Supplementary information

Preparation and mesomorphic properties of 1-methyl-1H-benzimidazole-based compounds

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Table s1. Melting point, clearing point and mesophase range for compounds nPPMx-M and non-1-methyl substituted analogs in heating process

| X | n | c_{6}H_{11}O-CH_{3} | m.p. (°C) | c.p. (°C) | mesophase range (°C) | C_{6}H_{11}O-H | m.p. (°C) | c.p. (°C) | mesophase range (°C) |
|---|---|---------------------|----------|----------|----------------------|----------------|----------|----------|----------------------|
| H | 4 | 168.7               | 192.7    | 24.0     | 275.8                | --            | 0        | --        | 0                    |
|   | 5 | 151.1               | 197.2    | 46.1     | 259.5                | --            | 0        | --        | 0                    |
|   | 6 | 157.9               | 199.1    | 41.2     | 255.6                | --            | 0        | --        | 0                    |
|   | 7 | 137.1               | 201.6    | 64.5     | 245.6                | 252.7         | 7.1      |           |          |
|   | 8 | 136.1               | 202.4    | 66.3     | 233.7                | 249.4         | 15.7     |           |          |
|   | 10| 135.8               | 203.1    | 67.3     | 223.0                | 248.4         | 25.4     |           |          |
|   | 14| 123.1               | 195.9    | 72.8     | 217.2                | 227.5         | 10.3     |           |          |
| CH_{3} | 4 | 149.8               | 240.2    | 90.4     | 200.2                | --            | 0        |           |          |
|    | 5 | 136.3               | 236.1    | 99.8     | 193.3                | --            | 0        |           |          |
|    | 6 | 132.9               | 235.7    | 102.8    | 199.8                | 247.8         | 48.0     |           |          |
|    | 7 | 131.7               | 235.9    | 104.2    | 195.8                | 245.9         | 50.1     |           |          |
|    | 8 | 132.8               | 234.9    | 102.1    | 197.8                | 279.2         | 81.4     |           |          |
|    | 10| 123.1               | 232.1    | 109.0    | 194.0                | 272.3         | 78.3     |           |          |
|    | 14| 104.7               | 224.2    | 119.5    | 181.4                | 250.5         | 69.1     |           |          |
| NO_{2} | 4 | 133.2               | 235.4    | 102.2    | 222.1                | --            | 0        |           |          |
|     | 5 | 116.6               | 223.7    | 107.1    | 192.1                | --            | 0        |           |          |
|     | 6 | 115.5               | 219.8    | 104.3    | 186.5                | 201.0         | 14.5     |           |          |
|     | 7 | 103.0               | 213.4    | 110.4    | 184.7                | 225.0         | 40.3     |           |          |
|     | 8 | 108.7               | 215.3    | 106.6    | 179.5                | 243.5         | 64.0     |           |          |
|     | 10| 93.4                | 219.6    | 126.2    | 176.6                | 250.0         | 73.4     |           |          |
|     | 14| 94.4                | 223.8    | 129.4    | 168.7                | 260.1         | 91.4     |           |          |
Spectroscopic data for 2-(4'-octyloxy-1,1'-biphenyl-4-yl)-1-methyl-1H,1,3-benzimidazole (nPPMx-M)

4PPMH-M: White crystals, yield 64.0%: m.p. 168.7 °C. $^1$H-NMR (400 MHz, CDCl$_3$, TMS): δ (ppm) 7.88-7.82 (m, 1H), 7.82-7.77 (m, 2H), 7.71-7.65 (m, 2H), 7.60-7.54 (m, 2H), 7.38-7.33 (m, 1H), 7.33-7.27 (m, 2H), 7.02-6.94 (m, 2H), 4.01-3.97 (t, $^3J = 6.5$ Hz, 2H), 3.83 (s, 3H), 1.85-1.73 (m, 2H), 1.58-1.45 (m, 2H), 1.01-0.97 (t, $^3J = 7.4$ Hz, 3H). IR (KBr, pellet, cm$^{-1}$): 3041, 2930, 2865, 1662, 1555, 1455, 1348, 1226, 1157, 988, 851, 728, 598, 525. EI-MS m/z (rel. int.): 356.13 (M$^+$, 4), 299.08 (21), 283.01 (4), 207.00 (100). EA: Calc. for C$_{23}$H$_{24}$N$_2$O: C 80.87, H 6.79, N 7.86; Found: C 80.67, H 6.84, N 7.79.

