

Supplementary Information for

**Empowering Alcohols as Carbonyl Surrogates for Grignard-Type  
Reactions**

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**Table of Content**

I. General experimental information .....	2
II. Experimental procedures .....	3
i. Preparation of hydrazone or hydrazone solution .....	3
ii. General procedure for Table 1-2, Scheme 2-4.....	4
III. Synthesis of active species .....	7
i. Preparation of Ru-PNP-1 .....	7
ii. Preparation of Ru-PNP-2 .....	7
IV. Mechanistic study .....	9
i. DFT study for the dehydrogenation step.....	9
ii. Proposed mechanism.....	11
V. Spectroscopic data of products.....	12
VI. NMR spectra of products .....	25
VII. Supplementary references.....	99

## I. General experimental information

**Reaction Setup:** All reactions were carried out in flame-dried V-shaped microwave reaction vials which were covered by aluminum seals with PTFE-faced silicone septa, under an atmosphere of nitrogen unless otherwise stated. All reaction temperatures corresponded to oil bath temperatures. All air and moisture-sensitive catalysts, ligands, and reagents were stored and charged in MBRAUN UNIlab Pro Glove Box Workstation unless otherwise stated.

**Purifications:** All work-up and purification procedures were carried out with reagent-grade solvents. Analytical thin-layer chromatography (TLC) was performed using E. Merck silica gel 60 F254 pre-coated plates (0.25 mm). Flash column chromatography was performed with E. Merck silica gel P60 (40–63  $\mu\text{m}$  particle size, 230–400 mesh) ( $\text{SiO}_2$ ). Unless otherwise specified, “ $\text{SiO}_2$ ” refers to P60 grade silica gel. Visualization was accomplished with UV light and/or iodine ( $\text{I}_2$ ) or Vanillin solution. Retention factor ( $R_f$ ) values reported were measured using a  $10 \times 2$  cm TLC plate in a developing chamber containing the solvent system (10 mL) described. Automated flash column chromatography was performed on Biotage Isolera™ Spektra Systems with ACI™.

**Solvents:** 2-methyl-tetrahydrofuran (2-Me-THF), ordered from Sigma Aldrich without any purification. Solvents for filtration, transfers and chromatography, were dichloromethane ( $\text{CH}_2\text{Cl}_2$ ) (ACS grade, amylene stabilized), acetone (ACS grade), ethyl acetate (EtOAc) (Fisher, ACS grade), hexane (Fisher, ACS grade), pentane (ACS grade), methanol (ACS grade).

**Chemicals:** In the model study, benzaldehyde (Aldrich) were distilled prior to use. Other chemicals that are commercially available and used without further purification: 2-penten-1-ol (Aldrich),  $\text{Ru}(\text{PPh}_3)_4\text{Cl}_2$  (Aldrich),  $\text{Ru}(\text{PPh}_3)_3\text{Cl}_2$  (Aldrich), dcypf (Aspira), potassium phosphate (Aldrich), hydrazine hydrate (Reagent Grade, 64–65% wt, Aldrich), mesitylene (Aldrich), 1,3,5-trimethoxylbenzene (Aldrich), anhydrous sodium sulfate. All liquid carbonyls were distilled, and solid ones were recrystallized prior to use. The PNP pincer ligands (**L1**, **L2**, **L3**) were purchased from Aldrich. All the alcohol substrates are commercially available (Aldrich, Oakwood & Combi Block)

**NMR Spectroscopy:** Nuclear magnetic resonance ( $^1\text{H}$  and  $^{13}\text{C}$  NMR) spectra were recorded on a Bruker AV500 equipped with a 60-position Sample Xpress sample changer ( $^1\text{H}$ , 500 MHz;  $^{13}\text{C}$ , 125 MHz), a Varian MERCURY plus-500 spectrometer ( $^1\text{H}$ , 500 MHz;  $^{13}\text{C}$ , 125 MHz) or Bruker AV400 spectrometer ( $^1\text{H}$ , 400 MHz;  $^{13}\text{C}$ , 100 MHz). Chemical shifts for both  $^1\text{H}$  NMR and  $^{13}\text{C}$  NMR spectra are expressed in parts per million (ppm) units downfield from TMS, with the solvent residue peak as the chemical shift standard ( $\text{CDCl}_3$ :  $\delta$  7.28 ppm in  $^1\text{H}$  NMR;  $\delta$  77.00 ppm in  $^{13}\text{C}$  NMR). Data are reported as following: chemical shift, multiplicity (s = singlet, d = doublet, dd = doublet of doublets, t = triplet, td = triplet of doublets, q = quartet, quin = quintet, sep = septet, m = multiplet), coupling constants  $J$  (Hz), and integration.

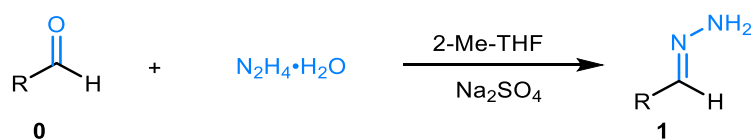
**Mass Spectrometry:** Mass spectrometry (MS) was performed by the McGill Chemistry Department Mass Spectrometry Facility. High resolution mass spectra were recorded using electrospray ionization (ESI+) and/or atmospheric pressure chemical ionization APCI (+/-), performed either on "Exactive Plus Orbitrap" a ThermoScientific high resolution accurate mass (HR/AM) FT mass spectrometer, or a Bruker Daltonics Maxis Impact quadrupole-time of flight (QTOF) mass spectrometer.

**Characterization of Products:** For the products, most of which are known compounds, we report the virtual states, NMR spectra and HRMS data.

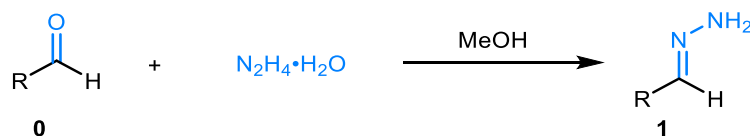
**DFT calculation:** All the calculations were carried out at the B3LYP/6-31G(d,p) level (LANL2DZ for Ru), using the Gaussian 16, Rev A.03 suite of programs.<sup>1</sup> Harmonic frequencies were calculated at the same level to characterize the stationary points and to determine the zeropoint energies (ZPE). Intrinsic reaction coordinate (IRC) studies were performed in ambiguous cases to confirm the relation of the transition states with the corresponding minima.

## II. Experimental procedures

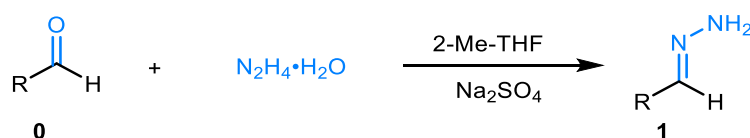
### i. Preparation of hydrazone or hydrazone solution



**Procedure A: For Table 1:** 2-Me-THF (4 mL) was added first into a small bottle with a stir bar. Then, hydrazine monohydrate (0.35 mL, 7 mmol) was added into the bottle. After that, **0** (5 mmol)\* was added dropwise into the stirred solution and the mixture was stirred for 5 min. Next, proper amount of anhydrous Na<sub>2</sub>SO<sub>4</sub> was added to remove water. After stirring for another 3h, the so-formed solution was ready to use.

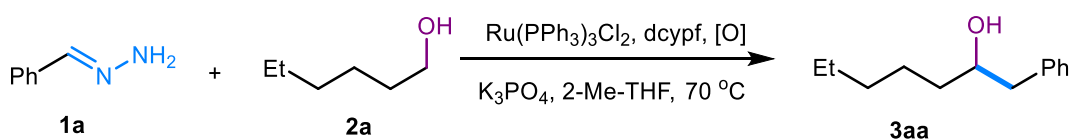


**Procedure B: For Table 2, Figure 2, Figure 3:** MeOH (5 mL) was added first into a small bottle with a stir bar. Then, hydrazine monohydrate (0.75 mL, 15 mmol) was added into the bottle. After that, **0** (10.0 mmol) was added dropwise into the stirred solution and the mixture was stirred for 5 min. After stirring for 3 h, **a.** if the solution is a homogeneity, the so-formed solution was concentrated by vacuum to dryness. Next, the crude hydrazone was frozen-dried under vacuum for three times to remove excess amount of hydrazine hydrate. The so formed hydrazone was directly used without further purification. **b.** if precipitates formed from the solution, the solid was filtered and washed with small portion of MeOH and then dried under vacuum, after which the hydrazone can be used directly without further purifications.



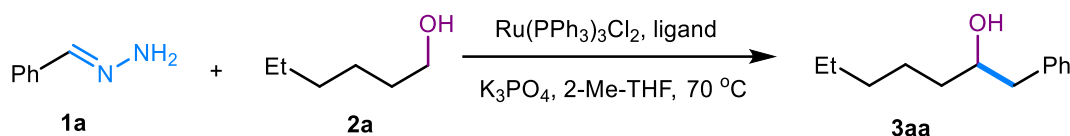
**Procedure C: For Figure 2, 3ks, 3ls:** 2-Me-THF (5 mL) was added first into a small bottle with a stir bar. Then, hydrazine monohydrate (0.4 mL, 8 mmol) was added into the bottle. After that, **0** (6 mmol) was added dropwise into the stirred solution and the mixture was stirred for 5 min. Next, proper amount of anhydrous Na<sub>2</sub>SO<sub>4</sub> was added to remove water. After stirring for another 3h, the so-formed solution was ready to use.

## ii. General procedure for Table 1-2, Scheme 2-4

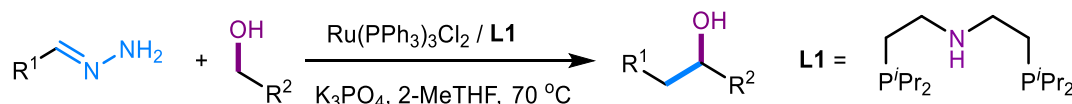


**General procedure for Table 1:** Ru(PPh<sub>3</sub>)<sub>2</sub>Cl<sub>2</sub> (0.01 mmol), dcypf (0.01 mmol), K<sub>3</sub>PO<sub>4</sub> (0.22 mmol), oxidant (0.4 mmol, 2 equiv)\* were added into a V-shaped reaction tube with a stir bar in the glovebox. Then, the reaction tube was sealed and moved out of the glovebox. After that, **1a** solution (prepared through **Procedure A**, 0.22 mL, 0.25 mmol) was added first and followed by the addition of **2a** (25.0 μL, 0.2 mmol). The mixture was stirred for 24h. Then, 1,3,5-trimethoxybenzene (11.2 mg, 0.067 mmol) was added in the mixture as standard. Then, the solution was filtered by celite and concentrated to dryness. The crude mixture was diluted by CDCl<sub>3</sub> to run the <sup>1</sup>H NMR test to determine the <sup>1</sup>H NMR yield.

\*For entry 2, the reaction tube was sealed before exposed to air for 5 min. For entry 3, after removing reaction tube out of the glovebox, it was charged with O<sub>2</sub> via 3 times vacuum-refill by oxygen balloon.



**General procedure for Table 2:** Ru(PPh<sub>3</sub>)<sub>2</sub>Cl<sub>2</sub> (0.01 mmol), ligand (0.01 mmol), K<sub>3</sub>PO<sub>4</sub> (0.4 mmol) were added into a V-shaped reaction tube with a stir bar in the glovebox. Then, the reaction tube was sealed and moved out of the glovebox. After that, 0.5 mL 2-Me-THF was added and followed by the addition of corresponding amount of **1a** (prepared through **Procedure B**) and **2a** (25.0 μL, 0.2 mmol). The mixture was stirred for 24h under N<sub>2</sub> at 70 °C. After completion, the solution was filtered by celite and concentrated to dryness. Then, 1,3,5-trimethoxybenzene (11.2 mg, 0.067 mmol) was added in the mixture as standard. The crude mixture was diluted by CDCl<sub>3</sub> to run the <sup>1</sup>H NMR test to determine the <sup>1</sup>H NMR yield.



**General procedure for Figure 3, Figure 4:** Ru(PPh<sub>3</sub>)<sub>3</sub>Cl<sub>2</sub> (0.01 mmol), **L1** (0.01 mmol) and K<sub>3</sub>PO<sub>4</sub> (0.4 mmol) and solid substrates were added into a V-shaped reaction tube with a stir bar in the glovebox. Then, the reaction tube was sealed and moved out of the glovebox. After that, 0.5 mL 2-Me-THF was added first followed by the addition of liquid substrates. The mixture was stirred under 70 °C for 24h. The reaction mixture was filtered through a celite plug with 2-3 mL CH<sub>2</sub>Cl<sub>2</sub>. The solvent was removed by a

rotary evaporator and the residue was purified by column chromatography on silica gel (using hexane and ethyl acetate as eluent) to give the pure product.

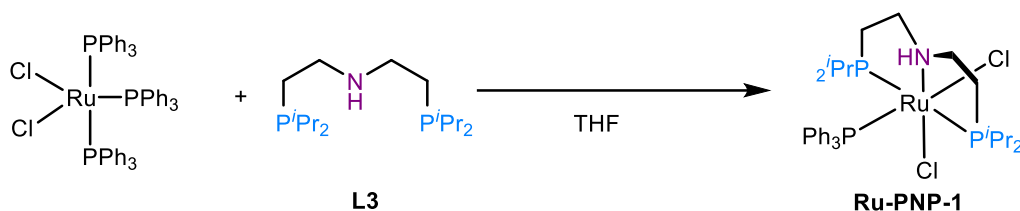
**General procedure for Figure 3, 3as, 3at, 3au, 3hv and 3hw:** Ru-PNP-3 (0.01 mmol), and K<sub>3</sub>PO<sub>4</sub> (0.4 mmol) and solid substrates were added into a V-shaped reaction tube with a stir bar in the glovebox. Then, the reaction tube was sealed and moved out of the glovebox. After that, 0.5 mL 2-Me-THF was added first followed by the addition of liquid substrates. The mixture was stirred under 100 °C for 24h. The reaction mixture was filtered through a celite plug with 2-3 mL CH<sub>2</sub>Cl<sub>2</sub>. The solvent was removed by a rotary evaporator and the residue was purified by column chromatography on silica gel (using hexane and ethyl acetate as eluent) to give the pure product.

**General procedure for Figure 3ax-3az:** Ru-PNP-1 (0.01 mmol), K<sub>3</sub>PO<sub>4</sub> (0.4 mmol) and solid alcohol (0.2 mmol, if applicable) were added into a V-shaped reaction tube with a stir bar in the glovebox. Then, the reaction tube was sealed and moved out of the glovebox. After that, 0.5 mL 2-Me-THF was added first followed by the addition of **1a** (0.6 mmol, 3 equiv.) and liquid alcohols (0.2 mmol, if applicable). The mixture was stirred under 70 °C for 24h. The reaction mixture was filtered through a celite plug with 2-3 mL CH<sub>2</sub>Cl<sub>2</sub>. The solvent was removed by a rotary evaporator and the residue was purified by column chromatography on silica gel (using hexane and ethyl acetate as eluent) to give the pure product. Specifically, for **3ay**, the mixture was diluted with CDCl<sub>3</sub> and run the <sup>1</sup>H NMR test to determine trace amount of desired product.

**Procedure for Figure 3 (3ks, 3ls):** Ru(PPh<sub>3</sub>)<sub>3</sub>Cl<sub>2</sub> (0.01 mmol), **L3** (0.006 mmol) and K<sub>3</sub>PO<sub>4</sub> (0.4 mmol) were added into a V-shaped reaction tube with a stir bar in the glovebox. Then, the reaction tube was sealed and moved out of the glovebox. After that, **1** solution (prepared through **Procedure B**, 0.55 mL, 0.6 mmol) was added. The mixture was stirred at 100 °C for 24h. The reaction mixture was filtered through a celite plug with 2-3 mL CH<sub>2</sub>Cl<sub>2</sub>. The solvent was removed by a rotary evaporator and the residue was added mesitylene as internal standard. The mixture was diluted with CDCl<sub>3</sub> and run the <sup>1</sup>H NMR test to determine trace amount of desired product based on the standard spectrum from literature.<sup>2,3</sup>

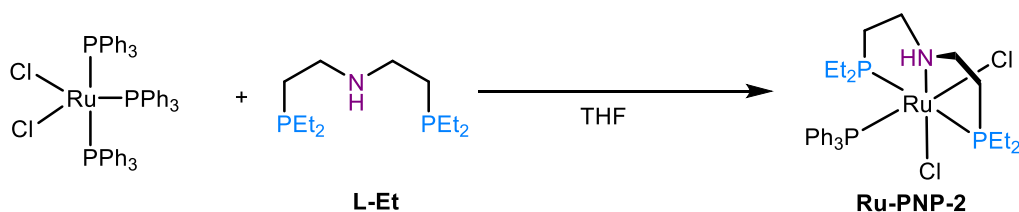
### III. Synthesis of active species

#### i. Preparation of Ru-PNP-1



To a solution of  $\text{Ru}(\text{PPh}_3)_3\text{Cl}_2$  (958 mg, 1 mmol) in THF (8 mL) was dropwise added bis(2-(diisopropylphosphino)ethyl)amine (3.5 mL, 10 w% in THF, 1 mmol). The mixture was stirred at room temperature for 2h. Then, most of THF was evaporated by rotavapor followed by the addition of pentane (25 mL) while stirring. At this period, solid was precipitated. It was placed at 4 °C for 1h. Then, the solid was collected by filtration which was washed by ether and dried under vacuum to give **Ru-PNP-1** as a light brown solid. The characterization was reported by previous literature.<sup>4</sup>

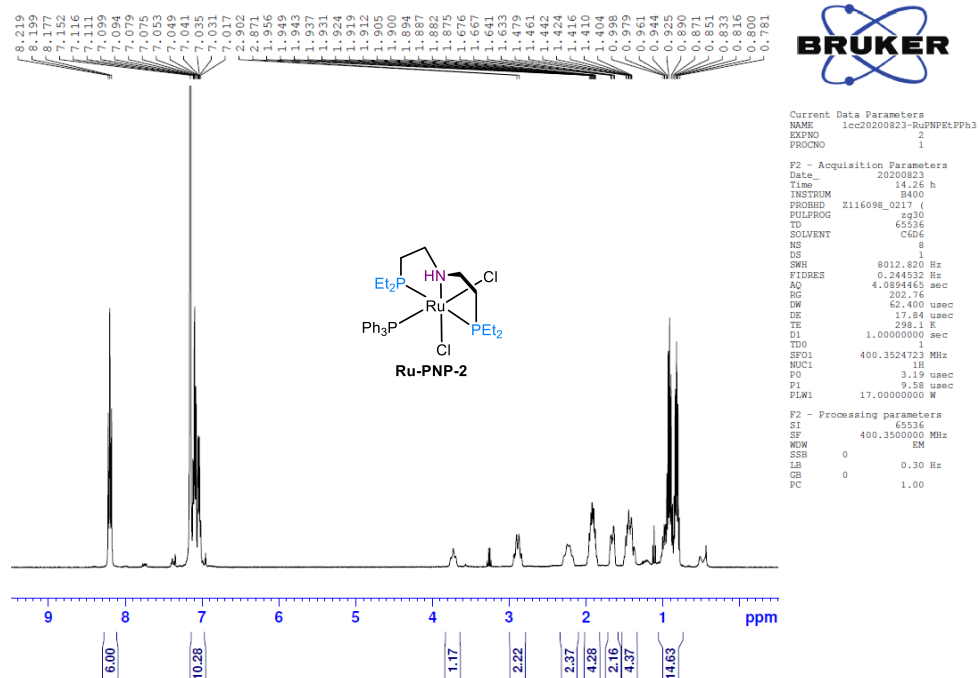
#### ii. Preparation of Ru-PNP-2



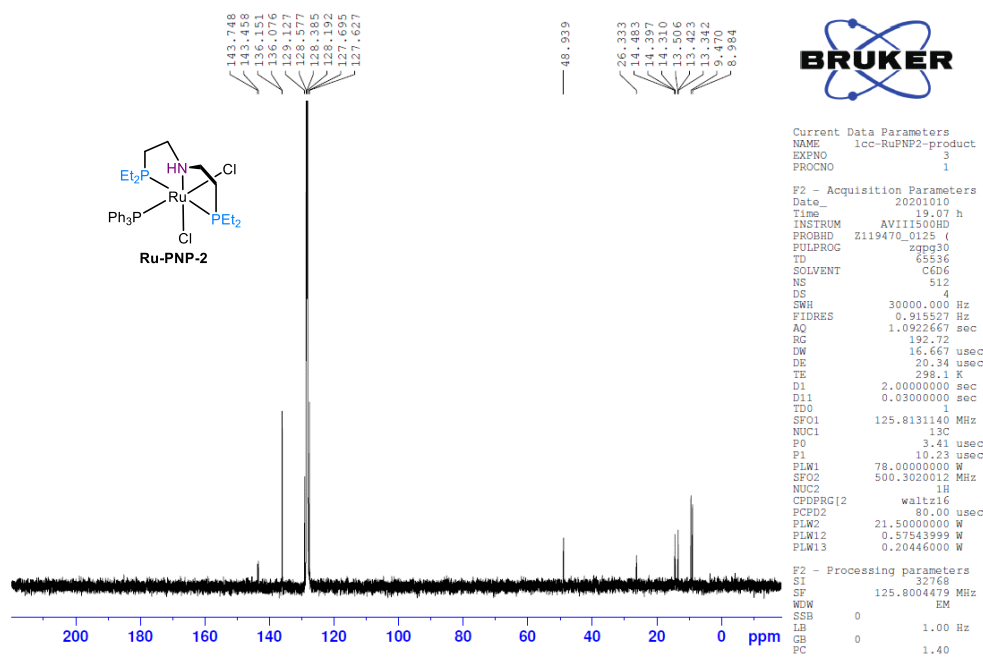
To a solution of  $\text{Ru}(\text{PPh}_3)_3\text{Cl}_2$  (958 mg, 1 mmol) in THF (8 mL) was dropwise added bis(2-(diethylphosphino)ethyl)amine (250 mg, 1 mmol). The mixture was stirred at room temperature for 2h. Then, most of THF was evaporated by rotavapor followed by the addition of pentane (25 mL) while stirring. At this period, solid was precipitated. It was placed at 4 °C for 1h. Then, the solid was collected by filtration which was washed by ether and dried under vacuum to give **Ru-PNP-2** as a green to yellow solid.

<sup>1</sup>H NMR (500 MHz,  $\text{C}_6\text{D}_6$ )  $\delta$  8.32 – 8.10 (m, 6H), 7.13 – 7.00 (m, 9H), 3.83 – 3.61 (m, 1H), 2.96 – 2.79 (m, 2H), 2.31 – 2.13 (m, 2H), 2.00 – 1.82 (m, 4H), 1.73 – 1.57 (m, 2H), 1.52 – 1.31 (m, 4H), 1.04 – 0.86 (m, 8H), 0.82 (p,  $J = 7.1$  Hz, 6H). <sup>13</sup>C NMR (126 MHz,  $\text{C}_6\text{D}_6$ )  $\delta$  143.6 (d,  $J = 36.5$  Hz), 136.1 (d,  $J = 9.5$  Hz), 129.1, 127.7 (d,  $J = 8.5$  Hz), 48.9, 26.3, 14.4 (t,  $J = 10.8$  Hz), 13.4 (t,  $J = 10.3$  Hz), 9.5, 9.0. <sup>31</sup>P NMR (203 MHz,  $\text{C}_6\text{D}_6$ )  $\delta$  42.7 (t,  $J = 28.1$  Hz), 33.7 (d,  $J = 28.0$  Hz). HRMS: (APCI,  $m/z$ ): calcd. for  $\text{C}_{30}\text{H}_{44}\text{ClNP}_3\text{Ru}[\text{M}-\text{Cl}]^+$  648.1410, found: 648.1413.

# <sup>1</sup>H NMR spectrum

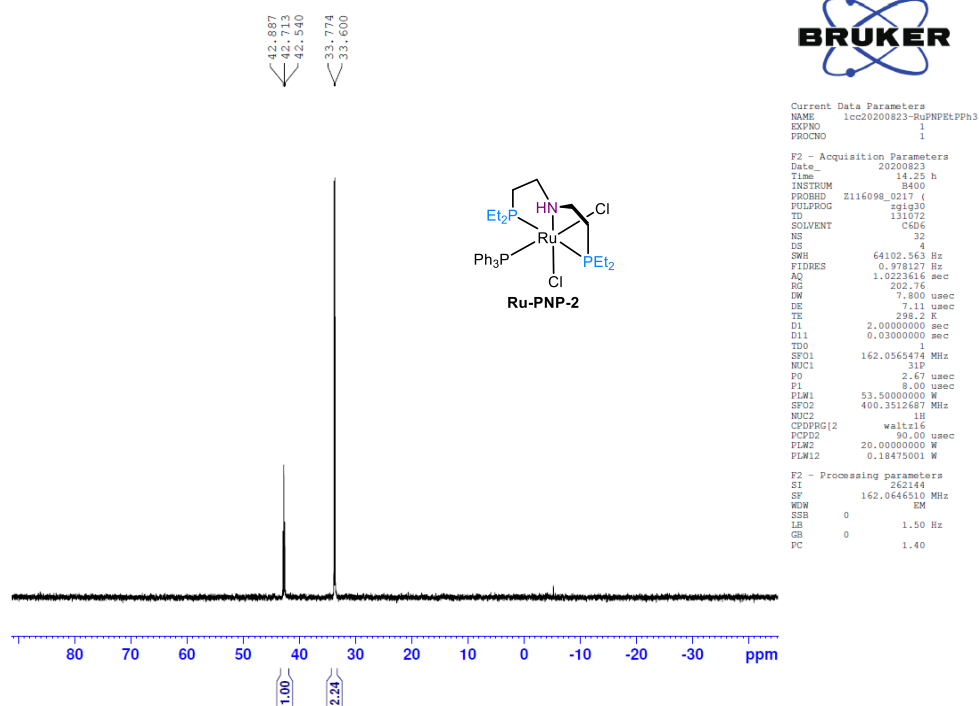


# <sup>13</sup>C NMR spectrum



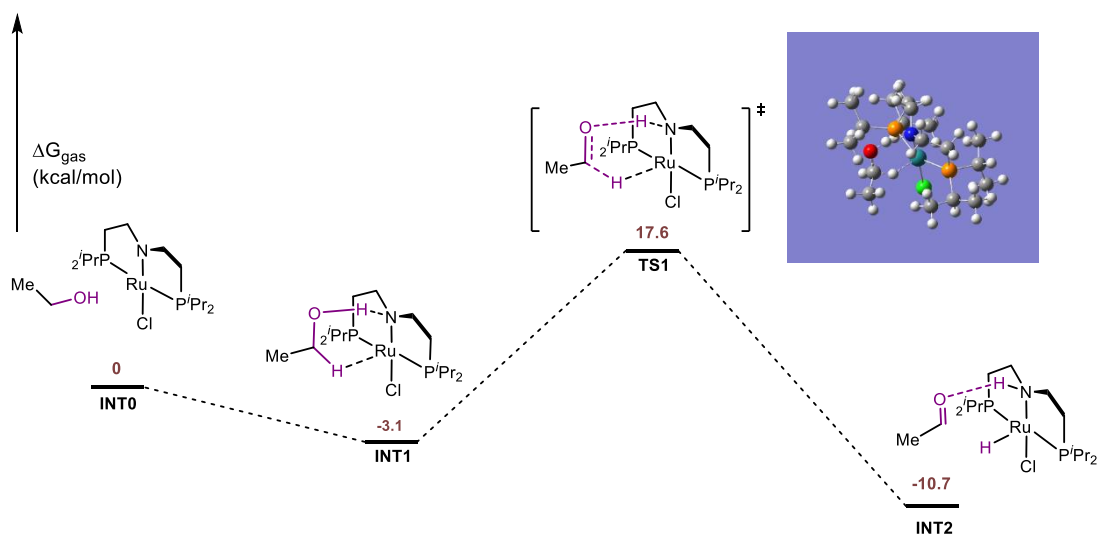


## $^{31}\text{P}$ NMR spectrum



## IV. Mechanistic study

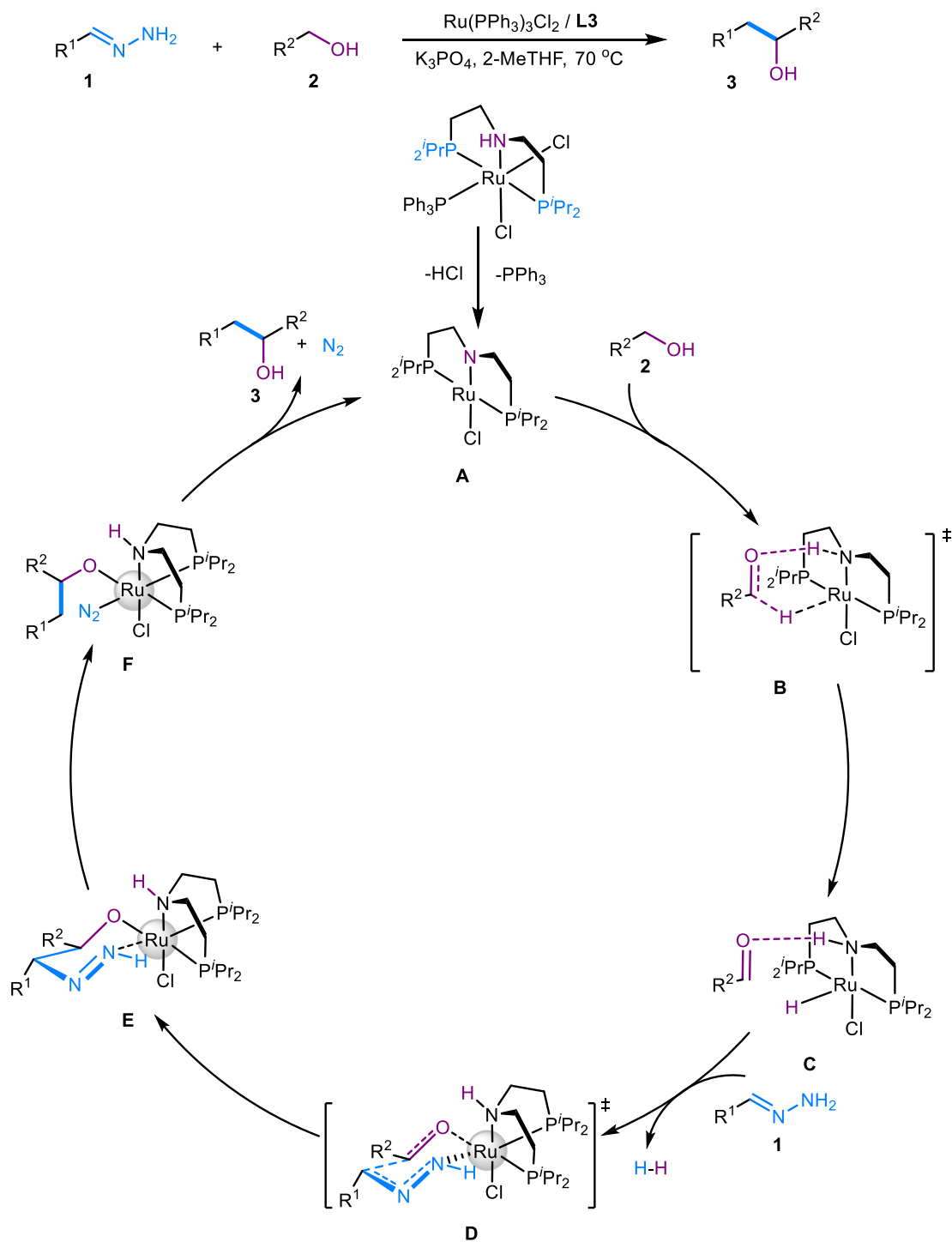
### i. DFT study for the dehydrogenation step



**Supplementary Figure 1.** Energy diagram of the dehydrogenation step based on DFT calculation. DFT calculation was conducted by Gaussian 16. The IRC study clearly shows the possibility of proposed six-membered ring transition state for dehydrogenation step.

Since the first step (dehydrogenation) is the key step of this dehydrogenative Grignard reaction, we mainly did the calculation for the first step. The result shows that the six-membered-ring transition state we proposed is reasonable in this case (Supplementary Figure 1). Furthermore, we also predicted a four-membered-ring transition state which is the corresponding to the classic  $\beta$ -hydride elimination process and the preliminary calculation shows that the free energy of transition state is 54.3 kcal/mol higher than the six-membered-ring one and the intermediate does not show a perfect match with transition state possibly due to the geometry mismatch (thus we did not show on the diagram), which suggested that the six-membered ring transition state is a more favorable transition state in this case. For the 1,2 addition step, we already did several studies in previous work done by us and others.<sup>2,5</sup>

## ii. Proposed mechanism



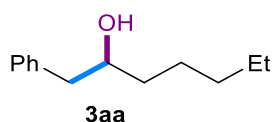
**Supplementary Figure 2. Proposed mechanism for alcohol surrogated Grignard reaction.** The proposed mechanism starts from the tetracoordinated ruthenium complex. The whole process includes a dehydrogenation step and a C-C bond formation step which are all experience six-membered-ring transition states.

In this proposed mechanism, the intermediate **A** was proposed refer to the previous literature about a similar structure study.<sup>6</sup> In that case, it is shown that the PNP

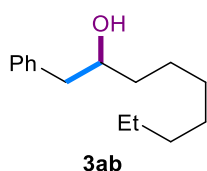
ruthenium complex would form a square planar structure with the presence of base. The dehydrogenation process **A** to **C**, it is also supported by the DFT calculation and other related literature.<sup>7</sup> For the hydrogen releasing step **C** to **D**, it also has the literature support which suggested that the hydride would protonated to hydrogen gas while nitrogen can serve as an internal base to assist the coordination of hydrazine.<sup>8,9</sup> For the 1,2-addition step, it is already illustrated in our previous work.<sup>2,5</sup>

## V. Spectroscopic data of products

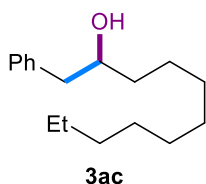
**Note:** references of the characterization data of some known compounds are marked before our characterization data.



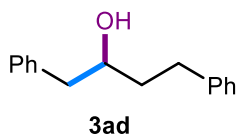
(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 95:5 as eluent, light brown oil, 28 mg, yield: 73%): **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.38 – 7.31 (m, 2H), 7.31 – 7.16 (m, 3H), 3.90 – 3.79 (m, 1H), 2.86 (dd, *J* = 13.6, 4.2 Hz, 1H), 2.68 (dd, *J* = 13.5, 8.4 Hz, 1H), 1.73 – 1.46 (m, 4H), 1.46 – 1.21 (m, 5H), 0.93 (t, *J* = 6.9 Hz, 3H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 138.6, 129.4, 128.5, 126.4, 72.7, 44.0, 36.8, 31.8, 25.4, 22.6, 14.0. **HRMS:** (ESI, *m/z*): calcd. for C<sub>13</sub>H<sub>20</sub>ONa[M+Na]<sup>+</sup> 215.1406, found: 215.1404.



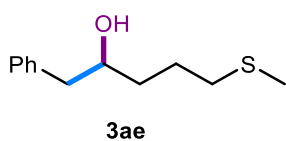
(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 95:5 as eluent, light brown oil, 31.5 mg, yield: 70%) **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.38 – 7.31 (m, 2H), 7.31 – 7.16 (m, 3H), 3.90 – 3.79 (m, 1H), 2.86 (dd, *J* = 13.6, 4.2 Hz, 1H), 2.67 (dd, *J* = 13.6, 8.4 Hz, 1H), 1.70 – 1.46 (m, 4H), 1.46 – 1.18 (m, 9H), 1.00 – 0.84 (m, 3H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 138.6, 129.4, 128.5, 126.4, 72.7, 44.0, 36.8, 31.8, 29.6, 29.3, 25.7, 22.6, 14.1. **HRMS:** (ESI, *m/z*): calcd. for C<sub>15</sub>H<sub>24</sub>ONa[M+Na]<sup>+</sup> 243.1719, found: 243.1717.



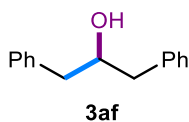
(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 95:5 as eluent, light brown oil, 33 mg, yield: 66%) **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.41 – 7.30 (t, *J* = 7.4 Hz, 2H), 7.30 – 7.18 (m, 3H), 3.90 – 3.79 (m, 1H), 2.86 (dd, *J* = 13.5, 4.2 Hz, 1H), 2.67 (dd, *J* = 13.5, 8.4 Hz, 1H), 1.68 – 1.46 (m, 4H), 1.45 – 1.16 (m, 13H), 0.92 (t, *J* = 6.9 Hz, 3H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 138.6, 129.4, 128.5, 126.4, 72.7, 44.0, 36.8, 31.9, 29.6, 29.6, 29.6, 29.3, 25.7, 22.7, 14.1. **HRMS:** (ESI, *m/z*): calcd. for C<sub>17</sub>H<sub>28</sub>ONa[M+Na]<sup>+</sup> 271.2032, found: 271.2038.



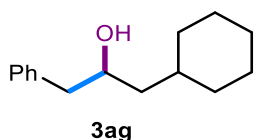
(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 94:6 as eluent, colorless oil, 31 mg, yield: 70%) **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.43 – 7.18 (m, 10H), 3.94 – 3.83 (m, 1H), 2.97 – 2.84 (m, 2H), 2.83 – 2.68 (m, 2H), 1.97 – 1.80 (m, 2H), 1.60 (s, 1H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 142.0, 138.3, 129.4, 128.6, 128.4, 128.4, 126.5, 125.8, 71.9, 44.1, 38.4, 32.1. **HRMS:** (ESI, *m/z*): calcd. for C<sub>16</sub>H<sub>18</sub>ONa[M+Na]<sup>+</sup> 249.1250, found: 249.1247.



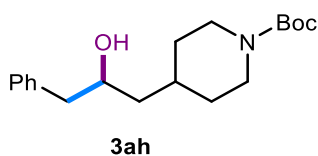
(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 93:7 as eluent, white solid, 28 mg, yield: 67%) **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.40 – 7.30 (m, 2H), 7.30 – 7.18 (m, 3H), 3.93 – 3.82 (m, 1H), 2.86 (dd, *J* = 13.7, 4.3 Hz, 1H), 2.69 (dd, *J* = 13.2, 8.5 Hz, 1H), 2.55 (t, *J* = 7.0 Hz, 2H), 2.13 (s, 3H), 1.92 – 1.80 (m, 1H), 1.78 – 1.54 (m, 4H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 138.3, 129.4, 128.6, 126.5, 72.2, 44.2, 35.8, 34.2, 25.3, 15.5. **HRMS:** (ESI, *m/z*): calcd. for C<sub>12</sub>H<sub>18</sub>OSNa[M+Na]<sup>+</sup> 233.0971, found: 233.0967.



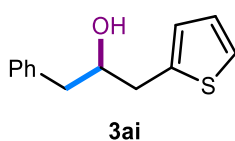
(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 94:6 as eluent, colorless oil, 29 mg, yield: 68%) **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.41 – 7.31 (m, 4H), 7.31 – 7.20 (m, 6H), 4.15 – 4.05 (m, 1H), 2.90 (dd, *J* = 13.5, 4.7 Hz, 2H), 2.80 (dd, *J* = 13.5, 8.2 Hz, 2H), 1.71 (s, 1H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 138.4, 129.4, 128.5, 126.5, 73.5, 43.3. **HRMS:** (ESI, *m/z*): calcd. for C<sub>15</sub>H<sub>16</sub>ONa[M+Na]<sup>+</sup> 235.1093, found: 235.1092.



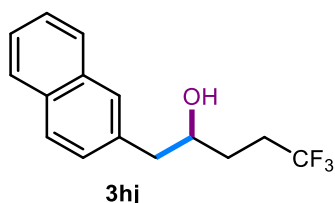
(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 94:6 as eluent, colorless oil, 30 mg, yield: 69%) **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.42 – 7.30 (m, 2H), 7.30 – 7.18 (m, 3H), 4.00 – 3.92 (m, 1H), 2.84 (dd, *J* = 13.6, 4.2 Hz, 1H), 2.66 (dd, *J* = 13.6, 8.4 Hz, 1H), 1.88 – 1.78 (m, 1H), 1.78 – 1.64 (m, 4H), 1.64 – 1.43 (m, 3H), 1.43 – 1.11 (m, 4H), 1.05 – 0.82 (m, 2H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 138.6, 129.4, 128.5, 126.4, 70.0, 44.7, 44.6, 34.1, 32.8, 26.6, 26.3, 26.2. **HRMS:** (ESI, *m/z*): calcd. for C<sub>15</sub>H<sub>22</sub>ONa[M+Na]<sup>+</sup> 241.1563, found: 241.1556.



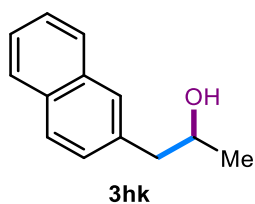
(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 80:20 as eluent, colorless oil, 45 mg, yield: 71%) **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.39 – 7.30 (m, 2H), 7.30 – 7.16 (m, 3H), 4.08 (s, 2H), 4.00 – 3.84 (m, 1H), 2.82 (dd, *J* = 13.5, 4.2 Hz, 1H), 2.77 – 2.62 (m, 3H), 1.90 – 1.56 (m, 4H), 1.56 – 1.31 (m, 11H), 1.24 – 0.96 (m, 3H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 154.8, 138.2, 129.3, 128.6, 126.5, 79.2, 69.7, 44.8, 43.5, 32.9, 32.5, 28.4. **HRMS:** (ESI, *m/z*): calcd. for C<sub>19</sub>H<sub>29</sub>O<sub>3</sub>NNa[M+Na]<sup>+</sup> 342.2040, found: 342.2041.



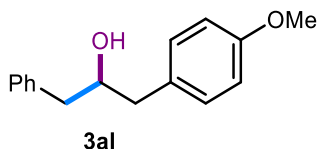
(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 94:6 as eluent, colorless oil, 35 mg, yield: 80%) **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.44 – 7.32 (m, 2H), 7.32 – 7.24 (m, 3H), 7.24 – 7.18 (m, 1H), 7.05 – 6.97 (m, 1H), 6.97 – 6.87 (m, 1H), 4.18 – 4.02 (m, 1H), 3.11 (dd, *J* = 14.7, 4.4 Hz, 1H), 3.01 (dd, *J* = 14.7, 7.8 Hz, 1H), 2.92 (dd, *J* = 13.6, 4.8 Hz, 1H), 2.80 (dd, *J* = 13.6, 8.0 Hz, 1H), 1.92 (s, 1H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 140.4, 138.1, 129.4, 128.5, 126.9, 126.5, 126.0, 124.2, 73.2, 43.0, 37.2. **HRMS**: (ESI, *m/z*): calcd. for C<sub>13</sub>H<sub>14</sub>OSNa[M+Na]<sup>+</sup> 241.0658, found: 241.0650.



