

Electronic Supplementary Information (ESI)
for *molecules*

**K₂S₂O₈-Promoted Aryl Thioamides Synthesis from Aryl
Aldehydes Using Thiourea as the Sulfur Source**

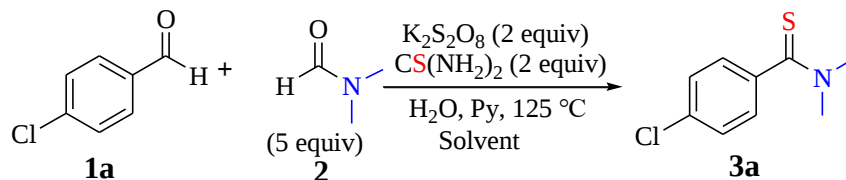
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Part I. Experimental Section

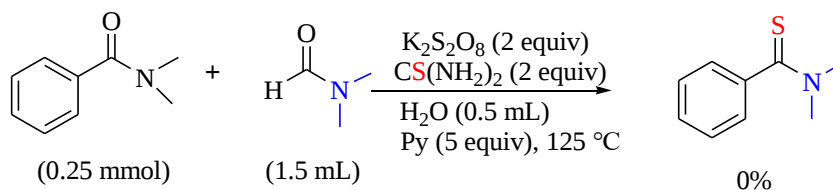
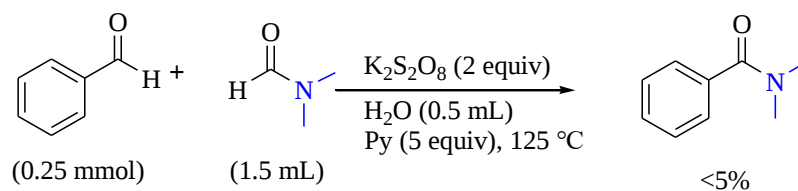
1. Table S1. Screening of Various Solvents



Entry	Solvent	Yield (%) ^b
1	NMP	<5
2	1,4-dioxane	trace
3	DCE	trace
4	toluene	0
5	PhCl	0
6	DMSO	0
7	HOCH ₂ CH ₂ OH	0

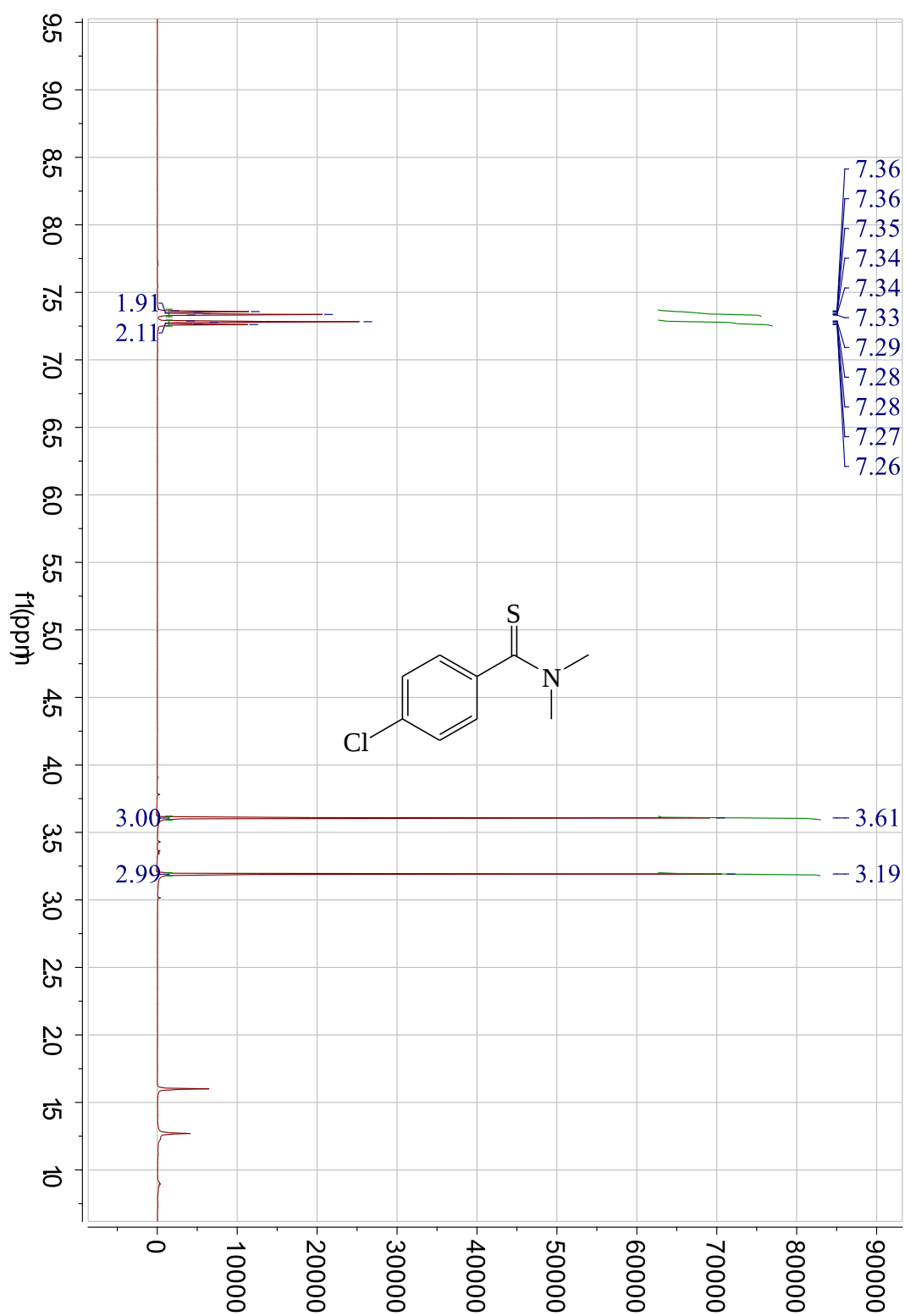
^a Conditions: **1a** (0.25 mmol), **2** (1.25 mmol), $K_2S_2O_8$ (0.5 mmol), thiourea (0.5 mmol), H_2O (0.5 mL), Py (1.25 mmol), $125\text{ }^\circ\text{C}$ for 24 h in solvent (1.5 mL), unless otherwise noted. ^b Isolated yield.

2. Three control experiments for mechanism study.

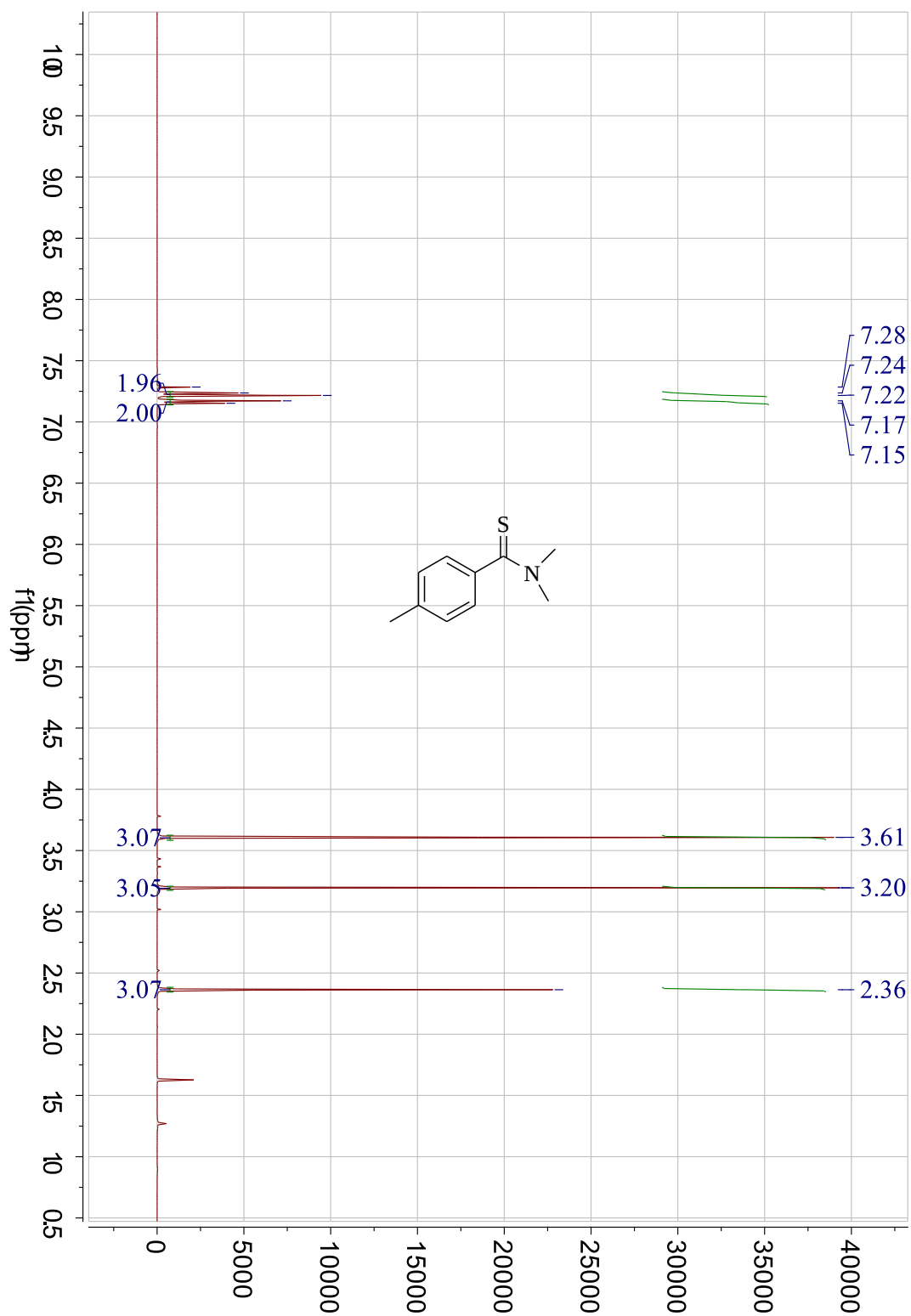


Part II ^1H NMR and ^{13}C NMR

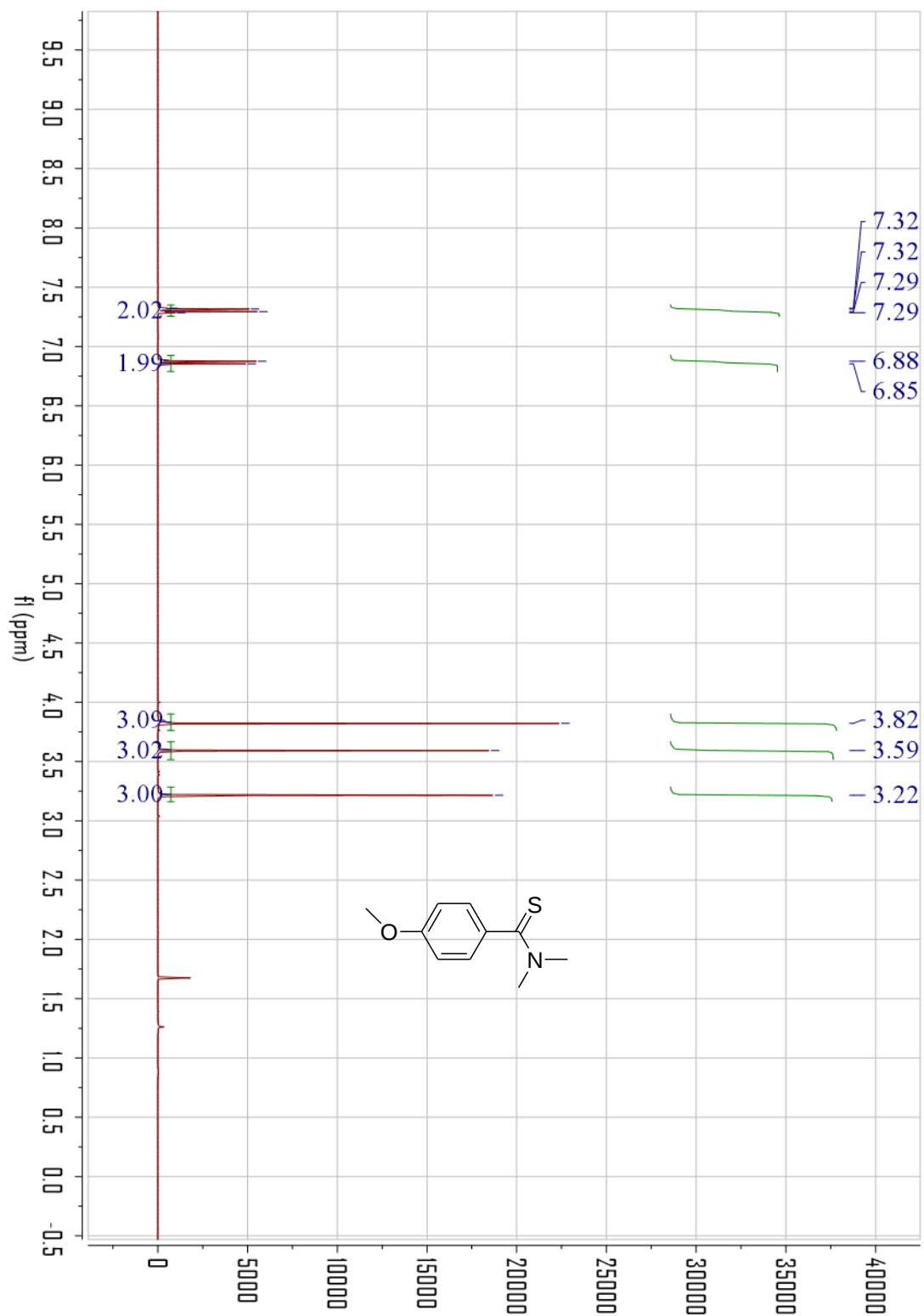
^1H NMR of 4-chloro-*N,N*-dimethylbenzothioamide **3a**