5PPMH-M: White crystals, yield 53.0%: m.p. 151.1 °C. $^1$H-NMR (400 MHz, CDCl$_3$, TMS): δ (ppm) 7.88-7.82 (m, 1H), 7.82-7.76 (m, 2H), 7.73-7.66 (m, 2H), 7.61-7.53 (m, 2H), 7.39-7.34 (m, 1H), 7.33-7.28 (m, 2H), 7.03-6.95 (m, 2H), 4.02-3.96 (t, $^3J = 6.5$ Hz, 2H), 3.85 (s, 3H), 1.89-1.74 (m, 2H), 1.54-1.33 (m, 4H), 1.01-0.90 (t, $^3J = 7.1$ Hz, 3H). IR (KBr, pellet, cm$^{-1}$): 3052, 2924, 2860, 1741, 1644, 1590, 1471, 1375, 1255, 1051, 954, 889, 826, 718, 640, 629, 536, 513. EI-MS m/z (rel. int.): 370.15 (M$^+$, 9), 299.06 (14), 283.00 (4), 206.99 (100). EA: Calc. for C$_{23}$H$_{25}$N$_2$O: C 81.05, H 7.07, N 7.56; Found: C 80.83, H 7.14, N 7.53.

6PPMH-M: White crystals, yield 55.3%: m.p. 157.9 °C. $^1$H-NMR (400 MHz, CDCl$_3$, TMS): δ (ppm) 7.87-7.82 (m, 1H), 7.82-7.78 (m, 2H), 7.72-7.66 (m, 2H), 7.60-7.54 (m, 2H), 7.40-7.34 (m, 1H), 7.34-7.28 (m, 2H), 7.02-6.96 (m, 2H), 4.02-3.96 (t, $^3J = 6.6$ Hz, 2H), 3.86 (s, 3H), 1.86-1.75 (m, 2H), 1.53-1.31 (m, 6H), 0.95-0.88 (t, $^3J = 7.1$ Hz, 3H). IR (KBr, pellet, cm$^{-1}$): 3073, 2939, 2869, 1708, 1644, 1590, 1461, 1449, 1385, 1245, 815, 729, 617, 524. EI-MS m/z (rel. int.): 384.13 (M$^+$, 3), 299.06 (15), 282.99 (4), 206.99 (100). EA: Calc. for C$_{24}$H$_{26}$N$_2$O: C 81.21, H 7.34, N 7.29; Found: C 80.78, H 7.38, N 7.14.

7PPMH-M: White crystals, yield 58.3%: m.p. 137.1 °C. $^1$H-NMR (400 MHz, CDCl$_3$, TMS): δ (ppm) 7.87-7.82 (m, 1H), 7.82-7.77 (m, 2H), 7.74-7.65 (m, 2H), 7.61-7.53 (m, 2H), 7.37-7.34 (m, 1H), 7.34-7.27 (m, 2H), 7.05-6.95 (m, 2H), 4.01-3.95 (t, $^3J = 6.5$ Hz, 2H), 3.84 (s, 3H), 1.88-1.76 (m, 2H), 1.53-1.28 (m, 8H), 1.00-0.86 (t, $^3J = 6.7$ Hz, 3H). IR (KBr, pellet, cm$^{-1}$): 3025, 2924, 2838, 1718, 1632, 1461, 1364, 1255, 1137, 933, 826, 729, 640, 547, 501. EI-MS m/z (rel. int.): 398.19 (M$^+$, 6), 299.09 (30), 283.01 (4), 207.00 (100). EA: Calc. for C$_{25}$H$_{28}$N$_2$O: C 81.37, H 7.59, N 7.03; Found: C 81.05, H 7.51, N 7.03.

