

Vitamin C as a green and efficient catalyst in synthesis of quinoxaline derivatives at room temperature

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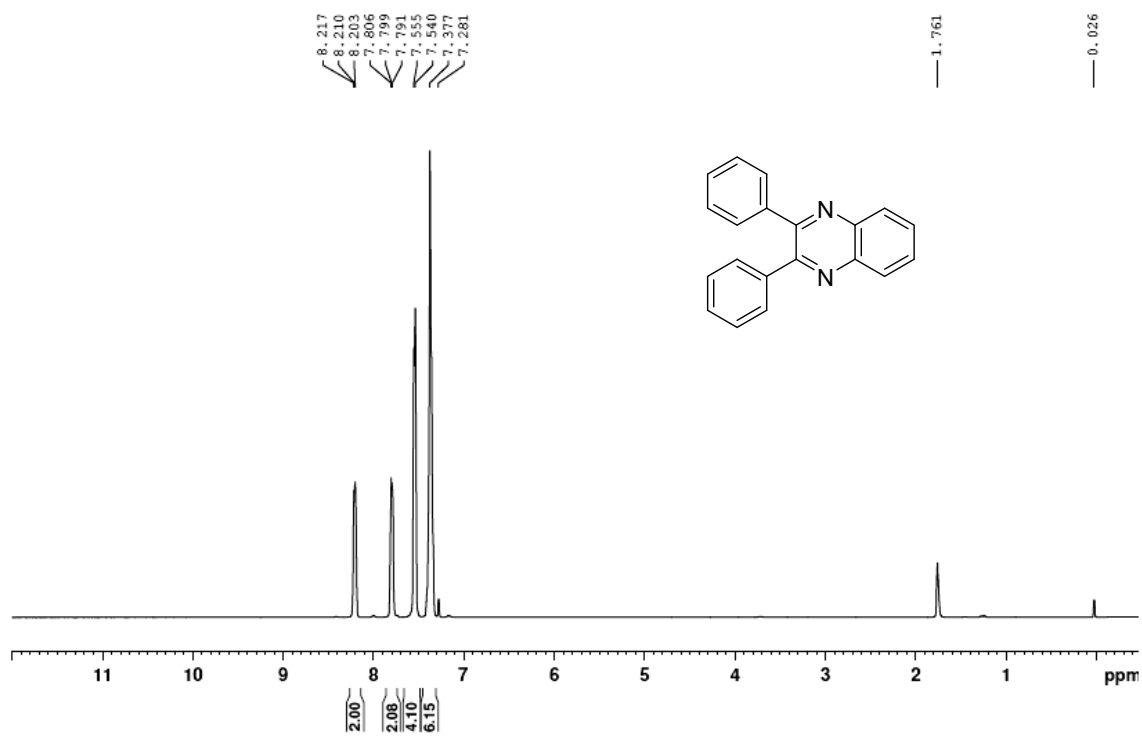
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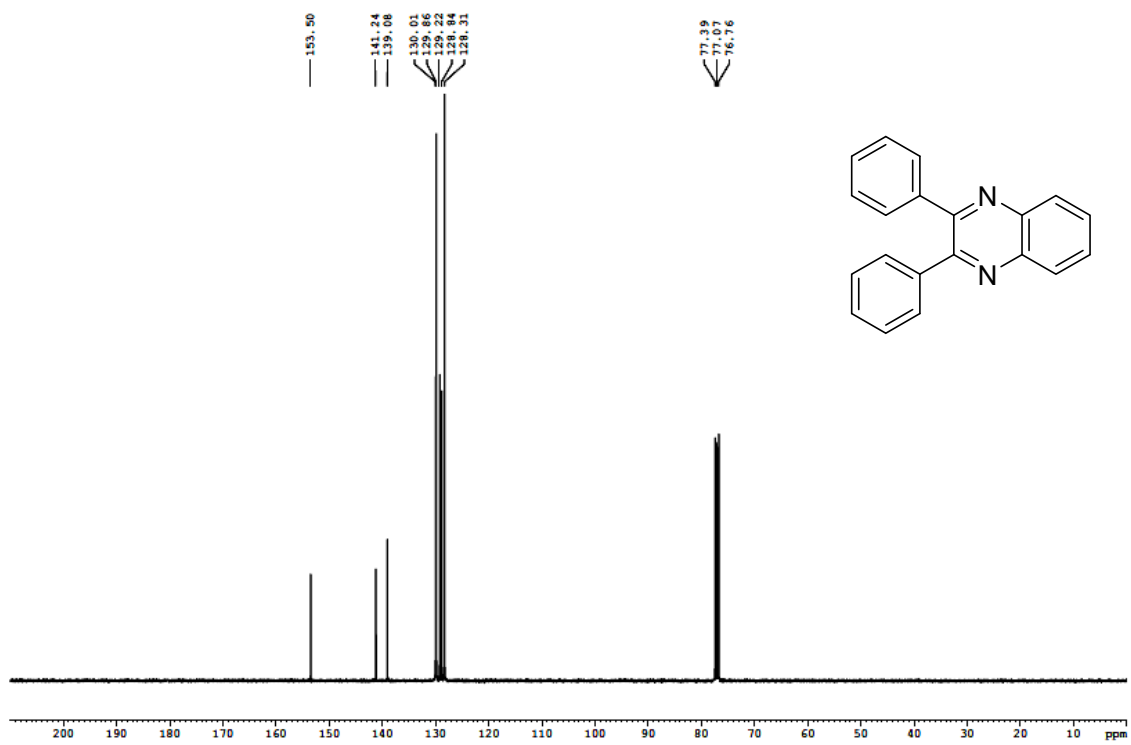
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Supporting information

2,3-Diphenylquinoxaline (entry 1)

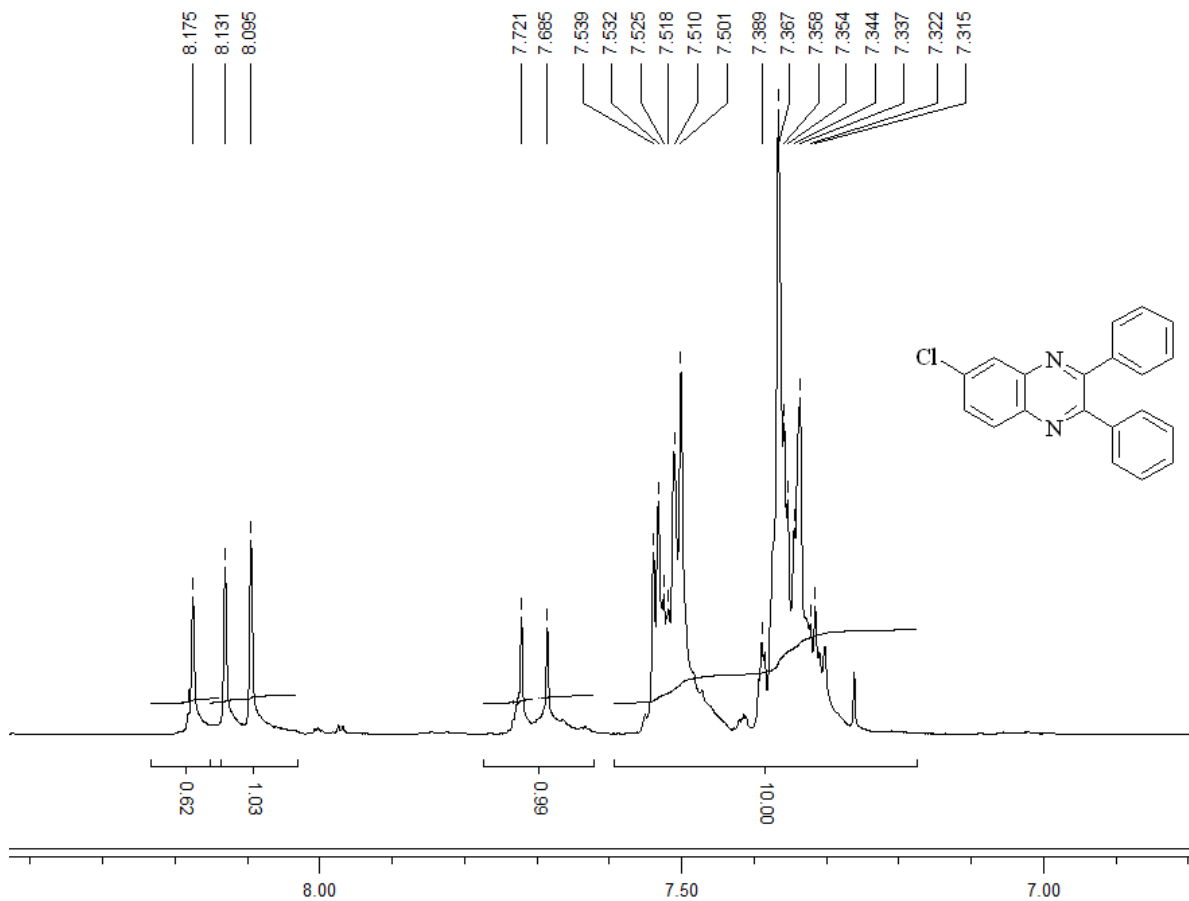
M.p. 128–129 °C; ^1H NMR (250 MHz, CDCl_3): δ = 7.33-7.37 (m, 6H, Ar-H), 7.51-7.54 (m, 4H, Ar-H), 7.75-7.79 (m, 4H, Ar-H), 8.16-8.20 (m, 2H, Ar-H); ^{13}C NMR (62.9 MHz, CDCl_3): δ = 128.3, 128.8, 129.2, 129.8, 129.9, 139.1, 141.2, 153.5.