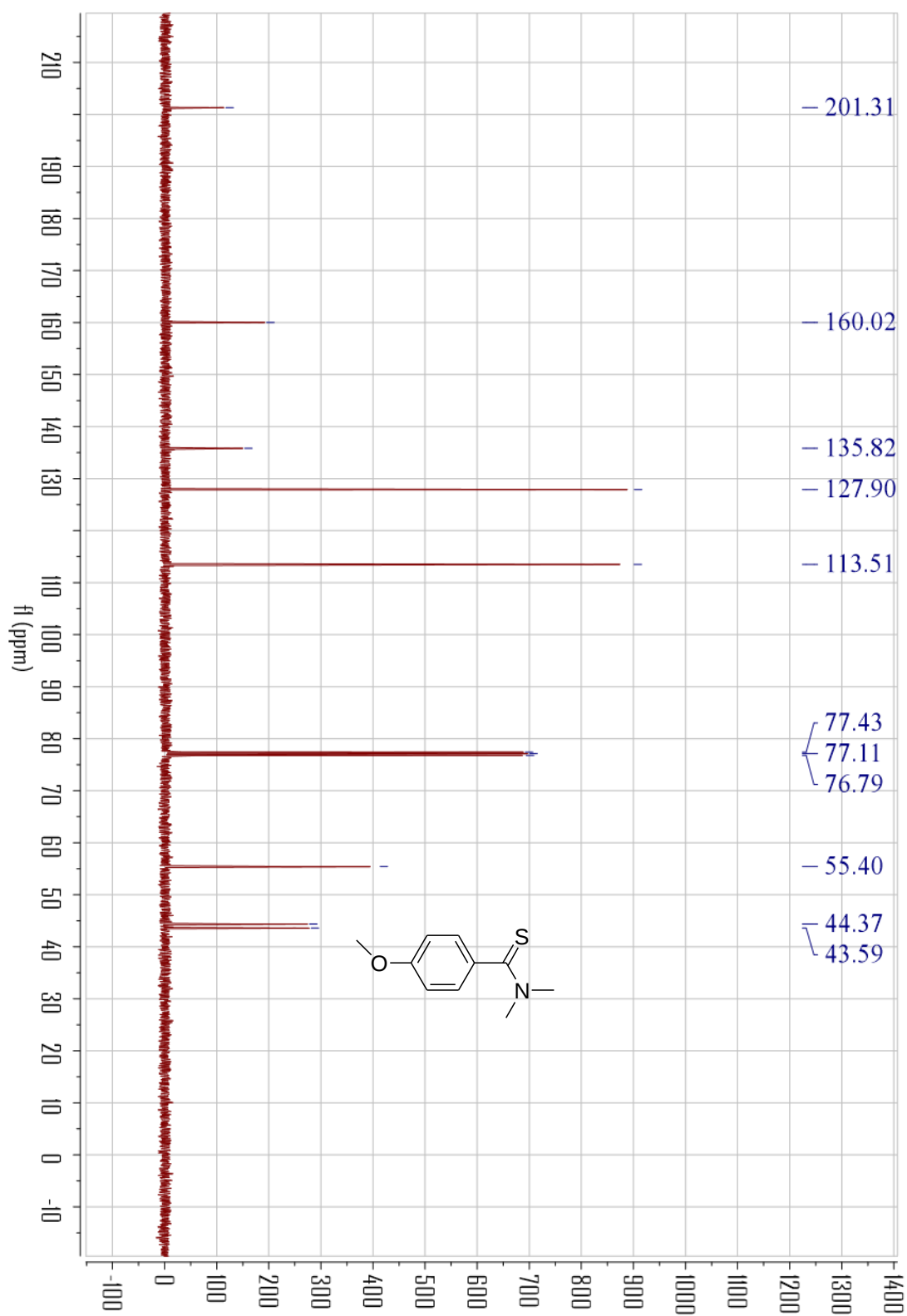
^1H NMR of *N,N*,4-trimethylbenzothioamide **3c**



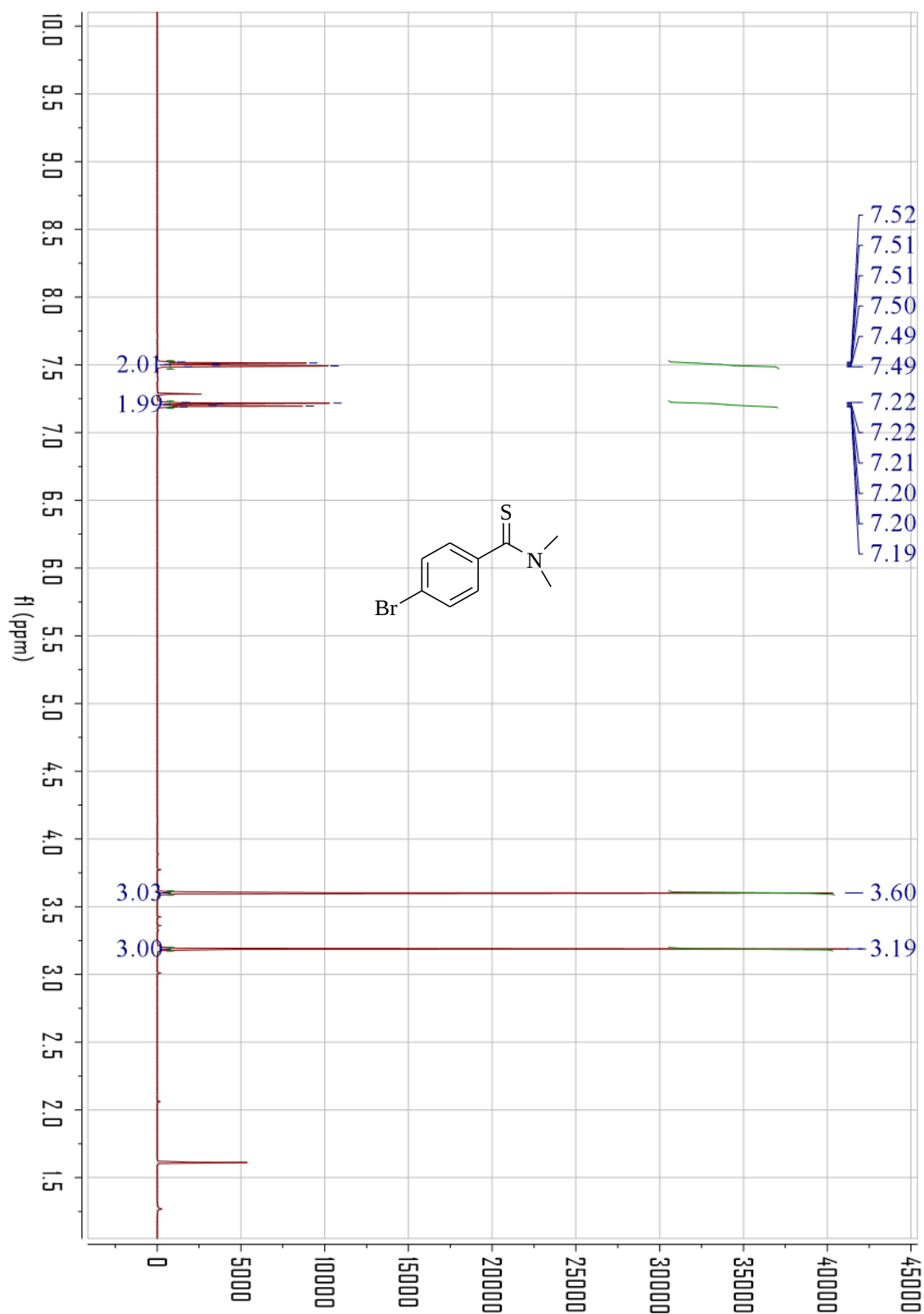
^1H NMR of 4-methoxy-*N,N*-dimethylbenzothioamide **3d**



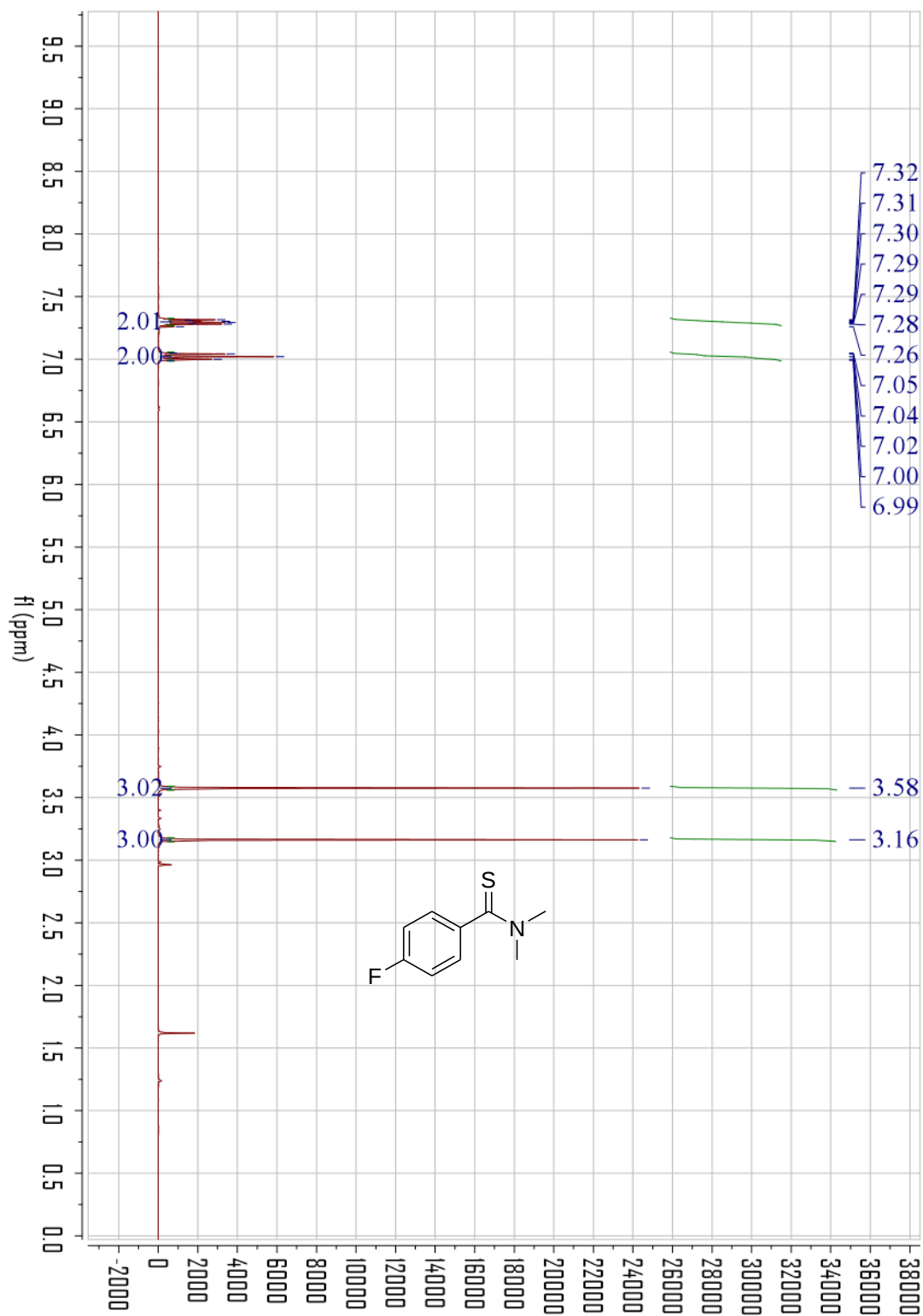
^{13}C NMR of 4-methoxy-*N,N*-dimethylbenzothioamide **3d**



