

# Supporting Information

## A Continuous Flow Method for the Desulfurization of Substituted Thioimidazoles: Synthesis of New Etomidate Derivatives

Marcus Baumann,<sup>\*[a]</sup> and Ian R. Baxendale<sup>[a]</sup>

<sup>a</sup>Durham University, Department of Chemistry, South Road, Durham DH1 3LE, United Kingdom

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## Materials and methods

Unless otherwise stated, all solvents were purchased from Fisher Scientific and used without further purification. Substrates and reagents were purchased from Alfa Aesar or Sigma Aldrich and used as received.

<sup>1</sup>H-NMR spectra were recorded on a Bruker Avance-400 instrument and are reported relative to residual solvent: CHCl<sub>3</sub> (δ 7.26 ppm) or DMSO (δ 2.50 ppm). <sup>13</sup>C-NMR spectra were recorded on the same instrument and are reported relative to CHCl<sub>3</sub> (δ 77.16 ppm) or DMSO (δ 39.52 ppm). Data for <sup>1</sup>H-NMR are reported as follows: chemical shift (δ/ ppm) (integration, multiplicity, coupling constant (Hz)). Multiplicities are reported as follows: s = singlet, d = doublet, t = triplet, q = quartet, p = pentet, m = multiplet, br. s = broad singlet, app = apparent. Data for <sup>13</sup>C-NMR are reported in terms of chemical shift (δ/ ppm) and multiplicity (C, CH, CH<sub>2</sub> or CH<sub>3</sub>). Data for <sup>19</sup>F-NMR were recorded on the above instrument at a frequency of 376 MHz using CFCl<sub>3</sub> as external standard. DEPT-135, COSY, HSQC, HMBC and NOESY experiments were used in the structural assignment.

IR spectra were obtained by use of a Perkin Elmer RX1 spectrometer (neat, ATR sampling) with the intensities of the characteristic signals being reported as weak (w, <20% of tallest signal), medium (m, 21-70% of tallest signal) or strong (s, >71% of tallest signal).

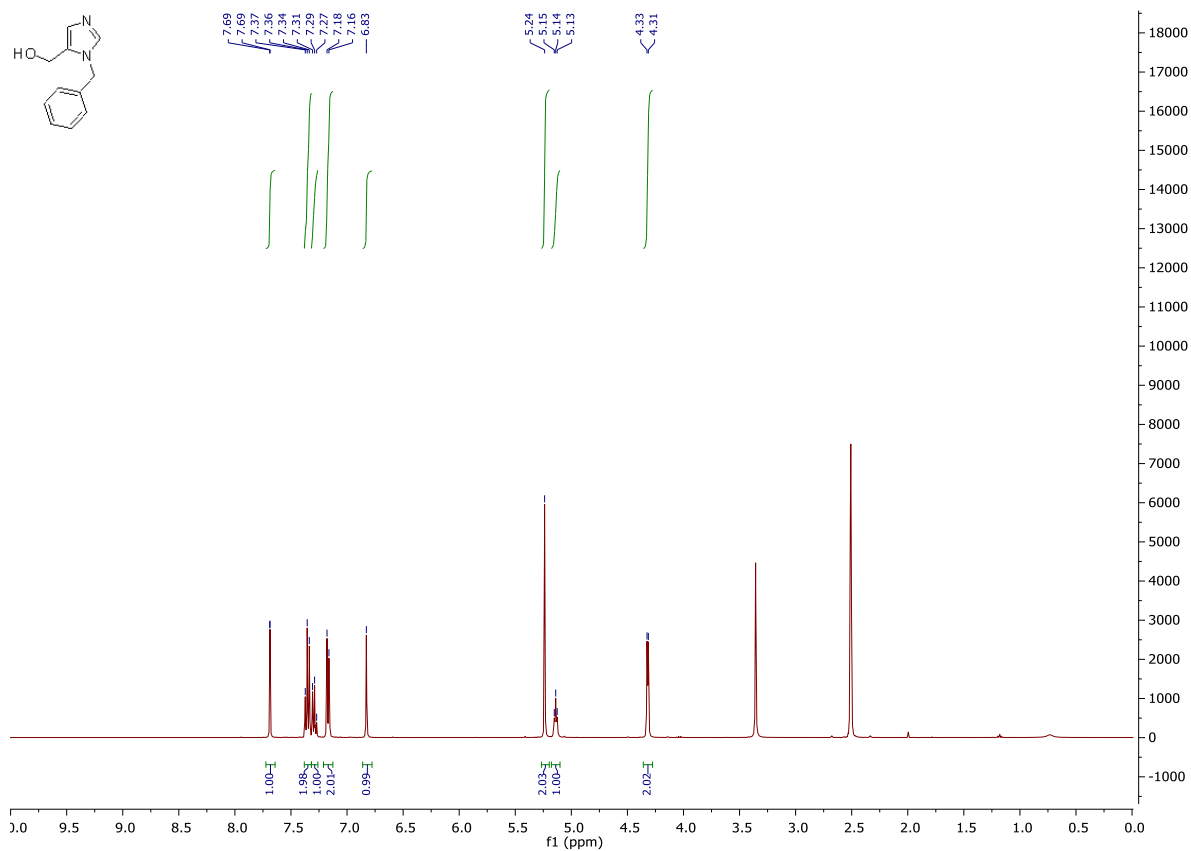
Low and high resolution mass spectrometry was performed using the indicated techniques on either Waters LCT Premier XE or Waters TQD instruments equipped with Acquity UPLC and a lock-mass electrospray ion source. For accurate mass data the deviation from the calculated formula is reported.

Melting points were recorded on an Optimelt automated melting point system with a heating rate of 1 °C/min and are uncorrected.

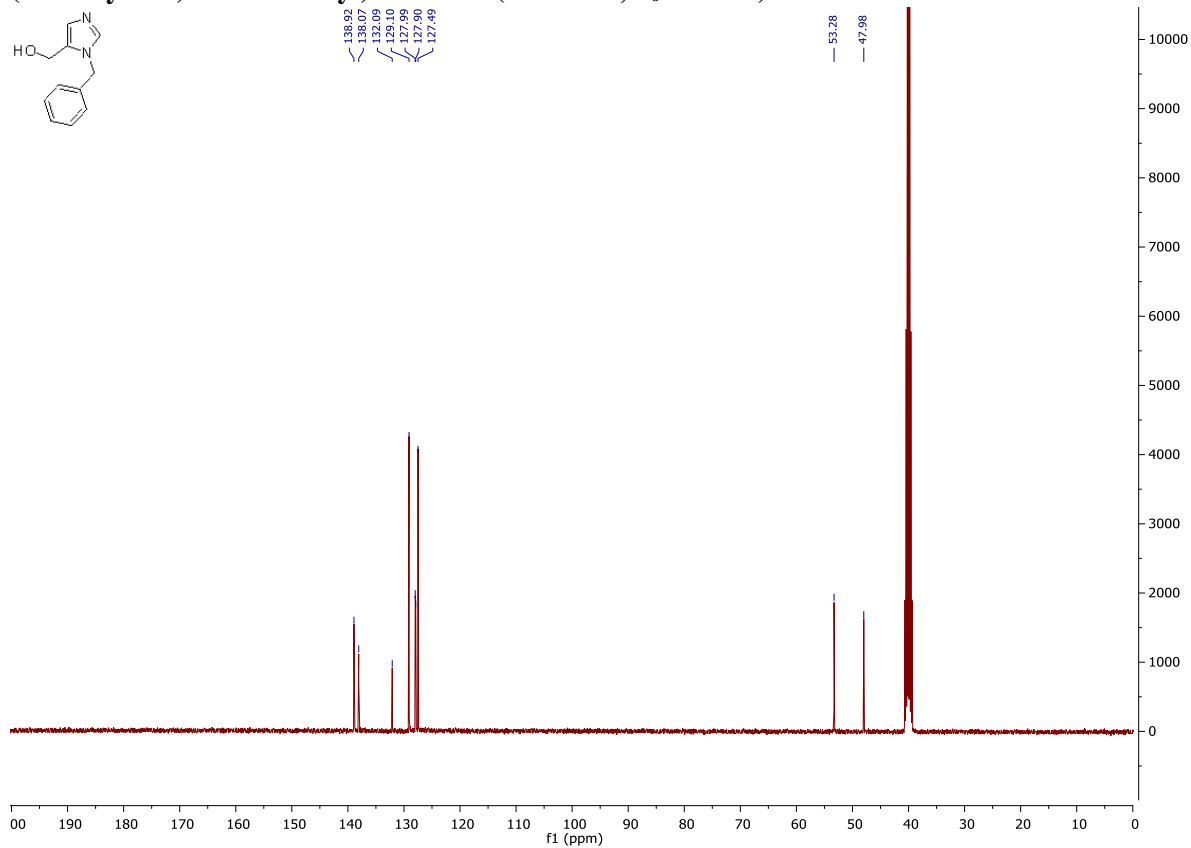
Flow chemistry experiments were performed with a Vapourtec E-series system.

# Copies of $^1\text{H}$ and $^{13}\text{C}$ NMR spectra

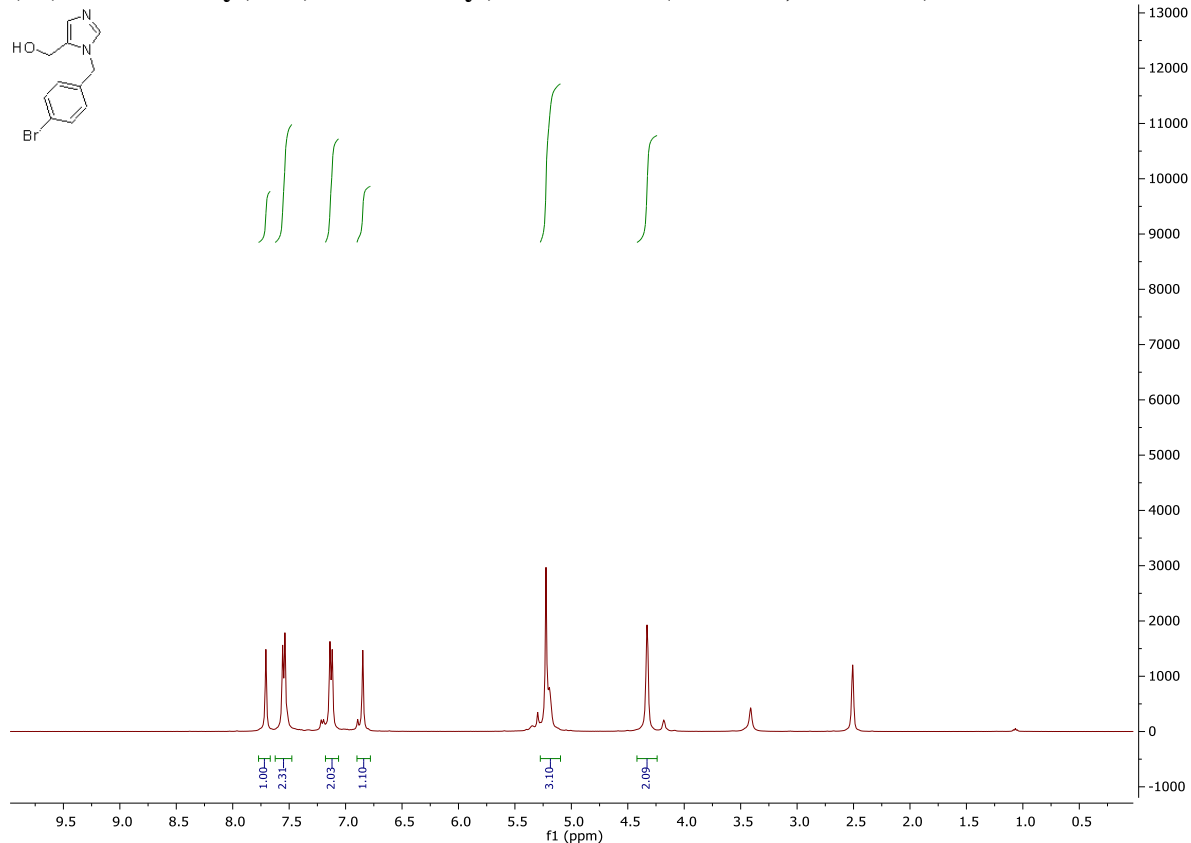
(1-Benzyl-1*H*)-imidazol-5-yl)methanol **6a** (400 MHz,  $\text{d}_6\text{-DMSO}$ ):



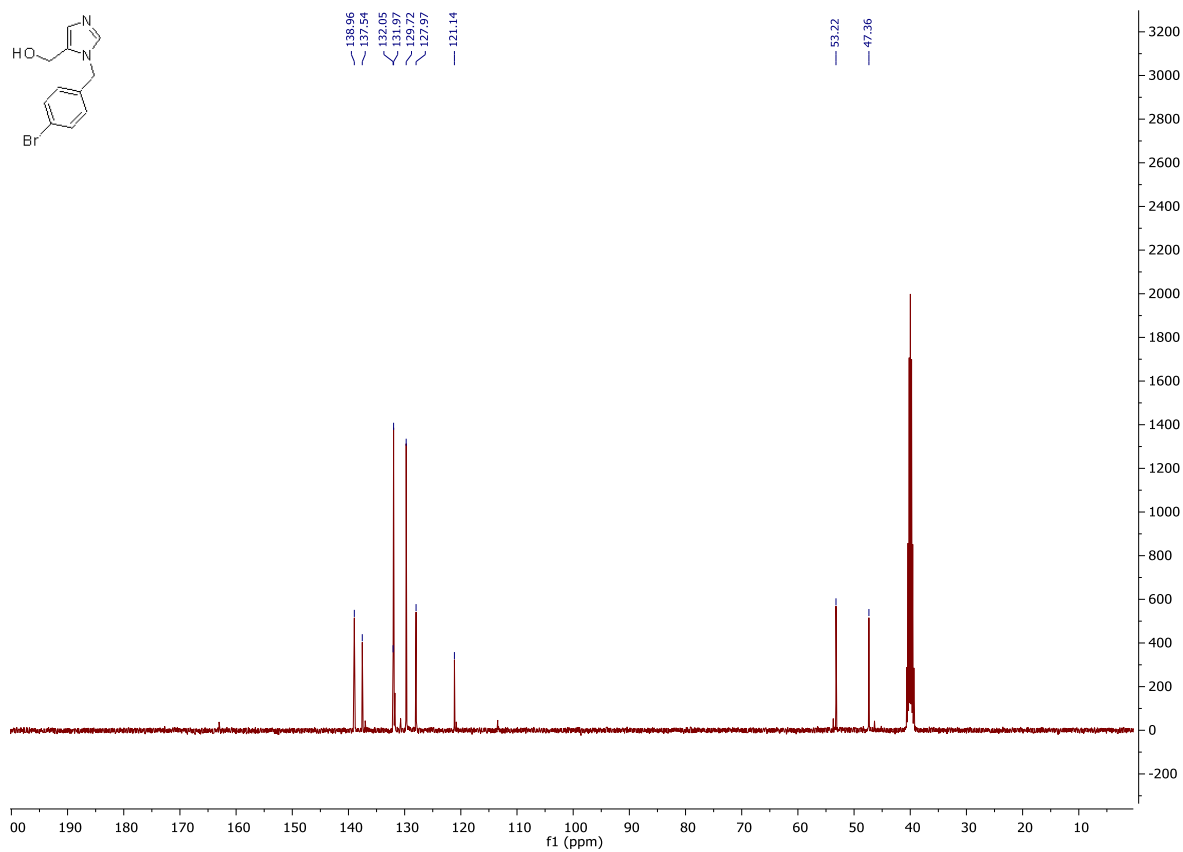
(1-Benzyl-1*H*)-imidazol-5-yl)methanol (101 MHz,  $\text{d}_6\text{-DMSO}$ ):



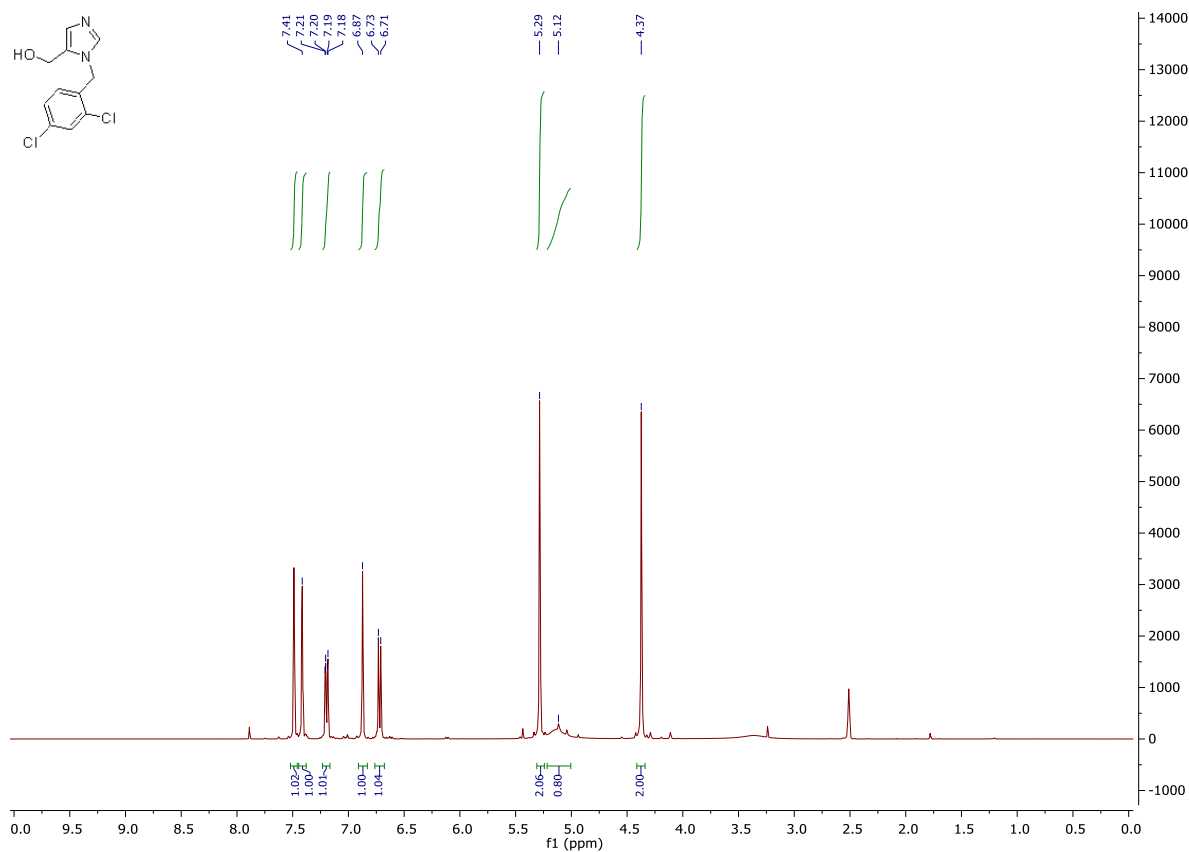
**(1-(4-Bromobenzyl)-1*H*-imidazol-5-yl)methanol 6b (400 MHz, d<sub>6</sub>-DMSO):**