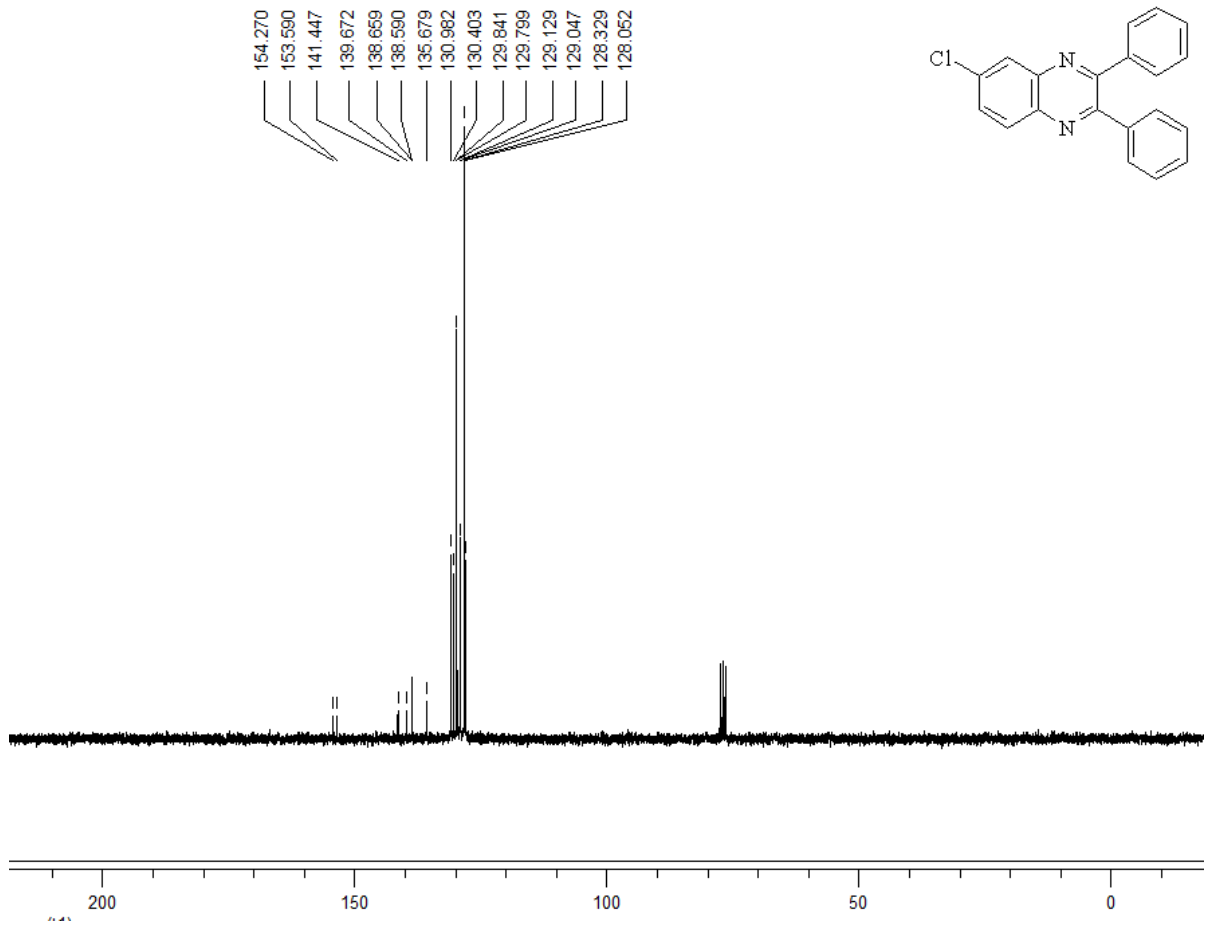




6-Chloro-2,3-Diphenylquinoxaline (entry 2):

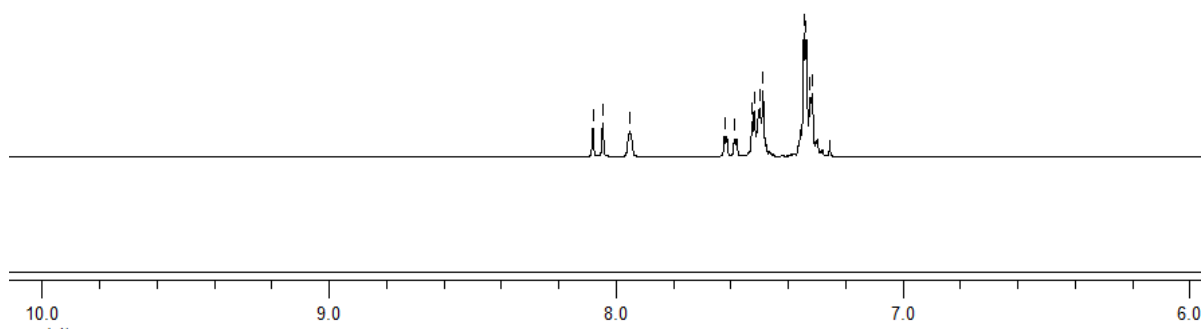
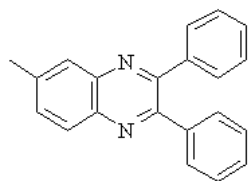
M.p: 120–121 °C; ¹H NMR (250 MHz, CDCl₃): δ= 7.32-7.35 (m, 6H, Ar-H), 7.49-7.51 (m, 4H, Ar-H), 7.72-7.76 (d, 1H, Ar-H), 8.11-8.14 (d, 1H,Ar-H), 8.17 (s, 1H, ArH); ¹³C NMR (62.9MHz, CDCl₃):127.9, 128.2, 128.9, 129.0, 129.7, 129.8, 130.3, 130.8, 135.5, 138.5, 138.6, 139.6, 141.3.

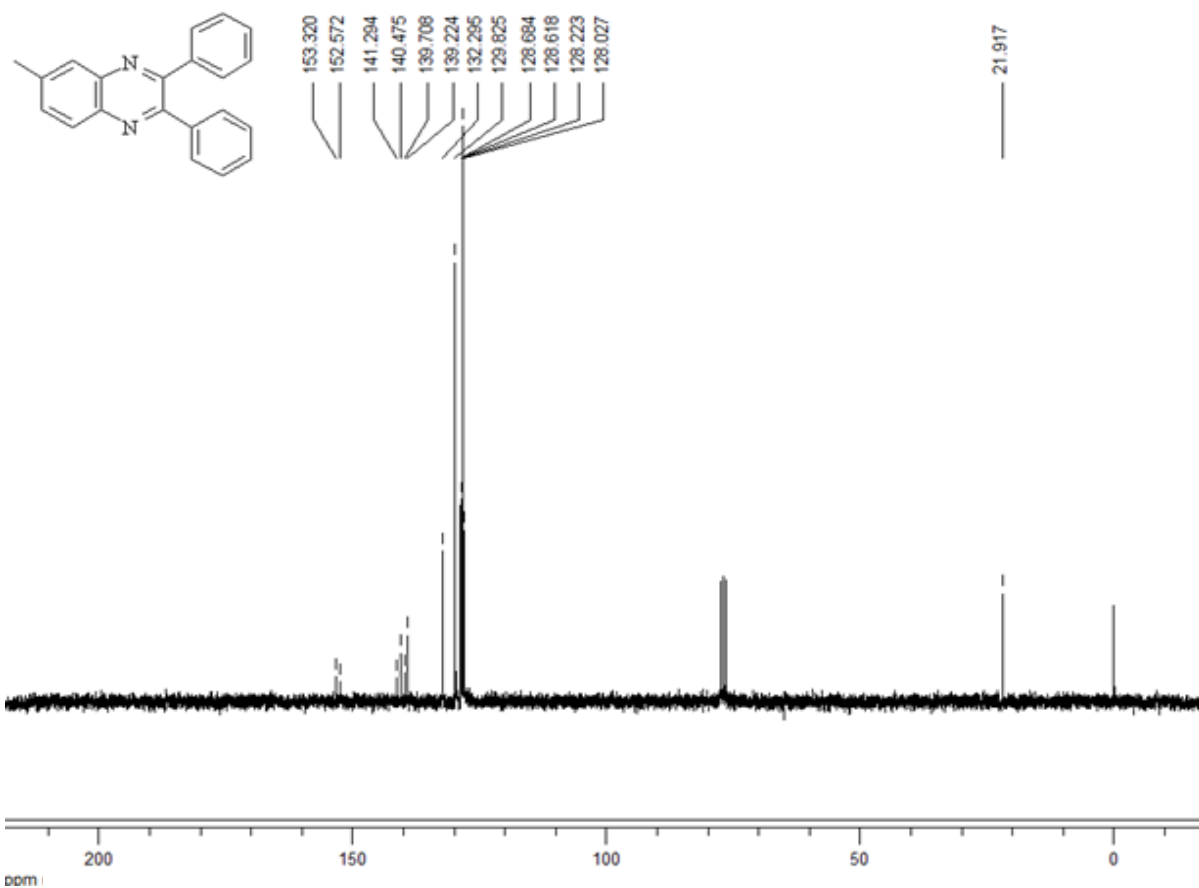




6-Methyl-2,3-diphenylquinoxaline (entry 3):