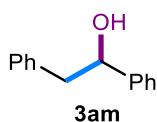
(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 93:7 as eluent, white solid, 32 mg, yield: 63%) **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 8.00 – 7.79 (m, 3H), 7.69 (s, 1H), 7.59 – 7.44 (m, 2H), 7.40 – 7.31 (m, 1H), 4.02 – 3.87 (m, 1H), 3.02 (dd, *J* = 13.6, 4.1 Hz, 1H), 2.86 (dd, *J* = 13.6, 8.7 Hz, 1H), 2.51 – 2.34 (m, 1H), 2.31 – 2.13 (m, 1H), 1.97 – 1.85 (m, 1H), 1.85 – 1.72 (m, 1H), 1.67 (s, 1H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 135.1, 133.6, 132.4, 130.7, 128.5, 128.0, 127.7, 127.5, 127.5, 127.4 (q, *J* = 276.6 Hz), 126.3, 125.8, 71.1, 44.3, 30.4 (q, *J* = 28.9 Hz), 29.0 (q, *J* = 2.7 Hz). **<sup>19</sup>F NMR** (471 MHz, CDCl<sub>3</sub>) δ -66.3. **HRMS**: (ESI, *m/z*): calcd. for C<sub>15</sub>H<sub>15</sub>OF<sub>3</sub>Na[M+Na]<sup>+</sup> 291.0967, found: 291.0972.



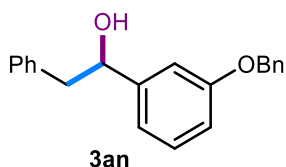
(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 90:10 as eluent, white solid, 24 mg, yield: 67%) **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.95 – 7.77 (m, 3H), 7.70 (s, 1H), 7.56 – 7.44 (m, 2H), 7.43 – 7.33 (m, 1H), 4.20 – 4.08 (m, 1H), 2.98 (dd, *J* = 13.5, 4.8 Hz, 1H), 2.89 (dd, *J* = 13.5, 8.0 Hz, 1H), 1.67 (s, 1H), 1.32 (d, *J* = 6.3 Hz, 3H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 136.0, 133.5, 132.2, 128.1, 127.8, 127.7, 127.6, 127.5, 126.1, 125.5, 68.7, 45.9, 22.8. **HRMS**: (ESI, *m/z*): calcd. for C<sub>13</sub>H<sub>14</sub>ONa[M+Na]<sup>+</sup> 209.0937, found: 209.0935.



(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 92:8 as eluent, colorless oil, 30 mg, yield: 64%) **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.40 – 7.31 (m, 2H), 7.31 – 7.22 (m, 3H), 7.22 – 7.13 (m, 2H), 6.94 – 6.84 (m, 2H), 6.97 – 6.87 (m, 1H), 4.11 – 3.99 (m, 1H), 3.82 (s, 3H), 2.94 – 2.68 (m, 4H), 1.68 (s, 1H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 158.3, 138.5, 130.3, 129.4, 128.5, 126.4, 113.9, 73.6, 55.2, 43.3, 42.4. **HRMS:** (ESI, *m/z*): calcd. for C<sub>16</sub>H<sub>18</sub>O<sub>2</sub>Na[M+Na]<sup>+</sup> 265.1199, found: 265.1197.

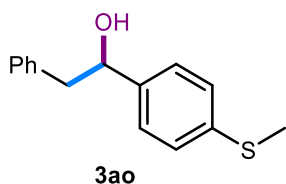


(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 95:5 as eluent, white solid, 24 mg, yield: 61%)<sup>2</sup> **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.42 – 7.37 (m, 4H), 7.37 – 7.30 (m, 3H), 7.30 – 7.26 (m, 1H), 7.26 – 7.20 (m, 2H), 4.93 (dd, *J* = 8.5, 4.9 Hz, 1H), 3.11 – 2.99 (m, 2H), 2.02 (s, 1H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 143.8, 138.0, 129.5, 128.5, 128.4, 127.6, 126.6, 125.9, 75.3, 46.1. **HRMS:** (ESI, *m/z*): calcd. for C<sub>14</sub>H<sub>14</sub>ONa[M+Na]<sup>+</sup> 221.0937, found: 221.0942.

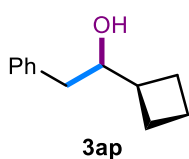


(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 92:8 as eluent, white solid, 33 mg, yield: 54%) **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.56 – 7.41 (m, 4H), 7.41 – 7.18 (m, 7H), 7.11 – 7.04 (m, 1H), 7.04 – 6.89 (m, 2H), 5.09 (s, 2H), 4.91 (dd, *J* = 8.5, 4.8 Hz, 1H), 3.11 – 2.98 (m, 2H), 2.07 (s, 1H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 158.9, 145.5, 138.0, 137.0, 129.5, 129.4, 128.5, 128.5, 127.9, 127.5, 126.6, 118.5, 114.0, 112.3, 75.2, 69.9, 46.0. **HRMS:** (ESI, *m/z*): calcd. for C<sub>21</sub>H<sub>20</sub>O<sub>2</sub>Na[M+Na]<sup>+</sup> 327.1356, found: 327.1360.

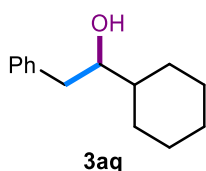




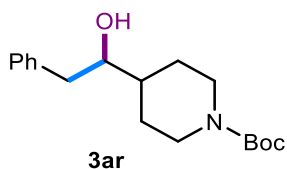
(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 93:7 as eluent, white solid, 26 mg, yield: 53%)  $^1\text{H NMR}$  (500 MHz,  $\text{CDCl}_3$ )  $\delta$  7.36 – 7.24 (m, 7H), 7.24 – 7.19 (m, 2H), 4.88 (dd,  $J = 8.1, 5.1$  Hz, 1H), 3.09 – 2.95 (m, 2H), 2.51 (s, 3H), 2.01 (s, 1H).  $^{13}\text{C NMR}$  (126 MHz,  $\text{CDCl}_3$ )  $\delta$  140.7, 137.8, 137.5, 129.5, 128.5, 126.6, 126.4, 74.9, 45.9, 15.9. **HRMS:** (ESI,  $m/z$ ): calcd. for  $\text{C}_{15}\text{H}_{16}\text{OSNa}[\text{M}+\text{Na}]^+$  267.0814, found: 267.0813.



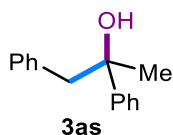
(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 95:5 as eluent, colorless oil, 24 mg, yield: 69%)  $^1\text{H NMR}$  (500 MHz,  $\text{CDCl}_3$ )  $\delta$  7.39 – 7.31 (m, 2H), 7.31 – 7.18 (m, 3H), 3.83 – 3.70 (m, 1H), 2.79 (dd,  $J = 13.7, 3.9$  Hz, 1H), 2.56 (dd,  $J = 13.7, 8.4$  Hz, 1H), 2.48 – 2.34 (m, 1H), 2.12 – 1.90 (m, 4H), 1.90 – 1.79 (m, 2H), 1.58 (s, 1H).  $^{13}\text{C NMR}$  (126 MHz,  $\text{CDCl}_3$ )  $\delta$  138.6, 129.4, 128.4, 126.3, 76.4, 40.9, 40.7, 24.4, 24.2, 17.8. **HRMS:** (ESI,  $m/z$ ): calcd. for  $\text{C}_{12}\text{H}_{16}\text{ONa}[\text{M}+\text{Na}]^+$  199.1093, found: 199.1095.



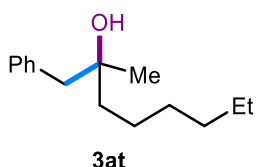
(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 95:5 as eluent, colorless oil, 21 mg, yield: 50%)  $^1\text{H NMR}$  (500 MHz,  $\text{CDCl}_3$ )  $\delta$  7.44 – 7.31 (m, 2H), 7.31 – 7.16 (m, 3H), 3.65 – 3.56 (m, 1H), 2.91 (dd,  $J = 13.6, 3.4$  Hz, 1H), 2.56 (dd,  $J = 13.6, 9.6$  Hz, 1H), 2.00 – 1.90 (m, 1H), 1.88 – 1.75 (m, 3H), 1.75 – 1.65 (m, 1H), 1.60 – 1.37 (m, 2H), 1.37 – 1.03 (m, 5H).  $^{13}\text{C NMR}$  (126 MHz,  $\text{CDCl}_3$ )  $\delta$  139.2, 129.4, 128.5, 126.3, 76.9, 43.2, 40.8, 29.3, 28.0, 26.5, 26.3, 26.1. **HRMS:** (ESI,  $m/z$ ): calcd. for  $\text{C}_{14}\text{H}_{20}\text{ONa}[\text{M}+\text{Na}]^+$  227.1406, found: 227.1415.



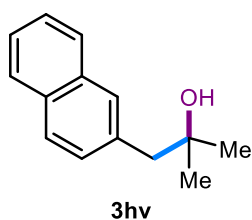
(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 82:18 as eluent, white solid, 31 mg, yield: 50%):  $^1\text{H NMR}$  (500 MHz,  $\text{CDCl}_3$ )  $\delta$  7.38 – 7.30 (m, 2H), 7.30 – 7.18 (m, 3H), 4.19 (s, 2H), 3.68 – 3.56 (m, 1H), 2.91 (dd,  $J = 13.5, 3.3$  Hz, 1H), 2.80 – 2.54 (m, 3H), 1.97 – 1.85 (m, 1H), 1.80 – 1.54 (m, 3H), 1.54 – 1.21 (m, 12H).  $^{13}\text{C NMR}$  (126 MHz,  $\text{CDCl}_3$ )  $\delta$  154.8, 138.5, 129.3, 128.6, 126.5, 79.3, 75.9, 43.5, 41.6, 40.8, 28.4. **HRMS:** (ESI,  $m/z$ ): calcd. for  $\text{C}_{18}\text{H}_{27}\text{O}_3\text{NNa}[\text{M}+\text{Na}]^+$  328.1883, found: 328.1887.



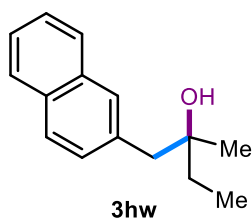
(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 96:4 as eluent, colorless oil, 23 mg, yield: 54%)<sup>2</sup>  $^1\text{H NMR}$  (500 MHz,  $\text{CDCl}_3$ )  $\delta$  7.47 – 7.41 (m, 2H), 7.41 – 7.33 (m, 2H), 7.33 – 7.19 (m, 4H), 7.08 – 6.98 (m, 2H), 3.17 (d,  $J = 13.4$  Hz, 1H), 3.06 (d,  $J = 13.4$  Hz, 1H), 1.90 (s, 1H), 1.60 (s, 3H).  $^{13}\text{C NMR}$  (126 MHz,  $\text{CDCl}_3$ )  $\delta$  147.5, 136.7, 130.6, 128.0, 126.6, 124.9, 74.4, 50.5, 29.4. **HRMS:** (ESI,  $m/z$ ): calcd. for  $\text{C}_{15}\text{H}_{16}\text{ONa}[\text{M}+\text{Na}]^+$  235.1093, found: 235.1096.



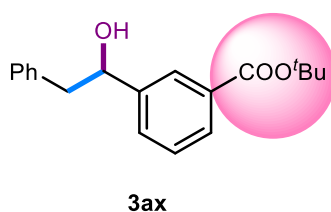
(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 96:4 as eluent, colorless oil, 10 mg, yield: 23%)  $^1\text{H NMR}$  (500 MHz,  $\text{CDCl}_3$ )  $\delta$  7.37 – 7.30 (m, 2H), 7.30 – 7.19 (m, 3H), 2.78 (dd,  $J = 29.4, 13.3$  Hz, 2H), 1.55 – 1.40 (m, 4H), 1.40 – 1.24 (m, 7H), 1.16 (s, 3H), 0.92 (t,  $J = 6.9$  Hz, 3H).  $^{13}\text{C NMR}$  (126 MHz,  $\text{CDCl}_3$ )  $\delta$  137.6, 130.5, 128.2, 126.4, 72.5, 48.0, 41.9, 31.9, 29.8, 26.5, 24.0, 22.6, 14.1. **HRMS:** (ESI,  $m/z$ ): calcd. for  $\text{C}_{15}\text{H}_{24}\text{ONa}[\text{M}+\text{Na}]^+$  243.1719, found: 243.1728.



(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 95:5 as eluent, white solid, 34 mg, yield: 85%) **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.91 – 7.78 (m, 3H), 7.71 (s, 1H), 7.56 – 7.45 (m, 2H), 7.41 (dd, *J* = 8.4, 1.8 Hz, 1H), 2.97 (s, 2H), 1.56 (s, 1H), 1.31 (s, 6H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 135.4, 133.3, 132.2, 129.0, 128.8, 127.6, 127.6, 126.0, 125.4, 70.9, 49.8, 29.2. **HRMS:** (ESI, *m/z*): calcd. for C<sub>14</sub>H<sub>16</sub>ONa[M+Na]<sup>+</sup> 223.1093, found: 223.1094.

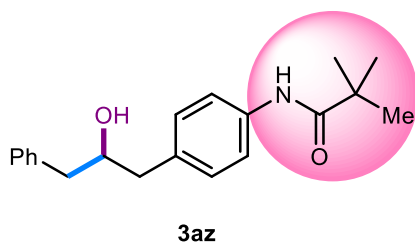


(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 95:5 as eluent, white solid, 26 mg, yield: 61%) **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.92 – 7.77 (m, 3H), 7.71 (s, 1H), 7.57 – 7.45 (m, 2H), 7.41 (dd, *J* = 8.4, 1.8 Hz, 1H), 2.95 (q, *J* = 13.3 Hz, 2H), 1.59 (q, *J* = 7.5 Hz, 2H), 1.47 (s, 1H), 1.21 (s, 3H), 1.04 (t, *J* = 7.5 Hz, 3H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 135.3, 133.3, 132.2, 129.1, 128.9, 127.6, 126.0, 125.4, 72.9, 47.6, 34.3, 26.0, 8.3. **HRMS:** (ESI, *m/z*): calcd. for C<sub>15</sub>H<sub>18</sub>ONa[M+Na]<sup>+</sup> 237.1250, found: 237.1254.

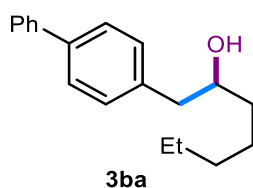


(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 90:10 as eluent, colorless oil, 35 mg, yield: 59%) **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 8.00 (s, 1H), 7.93 (d, *J* = 7.7 Hz, 1H), 7.53 (d, *J* = 7.6 Hz, 1H), 7.41 (t, *J* = 7.7 Hz, 1H), 7.37 – 7.14 (m, 5H), 4.97 (dd, *J* = 8.7, 4.7 Hz, 1H), 3.16 – 2.89 (m, 2H), 2.16 (s, 1H), 1.63 (s, 9H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 165.7, 144.0, 137.7, 132.1, 129.9, 129.5, 128.6, 128.5, 128.2, 126.8, 126.7,

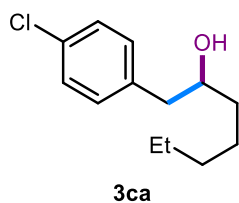
81.1, 74.9, 46.0, 28.2. **HRMS:** (ESI,  $m/z$ ): calcd. for  $C_{19}H_{22}O_3Na[M+Na]^+$  321.1461, found: 321.1470.



(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 65:35 as eluent, white solid, 30 mg, yield: 48%) **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.56 – 7.45 (m, 2H), 7.44 – 7.30 (m, 3H), 7.31 – 7.13 (m, 5H), 4.12 – 3.98 (m, 1H), 2.85 (ddd,  $J = 14.2, 9.7, 4.7$  Hz, 2H), 2.81 – 2.65 (m, 2H), 1.73 (s, 1H), 1.34 (s, 9H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 176.5, 138.4, 136.4, 134.2, 129.8, 129.4, 128.5, 126.4, 120.2, 73.5, 43.2, 42.7, 39.5, 27.6. **HRMS:** (ESI,  $m/z$ ): calcd. for  $C_{20}H_{25}O_2NNa[M+Na]^+$  334.1777, found: 334.1775.

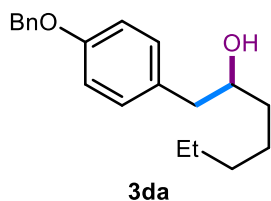


(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 94:6 as eluent, white solid, 40 mg, yield: 75%): **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.70 – 7.56 (m, 4H), 7.54 – 7.43 (m, 2H), 7.42 – 7.29 (m, 3H), 4.00 – 3.77 (m, 1H), 2.91 (dd,  $J = 13.6, 4.2$  Hz, 1H), 2.73 (dd,  $J = 13.6, 8.4$  Hz, 1H), 1.73 – 1.50 (m, 4H), 1.50 – 1.19 (m, 5H), 0.95 (t,  $J = 6.9$  Hz, 3H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 140.9, 139.3, 137.7, 129.8, 128.7, 127.2, 127.1, 127.0, 72.7, 43.6, 36.9, 31.8, 25.4, 22.6, 14.0. **HRMS:** (ESI,  $m/z$ ): calcd. for  $C_{19}H_{24}ONa[M+Na]^+$  291.1719, found: 291.1730.

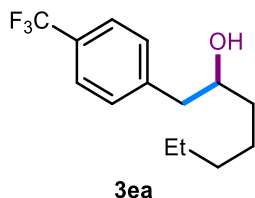


(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 94:6 as eluent, white solid, 29 mg,

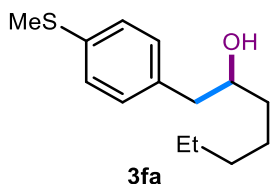
yield: 64%): **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.37 – 7.25 (m, 2H), 7.21 – 7.12 (m, 2H), 3.88 – 3.72 (m, 1H), 2.81 (dd, *J* = 13.7, 4.3 Hz, 1H), 2.65 (dd, *J* = 13.7, 8.3 Hz, 1H), 1.67 – 1.44 (m, 4H), 1.44 – 1.21 (m, 5H), 0.92 (t, *J* = 6.9 Hz, 3H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 137.2, 132.2, 130.7, 128.6, 72.5, 43.3, 36.8, 31.8, 25.4, 22.6, 14.0. **HRMS:** (ESI, *m/z*): calcd. for C<sub>13</sub>H<sub>19</sub>OCINa[M+Na]<sup>+</sup> 249.1017, found: 249.1019.



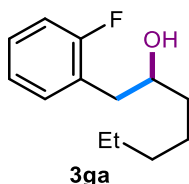
(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 94:6 as eluent, white solid, 38 mg, yield: 64%): **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.54 – 7.32 (m, 5H), 7.17 (d, *J* = 8.5 Hz, 2H), 6.97 (d, *J* = 8.5 Hz, 2H), 5.09 (s, 1H), 3.88 – 3.74 (m, 1H), 2.81 (dd, *J* = 13.7, 4.2 Hz, 1H), 2.62 (dd, *J* = 13.7, 8.4 Hz, 1H), 1.71 – 1.46 (m, 4H), 1.46 – 1.23 (m, 5H), 0.94 (t, *J* = 6.9 Hz, 3H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 157.5, 137.1, 130.9, 130.3, 128.5, 127.9, 127.4, 114.9, 72.7, 70.0, 43.1, 36.7, 31.8, 25.4, 22.6, 14.0. **HRMS:** (ESI, *m/z*): calcd. for C<sub>20</sub>H<sub>26</sub>O<sub>2</sub>Na[M+Na]<sup>+</sup> 321.1825, found: 321.1825.



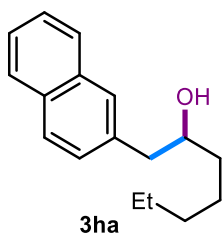
(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 94:6 as eluent, colorless oil, 26 mg, yield: 50%): **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.59 (d, *J* = 8.0 Hz, 2H), 7.36 (d, *J* = 8.0 Hz, 2H), 3.95 – 3.78 (m, 1H), 2.89 (dd, *J* = 13.6, 4.1 Hz, 1H), 2.75 (dd, *J* = 13.6, 8.3 Hz, 1H), 1.67 – 1.46 (m, 4H), 1.46 – 1.22 (m, 5H), 0.92 (t, *J* = 6.9 Hz, 3H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 143.0, 129.7, 128.7 (q, *J* = 32.4 Hz), 125.3 (q, *J* = 3.2 Hz), 124.3 (q, *J* = 271.2 Hz), 72.5, 43.7, 37.0, 31.8, 25.3, 22.6, 14.0. **<sup>19</sup>F NMR** (471 MHz, CDCl<sub>3</sub>) δ -62.4. **HRMS:** (ESI, *m/z*): calcd. for C<sub>14</sub>H<sub>19</sub>OF<sub>3</sub>Na[M+Na]<sup>+</sup> 283.1280, found: 283.1277.



(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 93:7 as eluent, colorless oil, 31 mg, yield: 65%): **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.24 (d, *J* = 8.2 Hz, 2H), 7.16 (d, *J* = 8.2 Hz, 2H), 3.87 – 3.75 (m, 1H), 2.81 (dd, *J* = 13.6, 4.3 Hz, 1H), 2.63 (dd, *J* = 13.6, 8.3 Hz, 1H), 2.50 (s, 3H), 1.63 – 1.44 (m, 4H), 1.44 – 1.20 (m, 5H), 0.92 (t, *J* = 6.9 Hz, 3H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 136.1, 135.6, 129.9, 127.0, 72.6, 43.4, 36.8, 31.8, 25.4, 22.6, 16.1, 14.0. **HRMS**: (ESI, *m/z*): calcd. for C<sub>14</sub>H<sub>22</sub>OSNa[M+Na]<sup>+</sup> 261.1284, found: 261.1284.

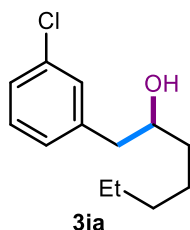


(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 95:5 as eluent, colorless oil, 26 mg, yield: 62%): **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.33 – 7.16 (m, 2H), 7.16 – 6.97 (m, 2H), 3.96 – 3.80 (m, 1H), 2.92 (dd, *J* = 13.8, 4.4 Hz, 1H), 2.71 (dd, *J* = 13.8, 8.2 Hz, 1H), 2.50 (s, 3H), 1.66 – 1.46 (m, 4H), 1.46 – 1.22 (m, 5H), 0.92 (t, *J* = 6.9 Hz, 3H). **<sup>13</sup>C NMR** (126 MHz, CDCl<sub>3</sub>) δ 161.4 (d, *J* = 244.7 Hz), 131.8 (d, *J* = 4.7 Hz), 128.2 (d, *J* = 8.1 Hz), 125.7 (d, *J* = 15.6 Hz), 124.0 (d, *J* = 3.5 Hz), 115.4 (d, *J* = 22.4 Hz), 71.7, 37.2, 37.0, 31.8, 25.4, 22.6, 14.1. **<sup>19</sup>F NMR** (471 MHz, CDCl<sub>3</sub>) δ -117.7. **HRMS**: (ESI, *m/z*): calcd. for C<sub>13</sub>H<sub>19</sub>OFNa[M+Na]<sup>+</sup> 233.1312, found: 233.1315.

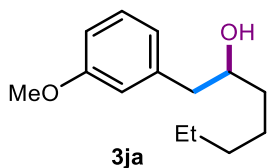


(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 94:6 as eluent, white solid, 33 mg, yield: 68%): **<sup>1</sup>H NMR** (500 MHz, CDCl<sub>3</sub>) δ 7.92 – 7.77 (m, 1H), 7.71 (s, 1H), 7.55 – 7.44 (m, 2H), 7.43 – 7.34 (m, 1H), 4.01 – 3.87 (m, 1H), 3.03 (dd, *J* = 13.6, 4.2 Hz, 1H),

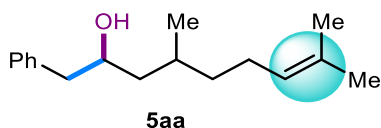
2.85 (dd,  $J = 13.6, 8.4$  Hz, 1H), 1.72 – 1.50 (m, 4H), 1.50 – 1.24 (m, 5H), 0.94 (t,  $J = 6.9$  Hz, 3H).  $^{13}\text{C NMR}$  (126 MHz,  $\text{CDCl}_3$ )  $\delta$  136.2, 133.5, 132.2, 128.1, 127.8, 127.8, 127.6, 127.5, 126.0, 125.4, 72.6, 44.2, 36.9, 31.8, 25.4, 22.6, 14.0. **HRMS:** (ESI,  $m/z$ ): calcd. for  $\text{C}_{17}\text{H}_{22}\text{ONa}[\text{M}+\text{Na}]^+$  265.1563, found: 265.1564.



(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 94:6 as eluent, white solid, 26 mg, yield: 57%):  $^1\text{H NMR}$  (500 MHz,  $\text{CDCl}_3$ )  $\delta$  7.33 – 7.19 (m, 3H), 7.17 – 7.08 (m, 1H), 3.89 – 3.75 (m, 1H), 2.81 (dd,  $J = 13.7, 4.2$  Hz, 1H), 2.65 (dd,  $J = 13.6, 8.4$  Hz, 1H), 1.63 – 1.45 (m, 4H), 1.45 – 1.23 (m, 5H), 0.92 (t,  $J = 6.9$  Hz, 3H).  $^{13}\text{C NMR}$  (126 MHz,  $\text{CDCl}_3$ )  $\delta$  140.8, 134.2, 129.7, 129.5, 127.6, 126.6, 72.5, 43.6, 36.9, 31.8, 25.4, 22.6, 14.0. **HRMS:** (ESI,  $m/z$ ): calcd. for  $\text{C}_{13}\text{H}_{19}\text{OCINa}[\text{M}+\text{Na}]^+$  249.1017, found: 249.1020.

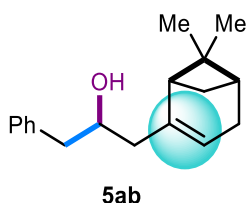


(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 92:8 as eluent, colorless oil, 27 mg, yield: 61%):  $^1\text{H NMR}$  (500 MHz,  $\text{CDCl}_3$ )  $\delta$  7.32 – 7.20 (m, 1H), 6.90 – 6.71 (m, 3H), 3.89 – 3.76 (m, 4H), 2.83 (dd,  $J = 13.5, 4.2$  Hz, 1H), 2.64 (dd,  $J = 13.5, 8.5$  Hz, 1H), 1.72 – 1.46 (m, 4H), 1.46 – 1.21 (m, 5H), 0.92 (t,  $J = 6.9$  Hz, 3H).  $^{13}\text{C NMR}$  (126 MHz,  $\text{CDCl}_3$ )  $\delta$  159.7, 140.2, 129.5, 121.7, 115.1, 111.7, 72.6, 55.1, 44.1, 36.8, 31.8, 25.4, 22.6, 14.0. **HRMS:** (ESI,  $m/z$ ): calcd. for  $\text{C}_{14}\text{H}_{22}\text{O}_2\text{Na}[\text{M}+\text{Na}]^+$  245.1512, found: 245.1521.



(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 95:5 as eluent, colorless oil, 33 mg, yield: 67%, mixture of two diastereomers, d.r. = 1:1)  $^1\text{H NMR}$  (500 MHz,  $\text{CDCl}_3$ )  $\delta$

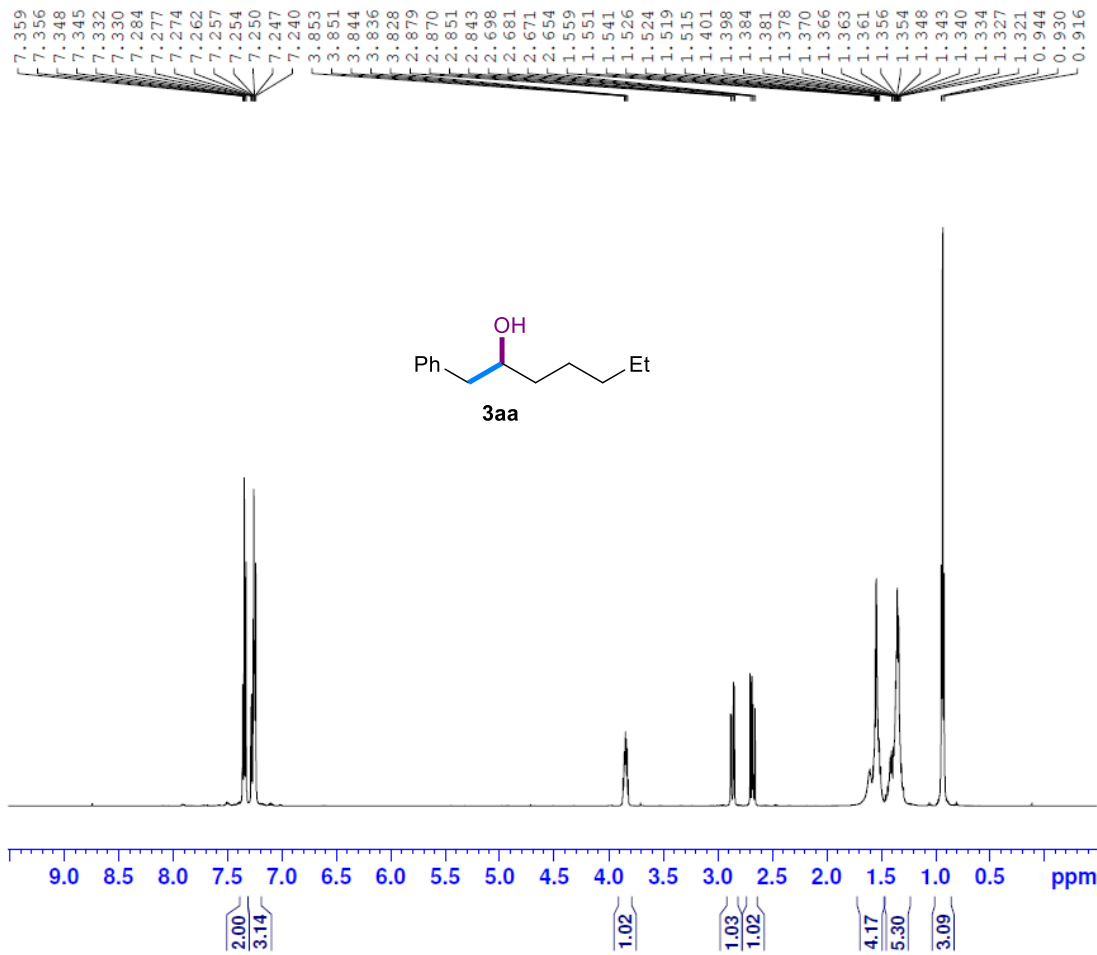
7.43 – 7.31 (m, 2H), 7.31 – 7.15 (m, 3H), 5.23 – 5.05 (m, 1H), 4.02 – 3.88 (m, 1H), 2.94 – 2.77 (m, 1H), 2.77 – 2.58 (m, 1H), 2.13 – 1.90 (m, 2H), 1.80 – 1.12 (m, 12H), 1.06 – 0.81 (m, 3H).  $^{13}\text{C}$  NMR (126 MHz,  $\text{CDCl}_3$ )  $\delta$  138.6, 138.6, 131.2, 131.2, 129.4, 128.5, 126.4, 126.4, 124.7, 70.7, 70.3, 44.8, 44.3, 44.2, 44.2, 37.9, 36.6, 29.3, 28.9, 25.7, 25.5, 25.3, 20.2, 19.1, 17.6. **HRMS:** (ESI,  $m/z$ ): calcd. for  $\text{C}_{17}\text{H}_{26}\text{ONa}[\text{M}+\text{Na}]^+$  269.1876, found: 269.1875.



(Generated following the corresponding general procedure, isolated by column chromatography on silica gel with hexane: EtOAc = 95:5 as eluent, colorless oil, 32 mg, yield: 62%, mixture of two diastereomers, d.r. = 1:1)  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ )  $\delta$  7.41 – 7.30 (m, 2H), 7.30 – 7.16 (m, 3H), 5.48 – 5.34 (m, 1H), 3.93 – 3.78 (m, 1H), 2.88 – 2.73 (m, 2H), 2.48 – 2.38 (m, 1H), 2.38 – 2.11 (m, 5H), 2.11 – 2.00 (m, 1H), 1.92 – 1.74 (m, 1H), 1.30 (d,  $J = 2.6$  Hz, 3H), 1.24 – 1.11 (m, 1H), 0.89 (d,  $J = 2.2$  Hz, 3H).  $^{13}\text{C}$  NMR (126 MHz,  $\text{CDCl}_3$ )  $\delta$  145.3, 145.0, 138.8, 138.8, 129.4, 128.4, 128.3, 126.3, 120.3, 120.0, 69.8, 69.6, 45.9, 45.6, 45.0, 44.7, 43.4, 43.4, 40.7, 40.6, 38.0, 37.7, 32.0, 31.7, 31.4, 31.4, 26.2, 26.2, 21.3, 21.2. **HRMS:** (ESI,  $m/z$ ): calcd. for  $\text{C}_{18}\text{H}_{24}\text{ONa}[\text{M}+\text{Na}]^+$  279.1719, found: 279.1728.



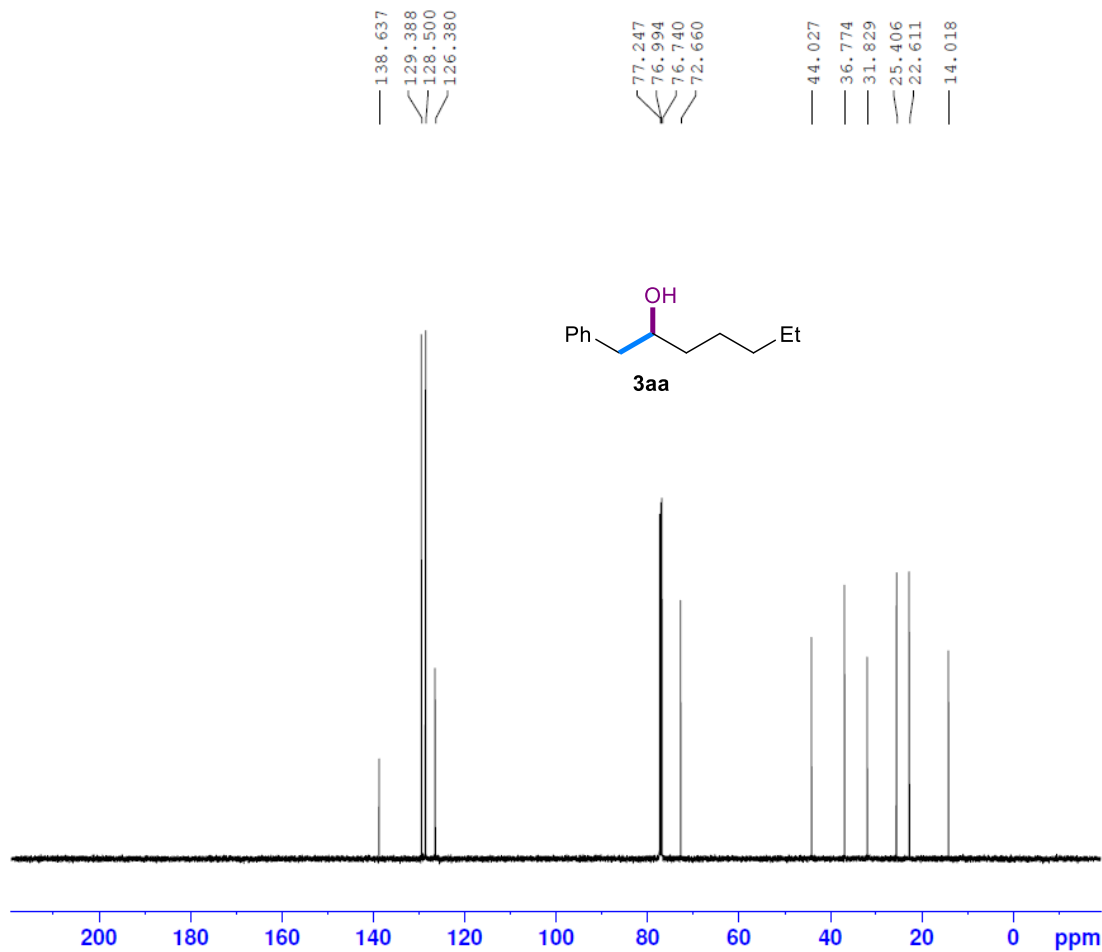
## **VI. NMR spectra of products**



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Current Data Parameters  
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 PROCNO 1

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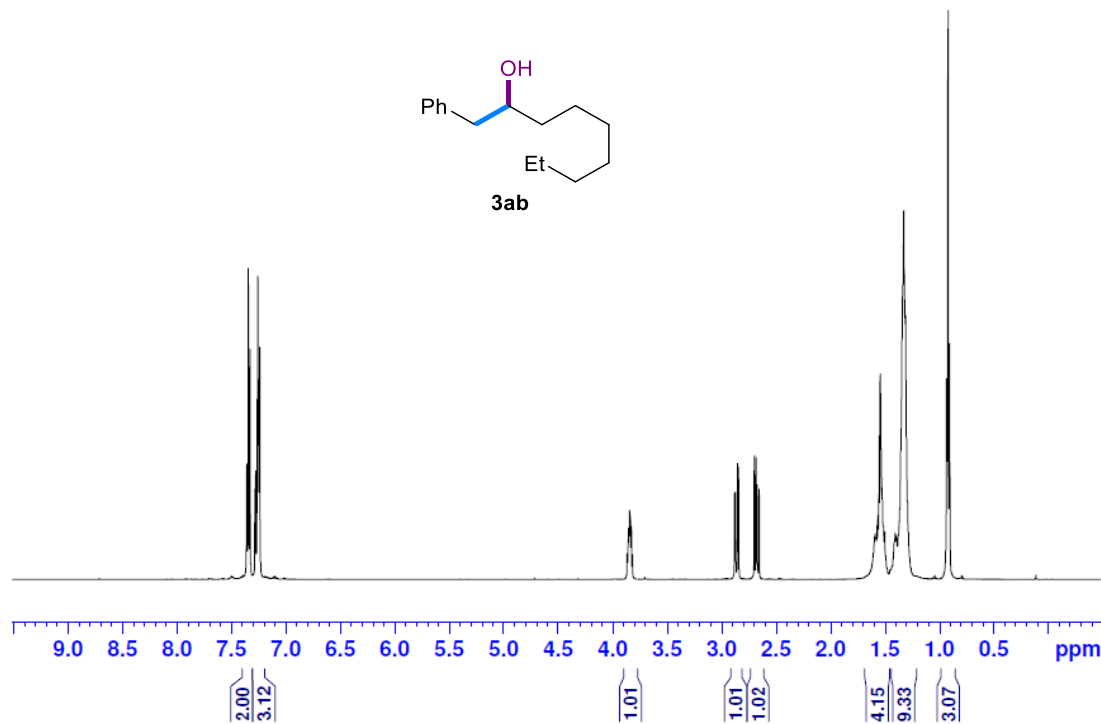
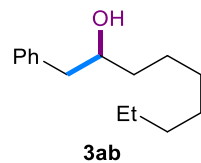
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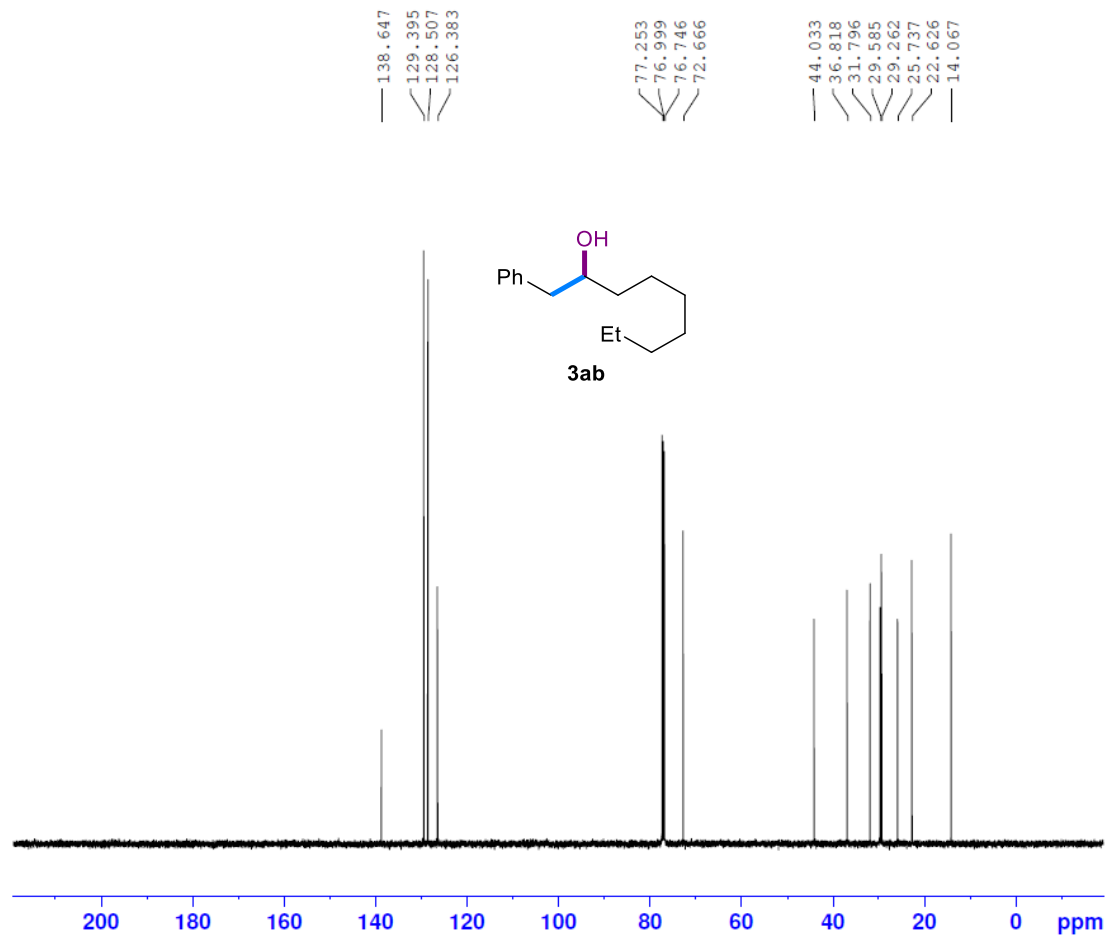


