Supporting Information

Nickel-Catalyzed Amination of Aryl Tosylates

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General Method. All reactions were carried out under nitrogen atmosphere with oven-dried glassware and heated in an oil bath. THF and dioxane were distilled from sodium/benzophenone before use. Secondary cyclic amines, anilines and anhydrous sodium *tert*-butoxide were commercially available and used without further purification. Column chromatography was performed on silica gel (200–300 mesh). Aryl tosylates were synthesized according to the previously published procedure.[1] The Ni(II)–(σ-aryl) complexes were prepared according to the literature procedures.[2] All yields refer to isolated yields (average of two run) of compounds estimated to be >95% pure as determined by ^{1}H NMR. The known compounds were partly characterized by melting points (for solid samples), MS and ^{1}H NMR, and compared to authentic samples or the literature data. Four new compounds were fully characterized by ^{1}H NMR, ^{13}C NMR, MS and EA.

General Procedure A for the Amination of Aryl Tosylates with Secondary Cyclic Amines. An oven-dried 100-mL three-necked flask was charged with NaO^{t}Bu (1.6 mmol, 154 mg), Ni(PPh$_3$)$_2$(1-naphthyl)Cl (5 mol % relative to aryl tosylate, 37 mg), and IPr·HCl (5 mol% relative to aryl tosylate, 21 mg). The aryl tosylate (1.0 mmol) was added at this time. The flask was evacuated and backfilled with nitrogen, with the operation being repeated twice. The amine (1.5 mmol) was added via syringe, followed by dried dioxane (5 mL). The reaction mixture was heated at an oil bath of 110 ^{0}C for 15 min. The reaction mixture was allowed to cool to room temperature and filtered through a pad of silica gel that was washed with ethyl acetate (20 mL × 3). Then the combined organic phases were evaporated under reduced pressure and the residue purified by column chromatography on silica gel with petroleum/ethyl acetate to give the desired product.

General Procedure B for the Amination of Aryl Tosylates with Anilines. An oven-dried 100-mL three-necked flask was charged with NaO^{t}Bu (1.6 mmol, 154 mg), Ni(PPh$_3$)$_2$(1-naphthyl)Cl (5 mol% relative to aryl tosylate, 37 mg), and IPr·HCl (10 mol% relative to aryl tosylate, 42 mg). The aryl tosylate (1.0 mmol) and the aniline (1.5 mmol) were added at this time if solid. The flask was evacuated and backfilled with nitrogen, with the operation being repeated twice. The aniline (1.5 mmol) was added at this time via syringe if liquid. Then dried dioxane (5 mL) was added via syringe. The reaction mixture was heated at an oil bath of 110 ^{0}C for 30 min. The reaction mixture is allowed to cool to room temperature and filtered through a pad of silica gel that was washed with ethyl acetate (20 mL × 3). Then the combined organic phases were evaporated under reduced pressure and the residue purified by column chromatography on silica gel with petroleum /ethyl acetate to give the desired product.

***N*-Phenylmorpholine**[3] (Table 2, entry 1)**.** According to General Procedure A, phenyl tosylate (248 mg, 1.0 mmol) and morpholine (131 mg, 1.5 mmol) were transformed into the product as a colorless solid (138 mg, 85%): mp 49–51 ^{0}C, (lit.[3] mp 52–53 ^{0}C). ^{1}H NMR ($CDCl_3$, 400 MHz): δ 3.13–3.25 (m, overlapped, 4H), 3.80–4.00 (m, overlapped, 4H), 6.86–7.05 (m, overlapped, 3H), 7.28–7.37 (m, overlapped, 2H); MS (EI): *m/z* 163 (M^+). CAS Number: 92-53-5.

***N*-Phenylpiperidine**[4] (Table 2, entry 2)**.** According to General Procedure A, phenyl tosylate (248 mg, 1.0 mmol) and piperidine (128 mg, 1.5 mmol) were transformed into the product as a colorless liquid (118 mg, 73%). ^{1}H NMR ($CDCl_3$, 400 MHz): δ 1.56–1.63 (m, 2H), 1.70–1.75 (m, 4H), 3.16 (t, J = 5.6 Hz 4H), 6.81 (dd, $J_1 = J_2$ = 7.26 Hz, 1H), 6.93 (d, J = 8.2 Hz, 2H), 7.23 (t, J = 7.4 Hz, 2H); MS (EI): *m/z* 161(M^+). CAS Number: 4096-20-2.

***N*-Phenylpyrrolidine**[5] (Table 2, entry 3)**.** According to General Procedure A, phenyl tosylate (248 mg, 1.0 mmol) and pyrrolidine (106 mg, 1.5 mmol) were transformed into the product as a colorless liquid (88 mg, 60%). ^{1}H NMR ($CDCl_3$, 400 MHz): δ 1.99 (t, J = 6.2 Hz, 4H), 3.23–3.38 (m, 4H), 6.57 (d, J = 7.8 Hz, 2H), 6.66 (t, J = 7.1 Hz, 1H), 7.22 (t, J = 8.4 Hz, 2H); MS (EI): *m/z* 147 (M^+). CAS Number: 4096-21-3.

***N*-(*m*-Anisyl)morpholine**[6] (Table 2, entry 6)**.** According to General Procedure A, *m*-anisyl tosylate (278 mg, 1.0 mmol) and morpholine (131 mg, 1.5 mmol) were transformed into the product as a colorless liquid (183 mg, 95%). ^{1}H NMR ($CDCl_3$, 400 MHz): δ 3.16 (t, J = 4.8 Hz, 4H), 3.79 (s, 3H), 3.82–4.00 (m, 4H), 6.40–6.65 (m, 3H), 7.19 (t, J = 8.2 Hz, 1H); MS (EI): *m/z* 193 (M^+). CAS Number: 32040-09-8.

***N*-(*m*-Anisyl)piperidine**[7] (Table 2, entry 7)**.** According to General Procedure A, *m*-anisyl tosylate (278 mg, 1.0 mmol) and piperidine (128 mg, 1.5 mmol) were transformed into the product as a colorless liquid (140 mg, 74%). ^{1}H NMR ($CDCl_3$, 400 MHz): δ 1.48–1.55 (m, 2H), 1.56–1.78 (m, 4H), 3.18 (t, *J* = 5.1 Hz, 4H), 3.81 (s, 3H), 6.41 (d, *J* = 8.0 Hz, 1H), 6.51 (s, 1H), 6.58 (d, *J* = 7.8 Hz, 1H), 7.18 (t, *J* = 8.2 Hz, 1H); MS (EI): *m/z* 191 (M^+). CAS Number: 32040-06-5.

***N*-(*m*-Anisyl) pyrrolidine**[8] (Table 2, entry 8)**.** According to General Procedure A, *m*-anisyl tosylate (278 mg, 1.0 mmol) and pyrrolidine (106 mg, 1.5 mmol) were transformed into the product as a colorless liquid (92 mg, 52%). ^{1}H NMR ($CDCl_3$, 400 MHz): δ 1.92–2.08 (m, 4H), 3.25–3.35 (m, 4H), 3.81 (s, 4H), 3.78 (s, 3H), 6.04–6.30 (m, 3H), 7.08–7.20 (m, 1H); MS (EI): *m/z* 177 (M^+). CAS Number: 32040-07-6.

4-morpholinobenzophenone[9] (Table 2, entry 9)**.** According to General Procedure A except with $Ni(PPh_3)_2(naph)Cl$ (15 mol%)–IPr·HCl (15 mol%) in place of $Ni(PPh_3)_2(naph)Cl$ (5 mol%)–IPr·HCl (5 mol%), 4-benzoylphenyl tosylate (352 mg) and morpholine (131 mg, 1.5 mmol) were transformed into the product as a pale yellow solid (179 mg, 67%): mp 135–136 ^{0}C, (lit.[9] mp 140–142 ^{0}C). ^{1}H NMR (DMSO-*d*$_6$, 400 MHz): δ 3.32 (t, *J* = 5.2 Hz, 4H), 3.75 (t, *J* = 4.6 Hz, 4H), 7.04 (d, *J* = 8.9 Hz, 2H), 7.53 (t, *J* = 7.5 Hz, 2H), 7.59–7.69 (m, 5H); MS (EI): *m/z* 267 (M^+). CAS Number: 13672-14-5.

1,4-Dimorpholinobenzene[10] (Table 2, entry 11)**.** According to General Procedure A, 1,4-phenylene bistosylate (418 mg, 1 mmol) and morpholine (262 mg, 3.0 mmol) were transformed into the product as a colorless solid (60 mg, 24%): mp 191–192 ^{0}C, (lit.[10] mp 198–200 ^{0}C). ^{1}H NMR ($CDCl_3$, 400 MHz): δ 3.00–3.20 (m, 8H), 3.80–3.86 (m, 8H), 6.83–7.00 (m, 4H); MS (EI): *m/z* 248 (M^+). CAS Number: 4096-22-4.

***N*-(2-Naphthyl)morpholine**[11] (Table 2, entry 12)**.** According to General Procedure A, 2-naphthyl tosylate (298 mg, 1mmol) and morpholine (131 mg, 1.5 mmol) were transformed into the product as a colorless solid (204 mg, 96%): mp 87–88 ^{0}C, (lit.[11] mp 87–88 ^{0}C). ^{1}H NMR ($CDCl_3$, 400 MHz): δ 3.20–3.40 (m, overlapped, 4H), 3.85–4.10 (m, overlapped, 4H), 7.02–7.15 (m, 1H), 7.18–7.31 (m, 2H), 7.38 (t, *J* = 7.2 Hz, 1H), 7.65–7.75 (m, 3H); MS (EI): *m/z* 213 (M^+). CAS Number: 7508-21-6.

***N*-(2-Naphthyl)piperidine**[11] (Table 2, entry 13)**.** According to General Procedure A, 2-naphthyl tosylate (298 mg, 1mmol) and piperidine (128 mg, 1.5 mmol) were transformed into the product as a colorless solid (167 mg, 79%): mp 56–58 ^{0}C, (lit.[11] 58–59 ^{0}C). ^{1}H NMR (DMSO-d_6, 400 MHz): δ 1.52–1.62 (m, 2H), 1.63–1.70 (m, 4H), 3.20–3.30 (m, 4H), 7.12 (s, 1H), 7.21 (t, J = 7.4 Hz, 1H), 7.33 (dd, J_1 = 12.8 Hz, J_2 = 7.9 Hz, 2H), 7.67 (d, J = 9.2 Hz, 1H), 7.69 (d, J = 9.1 Hz, 2H); MS (EI): *m/z* 211 (M^+). CAS Number: 5465-85-0.

***N*-(2-Naphthyl)pyrrolidine**[12] (Table 2, entry 14)**.** According to General Procedure A, 2-naphthyl tosylate (298 mg, 1mmol) and pyrrolidine (107 mg, 1.5 mmol) were transformed into the product as a colorless solid (114 mg, 58%): mp 90–92 ^{0}C, (lit.[12] 91–91.5 ^{0}C). ^{1}H NMR (DMSO-d_6, 400 MHz): δ 1.92–2.06 (m, 4H), 3.25–3.45 (m, 4H), 6.74 (s, 1H), 7.03 (d, J = 5.7 Hz, 1H), 7.11 (t, J = 6.9 Hz, 1H), 7.31 (t, J = 6.9 Hz, 1H), 7.61 (d, J = 8.3 Hz, 1H), 7.67 (d, J = 8.1 Hz, 1H), 7.70 (d, J = 8.9 Hz, 1H); MS (EI): *m/z* 197 (M^+). CAS Number: 13672-14-5.

***N*-(1-Naphthyl)morpholine**[13] (Table 2, entry 15)**.** According to General Procedure A, 1-naphthyl tosylate (298 mg, 1mmol) and morpholine (131 mg, 1.5 mmol) were transformed into the product as a colorless solid (162 mg, 76%): mp 83–84 ^{0}C, (lit.[13] 82 ^{0}C). ^{1}H NMR ($CDCl_3$, 400 MHz): δ 3.05–3.25 (m, overlapped, 4H), 4.04 (t, J = 4.2 Hz, 4H), 7.08–7.21 (m, 1H), 7.45 (t, J = 7.7 Hz, 1H), 7.47–7.57 (m, 2H), 7.62 (d, J = 8.2 Hz, 1H), 7.83–7.88 (m, 1H), 8.27 (d, J = 8.1 Hz, 1H); MS (EI): *m/z* 213 (M^+). CAS Number: 98223-72-4.

***N*-(1-Naphthyl)piperidine**[14] (Table 2, entry 16)**.** According to General Procedure A, 1-naphthyl tosylate (298 mg, 1mmol) and piperidine (128 mg, 1.5 mmol) were transformed into the product as a colorless liquid (120 mg, 57%). ^{1}H NMR ($CDCl_3$, 300 MHz): δ 1.48–1.78 (m, 2H), 1.79–1.93 (m, 4H), 2.80–3.30 (m, 4H), 7.04 (d, J = 7.3 Hz, 1H), 7.38 (t, J = 7.7 Hz, 1H), 7.40–7.53 (m, 3H), 7.80 (d, J = 7.7 Hz, 1H), 8.20 (d, J = 7.8 Hz, 1H); MS (EI): *m/z* 211 (M^+). CAS Number: 62062-39-9.

***N*-(1-Naphthyl)pyrrolidine**[12] (Table 2, entry 17)**.** According to General Procedure A, 1-naphthyl tosylate (298 mg, 1mmol) and pyrrolidine (107 mg, 1.5 mmol) were transformed into the product as a colorless liquid (89 mg, 45%). ^{1}H NMR (CDCl$_3$, 300 MHz): δ1.98–2.12 (m, 4H), 3.32–3.50 (m, 4H), 7.02 (d, *J* = 7.3 Hz, 1H), 7.41 (t, *J* = 7.7 Hz, 1H), 7.44–7.55 (m, 3H), 7.83–7.92 (m, 1H), 8.24–8.32 (m, 1H); MS (EI): *m/z* 197 (M$^+$). CAS Number: 82238-92-4.

Diphenylamine[15] (Table 3, entry 1)**.** According to General Procedure B, phenyl tosylate (248 mg, 1.0 mmol) and aniline (140 mg, 1.5 mmol) were transformed into the product as a pale yellow solid (115 mg, 68%): mp 48–50 ^{0}C, (lit.[15] mp 50–52 ^{0}C). ^{1}H NMR (CDCl$_3$, 400 MHz): δ 5.69 (br, 1H), 6.97 (t, *J* = 7.2 Hz, 2H), 7.13 (d, *J* = 7.9 Hz, 4H), 7.27 (t, *J* = 7.9 Hz, 4H); MS (EI): *m/z* 169 (M$^+$). CAS Number: 122-39-4.

(*p*-Anisyl)phenylamine[16] (Table 3, entry 2)**.** According to General Procedure B, phenyl tosylate (248 mg, 1.0 mmol) and *p*-anisidine (161 mg, 1.5 mmol) were transformed into the product as a colorless solid (126 mg, 69%): mp 101–103 ^{0}C, (lit.[16] mp 106 ^{0}C). ^{1}H NMR (DMSO-d_6, 400 MHz): δ 3.70 (s, 3H), 6.69 (t, *J* = 7.6 Hz, 1H), 6.85 (d, *J* = 7.6 Hz, 2H), 6.89 (d, *J* = 7.8 Hz, 2H), 7.02 (t, *J* = 7.9 Hz, 2H), 7.14 (t, *J* = 7.2 Hz, 2H), 7.79 (s, 1H); MS (EI): *m/z* 199 (M$^+$). CAS Number: 1208-86-2.

Phenyl(*p*-tolyl)amine[17] (Table 3, entry 3)**.** According to General Procedure B, phenyl tosylate (248 mg, 1.0 mmol) and *p*-toluidine (161 mg, 1.5 mmol) were transformed into the product as a colorless solid (84 mg, 46%): mp 85–86 ^{0}C, (lit.[17] mp 89 ^{0}C). ^{1}H NMR (DMSO-d_6, 400 MHz): δ 2.22 (s, 3H), 6.75 (t, *J* = 7.2 Hz, 1H), 6.96 (t, *J* = 6.9 Hz, 4H), 7.04 (d, *J* = 8.3 Hz, 2H), 7.18 (t, *J* = 7.4 Hz, 2H), 7.96 (s, 1H); MS (EI): *m/z* 183 (M$^+$). CAS Number: 620-84-8.

Phenyl(*m*-tolyl)amine[18] (Table 3, entry 4)**.** According to General Procedure B, phenyl tosylate (248 mg, 1.0 mmol) and *m*-toluidine (161 mg, 1.5 mmol) were transformed into the product as a colorless liquid (92 mg, 50 %), (lit.[18] mp 30–31 ^{0}C). ^{1}H NMR (CDCl$_3$, 400 MHz): δ 2.34 (s, 3H), 5.71 (br, 1H), 6.80 (d, *J* = 7.6 Hz, 1H), 6.94 (d, *J* = 7.0 Hz, 1H), 6.97 (t, *J* = 7.3 Hz, 2H), 7.12 (d, *J* = 7.6 Hz, 2H), 7.19 (t, *J* = 7.38 Hz, 1H), 7.27–7.33 (m, 2H); MS (EI): *m/z* 183 (M$^+$). CAS Number: 1205-64-7.

(2,6-Dimethylphenyl)phenylamine[19] (Table 3, entry 5)**.** According to General Procedure B, phenyl tosylate (248 mg, 1.0 mmol) and 2,6-dimethylphenylamine (182 mg, 1.5 mmol) were transformed into the product as a colorless solid (73 mg, 37%): mp 48–50 ^{0}C, (lit.[19] mp 53–56 ^{0}C). ^{1}H NMR (CDCl$_3$, 400 MHz):

δ 2.21 (s, 6H), 6.52 (d, J = 7.8 Hz, 2H), 6.76 (t, J = 7.6 Hz, 1H), 7.06–7.20 (m, 5H); MS (EI): m/z 197 (M^+). CAS Number: 4058-04-2.

(2-Naphthyl)phenylamine[20] (Table 3, entry 6)**.** According to General Procedure B, 2-naphthyl tosylate (298 mg, 1.0 mmol) and aniline (140 mg, 1.5 mmol) were transformed into the product as a colorless solid (201 mg, 92%): mp 108–110 ^{0}C, (lit.[20] mp 107–108 ^{0}C). ^{1}H NMR (DMSO-d_6, 400 MHz): δ 7.01 (t, J = 7.3 Hz, 1H), 7.21 (d, J = 7.5 Hz, 2H), 7.25–7.32 (m, 4H), 7.38 (t, J = 7.5 Hz, 1H), 7.47 (d, J = 2.0 Hz, 1H), 7.68 (d, J = 8.1 Hz, 1H), 7.75 (d, J = 8.2 Hz, 1H), 7.78 (d, J = 8.8 Hz, 1H), 8.40 (s, 1H); MS (EI): m/z 219 (M^+). CAS Number: 73405-62-6.

(*p*-Anisyl)(2-naphthyl)amine[21] (Table 3, entry 7)**.** According to General Procedure B, 2-naphthyl tosylate (298 mg, 1.0 mmol) and *p*-anisidine (161 mg, 1.5 mmol) were transformed into the product as a colorless solid (237 mg, 95%): mp 104–105 ^{0}C, (lit.[21] mp 101 ^{0}C). ^{1}H NMR ($CDCl_3$, 400 MHz): δ 3.79 (s, 3H), 5.75–6.20 (br, 1H), 6.88 (d, J = 8.8 Hz, 2H), 7.09 (d, J = 8.8 Hz, 1H), 7.14 (d, J = 8.8 Hz, 2H), 7.21 (d, J = 7.1 Hz, 2H), 7.34 (t, J = 7.0 Hz, 1H), 7.56 (d, J = 8.2 Hz, 1H), 7.67 (d, J = 7.9 Hz, 2H); MS (EI): m/z 249 (M^+). CAS Number: 6949-67-3.

(2-Naphthyl)(*p*-tolyl)amine (Table 3, entry 8)**.** According to General Procedure B, 2-naphthyl tosylate (298 mg, 1.0 mmol) and *p*-toluidine (161 mg, 1.5 mmol) were transformed into the product as a colorless solid (193 mg, 83%): mp 101–103 ^{0}C, (lit.[22] mp 102–103 ^{0}C). ^{1}H NMR (DMSO-d_6, 400 MHz): δ 2.26 (s, 3H), 7.08–7.13 (m, 4H), 7.18–7.24 (m, 2H), 7.33–7.37 (m, 2H), 7.63 (d, J = 8.2 Hz, 1H), 7.73 (t, J = 8.7 Hz, 2H), 8.24 (s, 1H); MS (EI): m/z 233 (M^+). CAS Number: 644-16-6.

(2,6-Dimethylphenyl)(2-naphthyl)amine (Table 3, entry 9)**.** According to General Procedure B, 2-naphthyl tosylate (298 mg, 1.0 mmol) and 2,6-dimethylphenylamine (182 mg, 1.5 mmol) were transformed into the product as a colorless solid (217 mg, 88%): mp 63–65 ^{0}C. ^{1}H NMR ($CDCl_3$, 400 MHz): δ 2.24 (s, 6H), 6.58 (s, 1H), 6.97 (d, J = 6.7 Hz, 1H), 7.10–7.20 (m, 4H), 7.32 (t, J = 7.1 Hz, 1H), 7.49 (d, J = 8.2 Hz, 1H), 7.65-7.70 (m, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 18.5, 106.4, 117.7, 122.4, 126.2, 126.5, 127.8, 128.1, 128.8, 129.3, 135.1, 136.2, 138.1, 144.0; MS (EI): m/z 247 (M^+). Anal. calcd.

for $C_{18}H_{17}N$: C, 87.41; H, 6.93; N, 5.66%; found: C, 87.25; H, 6.86; N, 5.72%.