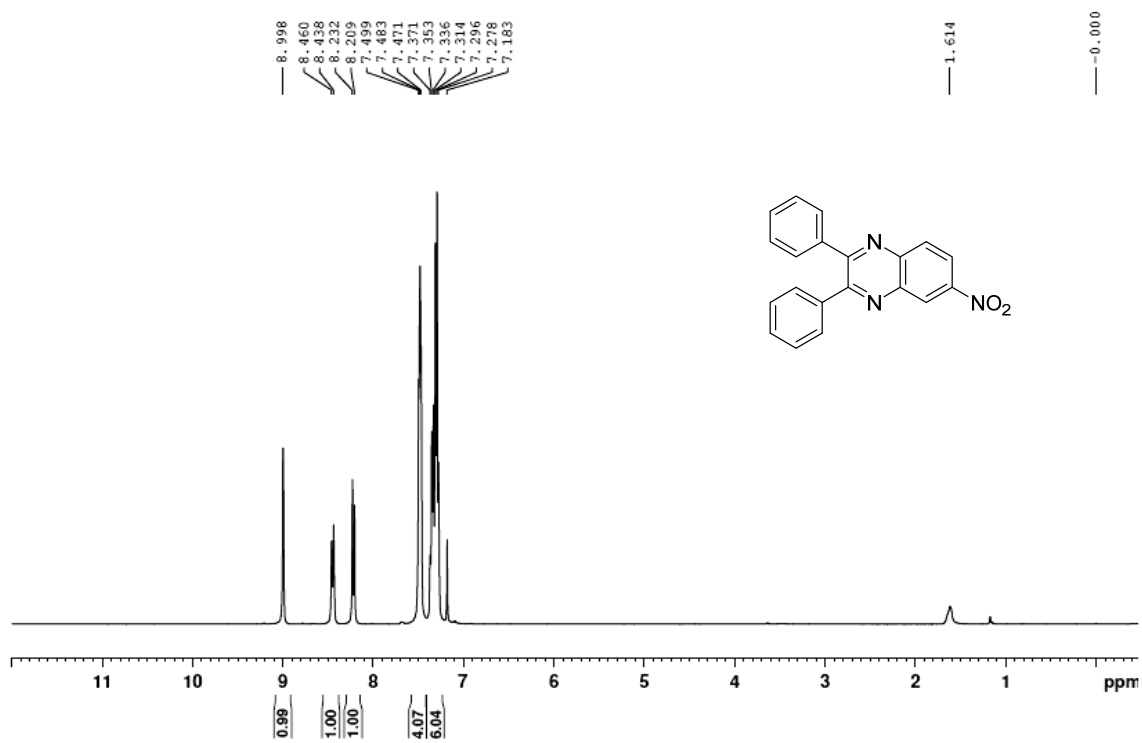
M.p: 115–116 °C; ^1H NMR (250 MHz, CDCl_3): δ = 2.6 (s, 3H), 7.35 (m, 6H), 7.5 (m, 4H), 7.63 (dd, 1H), 7.96 (s, 1H), 8.1 (d, 1H); ^{13}C NMR (62.9MHz, CDCl_3): d 152.82, 152.08, 140.52, 140.50, 138.92, 138.85, 132.52, 129.63, 128.64, 128.57, 128.32, 127.98, 127.47, 21.32.

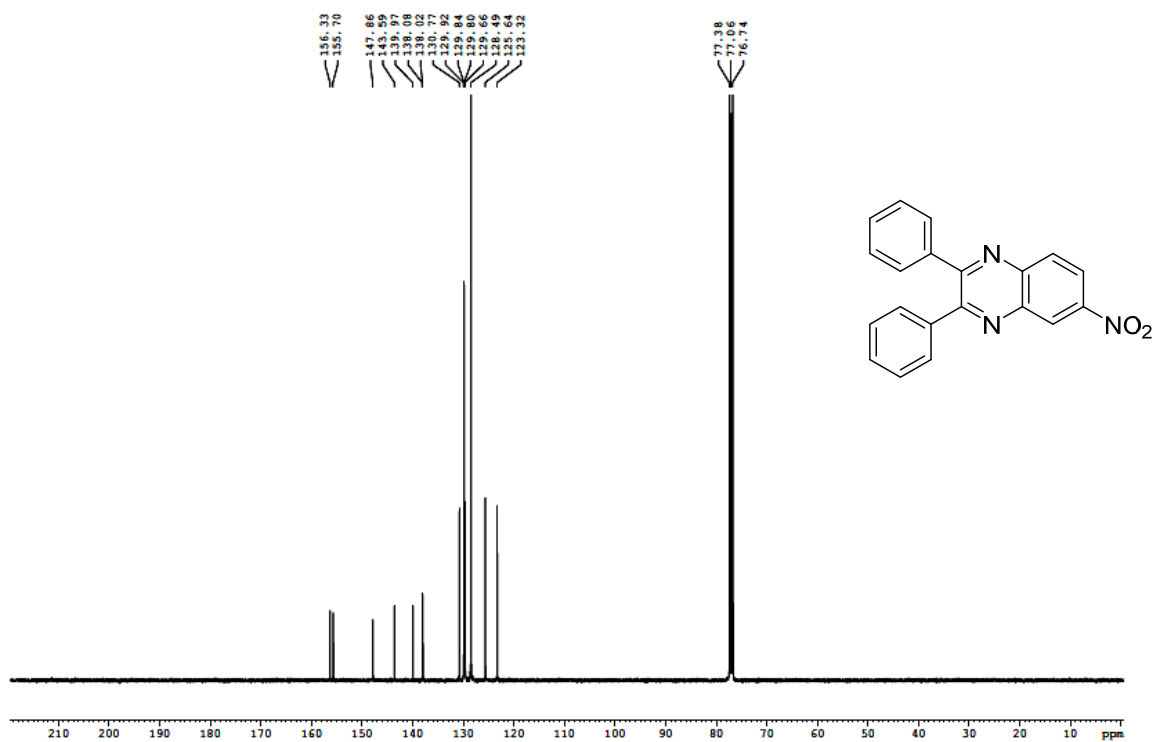




6-Nitro-2,3-diphenylquinoxaline (entry 5)

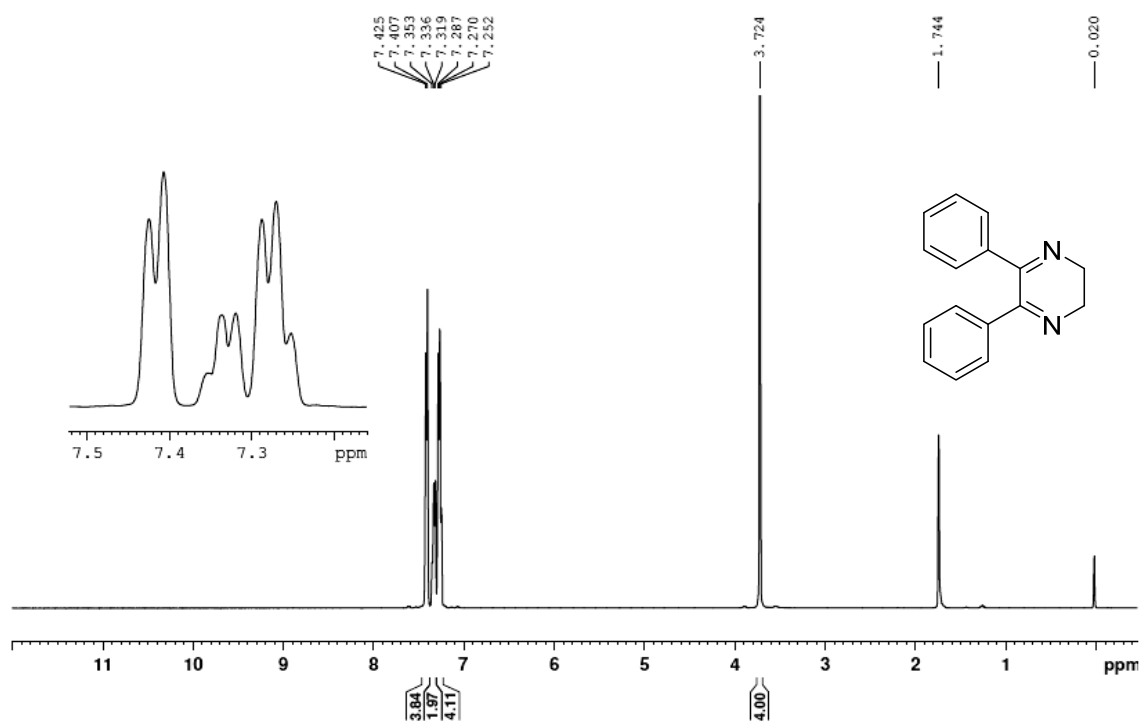
M.p: 192–193 °C; ¹H NMR (250 MHz, CDCl₃): δ= 7.42 (m,6H), 7.6 (m, 4H), 8.39 (d,1H), 8.53(dd,1H), 9.2 (d,1H, Ar-H); ¹³C NMR(62.9 MHz,CDCl₃): 123.33, 125.65, 128.49 (4C), 129.67, 129.80, 129.83 (2C), 129.91 (2C), 130.78, 138.00, 138.07, 139.97, 143.59, 147.86, 155.71, 156.34.

