

Electronic Supplementary Information for

Iridium complex immobilized on high-nitrogen containing covalent triazine framework derived from 2,5-pyrazinedicarbonitrile as a recyclable catalyst for the selective N-alkylation of aminobenzenesulfonamides with alcohols

Chenchen Yang, Shushu Hao, Lu Shen, Peng Liu, Jiazhi Yang, and Feng Li*

* E-mail: fengli@njust.edu.cn

School of Chemistry and Chemical Engineering, Nanjing University of Science & Technology, Nanjing
210094, P. R. China

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General Experimental Details. All reagents and materials used in this study were obtained from commercial sources and used as received unless mentioned otherwise. Quant 250 FEG operated at an accelerating voltage of 20.0 kV was used for the Scanning Electron Microscopy (SEM) and Energy-Dispersive X-ray Spectroscopy (EDS) measurements. X-ray Photoelectron Spectroscopy (XPS) analysis was performed on a PHI QUANTERA II using Mg K α as the excitation source. All binding energy values were calibrated using the adventitious carbon C1s peak at 284.6 eV. XRD patterns were collected on a Bruker D8 Advanced Diffractometer using Cu K α irradiation ($\lambda=0.15406$ Å). TGA was performed on a Mettler 851e instrument with a heating rate of 10 °C min⁻¹ in oxygen atmosphere. Metal contents in the Cp*Ir@CTF was determined by inductively coupled plasma optical emission spectrometry (ICP-MS) (iCAP-Q, Thermo Fisher Scientific) using microwave assisted acid digestion system (MARS6, CEM/U.S.A). BET surface area and N₂ adsorption-desorption measurements were conducted at 77 K using an automated gas sorption system (ASAP 2020). ATR-IR measurements were recorded on a Thermo Fisher Scientific Nicolet iS 10 instrument. Melting points were measured on a X-6 micro-melting apparatus. Proton nuclear magnetic resonance (¹H NMR) spectra were recorded at 500 MHz using a 500 spectrometer. Chemical shifts are reported in delta (δ) units, parts per million (ppm) downfield from tetramethylsilane or ppm relative to the center of the singlet at 2.50 ppm for DMSO-d₆. Coupling constants J values are reported in Hertz (Hz), and the splitting patterns were designated as follows: s, singlet; d, doublet; t, triplet; m, multiplet; b, broad. Carbon-13 nuclear magnetic resonance (¹³C NMR) spectra were recorded at 125 MHz using a 500 spectrometer. Chemical shifts are reported in delta (δ) units, ppm relative to the center of the triplet at 39.52 ppm for DMSO-d₆. ¹³C NMR spectra were routinely run with broadband decoupling. Analytical thin-layer chromatography (TLC) was carried out using 0.2 mm commercial silica gel plates. [Cp*IrCl₂]₂¹ and [Cp*Ir(bpy)Cl]Cl² were synthesized according to the previously reported methods.

Procedure for the synthesis of CTF.³ 2,5-pyrazinedicarbonitrile (0.30 g, 2.31 mmol) and zinc chloride (1.61 g, 11.8 mmol) were charged to a 20 mL ampoule under Ar atmosphere and closed with septum. The ampoule was then sealed under vacuum by flame and the contents were heated to 400 °C in a furnace for a period of 48 h. The heating rate was maintained to be 60 °C/h. The furnace was cooled to 20 °C after 48 h. The crude product was collected, ground well and stirred with 500 mL of water for 3 h. The black solid was filtered and washed with water and acetone. The resulting solid was

refluxed with 1 M HCl solution (500 mL) for 16 h, filtered and washed with 1 M HCl (3 × 100 mL), H₂O (3 × 100 mL), THF (3 × 100 mL) and acetone (3 × 100 mL). The black solid was dried under vacuum at 60 °C for 12 h.

Procedure for the synthesis of Cp*Ir@CTF. To a suspension of CTF (0.15 g) in mixed solution of 5.0 mL of dichloromethane was added [Cp*IrCl₂]₂ (0.10 g) under N₂ atm. The resulting suspension was reacted at 70 °C under N₂ atm for 12 h. After 12 h, the black solid was filtered and washed with an excess of dichloromethane (10 × 25 mL) to remove the unreacted metal precursor. The synthesized catalyst was dried under vacuum at 60 °C for 12 h for analysis and use as a catalyst.

General procedure for the N-alkylation of aminobenzenesulfonamides with alcohols catalyzed by Cp*Ir@CTF. Under a nitrogen atmosphere, to a 25-mL Schlenk tube were added aminobenzenesulfonamide (0.5 mmol), alcohol (0.6 mmol, 1.2 equiv), Cp*Ir@CTF (20 mg, 1 mol % Ir), Cs₂CO₃ (1 equiv) and *tert*-amyl alcohol (1 mL). The mixture was heated at 125 °C for 12 h and was then allowed to cool to ambient temperature. The reaction mixture was concentrated in vacuo and purified by flash column chromatography with hexanes/ethyl acetate to afford the corresponding product.

4-amino-N-benzylbenzenesulfonamide (3aa).⁴ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 86% yield (113 mg); mp 186-187 °C; ¹H NMR (500 MHz, DMSO-d₆) δ 7.63 (t, *J* = 6.4 Hz, 1H), 7.45 (d, *J* = 8.5 Hz, 2H), 7.30-7.21 (m, 5H), 6.61 (d, *J* = 8.6 Hz, 2H), 5.92 (s, 2H), 3.87 (d, *J* = 6.4 Hz, 2H); ¹³C {¹H} NMR (125 MHz, DMSO-d₆) δ 152.8, 138.4, 128.8, 128.5, 127.8, 127.3, 125.9, 113.0, 46.4.

N-(3-methoxybenzyl)-4-aminobenzenesulfonamide (3ab).⁵ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 82% yield (120 mg); mp 100-101 °C; ¹H NMR (500 MHz, DMSO-d₆) δ 7.62 (t, *J* = 6.4 Hz, 1H), 7.44 (d, *J* = 8.7 Hz, 2H), 7.19 (t, *J* = 7.5 Hz, 1H), 6.82-6.77 (m, 3H), 6.61 (d, *J* = 8.6 Hz, 2H), 5.91 (s, 2H), 3.86 (d, *J* = 6.3 Hz, 2H), 3.70 (s, 3H); ¹³C {¹H} NMR (125 MHz, DMSO-d₆) δ 164.3, 157.5, 144.7, 134.3, 133.5, 130.7, 124.8, 118.0, 117.8, 117.5, 60.0, 51.1.

N-(4-methoxybenzyl)-4-aminobenzenesulfonamide (3ac).⁵ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 85% yield (124 mg); mp 130-131 °C; ¹H NMR (500 MHz, DMSO-d₆) δ 7.53 (t, *J* = 6.4 Hz, 1H), 7.44 (d, *J* = 8.7 Hz, 2H), 7.14 (d, *J* = 8.5 Hz, 2H), 6.84 (d, *J* = 8.6 Hz, 2H), 6.61 (d, *J* = 8.7 Hz, 2H), 5.91 (s, 2H), 3.79 (d, *J* = 6.4 Hz, 2H), 3.71 (s, 3H); ¹³C {¹H} NMR (125 MHz, DMSO-d₆) δ 158.7, 152.7, 130.1, 129.2, 128.8, 126.0, 113.9, 113.0, 55.3, 45.9.

N-(4-methylbenzyl)-4-aminobenzenesulfonamide (3ad).⁵ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 88% yield (122 mg); mp 146-147 °C; ¹H NMR (500 MHz, DMSO-d₆) δ 7.56 (t, *J* = 6.3 Hz, 1H), 7.44 (d, *J* = 8.6 Hz, 2H), 7.10 (q, *J* = 8.0 Hz, 4H), 6.61 (d, *J* = 8.6 Hz, 2H), 5.91 (s, 2H), 3.81 (d, *J* = 6.3 Hz, 2H), 2.26 (s, 3H); ¹³C {¹H} NMR (125 MHz, DMSO-d₆) δ 152.7, 136.4, 135.2, 129.0, 128.8, 127.8, 125.9, 113.0, 46.2, 20.9.

N-(4-isopropylbenzyl)-4-aminobenzenesulfonamide (3ae).⁵ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 85% yield (129 mg); mp 137-138 °C; ¹H NMR (500 MHz, DMSO-d₆) δ 7.55 (t, *J* = 6.1 Hz, 1H), 7.44 (d, *J* = 8.5 Hz, 2H), 7.14 (s, 4H), 6.61 (d, *J* = 8.6 Hz, 2H), 5.91 (s, 2H), 3.83 (d, *J* = 6.3 Hz, 2H), 2.88-2.80 (m, 1H), 1.17 (d, *J* = 7.0 Hz, 6H); ¹³C {¹H} NMR (125 MHz, DMSO-d₆) δ 152.7, 147.5, 135.6, 128.8, 127.9, 126.4, 125.9, 112.9, 46.2, 33.4, 24.2.

N-(4-bromobenzyl)-4-aminobenzenesulfonamide (3af).⁵ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 86% yield (147 mg); mp 186-187 °C; ¹H NMR (500 MHz, DMSO-d₆) δ 7.69 (s, 1H), 7.48-7.41 (m, 4H), 7.21 (d, *J* = 8.4 Hz, 2H), 6.60 (d, *J* = 8.7 Hz, 2H), 5.94 (s, 2H), 3.84 (d, *J* = 6.6 Hz, 2H); ¹³C {¹H} NMR (125 MHz, DMSO-d₆) δ 152.8, 138.0, 131.3, 130.0, 128.7, 125.7, 120.3, 113.0, 45.7.

N-(2-chlorobenzyl)-4-aminobenzenesulfonamide (3ag).⁵ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 85% yield (126 mg); mp 111-112 °C; ¹H NMR (500 MHz, DMSO-d₆) δ 7.76 (t, *J* = 6.1 Hz, 1H), 7.54-7.48 (m, 3H), 7.37 (d, *J* = 7.7 Hz, 1H), 7.31-7.24 (m, 2H), 6.68 (d, *J* = 8.1 Hz, 2H), 5.96 (s, 2H), 4.01 (d, *J* = 5.9 Hz, 2H); ¹³C {¹H} NMR (125 MHz, DMSO-d₆) δ 152.9, 135.6, 132.4, 129.9, 129.3, 129.1, 128.9, 127.3, 125.6, 113.1, 43.9.

N-(4-chlorobenzyl)-4-aminobenzenesulfonamide (3ah).⁶ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 87% yield (129 mg); mp 167-168 °C; ¹H NMR (500 MHz, DMSO-d₆) δ 7.68 (t, *J* = 6.4 Hz, 1H), 7.43 (d, *J* = 8.6 Hz, 2H), 7.33 (d, *J* = 8.2 Hz, 2H), 7.26 (d, *J* = 8.2 Hz, 2H), 6.60 (d, *J* = 8.6 Hz, 2H), 5.93 (s, 2H), 3.86 (d, *J* = 6.4 Hz, 2H); ¹³C {¹H} NMR (125 MHz, DMSO-d₆) δ 152.8, 137.5, 131.8, 129.7, 128.7, 128.4, 125.8, 113.0, 45.6.

N-(3-fluorobenzyl)-4-aminobenzenesulfonamide (3ai).⁷ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 91% yield (127 mg); mp 107-108 °C; ¹H NMR (500 MHz, DMSO-d₆) δ 7.72 (t, *J* = 6.4 Hz, 1H), 7.43 (d, *J* = 8.6 Hz, 2H), 7.34-7.30 (m, 1H), 7.09-7.03 (m, 3H), 6.60 (d, *J* = 8.9 Hz, 2H), 5.94 (s, 2H), 3.91 (d, *J* = 6.7 Hz, 2H); ¹³C {¹H} NMR (125 MHz, DMSO-d₆) δ 163.3, 161.4, 152.8, 141.5, (C-F, ³*J*_{C-F} = 7.2 Hz), 130.4 (C-F, ³*J*_{C-F} = 8.2 Hz), 128.7, 125.8, 123.7 (C-F, ⁴*J*_{C-F} = 2.5 Hz), 114.2 (C-F, ²*J*_{C-F} = 31.4 Hz), 112.9, 45.7.

N-(4-(trifluoromethoxy)benzyl)-4-aminobenzenesulfonamide (3aj).⁵ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 85% yield (147 mg); mp 151-152 °C; ¹H NMR (500 MHz, DMSO-d₆) δ 7.70 (t, *J* = 6.4 Hz, 1H), 7.43 (d, *J* = 8.6 Hz, 2H), 7.37 (d, *J* = 8.4 Hz, 2H), 7.28 (d, *J* = 8.2 Hz, 2H), 6.60 (d, *J* = 8.6 Hz, 2H), 5.94 (s, 2H), 3.91 (d, *J* = 6.4 Hz, 2H); ¹³C {¹H} NMR (125 MHz, DMSO-d₆) δ 152.8, 147.6, 138.0, 129.6, 128.7, 125.7, 121.1, 120.4 (C-F, ¹*J*_{C-F} = 256.0 Hz), 112.9, 45.6.

N-(3-(trifluoromethyl)benzyl)-4-aminobenzenesulfonamide (3ak).⁸ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 84% yield (139 mg); mp 176-177 °C; ¹H NMR (500 MHz, DMSO-d₆) δ 7.80 (t, *J* = 6.2 Hz, 1H), 7.59-7.51 (m, 4H), 7.44 (d, *J* = 8.4 Hz, 2H), 6.60 (d, *J* = 8.4 Hz, 2H), 5.94 (s, 2H), 4.01 (d, *J* = 6.2 Hz, 2H); ¹³C {¹H} NMR (125 MHz, DMSO-d₆) δ 152.9, 140.1, 131.9, 129.5, 129.2 (C-F, ²*J*_{C-F} = 31.2 Hz), 128.7, 125.7, 124.5 (C-F, ¹*J*_{C-F} = 272.2 Hz), 124.2, 124.0, 113.0, 45.7.

N-(4-(trifluoromethyl)benzyl)-4-aminobenzenesulfonamide (3al).⁹ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 80% yield (132 mg); mp 168-170 °C; ¹H NMR (500 MHz, DMSO-d₆) δ 7.77 (t, *J* = 6.4 Hz, 1H), 7.65 (d, *J* = 8.0 Hz, 2H), 7.48 (d, *J* = 8.0 Hz, 2H), 7.43 (d, *J* = 8.6 Hz, 2H), 6.60 (d, *J* = 8.6 Hz, 2H), 5.94 (s, 2H), 3.98 (d, *J* = 6.4 Hz,

2H); ^{13}C $\{^1\text{H}\}$ NMR (125 MHz, DMSO- d_6) δ 152.9, 143.4, 128.8, 128.5, 127.9 (C-F, $^2J_{\text{C-F}} = 31.6$ Hz), 125.6, 125.3 (C-F, $^3J_{\text{C-F}} = 3.7$ Hz), 124.6 (C-F, $^1J_{\text{C-F}} = 268.8$ Hz), 112.9, 45.8.

4-amino-N-(thiophen-2-ylmethyl)benzenesulfonamide (3am).⁵ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 81% yield (109 mg); mp 130-131 °C; ^1H NMR (500 MHz, DMSO- d_6) δ 7.75 (t, $J = 6.3$ Hz, 1H), 7.44 (d, $J = 8.6$ Hz, 2H), 7.39-7.38 (d, $J = 4.8$ Hz, 1H), 6.91 (t, $J = 5.0$ Hz, 2H), 6.61 (d, $J = 8.6$ Hz, 2H), 5.93 (s, 2H), 4.05 (d, $J = 6.3$ Hz, 2H); ^{13}C $\{^1\text{H}\}$ NMR (125 MHz, DMSO- d_6) δ 152.8, 141.4, 128.8, 127.0, 125.9, 125.7, 125.6, 113.0, 41.7.

4-amino-N-(naphthalen-1-ylmethyl)benzenesulfonamide (3an).⁵ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 89% yield (139 mg); mp 174-175 °C; ^1H NMR (500 MHz, DMSO- d_6) δ 8.05 (t, $J = 5.4$ Hz, 1H), 7.94-7.92 (m, 1H), 7.86-7.84 (m, 1H), 7.64 (t, $J = 6.3$ Hz, 1H), 7.54-7.51 (m, 4H), 7.45-7.40 (m, 2H), 6.65 (d, $J = 8.6$ Hz, 2H), 5.97 (s, 2H), 4.28 (d, $J = 6.1$ Hz, 2H); ^{13}C $\{^1\text{H}\}$ NMR (125 MHz, DMSO- d_6) δ 152.9, 133.5, 133.3, 131.3, 128.9, 128.7, 128.3, 126.8, 126.5, 126.1, 125.6, 124.0, 113.0, 44.8.

4-amino-N-octylbenzenesulfonamide (3ao).¹⁰ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 90% yield (128 mg); mp 113-114 °C; ^1H NMR (500 MHz, DMSO- d_6) δ 7.40 (d, $J = 8.8$ Hz, 2H), 7.02 (t, $J = 5.9$ Hz, 1H), 6.60 (d, $J = 8.7$ Hz, 2H), 5.88 (s, 2H), 2.62 (q, $J = 6.6$ Hz, 2H), 1.33-1.29 (m, 2H), 1.24-1.16 (m, 10H), 0.84 (t, $J = 7.1$ Hz, 3H); ^{13}C $\{^1\text{H}\}$ NMR (125 MHz, DMSO- d_6) δ 152.6, 128.7, 125.9, 112.9, 42.7, 31.5, 29.2, 28.9, 28.8, 26.4, 22.4, 14.2.

4-amino-N-pentylbenzenesulfonamide (3ap).¹¹ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 86% yield (104 mg); mp 115-116 °C; ^1H NMR (500 MHz, DMSO- d_6) δ 7.40 (d, $J = 8.7$ Hz, 2H), 7.02 (t, $J = 6.0$ Hz, 1H), 6.60 (d, $J = 8.6$ Hz, 2H), 5.88 (s, 2H), 2.64-2.60 (m, 2H), 1.35-1.30 (m, 2H), 1.19-1.16 (m, 4H), 0.80 (t, $J = 6.8$ Hz, 3H); ^{13}C $\{^1\text{H}\}$ NMR (125 MHz, DMSO- d_6) δ 152.6, 128.7, 126.0, 112.9, 42.7, 28.8, 28.6, 22.0, 14.1.

4-amino-N-butylbenzenesulfonamide (3aq).¹² Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); Pink solid; 82% yield (94 mg); mp 92-93 °C; ^1H NMR (500 MHz,

DMSO- d_6) δ 7.40 (d, $J = 8.6$ Hz, 2H), 7.03 (t, $J = 5.9$ Hz, 1H), 6.60 (d, $J = 8.8$ Hz, 2H), 5.89 (s, 2H), 2.62 (q, $J = 6.7$ Hz, 2H), 1.31 (q, $J = 7.4$ Hz, 2H), 1.22 (m, 2H), 0.78 (t, $J = 7.1$ Hz, 3H); ^{13}C $\{^1\text{H}\}$ NMR (125 MHz, DMSO- d_6) δ 152.6, 128.7, 125.9, 112.9, 42.4, 31.2, 19.6, 13.8.

4-amino-N-(cyclohexylmethyl)benzenesulfonamide (3ar).⁵ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 83% yield (111 mg); mp 168-169 °C; ^1H NMR (500 MHz, DMSO- d_6) δ 7.39 (d, $J = 8.8$ Hz, 2H), 7.05 (t, $J = 6.2$ Hz, 1H), 6.59 (d, $J = 8.8$ Hz, 2H), 5.88 (s, 2H), 2.46 (t, $J = 6.7$ Hz, 2H), 1.64-1.57 (m, 5H), 1.32-1.25 (m, 1H), 1.12-1.05 (m, 3H), 0.80-0.72 (m, 2H); ^{13}C $\{^1\text{H}\}$ NMR (125 MHz, DMSO- d_6) δ 152.6, 128.6, 126.1, 112.9, 49.0, 37.4, 30.6, 26.3, 25.6.

4-amino-N-cyclohexylbenzenesulfonamide (3as).¹³ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 60% yield (76 mg); mp 84-85 °C; ^1H NMR (500 MHz, DMSO- d_6) δ 7.41 (d, $J = 8.6$ Hz, 2H), 7.10 (t, $J = 7.3$ Hz, 1H), 6.58 (d, $J = 8.7$ Hz, 2H), 5.87 (s, 2H), 2.78 (s, 1H), 1.55 (s, 4H), 1.43 (d, $J = 11.1$ Hz, 1H), 1.13-1.00 (m, 5H); ^{13}C $\{^1\text{H}\}$ NMR (125 MHz, DMSO- d_6) δ 152.5, 128.5, 127.6, 112.9, 52.1, 33.5, 25.2, 24.7.

4-amino-N-cyclopentylbenzenesulfonamide (3at).¹³ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 56% yield (67 mg); mp 104-105 °C; ^1H NMR (500 MHz, DMSO- d_6) δ 7.41 (d, $J = 8.4$ Hz, 2H), 7.10 (t, $J = 7.0$ Hz, 1H), 6.59 (d, $J = 8.4$ Hz, 2H), 5.88 (s, 2H), 3.28 (q, $J = 6.7$ Hz, 1H), 1.57-1.50 (m, 4H), 1.35-1.34 (m, 2H), 1.30-1.23 (m, 2H); ^{13}C $\{^1\text{H}\}$ NMR (125 MHz, DMSO- d_6) δ 152.6, 128.7, 126.9, 112.9, 54.6, 32.7, 23.1.

4-amino-N-benzyl-3-bromobenzenesulfonamide (3ba).⁵ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 84% yield (143 mg); mp 136-137 °C; ^1H NMR (500 MHz, DMSO- d_6) δ 7.85 (t, $J = 6.4$ Hz, 1H), 7.72 (d, $J = 2.0$ Hz, 1H), 7.50-7.47 (m, 1H), 7.28-7.21 (m, 5H), 6.86 (d, $J = 6.6$ Hz, 1H), 6.12 (s, 2H), 3.93 (d, $J = 6.4$ Hz, 2H); ^{13}C $\{^1\text{H}\}$ NMR (125 MHz, DMSO- d_6) δ 149.6, 138.0, 131.4, 128.5, 128.3, 127.9, 127.7, 127.4, 114.5, 106.2, 46.4.

4-amino-N-benzyl-3,5-dibromobenzenesulfonamide (3ca).⁵ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 81% yield (170 mg); mp 183-184 °C; ^1H NMR (500 MHz, DMSO- d_6) δ 8.02 (t, $J = 6.4$ Hz, 1H), 7.71 (s, 2H), 7.28-7.21 (m,

5H), 6.12 (s, 2H), 3.97 (d, $J = 6.4$ Hz, 2H); ^{13}C $\{^1\text{H}\}$ NMR (125 MHz, DMSO- d_6) δ 146.5, 137.7, 130.6, 129.1, 128.4, 127.9, 127.4, 106.6, 46.5.

4-amino-N-benzyl-3-chlorobenzenesulfonamide (3da). Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 83% yield (123 mg); mp 103-104 °C; ^1H NMR (500 MHz, DMSO- d_6) δ 7.84 (t, $J = 6.3$ Hz, 1H), 7.57-7.55 (m, 1H), 7.45-7.43 (m, 1H), 7.28-7.23 (m, 5H), 6.86 (d, $J = 8.6$ Hz, 1H), 6.19 (s, 2H), 3.92 (d, $J = 6.5$ Hz, 2H); ^{13}C $\{^1\text{H}\}$ NMR (125 MHz, DMSO- d_6) δ 148.6, 138.0, 128.5, 128.2, 127.9, 127.4, 127.1, 117.4, 116.2, 114.6, 46.4. HRMS (ESI) m/z calcd for $\text{C}_{13}\text{H}_{14}\text{ClN}_2\text{O}_2\text{S}^+[\text{M}^+\text{H}^+]$ 297.0465 found 297.0464.

4-amino-N-benzyl-3,5-dichlorobenzenesulfonamide (3ea).⁵ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 86% yield (142 mg); mp 184-185 °C; ^1H NMR (500 MHz, DMSO- d_6) δ 8.02 (t, $J = 6.1$ Hz, 1H), 7.56 (s, 2H), 7.27-7.20 (m, 5H), 6.34 (s, 2H), 3.98 (d, $J = 6.5$ Hz, 2H); ^{13}C $\{^1\text{H}\}$ NMR (125 MHz, DMSO- d_6) δ 144.9, 137.7, 128.4, 128.0, 127.8, 127.4, 126.9, 117.5, 46.5.

3-amino-N-benzylbenzenesulfonamide (3fa).⁵ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 85% yield (111 mg); mp 71-72 °C; ^1H NMR (500 MHz, DMSO- d_6) δ 7.95 (t, $J = 6.4$ Hz, 1H), 7.32-7.18 (m, 6H), 7.04 (s, 1H), 6.93 (d, $J = 6.5$ Hz, 1H), 6.77 (d, $J = 8.2$ Hz, 1H), 5.58 (s, 2H), 3.95 (d, $J = 6.4$ Hz, 2H); ^{13}C $\{^1\text{H}\}$ NMR (125 MHz, DMSO- d_6) δ 149.6, 141.4, 138.2, 129.9, 128.5, 127.8, 127.4, 117.5, 113.5, 111.4, 46.4.

5-amino-N-benzyl-2-methylbenzenesulfonamide (3ga).⁵ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 80% yield (111 mg); mp 82-83 °C; ^1H NMR (500 MHz, DMSO- d_6) δ 7.99 (t, $J = 6.4$ Hz, 1H), 7.28 (t, $J = 6.9$ Hz, 2H), 7.23 (d, $J = 7.3$ Hz, 3H), 7.14 (d, $J = 2.4$ Hz, 1H), 6.99 (d, $J = 8.2$ Hz, 1H), 6.68-6.66 (m, 1H), 5.31 (s, 2H), 3.97 (d, $J = 6.2$ Hz, 2H), 2.37 (s, 3H); ^{13}C $\{^1\text{H}\}$ NMR (125 MHz, DMSO- d_6) δ 147.1, 139.0, 138.5, 133.2, 128.4, 127.7, 127.4, 122.3, 117.6, 114.1, 46.1, 19.0.

2-amino-N-benzylbenzenesulfonamide (3ha).⁵ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid; 76% yield (100 mg); mp 55-56 °C; ^1H NMR (500 MHz, DMSO- d_6) δ 8.06 (t, $J = 5.9$ Hz, 1H), 7.53 (d, $J = 7.9$ Hz, 1H), 7.29-7.21 (m, 6H), 6.83 (t, $J = 8.3$ Hz,

1H), 6.61 (t, $J = 7.6$ Hz, 1H), 5.94 (s, 2H), 3.94 (d, $J = 5.9$ Hz, 2H); ^{13}C $\{^1\text{H}\}$ NMR (125 MHz, DMSO- d_6) δ 146.5, 138.0, 133.8, 129.4, 128.5, 127.8, 127.4, 120.3, 117.2, 115.4, 46.0.

Procedure for the reaction of aminobenzenesulfonamide (1a), benzaldehyde (4) and 2-propanol (5) (Scheme 6). Under a nitrogen atmosphere, to a 25-mL Schlenk tube were added **1a** (0.5 mmol), **4** (0.6 mmol, 1.2 equiv), **5** (1.5 mmol, 3 equiv), Cp*Ir@CTF (20 mg, 1 mol % Ir), Cs_2CO_3 (1 equiv) and *tert*-amyl alcohol (1 mL). The mixture was heated at 125 °C for 12 h and was then allowed to cool to ambient temperature. The reaction mixture was concentrated in vacuo and purified by flash column chromatography with hexanes/ethyl acetate to afford the corresponding product **3aa** in 82% yield (108 mg).

Procedure for the synthesis of 4-amino-N-phenethylbenzenesulfonamide (7). Under a nitrogen atmosphere, to a 25-mL Schlenk tube were added **1a** (1.72 g, 10 mmol), **6** (1.46 g, 12 mmol, 1.2 equiv), Cp*Ir@CTF (400 mg, 1 mol % Ir), Cs_2CO_3 (3.26 g, 10 mmol, 1 equiv) and *tert*-amyl alcohol (10 mL). The mixture was heated at 125 °C for 12 h and was then allowed to cool to ambient temperature. The reaction mixture was concentrated in vacuo and purified by flash column chromatography with hexanes/ethyl acetate to afford the corresponding product.

4-amino-N-phenethylbenzenesulfonamide (7).¹³ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); White solid, 81% yield (2.24 g); mp 130-131 °C; ^1H NMR (500 MHz, DMSO- d_6) δ 7.42 (d, $J = 8.6$ Hz, 2H), 7.26 (t, $J = 7.4$ Hz, 2H), 7.21-7.17 (m, 2H), 7.14 (d, $J = 7.2$ Hz, 2H), 6.62 (d, $J = 8.6$ Hz, 2H), 5.92 (s, 2H), 2.87 (q, $J = 6.7$ Hz, 2H), 2.65 (t, $J = 7.6$ Hz, 2H); ^{13}C $\{^1\text{H}\}$ NMR (125 MHz, DMSO- d_6) δ 152.7, 139.2, 128.9, 128.8, 128.6, 126.5, 125.6, 113.0, 44.4, 35.5.

Procedure for the synthesis of 4-(3-chloro-1,4-dioxo-1,4-dihydronaphthalen-2-ylamino)-N-phenethylbenzenesulfonamide (9). In a round-bottomed flask with a condenser tube were added **7** (1.38 g, 5 mmol), **8** (1.14 g, 5 mmol) and ethanol (20 mL). The mixture was heated under reflux for 24 h and was then allowed to cool to ambient temperature. The reaction mixture was concentrated in vacuo and purified by flash column chromatography with hexanes/ethyl acetate to afford the corresponding product.

4-((3-chloro-1,4-dioxo-1,4-dihydronaphthalen-2-yl)amino)-N-phenethylbenzenesulfonamide

(9).¹⁴ Purified by flash column chromatography on silica gel (hexanes/ethyl acetate = 2/1); Orange solid, 56% yield (1.30 g); ¹H NMR (500 MHz, DMSO-d₆) δ 9.54 (s, 1H), 8.05 (d, *J* = 7.5 Hz, 2H), 7.88 (t, *J* = 7.4 Hz, 1H), 7.83 (t, *J* = 7.4 Hz, 1H), 7.70 (d, *J* = 8.6 Hz, 2H), 7.62 (d, *J* = 5.7 Hz, 1H), 7.28-7.17 (m, 5H), 7.15 (d, *J* = 7.3 Hz, 2H), 2.97 (q, *J* = 6.6 Hz, 2H), 2.66 (t, *J* = 7.5 Hz, 2H); ¹³C {¹H} NMR (125 MHz, DMSO-d₆) δ 180.2, 177.2, 143.1, 143.0, 139.0, 135.0, 134.8, 133.8, 132.0, 130.7, 128.9, 128.6, 127.0, 126.9, 126.5, 122.8, 118.7, 44.4, 35.5.

