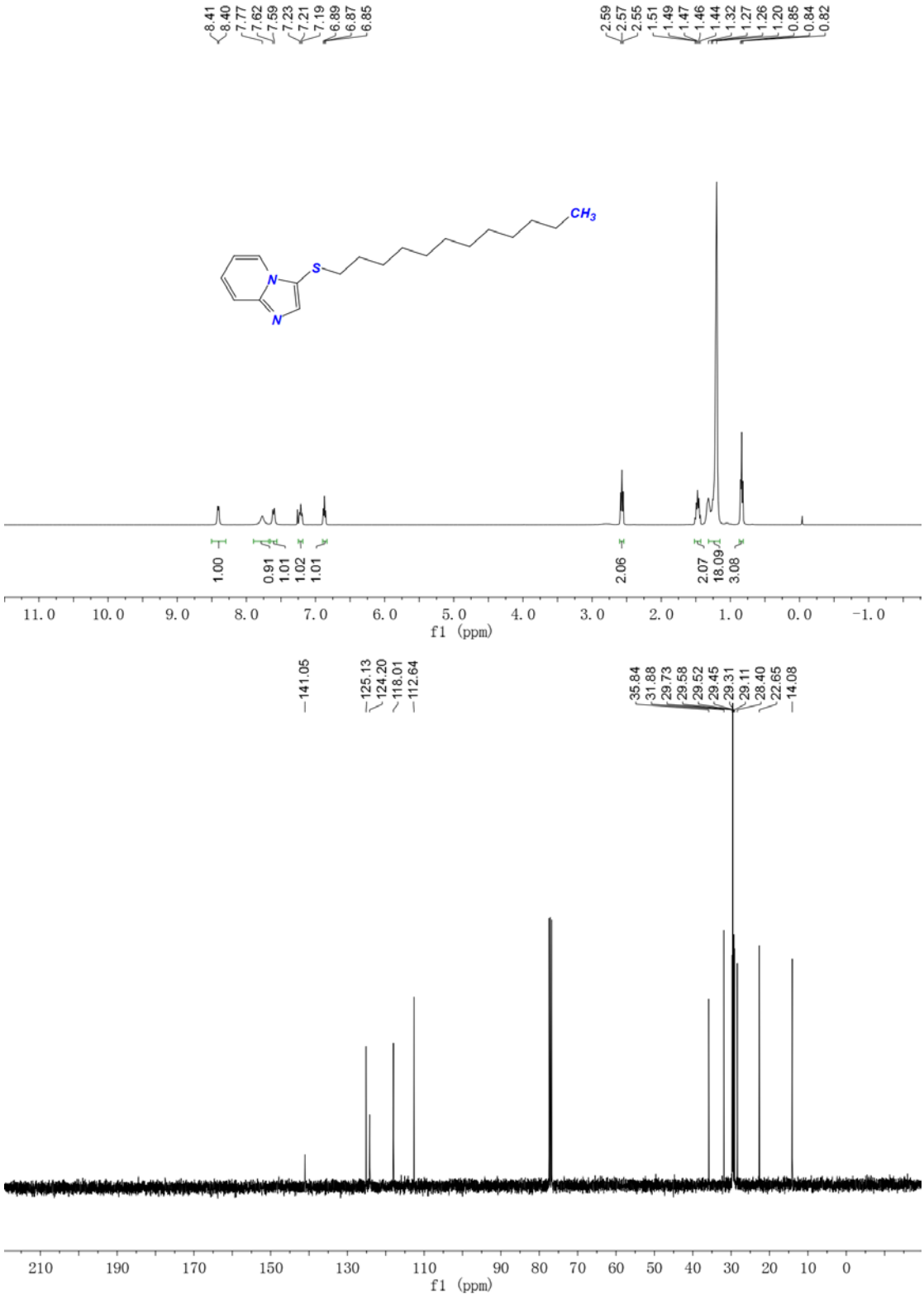


3-(benzylthio)-8-methylimidazo[1,2-a]pyridine(4dd)

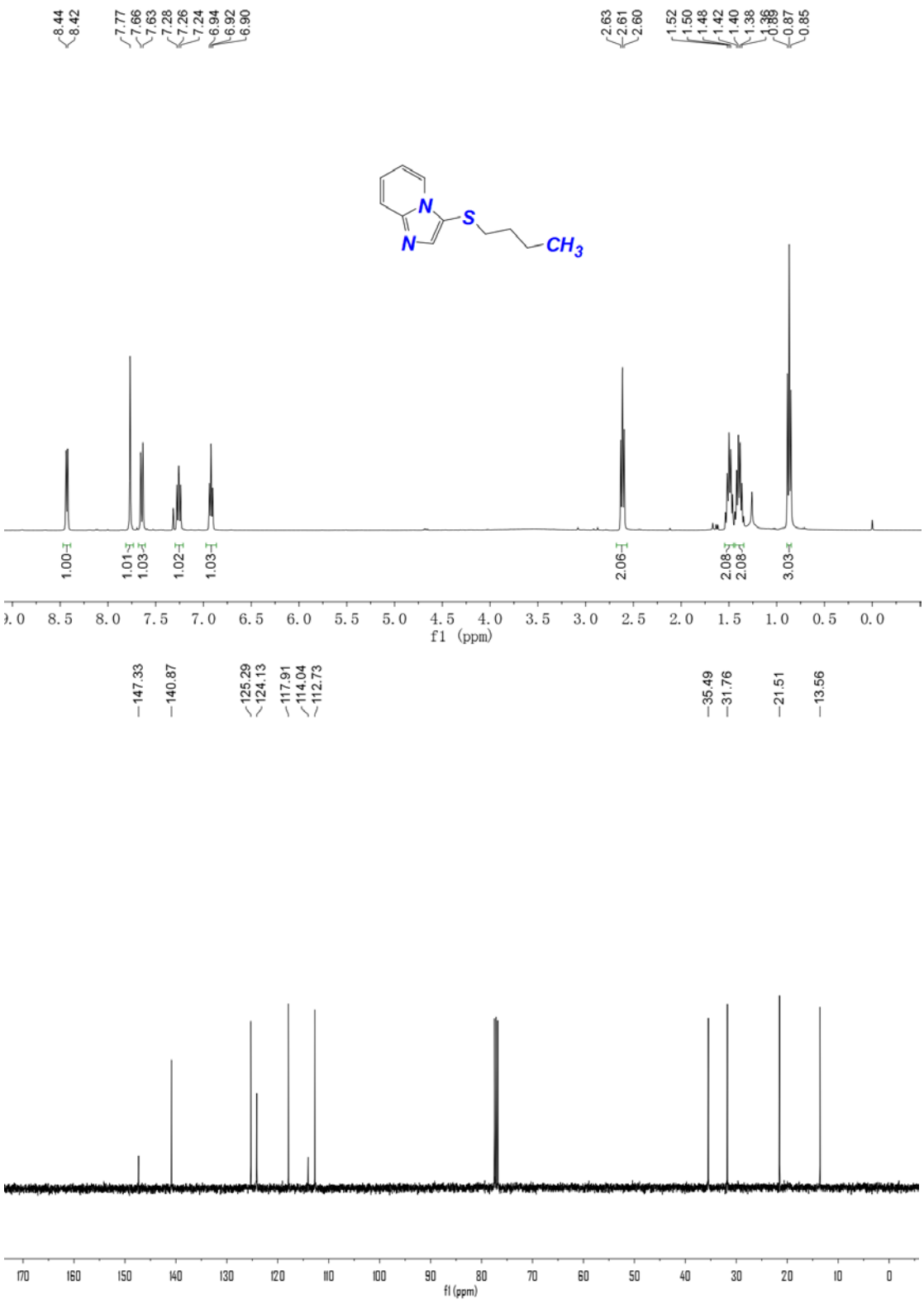




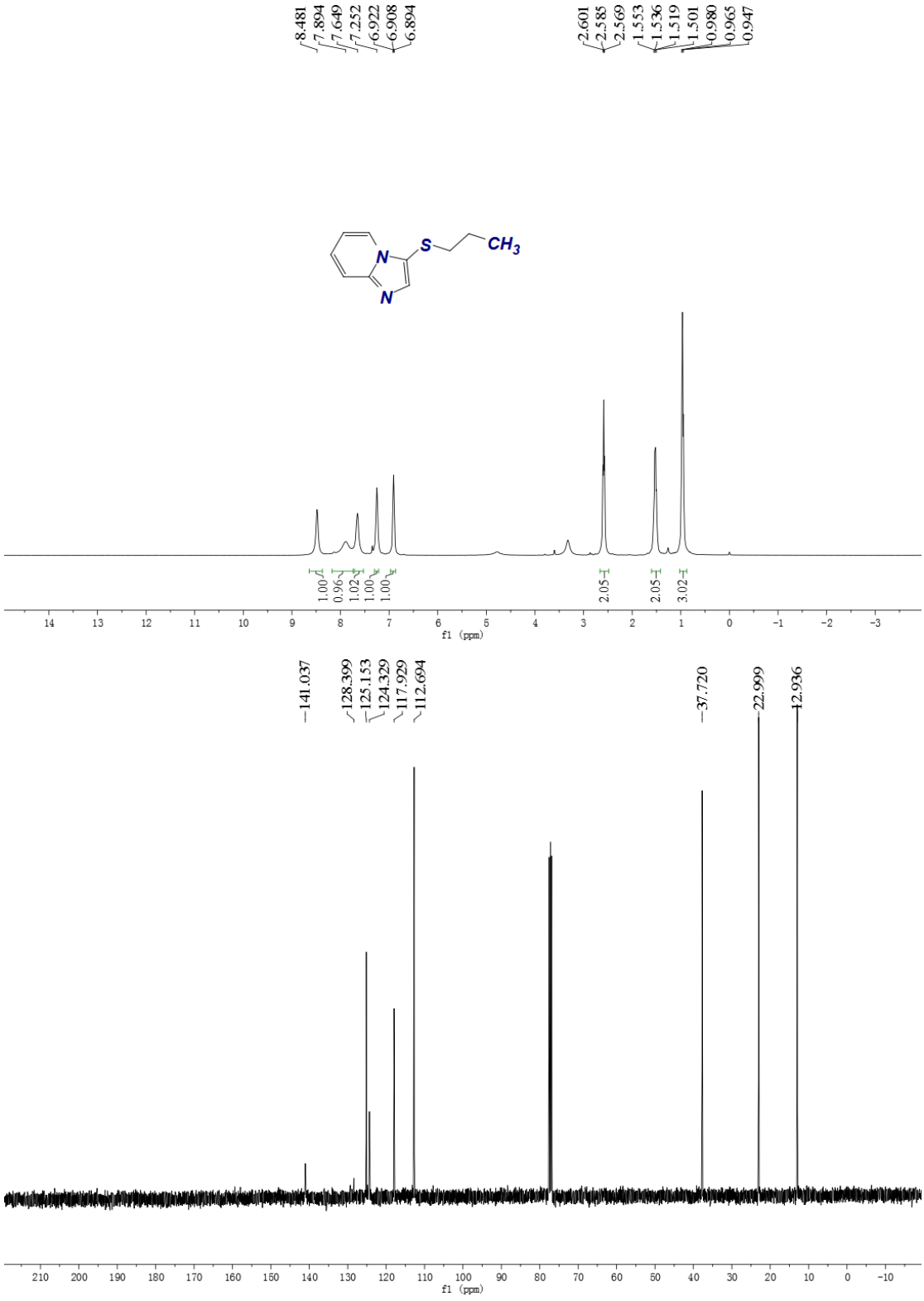
3-(dodecylthio)imidazo[1,2-a]pyridine(4ea)



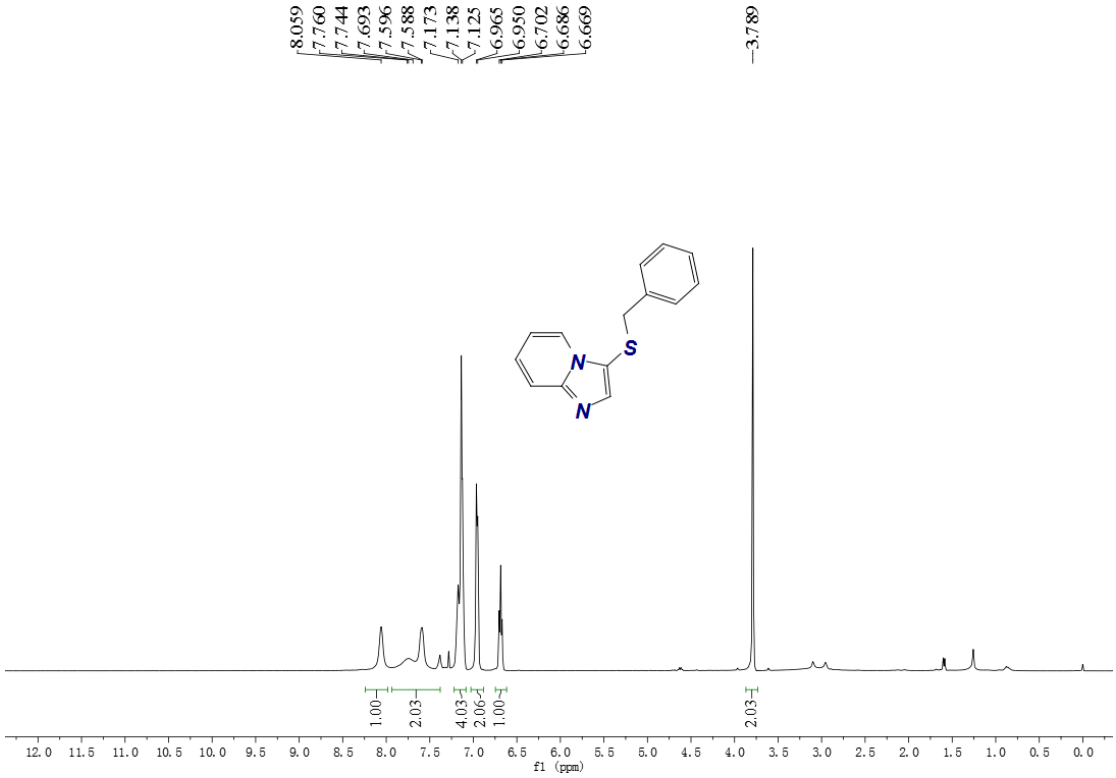
3-(butylthio)imidazo[1,2-a]pyridine(4eb)

