Cross-coupling of Mesylated Phenol Derivatives with Potassium Cyclopropyltrifluoroborate

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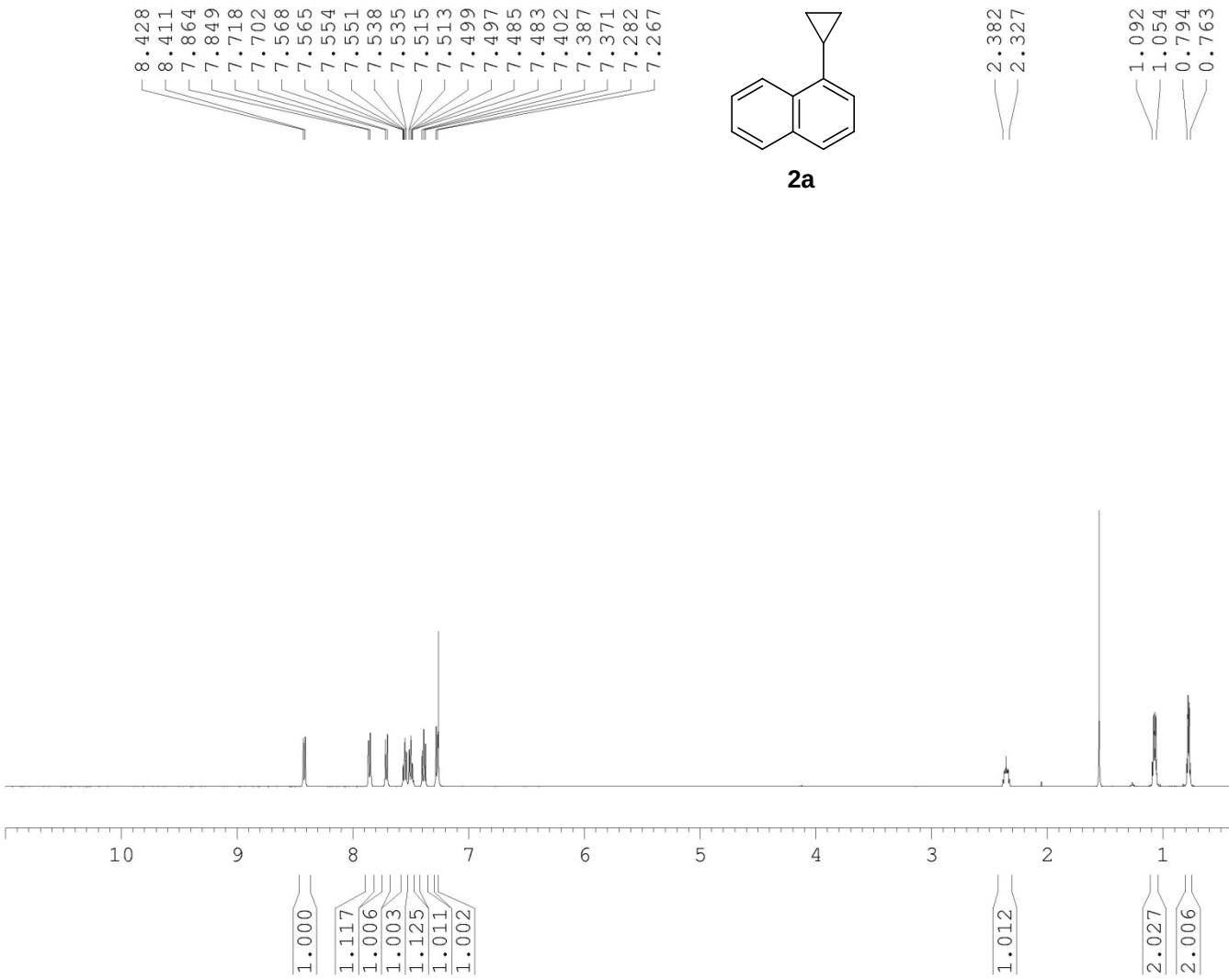
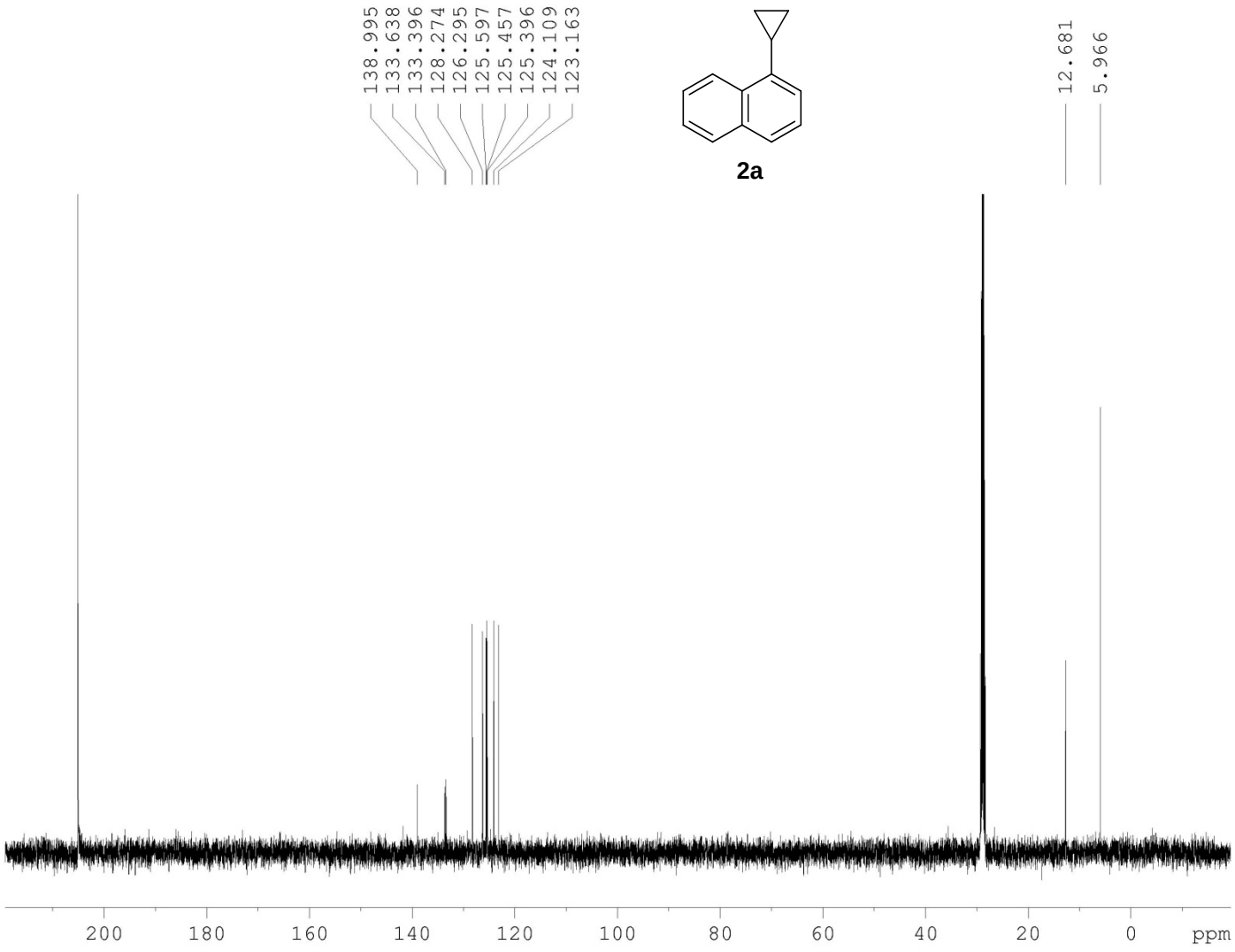
General Considerations

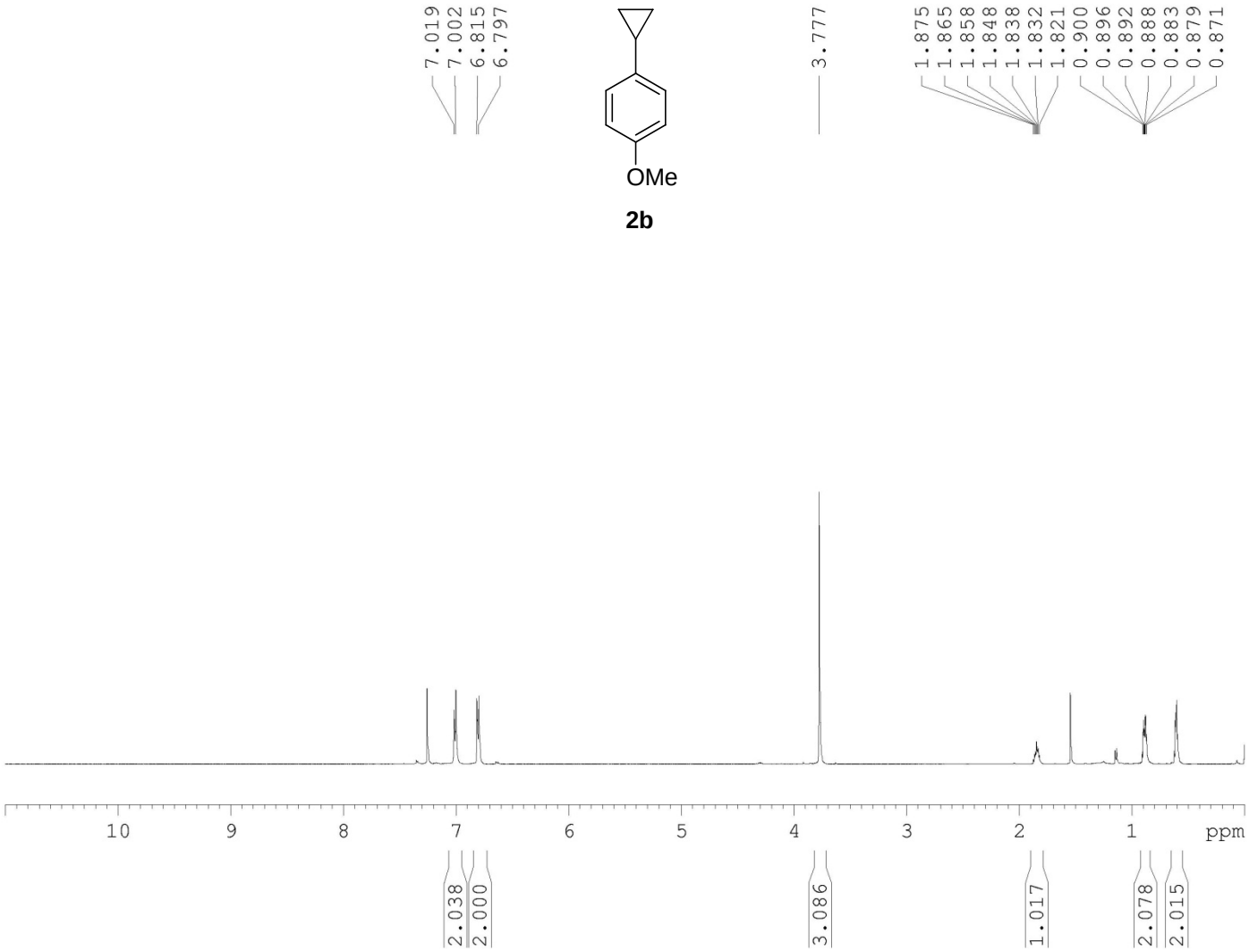
All reactions were carried out under an argon atmosphere. $Pd(OAc)_2$, $PdCl_2(COD)$, RuPhos, potassium cyclopropyltrifluoroborate and K_3PO_4 were used as received. Both solvents and deionized water were degassed with argon each time prior to use. Standard benchtop techniques were employed for handling air-sensitive reagents. Melting points (°C) are uncorrected. NMR spectra were recorded on a 500, 400, or 360 MHz spectrometer. Data are presented as follows: chemical shift (ppm), multiplicity (*s* = singlet, *d* = doublet, *t* = triplet, *m* = multiplet, *br* = broad), coupling constant *J* (Hz) and integration. Analytical thin-layer chromatography (TLC) was performed on TLC silica or alumina gel plates (0.25 mm) precoated with a fluorescent indicator. Standard flash chromatography procedures were followed using 32–63 μm silica gel. Visualization was effected with ultraviolet light.



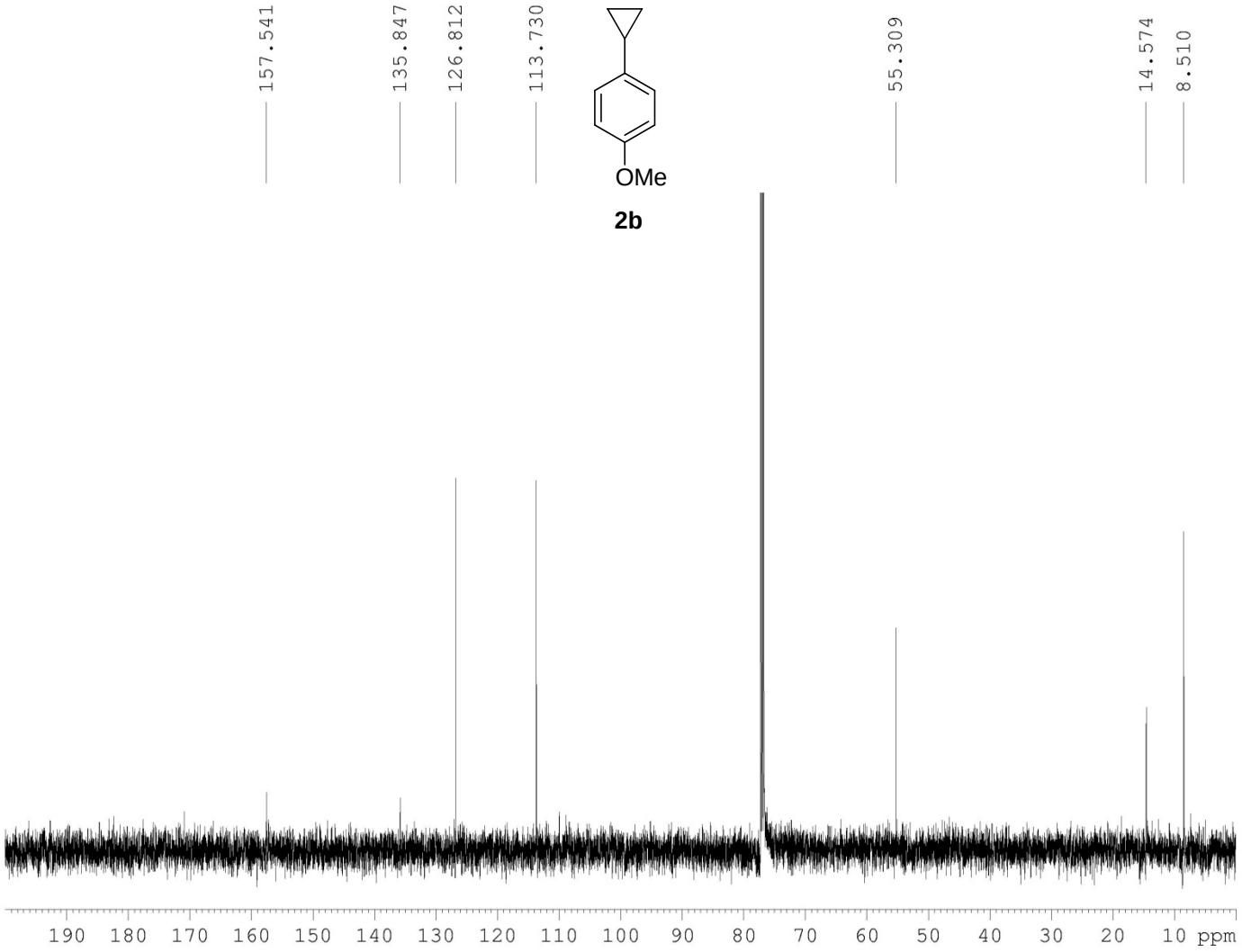
^{1}H NMR (500 MHz, $CDCl_3$) Spectrum of 1-cyclopropylnaphthalene **2a** (Table 2, entry 1)