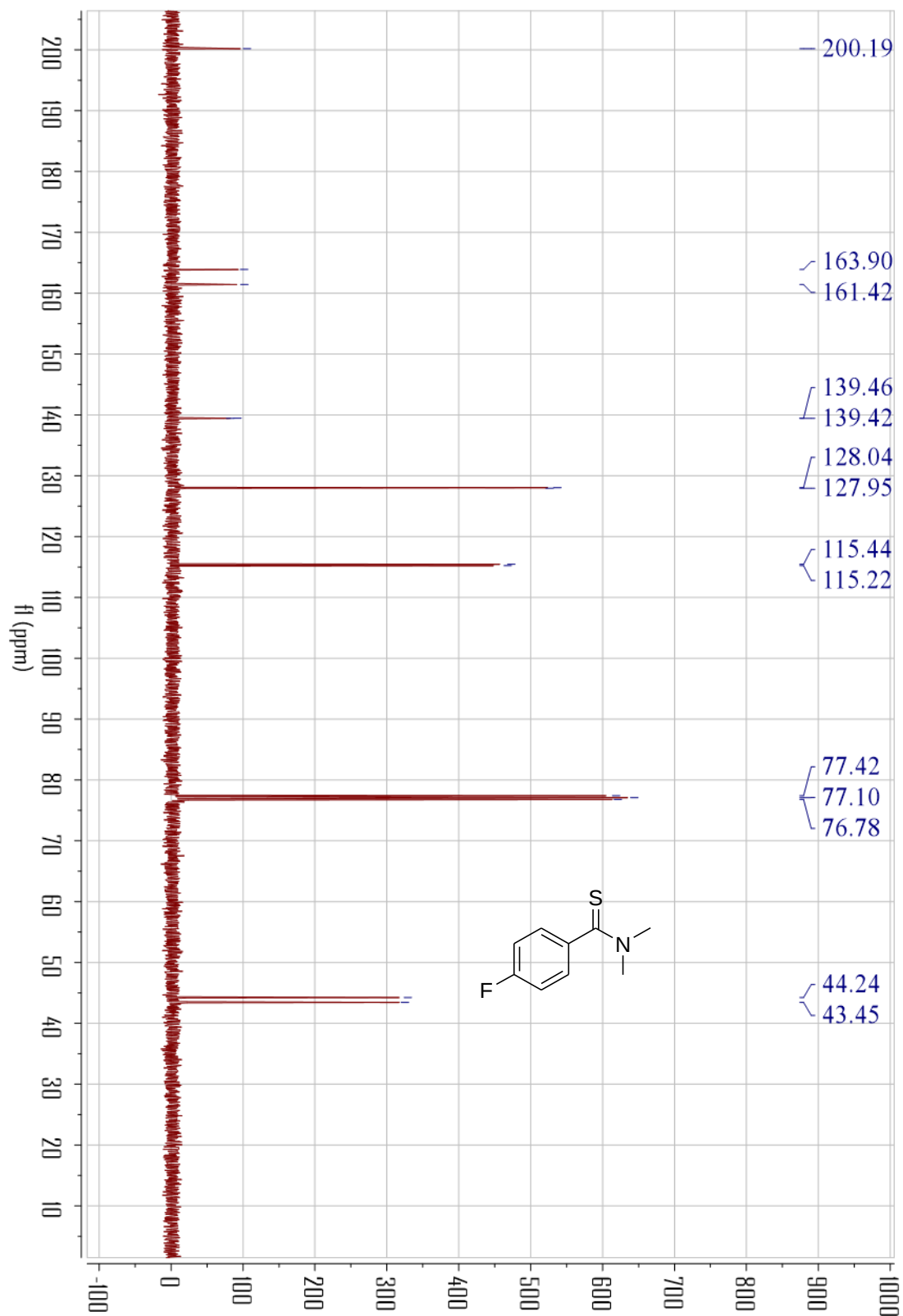
^1H NMR of 4-bromo-*N,N*-dimethylbenzothioamide **3e**



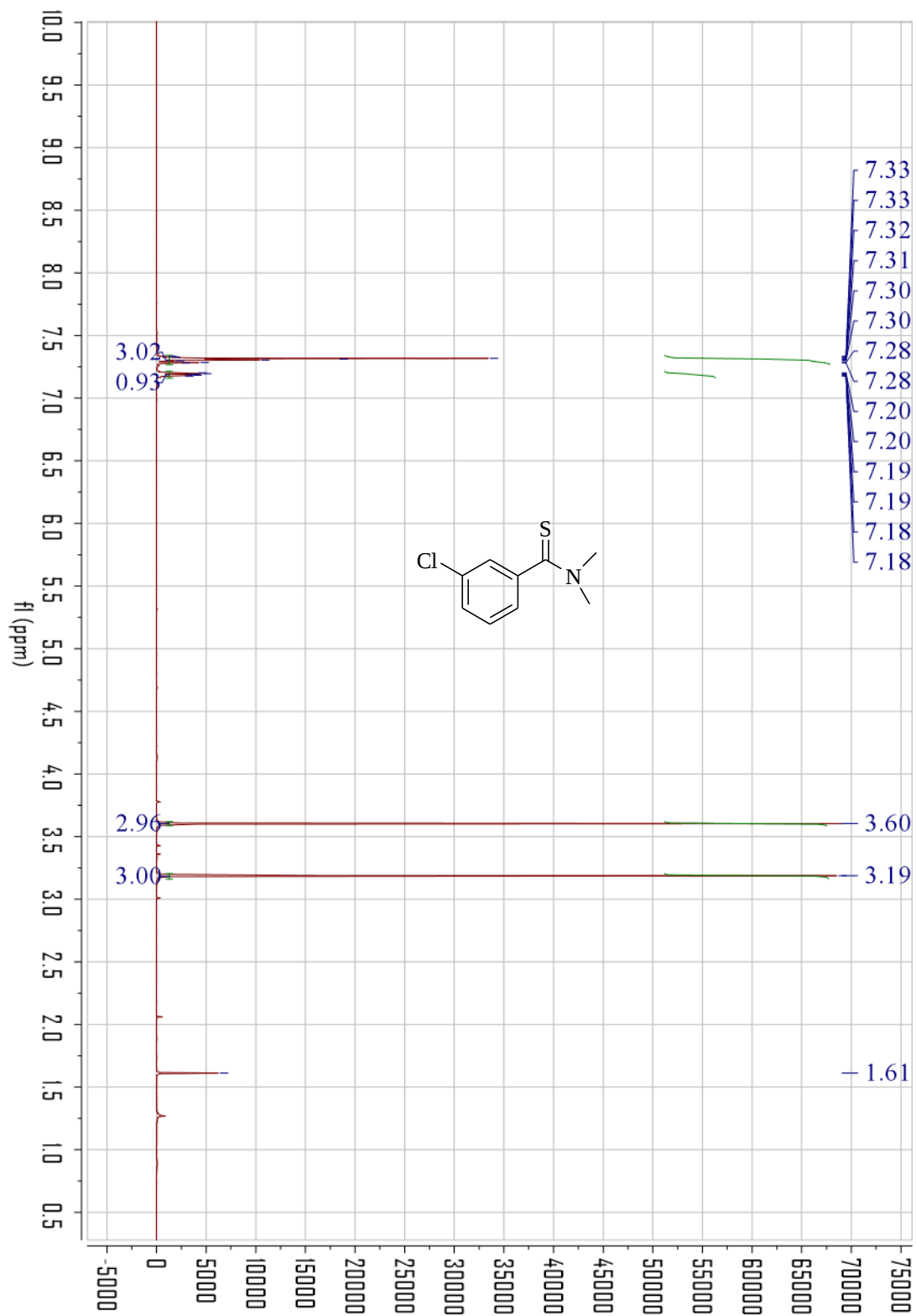
^1H NMR of 4-fluoro-*N,N*-dimethylbenzothioamide **3f**



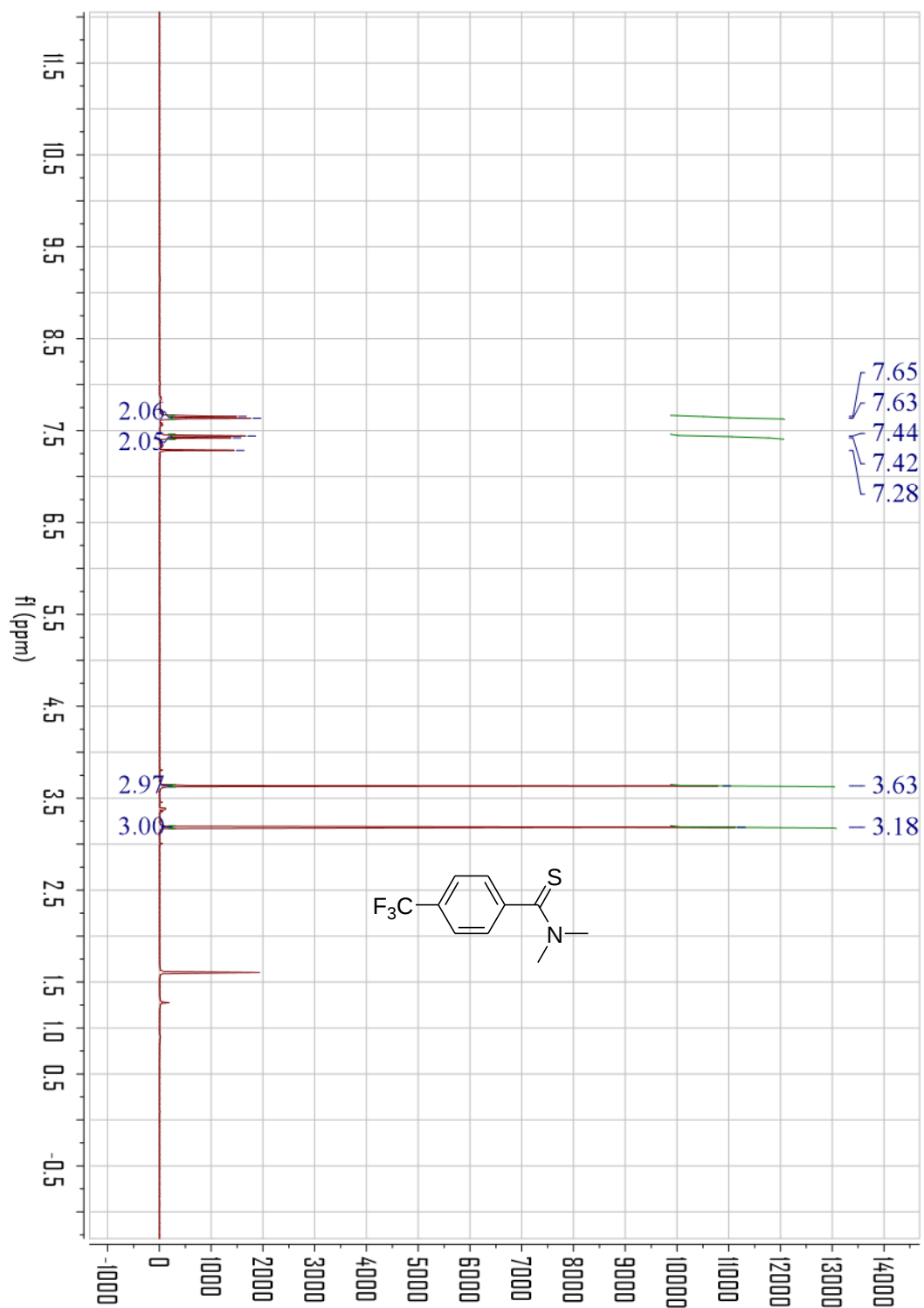
^{13}C NMR of 4-fluoro-*N,N*-dimethylbenzothioamide **3f**



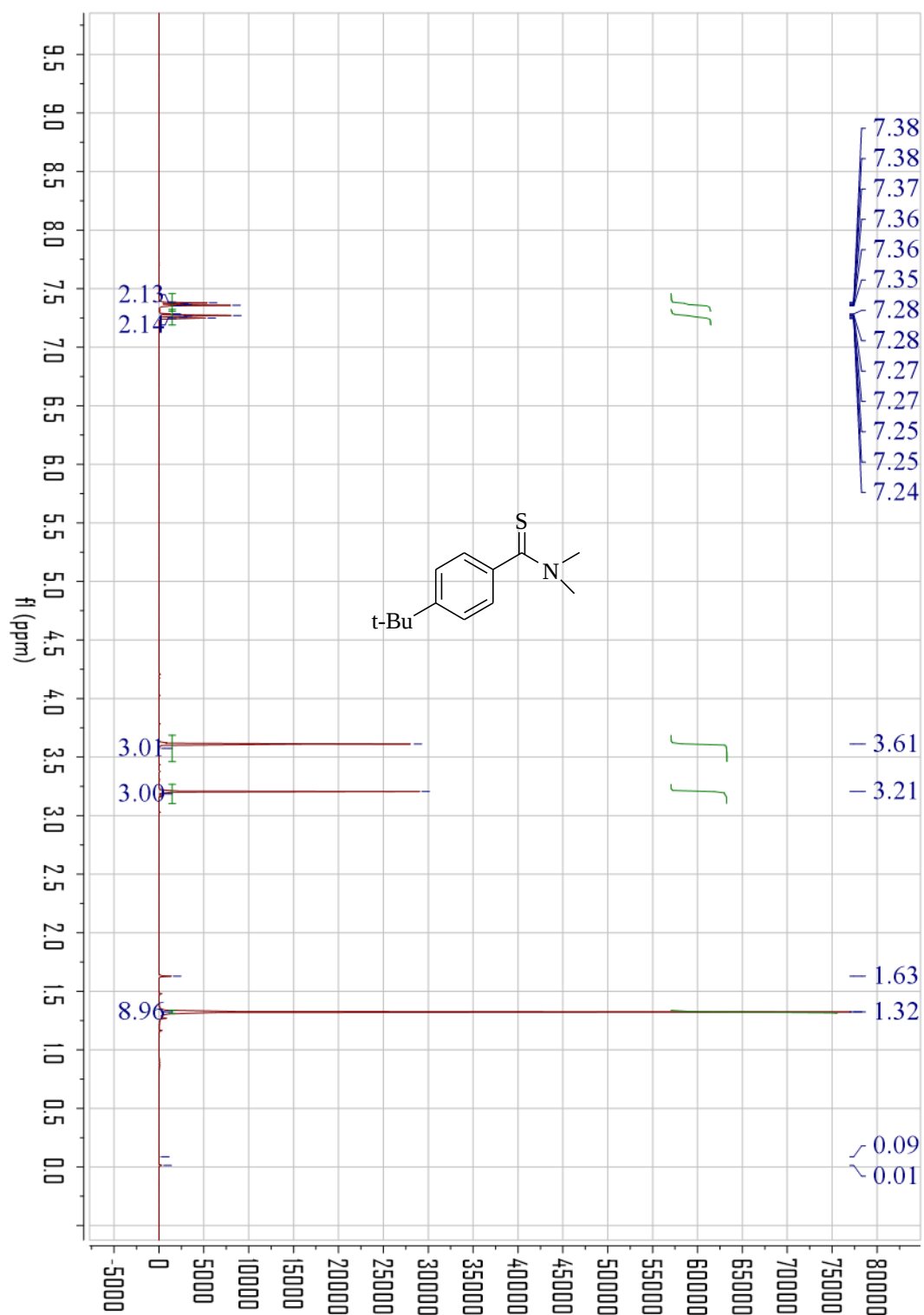
^1H NMR of 3-chloro-*N,N*-dimethylbenzothioamide **3g**