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Current Data Parameters  
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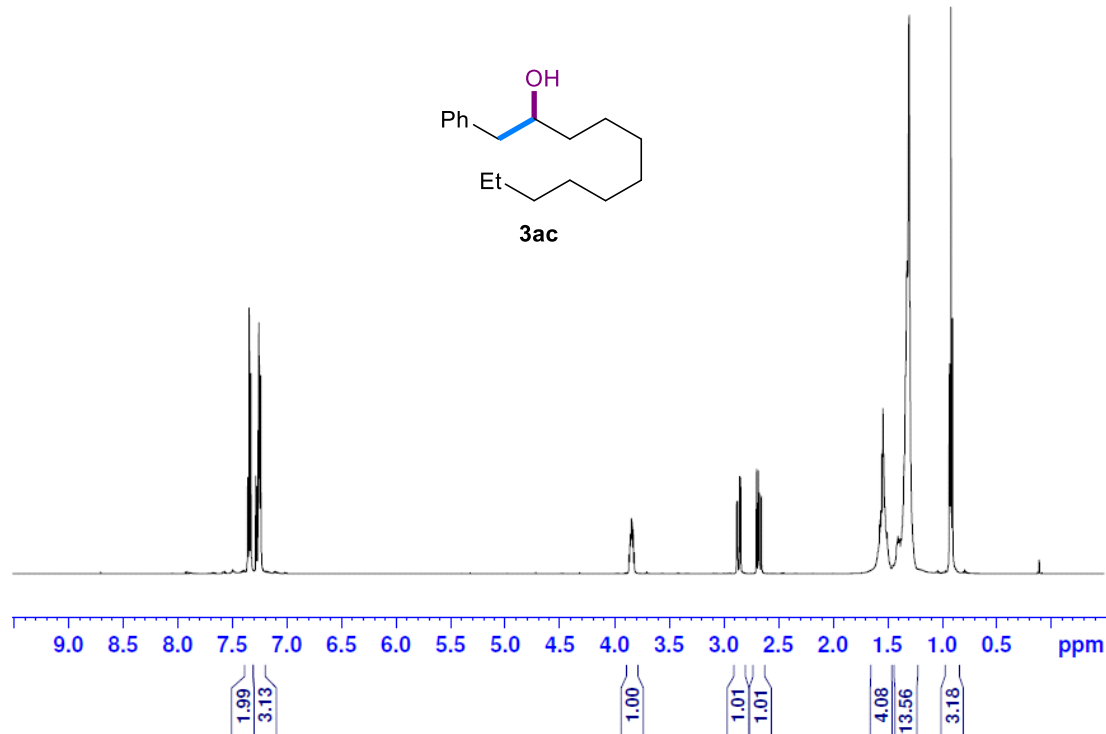
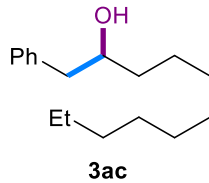
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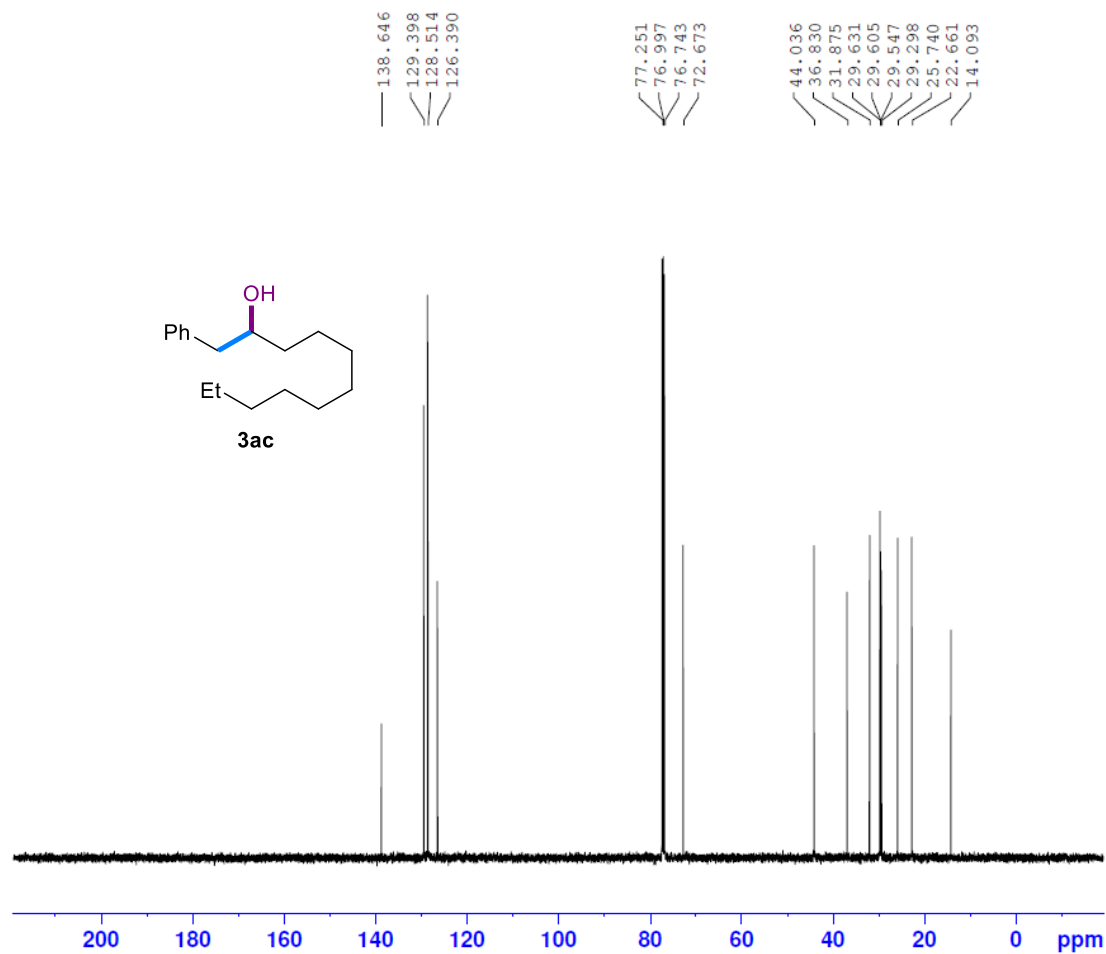


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RG 50.67  
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D1 1.00000000 sec  
TD0 1  
SFO1 500.3030896 MHz  
NUC1 1H  
PO 3.33 usec  
P1 10.00 usec  
PLW1 21.89999962 W

F2 - Processing parameters  
SI 65536  
SF 500.3000000 MHz  
WDW EM  
SSB 0  
LB 0.30 Hz  
GB 0  
PC 1.00





Current Data Parameters  
 NAME lcc-1960-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20191204  
 Time 9.47 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 (  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.49000001 W  
 PLW13 0.20446000 W

F2 - Processing parameters  
 SI 32768  
 SF 125.8005407 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40

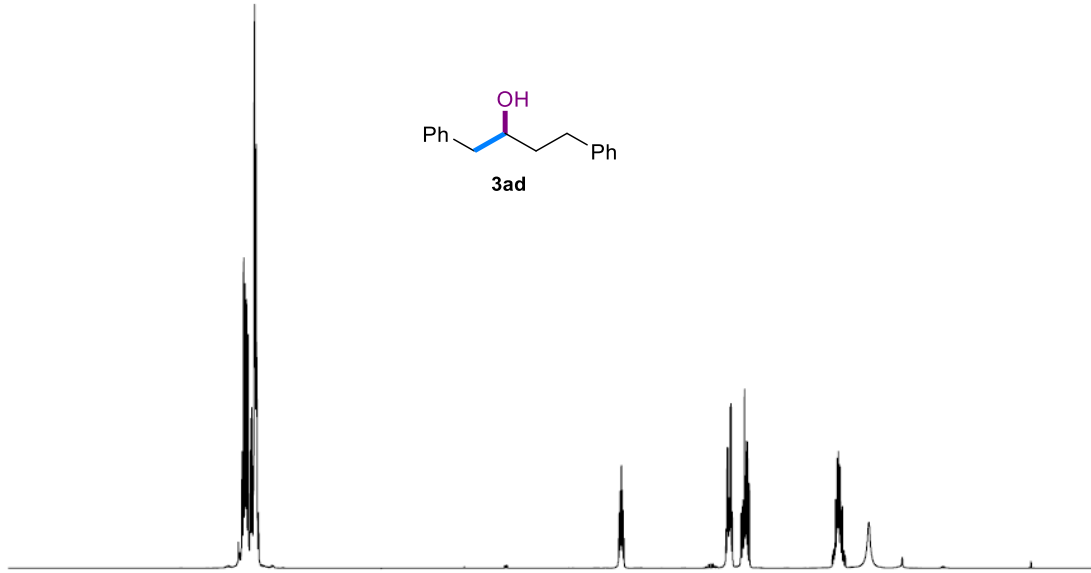
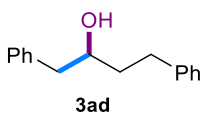
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7.365  
7.362  
7.350  
7.338  
7.335  
7.323  
7.312  
7.308  
7.289  
7.284  
7.274  
7.270  
7.259  
7.250  
7.245  
7.235  
7.228  
7.213  
3.907  
3.898  
3.890  
3.882  
3.874  
3.866  
3.857  
2.921  
2.909  
2.901  
2.893  
2.882  
2.874  
2.863  
2.783  
2.769  
2.765  
2.755  
2.750  
2.742  
2.733  
2.723  
2.706  
1.914  
1.909  
1.906  
1.900  
1.896  
1.892  
1.887  
1.882  
1.872  
1.869  
1.864  
1.853  
1.608



Current Data Parameters  
 NAME lcc-1959-product  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20191204  
 Time 9.28 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 (  
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 4  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RG 77.88  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TD0 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.89999962 W

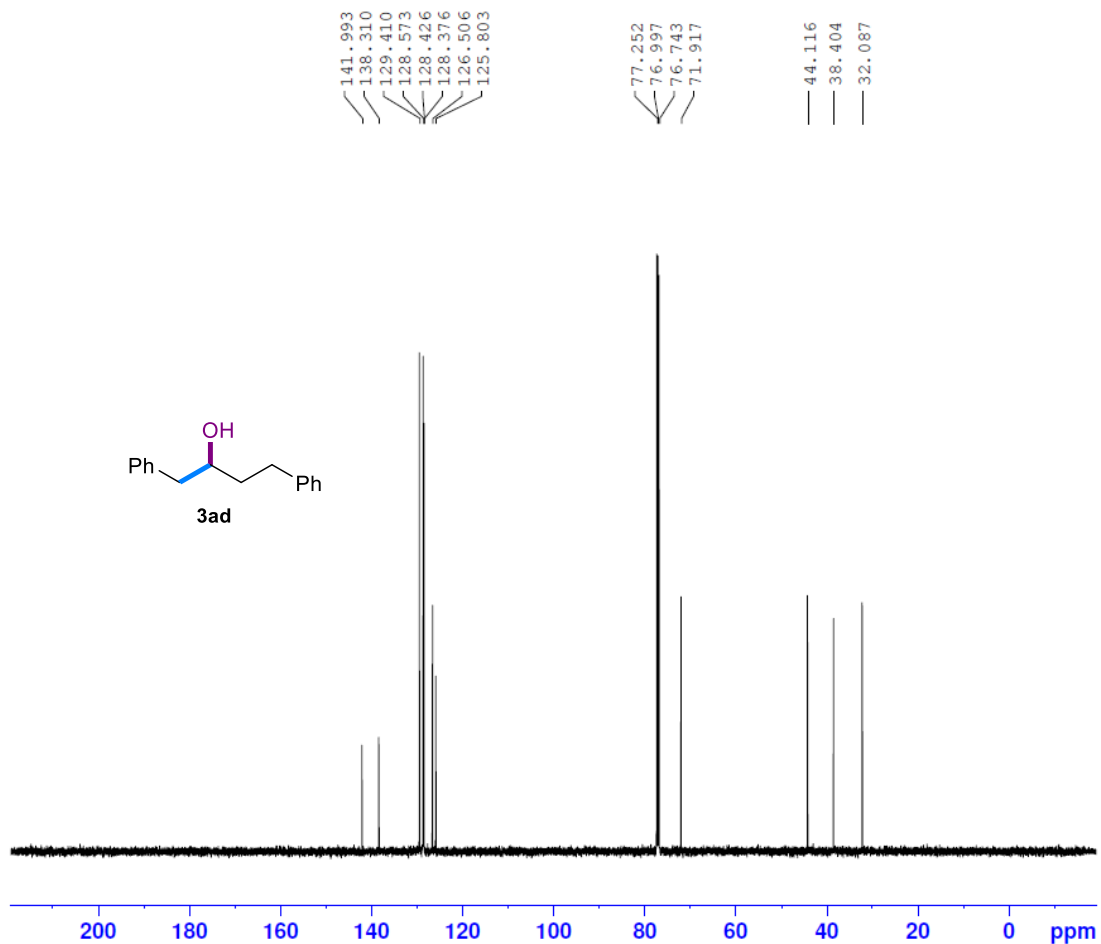
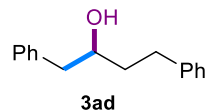
F2 - Processing parameters  
 SI 65536  
 SF 500.3000000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00



9.0 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 ppm

10.27  
1.00  
2.03  
2.03  
2.04  
1.12

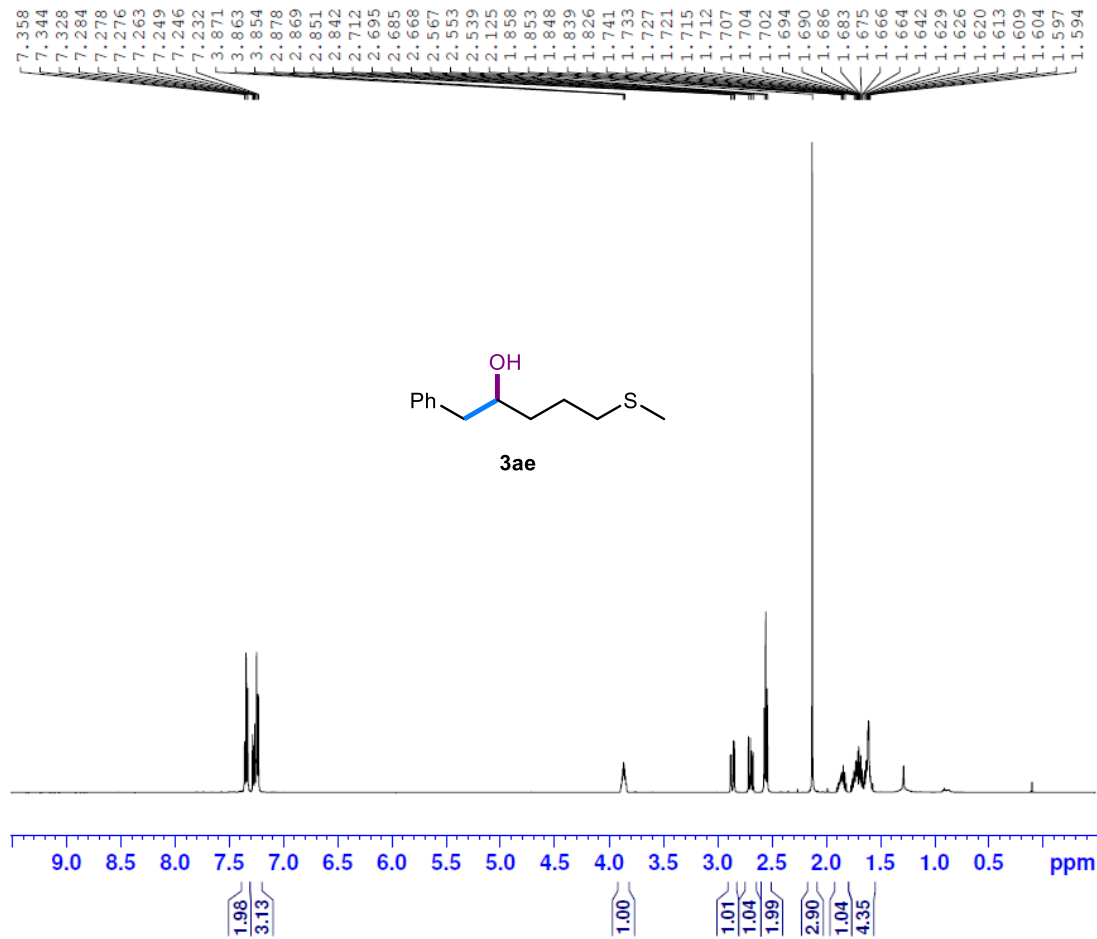




Current Data Parameters  
 NAME lcc-1959-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20191204  
 Time 9.35 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.49000001 W  
 PLW13 0.20446000 W

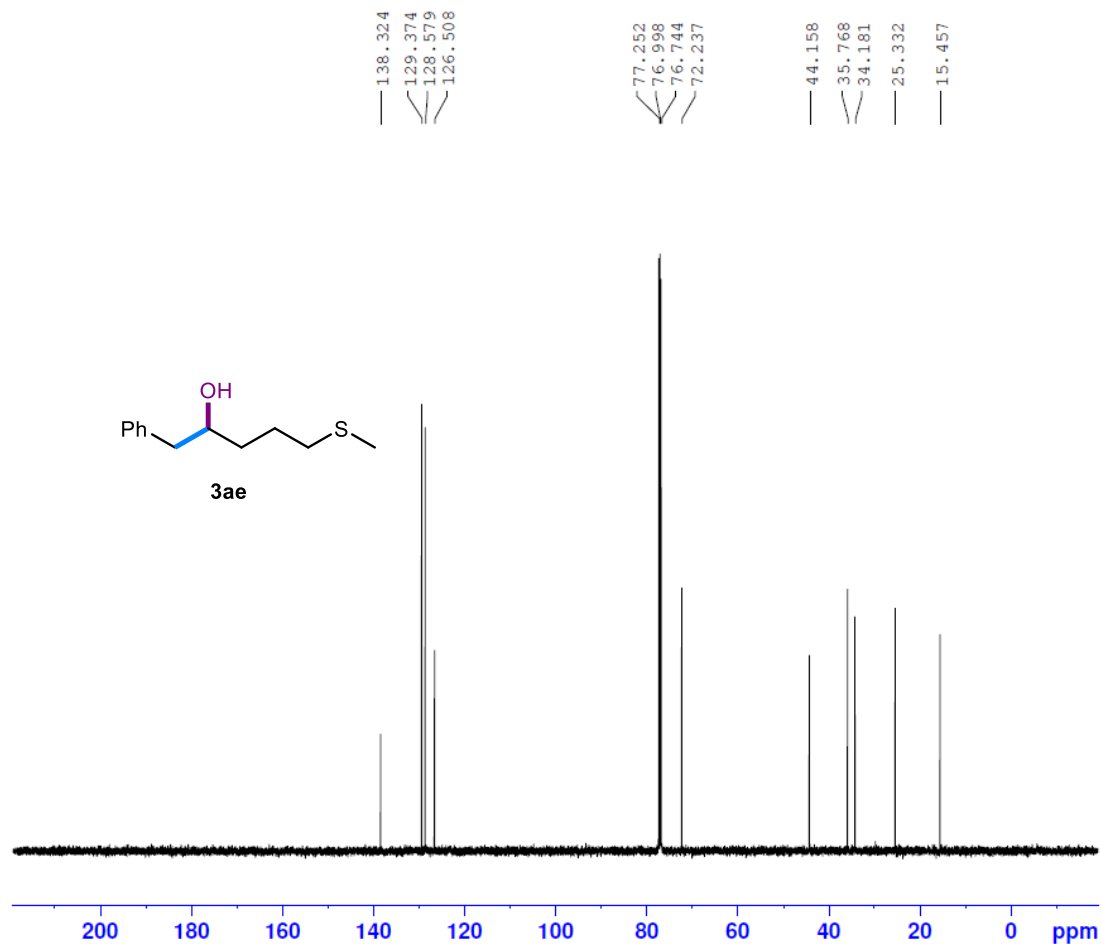
F2 - Processing parameters  
 SI 32768  
 SF 125.8005425 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40



Current Data Parameters  
 NAME lcc-1961-product  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20191204  
 Time 9.52 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 4  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RG 77.88  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TDO 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.89999962 W

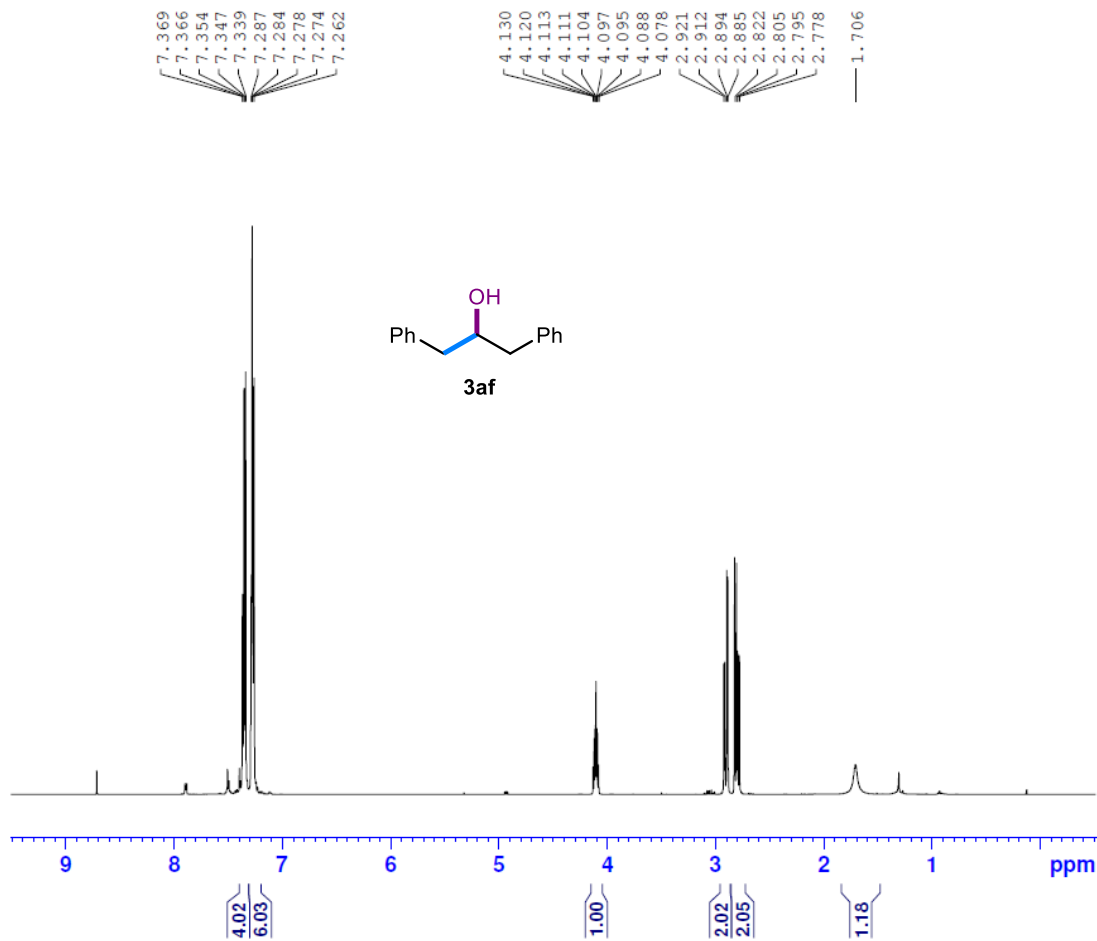
F2 - Processing parameters  
 SI 65536  
 SF 500.3000000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00



Current Data Parameters  
 NAME lcc-1961-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20191204  
 Time 9.59 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.49000001 W  
 PLW13 0.20446000 W

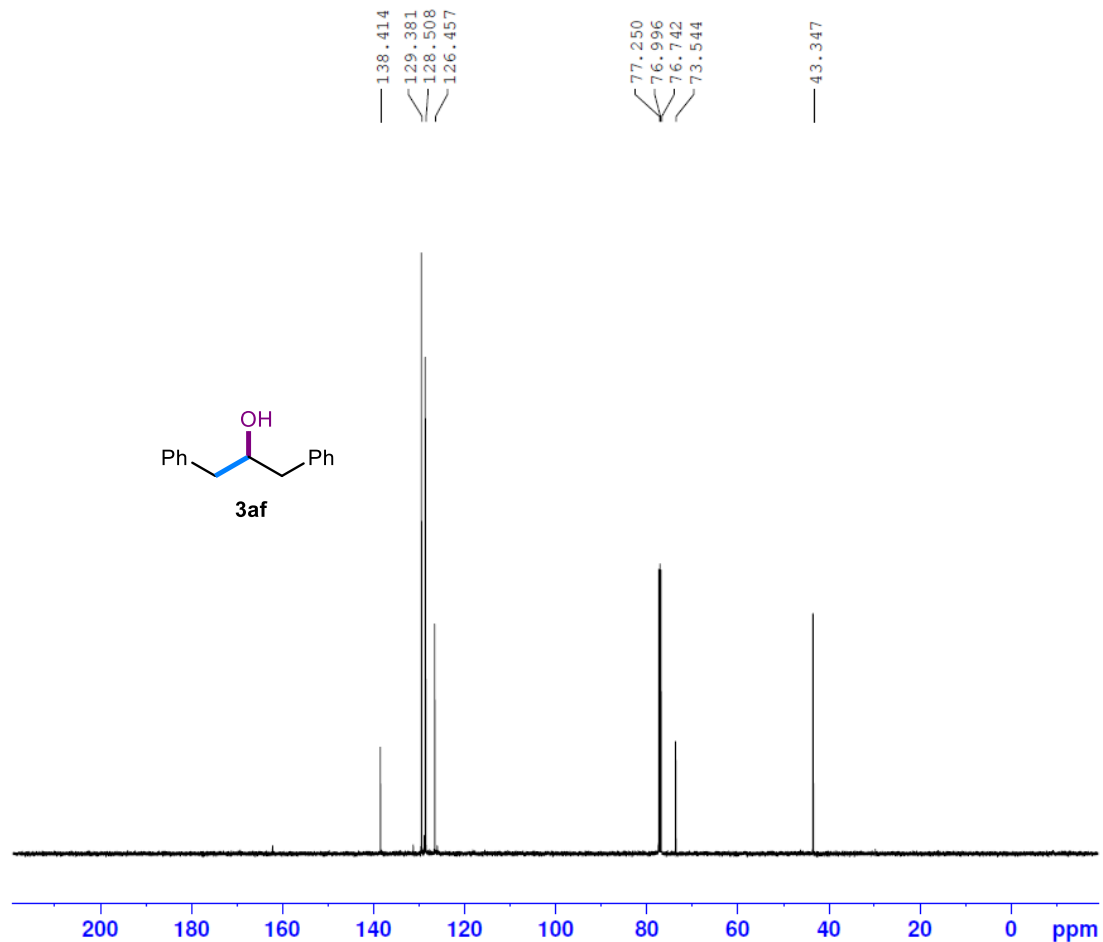
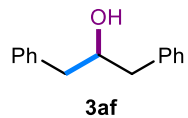
F2 - Processing parameters  
 SI 32768  
 SF 125.8005416 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40



Current Data Parameters  
 NAME lcc-1964-product  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20191213  
 Time 6.55 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 4  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RC 71.03  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TD0 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.89999962 W

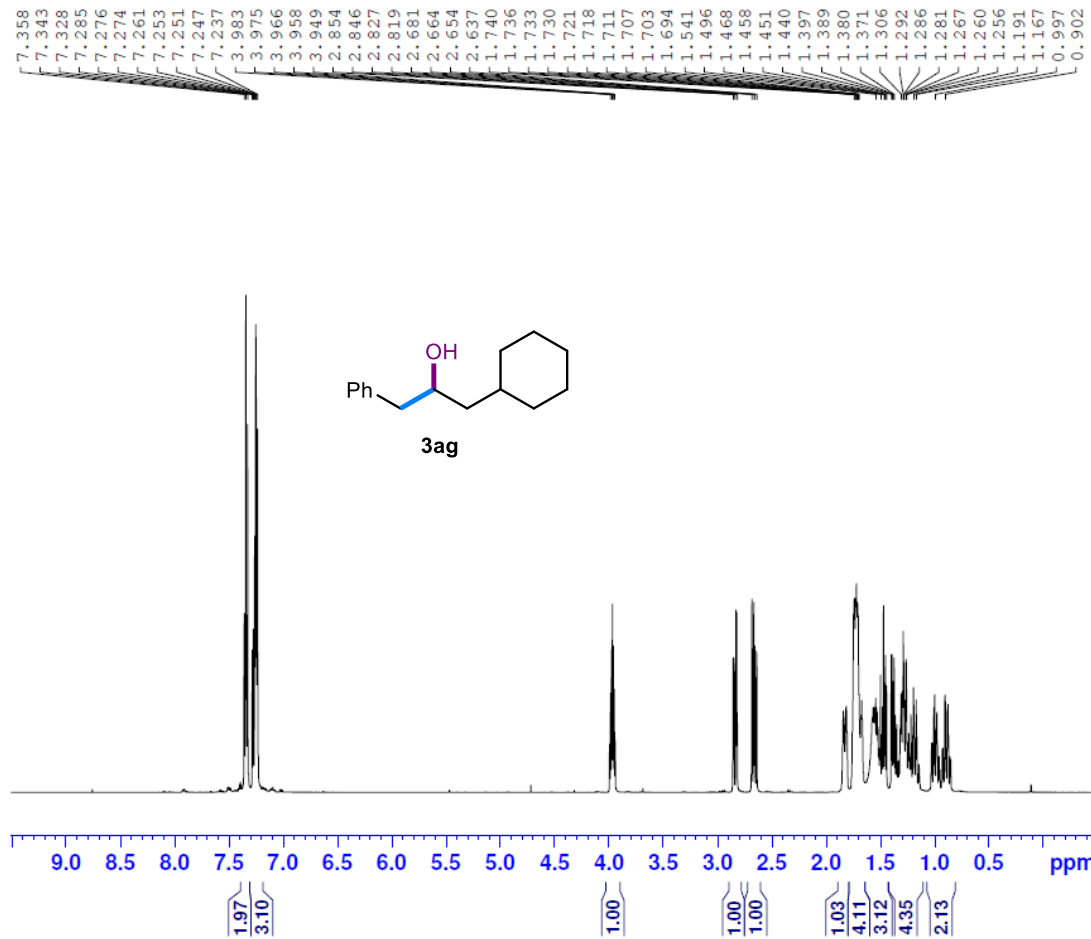
F2 - Processing parameters  
 SI 65536  
 SF 500.3000000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00



Current Data Parameters  
 NAME lcc-1964-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20191213  
 Time 7.02 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.49000001 W  
 PLW13 0.20446000 W

F2 - Processing parameters  
 SI 32768  
 SF 125.8005434 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40



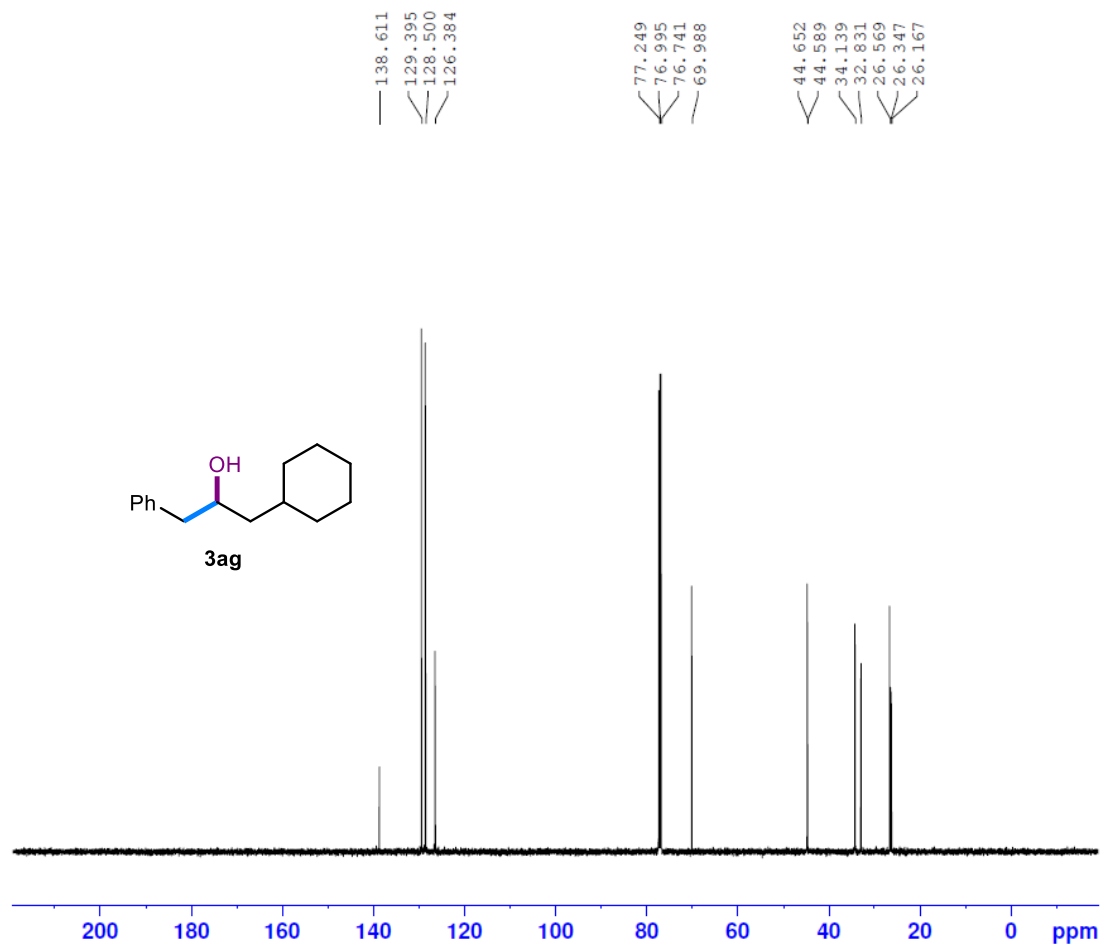
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7.274  
7.261  
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7.251  
7.247  
7.237  
3.983  
3.975  
3.966  
3.958  
3.949  
2.854  
2.846  
2.827  
2.819  
2.681  
2.664  
2.654  
2.637  
1.740  
1.736  
1.733  
1.730  
1.721  
1.718  
1.711  
1.707  
1.703  
1.694  
1.541  
1.496  
1.468  
1.458  
1.451  
1.440  
1.397  
1.389  
1.380  
1.371  
1.306  
1.292  
1.286  
1.281  
1.267  
1.260  
1.256  
1.191  
1.167  
0.997  
0.902



Current Data Parameters  
NAME lcc-1983-product  
EXPNO 1  
PROCNO 1

F2 - Acquisition Parameters  
Date\_ 20200102  
Time 11.11 h  
INSTRUM AVIII500HD  
PROBHD Z119470\_0125 ( )  
PULPROG zg30  
TD 65536  
SOLVENT CDCl3  
NS 4  
DS 2  
SWH 10000.000 Hz  
FIDRES 0.305176 Hz  
AQ 3.2767999 sec  
RG 50.67  
DW 50.000 usec  
DE 13.89 usec  
TE 298.0 K  
D1 1.00000000 sec  
TDO 1  
SFO1 500.3030896 MHz  
NUC1 1H  
P0 3.33 usec  
P1 10.00 usec  
PLW1 21.89999962 W

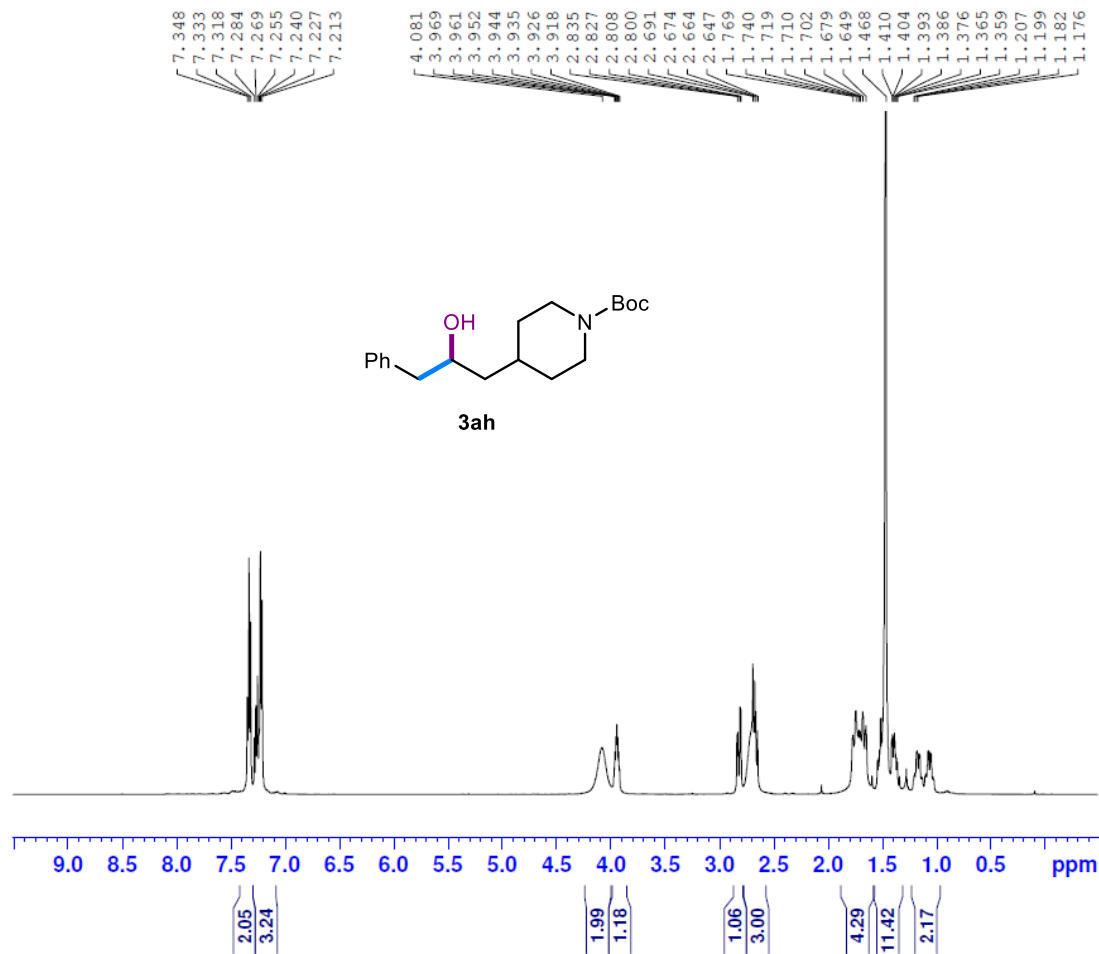
F2 - Processing parameters  
SI 65536  
SF 500.3000000 MHz  
WDW EM  
SSB 0  
LB 0.30 Hz  
GB 0  
PC 1.00



Current Data Parameters  
 NAME lcc-1983-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200102  
 Time 11.19 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

F2 - Processing parameters  
 SI 32768  
 SF 125.8005425 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40



Current Data Parameters  
 NAME lcc-1984-product  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200102  
 Time 11.24 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 4  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RG 28.65  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TD0 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.89999962 W

F2 - Processing parameters  
 SI 65536  
 SF 500.3000000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00

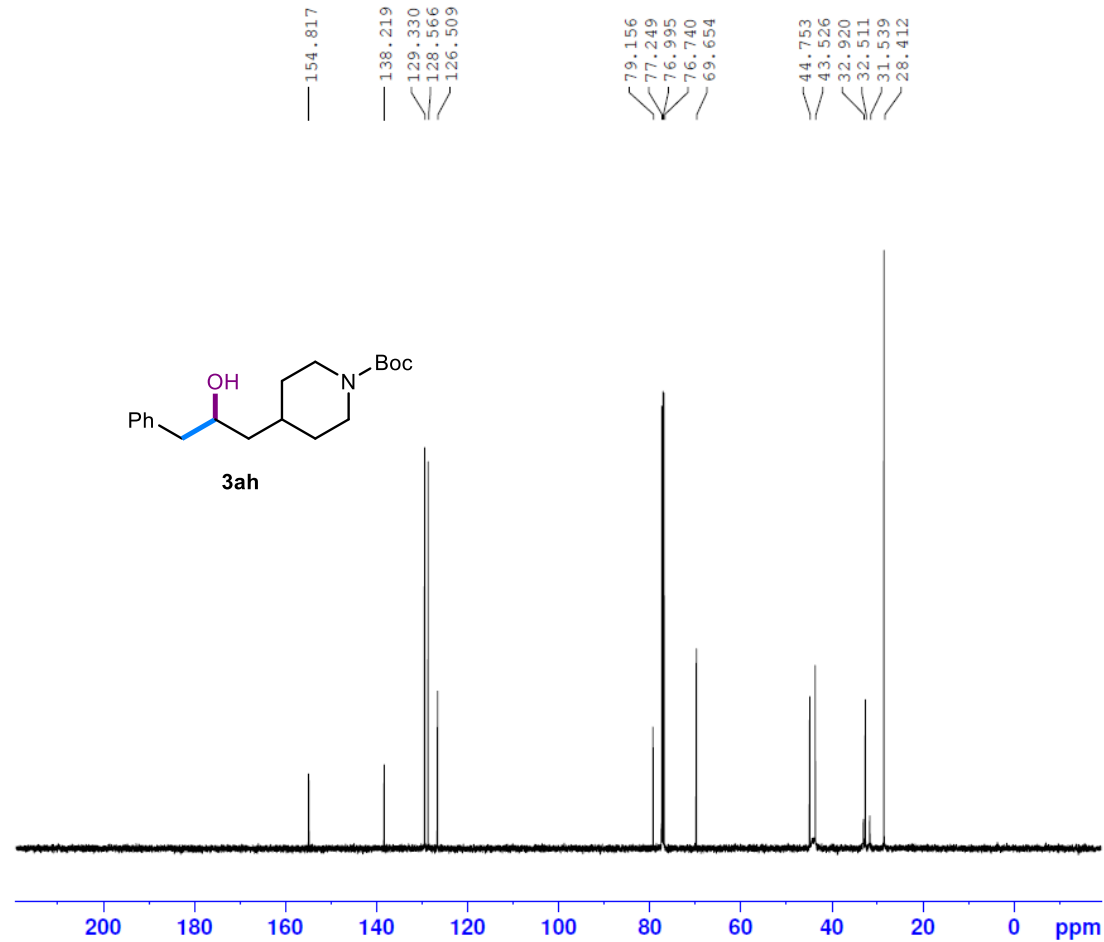




Current Data Parameters  
NAME lcc-1984-product  
EXPNO 2  
PROCNO 1

F2 - Acquisition Parameters  
Date\_ 20200102  
Time 11.31 h  
INSTRUM AVIII500HD  
PROBHD Z119470\_0125 (  
PULPROG zgpg30  
TD 65536  
SOLVENT CDCl3  
NS 128  
DS 4  
SWH 30000.000 Hz  
FIDRES 0.915527 Hz  
AQ 1.0922667 sec  
RG 192.72  
DW 16.667 usec  
DE 20.34 usec  
TE 298.0 K  
D1 2.00000000 sec  
D11 0.03000000 sec  
TD0 1  
SFO1 125.8131140 MHz  
NUC1 13C  
P0 3.41 usec  
P1 10.23 usec  
PLW1 78.00000000 W  
SFO2 500.3020012 MHz  
NUC2 1H  
CPDPRG[2] waltz16  
PCPD2 80.00 usec  
PLW2 21.50000000 W  
PLW12 0.57543999 W  
PLW13 0.20446000 W