(2,3-Dimethylphenyl)(2-naphthyl)amine (Table 3, entry 10). According to General Procedure B, 2-naphthyl tosylate (298 mg, 1.0 mmol) and 2,3-dimethylphenylamine (182 mg, 1.5 mmol) were transformed into the product as a colorless solid (227 mg, 92%): mp 111–113 ^{0}C. ^{1}H NMR ($CDCl_3$, 400 MHz): δ 2.22 (s, 3H), 2.35 (s, 3H), 6.90–7.00 (m, 3H), 7.03 (t, *J* = 7.7 Hz, 1H), 7.32 (t, *J* = 7.8 Hz, 1H), 7.43–7.55 (m, 3H), 7.85 (d, *J* = 7.4 Hz, 1H), 8.06 (br. s, 1H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 13.9, 20.9, 110.1, 119.5, 119.6, 123.1, 125.3, 126.2, 126.4, 126.5, 127.8, 128.8, 129.2, 129.4, 134.9, 138.2, 140.7, 142.9; MS (EI): *m/z* 247 (M^+). Anal. calcd. for $C_{18}H_{17}N$: C, 87.41; H, 6.93; N, 5.66%; found: C, 87.24; H, 6.93; N, 5.67%.

***N*-Methyl-*N*-(2-naphthyl)aniline**[23] (Table 3, entry 11). According to General Procedure B, 2-naphthyl tosylate (298 mg, 1.0 mmol) and *N*-methylaniline (161 mg, 1.5 mmol) were transformed into the product as a pale yellow liquid (121 mg, 52%), (lit.[23] mp 88–90 ^{0}C). ^{1}H NMR ($CDCl_3$, 400 MHz): δ 3.43 (s, 3H), 7.03 (t, *J* = 7.3 Hz, 1H), 7.12 (d, *J* = 7.9 Hz, 2H), 7.22–7.27 (m, 1H), 7.27–7.36 (m, 3H), 7.40 (m, 1H), 7.42 (t, *J* = 7.0 Hz, 1H), 7.67–7.75 (m, 3H); MS (EI): *m/z* 233 (M^+). CAS Number: 6364-05-2.

(1-Naphthyl)phenylamine[24] (Table 3, entry 12). According to General Procedure B, 1-naphthyl tosylate (298 mg, 1.0 mmol) and aniline (140 mg, 1.5 mmol) were transformed into the product as a colorless solid (180 mg, 82%): mp 55–56 ^{0}C, (lit.[24] mp 56–57 ^{0}C). ^{1}H NMR ($CDCl_3$, 400 MHz): δ 6.92 (t, *J* = 7.3 Hz, 1H), 7.01 (d, *J* = 7.7 Hz, 2H), 7.25 (t, *J* = 7.8 Hz, 2H), 7.39 (d, *J* = 5.1 Hz, 2H), 7.48–7.52 (m, 2H), 7.58 (t, *J* = 4.9 Hz, 1H), 7.86 (d, *J* = 7.8 Hz, 1H), 8.03 (d, *J* = 7.6 Hz, 1H); MS (EI): *m/z* 219 (M^+). CAS Number: 90-30-2.

(*p*-Anisyl)(1-naphthyl)amine[25] (Table 3, entry 13). According to General Procedure B, 1-naphthyl tosylate (298 mg, 1.0 mmol) and *p*-anisidine (161 mg, 1.5 mmol) were transformed into the product as a colorless solid (222 mg, 89%): mp 114–115 ^{0}C, (lit.[25] mp 110 ^{0}C). ^{1}H NMR ($CDCl_3$, 400 MHz): δ 3.80 (s, 3H), 6.86 (d, *J* = 8.6 Hz, 2H), 7.07 (d, *J* = 8.0 Hz, 2H), 7.13 (d, *J* = 6.7 Hz, 1H), 7.33 (t, *J* = 7.6 Hz, 1H), 7.42–7.52 (m, 3H), 7.80–7.88 (m, 1H), 8.00 (d, *J* = 8.1 Hz, 1H); MS (EI): *m/z* 249 (M^+). CAS Number:

6314-38-1.

(1-Naphthyl)(*p*-tolyl)amine (Table 3, entry 14)**.** According to General Procedure B, 1-naphthyl tosylate (298 mg, 1.0 mmol) and *p*-toluidine (161 mg, 1.5 mmol) were transformed into the product as a colorless solid (205 mg, 88%): mp 78–79 ^{0}C, (lit.[26] mp 78.5–79 ^{0}C). ^{1}H NMR (DMSO-d_6, 400 MHz): δ 2.07 (s, 3H), 7.10 (s, 4H), 7.19–7.25 (m, 2H), 7.28–7.37 (m, 2H), 7.63 (d, *J* = 8.2 Hz, 1H), 7.73 (t, *J* = 8.9 Hz, 2H), 8.24 (s, 1H); MS (EI): *m/z* 233 (M^+). CAS Number: 6314-38-1.

(2,6-Dimethylphenyl)(1-naphthyl)amine[27] (Table 3, entry 15)**.** According to General Procedure B, 1-naphthyl tosylate (298 mg, 1.0 mmol) and 2,6-dimethylphenylamine (182 mg, 1.5 mmol) were transformed into the product as a colorless solid (222 mg, 90%): mp 124–125 ^{0}C, (lit.[27] mp 124 ^{0}C). ^{1}H NMR ($CDCl_3$, 400 MHz): δ 2.21 (s, 6H), 6.23 (d, *J* = 7.5 Hz, 1H), 7.11–7.23 (m, 4H), 7.32 (d, *J* = 8.1 Hz, 1H), 7.48–7.55 (m, 2H), 7.84–7.87 (m, 1H), 8.05–8.10 (m, 1H); MS (EI): *m/z* 247 (M^+). CAS Number: 4558-20.

(2,3-Dimethylphenyl)(1-naphthyl)amine[27] (Table 3, entry 16)**.** According to General Procedure B, 2-naphthyl tosylate (298 mg, 1.0 mmol) and 2,3-dimethylphenylamine (182 mg, 1.5 mmol) were transformed into the product as a colorless solid (178 mg, 72%): mp 68–69 ^{0}C, (lit.[27] mp 58 ^{0}C). ^{1}H NMR (DMSO-d_6, 400 MHz): δ 2.05 (s, 3H), 2.27 (s, 3H), 6.43 (d, *J* = 7.3 Hz, 1H), 6.81 (d, *J* = 7.3 Hz, 1H), 7.02 (t, *J* = 7.6 Hz, 1H), 7.24 (t, *J* = 7.8 Hz, 1H), 7.32 (d, *J* = 8.0 Hz, 1H), 7.42–7.51 (m, 2H), 7.65 (s, 1H), 7.82 (d, *J* = 8.0 Hz, 1H), 8.22 (d, *J* = 7.8 Hz, 1H); MS (EI): *m/z* 247 (M^+). CAS Number: 3302724.

4-(4-methoxyphenylamino)benzophenone (Table 3, entry 17)**.** According to General Procedure B except with $Ni(PPh_3)_2$(naphthyl)Cl (15 mol%)–IPr·HCl (30 mol%) in place of $Ni(PPh_3)_2$(naphthyl)Cl (5 mol%)–IPr·HCl (10 mol%), 4-benzoylphenyl tosylate (352 mg) and *p*-anisidine (161 mg, 1.5 mmol) were transformed into the product as a yellow solid (0.20 mg, 66%): mp 128–130 ^{0}C. ^{1}H NMR ($CDCl_3$, 400 MHz): δ 3.85 (s, 3H), 6.75–7.04 (m, 4H), 7.07–7.25 (m, 2H), 7.48 (t, *J* = 7.2 Hz, 2H), 7.56 (t, *J* = 7.3 Hz, 1H) 7.67–7.88 (m, 4H); ^{13}C NMR ($CDCl_3$, 100 MHz): δ 55.7, 113.2, 114.9, 124.7, 127.9, 128.2, 129.7, 131.5, 133.0, 133.3, 139.0, 150.0, 156.9, 195.2; MS (EI): *m/z* 303 (M^+). Anal. calcd. for $C_{20}H_{17}NO_2$: C, 79.19; H, 5.65; N, 4.62%; found: C, 78.89; H, 5.66; N, 4.70%.

4-anilinobenzophenone[28] (Table 3, entry 18)**.** According to General Procedure B except with $Ni(PPh_3)_2$(naphthyl)Cl (15 mol%)–IPr·HCl (30 mol%) in place of $Ni(PPh_3)_2$(naphthyl)Cl (5 mol%)–IPr·HCl (10 mol%), 4-benzoylphenyl tosylate (352 mg) and aniline (140 mg, 1.5 mmol) were transformed into the product as a yellow solid (199 mg, 73%): mp 151–152 ^{0}C, (lit.[28] mp 152–155 ^{0}C). ^{1}H NMR ($CDCl_3$, 400 MHz): δ 7.04 (d, *J* = 8.7 Hz, 2H), 7.11 (t, *J* = 7.4 Hz, 1H), 7.22 (d, *J* = 7.7 Hz, 2H), 7.37 (t, *J* = 8.1 Hz, 2H), 7.48 (t, *J* = 7.5 Hz, 2H), 7.57 (t, *J* = 7.3 Hz, 1H), 7.77 (d, *J* = 7.2 Hz, 2H), 7.80 (d, *J* = 8.7 Hz, 2H); MS (EI): *m/z* 273 (M^+). CAS Number: 4058-17-7.

4-(2,6-dimethylphenylamino)benzophenone (Table 3, entry 19)**.** According to General Procedure B except with $Ni(PPh_3)_2$(naphthyl)Cl (15 mol%)–IPr·HCl (30 mol%) in place of $Ni(PPh_3)_2$(naphthyl)Cl (5 mol%)–IPr·HCl (10 mol%), 4-benzoylphenyl tosylate (352 mg) and 2,6-dimethylphenylamine (182 mg, 1.5 mmol) were transformed into the product as a yellow solid (196 mg, 65%): mp 152–154 ^{0}C. ^{1}H NMR ($CDCl_3$, 400 MHz): δ 2.21 (s, 6H), 6.48 (d, *J* = 8.6 Hz, 2H), 7.12–7.17 (m, 3H), 7.43 (t, *J* = 7.7 Hz, 2H), 7.51 (t, *J* = 7.4 Hz, 1H), 7.71 (d, *J* = 8.5 Hz, 4H); ^{13}C NMR ($CDCl_3$, 125 MHz): δ 18.4, 77.0, 77.2, 77.4, 112.1, 127.1, 128.1, 128.8, 129.6, 131.4, 133.1, 136.6, 136.7, 139.1, 150.9, 195.3; MS (EI): *m/z* 301 (M^+). Anal. calcd. for $C_{21}H_{19}NO$: C, 83.69; H, 6.35; N, 4.65%; found: C, 84.07; H, 6.23; N, 4.58%.