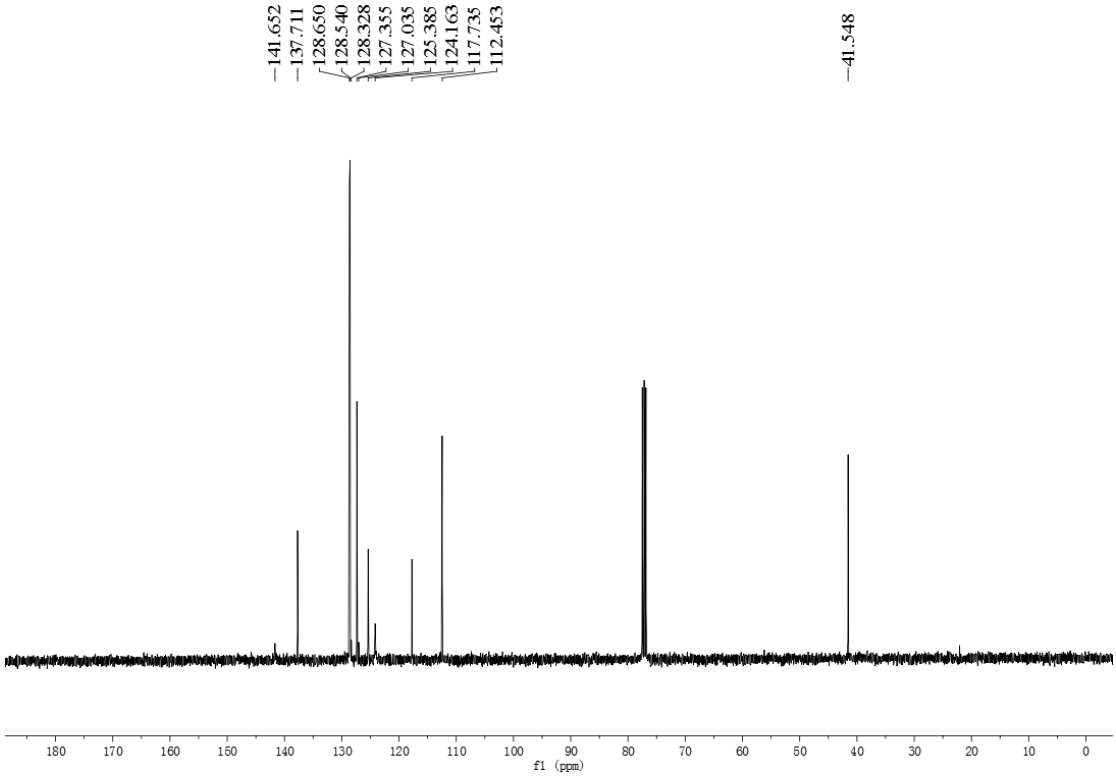


3-(propylthio)imidazo[1,2-a]pyridine(4ec)

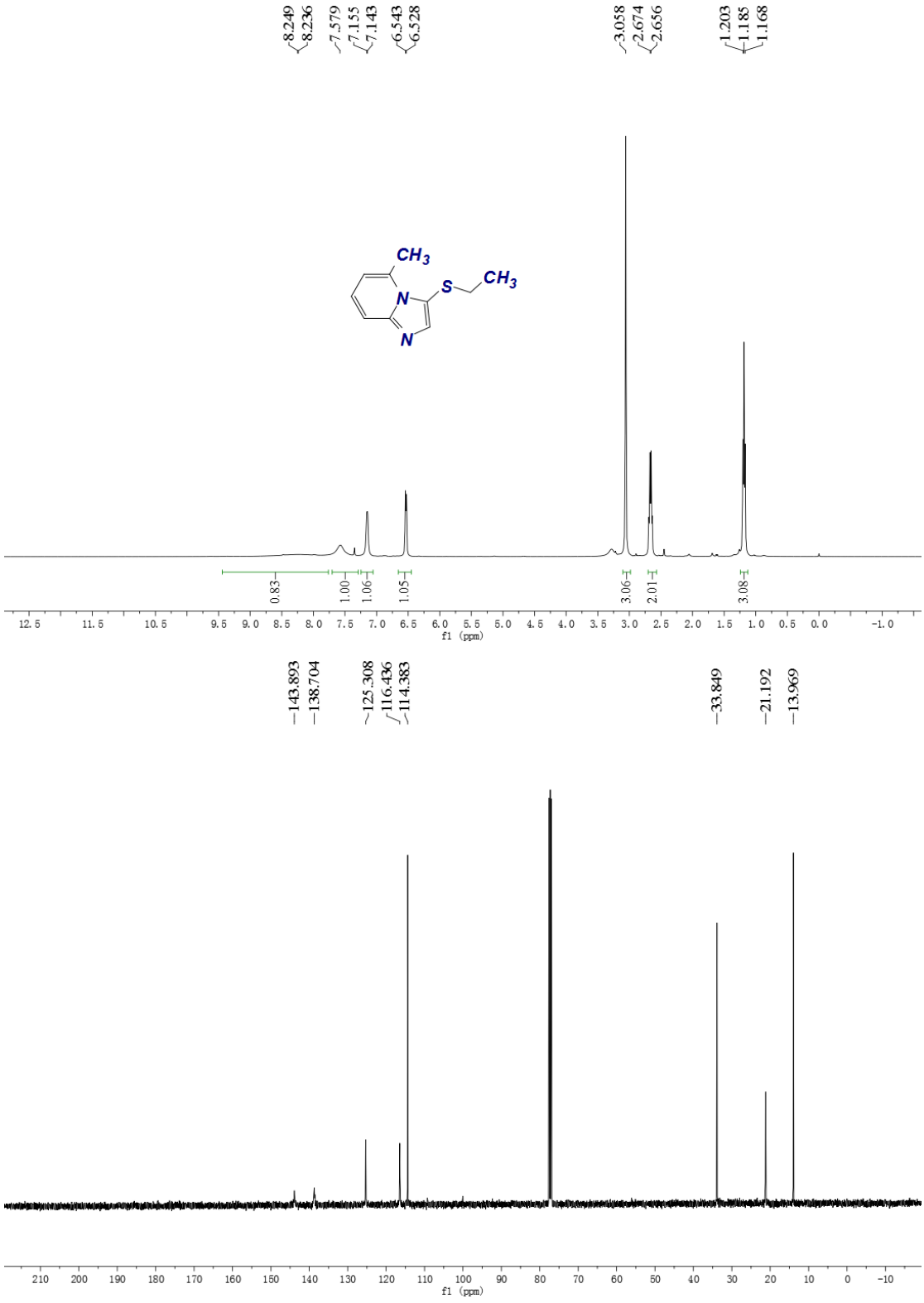


3-(benzylthio)imidazo[1,2-a]pyridine(4ed)

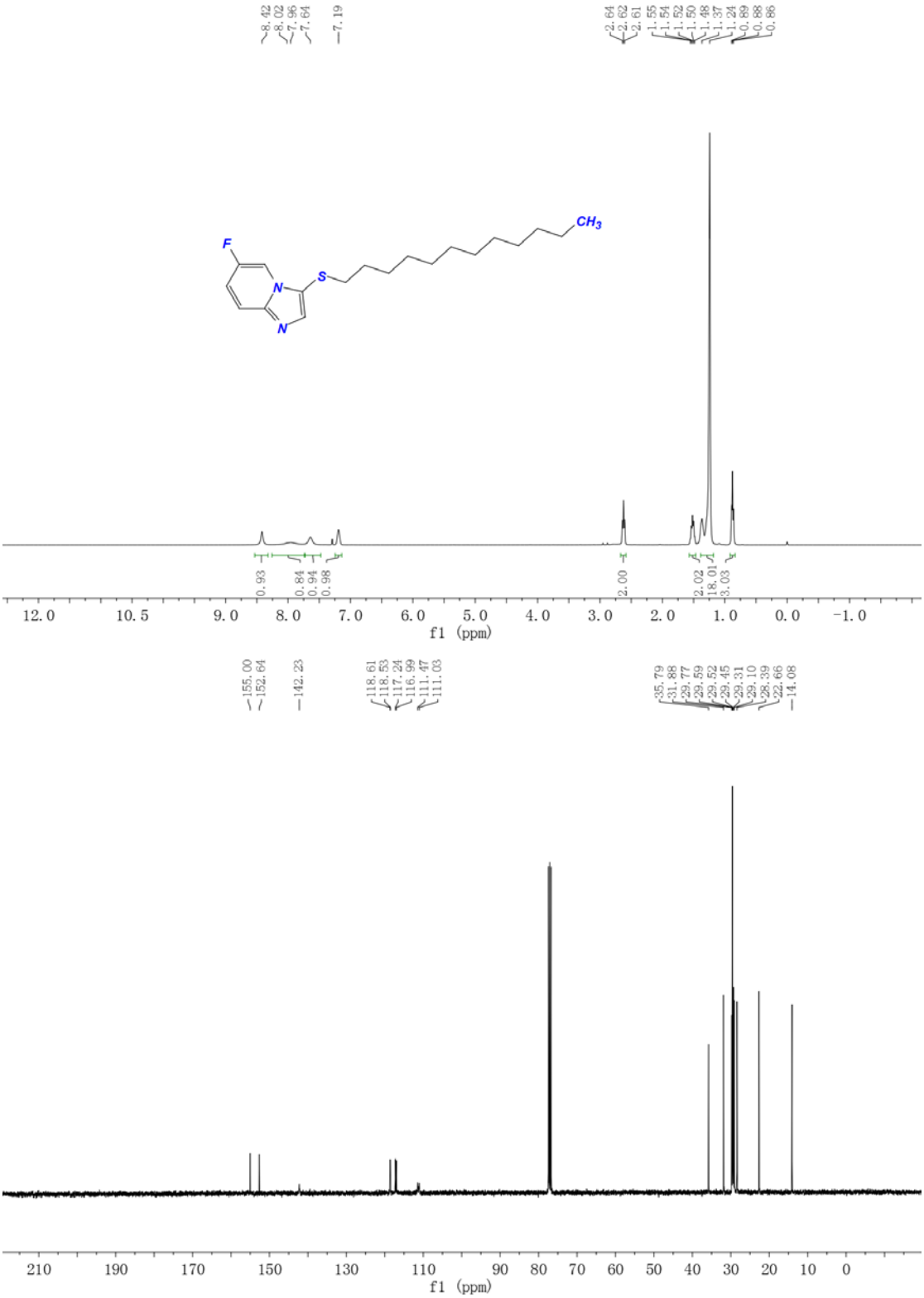




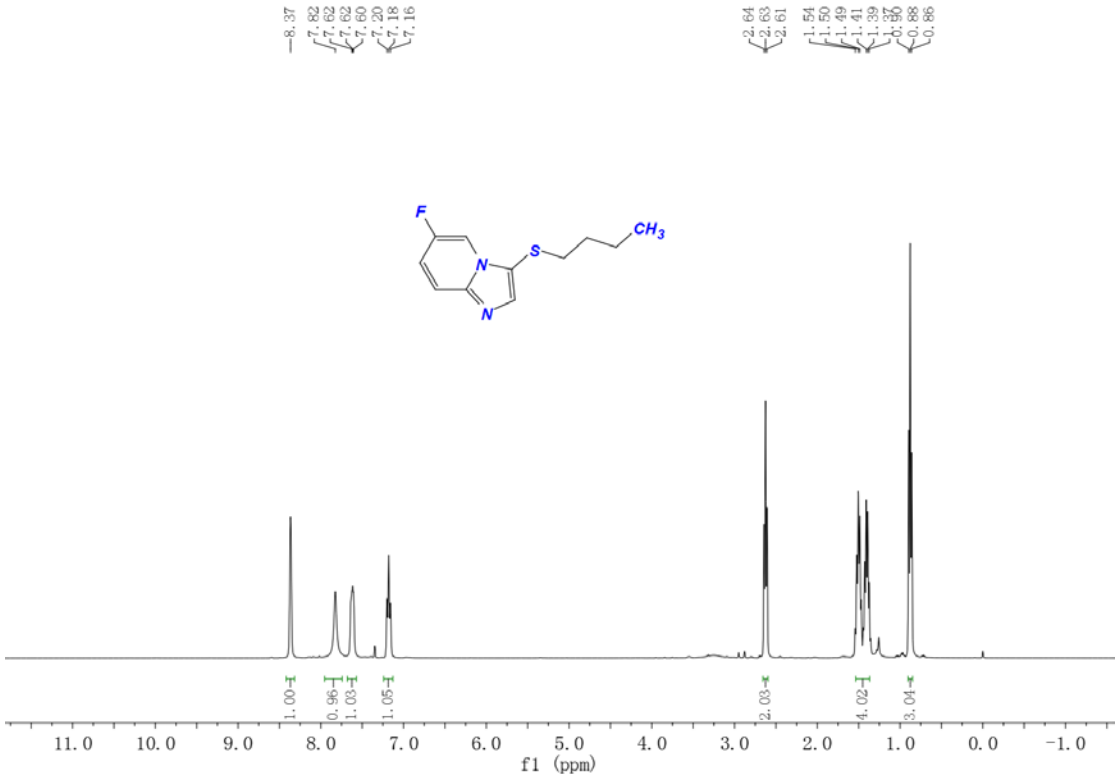
3-(ethylthio)-5-methylimidazo[1,2-a]pyridine(4ee)