F2 - Processing parameters  
SI 32768  
SF 125.8005443 MHz  
WDW EM  
SSB 0  
LB 1.00 Hz  
GB 0  
PC 1.40



7.381  
7.377  
7.362  
7.353  
7.344  
7.299  
7.287  
7.268  
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7.215  
7.213  
7.014  
7.006  
7.002  
6.993  
6.927  
6.920

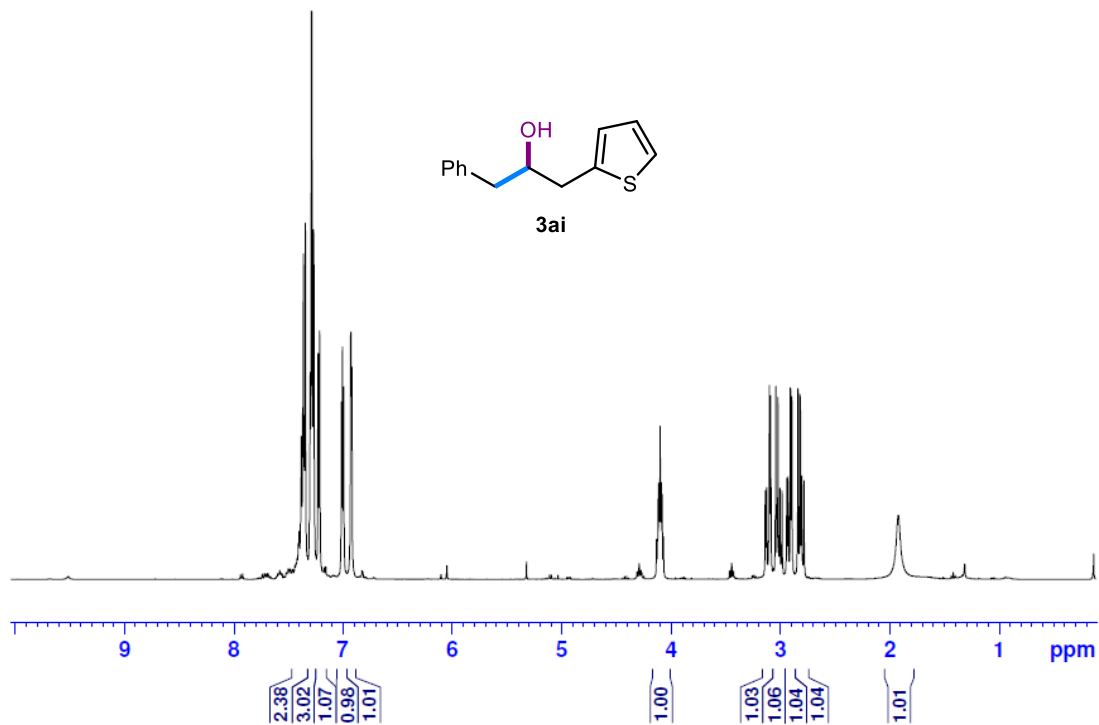
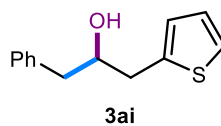
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4.098  
4.087  
4.079  
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3.098  
3.087  
3.039  
3.019  
3.002  
2.982  
2.939  
2.927  
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2.893  
2.836  
2.816  
2.802  
2.782  
1.918

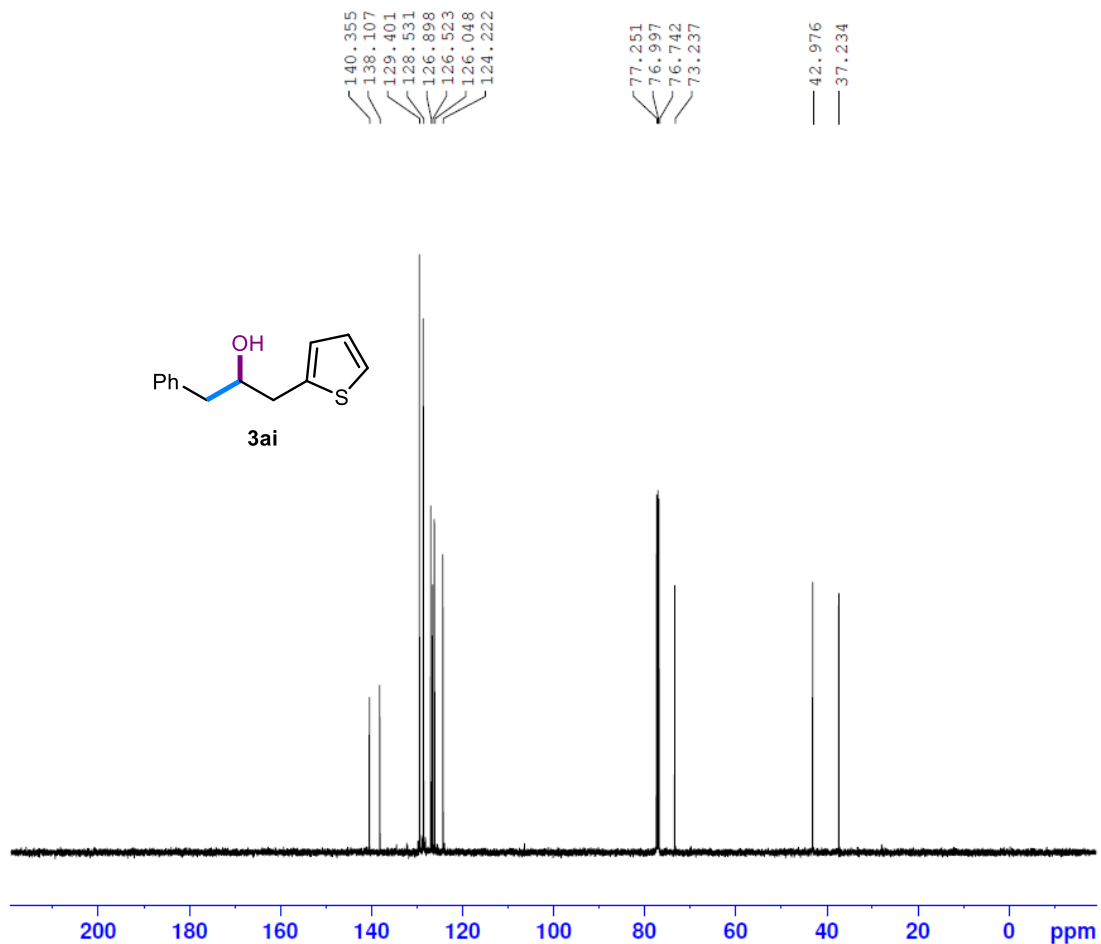
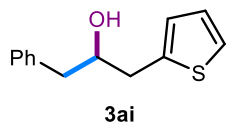


Current Data Parameters  
NAME lcc-2113-product  
EXPNO 1  
PROCNO 1

F2 - Acquisition Parameters  
Date\_ 20200229  
Time 17.59 h  
INSTRUM B400  
PROBHD Z116098\_0217 ( )  
PULPROG zg30  
TD 65536  
SOLVENT CDCl3  
NS 8  
DS 1  
SWH 8012.820 Hz  
FIDRES 0.244532 Hz  
AQ 4.0894465 sec  
RG 51.41  
DW 62.400 usec  
DE 17.84 usec  
TE 298.0 K  
D1 1.00000000 sec  
TDO 1  
SFO1 400.3524723 MHz  
NUC1 1H  
P0 3.19 usec  
P1 9.58 usec  
PLW1 17.00000000 W

F2 - Processing parameters  
SI 65536  
SF 400.3500000 MHz  
WDW EM  
SSB 0  
LB 0.30 Hz  
GB 0  
PC 1.00





Current Data Parameters  
 NAME lcc-2113-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200229  
 Time 23.04 h  
 INSTRUM AVI1500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.0000000 sec  
 D11 0.0300000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.0000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.5000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

F2 - Processing parameters  
 SI 32768  
 SF 125.8005453 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40

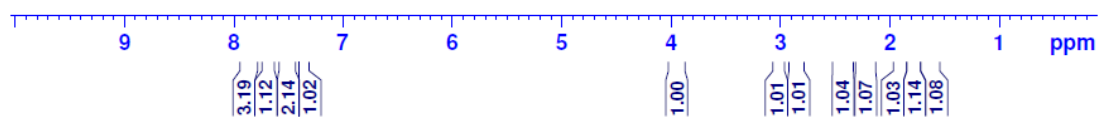
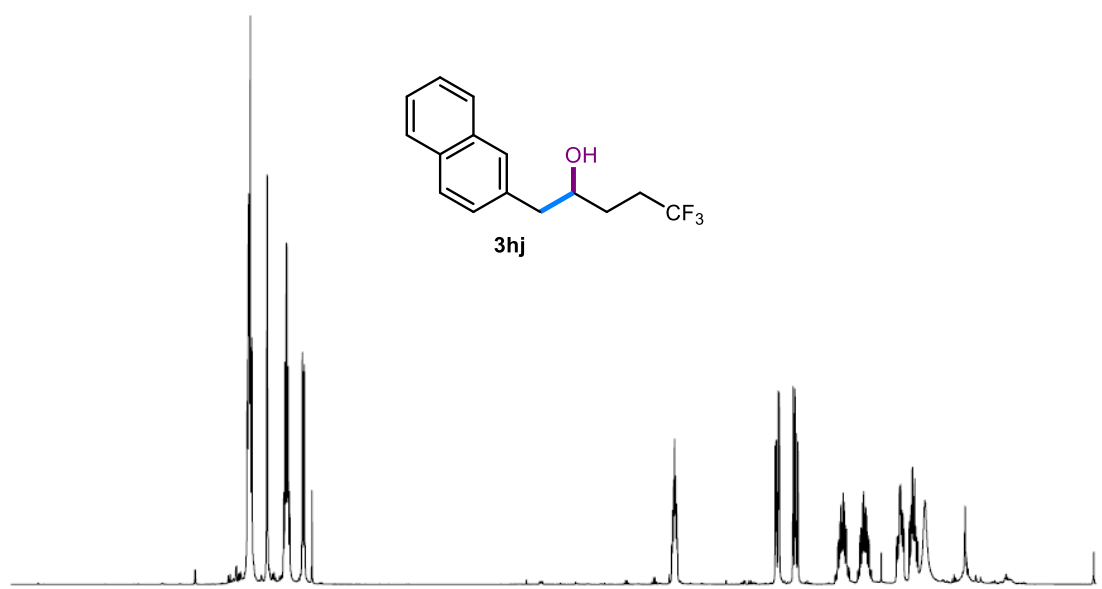
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7.531  
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7.517  
7.515  
7.503  
7.500  
7.490  
7.487  
7.372  
7.369  
7.355  
7.352  
7.284  
3.983  
3.973  
3.965  
3.957  
3.948  
3.043  
3.035  
3.016  
3.007  
2.881  
2.864  
2.854  
2.837  
2.442  
2.423  
2.413  
2.247  
2.236  
2.225  
2.217  
2.214  
1.907  
1.901  
1.896  
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1.789  
1.786  
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1.767  
1.674

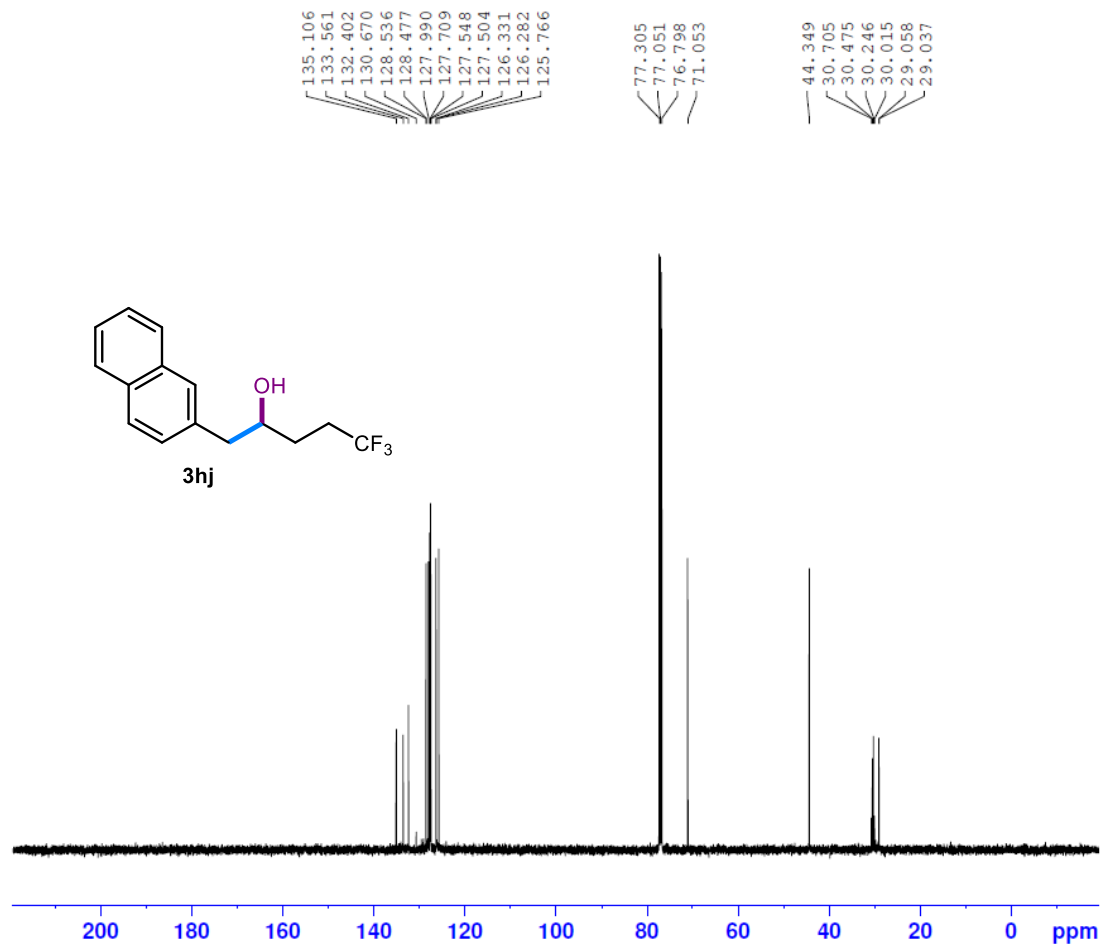


Current Data Parameters  
 NAME lcc-2125-product  
 EXPNO 4  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200309  
 Time 11.01 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 4  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RG 63.07  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TD0 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.89999962 W

F2 - Processing parameters  
 SI 65536  
 SF 500.3000000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00

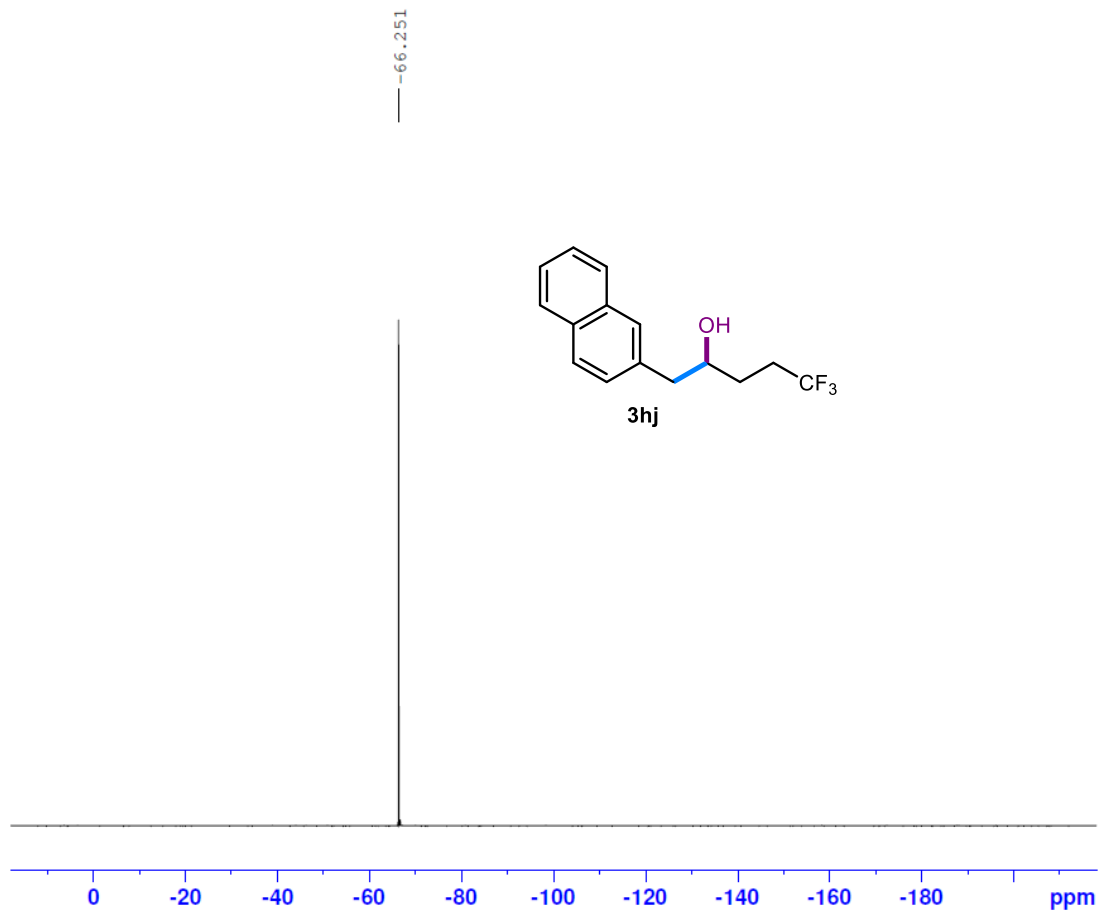




Current Data Parameters  
 NAME lcc-2125-product  
 EXPNO 3  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200309  
 Time 11.08 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

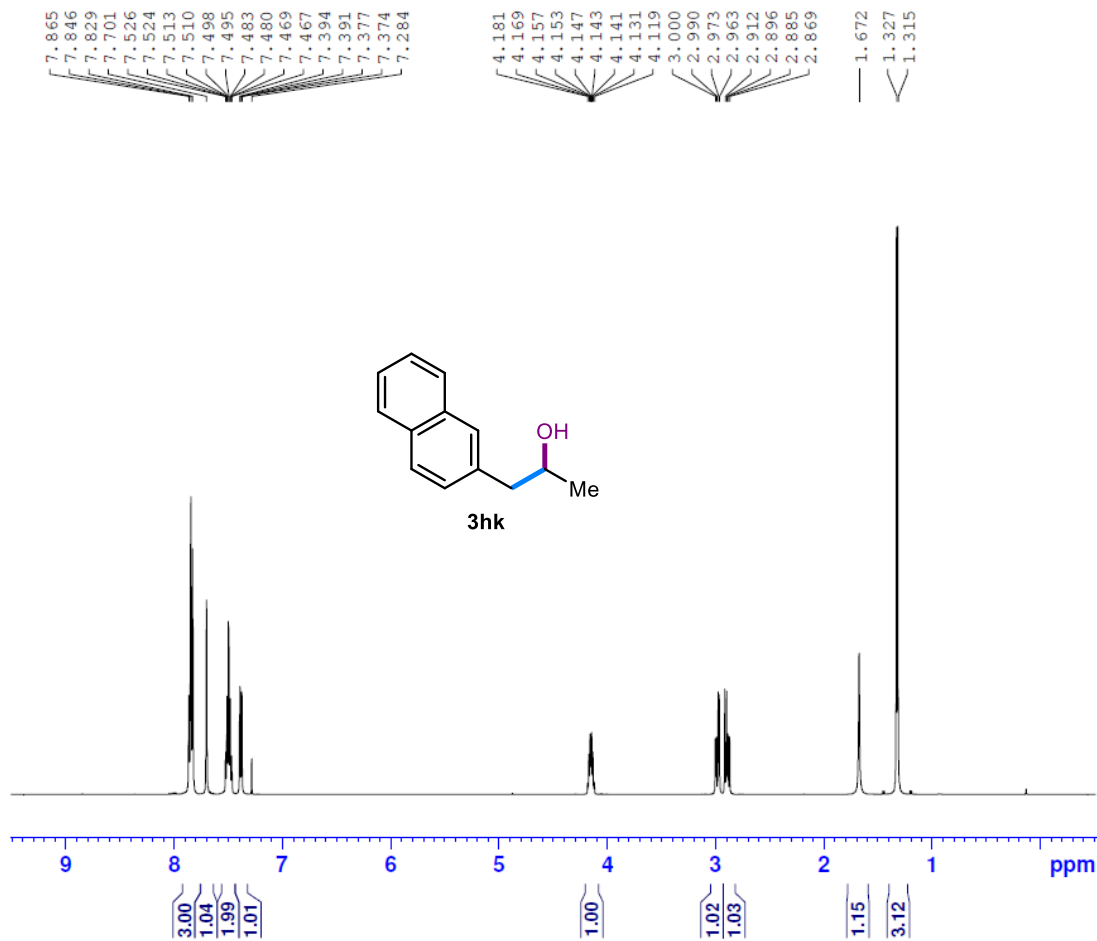
F2 - Processing parameters  
 SI 32768  
 SF 125.8005351 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40



Current Data Parameters  
 NAME lcc-2017-product  
 EXPNO 3  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200119  
 Time 18.55 h  
 INSTRUM AVII1500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 131072  
 SOLVENT CDCl3  
 NS 16  
 DS 4  
 SWH 111111.109 Hz  
 FIDRES 1.695421 Hz  
 AQ 0.5898240 sec  
 RG 192.72  
 DW 4.500 usec  
 DE 35.33 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 D11 0.03000000 sec  
 D12 0.00002000 sec  
 TD0 1  
 SFO1 470.7052618 MHz  
 NUC1 13C  
 P1 15.00 usec  
 F2 30.00 usec  
 PLW1 39.50000000 W  
 SFO2 500.3025015 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W

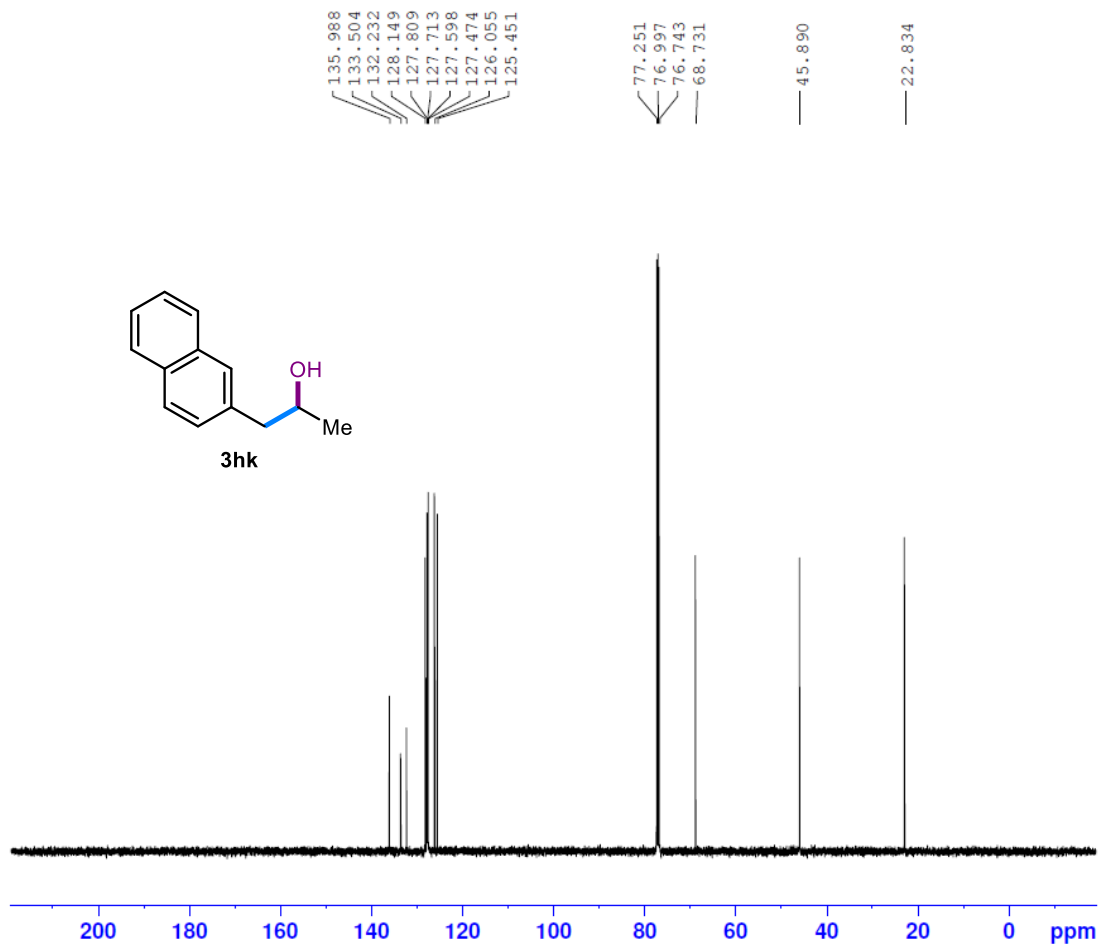
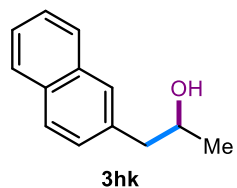
F2 - Processing parameters  
 SI 65536  
 SF 470.7523370 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00



Current Data Parameters  
 NAME lcc-2126-product  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200309  
 Time 11.13 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 4  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RG 71.03  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TD0 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.89999962 W

F2 - Processing parameters  
 SI 65536  
 SF 500.3000000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00

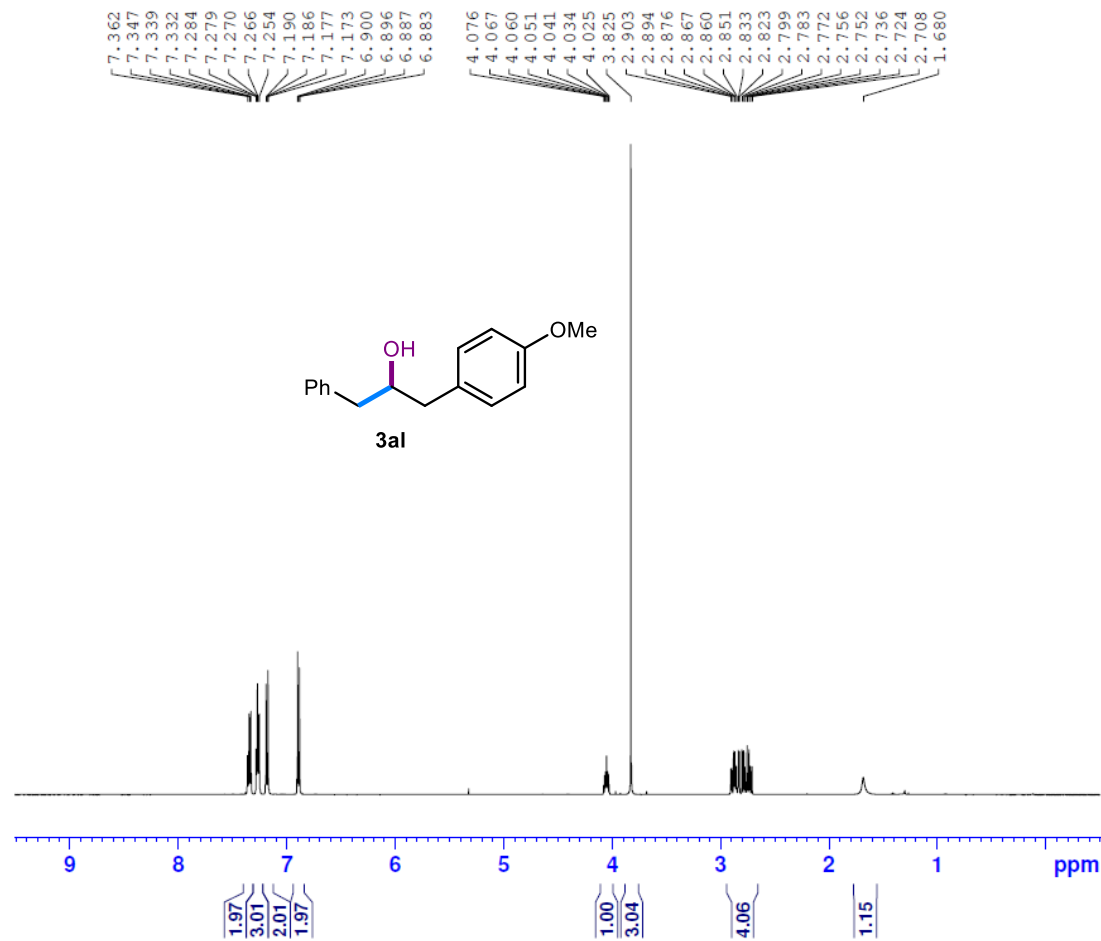


Current Data Parameters  
 NAME lcc-2126-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200309  
 Time 11.20 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

F2 - Processing parameters  
 SI 32768  
 SF 125.8005443 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40

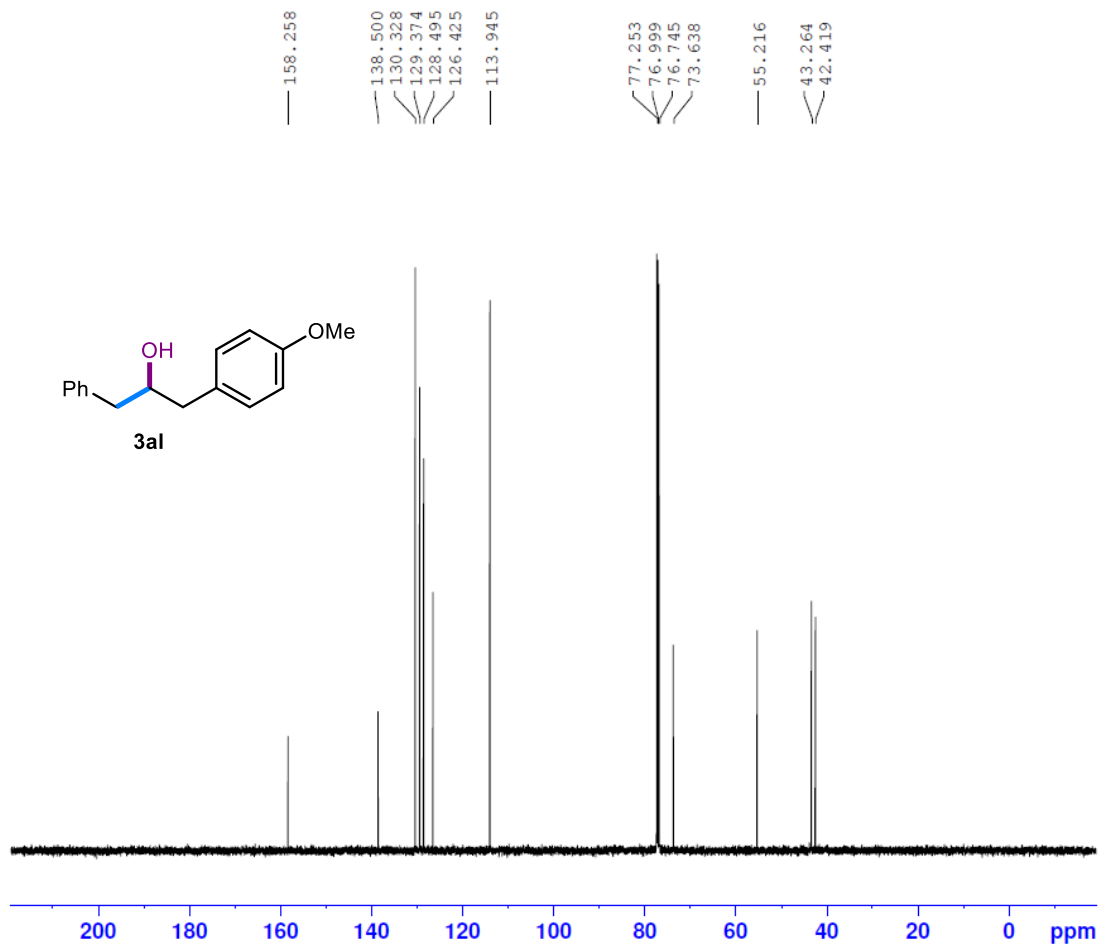
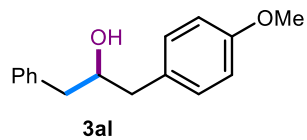




Current Data Parameters  
 NAME lcc-2139-product  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200313  
 Time 8.38 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 4  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RG 71.03  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TDO 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.89999962 W

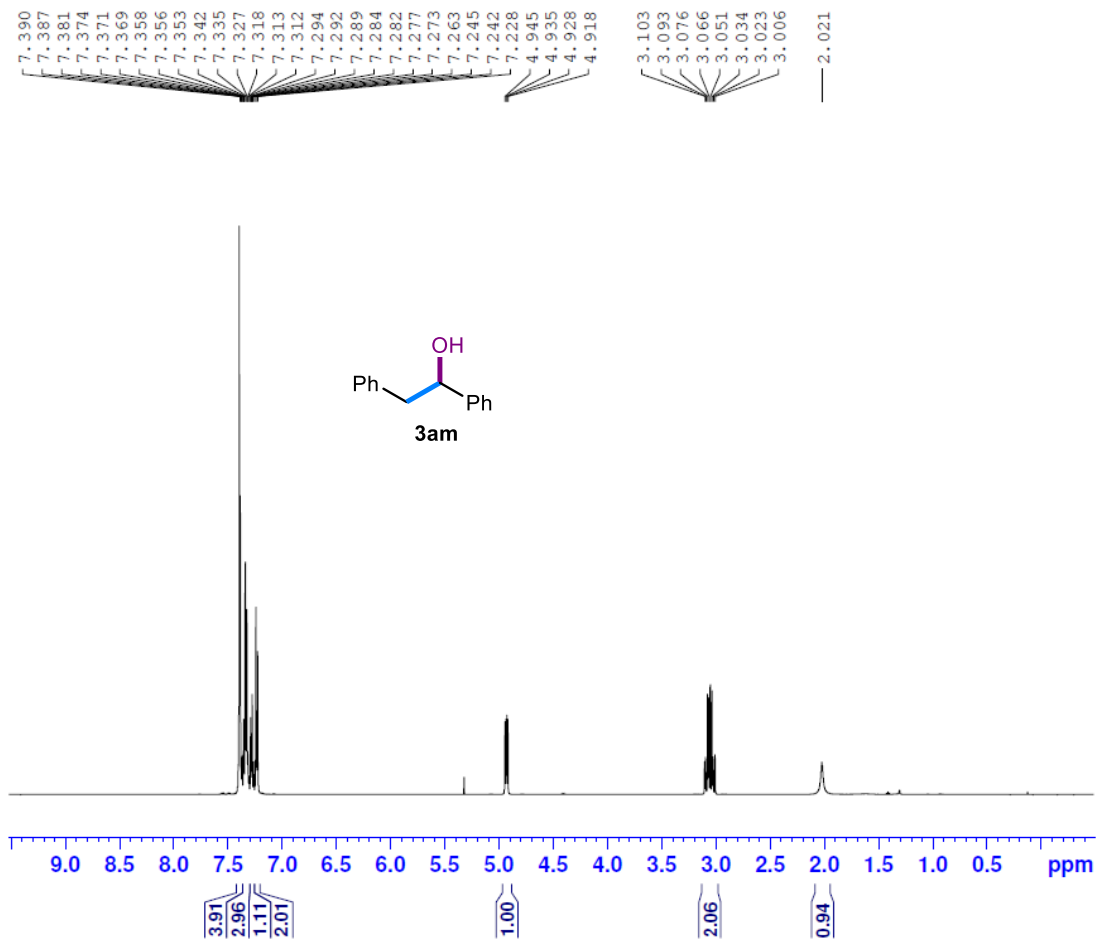
F2 - Processing parameters  
 SI 65536  
 SF 500.3000000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00



Current Data Parameters  
 NAME lcc-2139-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200313  
 Time 8.45 h  
 INSTRUM AVI1500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.0000000 sec  
 D11 0.0300000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.0000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.5000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

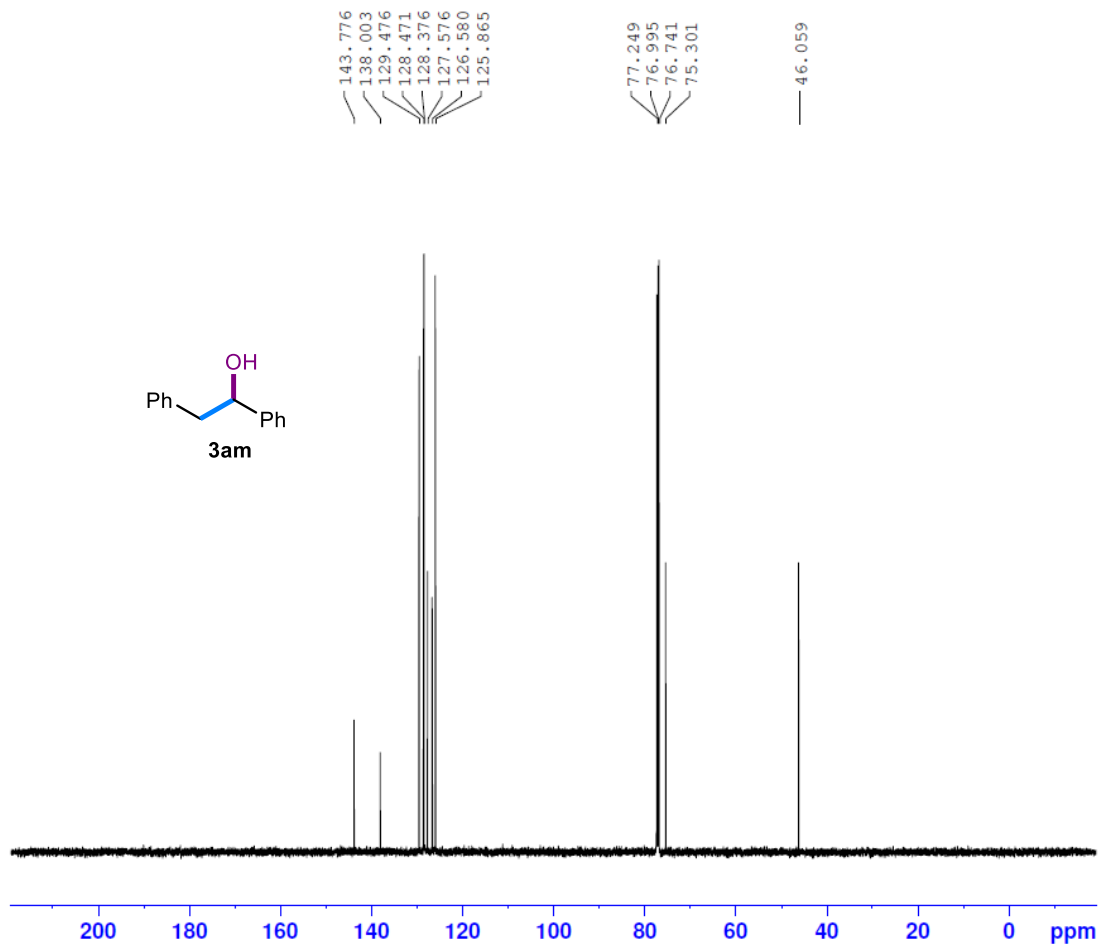
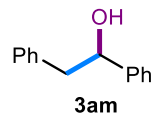
F2 - Processing parameters  
 SI 32768  
 SF 125.8005425 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40



Current Data Parameters  
 NAME lcc-2114-product  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200229  
 Time 23.08 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 4  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RG 77.88  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TDO 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.89999962 W

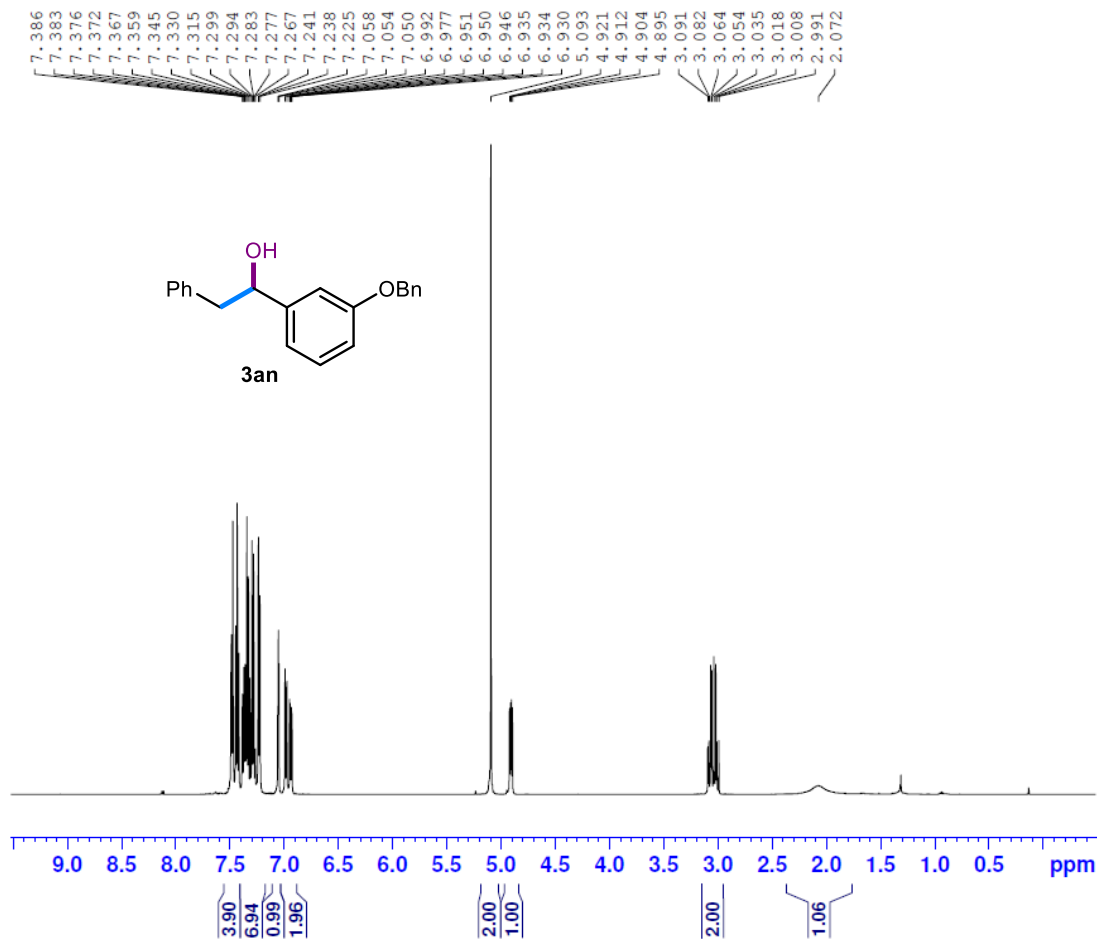
F2 - Processing parameters  
 SI 65536  
 SF 500.3000000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00