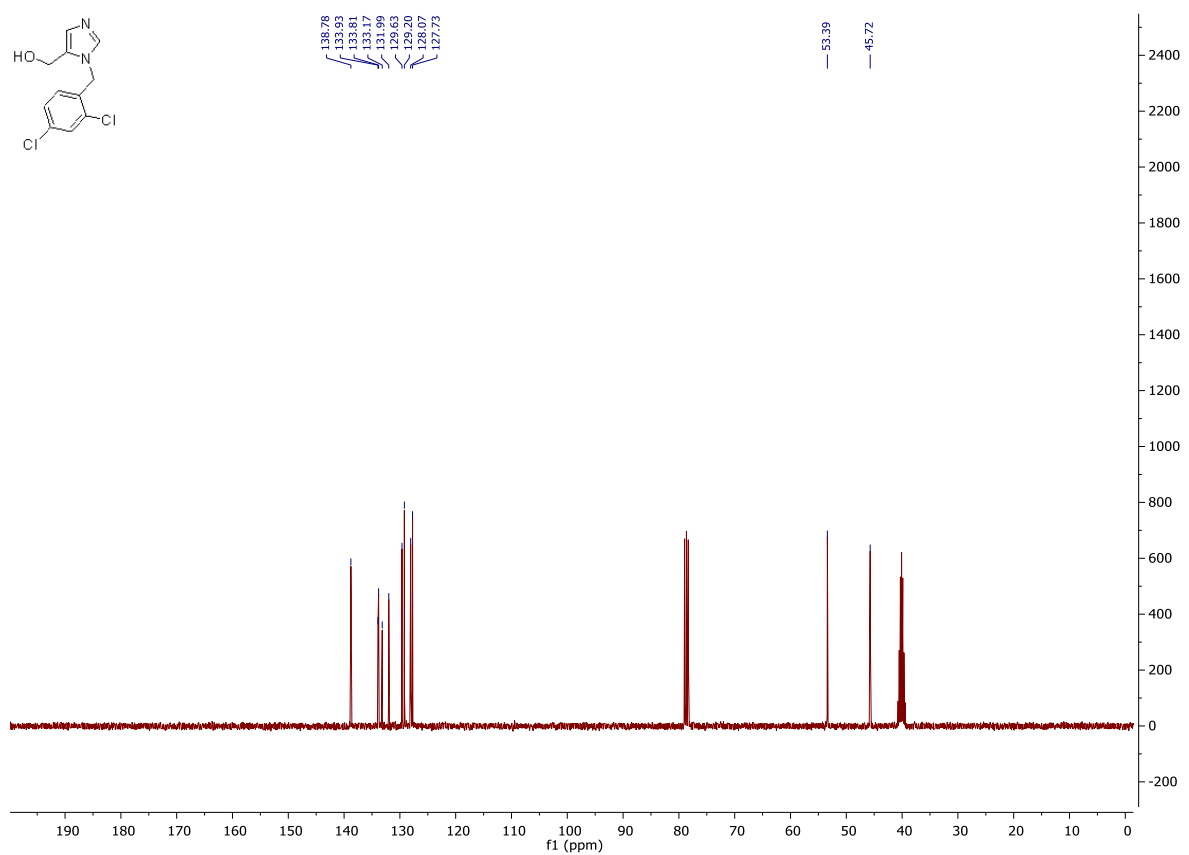
**(1-(4-Bromobenzyl)-1*H*-imidazol-5-yl)methanol (101 MHz, d<sub>6</sub>-DMSO):**



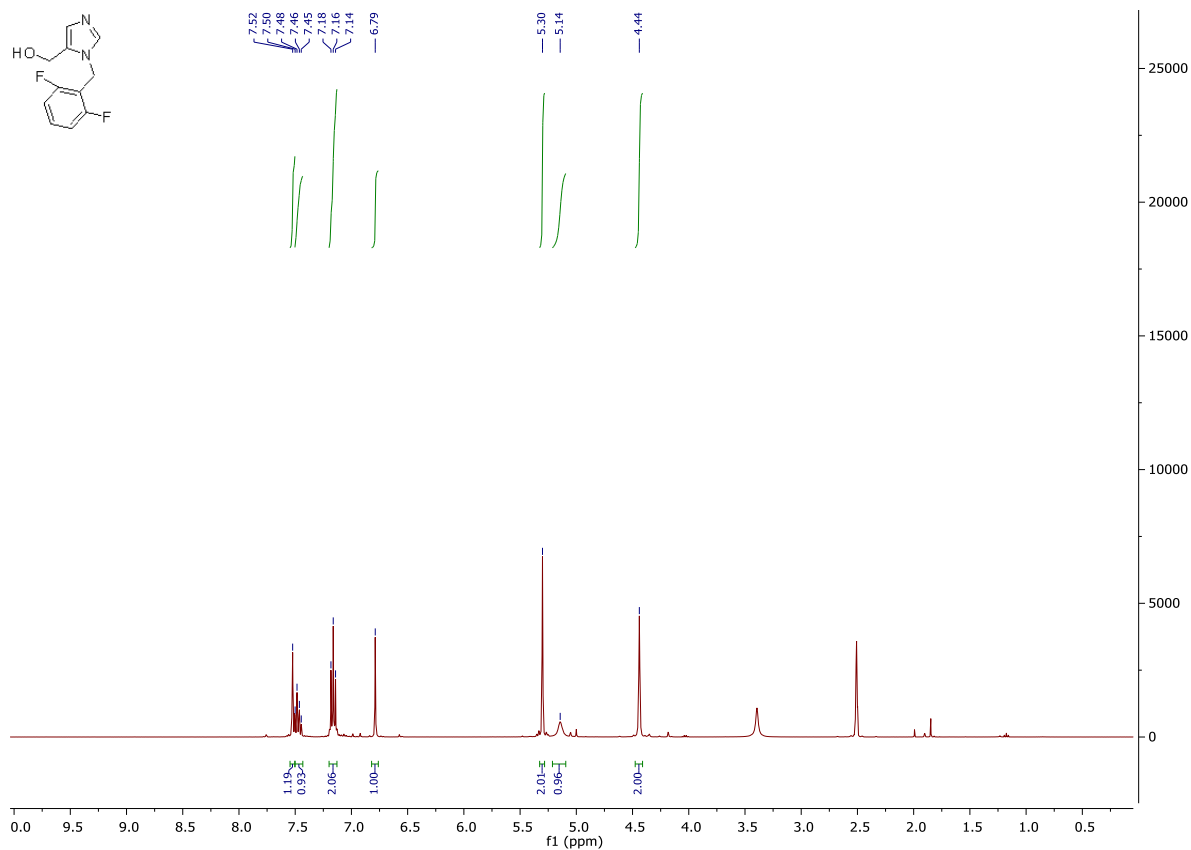
**(1-(2,4-Dichlorobenzyl)-1*H*-imidazol-5-yl)methanol 6c (400 MHz, d<sub>6</sub>-DMSO/CDCl<sub>3</sub>):**



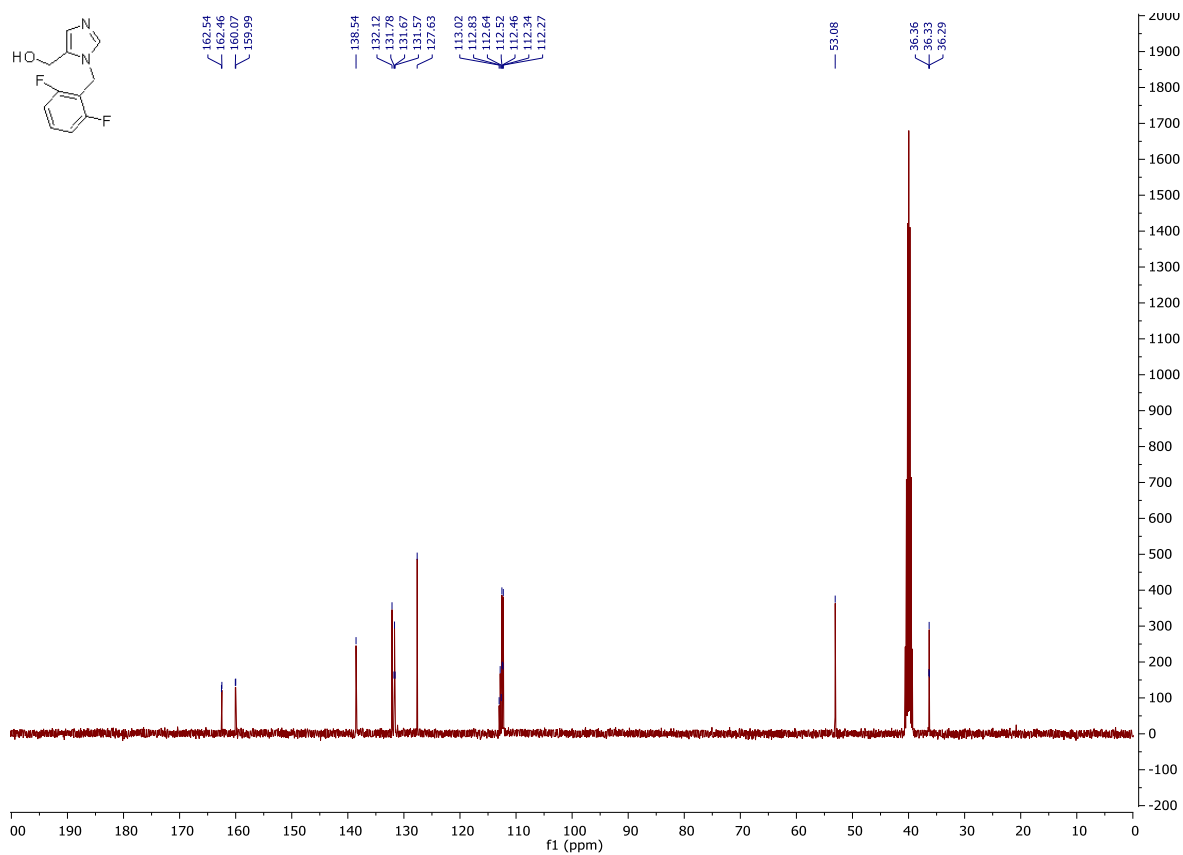
**(1-(2,4-Dichlorobenzyl)-1*H*-imidazol-5-yl)methanol (101 MHz, d<sub>6</sub>-DMSO/CDCl<sub>3</sub>):**



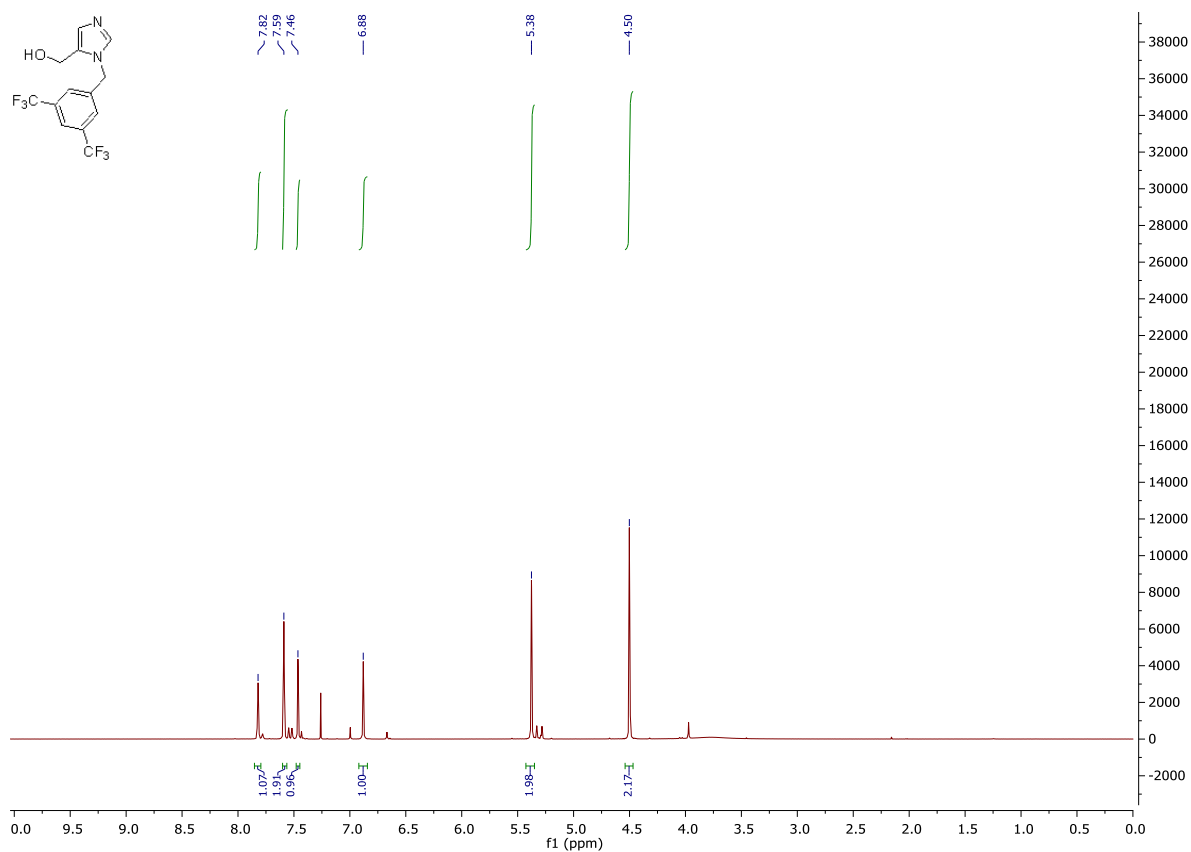
**(1-(2,6-Difluorobenzyl)-1*H*)-imidazol-5-yl)methanol 6d (400 MHz, d<sub>6</sub>-DMSO):**



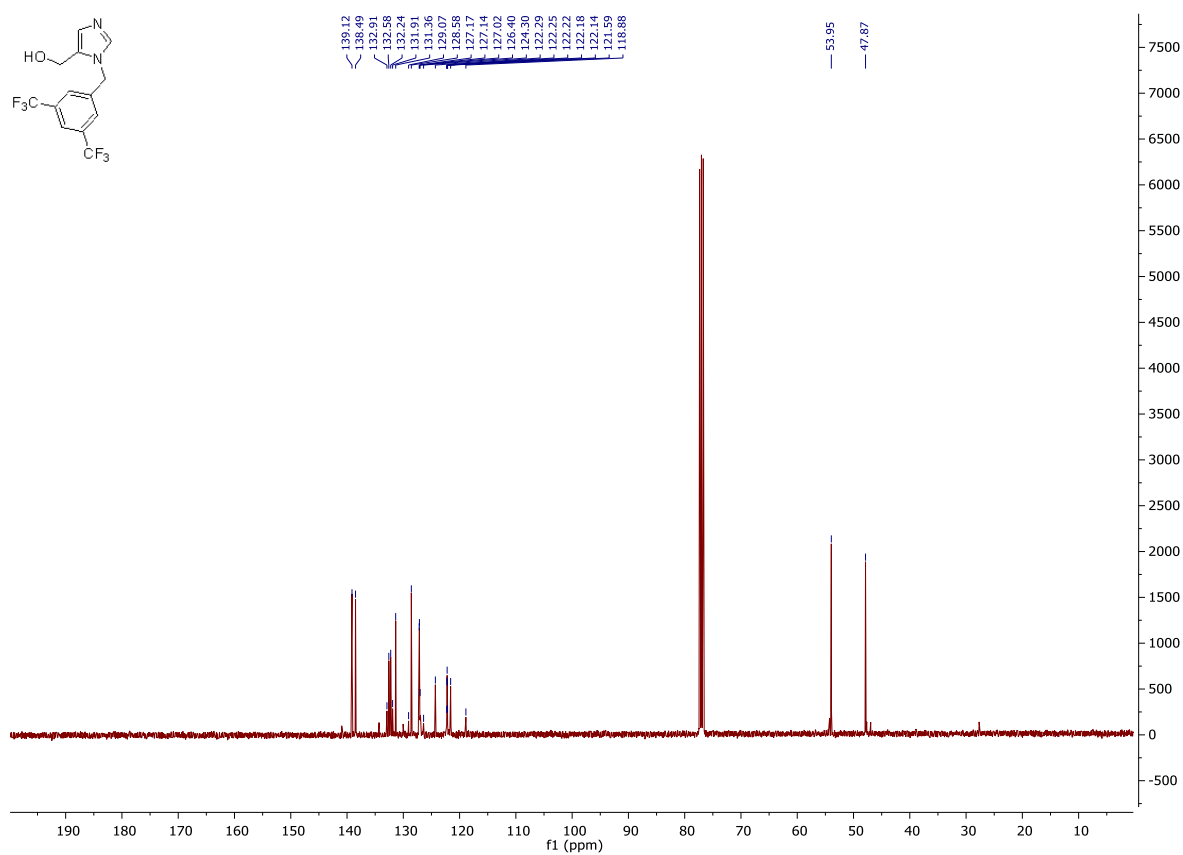
**(1-(2,6-Difluorobenzyl)-1*H*)-imidazol-5-yl)methanol (101 MHz, d<sub>6</sub>-DMSO):**



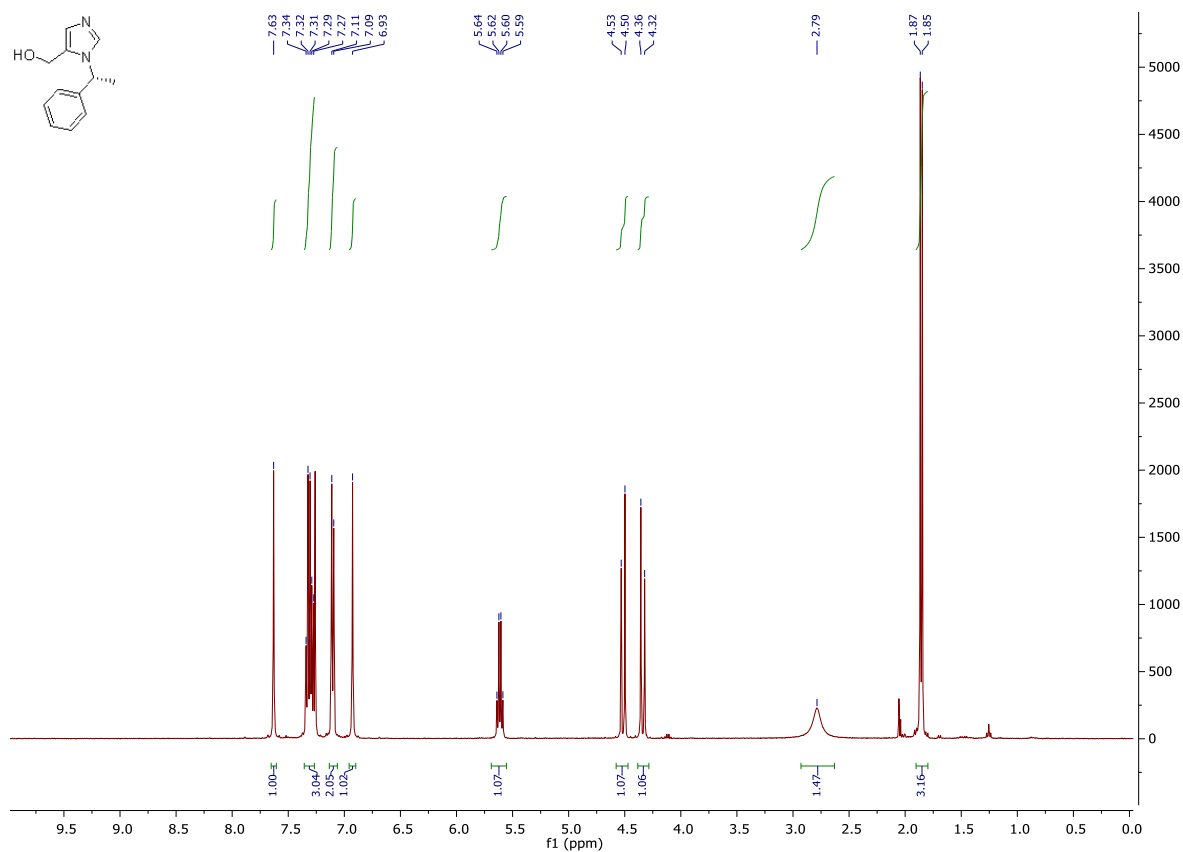
**(1-(3,5-bis-(Trifluoromethyl)benzyl)-1*H*-imidazol-5-yl)methanol 6e (400 MHz, CDCl<sub>3</sub>):**



