

## Supporting Information

### Synthesis of fluorinated spiro-1,3-oxazines and thiazines via Selectfluor-mediated intramolecular cyclization

Chinu Gogoi,<sup>1,2</sup> Ujwal Pratim Saikia,<sup>3</sup> Priyam Borah,<sup>1</sup> Trishna Saikia,<sup>1,2</sup> Anamika Bora,<sup>1,2</sup>  
Gaurav K. Rastogi,<sup>1</sup> Pallab Pahari<sup>1,2,\*</sup>

<sup>1</sup>Chemical Science and Technology Division, CSIR-North East Institute of Science and Technology, Jorhat-785006, Assam, India. Email: ppahari@gmail.com, pallab@neist.res.in

<sup>2</sup>Academy of Scientific and Innovative Research (AcSIR), Ghaziabad-201002, India

<sup>3</sup>Department of Chemistry, Sadiya College, Tinsukia-786157, Assam, India

### Table of Contents

Experimental.....	S2
Spectra.....	S14

## Experimental

**General Methods.** Chromatographic separations were performed using silica gel 60-120. Melting points are uncorrected. NMR spectra were recorded in Bruker Avance-III 500 MHz and 400 MHz FTNMR spectrometer using tetramethylsilane (TMS) as an internal standard in the indicated solvent. HRMS data were recorded in a Waters XEVO G2-Xs QToF apparatus.

### **General Procedure for the preparation of N-(2-(cyclohex-1-en-1-yl) ethyl) benzothioamide (6a-6o):**

Benzaldehyde (1 mmol), elemental sulfur (1.2 mmol), amine (1.1 mmol), and sodium sulfide (1.5 mmol) were dissolved in N,N-dimethyl formamide (5 ml). The reaction was allowed to reflux at 100 °C for 1 hour, and then water (5 mL) was added. The reaction was extracted with ethyl acetate (2 x 20 mL) and washed with water (2 x 10 mL), saturated sodium bicarbonate (15 mL), and brine (5 mL). Drying over Na<sub>2</sub>SO<sub>4</sub> and removal of the solvent under reduced pressure produced the crude mixture, which was purified by column chromatography.

### **General procedure for the synthesis of mono-fluorinated spiro-1,3-thiazines (7a-7o):**

To a solution of amide (1 mmol) in dichloromethane (10 mL), Selectfluor (1 mmol) was added portion-wise at 0 °C, and the mixture was stirred at 28 °C for 5 h. after completion, as checked by TLC, water (10 mL) was added, and the solution was extracted with chloroform (2 × 20 mL). The combined organic layer was washed with water (2 × 10 mL) and brine (10 mL). The resultant mixture was then dried over Na<sub>2</sub>SO<sub>4</sub>, and the solvent was removed under reduced pressure. The crude mixture obtained was purified by column chromatography using ethyl acetate: hexane as the eluent.

### **General Procedure for the preparation of N-2-(1-cyclohexenyl) ethyl benzamides (8a-8s):**

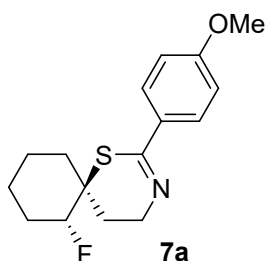
Benzoyl chloride (1 mmol) was dissolved in dry dichloromethane (10 mL). The mixture was cooled in an ice bath, followed by the addition of triethyl amine (2 mmol) and amine (1.2 mmol). The reaction was allowed to stir at room temperature for 2 hours and then water (5 mL) was added. The reaction was extracted with DCM (2 x 10 mL) and washed with saturated sodium bicarbonate (5 mL) and brine (5 mL). Drying over Na<sub>2</sub>SO<sub>4</sub> and removal of the solvent under reduced pressure produced the crude mixture, which was purified by column chromatography.

### **General procedure for the synthesis of mono-fluorinated spiro-1,3-oxazines (9a-9s):**

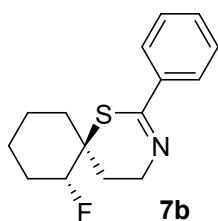
To a cooled solution (-5 °C, generated through ice salt mixture) of amide (1 mmol) in acetonitrile (10 mL), Selectfluor (1 mmol) was added portion-wise. The mixture was then stirred at the same temperature for 1 h. After completion of the reaction, as checked by TLC, acetonitrile was removed under vacuum, and the remaining solution was extracted with ethyl acetate (2 × 20 mL). The combined organic layer was washed with water (2 × 10 mL) and

brine (10 mL). The resulting mixture was then dried over Na<sub>2</sub>SO<sub>4</sub>, and the solvent was removed under reduced pressure. The crude mixture obtained was purified by column chromatography using ethyl acetate: hexane as the eluent.

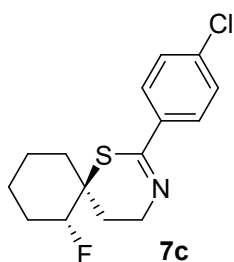
### Spectral Data



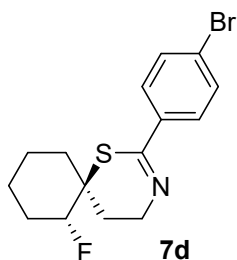
7-fluoro-2-(4-methoxyphenyl)-1-thia-3-azaspiro[5.5]undec-2-ene (**7a**): Colourless semisolid compound; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>): δ 7.73 (d, 2H, *J* = 8.8 Hz), 6.87 (d, 2H, *J* = 8.8 Hz), 4.71 (dt, 1H, *J* = 48.4, 3.6 Hz), 3.96-3.92 (m, 2H), 3.81 (s, 3H), 2.02-1.91 (m, 4H), 1.82-1.79 (m, 1H), 1.72-1.66 (m, 1H), 1.63-1.55 (m, 4H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>): δ 161.5 (C), 156.8 (C), 131.9 (C), 128.0 (CH), 113.6 (CH), 92.2 (d, *J* = 180.1 Hz, CH), 55.5 (CH<sub>3</sub>), 48.4 (d, *J* = 20.5 Hz, C), 45.3 (CH<sub>2</sub>), 34.7 (CH<sub>2</sub>), 29.2 (CH<sub>2</sub>), 26.9 (d, *J* = 21.3 Hz, CH<sub>2</sub>), 20.6 (CH<sub>2</sub>), 19.9 (CH<sub>2</sub>); HRMS (ESI): *m/z* 294.1325 ([M+H]<sup>+</sup> C<sub>16</sub>H<sub>20</sub>FNOS requires 294.1322)



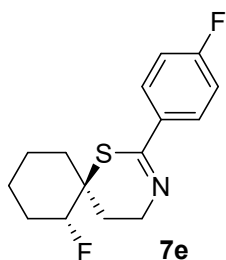
7-fluoro-2-phenyl-1-thia-3-azaspiro[5.5]undec-2-ene (**7b**): Colourless semisolid compound; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>): δ 7.79 - 7.76 (m, 2H), 7.40 - 7.34 (m, 3H), 4.71 (dt, 1H, *J* = 48.8, 2.8 Hz), 3.99 - 3.96 (m, 2H), 2.03 - 1.92 (m, 4H), 1.83 - 1.79 (m, 1H), 1.75 - 1.67 (m, 1H), 1.63 - 1.55 (m, 4H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>): δ 157.5 (C), 139.3 (C), 130.5 (CH), 128.4 (CH), 126.6 (CH), 92.2 (d, *J* = 180.1 Hz, CH), 48.4 (d, *J* = 20.8 Hz, C), 45.5 (CH<sub>2</sub>), 34.7 (CH<sub>2</sub>), 29.1 (CH<sub>2</sub>), 27.0 (d, *J* = 21 Hz, CH<sub>2</sub>), 20.5 (CH<sub>2</sub>), 19.9 (CH<sub>2</sub>) HRMS (ESI): *m/z* 264.1221 ([M+H]<sup>+</sup> C<sub>15</sub>H<sub>18</sub>FNS requires 264.1217)



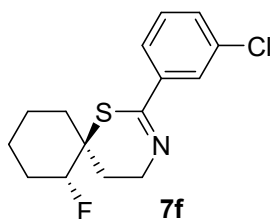
2-(4-chlorophenyl)-7-fluoro-1-thia-3-azaspiro[5.5]undec-2-ene (**7c**): Mp: 65-67 °C; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>): δ 7.72 (d, 2H, *J* = 8.4 Hz), 7.33 (d, 2H, *J* = 8.4 Hz), 4.70 (dt, 1H, *J* = 48.8, 4.0 Hz), 3.98 - 3.95 (m, 2H), 2.03 - 1.92 (m, 4H), 1.82 - 1.79 (m, 1H), 1.74 - 1.67(m, 1H), 1.63 - 1.55 (m, 4H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>): δ 156.4 (C), 137.6 (C), 136.6 (C), 128.6 (CH), 127.9 (CH), 92.1 (d, *J* = 180.7 Hz, CH), 48.6 (d, *J* = 19.0 Hz, C), 45.4 (CH<sub>2</sub>), 34.7 (CH<sub>2</sub>), 28.9 (CH<sub>2</sub>), 26.9 (d, *J* = 21.3 Hz, CH<sub>2</sub>), 20.5 (CH<sub>2</sub>), 19.8 (CH<sub>2</sub>) HRMS (ESI): *m/z* 298.0830 ([M+H] C<sub>15</sub>H<sub>17</sub>ClFNS requires 298.0827 )



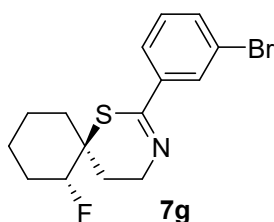
2-(4-bromophenyl)-7-fluoro-1-thia-3-azaspiro[5.5]undec-2-ene (**7d**): Mp: 78-80 °C; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>): δ 7.65 (d, 2H, *J* = 8.8 Hz), 7.49 (d, 2H, *J* = 8.8 Hz), 4.69 (dt, 1H, *J* = 48.8, 2.8 Hz), 3.97-3.94 (m, 2H), 2.04 - 1.51 (m, 10H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>): δ 157.6 (C), 137.7 (C), 131.6 (CH), 128.2 (CH), 125.2 (C), 92.0 (CH, d, *J* = 180.2 Hz), 48.8 (C, d, *J* = 20.9 Hz), 45.2 (CH<sub>2</sub>), 34.7 (CH<sub>2</sub>), 28.8 (CH<sub>2</sub>), 26.9 (CH<sub>2</sub>, d, *J* = 21.1 Hz), 20.5 (CH<sub>2</sub>), 19.8 (CH<sub>2</sub>); HRMS (ESI): *m/z* 342.0323 ([M+H] C<sub>15</sub>H<sub>17</sub>BrFNS requires 342.0323).



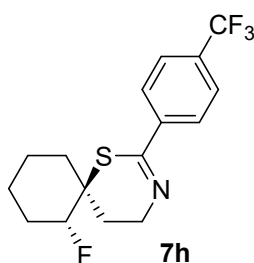
7-fluoro-2-(4-fluorophenyl)-1-thia-3-azaspiro[5.5]undec-2-ene (**7e**): Colourless semisolid compound; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>): δ 7.79 - 7.75 (m, 2H), 7.06 - 7.02 (m, 2H), 4.70 (dt, 1H, *J* = 48.8, 2.8 Hz), 3.97 - 3.94 (m, 2H), 2.03 - 1.97 (m, 2H), 1.95 - 1.90 (m, 2H), 1.83 - 1.79 (m, 1H), 1.74-1.67 (m, 2H) 1.63-1.60 (m, 3H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>): δ 165.6 (C), 163.1 (C), 156.3 (C), 128.6 (CH, d, *J* = 10 Hz), 115.3 (CH, d, *J* = 21 Hz), 92.1 (CH, d, *J* = 181.7 Hz), 48.6 (C, d, *J* = 20.8 Hz), 45.4 (CH<sub>2</sub>), 34.7 (CH<sub>2</sub>), 29.0 (CH<sub>2</sub>), 26.9 (CH<sub>2</sub>, d, *J* = 22 Hz), 20.5 (CH<sub>2</sub>), 19.9 (CH<sub>2</sub>) HRMS (ESI): *m/z* 282.1126 ([M+H] C<sub>15</sub>H<sub>17</sub>F<sub>2</sub>NS requires 282.1123).



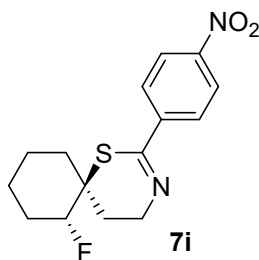
2-(3-chlorophenyl)-7-fluoro-1-thia-3-azaspiro[5.5]undec-2-ene (**7f**): Colourless semisolid compound;  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ):  $\delta$  7.78 (t, 1H,  $J = 2.0$  Hz), 7.65 (dt, 1H,  $J = 8.0, 2.0$  Hz), 7.39 - 7.36 (m, 1H), 7.29 (t, 1H,  $J = 8.0$  Hz), 4.69 (dt, 1H,  $J = 48.4, 3.0$  Hz), 4.00 - 3.96 (m, 2H), 2.04 - 1.54 (m, 10H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ):  $\delta$  156.2 (C), 140.9 (C), 134.5 (C), 130.5 (CH), 129.6 (CH), 126.8 (CH), 124.7 (CH), 92.1 (CH, d,  $J = 180.4$  Hz), 48.7 (C, d,  $J = 21.0$  Hz), 45.5 ( $\text{CH}_2$ ), 34.7 ( $\text{CH}_2$ ), 28.9 ( $\text{CH}_2$ , d,  $J = 3.8$  Hz), 26.9 ( $\text{CH}_2$ , d,  $J = 21.2$  Hz), 20.5 ( $\text{CH}_2$ ), 19.8 ( $\text{CH}_2$ ) HRMS (ESI):  $m/z$  298.0830 ( $[\text{M}+\text{H}]$   $\text{C}_{15}\text{H}_{17}\text{ClFNS}$  requires 298.0827)



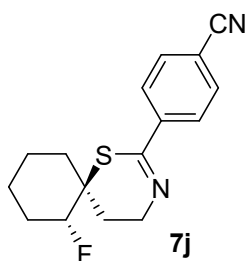
2-(3-bromophenyl)-7-fluoro-1-thia-3-azaspiro[5.5]undec-2-ene (**7g**): Colourless semisolid compound;  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ):  $\delta$  7.93 (t, 1H,  $J = 1.6$  Hz), 7.70 (dt, 1H,  $J = 8.0, 1.6$  Hz), 7.54 - 7.51 (m, 1H), 7.23 (t, 1H,  $J = 8.0$  Hz), 4.69 (dt, 1H,  $J = 48.8, 3.6$  Hz), 3.99 - 3.96 (m, 2H), 2.04 - 1.90 (m, 4H), 1.82 - 1.78 (m, 1H), 1.74 - 1.67 (m, 1H), 1.63-1.60 (m, 4H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ):  $\delta$  155.9 (C), 141.1 (C), 133.4 (CH), 129.9 (CH), 129.6 (CH), 125.2 (CH), 122.6 (C), 92.1 (CH, d,  $J = 180.2$  Hz), 48.7 (C, d,  $J = 23.1$  Hz), 45.5 ( $\text{CH}_2$ ), 34.7 ( $\text{CH}_2$ ), 28.9 ( $\text{CH}_2$ , d,  $J = 3.8$  Hz), 26.9 ( $\text{CH}_2$ , d,  $J = 21.2$  Hz), 20.5 ( $\text{CH}_2$ ), 19.8 ( $\text{CH}_2$ ) HRMS (ESI):  $m/z$  342.0322 ( $[\text{M}+\text{H}]$   $\text{C}_{15}\text{H}_{17}\text{BrFNS}$  requires 342.0322)