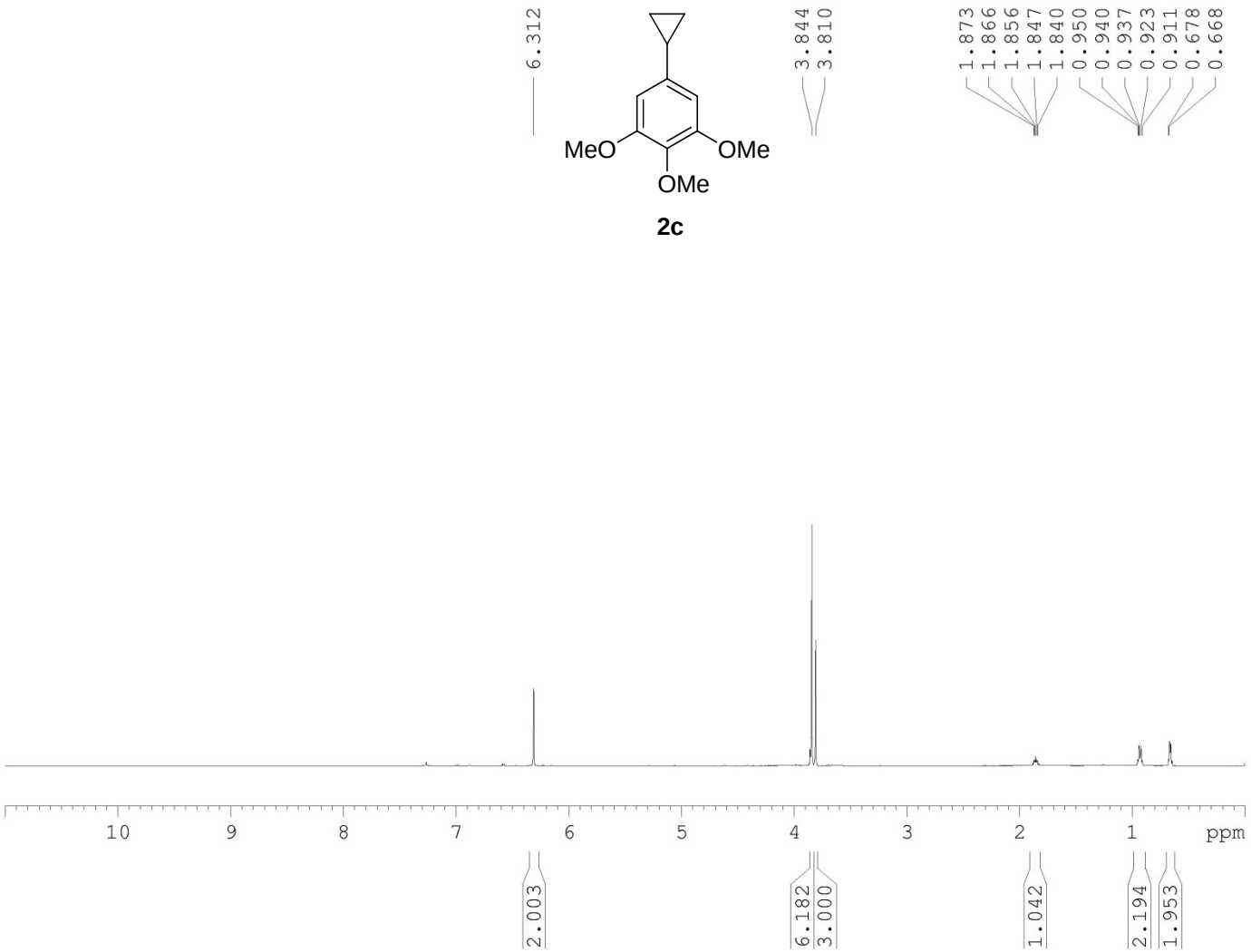
^{13}C NMR (125 MHz, acetone-d_6) Spectrum of 1-cyclopropylnaphthalene **2a** (Table 2, entry 1)



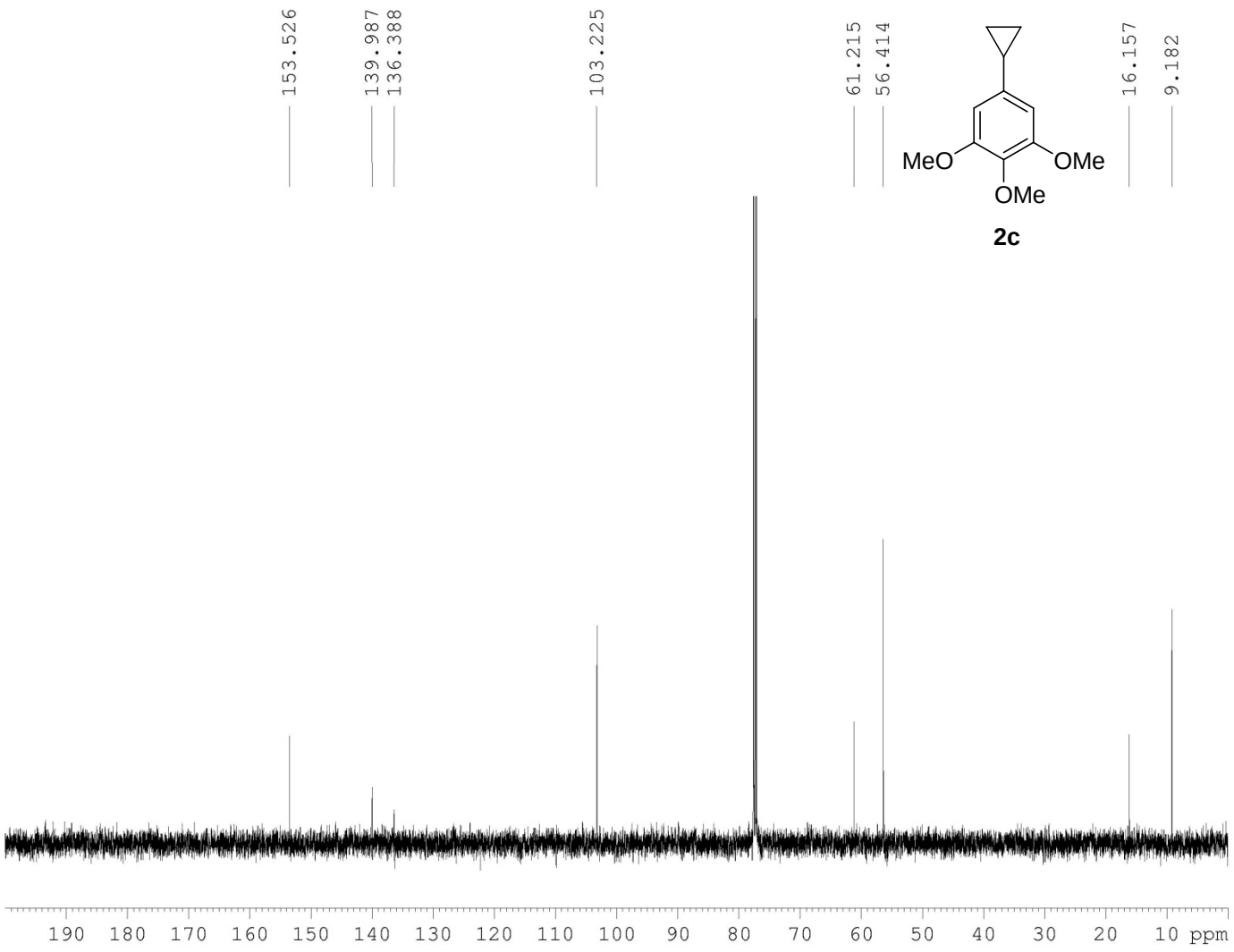
^{1}H NMR (500 MHz, $CDCl_3$) Spectrum of 1-cyclopropyl-4-methoxybenzene **2b** (Table 2, entry 2)



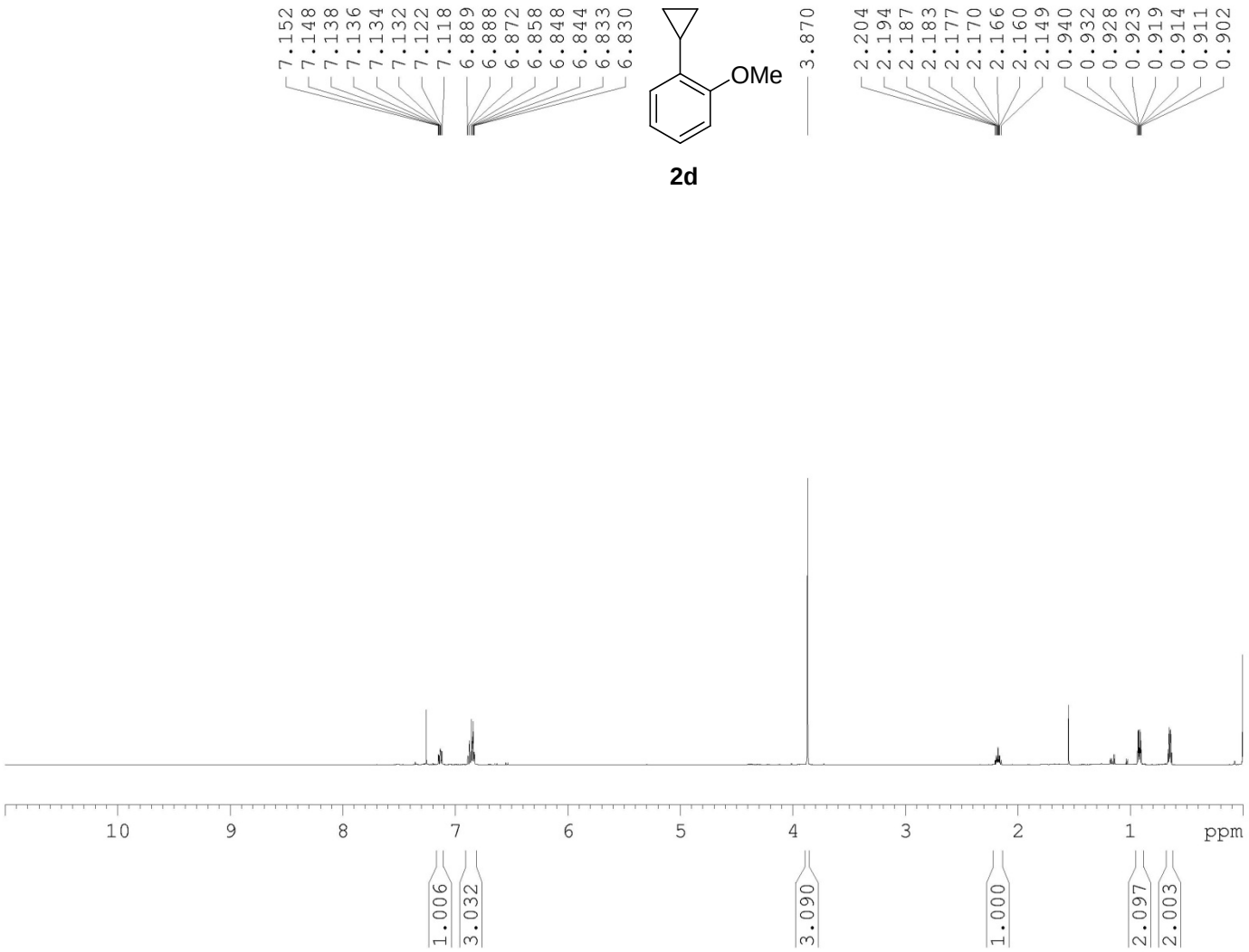
^{13}C NMR (125 MHz, $CDCl_3$) Spectrum of 1-cyclopropyl-4-methoxybenzene **2b** (Table 2, entry 2)



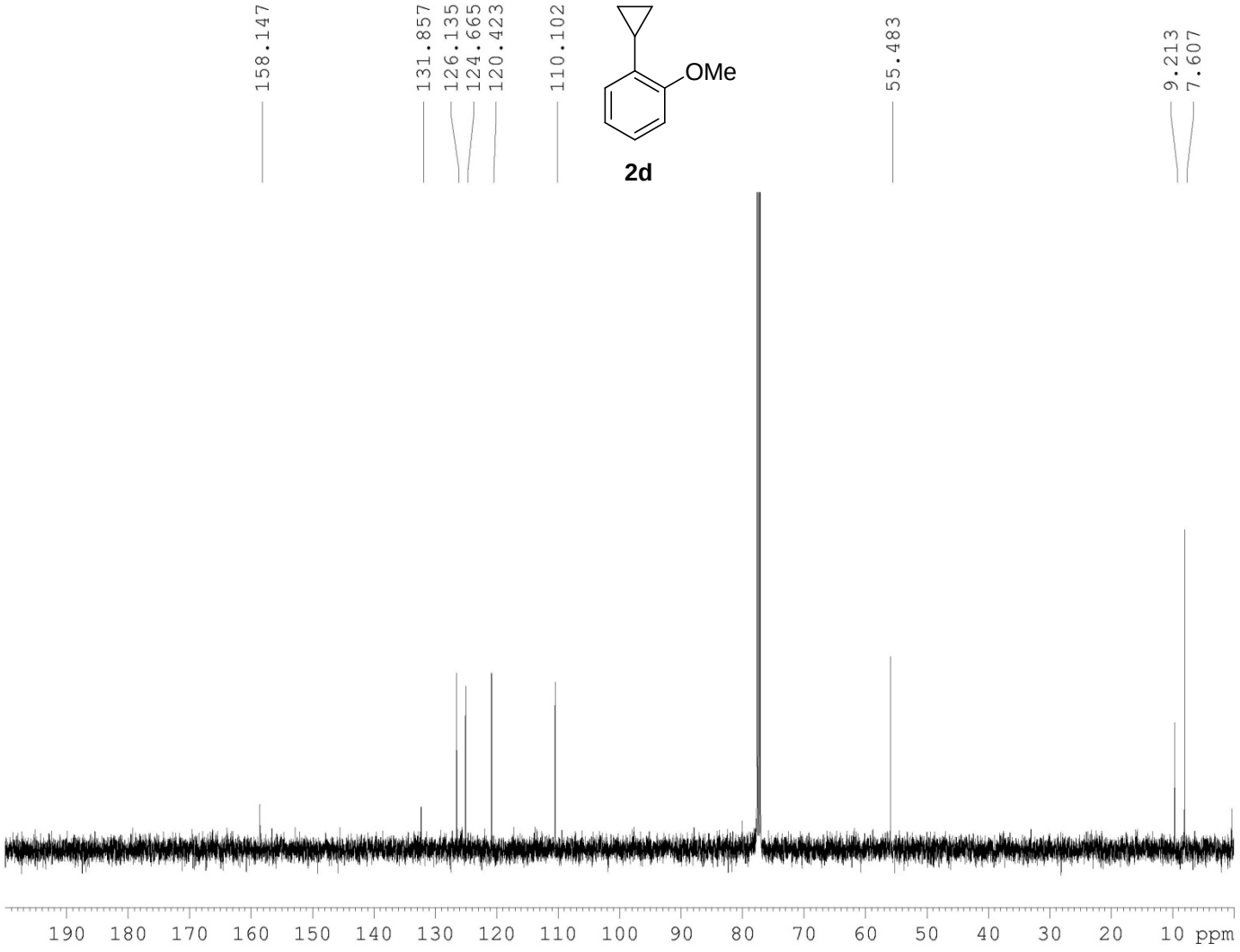
^{1}H NMR (500 MHz, $CDCl_3$) Spectrum of 5-cyclopropyl-1,2,3-trimethoxybenzene **2c** (Table 2, entry 3)