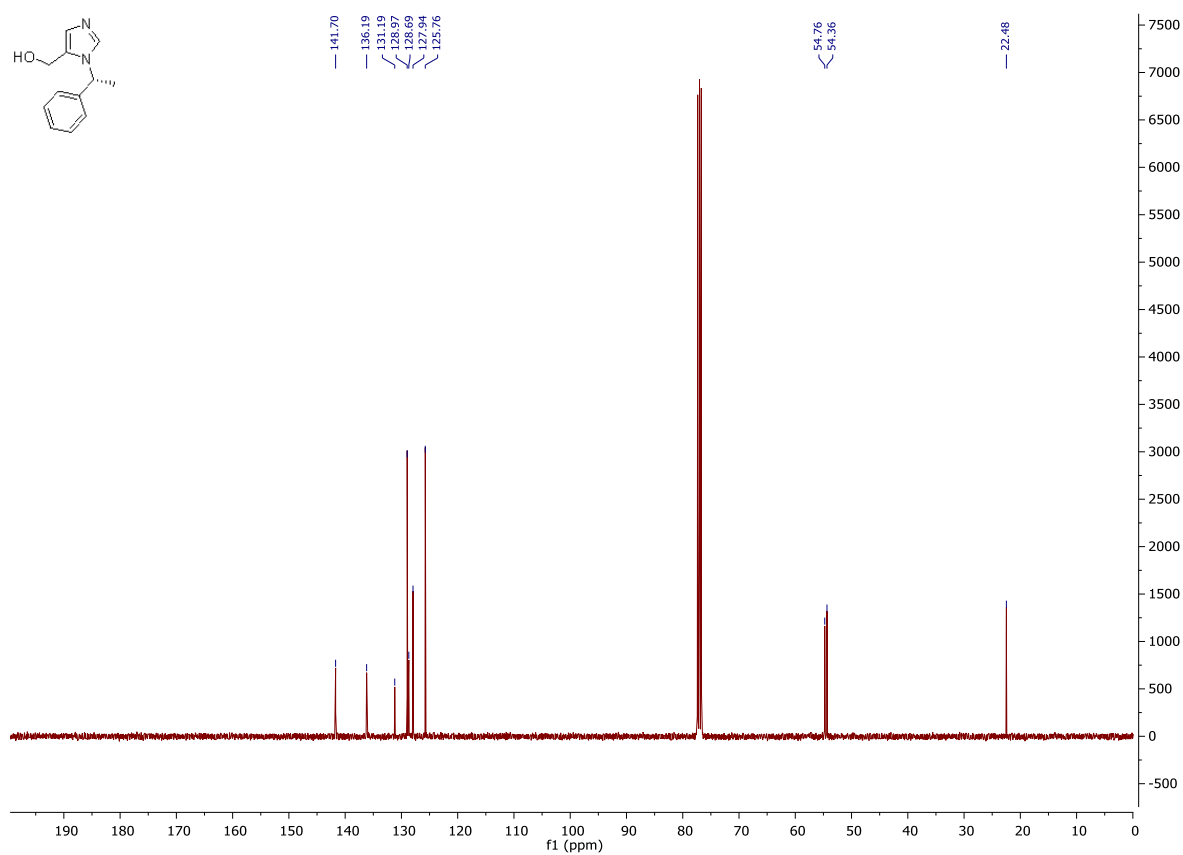
**(1-(3,5-bis-(Trifluoromethyl)benzyl)-1*H*-imidazol-5-yl)methanol (101 MHz, CDCl<sub>3</sub>):**



**1-[(1*R*)-1-Phenylethyl]-5-hydroxymethylimidazole 6f (400 MHz, CDCl<sub>3</sub>):**

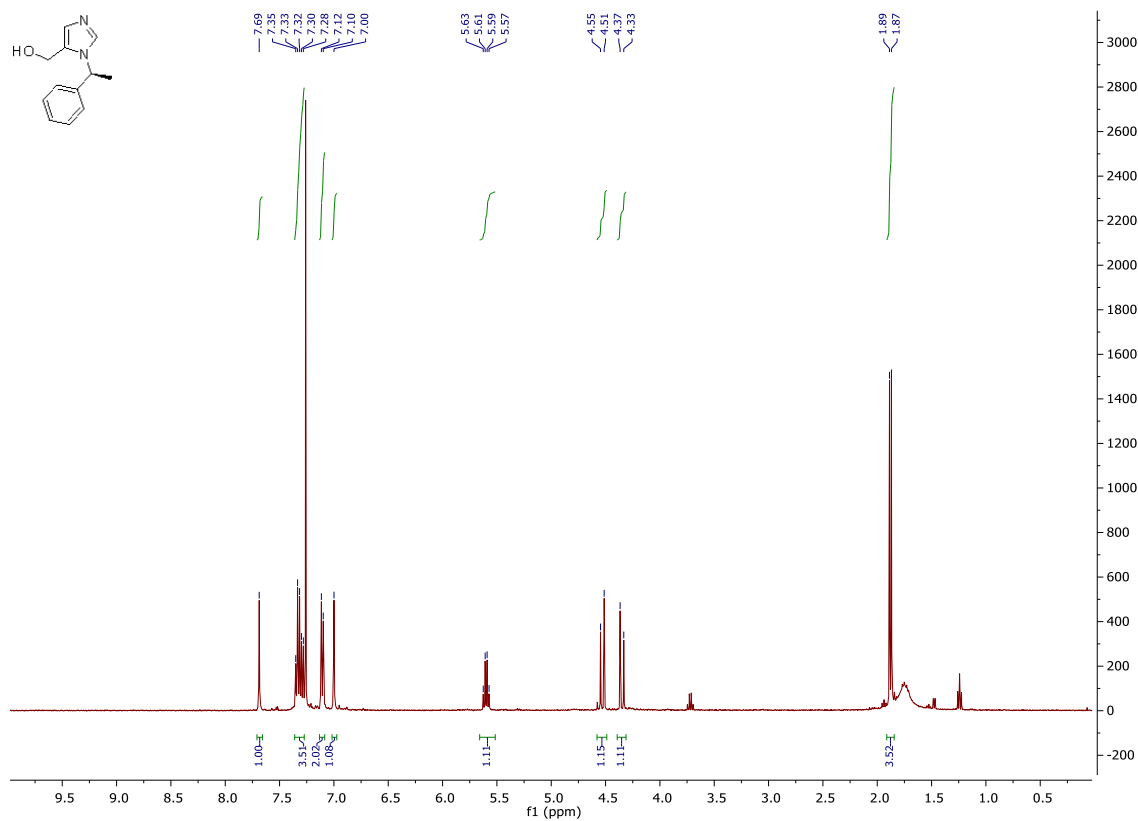


**1-[(1*R*)-1-Phenylethyl]-5-hydroxymethylimidazole (101 MHz, CDCl<sub>3</sub>):**

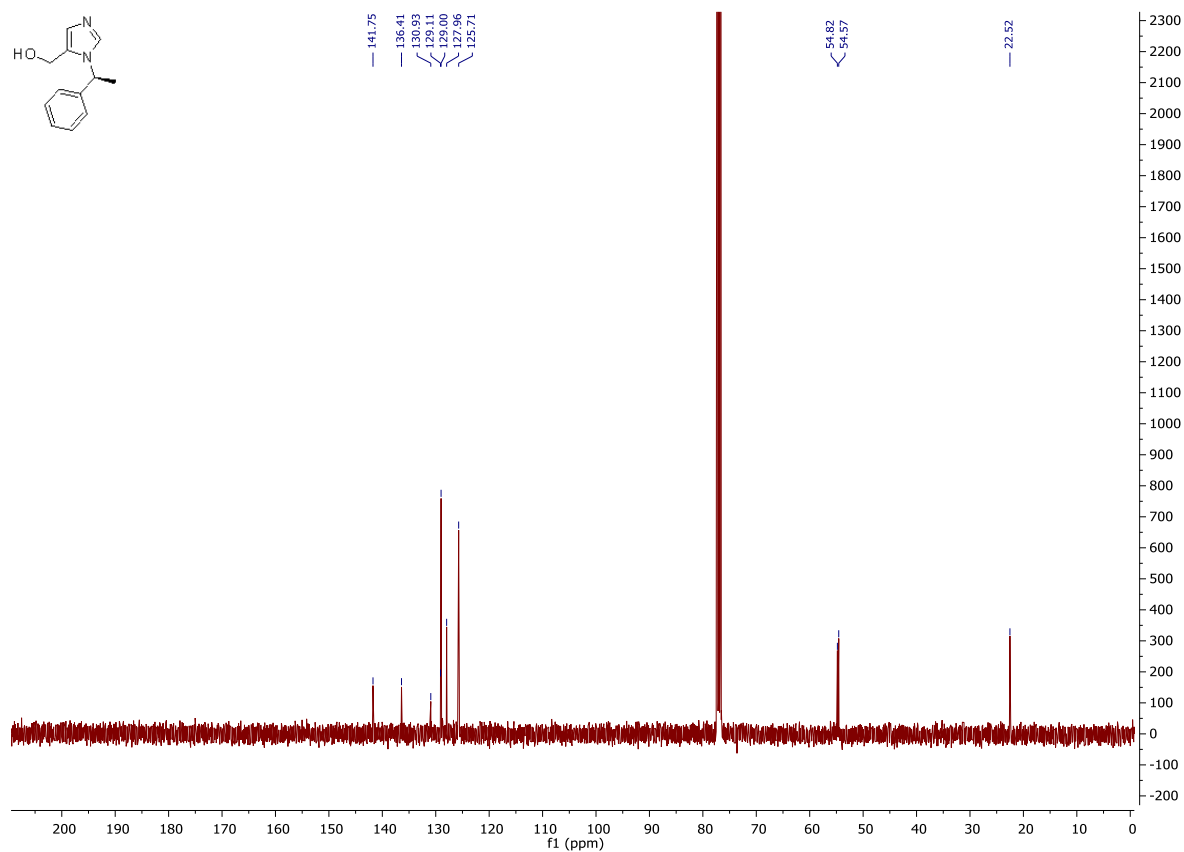




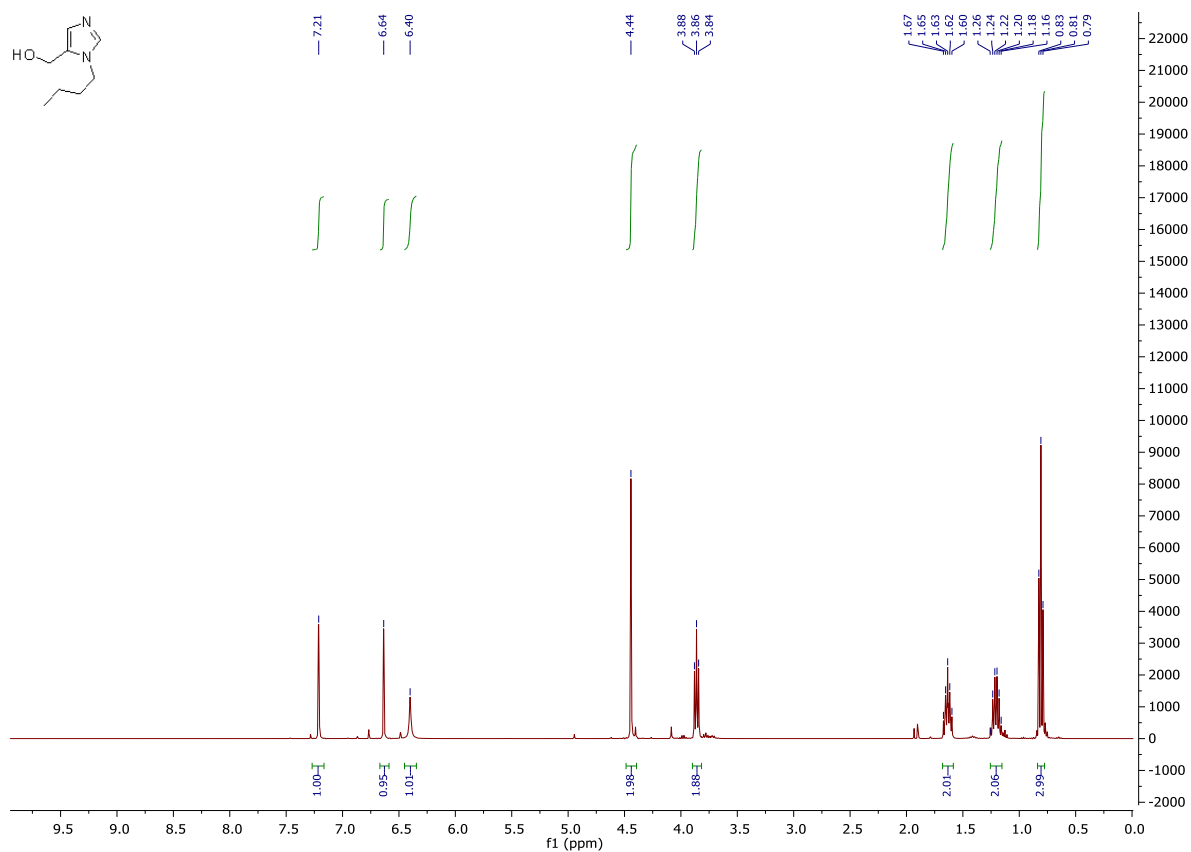
### 1-[(1S)-1-Phenylethyl]-5-hydroxymethylimidazole 6g (400 MHz, CDCl<sub>3</sub>):



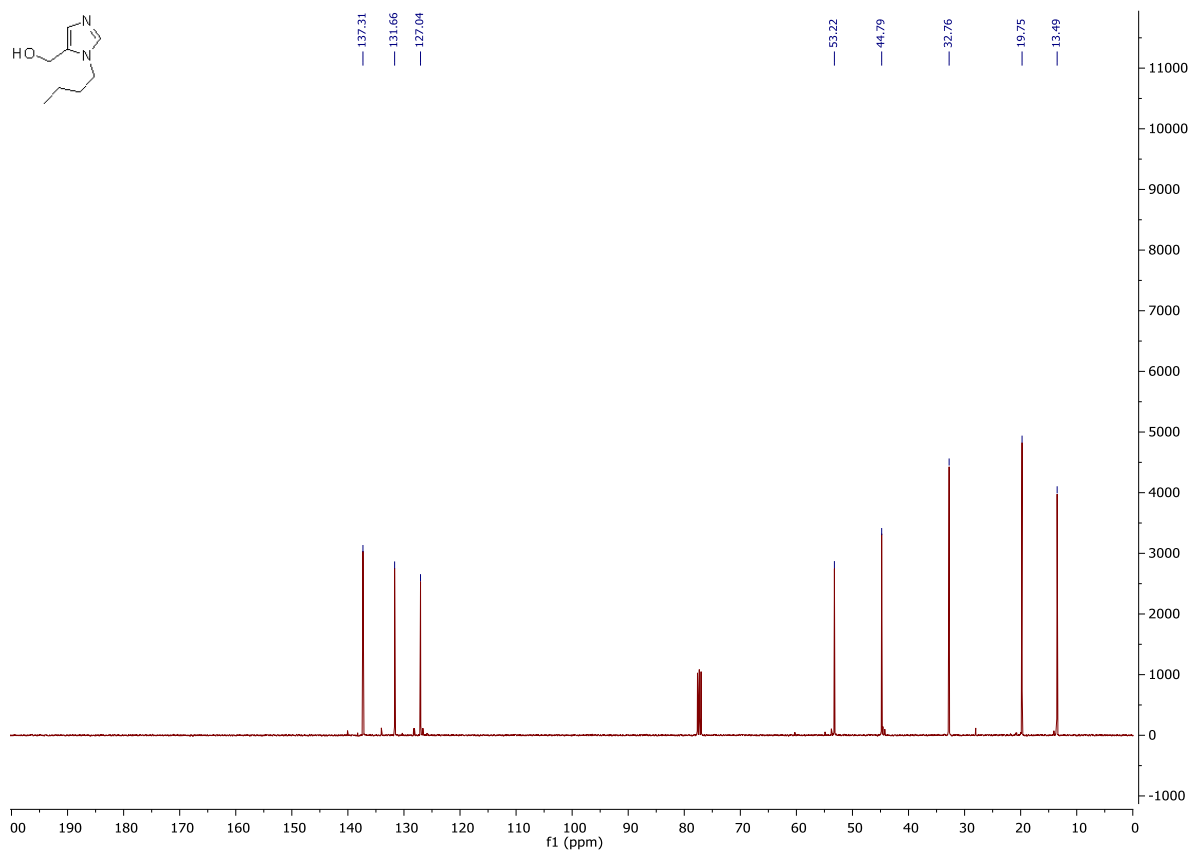
### 1-[(1S)-1-Phenylethyl]-5-hydroxymethylimidazole (101 MHz, CDCl<sub>3</sub>):



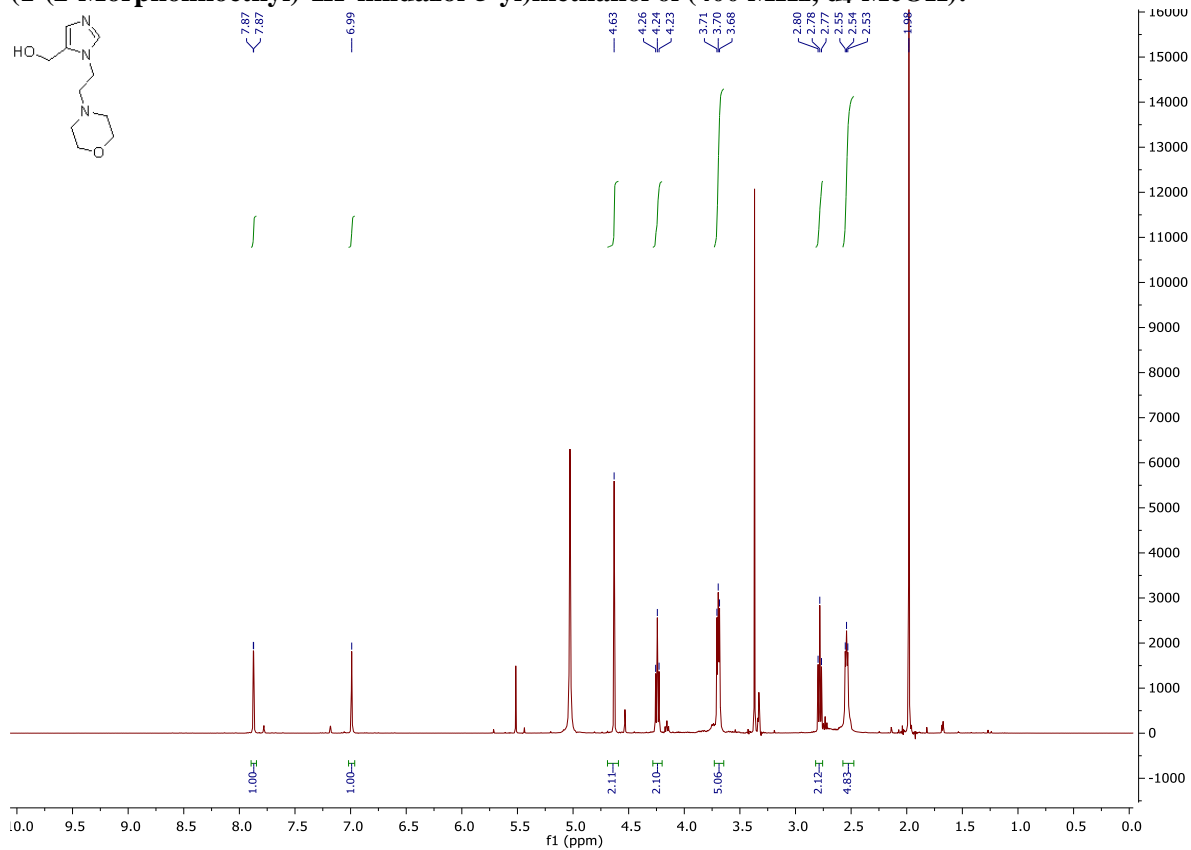
**(1-Butyl-1*H*)-imidazol-5-yl)methanol 6h (400 MHz, CDCl<sub>3</sub>):**