Current Data Parameters  
 NAME lcc-2114-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200229  
 Time 23.15 h  
 INSTRUM AVII1500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

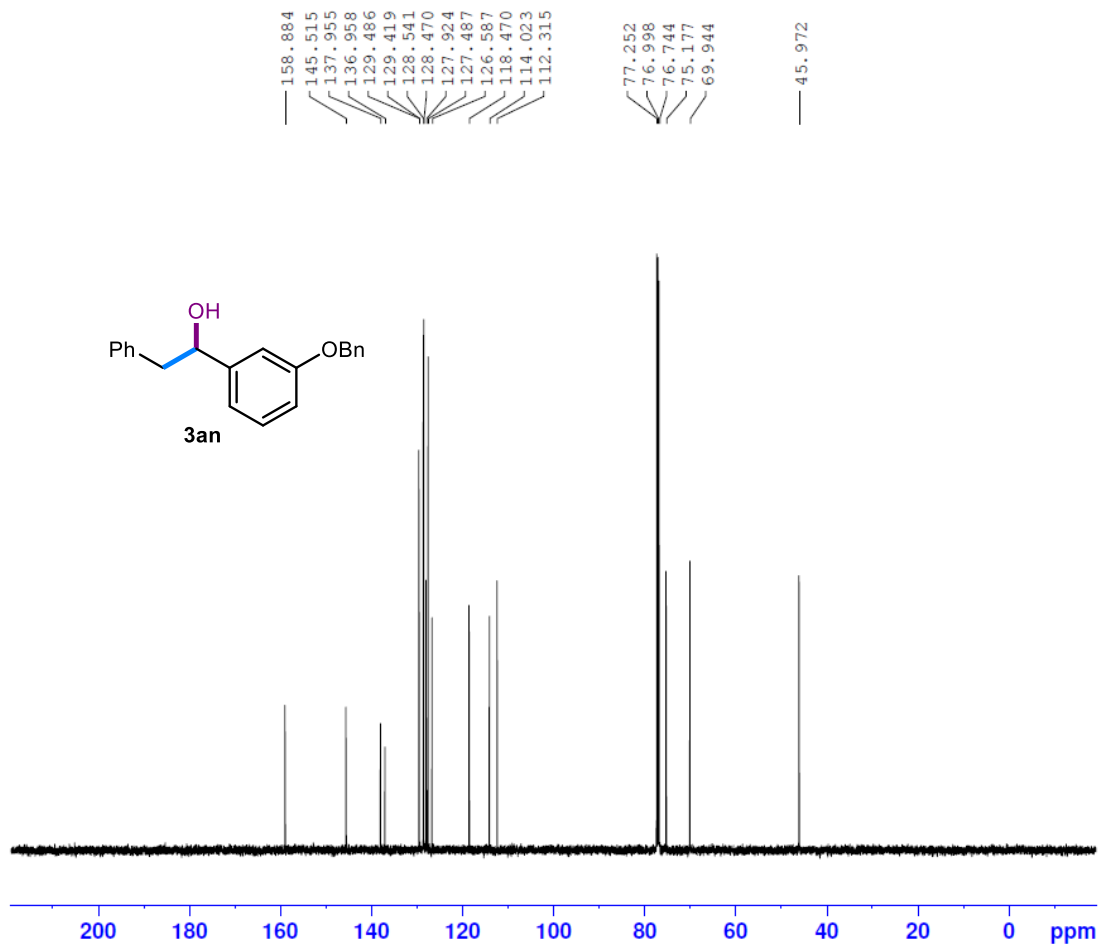
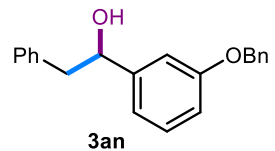
F2 - Processing parameters  
 SI 32768  
 SF 125.8005434 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40



Current Data Parameters  
 NAME lcc-2121-product  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200307  
 Time 18.59 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 4  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RG 71.03  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TDO 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.89999962 W

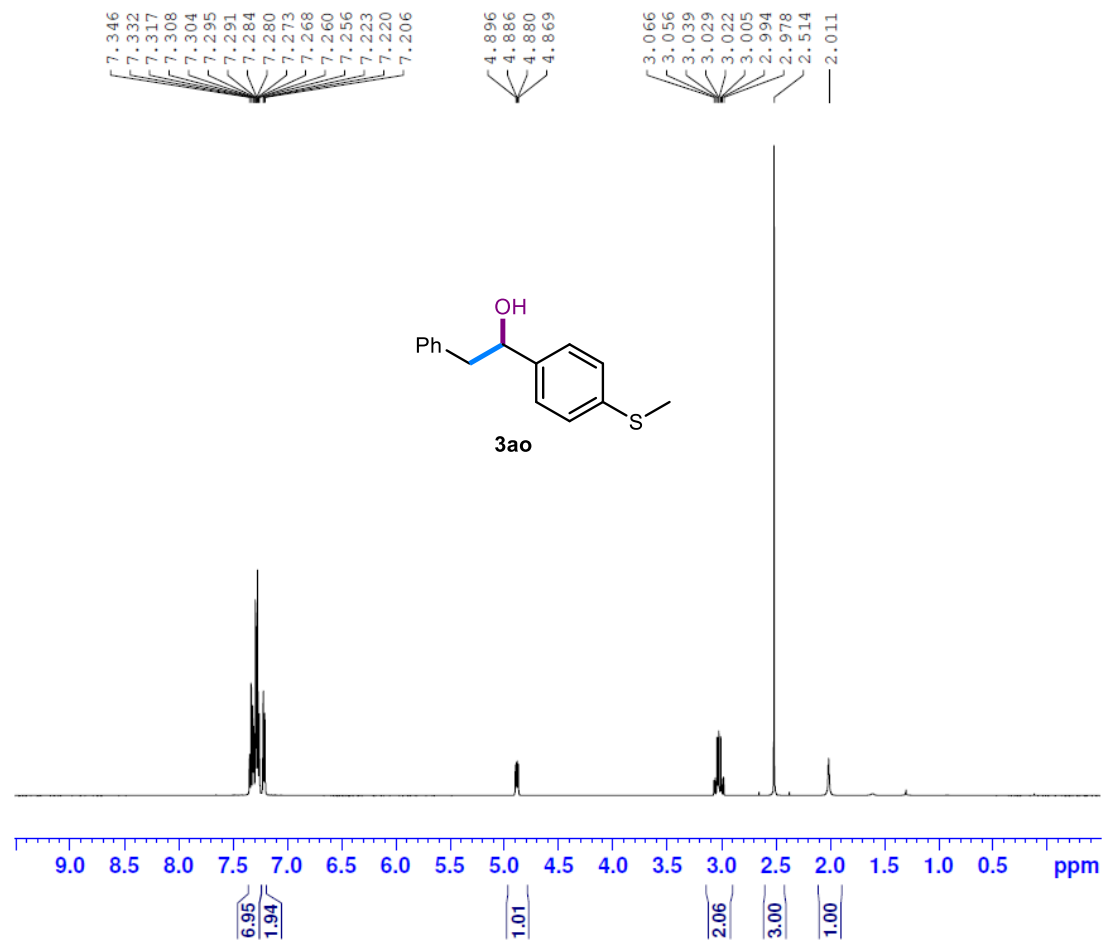
F2 - Processing parameters  
 SI 65536  
 SF 500.3000000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00



Current Data Parameters  
 NAME lcc-2121-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200307  
 Time 19.06 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

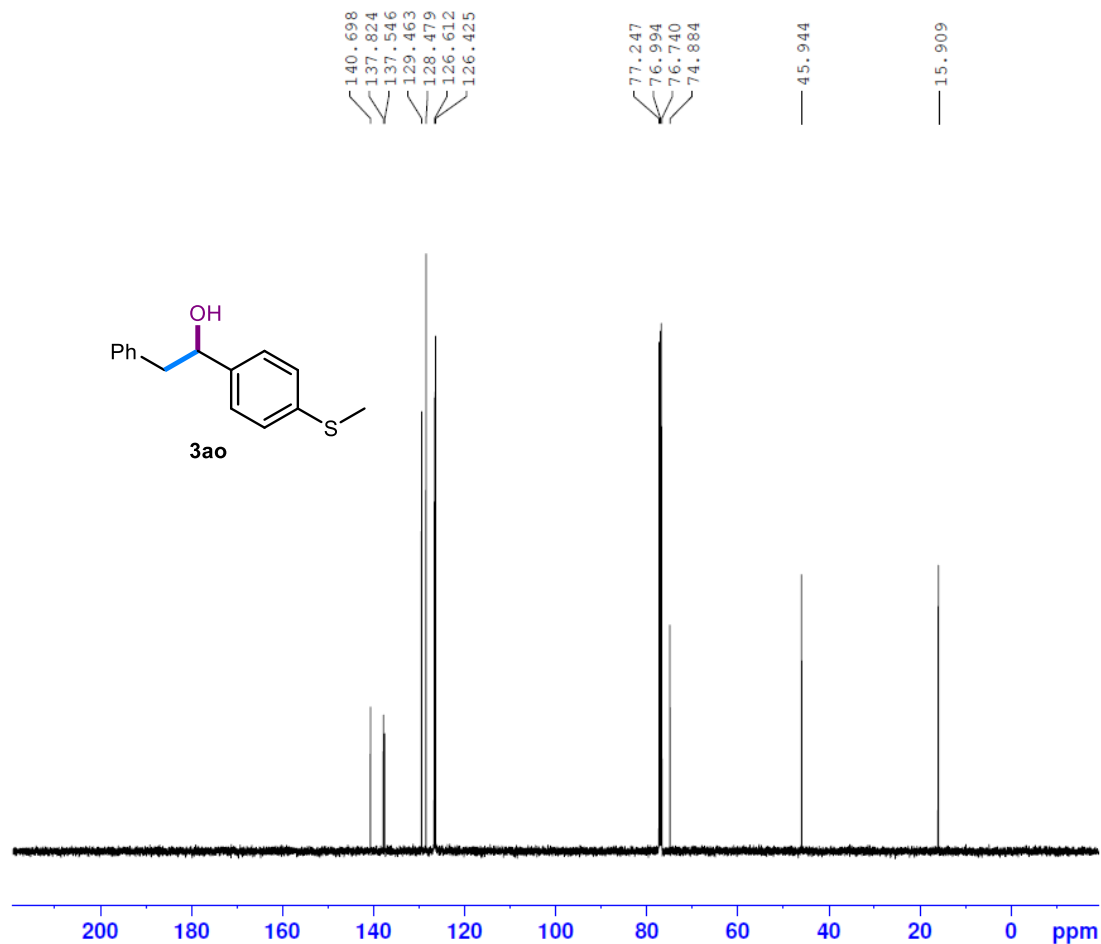
F2 - Processing parameters  
 SI 32768  
 SF 125.8005444 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40



Current Data Parameters  
 NAME lcc-2122-product  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200307  
 Time 19.11 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 4  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RG 77.88  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TDO 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.89999962 W

F2 - Processing parameters  
 SI 65536  
 SF 500.3000000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00

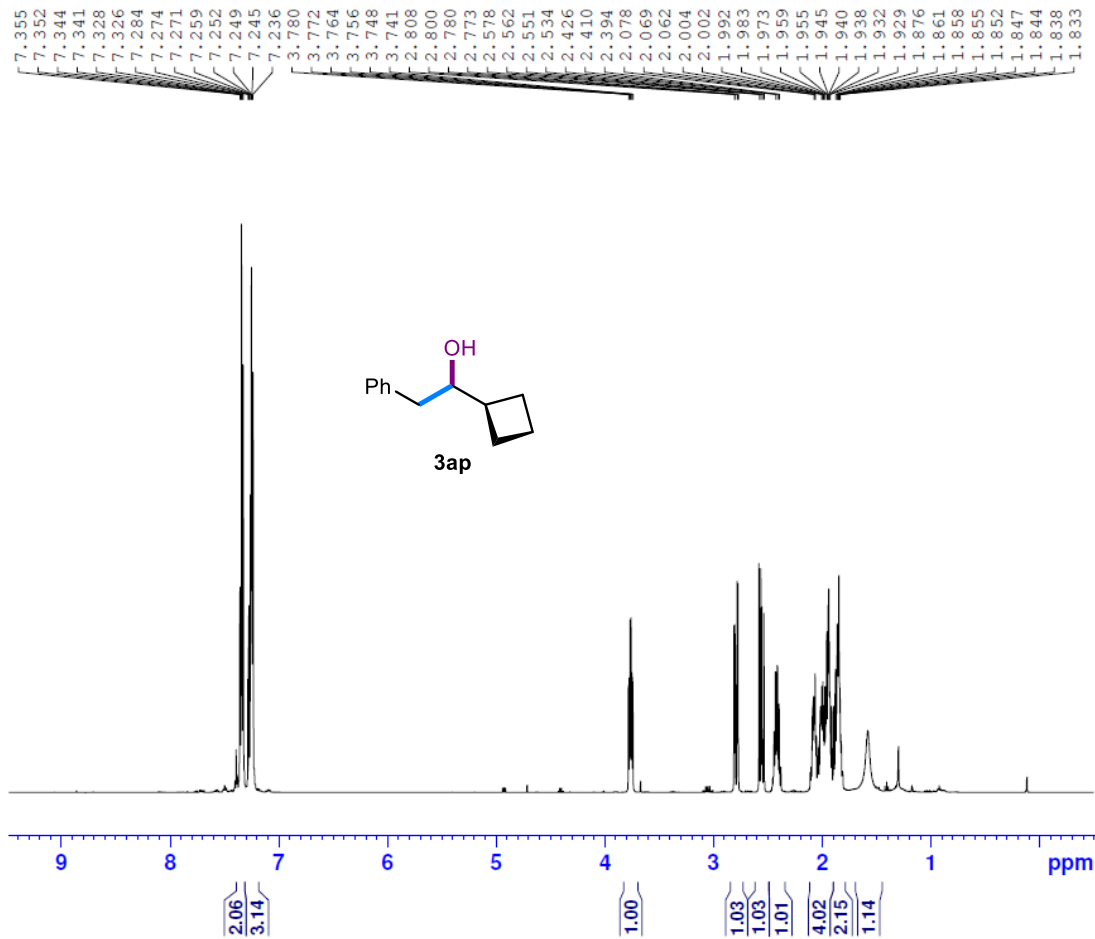


Current Data Parameters  
 NAME lcc-2122-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200307  
 Time 19.18 h  
 INSTRUM AVII1500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

F2 - Processing parameters  
 SI 32768  
 SF 125.8005443 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40

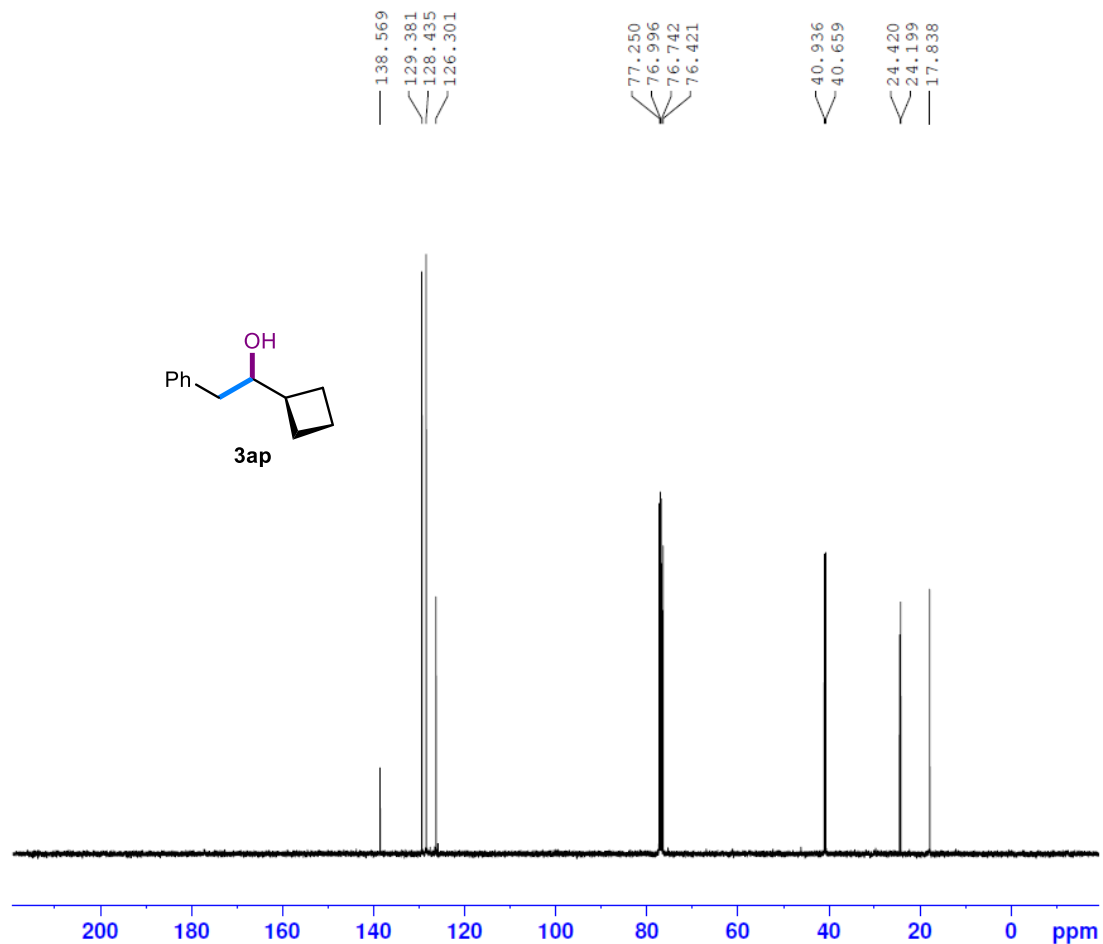




Current Data Parameters  
 NAME lcc-2120-product  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200307  
 Time 18.35 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 4  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RG 56.3  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TDO 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.89999962 W

F2 - Processing parameters  
 SI 65536  
 SF 500.3000000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00



Current Data Parameters  
 NAME lcc-2120-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200307  
 Time 18.54 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

F2 - Processing parameters  
 SI 32768  
 SF 125.8005434 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40

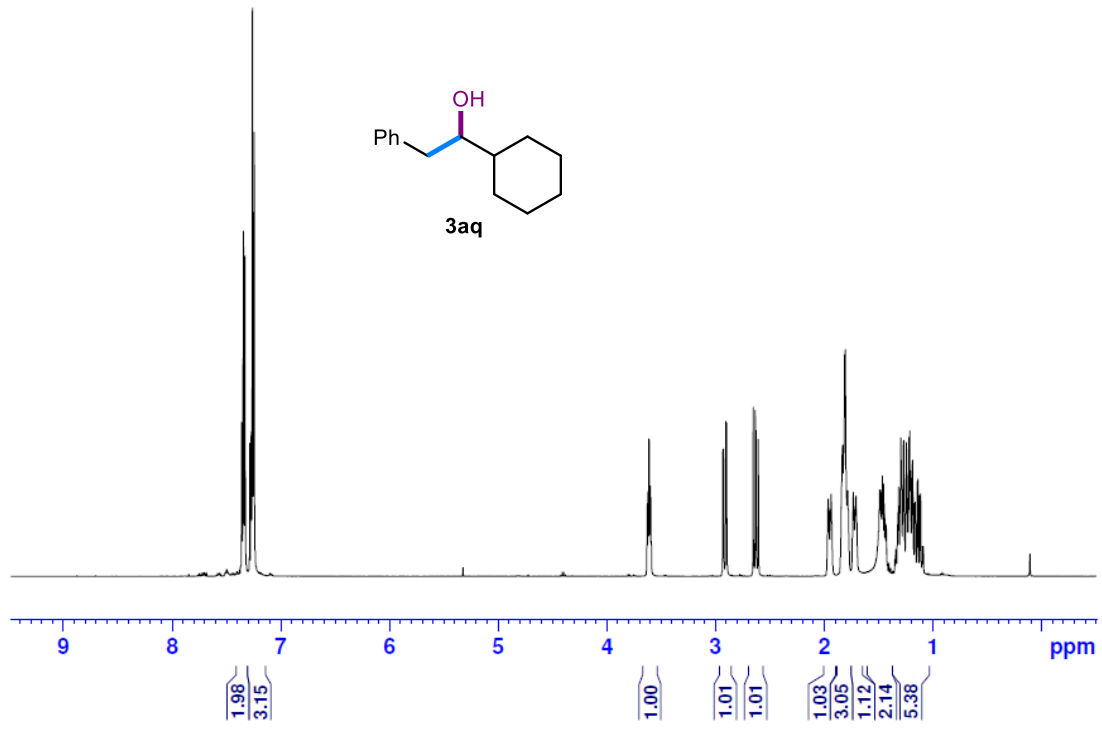
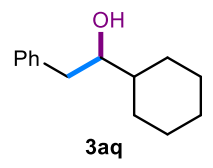
7.357  
7.341  
7.332  
7.327  
7.284  
7.271  
7.269  
7.258  
7.242  
3.620  
3.616  
3.609  
3.601  
3.597  
2.929  
2.922  
2.902  
2.895  
2.650  
2.631  
2.623  
2.604  
1.935  
1.834  
1.828  
1.808  
1.803  
1.787  
1.783  
1.780  
1.729  
1.705  
1.486  
1.469  
1.462  
1.457  
1.451  
1.315  
1.293  
1.290  
1.274  
1.268  
1.263  
1.241  
1.237  
1.216  
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1.205  
1.191  
1.186  
1.179  
1.141  
1.134  
1.117  
1.110

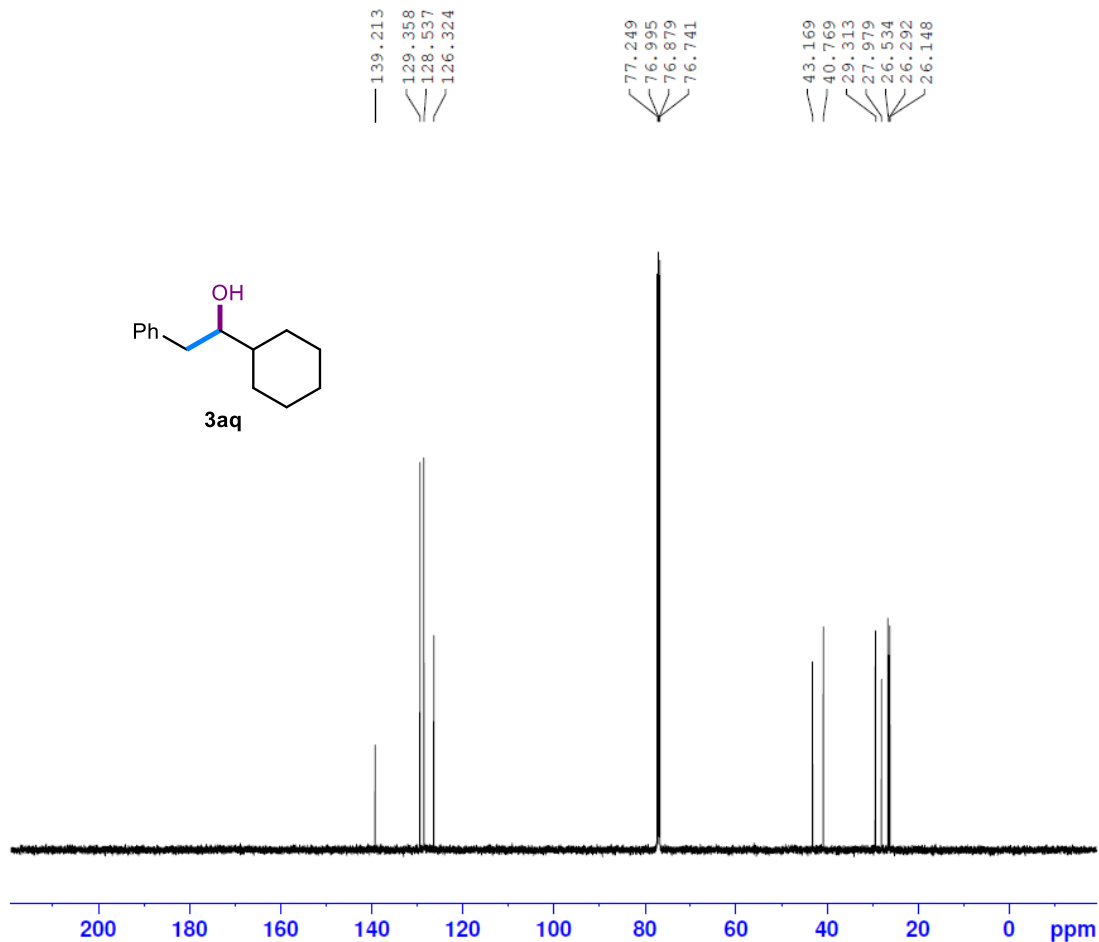
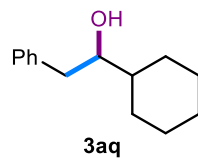


Current Data Parameters  
NAME lcc-2110-product  
EXPNO 1  
PROCNO 1

F2 - Acquisition Parameters  
Date\_ 20200301  
Time 23.18 h  
INSTRUM AVIII500HD  
PROBHD Z119470\_0125 ( )  
PULPROG zg30  
TD 65536  
SOLVENT CDCl3  
NS 4  
DS 2  
SWH 10000.000 Hz  
FIDRES 0.305176 Hz  
AQ 3.2767999 sec  
RG 77.88  
DW 50.000 usec  
DE 13.89 usec  
TE 298.0 K  
D1 1.00000000 sec  
TDO 1  
SFO1 500.3030896 MHz  
NUC1 1H  
P0 3.33 usec  
P1 10.00 usec  
PLW1 21.89999962 W

F2 - Processing parameters  
SI 65536  
SF 500.3000000 MHz  
WDW EM  
SSB 0  
LB 0.30 Hz  
GB 0  
PC 1.00

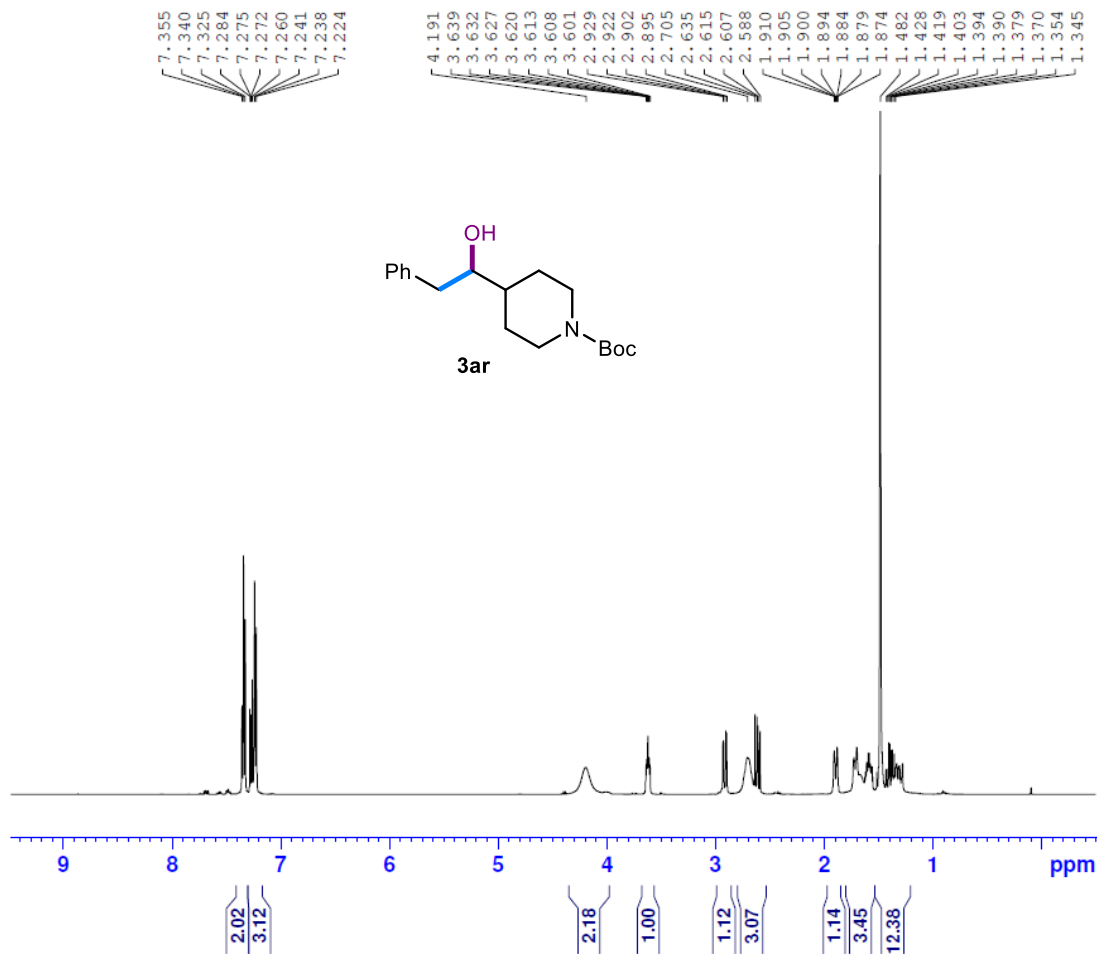




Current Data Parameters  
 NAME lcc-2110-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200301  
 Time 23.25 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

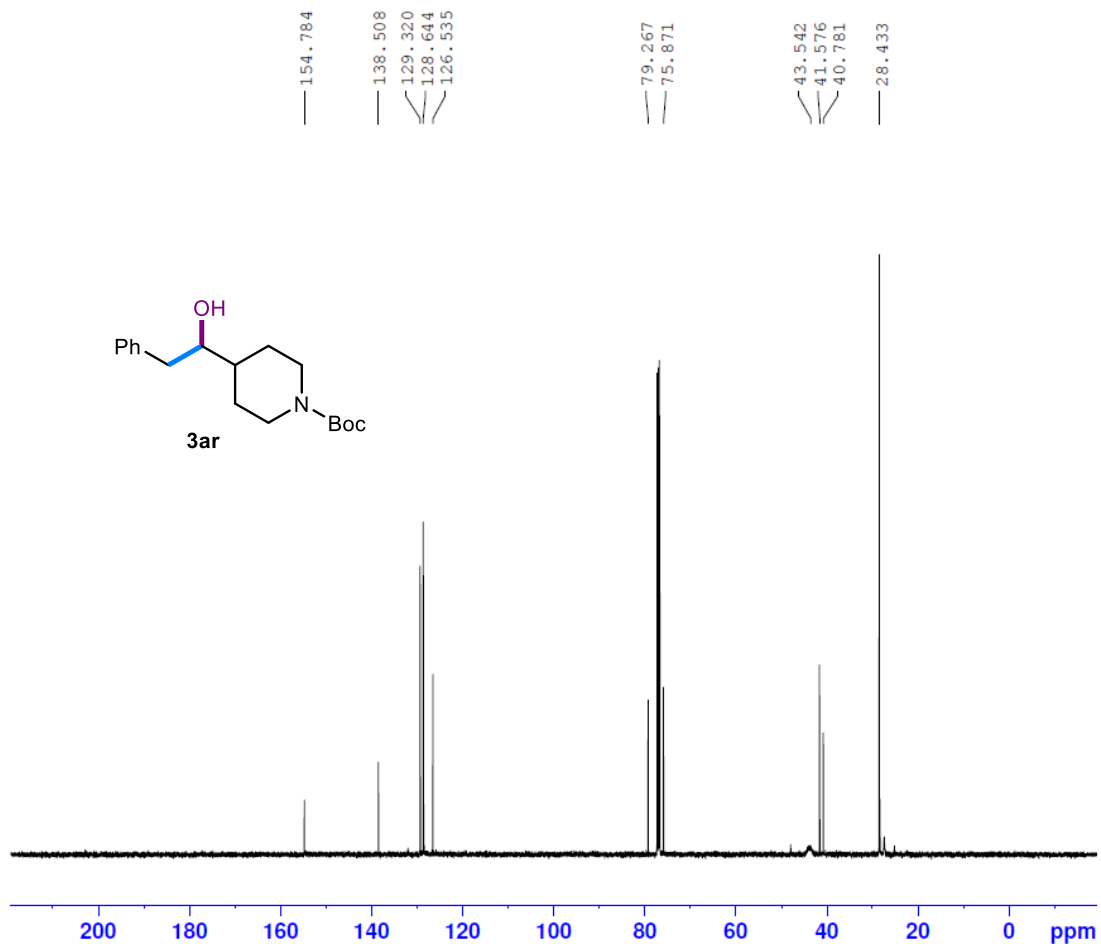
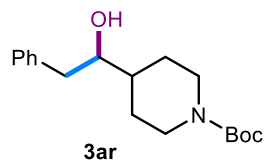
F2 - Processing parameters  
 SI 32768  
 SF 125.8005407 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40



Current Data Parameters  
 NAME lcc-2111-product  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200307  
 Time 17.26 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 4  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RG 56.3  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TD0 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.89999962 W

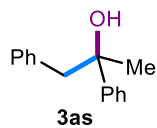
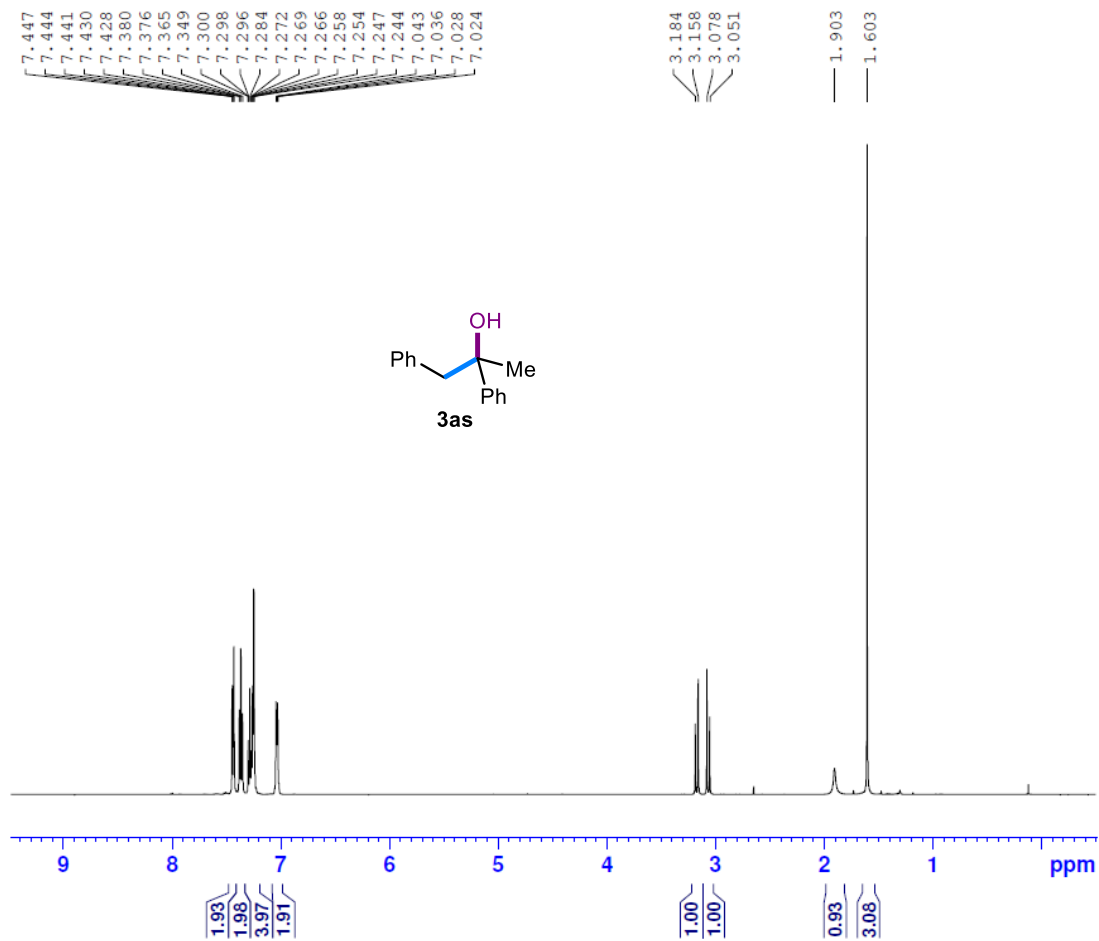
F2 - Processing parameters  
 SI 65536  
 SF 500.3000000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00



Current Data Parameters  
NAME lcc-2111-product  
EXPNO 2  
PROCNO 1

F2 - Acquisition Parameters  
Date\_ 20200307  
Time 18.31 h  
INSTRUM AVI1500HD  
PROBHD Z119470\_0125 ( )  
PULPROG zgpg30  
TD 65536  
SOLVENT CDCl3  
NS 256  
DS 4  
SWH 30000.000 Hz  
FIDRES 0.915527 Hz  
AQ 1.0922667 sec  
RG 192.72  
DW 16.667 usec  
DE 20.34 usec  
TE 298.0 K  
D1 2.0000000 sec  
D11 0.0300000 sec  
TD0 1  
SFO1 125.8131140 MHz  
NUC1 13C  
P0 3.41 usec  
P1 10.23 usec  
PLW1 78.0000000 W  
SFO2 500.3020012 MHz  
NUC2 1H  
CPDPRG2 waltz16  
PCPD2 80.00 usec  
PLW2 21.5000000 W  
PLW12 0.57543999 W  
PLW13 0.20446000 W

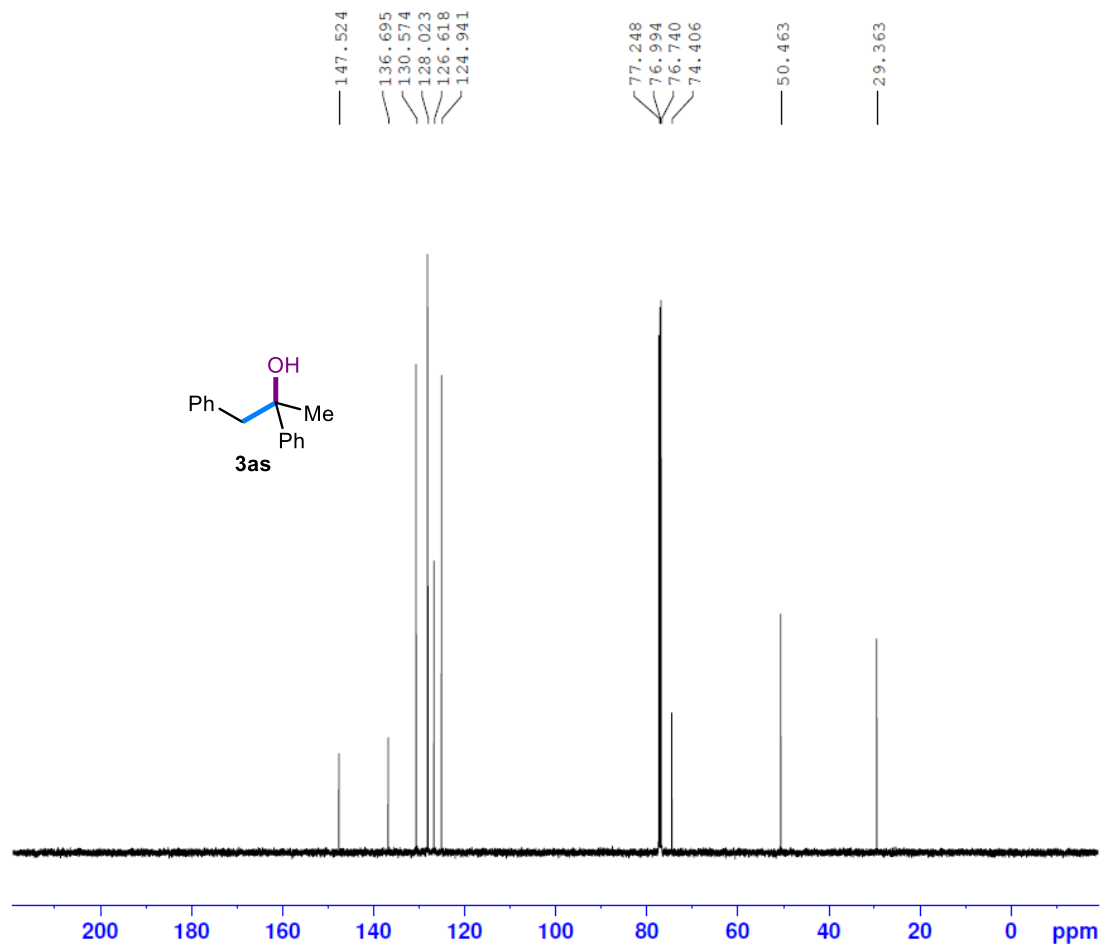
F2 - Processing parameters  
SI 32768  
SF 125.8005424 MHz  
WDW EM  
SSB 0  
LB 1.00 Hz  
GB 0  
PC 1.40



Current Data Parameters  
 NAME lcc-2128-product  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200309  
 Time 11.25 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 4  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RG 77.88  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TD0 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.89999962 W

F2 - Processing parameters  
 SI 65536  
 SF 500.3000000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00



Current Data Parameters  
 NAME lcc-2128-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200309  
 Time 11.32 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

F2 - Processing parameters  
 SI 32768  
 SF 125.8005425 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40



7.350  
7.347  
7.336  
7.321  
7.284  
7.275  
7.271  
7.266  
7.259  
7.256  
7.253  
7.247  
7.244  
7.230