8PPMH-M: White crystals, yield 63.5%: m.p. 136.1 °C. $^1$H-NMR (400 MHz, CDCl$_3$, TMS): δ (ppm) 7.87-7.83 (m, 1H), 7.82-7.77 (m, 2H), 7.72-7.66 (m, 2H), 7.61-7.52 (m, 2H), 7.39-7.34 (m, 1H), 7.34-7.27 (m, 2H), 7.03-7.94 (m, 2H), 4.02-3.96 (t, $^3J = 6.5$ Hz, 2H), 3.86 (s, 3H), 1.88-1.74 (m, 2H), 1.52-1.26 (m, 10H), 0.96-0.85 (t, $^3J = 6.7$ Hz, 3H). IR (KBr, pellet, cm$^{-1}$): 3037, 2935, 2849, 1654, 1590, 1471, 1396, 1245, 1127,
1019, 965, 826, 718, 647, 549, 501. EI-MS m/z (rel. int.): 412.18 (M⁺, 6), 299.10 (8), 282.01 (6), 207.00 (100). EA: Calc. for C₂₈H₃₂N₂O: C 81.51, H 7.82, N 6.79; Found: C 81.43, H 8.12, N 6.42.

**10PPMH-M:** White crystals, yield 65.3%; m.p. 135.8 °C. ¹H-NMR (400 MHz, CDCl₃, TMS): δ (ppm) 7.87-7.82 (m, 1H), 7.82-7.77 (m, 2H), 7.72-7.66 (m, 2H), 7.62-7.52 (m, 2H), 7.39-7.34 (m, 1H), 7.33-7.28 (m, 2H), 7.03-6.93 (m, 2H), 4.02-3.95 (t, ³J = 6.5 Hz, 2H), 3.85 (s, 3H), 1.88-1.74 (m, 2H), 1.54-1.24 (m, 14H), 0.98-0.82 (t, ³J = 6.8 Hz, 3H). IR (KBr, pellet, cm⁻¹): 3026, 2935, 2838, 1729, 1644, 1568, 1461, 1364, 1278, 1127, 933, 826, 718, 640, 582, 501. EI-MS m/z (rel. int.): 440.25 (M⁺, 4), 299.10 (6), 283.02 (5), 207.00 (100). EA: Calc. for C₃₀H₃₆N₂O: C 81.78, H 8.24, N 6.36; Found: C 81.33, H 8.21, N 6.39.

**14PPMH-M:** White crystals, yield 58.9%; m.p. 123.1 °C. ¹H-NMR (400 MHz, CDCl₃, TMS): δ (ppm) 7.87-7.83 (m, 1H), 7.82-7.77 (m, 2H), 7.72-7.66 (m, 2H), 7.59-7.55 (m, 2H), 7.41-7.36 (m, 1H), 7.34-7.29 (m, 2H), 7.02-6.96 (m, 2H), 4.03-3.95 (t, ³J = 6.6 Hz, 2H), 3.87 (s, 3H), 1.90-1.74 (m, 2H), 1.54-1.17 (m, 22H), 0.93-0.84 (t, ³J = 6.8 Hz, 3H). IR (KBr, pellet, cm⁻¹): 3042, 2935, 2838, 1762, 1654, 1514, 1364, 1255, 1116, 1030, 901, 815, 739, 641, 559, 501. MS (MOLDI-TOF) m/z calcd. for C₃₄H₄₄N₂O (M⁺): 496.73. Found: 496.00. EA: Calc. for C₃₄H₄₄N₂O: C 82.21, H 8.93, N 5.64; Found: C 82.69, H 8.82, N 5.56.