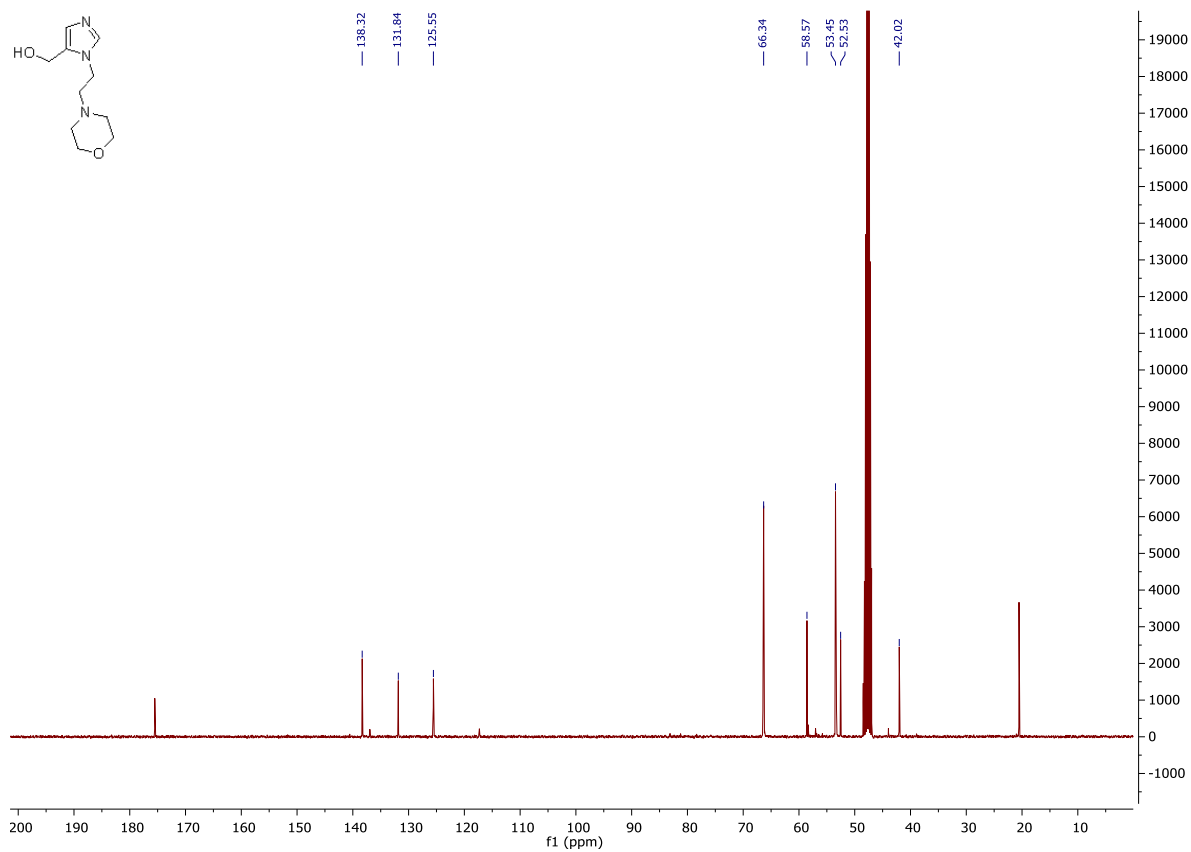
**(1-Butyl-1*H*)-imidazol-5-yl)methanol (101 MHz, CDCl<sub>3</sub>):**



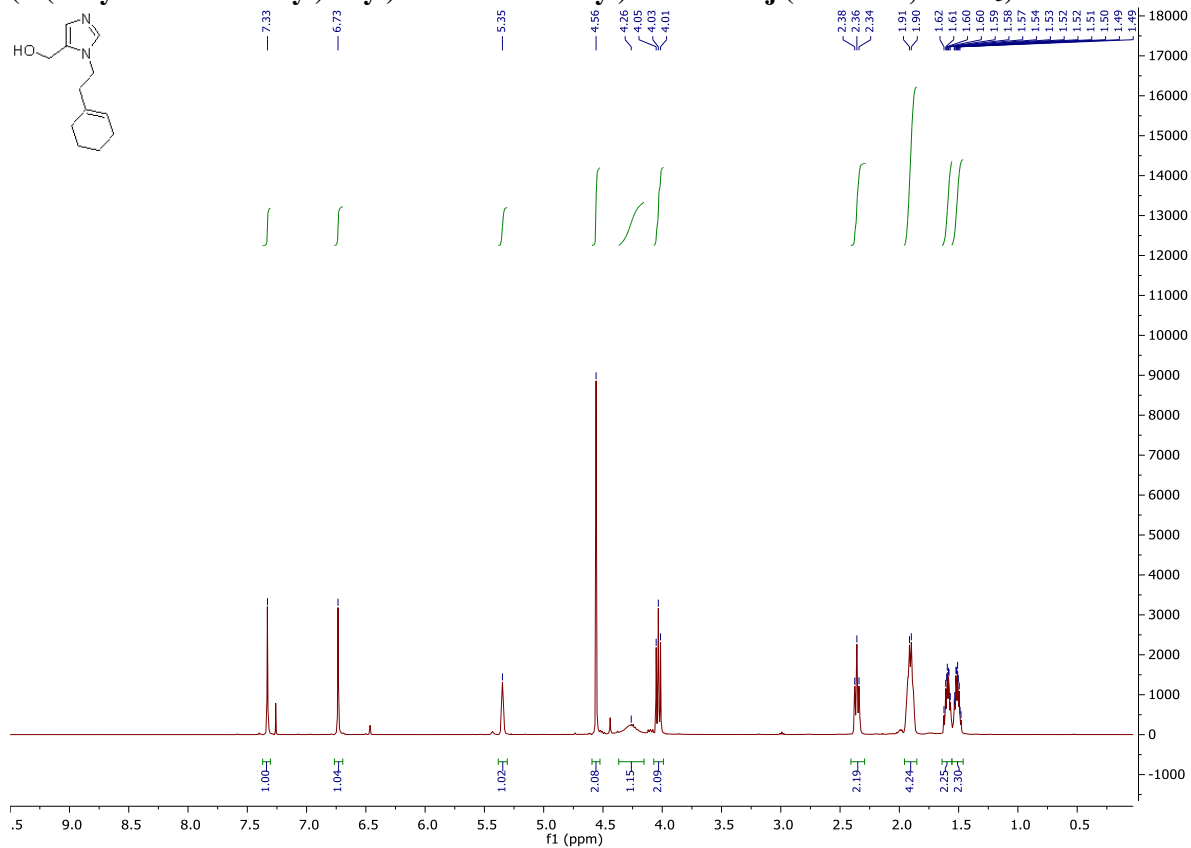
**(1-(2-Morpholinoethyl)-1*H*-imidazol-5-yl)methanol 6i (400 MHz, d<sub>4</sub>-MeOH):**



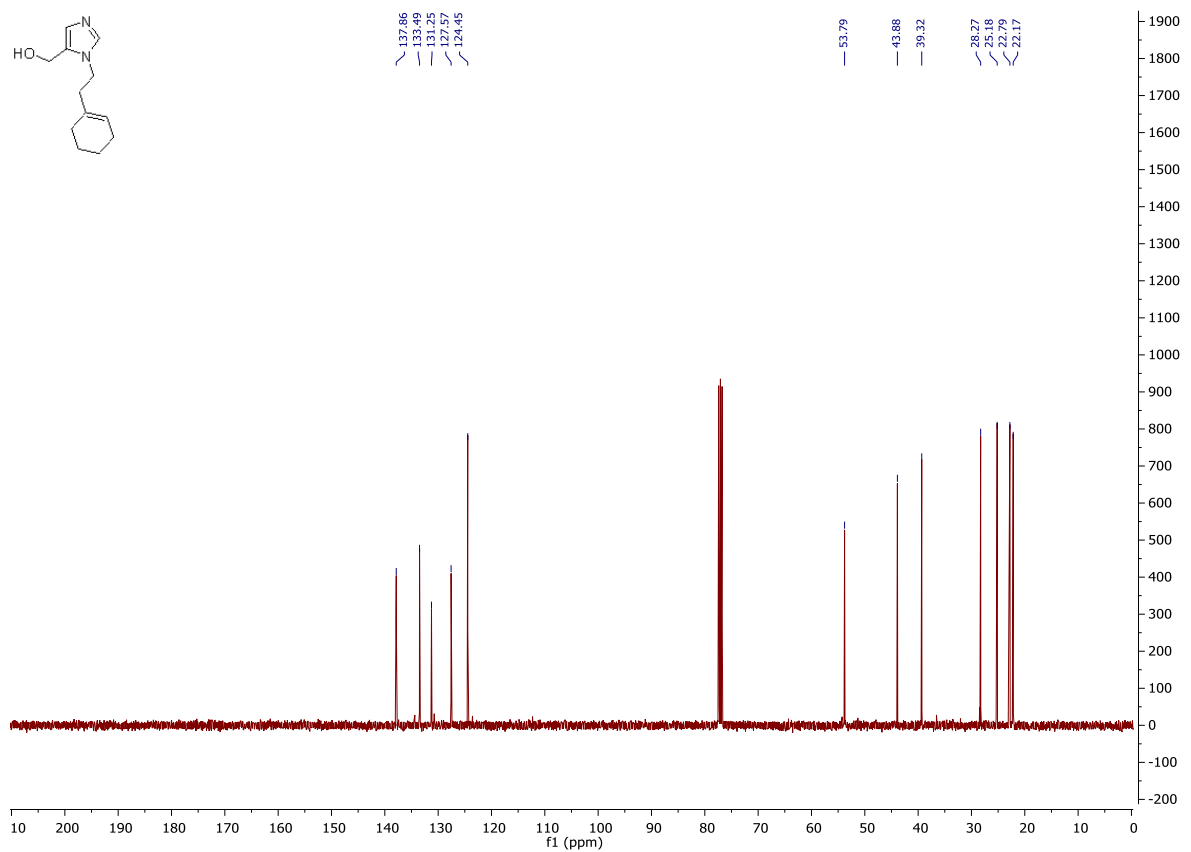
**(1-(2-Morpholinoethyl)-1*H*-imidazol-5-yl)methanol 6i (101 MHz, d<sub>4</sub>-MeOH):**



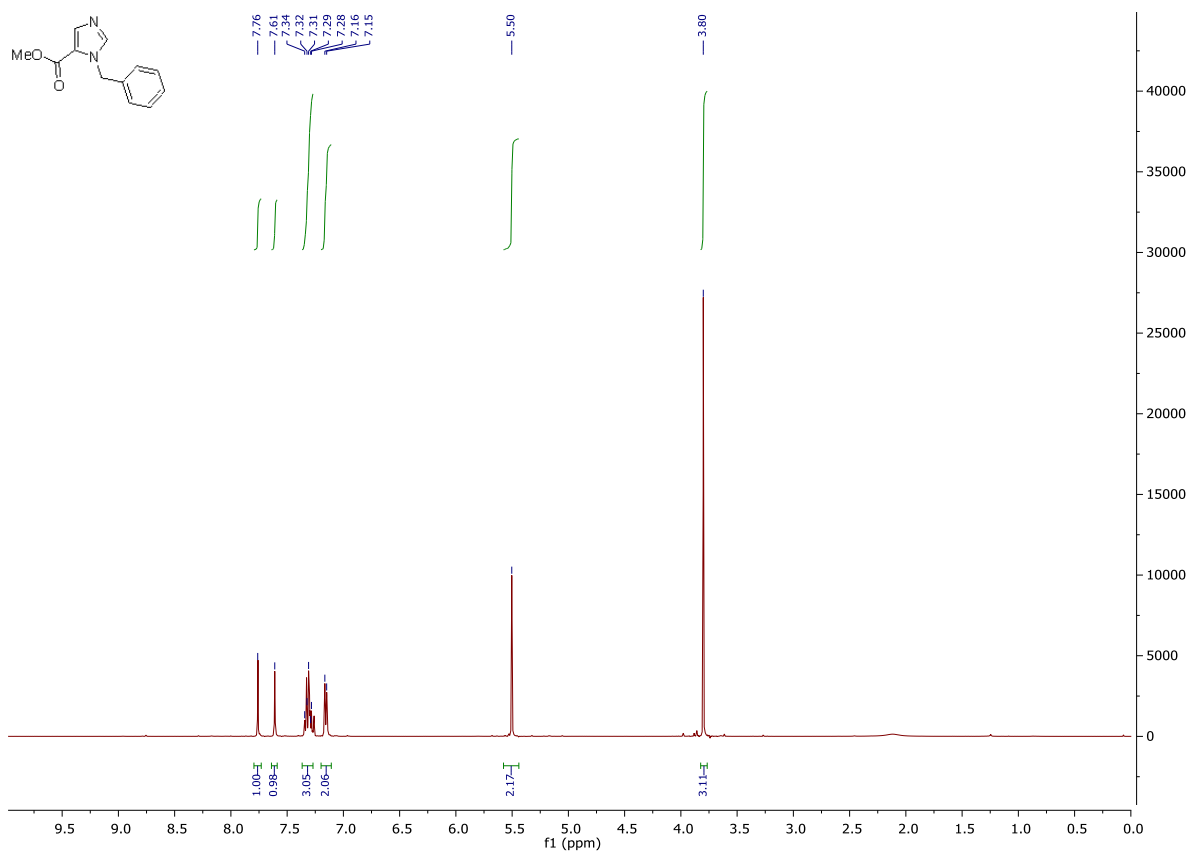
**(1-(2-Cyclohex-1-en-1-yl)ethyl)-1H-imidazol-5-yl)methanol 6j (400 MHz, CDCl<sub>3</sub>):**



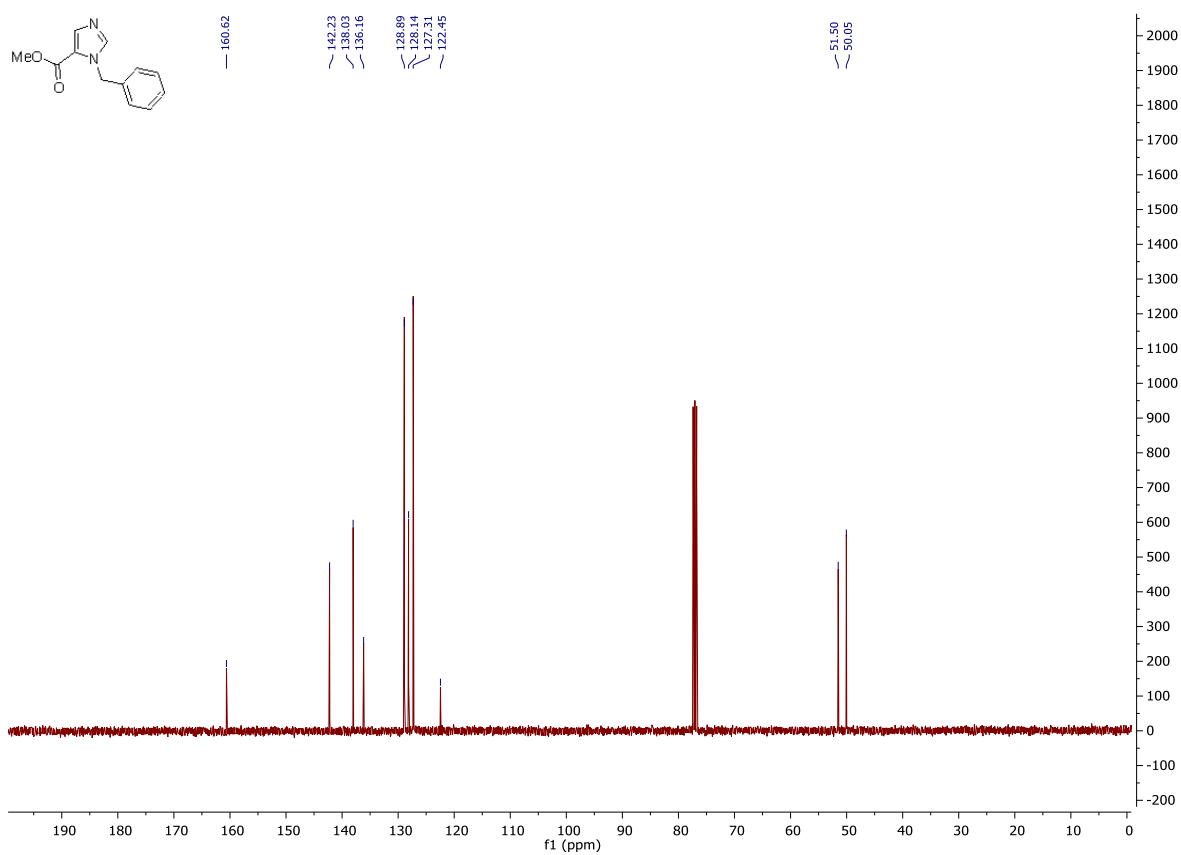
**(1-(2-Cyclohex-1-en-1-yl)ethyl)-1H-imidazol-5-yl)methanol 6j (101 MHz, CDCl<sub>3</sub>):**



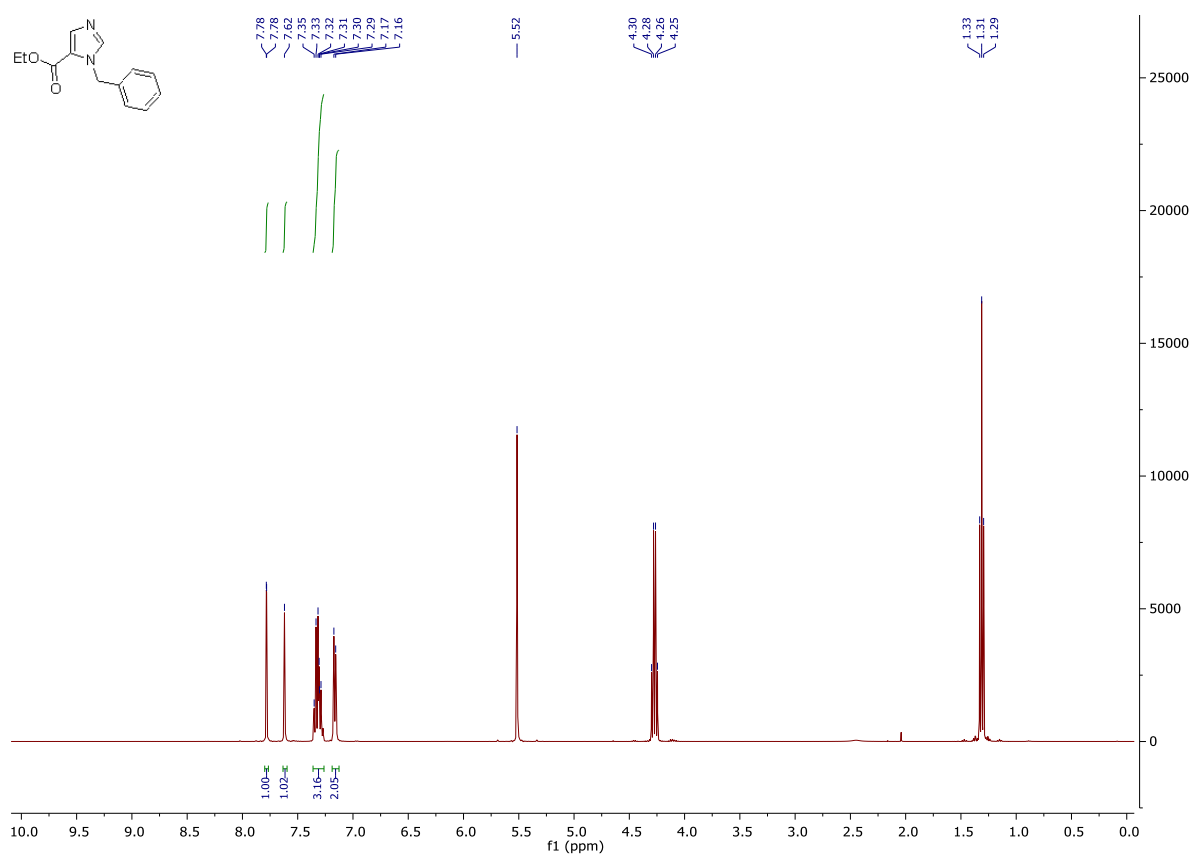
**Methyl 1-benzyl-1H-imidazole-5-carboxylate 7a (400 MHz, CDCl<sub>3</sub>):**