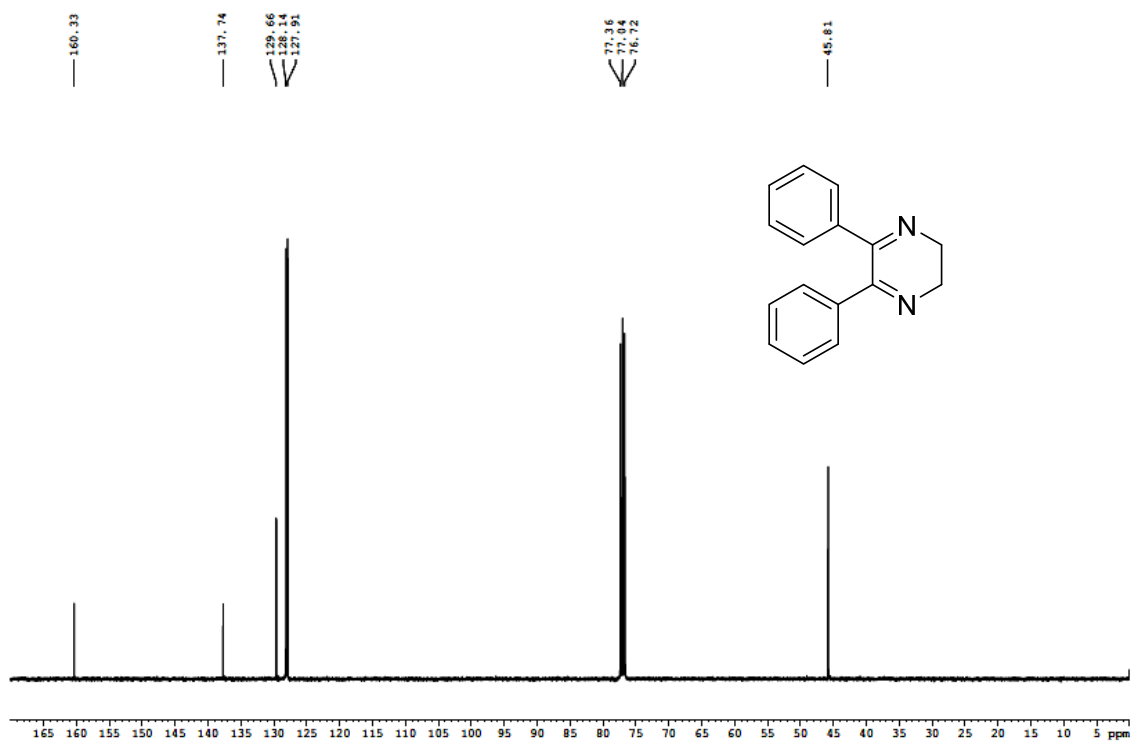




5,6-Diphenyl-2,3-dihydropyrazine (entry 6):

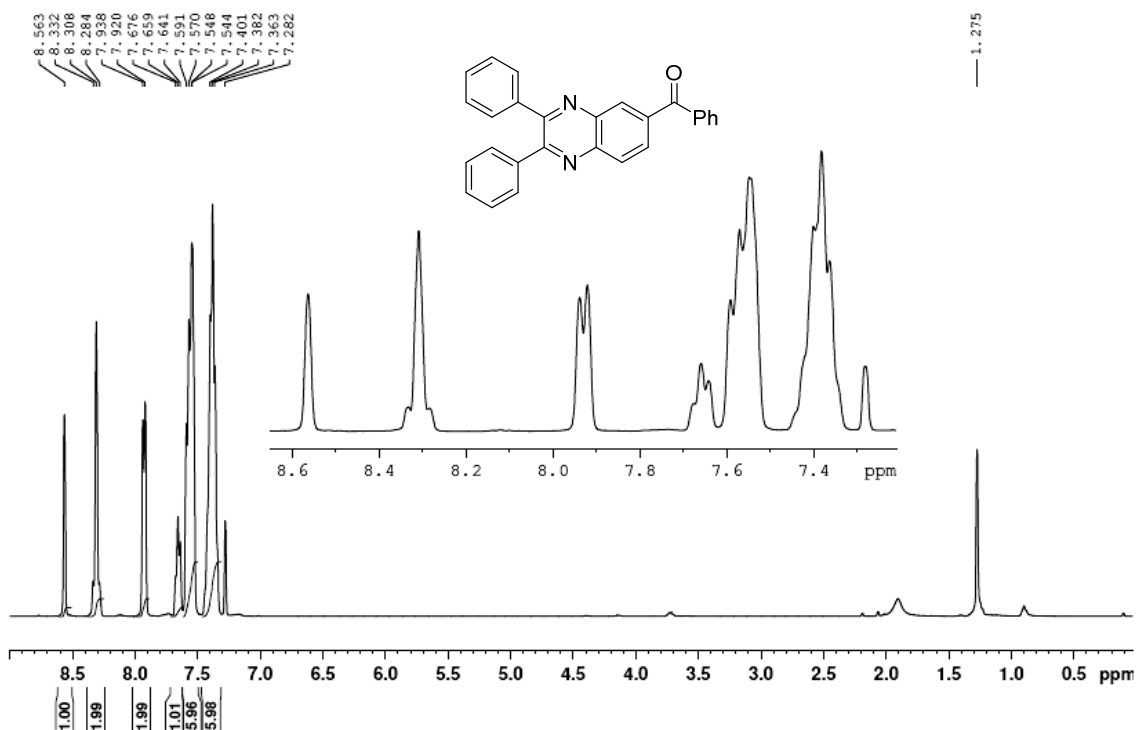
M.p 162-164 °C, ^1H NMR (250 MHz, CDCl_3): δ = 3.56 (s, 4H), 7.08-7.19 (m, 6H), 7.38-7.67 (m, 4H); ^{13}C NMR (62.9MHz, CDCl_3):38.9, 39.4, 125.7, 126.2, 127.4, 127.9, 128.3, 128.8, 129.3, 130.1, 131.2, 158.7, 159.3.

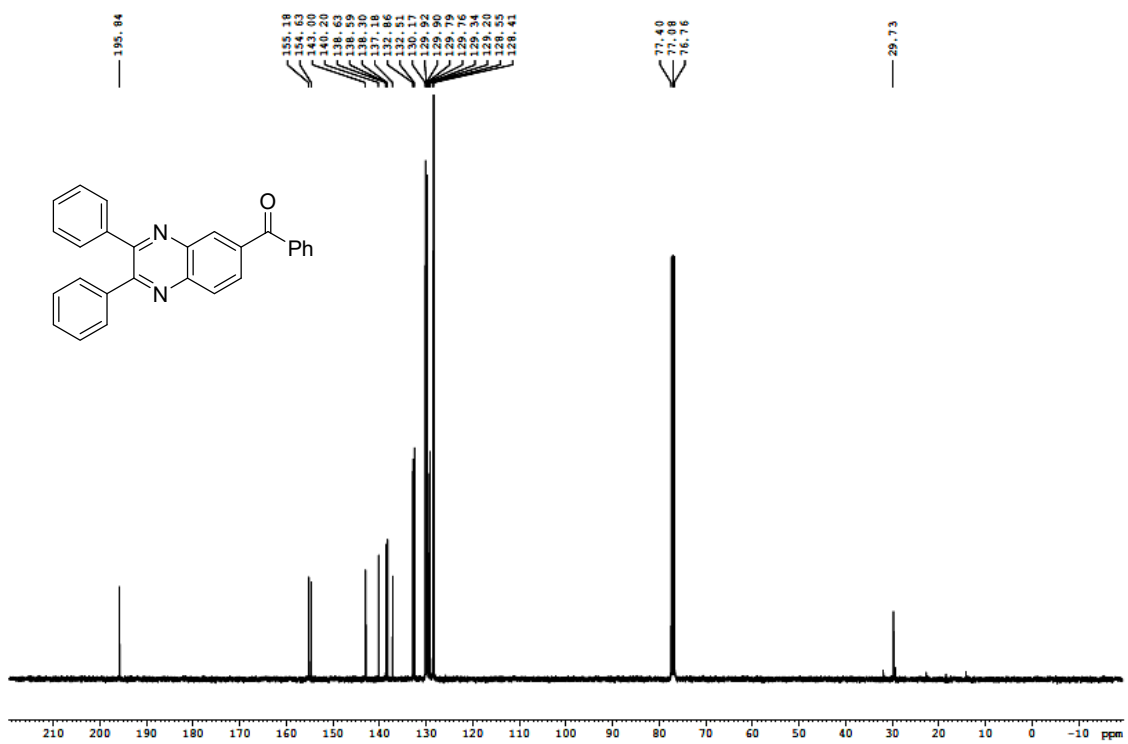




(2,3-Diphenylquinoxalin-6-yl)(phenyl)methanone (entry 7):

