

**Synthesis and Properties of 1,3-Disubstituted Ureas Containing (Adamantan-1-yl)(phenyl)methyl Fragment Based on One-Pot Direct Adamantane Moiety Inclusion**

**Vladimir Dyachenko<sup>1,2</sup>, Dmitry Danilov<sup>1</sup>, Yaroslav Kuznetsov<sup>1</sup>, Semyon Moiseev<sup>2</sup>, Vladimir Mokhov<sup>1</sup>, Vladimir Burmistrov<sup>1,2\*</sup> and Gennady Butov<sup>1,2</sup>**

**1** Department of Technology of Organic and Petrochemical Synthesis, Volgograd State Technical University (VSTU), 28 Lenin Avenue, Volgograd 400005, Russia; gmbutov@mail.ru (G.B.)

**2** Volzhsky Polytechnic Institute (Branch), Volgograd State Technical University (VSTU), 42a Engels Street, Volzhsky 404121, Russia

\* Correspondence: vburmistrov@vstu.ru

## **Supplementary materials**

**$^1\text{H}$  NMR,  $^{13}\text{C}$  NMR,  $^{19}\text{F}$  NMR and Mass spectra**

Figure S1. Chromatogram of compound 3b

Abundance

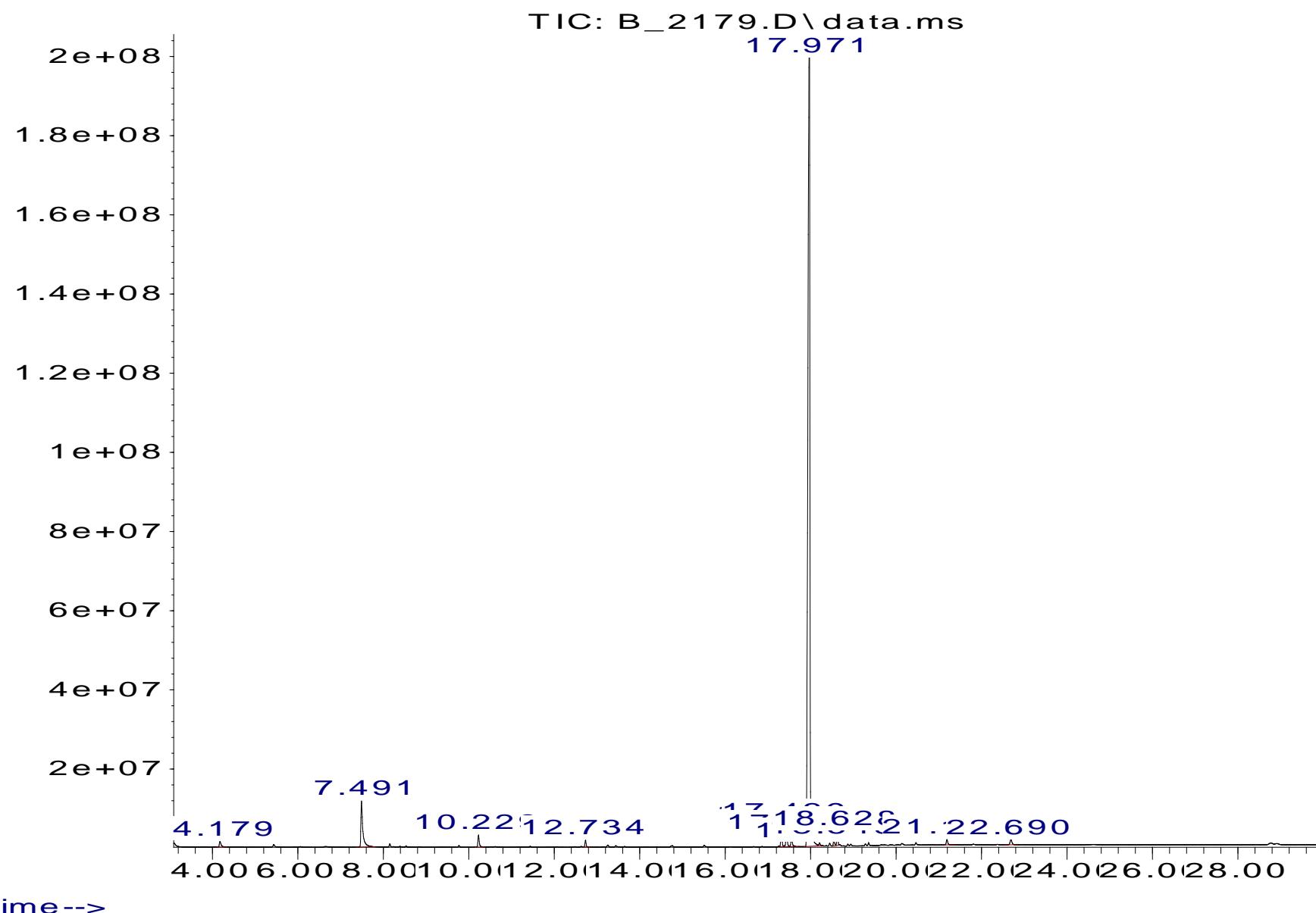
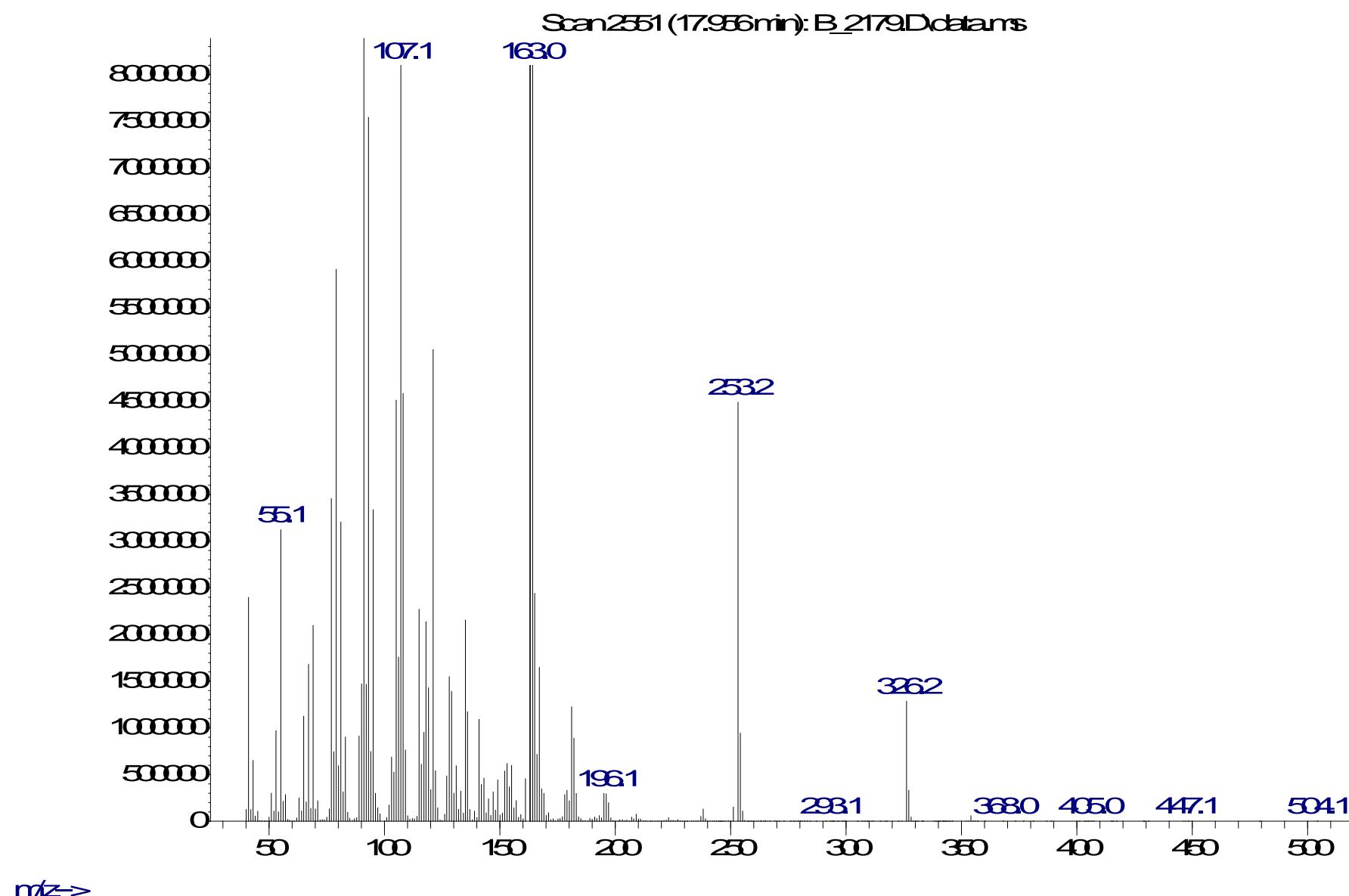