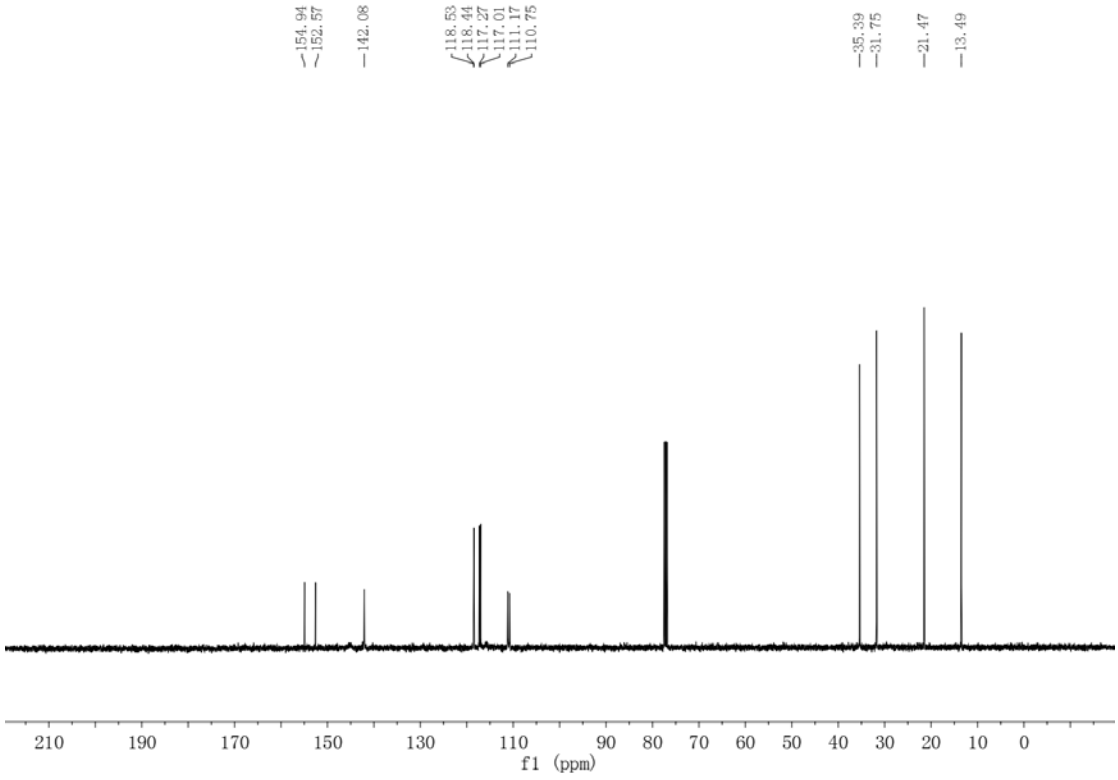


3-(dodecylthio)-6-fluoroimidazo[1,2-a]pyridine(4fa)

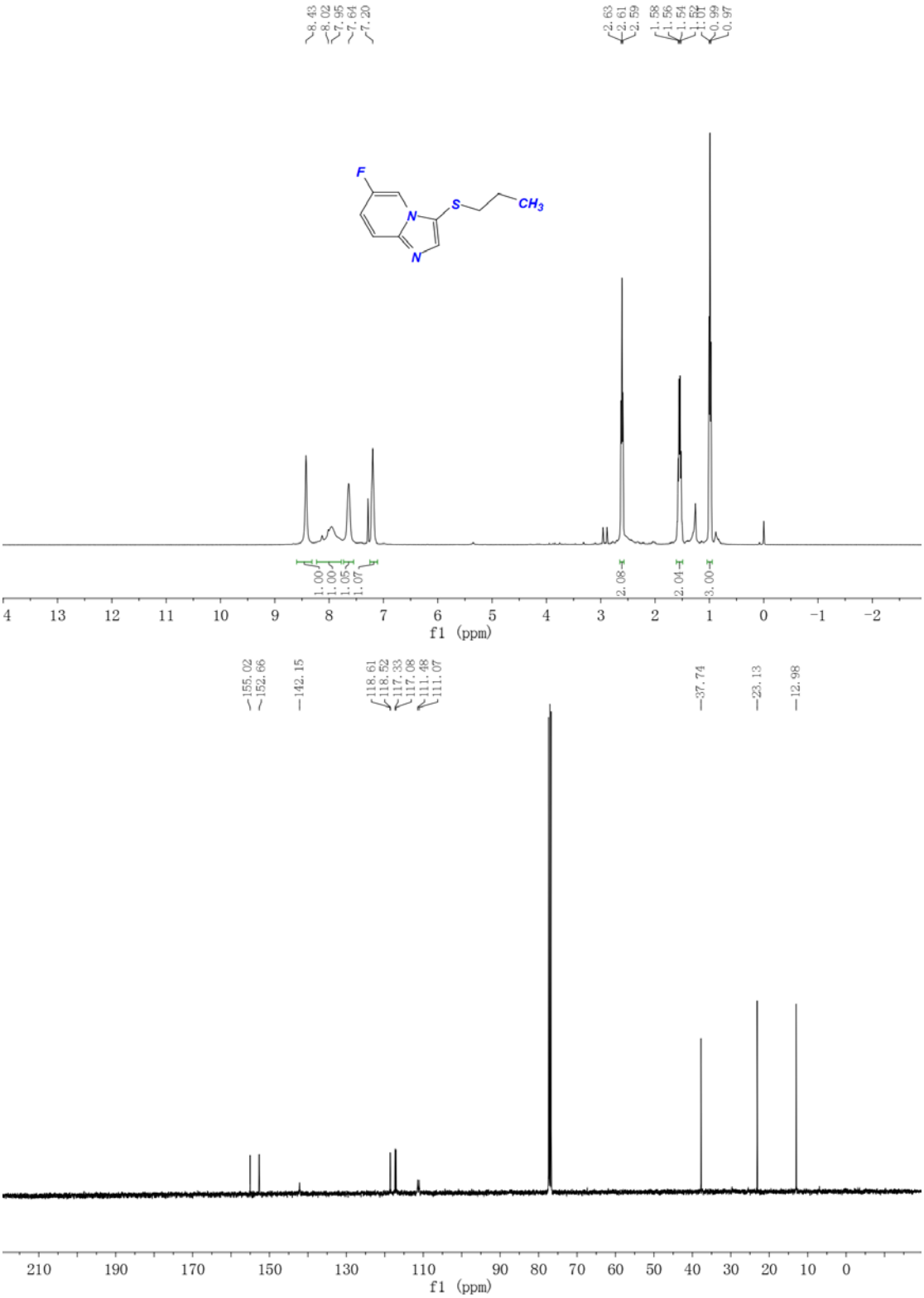


3-(butylthio)-6-fluoroimidazo[1,2-a]pyridine(4fb)

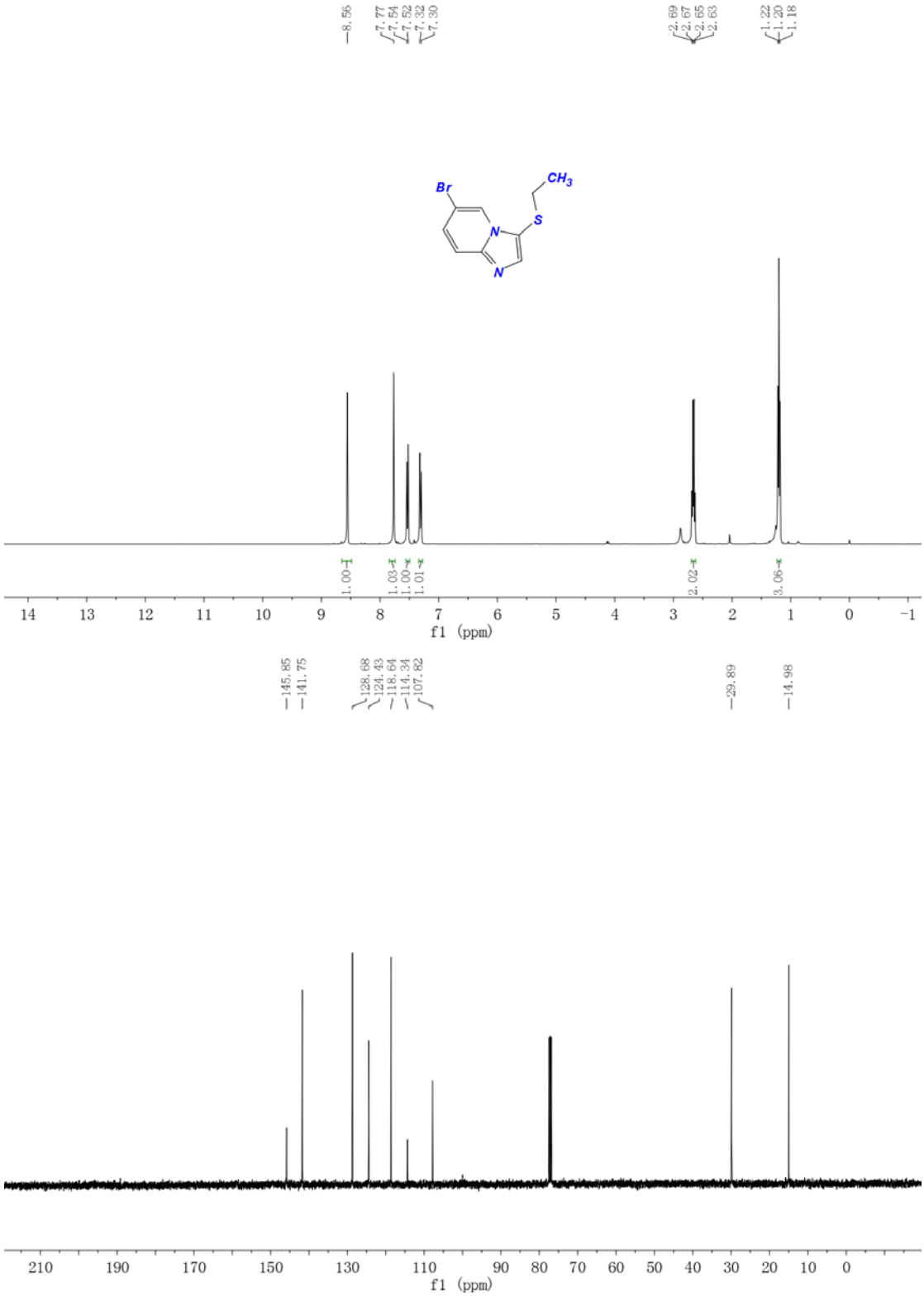




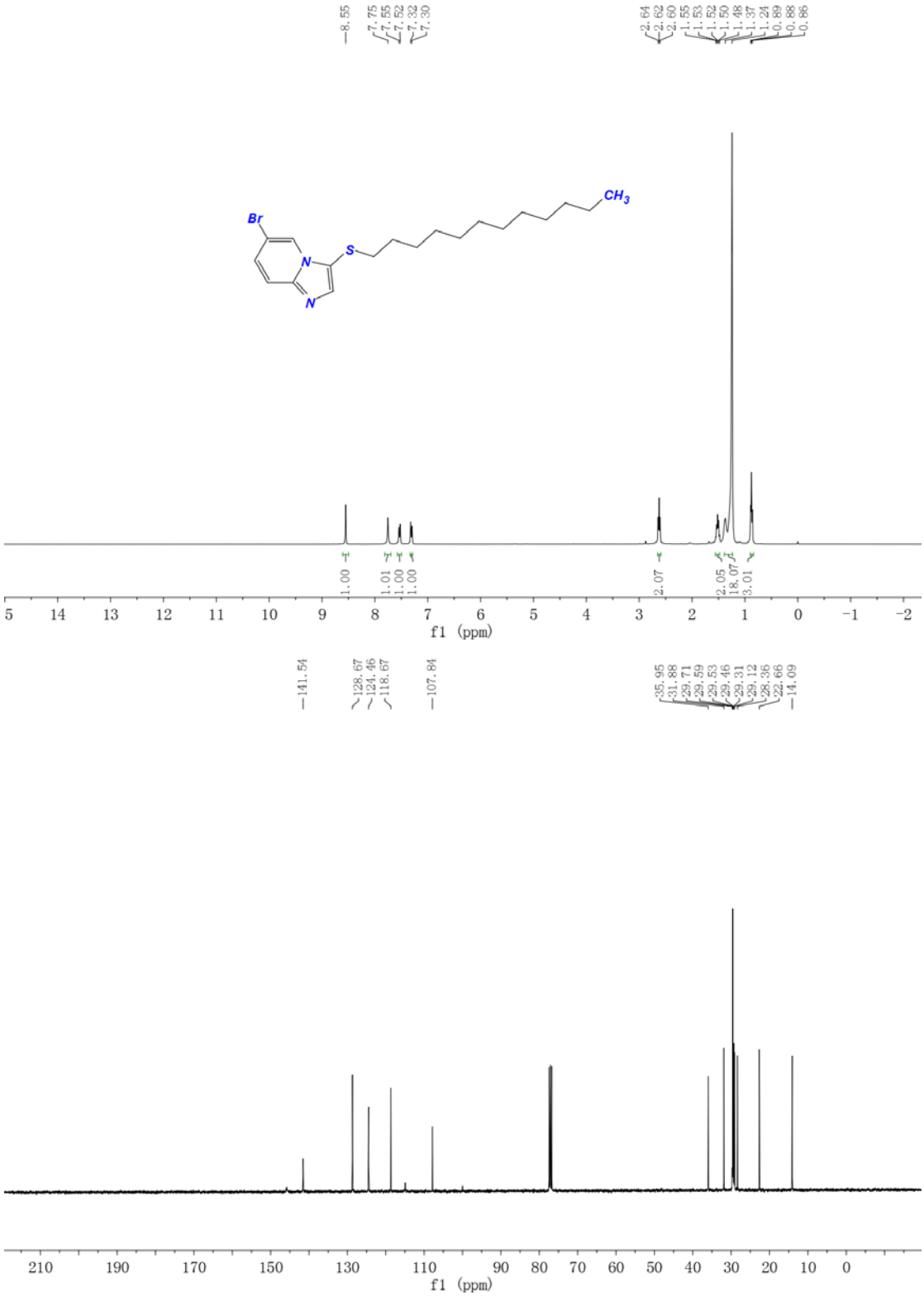
6-fluoro-3-(propylthio)imidazo[1,2-a]pyridine(4fc)