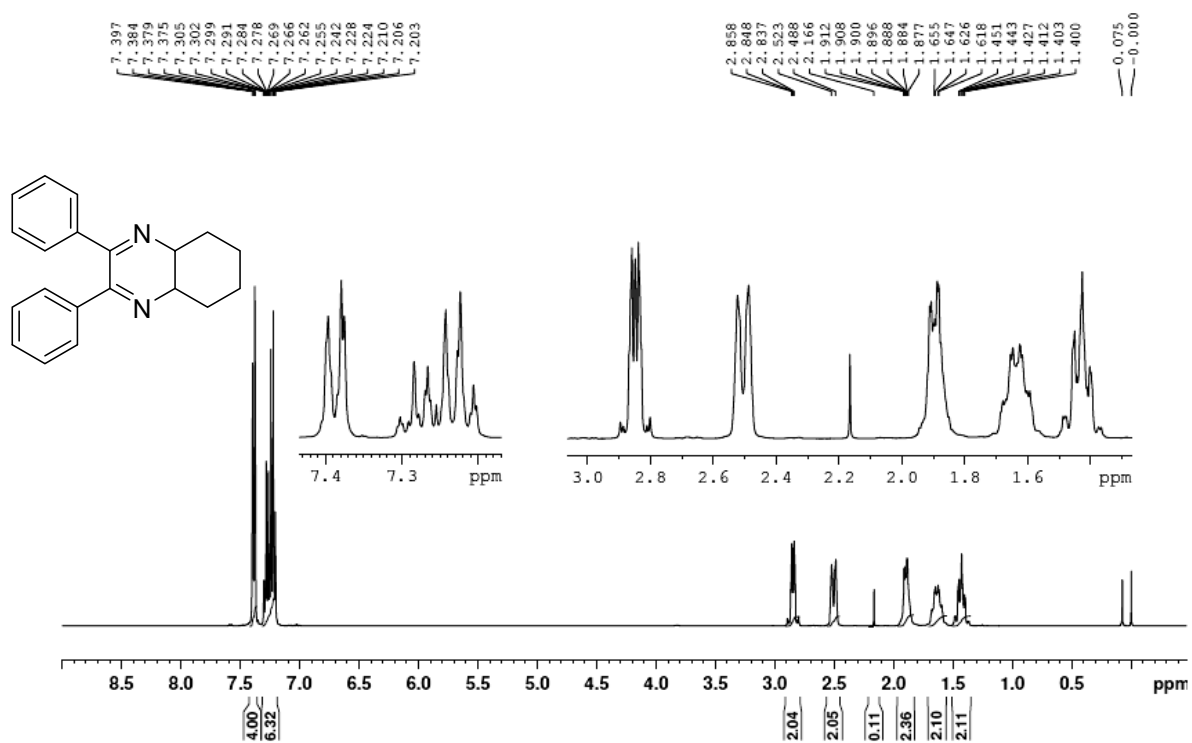
M.P. 141–142, ¹H NMR (250 MHz, CDCl₃): δ= 7.33–7.41 (m, 5H), 7.52–7.57 (m, 6H), 7.63–7.68 (m, 1H), 7.91 (d, 2H), 7.98 (d, 1H), 8.28 (d, 1H), 8.30 (d, 1H), 8.54 (s, 1H). ¹³C NMR (62.9 MHz, CDCl₃): 128.3, 128.5, 128.9, 129.1, 129.2, 129.7, 129.8, 130.1, 132.4, 132.8, 134.8, 137.1, 138.2, 138.5, 138.6, 140.1, 142.9, 154.6, 155.1, 195.7.

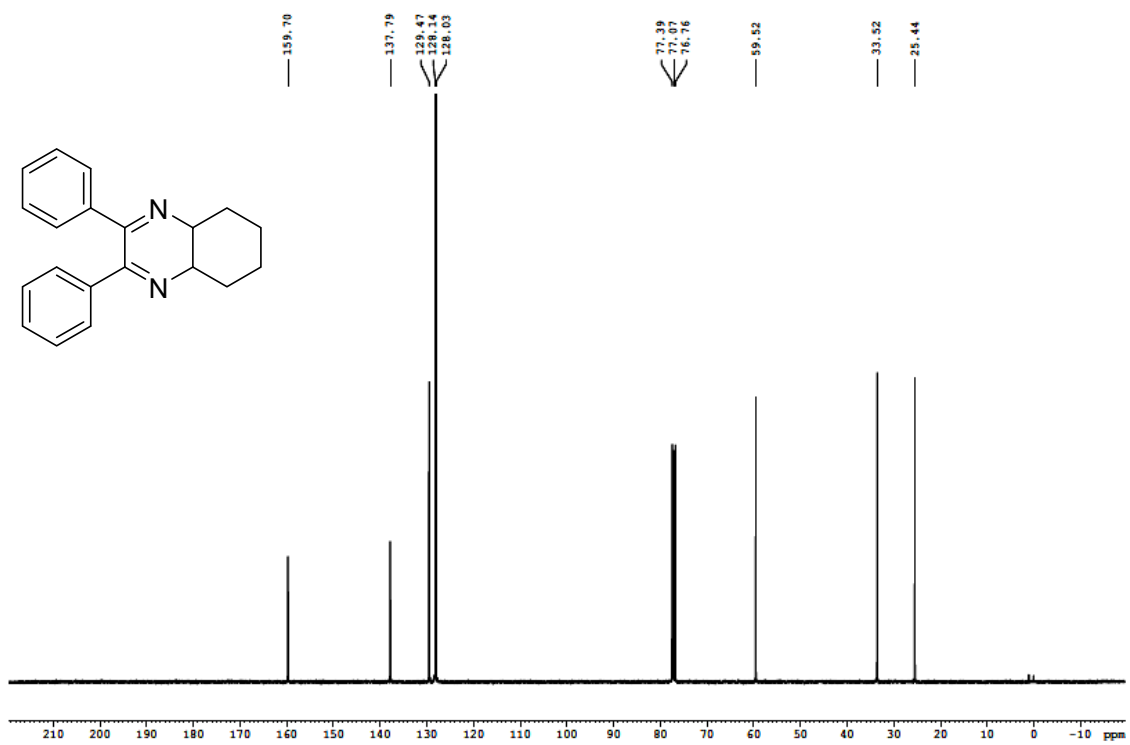




2,3-Diphenyl-4a,5,6,7,8,8a-hexahydroquinoxaline (entry 9):

