

Nitration of arenes by 1-sulfofpyridinium nitrate as an ionic liquid and reagent by *in situ* generation of NO₂

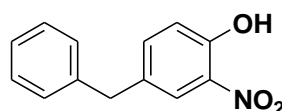
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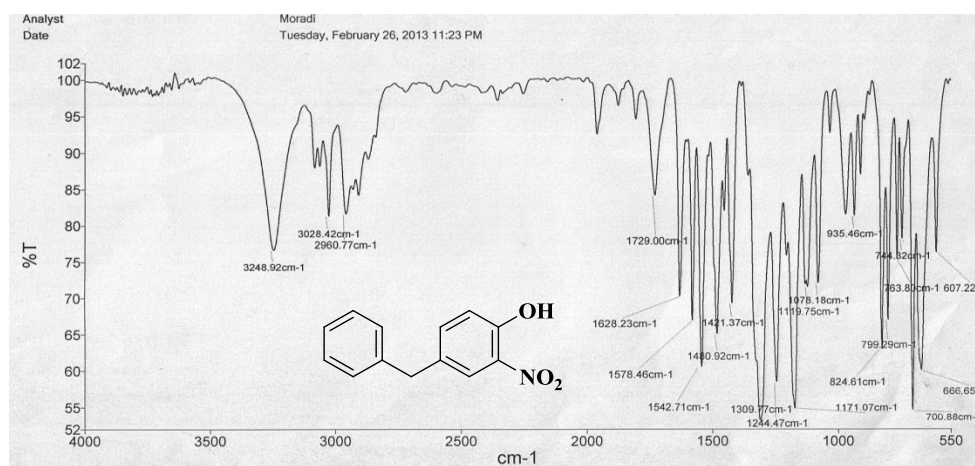
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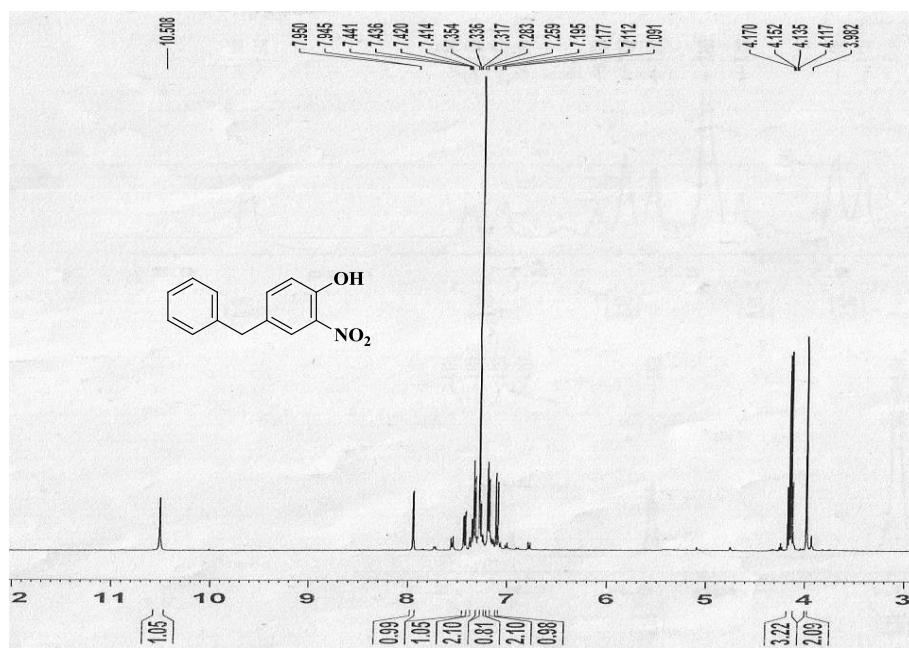
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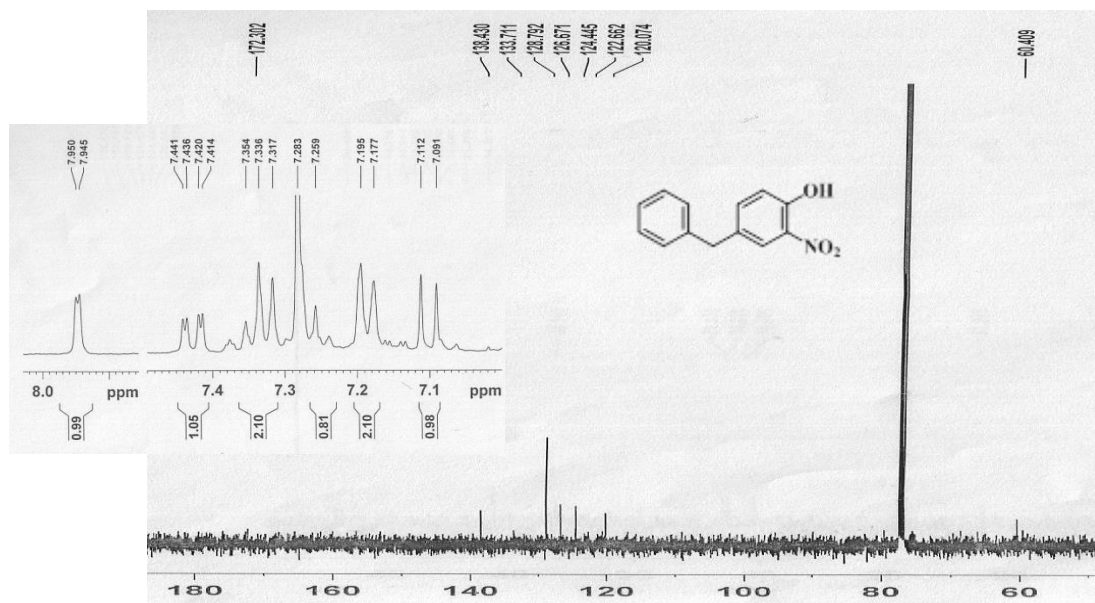
2-nitro-4-benzyl phenol (9). Yellow solid; isolated yield 81% (0.14g). IR (KBr) cm⁻¹; 1309, 1542, 2960, 3028, 3248, ; ¹H NMR (300 MHz, CDCl₃) δ (ppm) 3.98 (s, 2H), 7.10 (d, *J* = 6 Hz, 1H), 7.18 (d, *J* = 6.0 Hz, 2H), 7.25 (s, 1H), 7.31-7.35 (m, 2H), 7.41-7.44 (m, 1H); 7.94-7.95 (d, *J* = 3 Hz, 1H), 10.5 (s, 1H); ¹³C NMR (75 MHz, CDCl₃) δ (ppm) 60.4, 120.07, 122.66, 124.4, 126.67, 128.79, 133.77, 138.43, 172.32.