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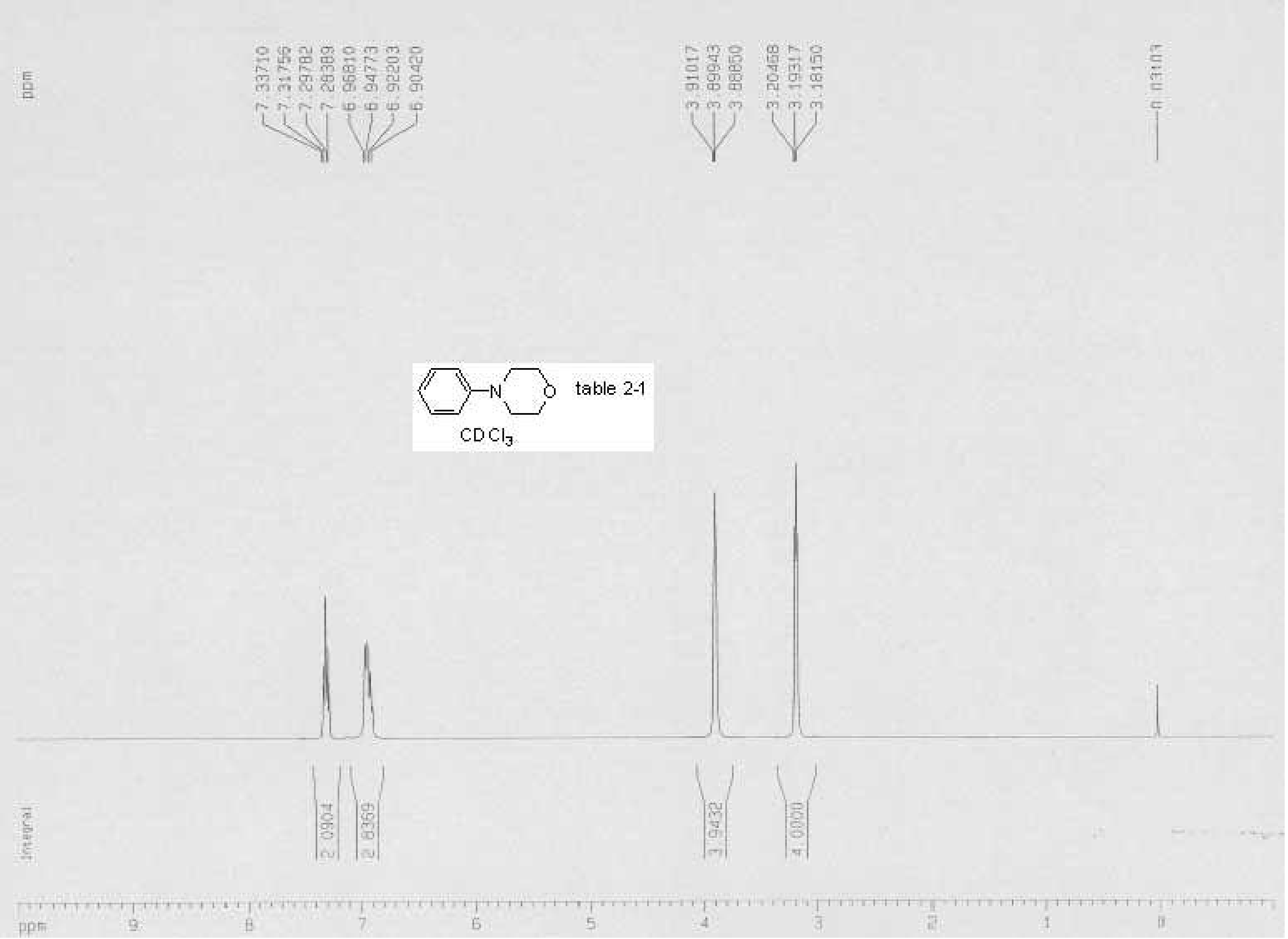
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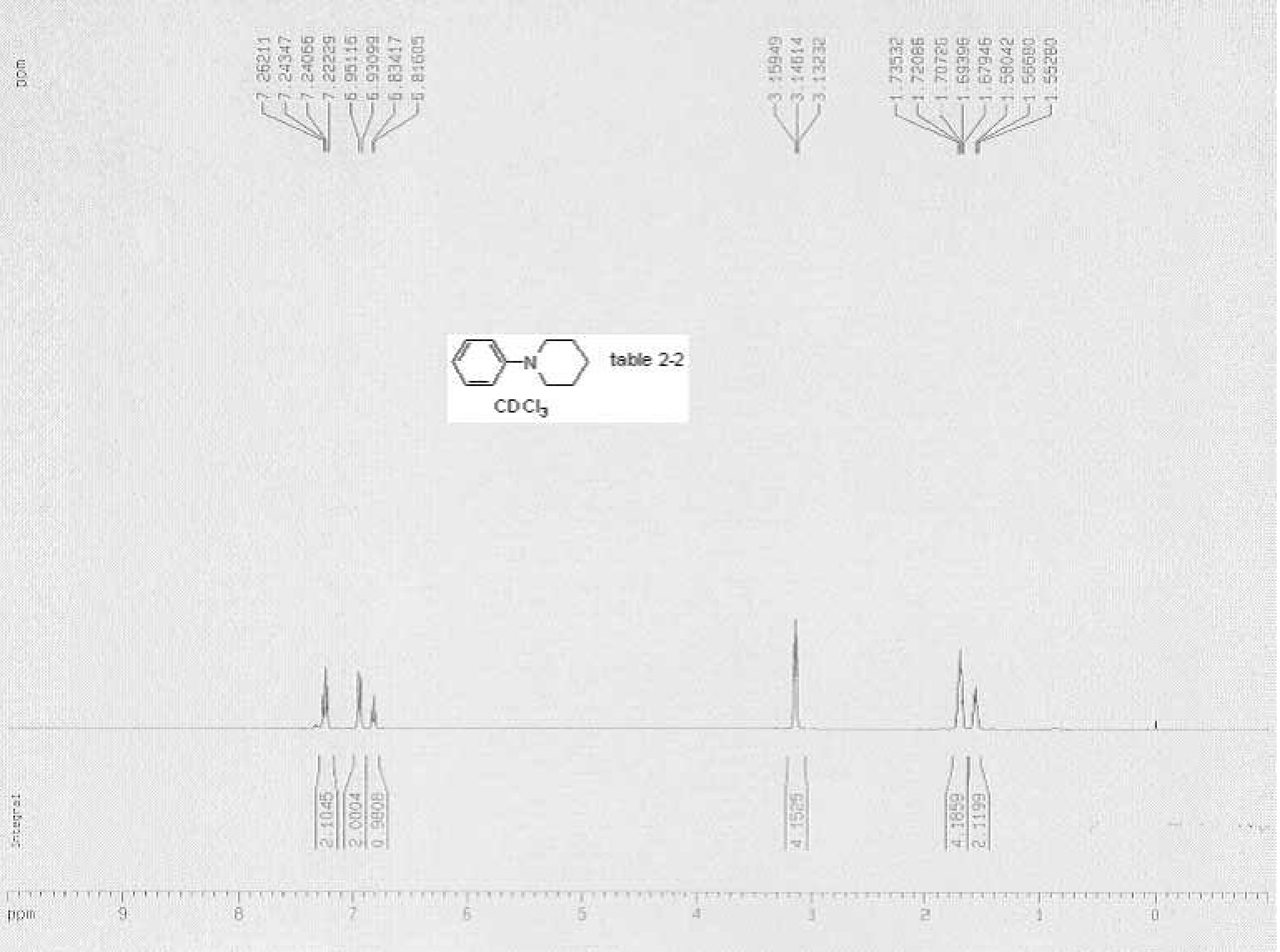
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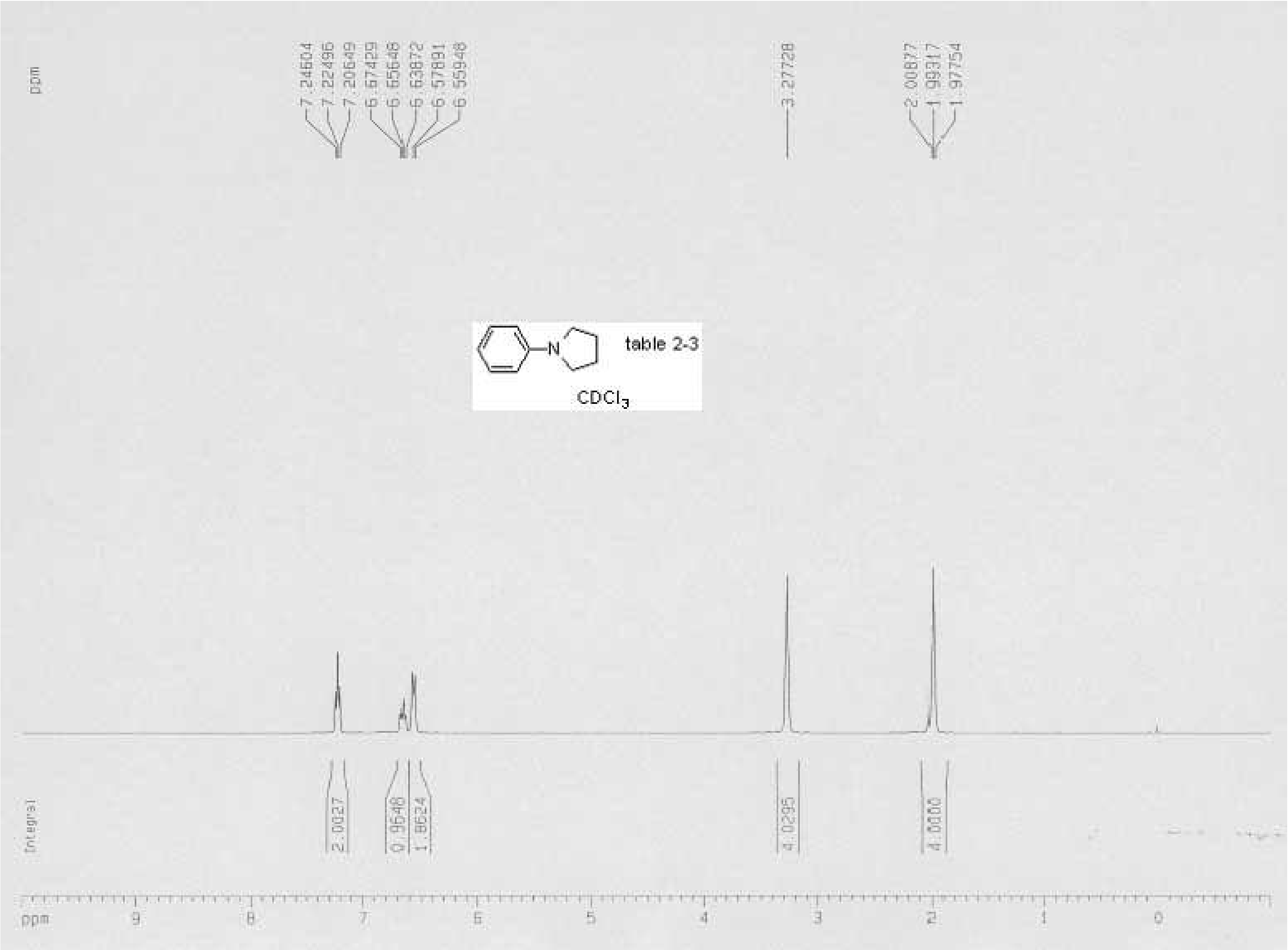
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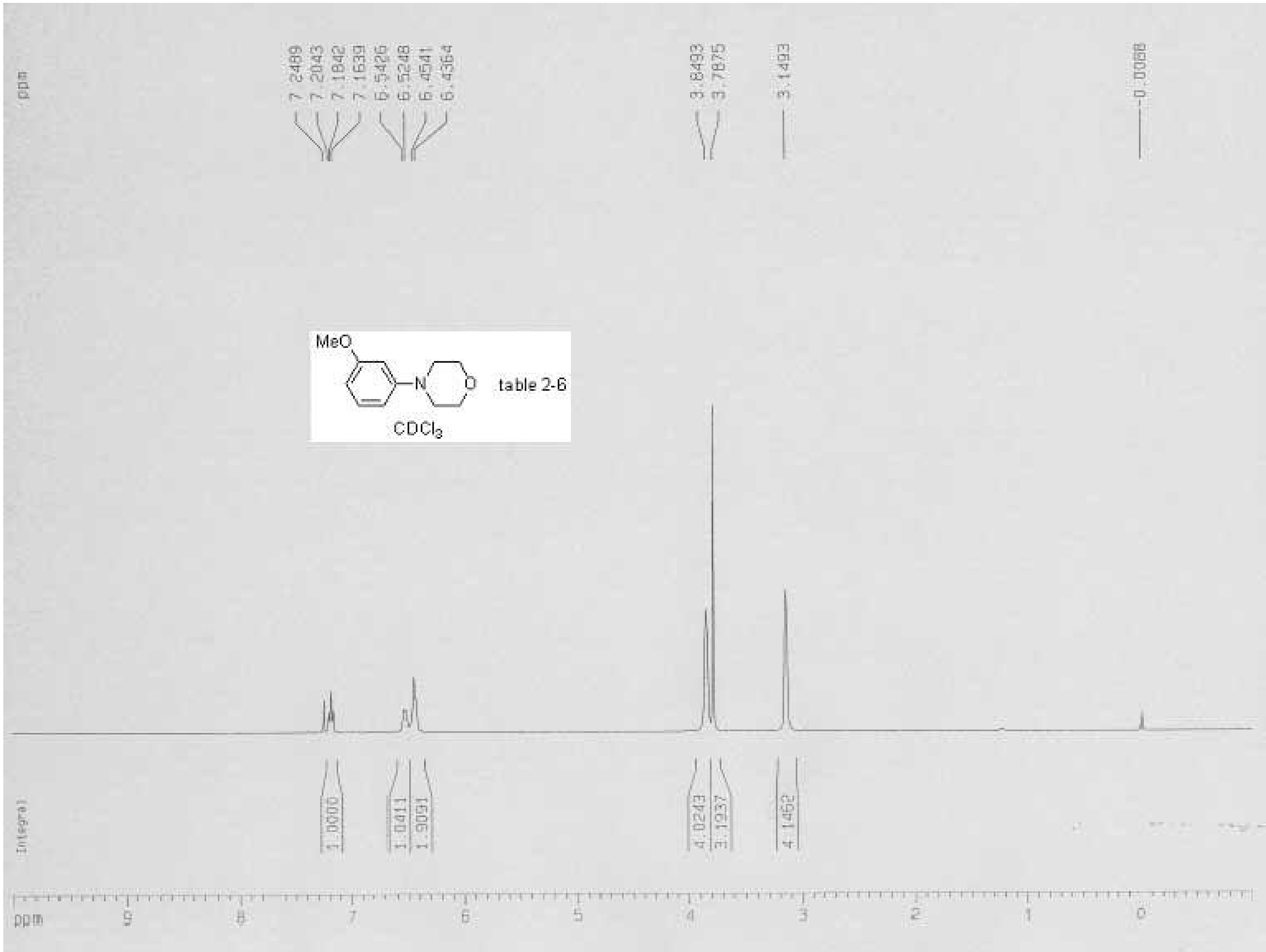
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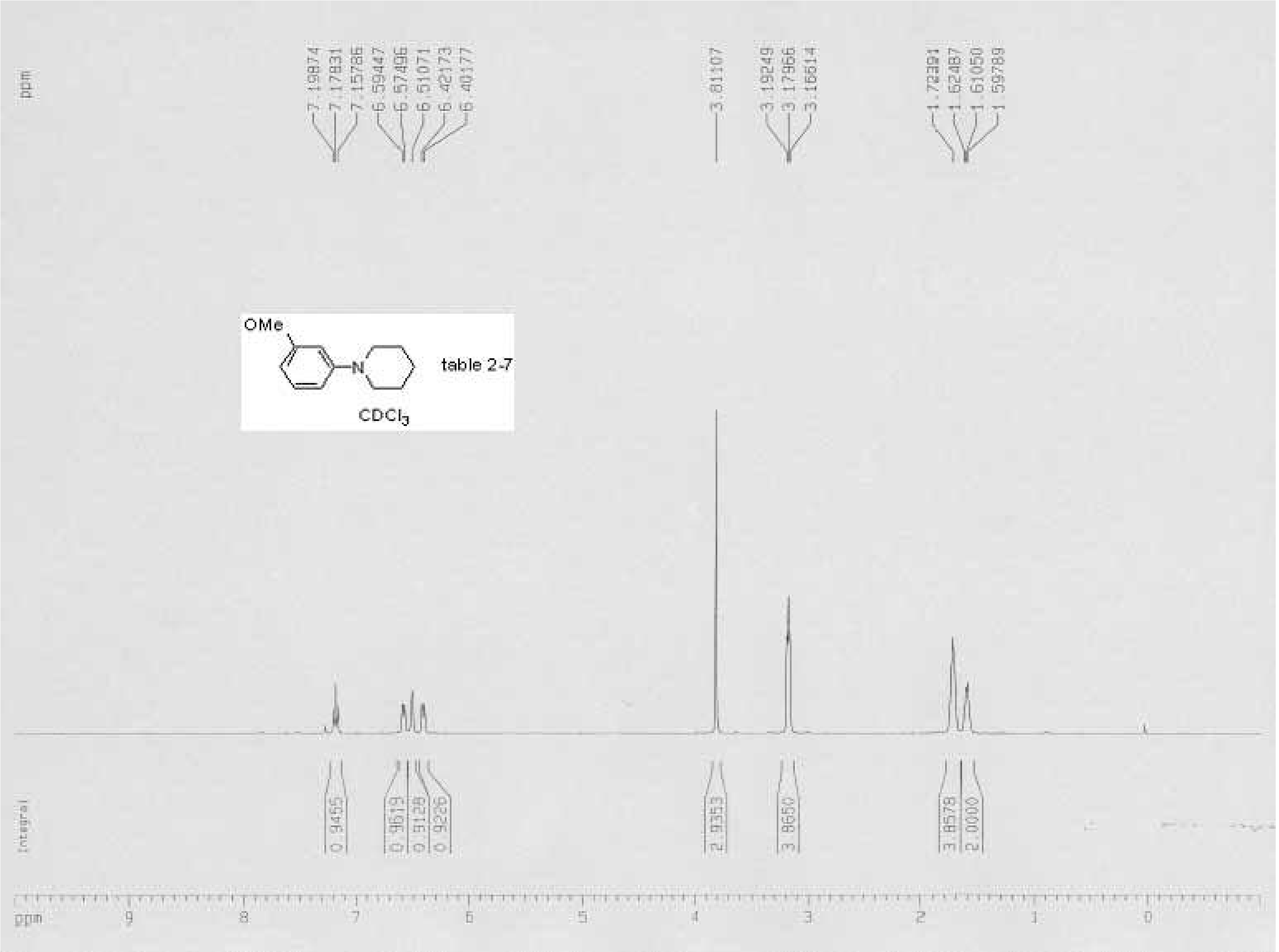
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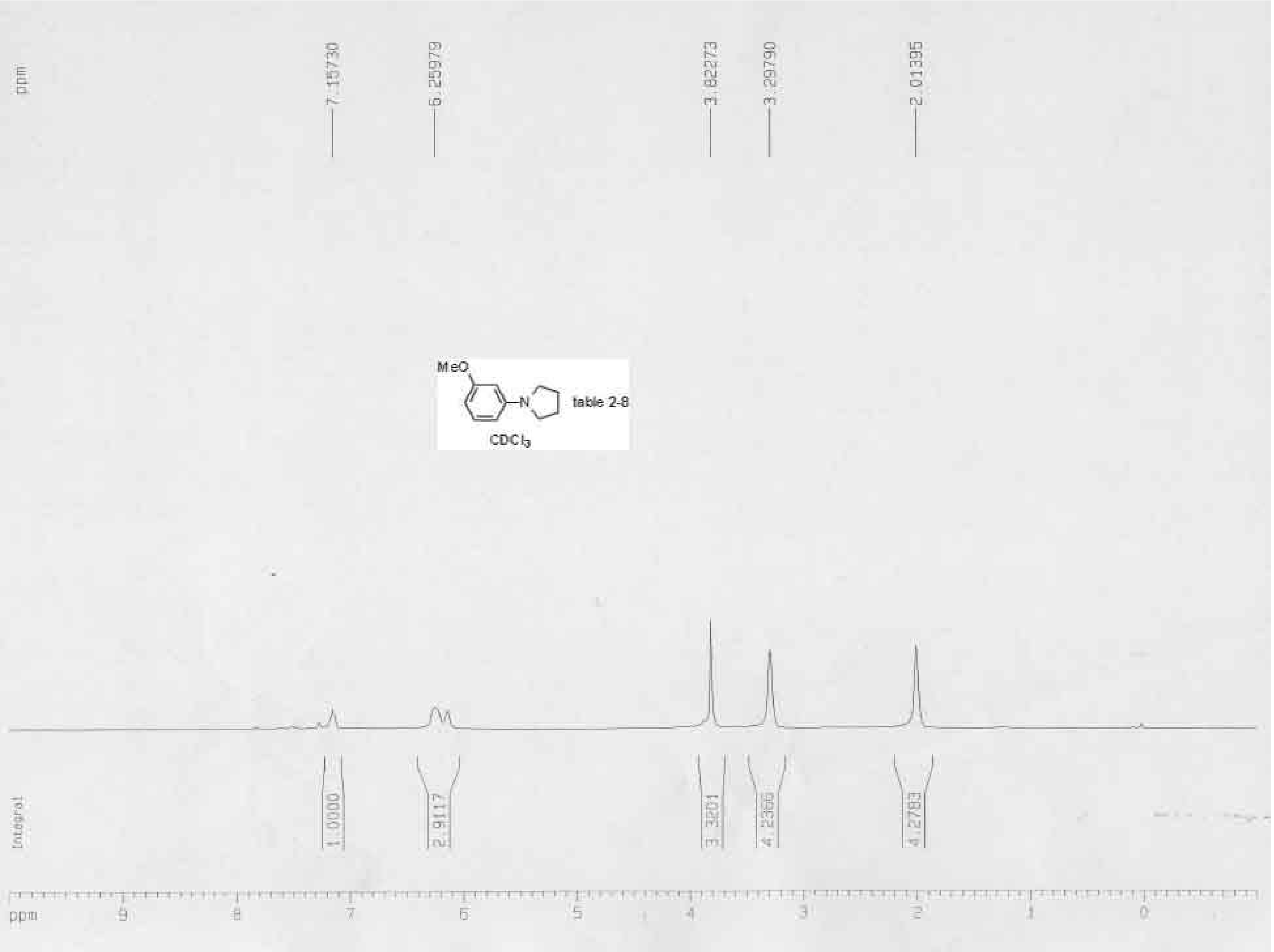
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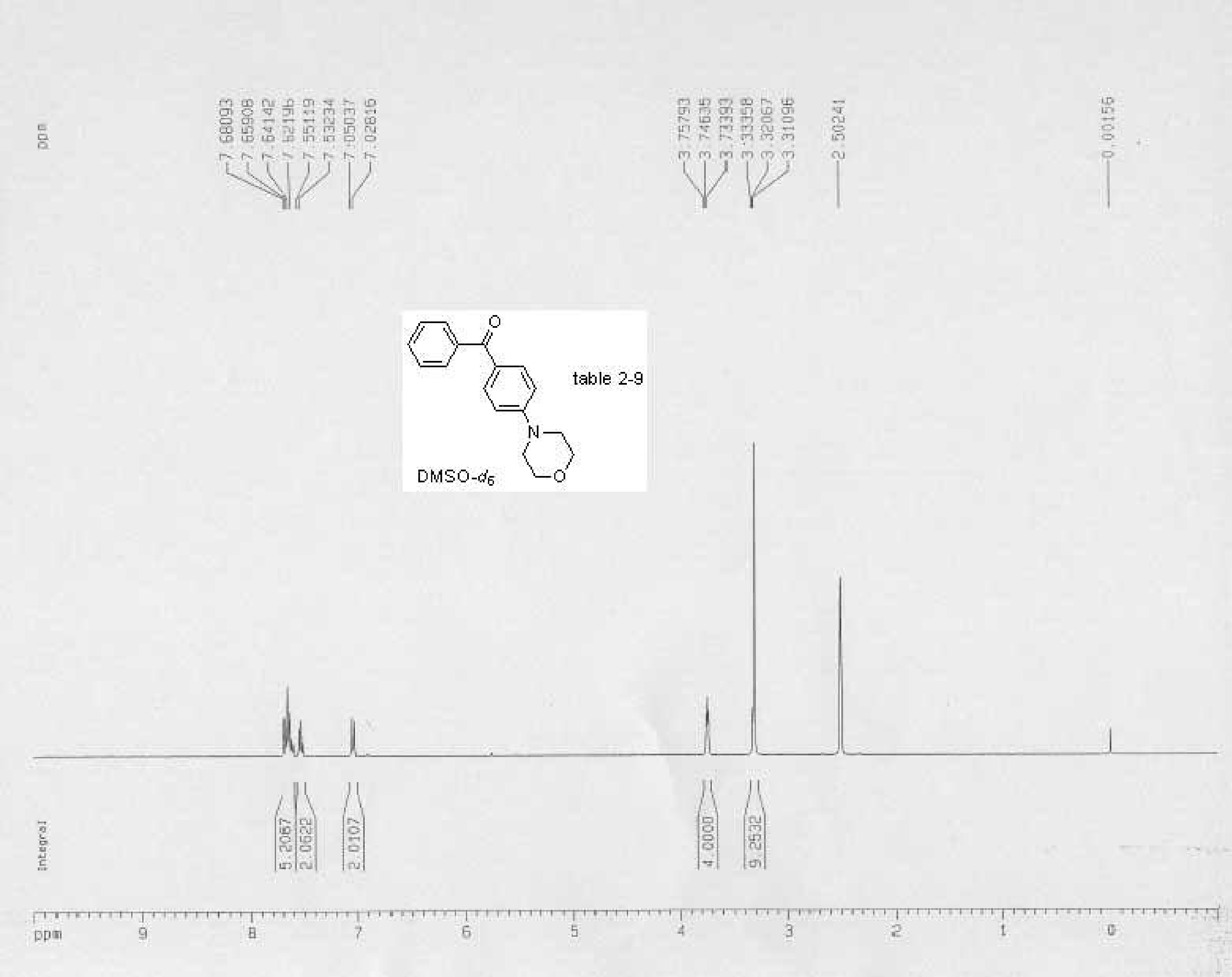