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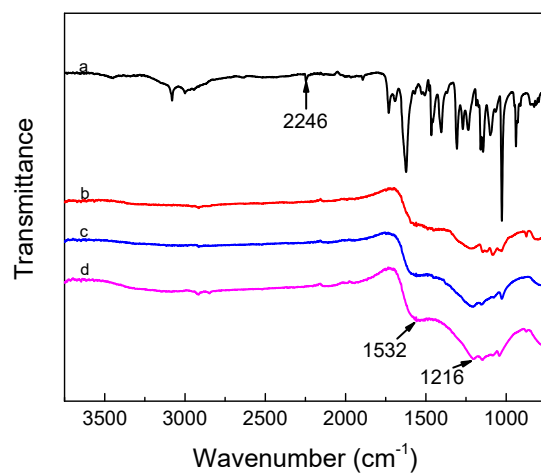


Fig. S1. FT-IR spectra of (a) 2,5-pyridinedicarbonitrile; (b) CTF; (c) Cp*Ir@CTF; (d) recovered Cp*Ir@CTF.

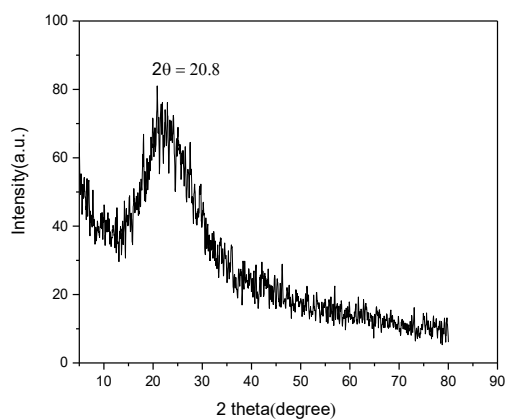


Fig. S2. XRD of CTF

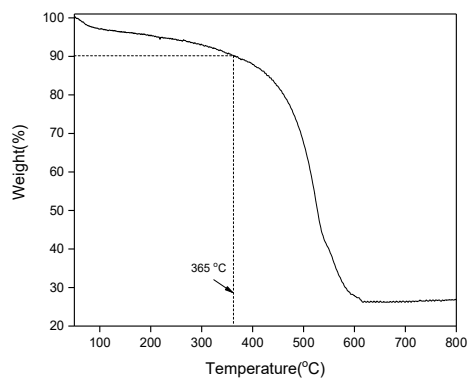


Fig. S3. TGA of CTF

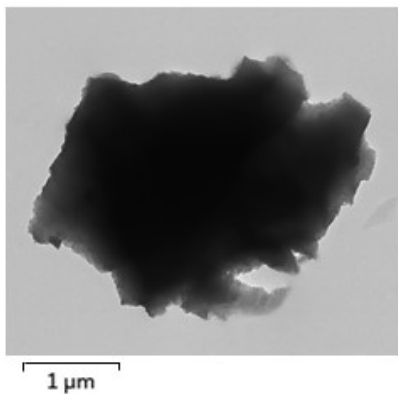


Fig. S4. TEM image of CTF.

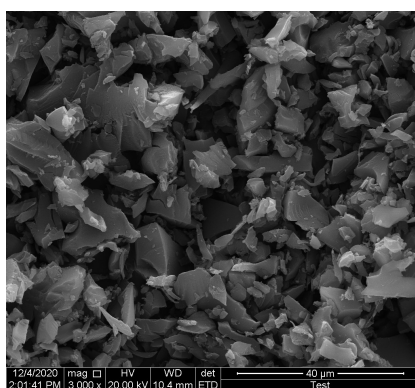


Fig. S5. SEM image of CTF.

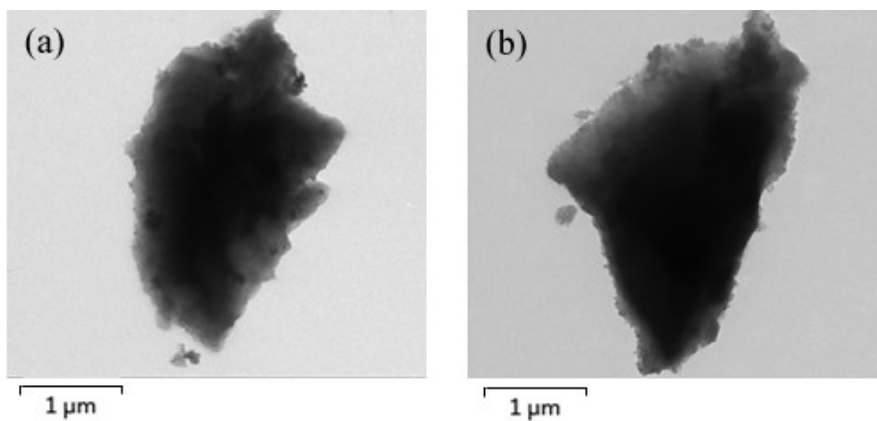


Fig. S6. TEM image of Cp*Ir@CTF (left) and recovered Cp*Ir@CTF (right).

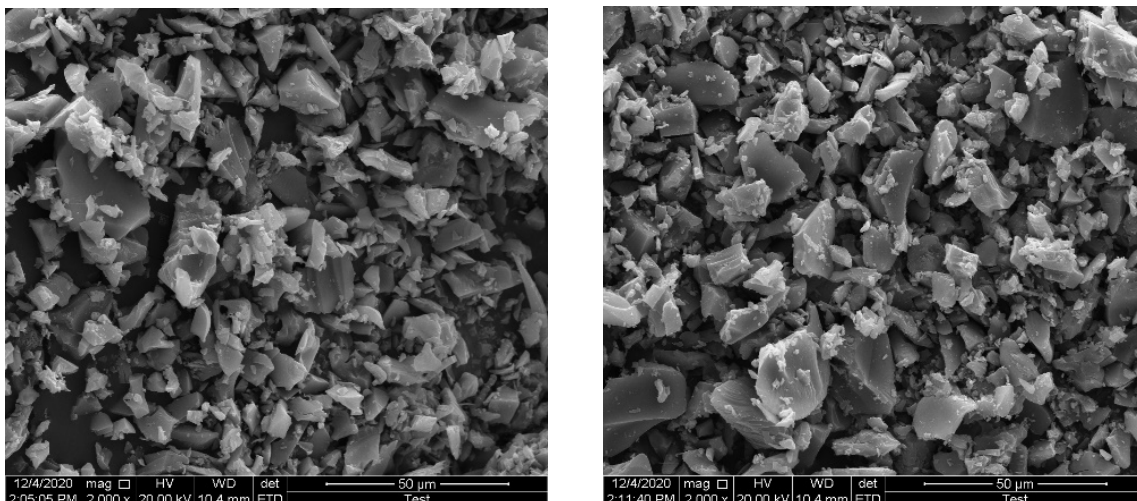


Fig. S7. SEM image of Cp*Ir@CTF (left) and recovered Cp*Ir@CTF (right).

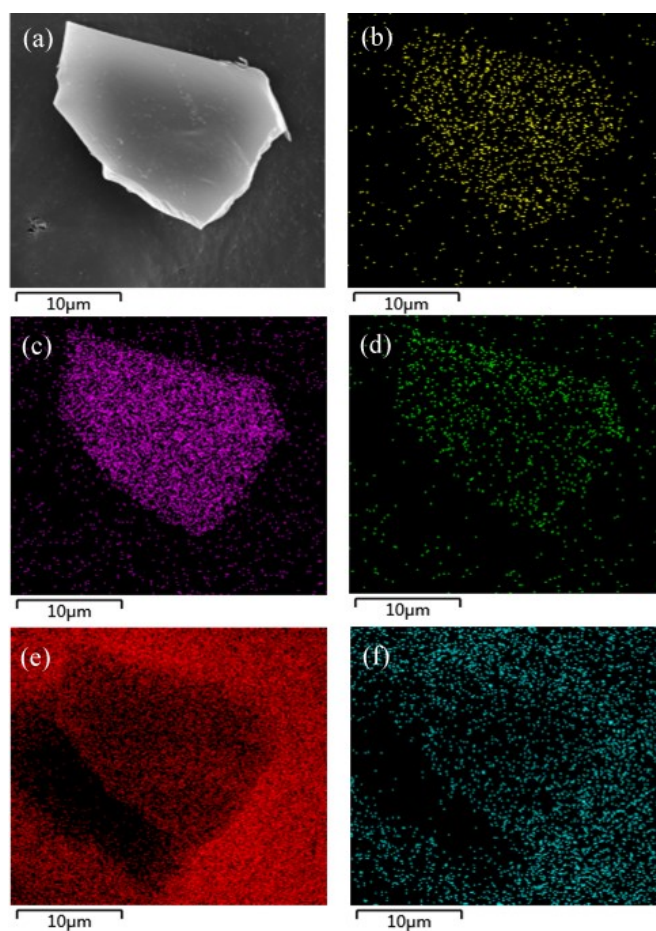


Fig. S8. SEM image of Cp*Ir@CTF (a). EDS mapping of (b) Ir; (c) Cl; (d) N; (e) C and (f) O atoms in Cp*Ir@CTF.

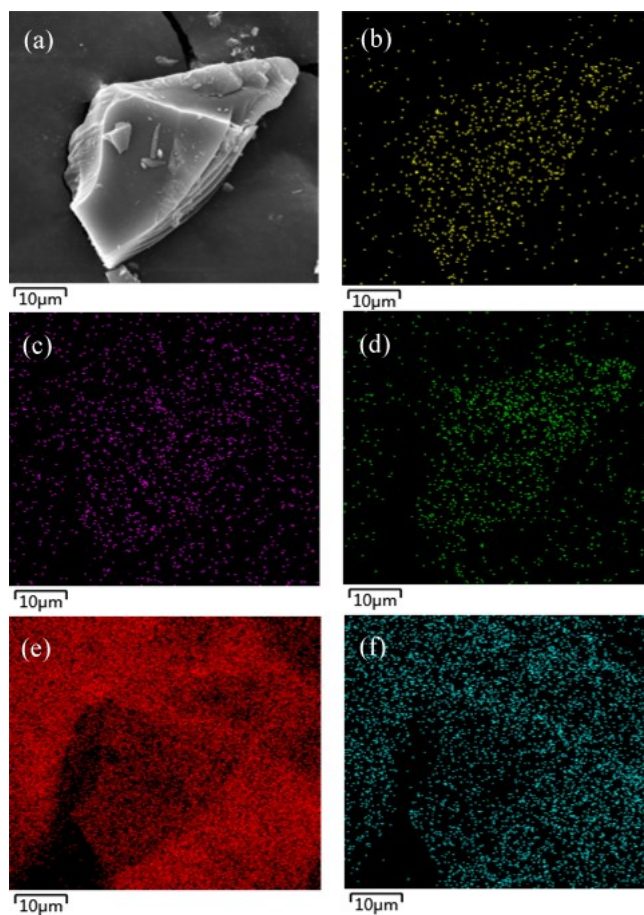


Fig. S9. SEM image of recovered Cp*Ir@CTF (a). EDS mapping of (b) Ir; (c) Cl; (d) N; (e) C and (f) O atoms in recovered Cp*Ir@CTF.

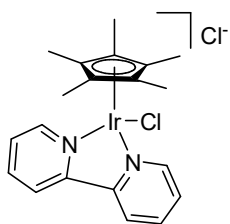


Fig. S10. The structure of [Cp*Ir(bpy)Cl]Cl

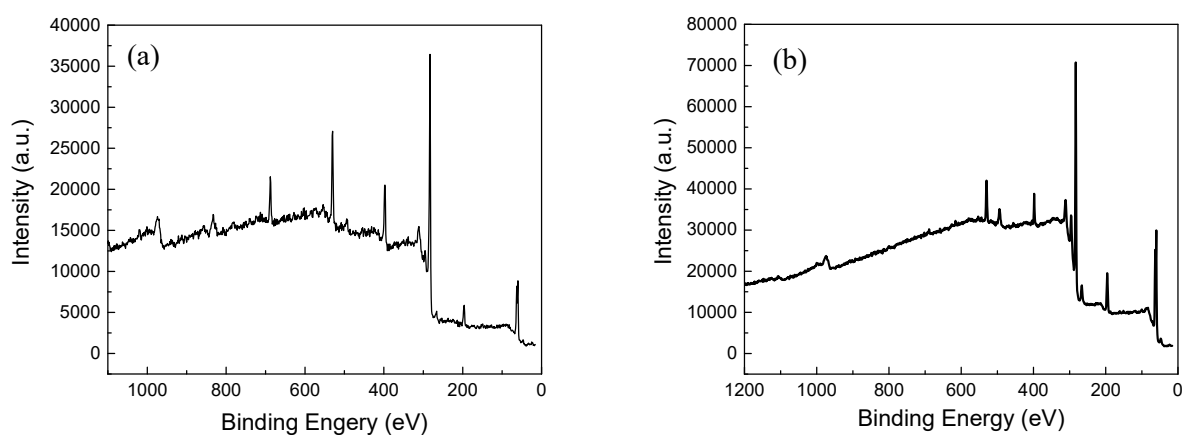


Fig. S11. XPS of Cp*Ir@CTF (a) and [Cp*Ir(bpy)Cl]Cl (b).

Table S1. Atomic composition by SEM-EDS.

Element	Before catalysis (Wt%)	After 6 cycles (Wt%)
C	72.41	65.07
N	6.34	10.42
O	16.34	22.00
Cl	1.27	0.03
Ir	3.64	2.47
Total	100.00	100.00

Table S2. BET analysis of CTF and Cp*Ir@CTF, and ICP-MS data.

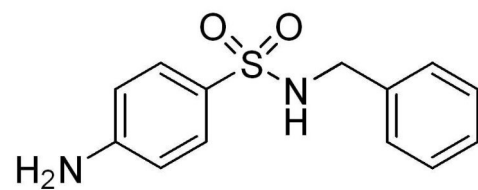
Material	S_{BET} (m ² /g)	Pore volume (cm ³ /g)	Pore size (nm)	wt% of Ir content
CTF	623	0.21	1.38	—
Cp*Ir@CTF	421	0.12	1.17	4.80

4-amino-N-benzylbenzenesulfonamide
Proton DMSO-d6

7.641
7.628
7.616
7.461
7.444
7.302
7.287
7.273
7.250
7.237
7.223
7.209
6.625
6.607
— 5.921

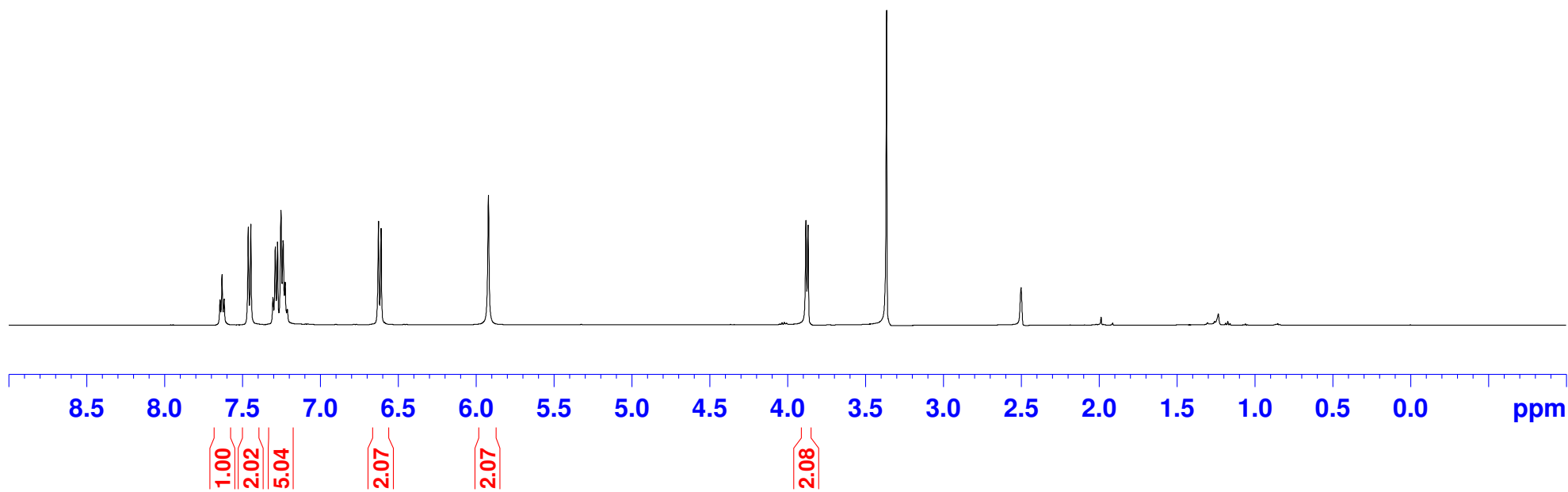
3.882
3.869

— 2.500



3aa

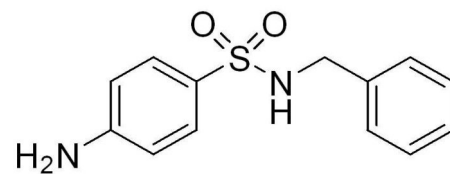
¹H NMR (500 MHz, DMSO-d6)



4-amino-N-benzylbenzenesulfonamide
C13CPD DMSO-d6

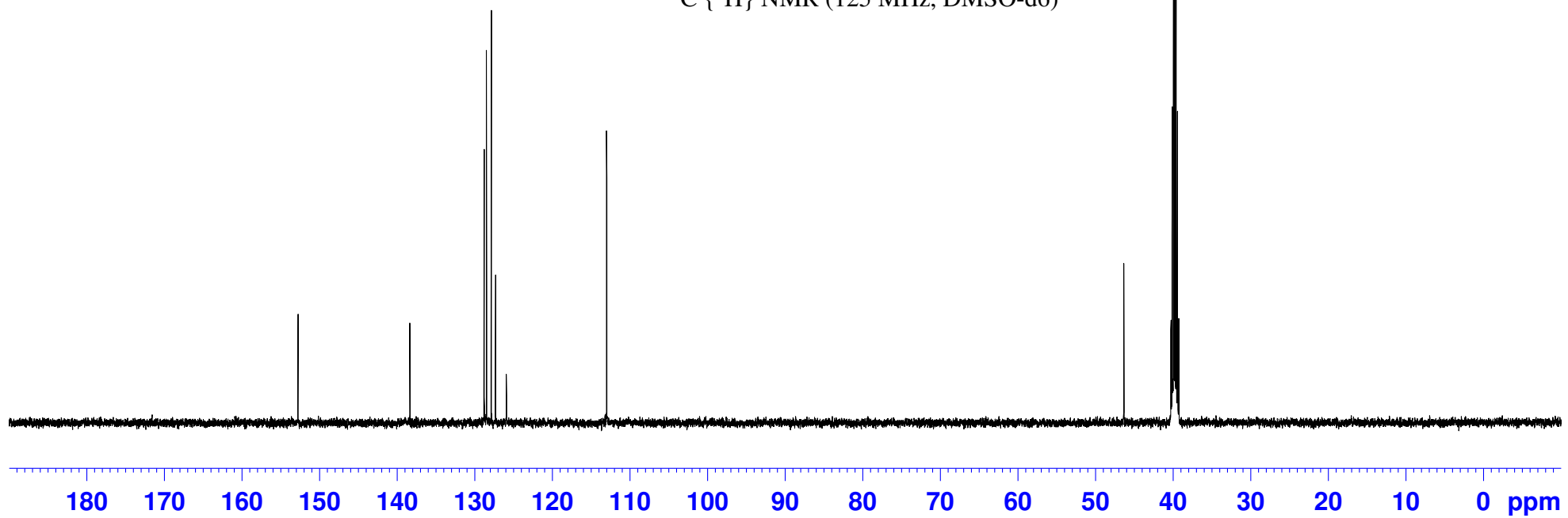
— 152.757
— 138.351
— 128.762
— 128.464
— 127.848
— 127.298
— 125.917
— 112.980

46.388
40.305
40.138
39.971
39.804
39.637
39.470
39.303

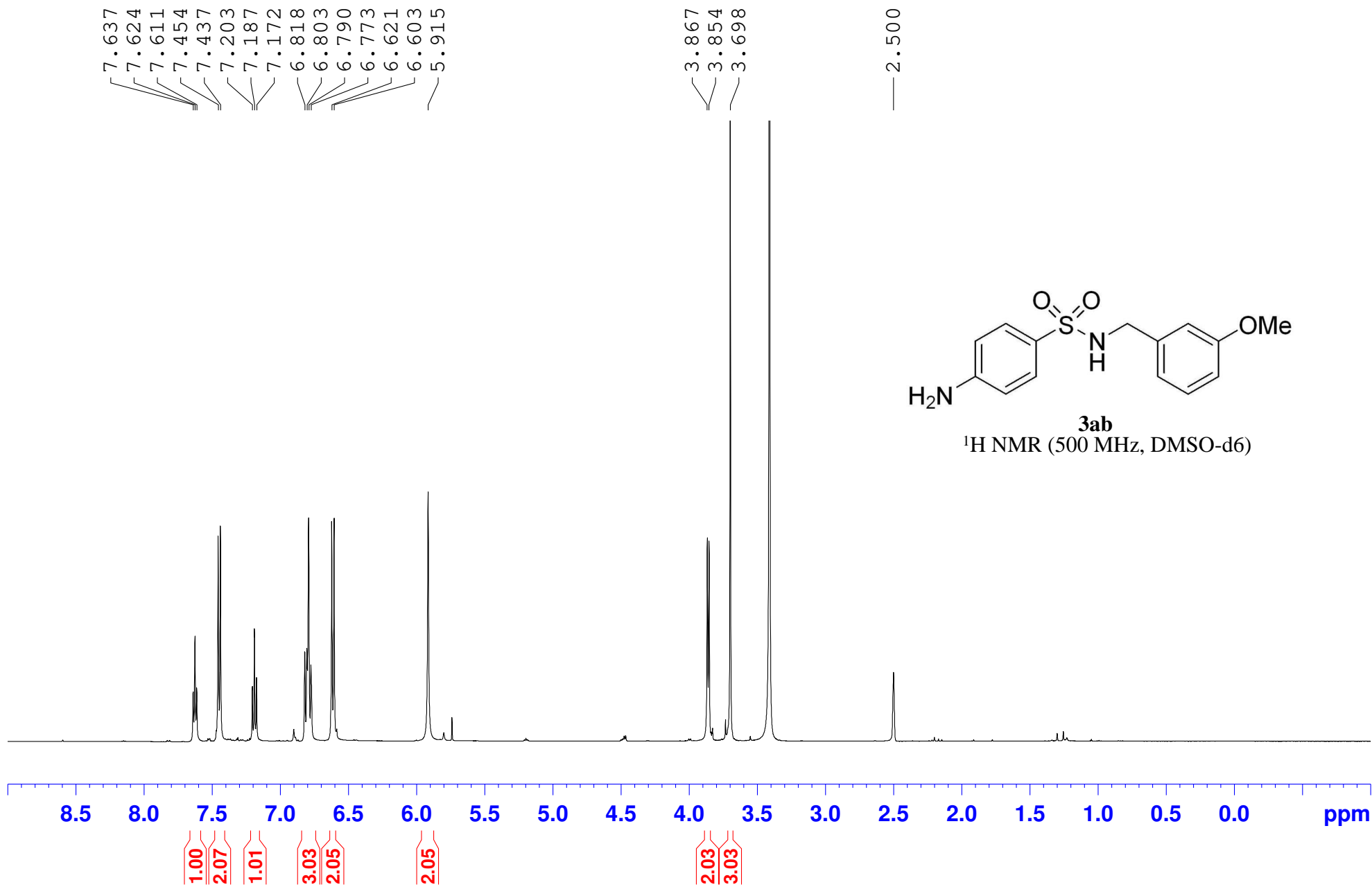


3aa

$^{13}\text{C} \{^1\text{H}\}$ NMR (125 MHz, DMSO-d6)

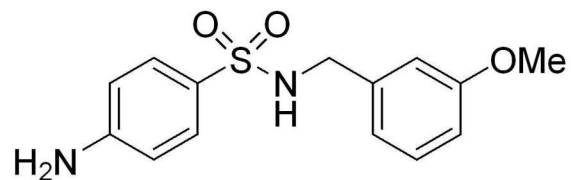


N-(3-methoxybenzyl)-4-aminobenzenesulfonamide
Proton DMSO-d6



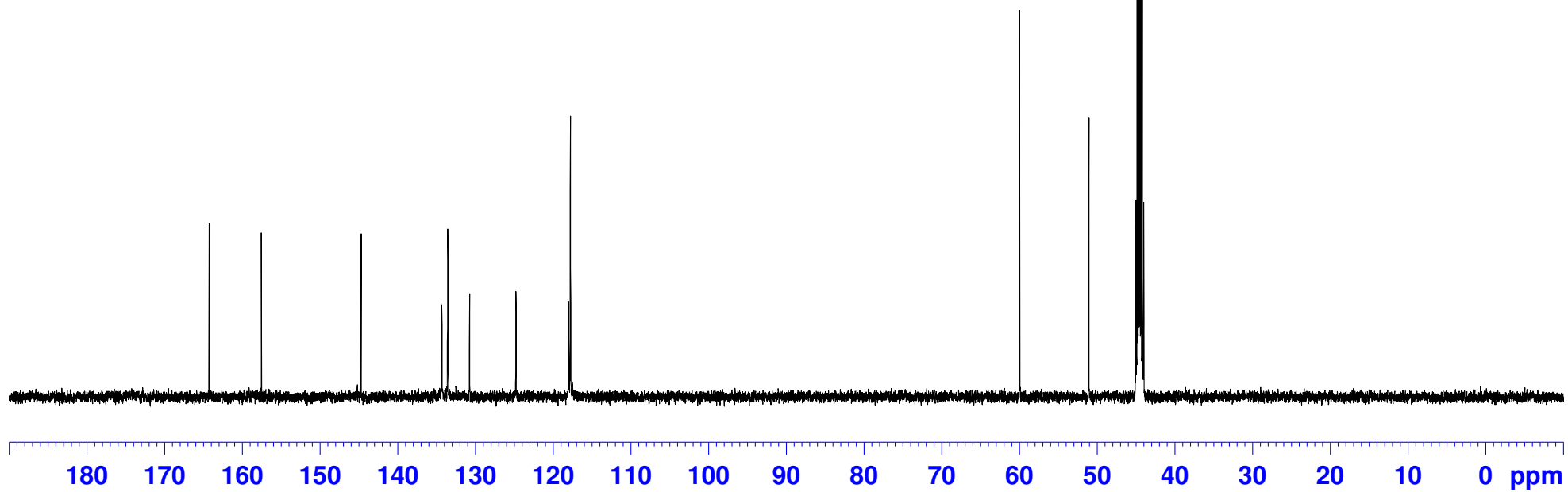
N-(3-methoxybenzyl)-4-aminobenzenesulfonamide
C13CPD DMSO-d6

— 164.257
— 157.537
— 144.690
— 134.327
— 133.541
— 130.743
— 124.758
— 117.981
— 117.764
— 117.526
— 60.017
— 51.103
— 45.049
— 44.882
— 44.715
— 44.548
— 44.381
— 44.214
— 44.047



3ab

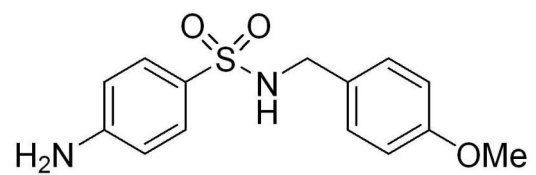
^{13}C { ^1H } NMR (125 MHz, DMSO-d6)



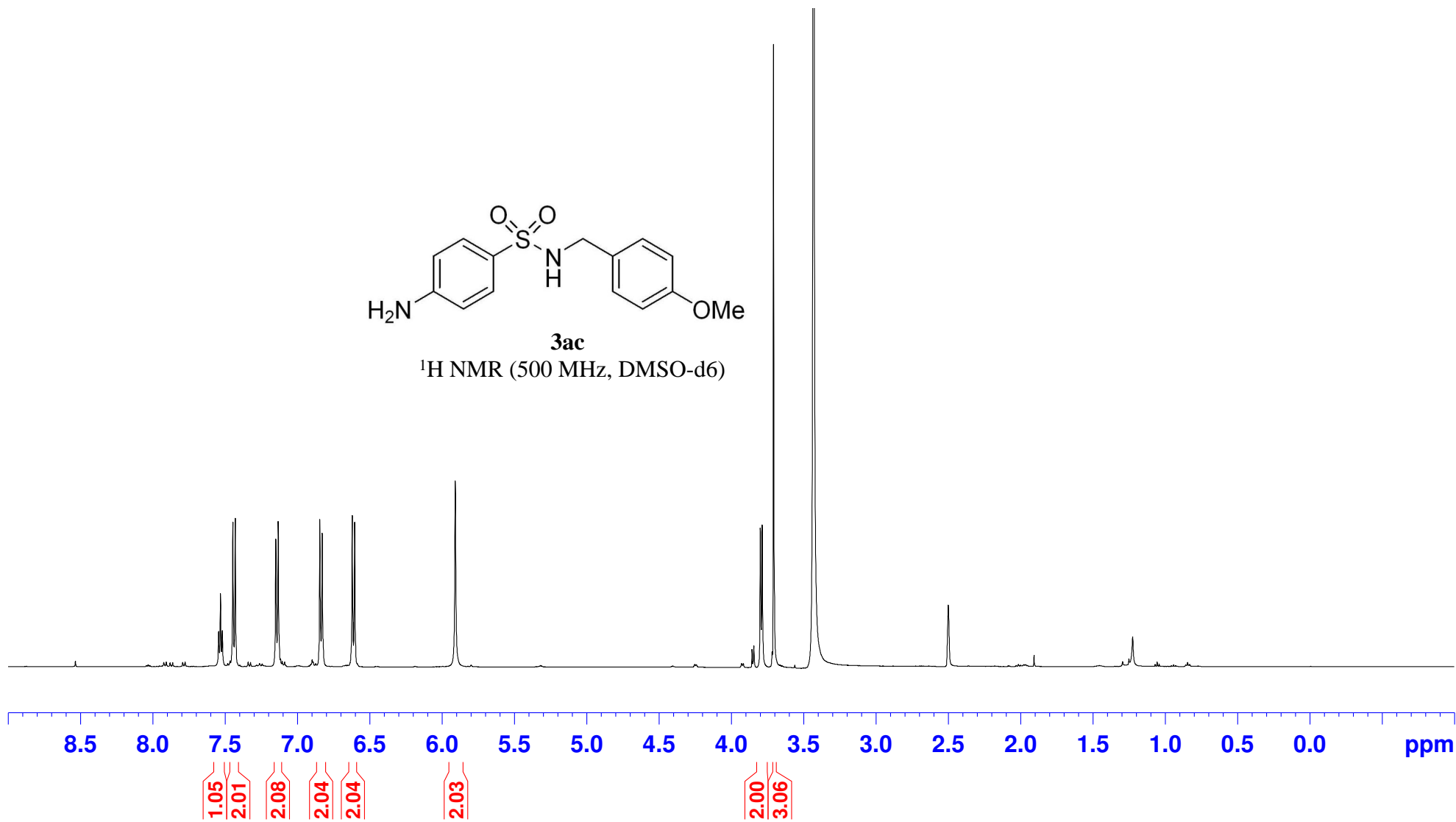
N-(4-methoxybenzyl)-4-aminobenzenesulfonamide
Proton DMSO-d6