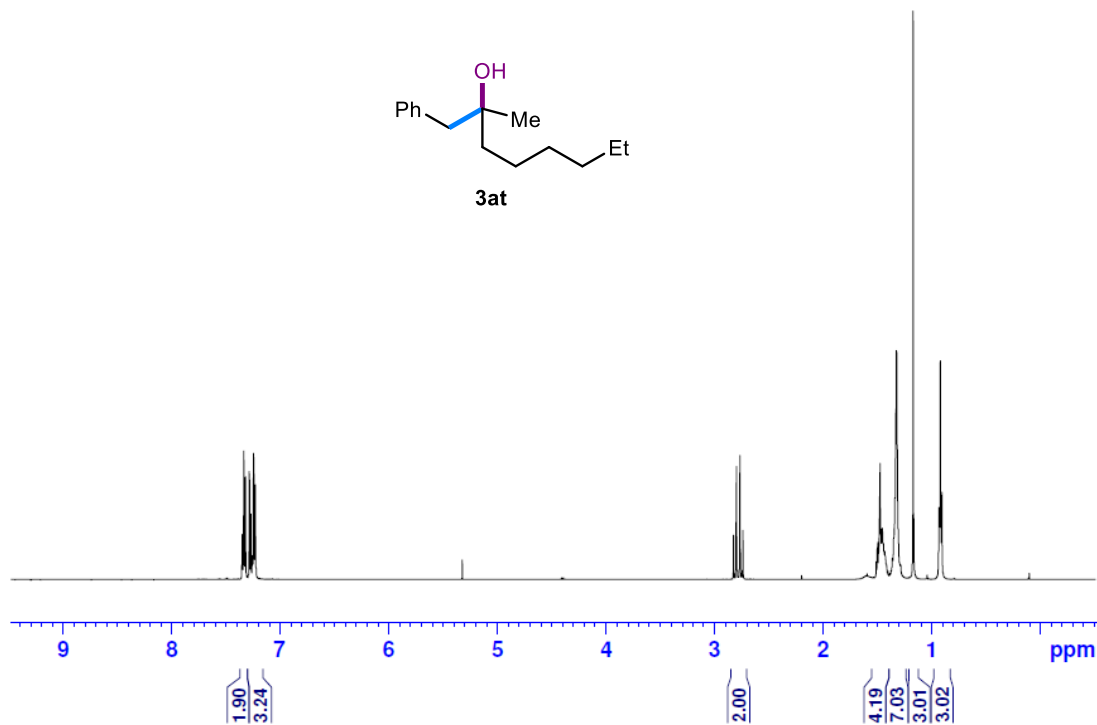
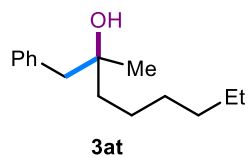
2.822  
2.796  
2.764  
2.737  
1.500  
1.494  
1.484  
1.478  
1.473  
1.458  
1.453  
1.444  
1.441  
1.430  
1.427  
1.427  
1.345  
1.323  
1.318  
1.167  
0.930  
0.924  
0.917  
0.903

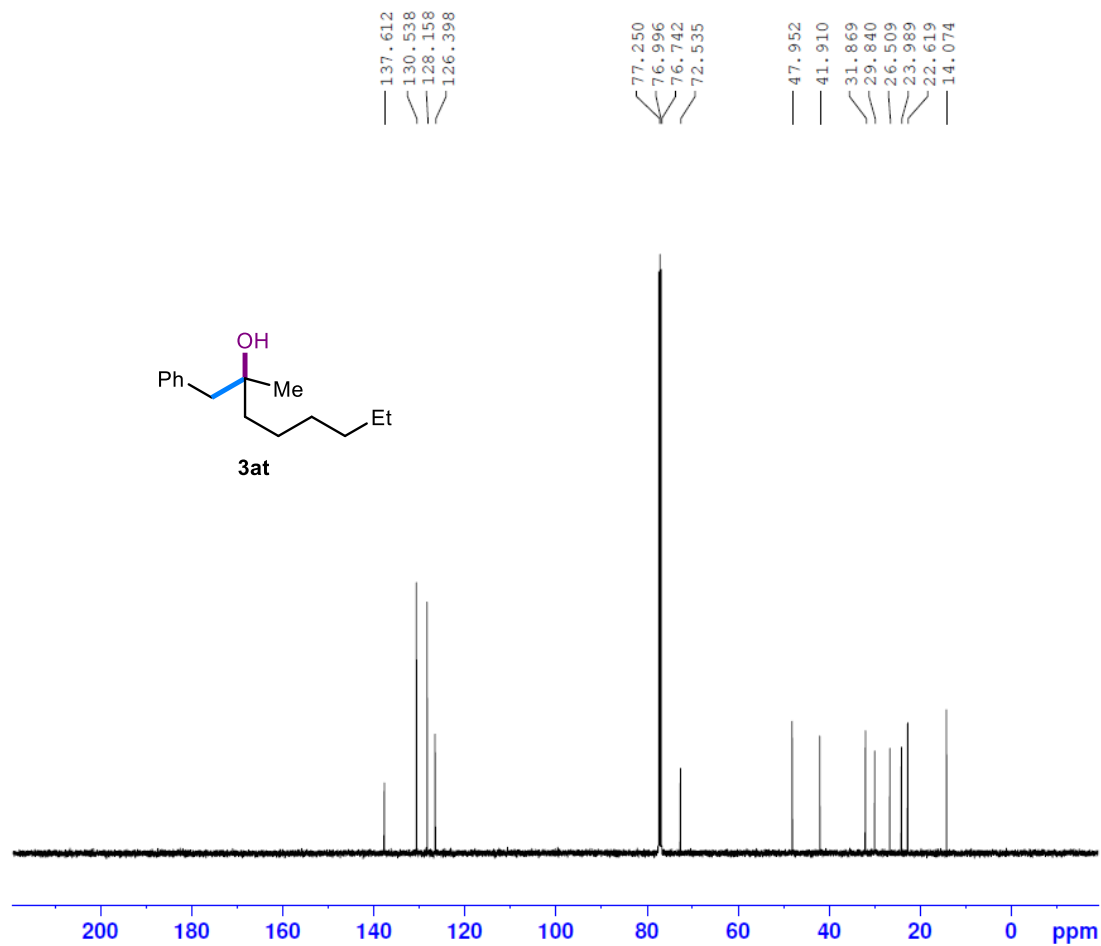


Current Data Parameters  
NAME lcc-2130-product  
EXPNO 1  
PROCNO 1

F2 - Acquisition Parameters  
Date\_ 20200313  
Time 8.06 h  
INSTRUM AVIII500HD  
PROBHD Z119470\_0125 ( )  
PULPROG zg30  
TD 65536  
SOLVENT CDCl3  
NS 16  
DS 2  
SWH 10000.000 Hz  
FIDRES 0.305176 Hz  
AQ 3.2767999 sec  
RG 106.56  
DW 50.000 usec  
DE 13.89 usec  
TE 298.0 K  
D1 1.00000000 sec  
TDO 1  
SFO1 500.3030896 MHz  
NUC1 1H  
P0 3.33 usec  
P1 10.00 usec  
PLW1 21.89999962 W

F2 - Processing parameters  
SI 65536  
SF 500.3000000 MHz  
WDW EM  
SSB 0  
LB 0.30 Hz  
GB 0  
PC 1.00

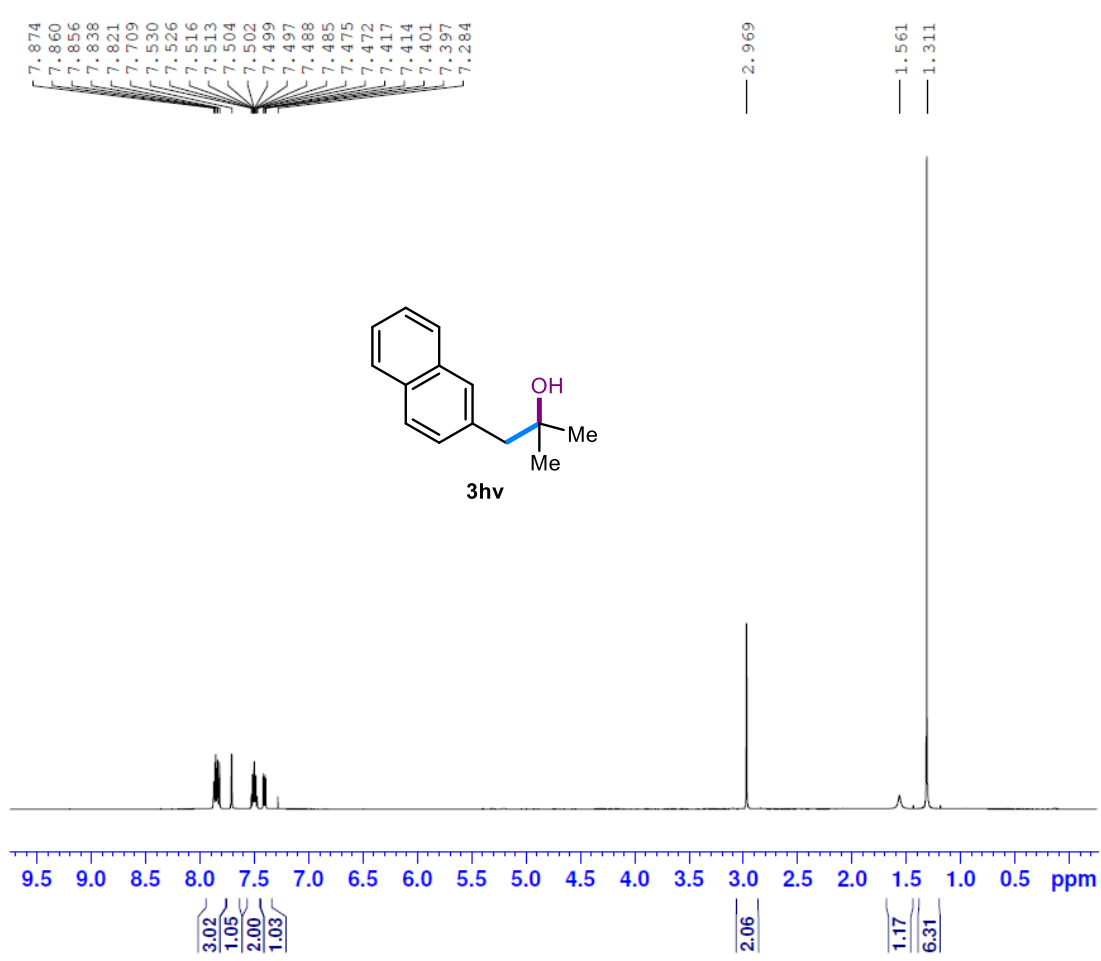




Current Data Parameters  
 NAME lcc-2130-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200313  
 Time 8.21 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 256  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

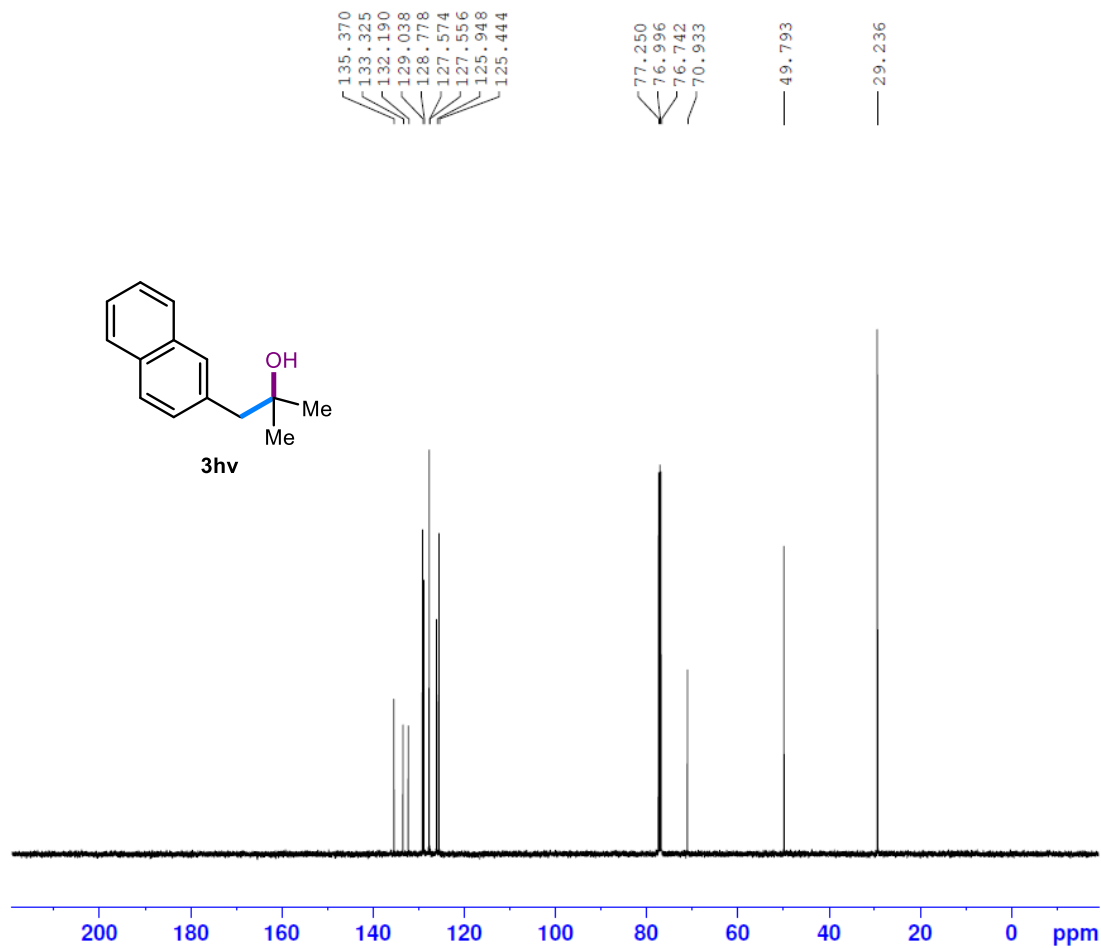
F2 - Processing parameters  
 SI 32768  
 SF 125.8005389 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40



Current Data Parameters  
 NAME lcc-2218-product  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200830  
 Time 14.01 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 (   
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 4  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RC 50.67  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TD0 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.899999962 W

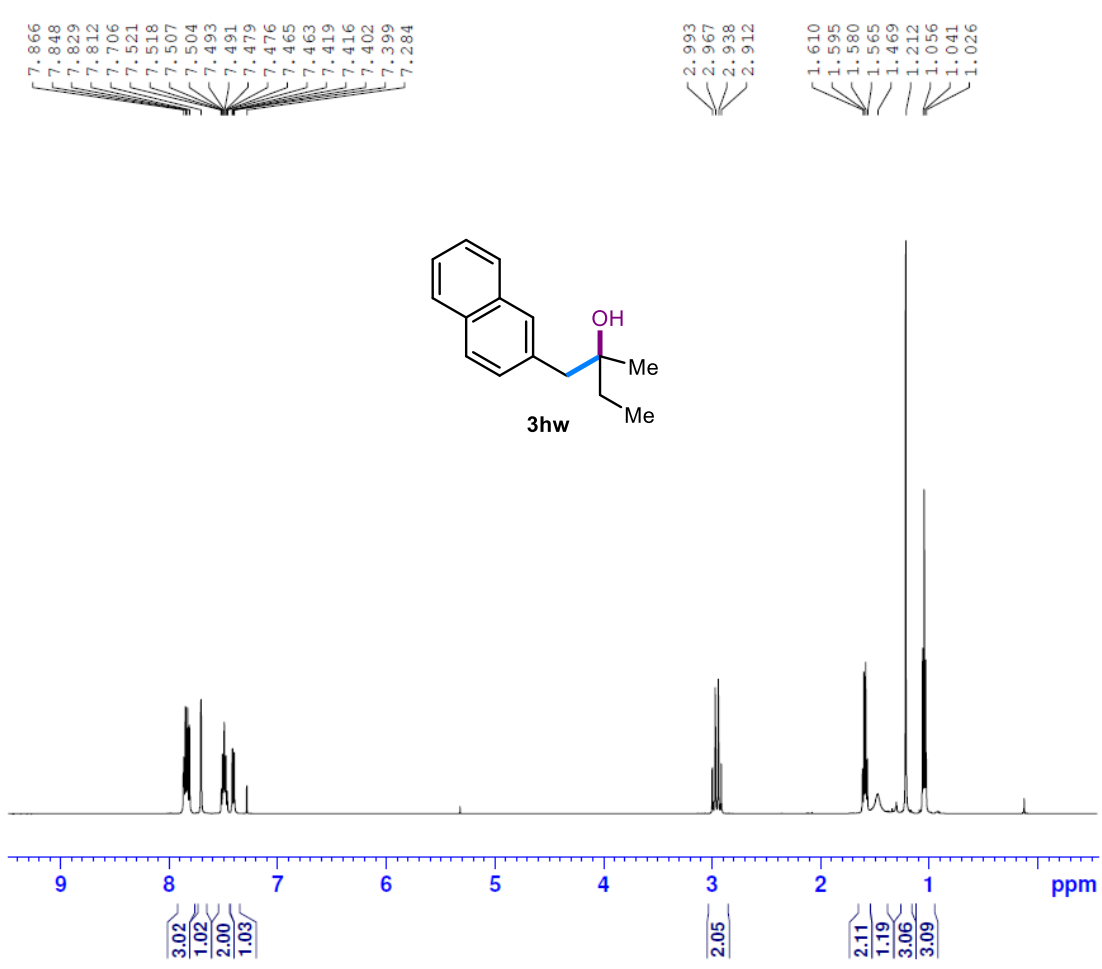
F2 - Processing parameters  
 SI 65536  
 SF 500.3000000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00



Current Data Parameters  
 NAME lcc-2218-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200830  
 Time 14.09 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 (  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

F2 - Processing parameters  
 SI 32768  
 SF 125.8005453 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40



7.866  
7.848  
7.829  
7.812  
7.706  
7.521  
7.518  
7.507  
7.504  
7.493  
7.491  
7.479  
7.476  
7.465  
7.463  
7.419  
7.416  
7.402  
7.399  
7.284

2.993  
2.967  
2.938  
2.912

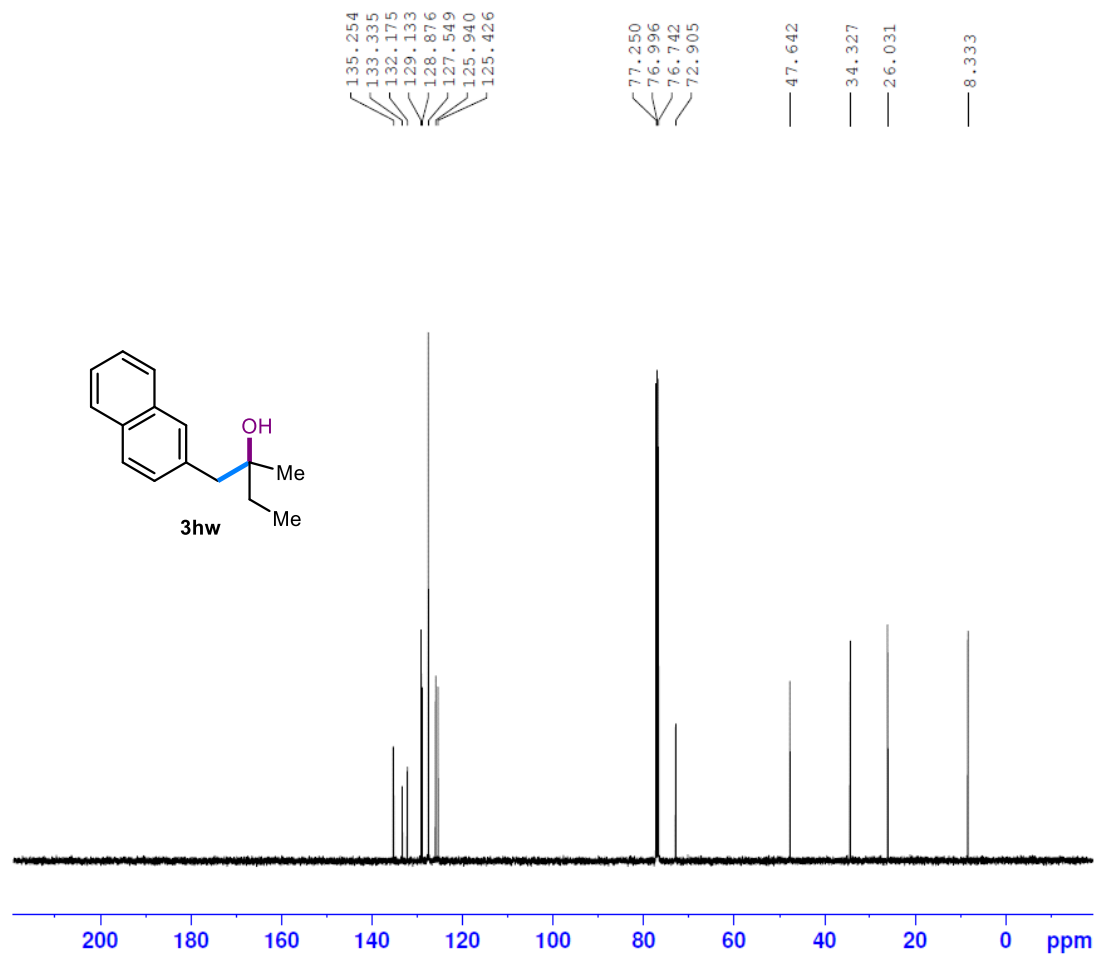
1.610  
1.595  
1.580  
1.565  
1.469  
1.212  
1.056  
1.041  
1.026



Current Data Parameters  
 NAME lcc-2223-product  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200904  
 Time 20.22 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 4  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RG 71.03  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TD0 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.89999962 W

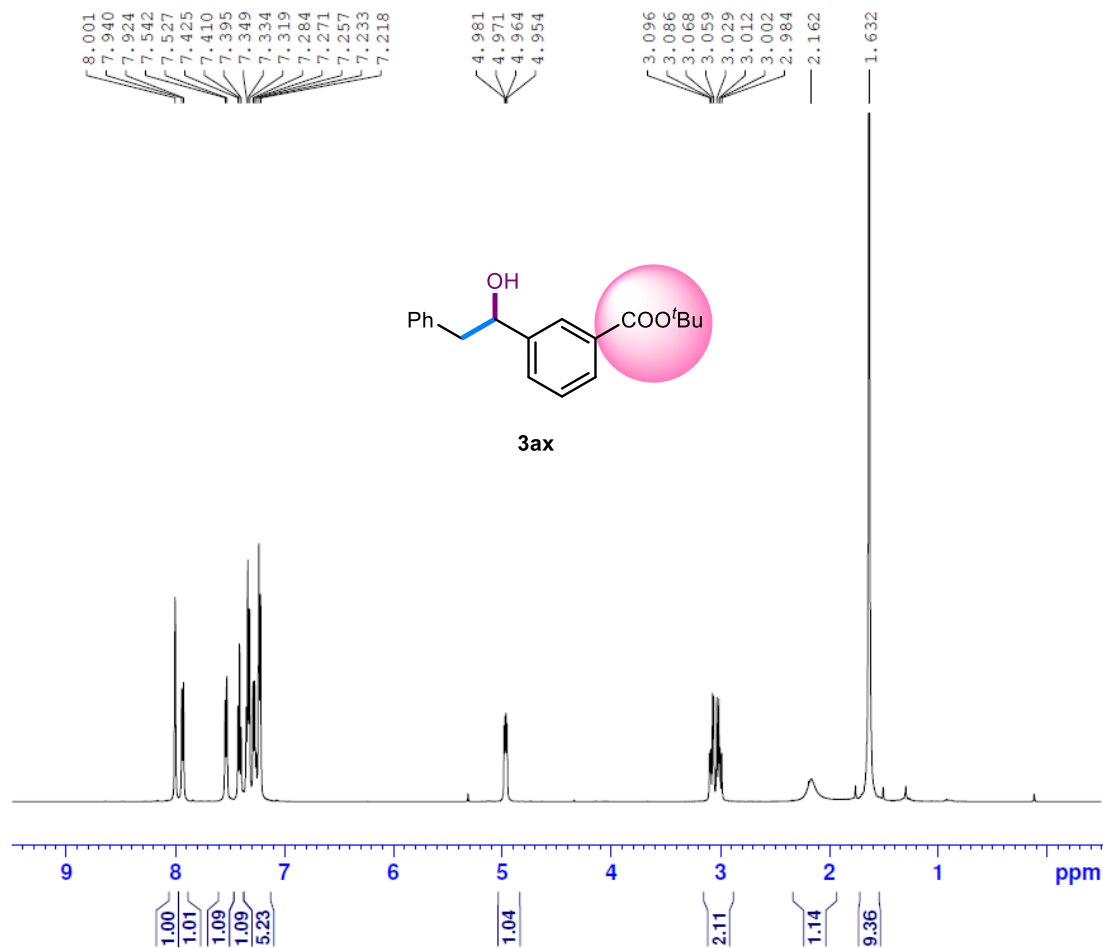
F2 - Processing parameters  
 SI 65536  
 SF 500.3000000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00



Current Data Parameters  
 NAME lcc-2223-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200904  
 Time 20.30 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( zppq30  
 PULPROG zppq30  
 TD 65536  
 SOLVENT CDC13  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

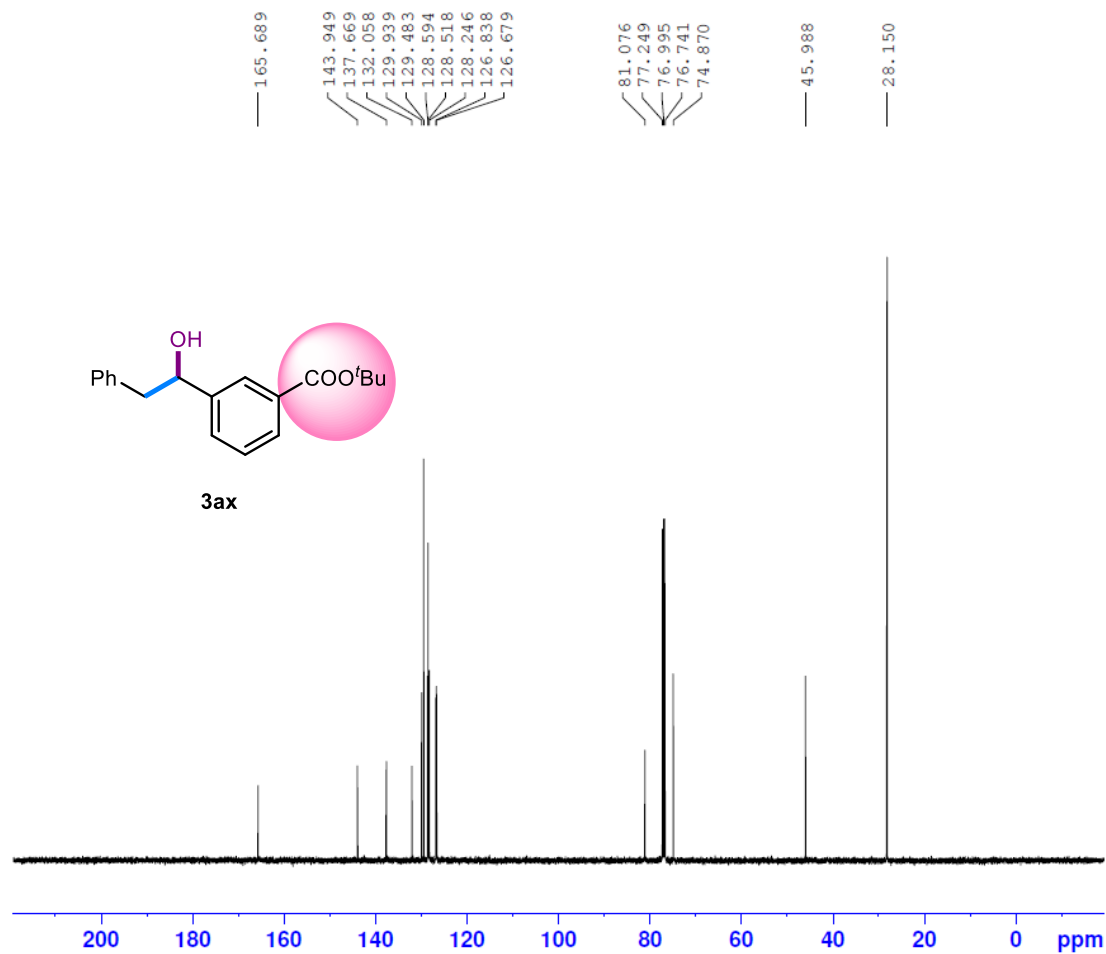
F2 - Processing parameters  
 SI 32768  
 SF 125.8005425 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 CB 0  
 PC 1.40



Current Data Parameters  
 NAME lcc-2174-product  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200718  
 Time 20.05 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 (   
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 4  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RG 32.48  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TD0 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.89999962 W

F2 - Processing parameters  
 SI 65536  
 SF 500.3000000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00

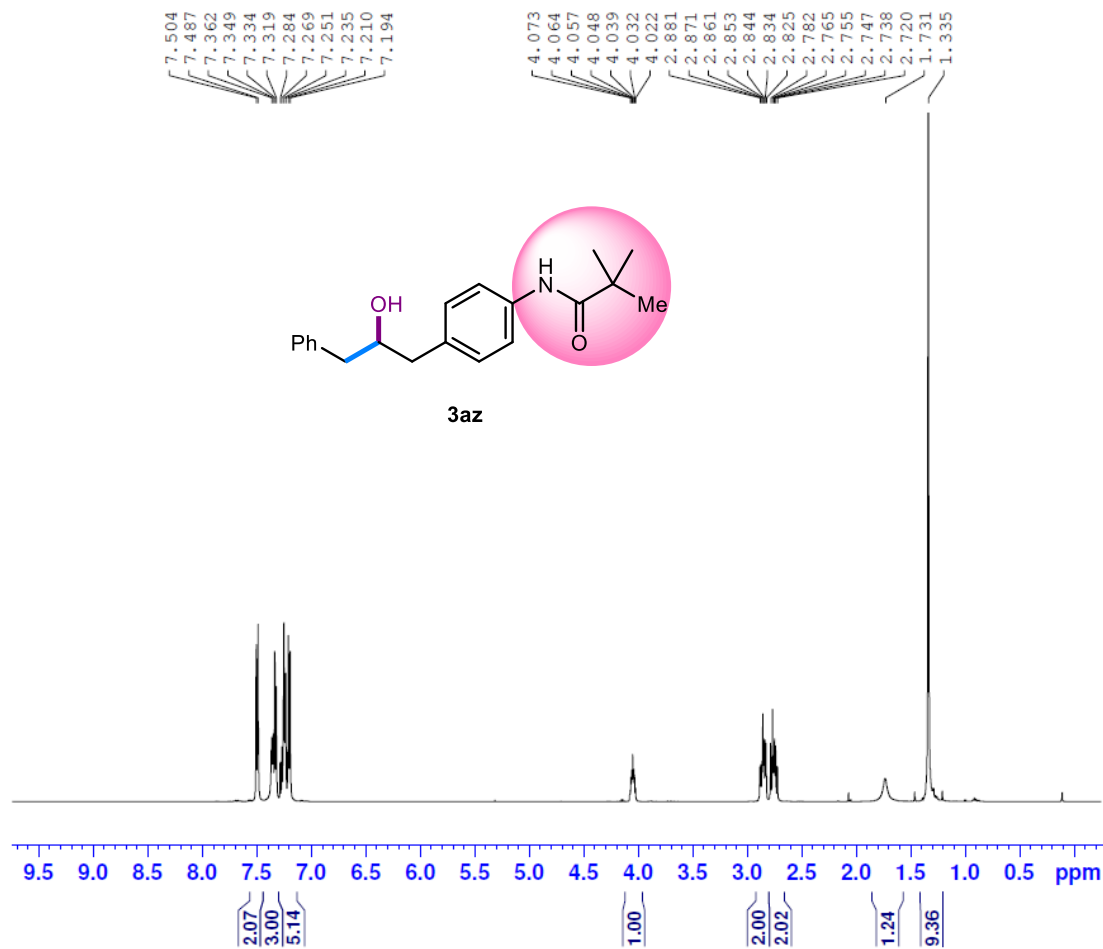


Current Data Parameters  
 NAME lcc-2174-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200718  
 Time 20.13 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

F2 - Processing parameters  
 SI 32768  
 SF 125.8005443 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40

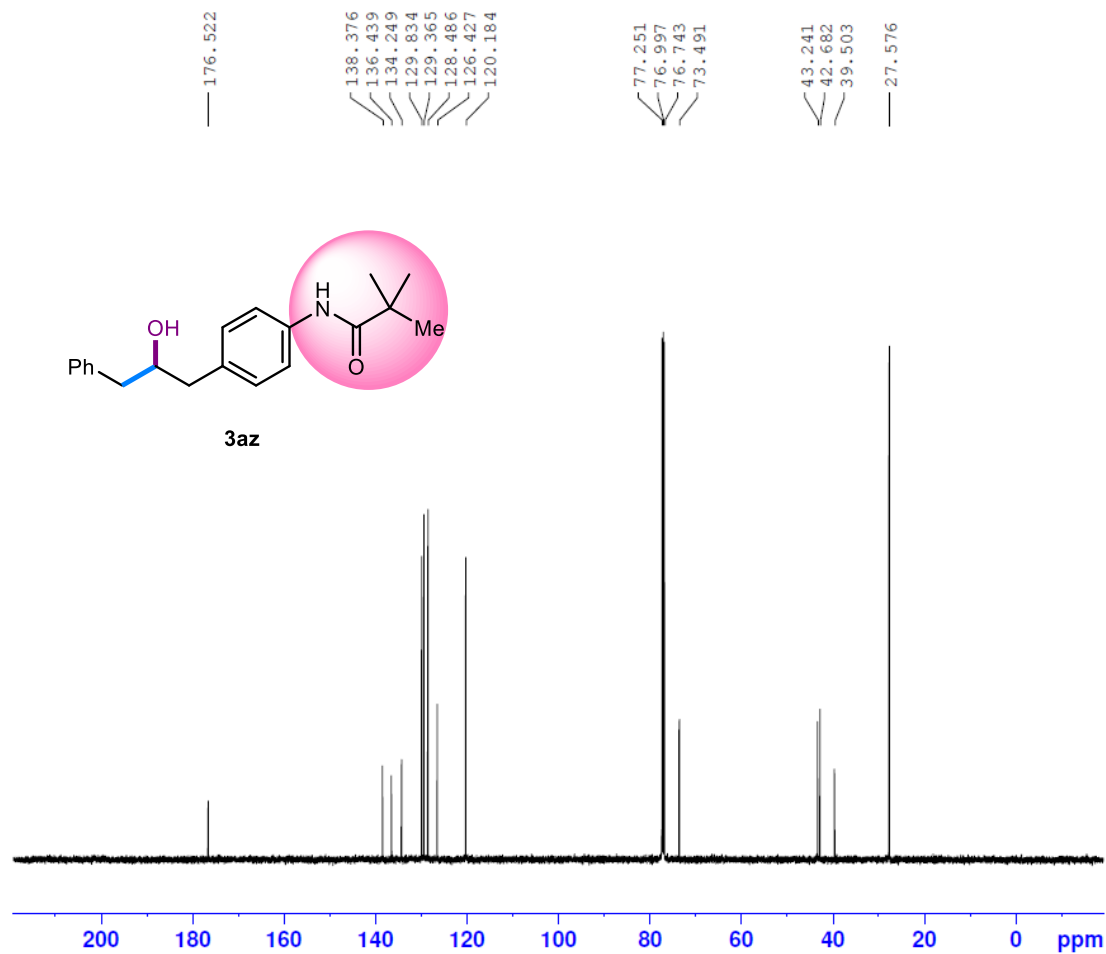




Current Data Parameters  
 NAME lcc-2245-product  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200915  
 Time 10.36 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 4  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RG 63.07  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TD0 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.89999962 W

F2 - Processing parameters  
 SI 65536  
 SF 500.3000000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00



Current Data Parameters  
 NAME lcc-2245-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200915  
 Time 10.43 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

F2 - Processing parameters  
 SI 32768  
 SF 125.8005443 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40

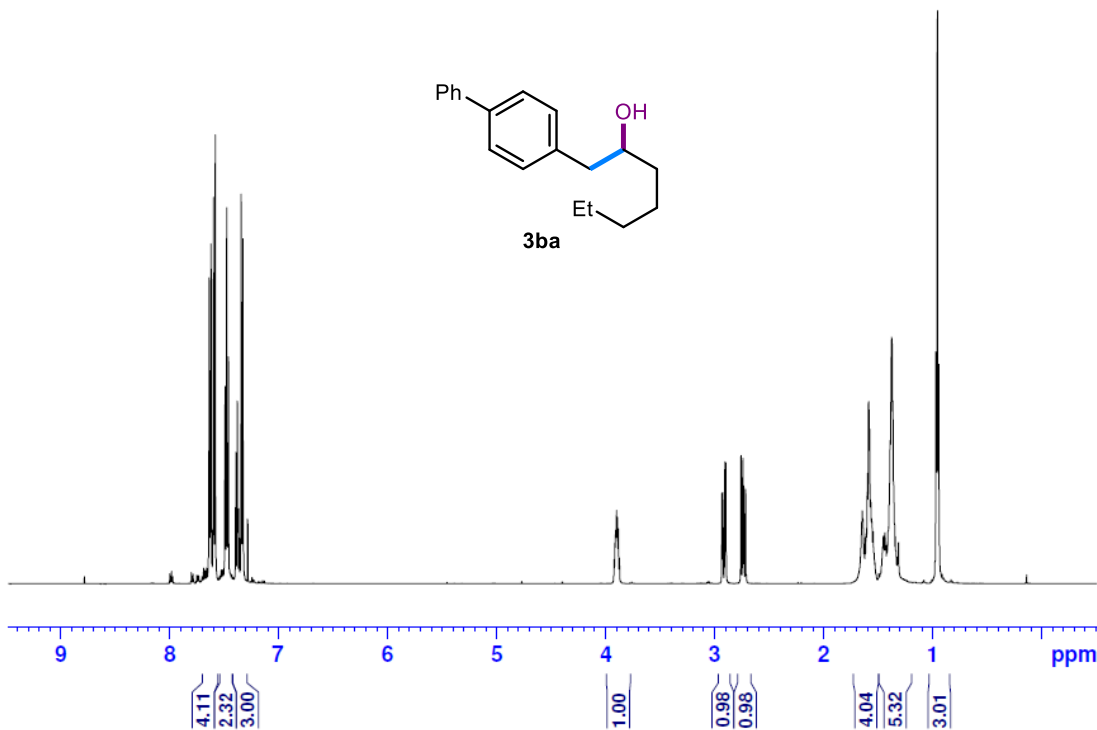
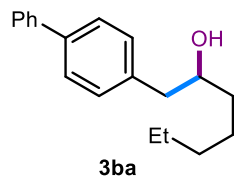
7.639  
7.636  
7.633  
7.622  
7.620  
7.598  
7.595  
7.586  
7.582  
7.491  
7.487  
7.476  
7.463  
7.460  
7.395  
7.393  
7.390  
7.382  
7.378  
7.363  
7.343  
7.327  
3.898  
3.890  
2.931  
2.922  
2.903  
2.895  
2.756  
2.740  
2.729  
2.712  
1.643  
1.596  
1.594  
1.585  
1.580  
1.577  
1.575  
1.568  
1.563  
1.558  
1.392  
1.388  
1.385  
1.379  
1.374  
1.368  
1.364  
1.361  
1.353  
0.968  
0.954  
0.948  
0.940

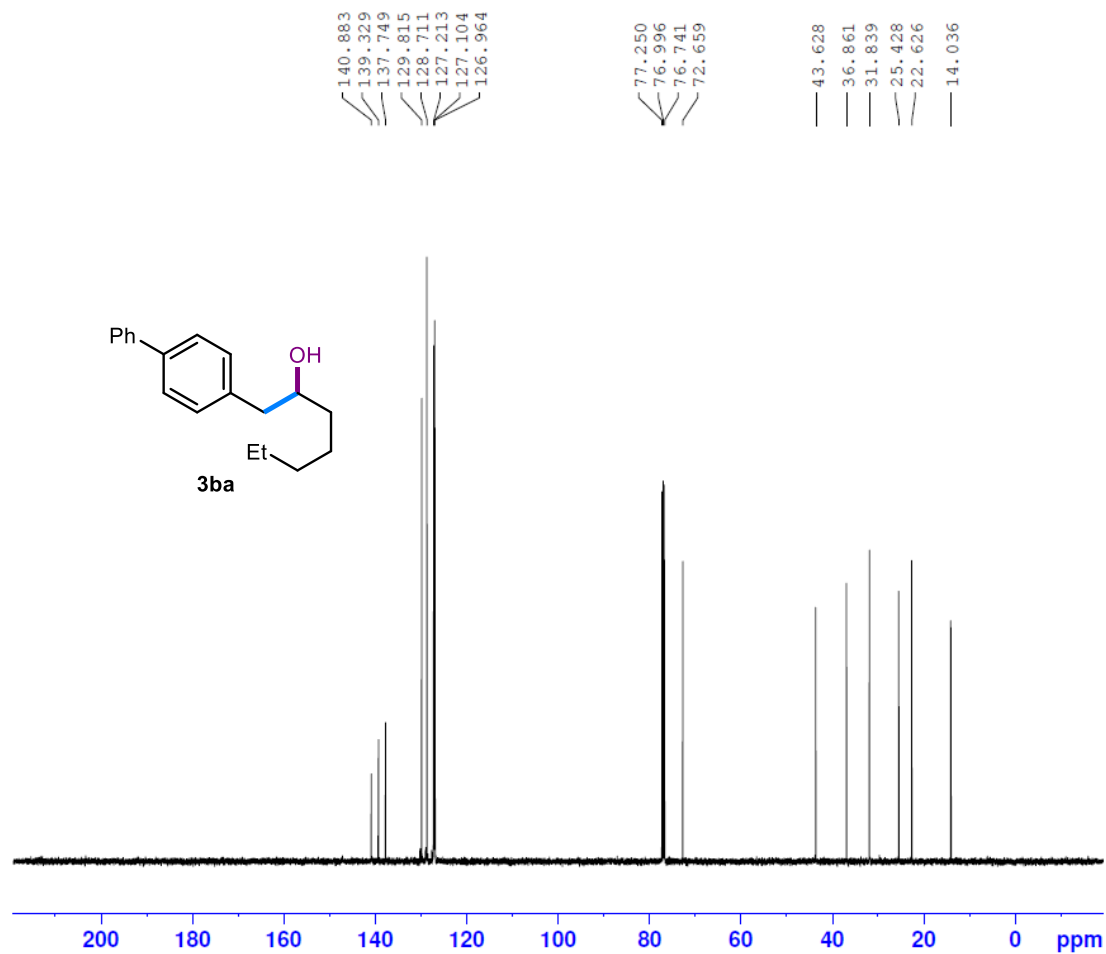


Current Data Parameters  
NAME lcc-2009-product  
EXPNO 1  
PROCNO 1

F2 - Acquisition Parameters  
Date\_ 20200116  
Time 7.13 h  
INSTRUM AVIII500HD  
PROBHD Z119470\_0125 (   
PULPROG zg30  
TD 65536  
SOLVENT CDC13  
NS 4  
DS 2  
SWH 10000.000 Hz  
FIDRES 0.305176 Hz  
AQ 3.2767999 sec  
RG 40.56  
DW 50.000 usec  
DE 13.89 usec  
TE 298.0 K  
D1 1.00000000 sec  
TD0 1  
SFO1 500.3030896 MHz  
NUC1 1H  
P0 3.33 usec  
P1 10.00 usec  
PLW1 21.89999962 W