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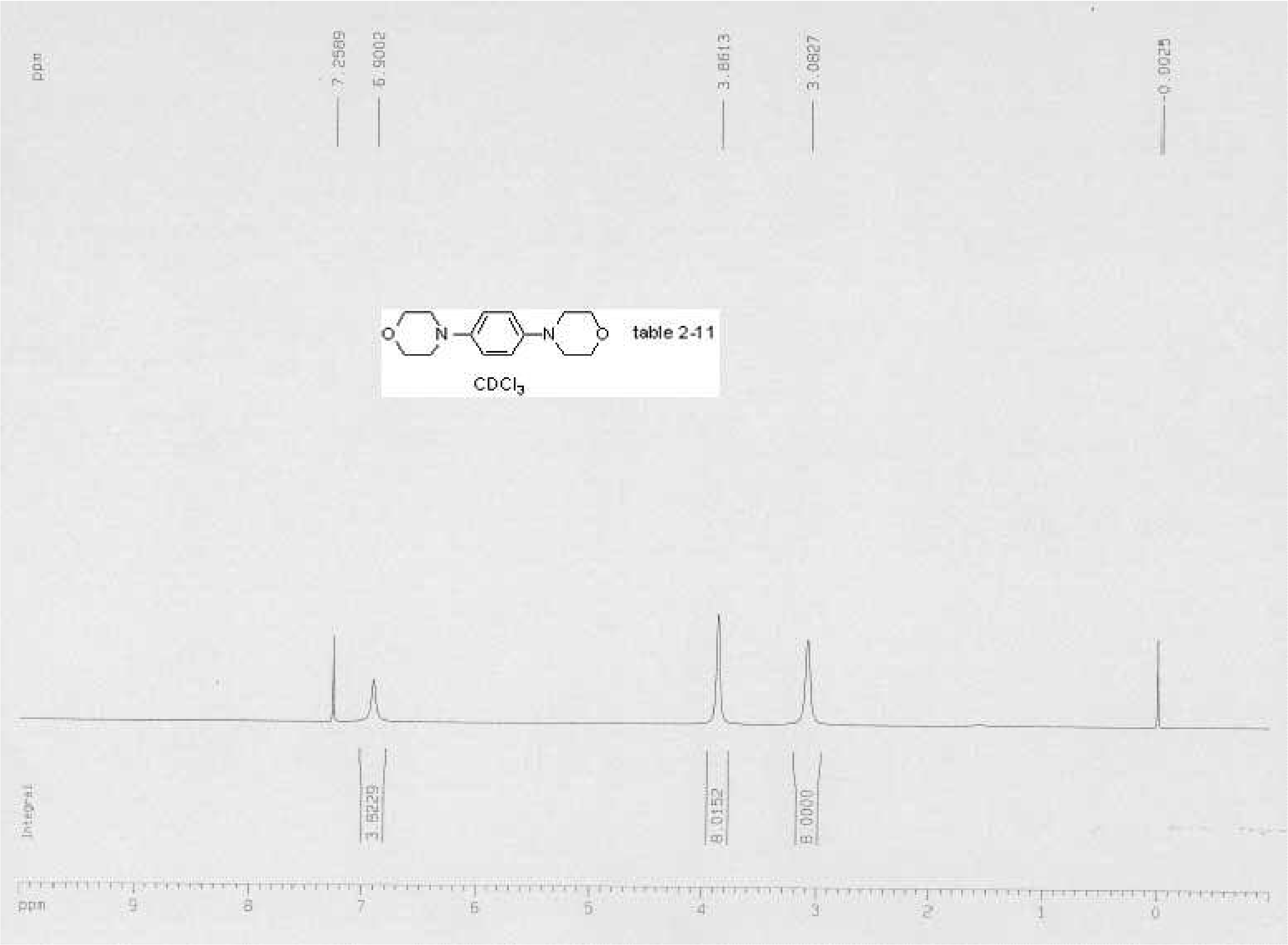
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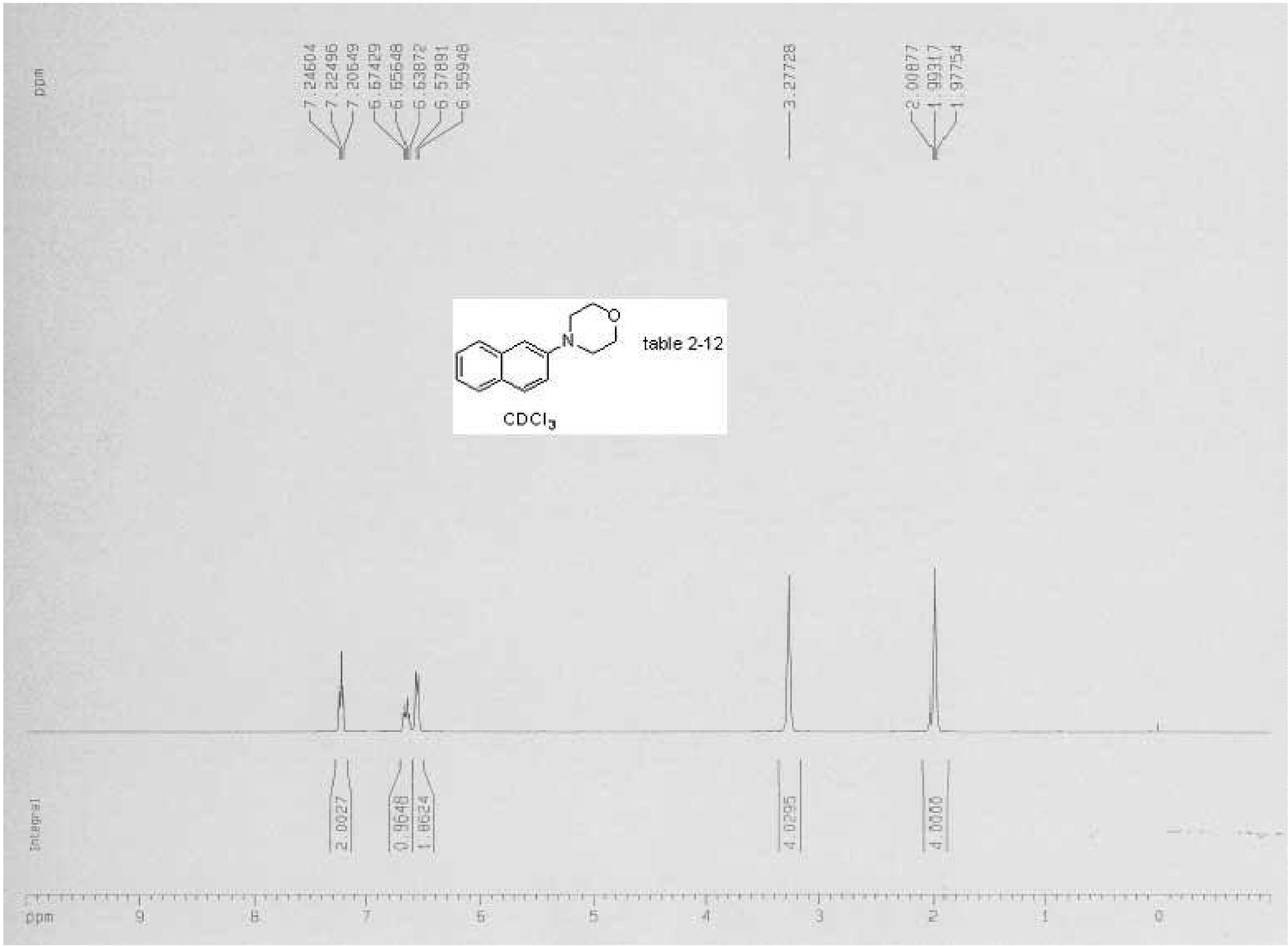
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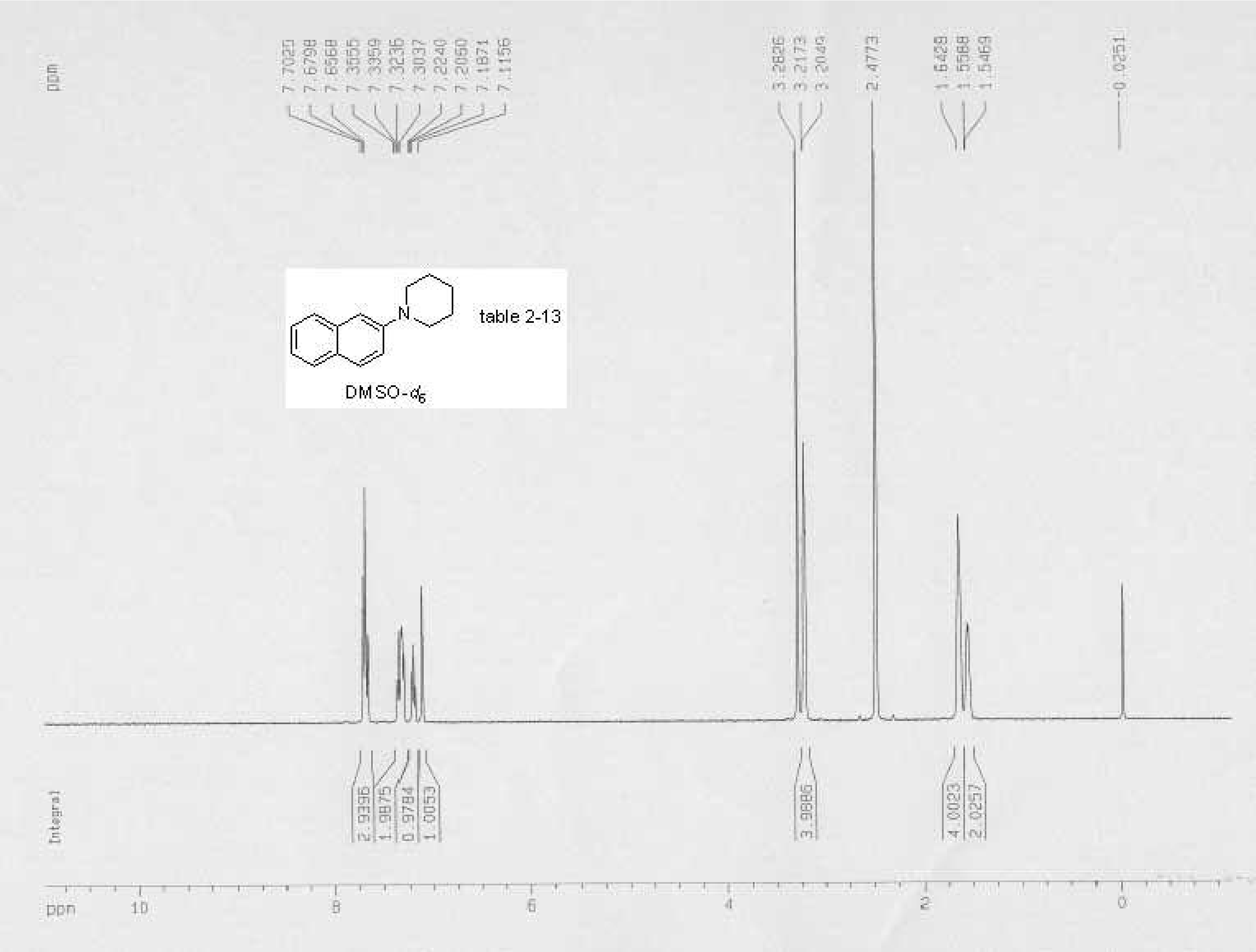
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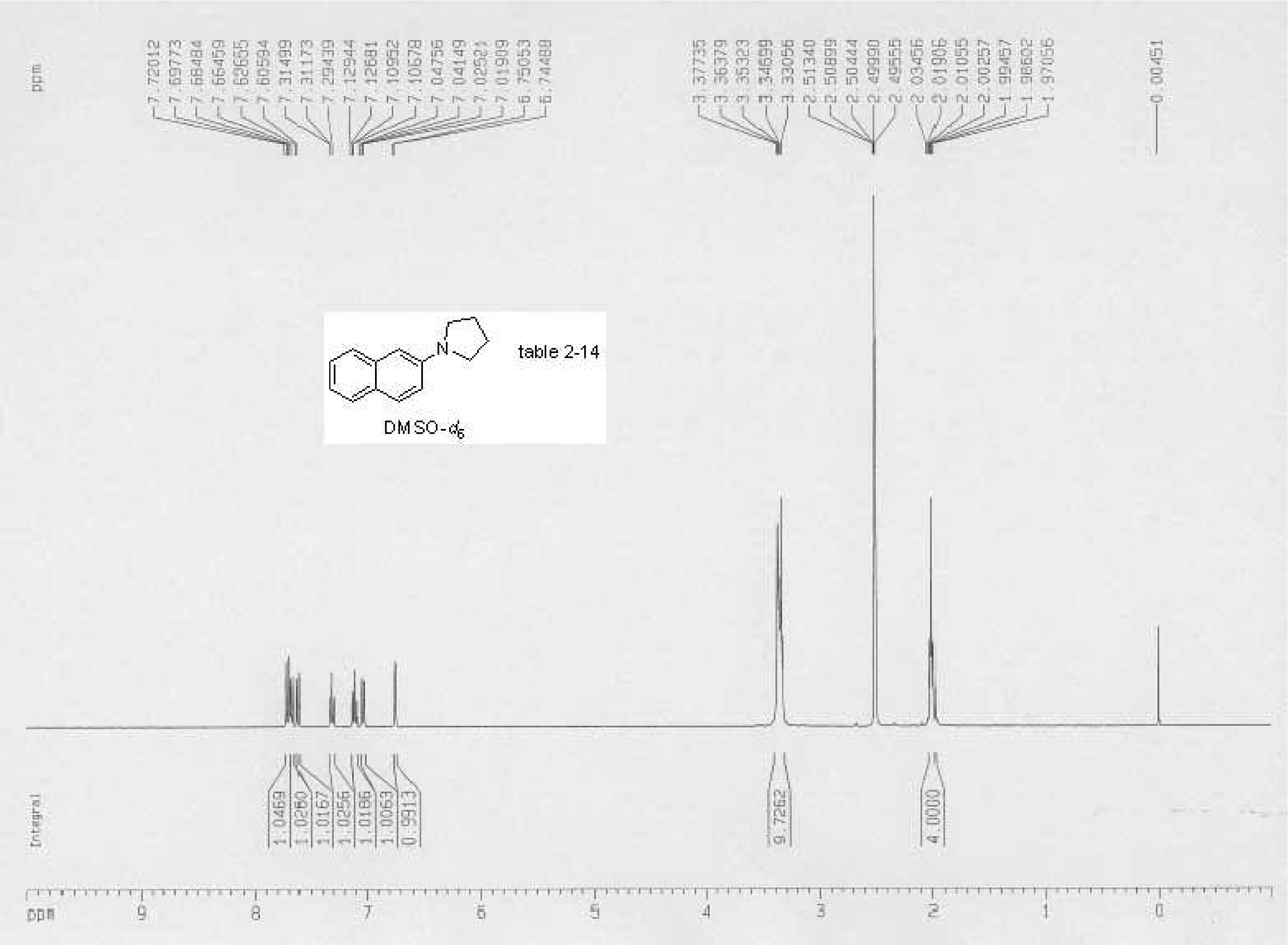
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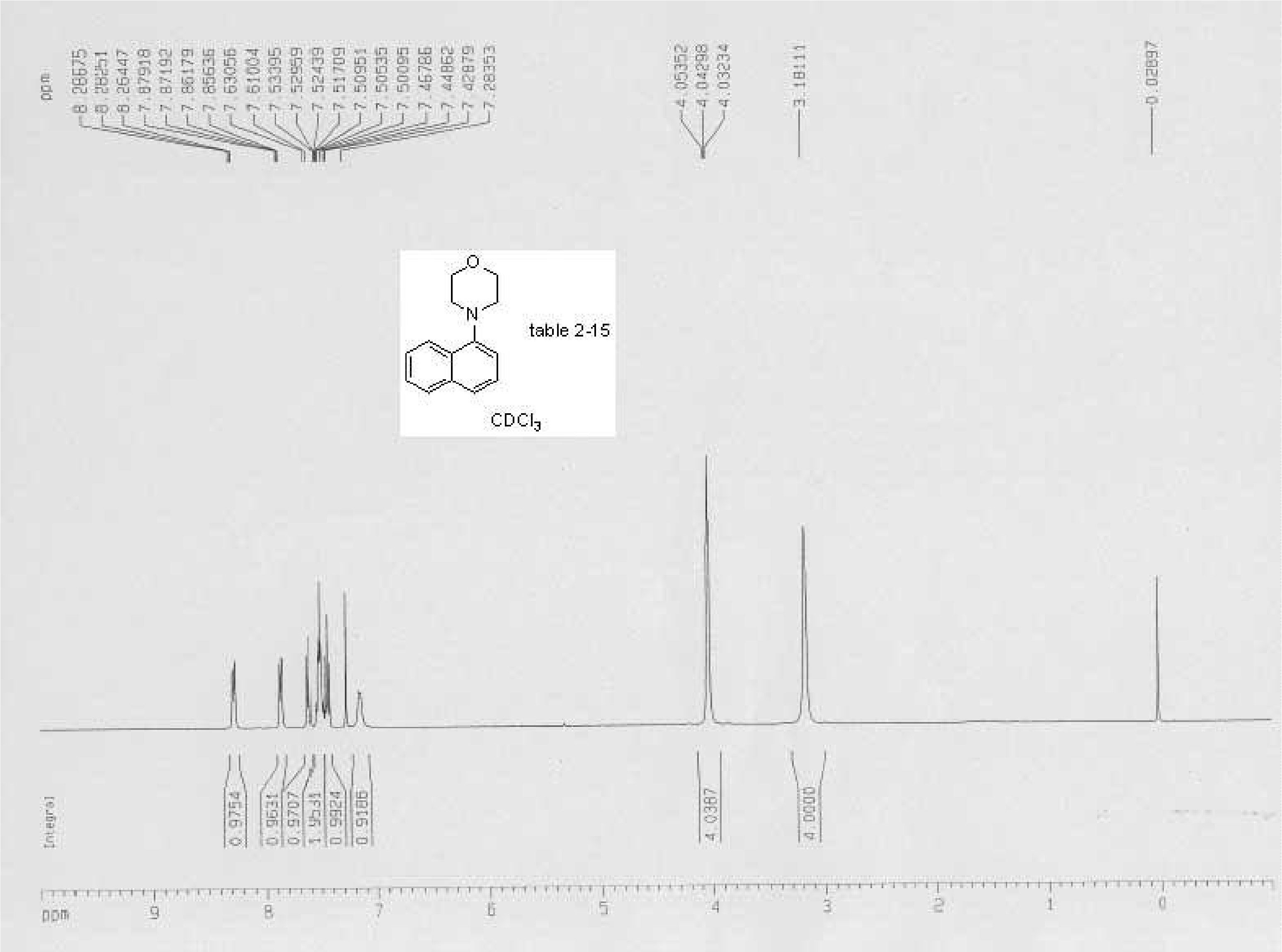
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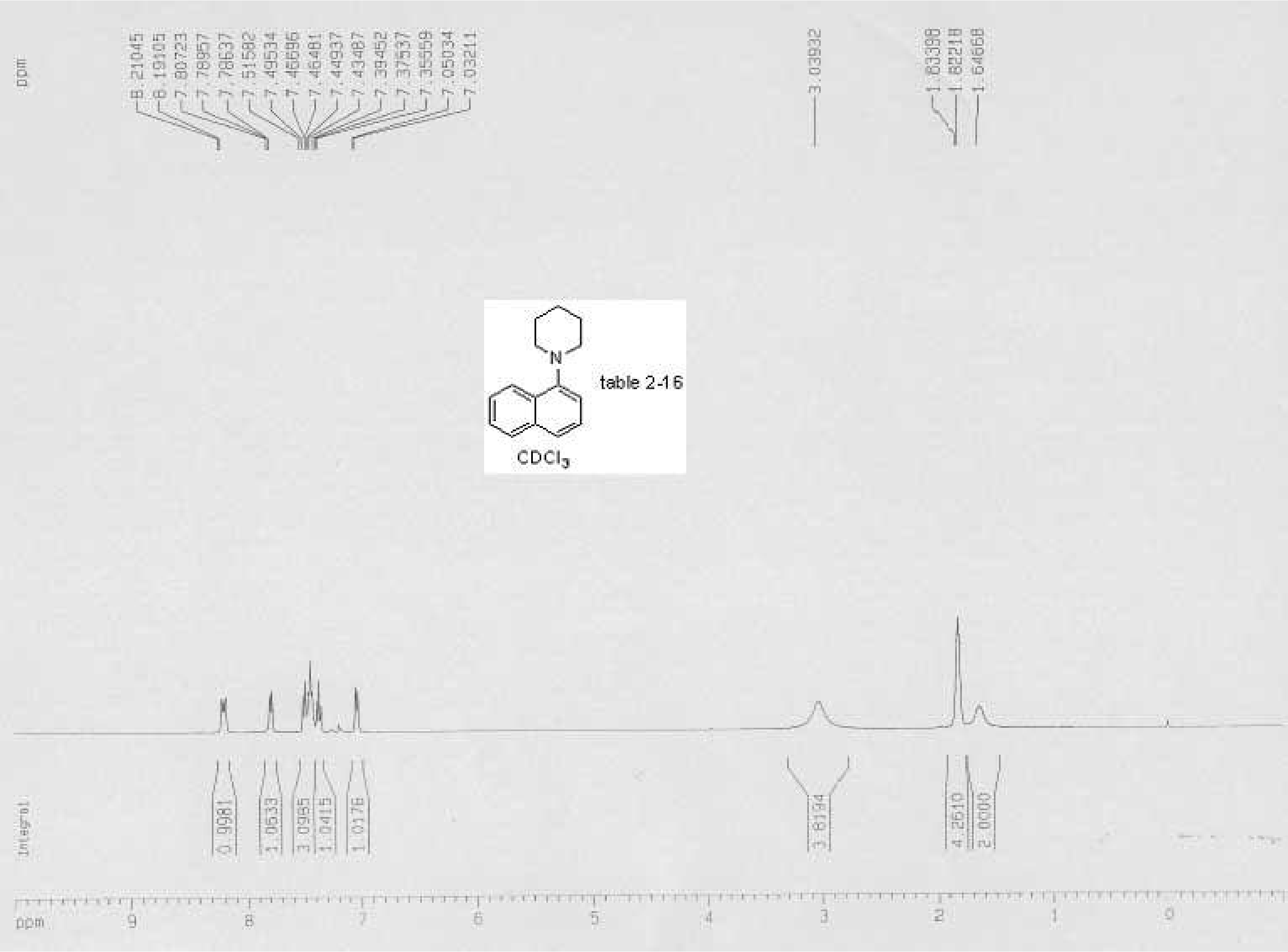
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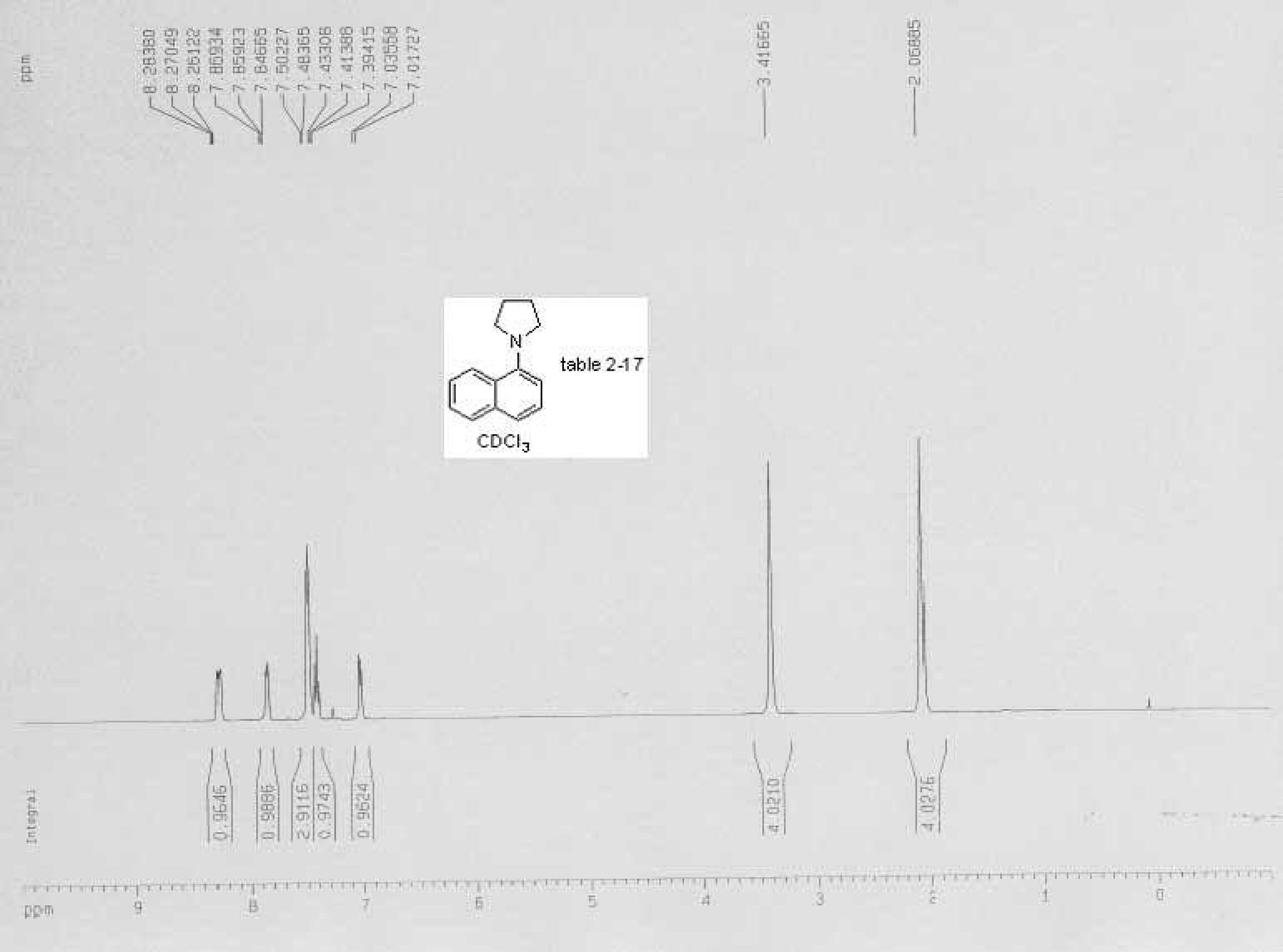
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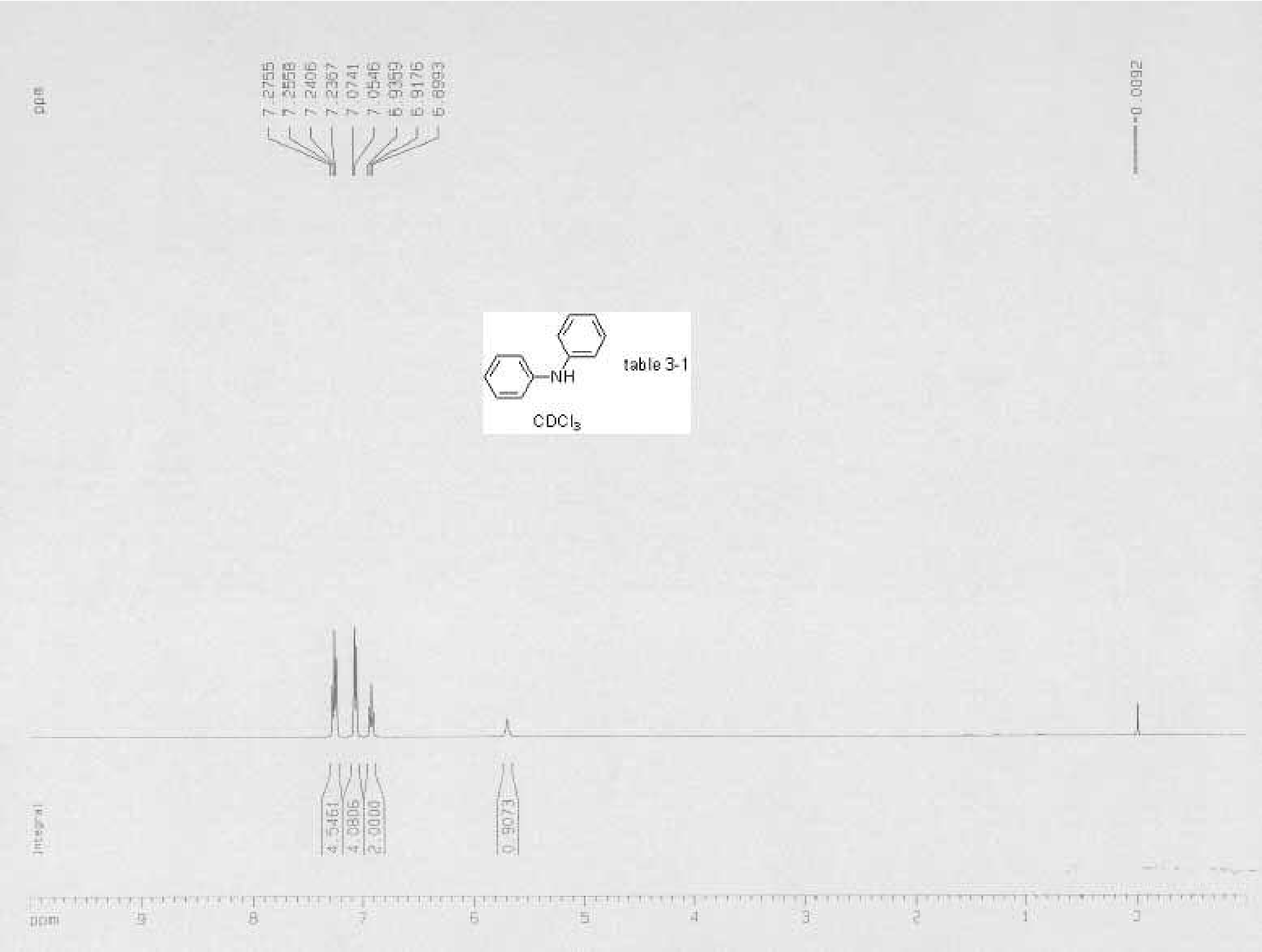