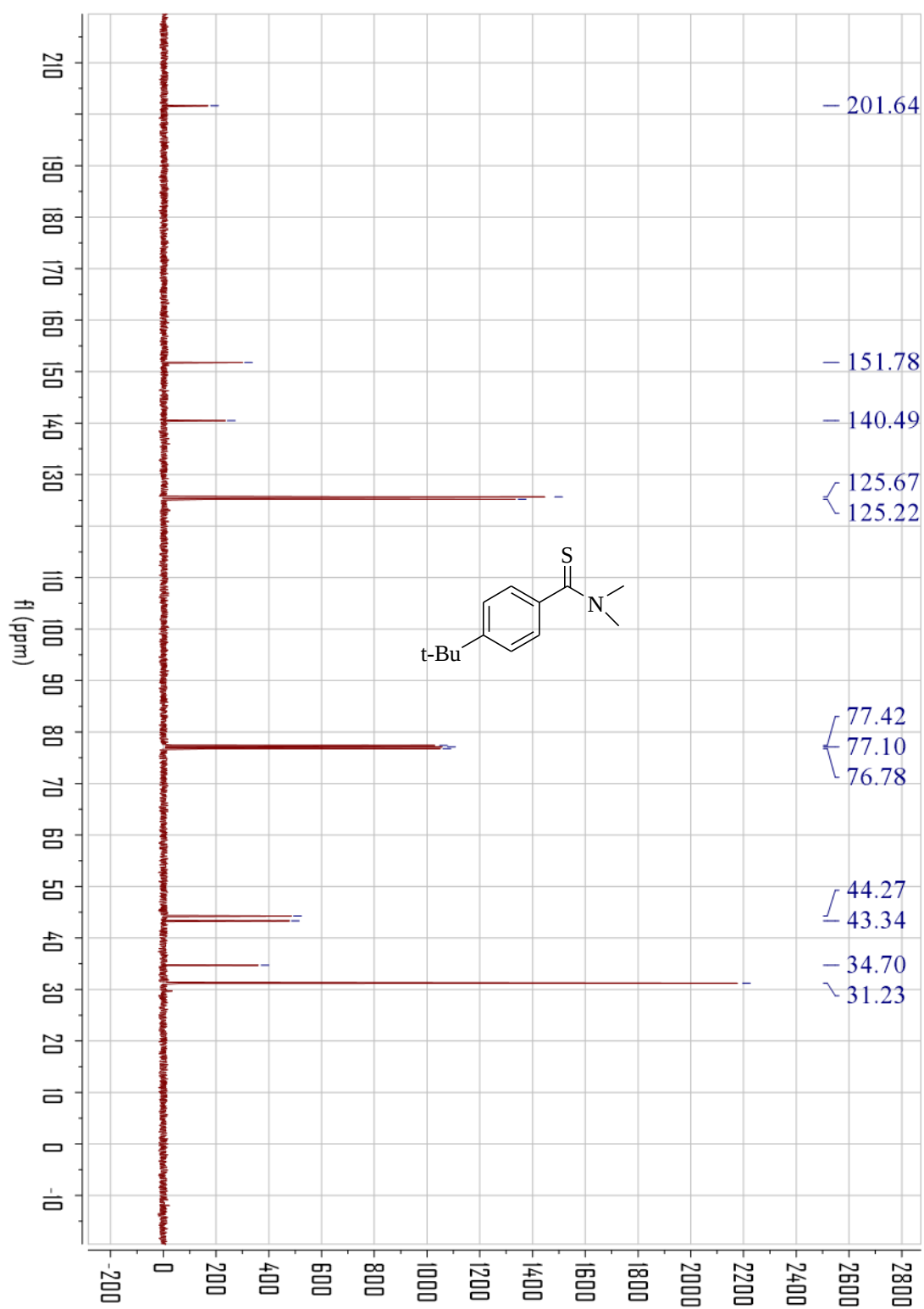
^1H NMR of 4-(trifluoromethyl)-*N,N*-dimethylbenzothioamide **3j**



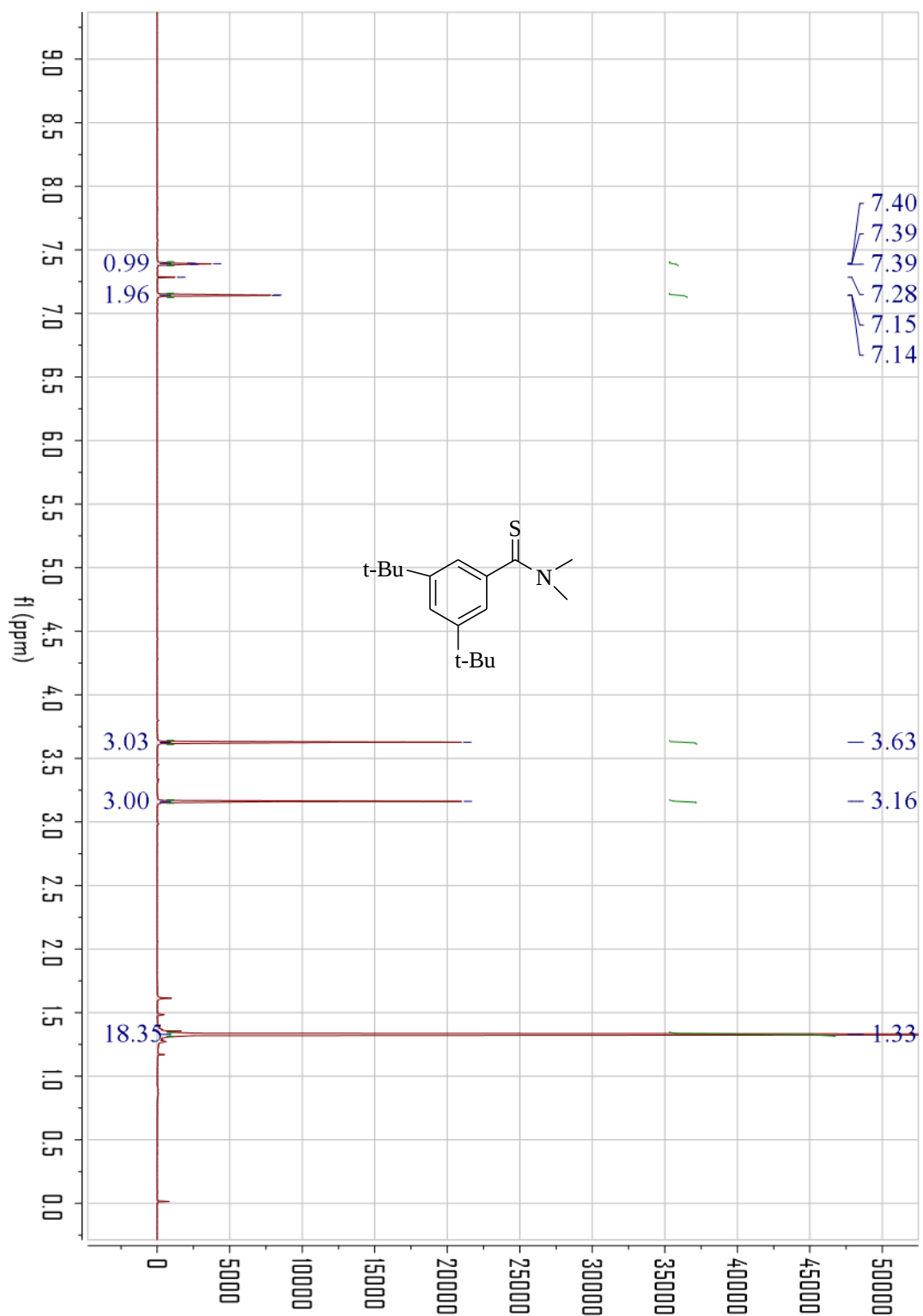
^1H NMR of 4-tert-butyl-*N,N*-dimethylbenzothioamide **3k**



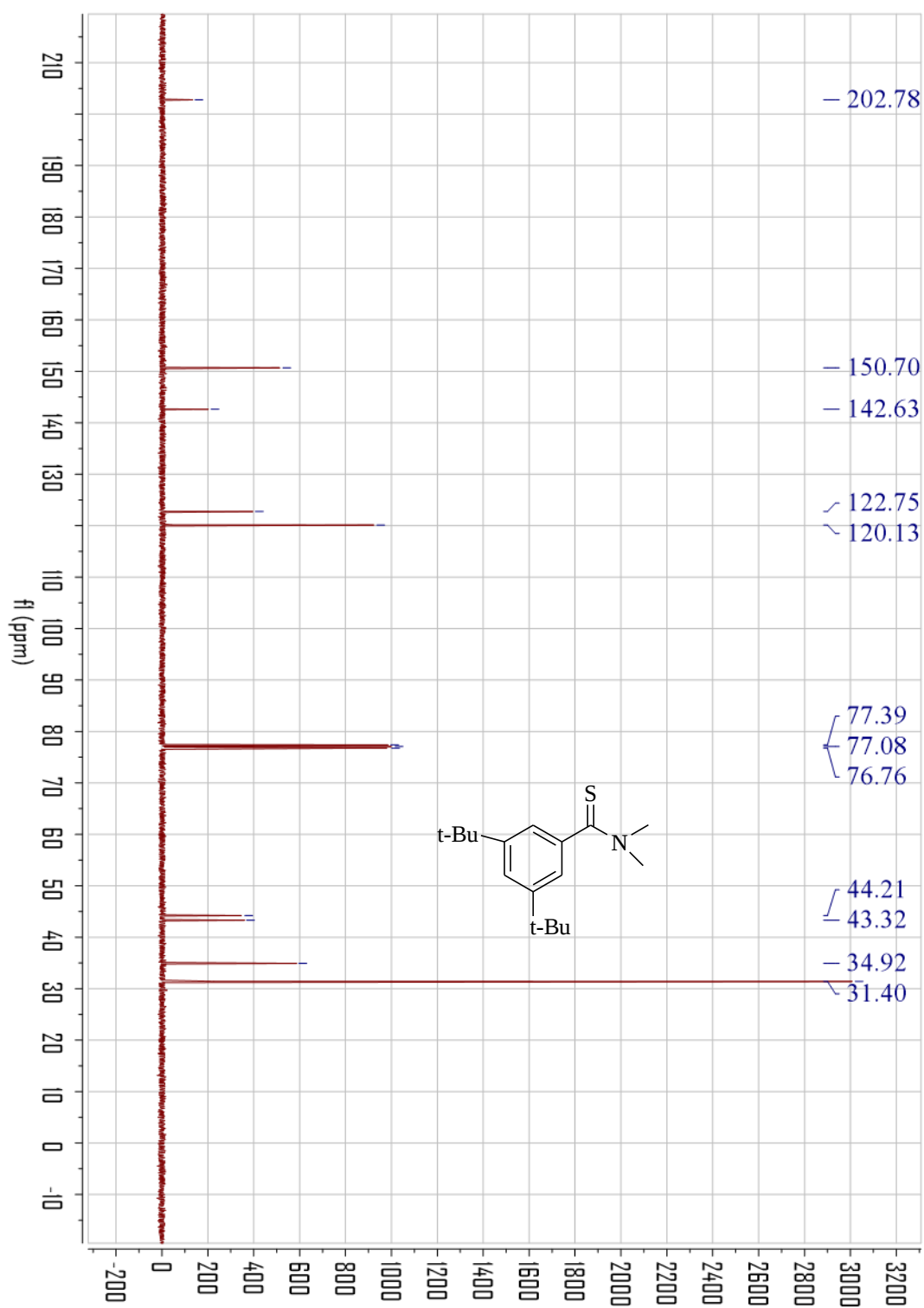
^{13}C NMR of 4-tert-butyl-*N,N*-dimethylbenzothioamide **3k**