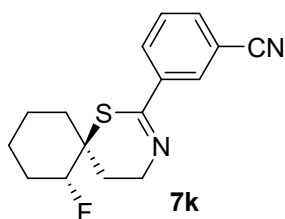
7-fluoro-2-(4-(trifluoromethyl)phenyl)-1-thia-3-azaspiro[5.5]undec-2-ene (**7h**): Mp: 72-74 °C;  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ):  $\delta$  7.90 (d, 2H,  $J = 8.0$  Hz), 7.63 (d, 2H,  $J = 8.0$  Hz), 4.72 (dt, 1H,  $J = 48.8, 2.8$  Hz), 4.04 - 3.96 (m, 2H), 2.08 - 1.52 (m, 10H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ):  $\delta$  156.2 (C), 142.3 (C), 132.2 ( $\text{CF}_3$ , q,  $J = 32.4$  Hz), 128.7 (C), 127.0 (CH), 125.4 (CH, q,  $J = 4.0$  Hz), 92.1 (CH, d,  $J = 180.6$  Hz), 48.7 (C, d,  $J = 21.0$  Hz), 45.6 ( $\text{CH}_2$ ), 34.7 ( $\text{CH}_2$ ), 28.8 ( $\text{CH}_2$ , d,  $J = 3.8$  Hz), 26.9 (CH, d,  $J = 21.1$  Hz), 20.5 ( $\text{CH}_2$ ), 19.8 ( $\text{CH}_2$ ); HRMS (ESI):  $m/z$  332.1093 ( $[\text{M}+\text{H}]$   $\text{C}_{16}\text{H}_{17}\text{F}_4\text{NS}$  requires 332.1091)



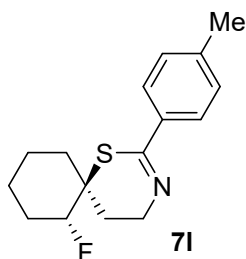
7-fluoro-2-(4-nitrophenyl)-1-thia-3-azaspiro[5.5]undec-2-ene (**7i**): Mp: 90-92 °C; <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>): δ 8.23 (d, 2H, *J* = 9.0 Hz), 7.95 (d, 2H, *J* = 9.0 Hz), 4.71 (dt, 1H, *J* = 48.0, 3.0 Hz), 4.05 - 4.03 (m, 2H), 2.01 - 1.92 (m, 3H), 1.85 - 1.81 (m, 1H), 1.78 - 1.72 (m, 1H), 1.66 - 1.58 (m, 5H); <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>): δ 155.4 (C), 148.9 (C), 144.4 (C), 127.4 (CH), 123.4 (CH), 91.8 (CH, *d*, *J* = 178.5 Hz), 48.8 (C, *d*, *J* = 22.1 Hz), 45.6 (CH<sub>2</sub>), 34.5 (CH<sub>2</sub>), 29.6 (CH<sub>2</sub>), 26.8 (CH<sub>2</sub>, *d*, *J* = 21.1 Hz), 20.3 (CH<sub>2</sub>), 19.7 (CH<sub>2</sub>) HRMS (ESI): *m/z* 309.1071 ([M+H] C<sub>15</sub>H<sub>17</sub>FN<sub>2</sub>O<sub>2</sub>S requires 309.1068)



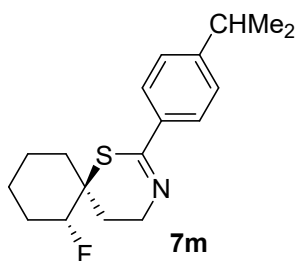
4-(7-fluoro-1-thia-3-azaspiro[5.5]undec-2-en-2-yl)benzonitrile (**7j**): Mp: 105-107 °C ; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>): δ 7.89 (d, *J* = 2H, 8.4 Hz), 7.66 (d, 2H, *J* = 8.4 Hz), 4.68 (dt, 1H, *J* = 48.8, 4.0 Hz), 4.02-3.99 (m, 2H), 2.06-1.93 (m, 4H), 1.83-1.78 (m, 1H), 1.74-1.68 (m, 1H), 1.63-1.57 (m, 4H); <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>): δ 155.8 (C), 142.7 (C), 132.0 (CH), 127.0 (CH), 118.3 (C), 113.7 (C), 91.8 (CH, *d*, *J* = 180.9 Hz), 48.7 (C, *d*, *J* = 20.8 Hz), 45.5 (CH<sub>2</sub>), 34.5 (CH<sub>2</sub>), 28.5(CH<sub>2</sub>), 26.7 (CH<sub>2</sub>, *d*, *J* = 21.1 Hz), 20.3 (CH<sub>2</sub>), 19.7 (CH<sub>2</sub>); HRMS (ESI): *m/z* 289.1172 ([M+H] C<sub>16</sub>H<sub>17</sub>FN<sub>2</sub>S requires 289.1169).



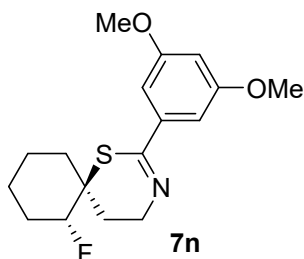
3-(7-fluoro-1-thia-3-azaspiro[5.5]undec-2-en-2-yl)benzonitrile (**7k**): Colourless semisolid compound; <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>): δ 8.11 (t, 1H, *J* = 1.5 Hz), 8.03 (dt, 1H, *J* = 8.0, 1.5 Hz), 7.70 (dt, 1H, *J* = 8.0, 1.5 Hz), 7.50 (t, 1H, *J* = 8.0 Hz), 4.71 (dt, 1H, *J* = 49.5, 2.5 Hz), 4.02-4.00 (m, 2H), 2.07-1.94 (m, 4H), 1.84-1.81 (m, 1H), 1.77-1.71 (m, 1H), 1.64-1.57 (m, 4H); <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>): δ 155.2 (C), 140.0 (C), 133.5 (CH), 130.6 (CH), 130.2 (CH), 129.1 (CH), 118.3 (C), 112.5 (C), 91.8 (CH, *d*, *J* = 181.2 Hz), 48.7 (C, *d*, *J* = 20.9 Hz), 45.4 (CH<sub>2</sub>), 34.5 (CH<sub>2</sub>), 28.5 (CH<sub>2</sub>, *d*, *J* = 20.9 Hz), 26.7 (CH<sub>2</sub>, *d*, *J* = 21.1 Hz), 20.3 (CH<sub>2</sub>), 19.7 (CH<sub>2</sub>); HRMS (ESI): *m/z* 289.1172 ([M+H] C<sub>16</sub>H<sub>17</sub>FN<sub>2</sub>S requires 289.1169).



7-fluoro-2-(p-tolyl)-1-thia-3-azaspiro[5.5]undec-2-ene (**7l**): Colourless semisolid compound;  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ):  $\delta$  7.61 (d, 2H,  $J = 6.5$  Hz), 7.11 (d, 2H,  $J = 6.5$  Hz), 4.65 (dt, 1H,  $J = 49.0, 2.5$  Hz), 3.93-3.87 (m, 2H), 2.30 (s, 3H), 2.00-1.45 (m, 10H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ):  $\delta$  157.3 (C), 140.7 (C), 136.5 (C), 129.1 (CH), 126.4 (CH), 92.2 (CH, d,  $J = 180.2$  Hz), 48.4 (C, d,  $J = 21.0$  Hz), 45.3 ( $\text{CH}_2$ ), 34.7 ( $\text{CH}_2$ ), 29.1 ( $\text{CH}_2$ , d,  $J = 3.8$  Hz), 26.9 ( $\text{CH}_2$ , d,  $J = 21.1$  Hz), 21.4 ( $\text{CH}_3$ ), 20.5 ( $\text{CH}_2$ ), 19.9 ( $\text{CH}_2$ ); HRMS (ESI):  $m/z$  278.1375 ([ $\text{M}+\text{H}$ ]  $\text{C}_{16}\text{H}_{20}\text{FNS}$  requires 278.1373)

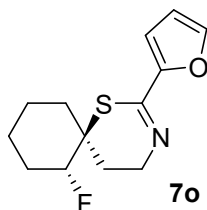


7-fluoro-2-(4-isopropylphenyl)-1-thia-3-azaspiro[5.5]undec-2-ene (**7m**): Colourless semisolid compound;  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ):  $\delta$  7.60 (d, 2H,  $J = 8.5$  Hz), 7.17 (d, 2H,  $J = 8.5$  Hz), 4.67 (dt, 1H,  $J = 48.5, 3.5$  Hz), 3.92-3.90 (m, 2H), 2.86 (septet, 1H,  $J = 7.0$  Hz), 1.97-1.88 (m, 4H), 1.79-1.75 (m, 1H), 1.69-1.63 (m, 1H), 1.58-1.56 (m, 4H), 1.19 (d,  $J = 7$  Hz, 6H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ):  $\delta$  157.0 (C), 154.4 (C), 136.7 (C), 126.3 (CH), 126.3 (CH), 92.0 (CH, d,  $J = 180.0$  Hz), 48.1 (C, d,  $J = 20.8$  Hz), 45.2 ( $\text{CH}_2$ ), 34.5 ( $\text{CH}_2$ ), 33.9 ( $\text{CH}_2$ ), 29.0 (CH), 26.7 ( $\text{CH}_2$ , d,  $J = 21.5$  Hz), 23.7 ( $\text{CH}_3$ ), 20.4 ( $\text{CH}_2$ ), 19.7 ( $\text{CH}_2$ ); HRMS (ESI):  $m/z$  306.1688 ([ $\text{M}+\text{H}$ ]  $\text{C}_{18}\text{H}_{24}\text{FNS}$  requires 306.1686)

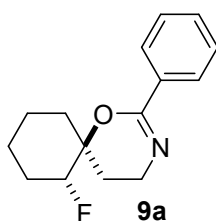


2-(3,5-dimethoxyphenyl)-7-fluoro-1-thia-3-azaspiro[5.5]undec-2-ene (**7n**): Colourless semisolid compound;  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ):  $\delta$  6.93 (d, 2H,  $J = 2.4$  Hz), 6.50 (t, 1H,  $J = 2.4$  Hz), 4.70 (dt, 1H,  $J = 48.8, 3.6$  Hz), 3.97-3.94 (m, 2H), 3.80 (s, 6H), 2.03-1.92 (m, 4H), 1.82-1.78 (m, 1H), 1.73-1.66 (m, 1H), 1.61-1.53 (m, 4H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ):  $\delta$  160.7 (C), 157.4 (C), 141.3 (C), 104.5 (CH), 103.0 (CH), 92.1 (CH, d,  $J = 180.1$  Hz), 55.6 ( $\text{CH}_3$ ), 48.5 (C, d,  $J = 20.6$  Hz), 45.4 ( $\text{CH}_2$ ), 34.7 ( $\text{CH}_2$ ), 29.1 ( $\text{CH}_2$ , d,  $J = 3.8$  Hz), 26.9 ( $\text{CH}_2$ ,

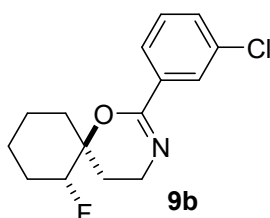
d,  $J = 21.3$  Hz), 20.5 (CH<sub>2</sub>), 19.8 (CH<sub>2</sub>); HRMS (ESI):  $m/z$  324.1430 ([M+H] C<sub>17</sub>H<sub>22</sub>FNO<sub>2</sub>S requires 324.1428).



7-fluoro-2-(furan-2-yl)-1-thia-3-azaspiro[5.5]undec-2-ene (**7o**): Reddish brown semisolid compound; <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>):  $\delta$  7.46 (d, 1H,  $J = 1.2$  Hz), 6.82 (dd, 1H,  $J = 3.6, 1.2$  Hz), 6.42 (dd, 1H,  $J = 3.6, 2.0$  Hz), 4.68 (d, 1H,  $J = 48.4, 2.4$  Hz), 3.98-3.93 (m, 2H), 2.05-1.96 (m, 2H), 1.93-1.88 (m, 2H), 1.82-1.68 (m, 2H), 1.61-1.56 (m, 4H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>):  $\delta$  151.2 (C), 148.0 (C), 144.2 (CH), 111.4 (CH), 110.8 (CH), 91.9 (CH, d,  $J = 180.3$  Hz), 48.1 (C, d,  $J = 21.1$  Hz), 44.9 (CH<sub>2</sub>), 34.6 (CH<sub>2</sub>), 29.4 (CH<sub>2</sub>), 26.9 (CH<sub>2</sub>, d,  $J = 21.6$  Hz), 20.5 (CH<sub>2</sub>), 19.8 (CH<sub>2</sub>); HRMS (ESI):  $m/z$  254.1012 ([M+H] C<sub>13</sub>H<sub>16</sub>FNOS requires 254.1009).



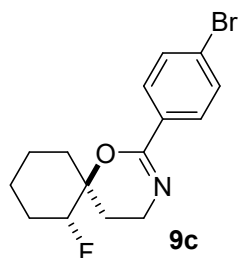
7-Fluoro-2-phenyl-1-oxa-3-azaspiro[5.5]undec-2-ene (**9a**): Mp: 125-127 °C; <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>):  $\delta$  7.94 (d, 2H,  $J = 8.5$  Hz), 7.46-7.35 (m, 3H), 4.59 (dt, 1H,  $J = 48.5, 4.5$  Hz), 3.74-3.55 (m, 2H), 2.07-1.50 (m, 10H); <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>):  $\delta$  154.4 (C), 133.9 (C), 130.3 (CH), 128.0 (CH), 126.8 (CH), 90.8 (CH, d,  $J = 175.4$  Hz), 74.9 (C, d,  $J = 23.7$  Hz), 39.6 (CH<sub>2</sub>), 31.9 (CH<sub>2</sub>), 27.1 (CH<sub>2</sub>, d,  $J = 20.0$  Hz), 26.9 (CH<sub>2</sub>), 20.3 (CH<sub>2</sub>), 20.0 (CH<sub>2</sub>); HRMS (ESI):  $m/z$  248.1454 ([M+H] C<sub>15</sub>H<sub>19</sub>FNO requires 248.1451).



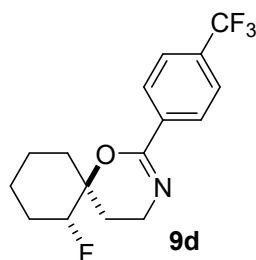
2-(3-Chlorophenyl)-7-fluoro-1-oxa-3-azaspiro[5.5]undec-2-ene (**9b**): Mp: 85-87 °C; <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>):  $\delta$  7.87 (s, 1H), 7.78 (d, 1H,  $J = 8.0$  Hz), 7.38 (d, 1H,  $J = 8.0$  Hz), 7.29 (t, 1H,  $J = 8.0$  Hz), 4.55 (d, 1H,  $J = 48.0$  Hz), 3.70-3.52 (m, 2H), 2.00-1.50 (m, 10H); <sup>13</sup>C NMR



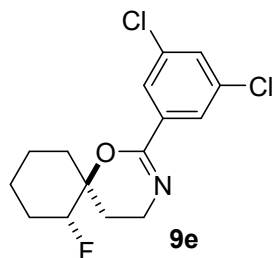
(125 MHz, CDCl<sub>3</sub>):  $\delta$  153.7 (C), 136.0 (C), 134.4 (C), 130.6 (CH), 129.5 (CH), 127.3 (CH), 125.2 (CH), 91.2 (CH, d,  $J$  = 176.2 Hz), 75.8 (C, d,  $J$  = 23.7 Hz), 40.0 (CH<sub>2</sub>), 32.3 (CH<sub>2</sub>), 27.5 (CH<sub>2</sub>, d,  $J$  = 20.0 Hz), 26.8 (CH<sub>2</sub>), 20.7 (CH<sub>2</sub>), 20.4 (CH<sub>2</sub>); HRMS (ESI):  $m/z$  282.1059 ([M+H] C<sub>15</sub>H<sub>18</sub>ClFNO requires 282.1061).