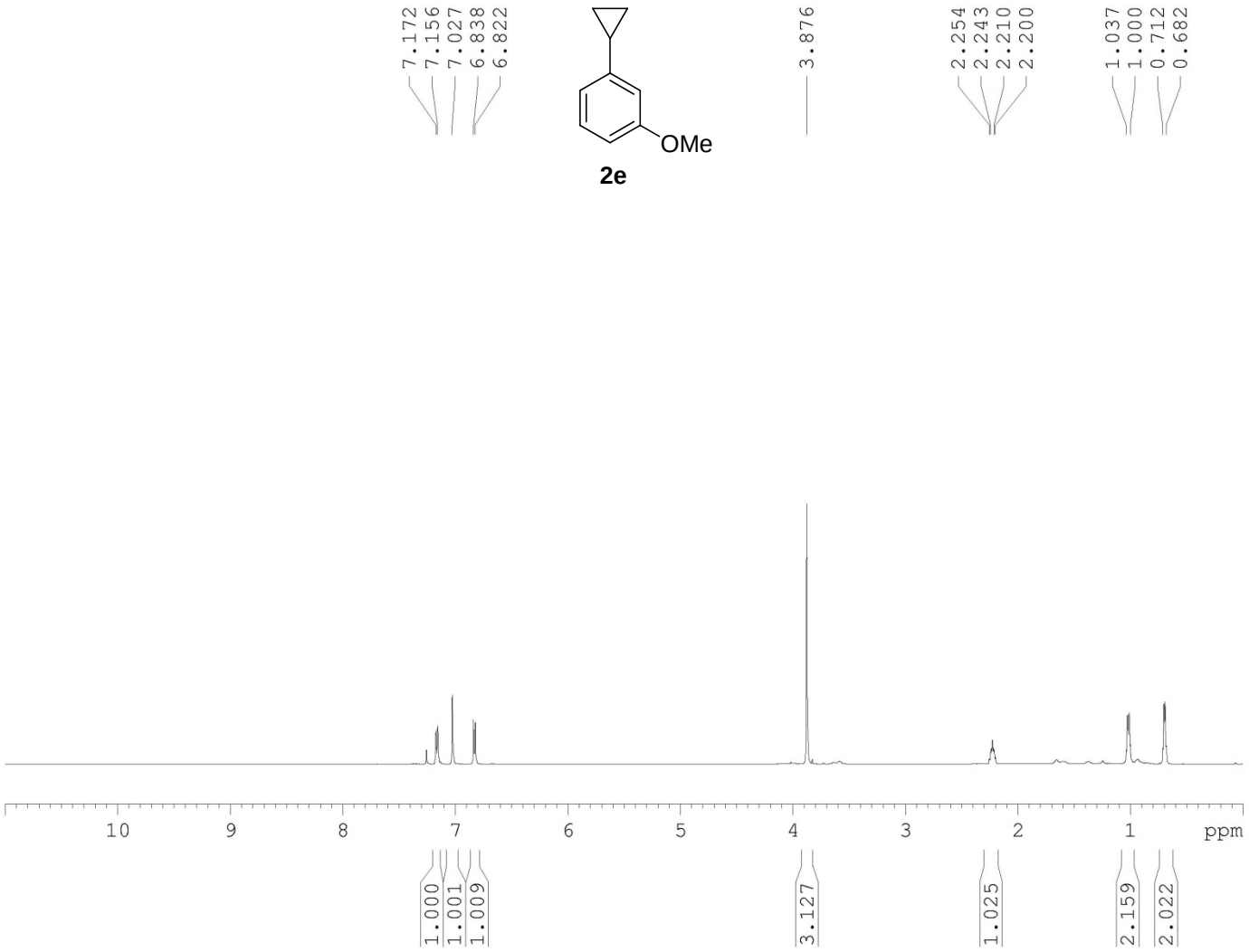
^{13}C NMR (125 MHz, $CDCl_3$) Spectrum of 5-cyclopropyl-1,2,3-trimethoxybenzene **2c** (Table 2, entry 3)



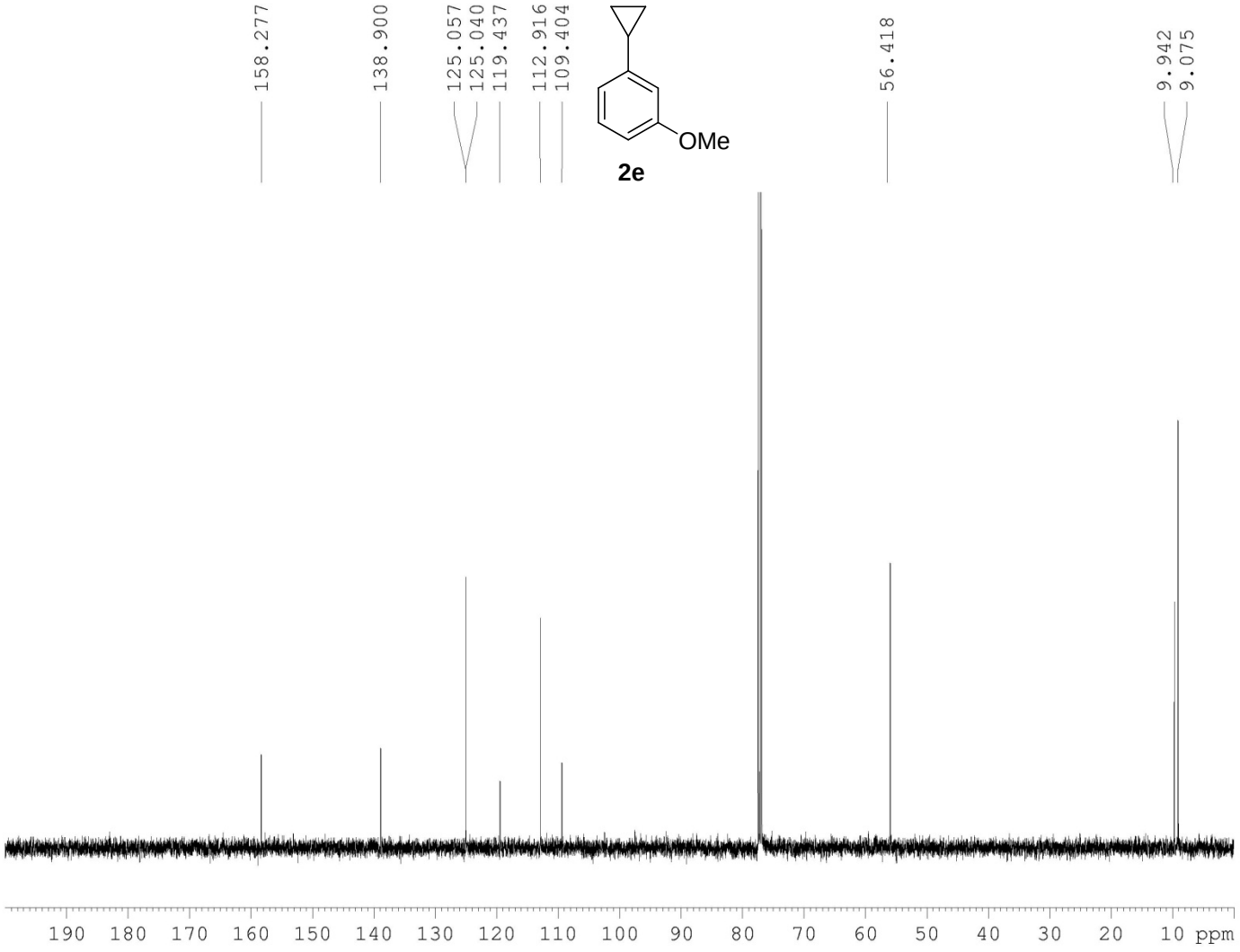
^{1}H NMR (500 MHz, $CDCl_3$) Spectrum of 1-cyclopropyl-2-methoxybenzene **2d** (Table 2, entry 4)



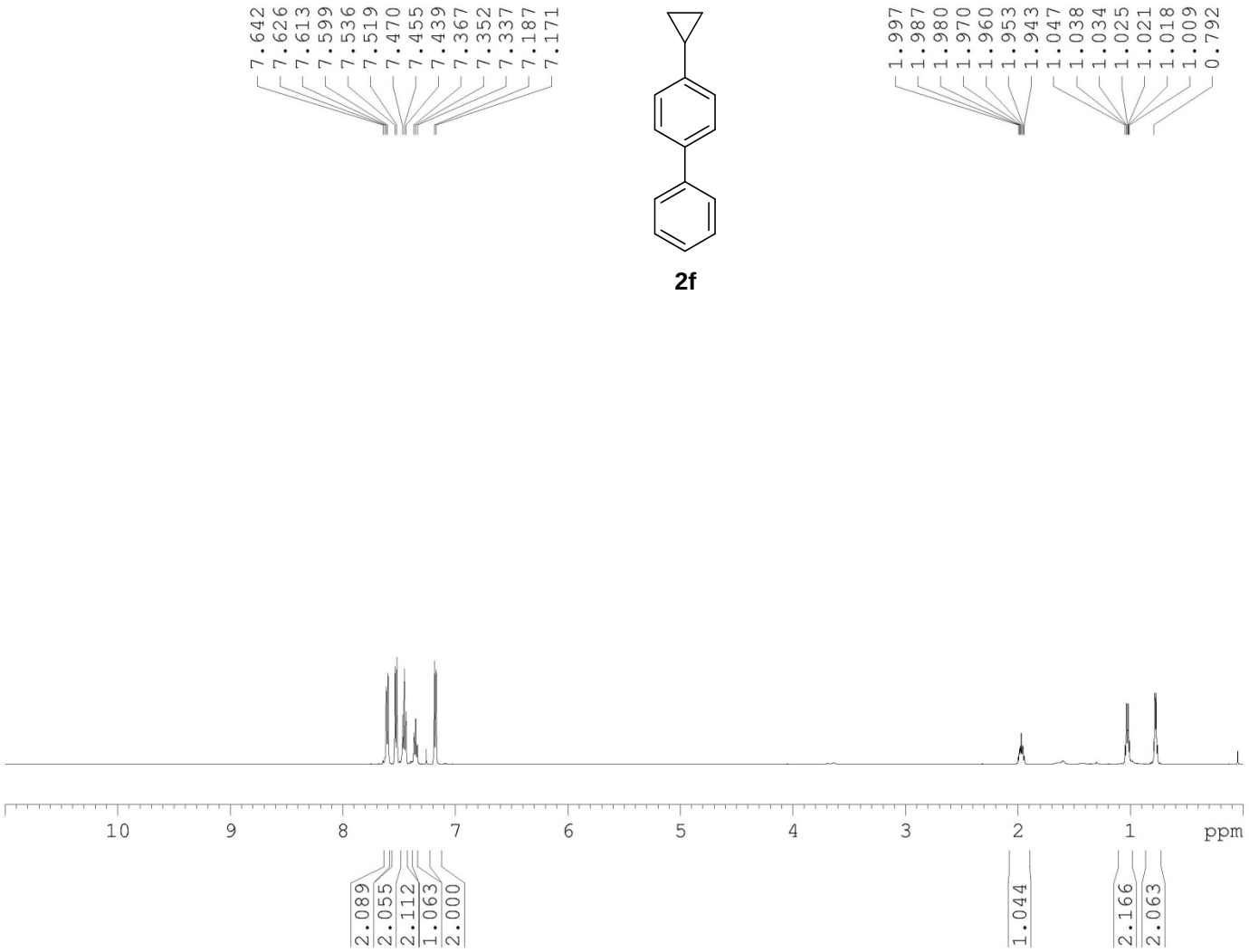
^{13}C NMR (125 MHz, $CDCl_3$) Spectrum of 1-cyclopropyl-2-methoxybenzene **2d** (Table 2, entry 4)



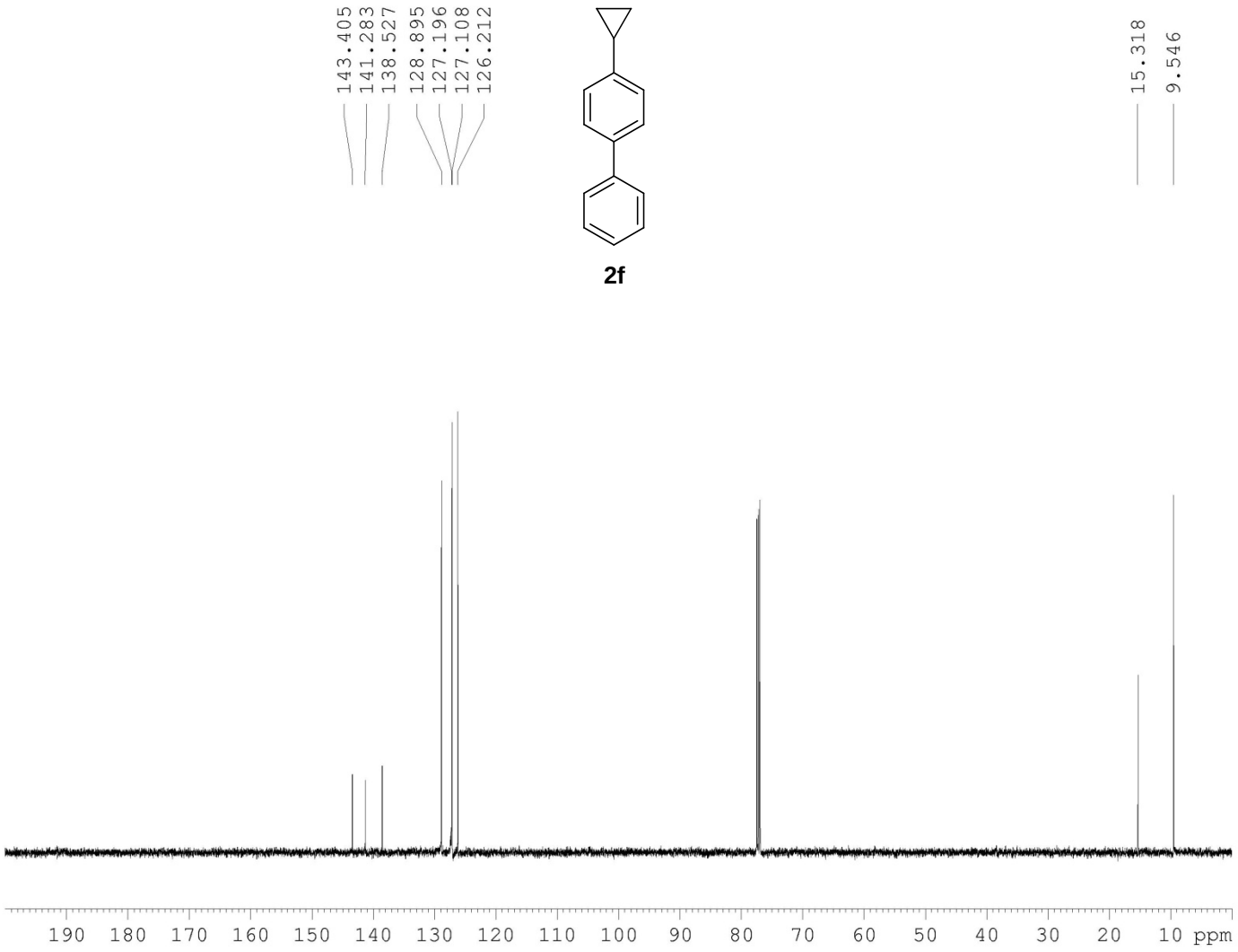
^{1}H NMR (500 MHz, $CDCl_3$) Spectrum of 4-cyclopropyl-3-methoxybenzonitrile**2e** (Table 2, entry 5)