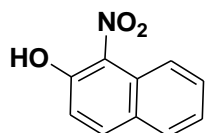
FT IR : 2-nitro-4-benzyl phenol



$^1\text{H NMR}$: 2-nitro4-benzyl phenol

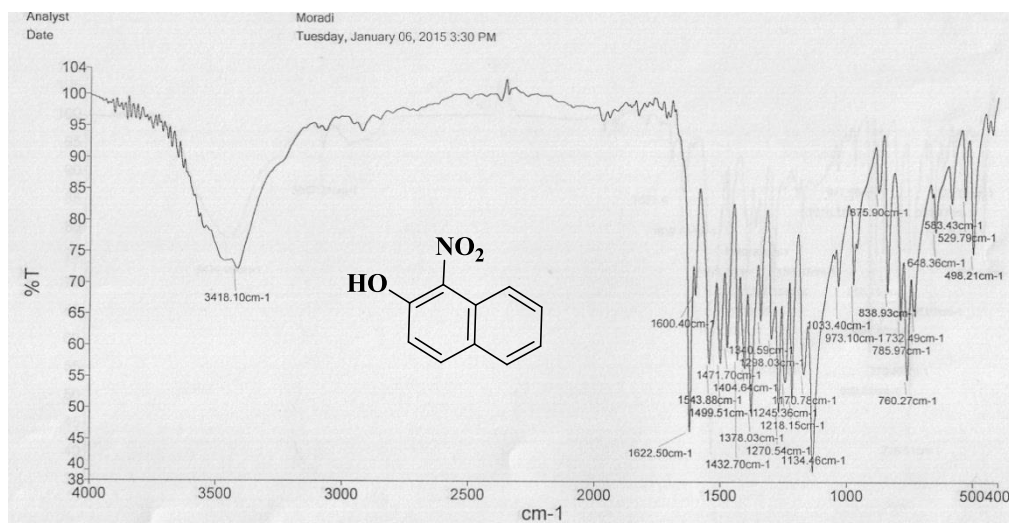


$^{13}\text{C NMR}$: 2-nitro4-benzyl phenol

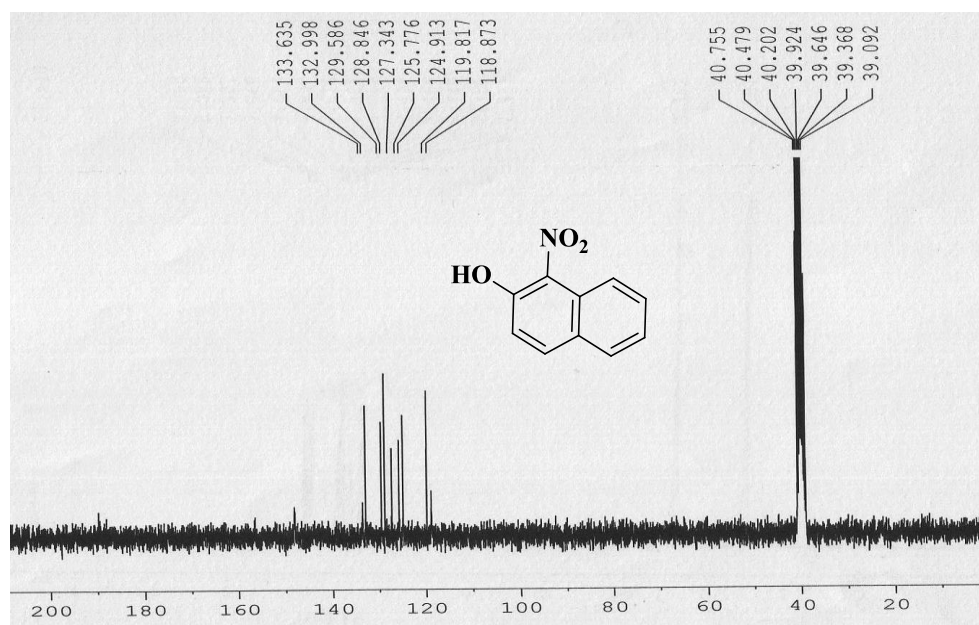


1-nitronaphthalene-2-ol (4). Yellow solid; isolated yield 92% (0.174 g). IR (KBr) 717, 1378, 1543, 