Figure S2. Mass spectrum of compound 3b

Abundance



**Figure S3. Chromatogram of compound 4b**

A b u n d a n c e

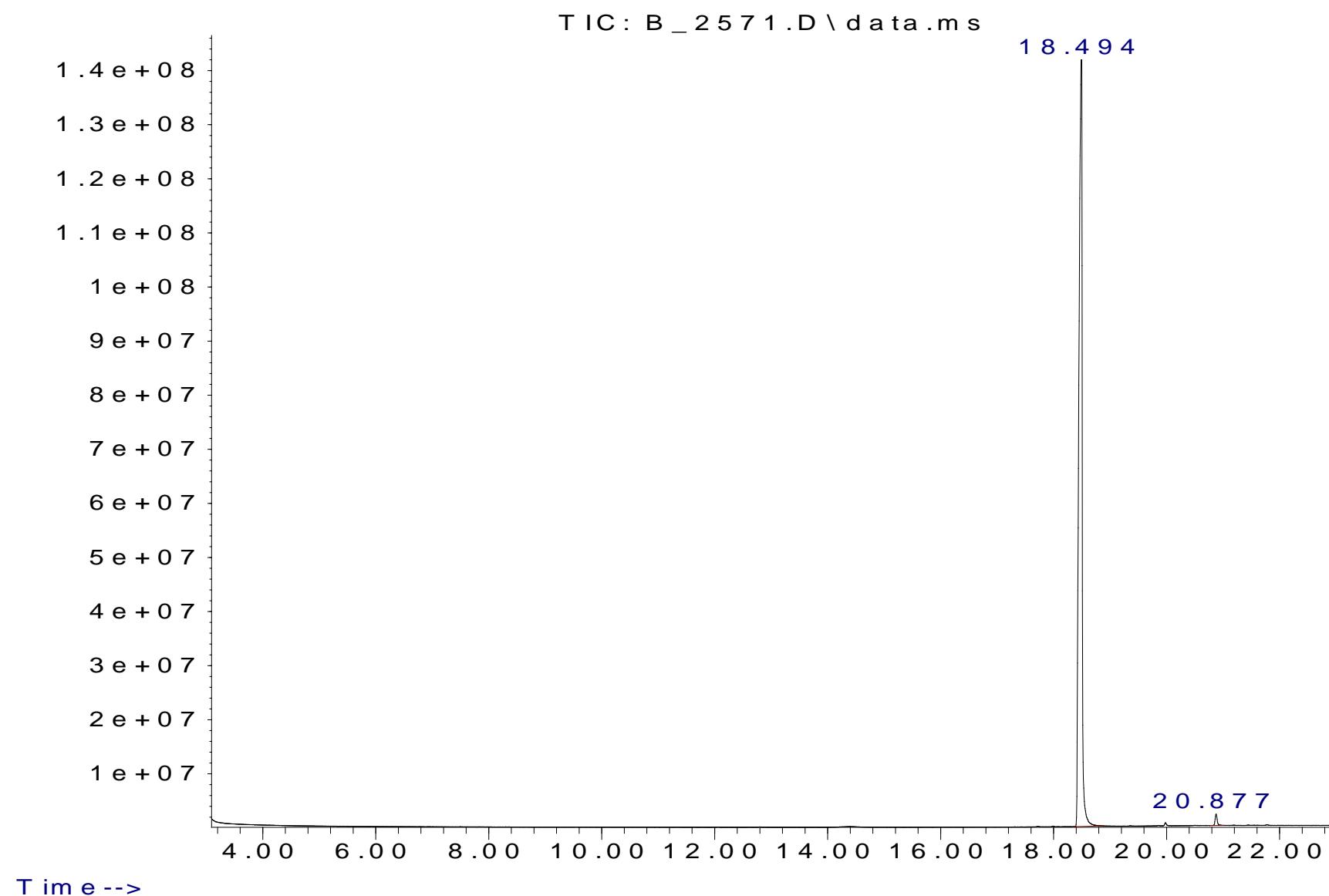


Figure S4. Mass spectrum of compound 4b

Abundance

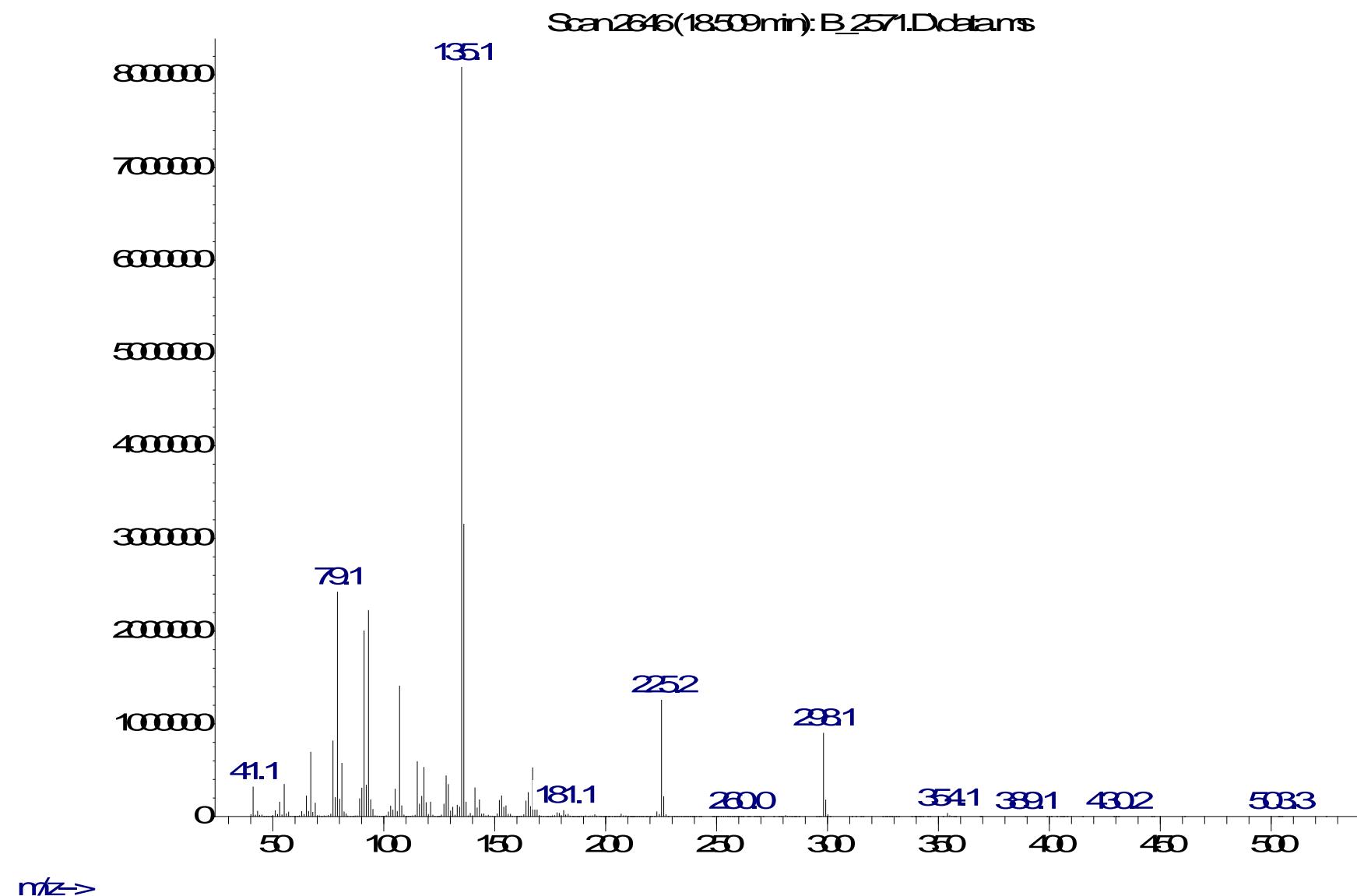


Figure S5. Chromatogram of compound 5b

A b u n d a n c e

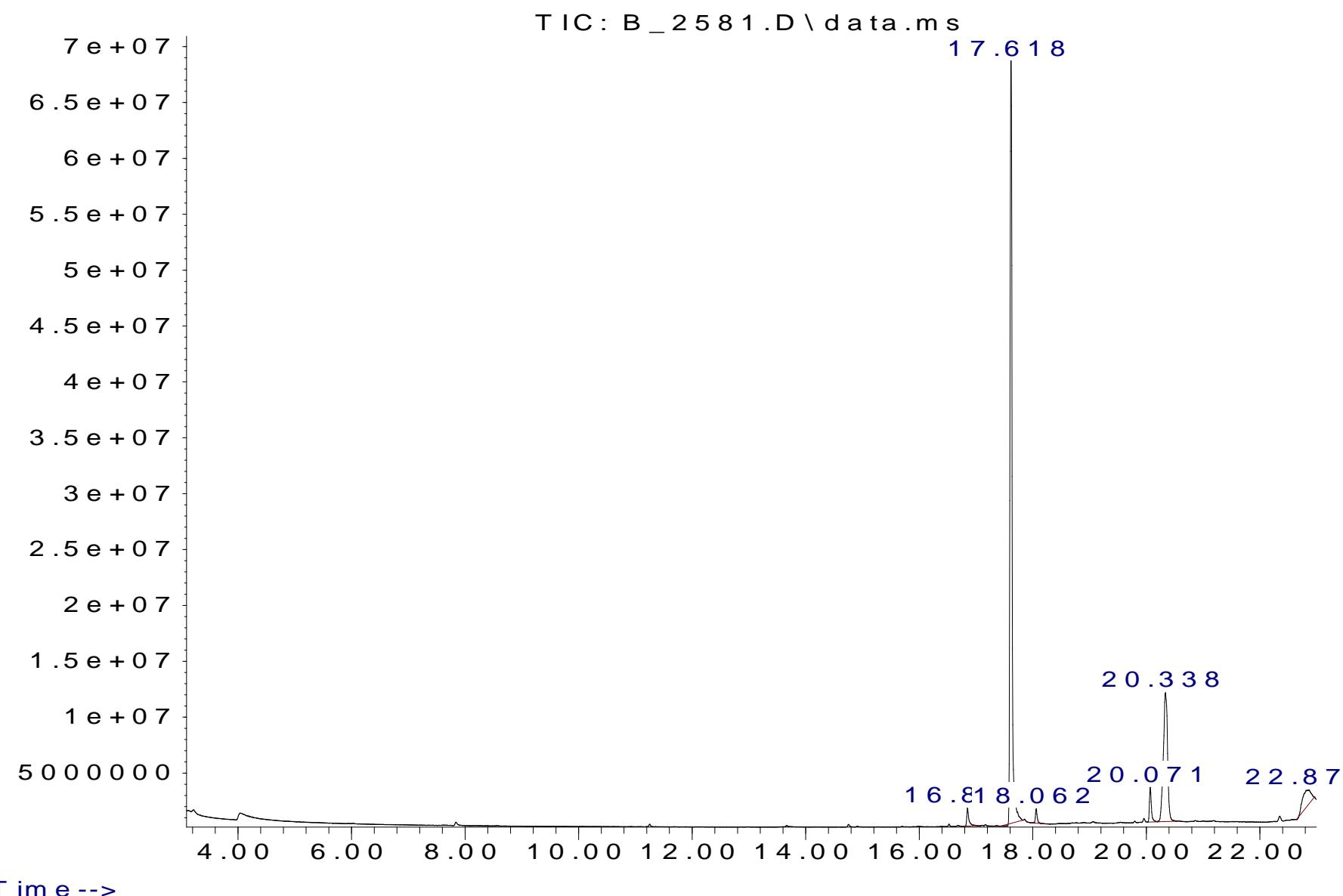


Figure S6. Mass spectrum of compound 5b

Abundance

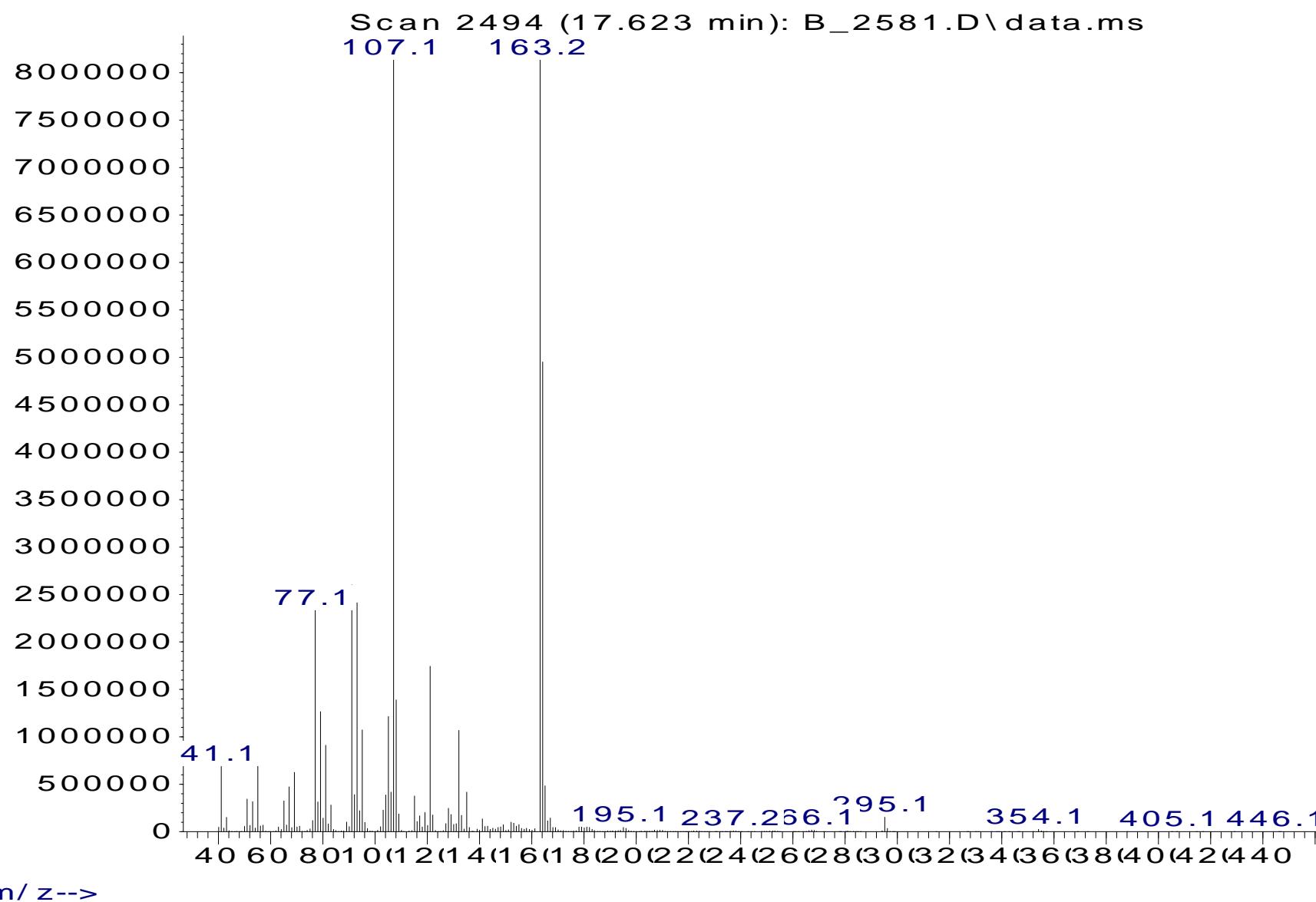


Figure S7. Chromatogram of compound 6a

Abundance

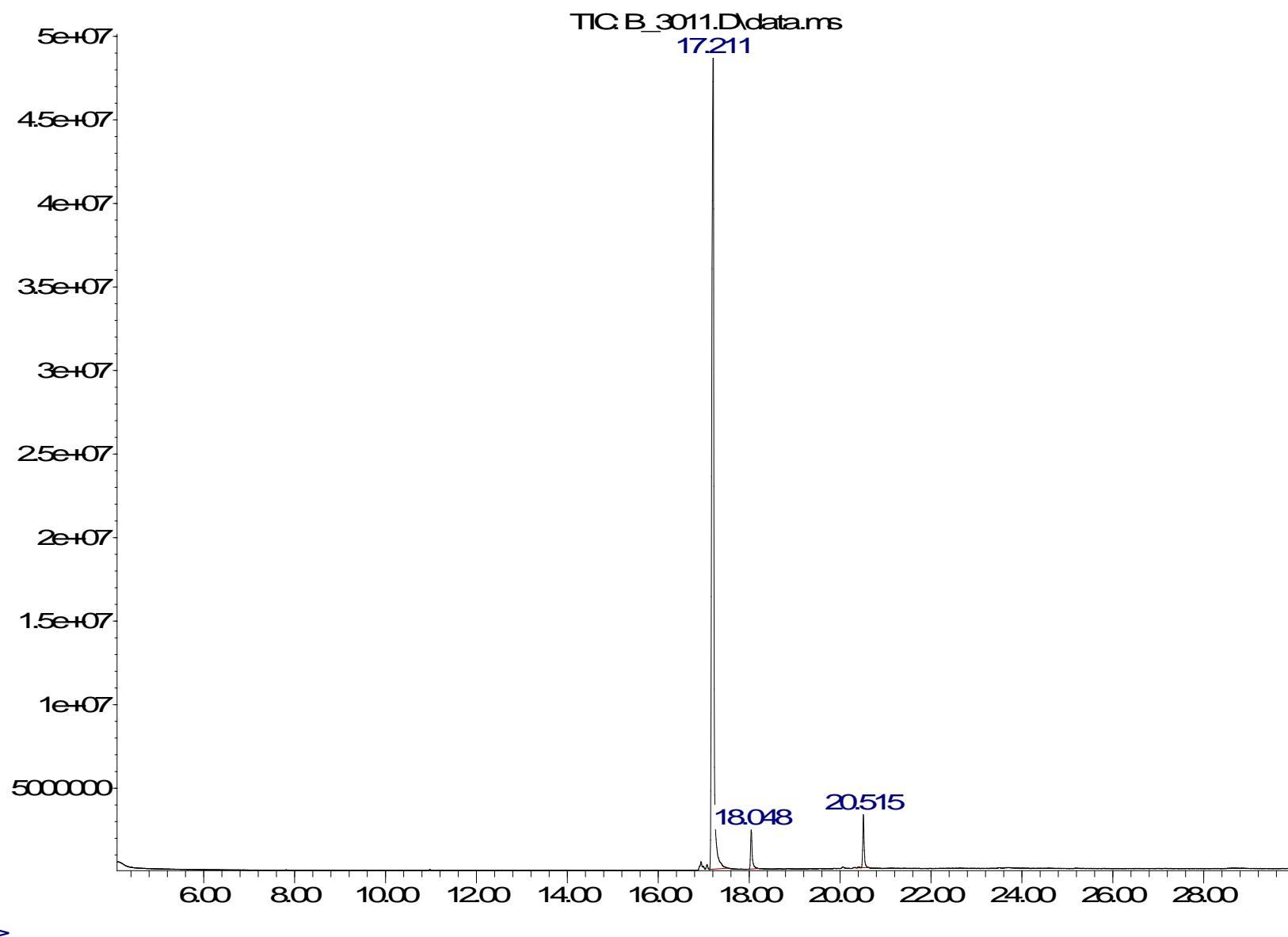


Figure S8. Mass spectrum of compound 6a

Abundance

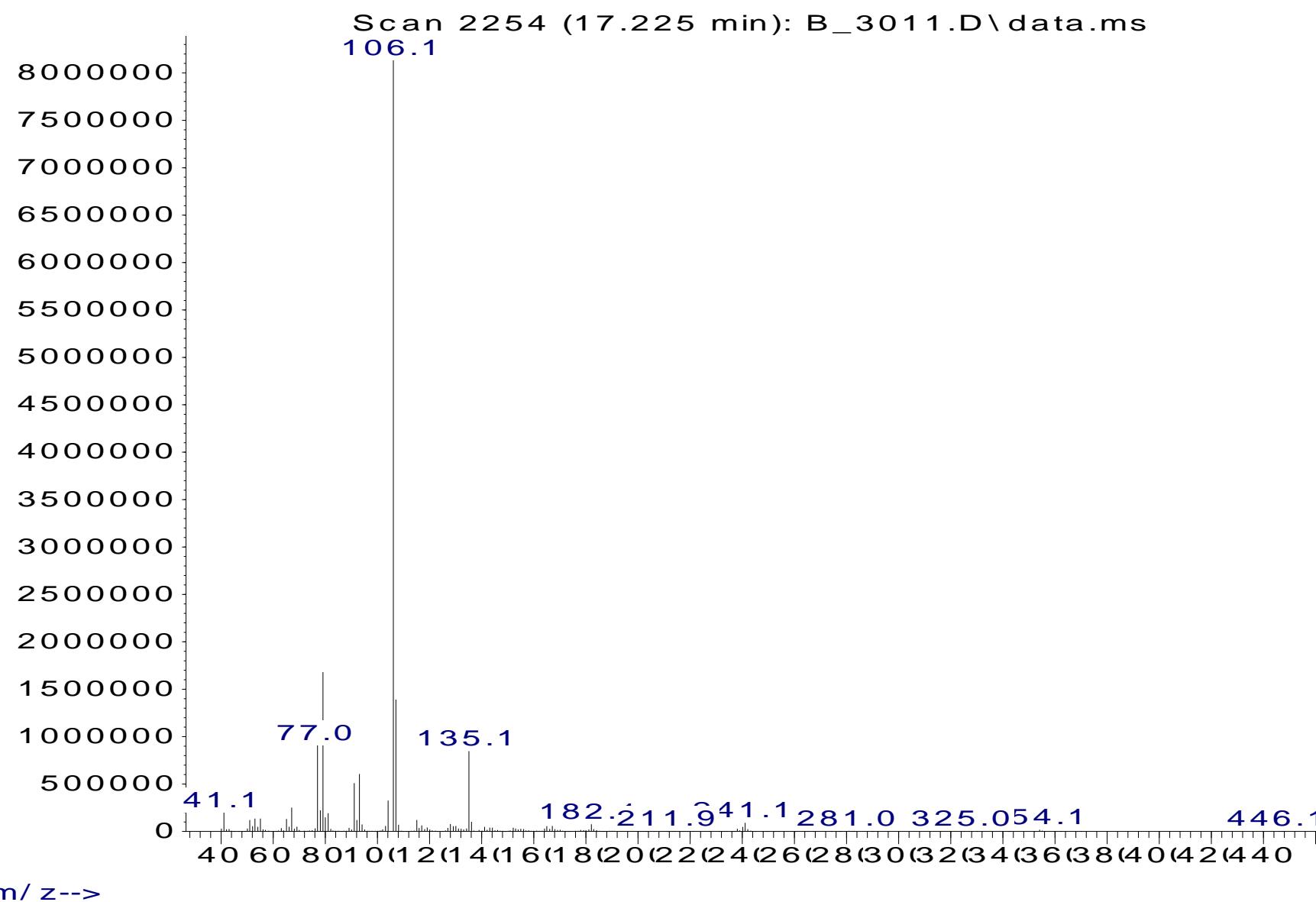


Figure S9.  $^1\text{H}$  NMR of compound 6a

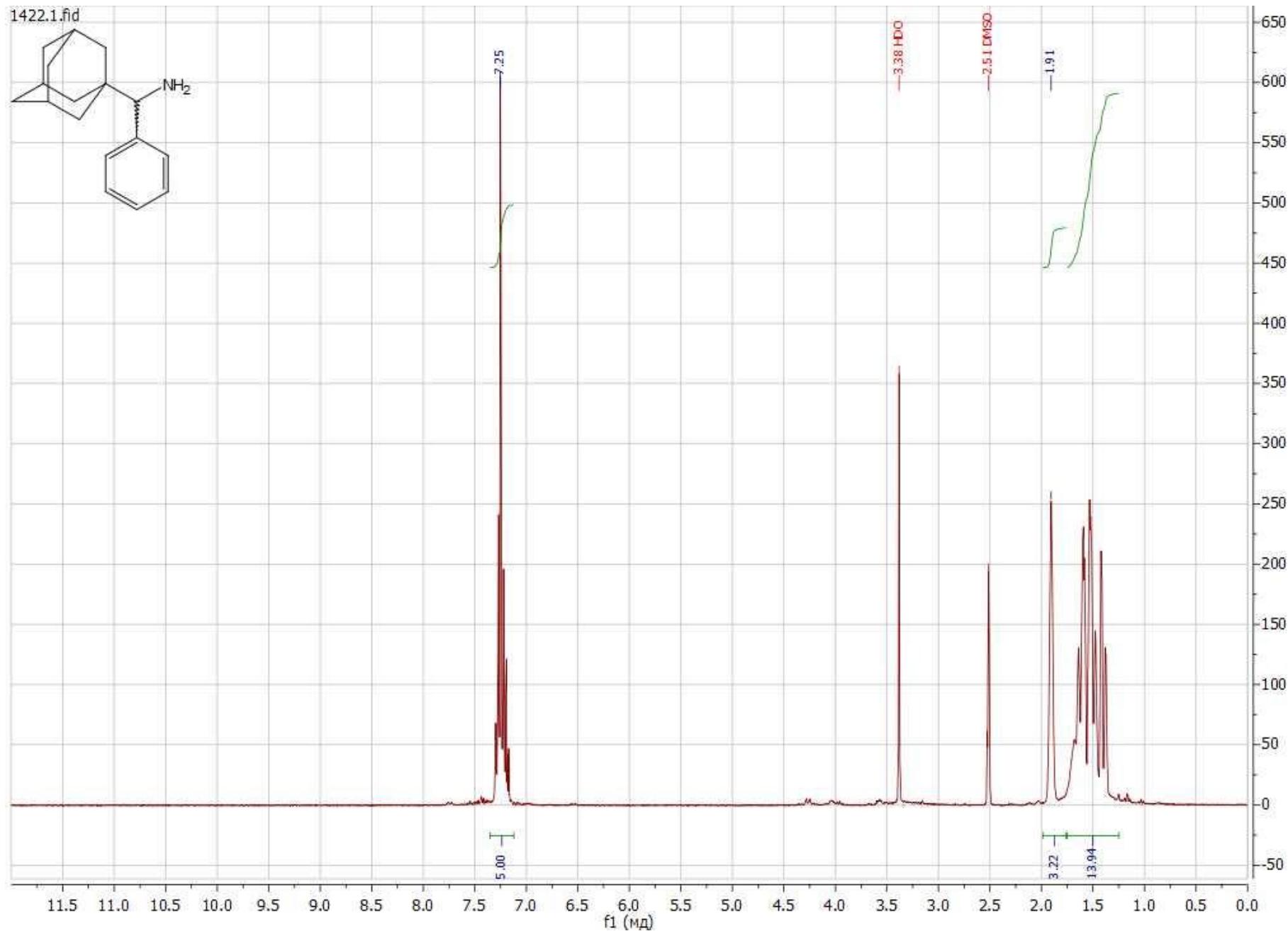
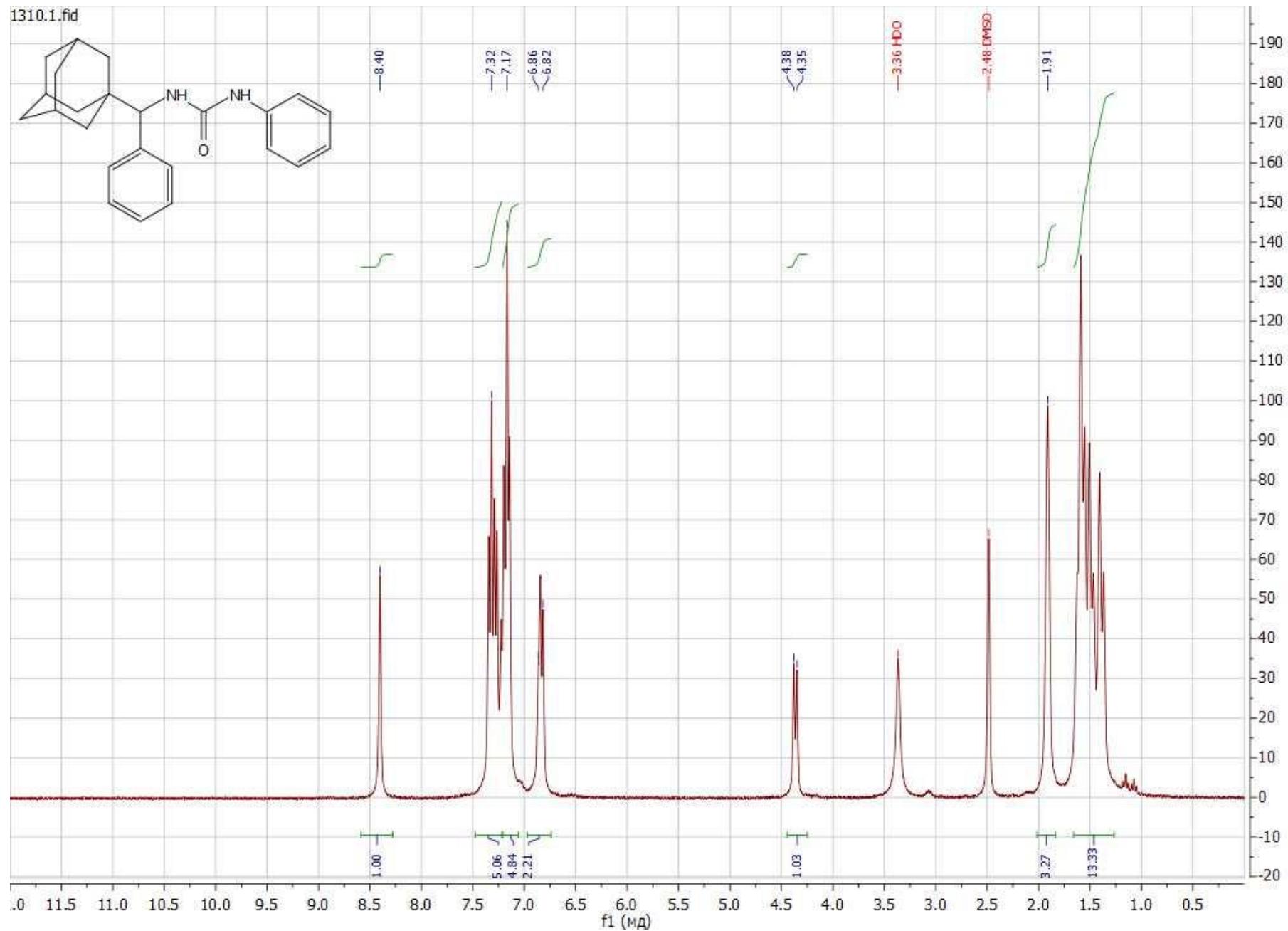