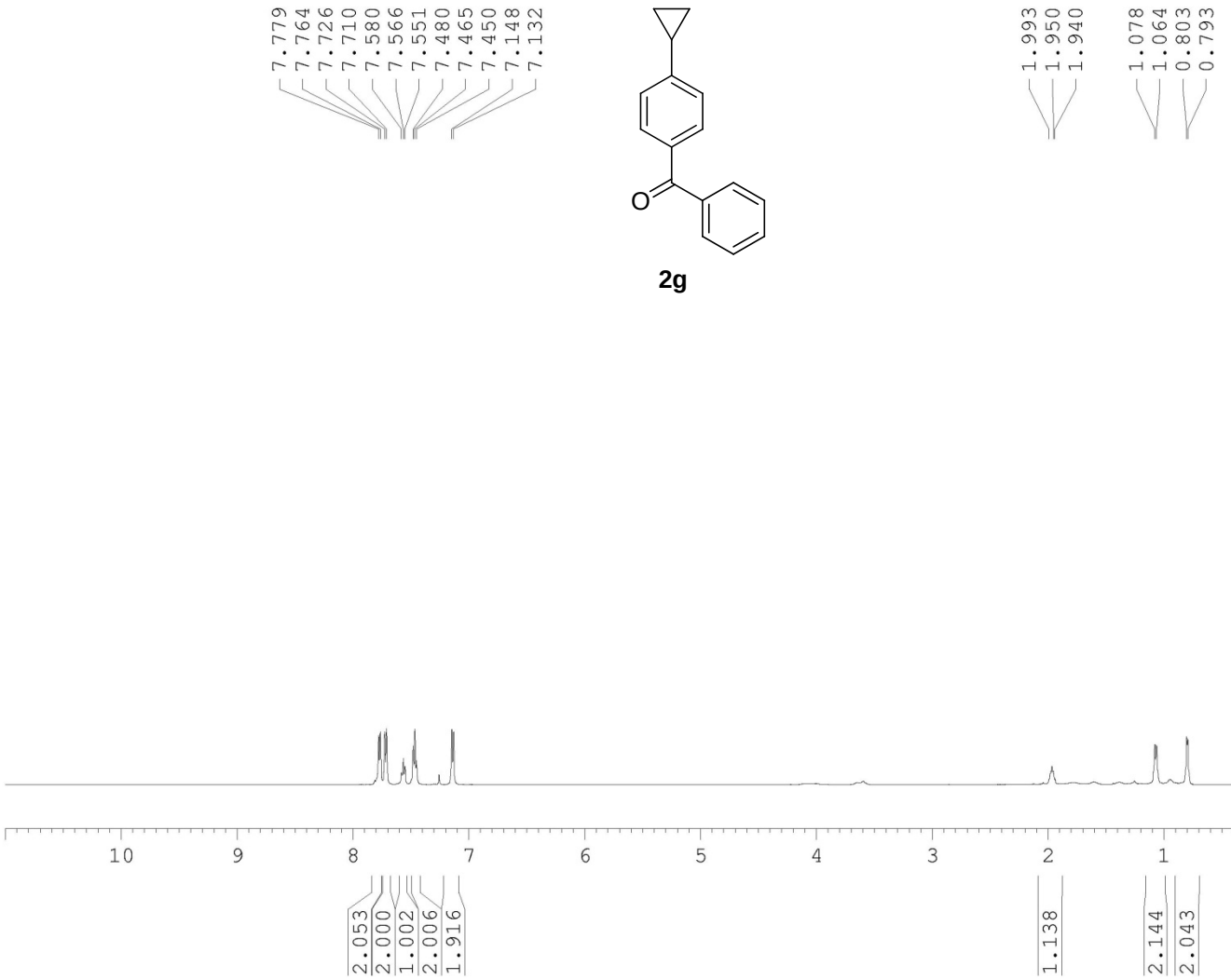
^{13}C NMR (125 MHz, $CDCl_3$) Spectrum of 4-cyclopropyl-3-methoxybenzonitrile **2e** (Table 2, entry 5)



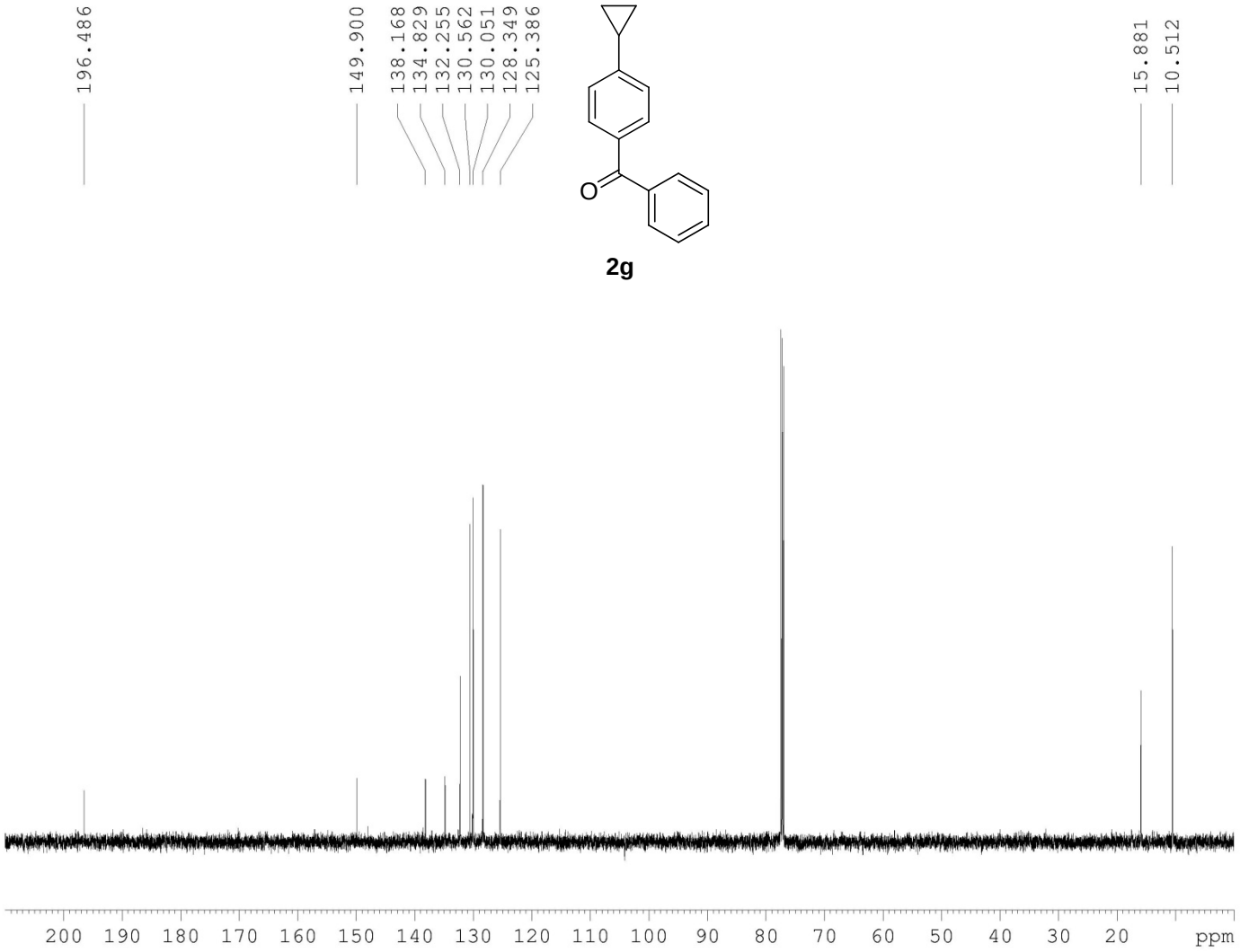
^{1}H NMR (500 MHz, $CDCl_3$) Spectrum of 4-cyclopropyl-1,1'-biphenyl **2f** (Table 2, entry 6)



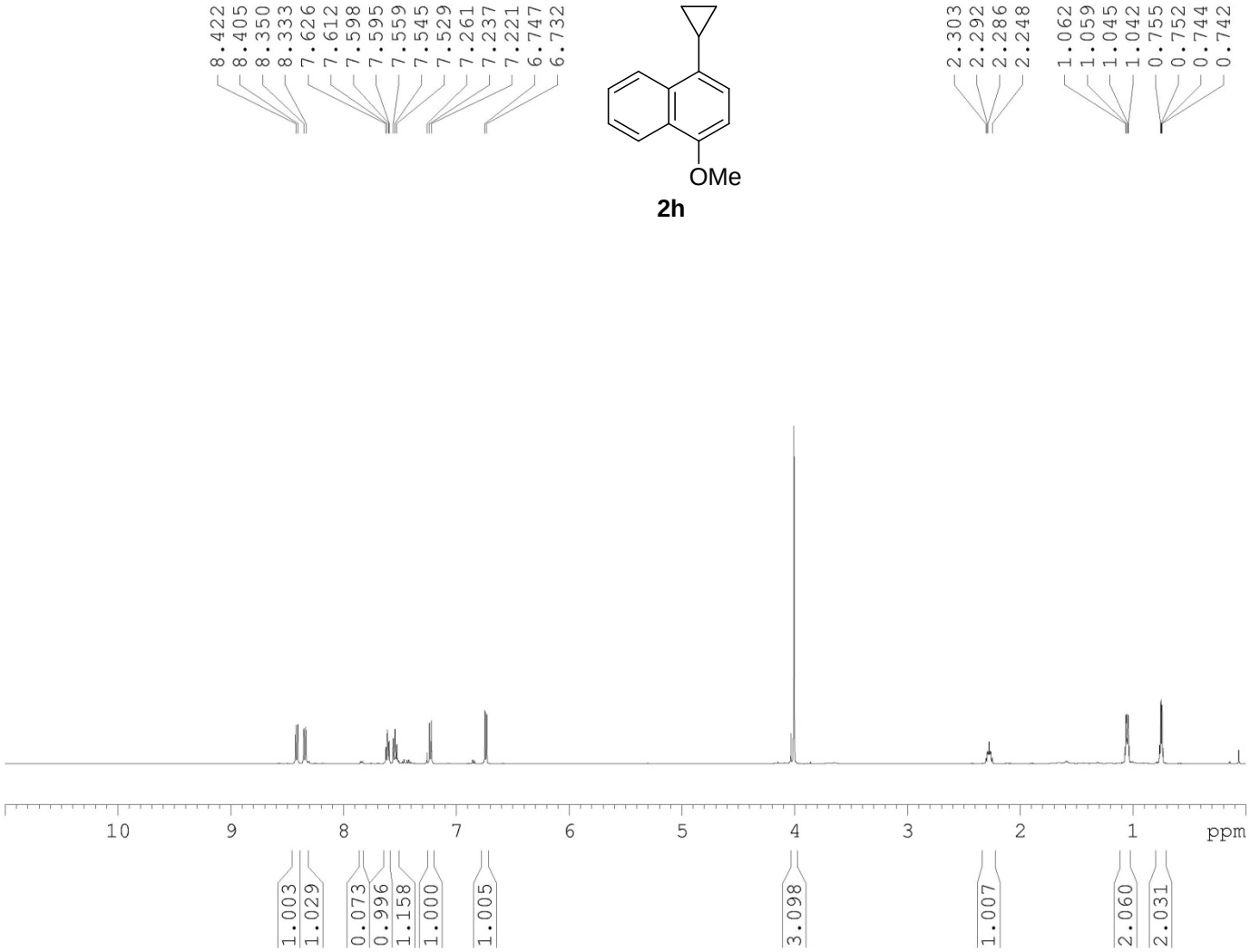
^{13}C NMR (125 MHz, $CDCl_3$) Spectrum of 4-cyclopropyl-1,1'-biphenyl **2f** (Table 2, entry 6)



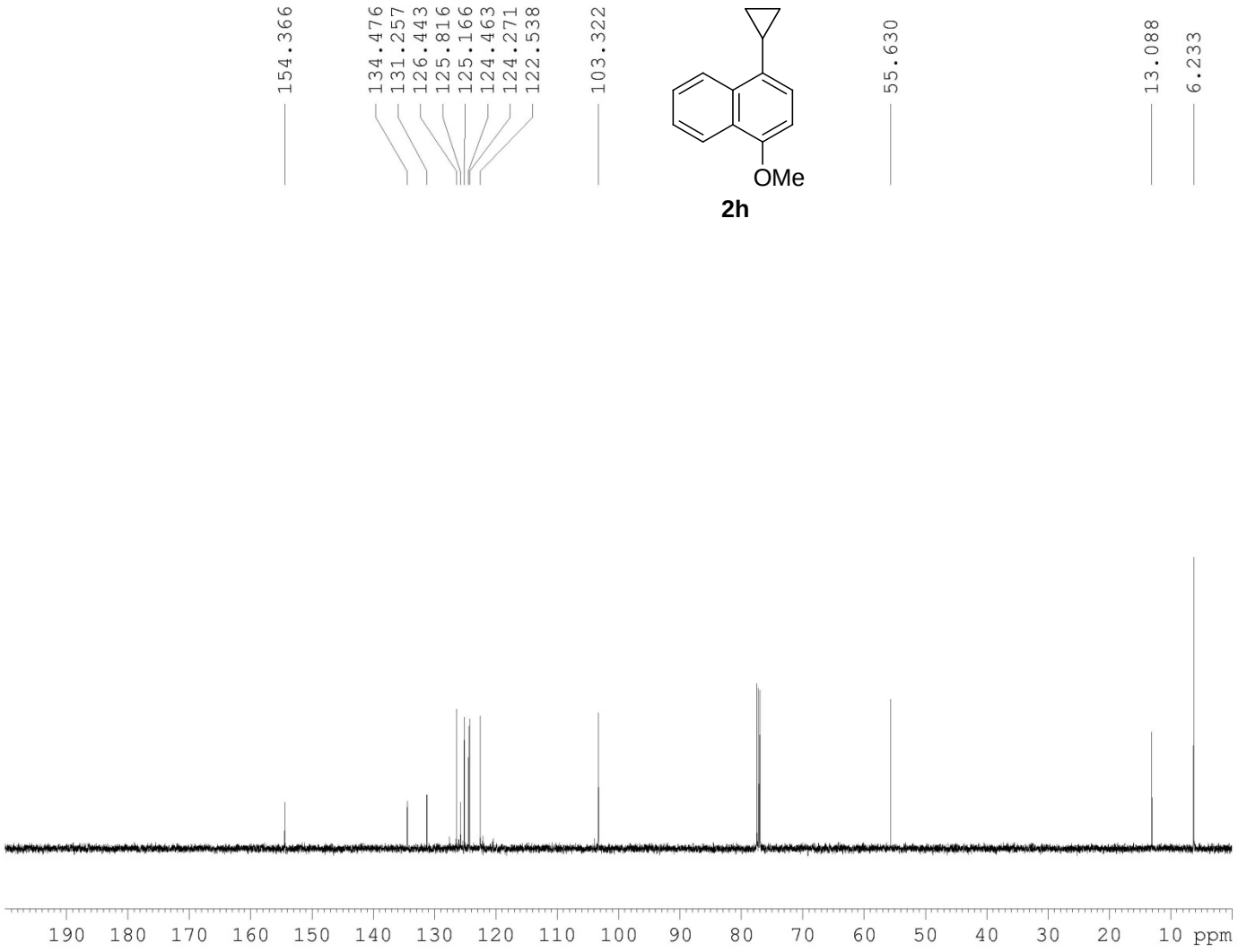
^{1}H NMR (500 MHz, $CDCl_3$) Spectrum of 4-cyclopropylphenyl)(phenyl)methanone **2g** (Table 2, entry 7)