**4PPMM-M:** White crystals, yield 71.2%; m.p. 149.8 °C. ¹H-NMR (400 MHz, CDCl₃, TMS): δ (ppm) 7.81-7.75 (m, 2H), 7.73-7.64 (m, 3H), 7.59-7.53 (m, 2H), 7.17-7.09 (m, 2H), 7.01-6.94 (m, 2H), 4.01-3.95 (t, ³J = 6.5 Hz, 2H), 3.79 (s, 3H), 2.51 (s, 2H), 1.84-1.74 (m, 2H), 1.57-1.44 (m, 2H), 1.02-0.96 (t, ³J = 8.0 Hz, 3H). IR (KBr, pellet, cm⁻¹): 3051, 2917, 2835, 1708, 1639, 1569, 1441, 1371, 1232, 1127, 1034, 918, 790, 722, 629, 547. EI-MS m/z (rel. int.): 370.14 (M⁺, 3), 313.07 (4), 283.00 (4), 207.00 (100). EA: Calc. for C₂₉H₂₆N₂O: C 81.05, H 7.07, N 7.56; Found: C 79.98, H 7.20, N 7.42.

**5PPMM-M:** White crystals, yield 69.3%; m.p. 136.3 °C. ¹H-NMR (400 MHz, CDCl₃, TMS): δ (ppm) 7.83-7.75 (m, 2H), 7.91-7.52 (m, 3H), 7.59-7.48 (m, 2H), 7.19-7.09 (m, 2H), 7.02-6.91 (m, 2H), 4.06-3.92 (t, ³J = 6.7 Hz, 2H), 3.82 (s, 3H), 2.51 (s, 2H), 1.89-1.75 (m, 2H), 1.52-1.37 (m, 4H), 0.98-0.91 (t, ³J = 7.1 Hz, 3H). IR (KBr, pellet, cm⁻¹): 3047, 2957, 2860, 1764, 1632, 1482, 1352, 1255, 1127, 1030, 933, 836, 739, 621, 524. EI-MS m/z (rel. int.): 384.08 (M⁺, 5), 313.10 (4), 283.01 (4), 206.99 (100). EA: Calc. for C₂₉H₂₈N₂O: C 81.21, H 7.34, N 7.29; Found: C 80.96, H 7.39, N 7.25.

**6PPMM-M:** White crystals, yield 58.3%; m.p. 132.9 °C. ¹H-NMR (400 MHz, CDCl₃, TMS): δ (ppm) 7.80-7.75 (m, 2H), 7.74-7.64 (m, 3H), 7.59-7.52 (m, 2H), 7.18-7.08 (m, 2H), 7.02-6.94 (m, 2H), 4.05-3.93 (t, ³J = 6.5 Hz, 2H), 3.79 (s, 3H), 2.51 (s, 3H), 1.87-1.75 (m, 2H), 1.54-1.31 (m, 6H), 0.92 (t, ³J = 6.8 Hz, 3H). IR (KBr, pellet, cm⁻¹): 3036, 2935, 2871, 1708, 1651, 1590, 1461, 1385, 1234, 1127, 1040, 944, 836, 718,
617, 547. EI-MS m/z (rel. int.): 398.16 (M⁺, 4), 313.08 (13), 283.00 (5), 206.99 (100). EA: Calc. for C₂₇H₃₀N₂O: C 81.37, H 7.59. Found: C 81.28, H 7.56, N 6.87.

7PPMM-M: White crystals, yield 64.1%; m.p. 131.7 °C. ¹H-NMR (400 MHz, CDCl₃, TMS): δ (ppm) 7.83-7.75 (m, 2H), 7.74-7.64 (m, 3H), 7.60-7.53 (m, 2H), 7.18-7.10 (m, 2H), 7.03-6.90 (m, 2H), 4.03-3.93 (t, ³J = 6.6 Hz, 2H), 3.81 (s, 3H), 2.51 (s, 3H), 1.87-1.74 (m, 2H), 1.57-1.25 (m, 8H), 0.97-0.81 (t, ³J = 7.1 Hz, 3H). IR (KBr, pellet, cm⁻¹): 3062, 2924, 2849, 1741, 1665, 1590, 1493, 1364, 1224, 1116, 1072, 944, 804, 706, 617, 559, 489. EI-MS m/z (rel. int.): 412.21 (M⁺, 25), 313.09 (100), 283.06 (6), 207.01 (30.61). EA: Calc. for C₂₈H₃₂N₂O: C 81.51, H 7.82, N 6.79; Found: C 81.25, H 7.77, N 6.80.