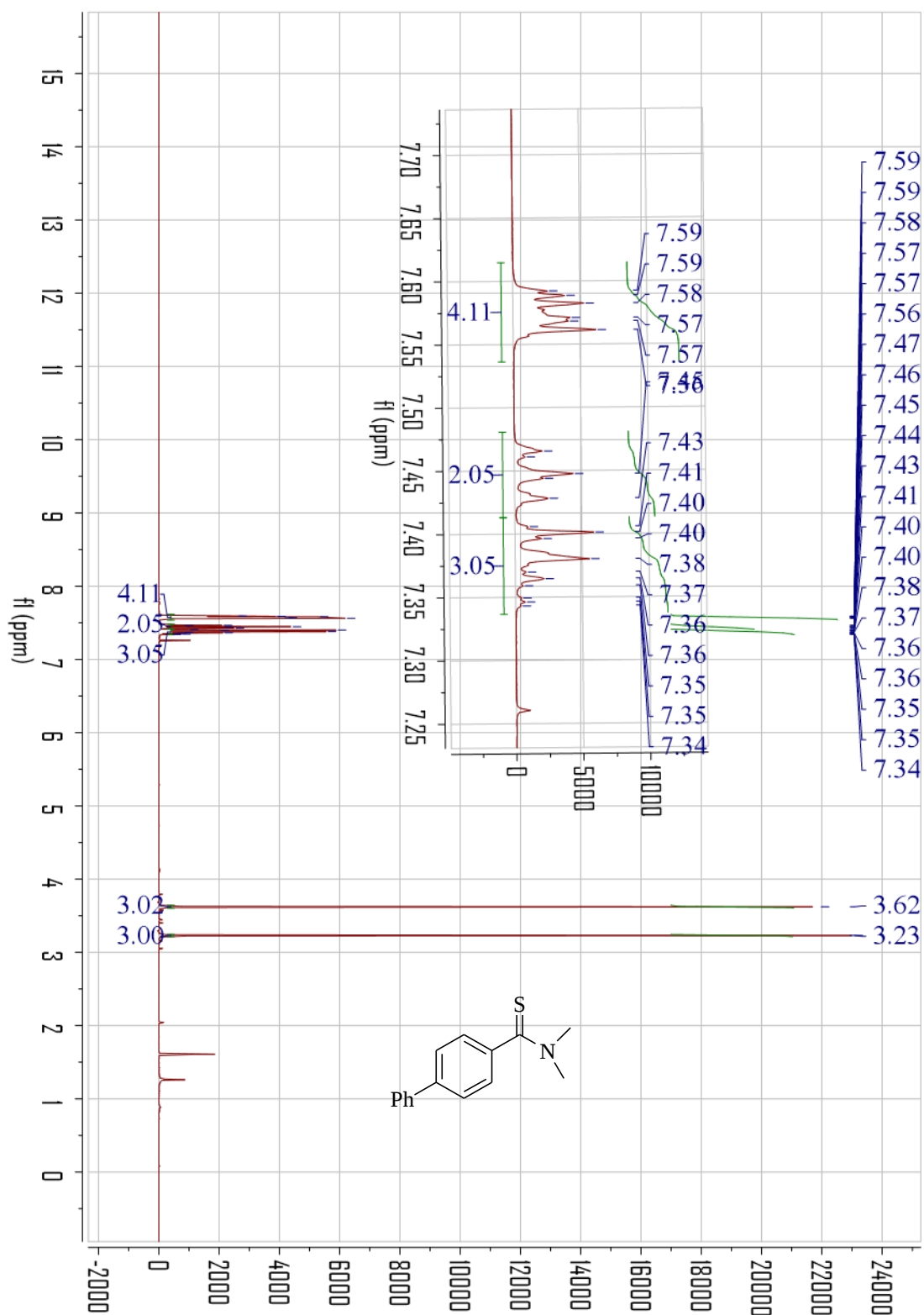
^1H NMR of 3,5-di-*tert*-butyl-*N,N*-dimethylbenzothioamide **3l**



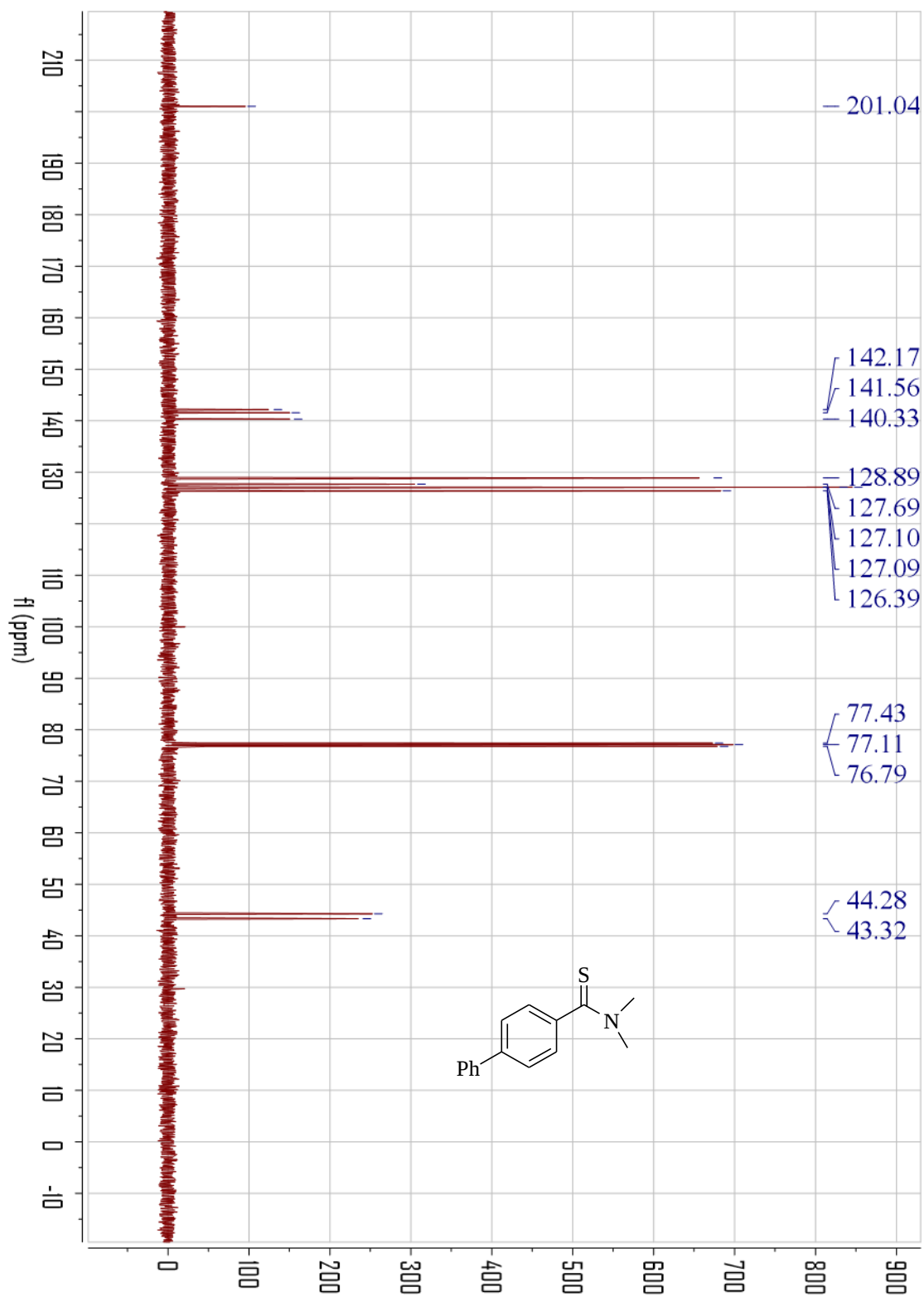
^{13}C NMR of 3,5-di-*tert*-butyl-*N,N*-dimethylbenzothioamide **3l**



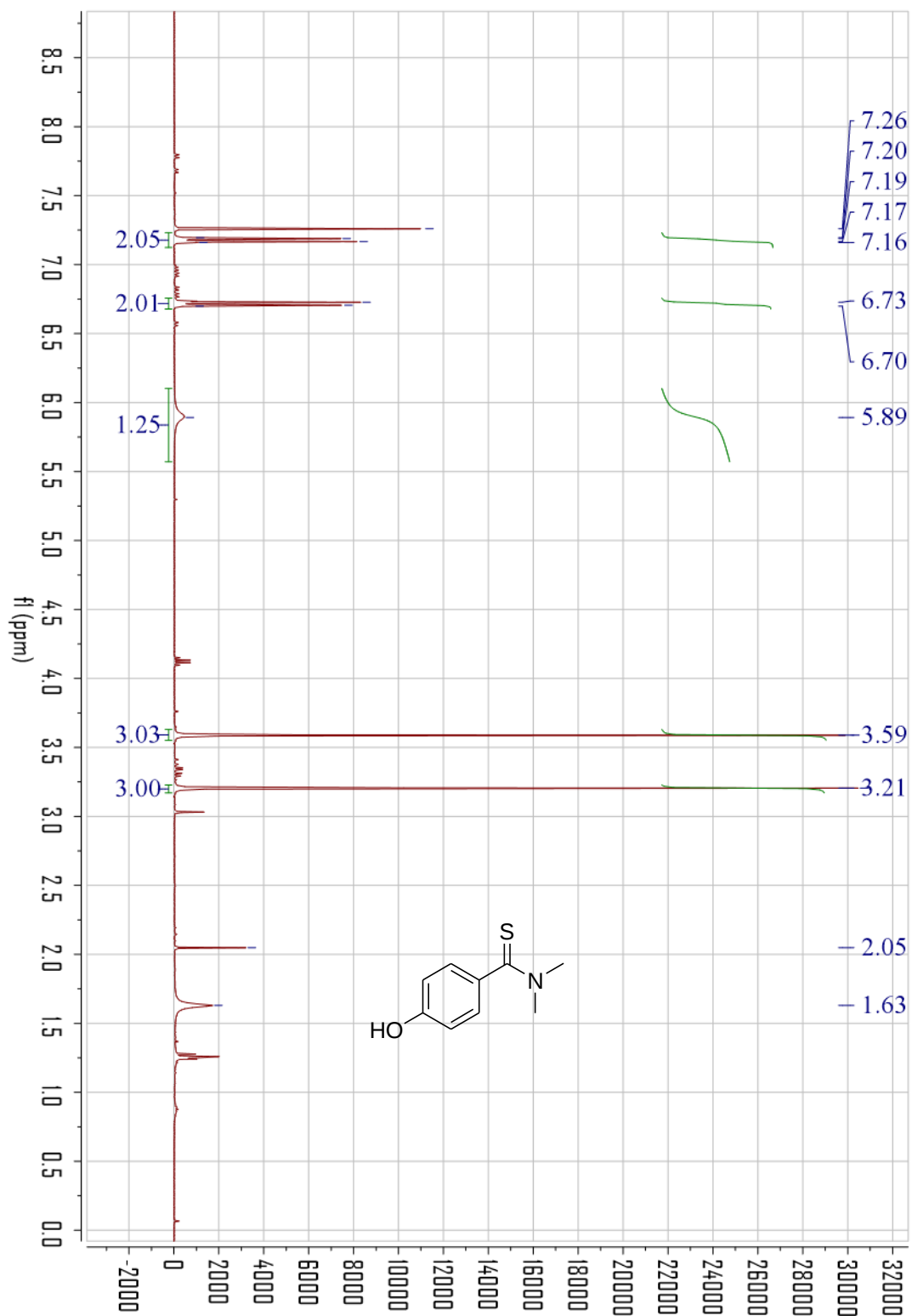
^1H NMR of 4-benzyl-*N,N*-dimethylbenzothioamide **3n**



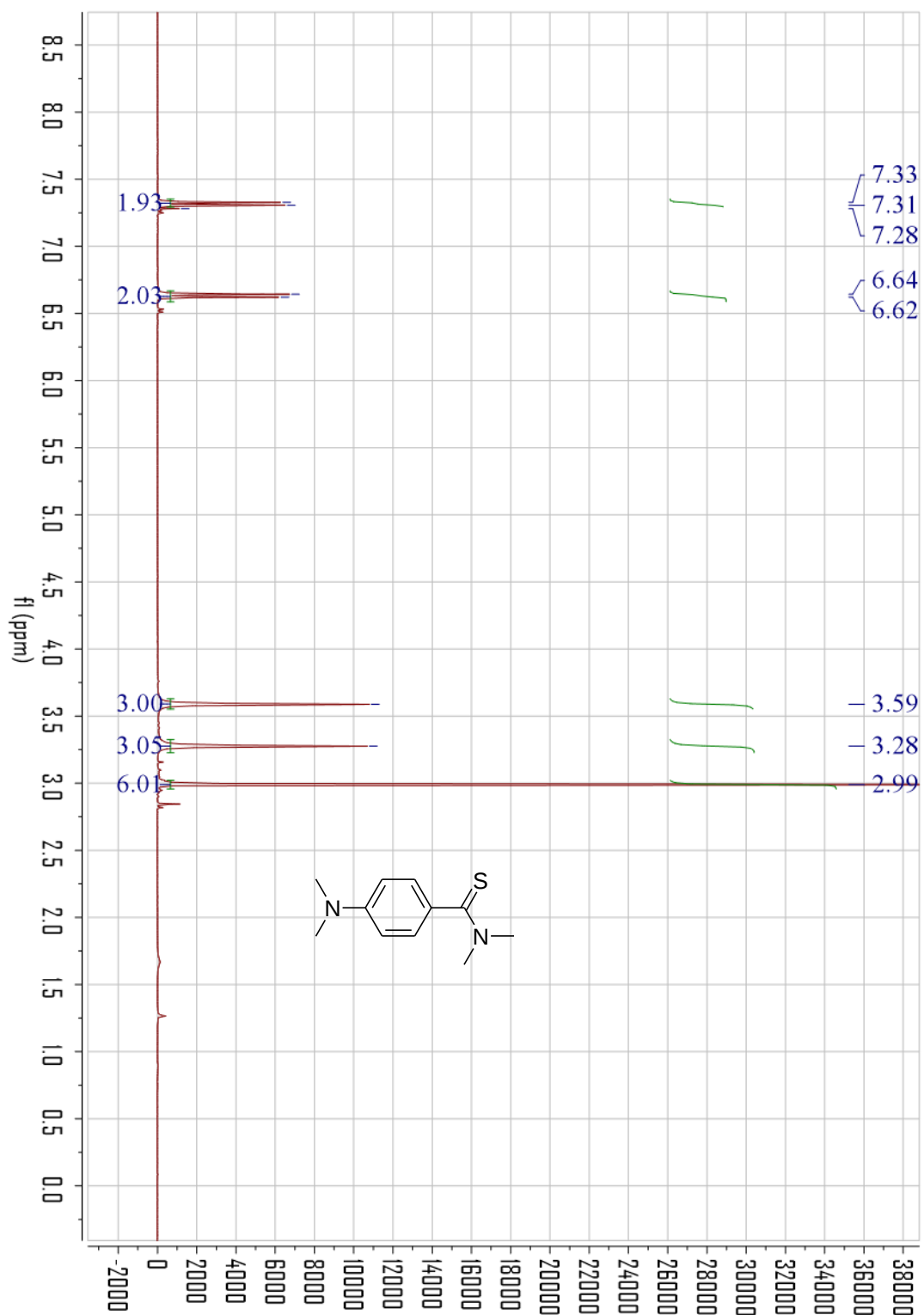
^{13}C NMR of 4-benzyl-*N*, *N*-dimethylbenzothioamide **3n**