2-(4-Bromophenyl)-7-fluoro-1-oxa-3-azaspiro[5.5]undec-2-ene (**9c**): Mp: 136-138 °C; <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>):  $\delta$  7.77 (d, 2H,  $J$  = 8.5 Hz), 7.51 (d, 2H,  $J$  = 8.5 Hz), 4.56 (dt, 1H,  $J$  = 48.5, 4.0 Hz), 3.70-3.54 (m, 2H), 2.05-1.52 (m, 10H); <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>):  $\delta$  153.8 (C), 132.8 (C), 131.2 (CH), 128.4 (CH), 124.9 (C), 90.9 (CH, d,  $J$  = 176.2 Hz), 75.4 (C, d,  $J$  = 23.7 Hz), 39.6 (CH<sub>2</sub>), 32.0 (CH<sub>2</sub>), 27.2 (CH<sub>2</sub>, d,  $J$  = 20.0 Hz), 26.6 (CH<sub>2</sub>), 20.4 (CH<sub>2</sub>), 20.0 (CH<sub>2</sub>); HRMS (ESI)  $m/z$  326.0558 ([M+H] C<sub>15</sub>H<sub>18</sub>BrFNO requires 326.0556).

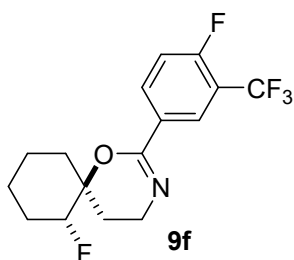


7-Fluoro-2-(4-(trifluoromethyl)phenyl)-1-oxa-3-azaspiro[5.5]undec-2-ene (**9d**): Mp: 150-152 °C; <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>):  $\delta$  8.00 (d, 2H,  $J$  = 8.5 Hz), 7.61 (d, 2H,  $J$  = 8.5 Hz), 4.55 (dt, 1H,  $J$  = 49.0, 4.0 Hz), 3.70-3.55 (m, 2H), 2.10-1.50 (m, 10H); <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>):  $\delta$  153.7 (C), 137.5 (C), 132.3 (CF<sub>3</sub>, q,  $J$  = 32.5 Hz), 127.4 (CH), 125.3 (CH), 123.1 (C), 91.2 (CH, d,  $J$  = 176.2 Hz), 75.9 (C, d,  $J$  = 23.7 Hz), 40.0 (CH<sub>2</sub>), 32.3 (CH<sub>2</sub>), 27.5 (CH<sub>2</sub>, d,  $J$  = 20.0 Hz), 26.8 (CH<sub>2</sub>), 20.7 (CH<sub>2</sub>), 20.4 (CH<sub>2</sub>); HRMS (ESI):  $m/z$  316.1324 ([M+H] C<sub>16</sub>H<sub>18</sub>F<sub>4</sub>NO requires 316.1325).

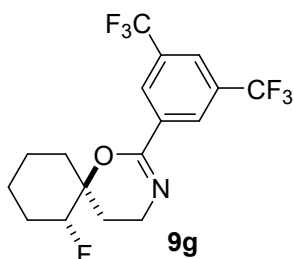


2-(3,5-Dichlorophenyl)-7-fluoro-1-oxa-3-azaspiro[5.5]undec-2-ene (**9e**): Mp: 88-90 °C; <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>):  $\delta$  7.74 (s, 2H), 7.37 (s, 1H), 4.52 (dt, 1H,  $J$  = 48.0, 4.0 Hz), 3.68-3.51 (m, 2H), 2.03-1.45 (m, 10H); <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>):  $\delta$  152.6 (C), 137.1 (C), 135.0 (C), 130.4 (CH), 125.6 (CH), 91.3 (CH, d,  $J$  = 176.2 Hz), 76.3 (C, d,  $J$  = 23.7 Hz), 40.0

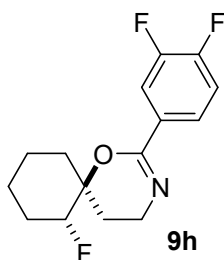
(CH<sub>2</sub>), 32.3 (CH<sub>2</sub>), 27.5 (CH<sub>2</sub>, d, *J* = 18.7 Hz), 26.4 (CH<sub>2</sub>), 20.7 (CH<sub>2</sub>), 20.5 (CH<sub>2</sub>); HRMS (ESI): *m/z* 316.0669 ([M+H] C<sub>15</sub>H<sub>17</sub>Cl<sub>2</sub>FNO requires 316.0671).



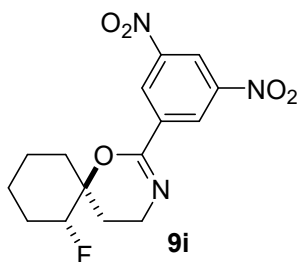
7-Fluoro-2-(4-fluoro-3-(trifluoromethyl)phenyl)-1-oxa-3-azaspiro[5.5]undec-2-ene (**9f**): Mp: 155-157 °C; <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>): δ 8.16 (dd, 1H, *J* = 7.0, 1.5 Hz), 8.09-8.05 (m, 1H), 7.17 (t, 1H, *J* = 9.0 Hz), 4.55 (dt, 1H, *J* = 48.0, 4.0 Hz), 3.69-3.51 (m, 2H), 2.05-1.50 (m, 10H); <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>): δ 161.2 (C, d, *J* = 256.5 Hz), 152.9 (C), 132.6 (CH, d, *J* = 9.0 Hz), 130.6 (C), 126.3 (CH), 121.5 (C), 118.4 (CF<sub>3</sub>, q, *J* = 20.0 Hz), 116.8 (CH, d, *J* = 21.0 Hz), 91.4 (CH, d, *J* = 176.2 Hz), 76.3 (C, d, *J* = 22.5 Hz), 39.9 (CH<sub>2</sub>), 32.4 (CH<sub>2</sub>), 27.5 (CH<sub>2</sub>, d, *J* = 18.7 Hz), 26.4 (CH<sub>2</sub>), 20.8 (CH<sub>2</sub>), 20.5 (CH<sub>2</sub>); HRMS (ESI): *m/z* 334.1226 ([M+H] C<sub>16</sub>H<sub>17</sub>F<sub>5</sub>NO requires 334.1230).



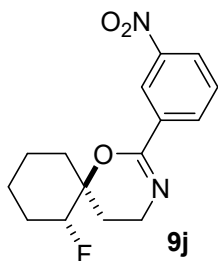
2-(3,5-bis(trifluoromethyl)phenyl)-7-fluoro-1-oxa-3-azaspiro[5.5]undec-2-ene (**9g**): Mp: 148-150 °C; <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>): δ 8.34 (s, 2H), 7.90 (s, 1H), 4.58 (dt, 1H, *J* = 49.0, 4.5 Hz), 3.70-3.55 (m, 2H), 2.10-1.45 (m, 10H); <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>): δ 152.5 (C), 136.3 (C), 131.7 (CF<sub>3</sub>, q, *J* = 33.7 Hz), 127.3 (CH), 124.5 (C), 124.0 (CH), 91.6 (CH, d, *J* = 177.5 Hz), 76.9 (C, d, *J* = 23.7 Hz), 40.1 (CH<sub>2</sub>), 32.6 (CH<sub>2</sub>), 27.7 (CH<sub>2</sub>, d, *J* = 18.7 Hz), 26.1 (CH<sub>2</sub>), 20.9 (CH<sub>2</sub>), 20.7 (CH<sub>2</sub>); HRMS (ESI): *m/z* 384.1195 ([M+H] C<sub>17</sub>H<sub>17</sub>F<sub>7</sub>NO requires 384.1198).



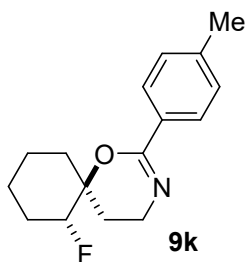
2-(3,4-Difluorophenyl)-7-fluoro-1-oxa-3-azaspiro[5.5]undec-2-ene (**9h**): Mp: 145-147 °C; <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>): δ 7.72-7.62 (m, 2H), 7.16-7.05 (m, 1H), 4.53 (dt, 1H, *J* = 48.0, 4.0 Hz), 3.66-3.51 (m, 2H), 2.01-1.50 (m, 10H); <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>): δ 153.1 (C, *d*, *J* = 13.7 Hz), 150.2 (C, *d*, *J* = 246.2 Hz), 150.1 (C, *d*, *J* = 246.2 Hz), 131.2 (C, *d*, *J* = 10.0 Hz), 123.5 (CH, *d*, *J* = 11.2 Hz), 117.1 (CH, *d*, *J* = 17.5 Hz), 116.4 (CH, *d*, *J* = 18.7 Hz), 91.2 (CH, *d*, *J* = 176.2 Hz), 76.0 (C, *d*, *J* = 23.7 Hz), 39.9 (CH<sub>2</sub>), 32.3 (CH<sub>2</sub>), 27.5 (CH<sub>2</sub>, *d*, *J* = 20.0 Hz), 26.7 (CH<sub>2</sub>), 20.7 (CH<sub>2</sub>), 20.4 (CH<sub>2</sub>); HRMS (ESI): *m/z* 284.1261 ([M+H] C<sub>15</sub>H<sub>17</sub>F<sub>3</sub>NO requires 284.1262).



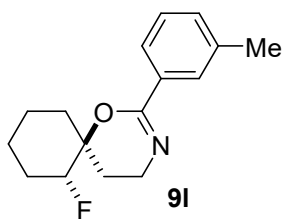
2-(3,5-Dinitrophenyl)-7-fluoro-1-oxa-3-azaspiro[5.5]undec-2-ene (**9i**): Mp: 140-142 °C; <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>): δ 9.06 (s, 1H), 9.03 (s, 2H), 4.62 (dq, 1H, *J* = 48.0, 3.0 Hz), 3.78-3.57 (m, 2H), 2.10-1.45 (m, 10H); <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>): δ 151.2 (C), 148.6 (C), 138.0 (C), 127.1 (CH), 120.2 (CH), 91.8 (CH, *d*, *J* = 177.5 Hz), 77.8 (C, *d*, *J* = 23.7 Hz), 40.3 (CH<sub>2</sub>), 32.7 (CH<sub>2</sub>), 27.8 (CH<sub>2</sub>, *d*, *J* = 18.7 Hz), 25.7 (CH<sub>2</sub>), 21.0 (CH<sub>2</sub>), 20.9 (CH<sub>2</sub>); HRMS (ESI): *m/z* 338.1155 ([M+H] C<sub>15</sub>H<sub>17</sub>FN<sub>3</sub>O<sub>5</sub> requires 338.1152).



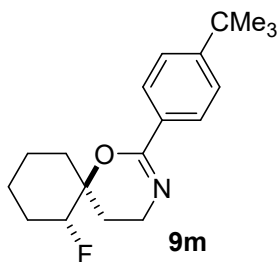
7-Fluoro-2-(3-nitrophenyl)-1-oxa-3-azaspiro[5.5]undec-2-ene (**9j**): Mp: 101-103 °C; <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>): δ 8.75 (s, 1H), 8.35-8.25 (m, 2H), 7.59 (t, 1H, *J* = 8.0 Hz), 4.62 (dt, 1H, *J* = 48.0, 4.5 Hz), 3.76-3.62 (m, 2H), 2.10-1.55 (m, 10H); <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>): δ 152.9 (C), 148.4 (C), 136.0 (C), 133.0 (CH), 129.3 (CH), 125.2 (CH), 122.2 (CH), 91.5 (CH, *d*, *J* = 176.2 Hz), 76.5 (C, *d*, *J* = 22.5 Hz), 40.1 (CH<sub>2</sub>), 32.5 (CH<sub>2</sub>), 27.6 (CH<sub>2</sub>, *d*, *J* = 20.0 Hz), 26.5 (CH<sub>2</sub>), 20.8 (CH<sub>2</sub>), 20.6 (CH<sub>2</sub>); HRMS (ESI): *m/z* 293.1301 ([M+H] C<sub>15</sub>H<sub>18</sub>FN<sub>2</sub>O<sub>3</sub> requires 293.1301).



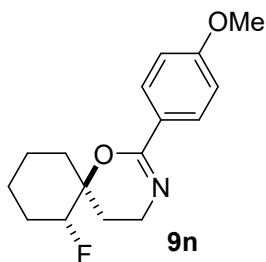
7-Fluoro-2-(p-tolyl)-1-oxa-3-azaspiro[5.5]undec-2-ene (**9k**): Mp: 130-132 °C;  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ):  $\delta$  7.82 (d, 2H,  $J = 8.5$  Hz), 7.20 (d, 2H,  $J = 8.5$  Hz), 4.58 (dt, 1H,  $J = 48.0, 3.5$  Hz), 3.70-3.56 (m, 2H), 2.40 (s, 3H), 2.05-1.52 (m, 10H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ):  $\delta$  154.8 (C), 140.8 (C), 131.4 (C), 129.0 (CH), 127.0 (CH), 91.1 (CH, d,  $J = 175.0$  Hz), 75.1 (C, d,  $J = 24.2$  Hz), 39.9 ( $\text{CH}_2$ ), 32.2 ( $\text{CH}_2$ ), 27.4 ( $\text{CH}_2$ , d,  $J = 20.0$  Hz), 27.3 ( $\text{CH}_2$ ), 21.6 ( $\text{CH}_3$ ), 20.6 ( $\text{CH}_2$ ), 20.3 ( $\text{CH}_2$ ); HRMS (ESI):  $m/z$  262.1608 ( $[\text{M}+\text{H}]^+$   $\text{C}_{16}\text{H}_{21}\text{FNO}$  requires 262.1607).



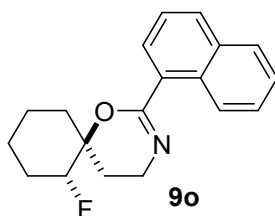
7-Fluoro-2-(m-tolyl)-1-oxa-3-azaspiro[5.5]undec-2-ene (**9l**): Mp: 125-127 °C;  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ):  $\delta$  7.74 (s, 1H), 7.69 (d, 1H,  $J = 7.0$  Hz), 7.30-7.21 (m, 2H), 4.55 (dt, 1H,  $J = 49.0, 4.0$  Hz), 3.70-3.52 (m, 2H), 2.38 (s, 3H), 2.00-1.50 (m, 10H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ):  $\delta$  155.2 (C), 138.0 (C), 133.9 (C), 131.5 (CH), 128.2 (CH), 127.7 (CH), 124.2 (CH), 91.2 (CH, d,  $J = 176.2$  Hz), 75.5 (C, d,  $J = 23.7$  Hz), 39.9 ( $\text{CH}_2$ ), 32.3 ( $\text{CH}_2$ ), 27.5 ( $\text{CH}_2$ , d,  $J = 20.0$  Hz), 27.1 ( $\text{CH}_2$ ), 21.6 ( $\text{CH}_3$ ), 20.7 ( $\text{CH}_2$ ), 20.3 ( $\text{CH}_2$ ); HRMS (ESI)  $m/z$  262.1604 ( $[\text{M}+\text{H}]^+$   $\text{C}_{16}\text{H}_{21}\text{FNO}$  requires 262.1607).