7.543
7.530
7.518
7.445
7.427
7.148
7.130
6.844
6.827
6.620
6.602
— 5.906

3.800
3.787
3.708
— 2.500



3ac
¹H NMR (500 MHz, DMSO-d6)



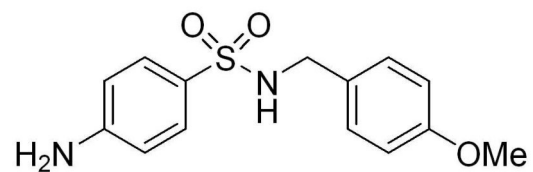
N-(4-methoxybenzyl)-4-aminobenzenesulfonamide
C13CPD DMSO-d6

— 158.654
— 152.705

130.139
129.181
128.752
125.953

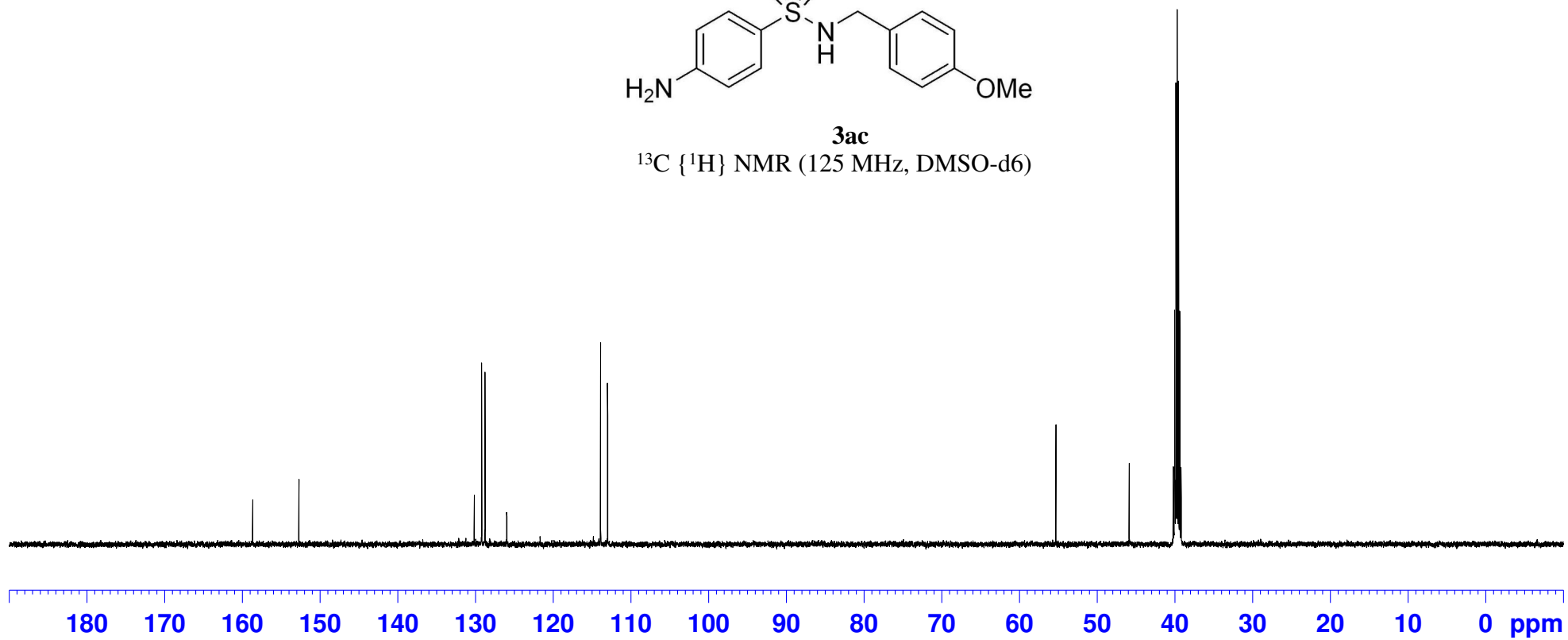
113.878
112.980

55.344
45.908
40.230
40.064
39.985
39.730
39.563
39.395
39.229



3ac

^{13}C { ^1H } NMR (125 MHz, DMSO-d6)



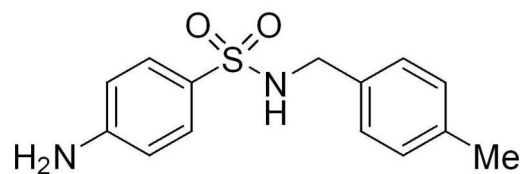
N-(4-methylbenzyl)-4aminobenzenesulfonamide
Proton DMSO-d6

7.572
7.559
7.547
7.452
7.435
7.124
7.108
7.093
7.077
6.622
6.605

5.914

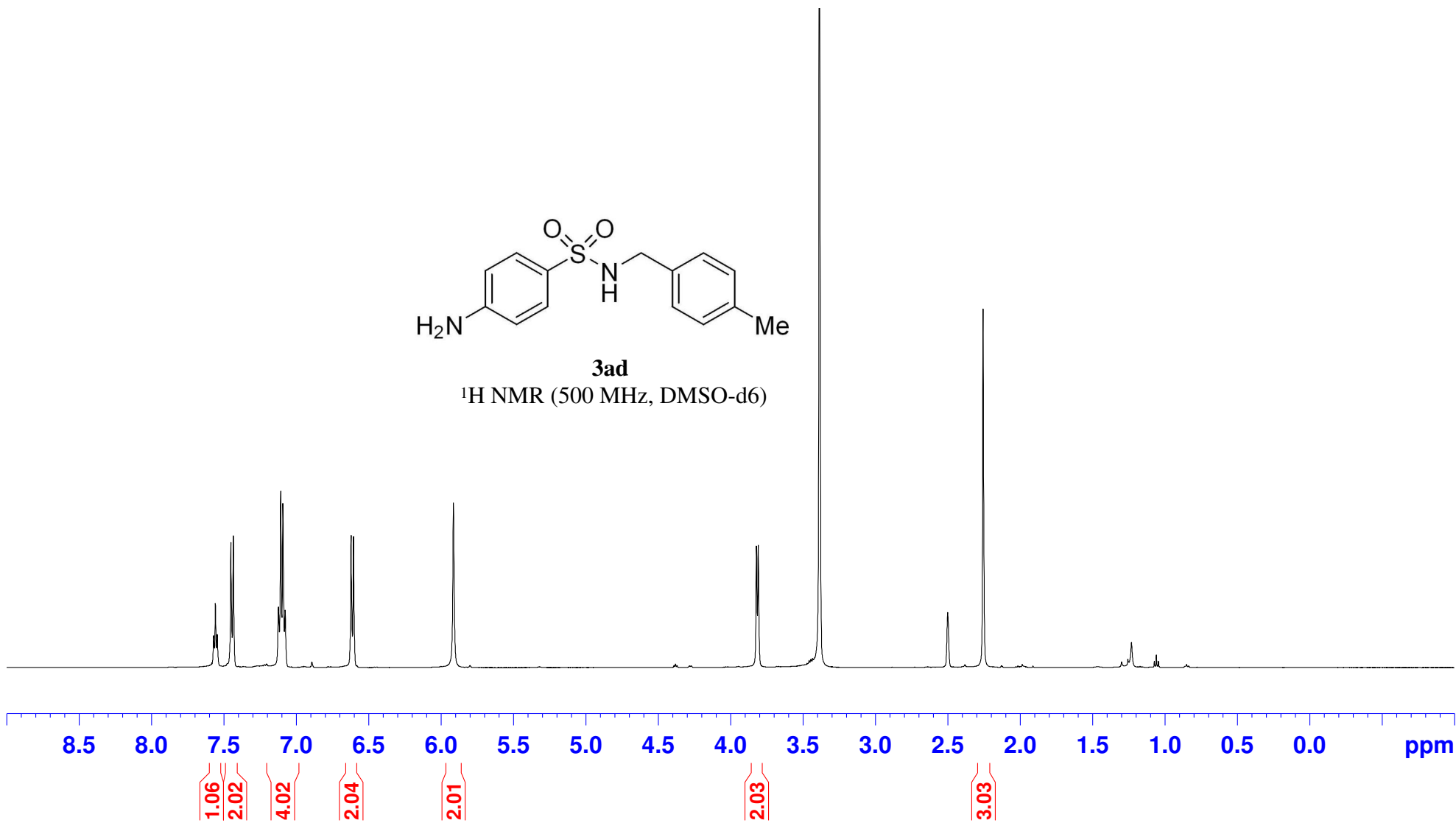
3.822
3.809

2.500
2.256



3ad

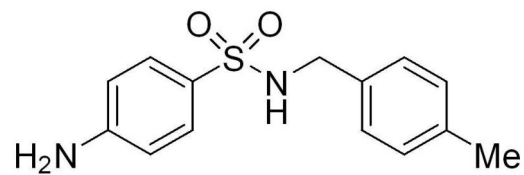
¹H NMR (500 MHz, DMSO-d6)



N-(4-methylbenzyl)-4-aminobenzenesulfonamide
C13CPD DMSO-d6

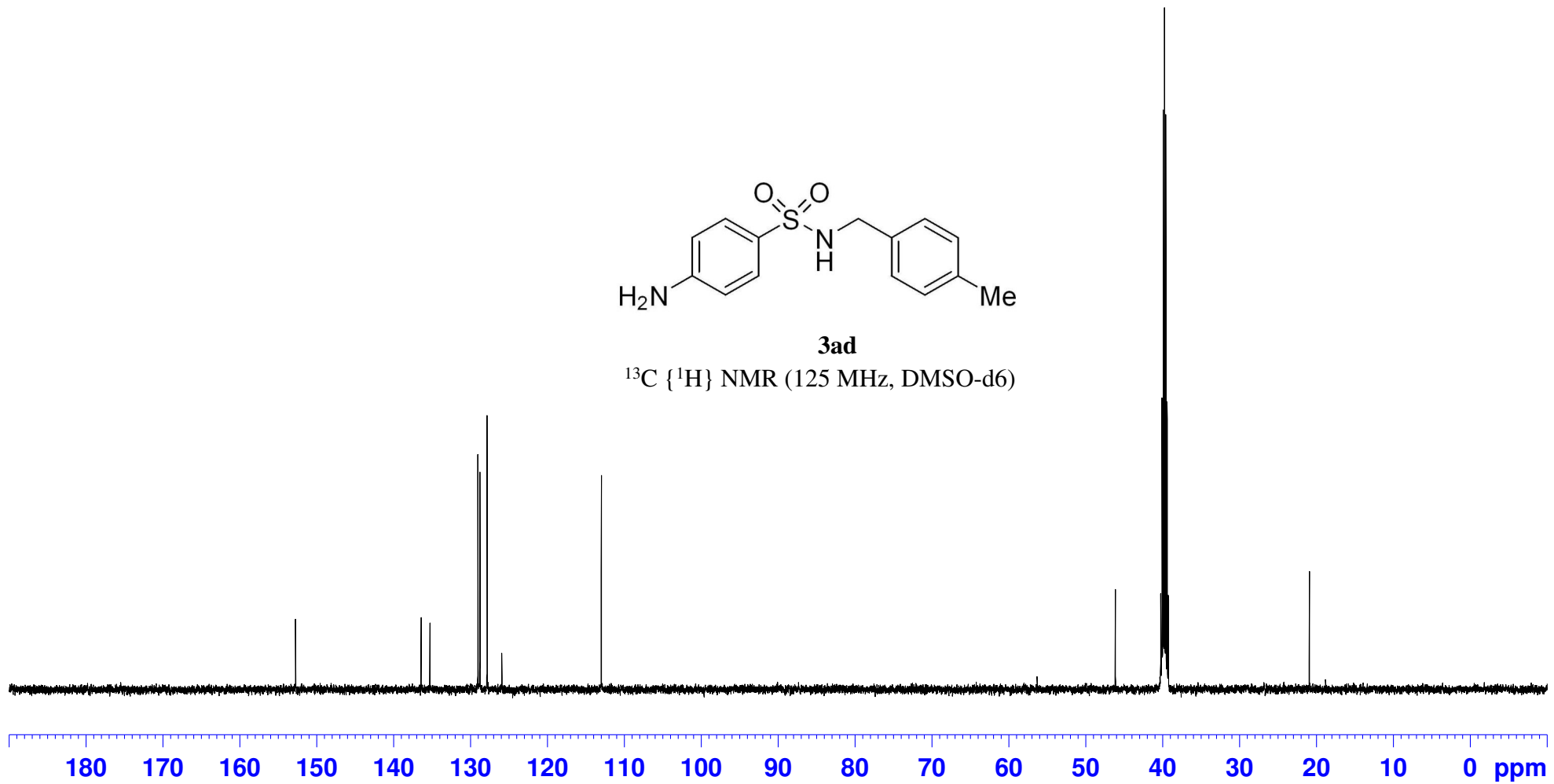
— 152.742
— 136.395
— 135.240
— 129.019
— 128.762
— 127.828
— 125.896
— 112.970

— 46.170
— 40.269
— 40.100
— 39.933
— 39.766
— 39.599
— 39.432
— 39.264
— 20.948



3ad

¹³C {¹H} NMR (125 MHz, DMSO-d6)



N-(4-isopropylbenzyl)-4-aminobenzenesulfonamide
Proton DMSO-d6

7.567
7.555
7.542
7.450
7.433
7.145

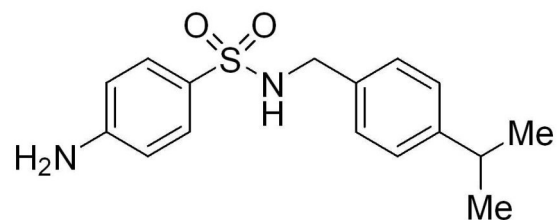
6.620
6.603

5.910

3.834
3.821

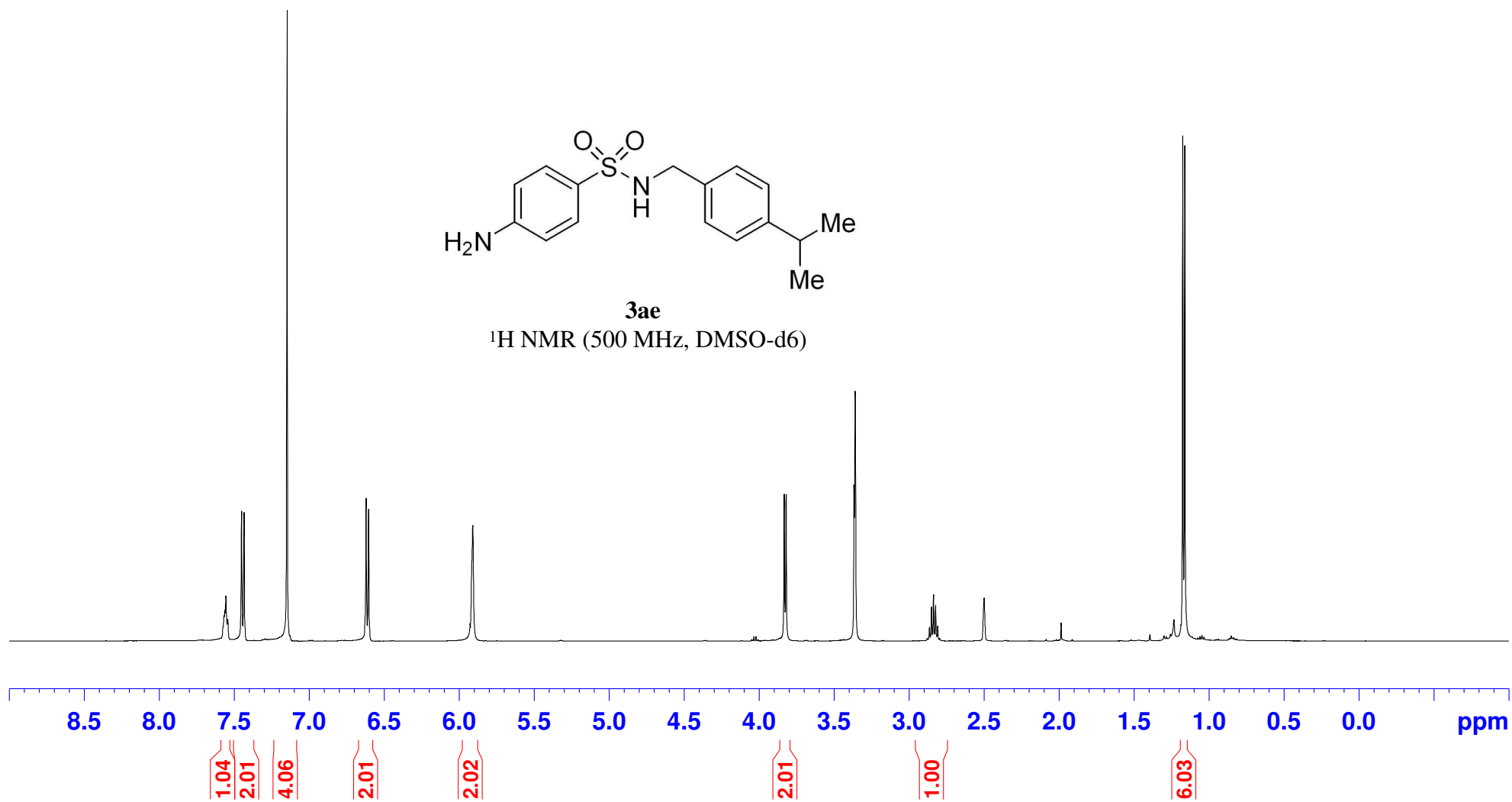
2.879
2.865
2.851
2.837
2.824
2.810
2.796
2.500

1.175
1.161



3ae

¹H NMR (500 MHz, DMSO-d6)



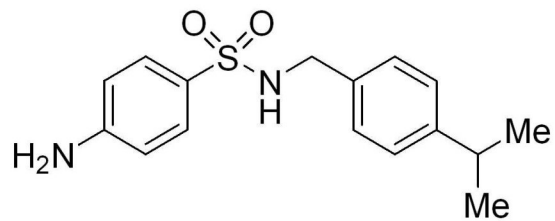
N-(4-isopropylbenzyl)-4-aminobenzenesulfonamide
C13CPD DMSO-d6

— 152.732
— 147.520

— 135.622
— 128.759
— 127.945
— 126.365
— 125.885

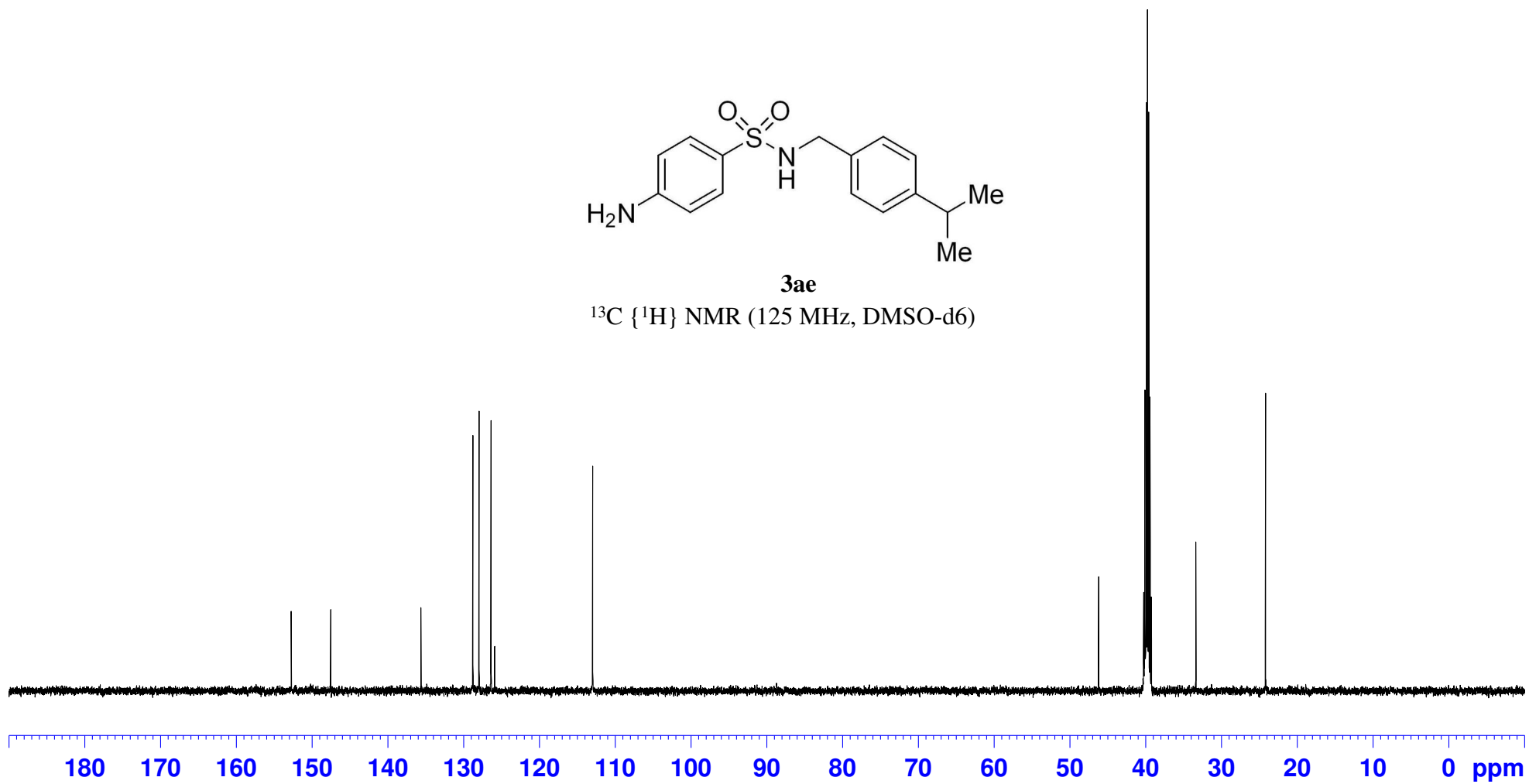
— 112.948

46.232
40.285
40.119
39.952
39.785
39.618
39.451
39.284
33.408
24.215

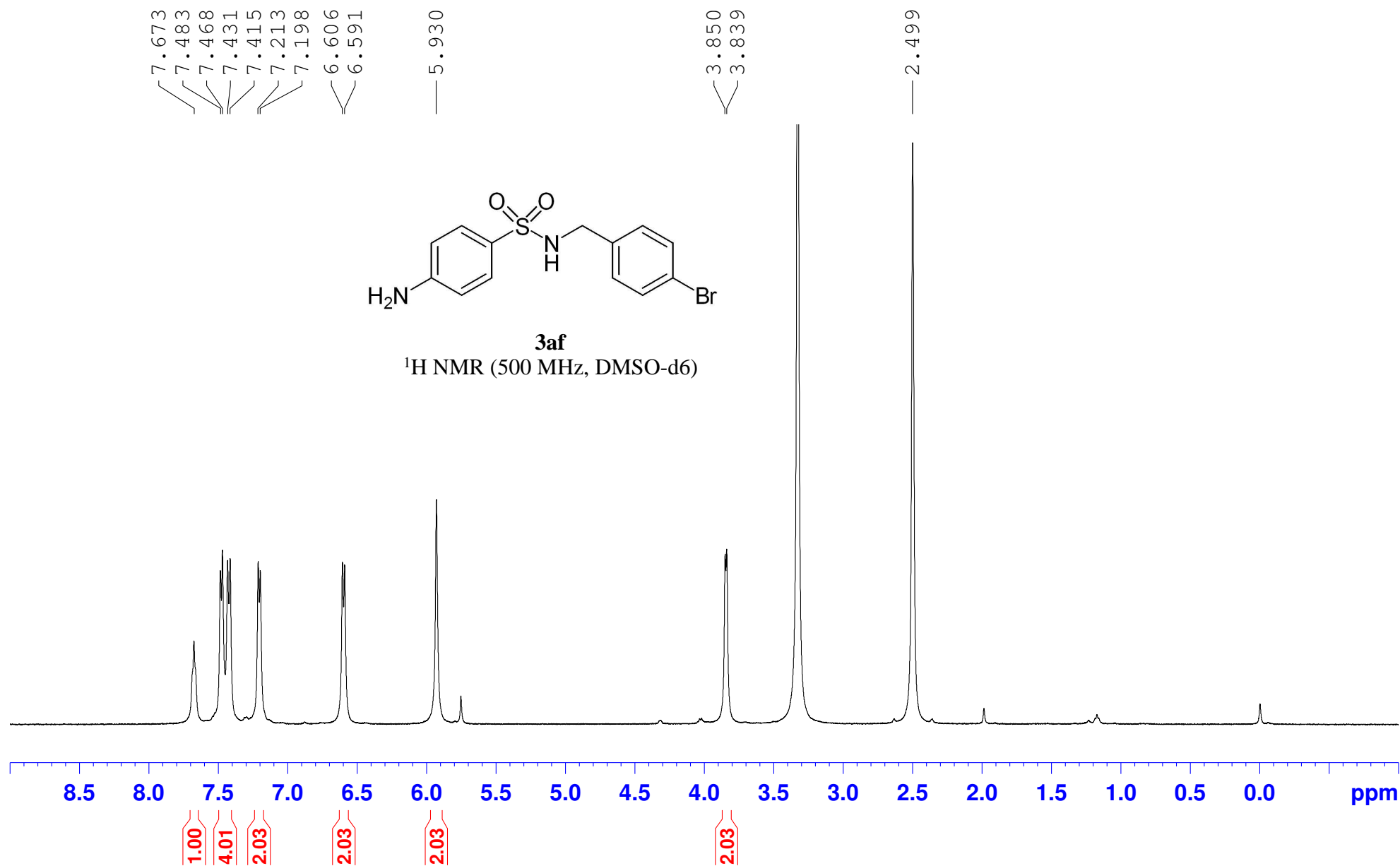


3ae

¹³C {¹H} NMR (125 MHz, DMSO-d6)



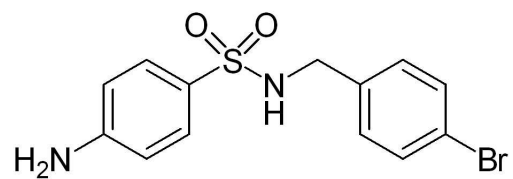
N-(4-bromobenzyl)-4-aminobenzenesulfonamide
Proton DMSO-d6



N-(4-bromobenzyl)-4-aminobenzenesulfonamide
C13CPD DMSO-d6

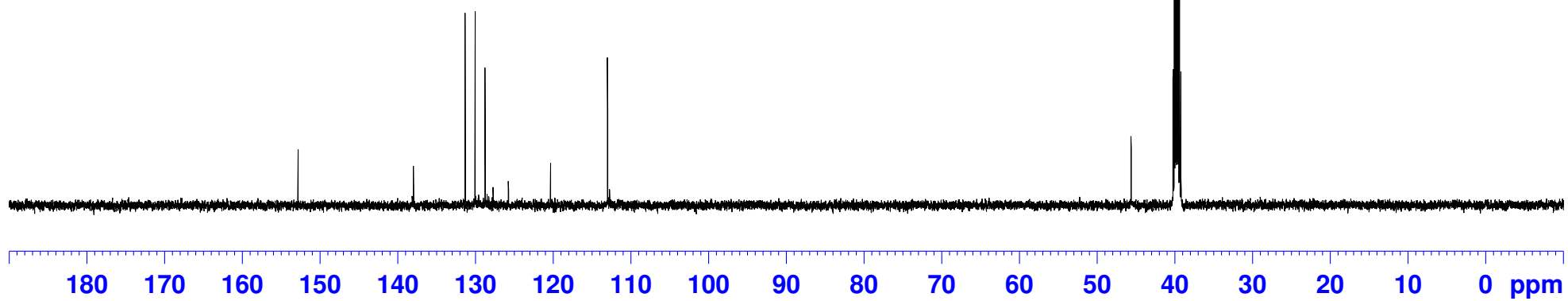
— 152.814
— 137.973
— 131.309
— 130.030
— 128.747
— 125.743
— 120.321
— 112.981

45.655
40.254
40.086
39.919
39.752
39.585
39.418
39.251



3af

^{13}C { ^1H } NMR (125 MHz, DMSO-d6)

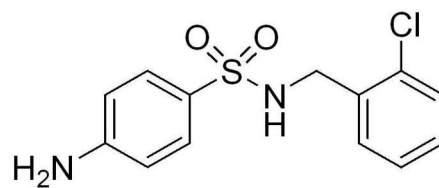


N-(2-chlorobenzyl)-4-aminobenzenesulfonamide
Proton DMSO-d6

7.773
7.761
7.749
7.540
7.524
7.491
7.476
7.375
7.360
7.309
7.294
7.279
7.266
7.251
7.236
6.690
6.674
5.956

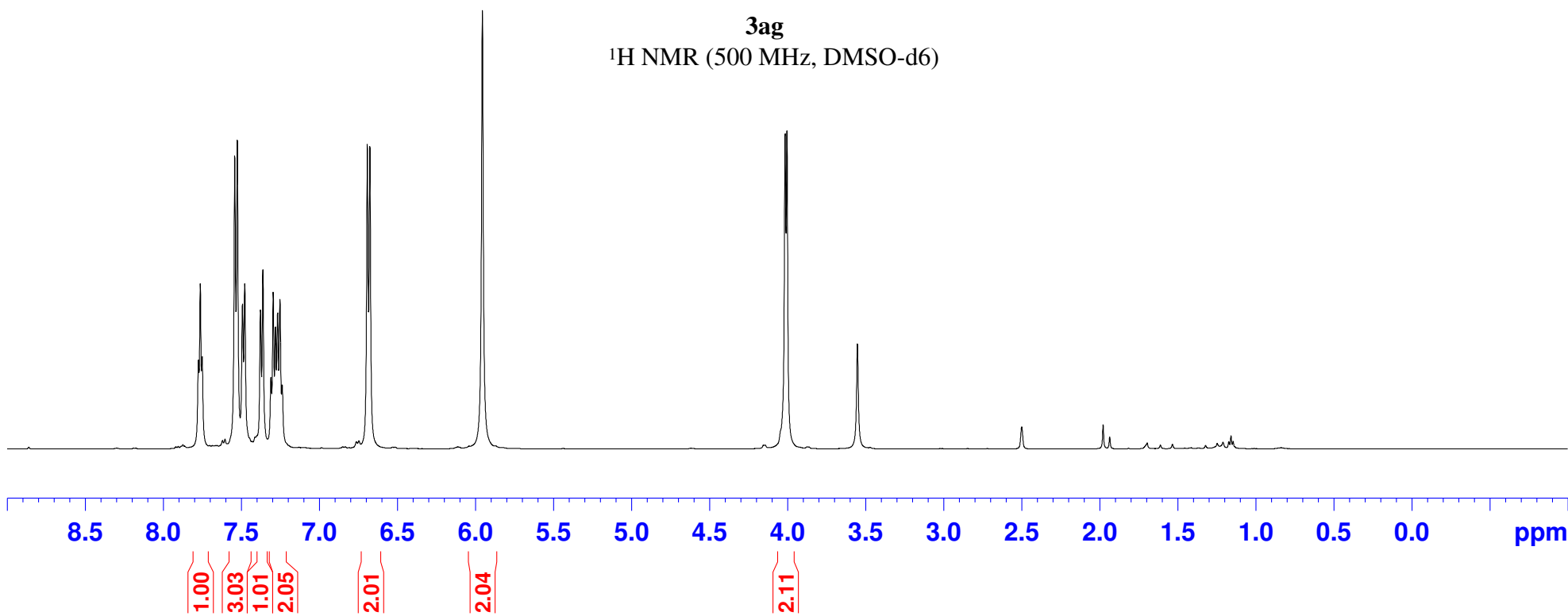
4.016
4.004

2.500



3ag

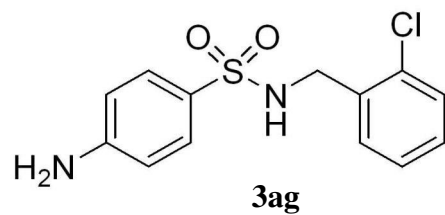
¹H NMR (500 MHz, DMSO-d6)