3418 cm^{-1} ; $^1\text{H NMR}$ (300 MHz, CDCl_3) δ (ppm) 7.34 (d, $J = 9$ Hz, 1H), 7.46 (t, $J = 12$ Hz, 1H),

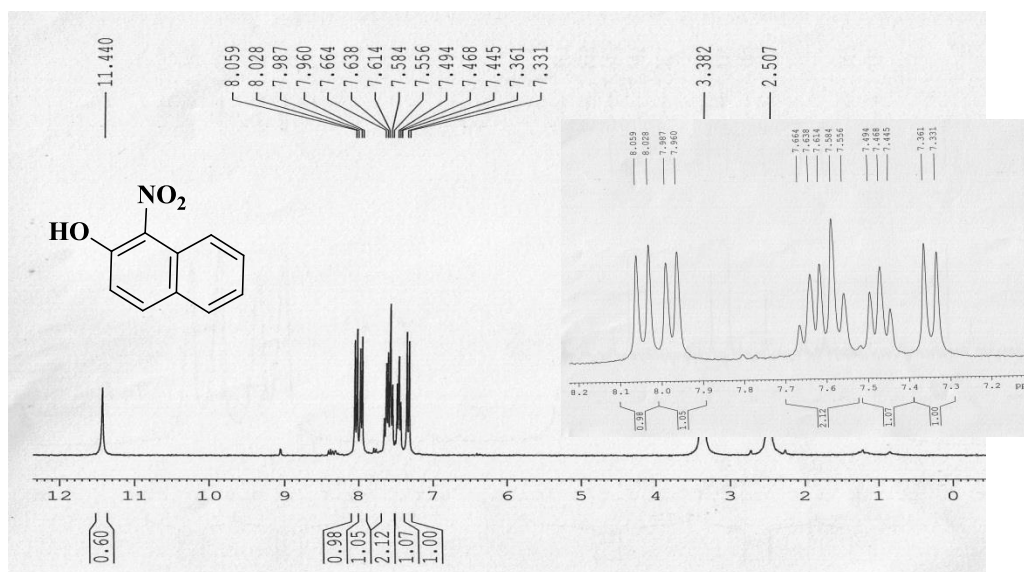
7.55-7.66 (m, 2H), 7.97 (d, $J = 6$ Hz, 1H), 8.03 (d, $J = 9$ Hz, 1H), 11.44 (s, 1H, OH); ^{13}C NMR (75 MHz, CDCl_3) δ (ppm) 118.8, 119.8, 124.9, 125.7, 127.3, 128.8, 129.5, 132.9, 133.6, 148.8.