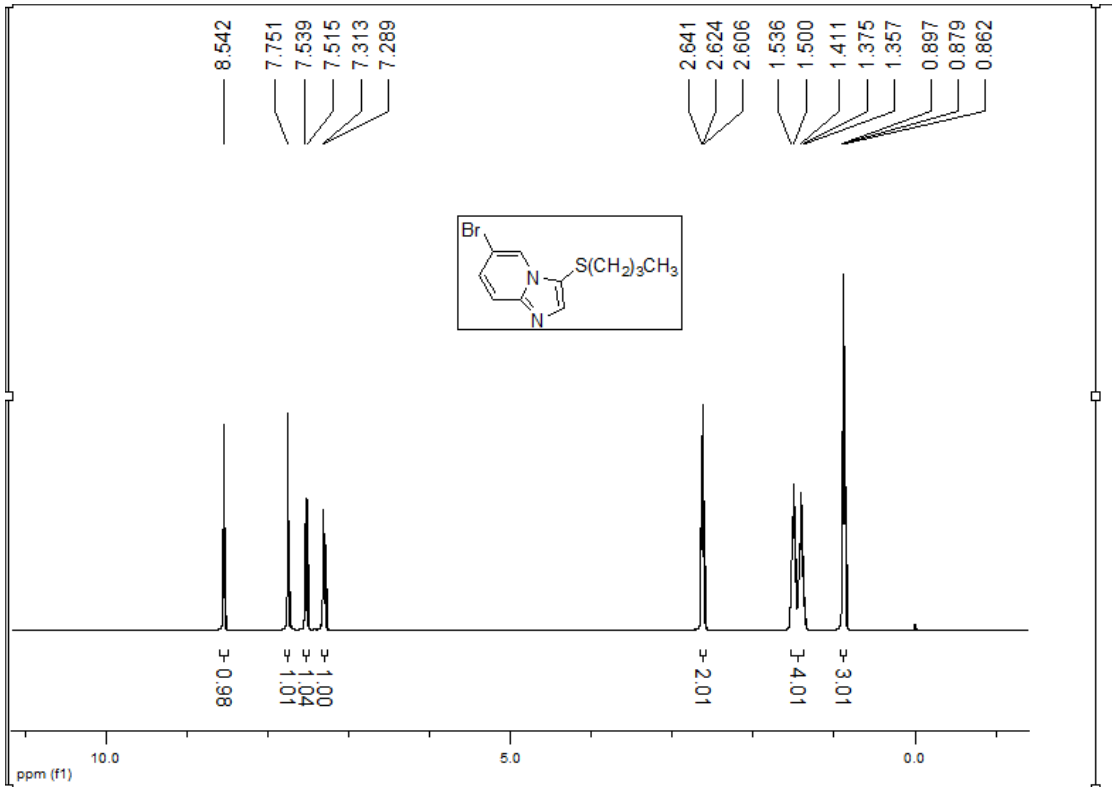
6-bromo-3-(ethylthio)imidazo[1,2-a]pyridine(4ga)

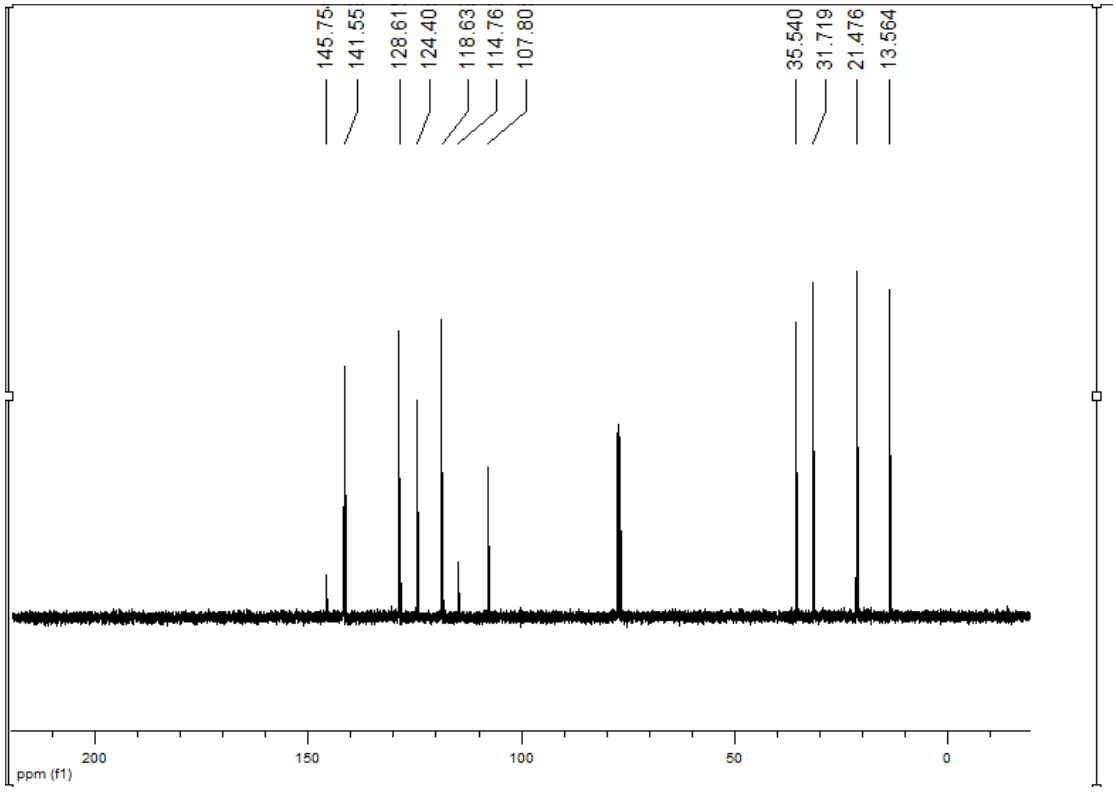


6-bromo-3-(dodecylthio)imidazo[1,2-a]pyridine(4gb)

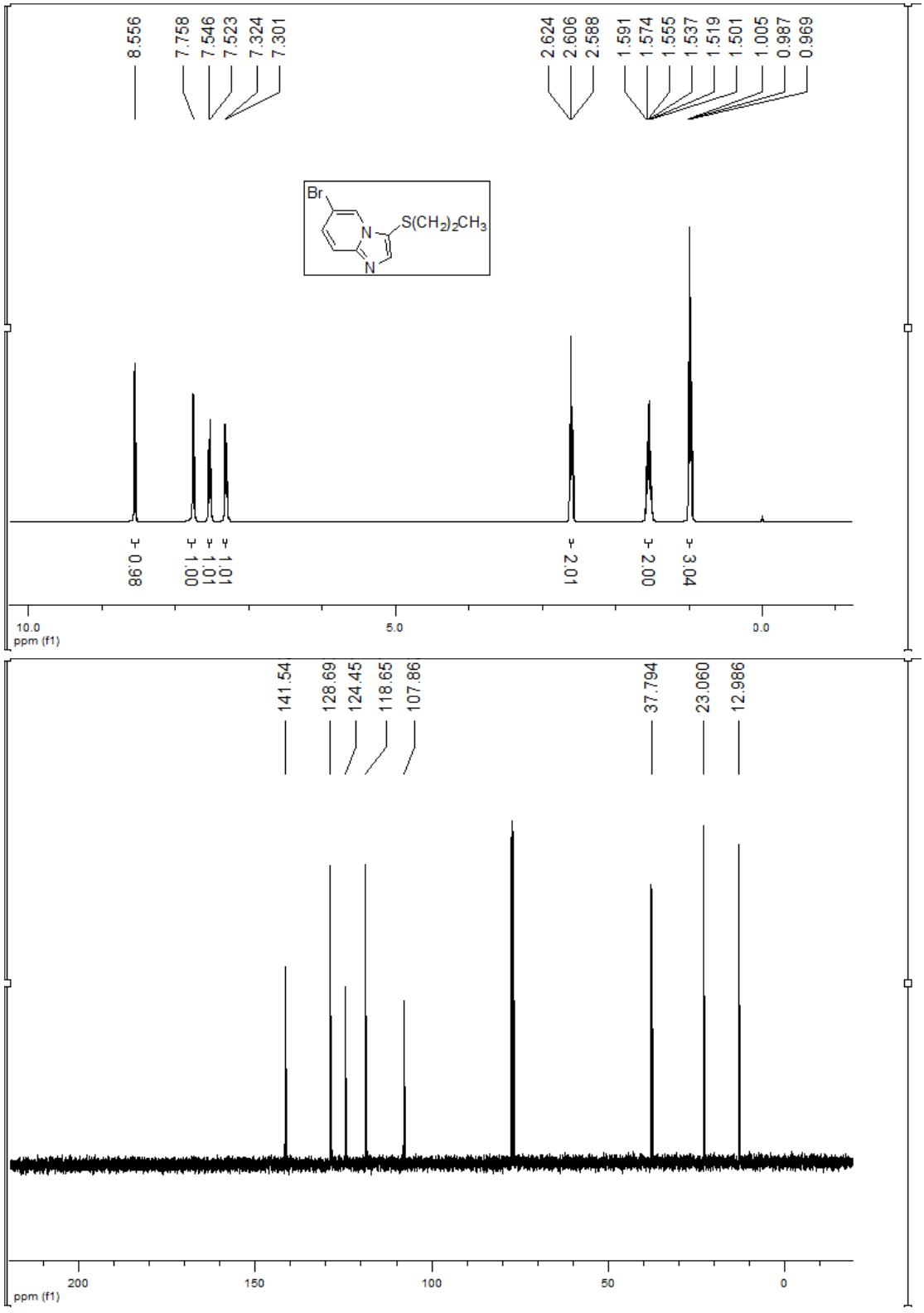


6-bromo-3-(butylthio)imidazo[1,2-a]pyridine(4gc)