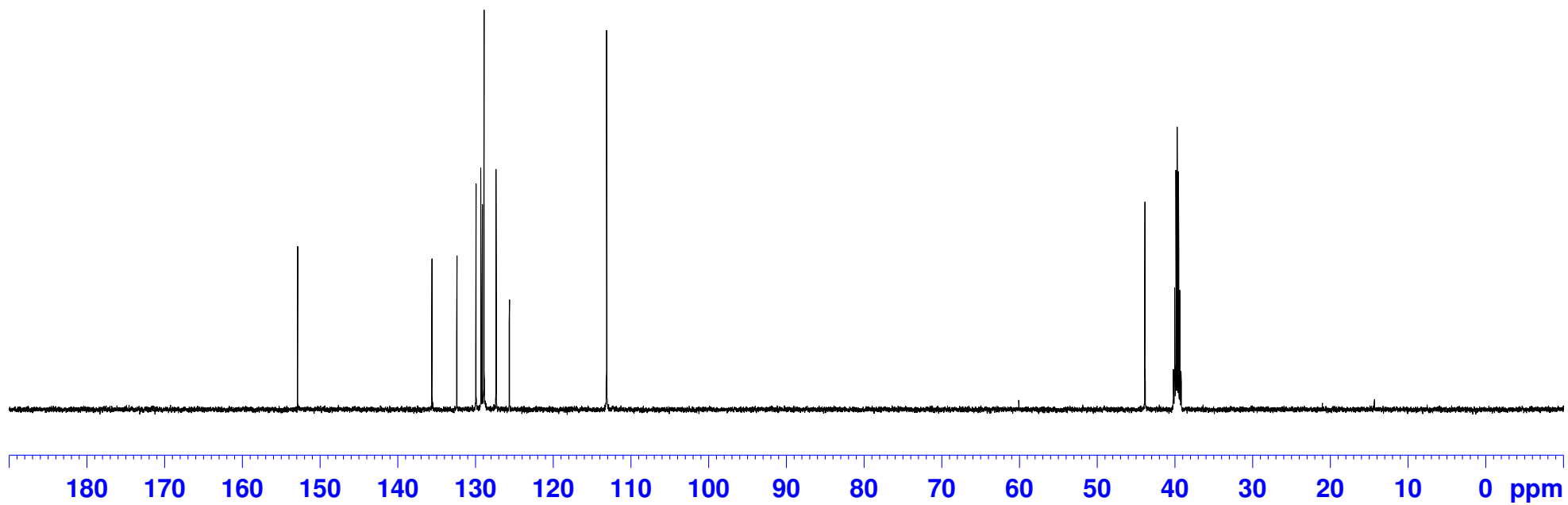
N-(2-chlorobenzyl)-4-aminobenzenesulfonamide
C13CPD DMSO-d6

— 152.872
135.575
132.377
129.918
129.283
129.098
128.881
127.328
125.620
— 113.101

43.882
40.226
40.059
39.892
39.725
39.558
39.391
39.225



^{13}C { ^1H } NMR (125 MHz, DMSO-d6)



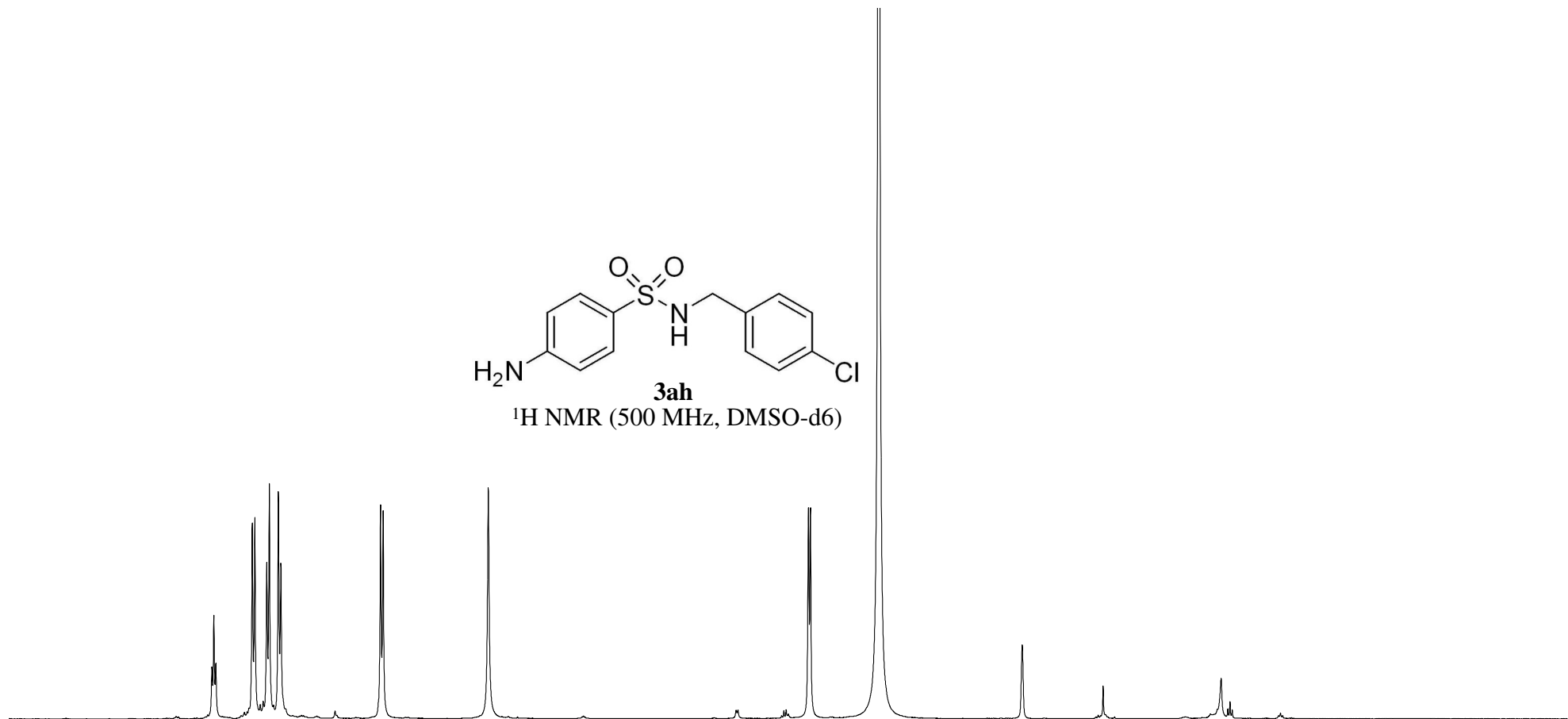
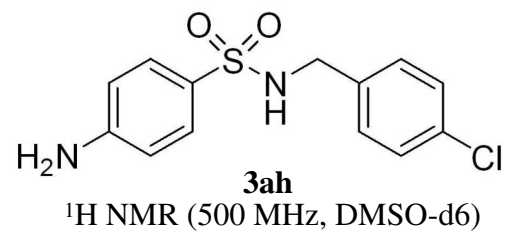
N-(4-chlorobenzyl)-4-aminobenzenesulfonamide
Proton DMSO-d6

7.695
7.683
7.670
7.436
7.419
7.344
7.327
7.269
7.253
6.614
6.597

5.925

3.872
3.859

2.500



8.5

8.0

7.5

7.0

6.5

6.0

5.5

5.0

4.5

4.0

3.5

3.0

2.5

2.0

1.5

1.0

0.5

0.0

ppm

1.00

2.01

2.00

2.08

2.09

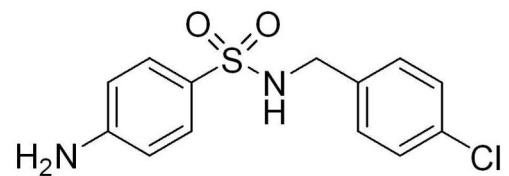
2.01

2.08

N-(4-chlorobenzyl)-4-aminobenzenesulfonamide
C13CPD DMSO-d6

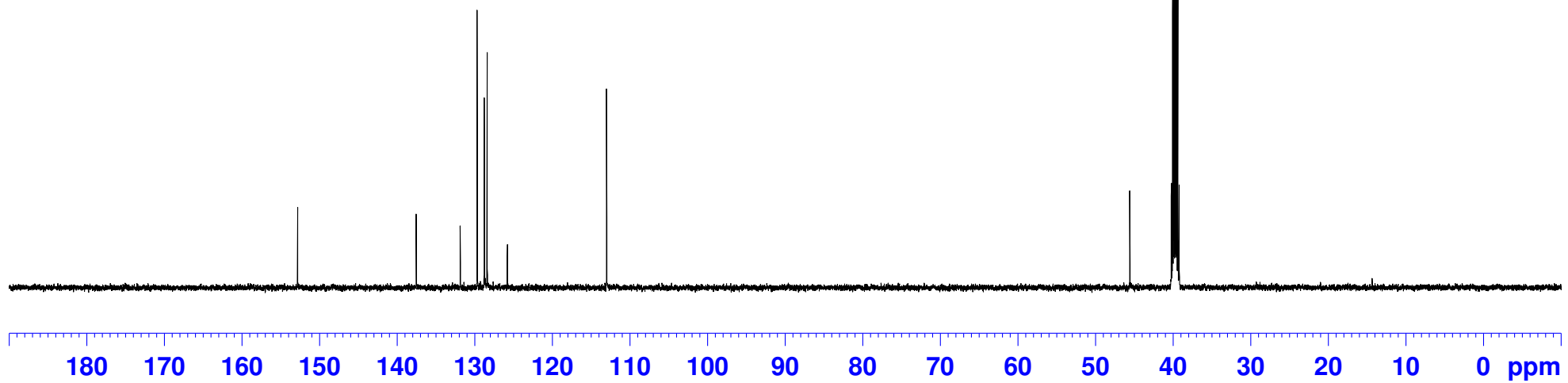
— 152.807
— 137.528
— 131.844
— 129.662
— 128.749
— 128.388
— 125.781
— 112.987

45.611
40.253
40.087
39.919
39.752
39.585
39.418
39.251



3ah

^{13}C { ^1H } NMR (125 MHz, DMSO-d6)



N-(3-fluorophenyl)-4-aminobenzenesulfonamide
Proton DMSO-d6

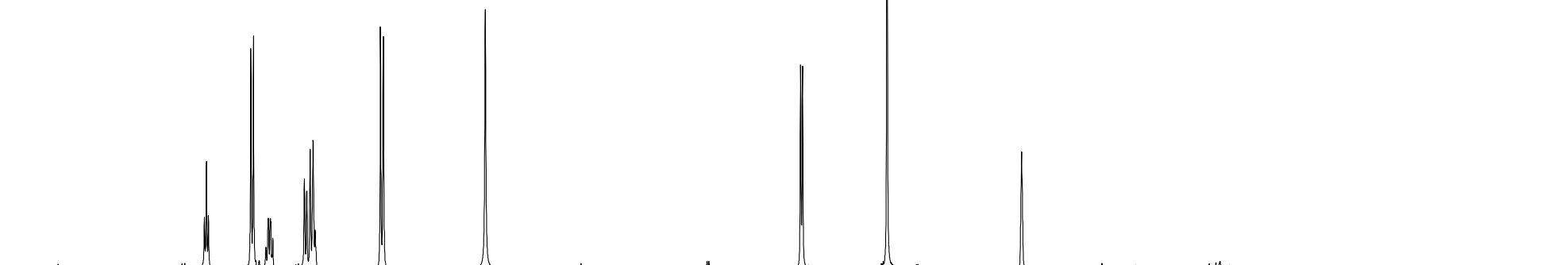
7.734
7.722
7.709
7.437
7.420
7.341
7.326
7.312
7.309
7.296
7.094
7.079
7.057
7.038
7.025
6.607
6.590
5.937

3.917
3.904

2.500



3ai
¹H NMR (500 MHz, DMSO-d6)



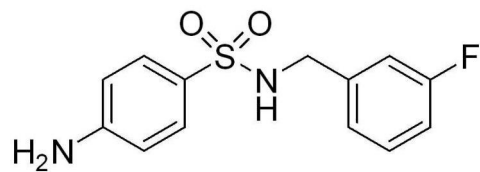
8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 ppm

1.03
2.05
1.03
3.00
2.06
2.05
2.05

N-(3-fluorophenyl)-4-aminobenzenesulfonamide
C13CPD DMSO-d6

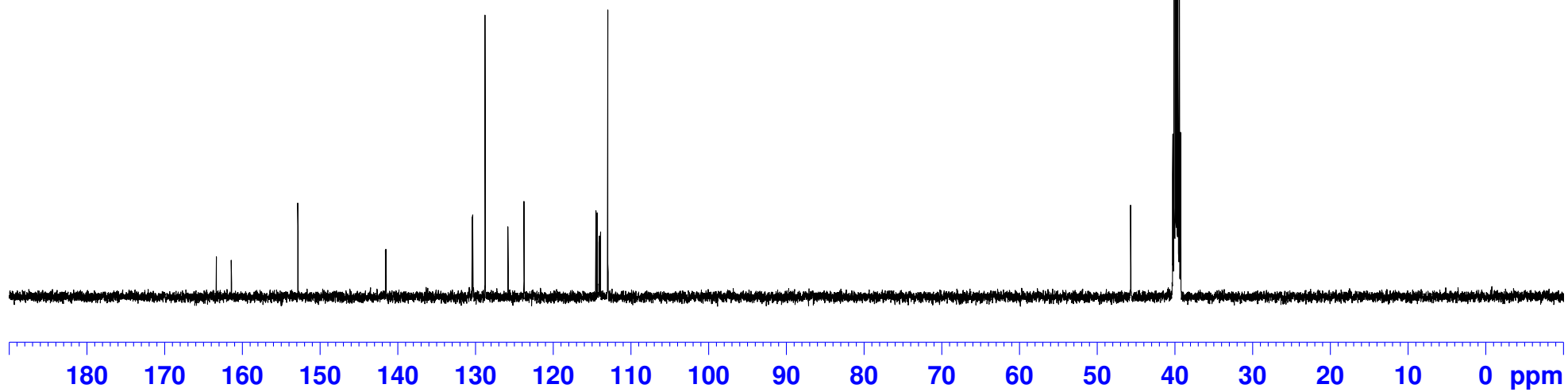
163.324
161.389
152.827
141.552
141.495
130.406
130.341
128.745
125.796
123.752
123.732
114.492
114.319
114.068
113.902
112.953

45.727
40.301
40.133
39.967
39.800
39.633
39.466
39.299



3ai

^{13}C { ^1H } NMR (125 MHz, DMSO-d6)



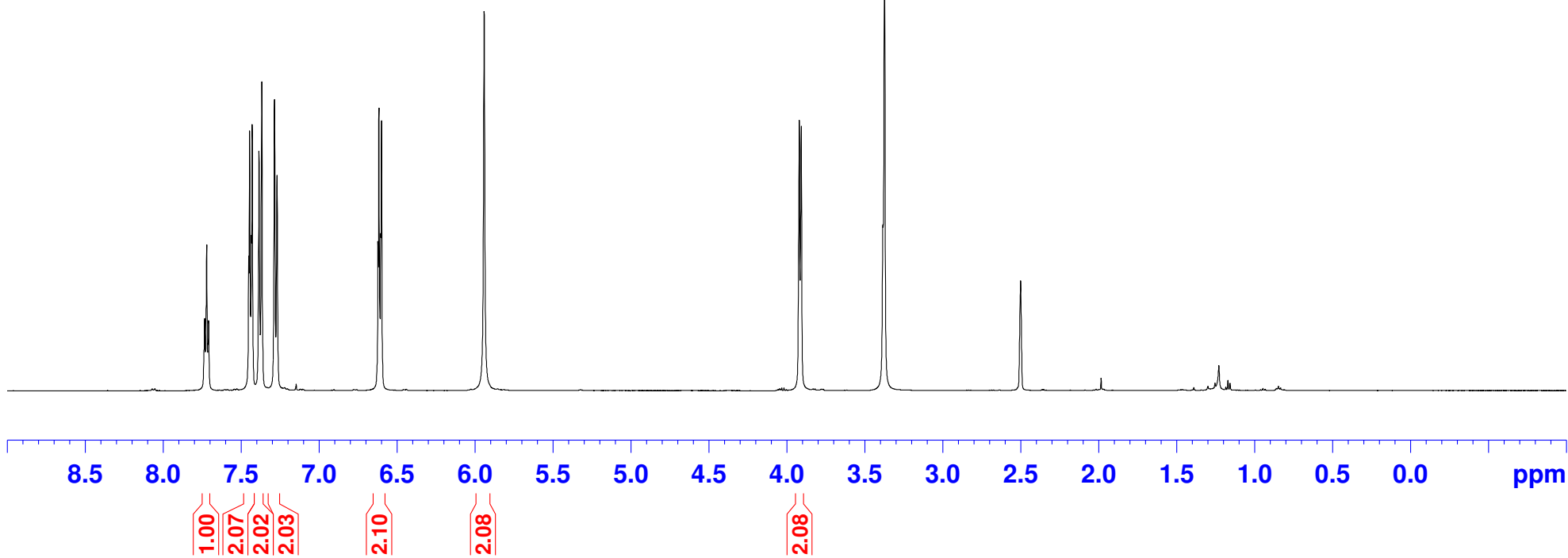
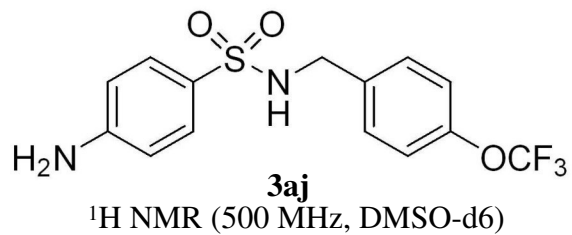
N-(4-(trifluoromethoxy)benzyl)-4-aminobenzenesulfonamide
Proton DMSO-d6

7.732
7.719
7.706
7.444
7.426
7.383
7.365
7.284
7.268
6.615
6.598

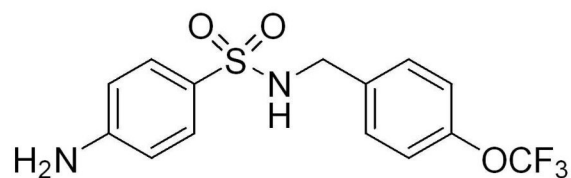
5.939

3.920
3.907

2.500

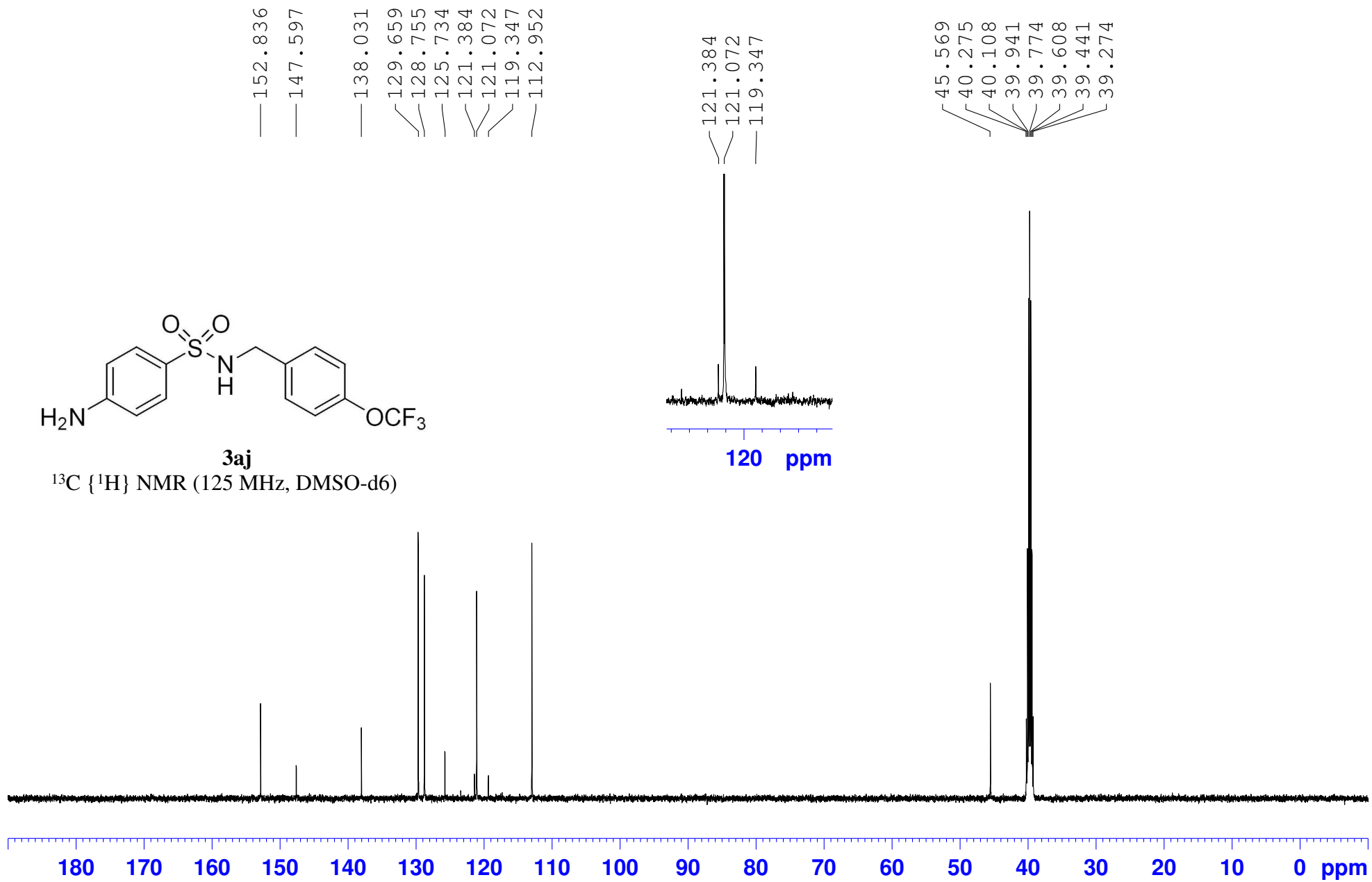


N-(4-(trifluoromethoxy)benzyl)-4-aminobenzenesulfonamide
C13CPD DMSO-d6



3aj

^{13}C { ^1H } NMR (125 MHz, DMSO-d6)



N-(3-(trifluoromethyl)benzyl)-4-aminobenzenesulfonamide
Proton DMSO-d6

7.816
7.804
7.791
7.595
7.580
7.563
7.544
7.524
7.509
7.445
7.429
6.612
6.595

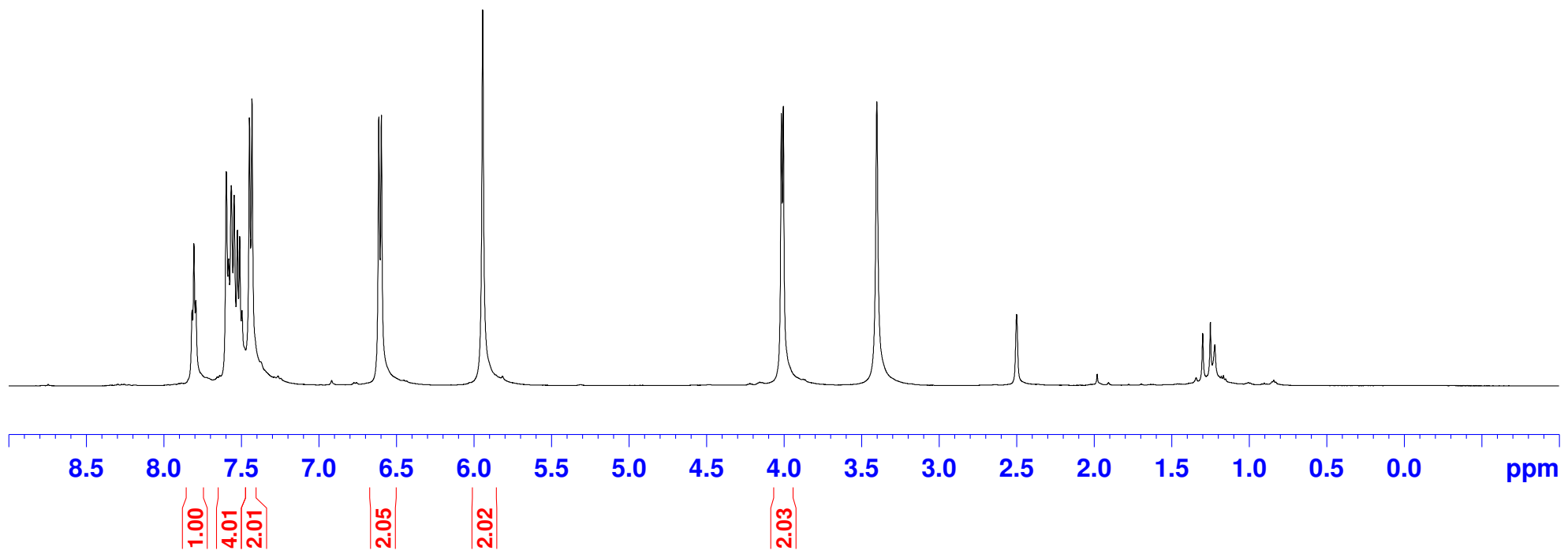
5.944

4.017
4.005

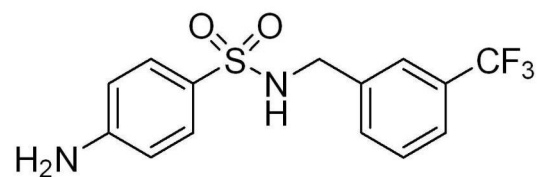
2.499



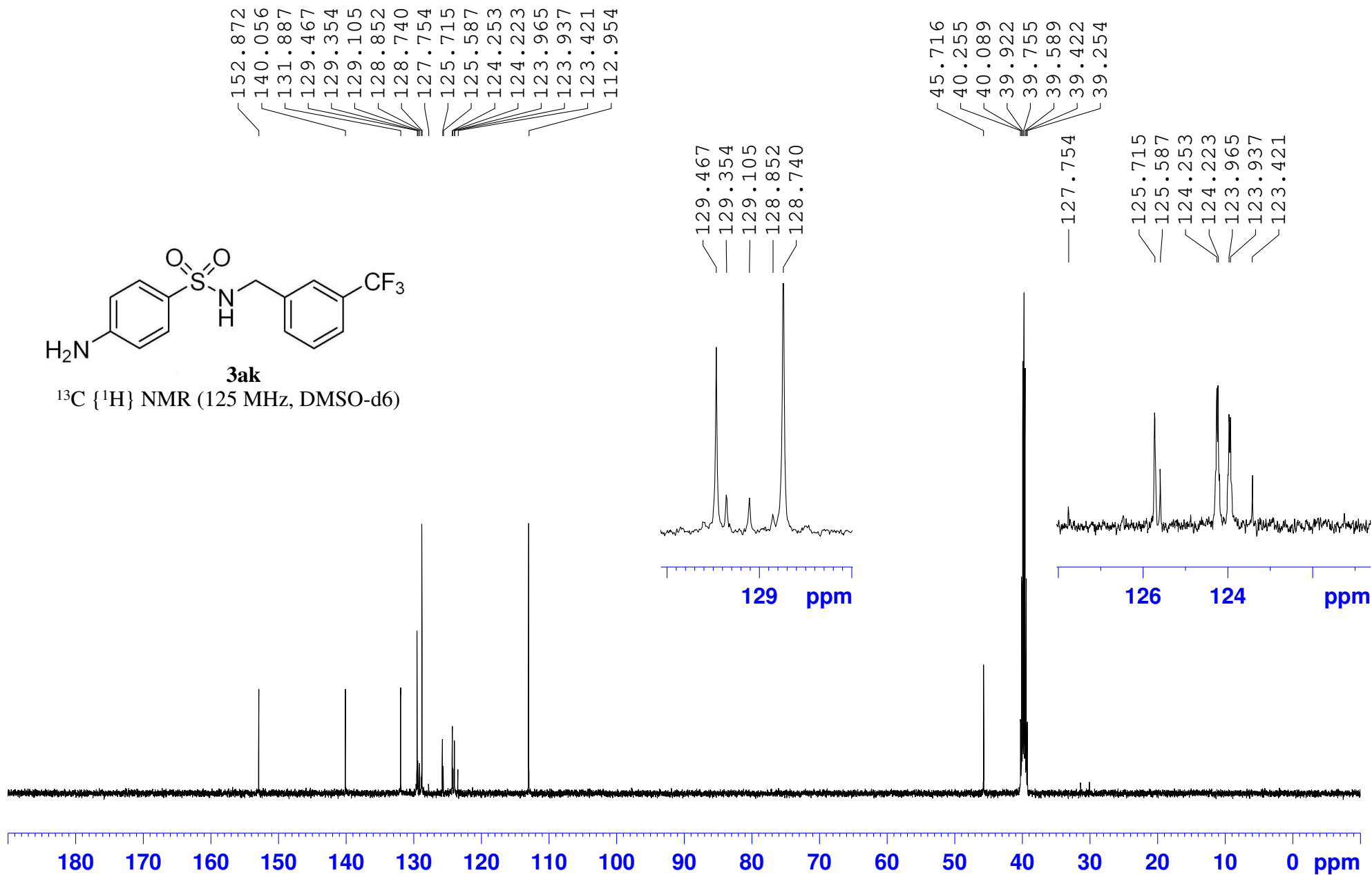
3ak
¹H NMR (500 MHz, DMSO-d6)



N-(3-(trifluoromethyl)benzyl)-4-aminobenzenesulfonamide
C13CPD DMSO-d6



^{13}C { ^1H } NMR (125 MHz, DMSO-d6)