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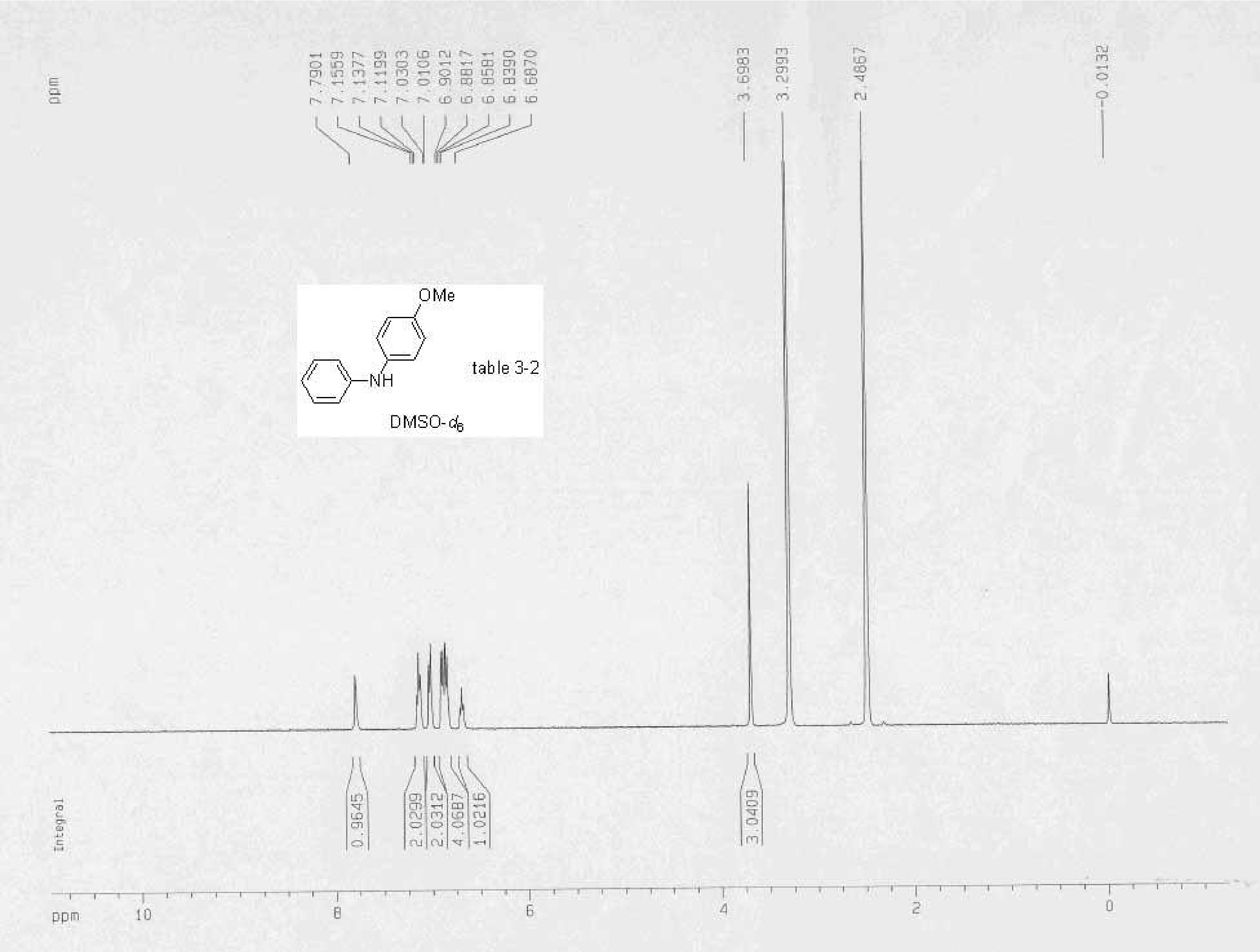
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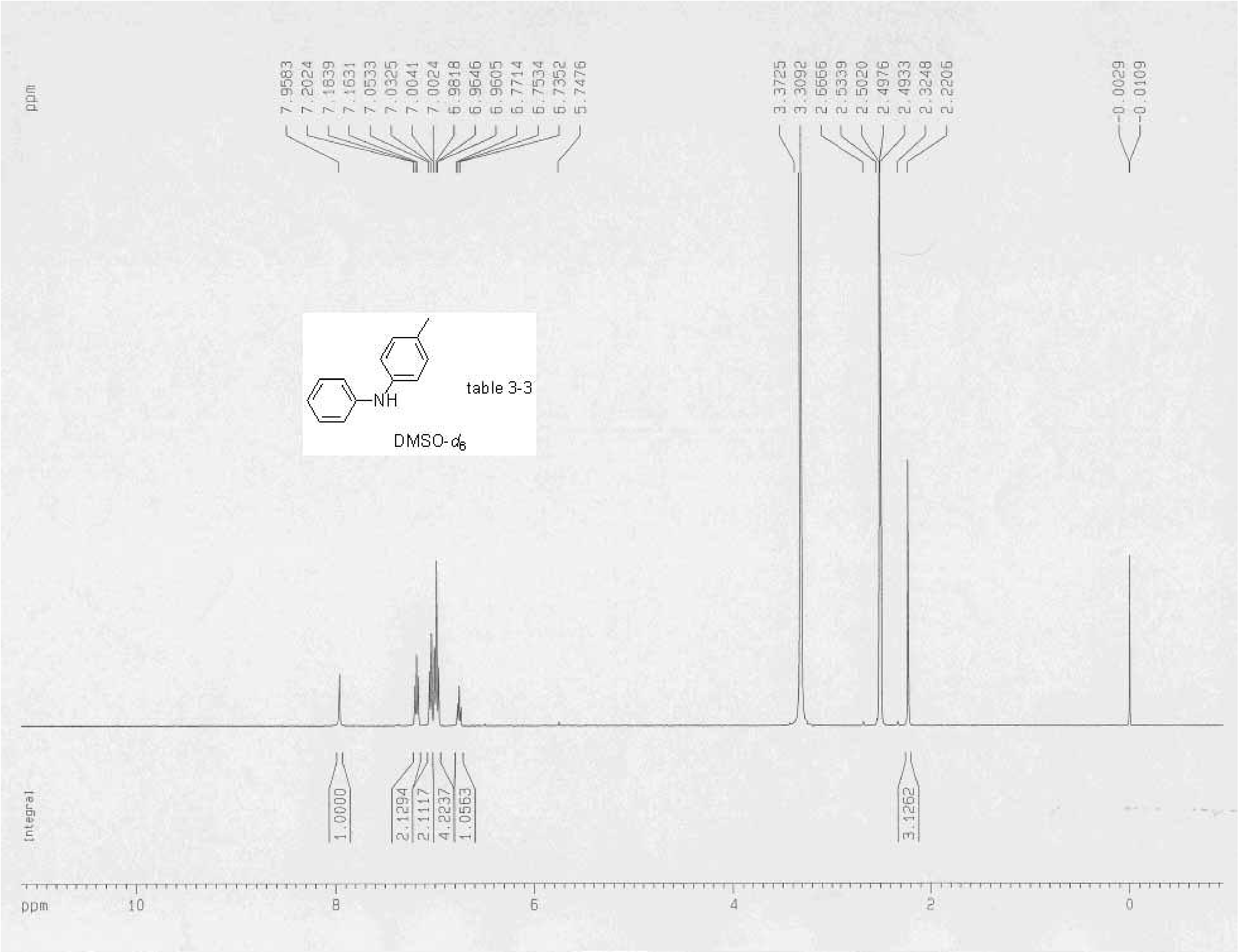
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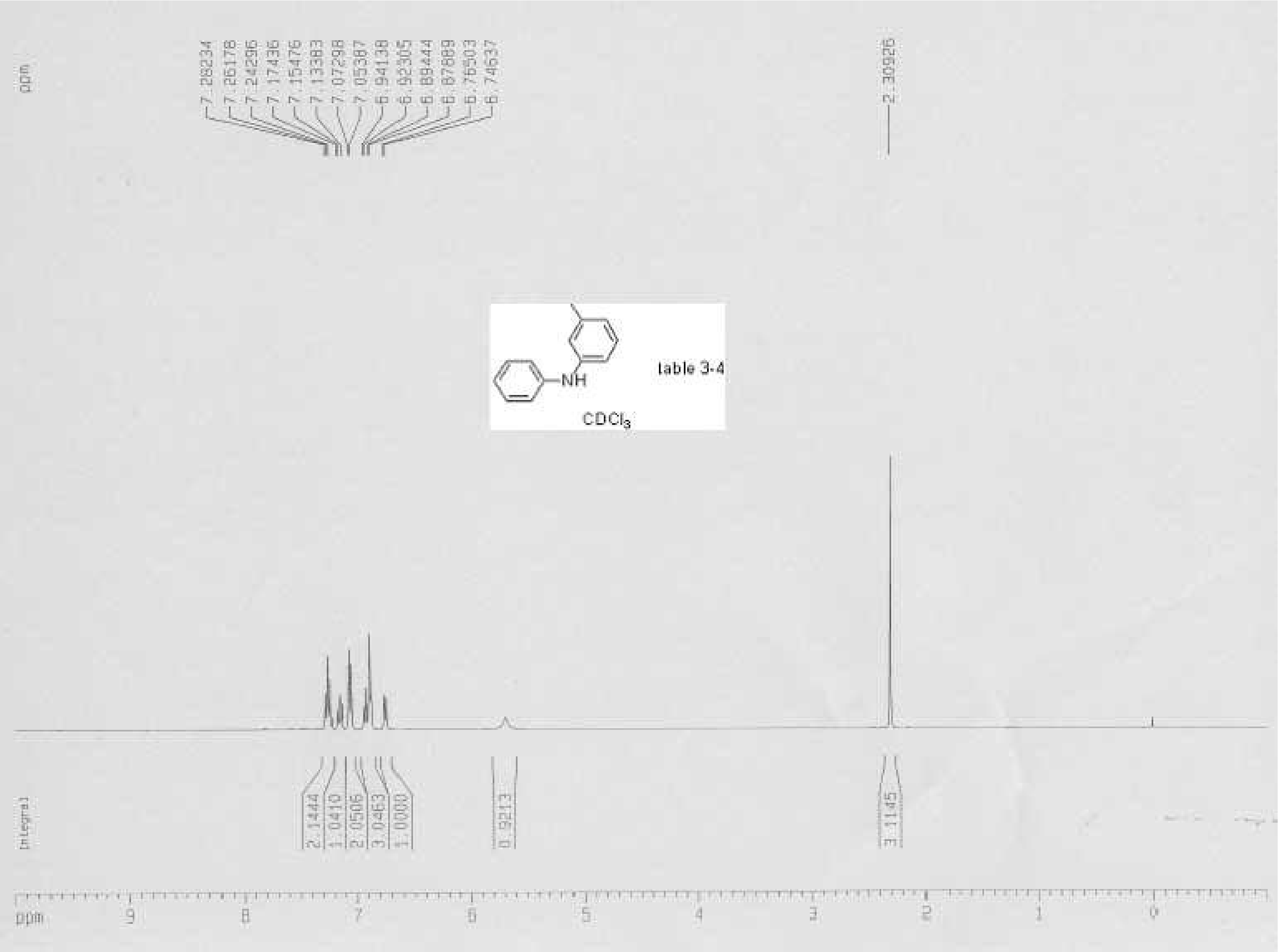
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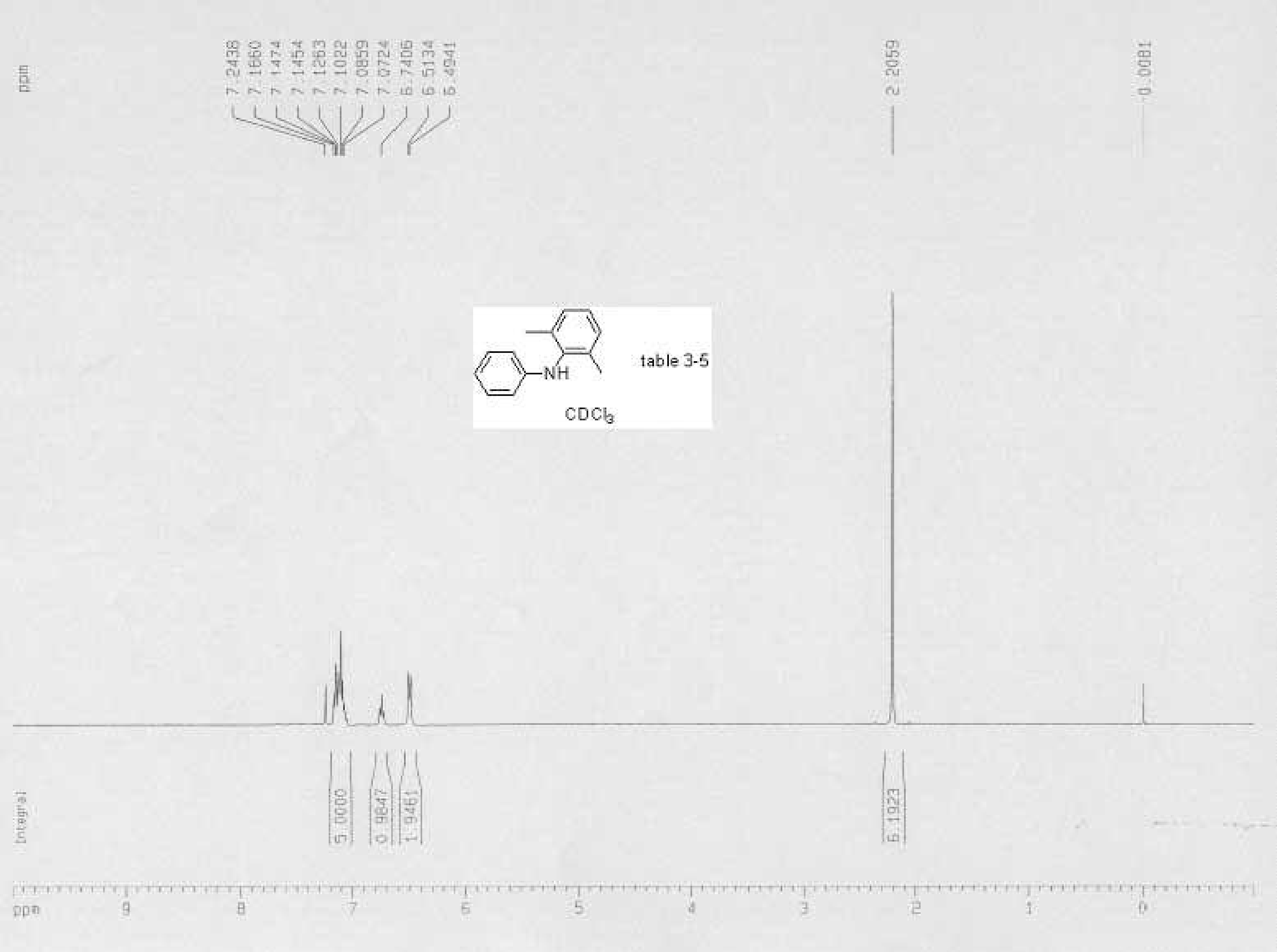
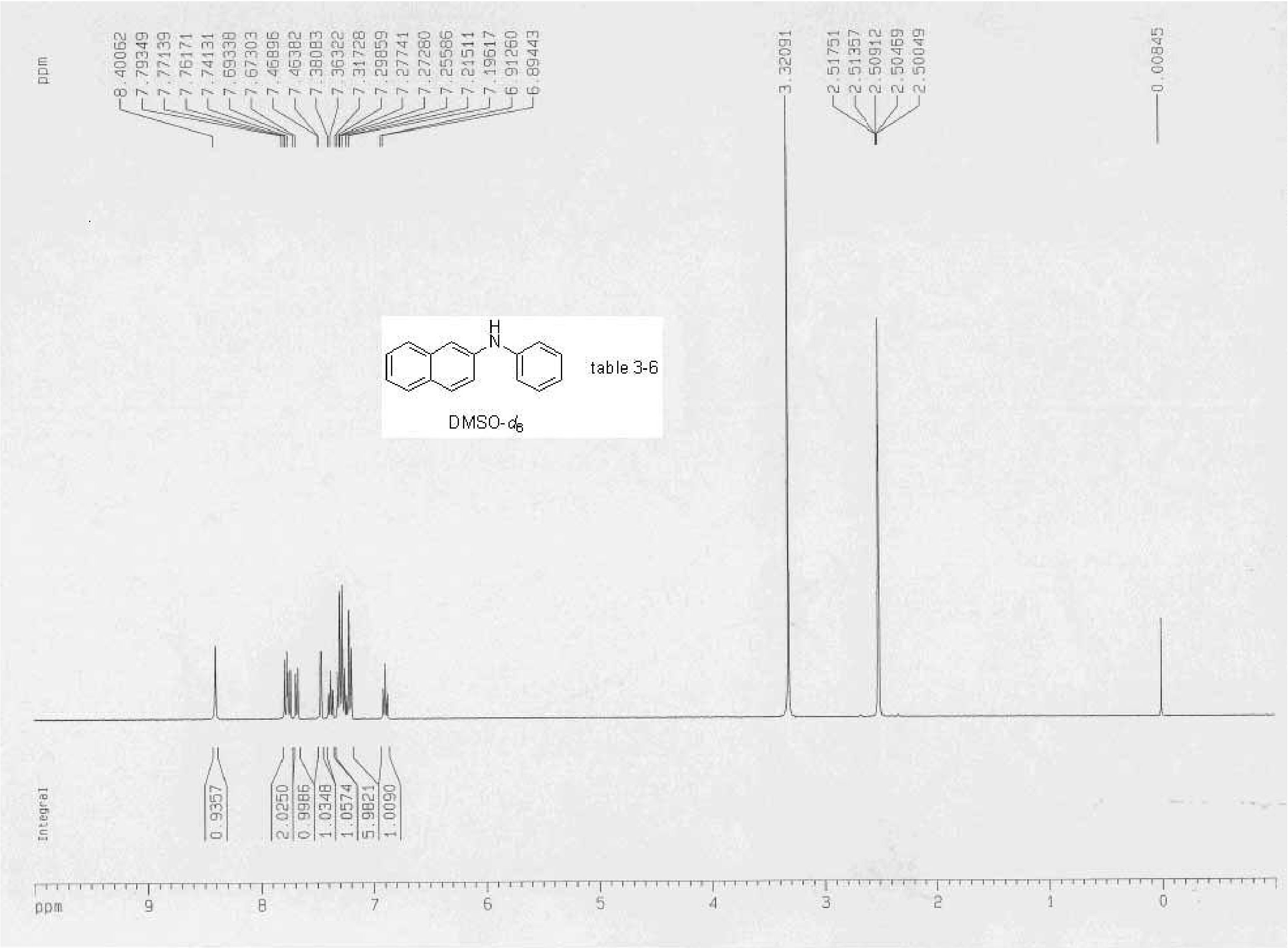
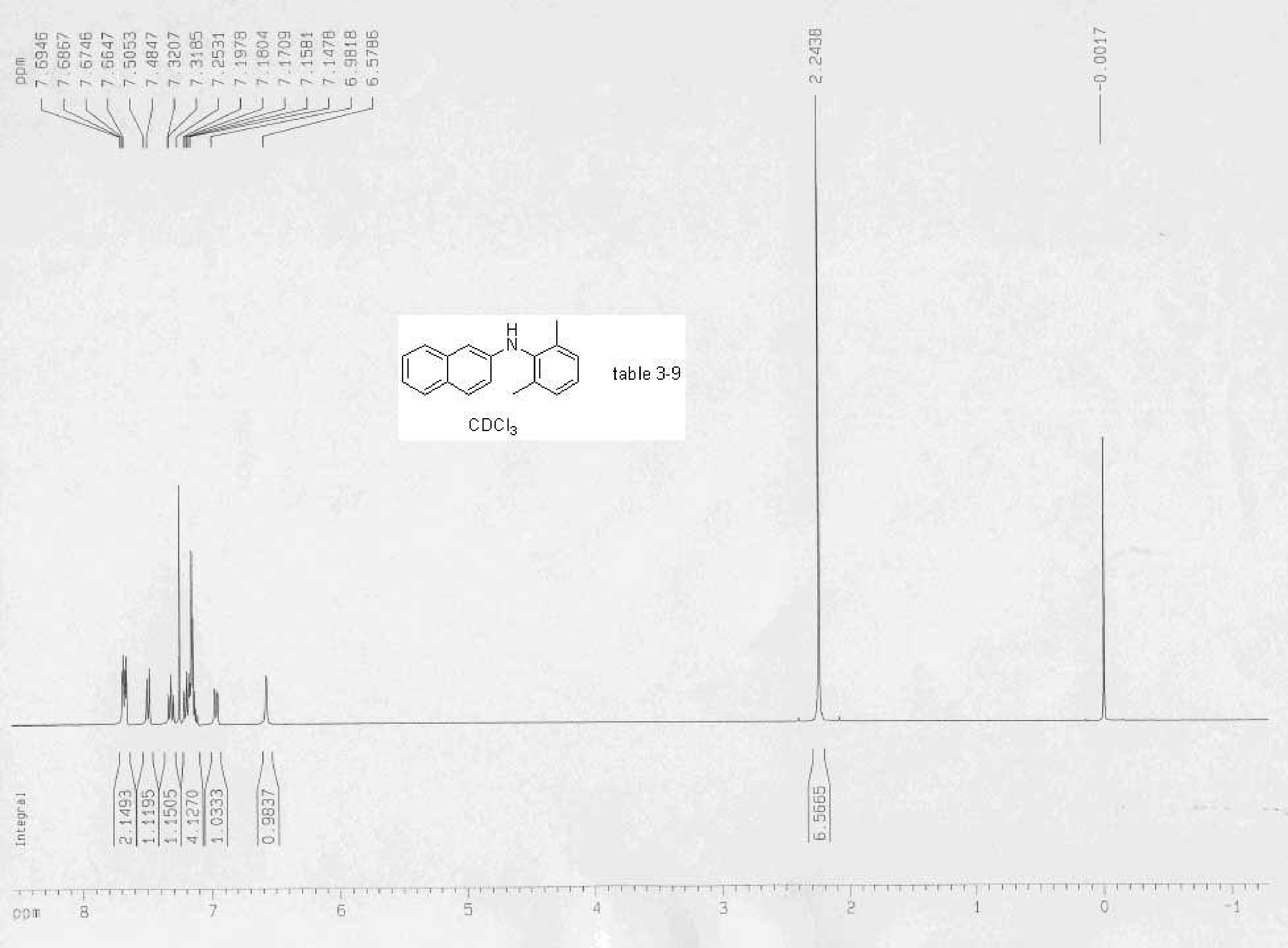
7.26178
7.24296
7.17436
7.15476
7.13383
7.07298
7.05387
6.94138
6.92305
6.89444
6.87889
6.76503
6.74637
2.30926
NH
table 3-4
CDCl$_3$
[integral]
2.1444
1.0410
2.0506
3.0463
1.0000
0.9213
3.1145
ppm
9
8
7
6
5
4
3
2
1
0