Figure S10.  $^1\text{H}$  NMR of compound 8a



**Figure S11.**  $^{13}\text{C}$  NMR of compound 8a

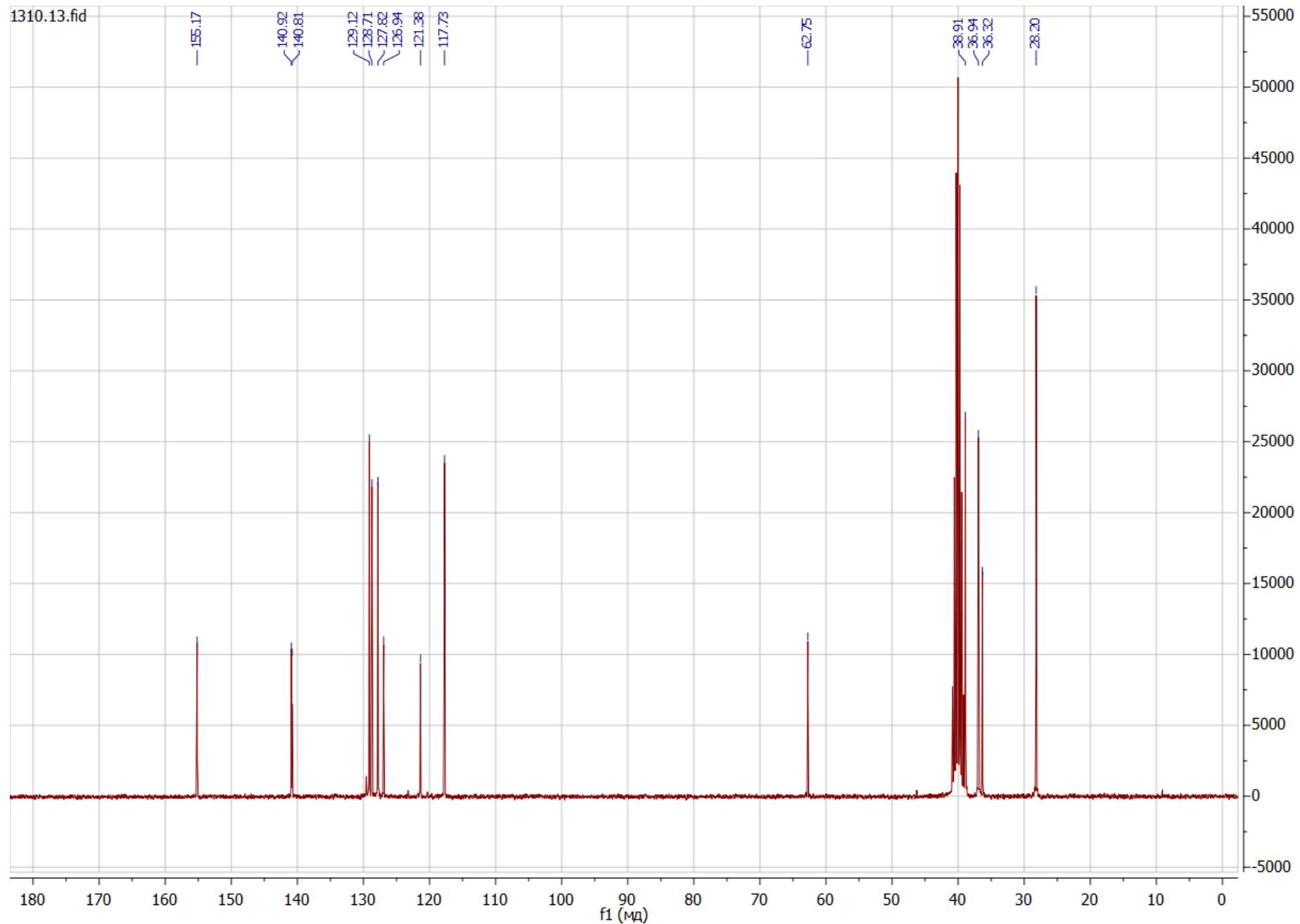


Figure S12.  $^1\text{H}$  NMR of compound 8b

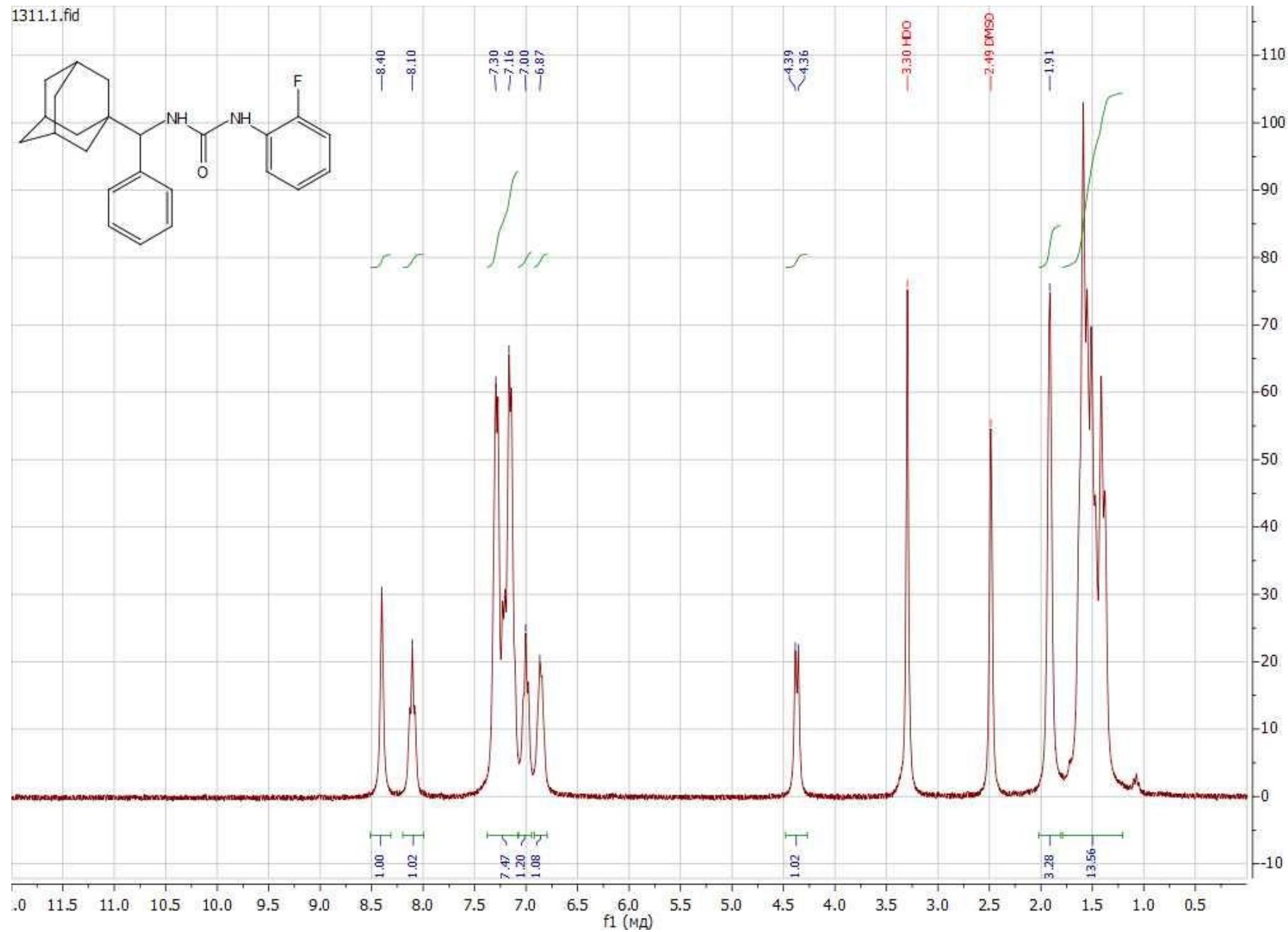


Figure S13.  $^{13}\text{C}$  NMR of compound 8b

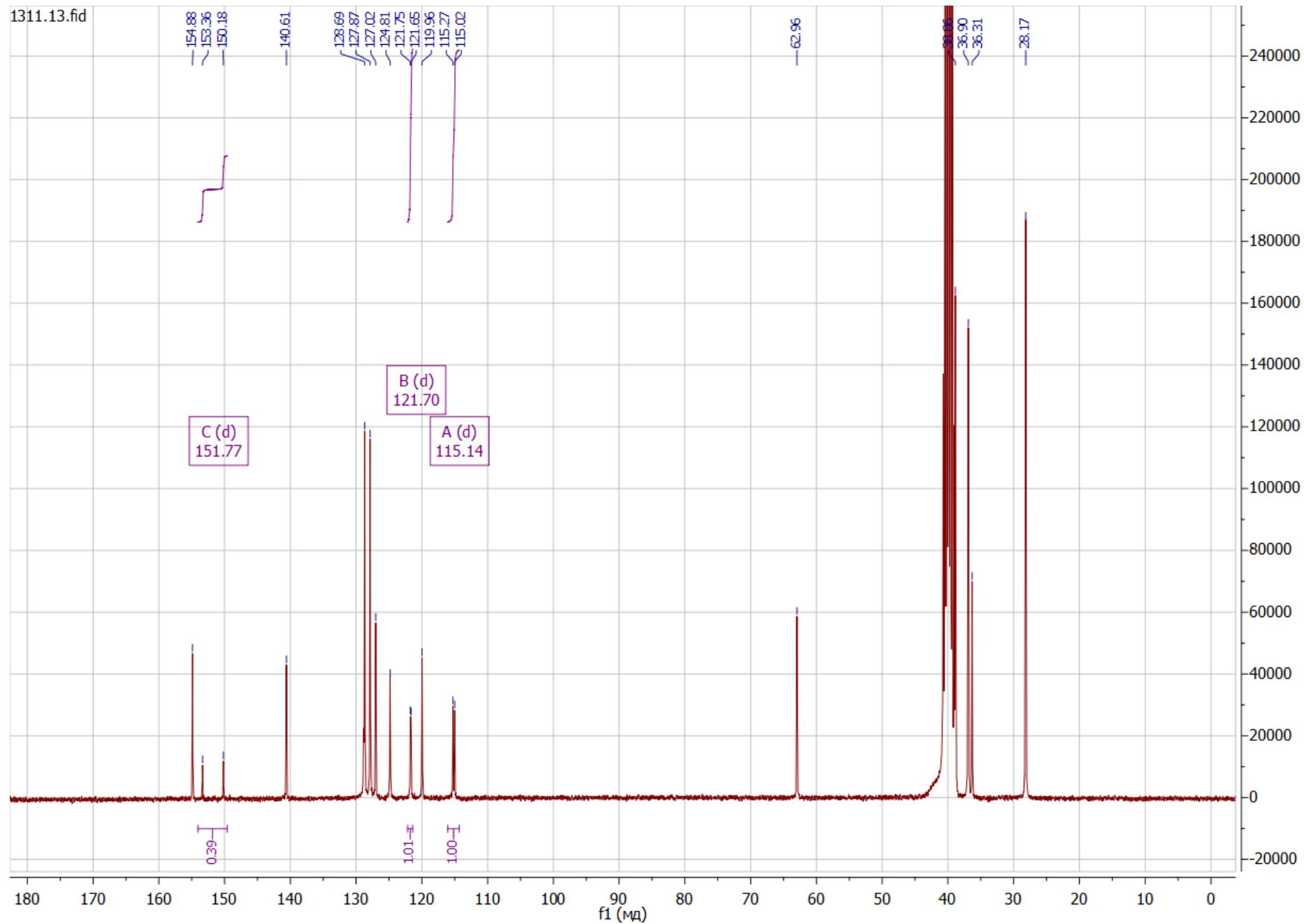


Figure S14.  $^{19}\text{F}$  NMR of compound 8b

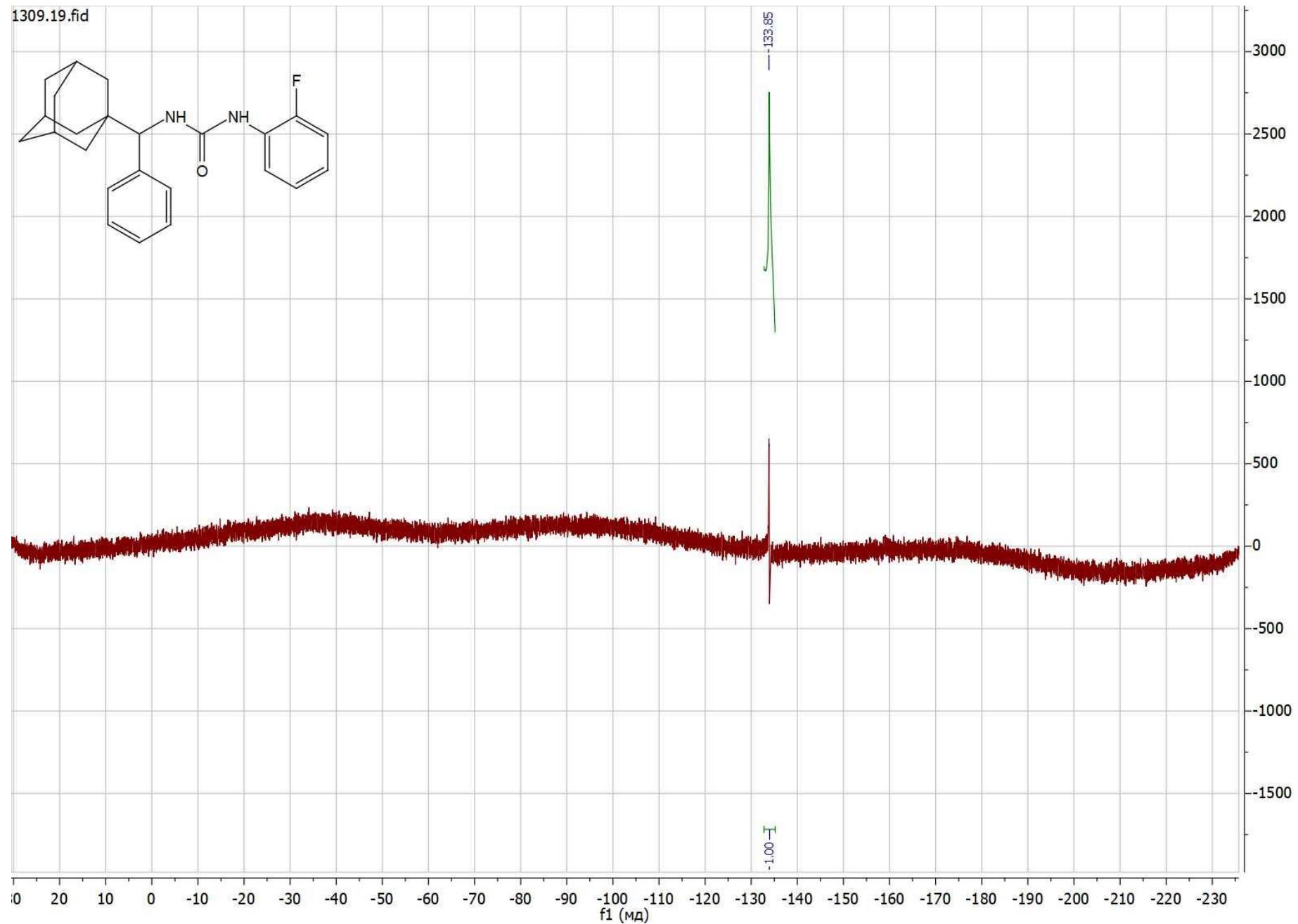


Figure S15.  $^1\text{H}$  NMR of compound 8c