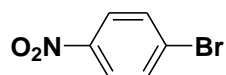
FT IR: 1-nitronaphthalene-2-ol



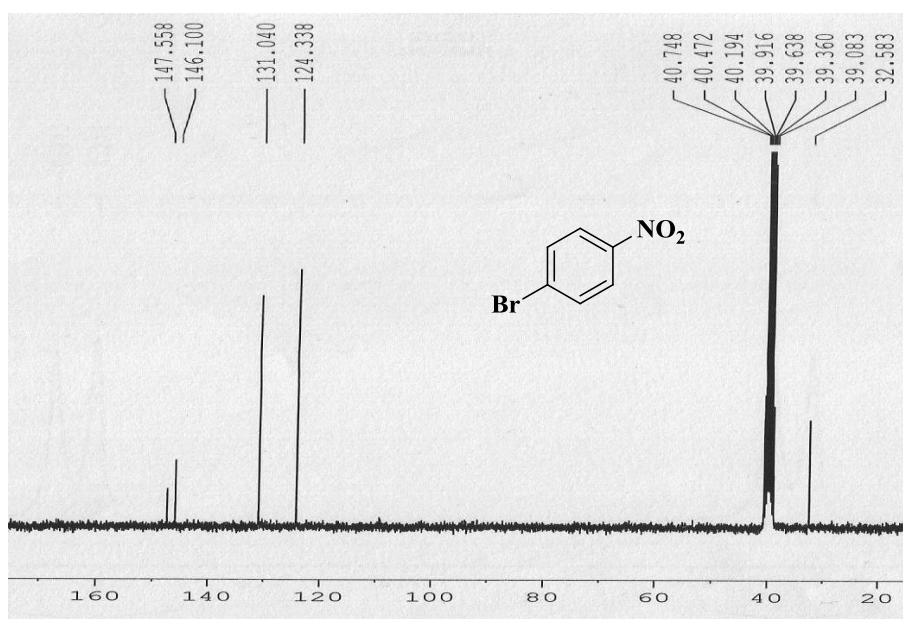
^{13}C NMR :1-nitronaphthalene-2-ol



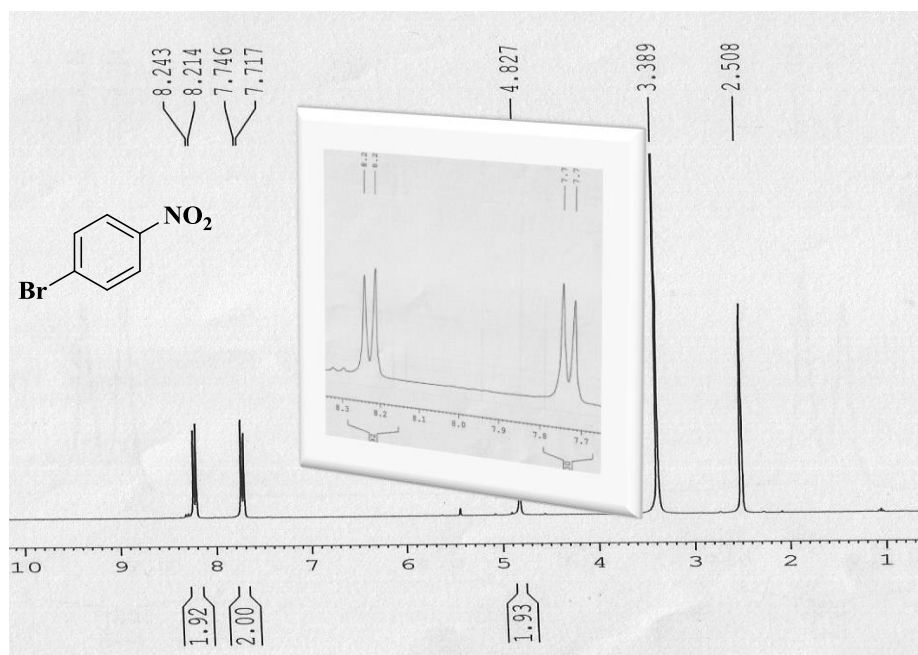
¹H NMR :1-nitronaphthalene-2-ol



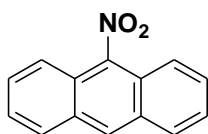
1- bromo4-nitrobenzene (12). Yellow solid; isolated yield 80% (0.15 g); ¹H NMR (300 MHz, DMSO-*d*₆) δ (ppm) 7.72 (d, *J* = 9.0 Hz, 2H), 8.22 (d, *J* = 9.0 Hz, 2H); ¹³C NMR (75 MHz, DMSO-*d*₆) δ (ppm) 124.3, 131.0, 146.1, 147.5.