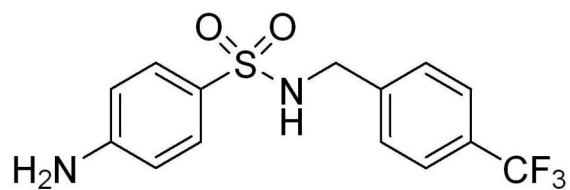
N-(4-(trifluoromethyl)benzyl)-4-aminobenzenesulfonamide
Proton DMSO-d6

7.786
7.773
7.760
7.656
7.640
7.486
7.470
7.438
7.420
6.606
6.589

5.936

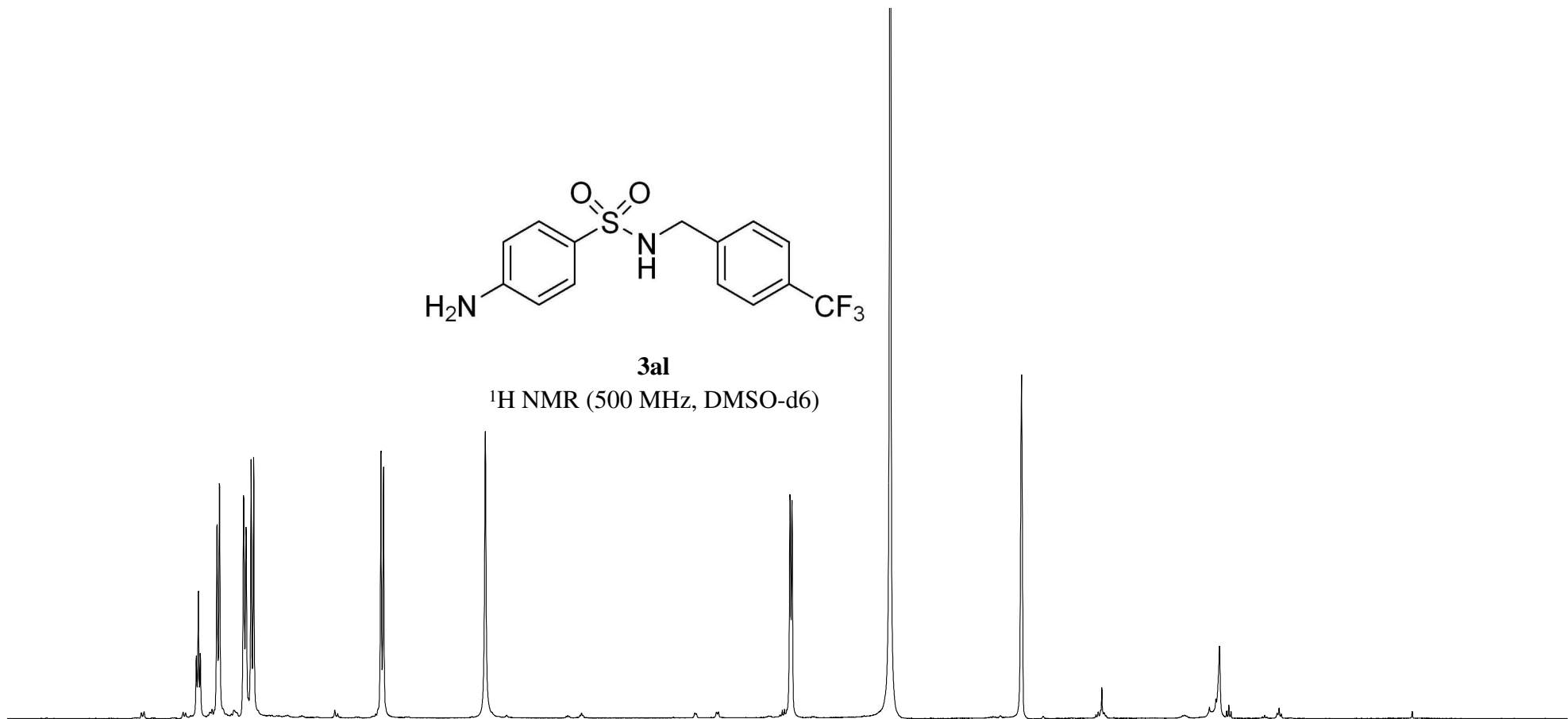
3.984
3.971

2.500



3al

¹H NMR (500 MHz, DMSO-d6)



8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 ppm

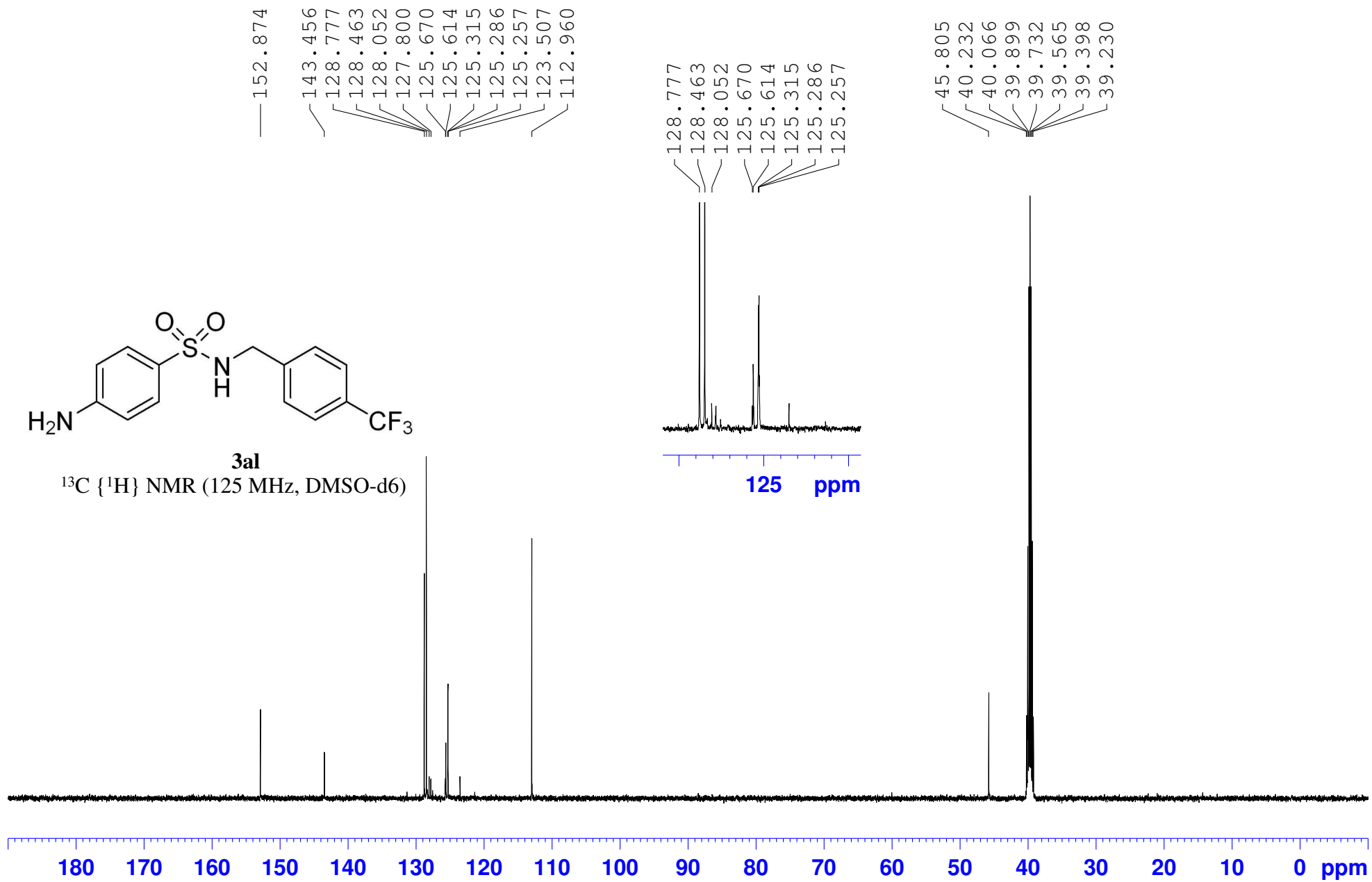
1.00
2.00
2.02
2.05

2.07

2.03

2.09

N-(4-(trifluoromethyl)benzyl)-4-aminobenzenesulfonamide
C13CPD DMSO-d6

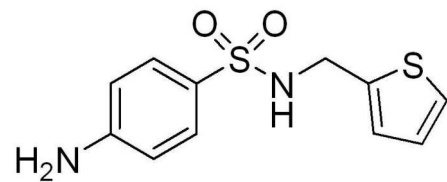


4-amino-N-(thiophen-2-ylmethyl)benzenesulfonamide
Proton DMSO-d6

7.758
7.746
7.733
7.446
7.429
7.391
7.384
7.382
6.921
6.914
6.904
6.618
6.600
— 5.934

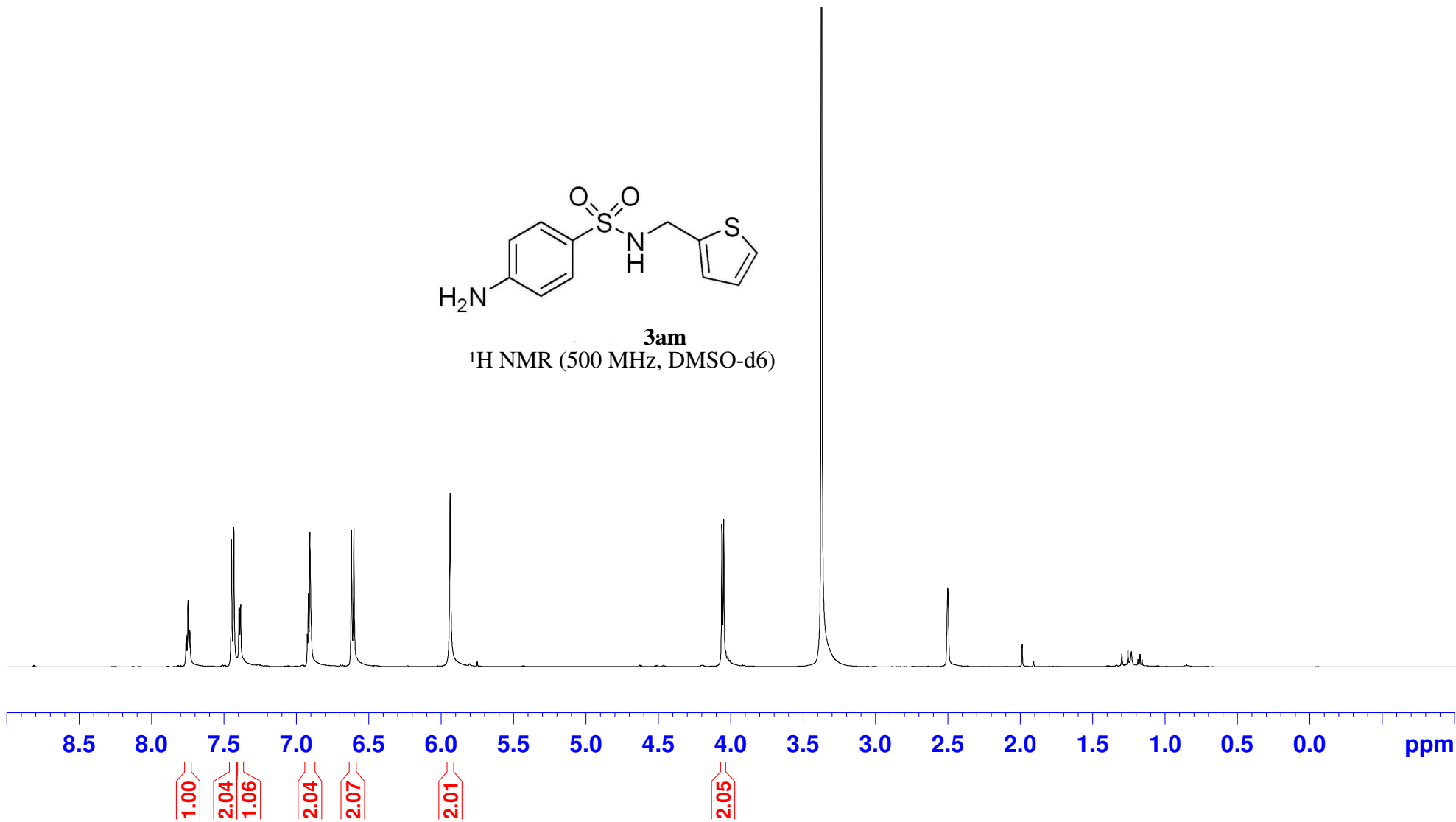
4.061
4.048

— 2.500



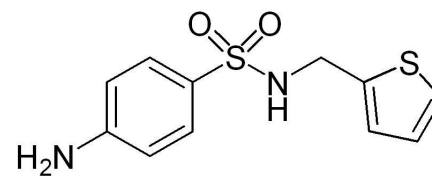
3am

¹H NMR (500 MHz, DMSO-d6)



4-amino-N-(thiophen-2-ylmethyl)benzenesulfonamide
C13CPD DMSO

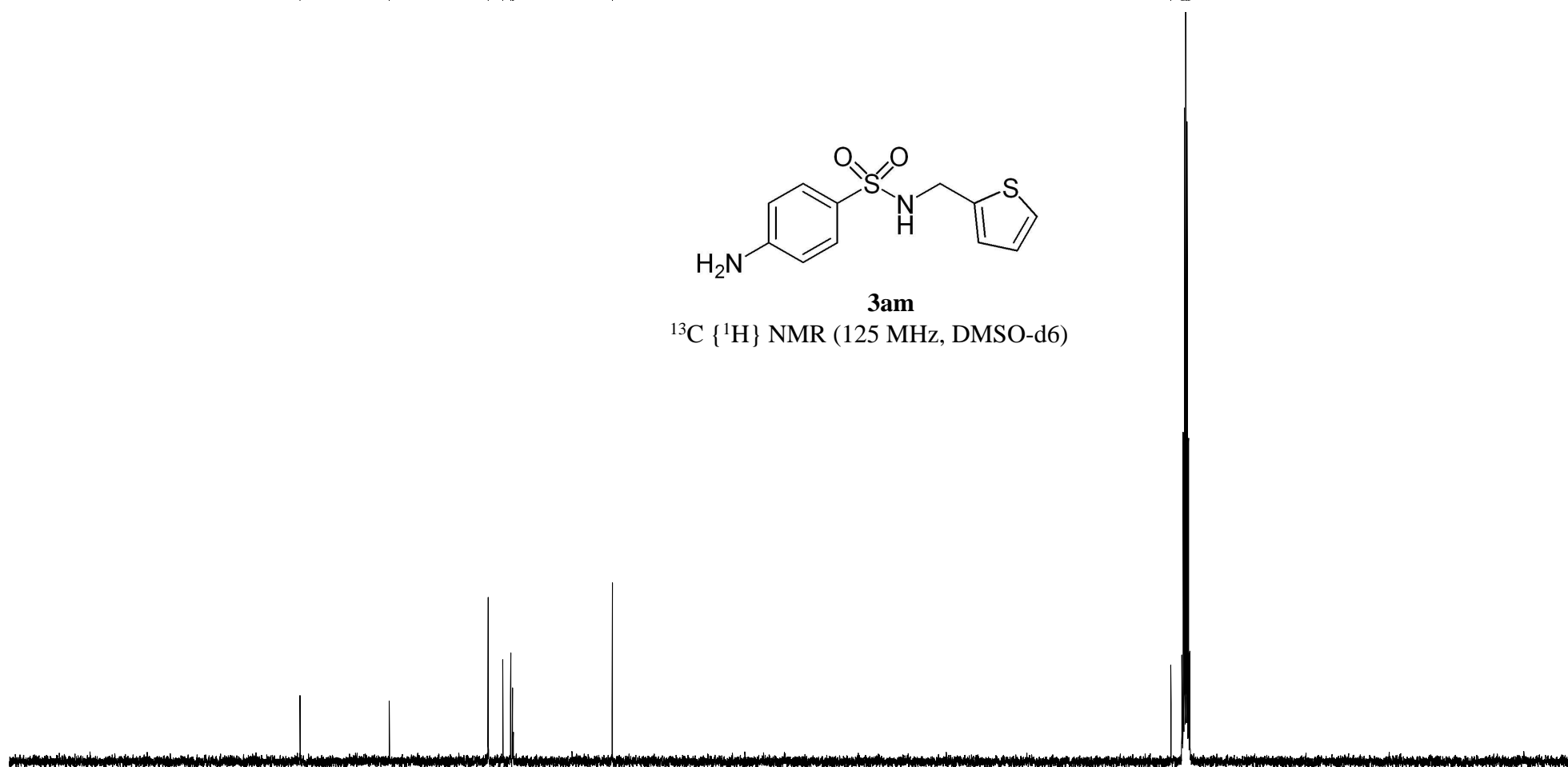
— 152.850
— 141.444
— 128.812
— 126.952
— 125.950
— 125.707
— 125.618
— 112.968



3am

$^{13}\text{C} \{^1\text{H}\}$ NMR (125 MHz, DMSO-d₆)

41.676
40.275
40.108
39.941
39.774
39.607
39.439
39.272



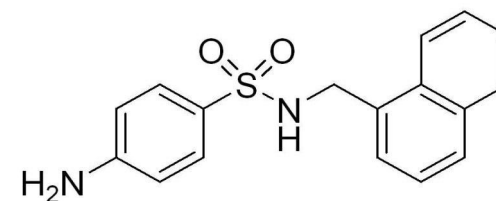
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm

4-amino-N-(naphthalen-1-ylmethyl) benzenesulfonamide
Proton DMSO-d6

7.928
7.922
7.859
7.855
7.844
7.840
7.653
7.640
7.628
7.545
7.542
7.534
7.525
7.508
7.445
7.431
7.416
7.404
6.654
6.637
5.968

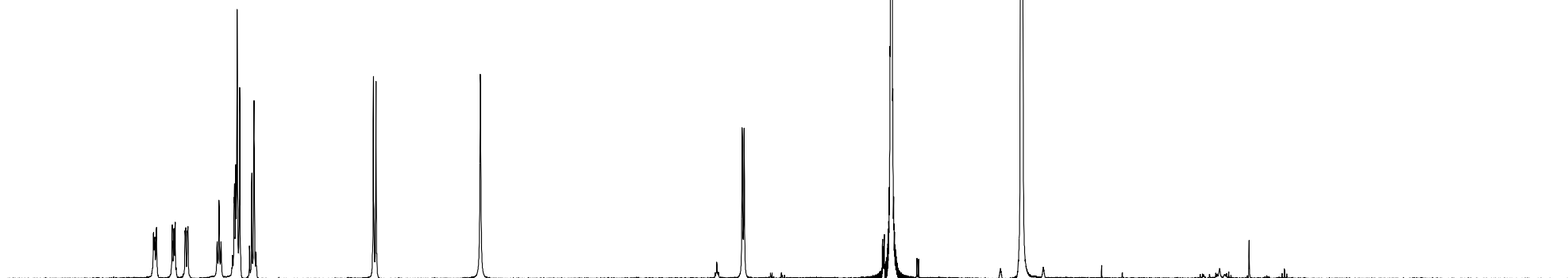
4.291
4.278

2.500



3an

¹H NMR (500 MHz, DMSO-d6)



8.5

1.06

1.06

1.02

1.08

4.00

2.04

2.02

2.02

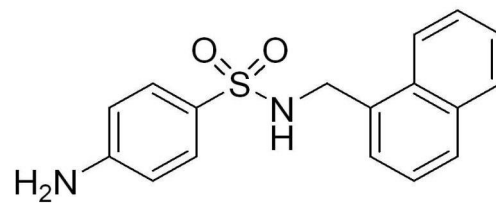
2.04

ppm

4-amino-N-(naphthalen-1-ylmethyl)benzenesulfonamide
C13CPD DMSO-d6

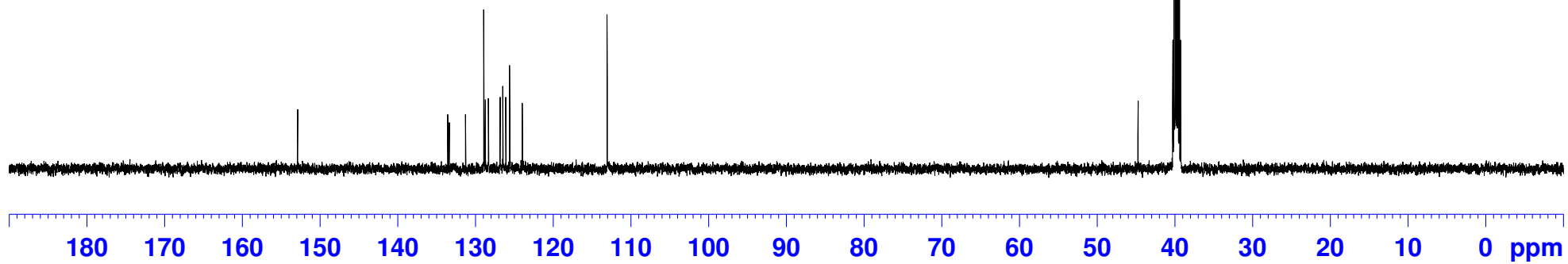
152.873
133.548
133.347
131.266
128.904
128.717
128.312
126.802
126.470
126.080
125.588
123.962
113.034

44.770
40.293
40.127
39.960
39.793
39.626
39.459
39.291



3an

^{13}C { ^1H } NMR (125 MHz, DMSO-d6)

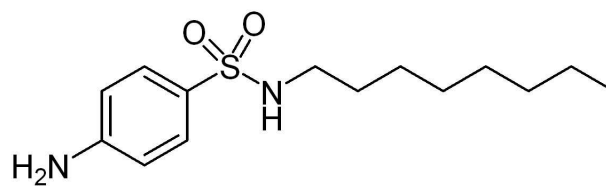


4-amino-N-octylbenzenesulfonamide
Proton DMSO-d6

7.406
7.388
7.029
7.017
7.005
6.608
6.591

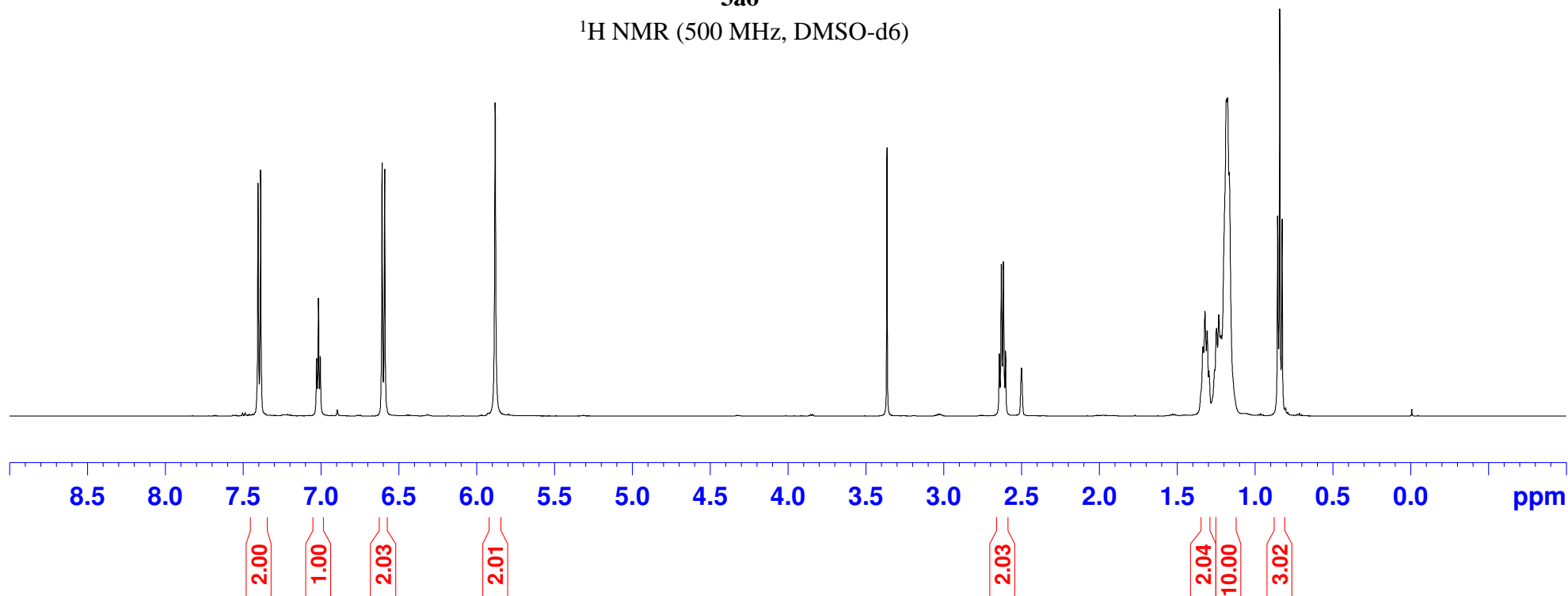
5.882

2.643
2.629
2.616
2.602
2.500
1.334
1.321
1.307
1.296
1.247
1.233
1.219
1.183
1.176
1.165
0.854
0.841
0.826



3ao

¹H NMR (500 MHz, DMSO-d6)



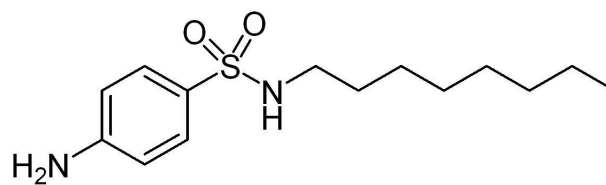
4-amino-N-octylbenzenesulfonamide
C13CPD DMSO-d6

— 152.633

— 128.660
— 125.929

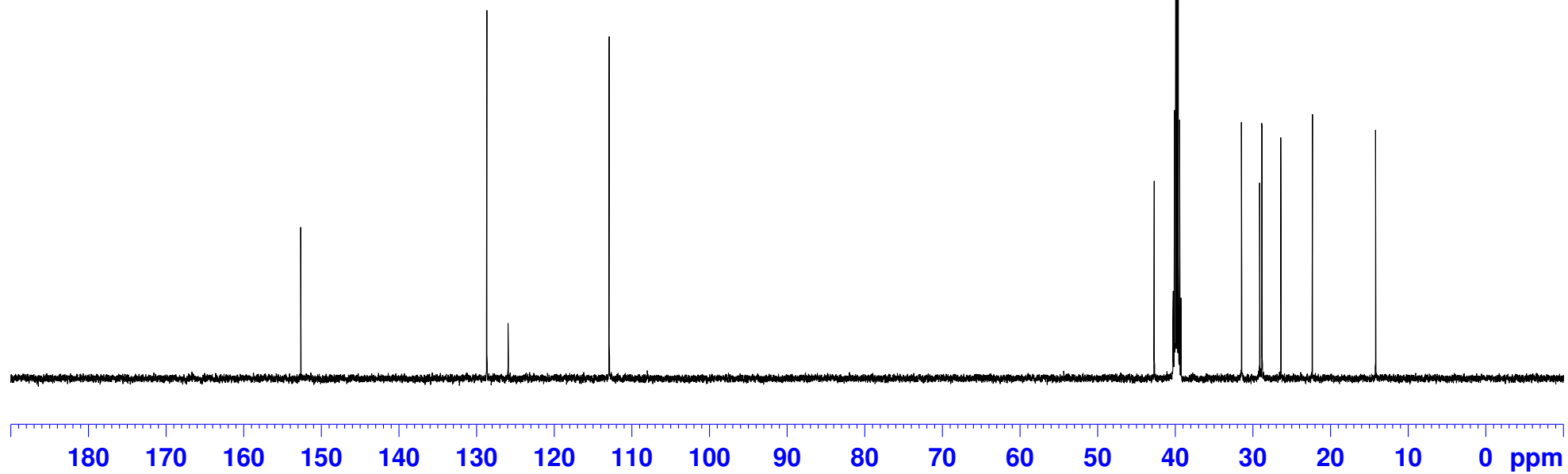
— 112.900

42.737
40.298
40.131
39.964
39.797
39.630
39.463
39.297
31.486
29.153
28.869
28.834
26.419
22.369
14.221

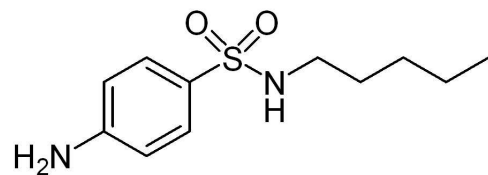


3ao

^{13}C $\{^1\text{H}\}$ NMR (125 MHz, DMSO-d6)



4-amino-N-pentylbenzenesulfonamide
Proton DMSO-d6



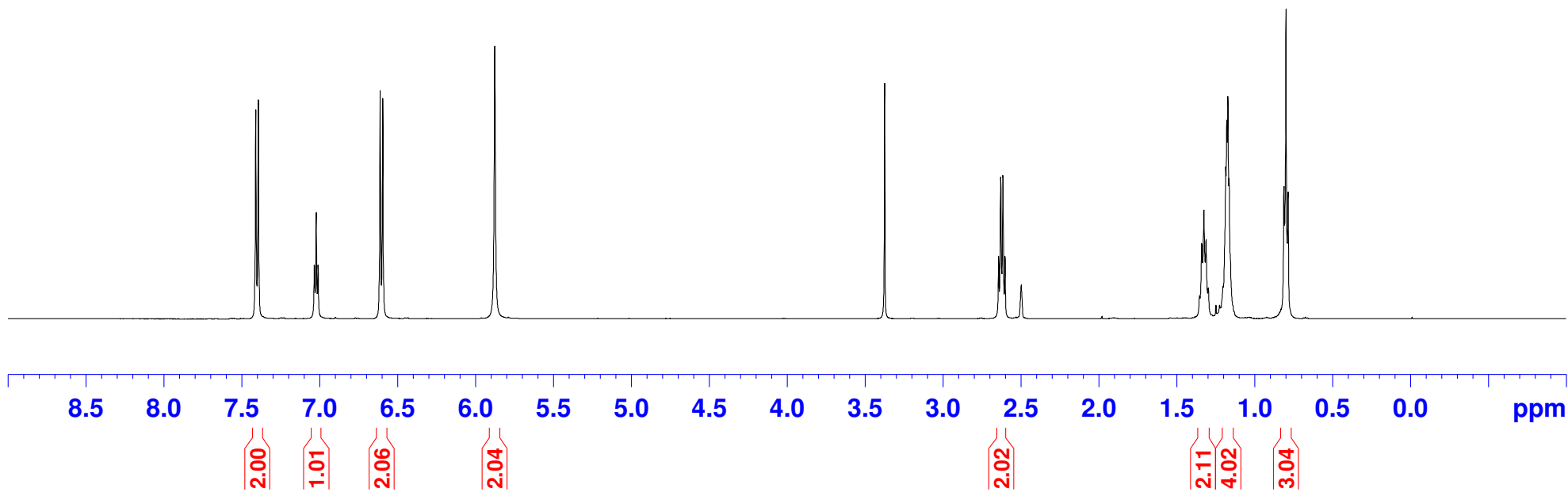
3ap

¹H NMR (500 MHz, DMSO-d6)