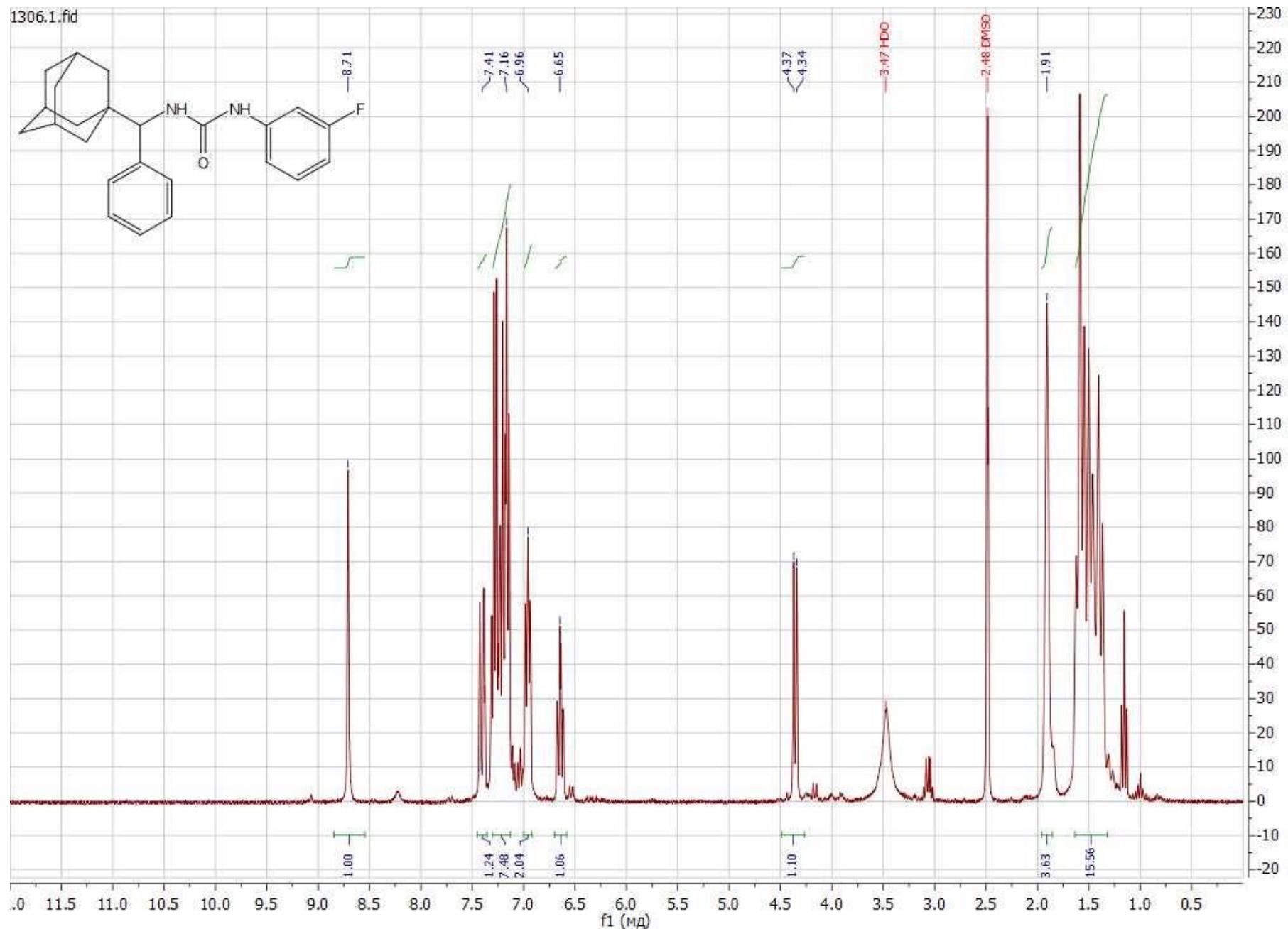


Figure S16.  $^{13}\text{C}$  NMR of compound 8c

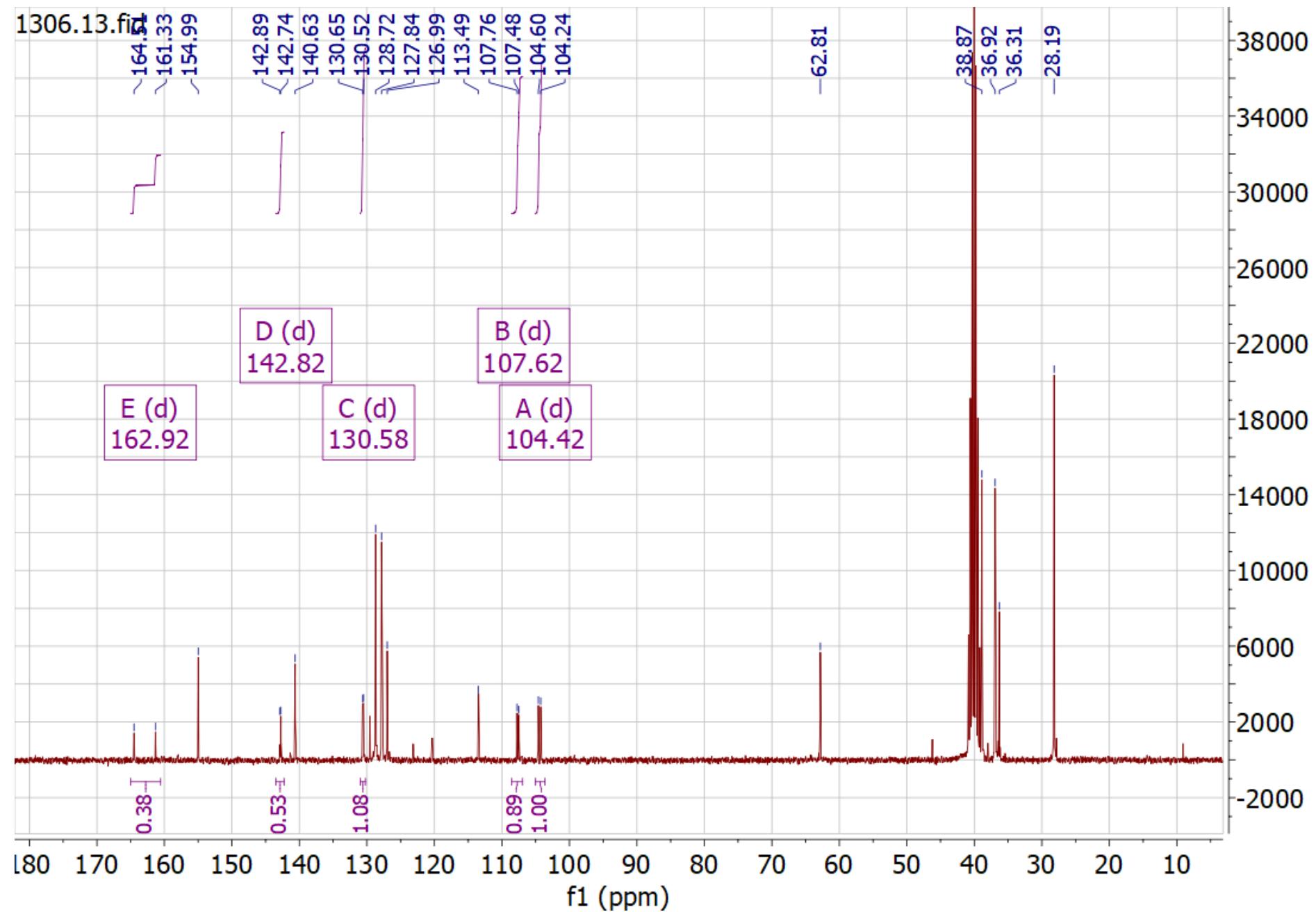


Figure S17.  $^{19}\text{F}$  NMR of compound 8c

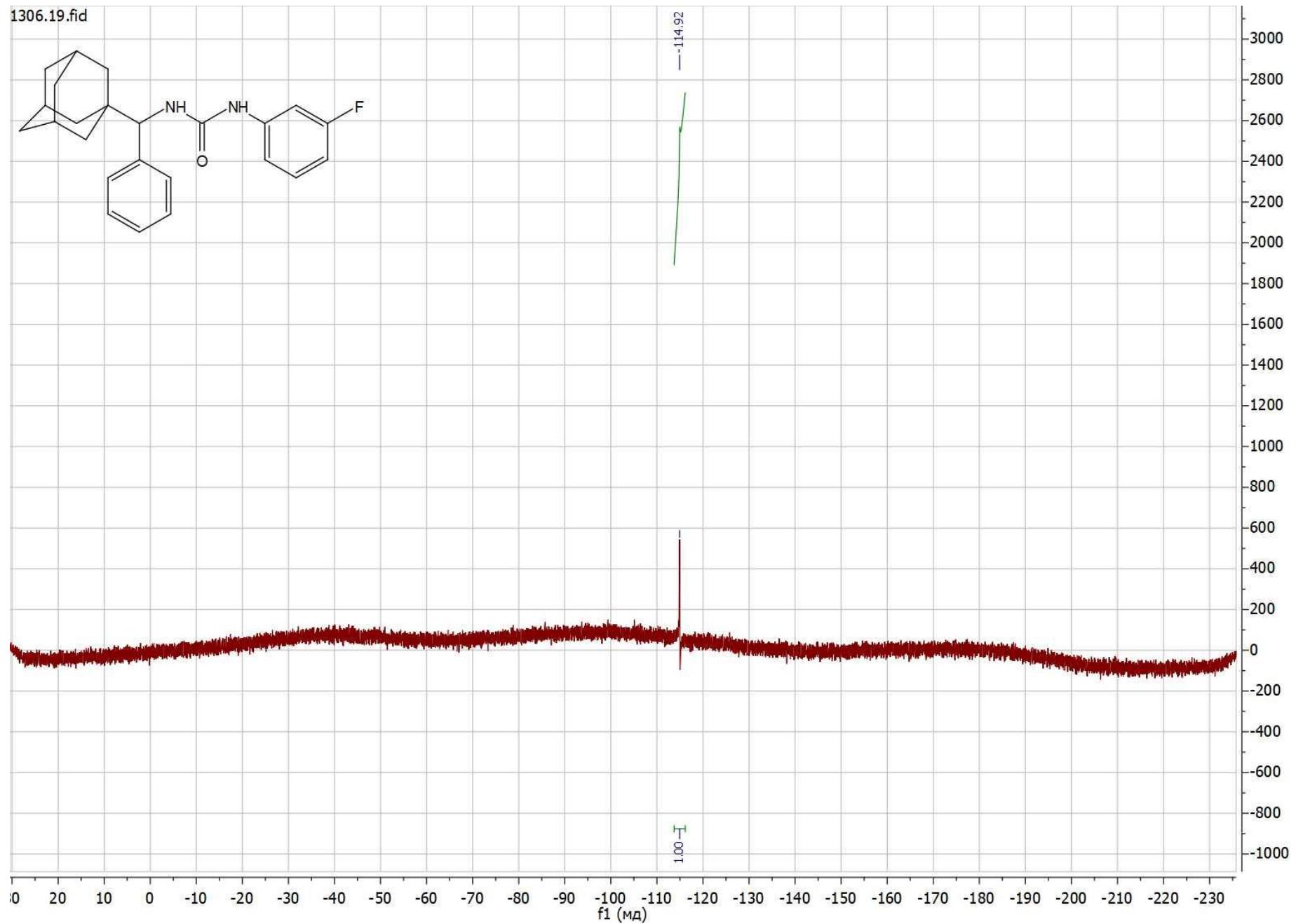


Figure S18.  $^1\text{H}$  NMR of compound 8d

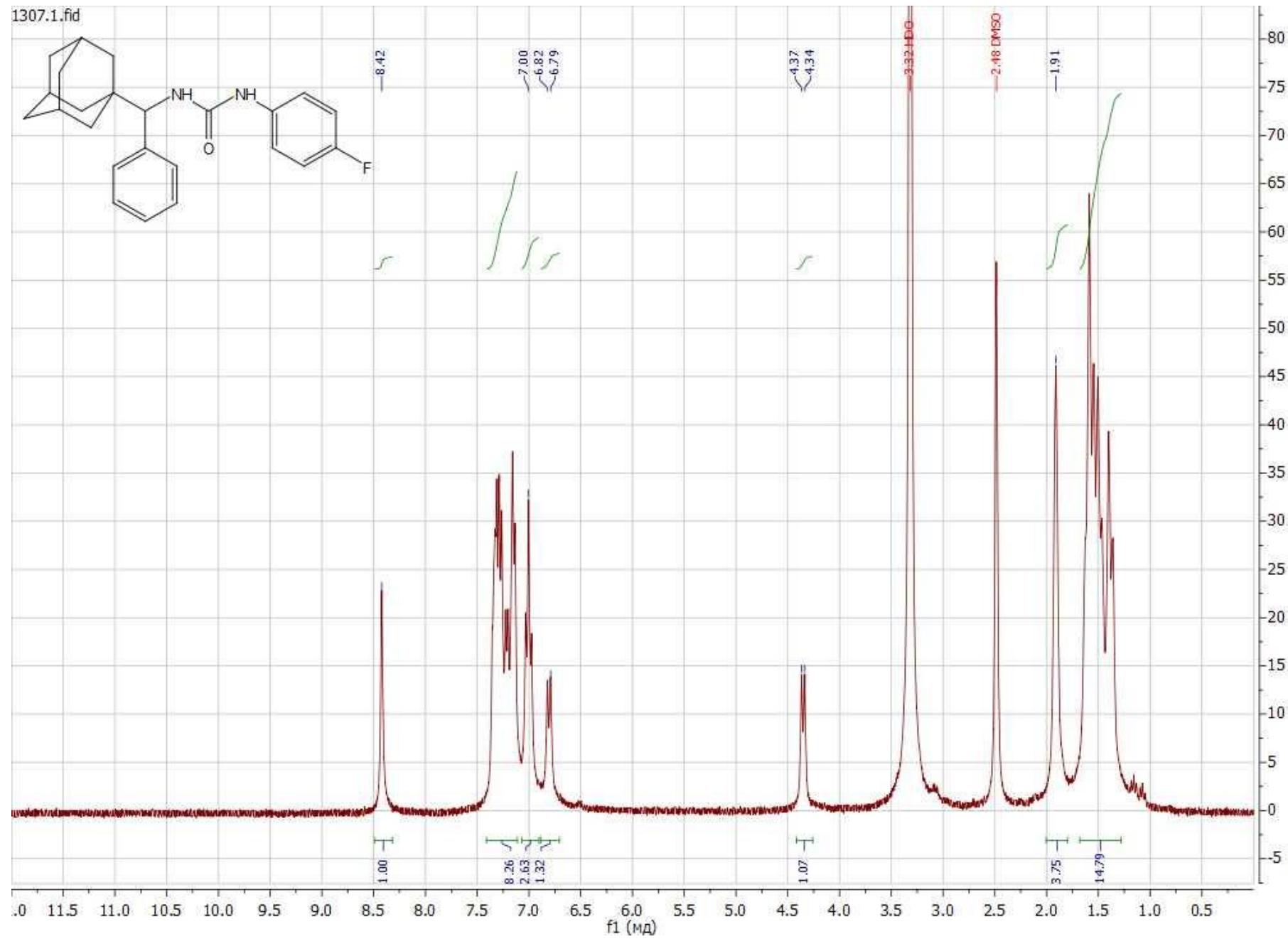


Figure S19.  $^{13}\text{C}$  NMR of compound 8d

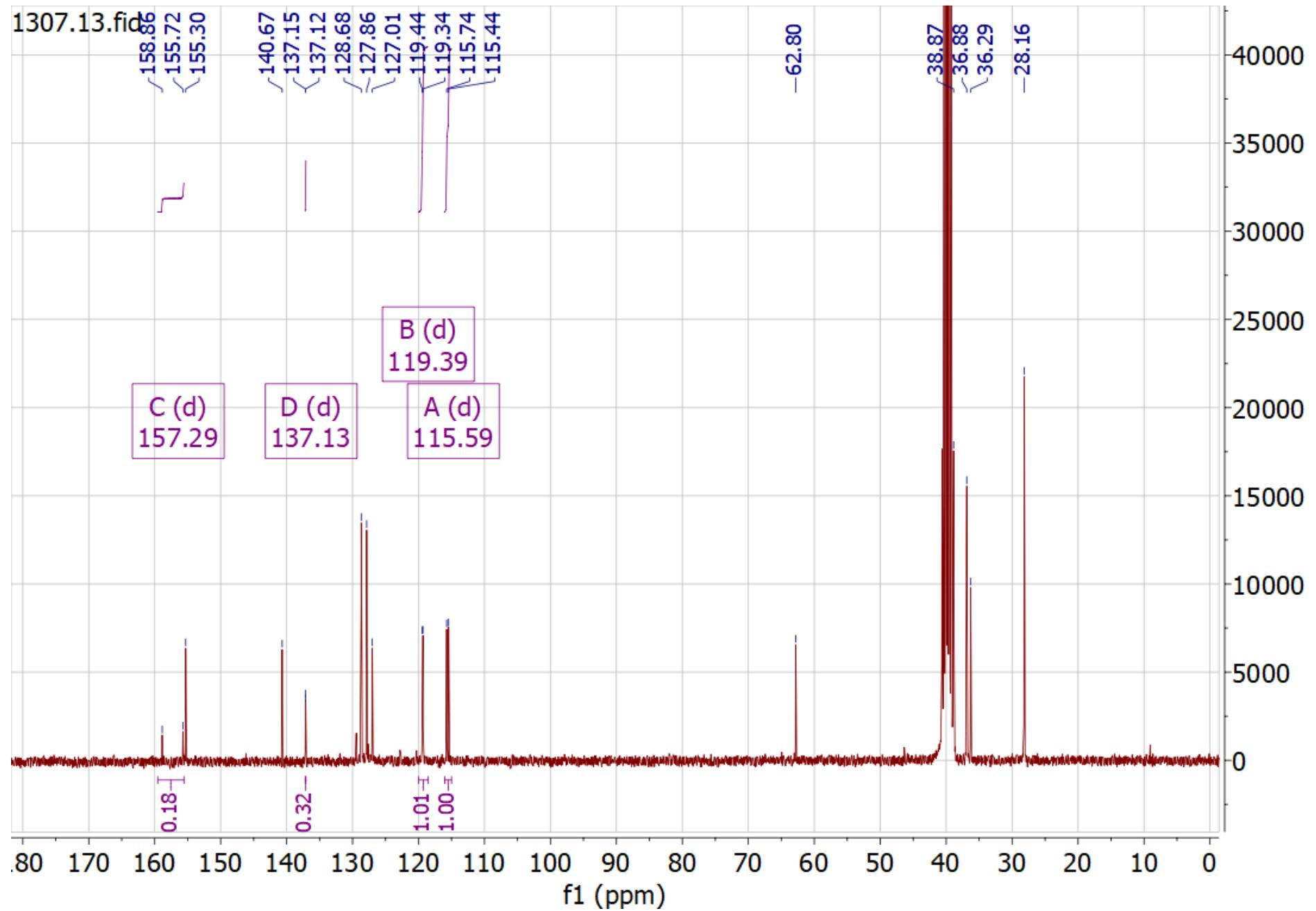


Figure S20.  $^1\text{H}$  NMR of compound 8e