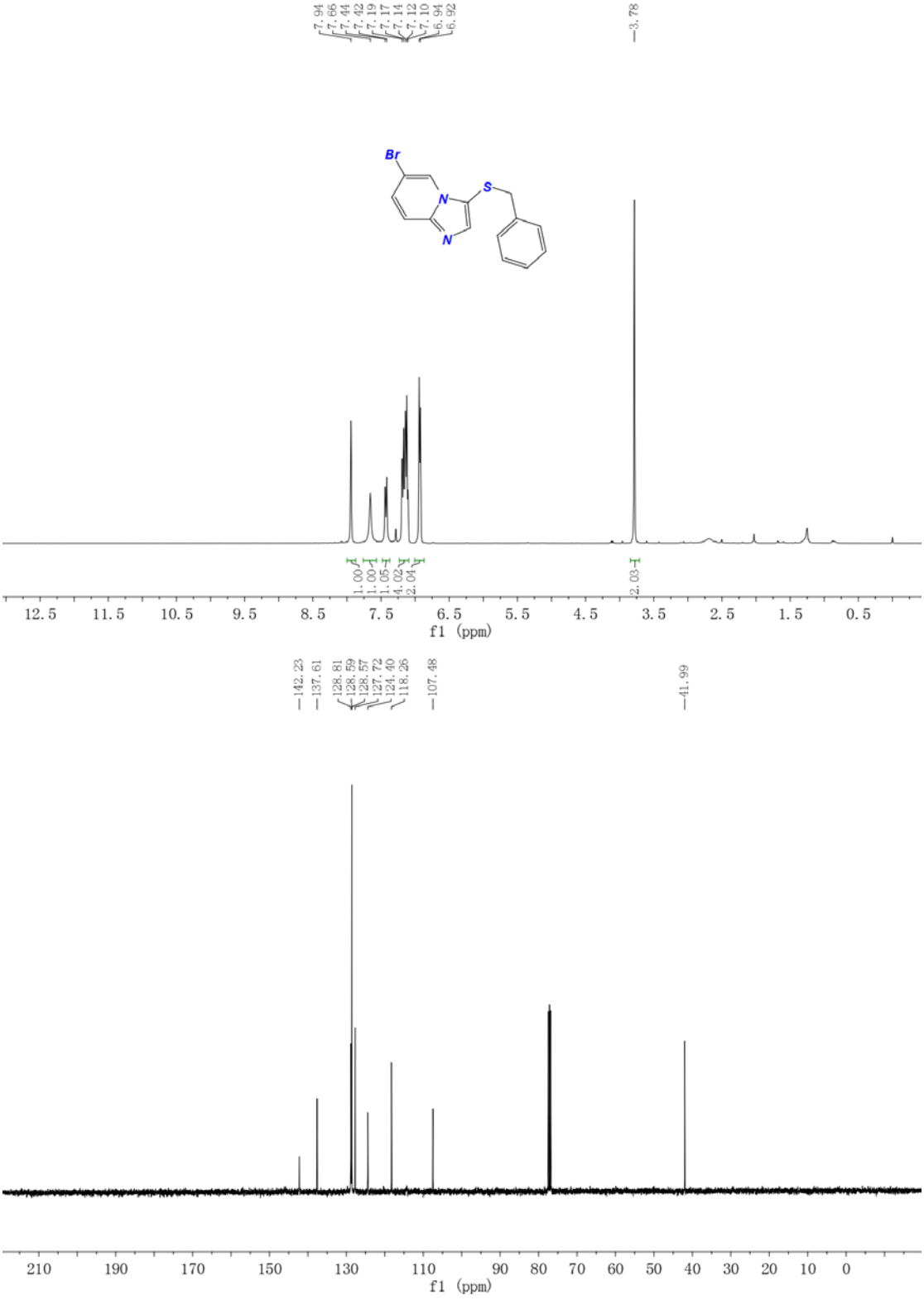




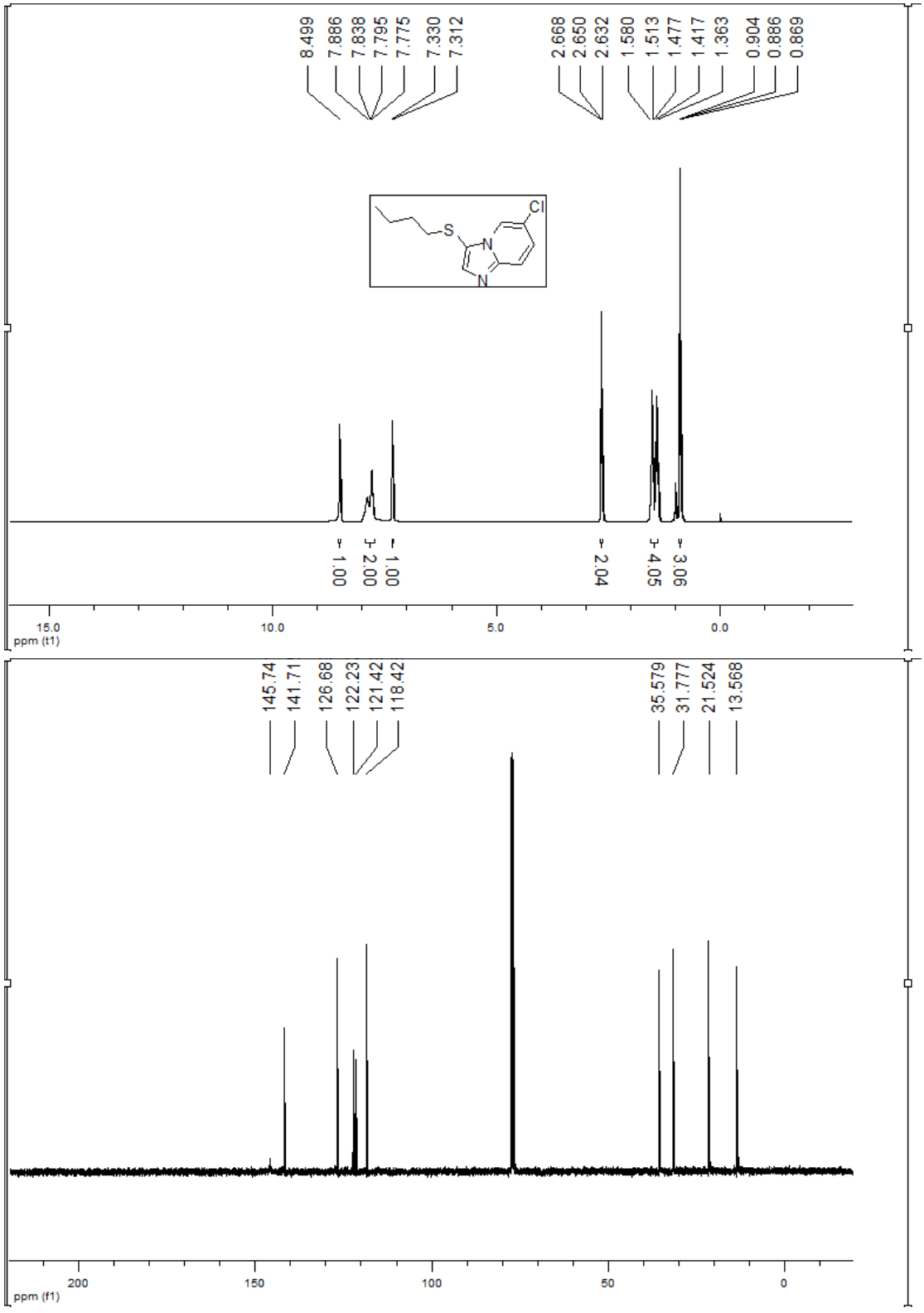
6-bromo-3-(propylthio)imidazo[1,2-a]pyridine(4gd)



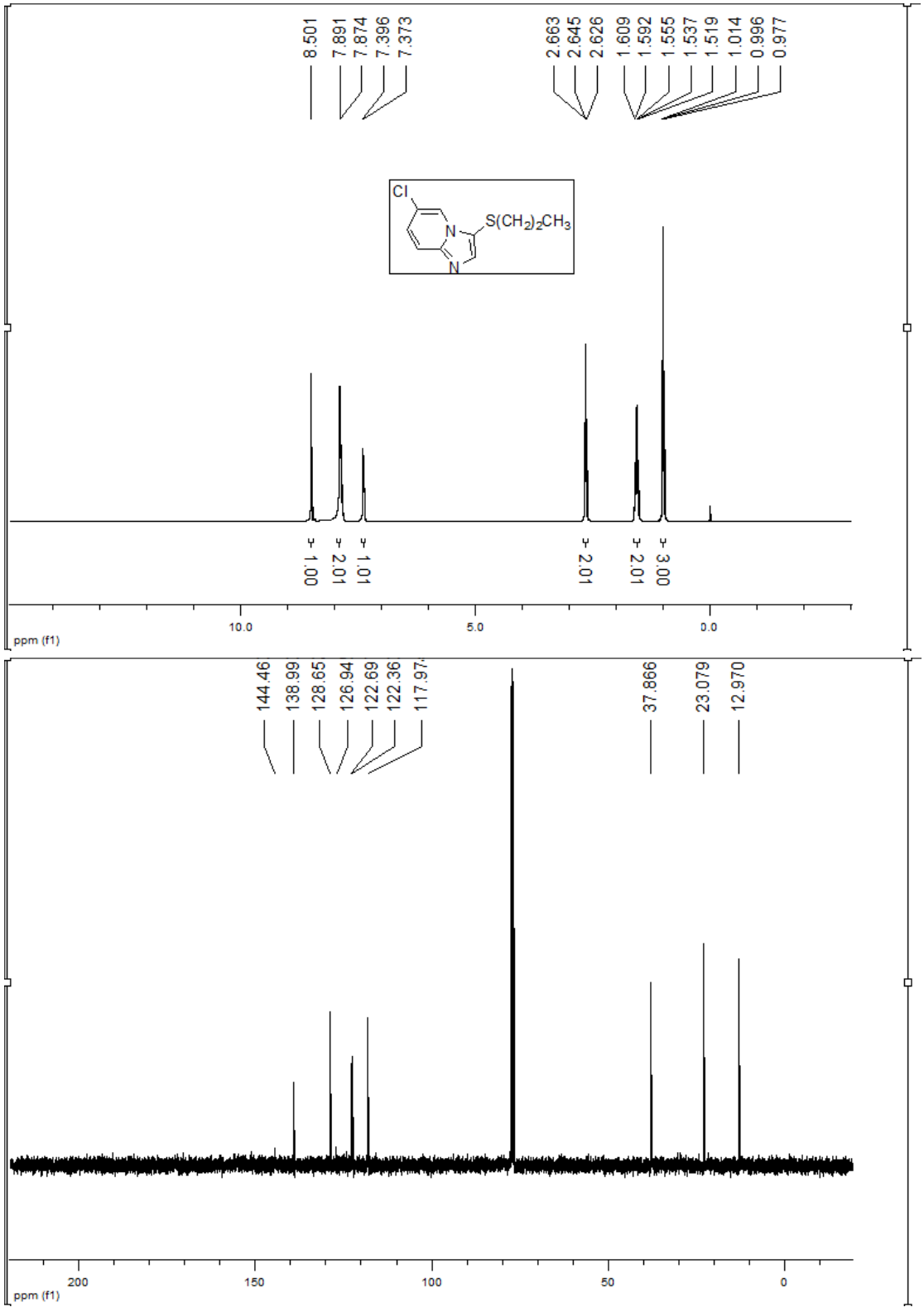
3-(benzylthio)-6-bromoimidazo[1,2-a]pyridine(4ge)



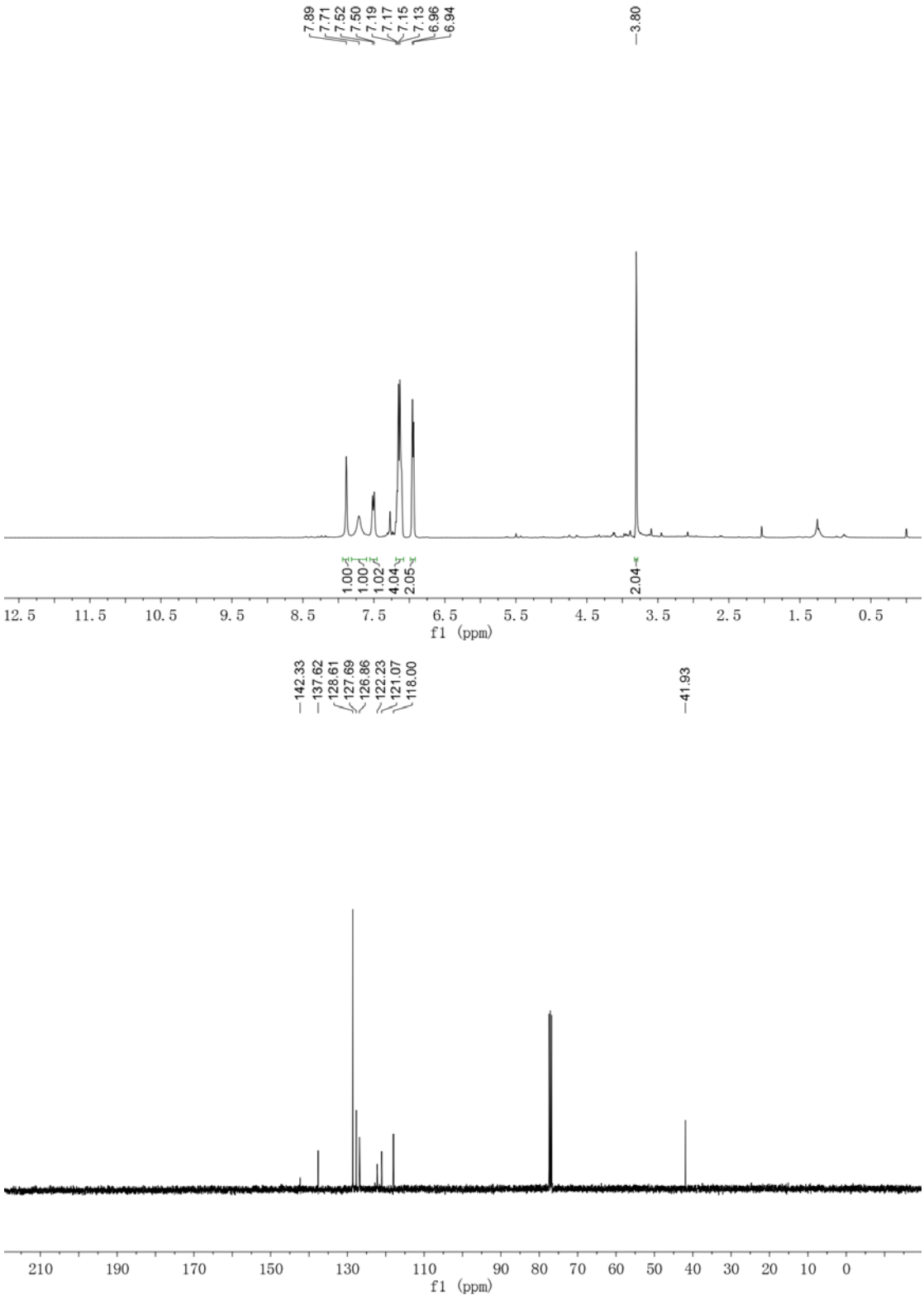
3-(butylthio)-6-chloroimidazo[1,2-a]pyridine(4ha)



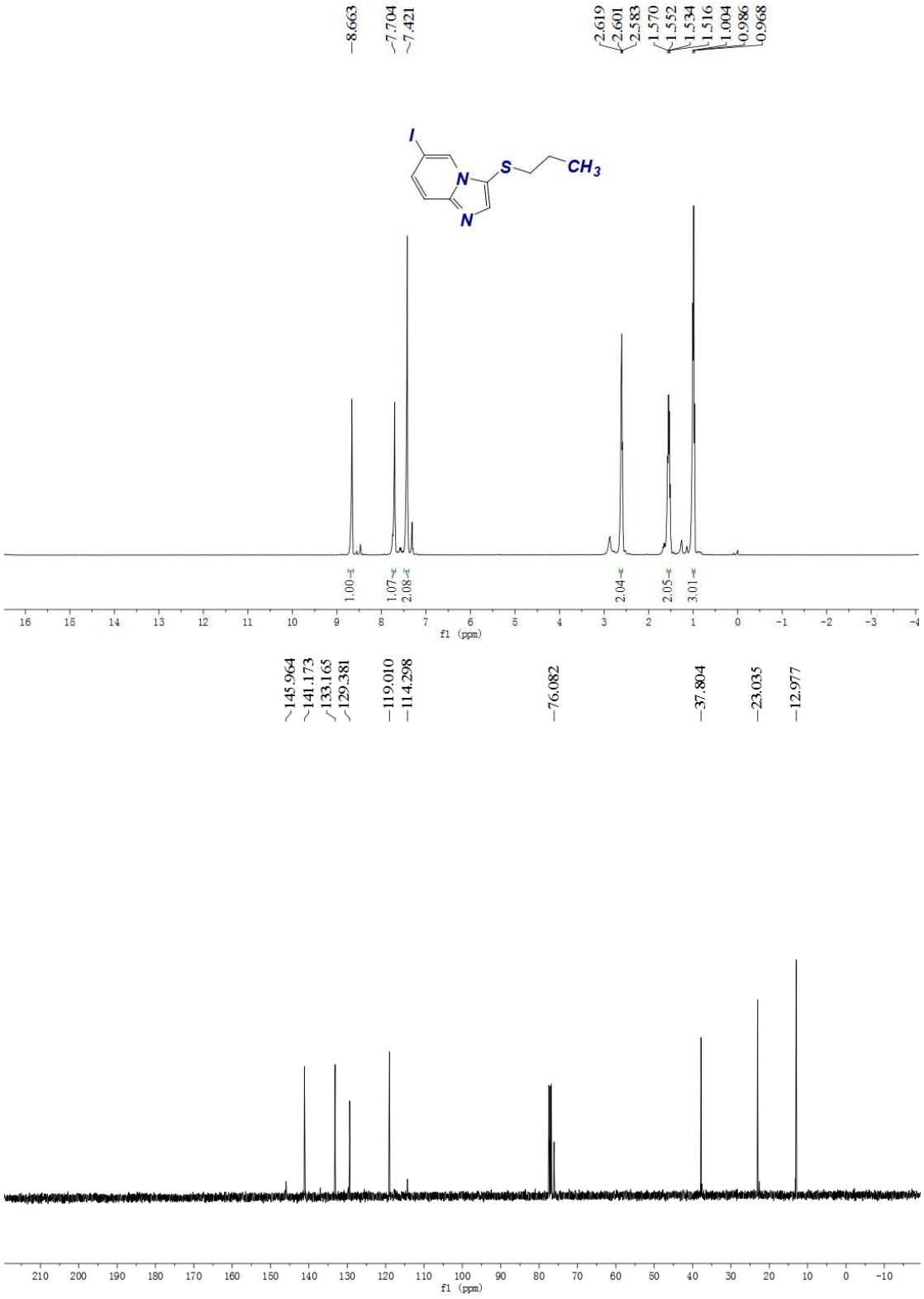
6-chloro-3-(propylthio)imidazo[1,2-a]pyridine(4hb)