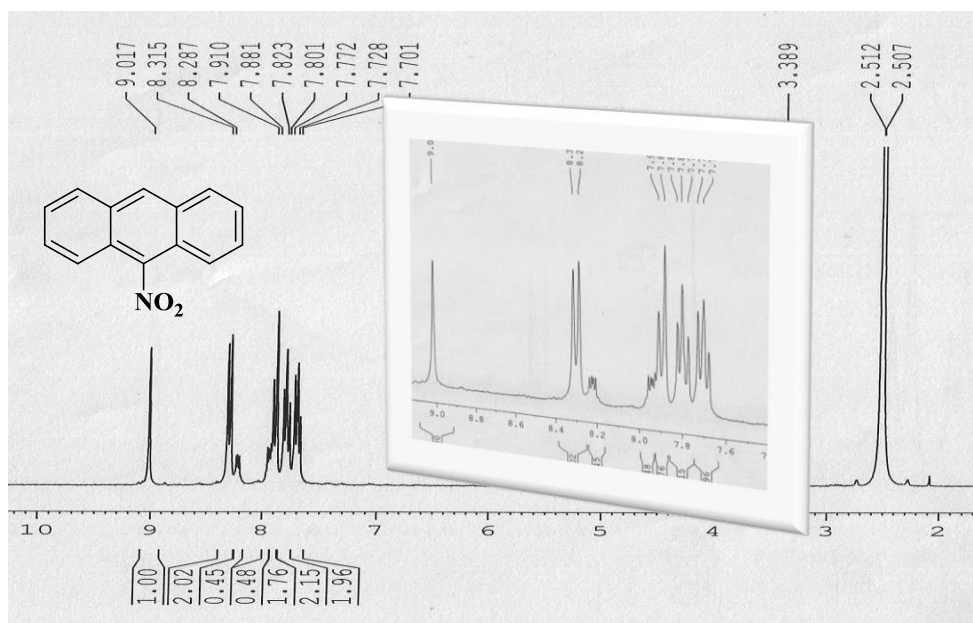
¹³C NMR: 1- bromo4-nitrobenzene



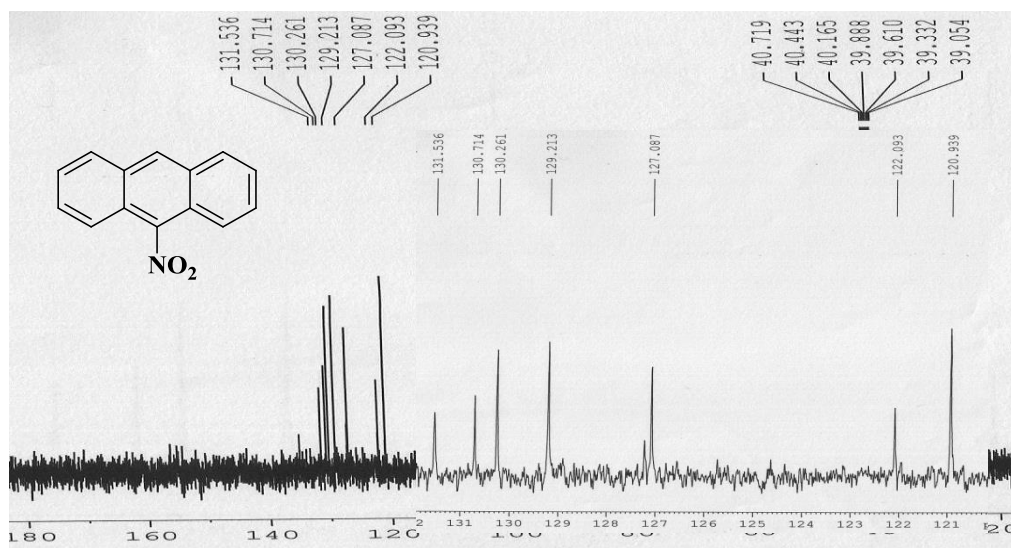
^1H NMR: 1-bromo4-nitrobenzene



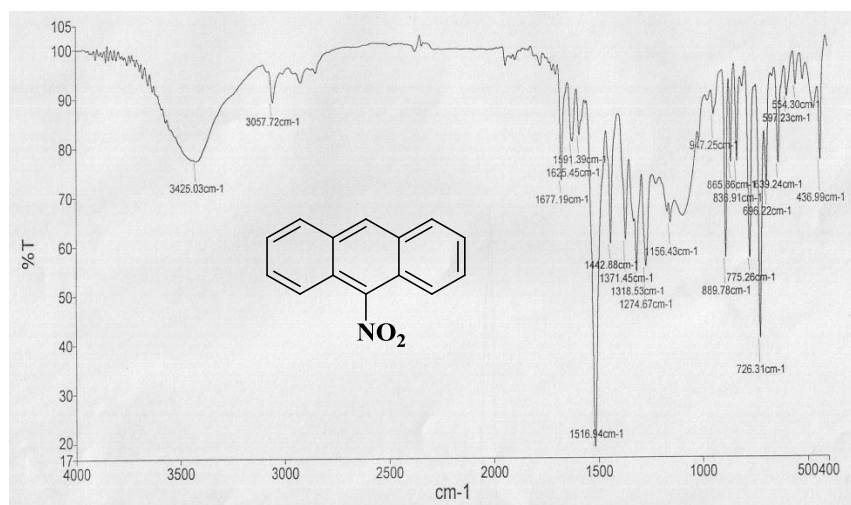
9-nitroanthracene (8). Yellow solid; isolated yield 83% (0.1825 g). IR (KBr) 692, 1371, 1516 cm^{-1} ; ^1H NMR (300 MHz, CDCl_3) δ (ppm) 7.7-7.2 (m, 2H), 7.72 (t, $J = 10.8$ Hz, 2H), 7.89 (d, $J = 9$ Hz, 2H), 8.29 (d, $J = 9$ Hz, 2H), 9.01 (s, 1H); ^{13}C NMR (75 MHz, CDCl_3) δ (ppm) 120.9, 122.09, 127.08, 129.2, 130.2, 130.7, 131.5, 144.9.