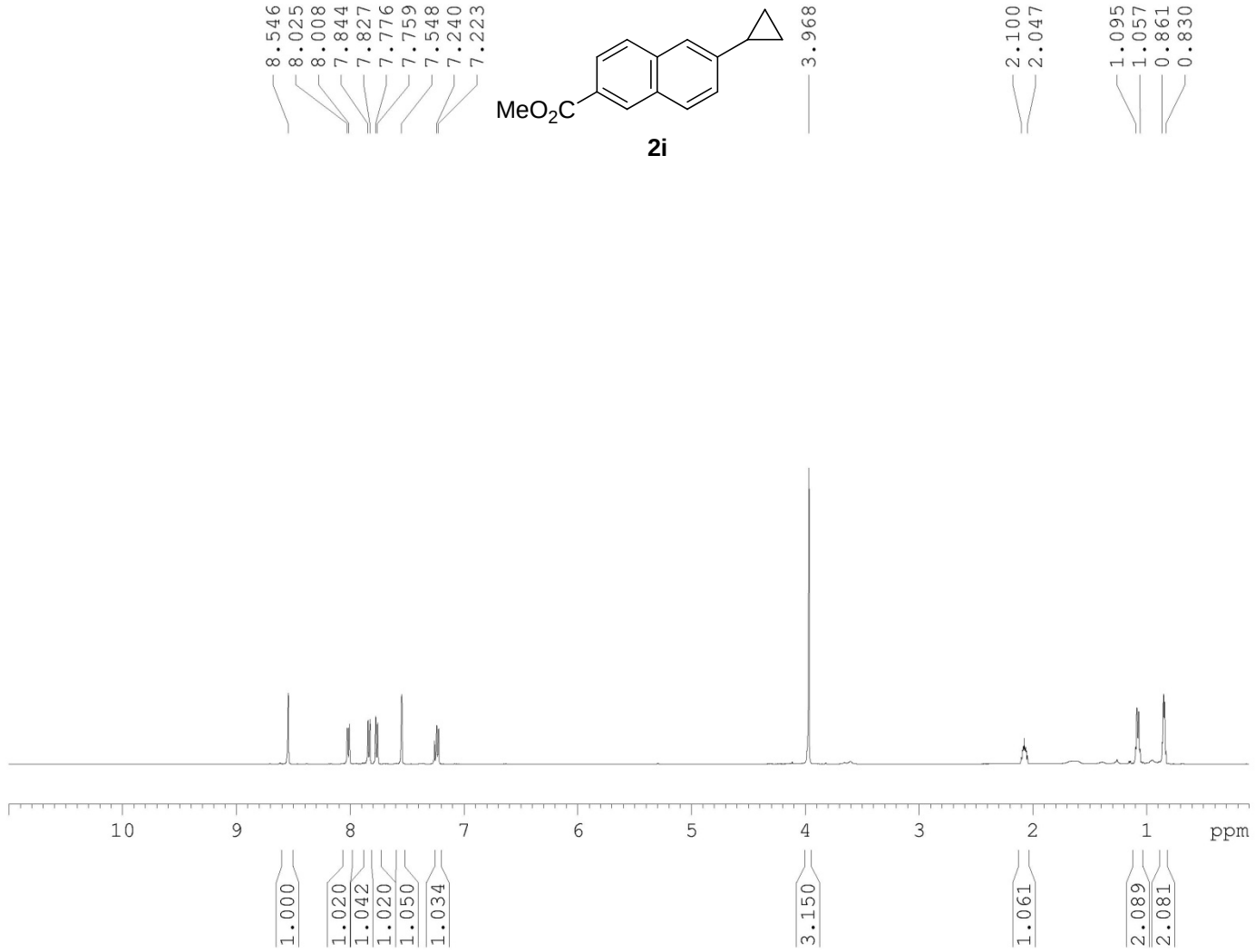
^{13}C NMR (125 MHz, $CDCl_3$) Spectrum of 4-cyclopropylphenyl)(phenyl)methanone **2g** (Table 2, entry 7)



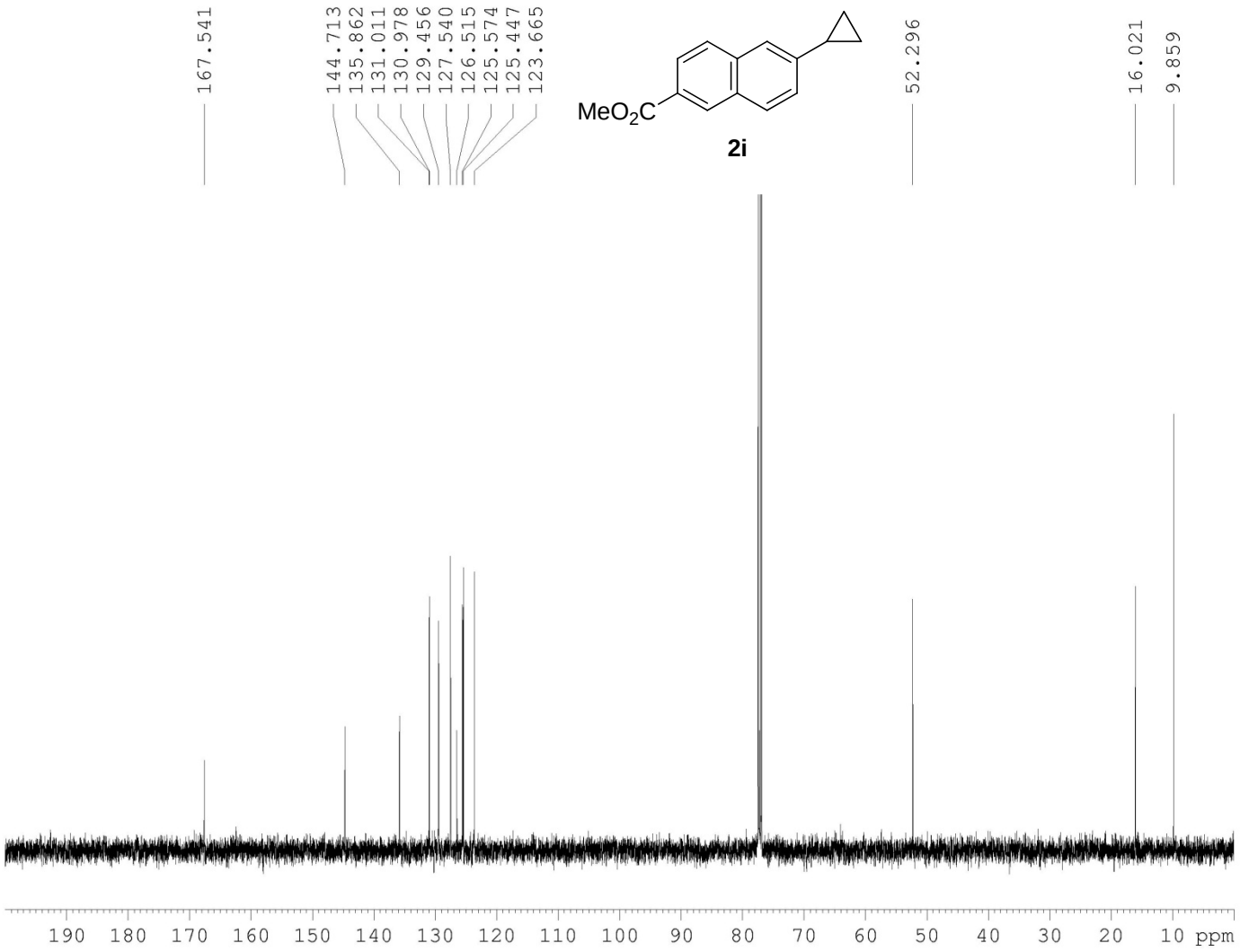
^{1}H NMR (500 MHz, $CDCl_3$) Spectrum of 1-cyclopropyl-4-methoxynaphthalene **2h** (Table 2, entry 8)



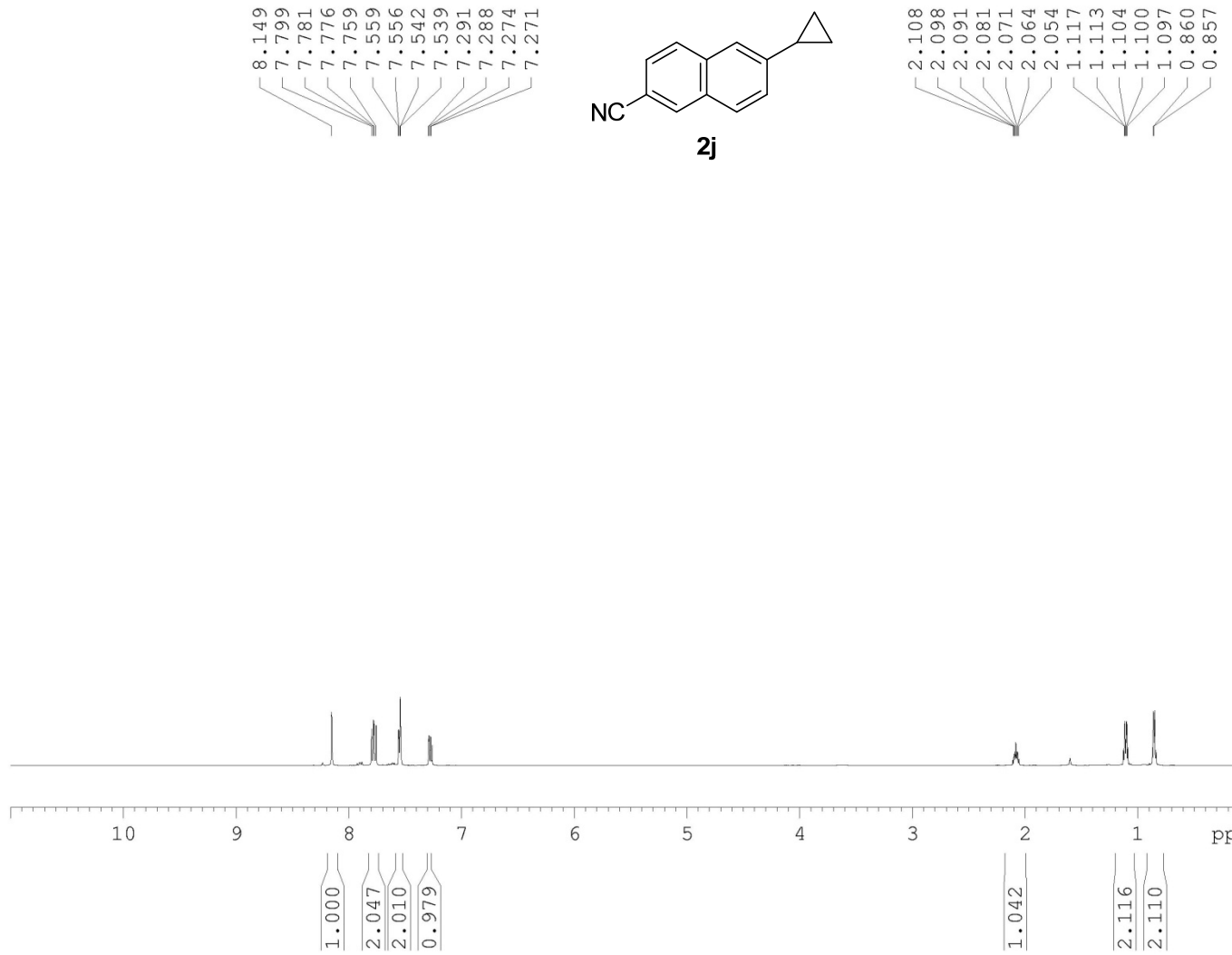
^{13}C NMR (125 MHz, $CDCl_3$) Spectrum of 1-cyclopropyl-4-methoxynaphthalene **2h** (Table 2, entry 8)



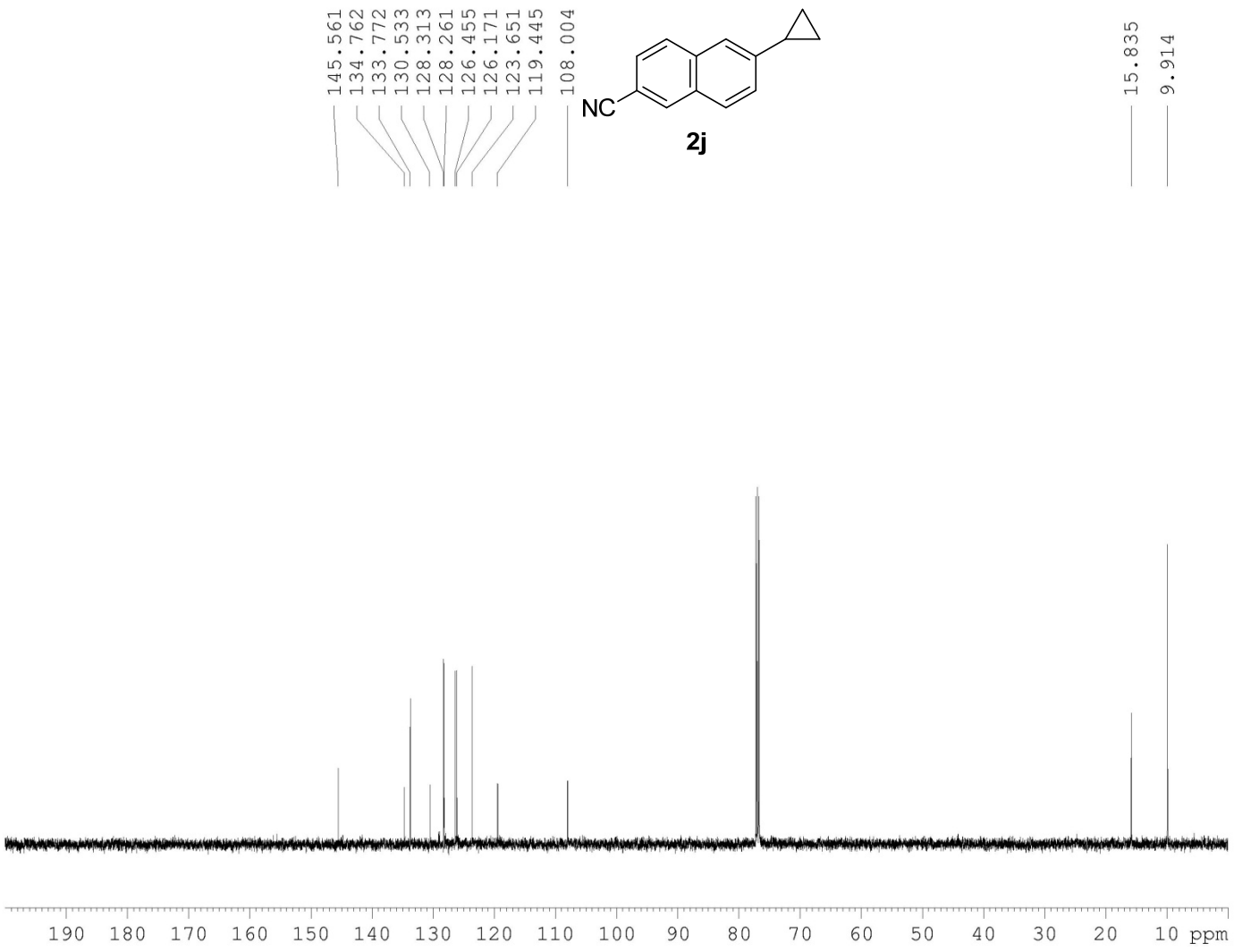
^{1}H NMR (500 MHz, $CDCl_3$) Spectrum of methyl 6-cyclopropyl-2-naphthoate **2i** (Table 2, entry 9)