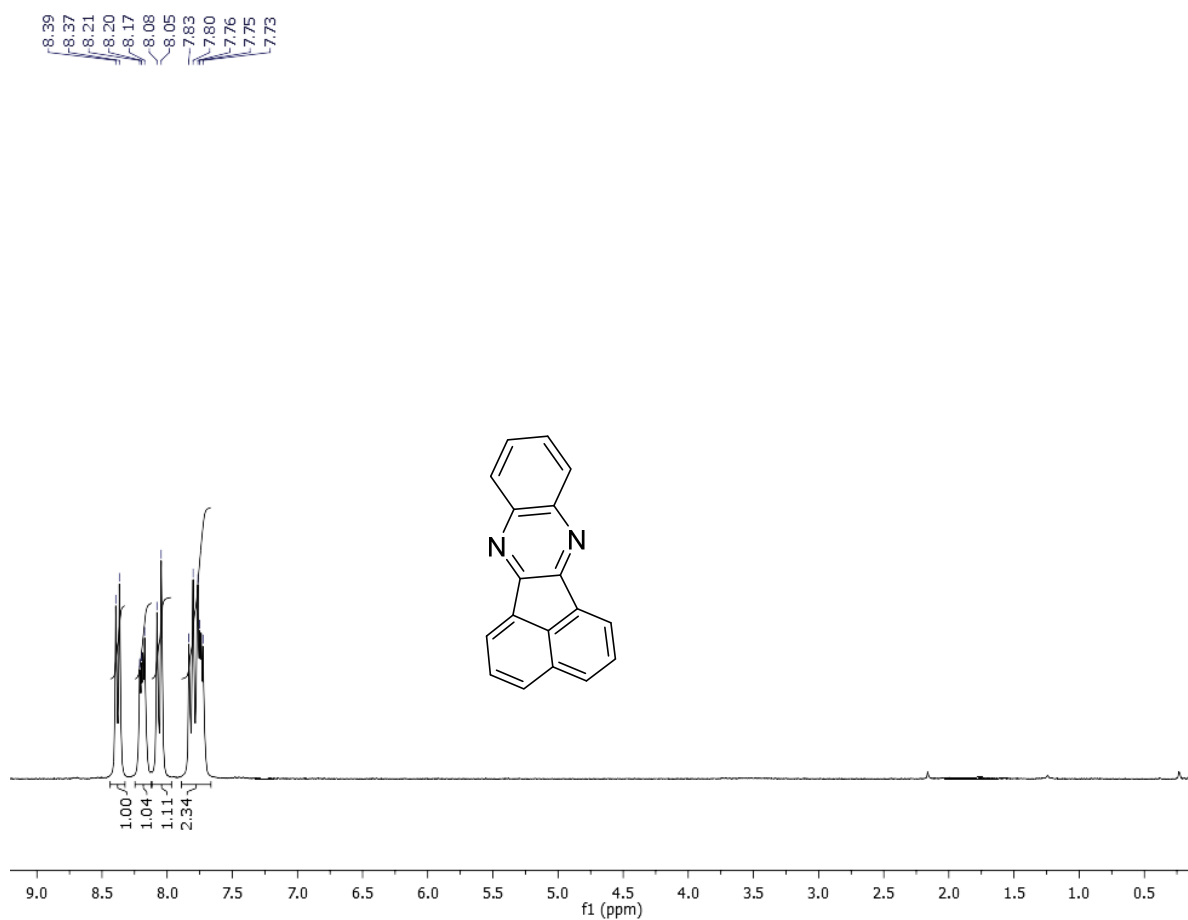
M.p: 167-168 °C; ¹H NMR (250 MHz, CDCl₃): δ= 1.48 (d, 2H), 1.68 (d, 2H), 1.95 (d, 2H), 2.56 (d, 2H), 2.90 (dd, 2H); 7.26-7.29(m, 4H), 7.31-7.35 (dd, 2H), 7.41-7.45 (d, 4H); ¹³C NMR (62.9 MHz, CDCl₃): 25.88, 33.96, 59.99, 128.46 (2C),128.54 (2C), 129.87, 138.26, 160.09.

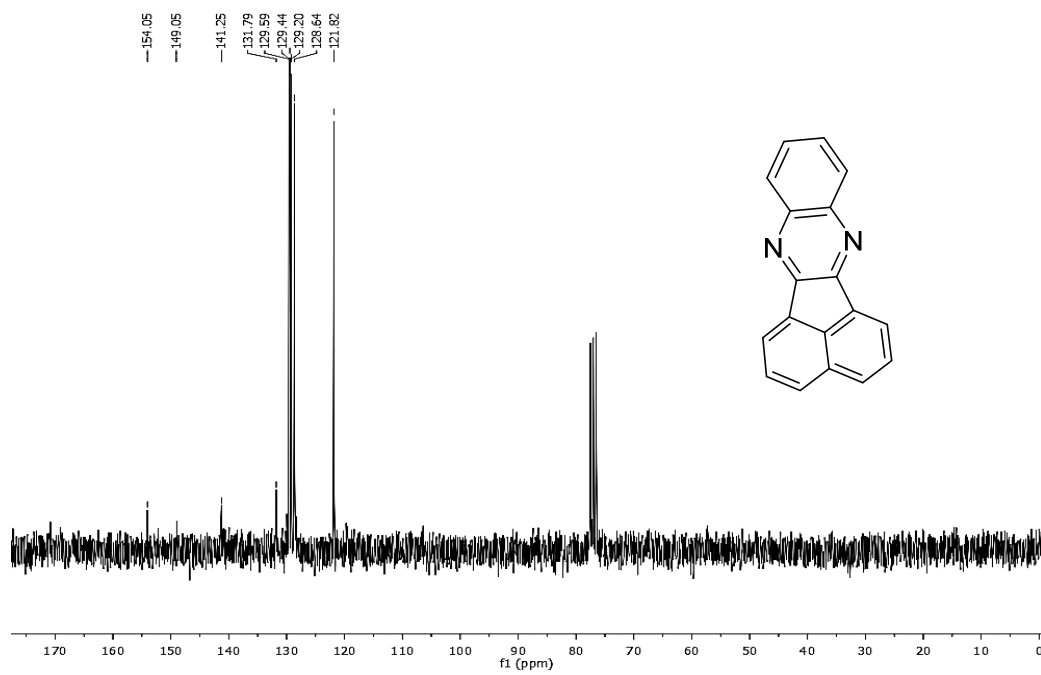
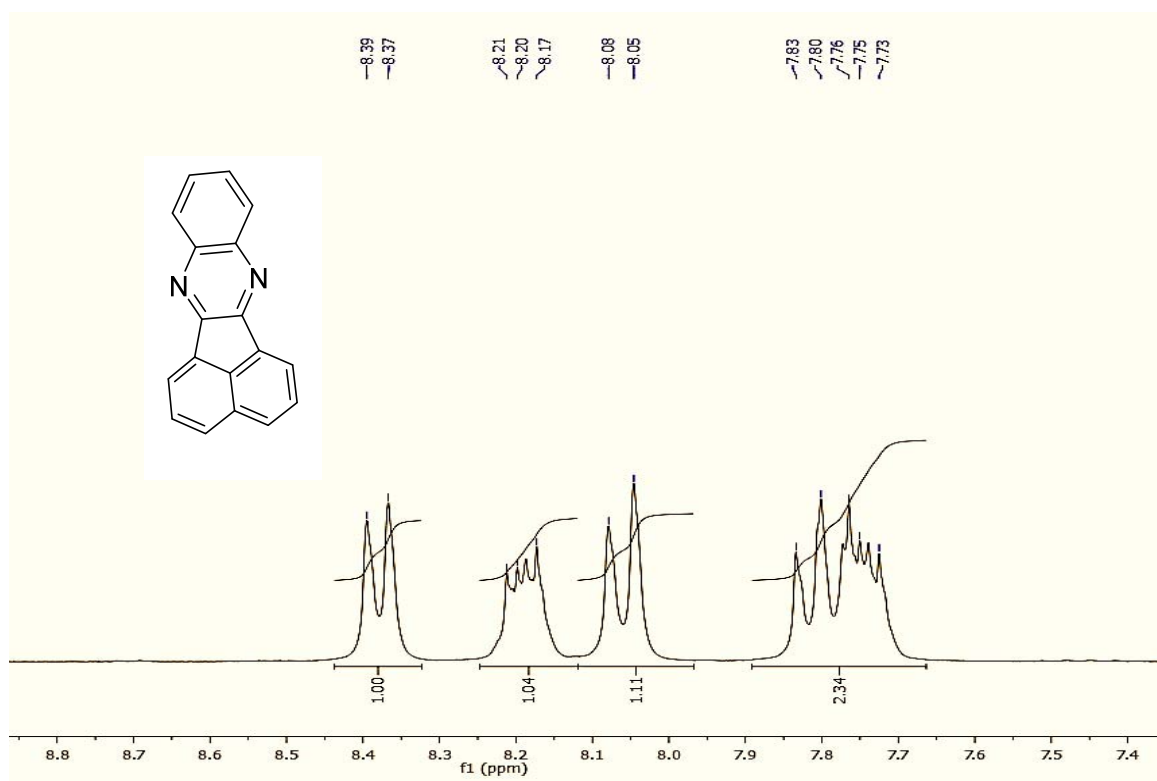




Acenaphtho[1,2-b]quinoxaline (entry 10):