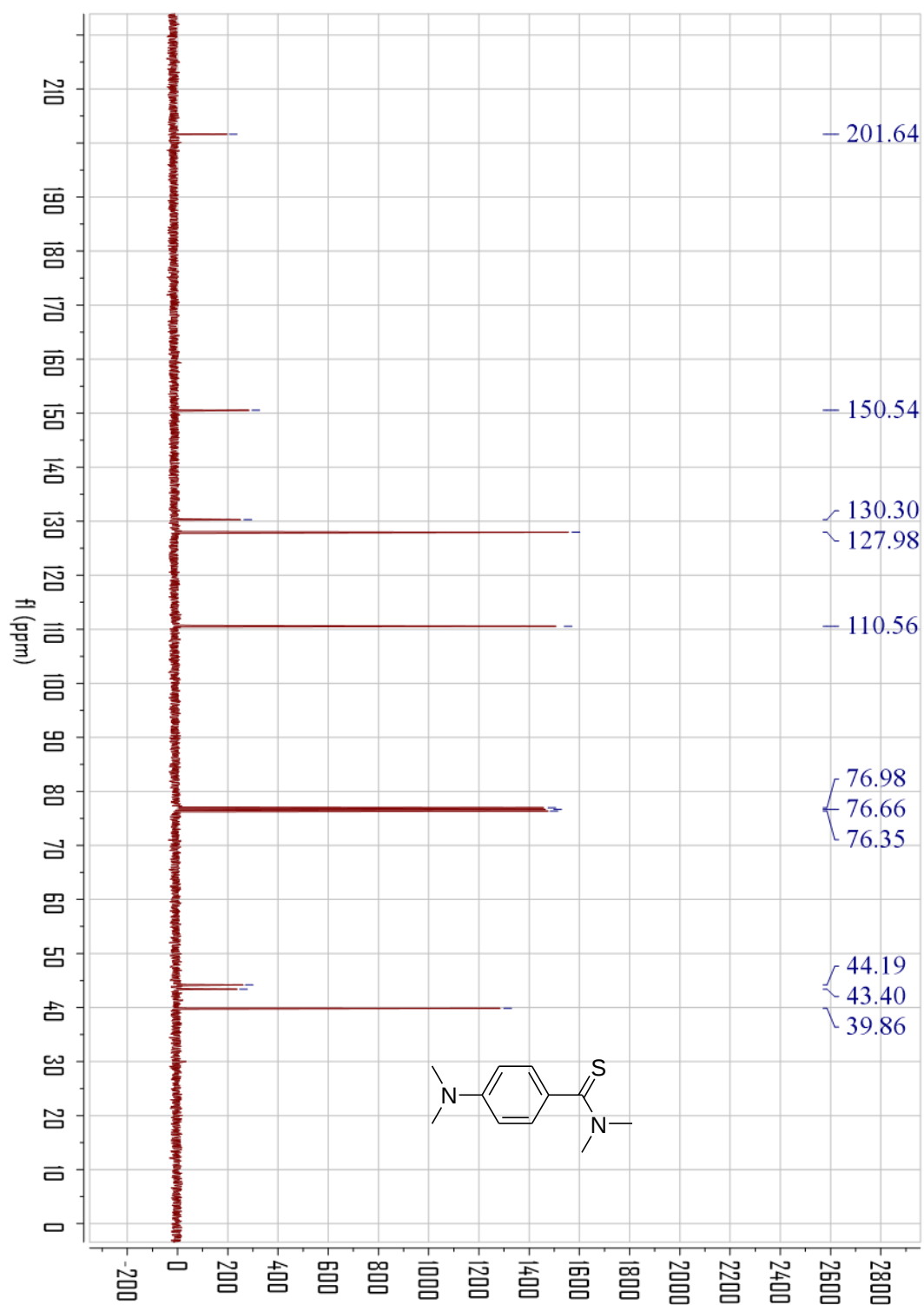
^1H NMR of 4-hydroxy-*N,N*-dimethylbenzothioamide **3o**



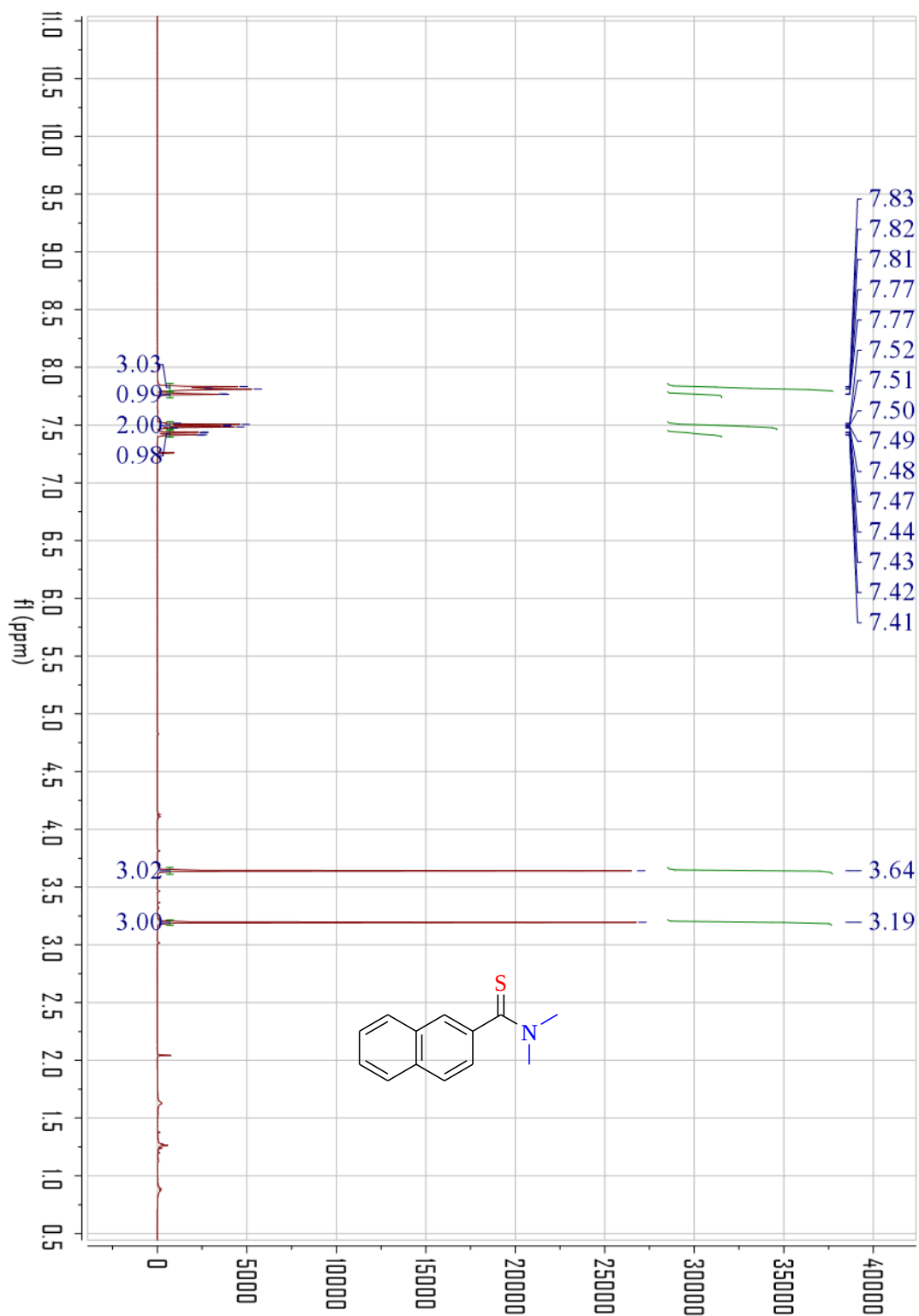
^1H NMR of 4-(dimethylamino)-*N,N*-dimethylbenzothioamide **3p**



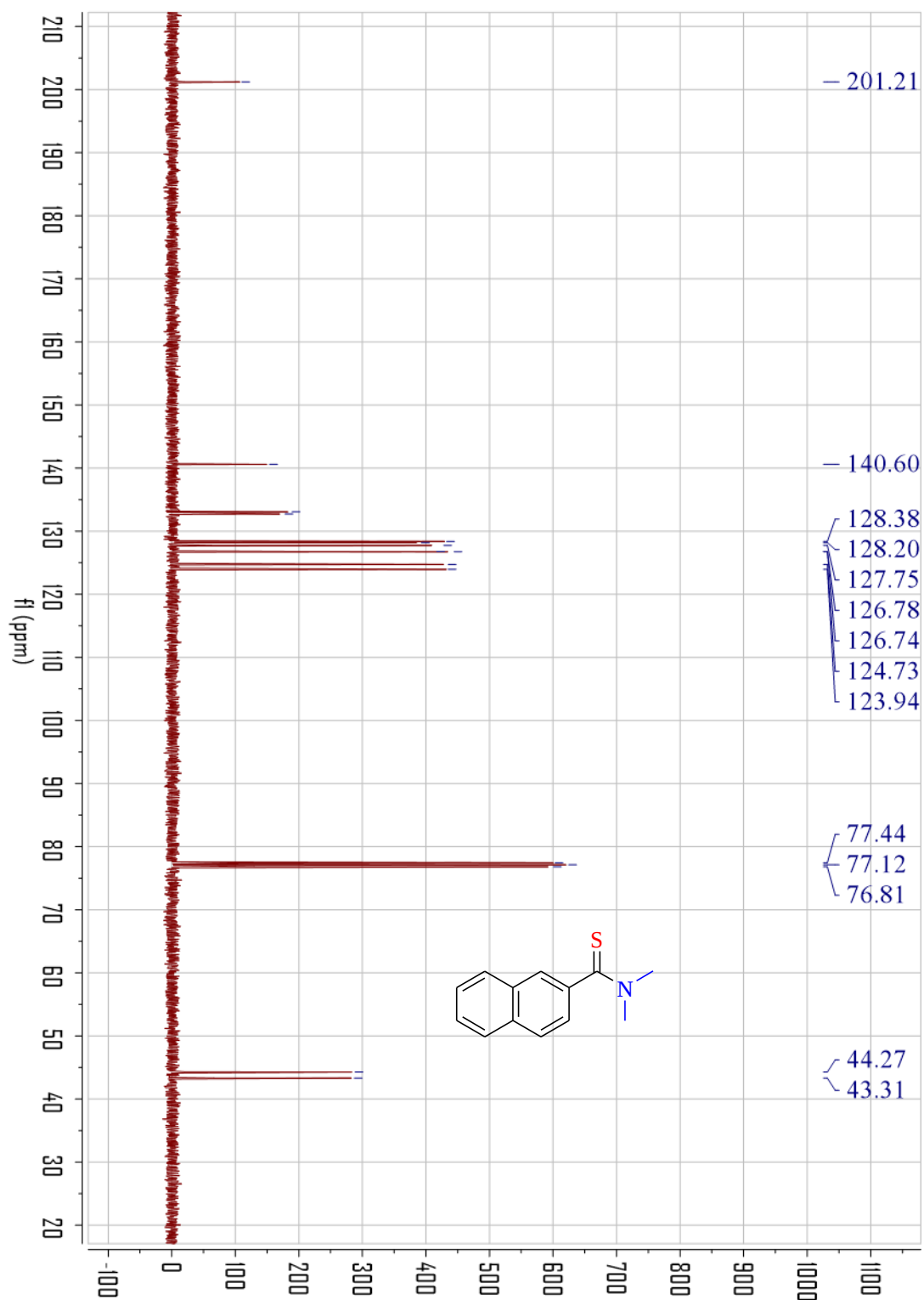
^{13}C NMR of 4-(dimethylamino)-*N,N*-dimethylbenzothioamide **3p**