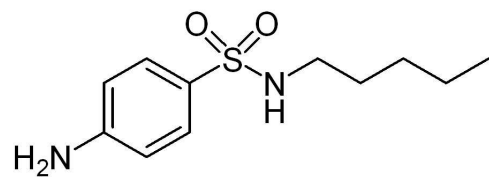
7.409
7.391
7.033
7.021
7.009
6.611
6.593

5.877

2.643
2.629
2.616
2.603
2.498
1.355
1.340
1.326
1.312
1.298
1.185
1.178
1.171
1.164
0.813
0.799
0.785

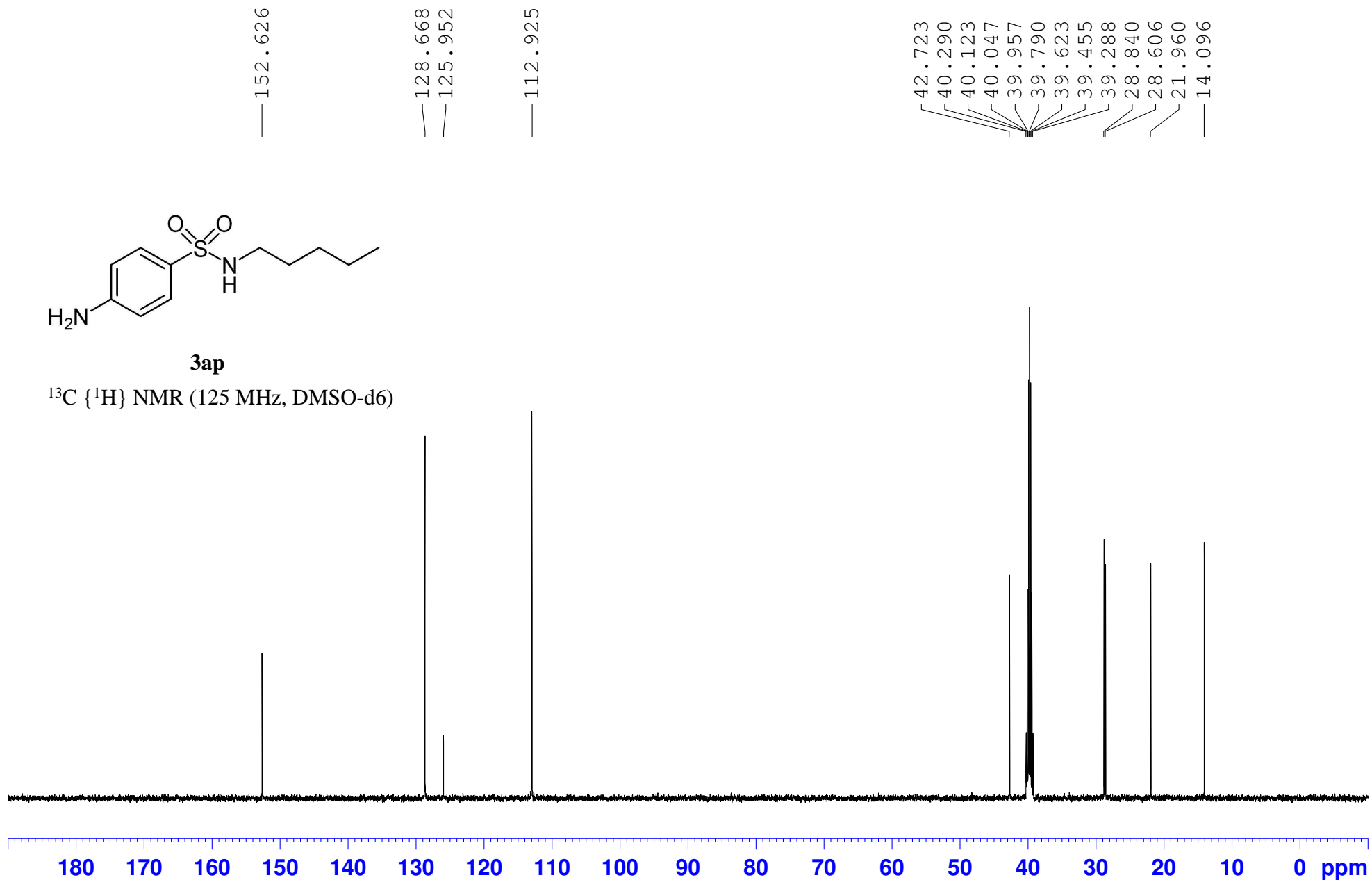


4-amino-N-pentylbenzenesulfonamide
C13CPD DMSO-d6



3ap

^{13}C { ^1H } NMR (125 MHz, DMSO-d6)

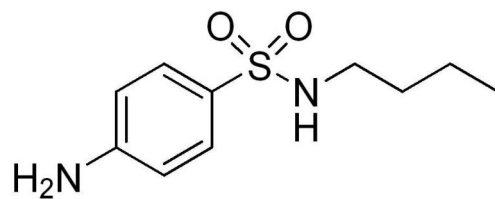


4-amino-N-butylbenzenesulfonamide
Proton DMSO-d6

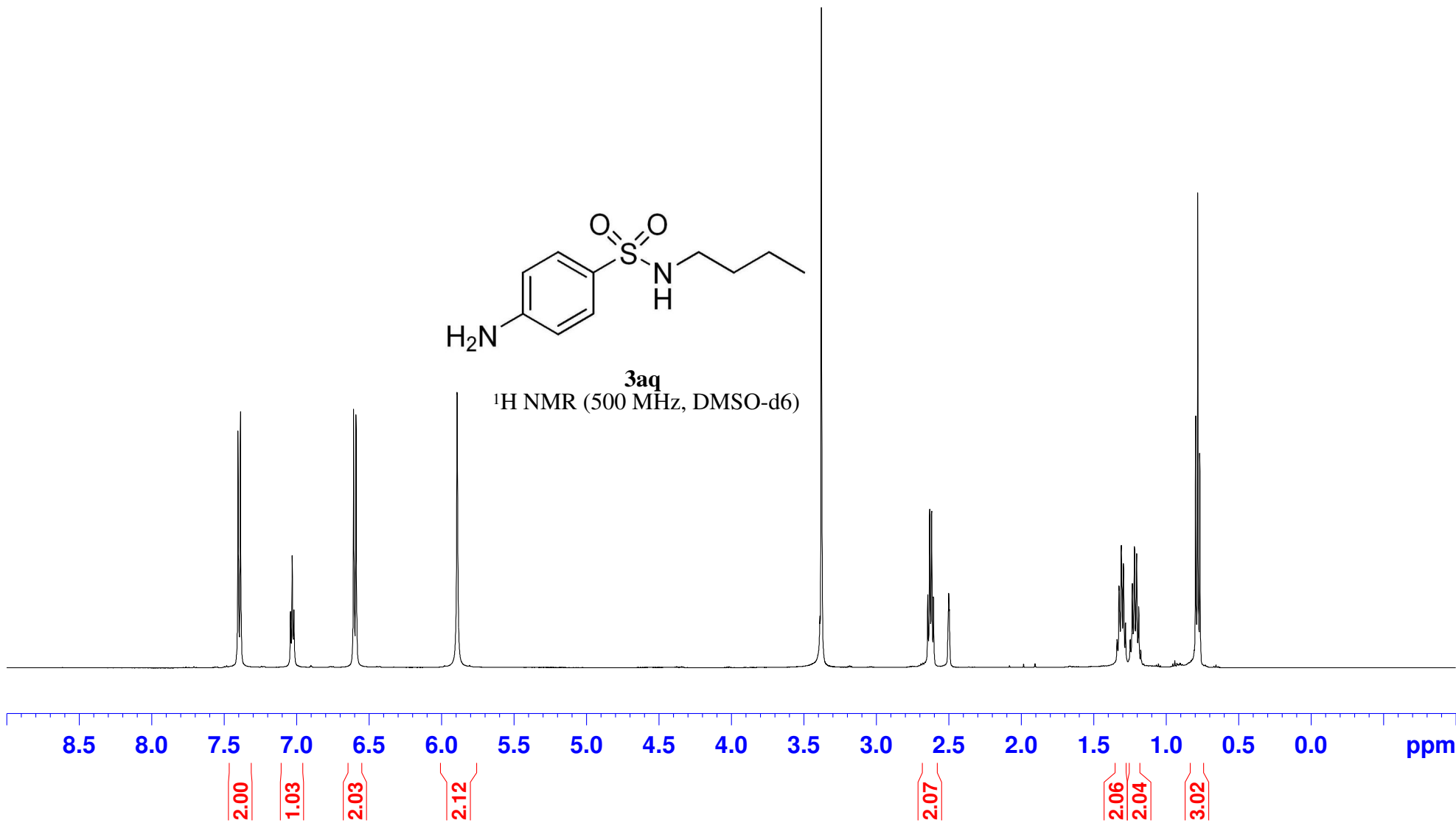
7.405
7.388
7.042
7.030
7.018
6.607
6.590

5.892

2.645
2.631
2.618
2.605
2.500
1.338
1.324
1.310
1.295
1.280
1.248
1.233
1.218
1.203
1.188
0.796
0.782
0.767



3aq
¹H NMR (500 MHz, DMSO-d6)



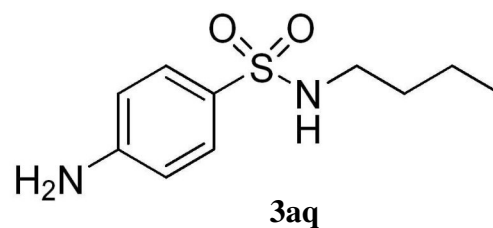
4-amino-N-butylbenzenesulfonamide
C13CPD DMSO-d6

— 152.632

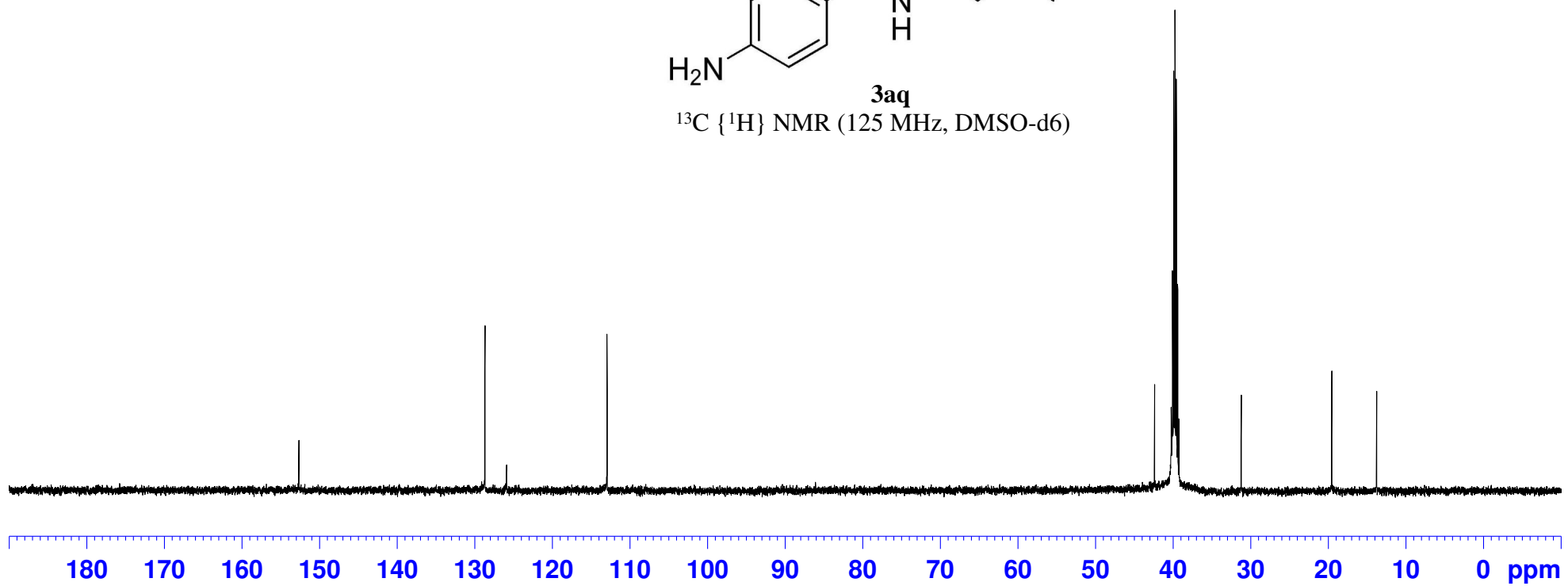
— 128.673
— 125.884

— 112.923

42.420
40.271
40.105
39.937
39.770
39.603
39.437
39.270
31.258
— 19.593
— 13.799



^{13}C { ^1H } NMR (125 MHz, DMSO-d6)

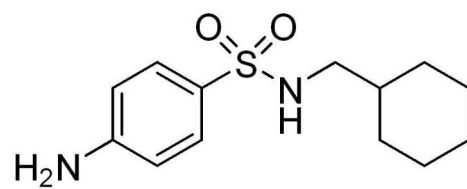


4-amino-N-(cyclohexylmethyl)benzenesulfonamide
Proton DMSO-d6

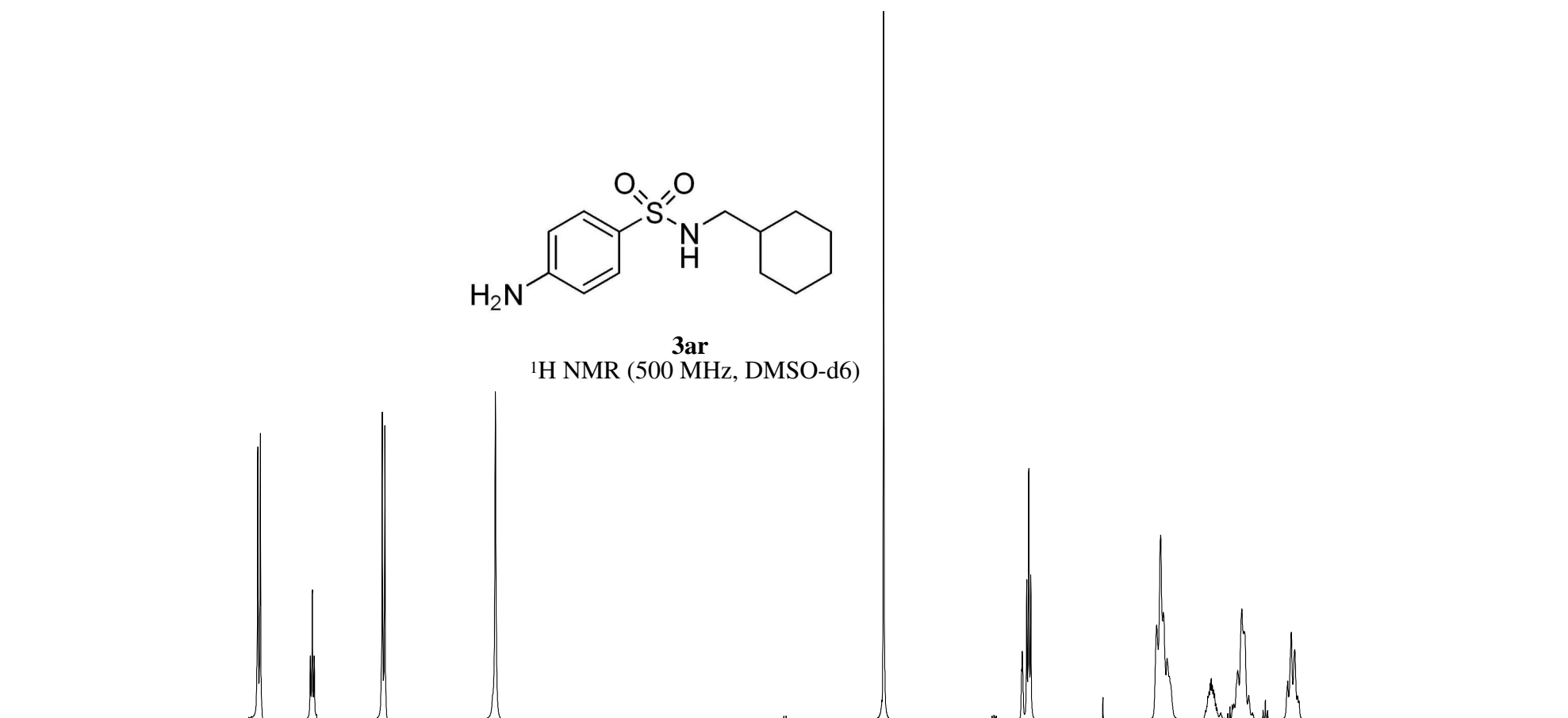
7.401
7.384
7.064
7.051
7.039
6.603
6.586

5.879

2.500
2.471
2.458
2.445
1.637
1.612
1.595
1.571
1.316
1.309
1.302
1.294
1.288
1.281
1.273
1.266
1.259
1.251
1.118
1.091
1.077
1.047
0.797
0.774
0.752
0.733
0.724



3ar
¹H NMR (500 MHz, DMSO-d6)



8.5

8.0

7.5

7.0

6.5

6.0

5.5

5.0

4.5

4.0

3.5

3.0

2.5

2.0

1.5

1.0

0.5

0.0

ppm

2.02

1.04

2.04

2.05

2.00

5.08

1.07

3.02

2.02

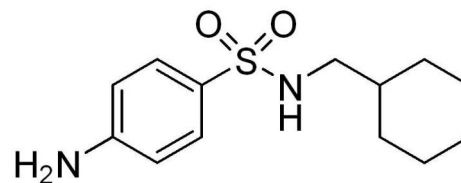
4-amino-N-(cyclohexylmethyl)benzenesulfonamide
C13CPD DMSO-d6

— 152.569

— 128.630
— 126.093

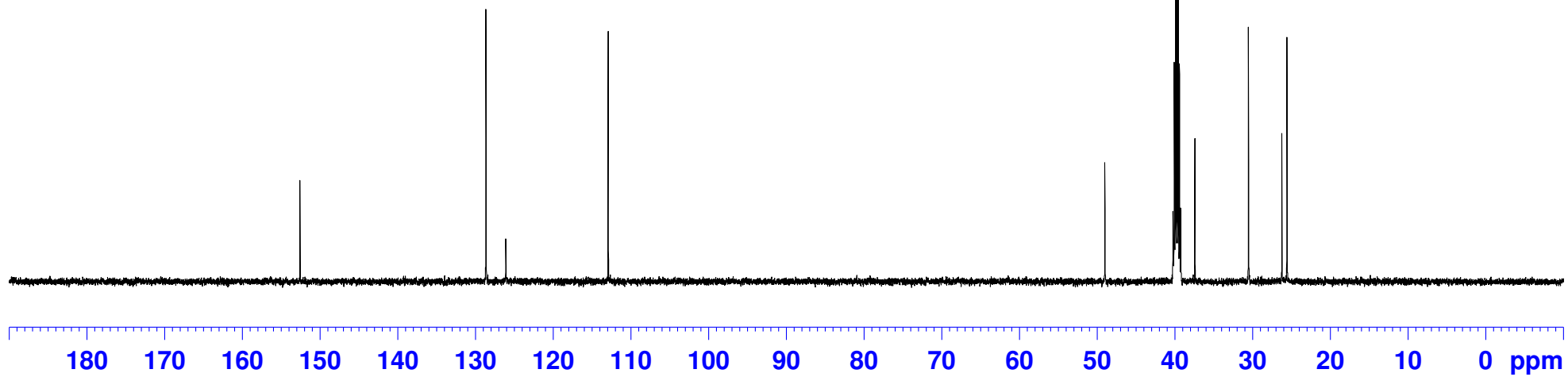
— 112.908

49.039
40.275
40.108
39.941
39.774
39.607
39.440
39.273
37.451
30.563
26.268
25.607

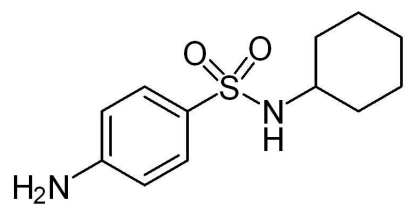


3ar

^{13}C { ^1H } NMR (125 MHz, DMSO-d6)

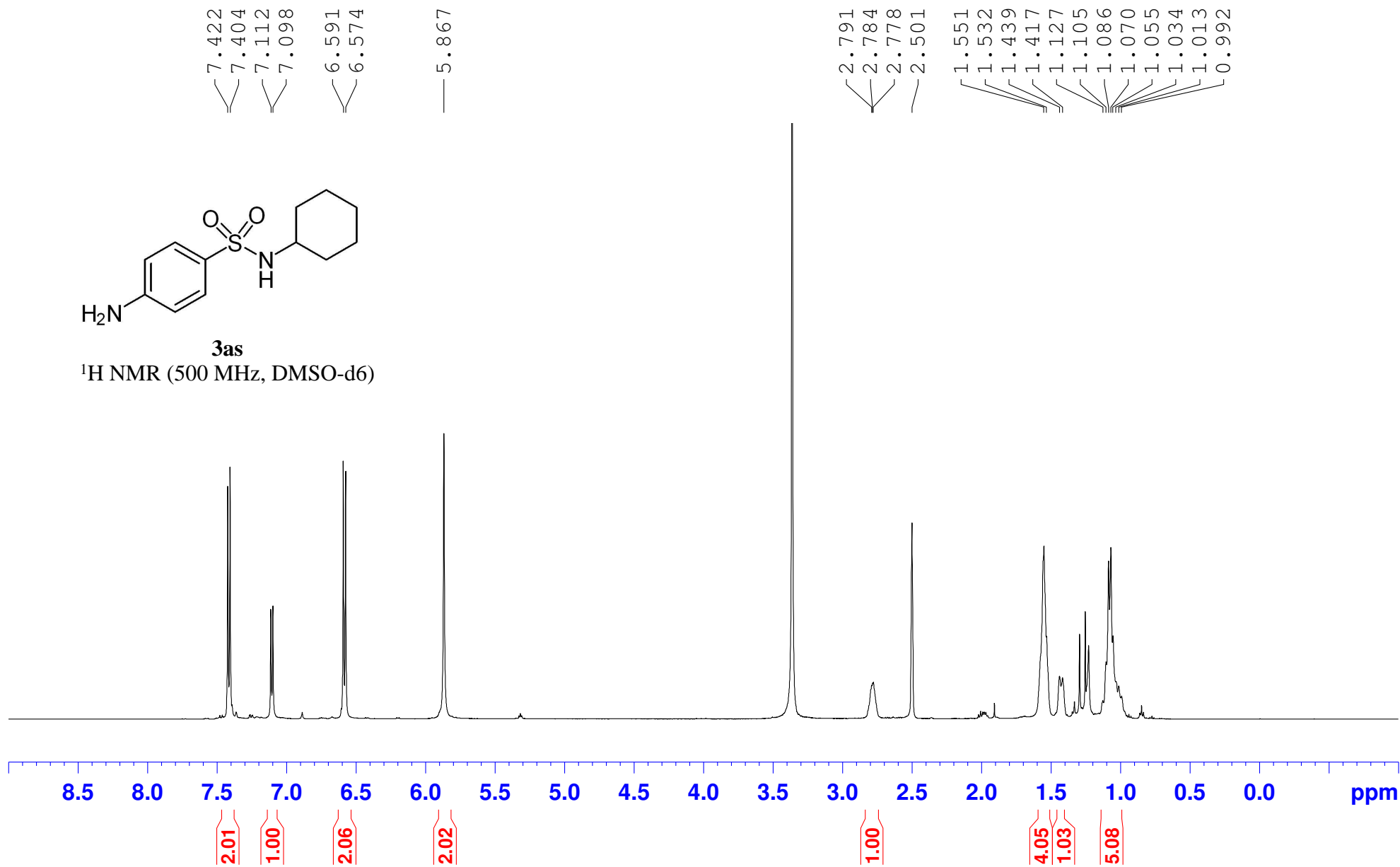


4-amino-N-cyclohexylbenzenesulfonamide
Proton DMSO-d6

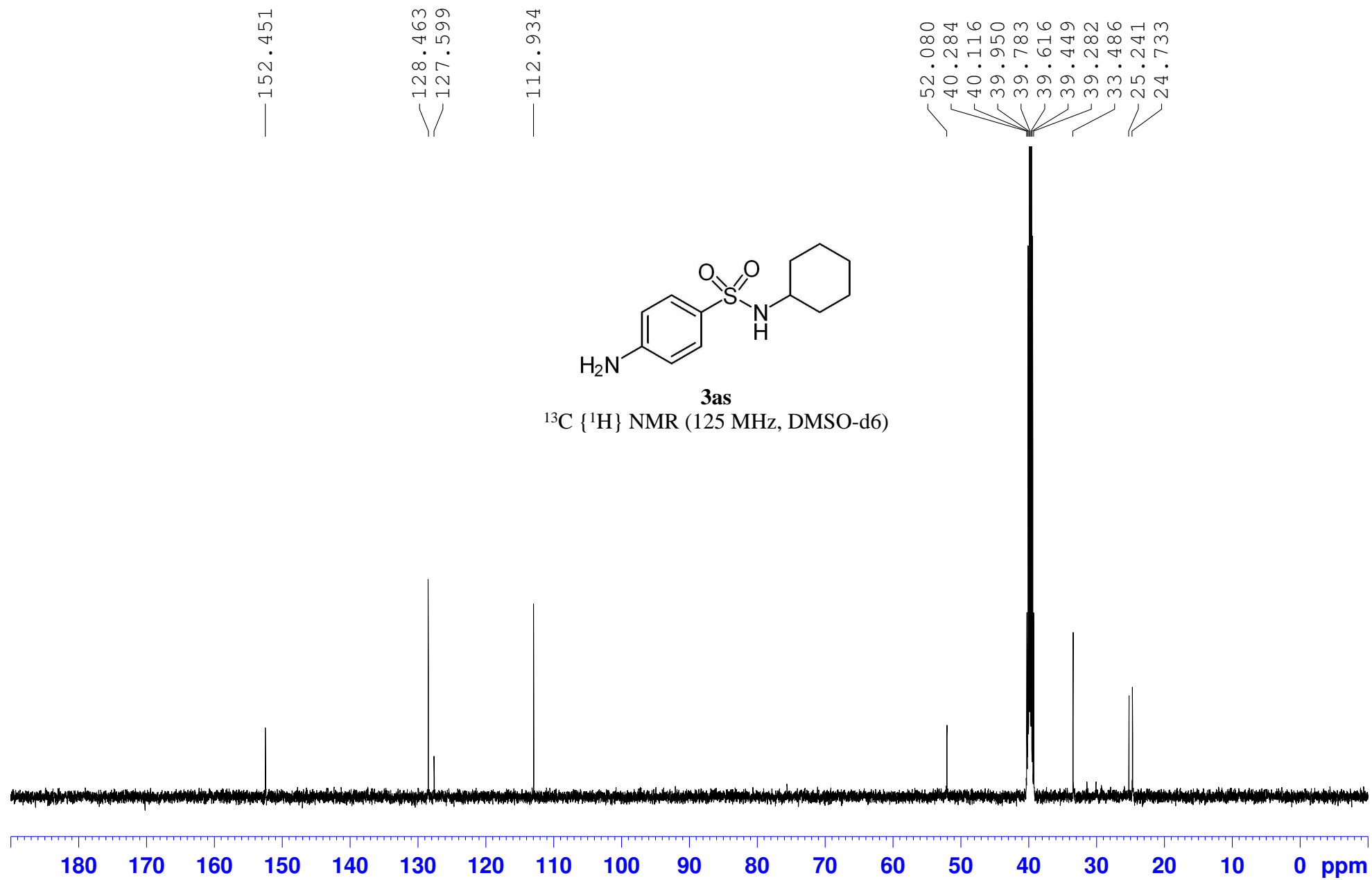


3as

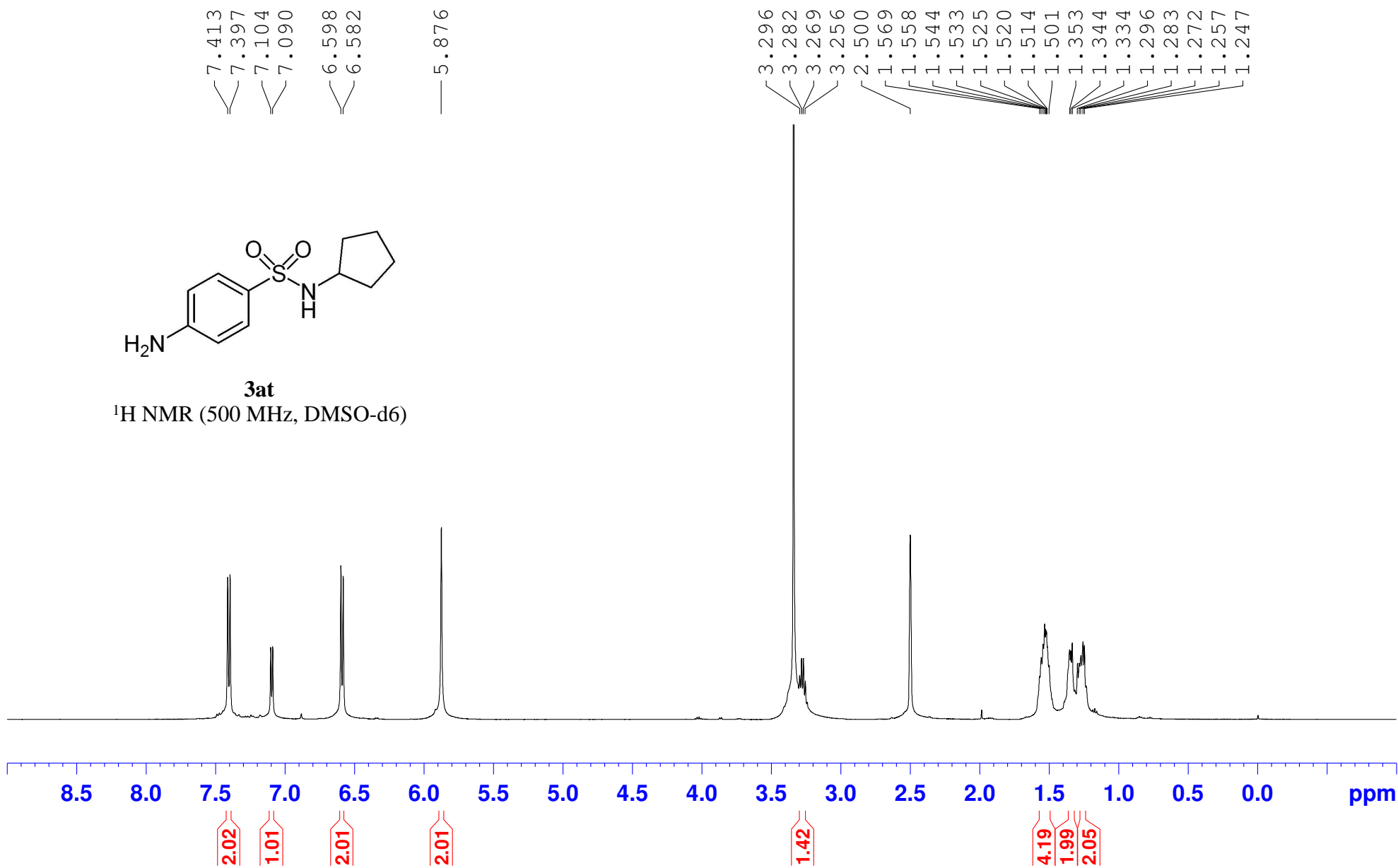
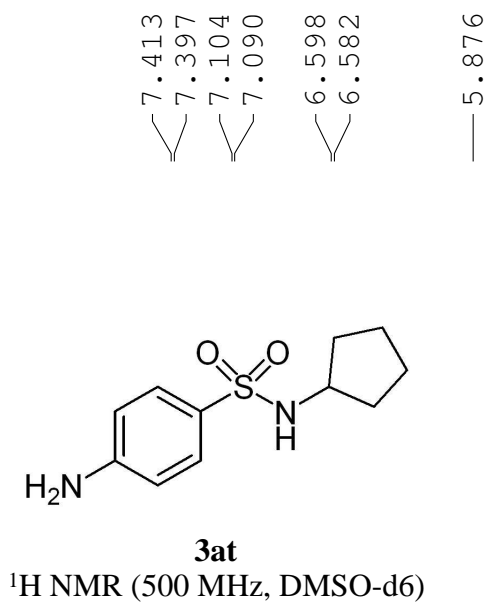
¹H NMR (500 MHz, DMSO-d6)