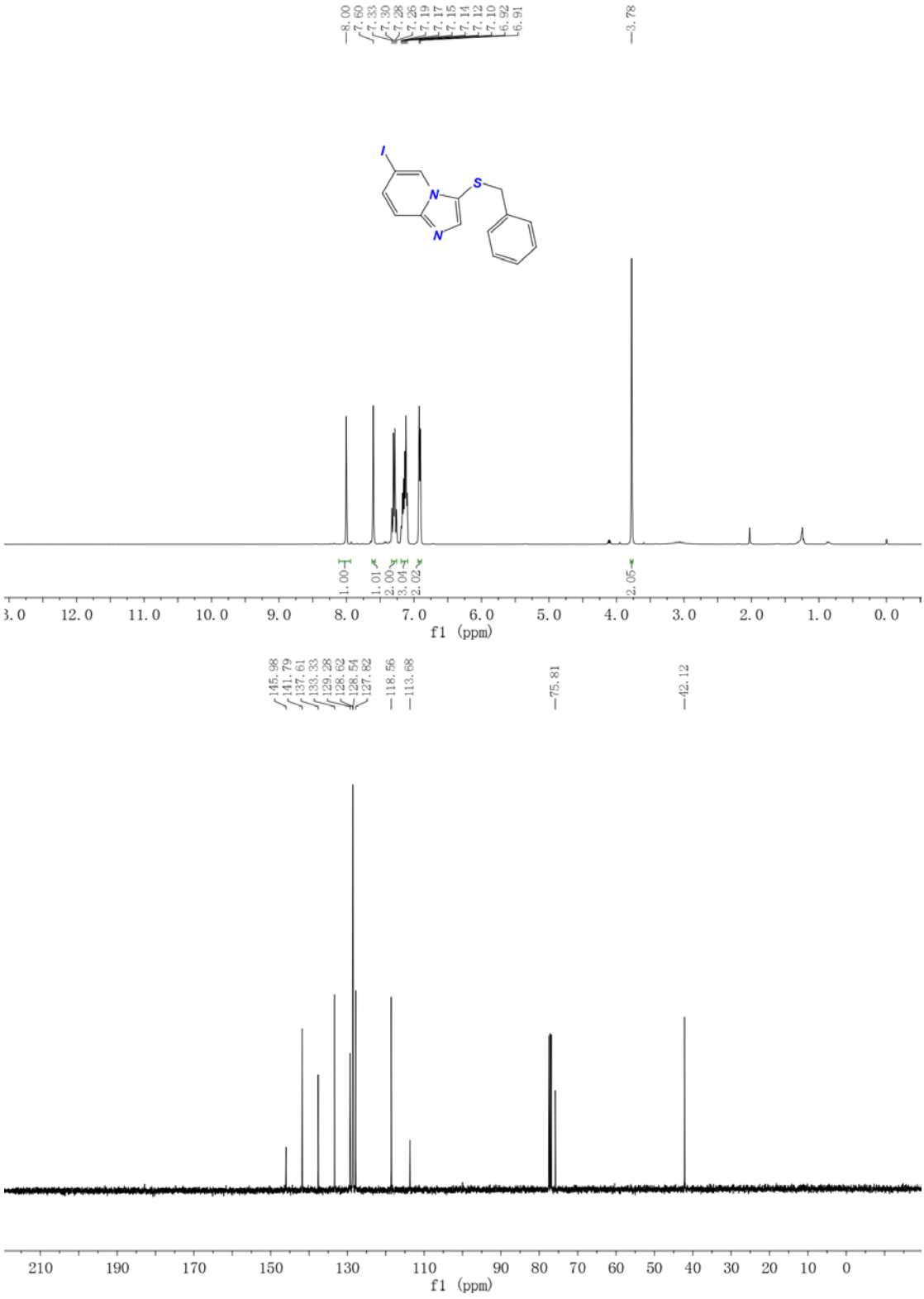
3-(benzylthio)-6-chloroimidazo[1,2-a]pyridine(4hc)



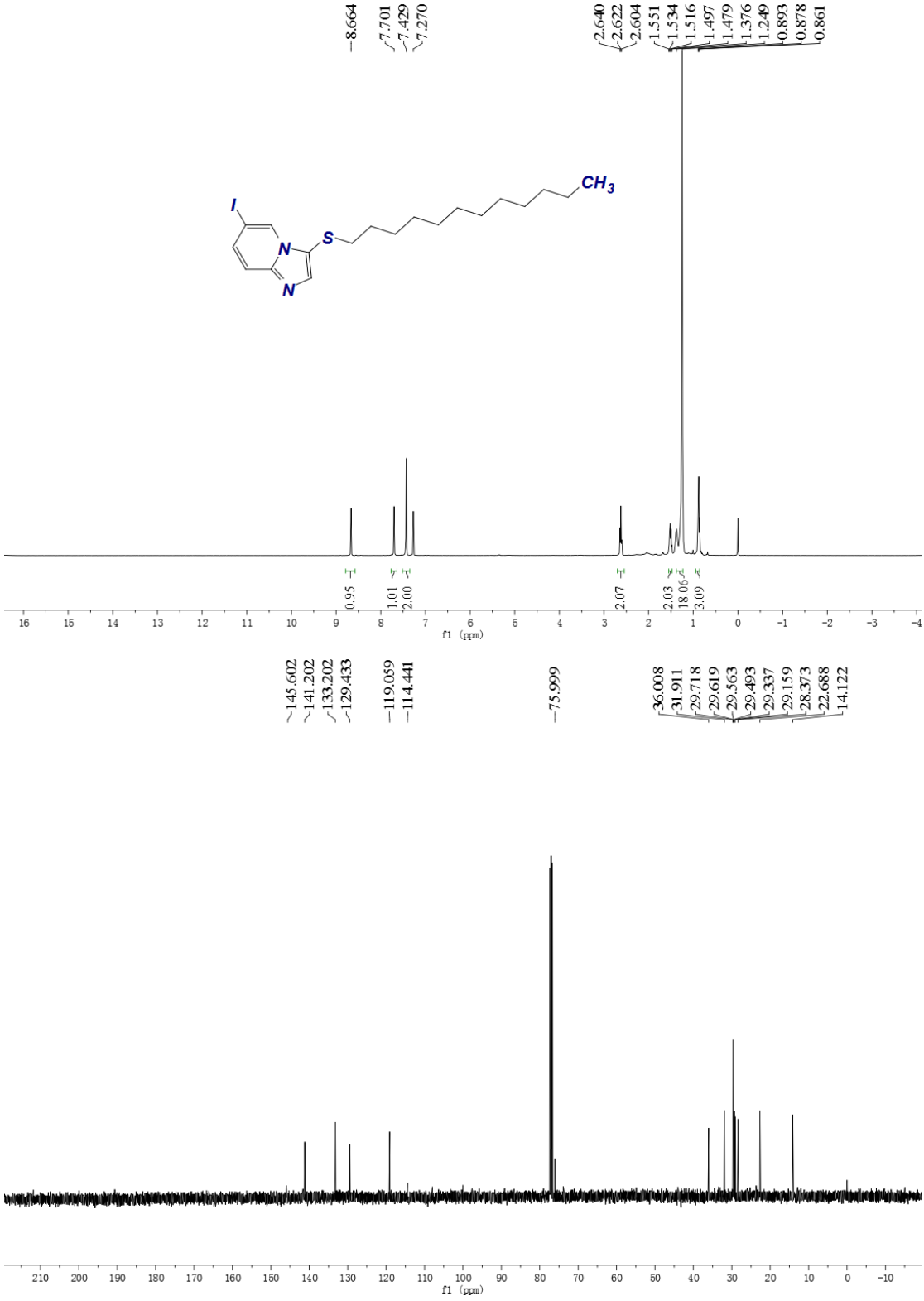
6-iodo-3-(propylthio)imidazo[1,2-a]pyridine(4ia)



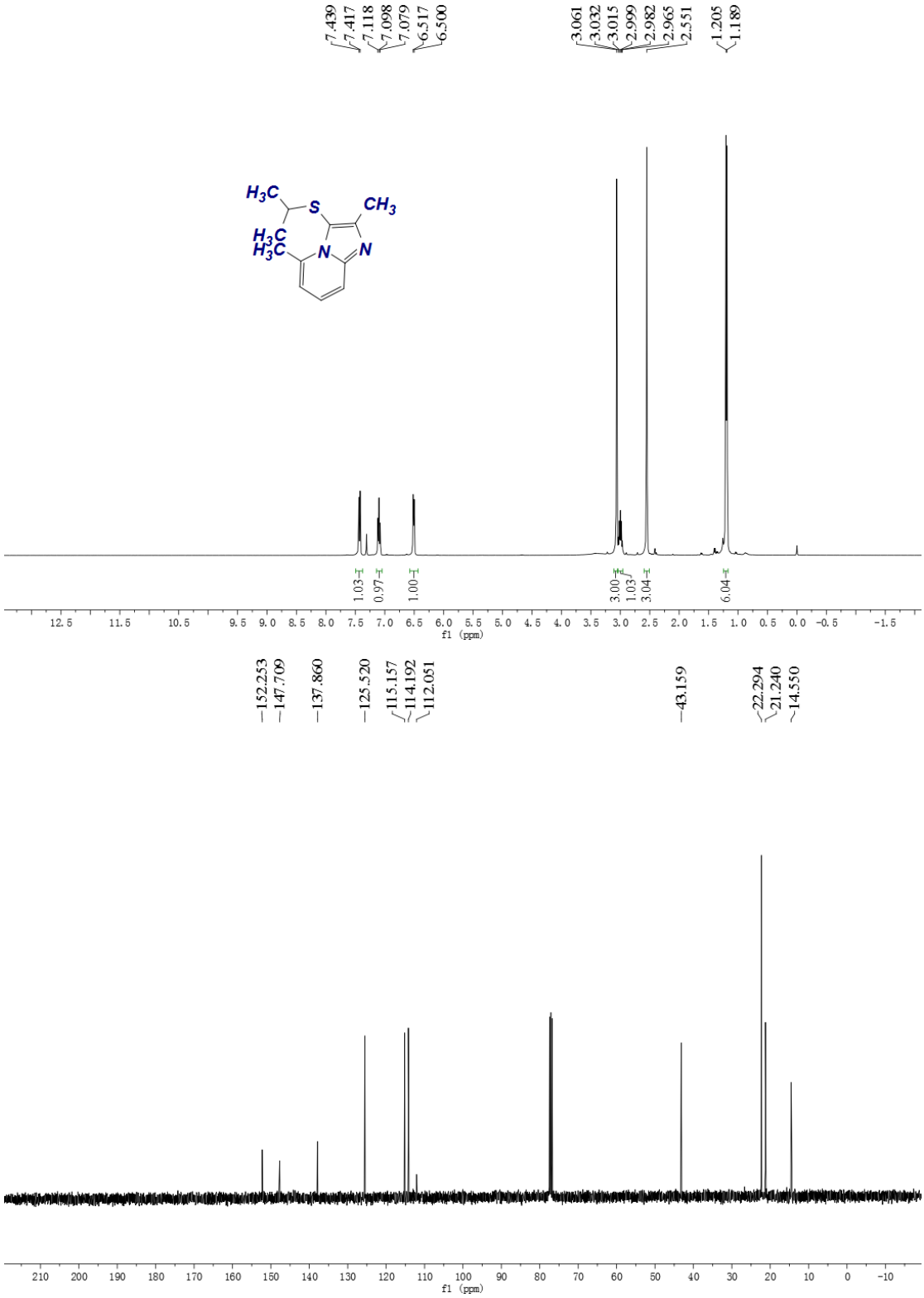
3-(benzylthio)-6-iodoimidazo[1,2-a]pyridine(4ib)



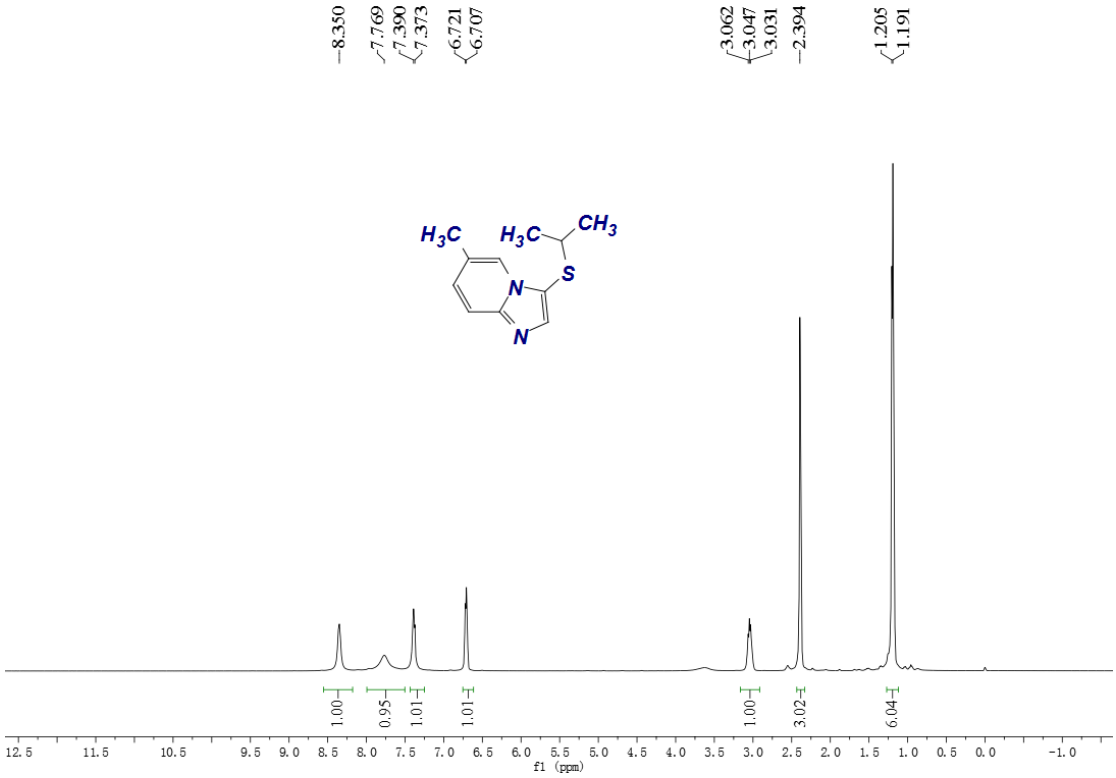
3-(dodecylthio)-6-iodoimidazo[1,2-a]pyridine(4ic)