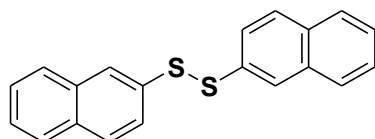
¹H NMR: 9-nitroanthracene



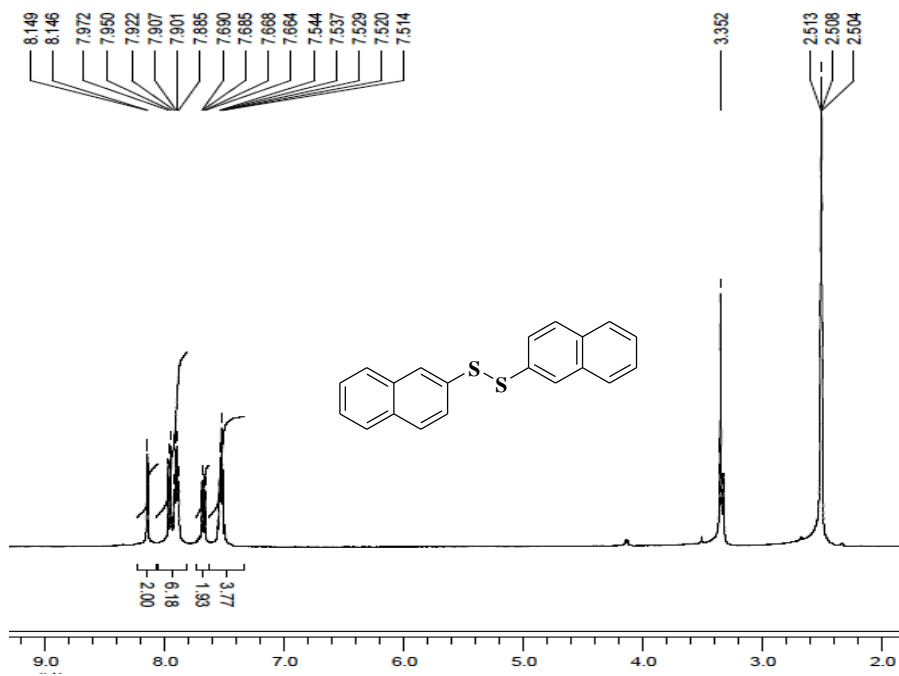
¹³C NMR: 9-nitroanthracene



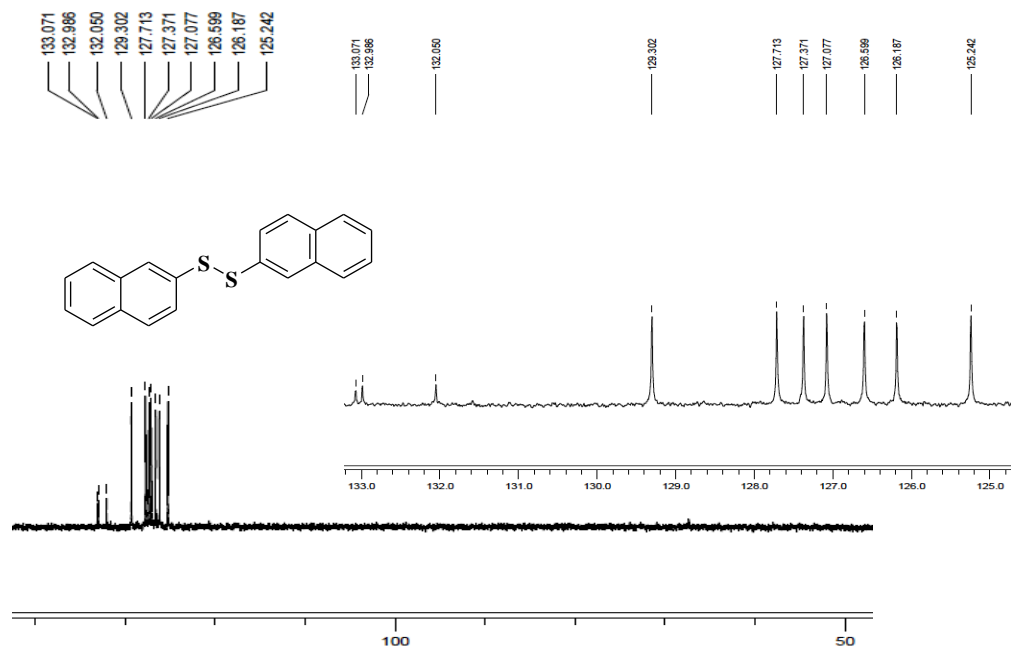
FT IR: 9-nitroanthracene



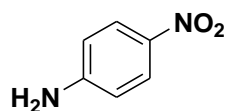
1-(naphthalen-2-yl)-2-(naphthalen-6-yl)disulfane (13). Brown solid; isolated yield 75%; ¹H NMR (400 MHz, DMSO-*d*₆) δ (ppm) 7.52 (m, 4H), 7.67 (q, *J* = 1.6 Hz, 2H), 7.91 (m, 6H), 8.14 (d, *J* = 1.2 Hz, 2H); ¹³C NMR (100 MHz, DMSO-*d*₆) δ (ppm) 125.2, 126.1, 126.5, 127.07, 127.3, 127.7, 129.3, 132.0, 132.9, 133.05.



¹H NMR: 1-(naphthalen-2-yl)-2-(naphthalen-6-yl)disulfane



¹³C NMR: 1-(naphthalen-2-yl)-2-(naphthalen-6-yl)disulfane



4-nitroaniline (10b). Yellow solid; isolated yield 40% (0.0549 g). IR (KBr) 840, 1298, 1587, 3360, 3481 cm^{-1} ; ^1H NMR (400 MHz, $\text{DMSO-}d_6$) δ (ppm) 6.61 (d, $J=8$ Hz, 2H), 6.73 (s, 2H), 7.95 (d, $J=8.4$ Hz, 2H); ^{13}C NMR (100 MHz, $\text{DMSO-}d_6$) δ (ppm) 112.32, 126.34, 135.59, 155.49.