2-(4-(tert-Butyl)phenyl)-7-fluoro-1-oxa-3-azaspiro[5.5]undec-2-ene (**9m**): Mp: 122-124 °C;  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ):  $\delta$  7.77 (d, 2H,  $J = 7.0$  Hz), 7.33 (d, 2H,  $J = 7.0$  Hz), 4.49 (dt, 1H,  $J = 48.0, 3.5$  Hz), 3.64-3.47 (m, 2H), 1.95-1.45 (m, 10H), 1.26 (s, 9H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ):  $\delta$  154.5 (C), 153.7 (C), 131.0 (C), 126.5 (CH), 124.9 (CH), 90.8 (CH, d,  $J = 176.2$  Hz), 74.8 (C, d,  $J = 23.7$  Hz), 39.5 ( $\text{CH}_2$ ), 34.7 (C), 31.9 ( $\text{CH}_2$ ), 31.1 ( $\text{CH}_3$ ), 27.2 ( $\text{CH}_2$ , d,  $J = 20.0$  Hz), 27.0 ( $\text{CH}_2$ ), 20.3 ( $\text{CH}_2$ ), 19.9 ( $\text{CH}_2$ ); HRMS (ESI):  $m/z$  304.2079 ( $[\text{M}+\text{H}]^+$   $\text{C}_{19}\text{H}_{27}\text{FNO}$  requires 304.2077).

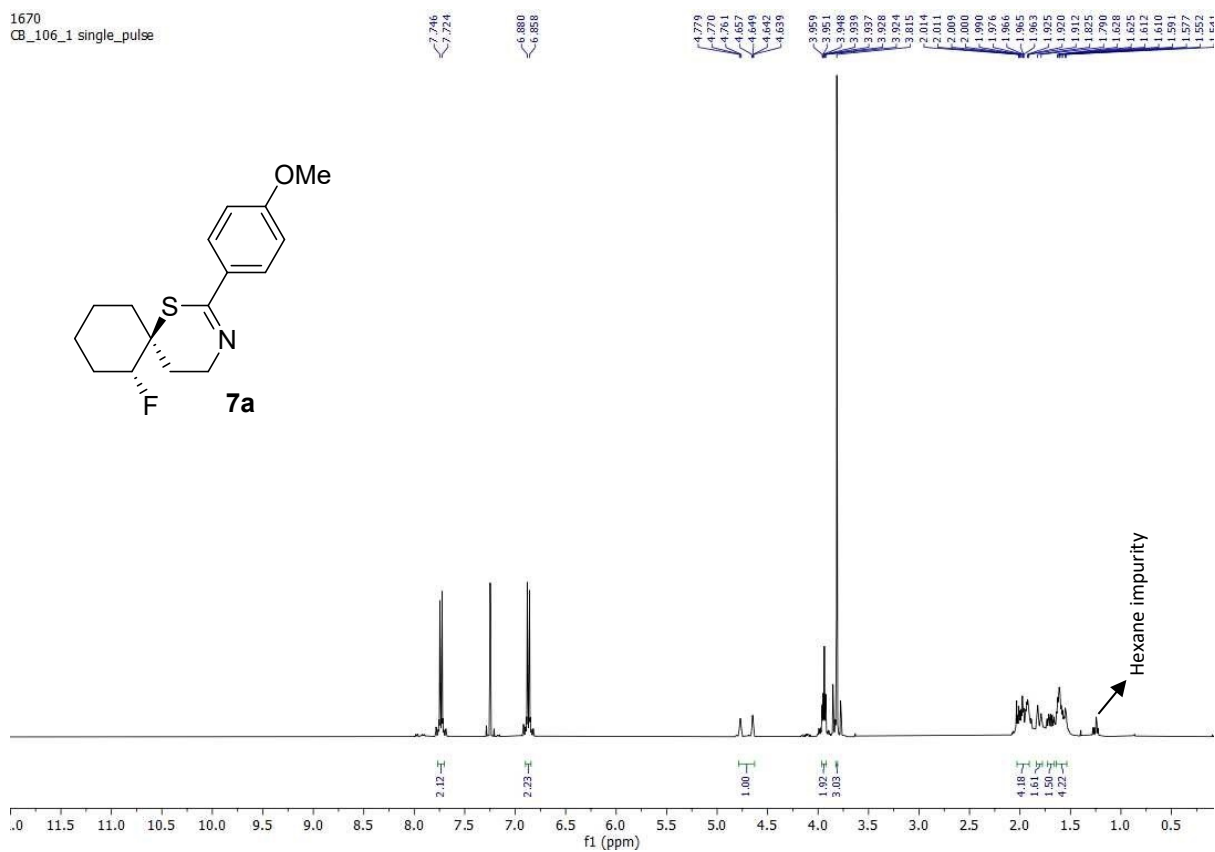


7-Fluoro-2-(4-methoxyphenyl)-1-oxa-3-azaspiro[5.5]undec-2-ene (**9n**): Mp: 108-110 °C;  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ):  $\delta$  7.84 (d, 2H,  $J = 9.0$  Hz), 6.86 (d, 2H,  $J = 9.0$  Hz), 4.55 (dt, 1H,  $J = 48.0, 4.0$  Hz), 3.81 (s, 3H), 3.65-3.51 (m, 2H), 2.00-1.50 (m, 10H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ):  $\delta$  161.4 (C), 154.4 (C), 128.4 (CH), 126.3 (C), 113.3 (CH), 90.8 (CH, d,  $J = 173.7$  Hz), 74.9 (C, d,  $J = 24.1$  Hz), 55.2 (OCH<sub>3</sub>), 39.4 (CH<sub>2</sub>), 31.9 (CH<sub>2</sub>), 27.1 (CH<sub>2</sub>, d,  $J = 20.0$  Hz), 26.9 (CH<sub>2</sub>), 20.3 (CH<sub>2</sub>), 20.0 (CH<sub>2</sub>); HRMS (ESI):  $m/z$  278.1554 ([M+H] C<sub>16</sub>H<sub>21</sub>FNO<sub>2</sub> requires 278.1556).

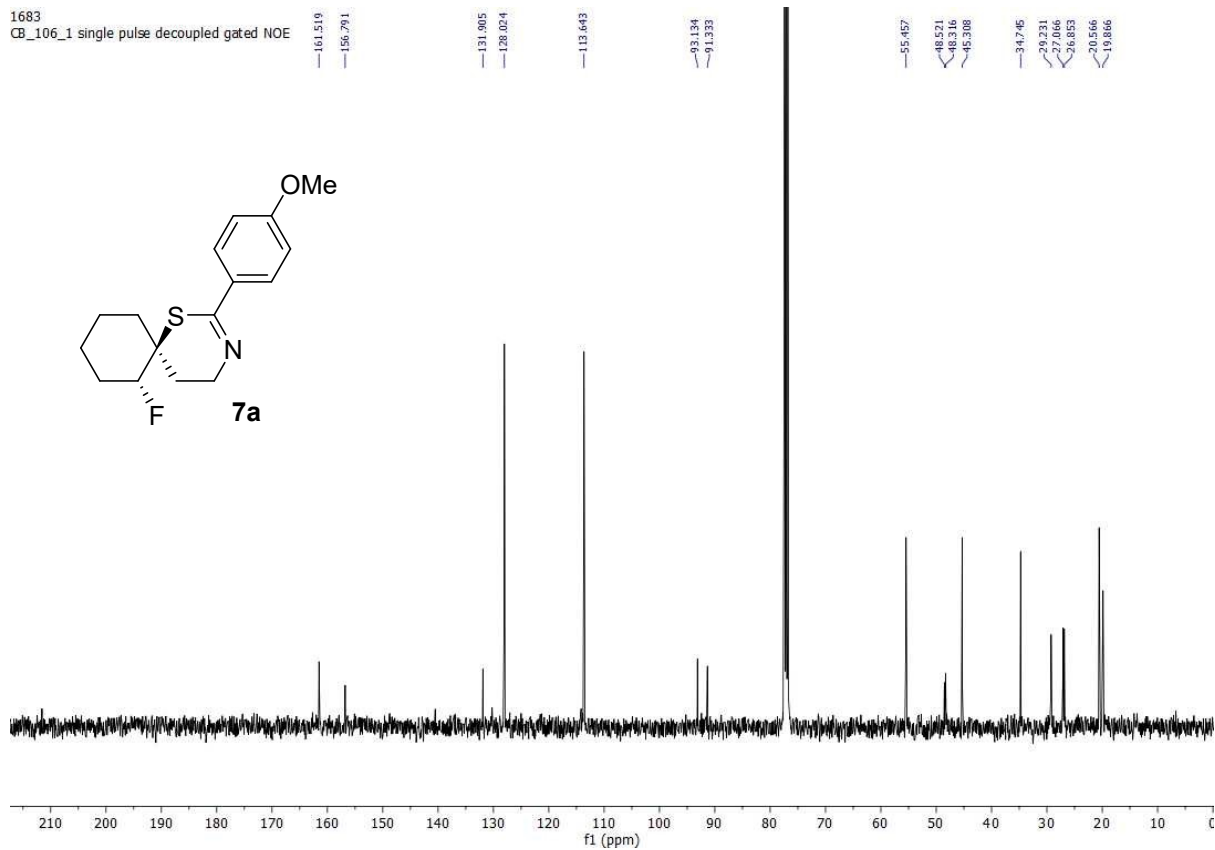


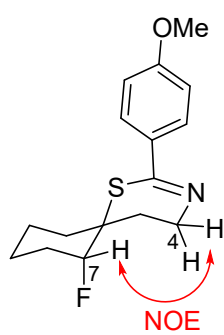
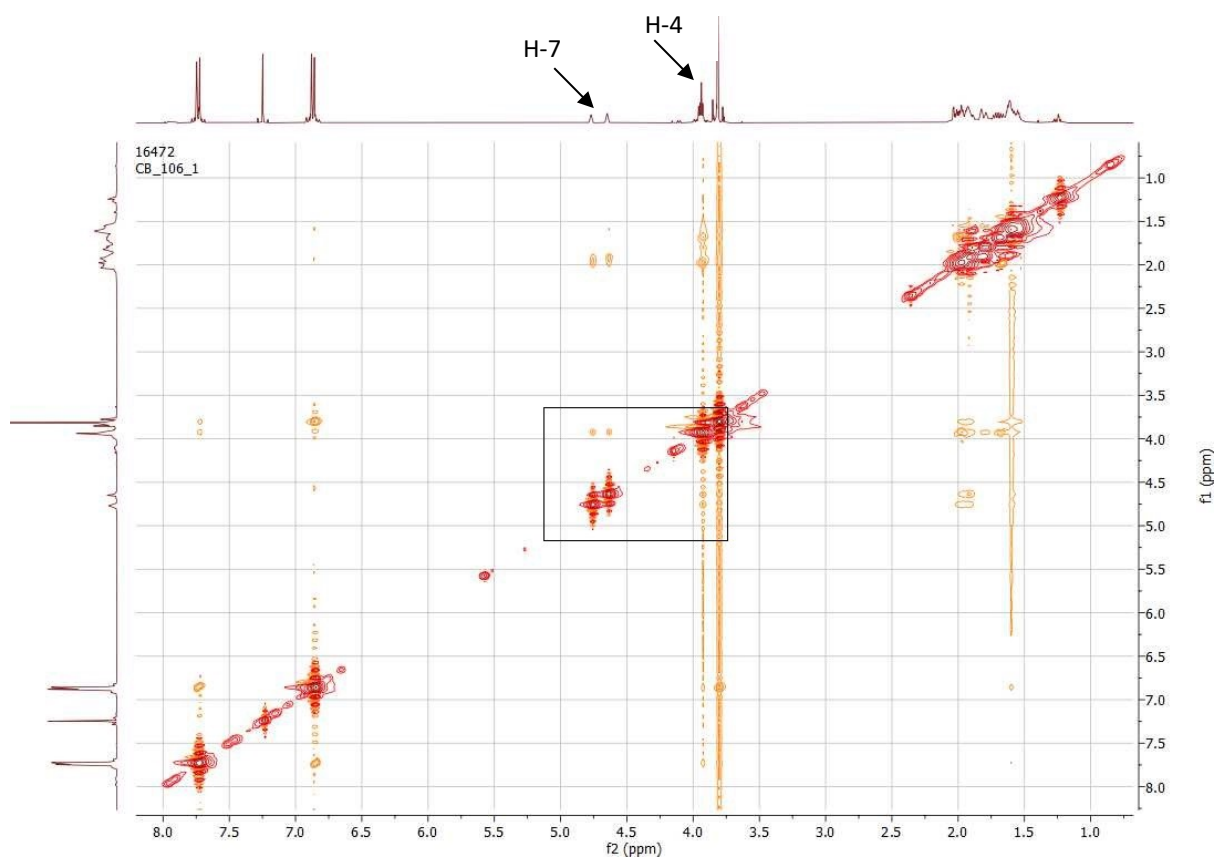
7-Fluoro-2-(naphthalen-2-yl)-1-oxa-3-azaspiro[5.5]undec-2-ene (**9o**): Mp: 88-90 °C;  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ):  $\delta$  8.37 (s, 1H), 8.00 (d, 1H,  $J = 8.5$  Hz), 7.89 (d, 1H,  $J = 8.5$  Hz), 7.85-7.80 (m, 2H), 7.52-7.46 (m, 2H), 4.62 (dt, 1H,  $J = 48.0, 4.0$  Hz), 3.75-3.59 (m, 2H), 2.10-1.50 (m, 10H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ):  $\delta$  155.0 (C), 134.6 (C), 133.0 (C), 131.5 (C), 129.1 (CH), 128.0 (CH), 127.9 (CH), 127.2 (CH), 127.1 (CH), 126.4 (CH), 124.3 (CH), 91.3 (CH, d,  $J = 175.4$  Hz), 75.6 (C, d,  $J = 23.9$  Hz), 40.1 (CH<sub>2</sub>), 32.4 (CH<sub>2</sub>), 27.5 (CH<sub>2</sub>, d,  $J = 20.0$  Hz), 27.1 (CH<sub>2</sub>), 20.8 (CH<sub>2</sub>), 20.4 (CH<sub>2</sub>); HRMS (ESI):  $m/z$  298.1608 ([M+H] C<sub>19</sub>H<sub>21</sub>FNO requires 298.1607).