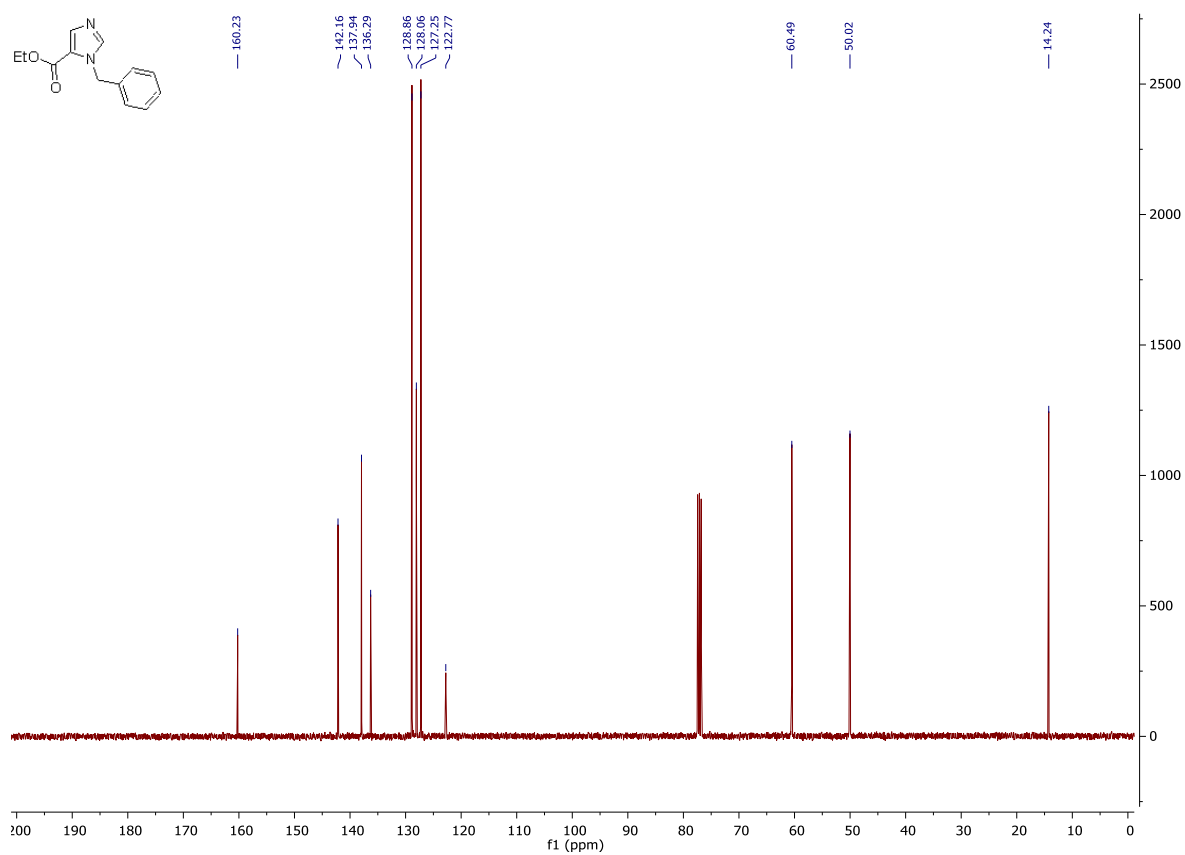
**Methyl 1-benzyl-1H-imidazole-5-carboxylate (101 MHz, CDCl<sub>3</sub>):**



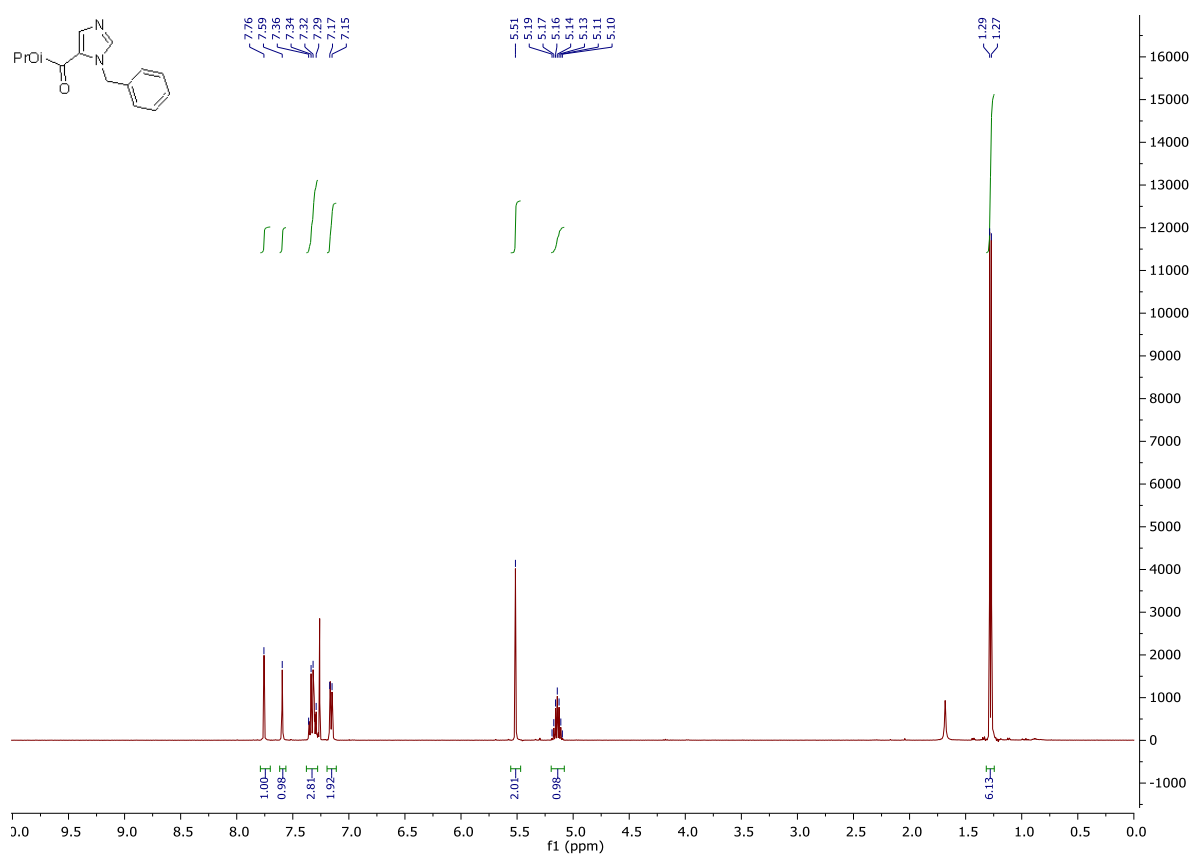
**Ethyl 1-benzyl-1H-imidazole-5-carboxylate 7b (400 MHz, CDCl<sub>3</sub>):**



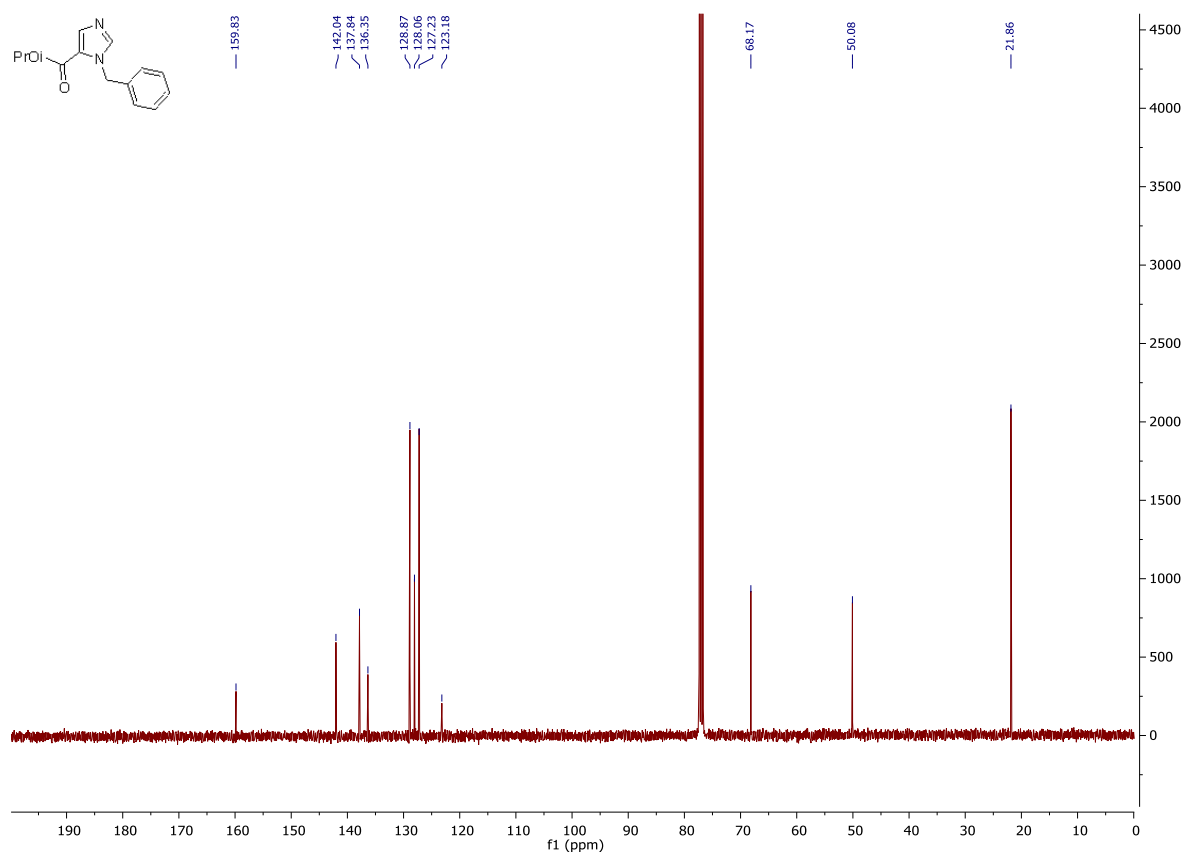
**Ethyl 1-benzyl-1H-imidazole-5-carboxylate (101 MHz, CDCl<sub>3</sub>):**



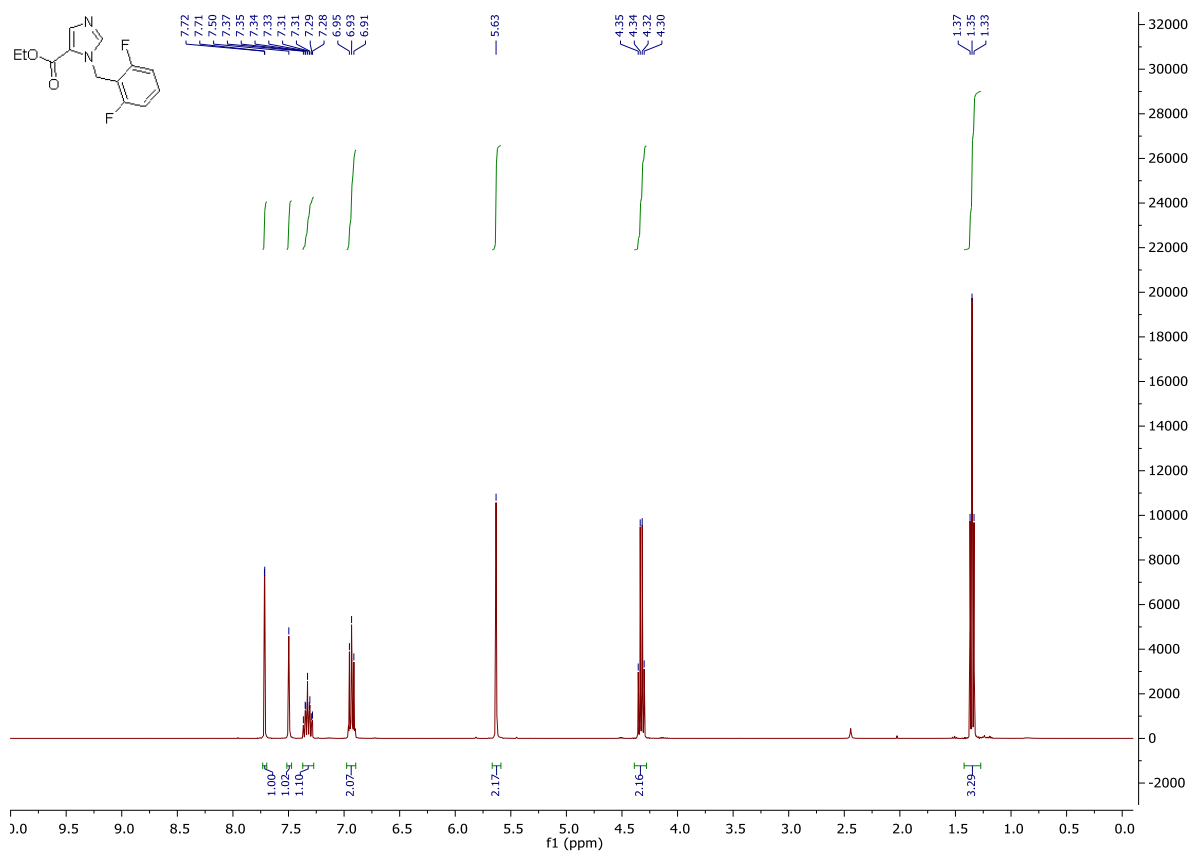
**Isopropyl 1-benzyl-1H-imidazole-5-carboxylate 7c (400 MHz, CDCl<sub>3</sub>):**



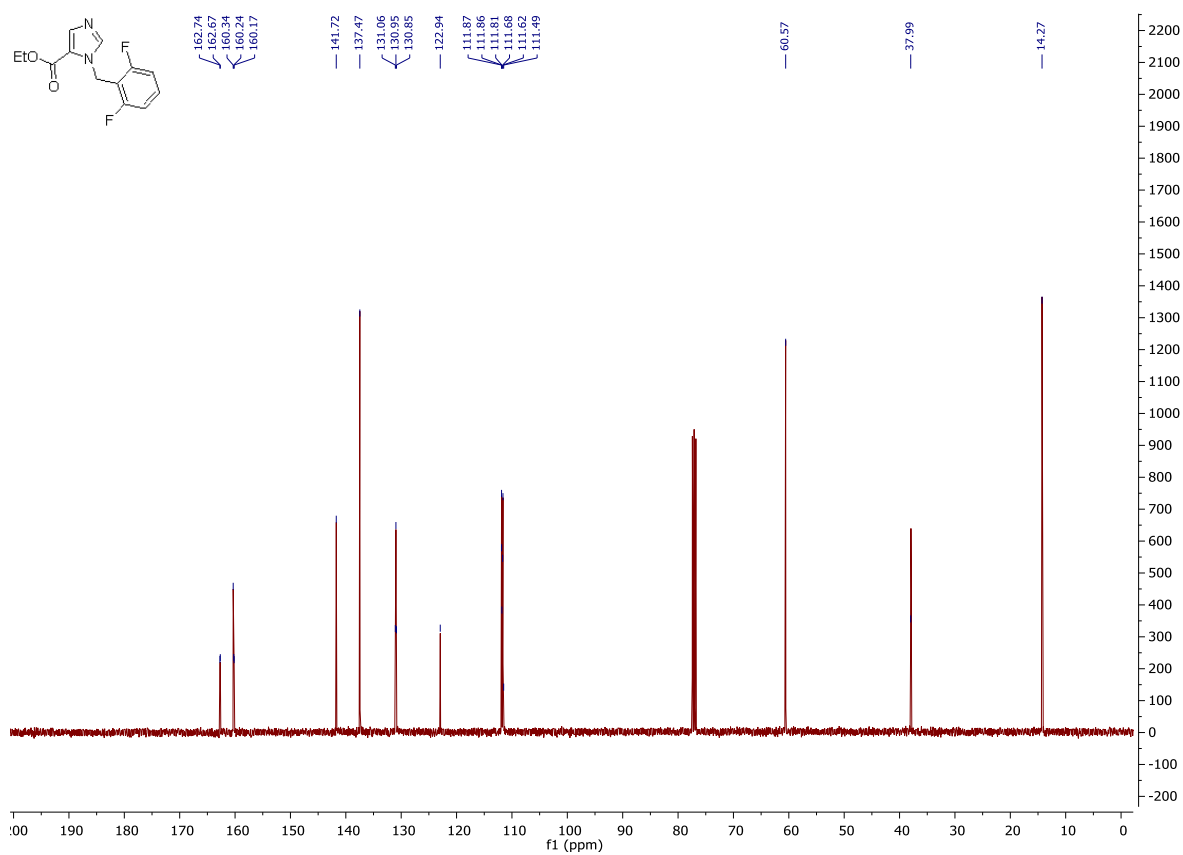
**Isopropyl 1-benzyl-1H-imidazole-5-carboxylate (101 MHz, CDCl<sub>3</sub>):**