4-amino-N-cyclohexylbenzenesulfonamide
C13CPD DMSO-d6



4-amino-N-cyclopentylbenzenesulfonamide
Proton DMSO-d6



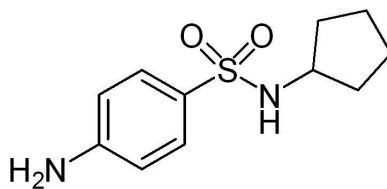
4-amino-N-cyclopentylbenzenesulfonamide
C13CPD DMSO-d6

— 152.566

— 128.692
— 126.886

— 112.937

— 54.566
— 40.291
— 40.124
— 39.957
— 39.790
— 39.623
— 39.456
— 39.289
— 32.712
— 23.116



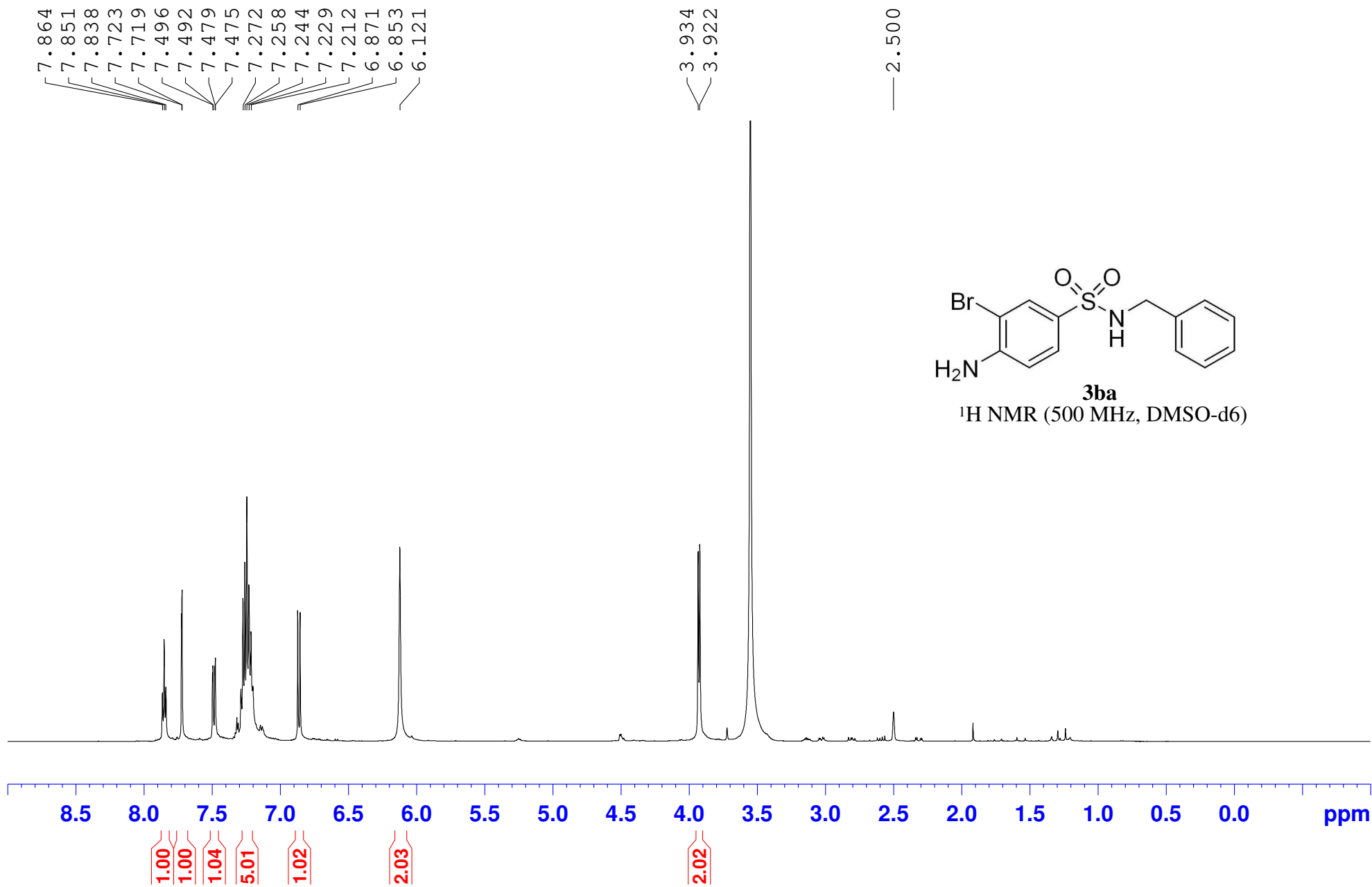
3at

^{13}C { ^1H } NMR (125 MHz, DMSO-d6)



180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm

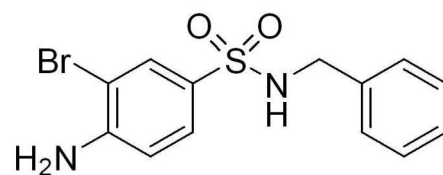
4-amino-N-benzyl-3-bromobenzenesulfonamide
Proton DMSO-d6



4-amino-N-benzyl-3-bromobenzenesulfonamide
C13CPD DMSO-d6

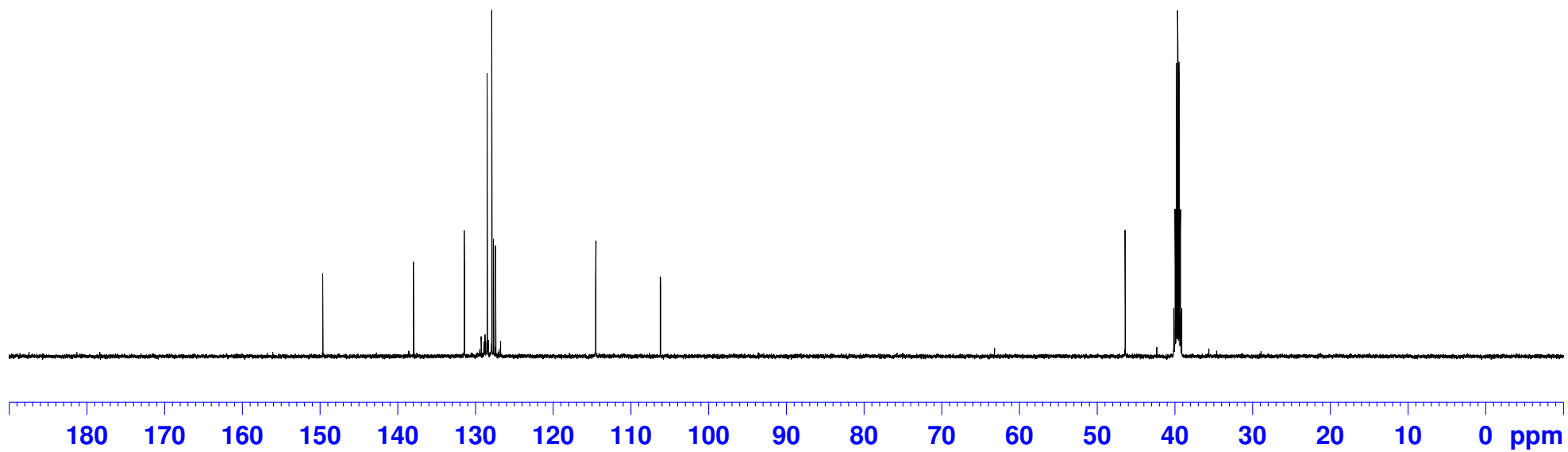
— 149.630
— 137.962
— 131.410
— 128.480
— 128.340
— 127.877
— 127.654
— 127.396
— 114.498
— 106.168

— 46.431
— 40.161
— 39.994
— 39.827
— 39.660
— 39.493
— 39.325
— 39.158

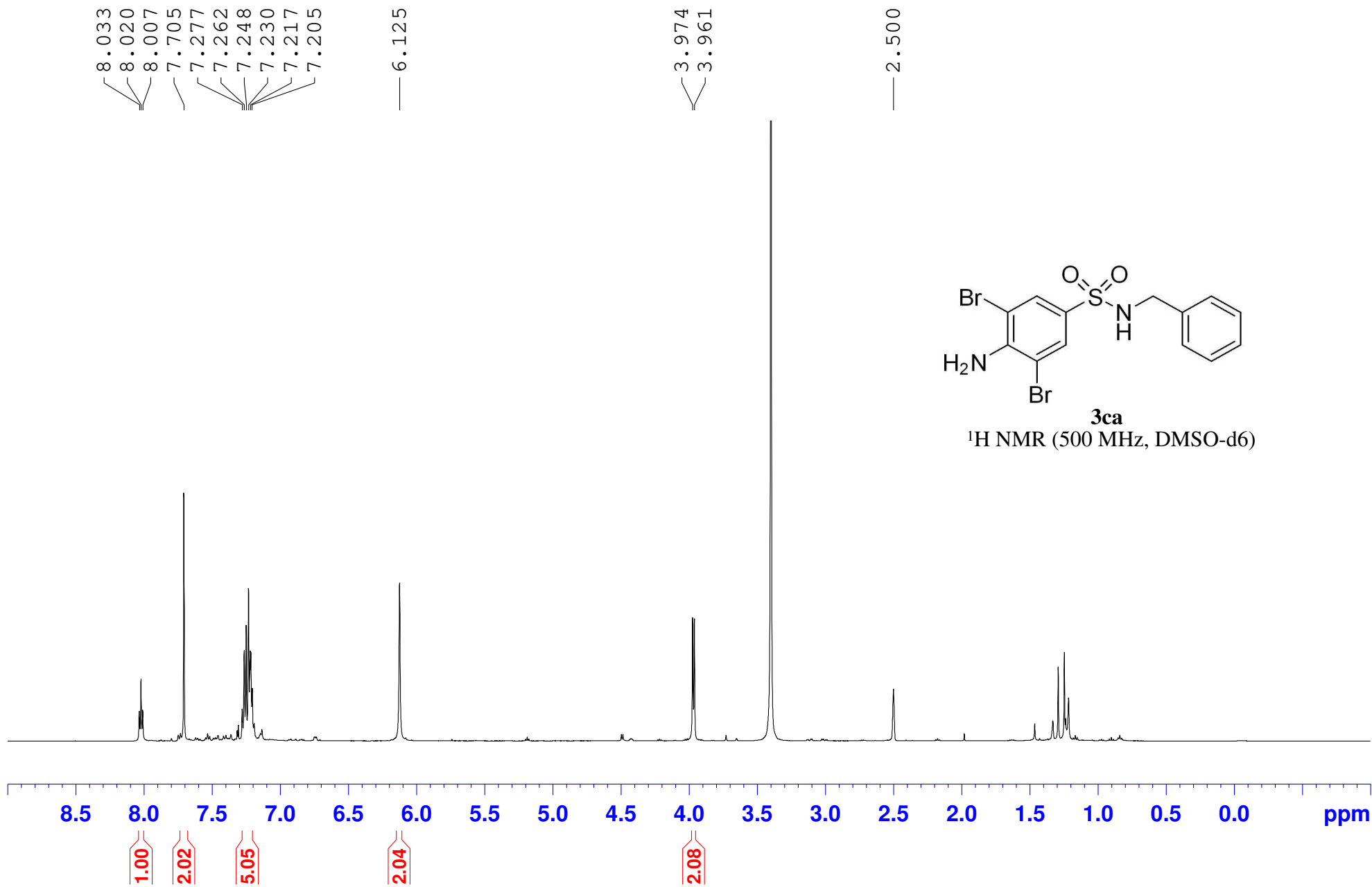


3ba

¹³C {¹H} NMR (125 MHz, DMSO-d6)



4-amino-N-benzyl-3,5-dibromobenzenesulfonamide
Proton DMSO-d6

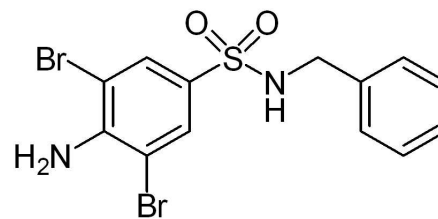


4-amino-N-benzyl-3,5-dibromobenzenesulfonamide
C13CPD DMSO-d6

— 146.517
— 137.650
— 130.602
— 129.154
— 128.427
— 127.929
— 127.425

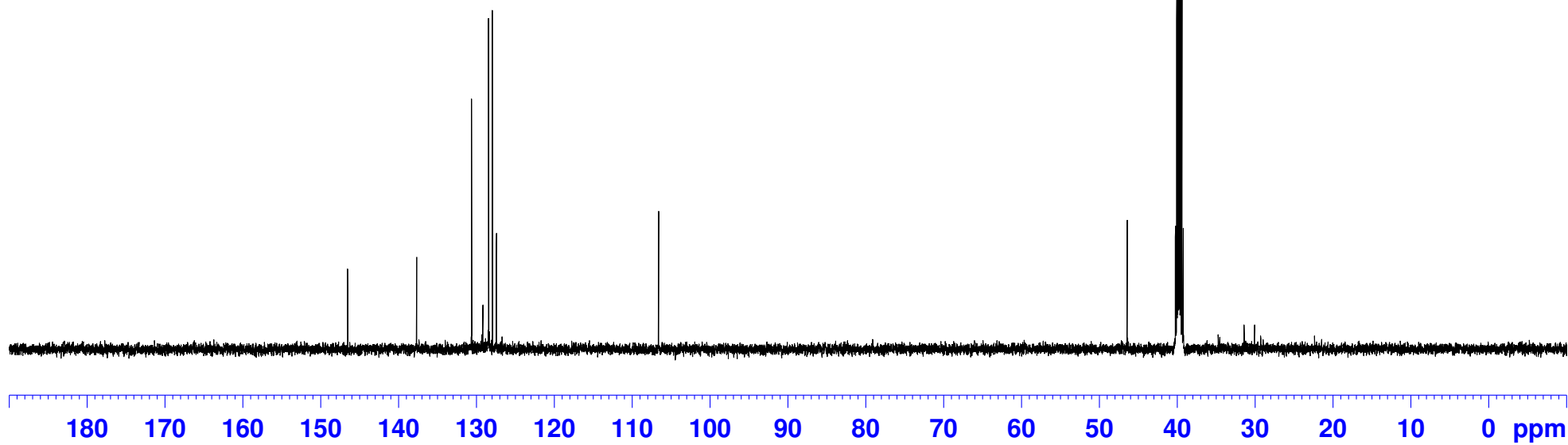
— 106.577

— 46.450
— 40.254
— 40.087
— 39.920
— 39.752
— 39.586
— 39.418
— 39.252

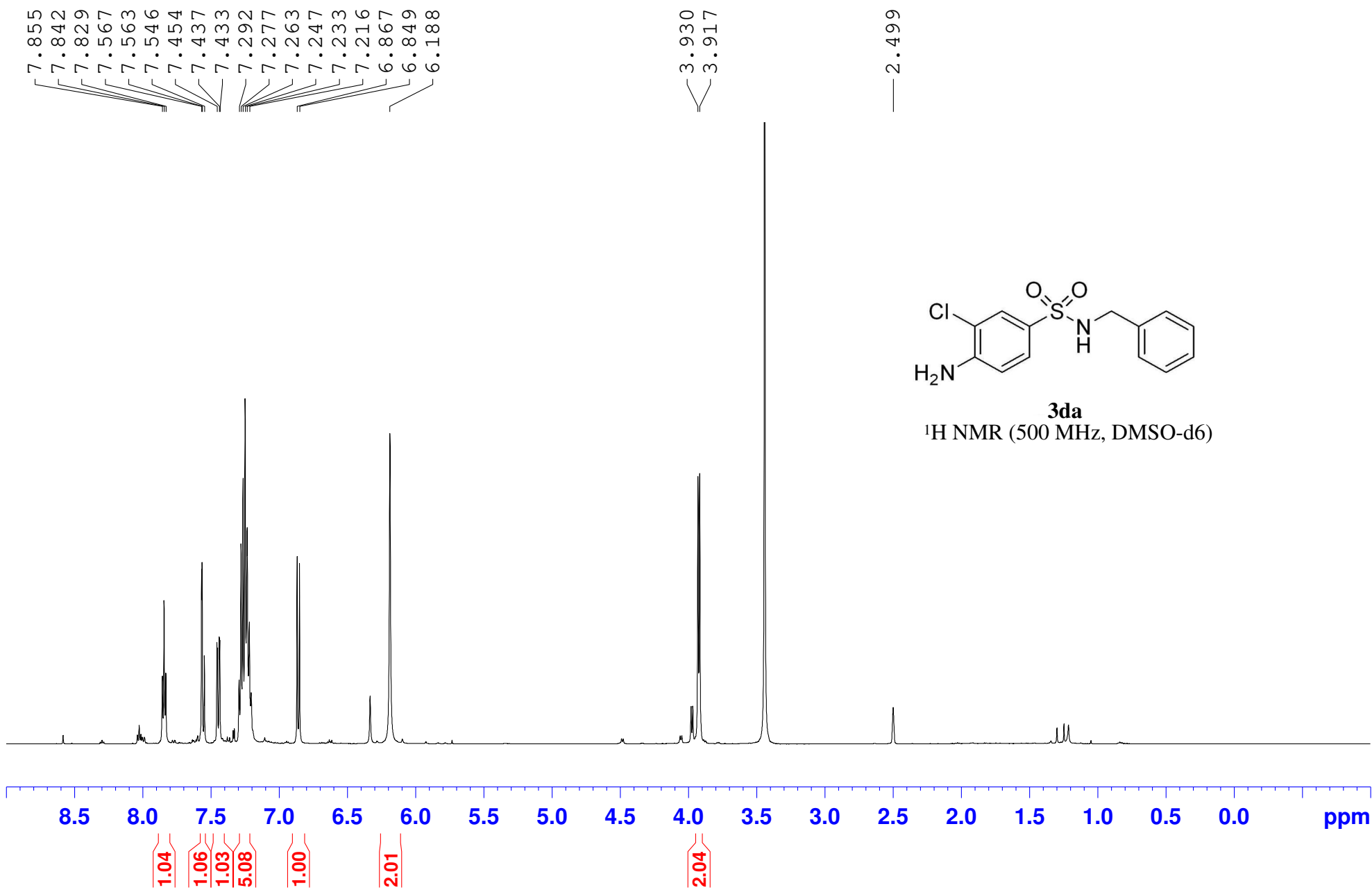


3ca

^{13}C { ^1H } NMR (125 MHz, DMSO-d6)



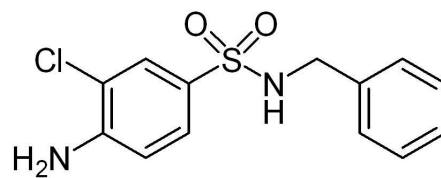
4-amino-N-benzyl-3-chlorobenzenesulfonamide
Proton DMSO-d6



4-amino-N-benzyl-3-chlorobenzenesulfonamide
C13CPD DMSO-d6

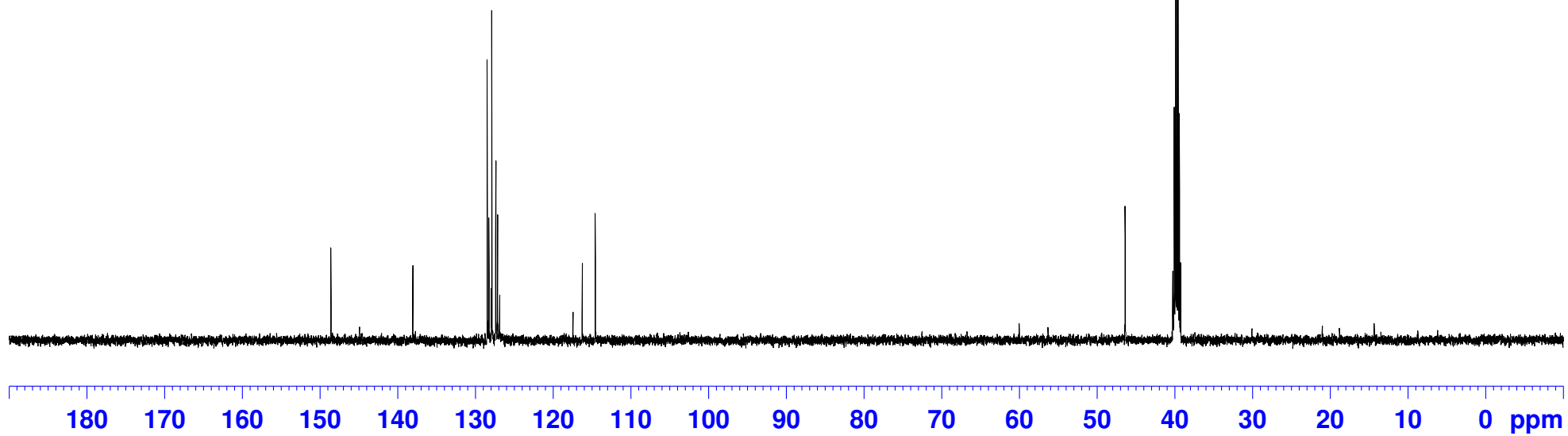
— 148.581
— 138.038
— 128.465
— 128.247
— 127.884
— 127.364
— 127.132
— 117.433
— 116.245
— 114.564

— 46.421
— 40.285
— 40.118
— 39.951
— 39.784
— 39.617
— 39.450
— 39.283



3da

¹³C {¹H} NMR (125 MHz, DMSO-d6)

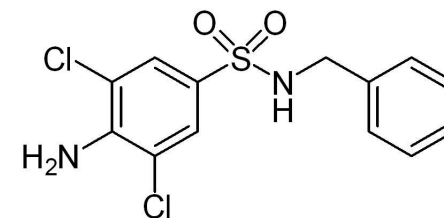


4-amino-N-benzyl-3,5-dichlorobenzenesulfonamide
Proton DMSO-d6

8.035
8.022
8.009
7.557
7.277
7.262
7.248
7.239
7.226
7.221
7.203
7.190
6.343

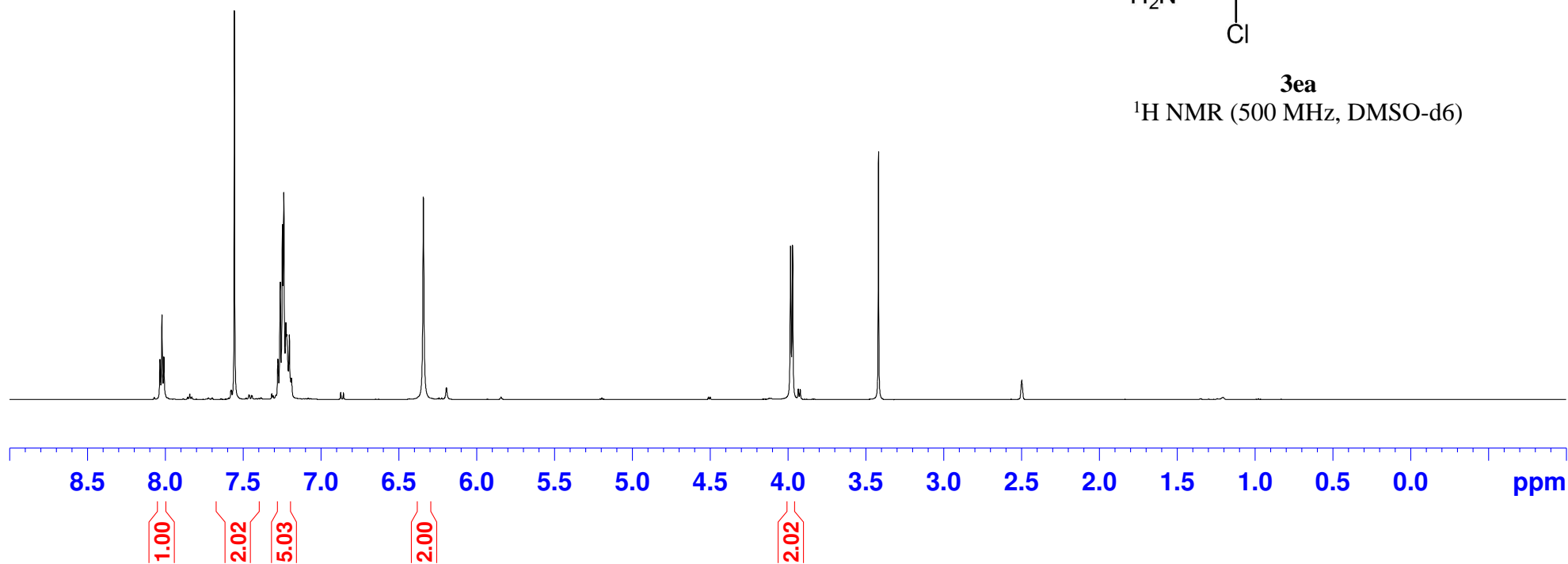
3.984
3.971

2.498



3ea

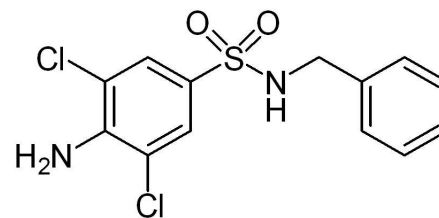
¹H NMR (500 MHz, DMSO-d6)



4-amino-N-benzyl-3,5-dichlorobenzenesulfonamide
C13CPD DMSO-d6

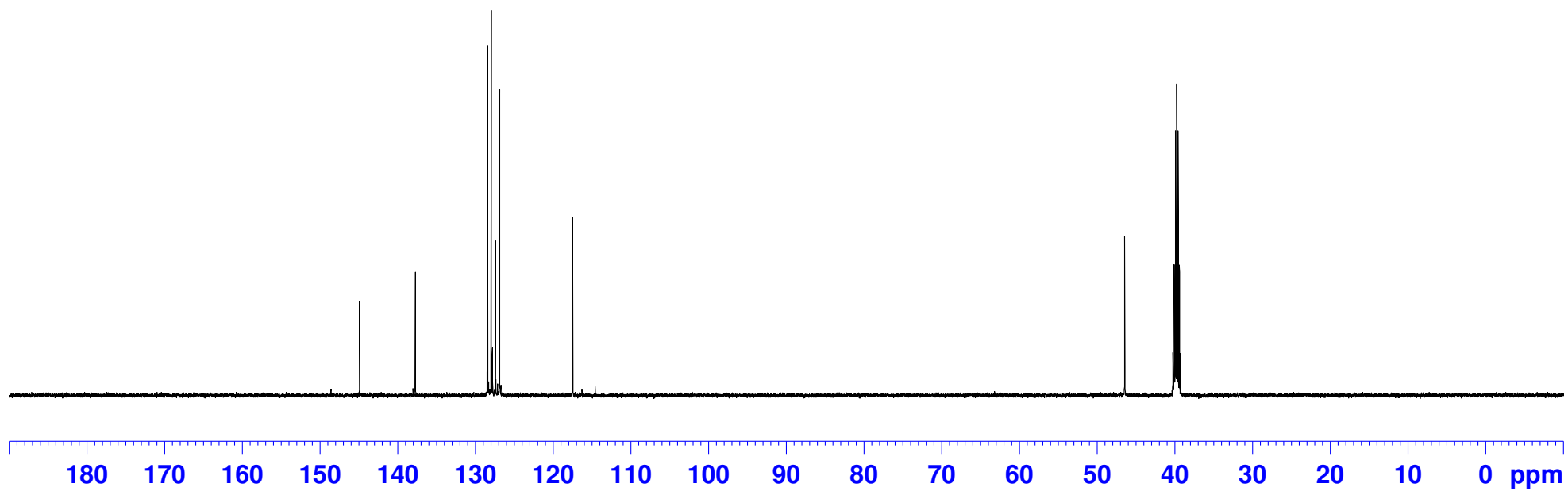
— 144.892
— 137.702
— 128.455
— 127.944
— 127.797
— 127.402
— 126.875
— 117.467

— 46.487
— 40.278
— 40.110
— 39.944
— 39.777
— 39.610
— 39.443
— 39.275



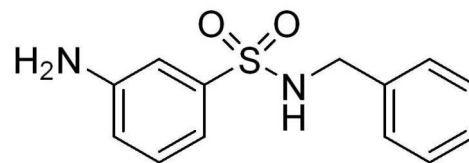
3ea

^{13}C { ^1H } NMR (125 MHz, DMSO-d6)