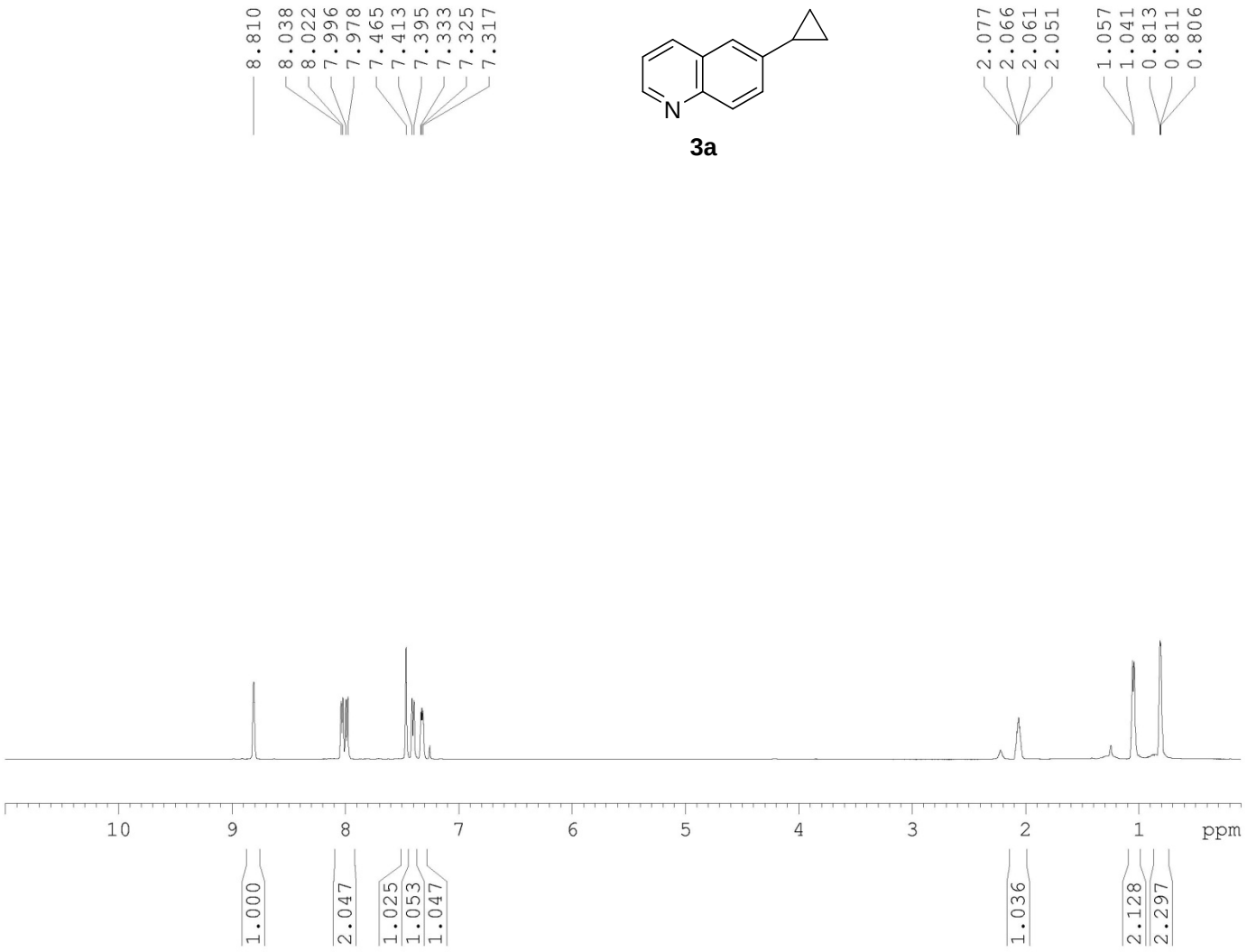
^{13}C NMR (125 MHz, $CDCl_3$) Spectrum of methyl 6-cyclopropyl-2-naphthoate **2i** (Table 2, entry 9)



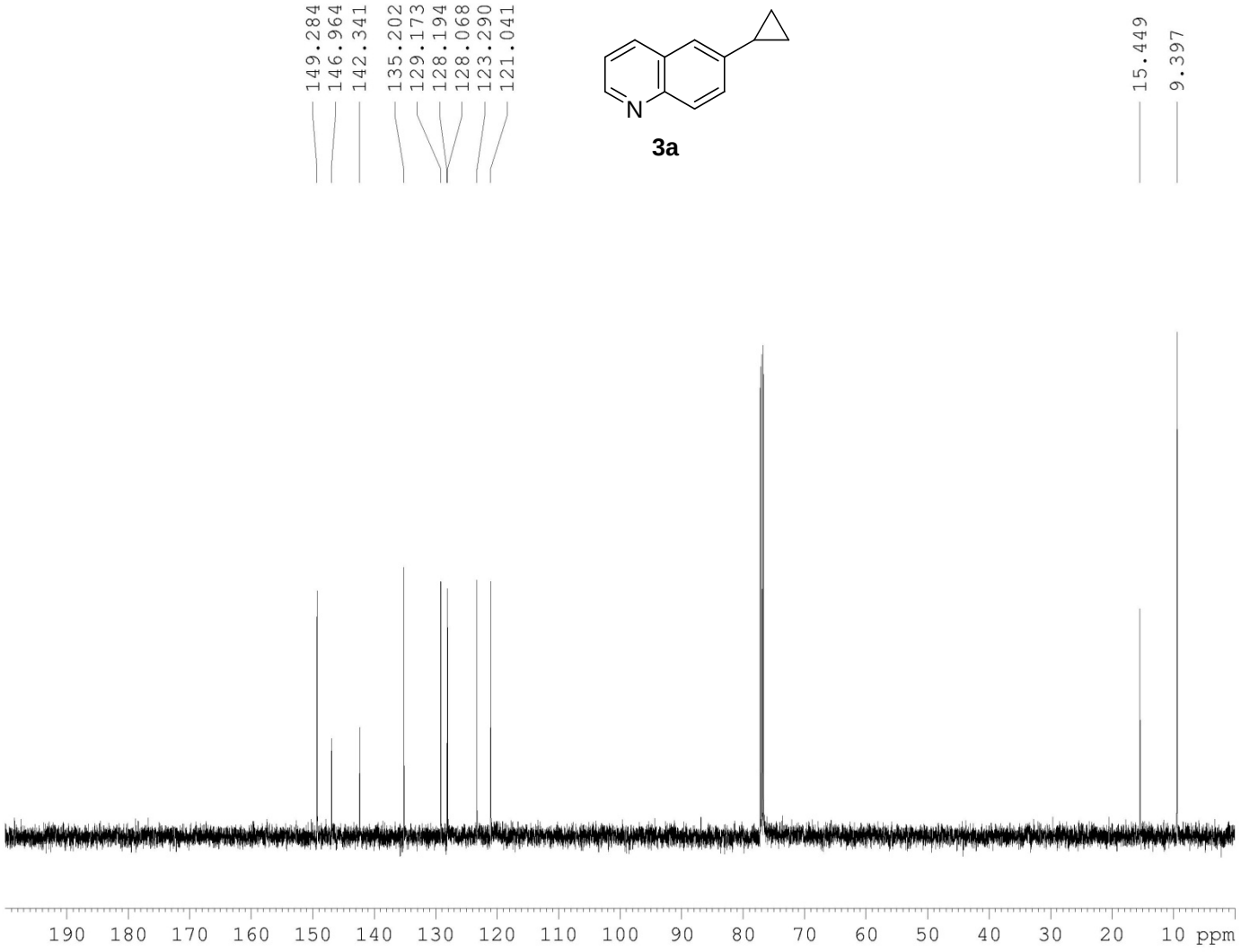
^{1}H NMR (500 MHz, $CDCl_3$) Spectrum of 6-cyclopropyl-2-naphthonitrile **2j** (Table 2, entry 10)



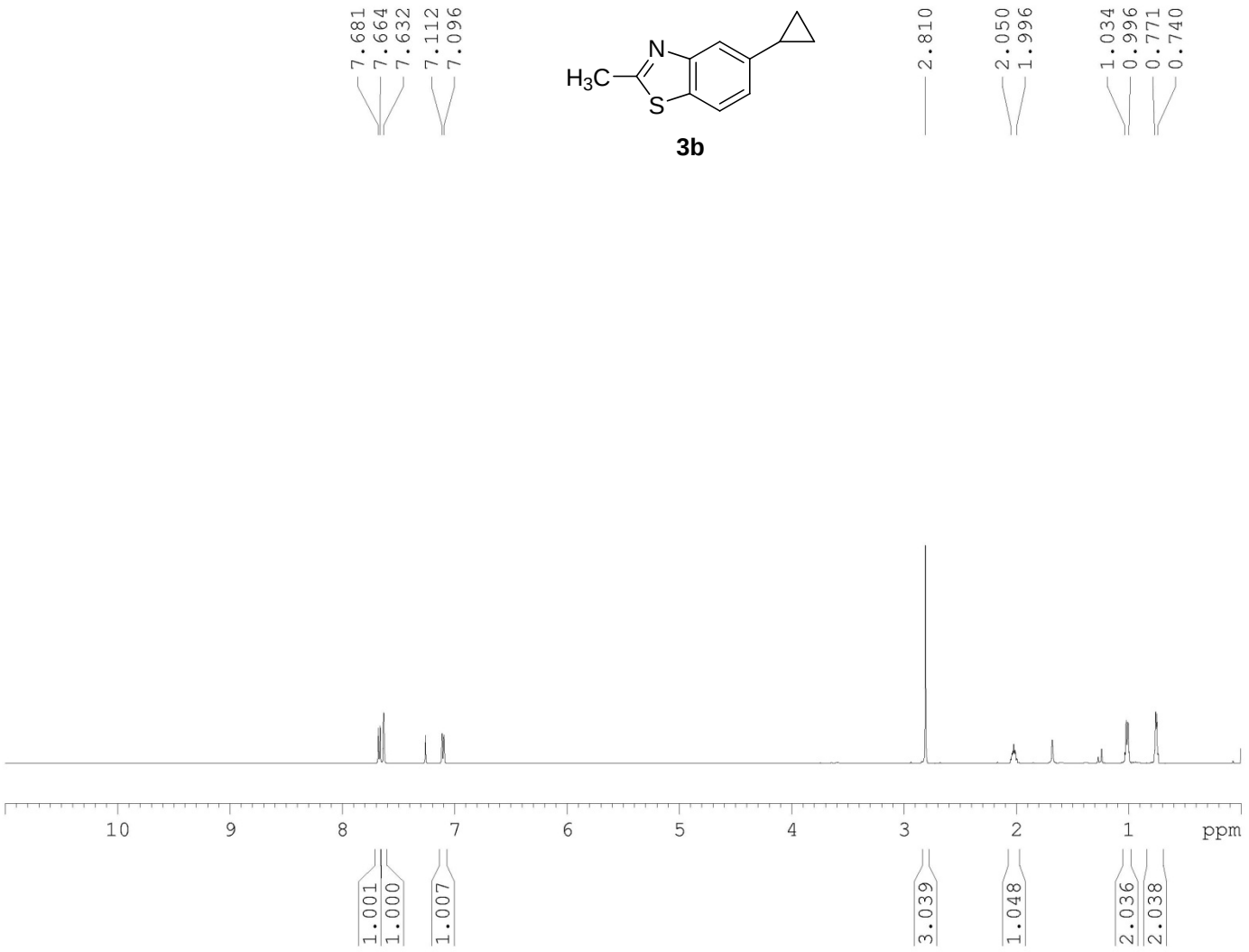
^{13}C NMR (125 MHz, $CDCl_3$) Spectrum of 6-cyclopropyl-2-naphthonitrile **2j** (Table 2, entry 10)



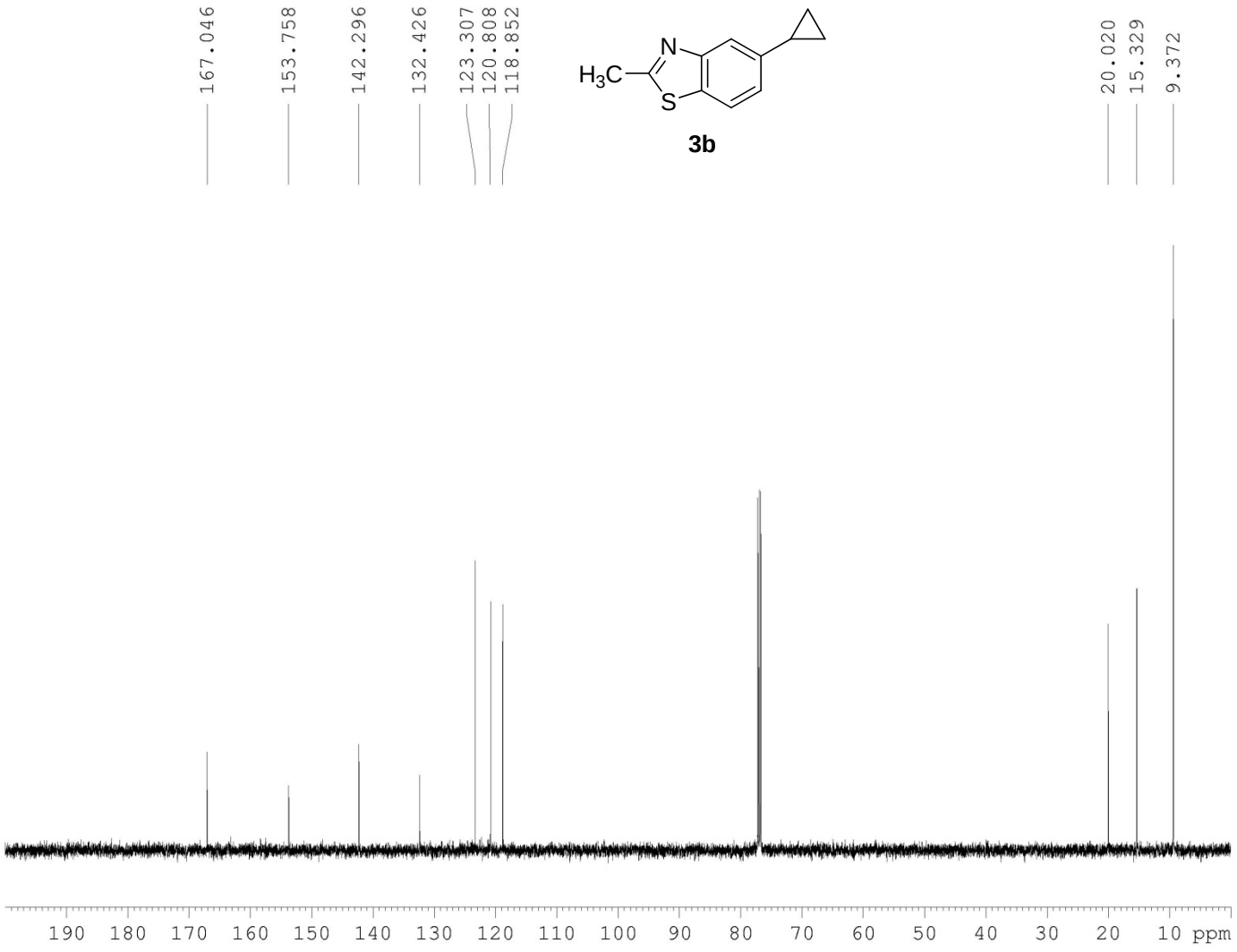
^{1}H NMR (500 MHz, $CDCl_3$) Spectrum of 6-cyclopropylquinoline **3a** (Table 3, entry 1)