**Ethyl 1-(2,6-difluorobenzyl)-1*H*-imidazole-5-carboxylate 7d (400 MHz, CDCl<sub>3</sub>):**

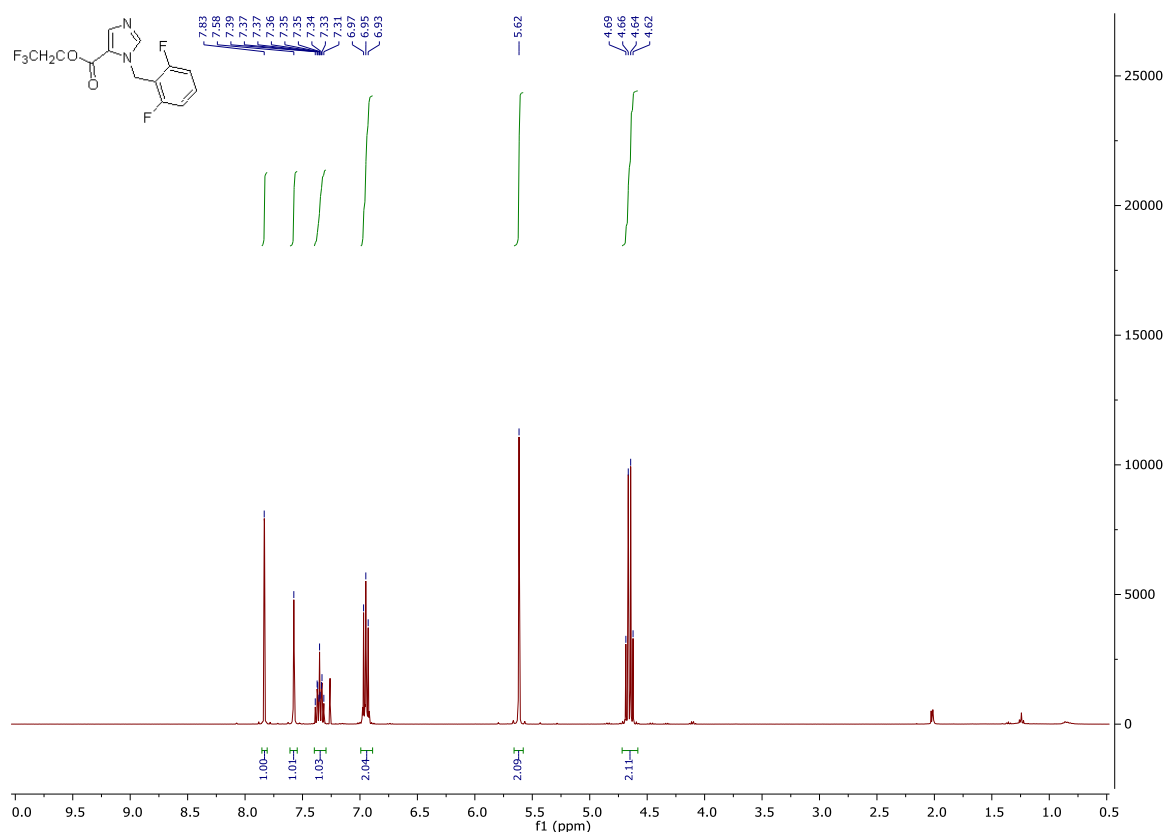


**Ethyl 1-(2,6-difluorobenzyl)-1*H*-imidazole-5-carboxylate (101 MHz, CDCl<sub>3</sub>):**

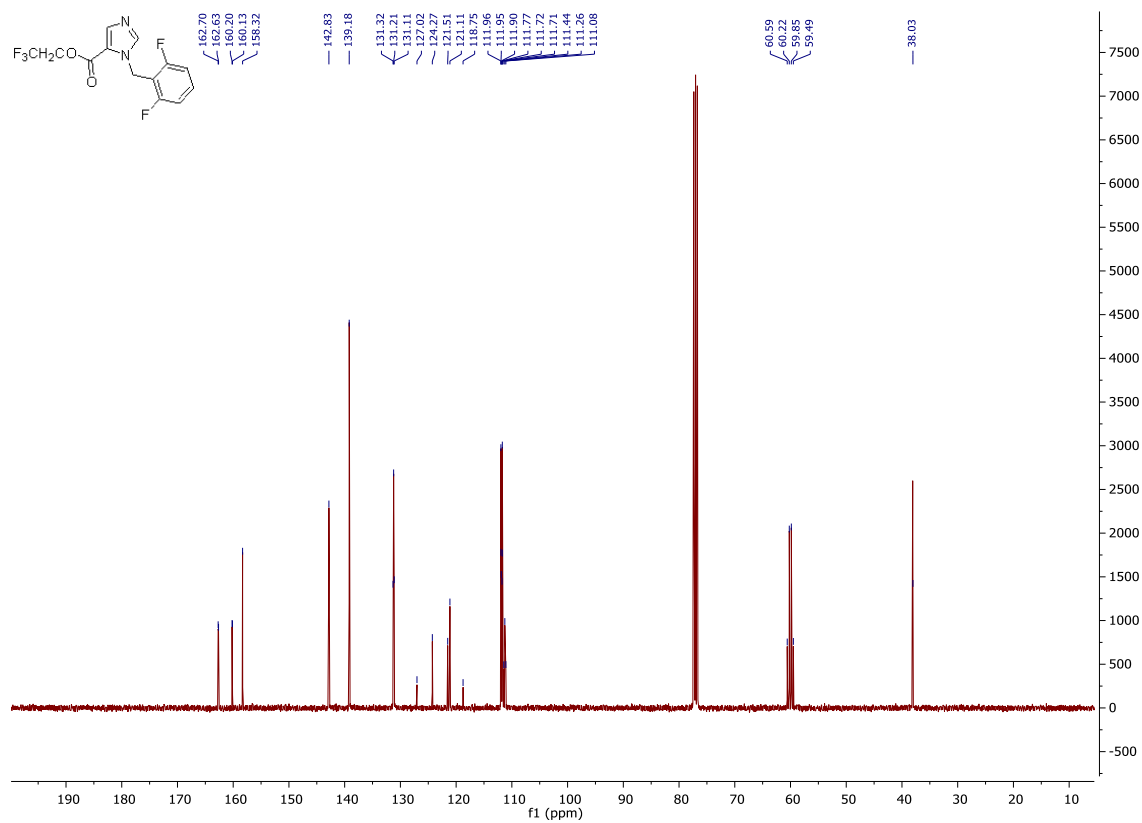




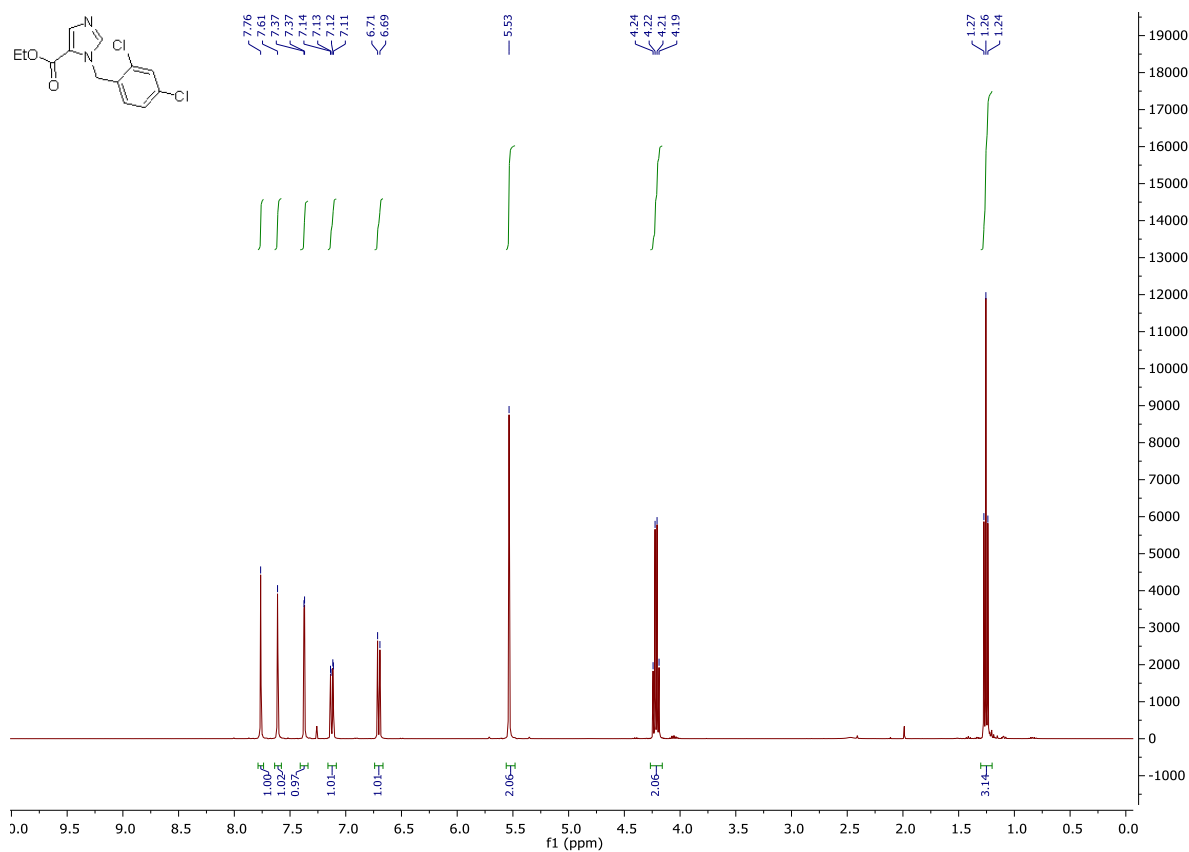
**2,2,2-Trifluoroethyl 1-(2,6-difluorobenzyl)-1H-imidazole-5-carboxylate 7e (400 MHz, CDCl<sub>3</sub>):**



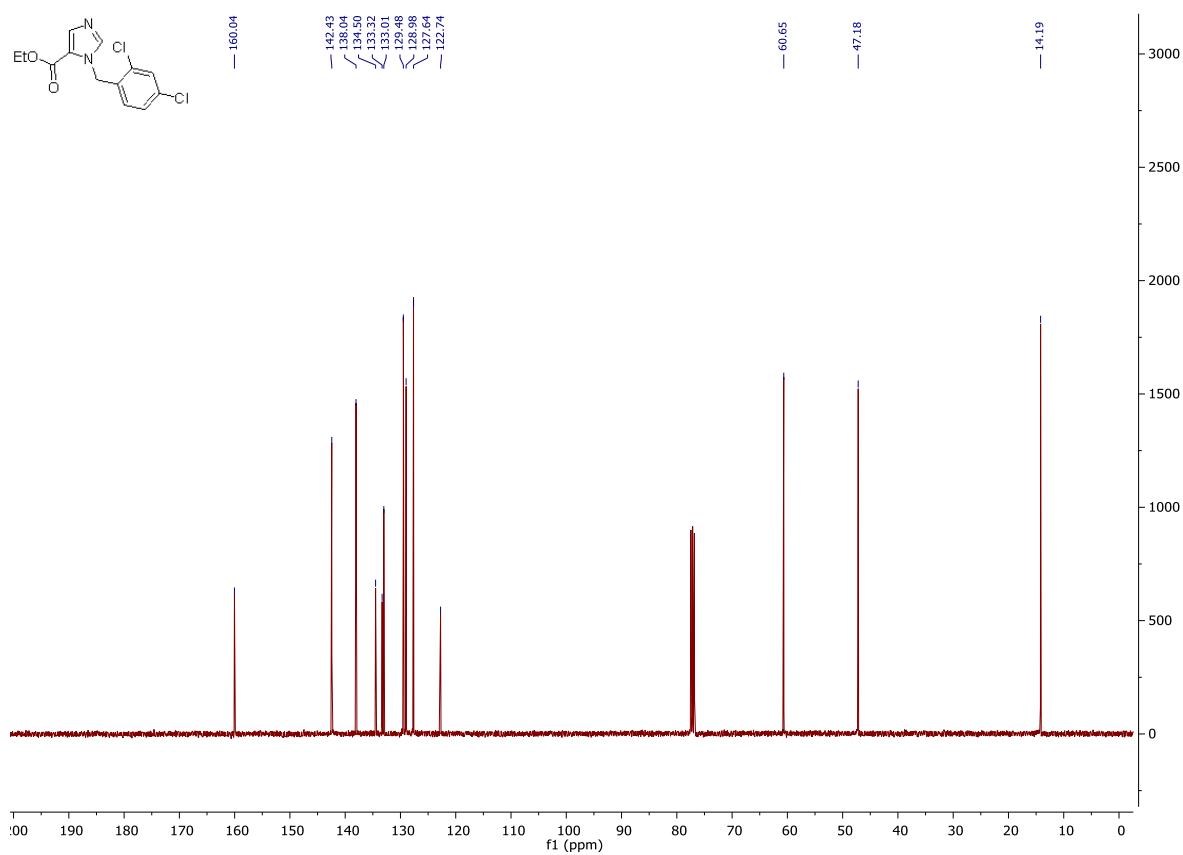
**2,2,2-Trifluoroethyl 1-(2,6-difluorobenzyl)-1H-imidazole-5-carboxylate (101 MHz, CDCl<sub>3</sub>):**



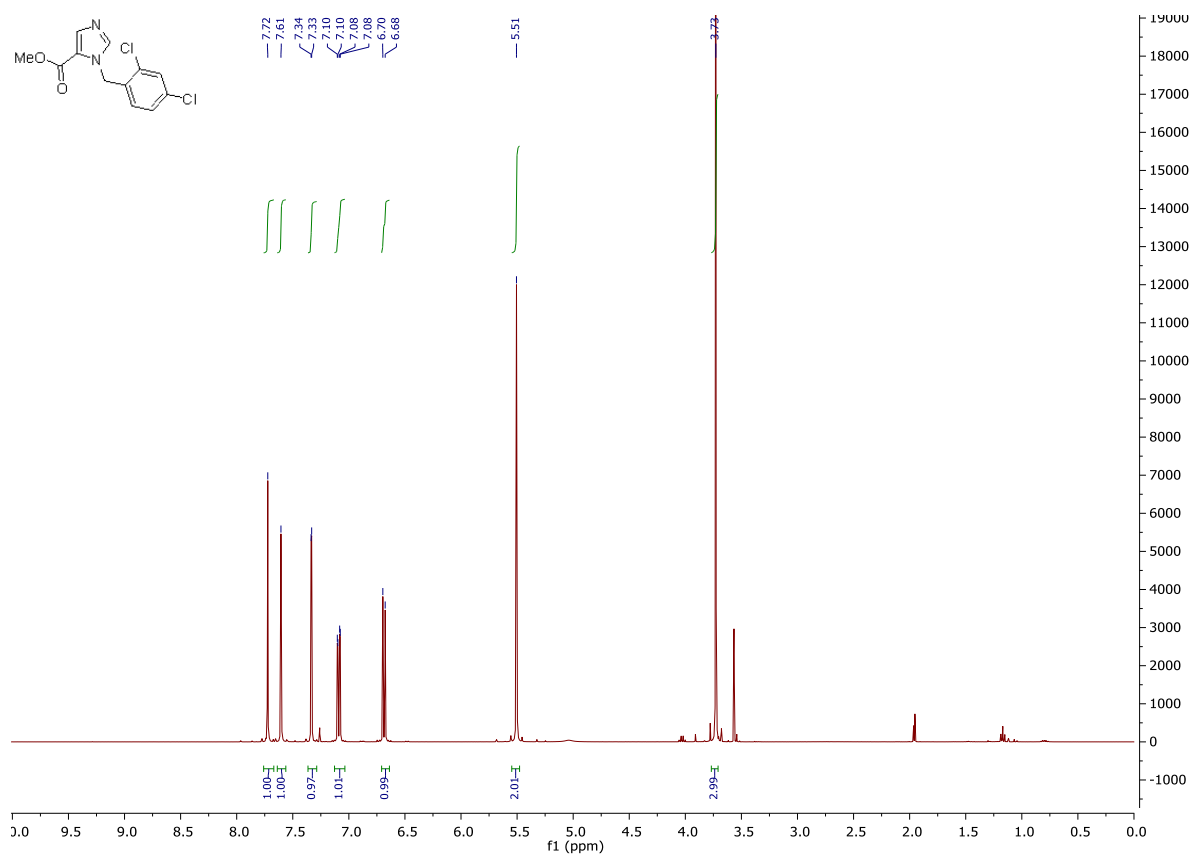
**Ethyl 1-(2,4-dichlorobenzyl)-1H-imidazole-5-carboxylate 7f (400 MHz, CDCl<sub>3</sub>):**



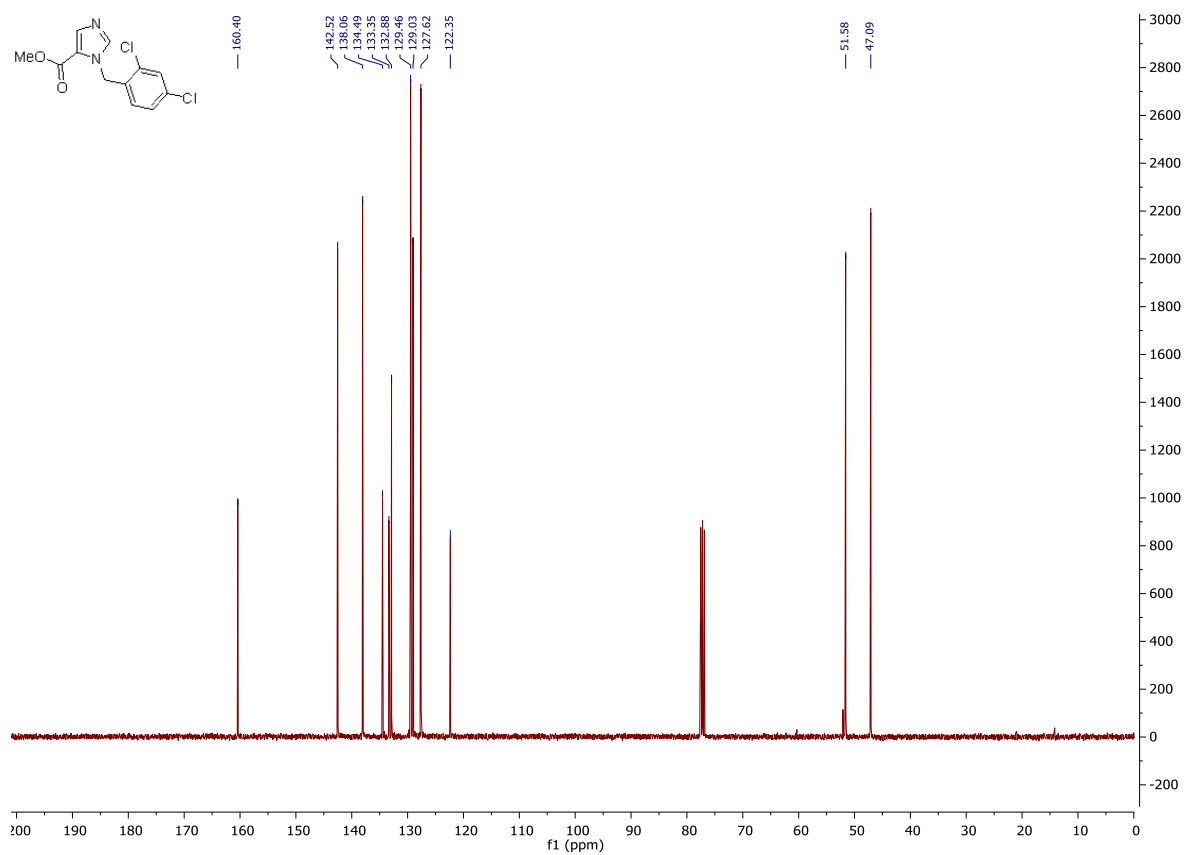
**Ethyl 1-(2,4-dichlorobenzyl)-1H-imidazole-5-carboxylate (101 MHz, CDCl<sub>3</sub>):**



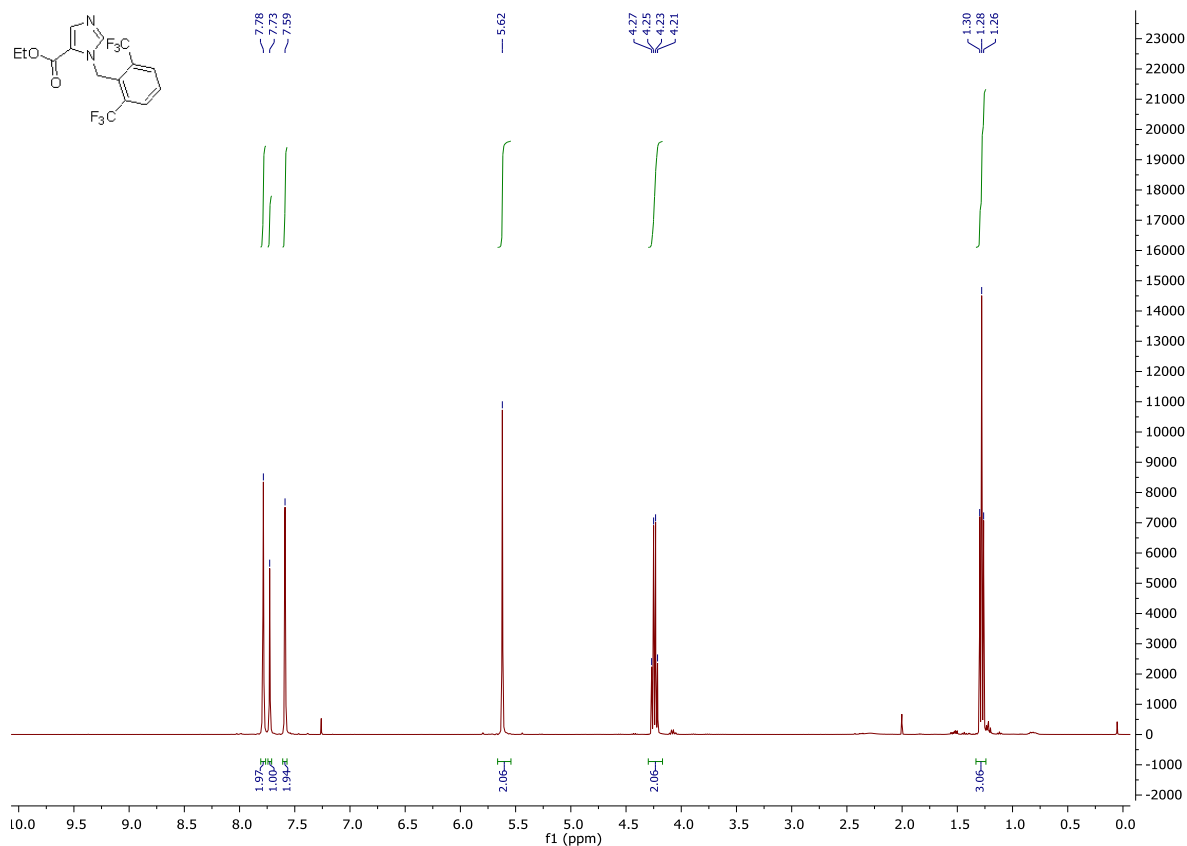
**Methyl 1-(2,4-dichlorobenzyl)-1H-imidazole-5-carboxylate 7g (400 MHz, CDCl<sub>3</sub>):**