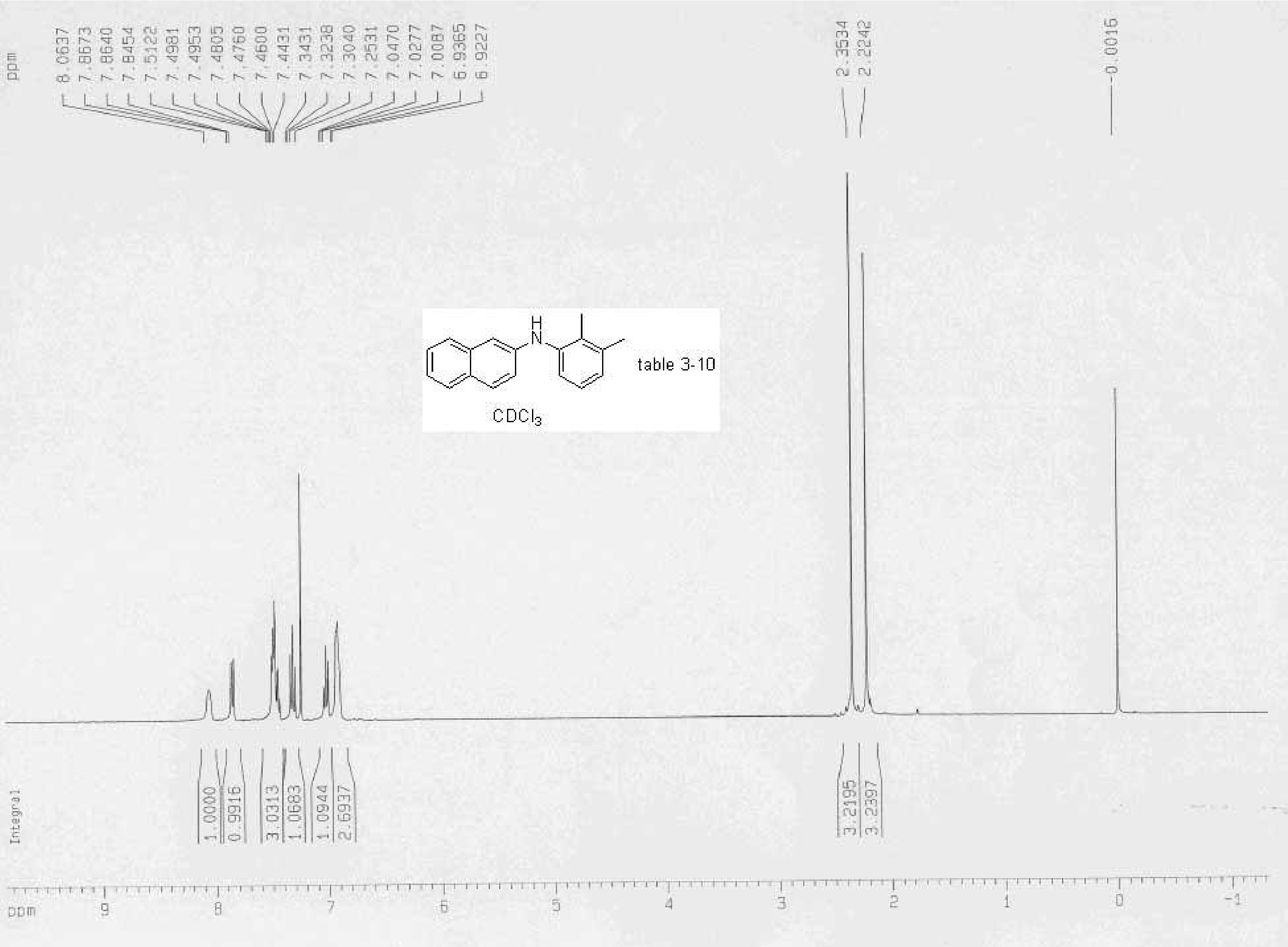

ppm
7.2438
7.1660
7.1474
7.1454
7.1263
7.1022
7.0859
7.0724
6.7406
6.5134
6.4941
2.2059
0.0081
NH
table 3-5
$CDCl_3$
Integral
5.0000
0.9647
1.9461
6.1923
ppm
9
8
7
6
5
4
3
2
1
0

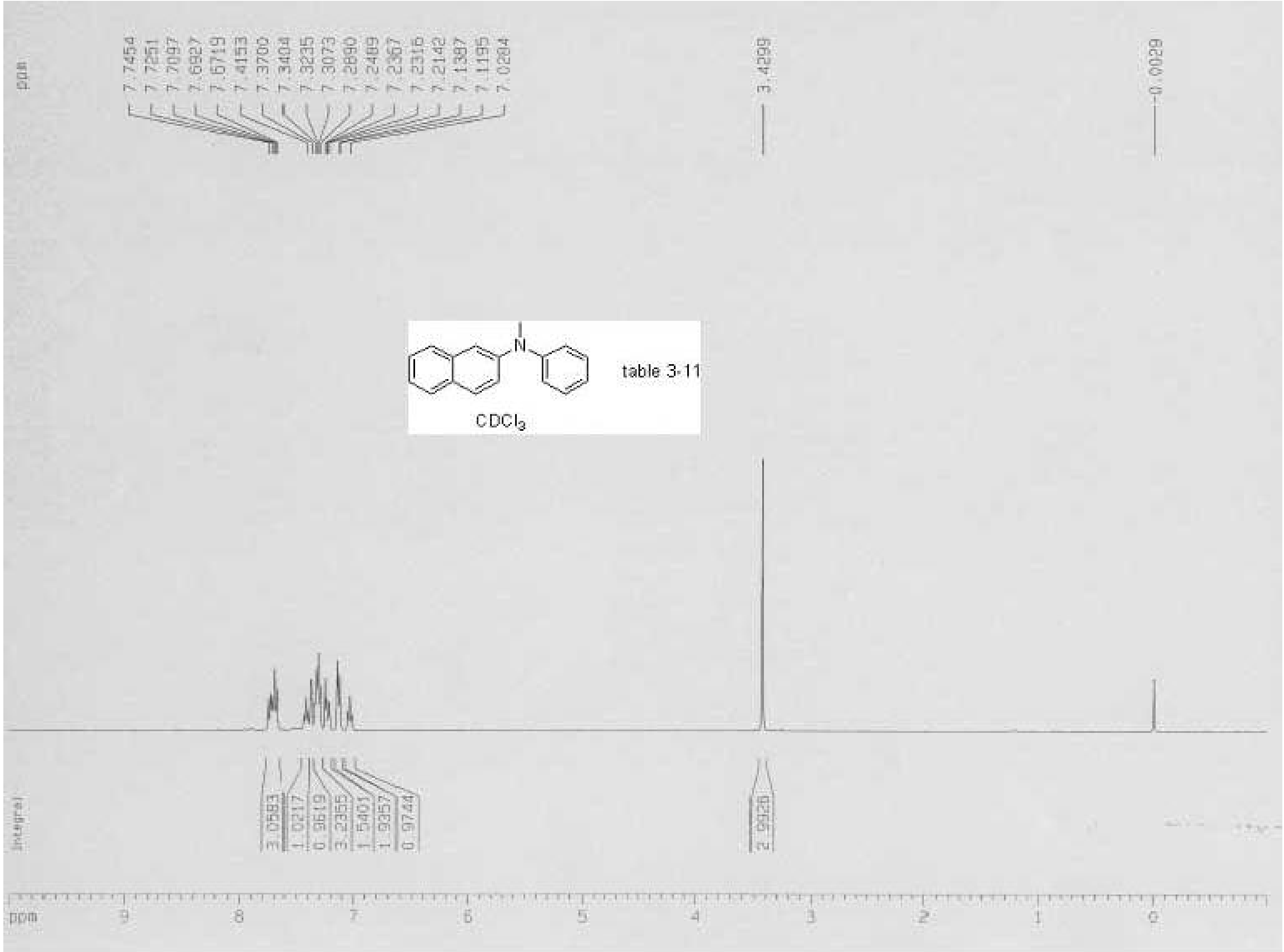

ppm
8.40062
7.79349
7.77139
7.76171
7.74131
7.69338
7.67303
7.46896
7.46382
7.38083
7.36322
7.31728
7.29859
7.27741
7.27280
7.25586
7.21511
7.19617
6.91260
6.89443
3.32091
2.51751
2.51357
2.50912
2.50469
2.50049
0.00845
H
N
table 3-6
DMSO-d_6
Integral
0.9357
2.0250
0.9986
1.0348
1.0574
5.9821
1.0090
ppm
9
8
7
6
5
4
3
2
1
0

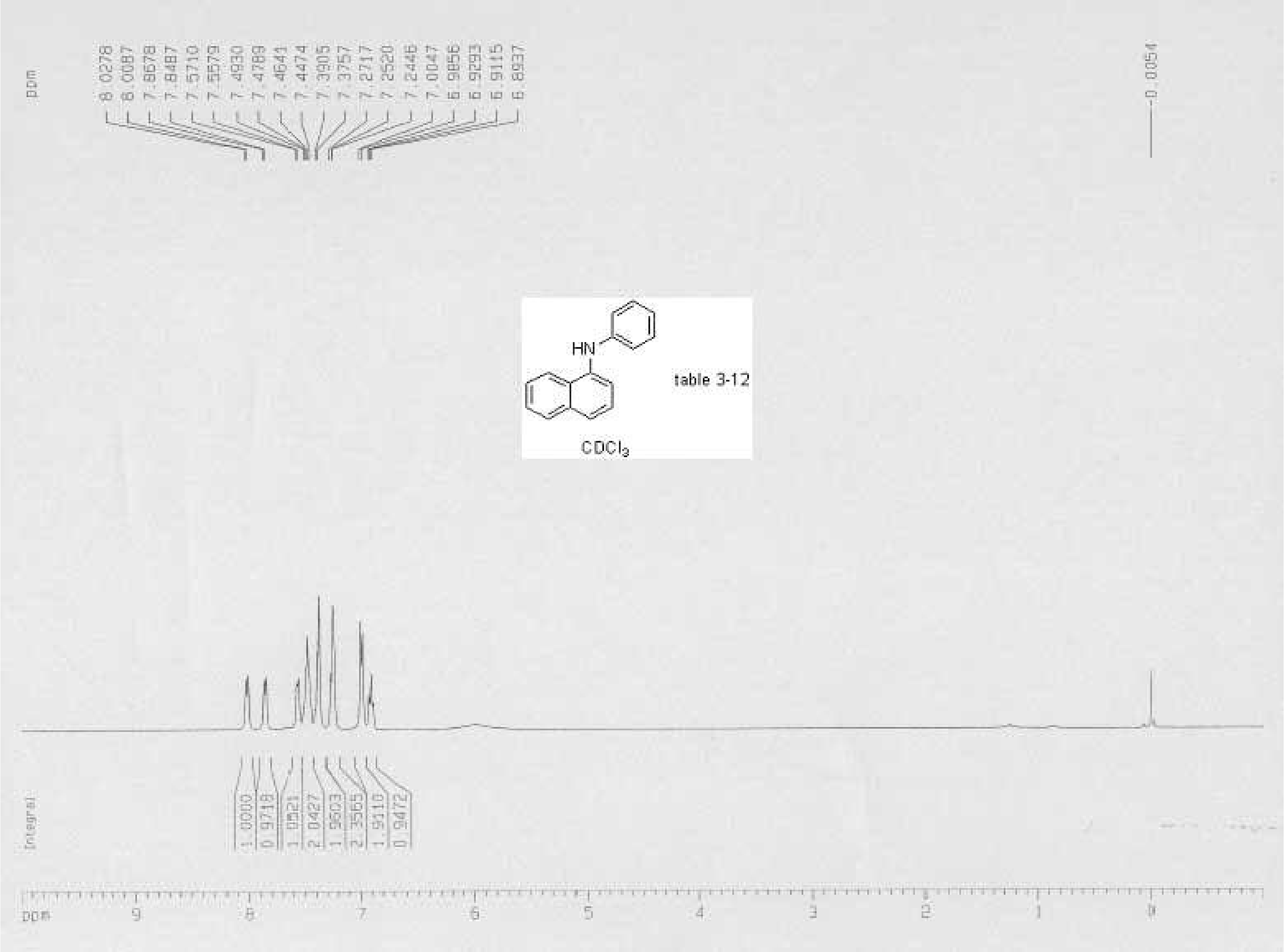

ppm
7.6839
7.6664
7.6616
7.5704
7.5499
7.3406
7.3227
7.2448
7.2428
7.2231
7.2054
7.1943
7.1322
7.1050
7.1000
7.0831
7.0782
6.8866
6.8646
3.7923
0.0253
H
N
OCH3
table 3-7
CDCl3
Integral
2.1787
1.0860
1.1268
2.1497
2.1055
1.0789
2.0854
1.0000
3.2494
ppm
9
8
7
6
5
4
3
2
1
0

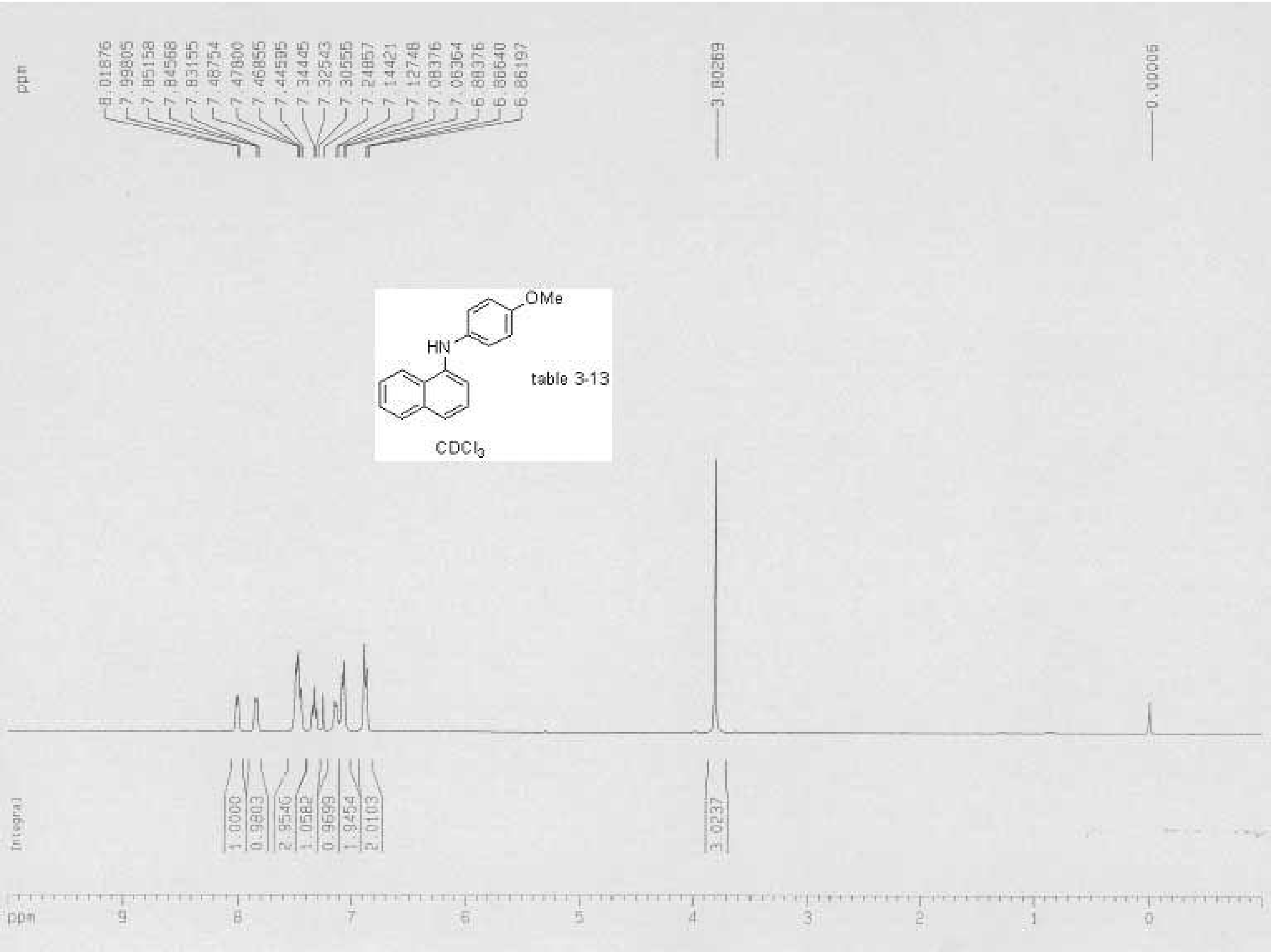

ppm
8.24367
7.75459
7.73201
7.71013
7.64338
7.62296
7.35561
7.36010
7.35506
7.35169
7.33416
7.33142
7.24393
7.23820
7.22151
7.21753
7.11196
3.30804
2.51151
2.50719
2.50272
2.49825
2.49393
2.26321
0.00273
H
N
table 3-8
DMSO-d_6
Integral
0.9944
2.1071
1.0534
2.1023
2.1121
4.0647
3.0000
ppm
9
8
7
6
5
4
3
2
1
0