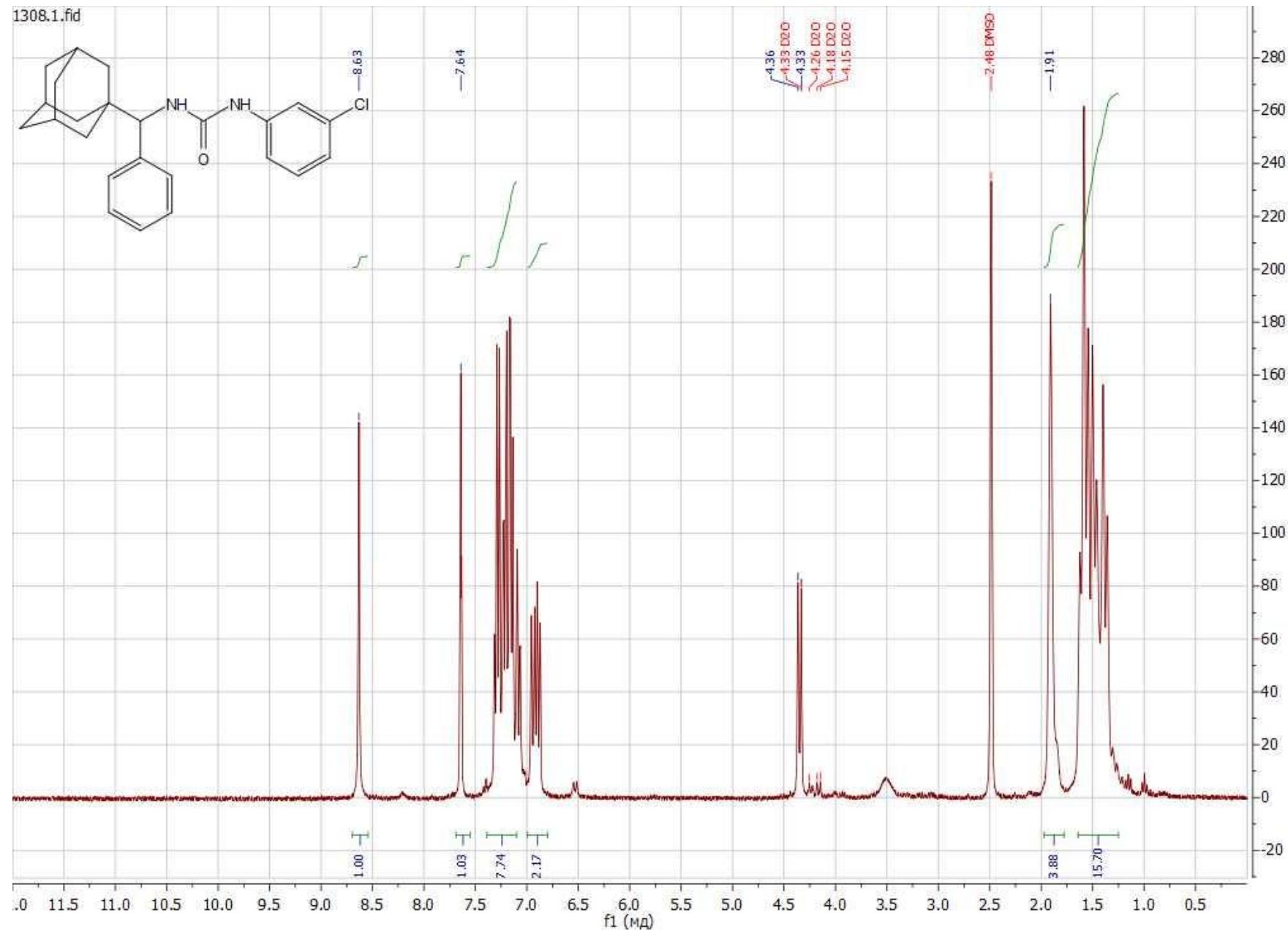


Figure S21  $^{13}\text{C}$  NMR of compound 8e

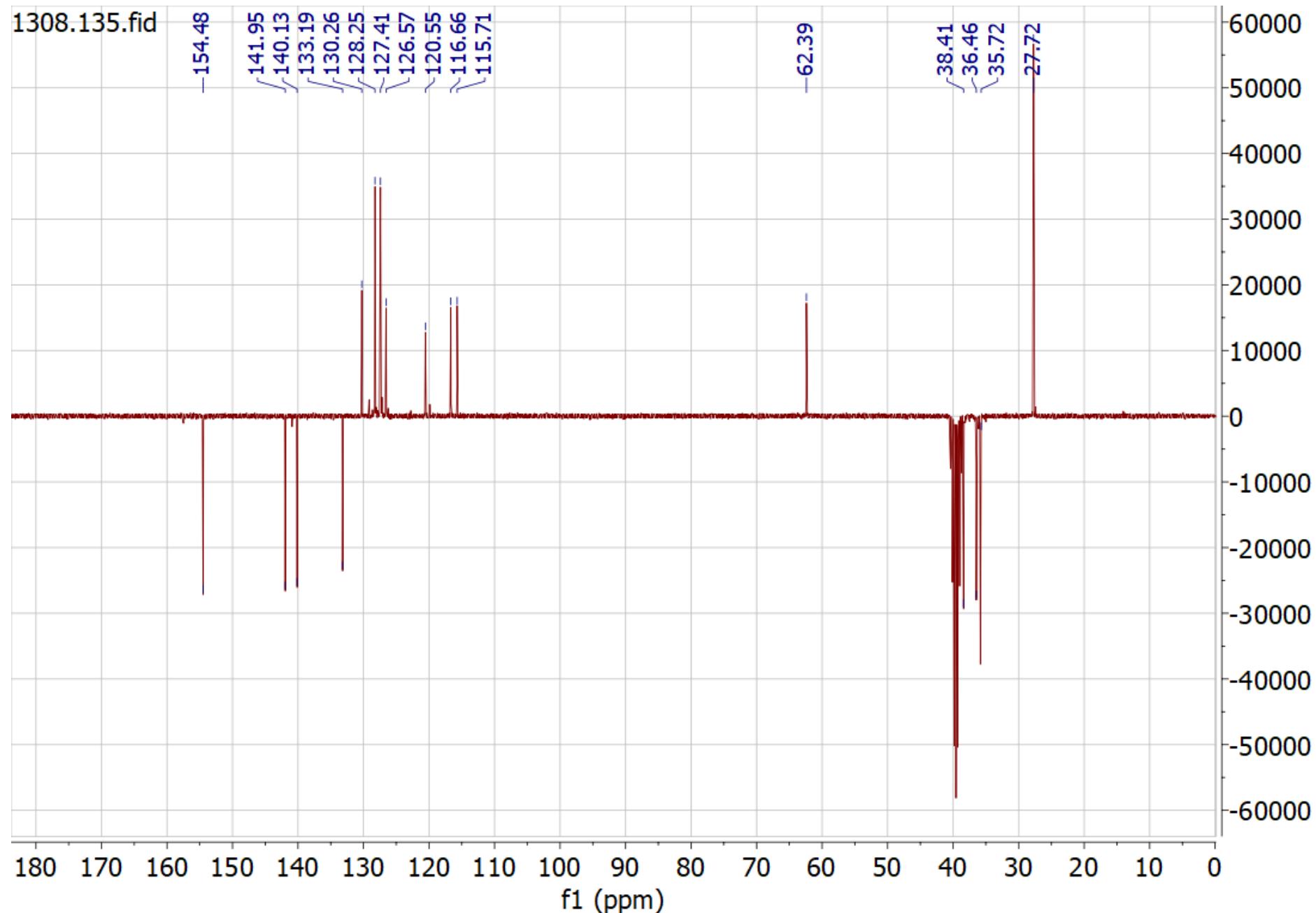


Figure S22.  $^1\text{H}$  NMR of compound 8f

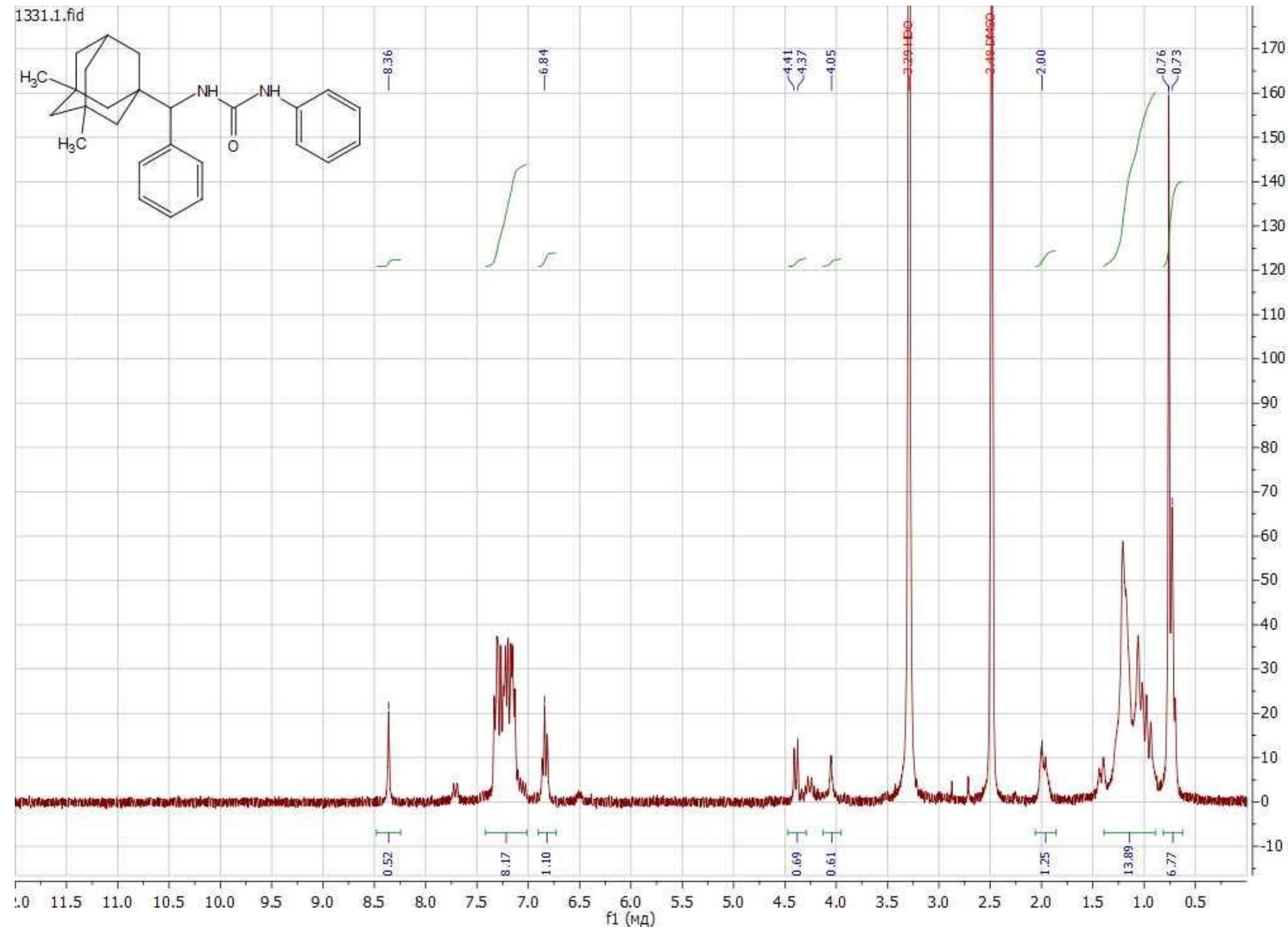


Figure S23.  $^{13}\text{C}$  NMR of compound 8f

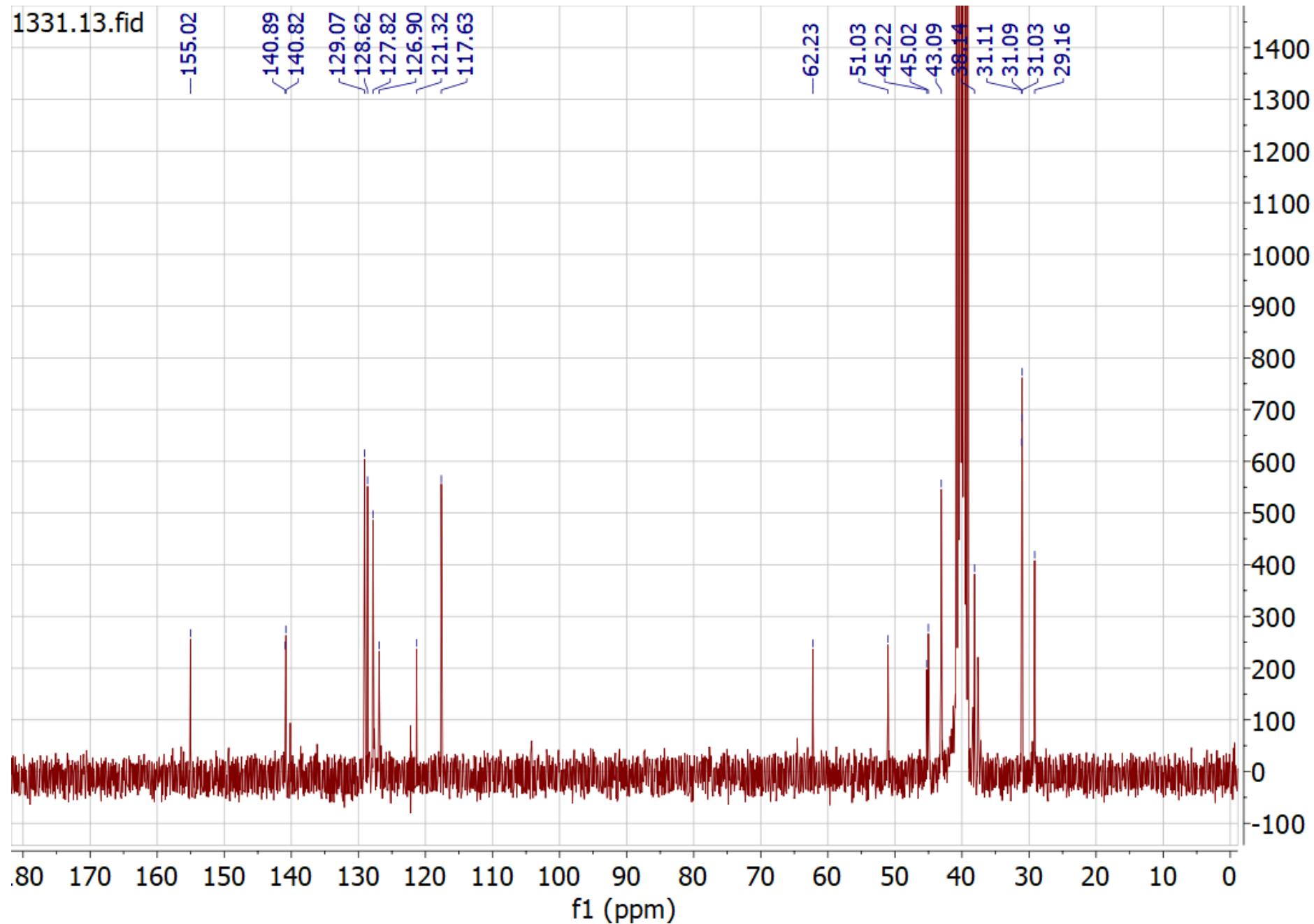


Figure S24.  $^1\text{H}$  NMR of compound 8g

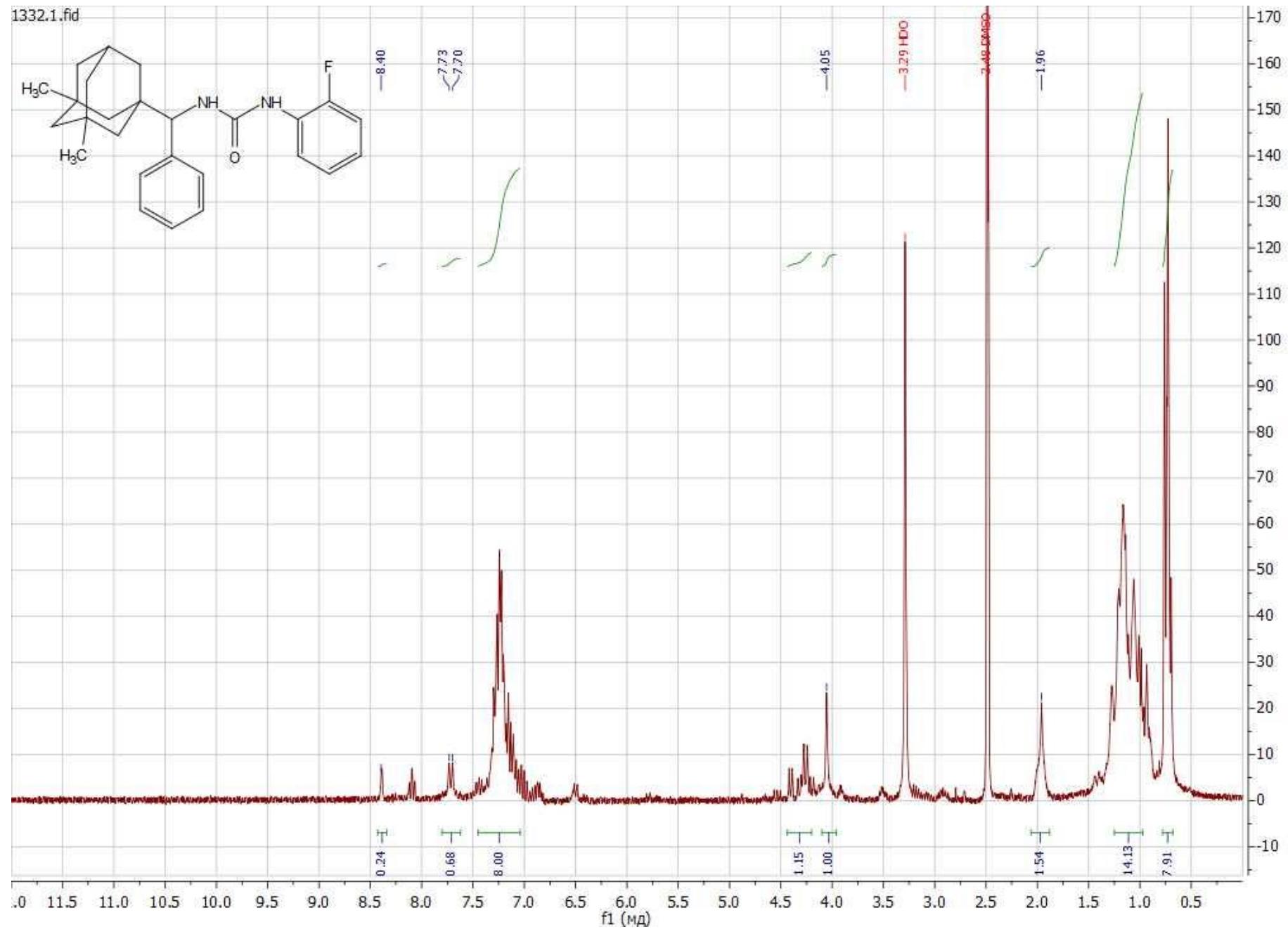


Figure S25.  $^{13}\text{C}$  NMR of compound 8g