8PPMM-M: White crystals, yield 59.8%; m.p. 132.8 °C. ¹H-NMR (400 MHz, CDCl₃, TMS): δ (ppm) 7.85-7.77 (m, 2H), 7.74-7.66 (m, 3H), 7.62-7.55 (m, 2H), 7.20-7.11 (m, 2H), 7.03-6.96 (m, 2H), 4.03-3.97 (t, ³J = 6.7 Hz, 2H), 3.88 (s, 3H), 2.51 (s, 3H), 1.90-1.74 (m, 2H), 1.56-1.20 (m, 10H), 0.94-0.83 (t, ³J = 6.8 Hz, 3H). IR (KBr, pellet, cm⁻¹): 3054, 2963, 2838, 2375, 1718, 1665, 1514, 1364, 1245, 1040, 998, 847, 739, 629, 547, 489. EI-MS m/z (rel. int.): 426.24 (M⁺, 4), 313.11 (14), 282.04 (7), 207.01 (100). EA: Calc. for C₂₉H₃₄N₂O: C 81.65, H 8.03, N 6.57; Found: C 81.72, H 7.94, N 6.69.

10PPMM-M: White crystals, yield 71.0%; m.p. 123.1 °C. ¹H-NMR (400 MHz, CDCl₃, TMS): δ (ppm) 7.83-7.75 (m, 2H), 7.72-7.64 (m, 3H), 7.61-7.53 (m, 2H), 7.20-7.10 (m, 2H), 7.02-6.95 (m, 2H), 4.01-3.98 (t, ³J = 6.7 Hz, 2H), 3.90 (s, 3H), 2.49 (s, 3H), 1.88-1.75 (m, 2H), 1.37 (m, 14H), 0.90 (t, ³J = 6.8 Hz, 3H). IR (KBr, pellet, cm⁻¹): 3033, 2919, 2840, 1767, 1615, 1508, 1387, 1251, 1144, 1023, 811, 750, 639, 540. EI-MS m/z (rel. int.): 454.25 (M⁺, 5), 313.08 (5), 283.02 (5), 207.02 (100). EA: Calc. for C₃₀H₃₆N₂O: C 81.89, H 8.42, N 6.16; Found: C 81.45, H 8.39, N 6.14.

14PPMM-M: White crystals, yield 63.2%; m.p. 104.7 °C. ¹H-NMR (400 MHz, CDCl₃, TMS): δ (ppm) 7.83-7.75 (m, 2H), 7.72-7.63 (m, 3H), 7.58-7.52 (m, 2H), 7.21-7.10 (m, 2H), 7.01-6.94 (m, 2H), 4.02-3.96 (t, ³J = 8.0 Hz, 2H), 3.85 (s, 3H), 2.51 (s, 3H), 1.87-1.70 (m, 2H), 1.52-1.18 (m, 22H), 0.91-0.81 (t, ³J = 6.3 Hz, 3H). IR (KBr, pellet, cm⁻¹): 3023, 2924, 2838, 1718, 1654, 1482, 1385, 1234, 1127, 1030, 922, 815, 718, 632, 536. MS (MOLDI-TOF) m/z calcd. for C₁₃H₁₆N₂O (M⁺) 510.75. Found: 510.10. EA: Calc. for C₁₃H₁₆N₂O: C 82.30, H 9.08, N 5.48; Found: C 81.89, H 8.90, N 5.52.