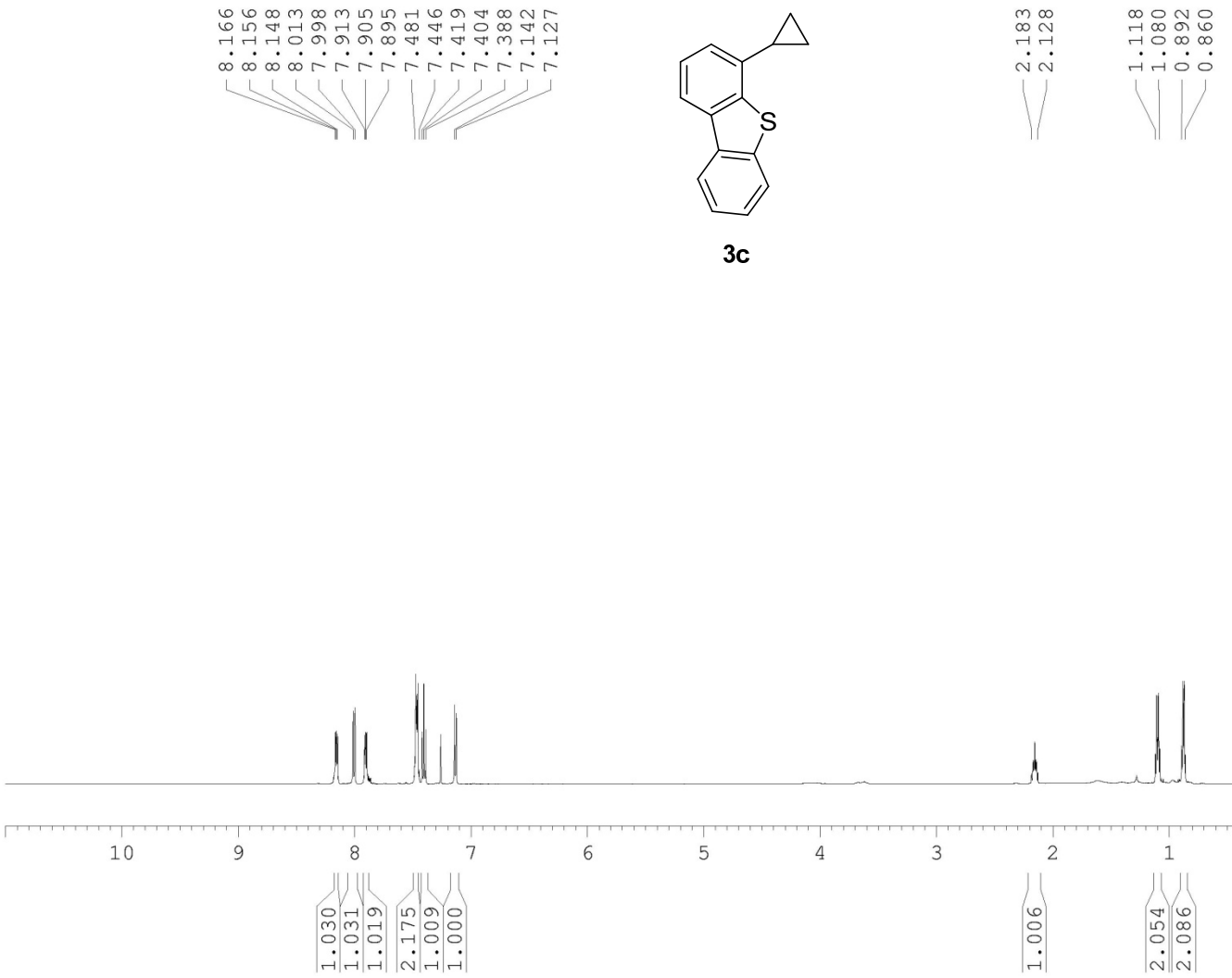
^{13}C NMR (125 MHz, $CDCl_3$) Spectrum of 6-cyclopropylquinoline **3a** (Table 3, entry 1)



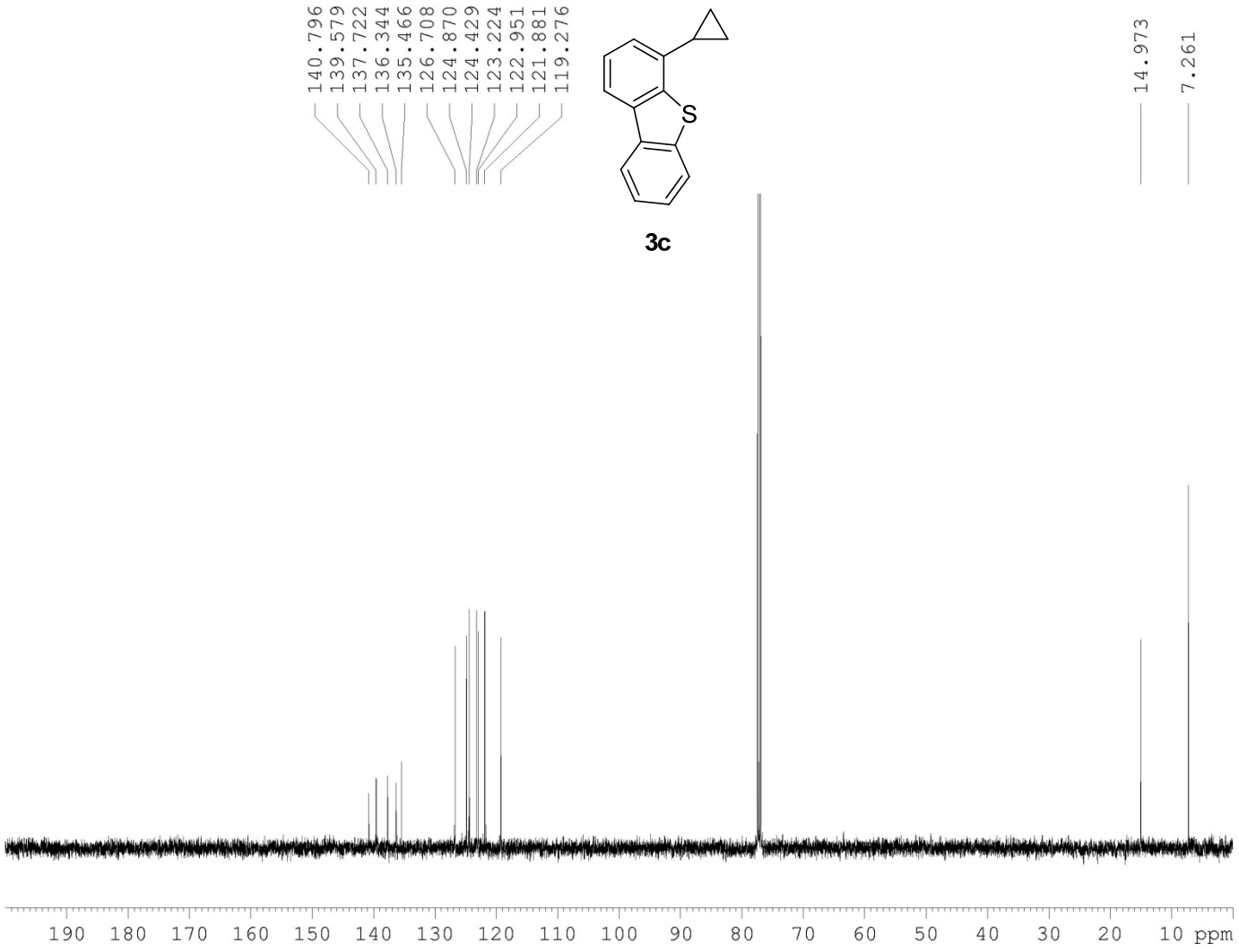
^{1}H NMR (500 MHz, $CDCl_3$) Spectrum of 5-cyclopropyl-2-methylbenzo[d]thiazole **3b** (Table 3, entry 2)



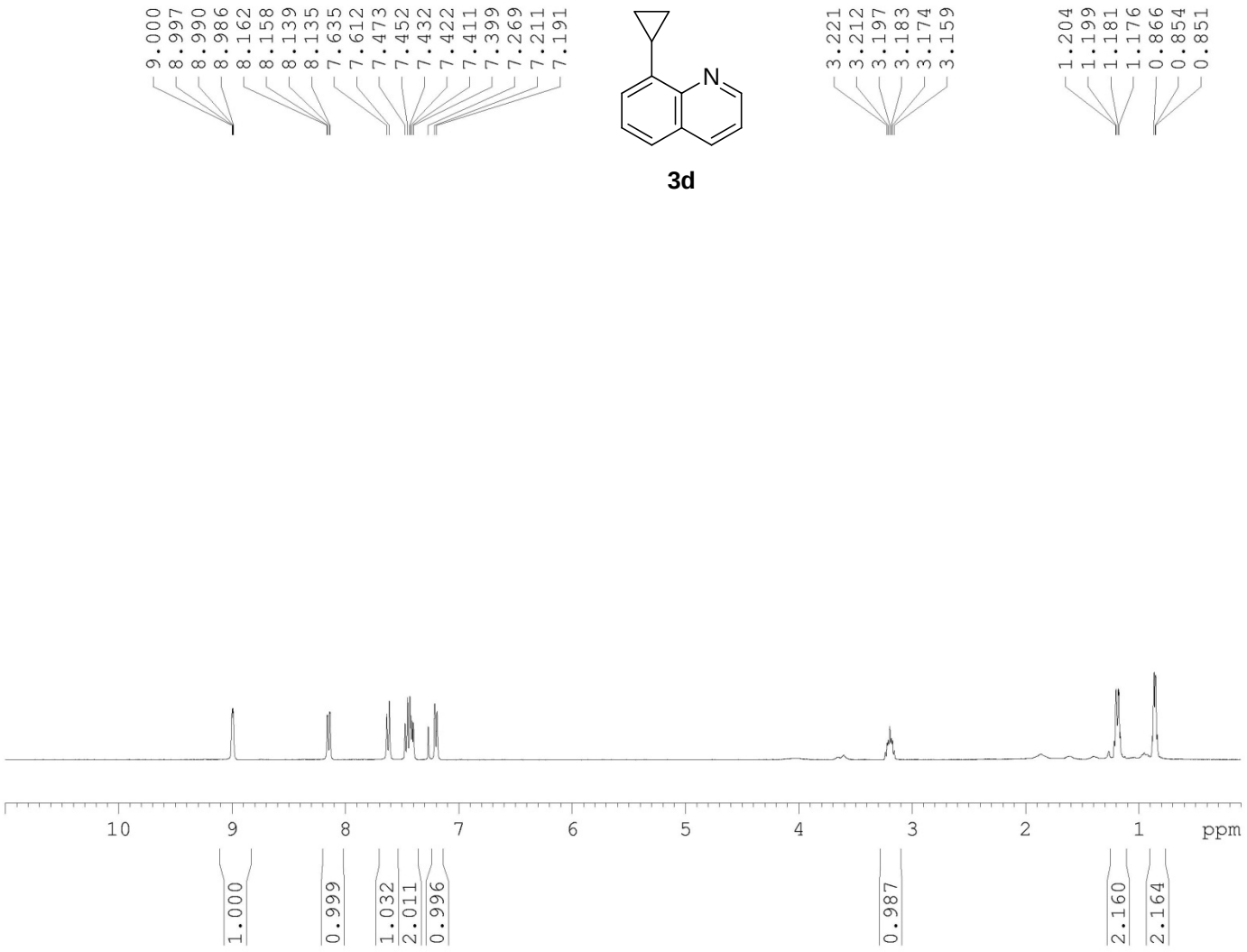
^{13}C NMR (125 MHz, $CDCl_3$) Spectrum of 5-cyclopropyl-2-methylbenzo[d]thiazole **3b** (Table 3, entry 2)



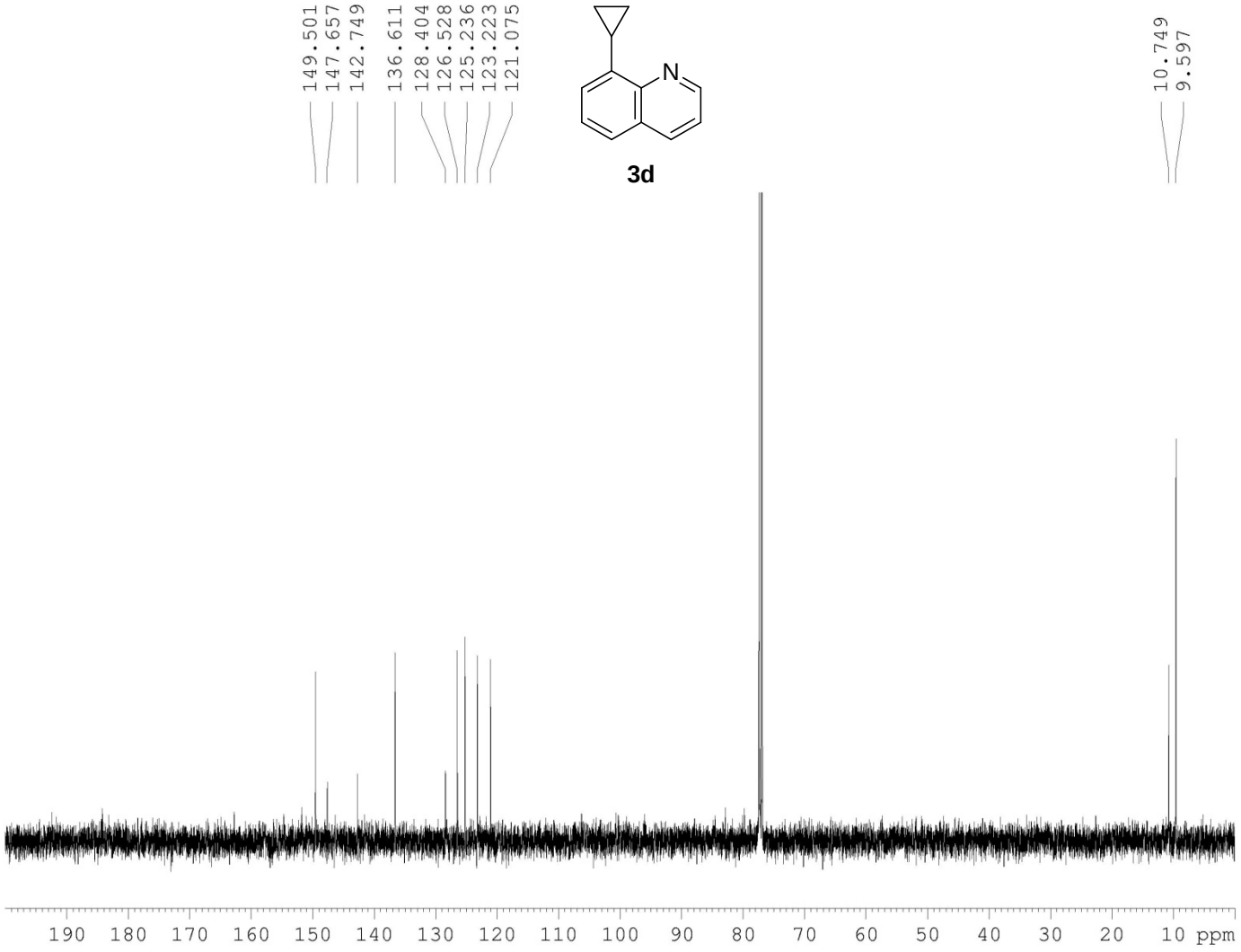
^{1}H NMR (500 MHz, $CDCl_3$) Spectrum of 4-cyclopropyldibenzo[b,d]thiophene **3c** (Table 3, entry 3)