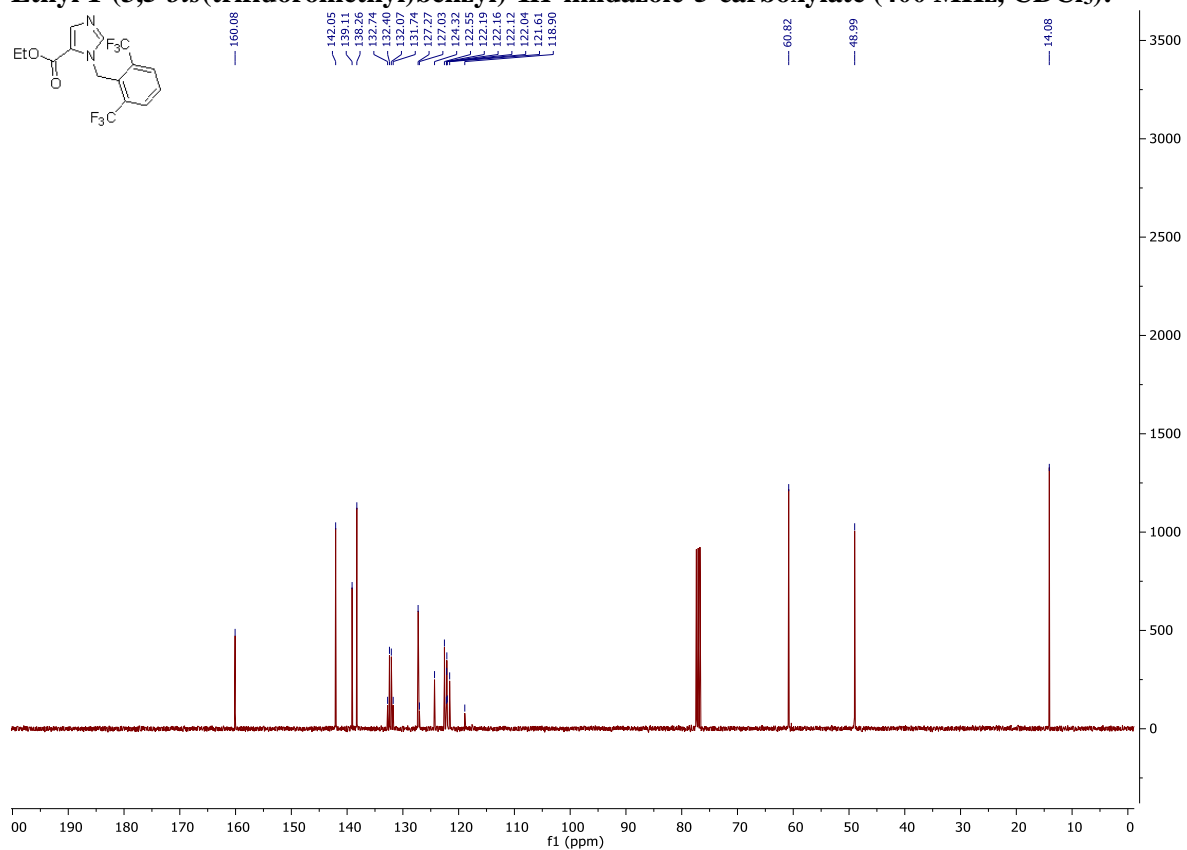
**Methyl 1-(2,4-dichlorobenzyl)-1H-imidazole-5-carboxylate (101 MHz, CDCl<sub>3</sub>):**



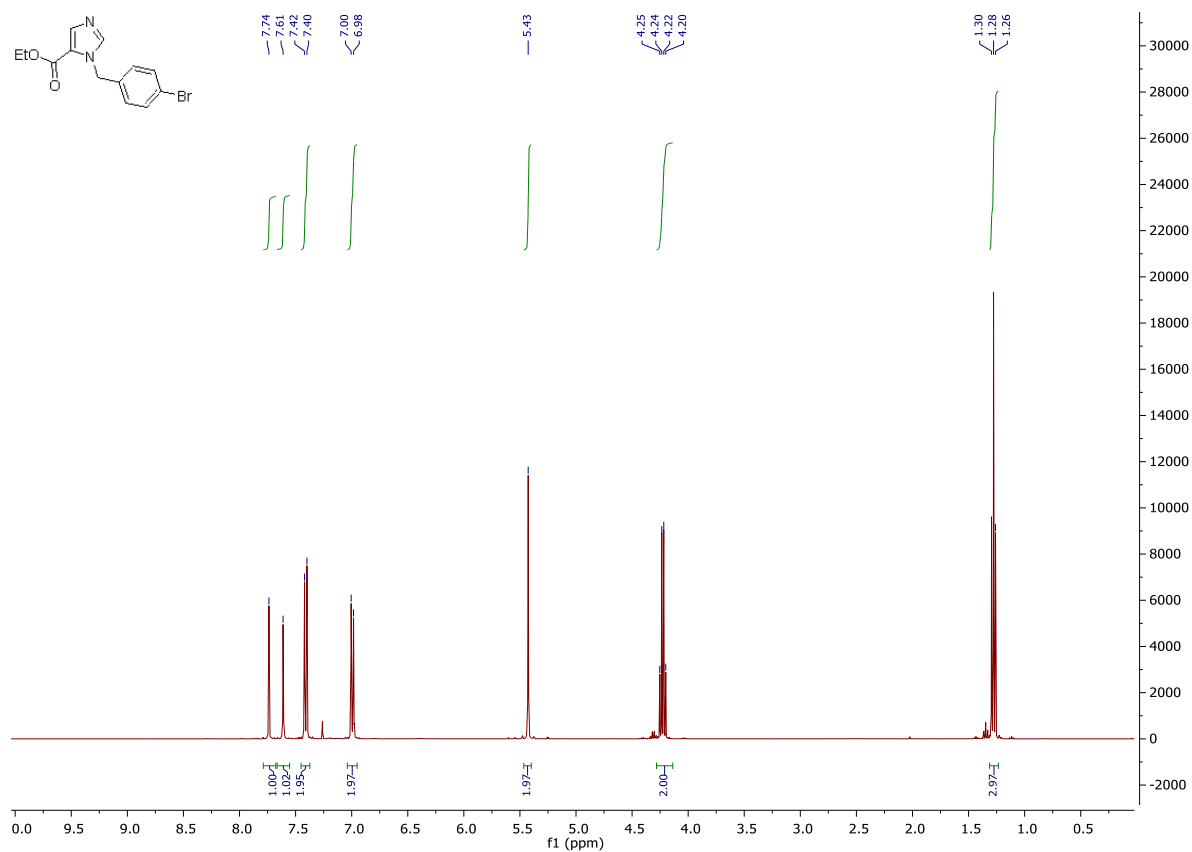
**Ethyl 1-(3,5-bis(trifluoromethyl)benzyl)-1H-imidazole-5-carboxylate 7h (400 MHz, CDCl<sub>3</sub>):**



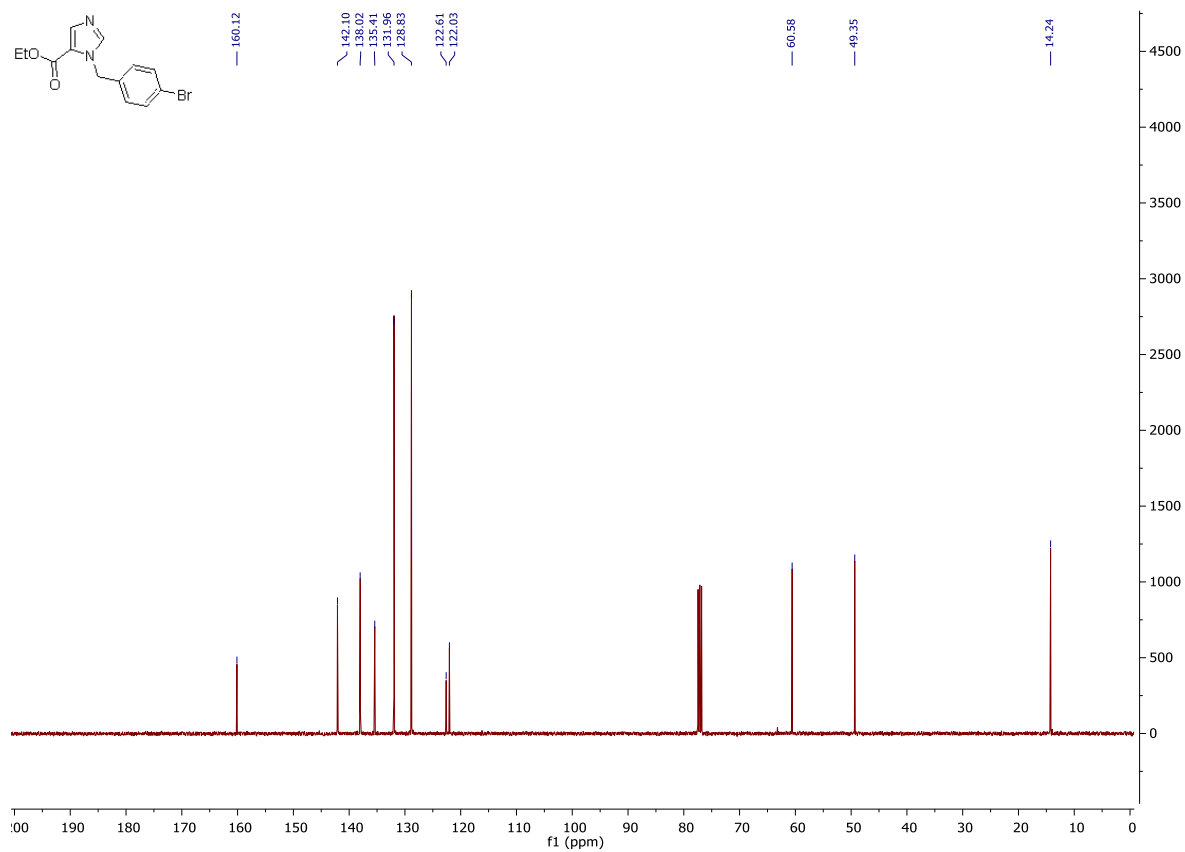
**Ethyl 1-(3,5-bis(trifluoromethyl)benzyl)-1H-imidazole-5-carboxylate (400 MHz, CDCl<sub>3</sub>):**



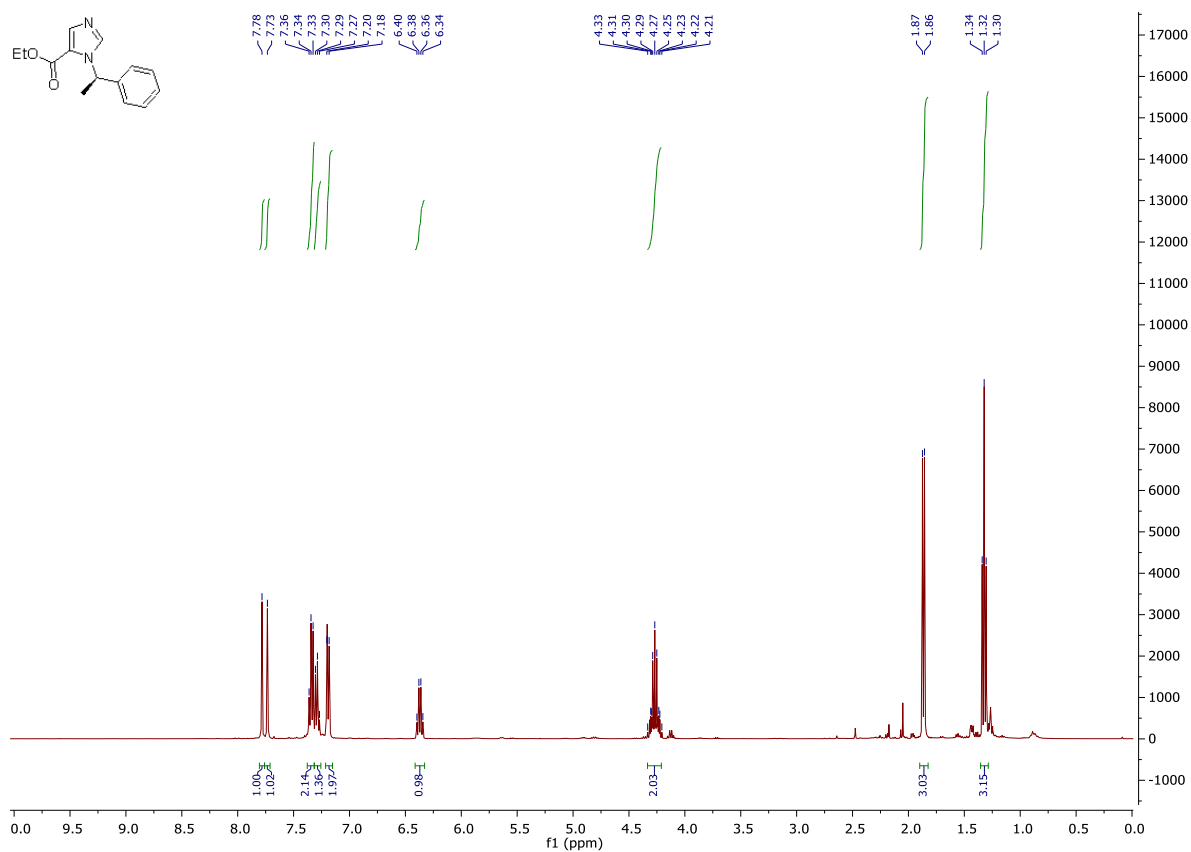
**Ethyl 1-(4-bromobenzyl)-1H-imidazole-5-carboxylate 7i (400 MHz, CDCl<sub>3</sub>):**



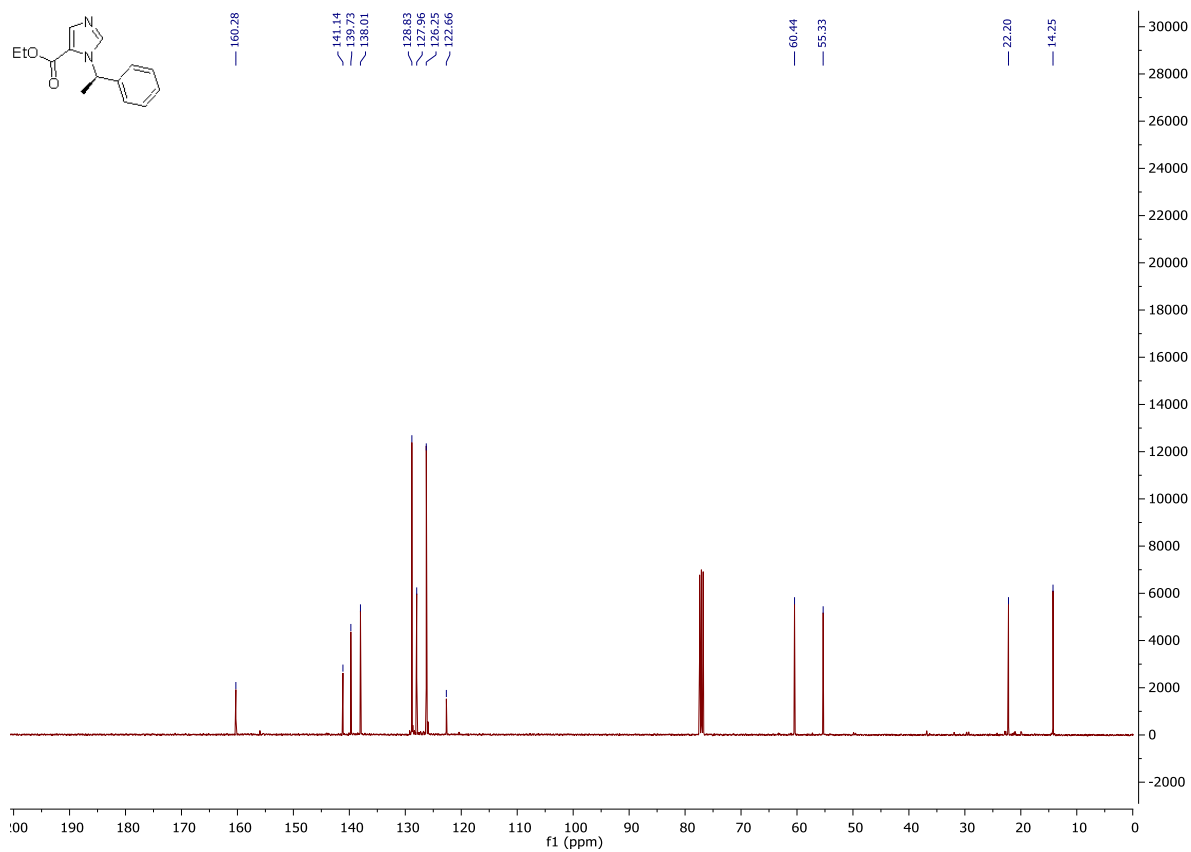
**Ethyl 1-(4-bromobenzyl)-1H-imidazole-5-carboxylate (101 MHz, CDCl<sub>3</sub>):**



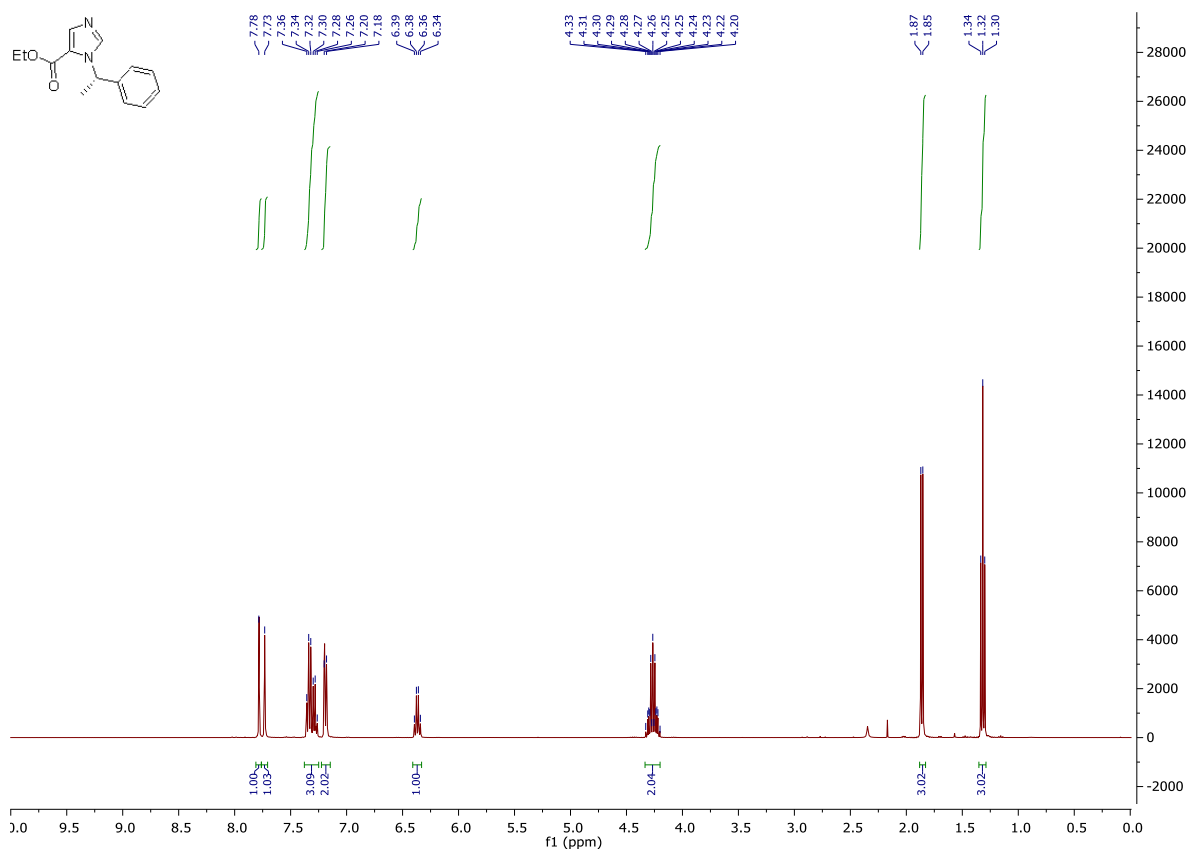
**(R)-Ethyl 1-(1-phenylethyl)-1H-imidazole-5-carboxylate 7j (400 MHz, CDCl<sub>3</sub>):**