1670  
CB\_106\_1\_single\_pulse

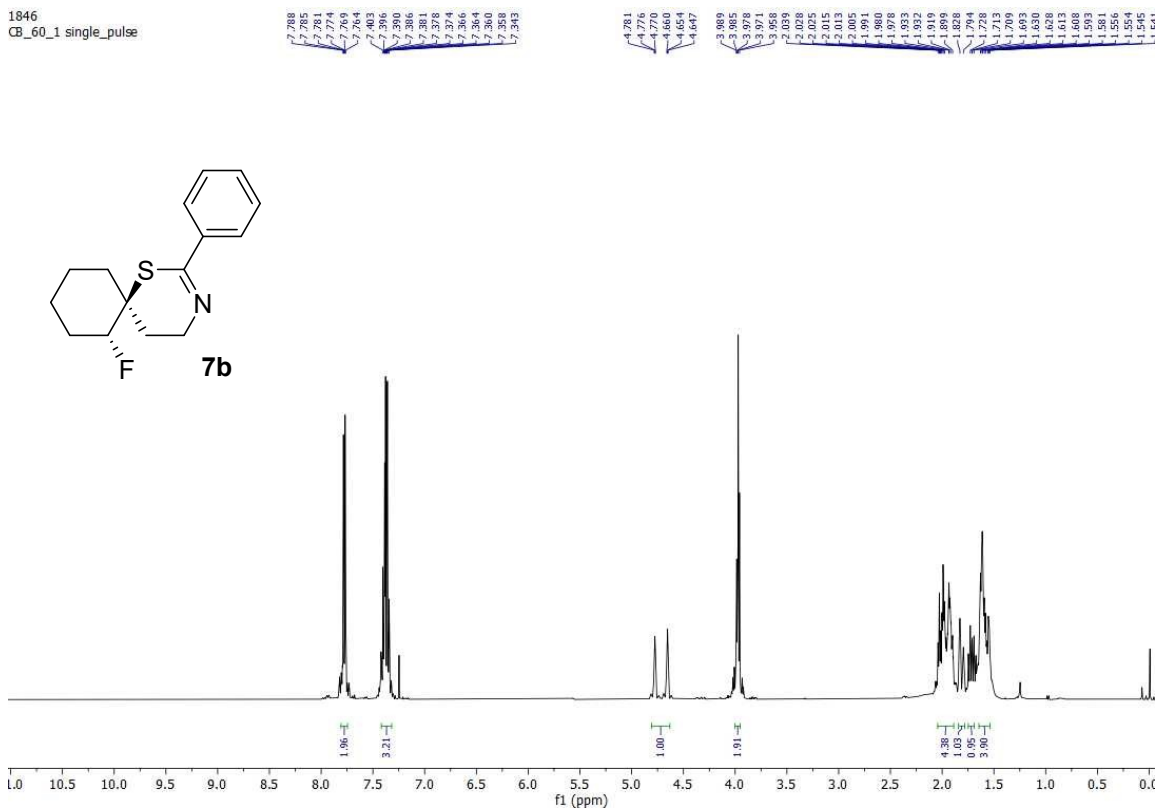


1683  
CB\_106\_1\_single\_pulse\_decoupled\_gated\_NOE

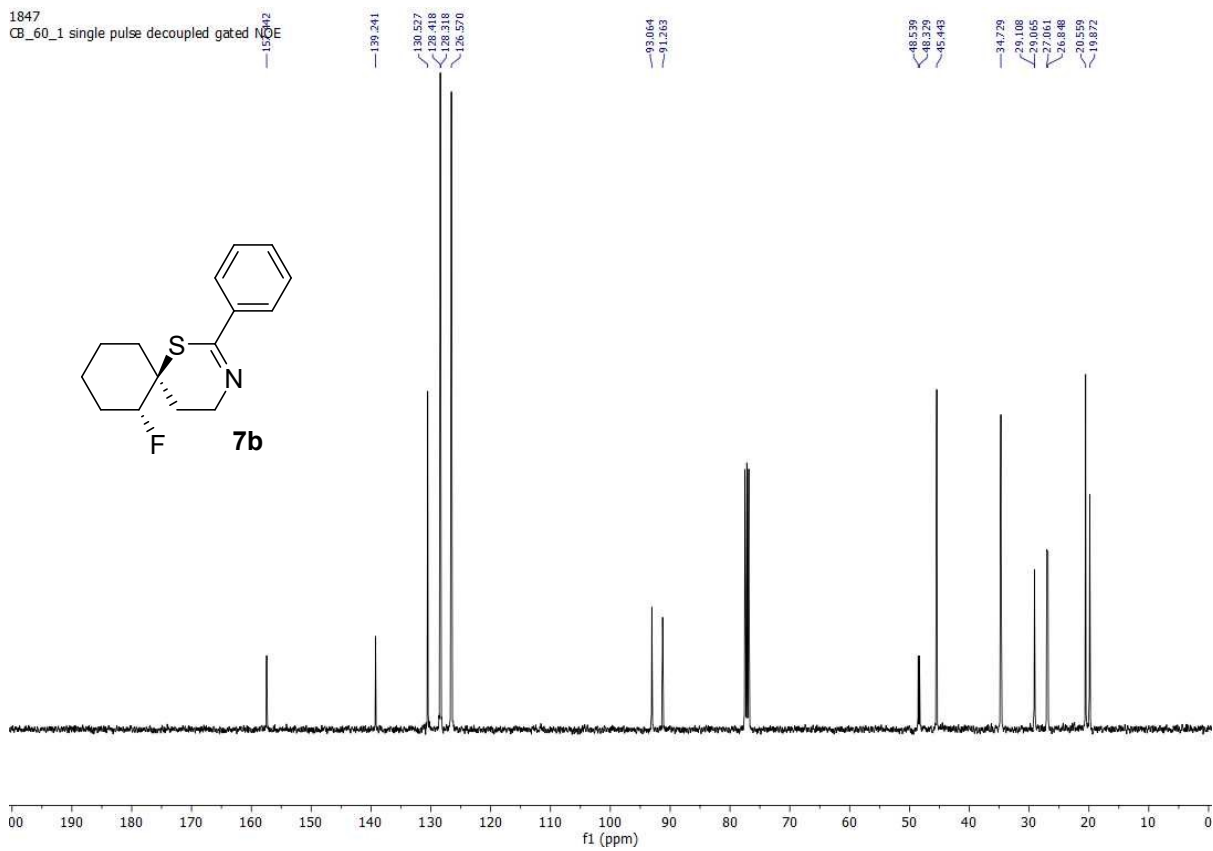




1846  
CB\_60\_1\_single\_pulse

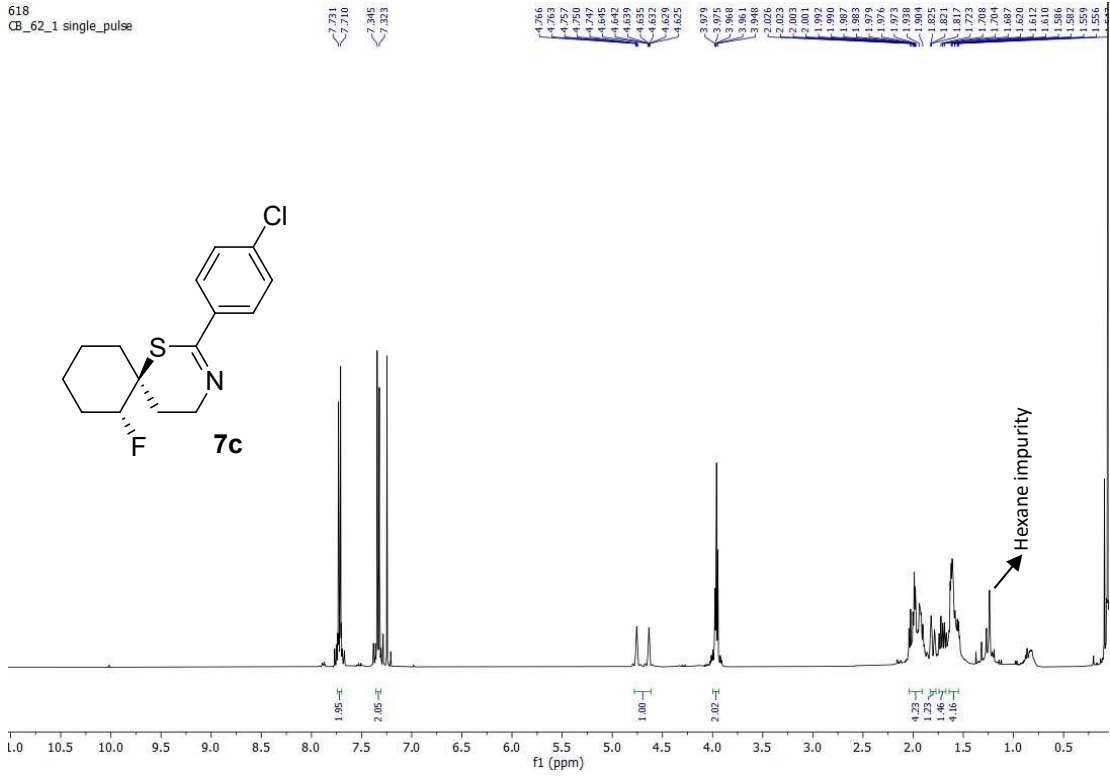


1847  
CB\_60\_1\_single\_pulse\_decoupled\_gated

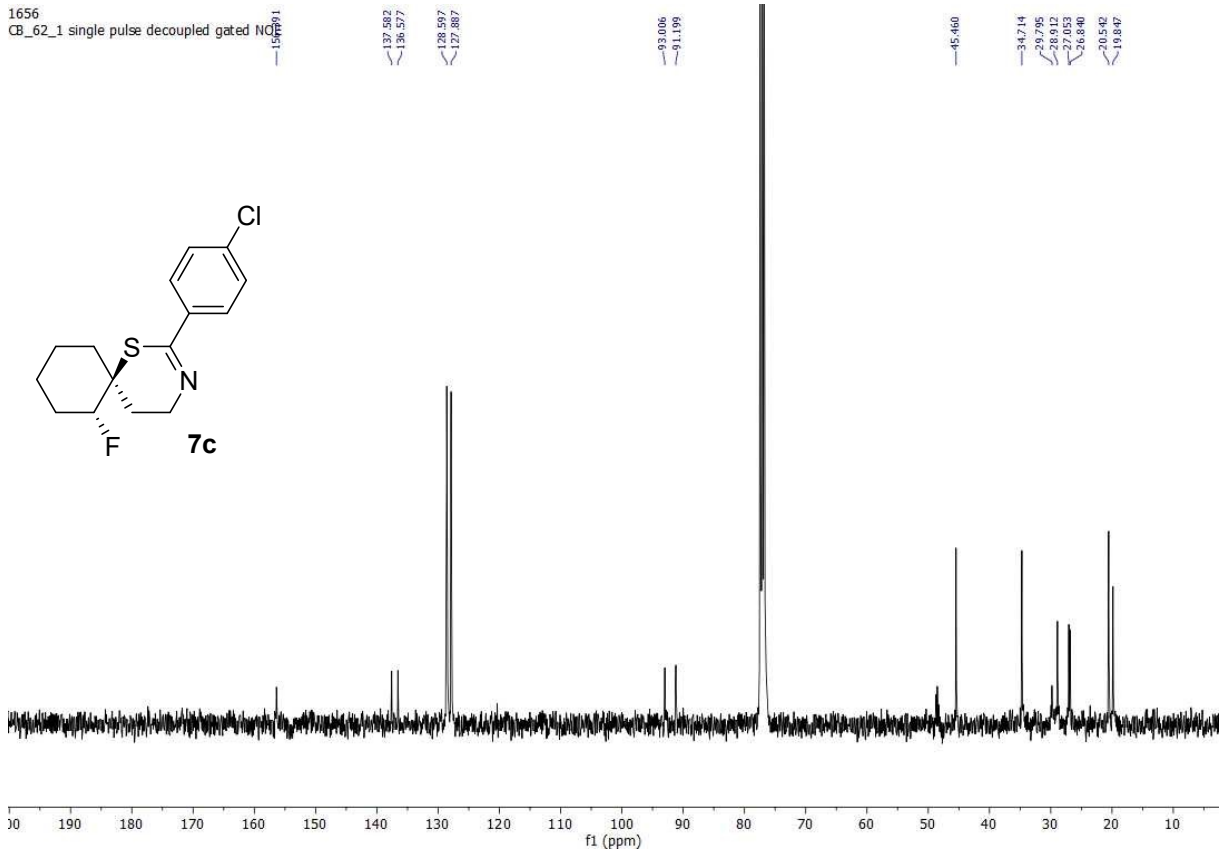




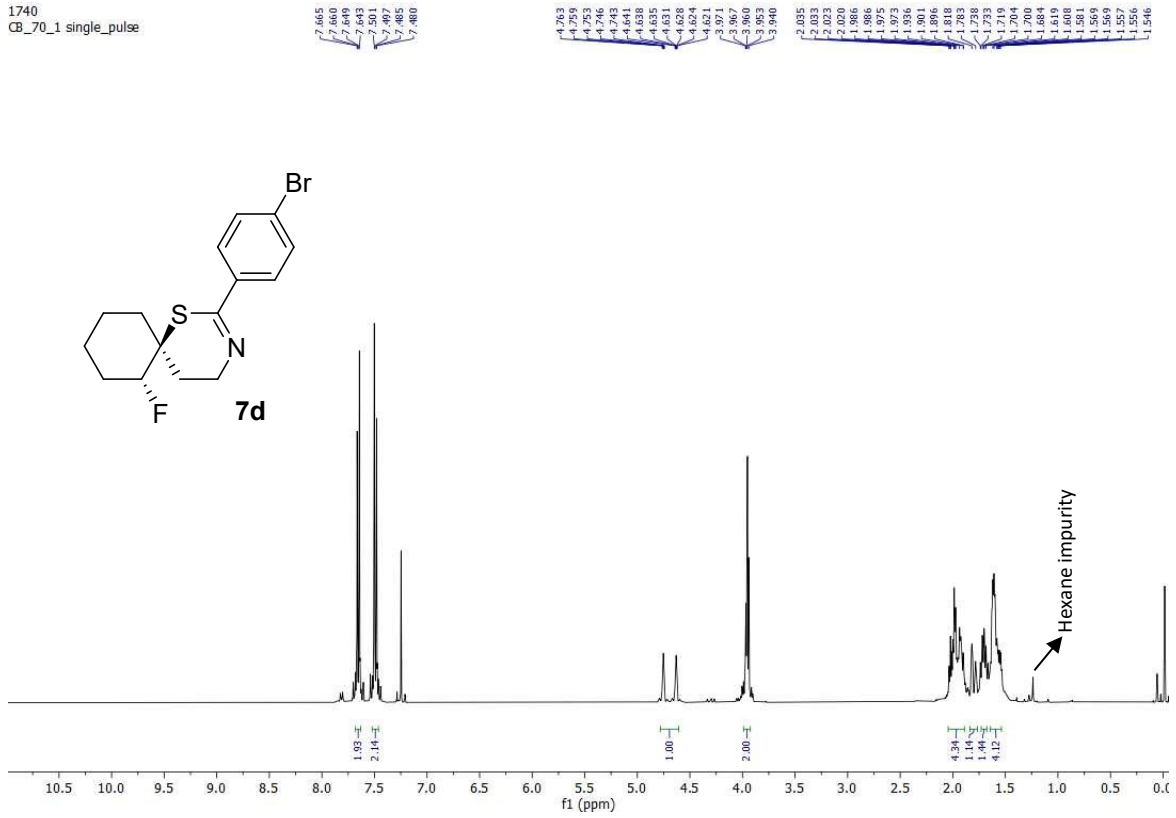
618  
CB\_62\_1\_single\_pulse



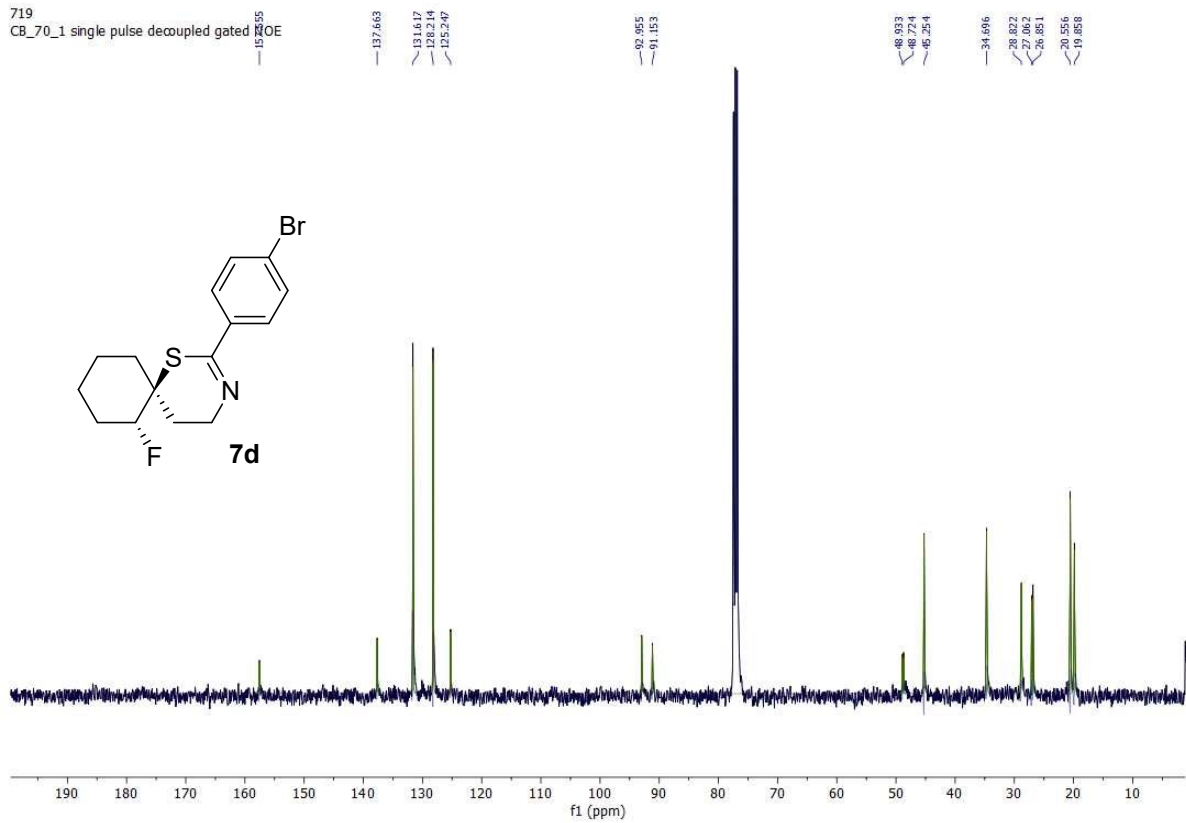
1656  
CB\_62\_1\_single\_pulse decoupled gated NO