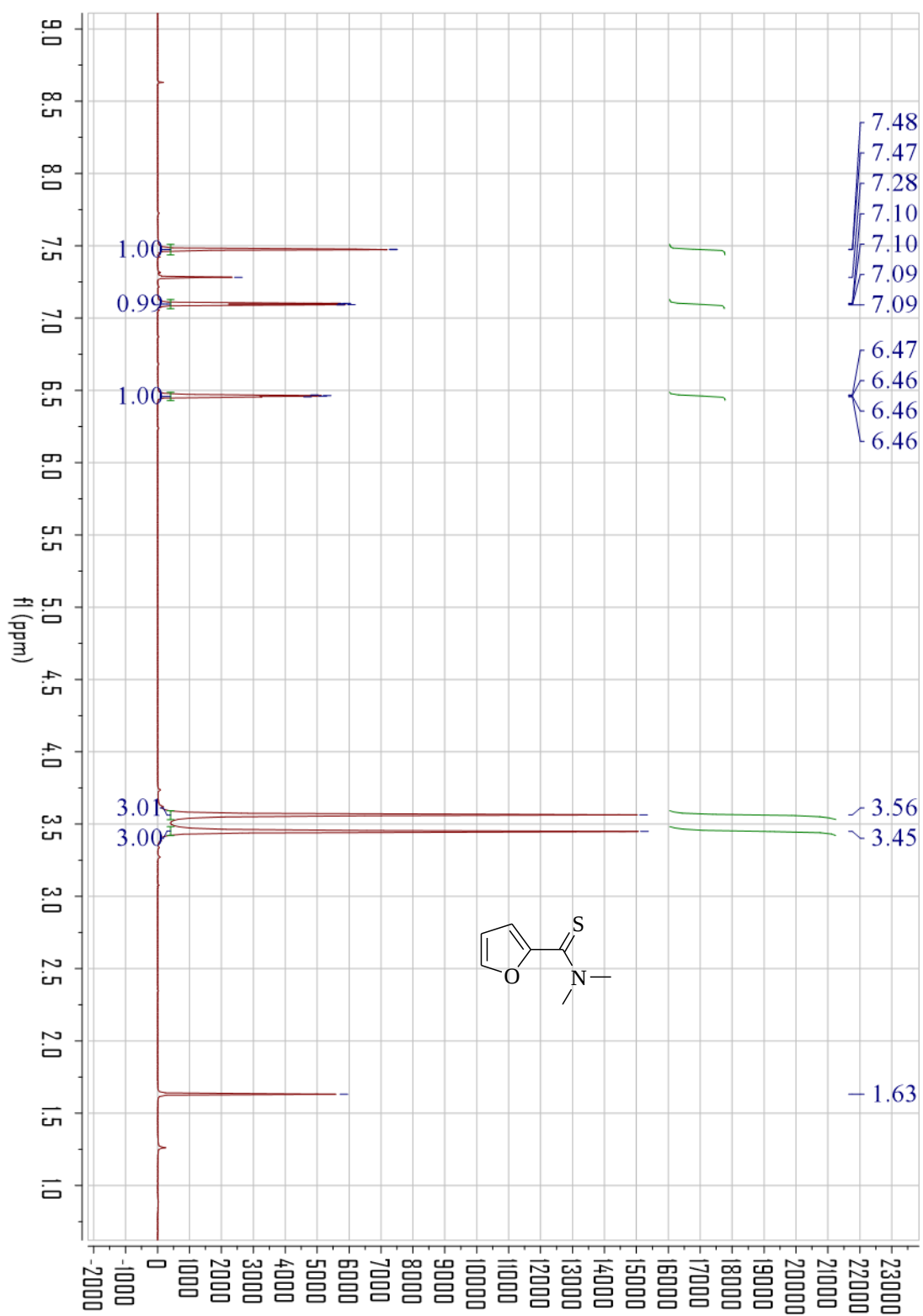
^1H NMR of *N,N*-dimethylnaphthalene-2-carbothioamide **3q**



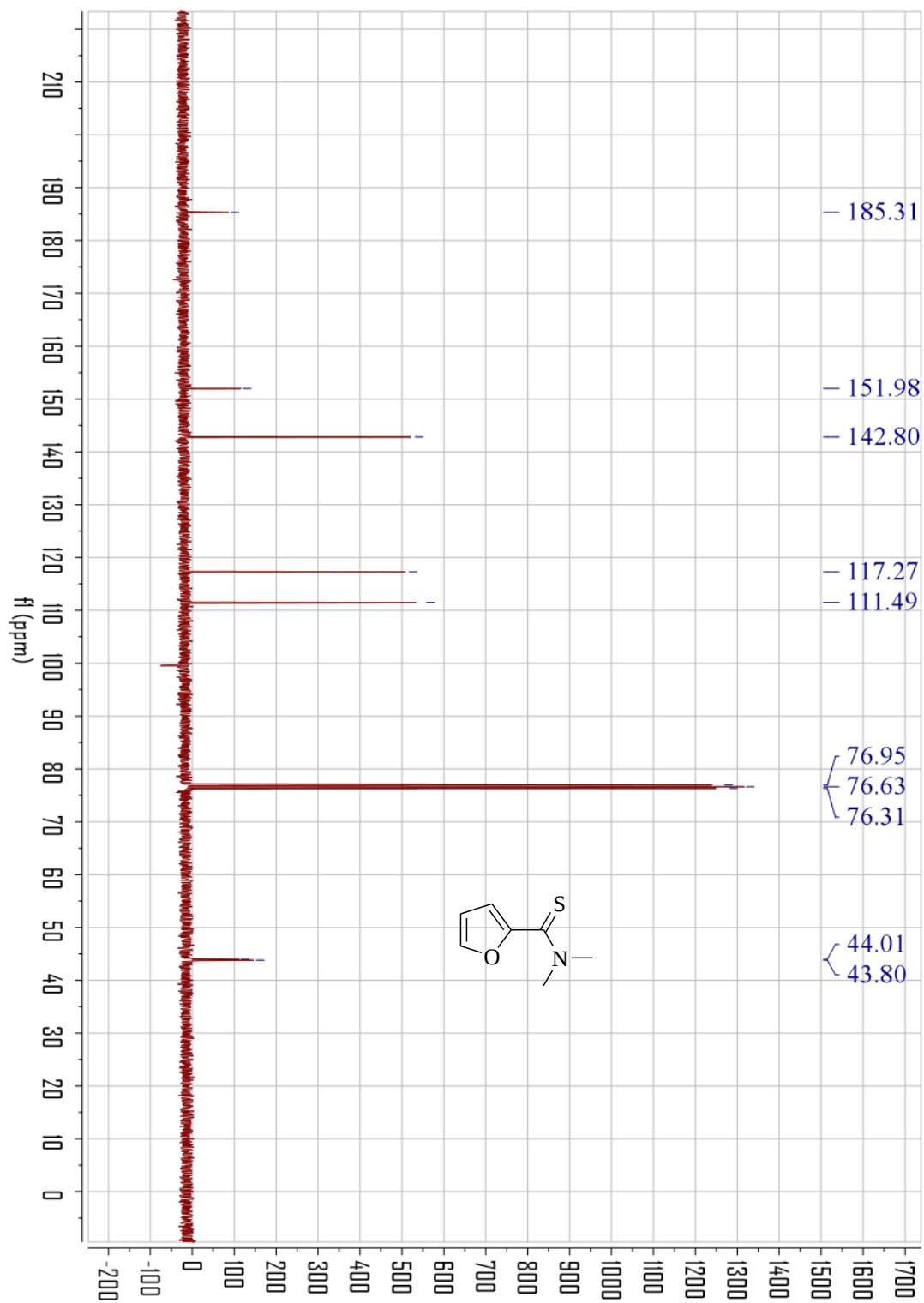
^{13}C NMR of *N,N*-dimethylnaphthalene-2-carbothioamide **3q**



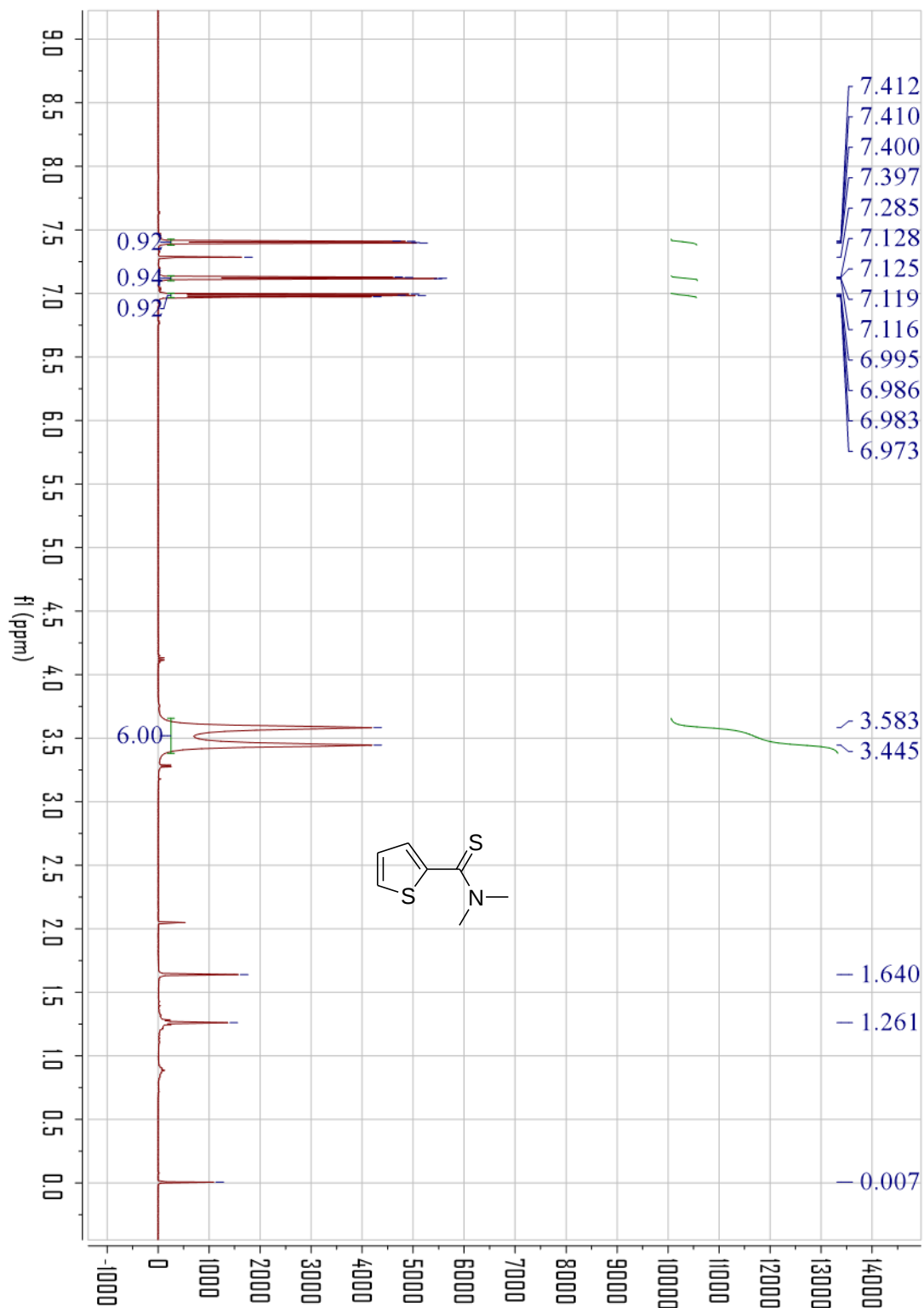
^1H NMR of *N,N*-dimethylfuran-2-carbothioamide **3s**



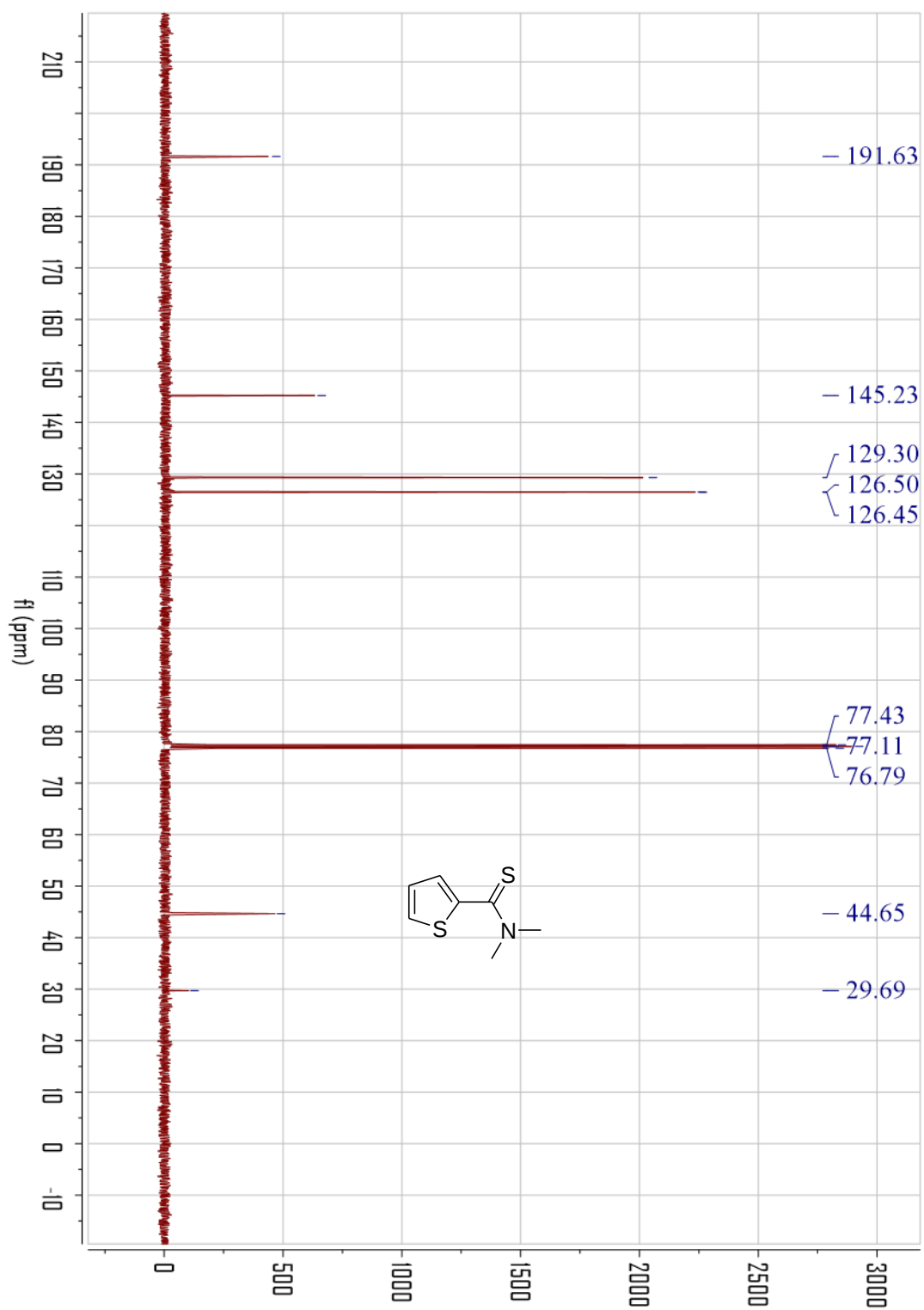
^{13}C NMR of *N,N*-dimethylfuran-2-carbothioamide **3s**