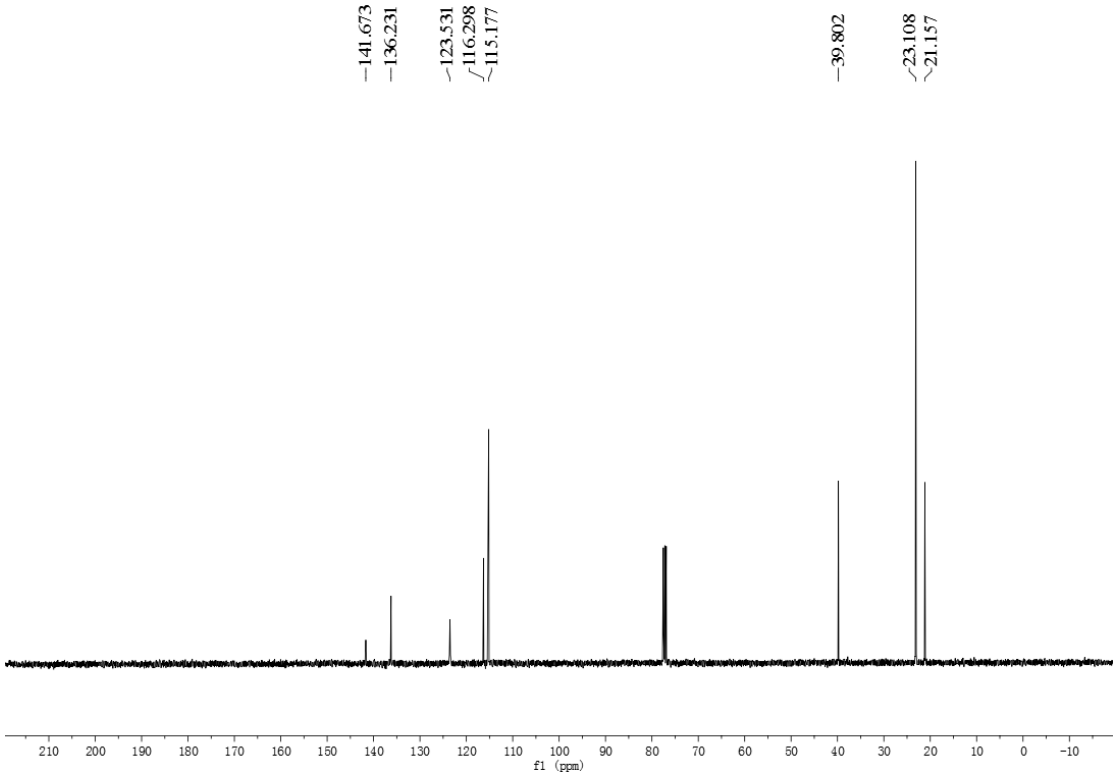


3-(isopropylthio)-2,5-dimethylimidazo[1,2-a]pyridine(5a)

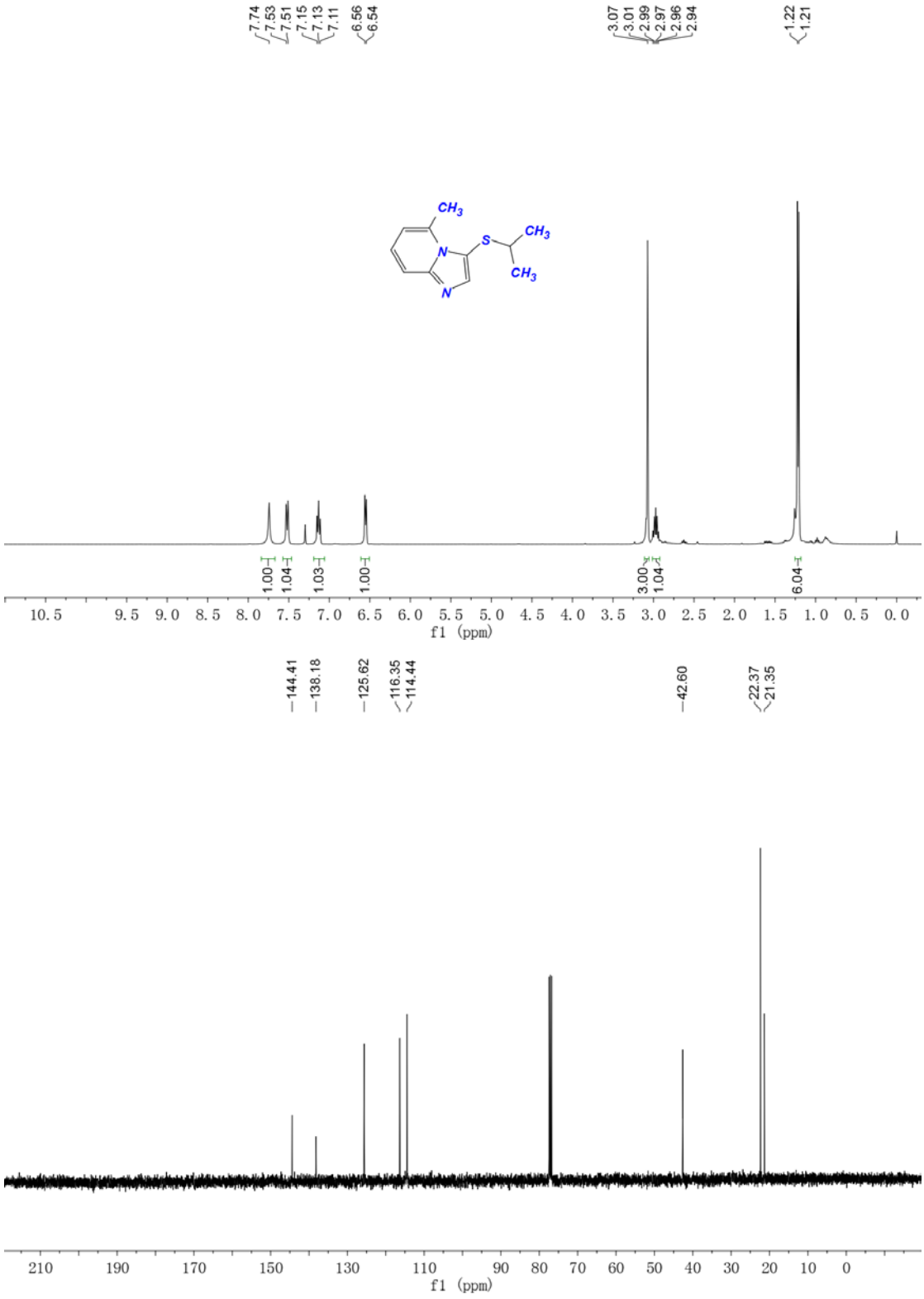


3-(isopropylthio)-6-methylimidazo[1,2-a]pyridine(5b)

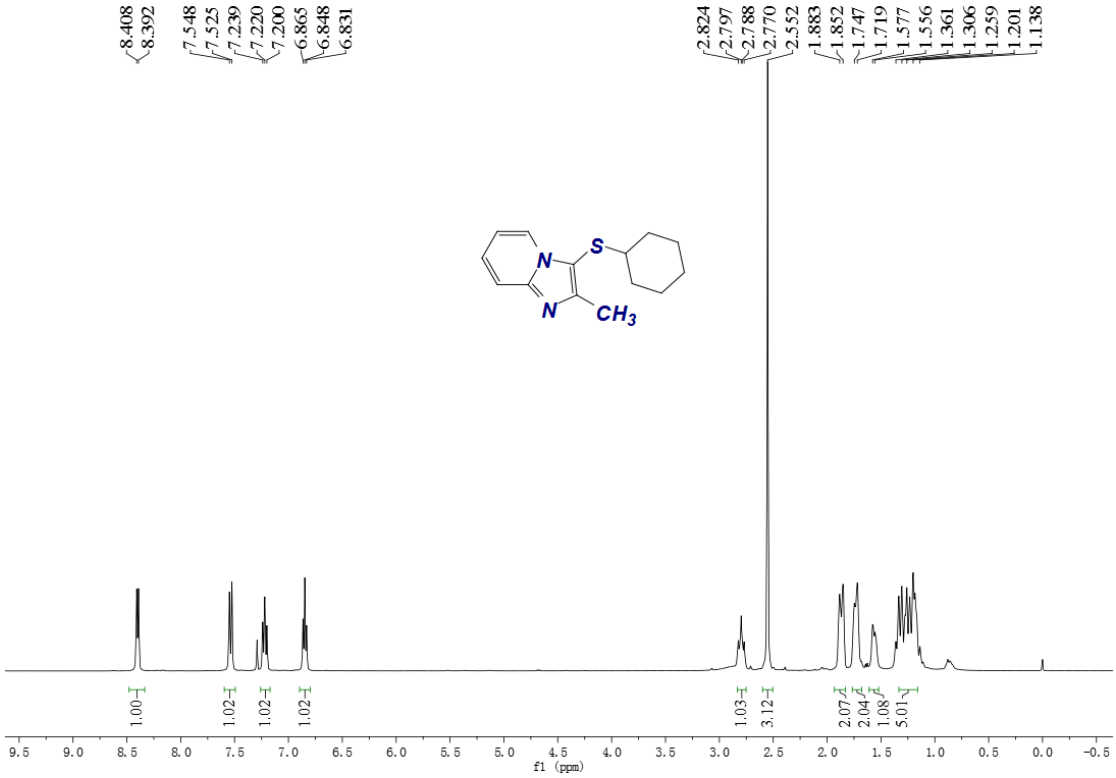


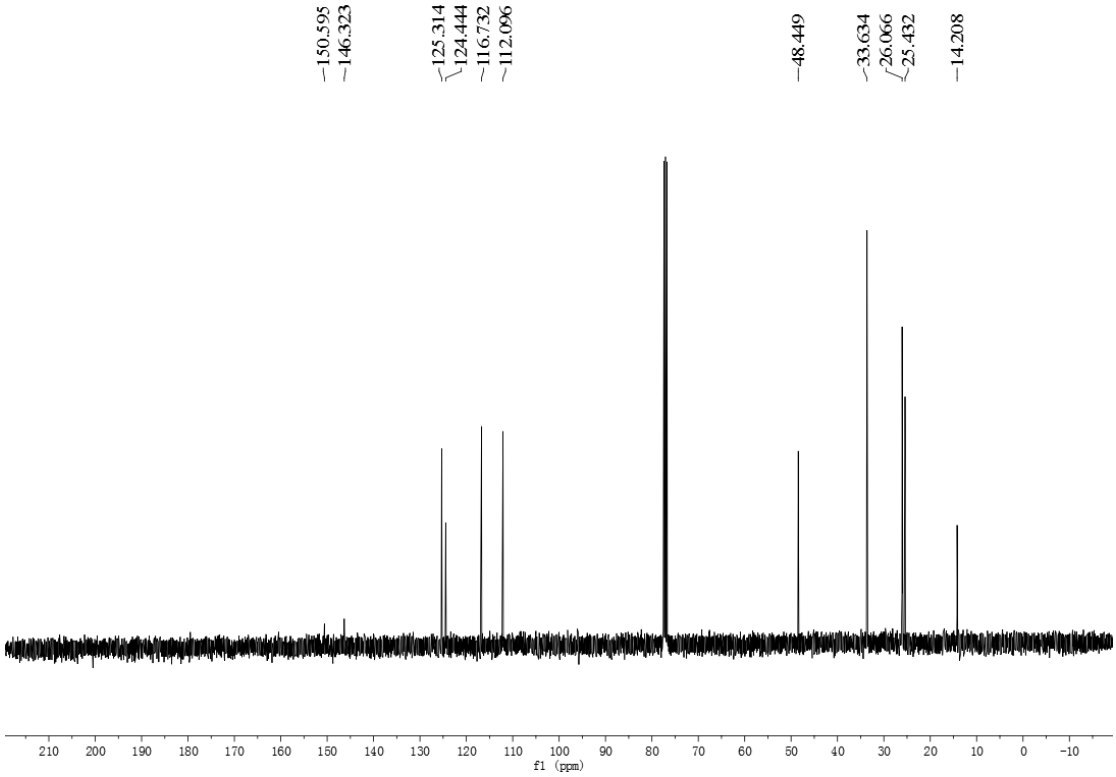


3-(isopropylthio)-5-methylimidazo[1,2-a]pyridine(5c)