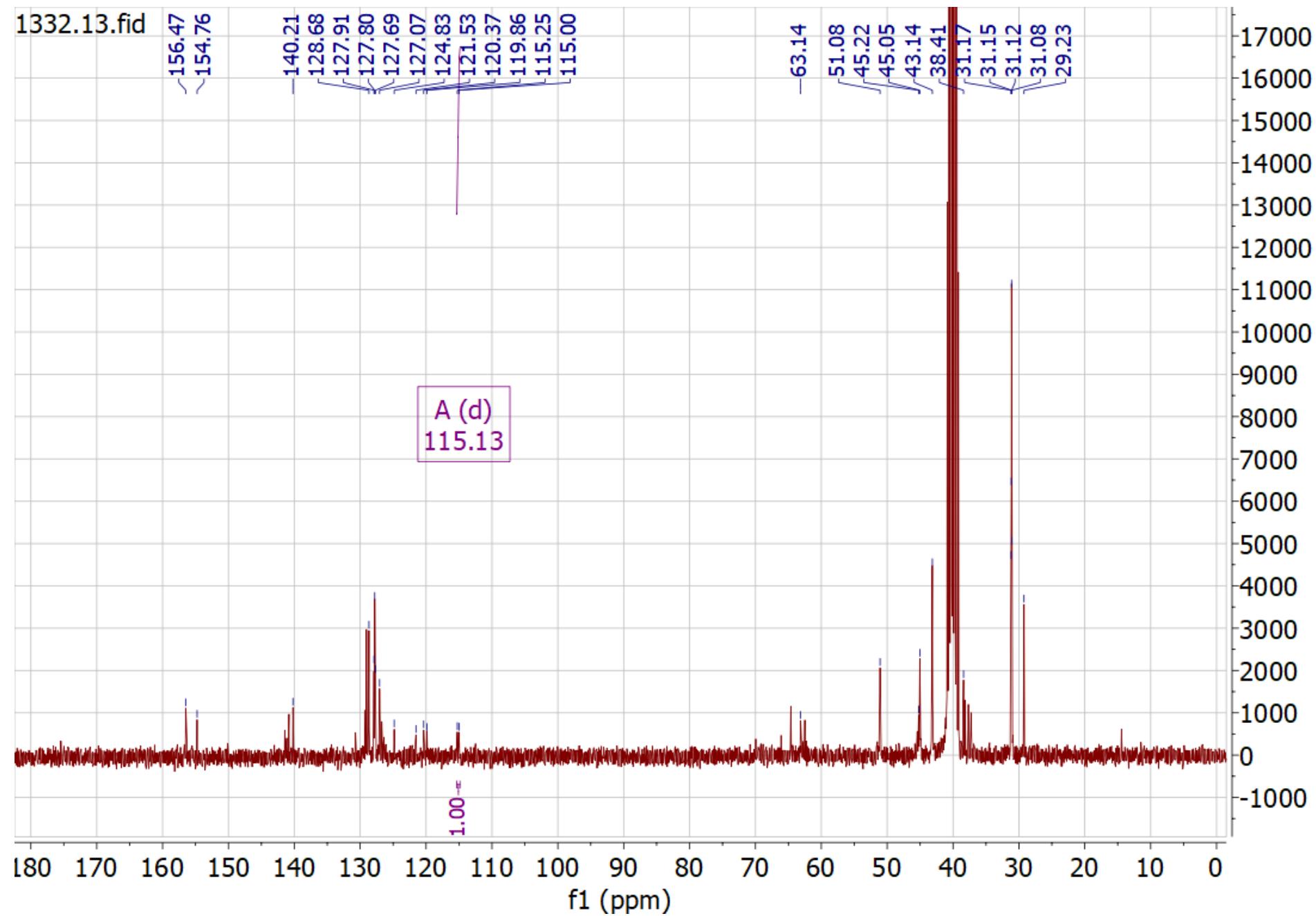


Figure S26.  $^1\text{H}$  NMR of compound 8h

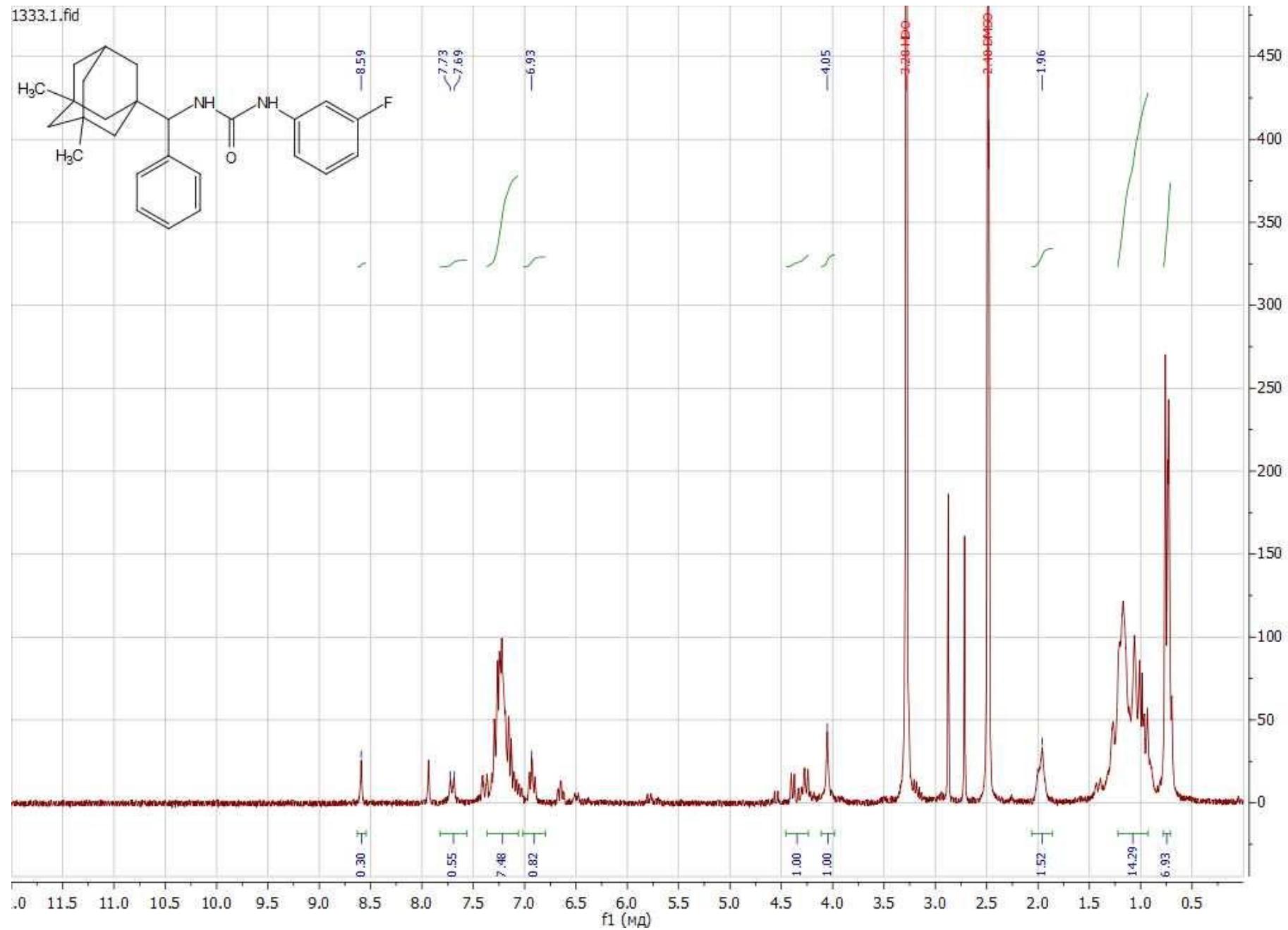


Figure S27.  $^{13}\text{C}$  NMR of compound 8h

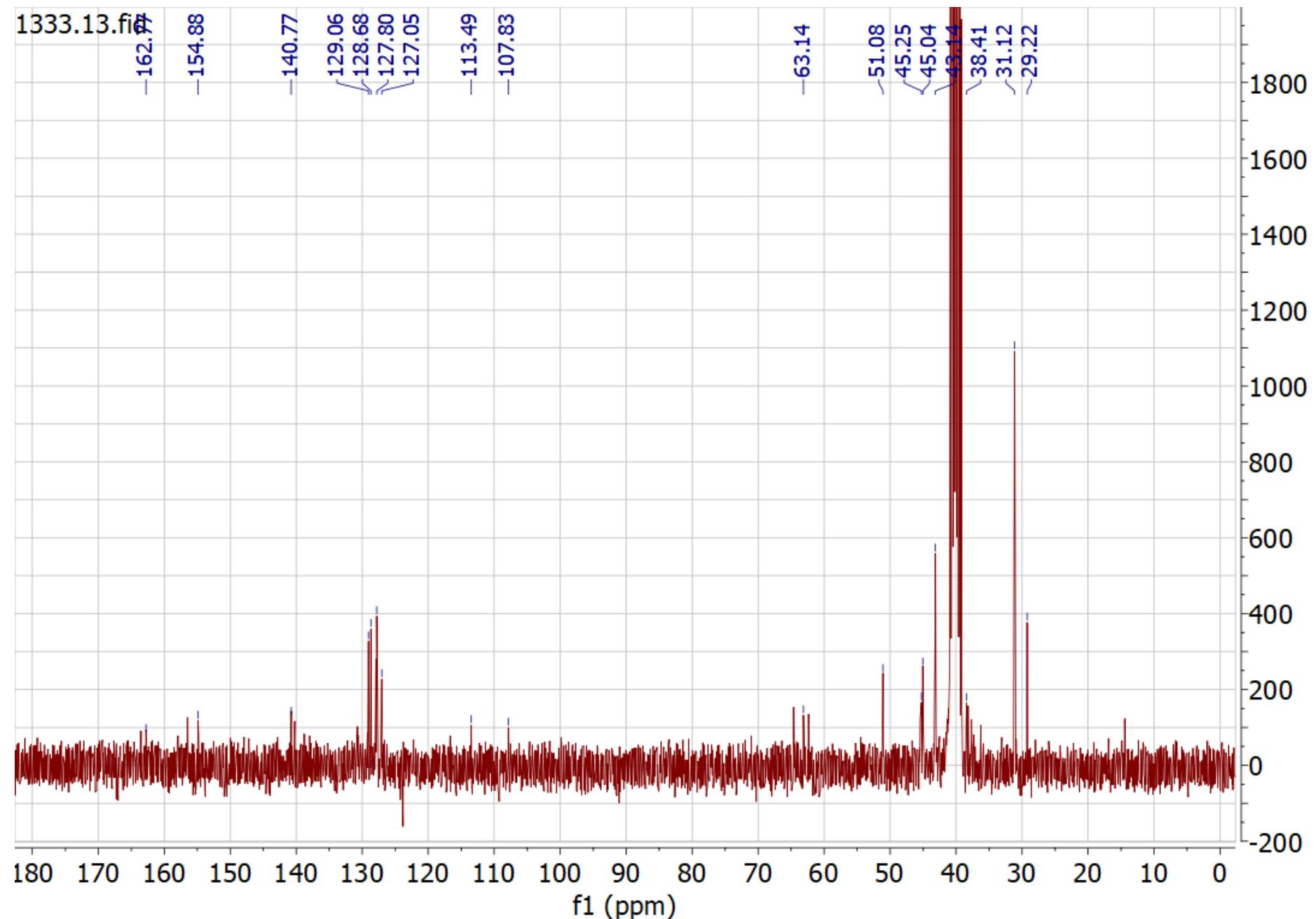


Figure S28.  $^1\text{H}$  NMR of compound 8i

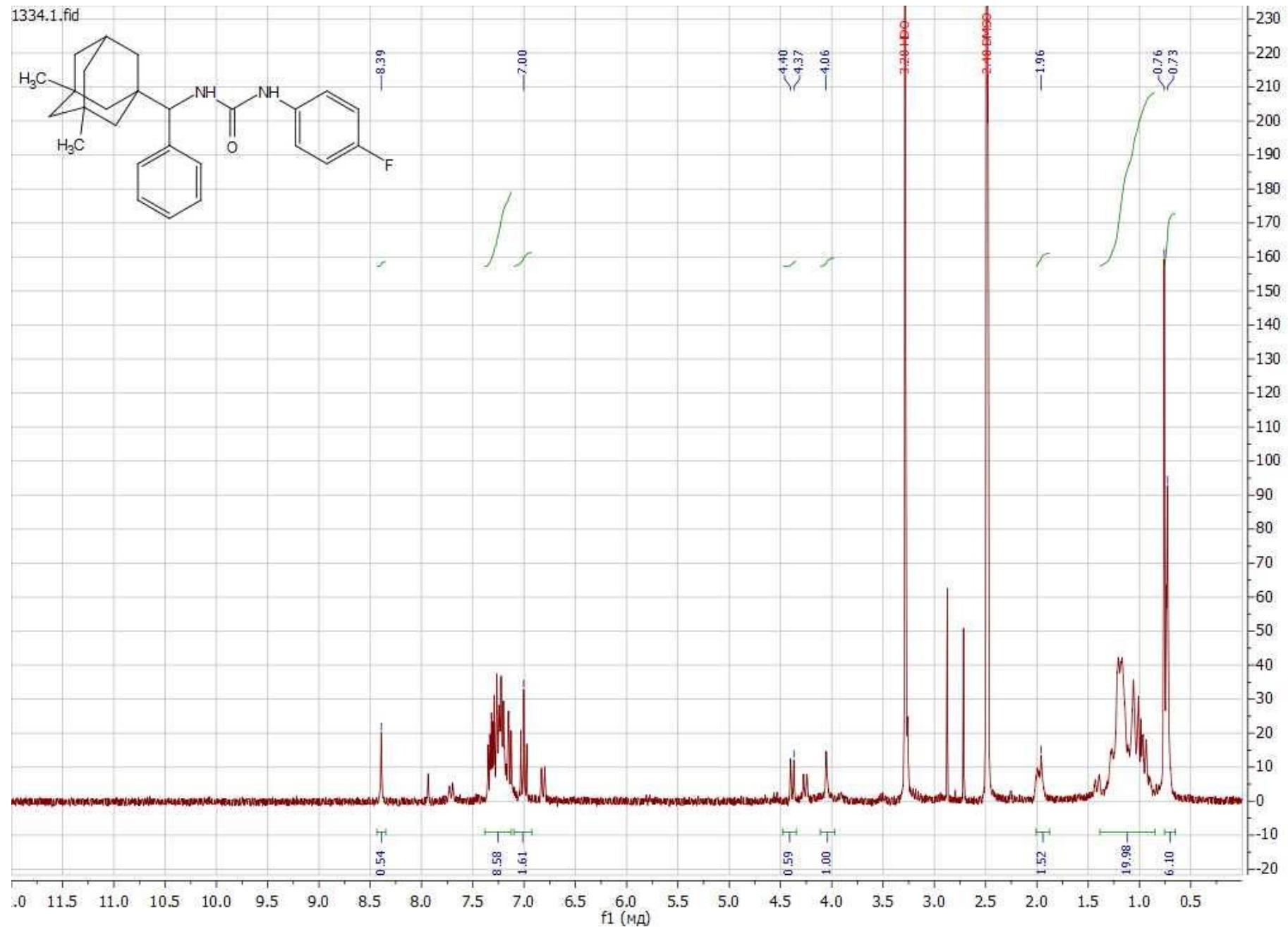


Figure S29.  $^{13}\text{C}$  NMR of compound 8i

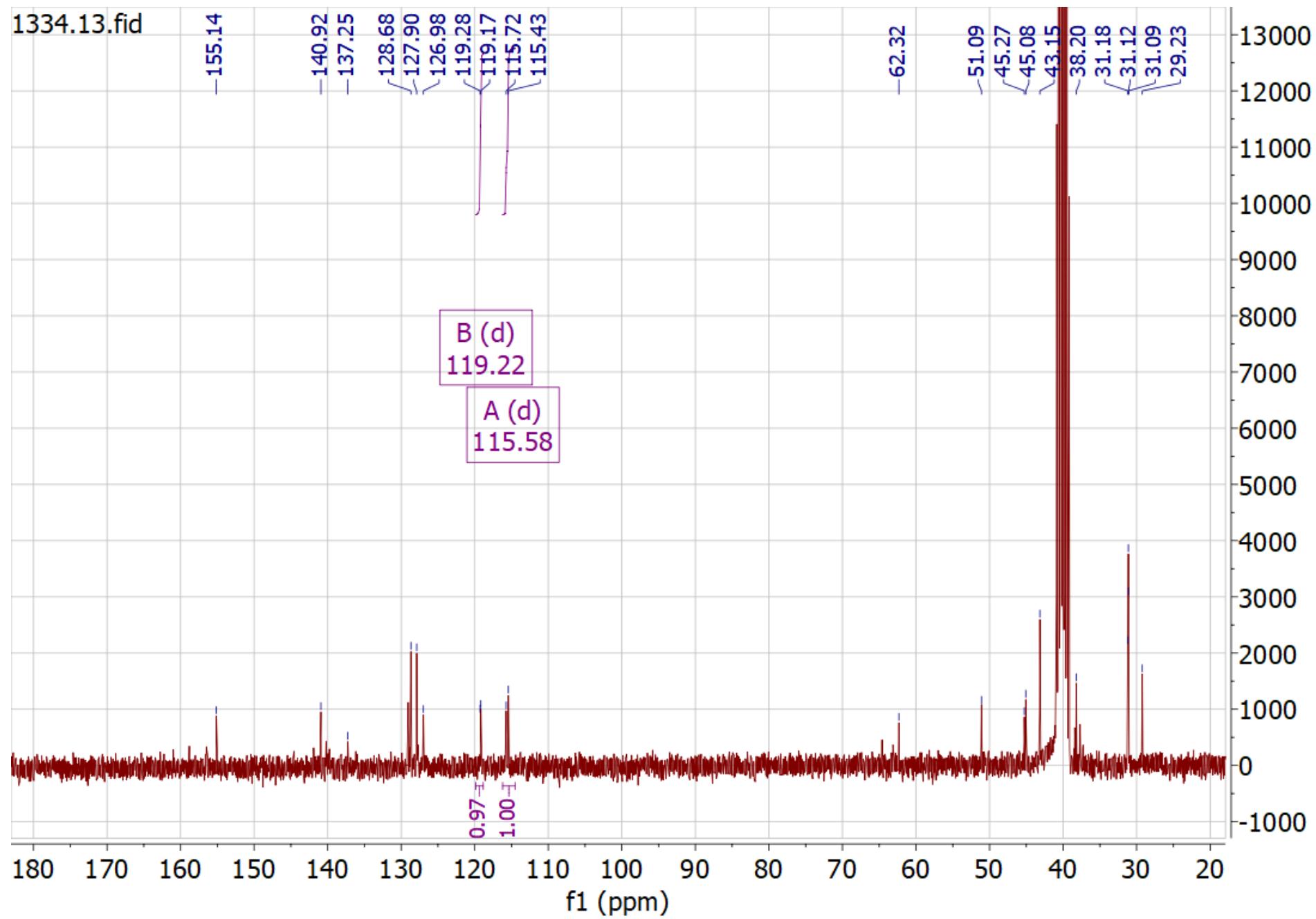


Figure S30.  $^1\text{H}$  NMR of compound 8j