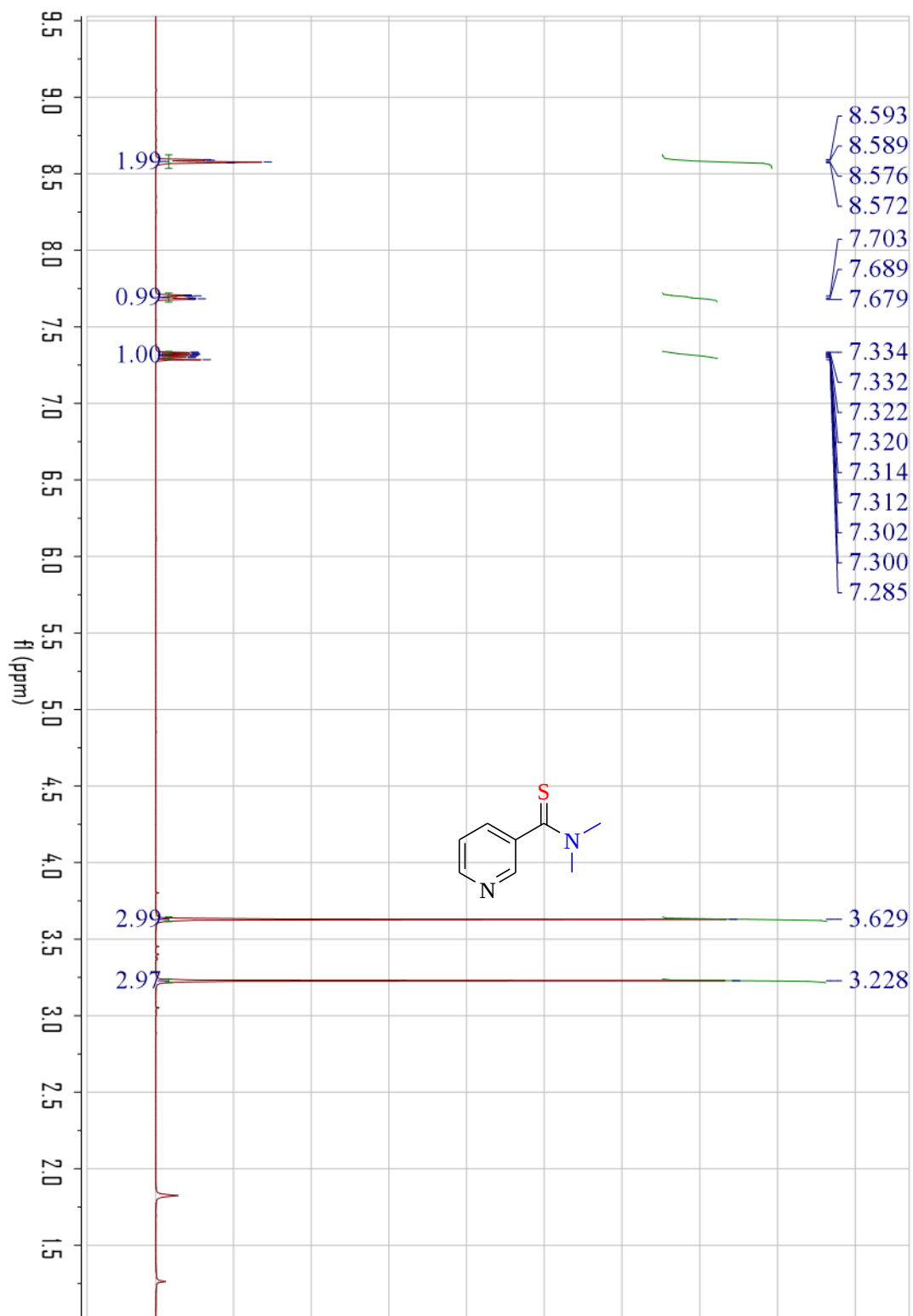
^1H NMR of *N,N*-dimethylthiophene-2-carbothioamide **3t**



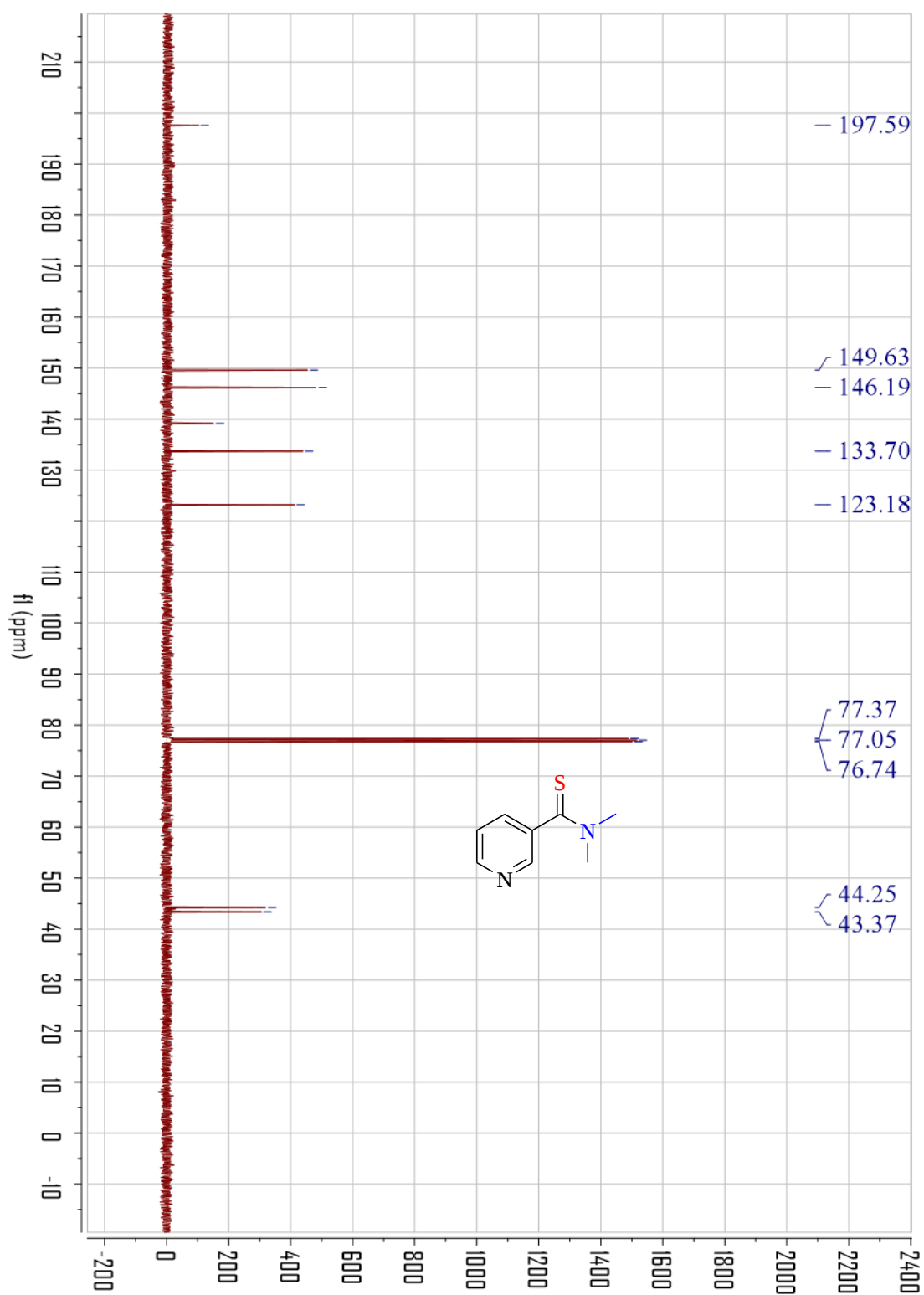
^{13}C NMR of *N,N*-dimethylthiophene-2-carbothioamide **3t**



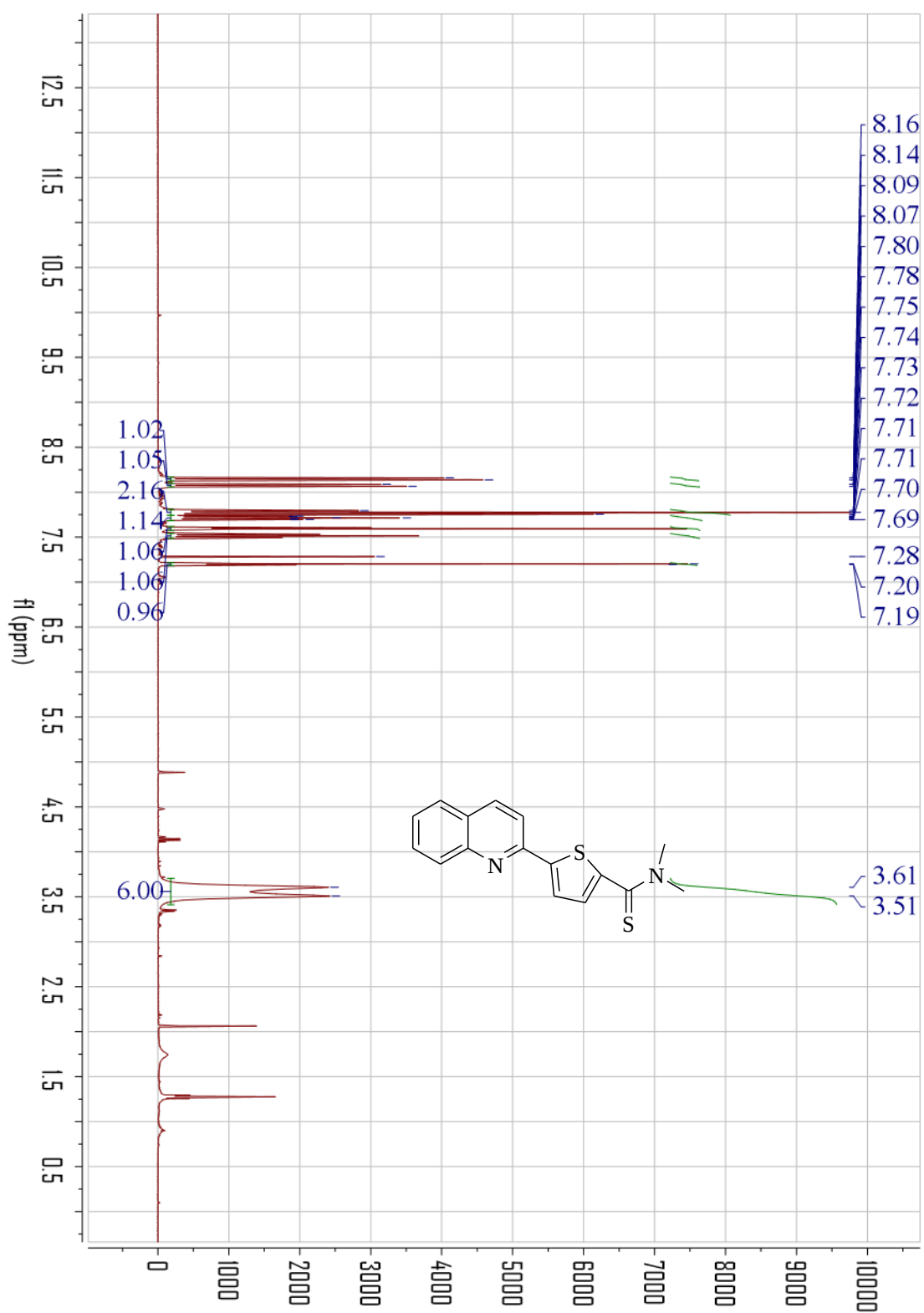
^1H NMR of *N,N*-dimethylpyridine-3-carbothioamide **3u**



^{13}C NMR of *N,N*-dimethylpyridine-3-carbothioamide **3u**



^1H NMR of *N,N*-dimethyl-5-(quinolin-2-yl)thiophene-2-carbothioamide **3v**



^{13}C NMR of *N,N*-dimethyl-5-(quinolin-2-yl)thiophene-2-carbothioamide **3v**