1740  
CB\_70\_1 single\_pulse

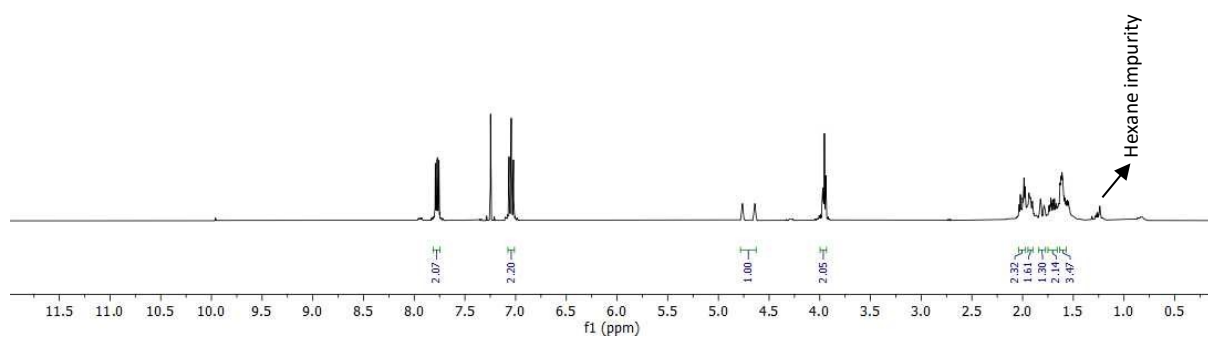
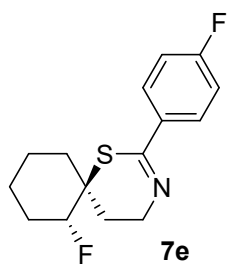


719  
CB\_70\_1 single pulse decoupled gated

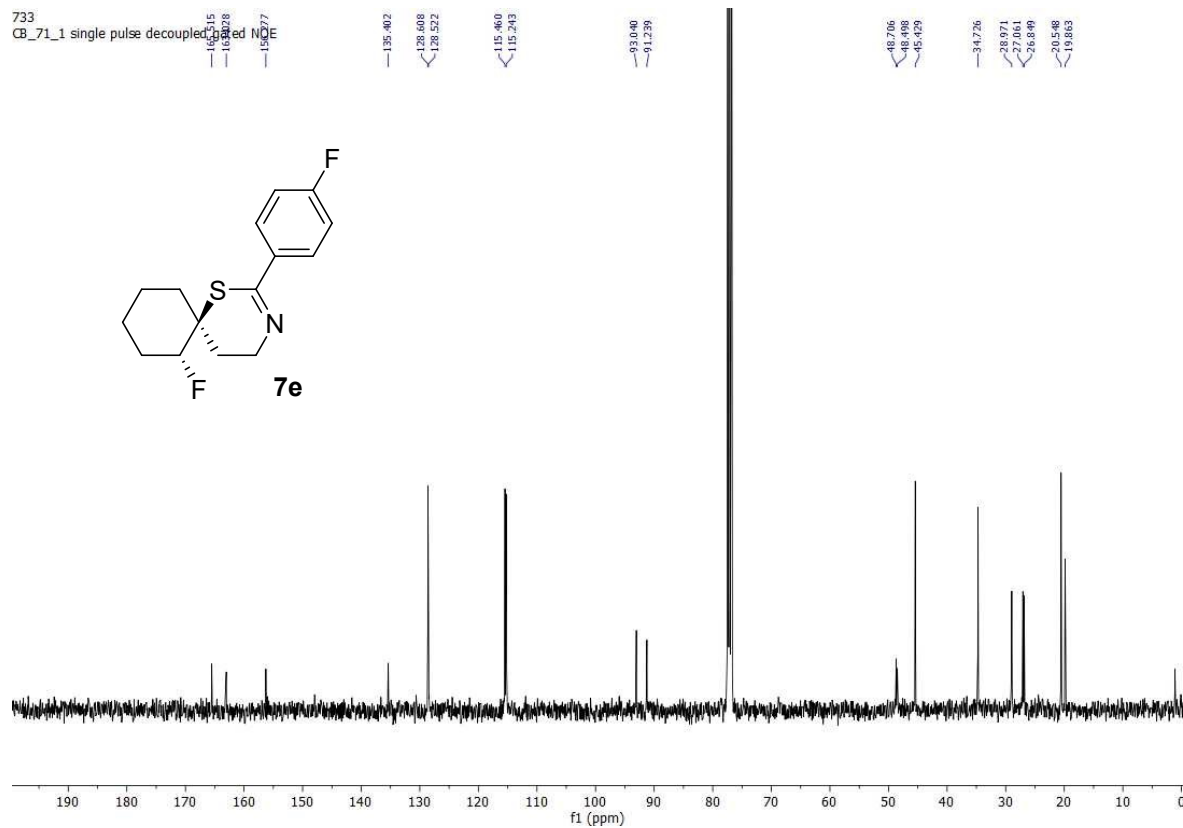
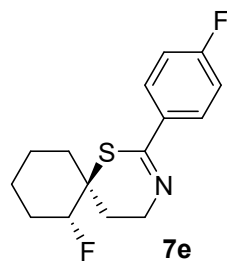


732  
CB\_71\_1\_single\_pulse

7.792  
7.778  
7.775  
7.772  
7.770  
7.756  
7.064  
7.059  
7.048  
7.043  
7.038  
7.021  
4.762  
4.690  
4.664  
3.968  
3.963  
3.954  
3.942  
2.023  
2.020  
2.011  
2.006  
2.000  
1.997  
1.987  
1.984  
1.975  
1.973  
1.968  
1.962  
1.931  
1.926  
1.922  
1.919  
1.916  
1.903  
1.898  
1.872  
1.823  
1.819  
1.815  
1.788  
1.727  
1.721  
1.716  
1.706  
1.696  
1.701  
1.690  
1.686  
1.681  
1.672  
1.667  
1.662  
1.653  
1.612  
1.593  
1.581  
1.571



733  
CB\_71\_1\_single\_pulse\_decoupled

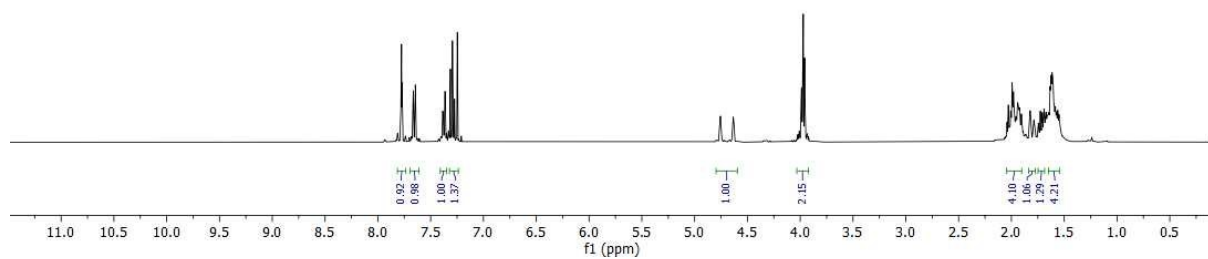
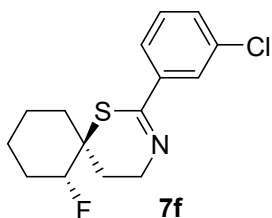


1741  
CB\_72\_1 single\_pulse

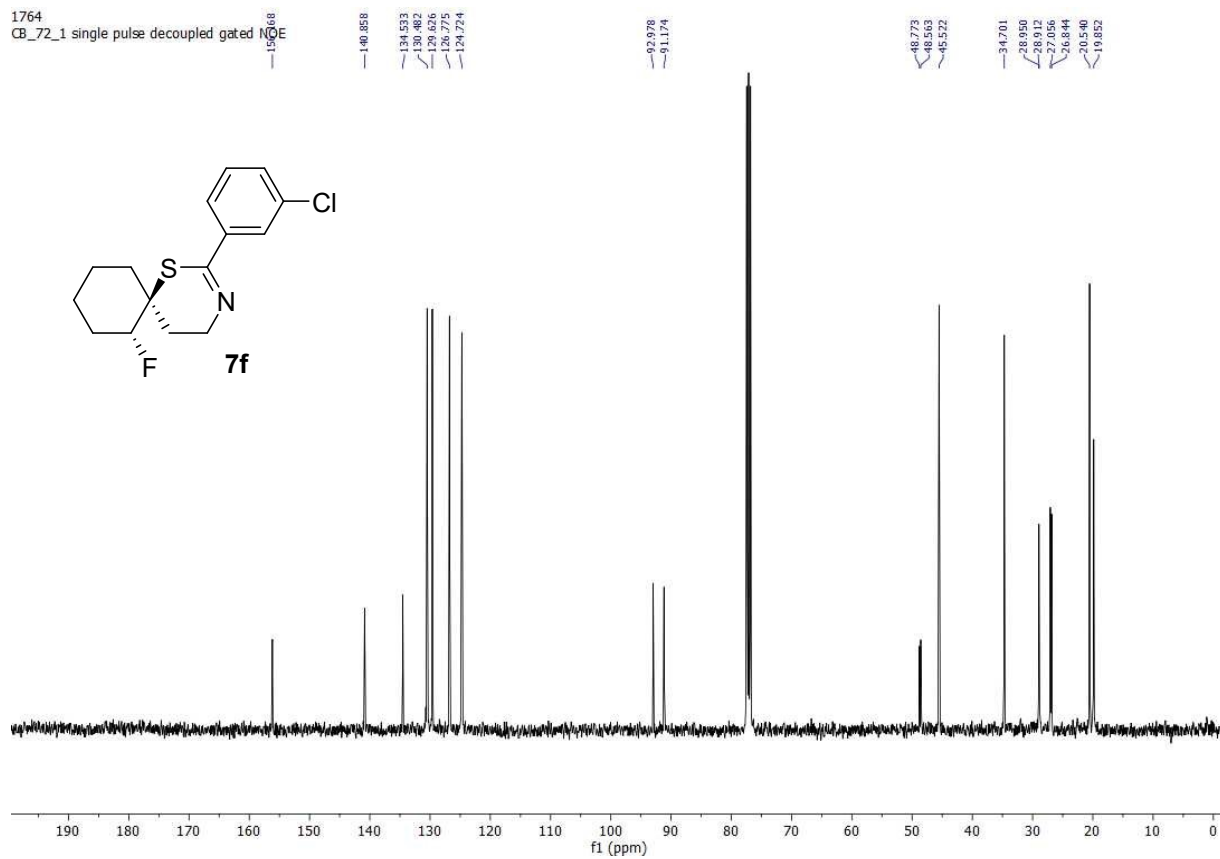
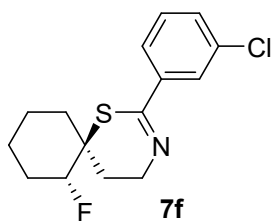
7.781  
7.776  
7.771  
7.668  
7.665  
7.664  
7.649  
7.645  
7.641  
7.389  
7.386  
7.384  
7.381  
7.366  
7.366  
7.361  
7.313  
7.294  
7.274  
7.267

4.764  
4.756  
4.749  
4.640  
4.634  
4.628  
3.989  
3.986  
3.979  
3.971  
3.958

2.030  
2.028  
2.018  
2.007  
1.996  
1.993  
1.980  
1.940  
1.937  
1.922  
1.905  
1.892  
1.882  
1.787  
1.745  
1.726  
1.708  
1.690  
1.672  
1.656  
1.615  
1.584  
1.561  
1.549

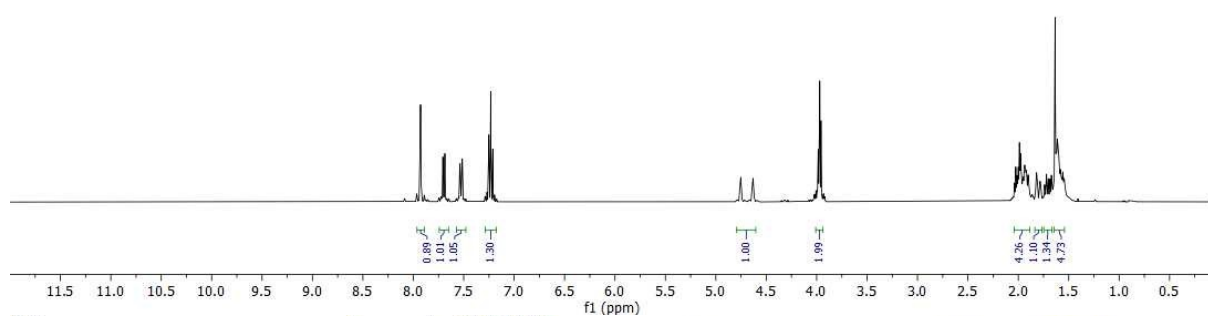
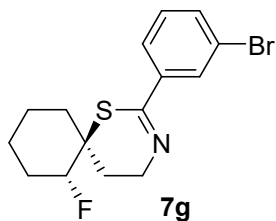


1764  
CB\_72\_1 single pulse decoupled gated



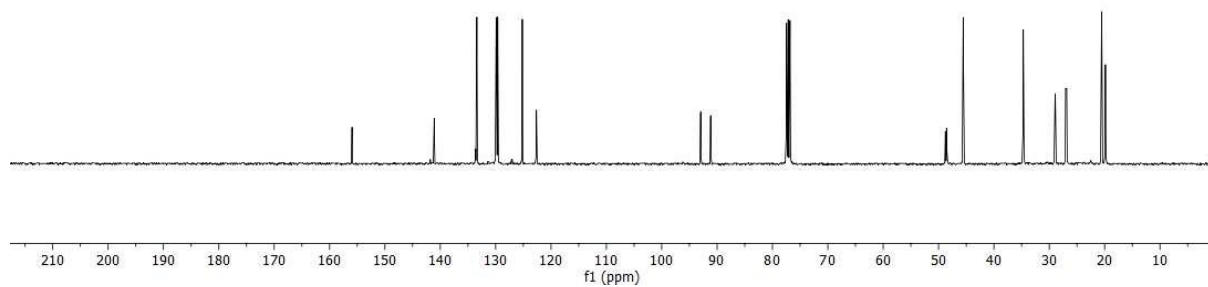
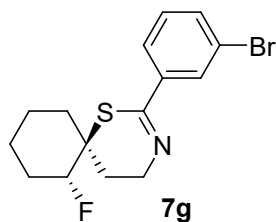
2028  
CB\_101\_1\_single\_pulse