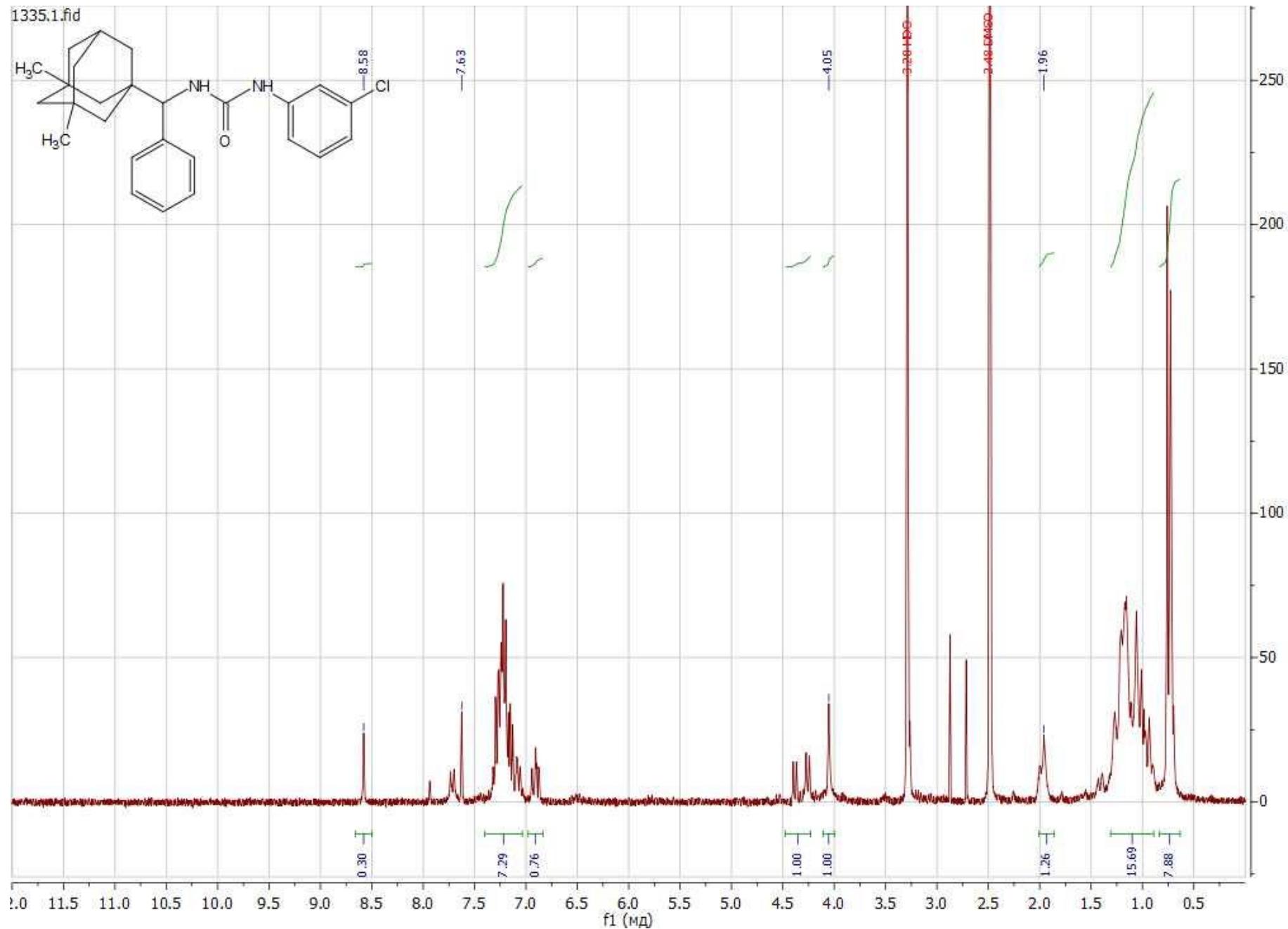


Figure S31.  $^{13}\text{C}$  NMR of compound 8j

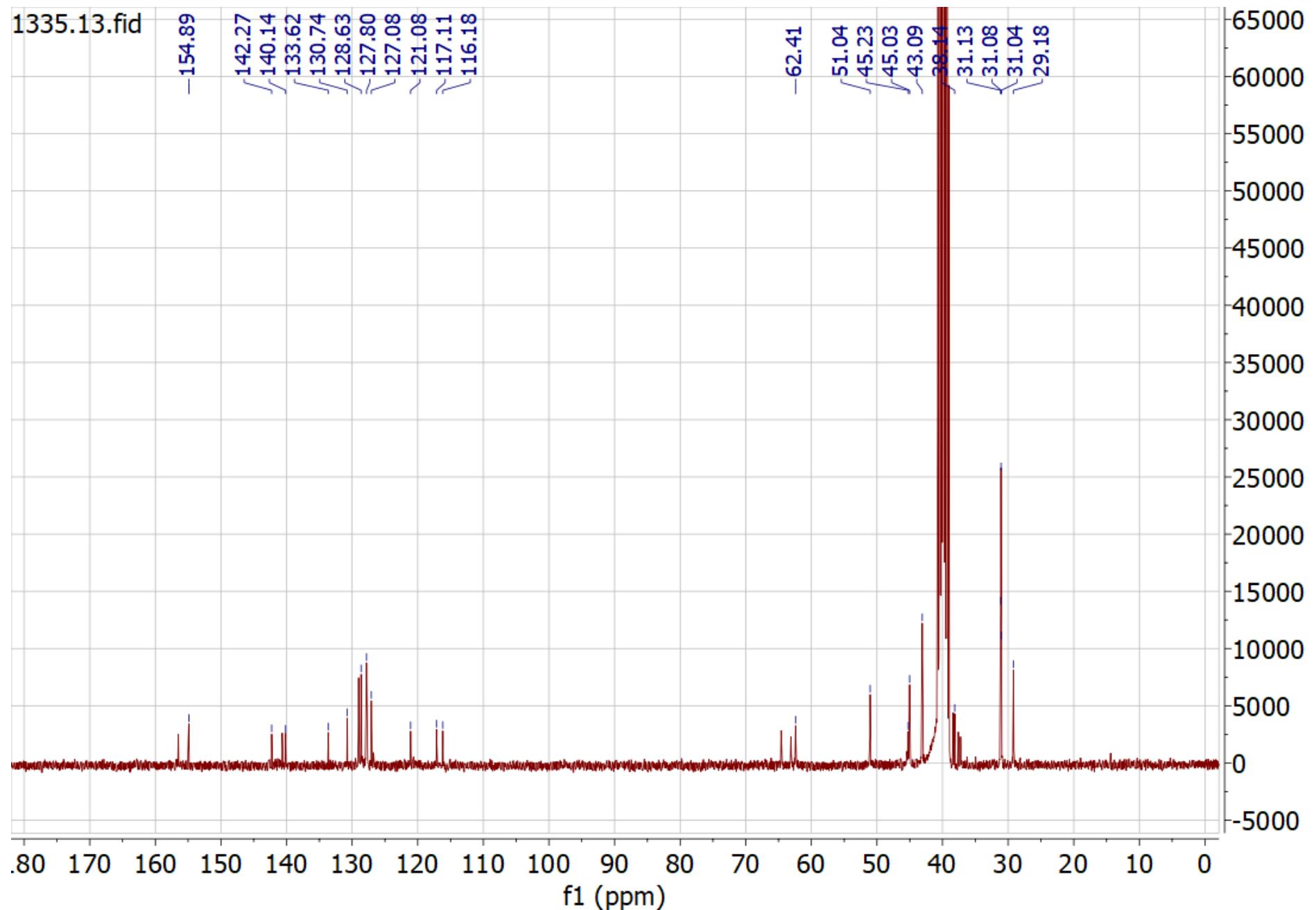


Figure S32.  $^1\text{H}$  NMR of compound 8k

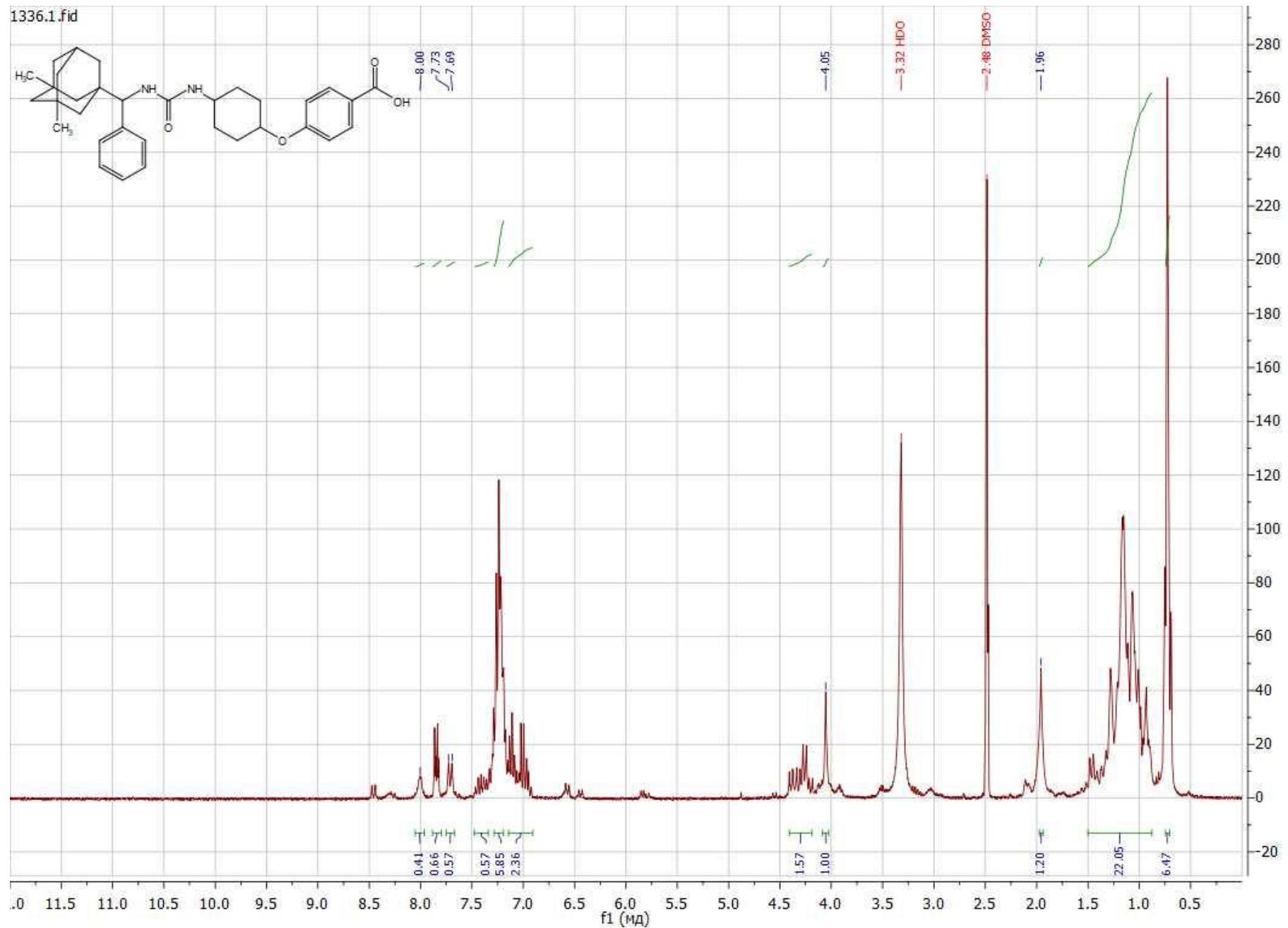


Figure S33.  $^{13}\text{C}$  NMR of compound 8k

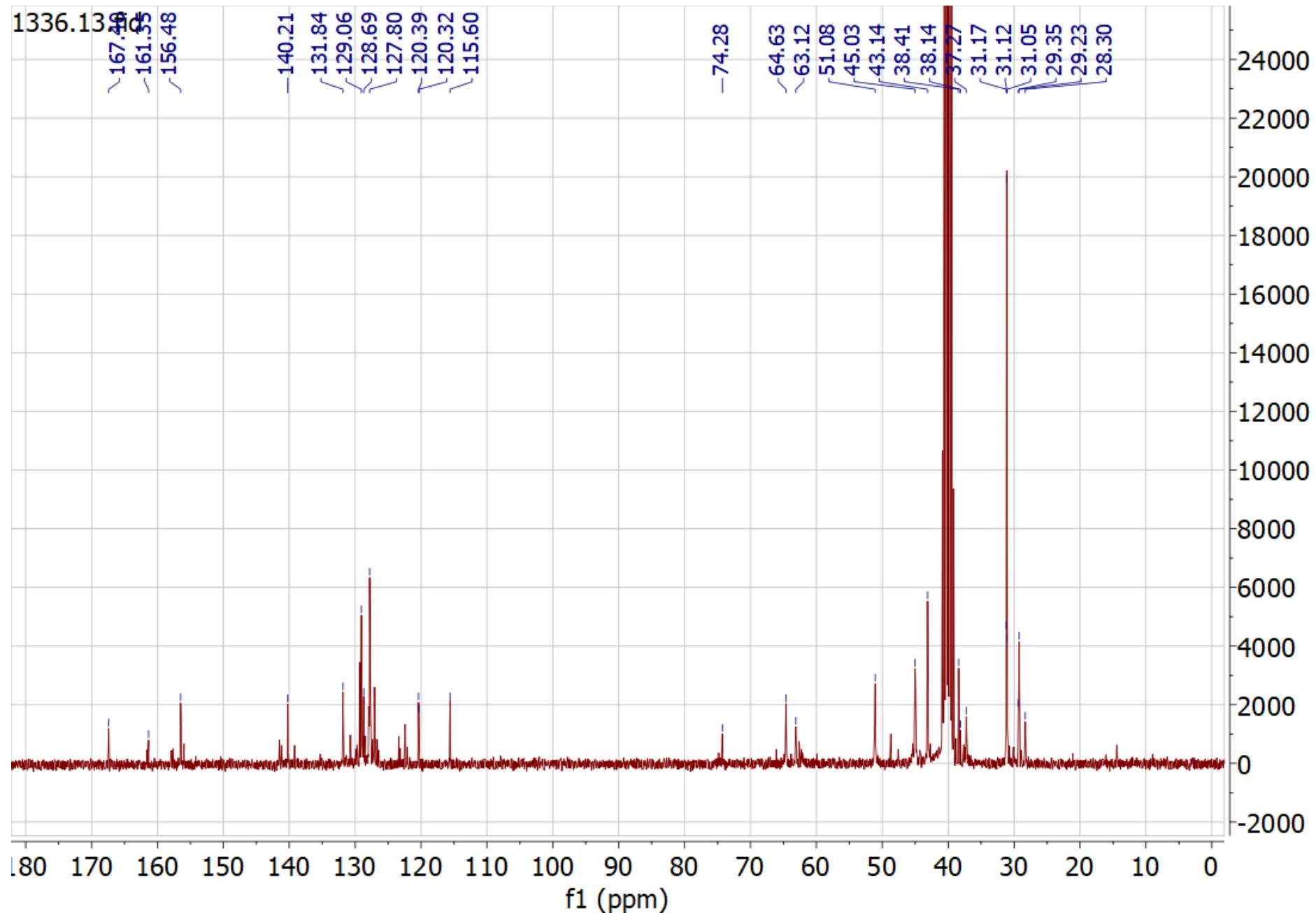


Figure S34.  $^1\text{H}$  NMR of compound 10a

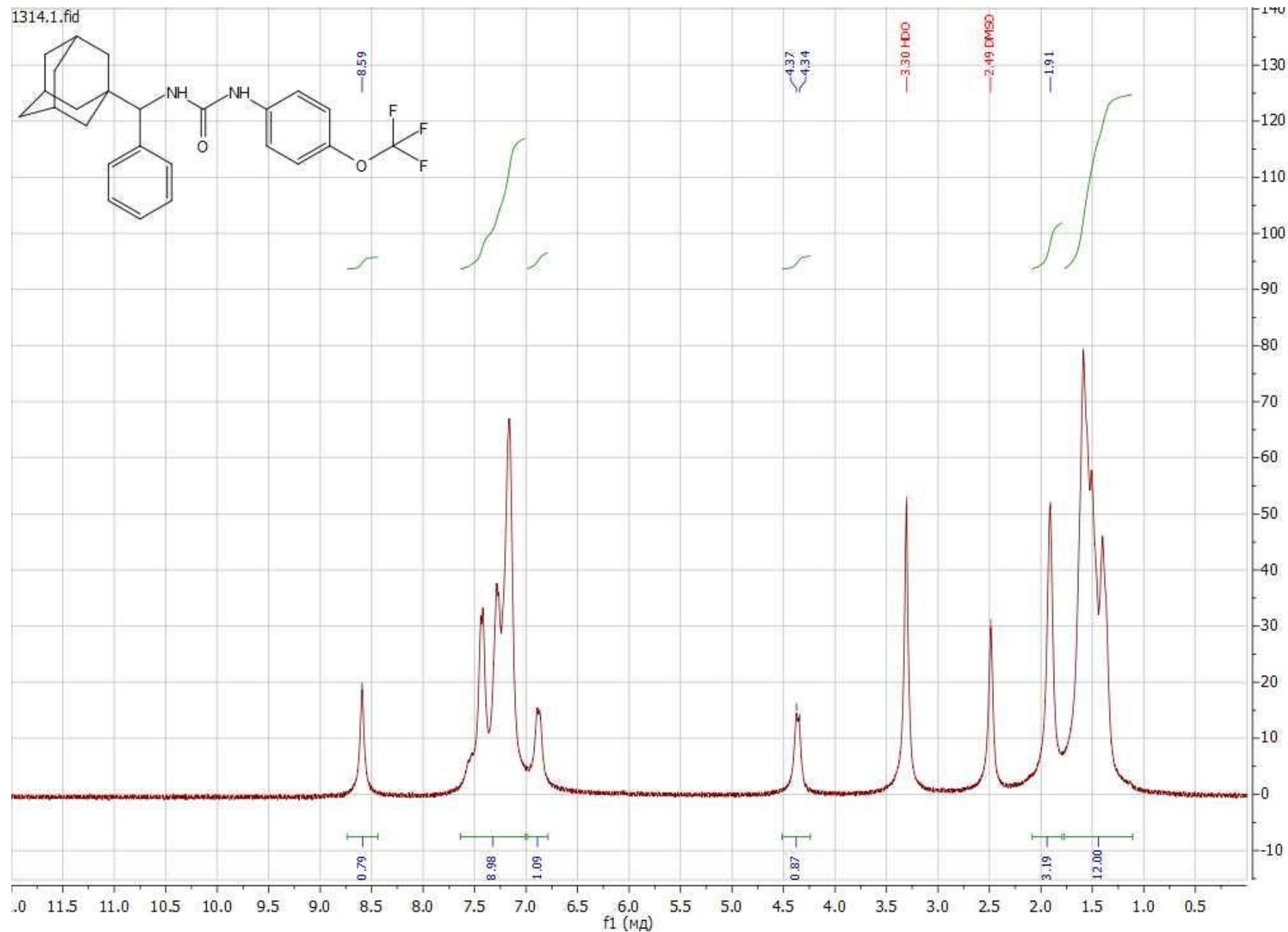


Figure S35.  $^{13}\text{C}$  NMR of compound 10a