4PPMN-M: Yellow crystals, yield 58.3%; m.p. 133.2 °C. ¹H-NMR (400 MHz, CDCl₃, TMS): δ (ppm) 8.39-8.28 (d, ⁴J = 2.2 Hz, 1H), 8.25-8.15 (m, 1H), 7.87-7.77 (m, 3H), 7.76-7.67 (m, 2H), 7.60-7.52 (m, 2H), 7.01-6.91 (m, 2H), 4.03-3.93 (m, 5H), 1.84-1.73 (m, 2H), 1.63-1.40 (m, 2H), 1.07-0.91 (t, ³J = 8.0 Hz, 3H). IR (KBr, pellet, cm⁻¹): 3064, 2935, 2860, 1665, 1525, 1461, 1352, 1255, 1095, 998, 836, 729, 699, 594. EI-MS
m/z (rel. int.): 401.07 (M+, 13), 345.06 (14), 282.04 (10), 206.98 (100). EA: Calc. for C_{26}H_{25}N_{3}O_{5}: C 71.80, H 5.77, N 10.47; Found: C 71.47, H 5.83, N 10.38.

5PPMN-M: Yellow crystals, yield 51.2%; m.p. 116.6 °C. ^1^H-NMR (400 MHz, CDCl_3, TMS): δ (ppm) 8.40-8.32 (d, ^4^J = 1.6 Hz, 1H), 8.27-8.18 (m, 1H), 7.88-7.78 (m, 3H), 7.77-7.69 (m, 2H), 7.63-7.52 (m, 2H), 7.03-6.94 (m, 2H), 4.02-3.94 (m, 5H), 1.90-1.76 (m, 2H), 1.51-1.33 (m, 4H), 0.96-0.90 (t, ^3^J = 7.1 Hz, 3H). IR (KBr, pellet, cm⁻¹): 3065, 2938, 2811, 1753, 1591, 1521, 1335, 1230, 1102, 1033, 917, 824, 742, 627, 571, 513. EI-MS m/z (rel. int.): 415.10 (M+, 8), 345.04 (11), 282.07 (5), 206.99 (100). EA: Calc. for C_{25}H_{25}N_{3}O_{5}: C 72.27, H 6.06, N 10.11; Found: C 71.53, H 6.21, N 9.70.

6PPMN-M: Yellow crystals, yield 65.4%; m.p. 115.5 °C. ^1^H-NMR (400 MHz, CDCl_3, TMS): δ (ppm) 8.37-8.29 (d, ^4^J = 2.0 Hz, 1H), 8.26-8.16 (m, 1H), 7.87-7.76 (m, 3H), 7.77-7.67 (m, 2H), 7.62-7.51 (m, 2H), 7.04-6.92 (m, 2H), 4.03-3.89 (m, 5H), 1.84-1.70 (m, 2H), 1.53-1.27 (m, 6H), 0.97-0.81 (t, ^3^J = 7.0 Hz, 3H). IR (KBr, pellet, cm⁻¹): 3073, 2962, 2834, 1730, 1637, 1521, 1346, 1288, 1102, 1033, 928, 835, 742, 639, 571, 513. EI-MS m/z (rel. int.): 429.08 (M+, 5), 345.06 (4), 283.01 (4), 207.00 (100). EA: Calc. for C_{26}H_{25}N_{3}O_{5}: C 72.71, H 6.34, N 9.78; Found: C 72.64, H 6.41, N 9.66.

7PPMN-M: Yellow crystals, yield 59.6%; m.p. 103.0 °C. ^1^H-NMR (400 MHz, CDCl_3, TMS): δ (ppm) 8.47-8.32 (d, ^4^J = 2.1 Hz, 1H), 8.29-8.18 (m, 1H), 7.94-7.81 (m, 3H), 7.80-7.70 (m, 2H), 7.66-7.49 (m, 2H), 7.06-7.88 (m, 2H), 4.07-3.98 (m, 5H), 1.89-1.75 (m, 2H), 1.52-1.25 (m, 8H), 0.98-0.84 (t, ^3^J = 6.8 Hz, 3H). IR (KBr, pellet, cm⁻¹): 3041, 2938, 2869, 1730, 1660, 1509, 1346, 1230, 1114, 998, 824, 697, 559, 513. EI-MS m/z (rel. int.): 443.16 (M+, 3), 345.06 (6), 283.01 (4), 207.01 (100). EA: Calc. for C_{27}H_{25}N_{3}O_{5}: C 73.11, H 6.59, N 9.47; Found: C 72.57, H 5.62, N 9.38.