7.933 7.928 7.924 7.907 7.703 7.691 7.687 7.684 7.537 7.536 7.532 7.519 7.517 7.514 7.512 7.252 7.248 7.238 7.212 4.762 4.759 4.752 4.746 4.742 4.661 4.658 4.634 4.630 4.625 4.621 3.987 3.984 3.976 3.969 3.967 2.088 2.084 2.033 2.013 2.011 2.000 1.989 1.978 1.975 1.957 1.920 1.902 1.819 1.785 1.721 1.705 1.695 1.685 1.672 1.635 1.624 1.621 1.613 1.603 1.593 1.577

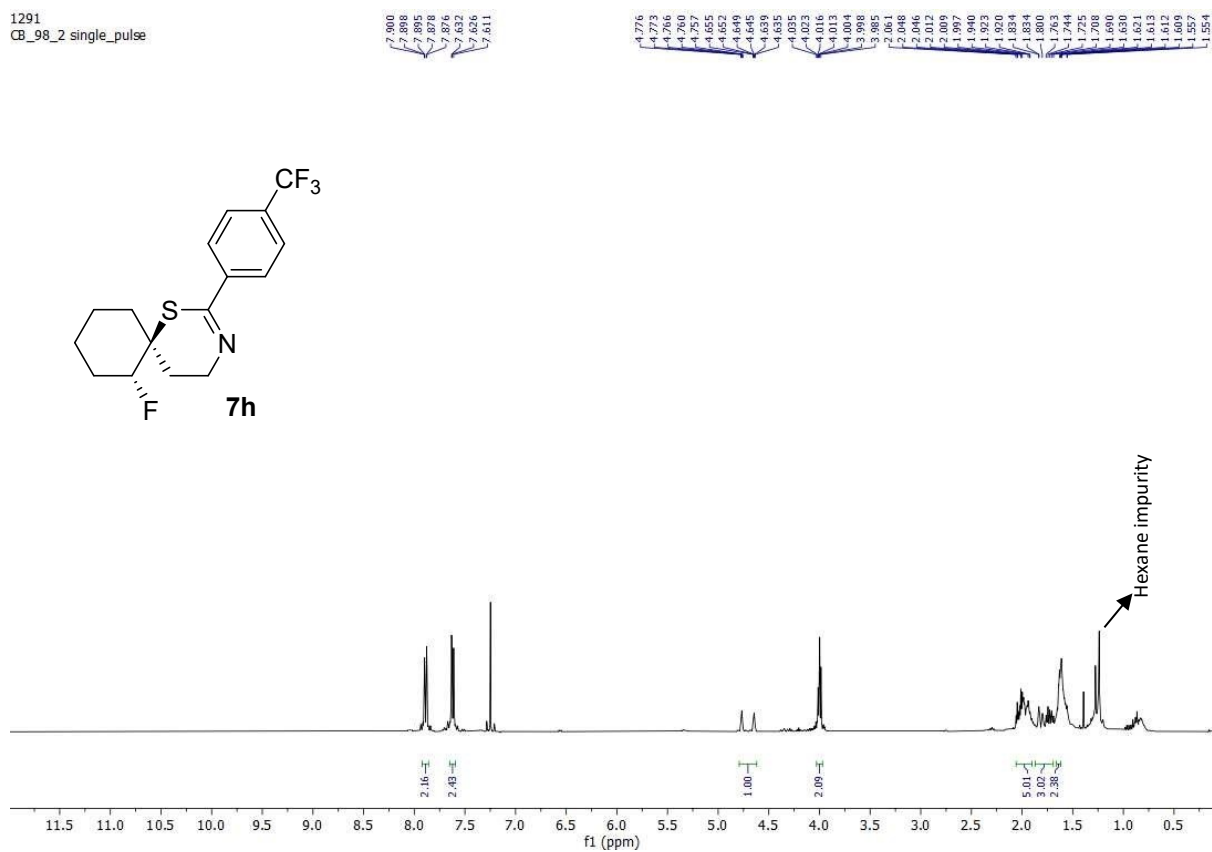
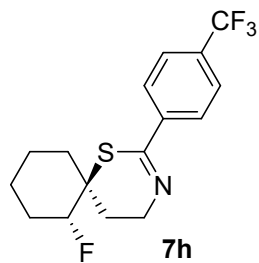


2182  
CB\_101\_1\_single\_pulse decoupled gated NOE

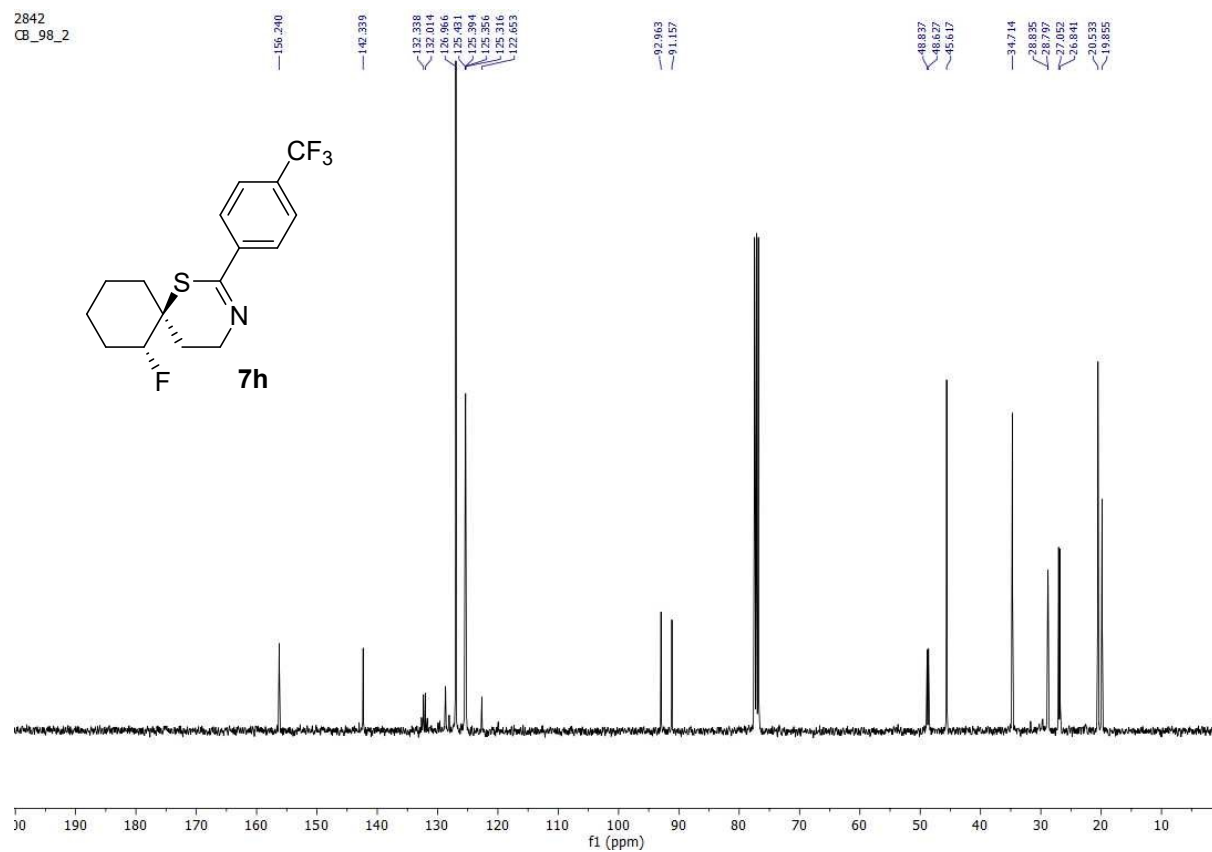
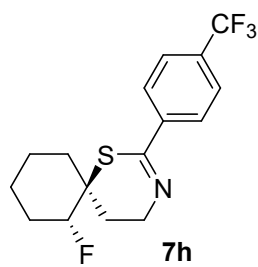
155.038 141.087 133.620 133.397 129.889 129.771 129.636 129.604 122.644 92.564 91.162 48.764 48.553 45.540 34.701 28.660 28.912 27.698 26.846 20.544 19.855



1291  
CB\_98\_2 single\_pulse



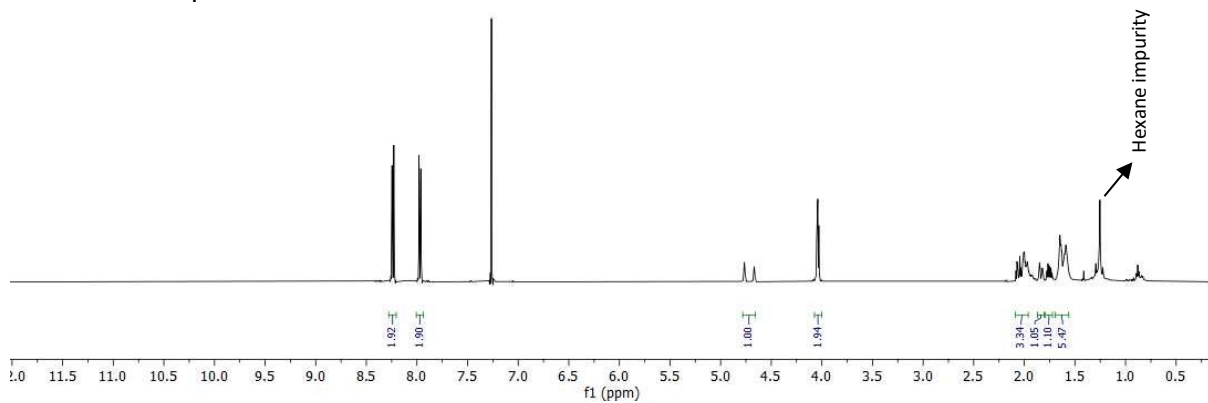
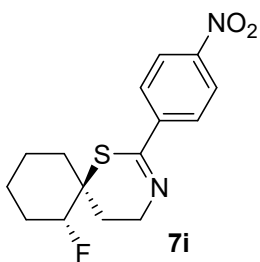
2842  
CB\_98\_2



37443  
CB-91-4

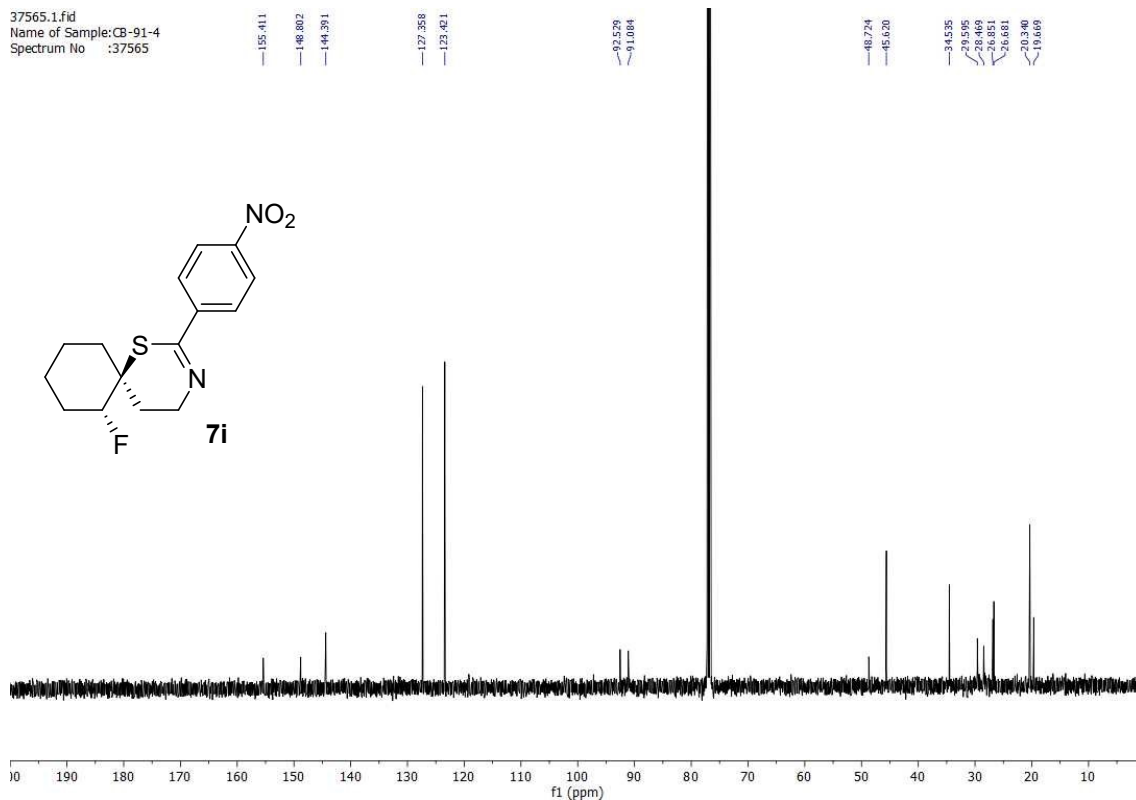
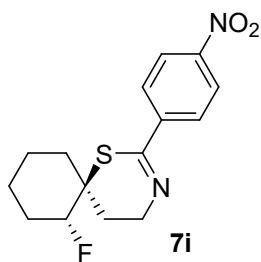
8.246  
8.242  
8.233  
8.229  
8.224  
8.200  
7.976  
7.966  
7.952

4.774  
4.771  
4.767  
4.765  
4.760  
4.676  
4.676  
4.669  
4.663  
4.661  
4.054  
4.052  
4.045  
4.040  
4.030  
2.074  
2.072  
2.046  
2.045  
2.043  
2.015  
2.008  
2.006  
1.999  
1.999  
1.989  
1.984  
1.978  
1.971  
1.968  
1.850  
1.847  
1.766  
1.751  
1.650  
1.649  
1.642  
1.636  
1.591  
1.587



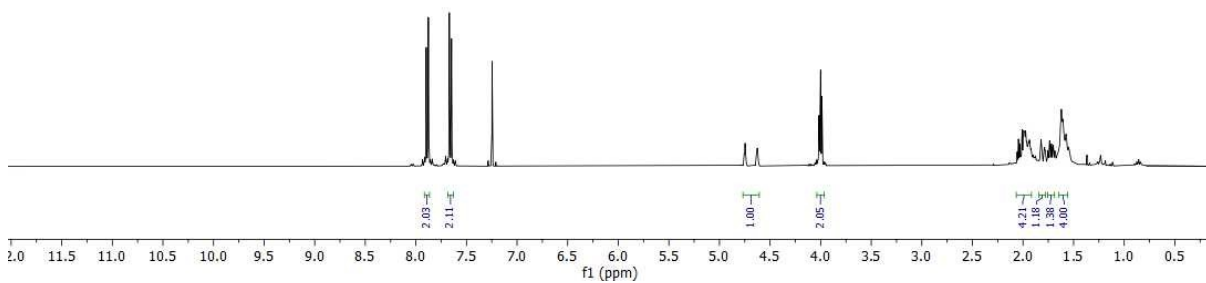
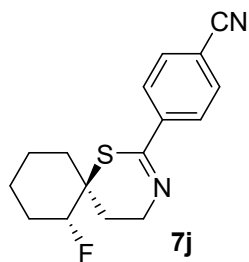
37565.1.fid  
Name of Sample: CB-91-4  
Spectrum No : 37565

155.411  
148.802  
144.391  
127.358  
123.741  
93.529  
91.084  
48.724  
45.620  
34.535  
29.995  
28.469  
26.851  
26.681  
23.340  
19.609