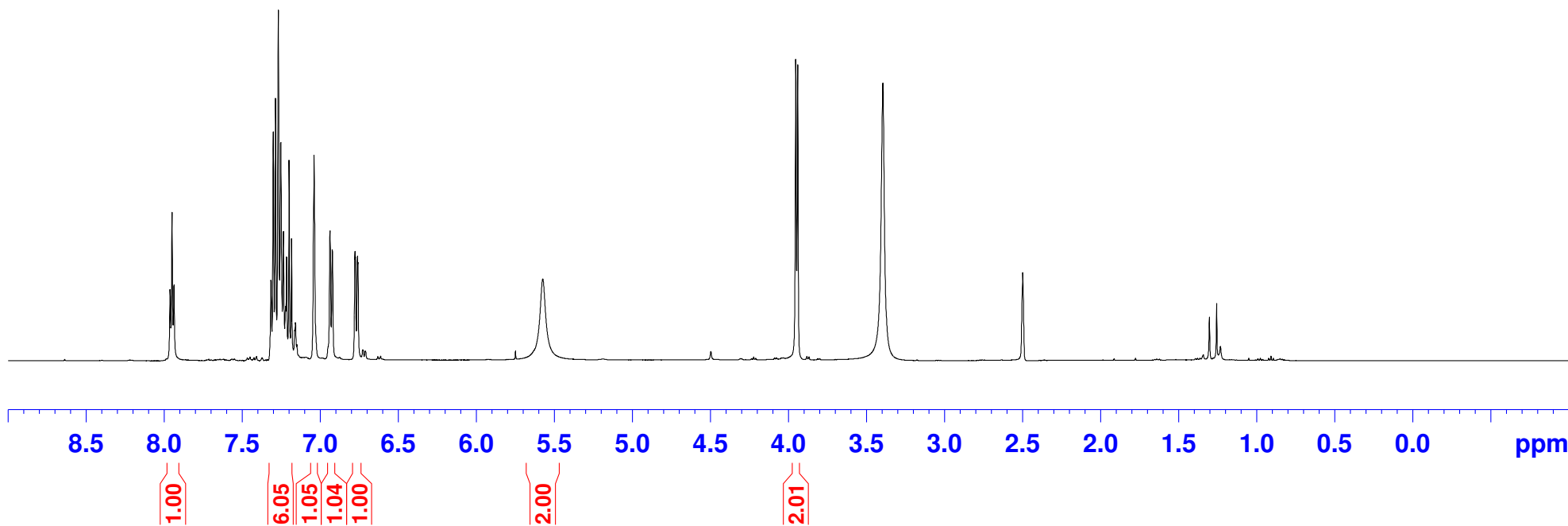


3-amino-N-benzylbenzenesulfonamide
Proton DMSO-d6

7.961
7.949
7.936
7.315
7.300
7.286
7.268
7.252
7.235
7.214
7.199
7.183
7.039
6.936
6.921
6.777
6.761
— 5.576
3.954
3.942
— 2.500



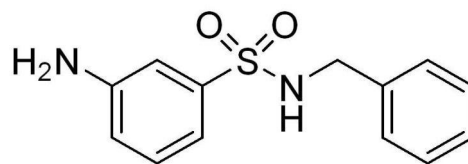
3fa
¹H NMR (500 MHz, DMSO-d6)



3-amino-N-benzylbenzenesulfonamide
Proton DMSO-d6

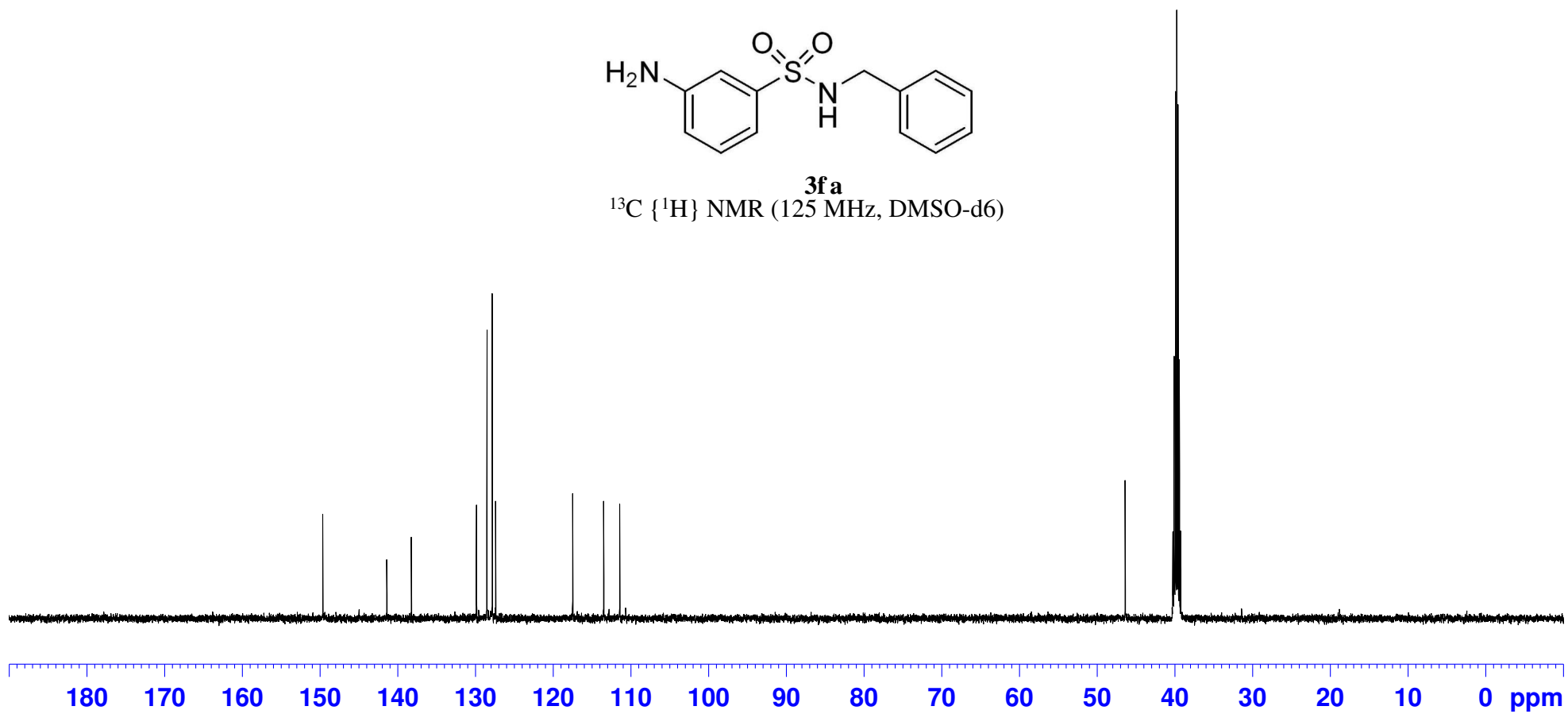
— 149.636
— 141.394
— 138.231
 { 129.853
 { 128.511
 { 127.814
 { 127.398
— 117.475
— 113.480
— 111.424

{ 46.436
{ 40.290
{ 40.122
{ 39.955
{ 39.788
{ 39.621
{ 39.454
{ 39.287

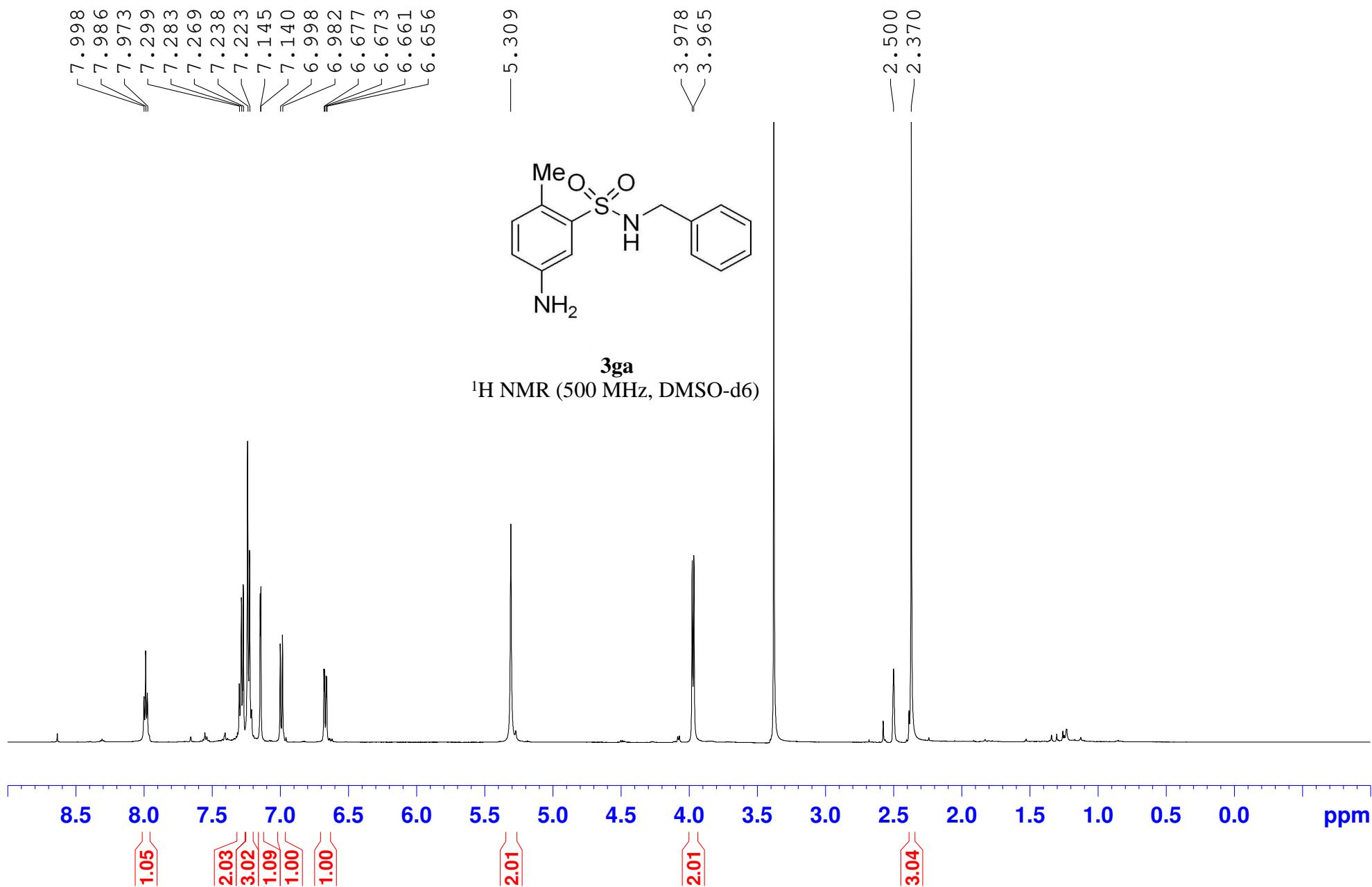


3fa

¹³C {¹H} NMR (125 MHz, DMSO-d6)



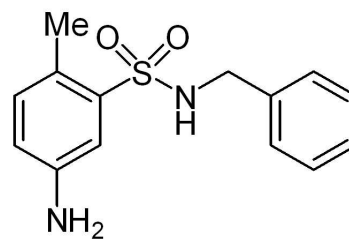
5-amino-N-benzyl-2-methylbenzenesulfonamide
Proton DMSO-d6



5-amino-N-benzyl-2-methylbenzenesulfonamide
C13CPD DMSO-d6

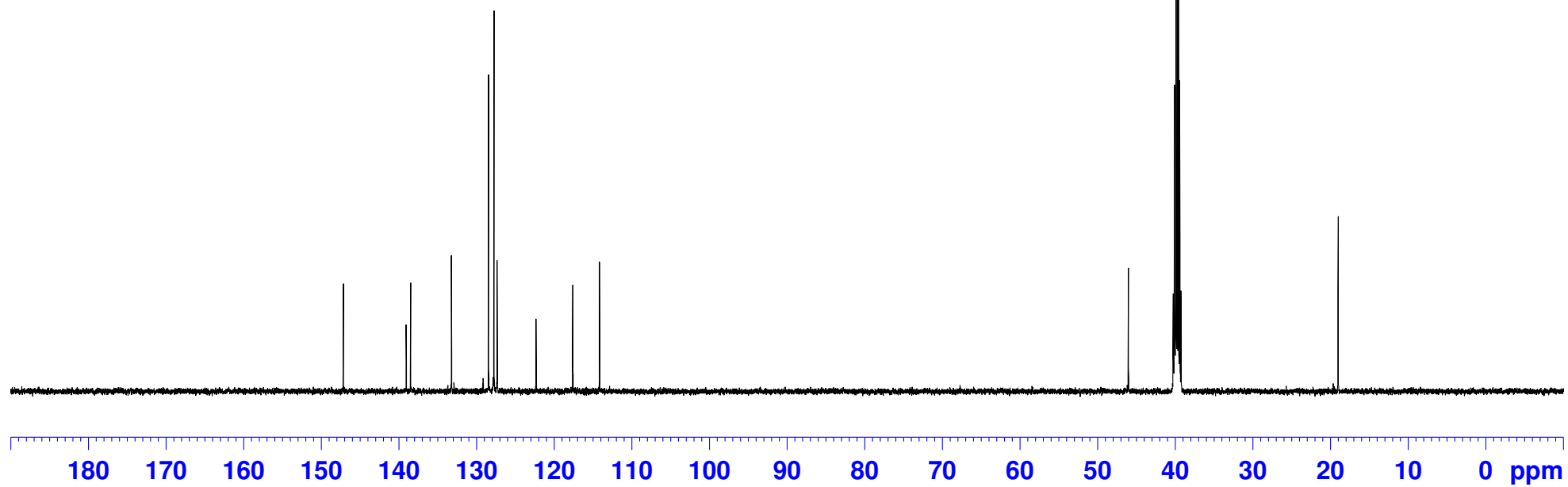
— 147.137
— 139.045
— 138.482
— 133.217
— 128.447
— 127.740
— 127.334
— 122.328
— 117.589
— 114.145

— 46.066
— 40.292
— 40.126
— 39.959
— 39.792
— 39.625
— 39.458
— 39.291
— 19.045



3ga

^{13}C { ^1H } NMR (125 MHz, DMSO-d6)

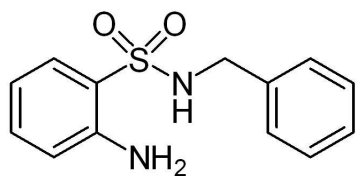


2-amino-N-benzylbenzenesulfonamide
Proton DMSO-d6

8.073
8.061
8.050
7.540
7.524
7.290
7.275
7.261
7.245
7.232
7.219
7.205
6.836
6.820
6.630
6.615
6.600
5.939

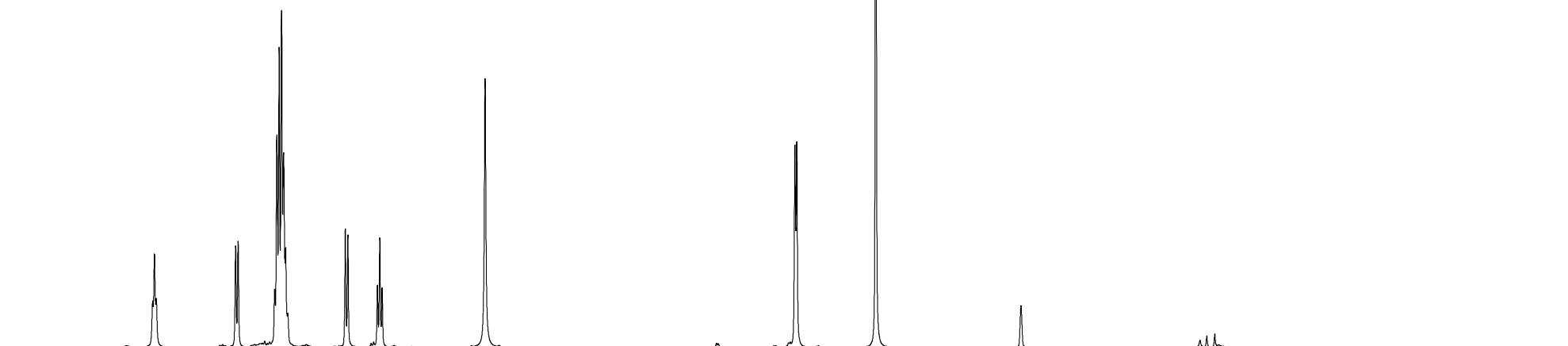
3.951
3.939

2.500



3ha

¹H NMR (500 MHz, DMSO-d6)



8.5

8.0

7.5

7.0

6.5

6.0

5.5

5.0

4.5

4.0

3.5

3.0

2.5

2.0

1.5

1.0

0.5

0.0

ppm

1.00

1.01

6.05

1.02

1.03

1.99

2.04

2-amino-N-benzylbenzenesulfonamide
C13CPD DMSO-d6

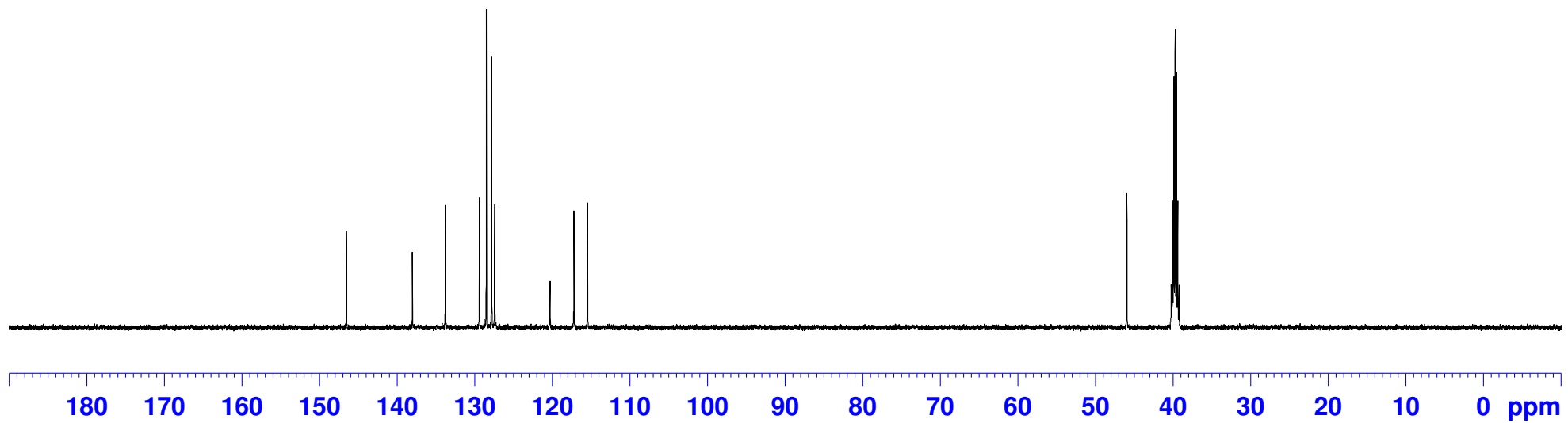
— 146.507
— 138.015
— 133.766
— 129.372
— 128.485
— 127.795
— 127.406
— 120.272
— 117.190
— 115.440

45.980
40.263
40.097
39.930
39.763
39.596
39.429
39.262

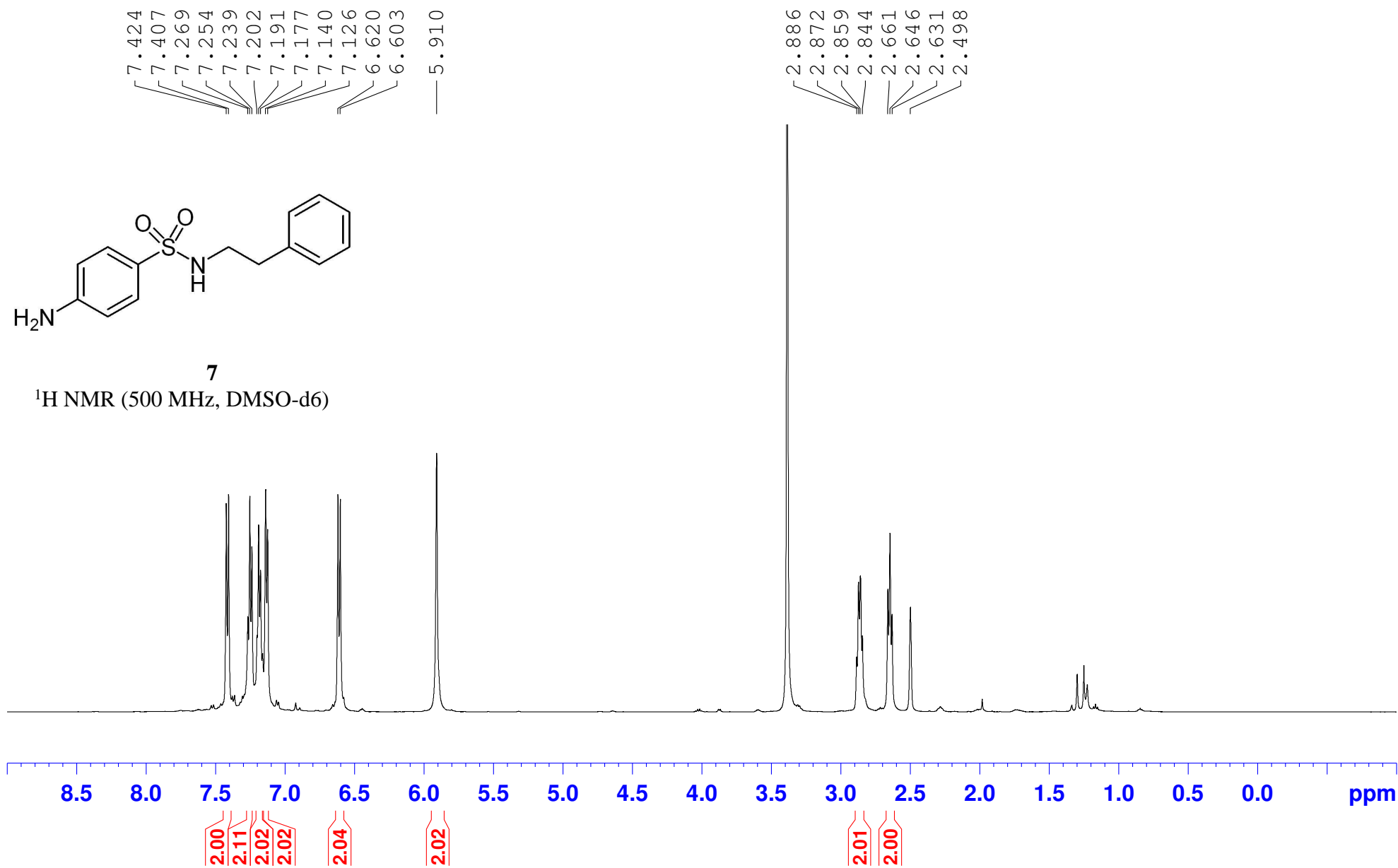


3ha

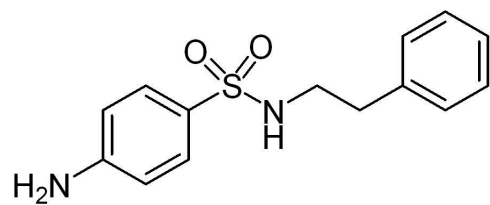
^{13}C { ^1H } NMR (125 MHz, DMSO-d6)



4-amino-N-phenethylbenzenesulfonamide
Proton DMSO-d6

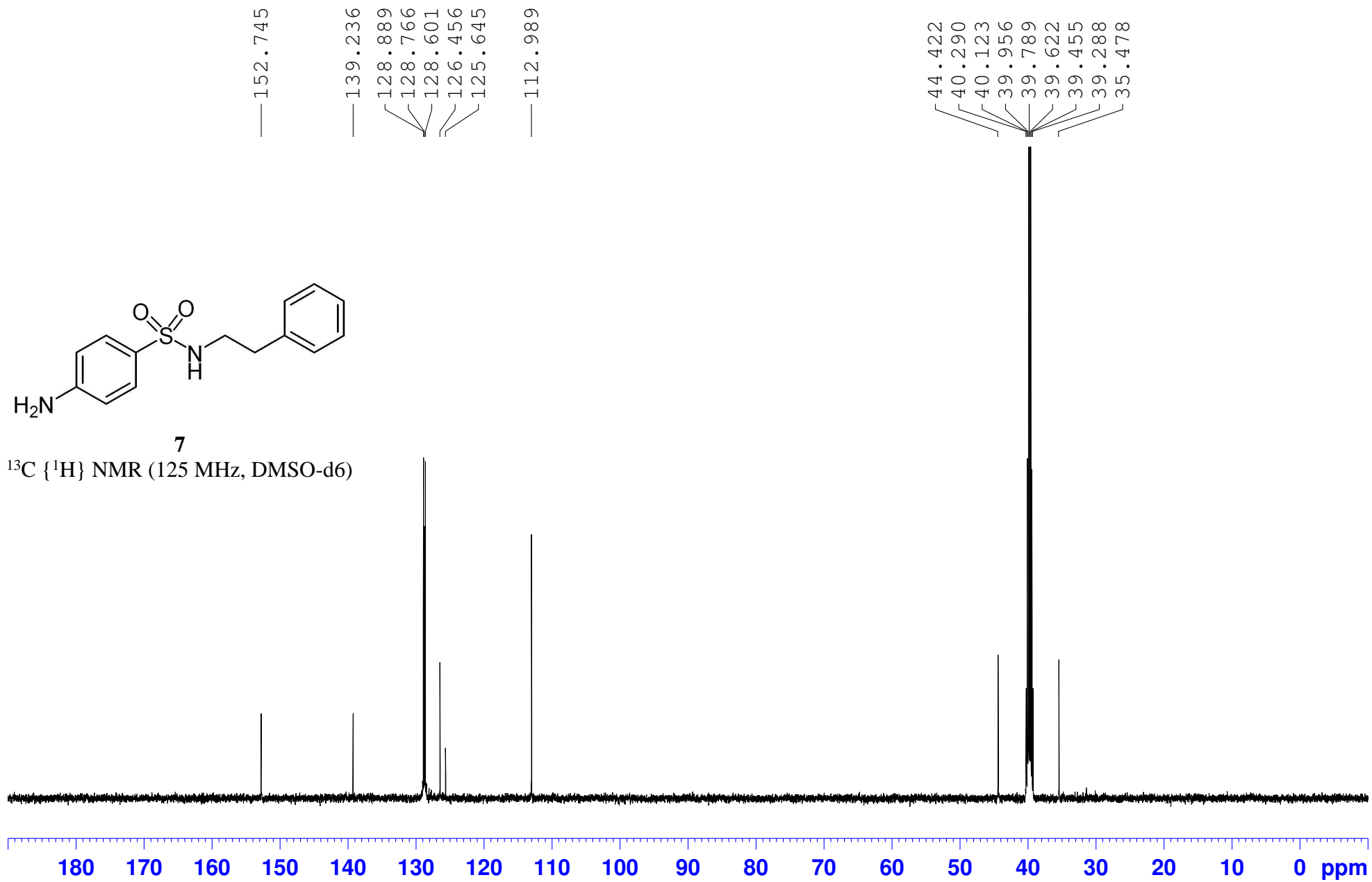


4-amino-N-phenethylbenzenesulfonamide
C13CPD DMSO-d6



7

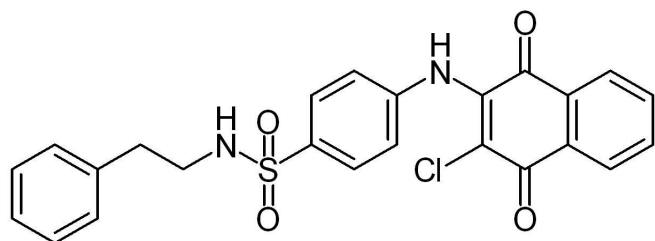
^{13}C { ^1H } NMR (125 MHz, DMSO-d6)



4-((3-chloro-1,4-dioxo-1,4-dihydronaphthalen-2-yl)amino)-N-phenethylbenzenesulfonamide
Proton DMSO-d6

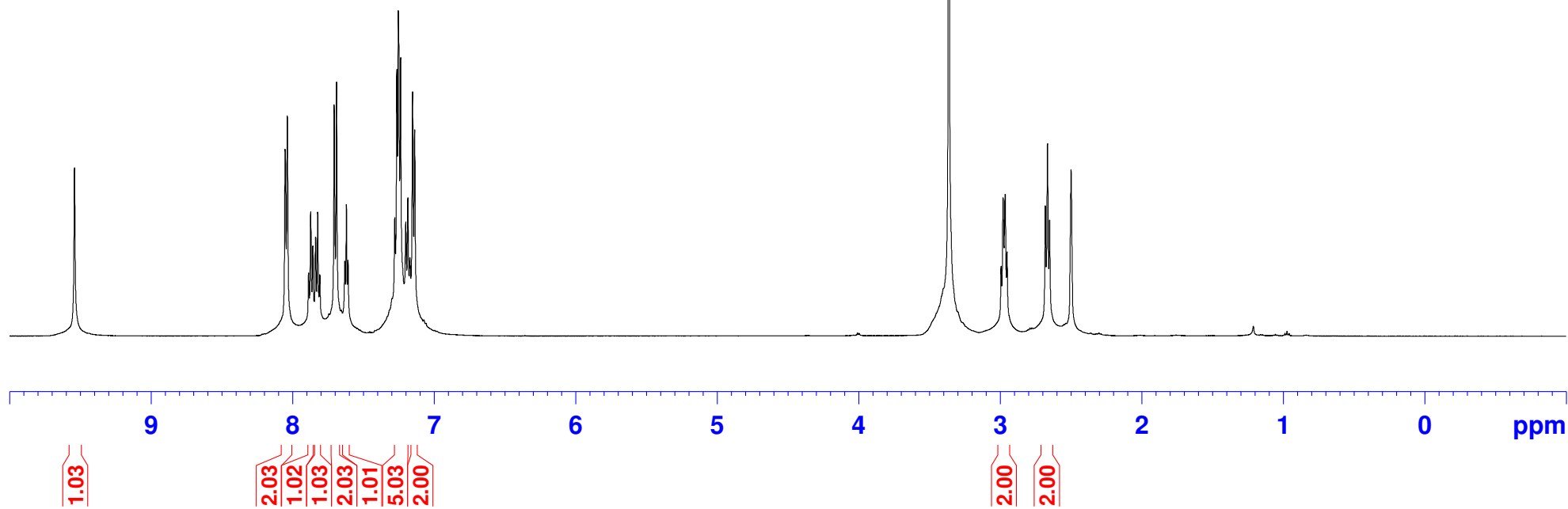
9.540
8.054
8.039
7.888
7.873
7.858
7.839
7.824
7.809
7.707
7.690
7.632
7.621
7.609
7.279
7.264
7.255
7.251
7.238
7.201
7.187
7.172
7.153
7.138

2.994
2.980
2.966
2.952
2.682
2.666
2.652
2.500



9

¹H NMR (500 MHz, DMSO-d6)

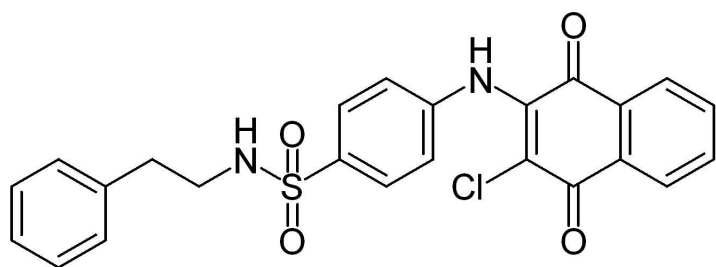


4-((3-chloro-1,4-dioxo-1,4-dihydronaphthalen-2-yl)amino)-N-phenethylbenzenesulfonamide
C13CPD DMSO-d6

180.159
177.240

143.135
142.953
139.000
135.015
134.820
133.783
131.995
130.717
128.910
128.621
127.018
126.874
126.523
122.793
118.662

44.415
40.280
40.113
39.945
39.778
39.611
39.445
39.273
35.521



9

^{13}C { ^1H } NMR (125 MHz, DMSO-d6)