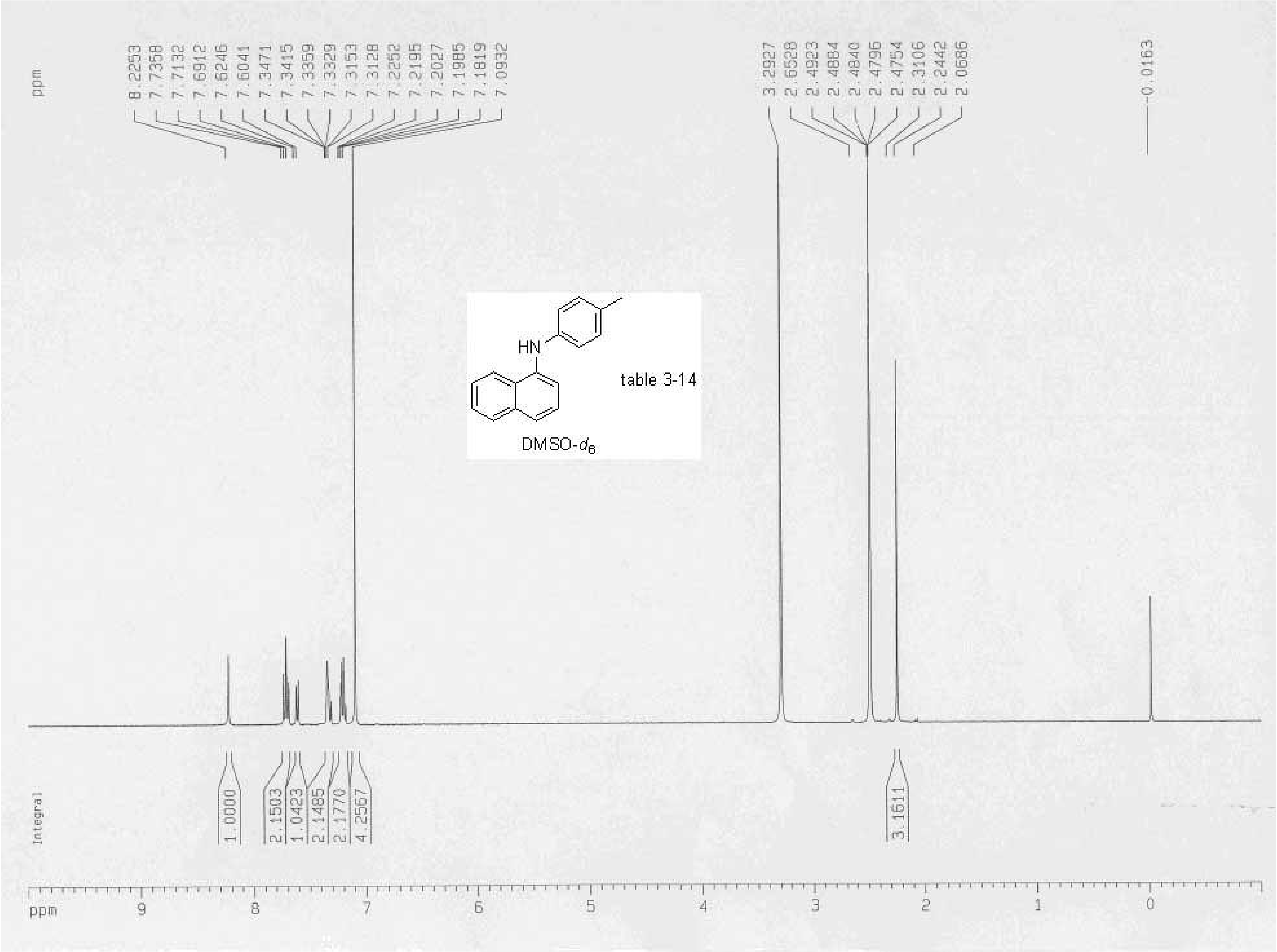

ppm
7.6946
7.6867
7.6746
7.6647
7.5053
7.4847
7.3207
7.3185
7.2531
7.1978
7.1804
7.1709
7.1581
7.1478
6.9818
6.5786
2.2438
-0.0017
H
N
table 3-9
CDCl3
Integral
2.1493
1.1195
1.1505
4.1270
1.0333
0.9837
6.5665
ppm
8
7
6
5
4
3
2
1
0
-1

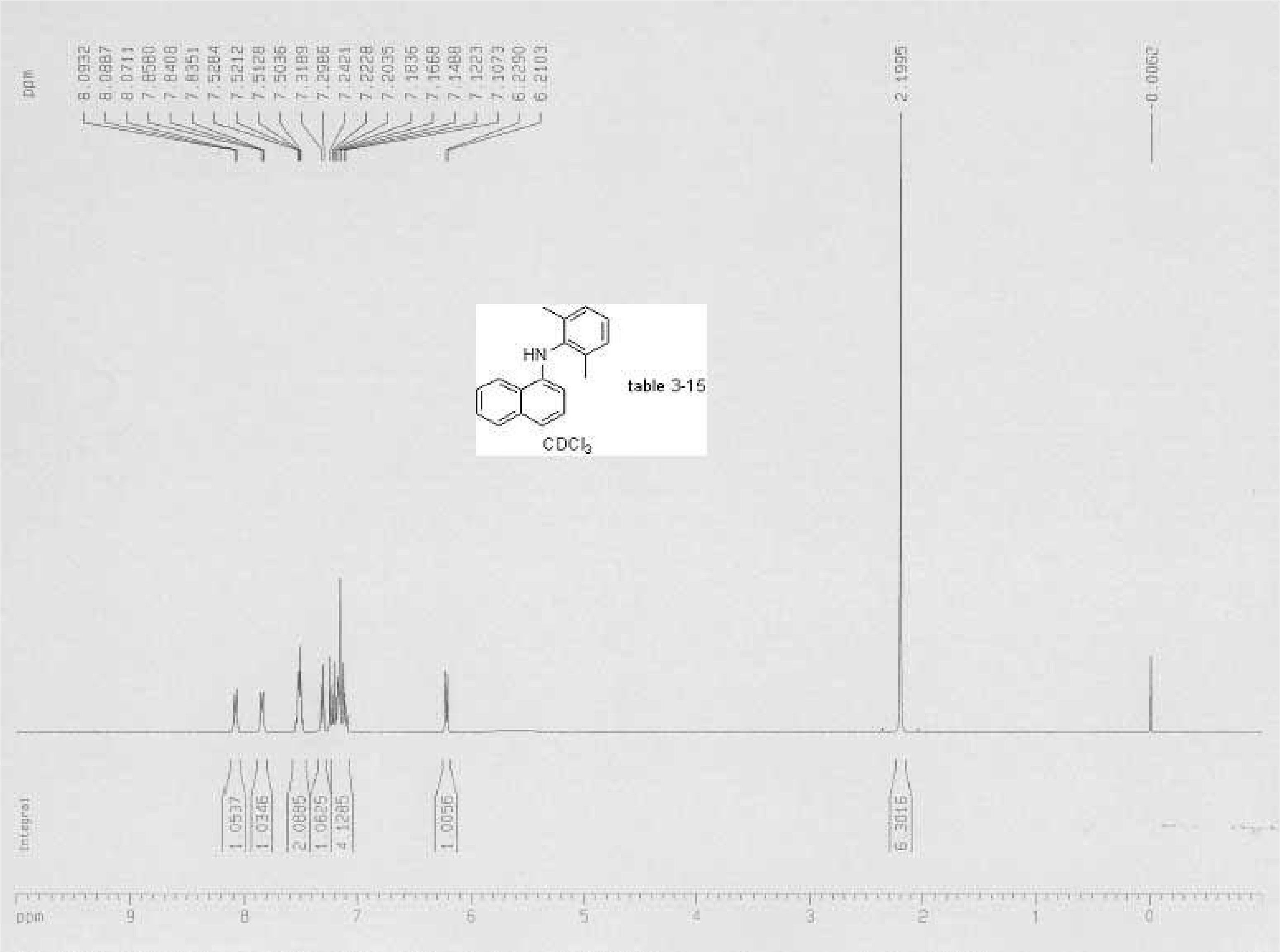

ppm
8.0637
7.8673
7.8640
7.8454
7.5122
7.4981
7.4953
7.4805
7.4760
7.4600
7.4431
7.3431
7.3238
7.3040
7.2531
7.0470
7.0277
7.0087
6.9365
6.9227
2.3534
2.2242
-0.0016
H
N
table 3-10
$CDCl_3$
Integral
1.0000
0.9916
3.0313
1.0683
1.0944
2.6937
3.2195
3.2397
ppm
9
8
7
6
5
4
3
2
1
0
-1

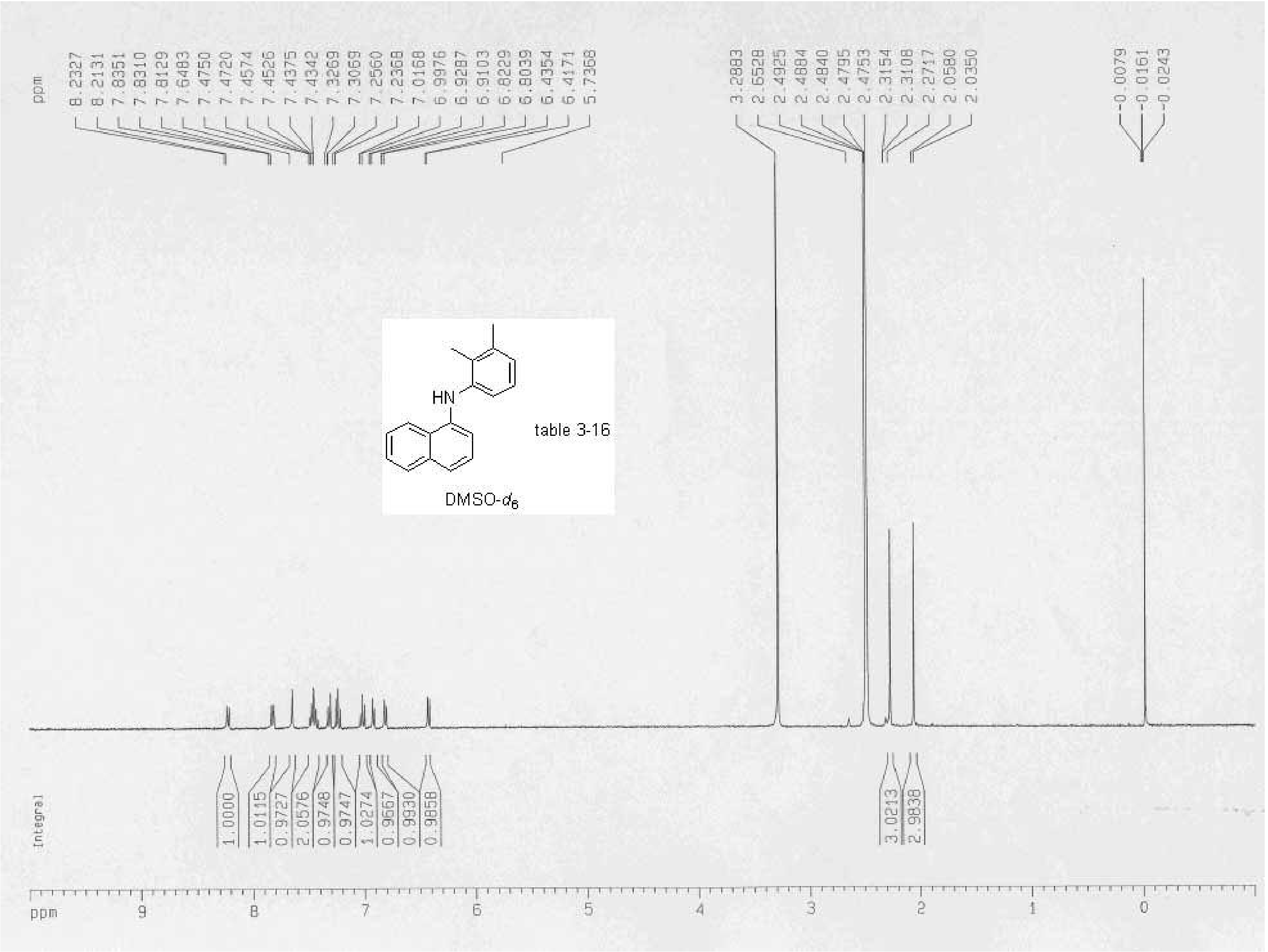

ppm
7.7454
7.7251
7.7097
7.6927
7.6719
7.4153
7.3700
7.3404
7.3235
7.3073
7.2890
7.2489
7.2367
7.2316
7.2142
7.1387
7.1195
7.0284
3.4299
-0.0029
N
table 3-11
$CDCl_3$
Integral
3.0583
1.0217
0.9619
3.2355
1.5401
1.9357
0.9744
2.9926
ppm
9
8
7
6
5
4
3
2
1
0

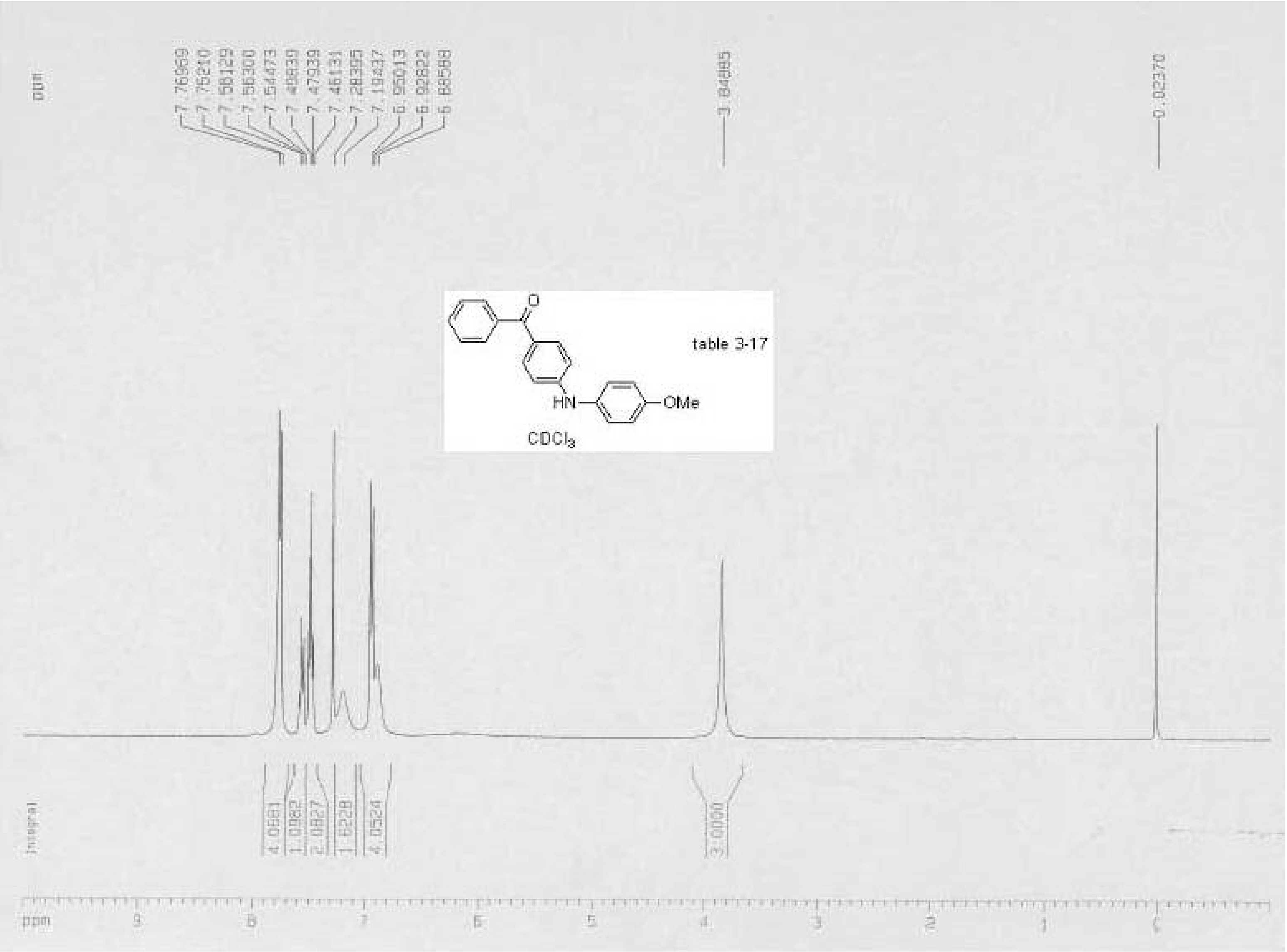

ppm
8.0278
8.0087
7.8678
7.8487
7.5710
7.5579
7.4930
7.4789
7.4641
7.4474
7.3905
7.3757
7.2717
7.2520
7.2446
7.0047
6.9856
6.9293
6.9115
6.8937
0.0054
HN
table 3-12
$CDCl_3$
[integral]
1.0000
0.9718
1.0521
2.0427
1.9603
2.3565
1.9310
0.9472
ppm
9
8
7
6
5
4
3
2
1
0

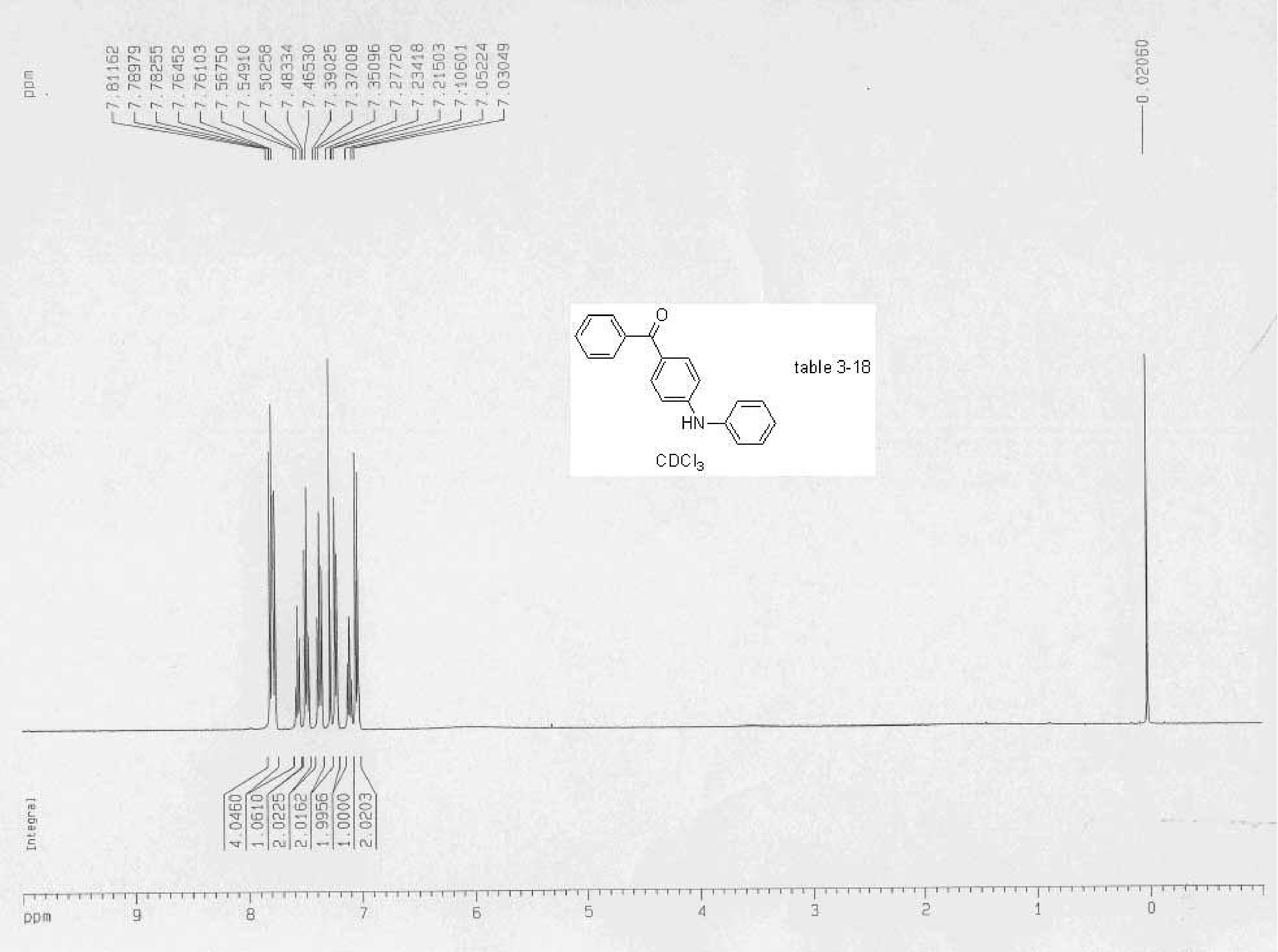

ppm
8.01876
7.99805
7.85158
7.84568
7.83155
7.48754
7.47800
7.46855
7.44595
7.34445
7.32543
7.30555
7.24857
7.14421
7.12748
7.08376
7.05364
6.88376
6.86640
6.86197
3.80269
0.00006
OMe
HN
table 3-13
$CDCl_3$
Integral
1.0000
0.9803
2.9540
1.0582
0.9699
1.9454
2.0103
3.0237
ppm
9
8
7
6
5
4
3
2
1
0