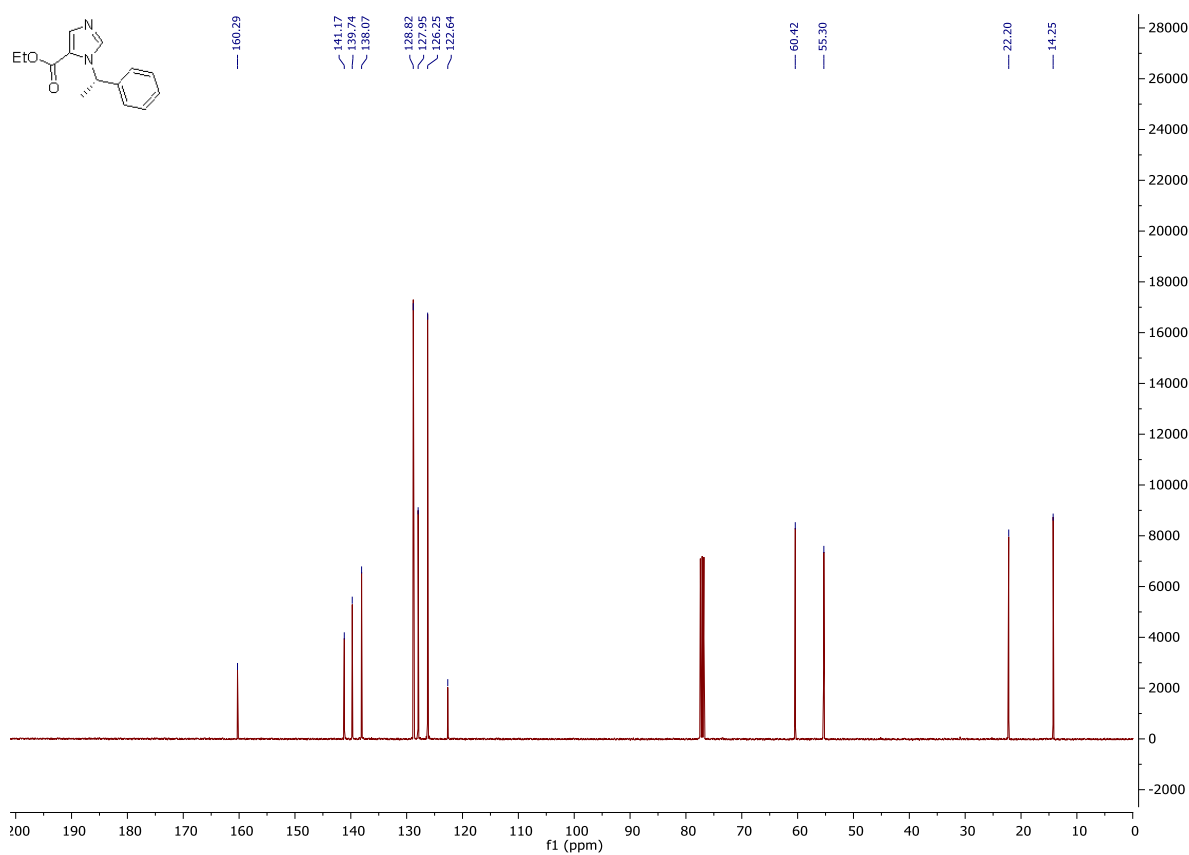
**(R)-Ethyl 1-(1-phenylethyl)-1H-imidazole-5-carboxylate (101 MHz, CDCl<sub>3</sub>):**



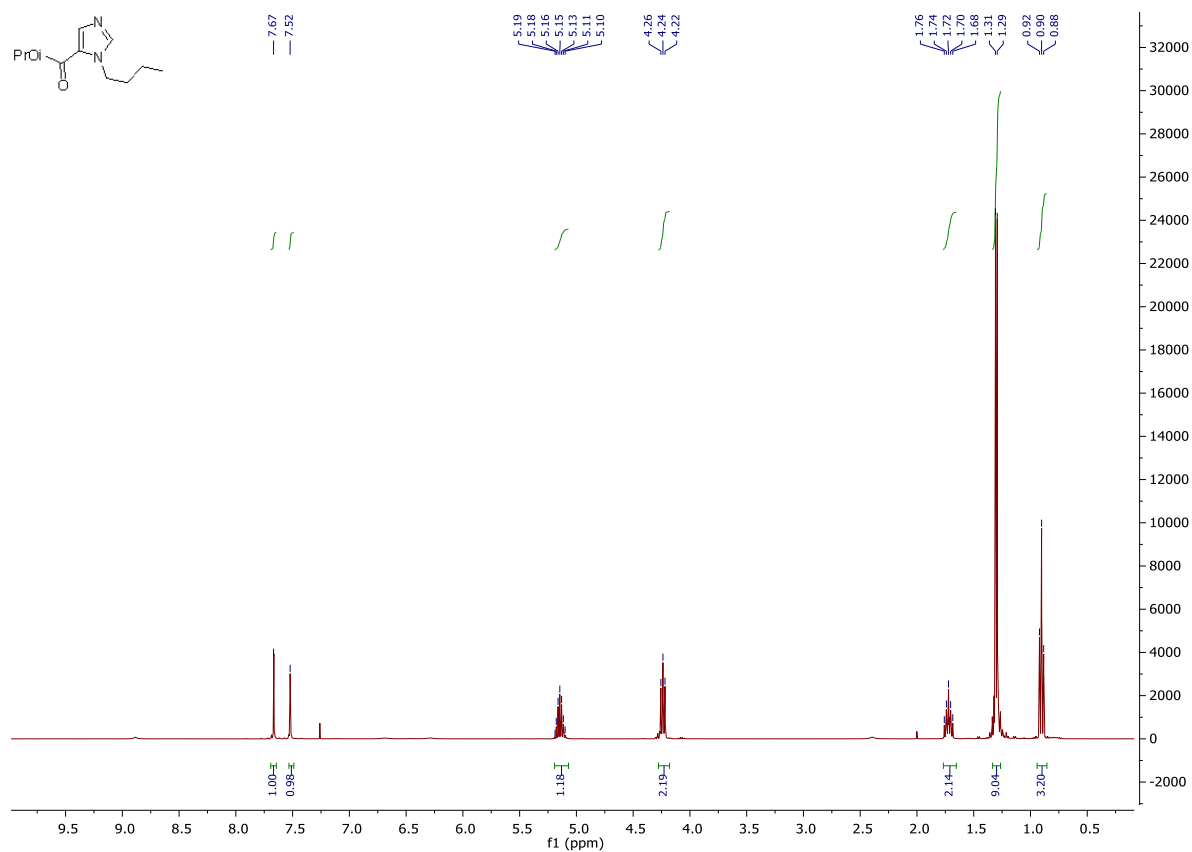
**(S)-Ethyl 1-(1-phenylethyl)-1H-imidazole-5-carboxylate 7k (400 MHz, CDCl<sub>3</sub>):**



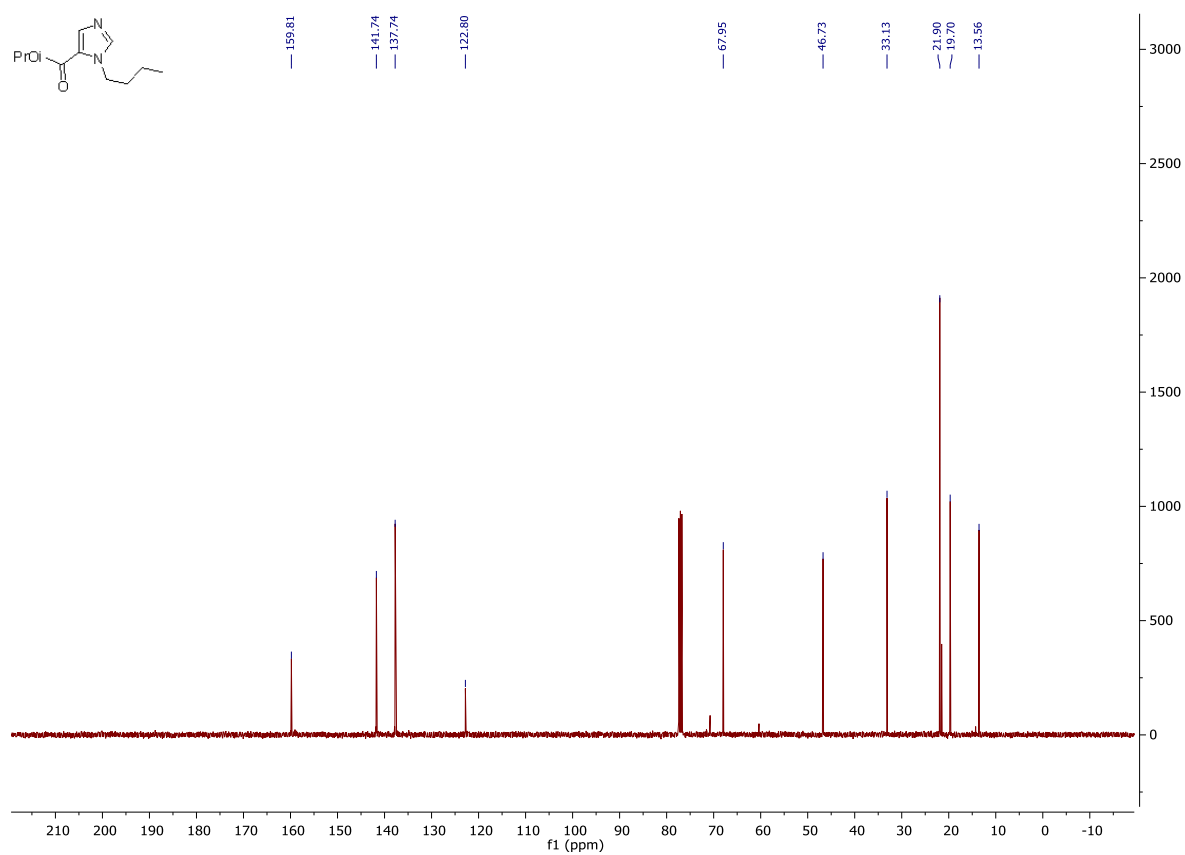
**(S)-Ethyl 1-(1-phenylethyl)-1H-imidazole-5-carboxylate (101 MHz, CDCl<sub>3</sub>):**



### Isopropyl 1-butyl-1H-imidazole-5-carboxylate 71 (400 MHz, CDCl<sub>3</sub>):

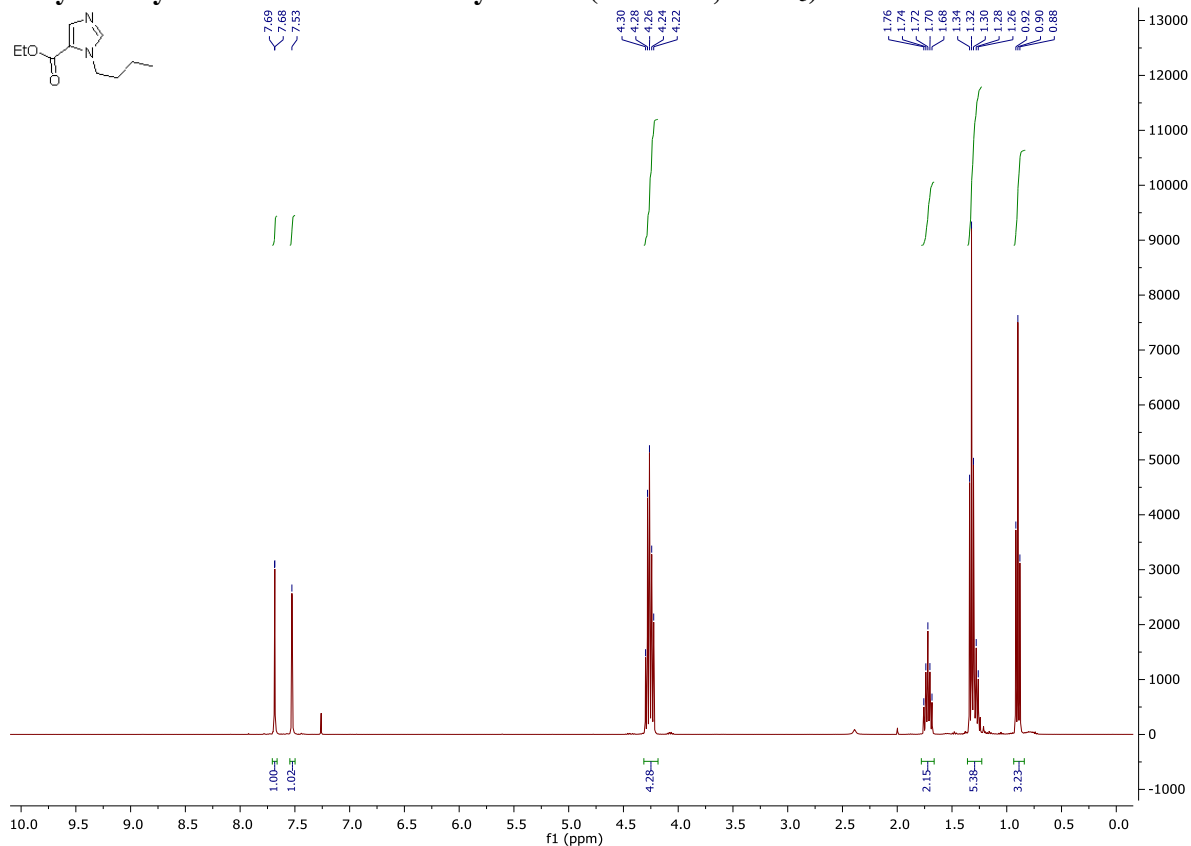


### Isopropyl 1-butyl-1H-imidazole-5-carboxylate (101 MHz, CDCl<sub>3</sub>):

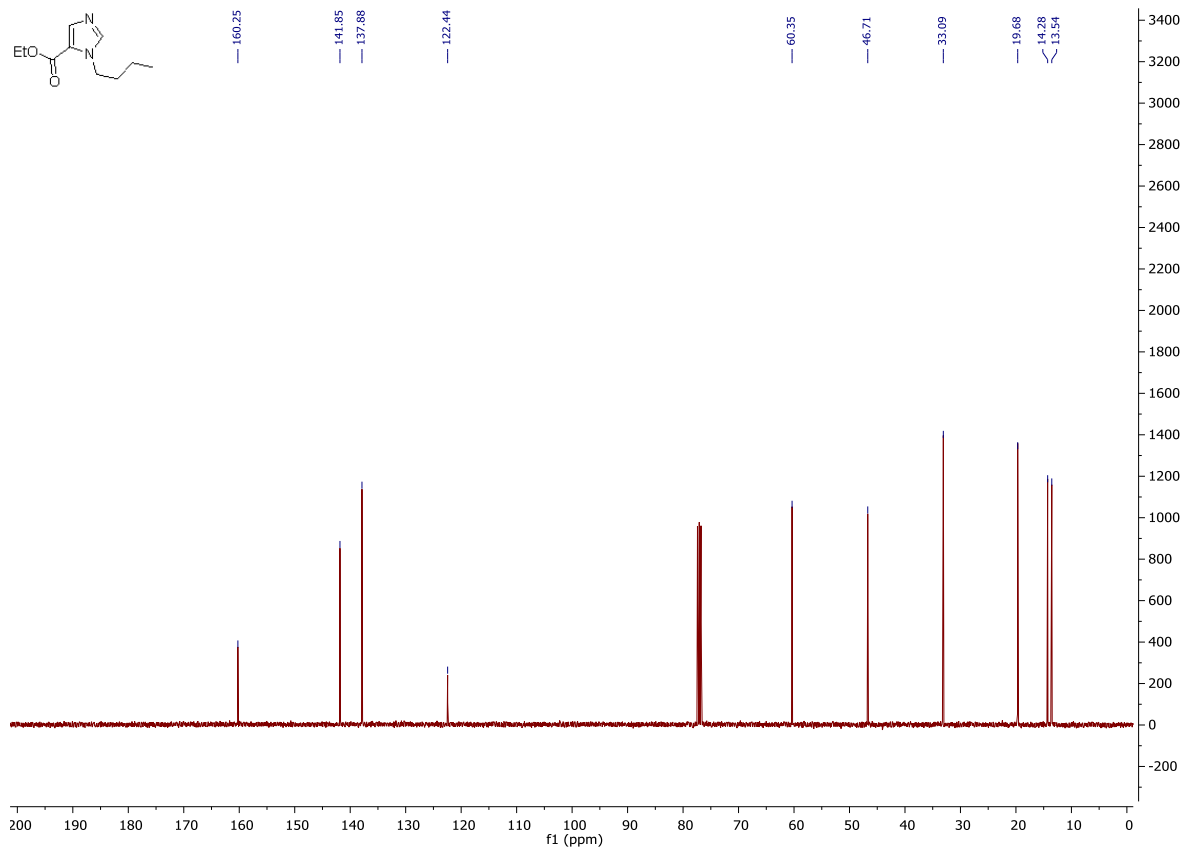




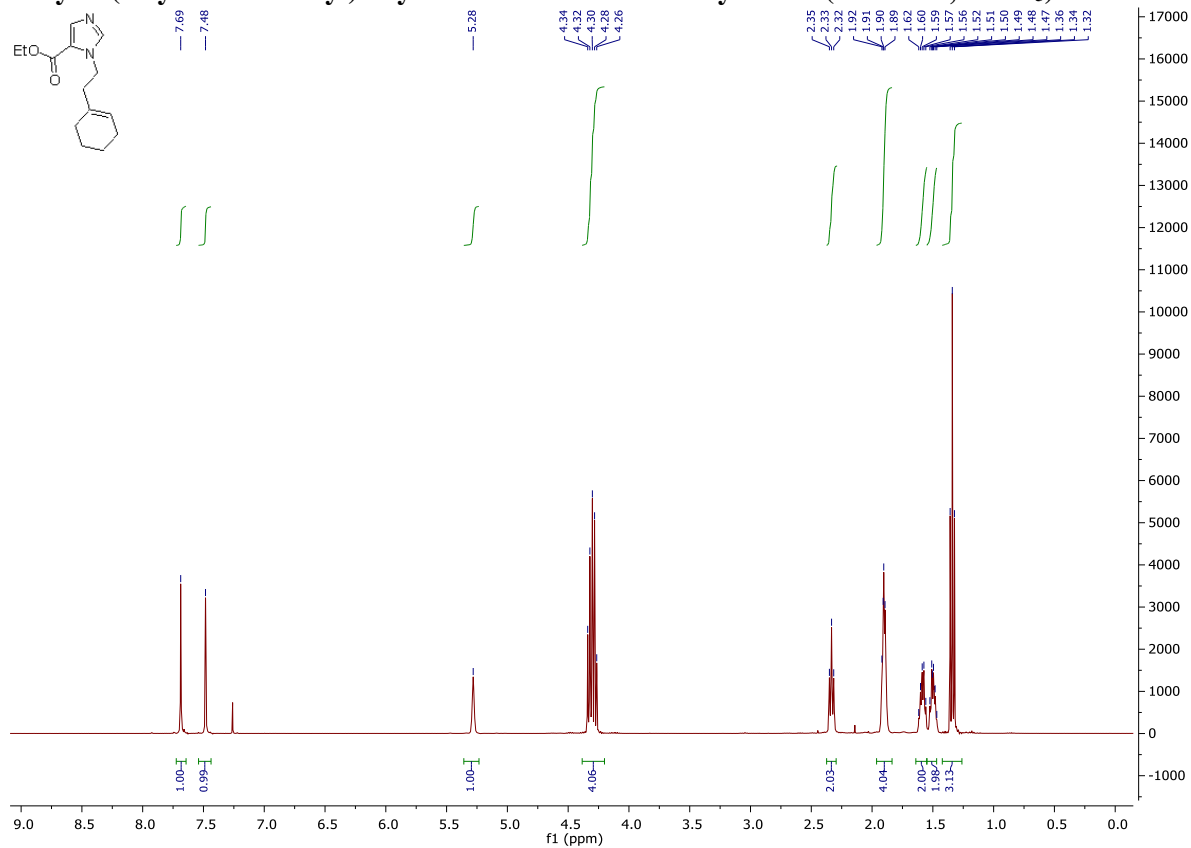
**Ethyl 1-butyl-1*H*-imidazole-5-carboxylate 7m (400 MHz, CDCl<sub>3</sub>):**



**Ethyl 1-butyl-1*H*-imidazole-5-carboxylate (101 MHz, CDCl<sub>3</sub>):**



**Ethyl 1-(2-cyclohex-1-en-yl)ethyl-1H-imidazole-5-carboxylate 7n (400 MHz, CDCl<sub>3</sub>):**



**Ethyl 1-(2-cyclohex-1-en-yl)ethyl-1H-imidazole-5-carboxylate 7n (101 MHz, CDCl<sub>3</sub>):**