8PPMN-M: Yellow crystals, yield 61.2%; m.p. 108.7 °C. ^1^H-NMR (400 MHz, CDCl_3, TMS): δ (ppm) 8.41-8.34 (d, ^4^J = 2.0 Hz, 1H), 8.28-8.20 (m, 1H), 7.88-7.79 (m, 3H), 7.76-7.71 (m, 2H), 7.63-7.55 (m, 2H), 7.07-6.93 (m, 2H), 4.12-3.90 (m, 5H), 1.85-1.78 (m, 2H), 1.52-1.22 (m, 10H), 0.92-0.84 (t, ^3^J = 7.0 Hz, 3H). IR (KBr, pellet, cm⁻¹): 3060, 2938, 2868, 1788, 1614, 1498, 1335, 1265, 1102, 1010, 940, 789, 732, 640, 547. EI-MS m/z (rel. int.): 457.18 (M+, 12), 345.08 (20), 283.03 (5), 207.03 (100). EA: Calc. for C_{28}H_{25}N_{3}O_{5}: C 73.50, H 6.83, N 9.18; Found: C 73.32, H 6.88, N 9.15.

10PPMN-M: Yellow crystals, yield 64.3%; m.p. 93.4 °C. ^1^H-NMR (400 MHz, CDCl_3, TMS): δ (ppm) 8.40-8.33 (d, ^4^J = 2.2 Hz, 1H), 8.26-8.15 (m, 1H), 7.92-7.78 (m, 3H), 7.77-7.68 (m, 2H), 7.66-7.51 (m, 2H), 7.07-6.90 (m, 2H), 4.14-3.86 (m, 5H), 1.94-1.64 (m, 2H), 1.55-1.19 (m, 14H), 0.94-0.75 (t, ^3^J = 6.9 Hz, 3H). IR (KBr, pellet, cm⁻¹): 3056, 2927, 2834, 1730, 1637, 1521, 1358, 1265, 1184, 1102, 1033, 812, 742, 617, 559,
489. MS (MOLDI-TOF) m/z calcd. for C$_{30}$H$_{35}$N$_3$O$_3$ (M$^+$) 485.62. Found: 486.00. EA: Calc. for C$_{30}$H$_{35}$N$_3$O$_3$: C 74.20, H 7.26, N 8.65; Found: C 74.27, H 7.32, N 8.73.

**14PPMN-M:** Yellow crystals, yield 59.3%; m.p. 94.4 °C. $^1$H-NMR (400 MHz, CDCl$_3$, TMS): $\delta$ (ppm) 8.38-8.31 (d, $^4J = 2.0$ Hz, 1H), 8.28-8.15 (m, 1H), 7.89-7.78 (m, 3H), 7.76-7.68 (m, 2H), 7.61-7.52 (m, 2H), 7.04-6.92 (m, 2H), 4.23-3.72 (m, 5H), 2.08-1.64 (m, 2H), 1.50-1.19 (m, 22H), 0.91-0.79 (t, $^3J = 6.9$ Hz, 3H). IR (KBr, pellet, cm$^{-1}$): 3014, 2938, 2822, 1718, 1614, 1498, 1323, 1265, 1172, 1114, 998, 824, 697, 606, 536.

MS (MOLDI-TOF) m/z calcd. for C$_{34}$H$_{43}$N$_3$O$_3$ (M$^+$) 541.72. Found:542.10. EA: Calc. for C$_{34}$H$_{43}$N$_3$O$_3$: C 75.38, H 8.00, N 7.76; Found: C 75.19, H 8.08, N 7.74.