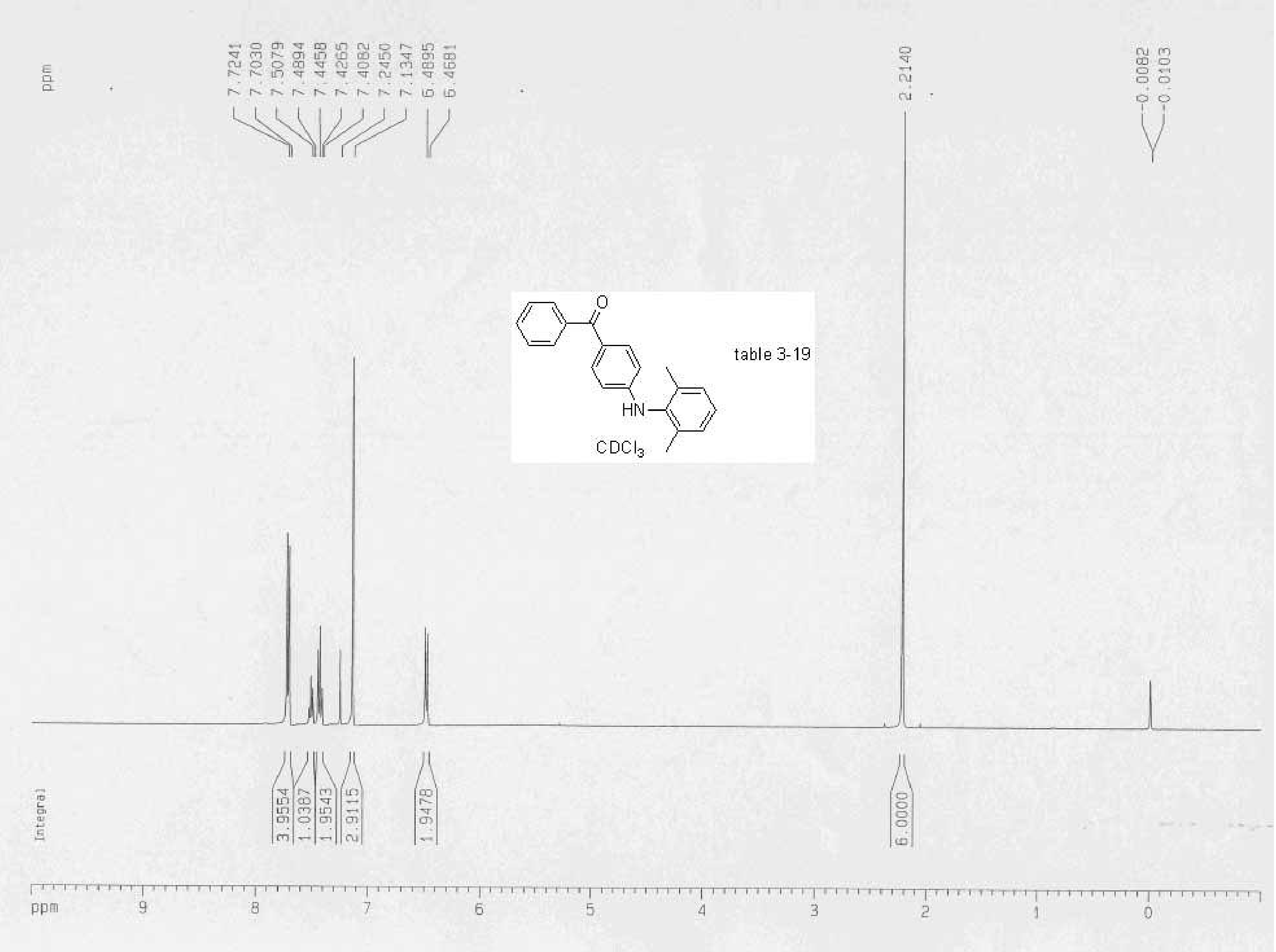

ppm
8.2253
7.7358
7.7132
7.6912
7.6246
7.6041
7.3471
7.3415
7.3359
7.3329
7.3153
7.3128
7.2252
7.2195
7.2027
7.1985
7.1819
7.0932
3.2927
2.6528
2.4923
2.4884
2.4840
2.4796
2.4754
2.3106
2.2442
2.0686
-0.0163
HN
table 3-14
DMSO-d_6
Integral
1.0000
2.1503
1.0423
2.1485
2.1770
4.2567
3.1611
ppm
9
8
7
6
5
4
3
2
1
0

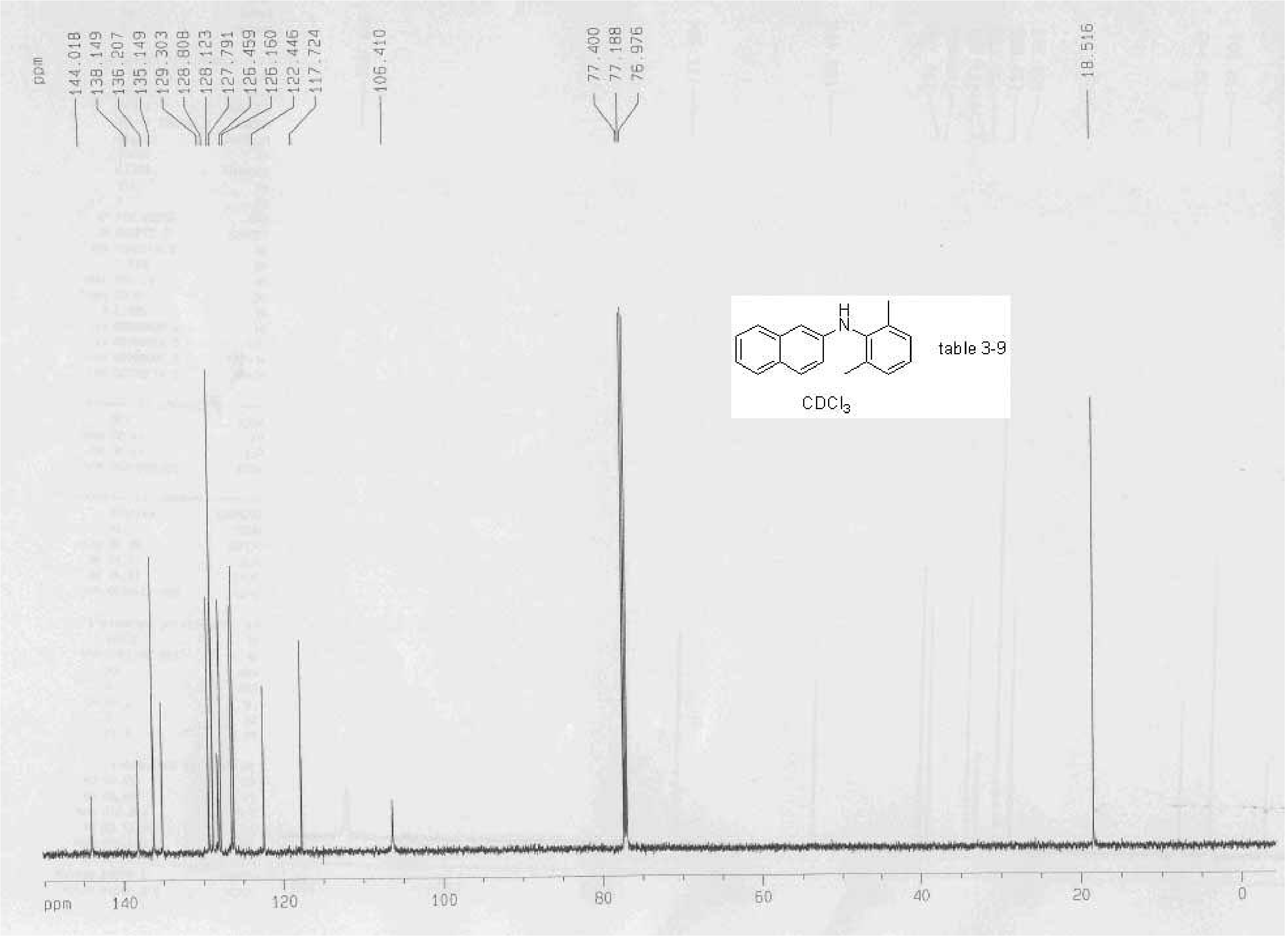

ppm
8.0932
8.0887
8.0711
7.8580
7.8408
7.8351
7.5284
7.5212
7.5128
7.5036
7.3189
7.2986
7.2421
7.2228
7.2035
7.1836
7.1668
7.1488
7.1223
7.1073
6.2290
6.2103
2.1995
0.0062
HN
table 3-15
$CDCl_3$
Integral
1.0537
1.0346
2.0885
1.0625
4.1285
1.0056
6.3016
ppm
9
8
7
6
5
4
3
2
1
0

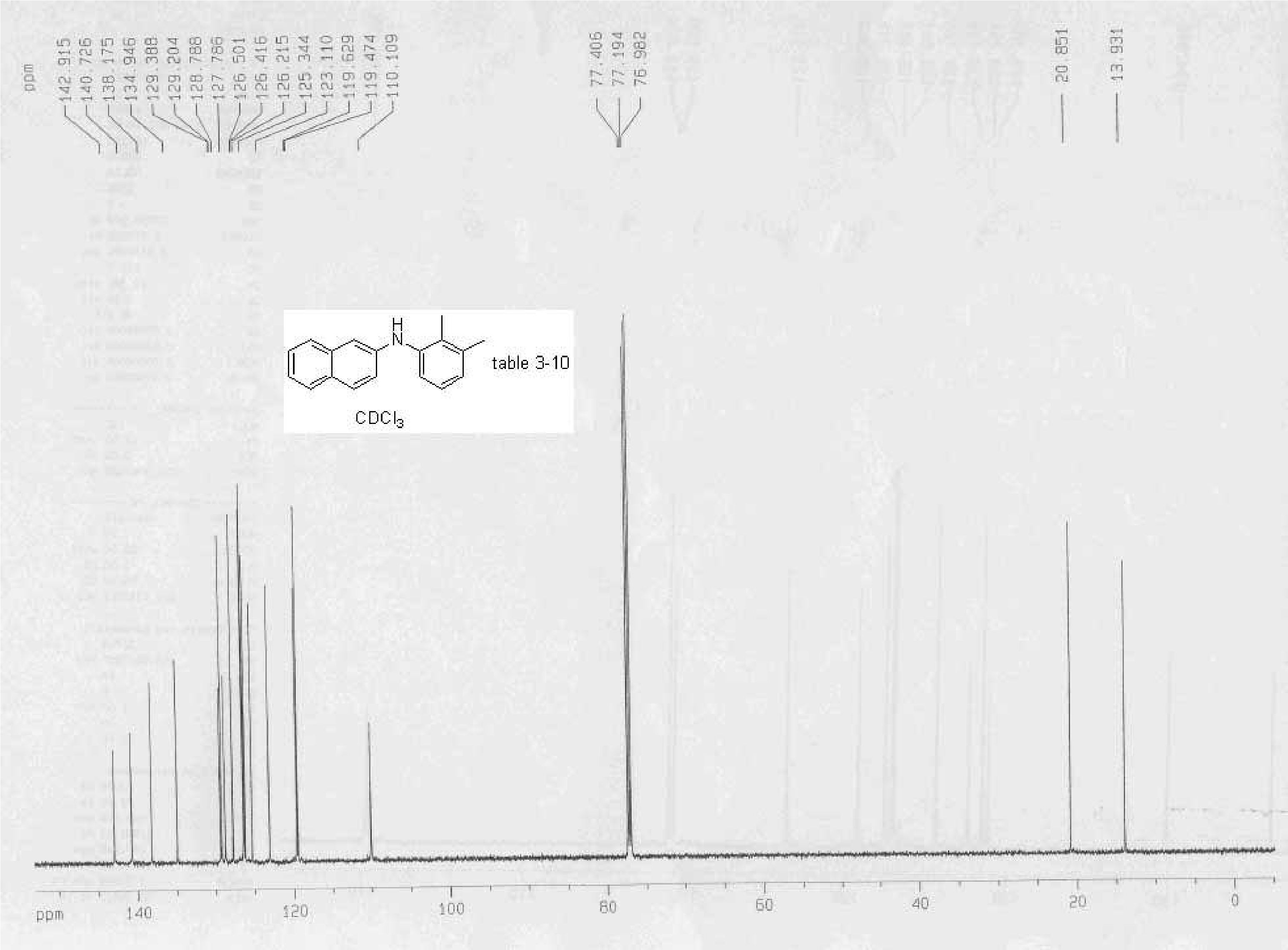

ppm
8.2327
8.2131
7.8351
7.8310
7.8129
7.6483
7.4750
7.4720
7.4574
7.4526
7.4375
7.4342
7.3269
7.3069
7.2560
7.2368
7.0168
6.9976
6.9287
6.9103
6.8229
6.8039
6.4354
6.4171
5.7368
3.2883
2.5528
2.4925
2.4884
2.4840
2.4795
2.4753
2.3154
2.3108
2.2717
2.0580
2.0350
-0.0079
-0.0161
-0.0243
HN
table 3-16
DMSO-d_6
Integral
1.0000
1.0115
0.9727
2.0576
0.9748
0.9747
1.0274
0.9667
0.9930
0.9858
3.0213
2.9838
ppm
9
8
7
6
5
4
3
2
1
0

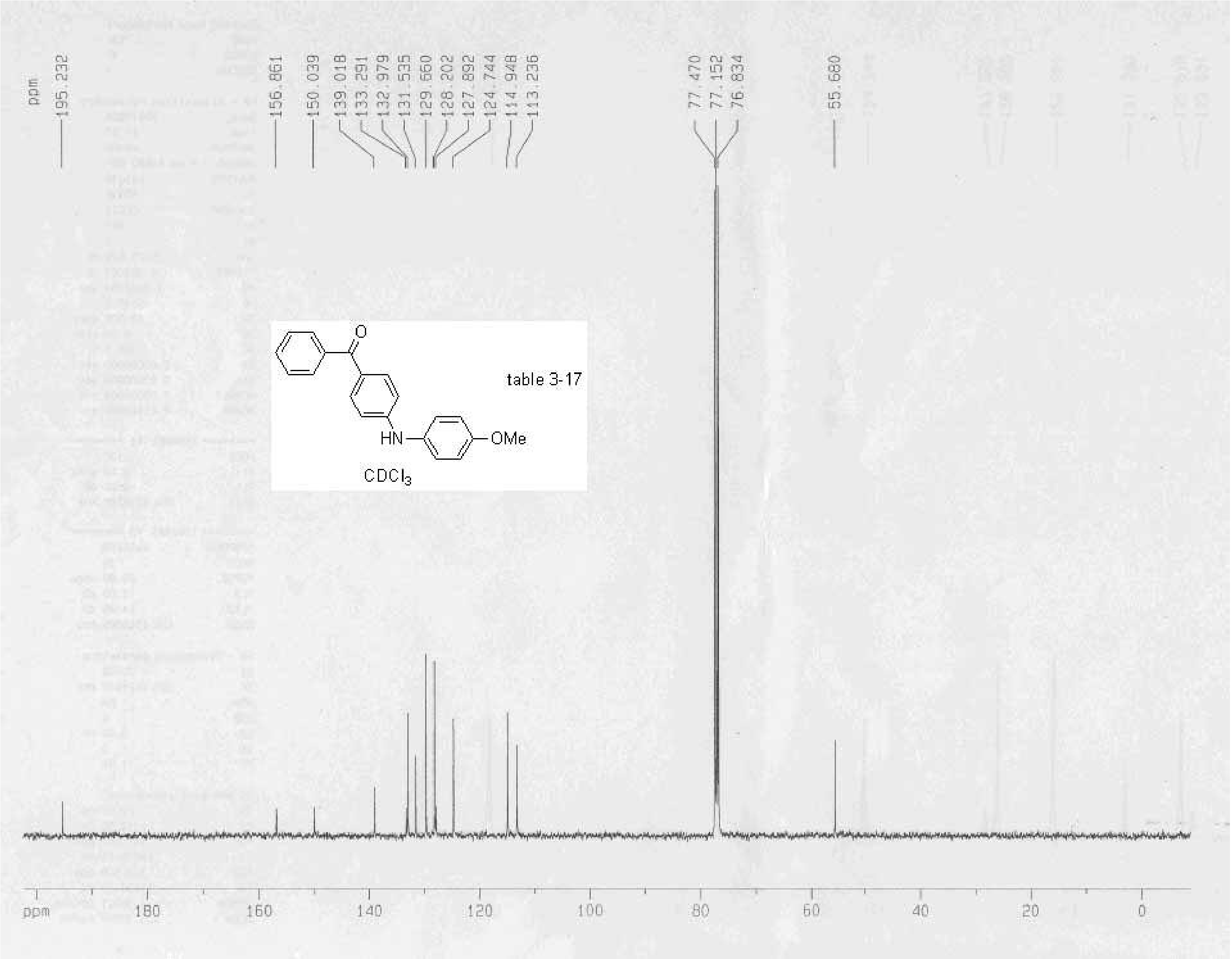

ppm
7.76669
7.75210
7.58129
7.56300
7.54473
7.49839
7.47939
7.46131
7.28395
7.19437
6.95013
6.92822
6.88568
3.84885
0.02370
O
HN
OMe
table 3-17
CDCl$_3$
Integral
4.0681
1.0982
2.0827
1.6228
4.0524
3.0000
ppm
9
8
7
6
5
4
3
2
1
0

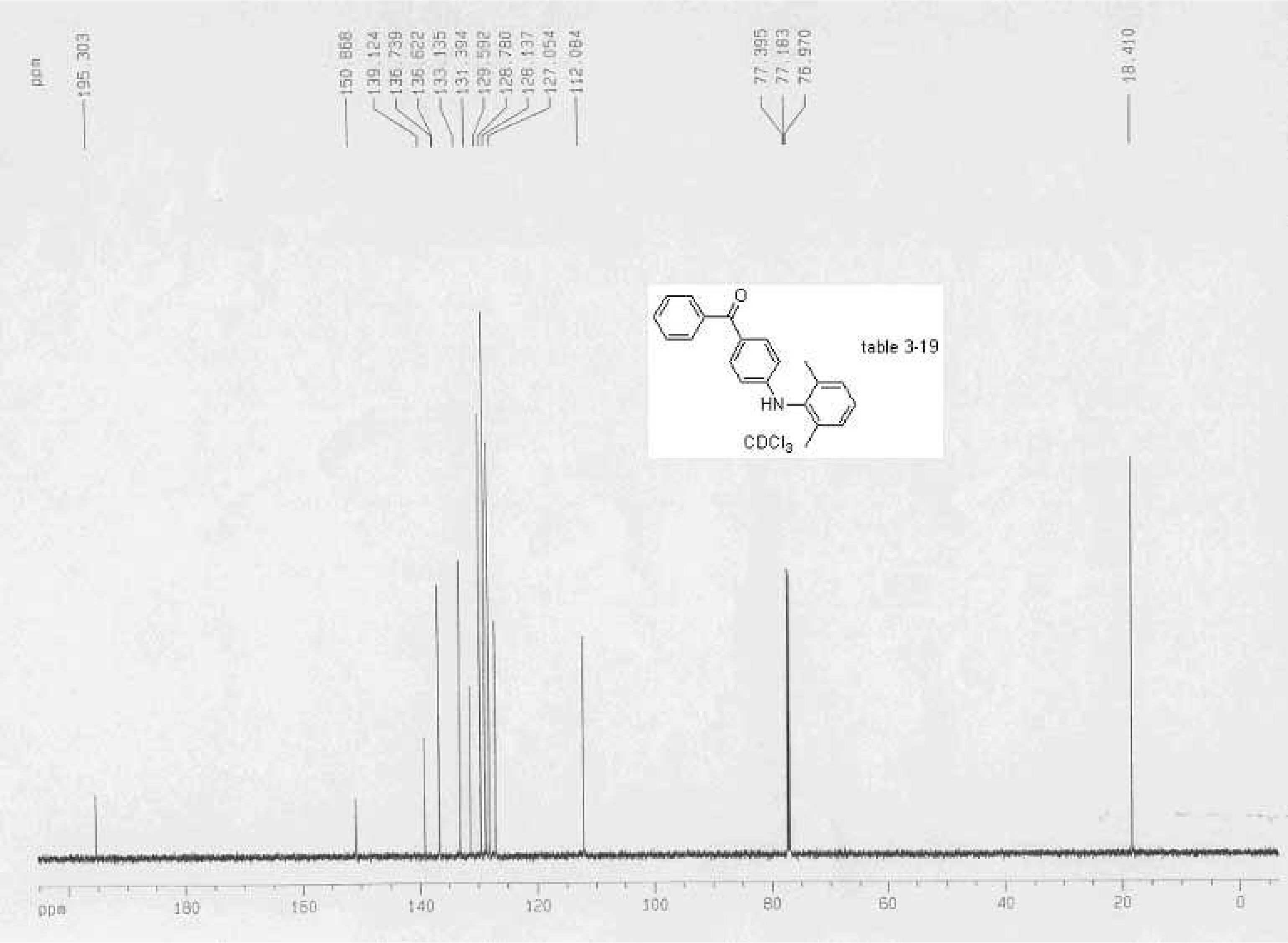

ppm
7.81162
7.78979
7.78255
7.76452
7.76103
7.56750
7.54910
7.50258
7.48334
7.46530
7.39025
7.37008
7.35096
7.27720
7.23418
7.21503
7.10601
7.05224
7.03049
0.02060
table 3-18
HN
O
CDCl3
Integral
4.0460
1.0610
2.0225
2.0162
1.9956
1.0000
2.0203
ppm
9
8
7
6
5
4
3
2
1
0


ppm
7.7241
7.7030
7.5079
7.4894
7.4458
7.4265
7.4082
7.2450
7.1347
6.4895
6.4681
2.2140
-0.0082
-0.0103
O
HN
table 3-19
CDCl3
Integral
3.9554
1.0387
1.9543
2.9115
1.9478
6.0000
ppm
9
8
7
6
5
4
3
2
1
0


ppm
144.018
138.149
136.207
135.149
129.303
128.808
128.123
127.791
126.459
126.160
122.446
117.724
106.410
77.400
77.188
76.976
18.516
H
N
table 3-9
CDCl$_3$
ppm
140
120
100
80
60
40
20
0


ppm
142.915
140.726
138.175
134.946
129.388
129.204
128.788
127.786
126.501
126.416
126.215
125.344
123.110
119.629
119.474
110.109
77.406
77.194
76.982
20.851
13.931
H
N
table 3-10
CDCl$_3$
ppm
140
120
100
80
60
40
20
0


ppm
195.232
156.861
150.039
139.018
133.291
132.979
131.535
129.560
128.202
127.892
124.744
114.948
113.236
77.470
77.152
76.834
55.680
O
HN
OMe
table 3-17
CDCl3
ppm
180
160
140
120
100
80
60
40
20
0


ppm
195.303
150.868
139.124
136.739
136.622
133.135
131.394
129.592
128.780
128.137
127.054
112.084
77.395
77.183
76.970
18.410
O
HN
table 3-19
CDCl$_3$
ppm
180
160
140
120
100
80
60
40
20
0