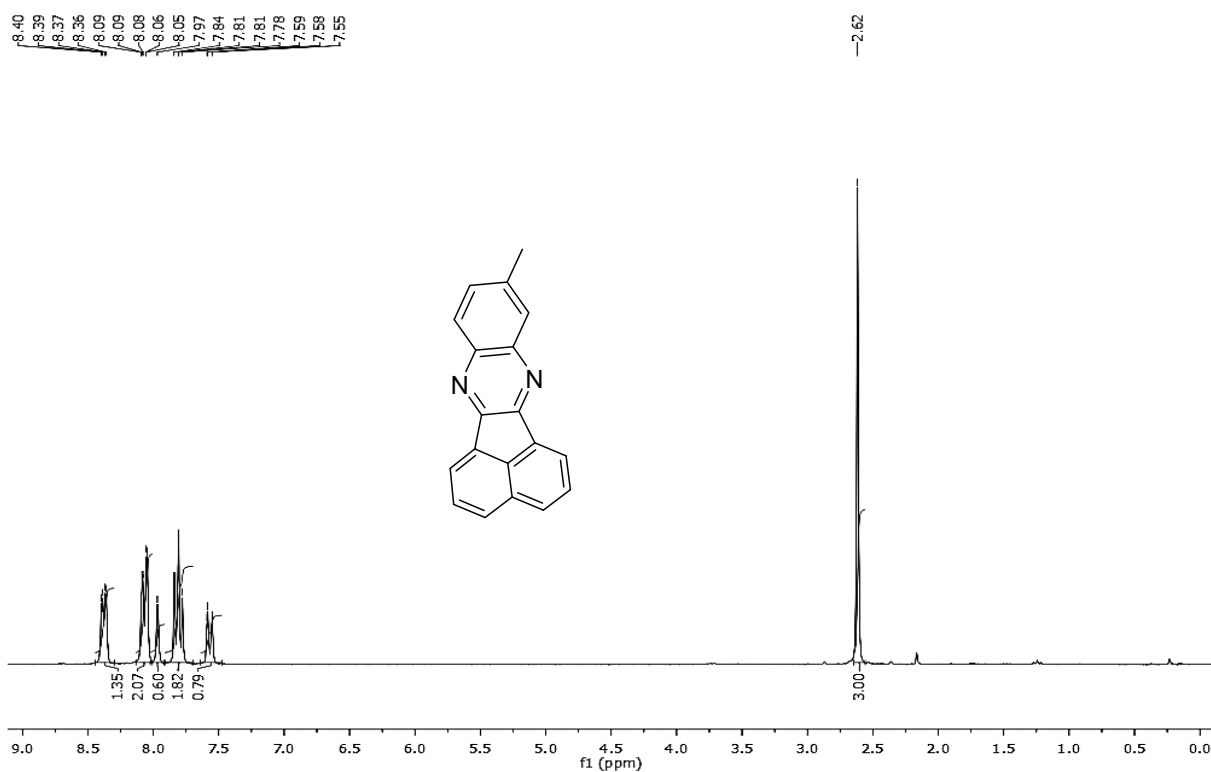
M.p: 243–244 °C. ^1H NMR (250 MHz, CDCl_3): δ = 7.72–7.74 (m, 2 H, Ar-H), 7.95 (t, 2 H, Ar-H), 8.10 (d, 2 H, Ar-H), 8.20–8.22 (m, 2 H, Ar-H), 8.45 (d, 2 H, Ar-H); ^{13}C NMR (62.9MHz, CDCl_3): 125.6, 126.5, 127.4, 128.0, 128.3, 128.9, 131.1, 133.3, 143.5, 144.9.

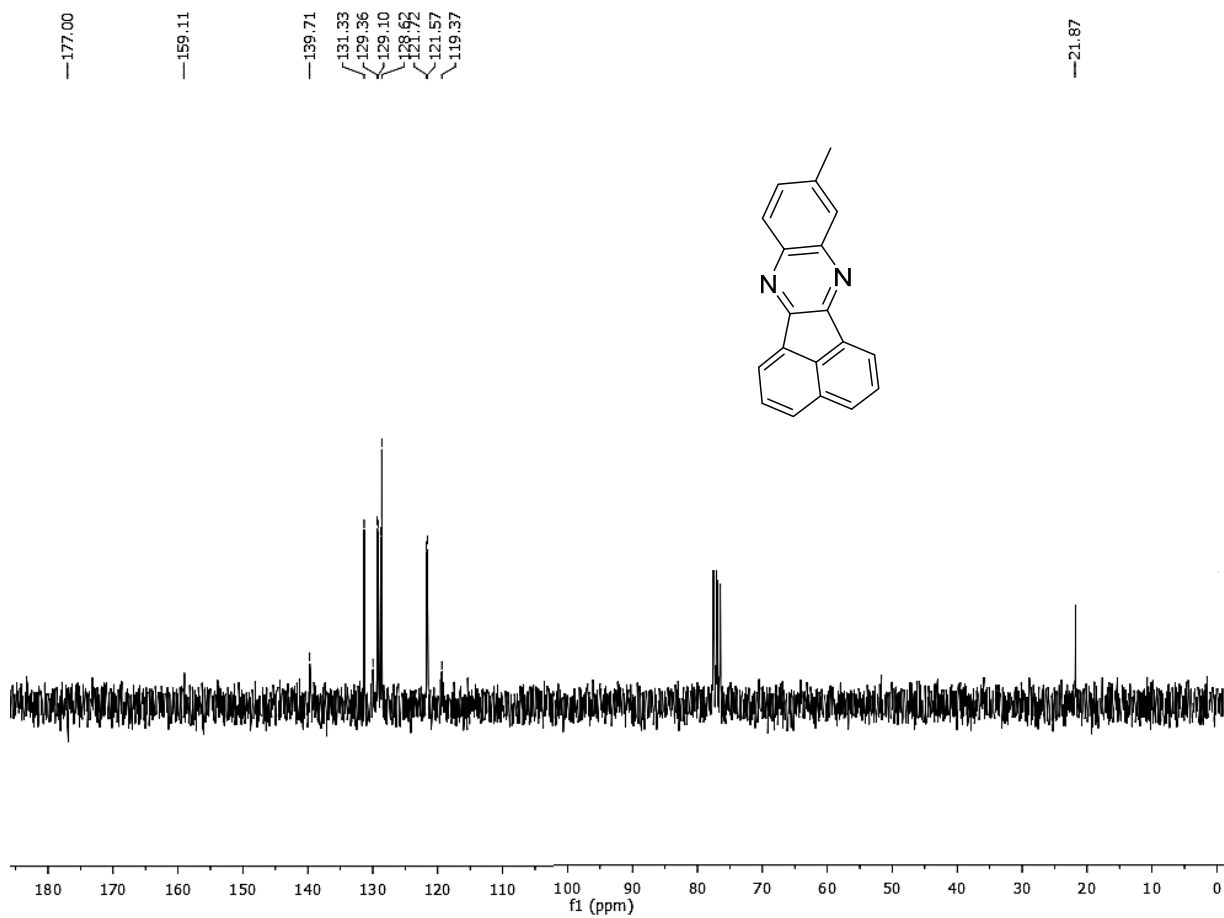
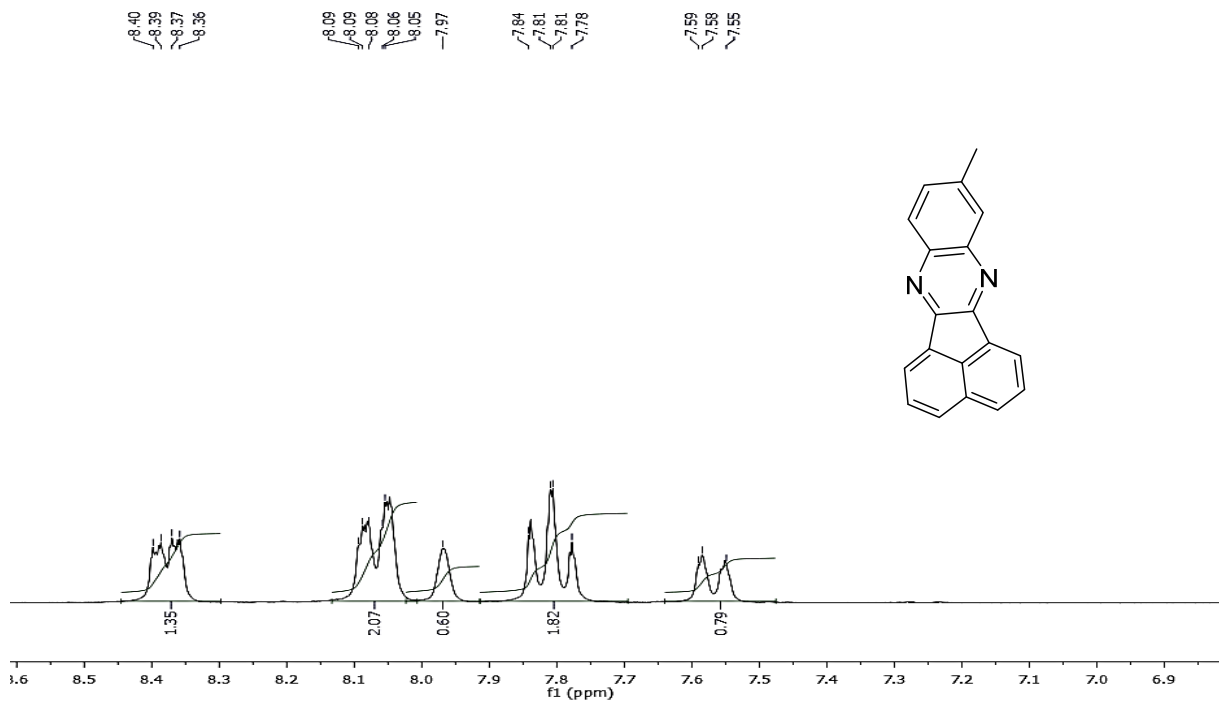