F2 - Processing parameters  
SI 65536  
SF 500.3000000 MHz  
WDW EM  
SSB 0  
LB 0.30 Hz  
GB 0  
PC 1.00

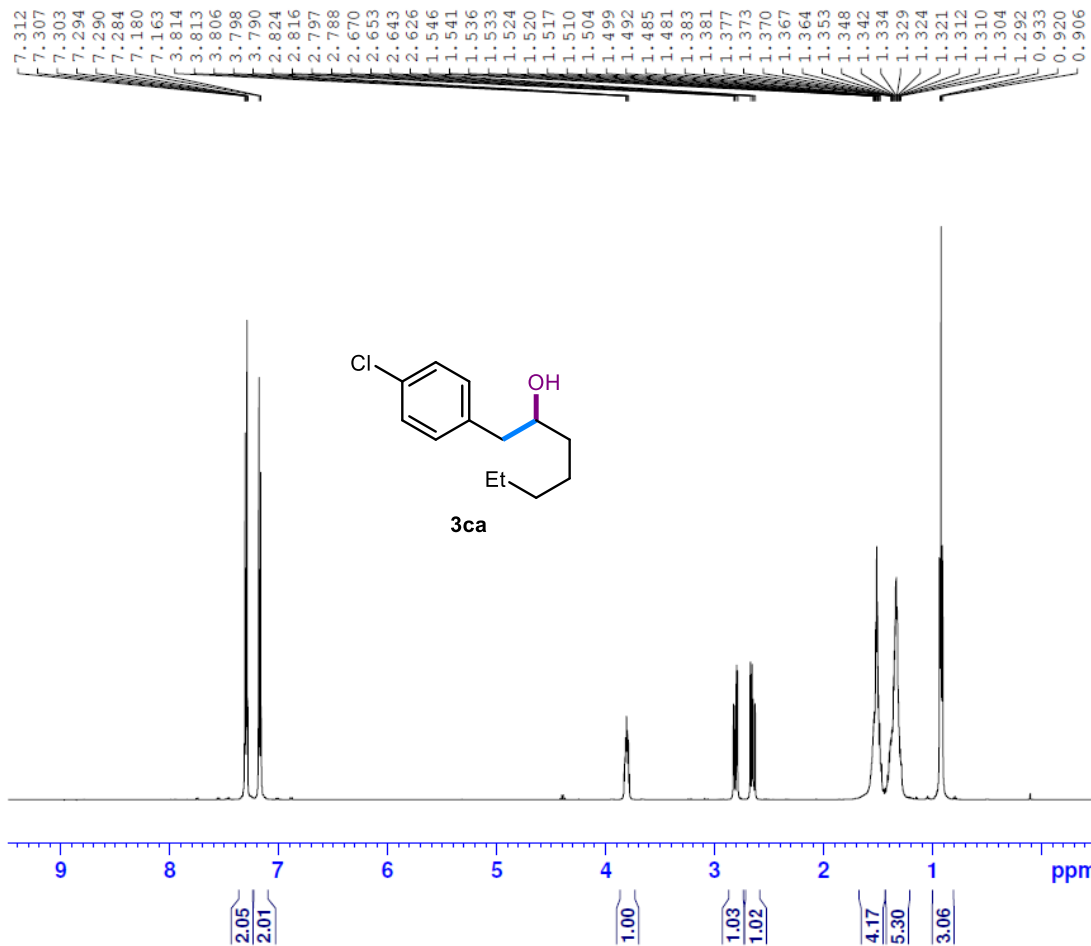




Current Data Parameters  
 NAME lcc-2009-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200116  
 Time 7.20 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

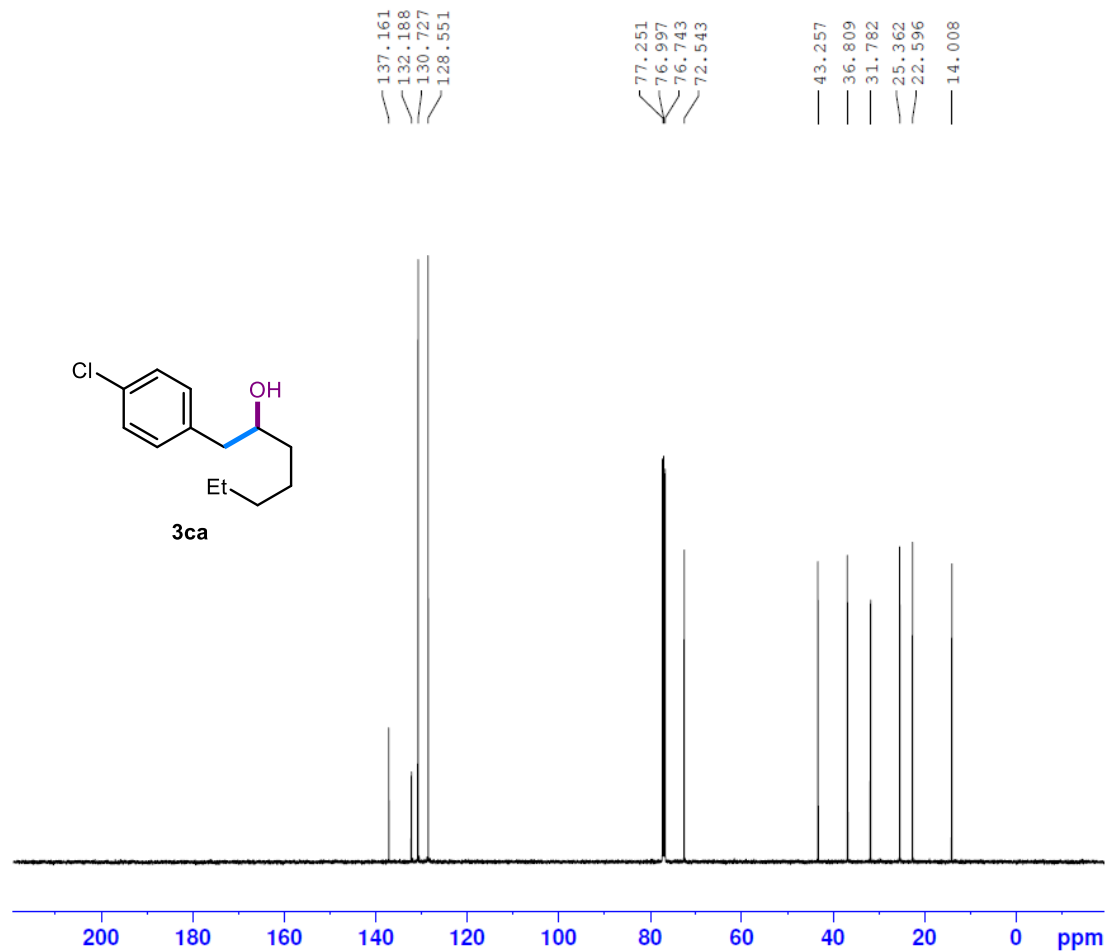
F2 - Processing parameters  
 SI 32768  
 SF 125.8005443 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40



Current Data Parameters  
 NAME lcc-2104-product  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200228  
 Time 2.00 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 16  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RG 56.3  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TD0 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.89999962 W

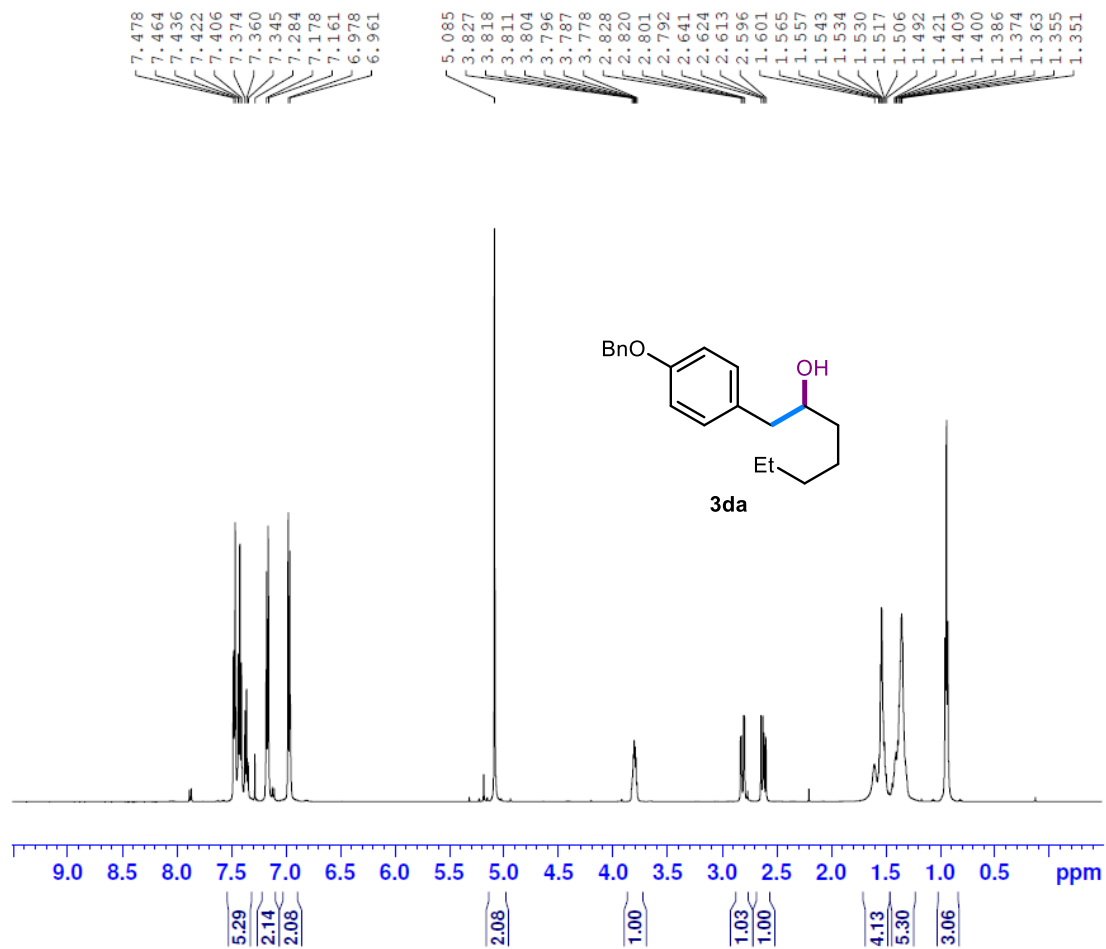
F2 - Processing parameters  
 SI 65536  
 SF 500.300000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00



Current Data Parameters  
 NAME lcc-2104-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200228  
 Time 2.28 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 512  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

F2 - Processing parameters  
 SI 32768  
 SF 125.8005407 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40



7.478  
7.464  
7.436  
7.422  
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7.374  
7.360  
7.345  
7.284  
7.178  
7.161  
6.978  
6.961

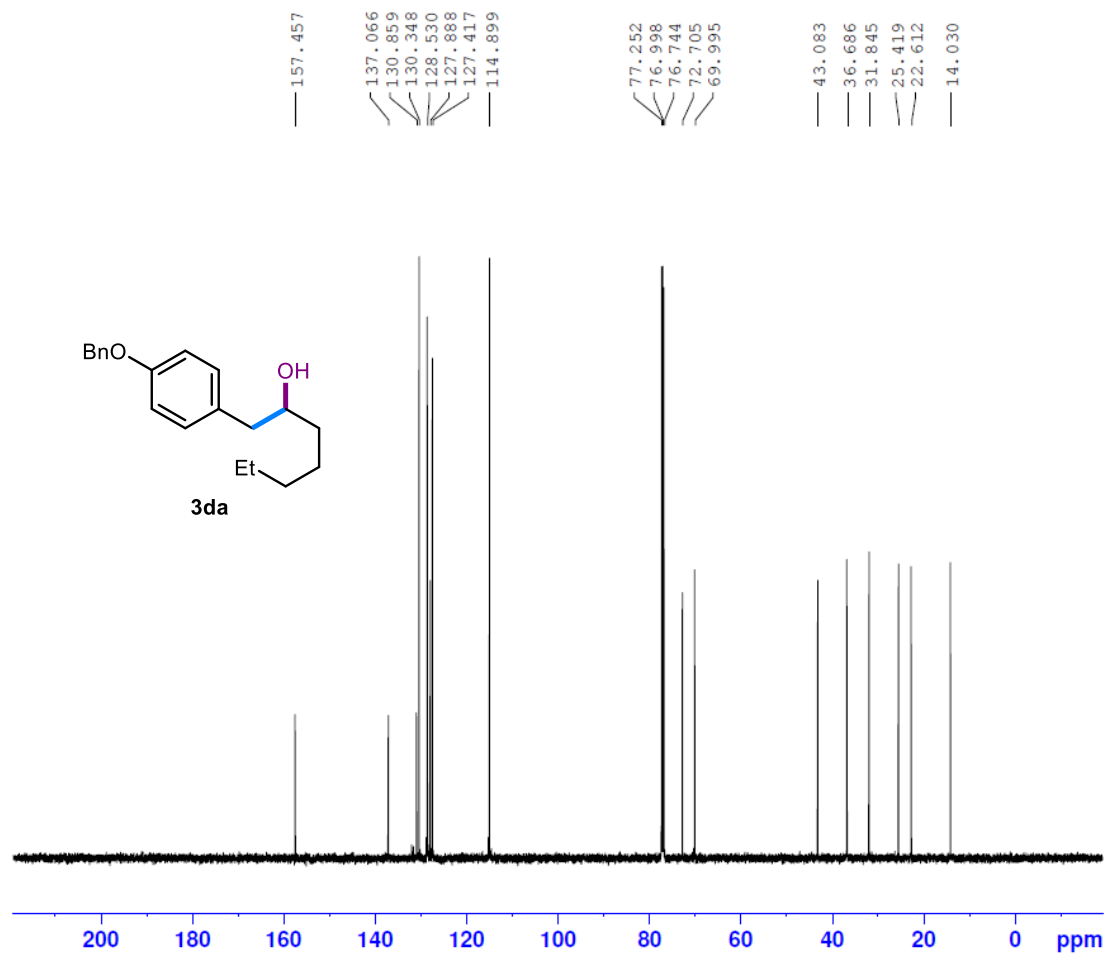
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3.804  
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3.778  
2.828  
2.820  
2.801  
2.792  
2.641  
2.624  
2.613  
2.596  
1.601  
1.565  
1.557  
1.543  
1.534  
1.530  
1.517  
1.506  
1.492  
1.421  
1.409  
1.400  
1.386  
1.374  
1.363  
1.355  
1.351



Current Data Parameters  
 NAME lcc-2140-product  
 EXPNO 6  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200325  
 Time 11.05 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 4  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RG 44.1  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TD0 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.89999962 W

F2 - Processing parameters  
 SI 65536  
 SF 500.3000000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00



Current Data Parameters  
 NAME lcc-2140-product  
 EXPNO 7  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200325  
 Time 11.04 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

F2 - Processing parameters  
 SI 32768  
 SF 125.8005443 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40



7.596  
7.580  
7.570  
7.354  
7.284

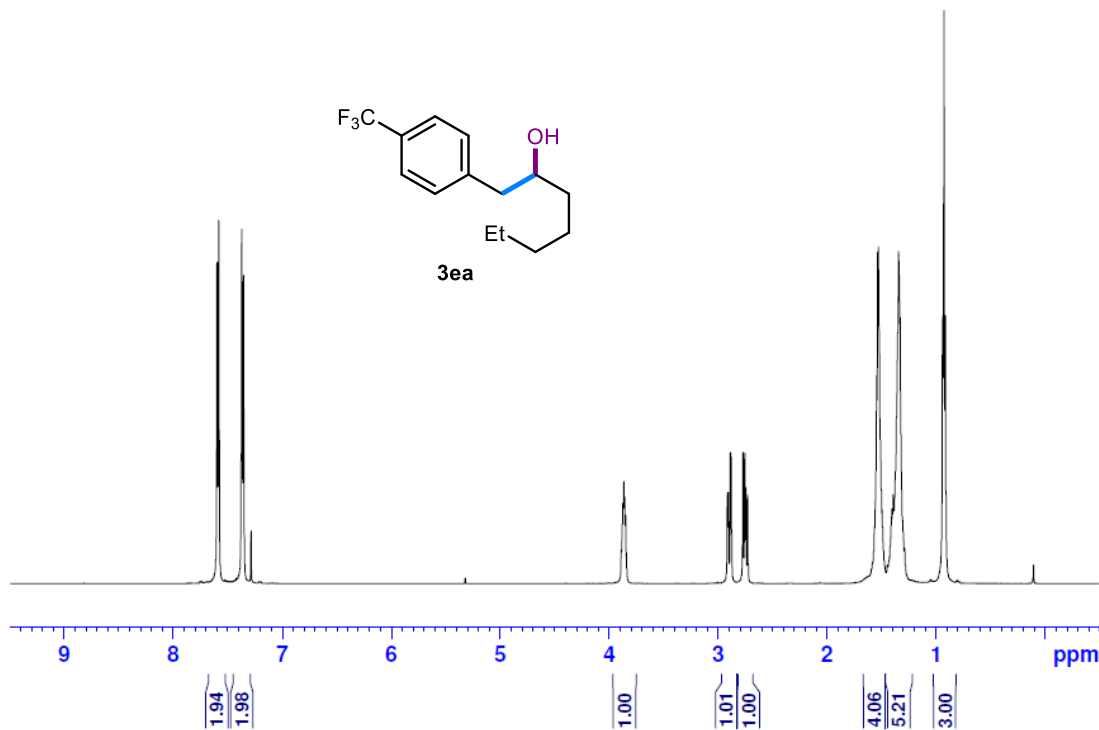
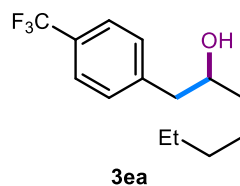
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3.863  
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2.903  
2.884  
2.876  
2.770  
2.753  
2.742  
2.726  
1.564  
1.541  
1.533  
1.528  
1.491  
1.414  
1.403  
1.397  
1.391  
1.387  
1.341  
1.335  
1.328  
1.302  
1.285  
0.938

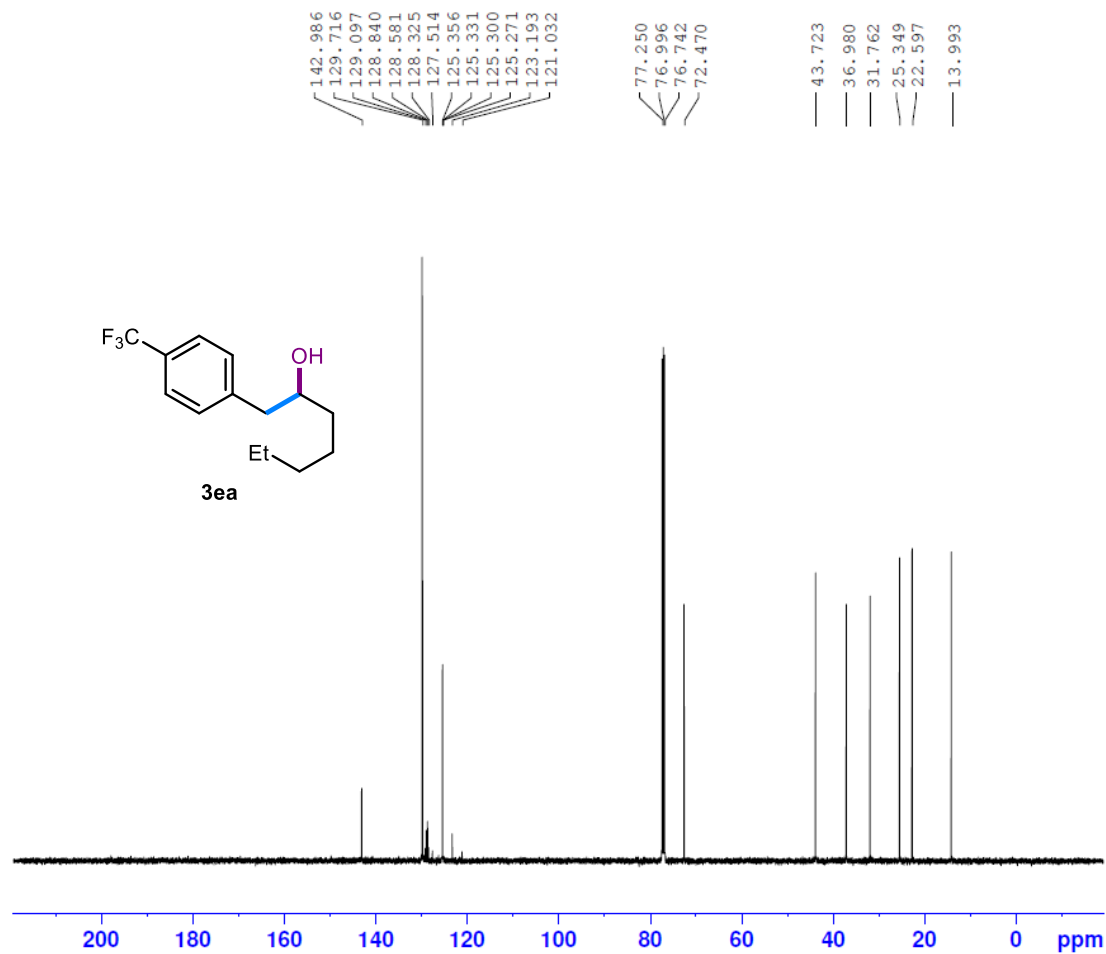


Current Data Parameters  
NAME lcc-2115-product  
EXPNO 1  
PROCNO 1

F2 - Acquisition Parameters  
Date\_ 20200301  
Time 23.31 h  
INSTRUM AVIII500HD  
PROBHD Z119470\_0125 ( )  
PULPROG zg30  
TD 65536  
SOLVENT CDCl3  
NS 4  
DS 2  
SWH 10000.000 Hz  
FIDRES 0.305176 Hz  
AQ 3.2767999 sec  
RG 56.3  
DW 50.000 usec  
DE 13.89 usec  
TE 298.0 K  
D1 1.00000000 sec  
TD0 1  
SFO1 500.3030896 MHz  
NUC1 1H  
P0 3.33 usec  
P1 10.00 usec  
PLW1 21.89999962 W

F2 - Processing parameters  
SI 65536  
SF 500.3000000 MHz  
WDW EM  
SSB 0  
LB 0.30 Hz  
GB 0  
PC 1.00

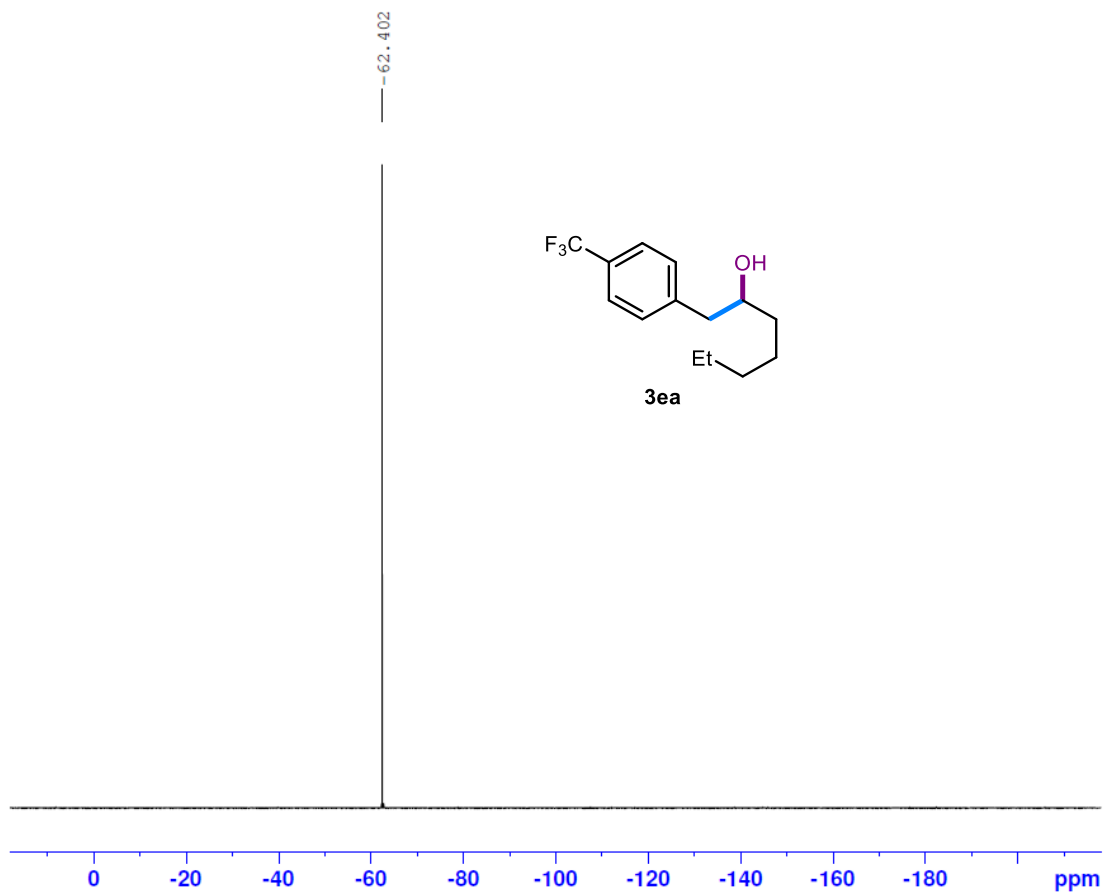




Current Data Parameters  
 NAME lcc-2115-product  
 EXPNO 3  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200301  
 Time 23.47 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 256  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

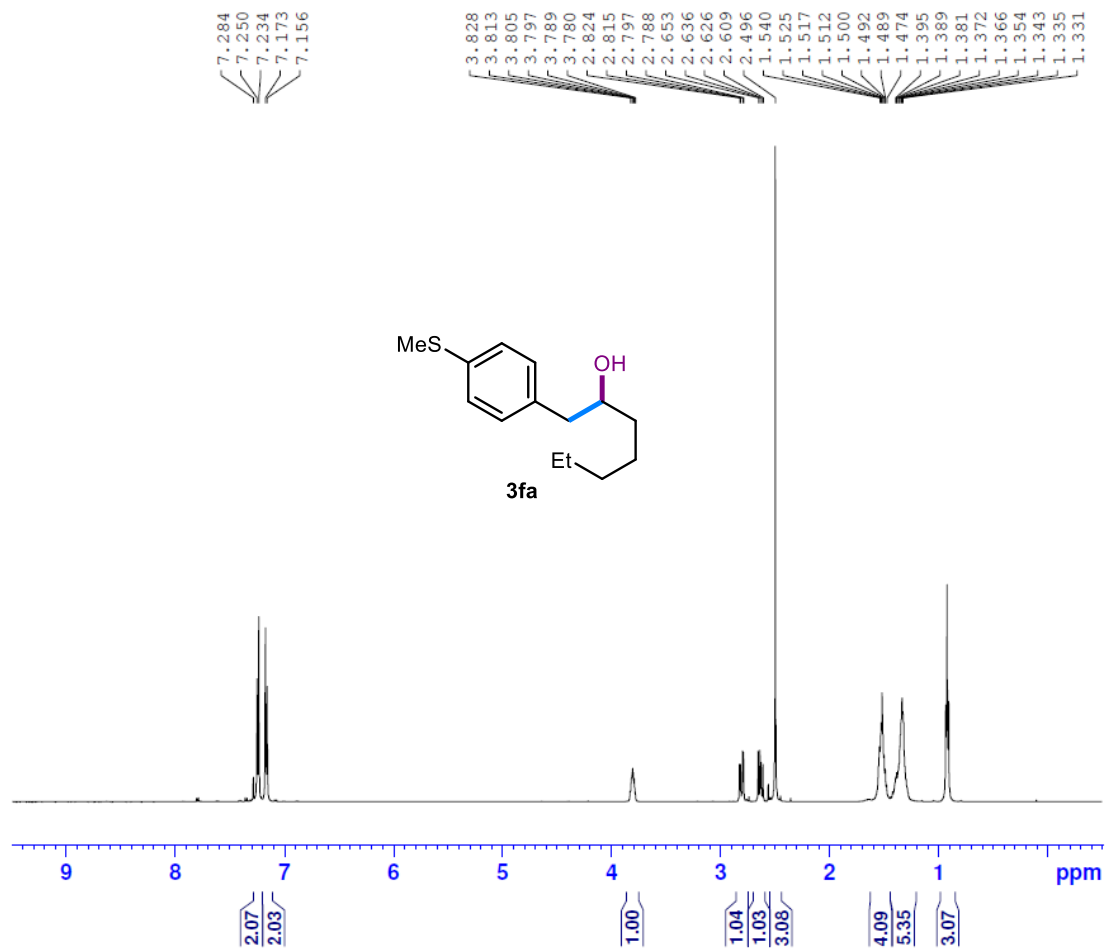
F2 - Processing parameters  
 SI 32768  
 SF 125.8005388 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40



Current Data Parameters  
 NAME lcc-2115-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200301  
 Time 23.32 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 (  
 PULPROG zgbsfhigqn.baseopt  
 TD 131072  
 SOLVENT CDCl3  
 NS 16  
 DS 4  
 SWH 111111.109 Hz  
 FIDRES 1.695421 Hz  
 AQ 0.5898240 sec  
 RG 192.72  
 DW 4.500 usec  
 DE 35.33 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 D11 0.03000000 sec  
 D12 0.00002000 sec  
 TD0 1  
 SFO1 470.7052618 MHz  
 NUC1 19F  
 P1 15.00 usec  
 P2 30.00 usec  
 PLW1 39.50000000 W  
 SFO2 500.3025015 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W

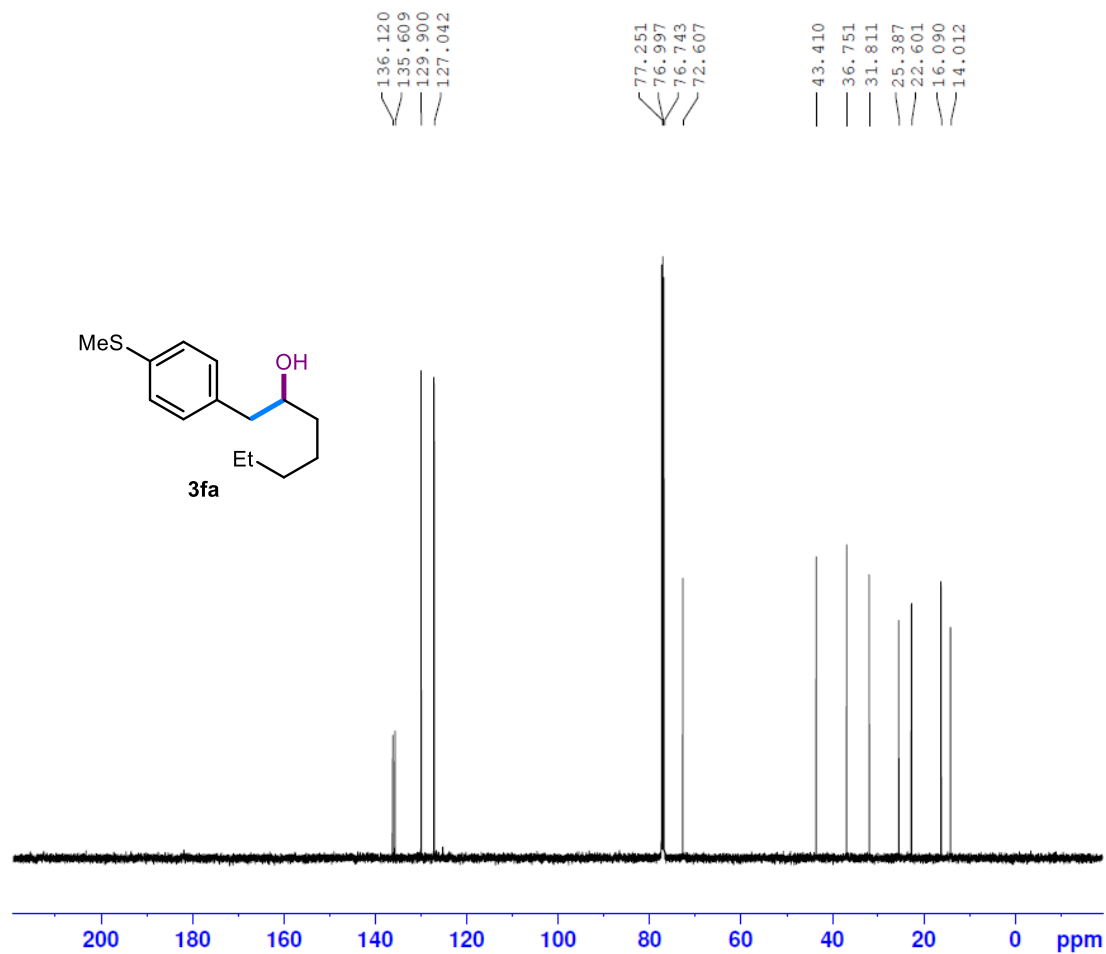
F2 - Processing parameters  
 SI 65536  
 SF 470.7523370 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00



Current Data Parameters  
 NAME lcc-2108-product  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200228  
 Time 14.20 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 4  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RG 50.67  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TD0 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.89999962 W

F2 - Processing parameters  
 SI 65536  
 SF 500.3000000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00



Current Data Parameters  
 NAME lcc-2108-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200228  
 Time 14.27 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 (  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

F2 - Processing parameters  
 SI 32768  
 SF 125.8005425 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40

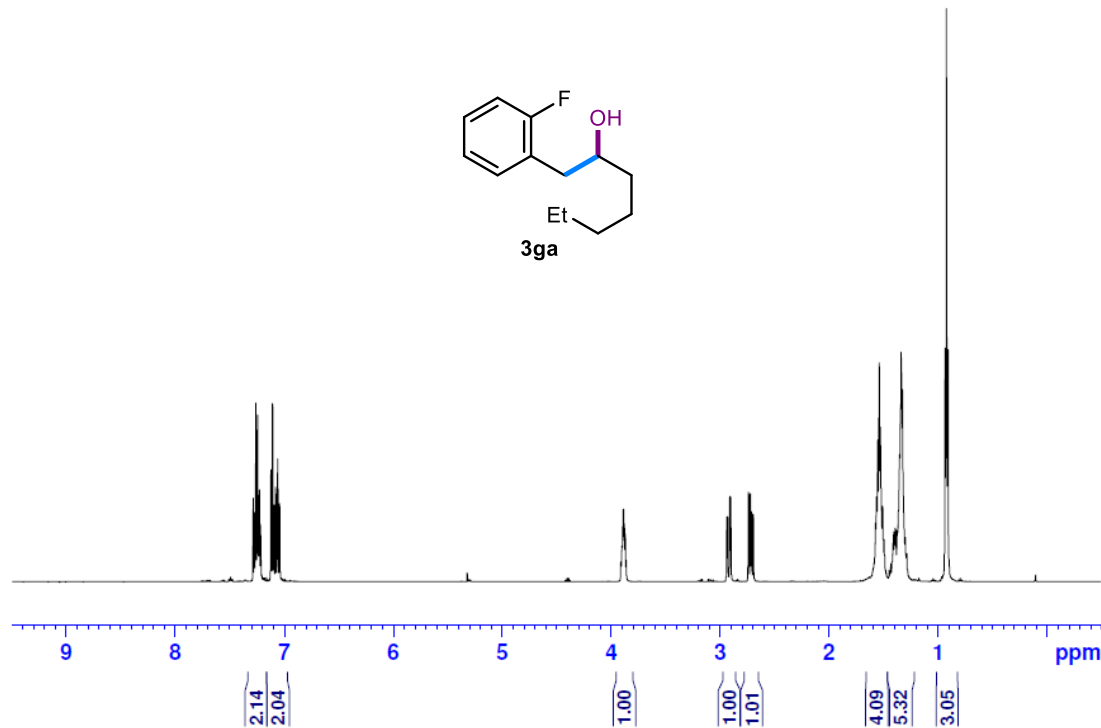
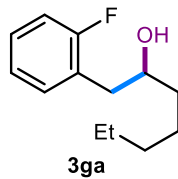
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7.273  
7.261  
7.258  
7.247  
7.243  
7.232  
7.227  
7.216  
7.122  
7.120  
7.107  
7.105  
7.092  
7.090  
7.078  
7.076  
7.061  
7.058  
7.056  
7.041  
7.040  
3.893  
3.884  
3.877  
2.935  
2.928  
2.908  
2.900  
2.737  
2.720  
2.709  
2.693  
1.569  
1.562  
1.553  
1.549  
1.542  
1.537  
1.529  
1.525  
1.509  
1.505  
1.392  
1.366  
1.355  
1.350  
1.344  
1.337  
1.330  
1.324  
0.933  
0.920  
0.906

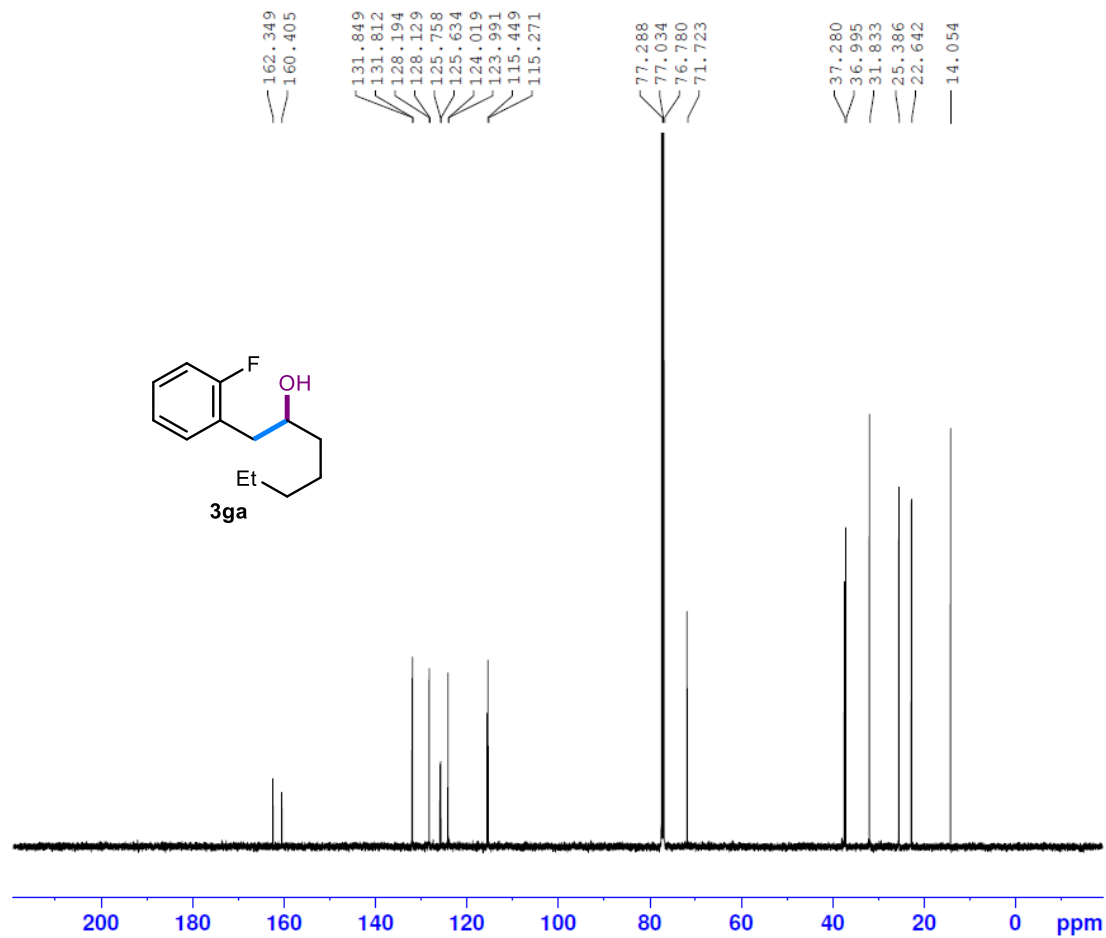
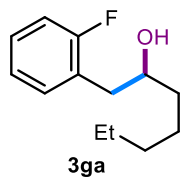


Current Data Parameters  
NAME lcc-2116-product  
EXPNO 1  
PROCNO 1

F2 - Acquisition Parameters  
Date\_ 20200301  
Time 23.52 h  
INSTRUM AVIII500HD  
PROBHD Z119470\_0125 ( )  
PULPROG zg30  
TD 65536  
SOLVENT CDCl3  
NS 4  
DS 2  
SWH 10000.000 Hz  
FIDRES 0.305176 Hz  
AQ 3.2767999 sec  
RG 63.07  
DW 50.000 usec  
DE 13.89 usec  
TE 298.0 K  
D1 1.00000000 sec  
TD0 1  
SFO1 500.3030896 MHz  
NUC1 1H  
P0 3.33 usec  
P1 10.00 usec  
PLW1 21.89999962 W

F2 - Processing parameters  
SI 65536  
SF 500.3000000 MHz  
WDW EM  
SSB 0  
LB 0.30 Hz  
GB 0  
PC 1.00