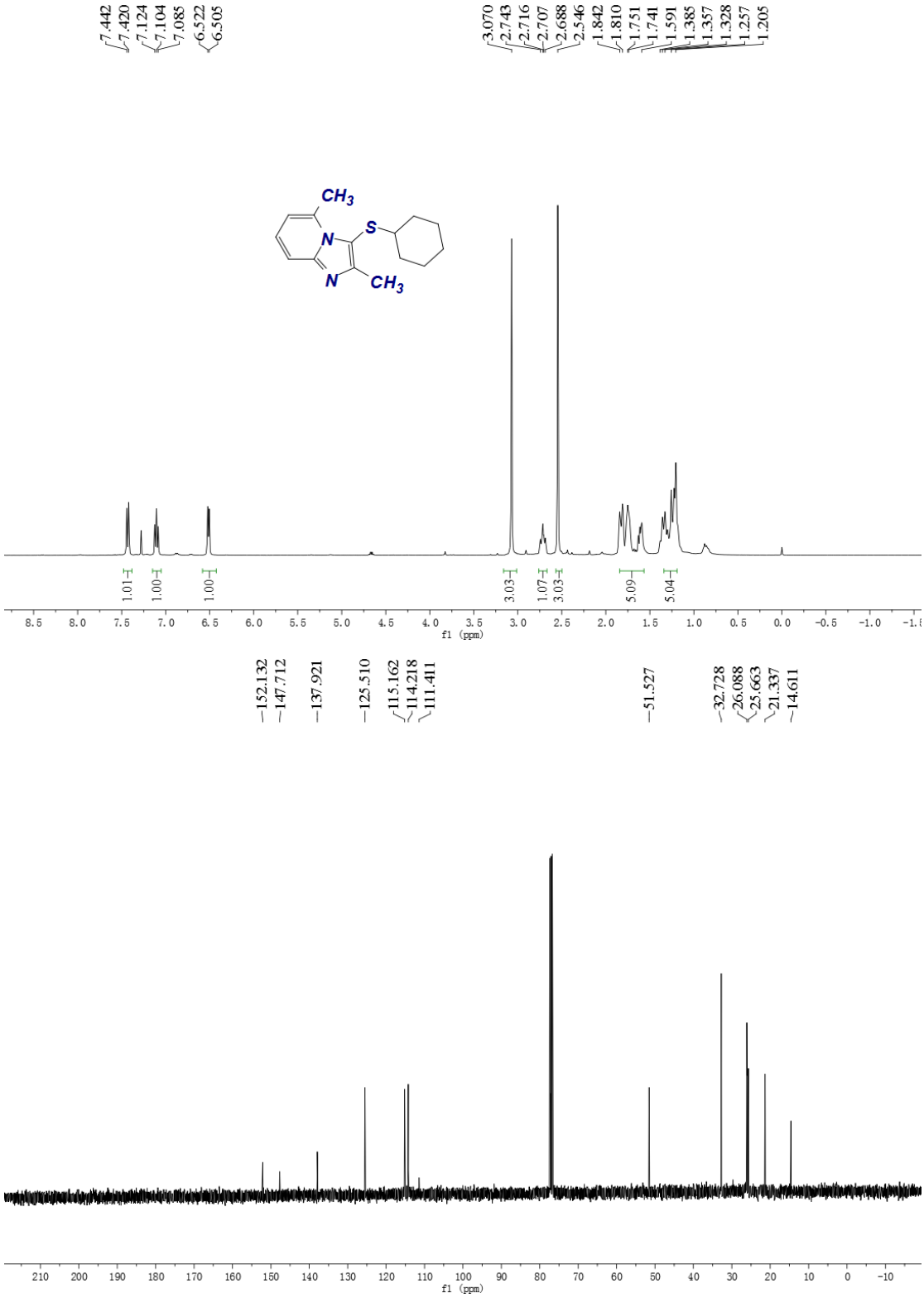


3-(cyclohexylthio)-2-methylimidazo[1,2-a]pyridine(5d)

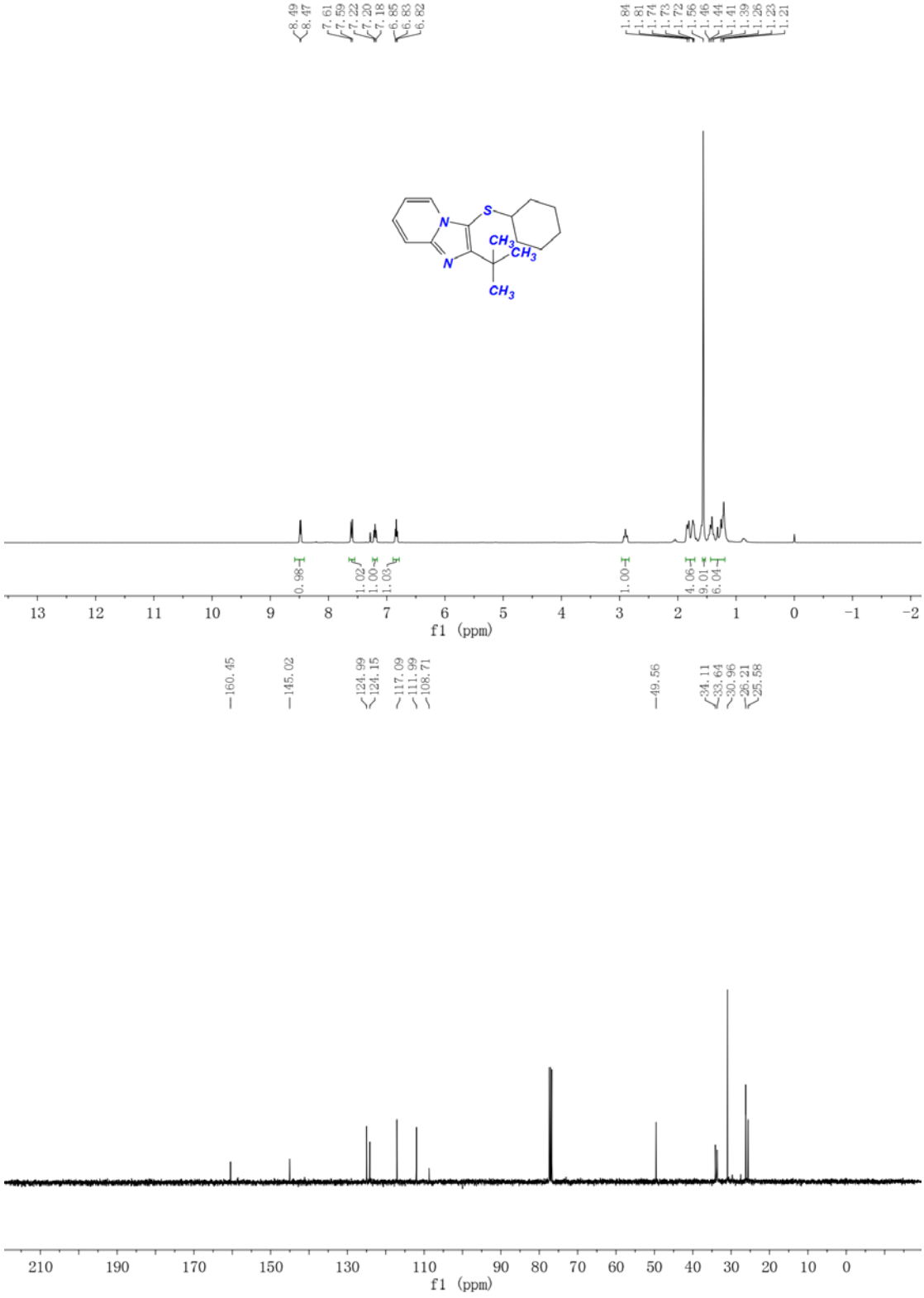




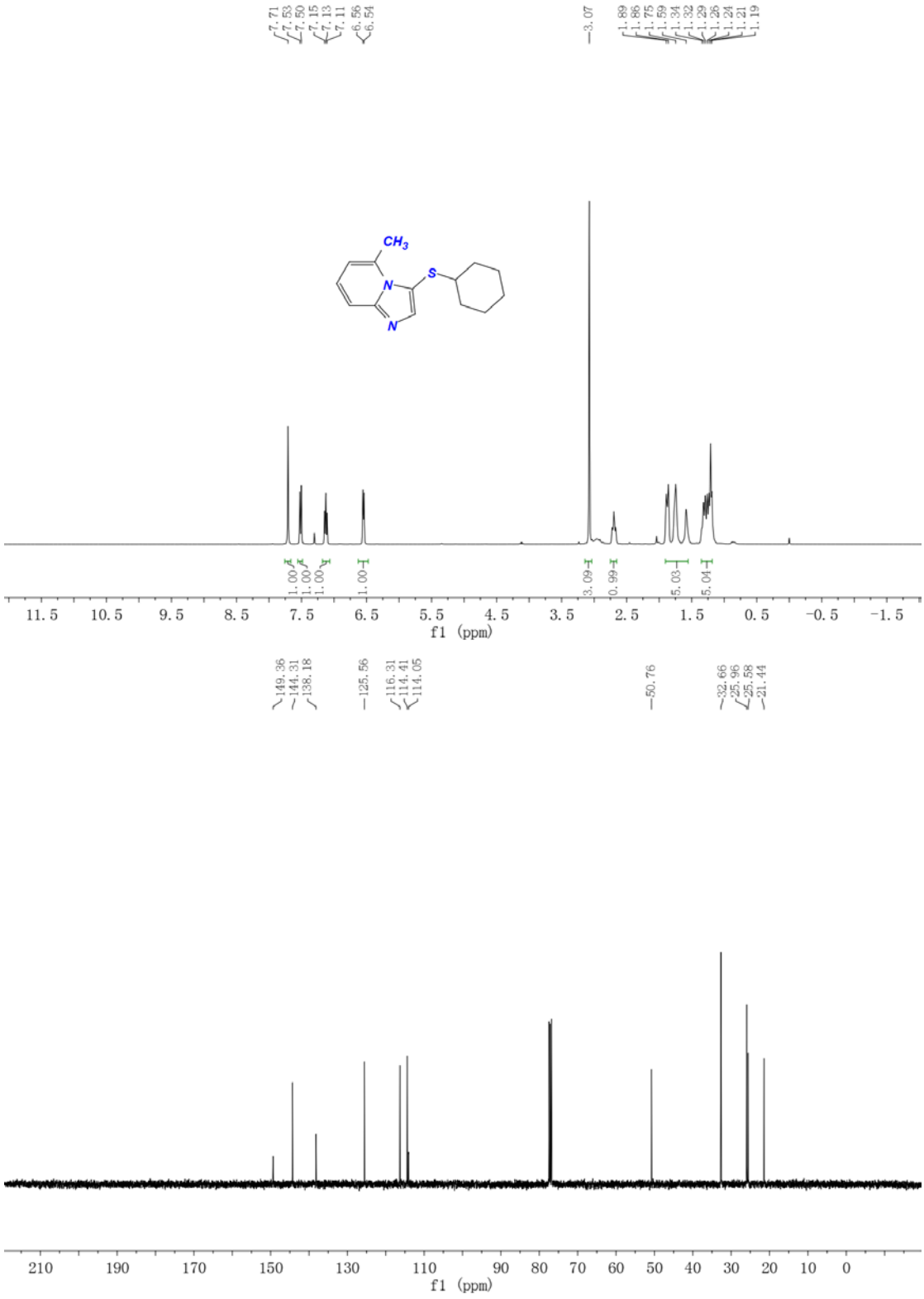
3-(cyclohexylthio)-2,5-dimethylimidazo[1,2-a]pyridine(5e)



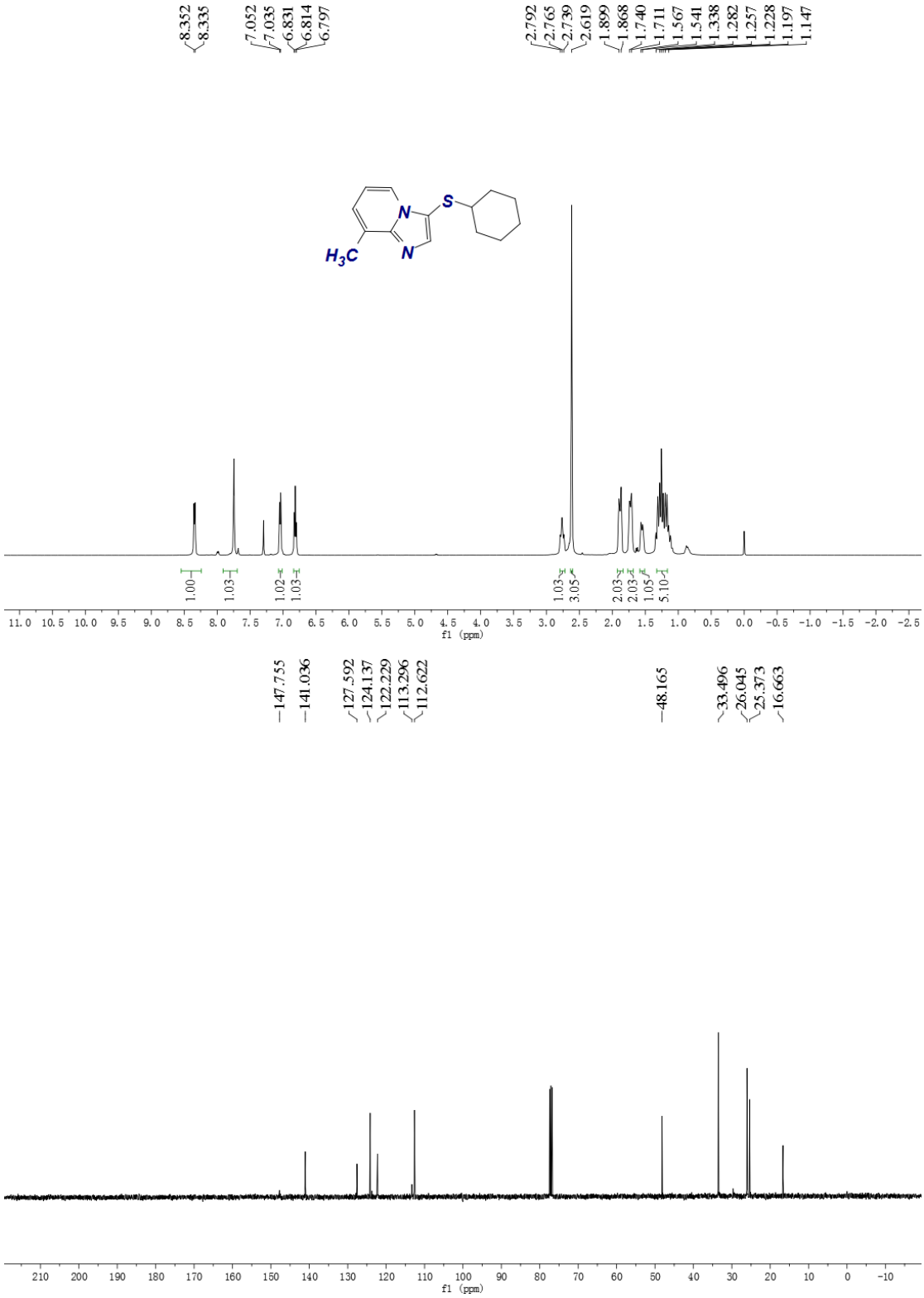
2-(tert-butyl)-3-(cyclohexylthio)imidazo[1,2-a]pyridine(5f)



3-(cyclohexylthio)-5-methylimidazo[1,2-a]pyridine(5g)



3-(cyclohexylthio)-8-methylimidazo[1,2-a]pyridine(5h)



3-(cyclohexylthio)-7-methylimidazo[1,2-a]pyridine(5i)