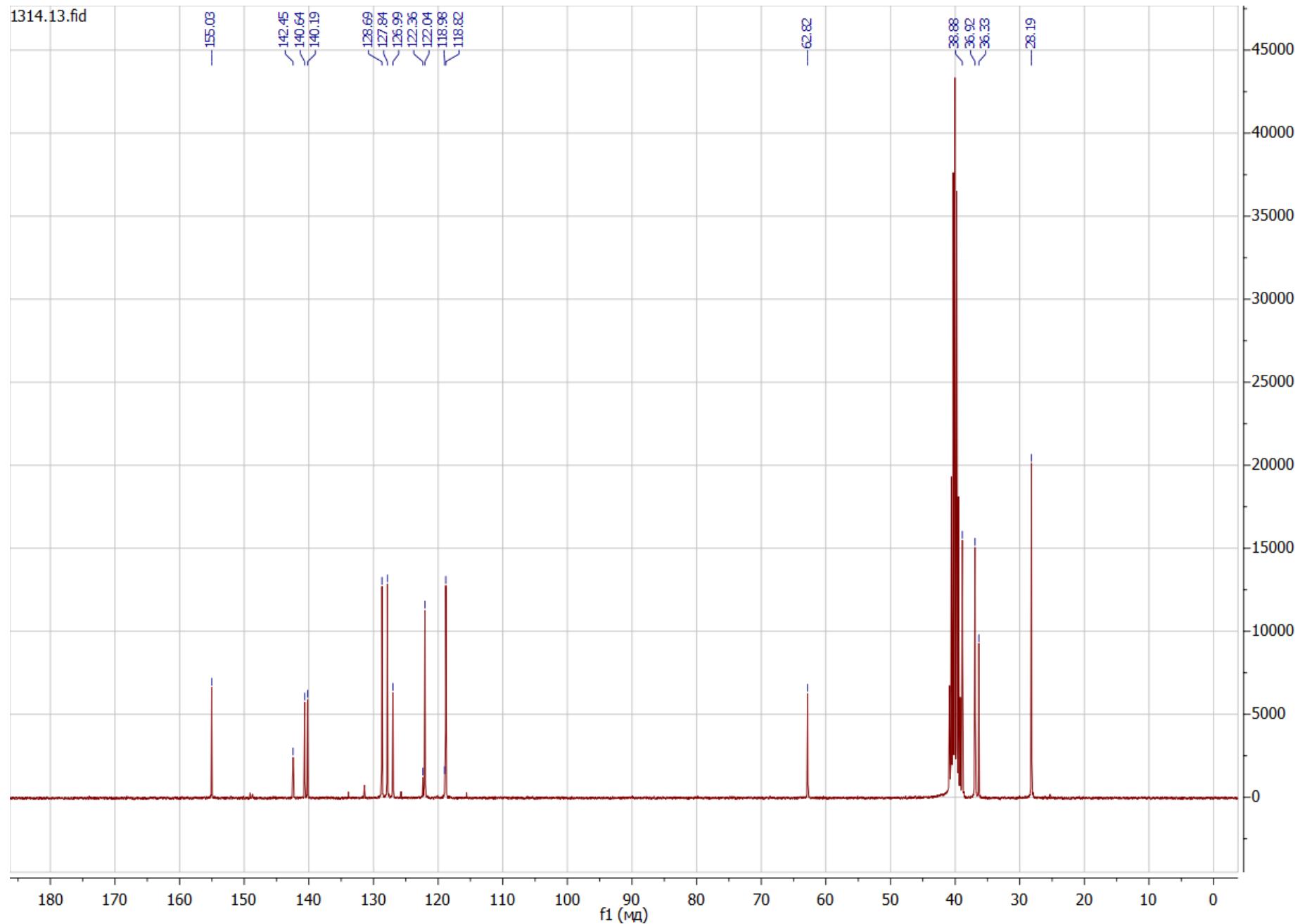


Figure S36.  $^{19}\text{F}$  NMR of compound 10a

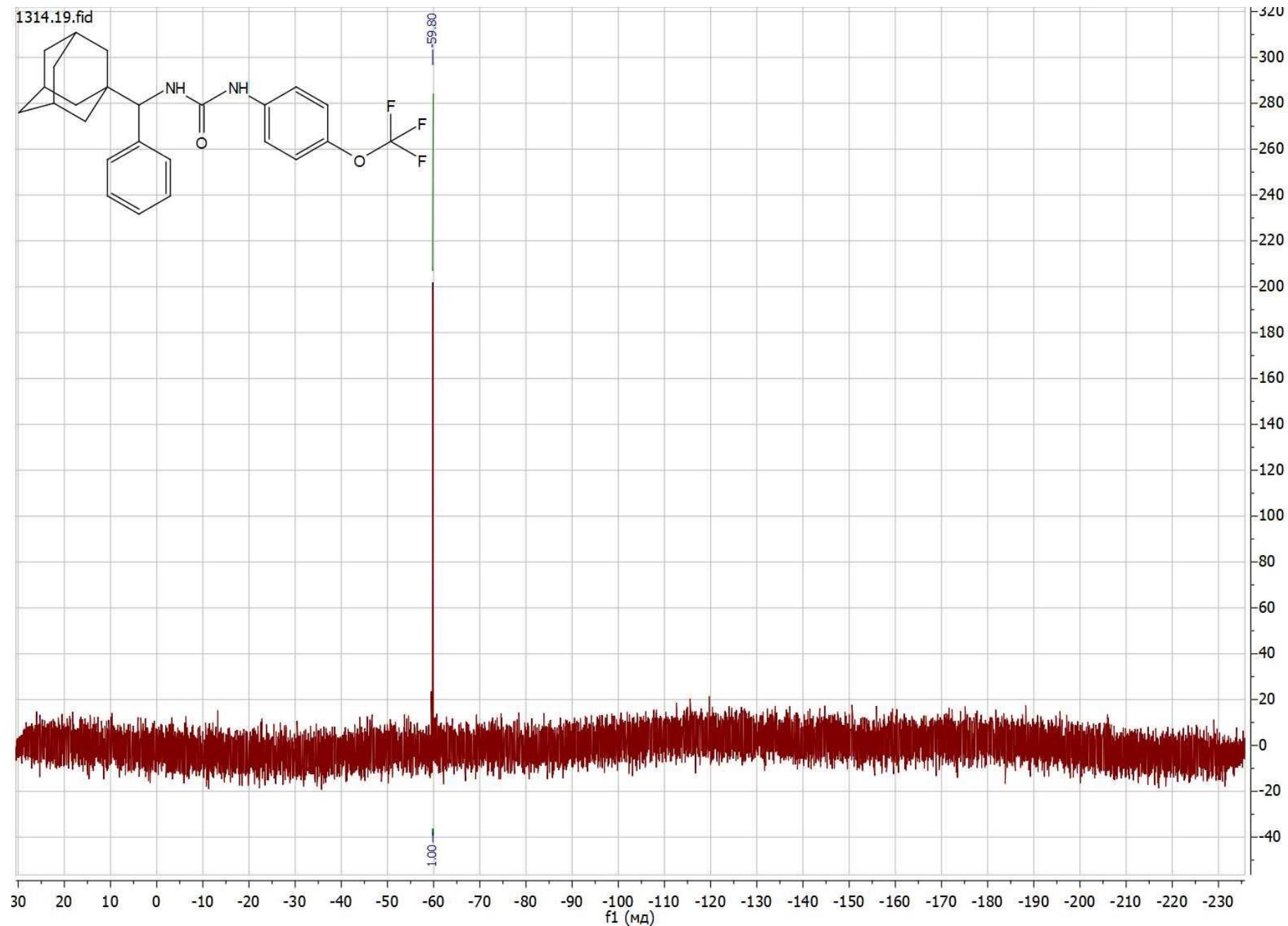


Figure S37.  $^1\text{H}$  NMR of compound 10b

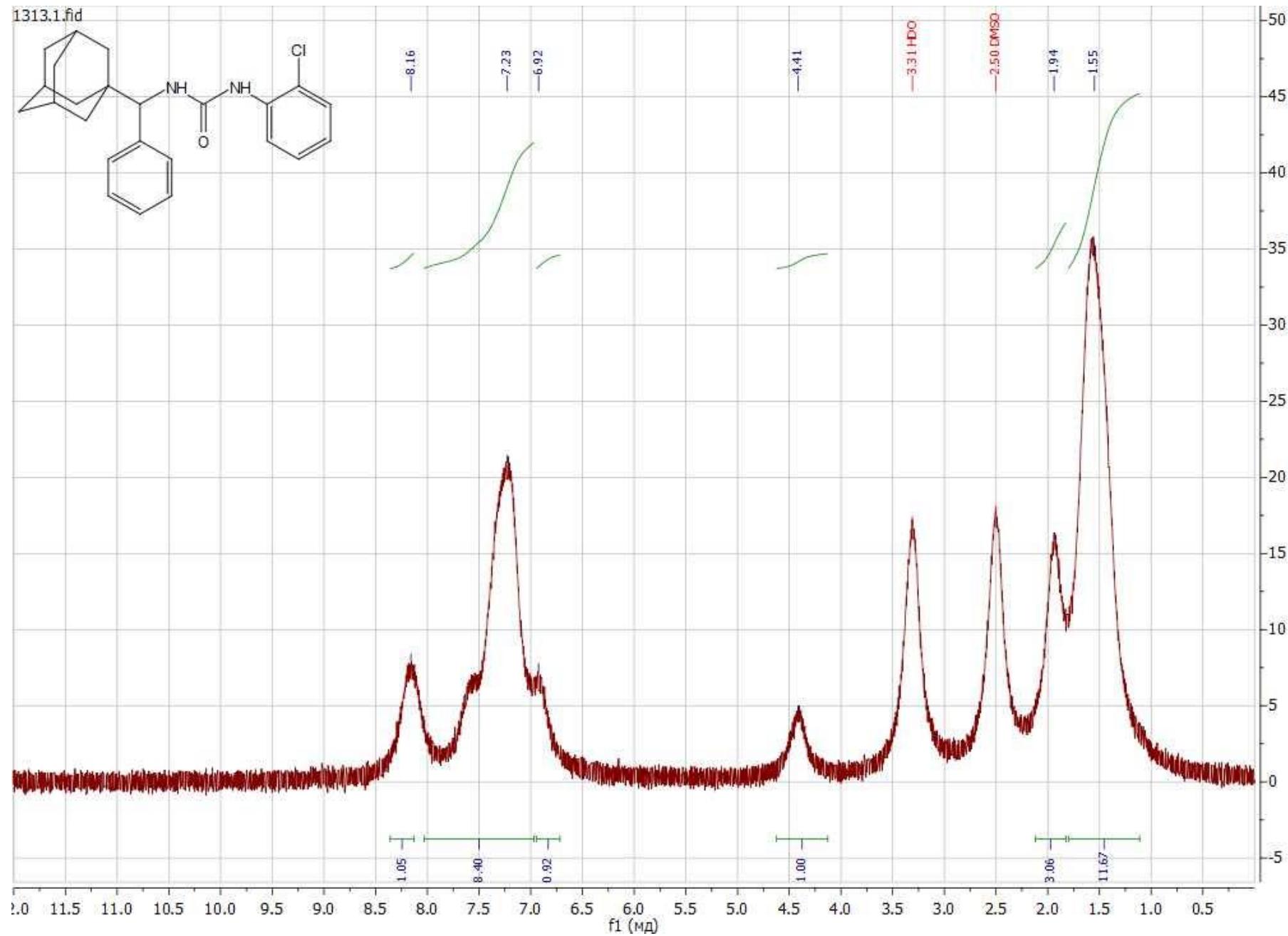


Figure S38.  $^{13}\text{C}$  NMR of compound 10b

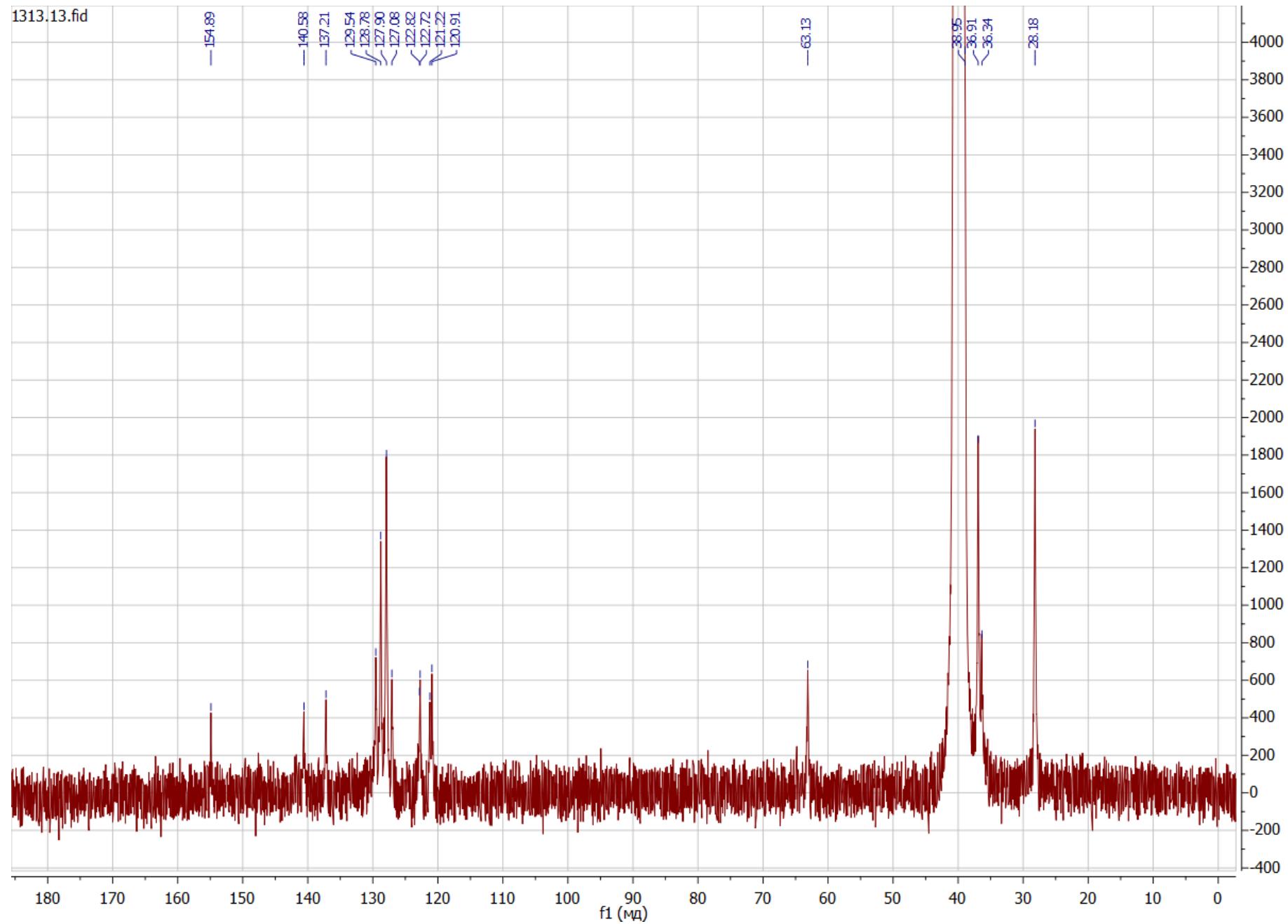


Figure S39.  $^1\text{H}$  NMR of compound 10c

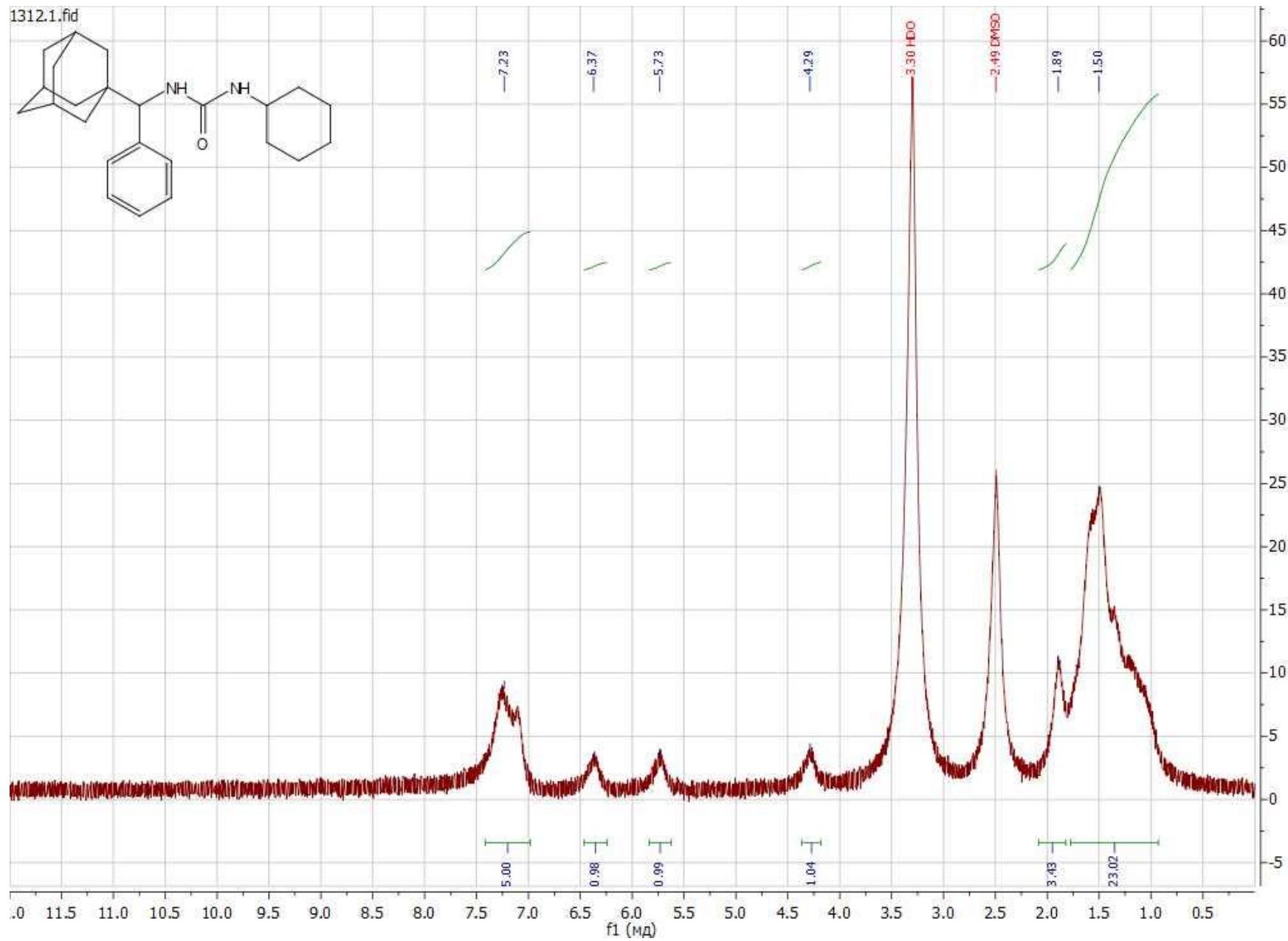


Figure S40.  $^{13}\text{C}$  NMR of compound 10c