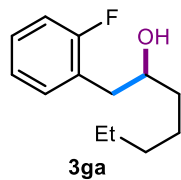




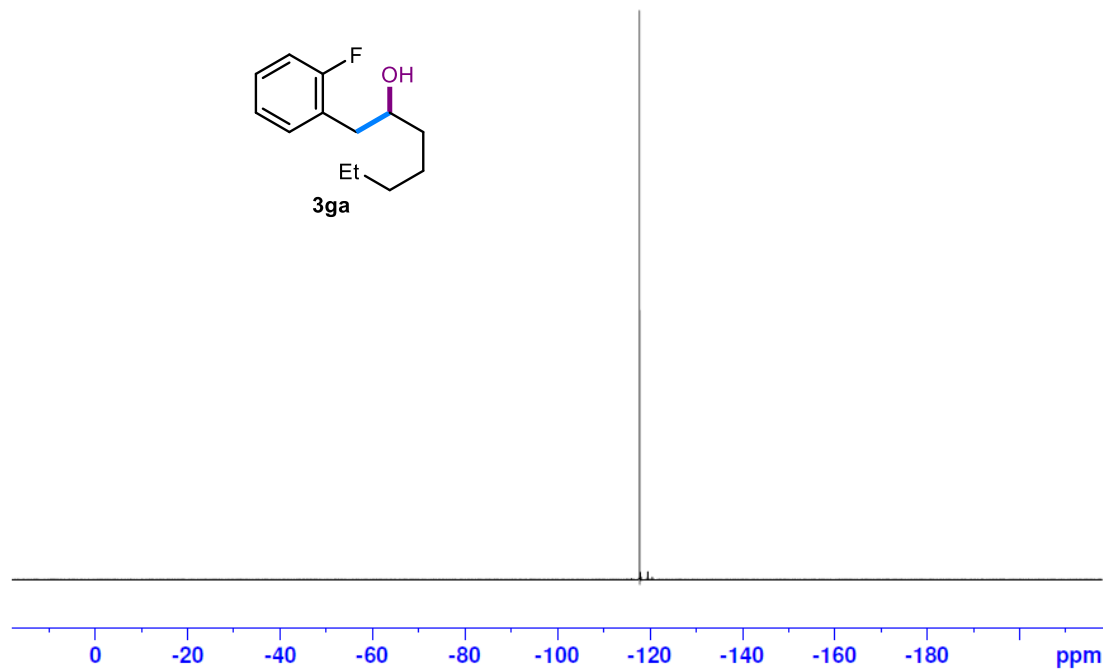
Current Data Parameters  
 NAME lcc-2116-product  
 EXPNO 3  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200302  
 Time 0.08 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 (  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 256  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

F2 - Processing parameters  
 SI 32768  
 SF 125.8005351 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40



-117.739



Current Data Parameters  
 NAME lcc-2116-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200301  
 Time 23.53 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 131072  
 SOLVENT CDCl3  
 NS 16  
 DS 4  
 SWH 11111.109 Hz  
 FIDRES 1.695421 Hz  
 AQ 0.5898240 sec  
 RG 192.72  
 DW 4.500 usec  
 DE 35.33 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 D11 0.03000000 sec  
 D12 0.00002000 sec  
 TD0 1  
 SFO1 470.7052618 MHz  
 NUC1 19F  
 P1 15.00 usec  
 P2 30.00 usec  
 PLW1 39.50000000 W  
 SFO2 500.3025015 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W

F2 - Processing parameters  
 SI 65536  
 SF 470.7523370 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00



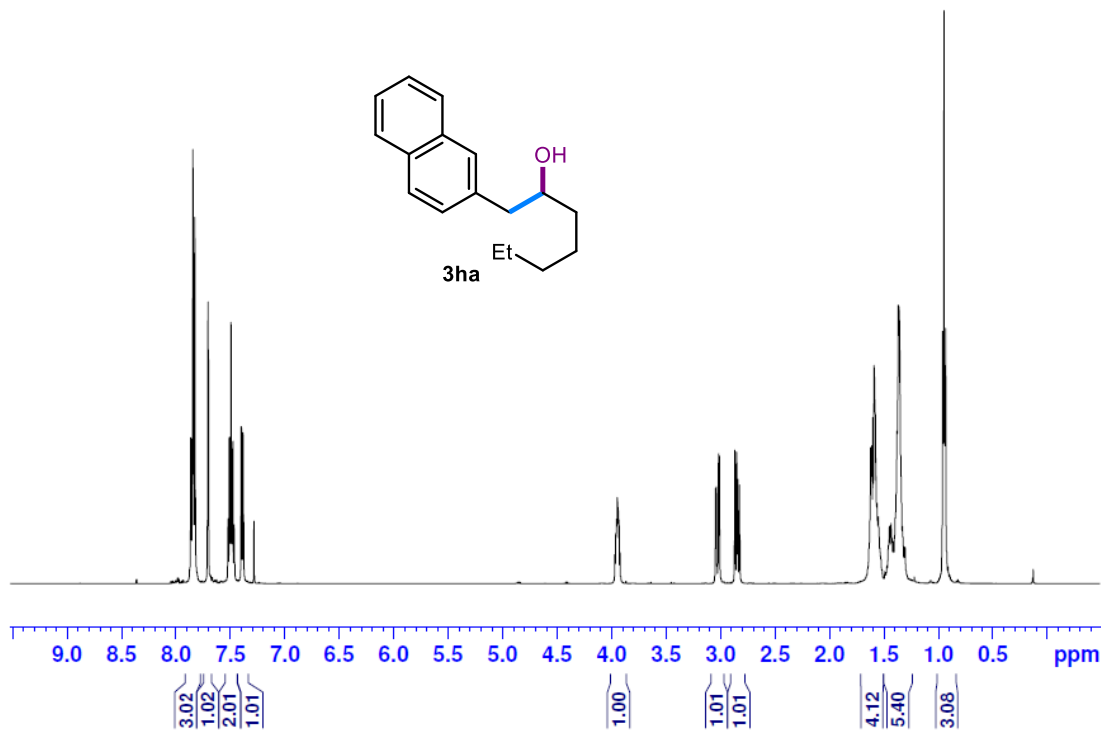
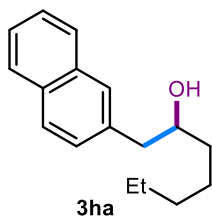
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7.466  
7.401  
7.398  
7.385  
7.382  
7.284  
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3.953  
3.947  
3.939  
3.930  
3.044  
3.036  
3.017  
3.008  
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1.430  
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0.931

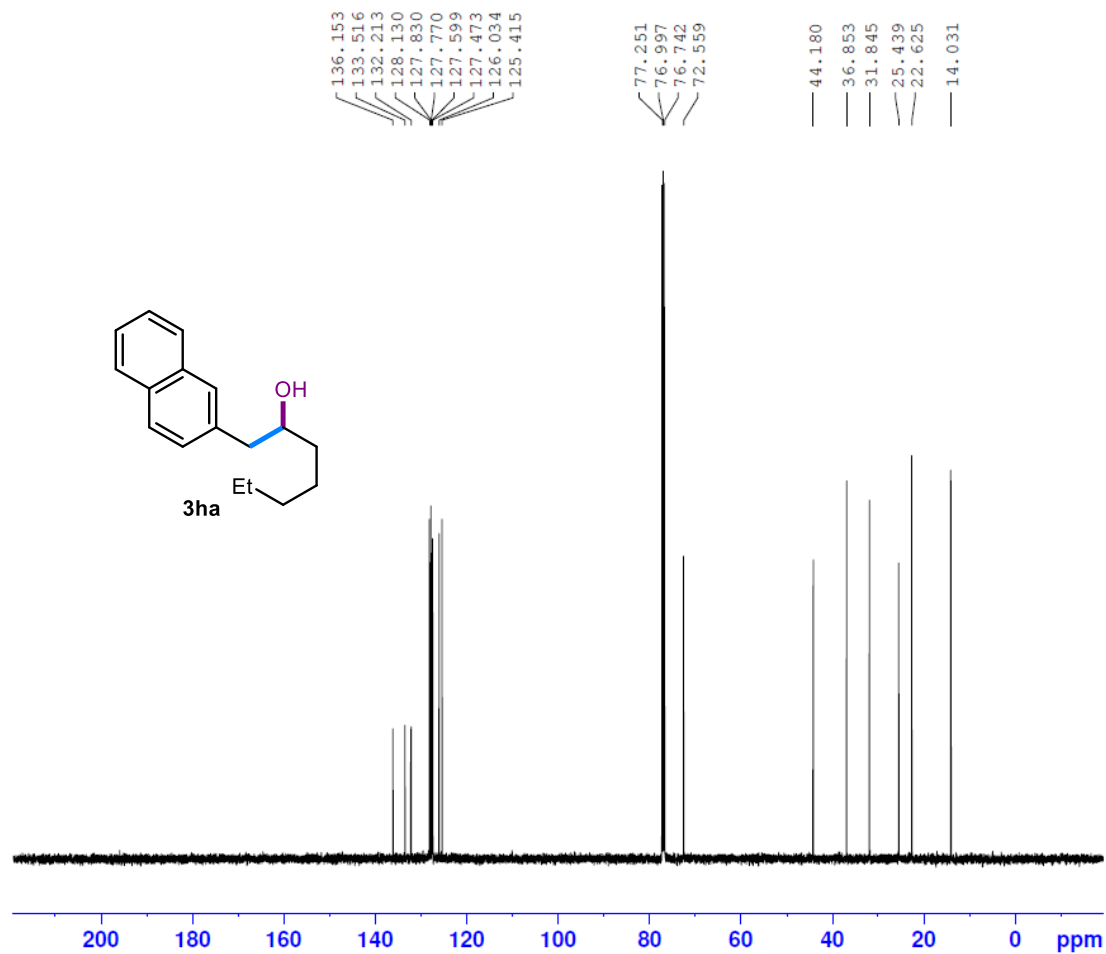


Current Data Parameters  
NAME lcc-2124-product  
EXPNO 1  
PROCNO 1

F2 - Acquisition Parameters  
Date\_ 20200309  
Time 10.49 h  
INSTRUM AVIII500HD  
PROBHD Z119470\_0125 ( )  
PULPROG zg30  
TD 65536  
SOLVENT CDCl3  
NS 4  
DS 2  
SWH 10000.000 Hz  
FIDRES 0.305176 Hz  
AQ 3.2767999 sec  
RG 50.67  
DW 50.000 usec  
DE 13.89 usec  
TE 298.0 K  
D1 1.00000000 sec  
TD0 1  
SFO1 500.3030896 MHz  
NUC1 1H  
P0 3.33 usec  
P1 10.00 usec  
PLW1 21.89999962 W

F2 - Processing parameters  
SI 65536  
SF 500.3000000 MHz  
WDW EM  
SSB 0  
LB 0.30 Hz  
GB 0  
PC 1.00





Current Data Parameters  
 NAME lcc-2124-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200309  
 Time 10.57 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

F2 - Processing parameters  
 SI 32768  
 SF 125.8005434 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40

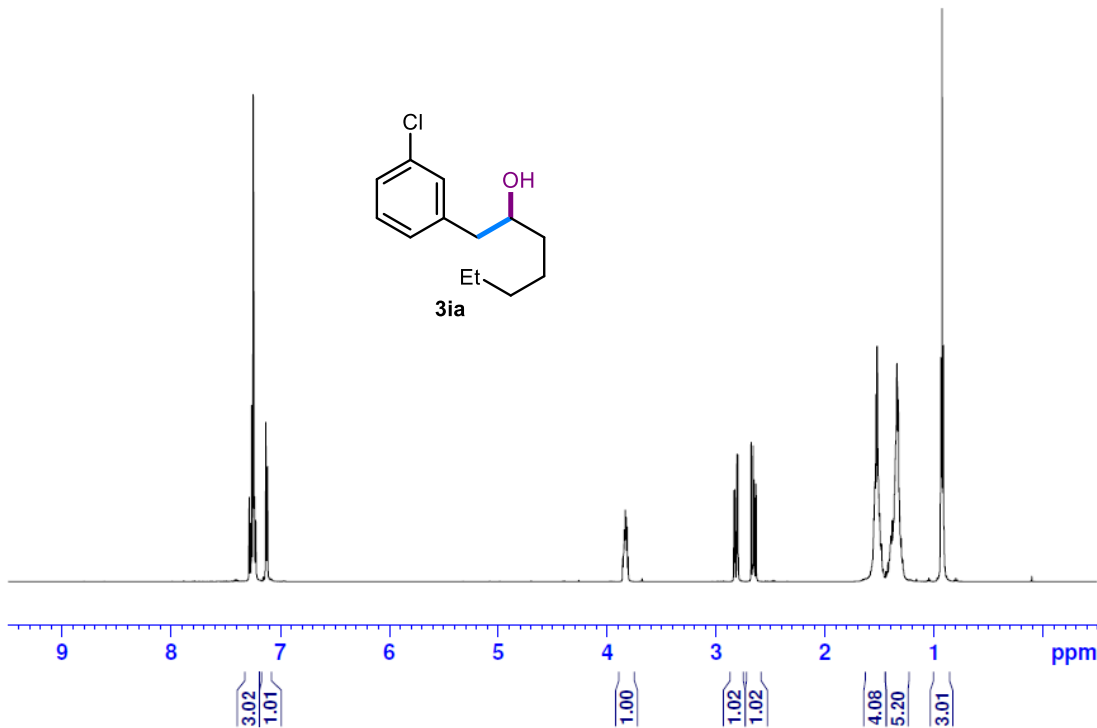
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7.239  
7.235  
7.227  
7.223  
7.133  
7.130  
7.127  
7.119  
7.116  
7.113  
3.840  
3.838  
3.831  
3.823  
3.815  
2.833  
2.825  
2.806  
2.798  
2.676  
2.659  
2.648  
2.631  
1.550  
1.539  
1.530  
1.520  
1.518  
1.503  
1.494  
1.396  
1.383  
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1.374  
1.371  
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1.353  
1.351  
1.347  
1.339  
1.333  
1.331  
1.325  
1.317  
1.310  
0.937  
0.923  
0.917  
0.909

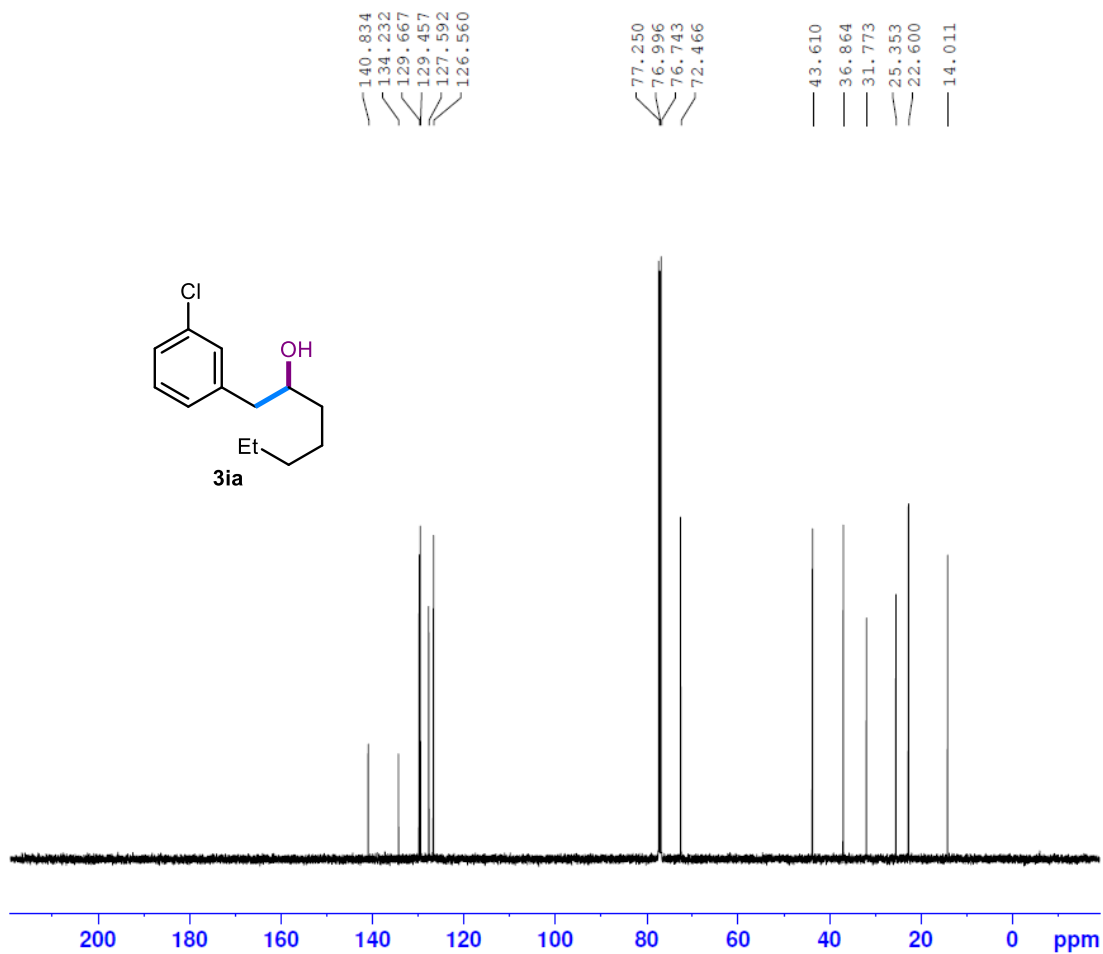
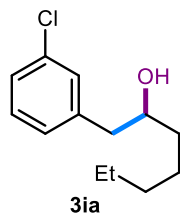


Current Data Parameters  
NAME lcc-2107-product  
EXPNO 1  
PROCNO 1

F2 - Acquisition Parameters  
Date\_ 20200228  
Time 14.08 h  
INSTRUM AVIII500HD  
PROBHD Z119470\_0125 ( )  
PULPROG zg30  
TD 65536  
SOLVENT CDCl3  
NS 4  
DS 2  
SWH 10000.000 Hz  
FIDRES 0.305176 Hz  
AQ 3.2767999 sec  
RG 63.07  
DW 50.000 usec  
DE 13.89 usec  
TE 298.0 K  
D1 1.00000000 sec  
TD0 1  
SFO1 500.3030896 MHz  
NUC1 1H  
P0 3.33 usec  
P1 10.00 usec  
PLW1 21.89999962 W

F2 - Processing parameters  
SI 65536  
SF 500.300000 MHz  
WDW EM  
SSB 0  
LB 0.30 Hz  
GB 0  
PC 1.00

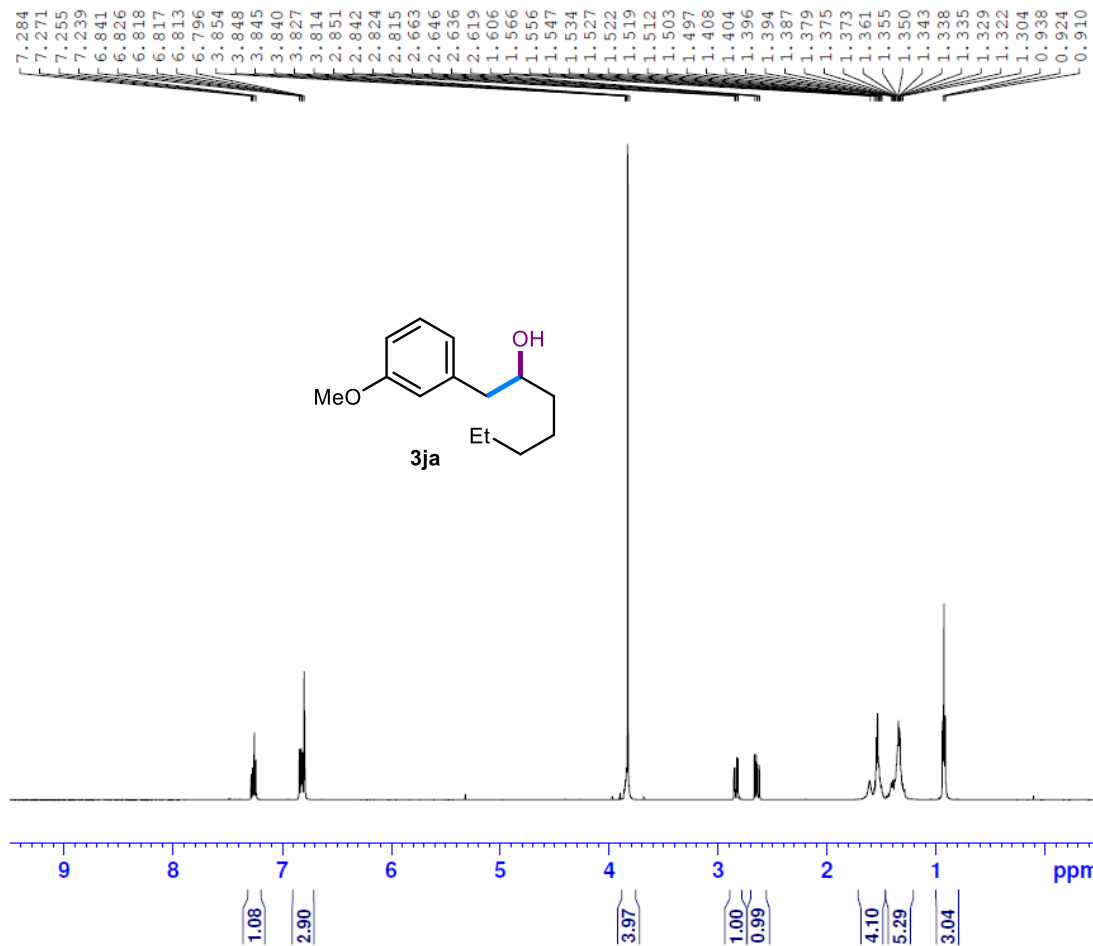




Current Data Parameters  
NAME lcc-2107-product  
EXPNO 2  
PROCNO 1

F2 - Acquisition Parameters  
Date\_ 20200228  
Time 14.15 h  
INSTRUM AVIII500HD  
PROBHD Z119470\_0125 ( )  
PULPROG zgpg30  
TD 65536  
SOLVENT CDCl3  
NS 128  
DS 4  
SWH 30000.000 Hz  
FIDRES 0.915527 Hz  
AQ 1.0922667 sec  
RG 192.72  
DW 16.667 usec  
DE 20.34 usec  
TE 298.0 K  
D1 2.00000000 sec  
D11 0.03000000 sec  
TD0 1  
SF01 125.8131140 MHz  
NUC1 13C  
P0 3.41 usec  
P1 10.23 usec  
PLW1 78.00000000 W  
SF02 500.3020012 MHz  
NUC2 1H  
CPDPRG2 waltz16  
PCPD2 80.00 usec  
PLW2 21.50000000 W  
PLW12 0.57543999 W  
PLW13 0.20446000 W

F2 - Processing parameters  
SI 32768  
SF 125.8005403 MHz  
WDW EM  
SSB 0  
LB 1.00 Hz  
GB 0  
PC 1.40



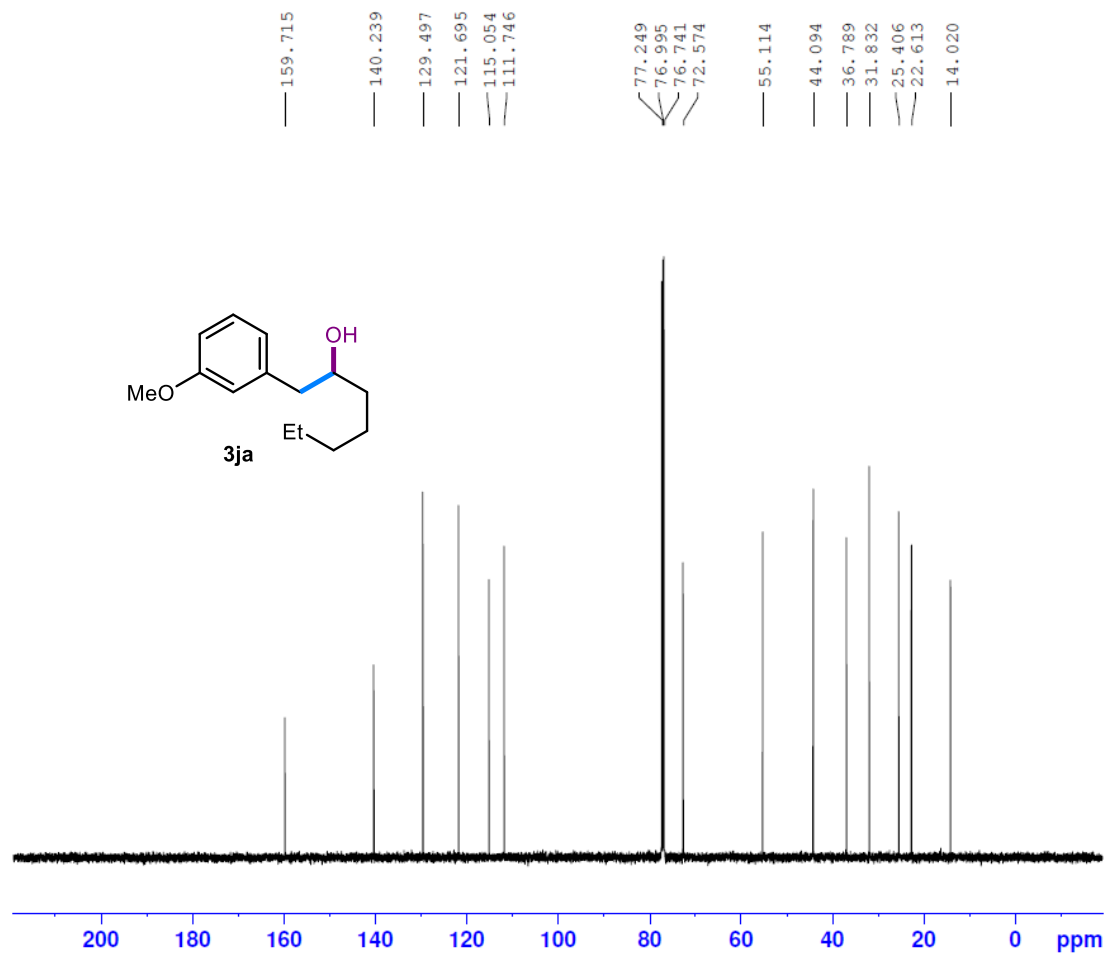
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6.813  
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3.854  
3.848  
3.845  
3.840  
3.827  
3.814  
2.851  
2.842  
2.824  
2.815  
2.663  
2.646  
2.636  
2.619  
1.606  
1.566  
1.556  
1.547  
1.534  
1.527  
1.522  
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1.350  
1.343  
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1.335  
1.329  
1.322  
1.304  
0.938  
0.924  
0.910



Current Data Parameters  
NAME lcc-2136-product  
EXPNO 1  
PROCNO 1

F2 - Acquisition Parameters  
Date\_ 20200313  
Time 8.25 h  
INSTRUM AVIII500HD  
PROBHD Z119470\_0125 ( )  
PULPROG zg30  
TD 65536  
SOLVENT CDCl3  
NS 4  
DS 2  
SWH 10000.000 Hz  
FIDRES 0.305176 Hz  
AQ 3.2767999 sec  
RG 50.67  
DW 50.000 usec  
DE 13.89 usec  
TE 298.0 K  
D1 1.00000000 sec  
TD0 1  
SFO1 500.3030896 MHz  
NUC1 1H  
P0 3.33 usec  
P1 10.00 usec  
PLW1 21.89999962 W

F2 - Processing parameters  
SI 65536  
SF 500.3000000 MHz  
WDW EM  
SSB 0  
LB 0.30 Hz  
GB 0  
PC 1.00



Current Data Parameters  
 NAME lcc-2136-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200313  
 Time 8.33 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

F2 - Processing parameters  
 SI 32768  
 SF 125.8005416 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40

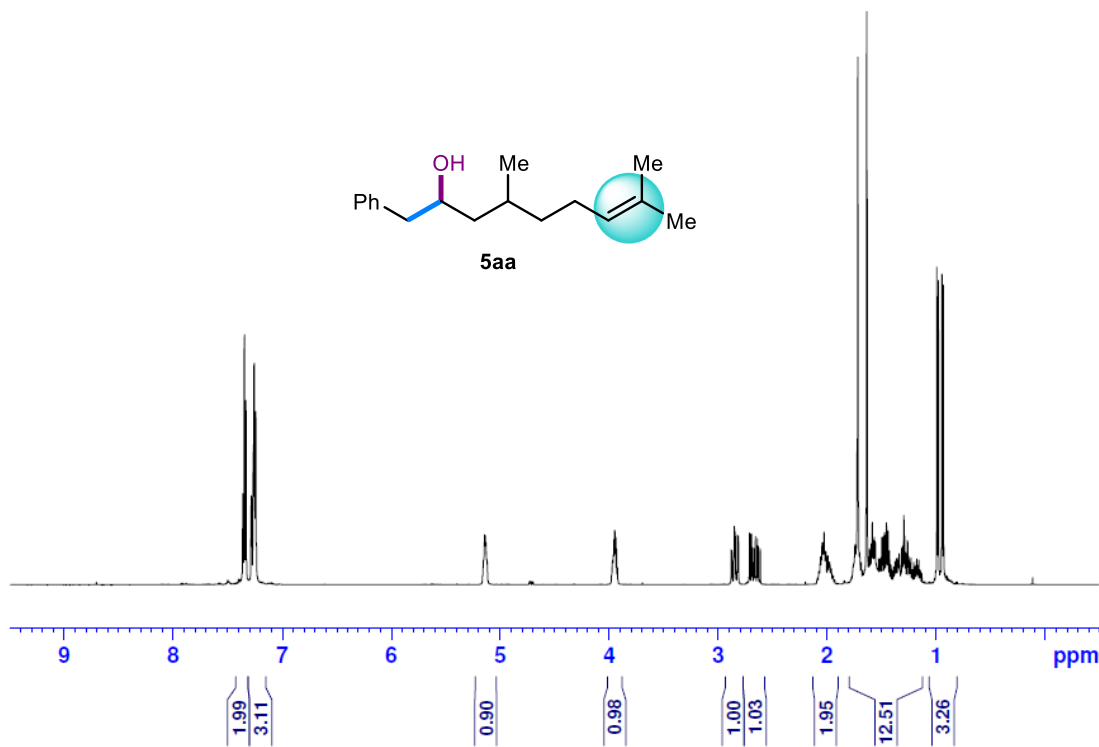
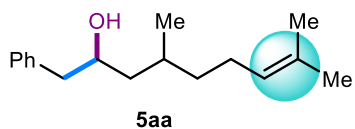
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7.358  
7.346  
7.331  
7.284  
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7.256  
7.249  
7.241  
5.142  
5.139  
5.136  
5.134  
5.131  
5.128  
3.954  
3.947  
3.938  
2.849  
2.842  
2.820  
2.812  
2.709  
2.692  
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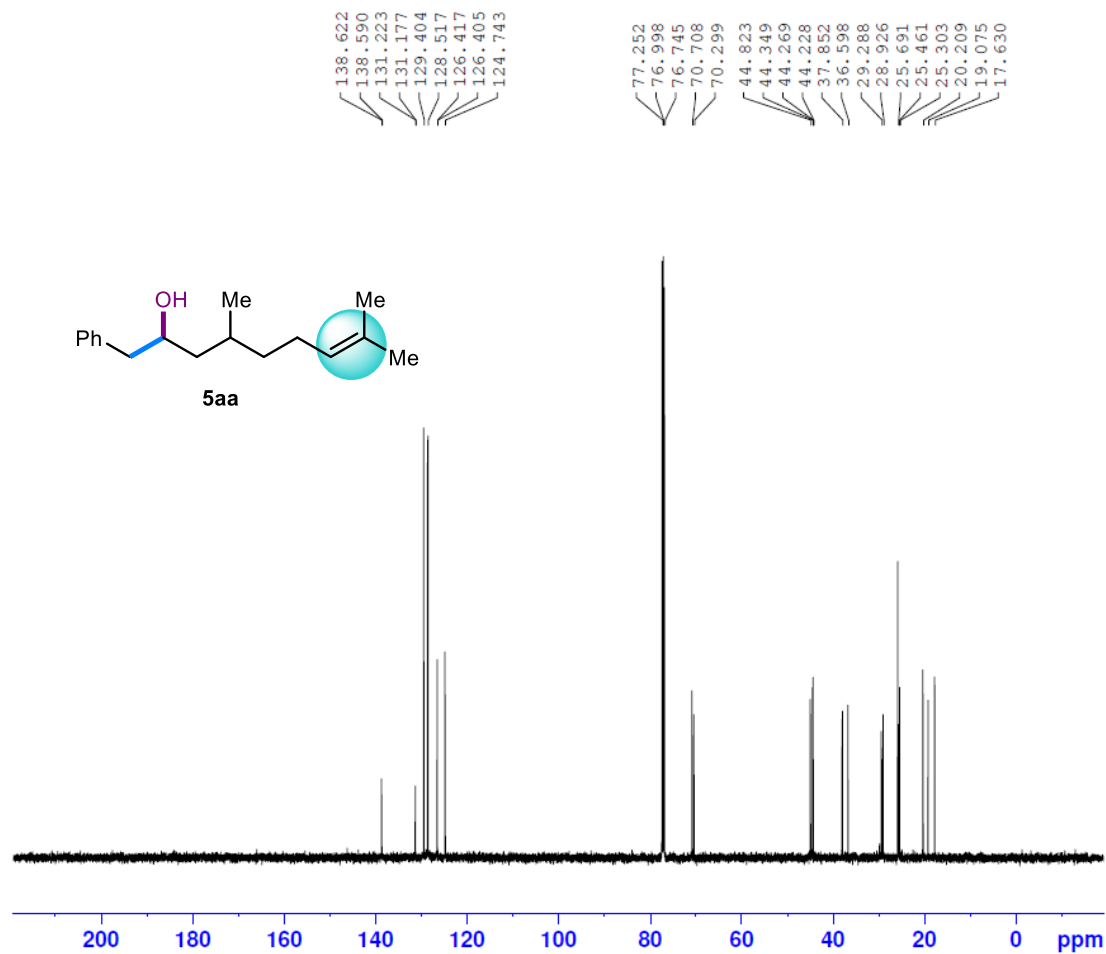


Current Data Parameters  
NAME lcc-1975-product  
EXPNO 1  
PROCNO 1

F2 - Acquisition Parameters  
Date\_ 20191223  
Time 3.22 h  
INSTRUM AVIII500HD  
PROBHD Z119470\_0125 (   
PULPROG zg30  
TD 65536  
SOLVENT CDCl3  
NS 4  
DS 2  
SWH 10000.000 Hz  
FIDRES 0.305176 Hz  
AQ 3.2767999 sec  
RG 44.1  
DW 50.000 usec  
DE 13.89 usec  
TE 298.0 K  
D1 1.00000000 sec  
TD0 1  
SFO1 500.3030896 MHz  
NUC1 1H  
P0 3.33 usec  
P1 10.00 usec  
PLW1 21.89999962 W

F2 - Processing parameters  
SI 65536  
SF 500.3000000 MHz  
WDW EM  
SSB 0  
LB 0.30 Hz  
GB 0  
PC 1.00



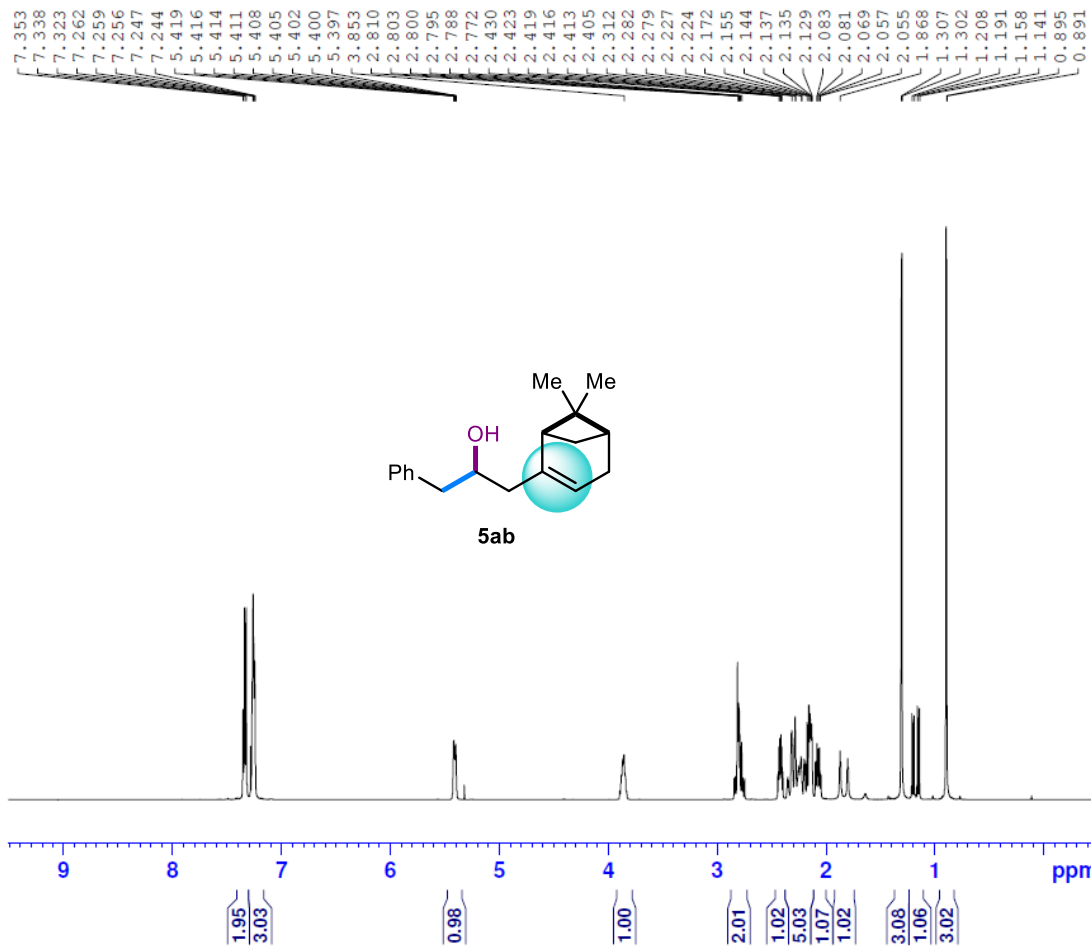


Current Data Parameters  
 NAME lcc-1975-product  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
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 Time 3.29 h  
 INSTRUM AVIII500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.49000001 W  
 PLW13 0.20446000 W

F2 - Processing parameters  
 SI 32768  
 SF 125.8005416 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40

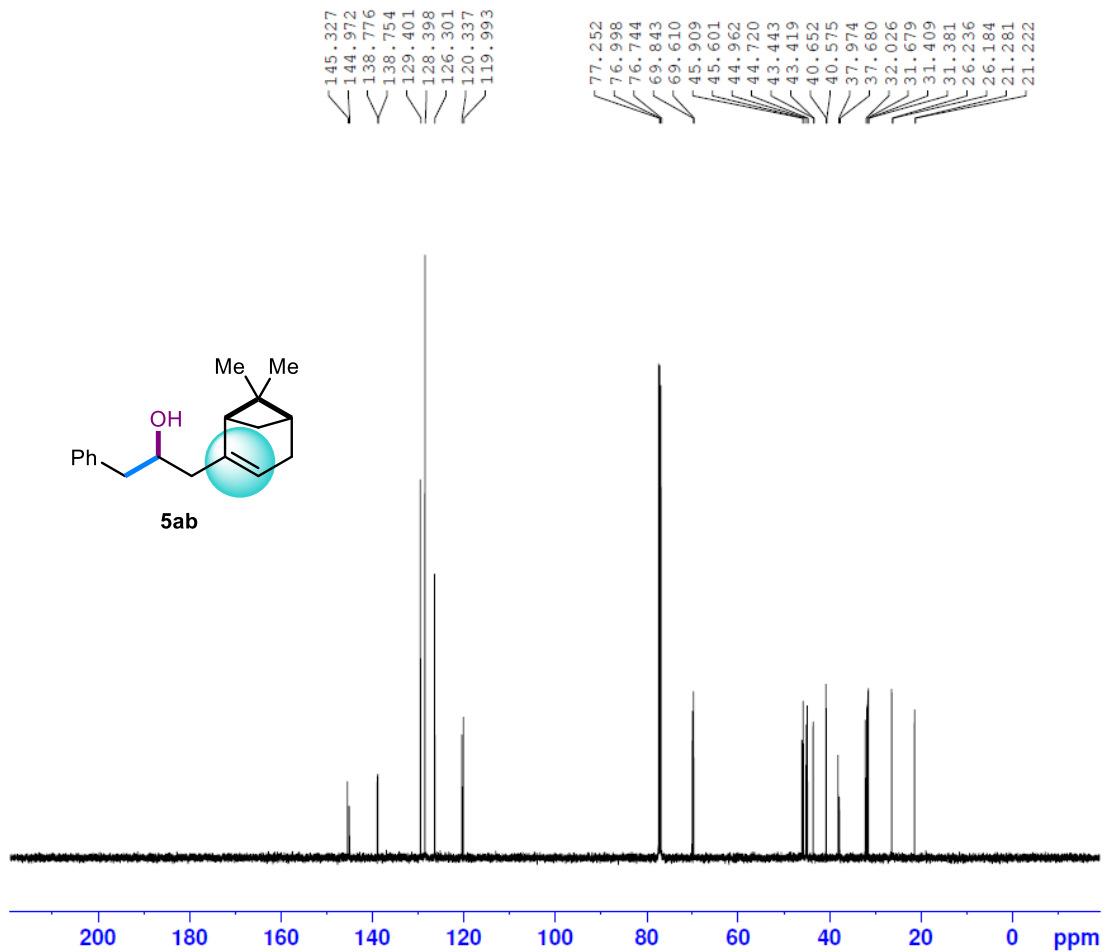
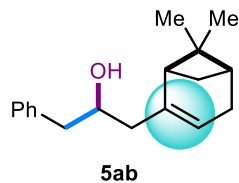




Current Data Parameters  
 NAME lcc-2112-product-5ab  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200229  
 Time 22.44 h  
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 PROBHD Z119470\_0125 ( )  
 PULPROG zg30  
 ID 65536  
 SOLVENT CDCl3  
 NS 4  
 DS 2  
 SWH 10000.000 Hz  
 FIDRES 0.305176 Hz  
 AQ 3.2767999 sec  
 RG 50.67  
 DW 50.000 usec  
 DE 13.89 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TD0 1  
 SFO1 500.3030896 MHz  
 NUC1 1H  
 P0 3.33 usec  
 P1 10.00 usec  
 PLW1 21.899999962 W

F2 - Processing parameters  
 SI 65536  
 SF 500.3000000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00



Current Data Parameters  
 NAME lcc-2112-product-5ab  
 EXPNO 2  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20200229  
 Time 22.52 h  
 INSTRUM AVII1500HD  
 PROBHD Z119470\_0125 ( )  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 128  
 DS 4  
 SWH 30000.000 Hz  
 FIDRES 0.915527 Hz  
 AQ 1.0922667 sec  
 RG 192.72  
 DW 16.667 usec  
 DE 20.34 usec  
 TE 298.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 TD0 1  
 SFO1 125.8131140 MHz  
 NUC1 13C  
 P0 3.41 usec  
 P1 10.23 usec  
 PLW1 78.00000000 W  
 SFO2 500.3020012 MHz  
 NUC2 1H  
 CPDPRG[2] waltz16  
 PCPD2 80.00 usec  
 PLW2 21.50000000 W  
 PLW12 0.57543999 W  
 PLW13 0.20446000 W

F2 - Processing parameters  
 SI 32768  
 SF 125.8005416 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40

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