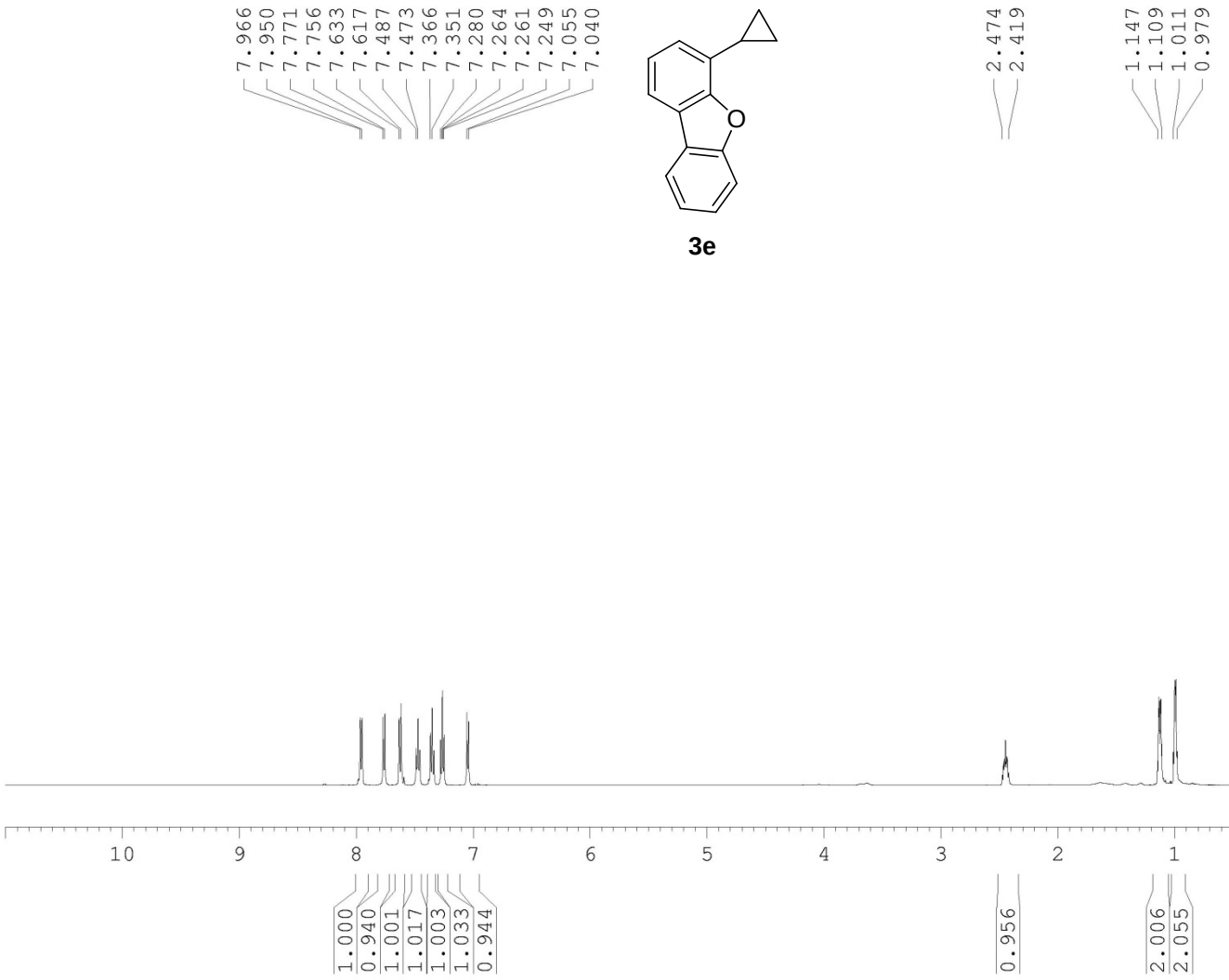
^{13}C NMR (125 MHz, $CDCl_3$) Spectrum of 4-cyclopropyldibenzo[b,d]thiophene **3c** (Table 3, entry 3)



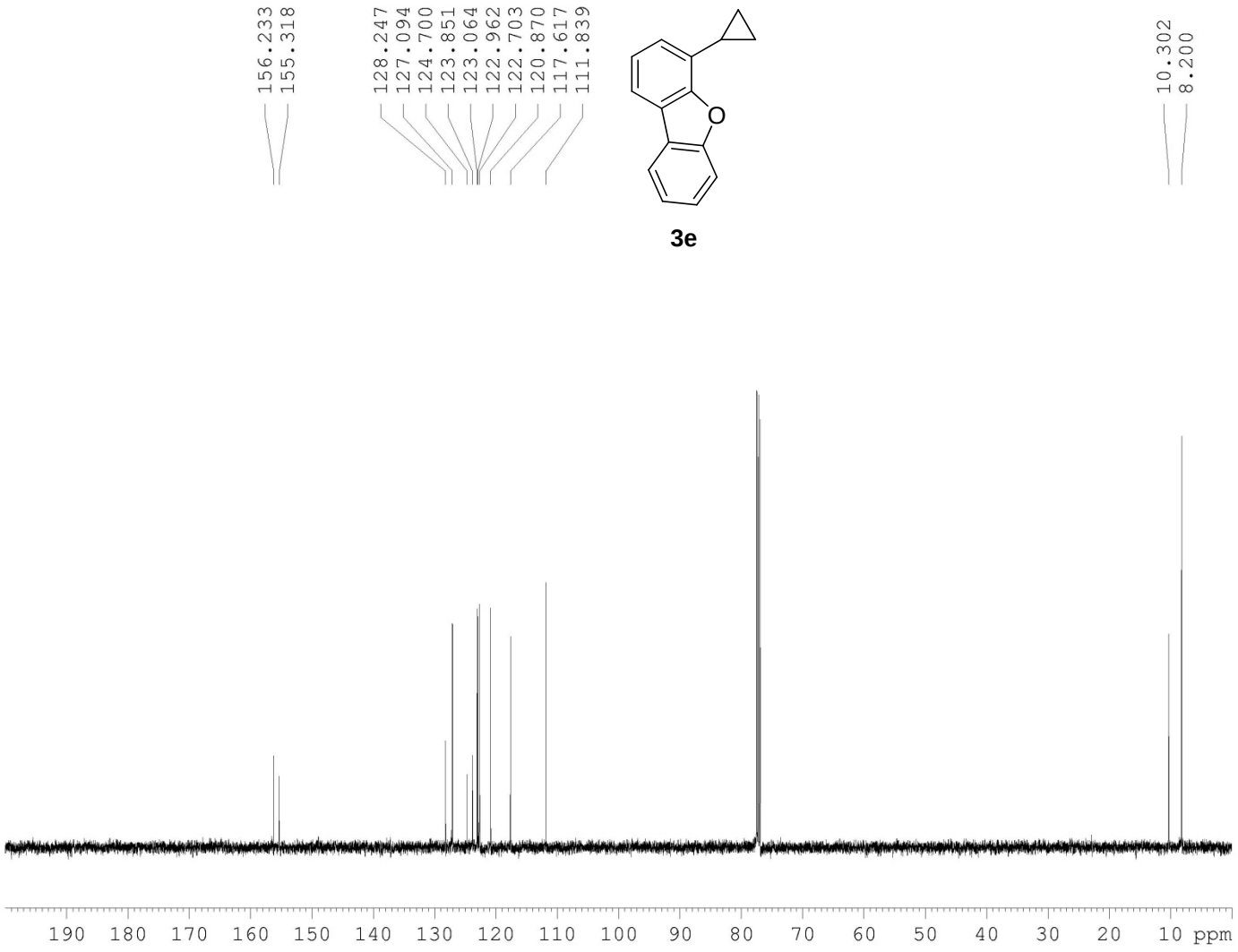
^{1}H NMR (500 MHz, $CDCl_3$) Spectrum of 8-cyclopropylquinoline **3d** (Table 3, entry 4)



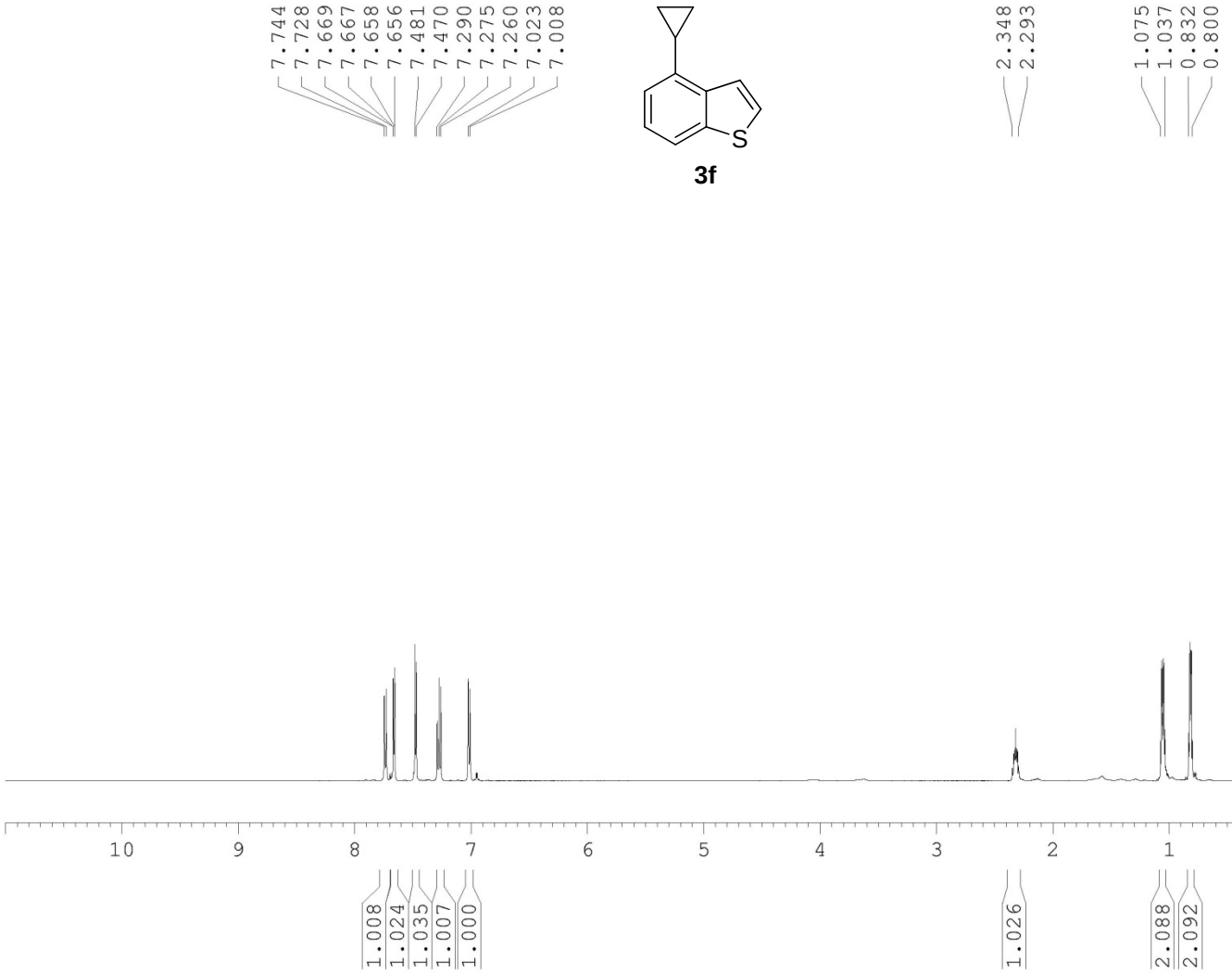
^{13}C NMR (125 MHz, $CDCl_3$) Spectrum of 8-cyclopropylquinoline **3d** (Table 3, entry 4)



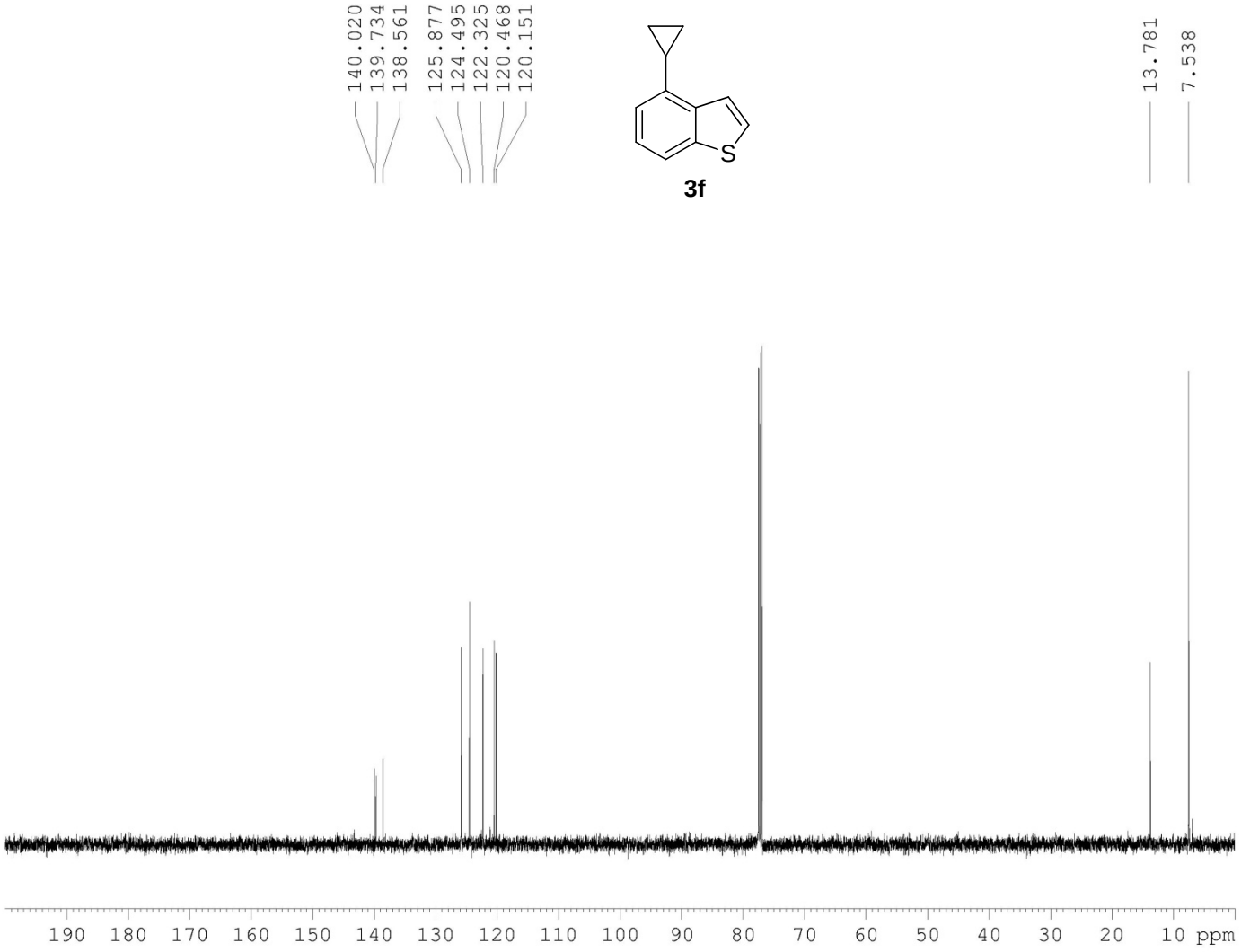
^{1}H NMR (500 MHz, $CDCl_3$) Spectrum of 4-cyclopropyldibenzo[b,d]furan **3e** (Table 3, entry 5)



^{13}C NMR (125 MHz, $CDCl_3$) Spectrum of 4-cyclopropyldibenzo[b,d]furan **3e** (Table 3, entry 5)



^{1}H NMR (500 MHz, $CDCl_3$) Spectrum of 4-cyclopropylbenzo[b]thiophene **3f** (Table 3, entry 6)



^{13}C NMR (125 MHz, $CDCl_3$) Spectrum of 4-cyclopropylbenzo[b]thiophene **3f** (Table 3, entry 6)