9-Methylacenaphtho[1,2-b]quinoxaline (entry 11):

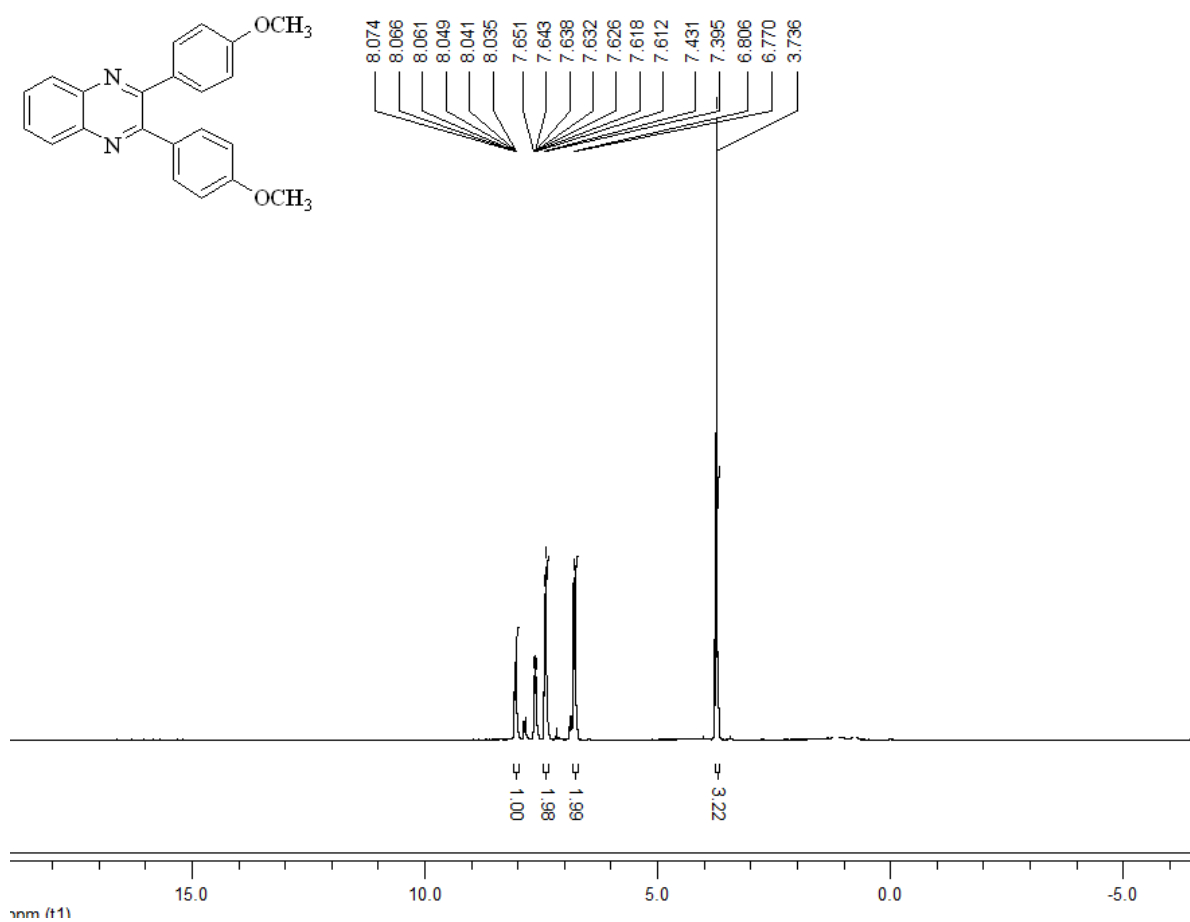
M.p >300 °C; ¹H-NMR (250 MHz, CDCl₃): δ= 2.60 (s, 3H), 7.55 (d, 1H), 7.79 (t, 2H), 7.95 (s, 1H), 8.03-8.07 (m, 3H), 8.35 (t, 2H); ¹³C NMR (62.9 MHz, CDCl₃): 22.19, 121.97, 122.12, 129.01, 129.03, 129.21, 129.53, 129.60, 129.75, 130.39, 131.72, 132.44, 136.68, 140.06, 140.10, 141.73, 153.76, 154.48.

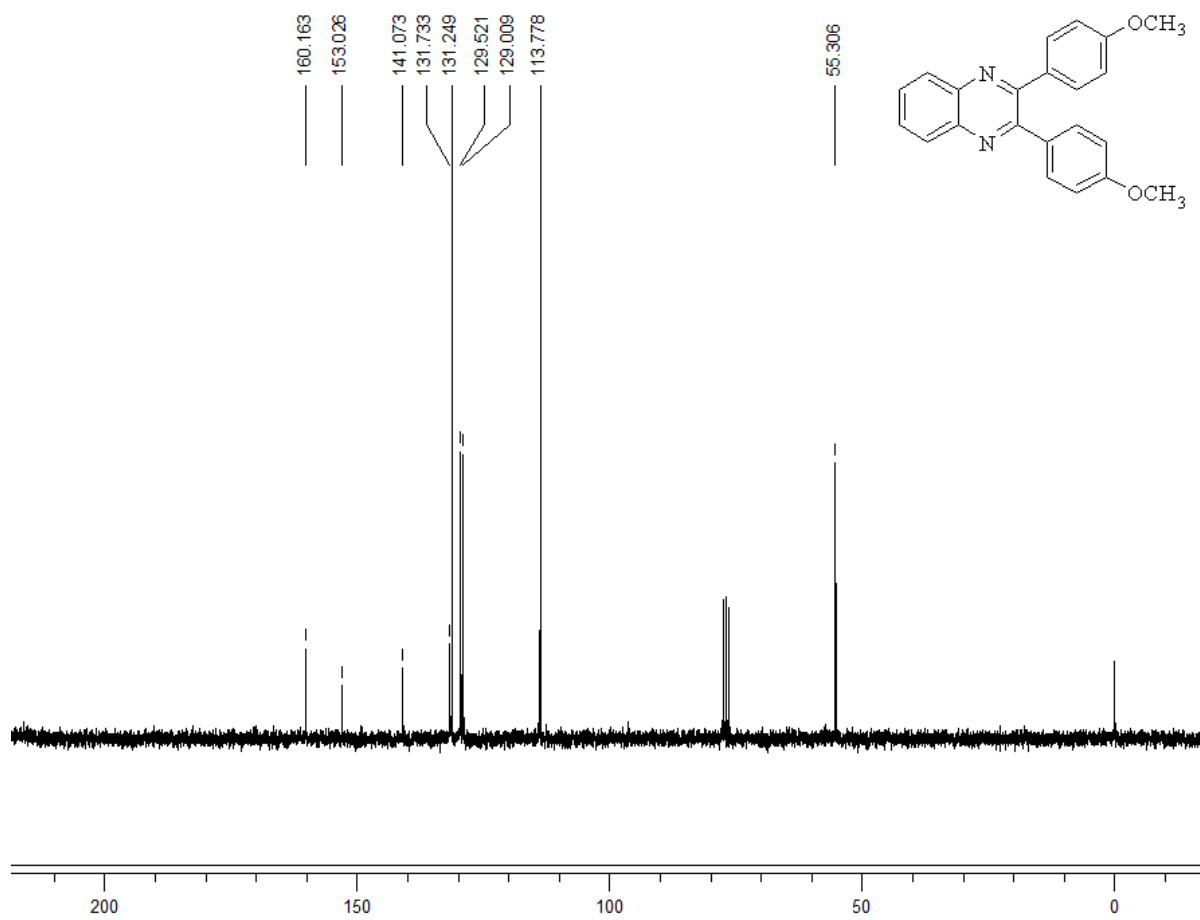




2,3-Bis(4-methoxy-phenyl) quinoxaline (entry 15):

M.p: 150–151 °C; ¹H NMR (250 MHz, CDCl₃): δ= 3.80 (s, 6H), 6.86 (d,4H, Ar-H), 7.47 (d, 4H), 7.68 (m, 2H), 8.19 (m, 2H); ¹³C NMR (62.9 MHz, CDCl₃): 55.3, 113.8, 129.0, 129.5,131.2,131.7, 141.1, 153.0,160.2.





2,3-Bis(3-methoxyphenyl)-6-nitroquinoxaline (entry 17)

M.p: 190-191 °C. ^1H NMR (250 MHz, CDCl_3): 3.86 (6H, s), 6.92,6.89 (4H, t), 7.59-7.52 (4H, m), 8.24 (1H, d), 8.48 (1H, dd), 9.02 (1H, d); ^{13}C NMR (62.9 MHz, CDCl_3): 161.02, 160.87, 155.75, 155.17, 147.58, 143.46,139.75,131.50,131.34,130.64, 130.39, 125.39, 122.87, 113.98, 55.37.