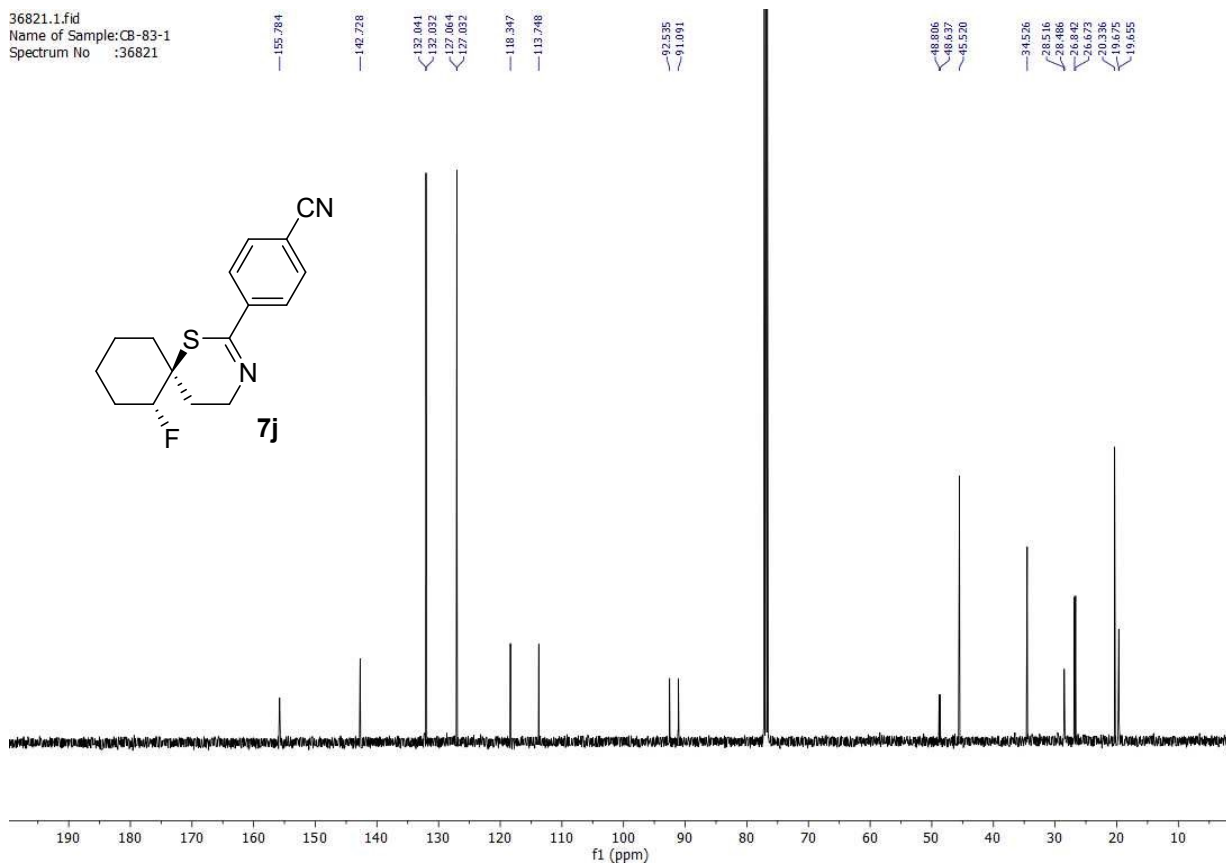
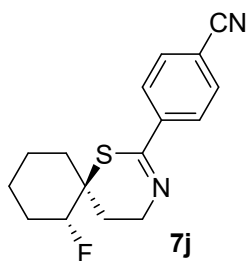


955  
CB\_83\_1\_single\_pulse

7.898  
7.893  
7.884  
7.877  
7.669  
7.664  
7.653  
7.648  
7.627  
7.598  
7.576  
7.476  
7.470  
7.437  
4.635  
4.631  
4.625  
4.618  
4.615  
4.018  
4.015  
4.006  
4.000  
3.988  
3.988  
3.985  
3.982  
3.979  
3.976  
3.973  
3.970  
3.967  
3.964  
3.961  
3.958  
3.955  
3.952  
3.949  
3.946  
3.943  
3.940  
3.937  
3.934  
3.931  
3.928  
3.925  
3.922  
3.919  
3.916  
3.913  
3.910  
3.907  
3.904  
3.901  
3.898  
3.895  
3.892  
3.889  
3.886  
3.883  
3.880  
3.877  
3.874  
3.871  
3.868  
3.865  
3.862  
3.859  
3.856  
3.853  
3.850  
3.847  
3.844  
3.841  
3.838  
3.835  
3.832  
3.829  
3.826  
3.823  
3.820  
3.817  
3.814  
3.811  
3.808  
3.805  
3.802  
3.799  
3.796  
3.793  
3.790  
3.787  
3.784  
3.781  
3.778  
3.775  
3.772  
3.769  
3.766  
3.763  
3.760  
3.757  
3.754  
3.751  
3.748  
3.745  
3.742  
3.739  
3.736  
3.733  
3.730  
3.727  
3.724  
3.721  
3.718  
3.715  
3.712  
3.709  
3.706  
3.703  
3.700  
3.697  
3.694  
3.691  
3.688  
3.685  
3.682  
3.679  
3.676  
3.673  
3.670  
3.667  
3.664  
3.661  
3.658  
3.655  
3.652  
3.649  
3.646  
3.643  
3.640  
3.637  
3.634  
3.631  
3.628  
3.625  
3.622  
3.619  
3.616  
3.613  
3.610  
3.607  
3.604  
3.601  
3.598  
3.595  
3.592  
3.589  
3.586  
3.583  
3.580  
3.577  
3.574  
3.571  
3.568  
3.565  
3.562  
3.559  
3.556  
3.553  
3.550  
3.547  
3.544  
3.541  
3.538  
3.535  
3.532  
3.529  
3.526  
3.523  
3.520  
3.517  
3.514  
3.511  
3.508  
3.505  
3.502  
3.499  
3.496  
3.493  
3.490  
3.487  
3.484  
3.481  
3.478  
3.475  
3.472  
3.469  
3.466  
3.463  
3.460  
3.457  
3.454  
3.451  
3.448  
3.445  
3.442  
3.439  
3.436  
3.433  
3.430  
3.427  
3.424  
3.421  
3.418  
3.415  
3.412  
3.409  
3.406  
3.403  
3.400  
3.397  
3.394  
3.391  
3.388  
3.385  
3.382  
3.379  
3.376  
3.373  
3.370  
3.367  
3.364  
3.361  
3.358  
3.355  
3.352  
3.349  
3.346  
3.343  
3.340  
3.337  
3.334  
3.331  
3.328  
3.325  
3.322  
3.319  
3.316  
3.313  
3.310  
3.307  
3.304  
3.301  
3.298  
3.295  
3.292  
3.289  
3.286  
3.283  
3.280  
3.277  
3.274  
3.271  
3.268  
3.265  
3.262  
3.259  
3.256  
3.253  
3.250  
3.247  
3.244  
3.241  
3.238  
3.235  
3.232  
3.229  
3.226  
3.223  
3.220  
3.217  
3.214  
3.211  
3.208  
3.205  
3.202  
3.199  
3.196  
3.193  
3.190  
3.187  
3.184  
3.181  
3.178  
3.175  
3.172  
3.169  
3.166  
3.163  
3.160  
3.157  
3.154  
3.151  
3.148  
3.145  
3.142  
3.139  
3.136  
3.133  
3.130  
3.127  
3.124  
3.121  
3.118  
3.115  
3.112  
3.109  
3.106  
3.103  
3.100  
3.097  
3.094  
3.091  
3.088  
3.085  
3.082  
3.079  
3.076  
3.073  
3.070  
3.067  
3.064  
3.061  
3.058  
3.055  
3.052  
3.049  
3.046  
3.043  
3.040  
3.037  
3.034  
3.031  
3.028  
3.025  
3.022  
3.019  
3.016  
3.013  
3.010  
3.007  
3.004  
3.001  
2.998  
2.995  
2.992  
2.989  
2.986  
2.983  
2.980  
2.977  
2.974  
2.971  
2.968  
2.965  
2.962  
2.959  
2.956  
2.953  
2.950  
2.947  
2.944  
2.941  
2.938  
2.935  
2.932  
2.929  
2.926  
2.923  
2.920  
2.917  
2.914  
2.911  
2.908  
2.905  
2.902  
2.899  
2.896  
2.893  
2.890  
2.887  
2.884  
2.881  
2.878  
2.875  
2.872  
2.869  
2.866  
2.863  
2.860  
2.857  
2.854  
2.851  
2.848  
2.845  
2.842  
2.839  
2.836  
2.833  
2.830  
2.827  
2.824  
2.821  
2.818  
2.815  
2.812  
2.809  
2.806  
2.803  
2.800  
2.797  
2.794  
2.791  
2.788  
2.785  
2.782  
2.779  
2.776  
2.773  
2.770  
2.767  
2.764  
2.761  
2.758  
2.755  
2.752  
2.749  
2.746  
2.743  
2.740  
2.737  
2.734  
2.731  
2.728  
2.725  
2.722  
2.719  
2.716  
2.713  
2.710  
2.707  
2.704  
2.701  
2.698  
2.695  
2.692  
2.689  
2.686  
2.683  
2.680  
2.677  
2.674  
2.671  
2.668  
2.665  
2.662  
2.659  
2.656  
2.653  
2.650  
2.647  
2.644  
2.641  
2.638  
2.635  
2.632  
2.629  
2.626  
2.623  
2.620  
2.617  
2.614  
2.611  
2.608  
2.605  
2.602  
2.599  
2.596  
2.593  
2.590  
2.587  
2.584  
2.581  
2.578  
2.575  
2.572  
2.569  
2.566  
2.563  
2.560  
2.557  
2.554  
2.551  
2.548  
2.545  
2.542  
2.539  
2.536  
2.533  
2.530  
2.527  
2.524  
2.521  
2.518  
2.515  
2.512  
2.509  
2.506  
2.503  
2.500  
2.497  
2.494  
2.491  
2.488  
2.485  
2.482  
2.479  
2.476  
2.473  
2.470  
2.467  
2.464  
2.461  
2.458  
2.455  
2.452  
2.449  
2.446  
2.443  
2.440  
2.437  
2.434  
2.431  
2.428  
2.425  
2.422  
2.419  
2.416  
2.413  
2.410  
2.407  
2.404  
2.401  
2.398  
2.395  
2.392  
2.389  
2.386  
2.383  
2.380  
2.377  
2.374  
2.371  
2.368  
2.365  
2.362  
2.359  
2.356  
2.353  
2.350  
2.347  
2.344  
2.341  
2.338  
2.335  
2.332  
2.329  
2.326  
2.323  
2.320  
2.317  
2.314  
2.311  
2.308  
2.305  
2.302  
2.299  
2.296  
2.293  
2.290  
2.287  
2.284  
2.281  
2.278  
2.275  
2.272  
2.269  
2.266  
2.263  
2.260  
2.257  
2.254  
2.251  
2.248  
2.245  
2.242  
2.239  
2.236  
2.233  
2.230  
2.227  
2.224  
2.221  
2.218  
2.215  
2.212  
2.209  
2.206  
2.203  
2.200  
2.197  
2.194  
2.191  
2.188  
2.185  
2.182  
2.179  
2.176  
2.173  
2.170  
2.167  
2.164  
2.161  
2.158  
2.155  
2.152  
2.149  
2.146  
2.143  
2.140  
2.137  
2.134  
2.131  
2.128  
2.125  
2.122  
2.119  
2.116  
2.113  
2.110  
2.107  
2.104  
2.101  
2.098  
2.095  
2.092  
2.089  
2.086  
2.083  
2.080  
2.077  
2.074  
2.071  
2.068  
2.065  
2.062  
2.059  
2.056  
2.053  
2.050  
2.047  
2.044  
2.041  
2.038  
2.035  
2.032  
2.029  
2.026  
2.023  
2.020  
2.017  
2.014  
2.011  
2.008  
2.005  
2.002  
1.999  
1.996  
1.993  
1.990  
1.987  
1.984  
1.981  
1.978  
1.975  
1.972  
1.969  
1.966  
1.963  
1.960  
1.957  
1.954  
1.951  
1.948  
1.945  
1.942  
1.939  
1.936  
1.933  
1.930  
1.927  
1.924  
1.921  
1.918  
1.915  
1.912  
1.909  
1.906  
1.903  
1.900  
1.897  
1.894  
1.891  
1.888  
1.885  
1.882  
1.879  
1.876  
1.873  
1.870  
1.867  
1.864  
1.861  
1.858  
1.855  
1.852  
1.849  
1.846  
1.843  
1.840  
1.837  
1.834  
1.831  
1.828  
1.825  
1.822  
1.819  
1.816  
1.813  
1.810  
1.807  
1.804  
1.801  
1.798  
1.795  
1.792  
1.789  
1.786  
1.783  
1.780  
1.777  
1.774  
1.771  
1.768  
1.765  
1.762  
1.759  
1.756  
1.753  
1.750  
1.747  
1.744  
1.741  
1.738  
1.735  
1.732  
1.729  
1.726  
1.723  
1.720  
1.717  
1.714  
1.711  
1.708  
1.705  
1.702  
1.699  
1.696  
1.693  
1.690  
1.687  
1.684  
1.681  
1.678  
1.675  
1.672  
1.669  
1.666  
1.663  
1.660  
1.657  
1.654  
1.651  
1.648  
1.645  
1.642  
1.639  
1.636  
1.633  
1.630  
1.627  
1.624  
1.621  
1.618  
1.615  
1.612  
1.609  
1.606  
1.603  
1.600  
1.597  
1.594  
1.591  
1.588  
1.585  
1.582  
1.579  
1.576  
1.573  
1.570  
1.567  
1.564  
1.561  
1.558  
1.555  
1.552  
1.549  
1.546  
1.543  
1.540  
1.537  
1.534  
1.531  
1.528  
1.525  
1.522  
1.519  
1.516  
1.513  
1.510  
1.507  
1.504  
1.501  
1.498  
1.495  
1.492  
1.489  
1.486  
1.483  
1.480  
1.477  
1.474  
1.471  
1.468  
1.465  
1.462  
1.459  
1.456  
1.453  
1.450  
1.447  
1.444  
1.441  
1.438  
1.435  
1.432  
1.429  
1.426  
1.423  
1.420  
1.417  
1.414  
1.411  
1.408  
1.405  
1.402  
1.399  
1.396  
1.393  
1.390  
1.387  
1.384  
1.381  
1.378  
1.375  
1.372  
1.369  
1.366  
1.363  
1.360  
1.357  
1.354  
1.351  
1.348  
1.345  
1.342  
1.339  
1.336  
1.333  
1.330  
1.327  
1.324  
1.321  
1.318  
1.315  
1.312  
1.309  
1.306  
1.303  
1.300  
1.297  
1.294  
1.291  
1.288  
1.285  
1.282  
1.279  
1.276  
1.273  
1.270  
1.267  
1.264  
1.261  
1.258  
1.255  
1.252  
1.249  
1.246  
1.243  
1.240  
1.237  
1.234  
1.231  
1.228  
1.225  
1.222  
1.219  
1.216  
1.213  
1.210  
1.207  
1.204  
1.201  
1.198  
1.195  
1.192  
1.189  
1.186  
1.183  
1.180  
1.177  
1.174  
1.171  
1.168  
1.165  
1.162  
1.159  
1.156  
1.153  
1.150  
1.147  
1.144  
1.141  
1.138  
1.135  
1.132  
1.129  
1.126  
1.123  
1.120  
1.117  
1.114  
1.111  
1.108  
1.105  
1.102  
1.099  
1.096  
1.093  
1.090  
1.087  
1.084  
1.081  
1.078  
1.075  
1.072  
1.069  
1.066  
1.063  
1.060  
1.057  
1.054  
1.051  
1.048  
1.045  
1.042  
1.039  
1.036  
1.033  
1.030  
1.027  
1.024  
1.021  
1.018  
1.015  
1.012  
1.009  
1.006  
1.003  
1.000  
0.997  
0.994  
0.991  
0.988  
0.985  
0.982  
0.979  
0.976  
0.973  
0.970  
0.967  
0.964  
0.961  
0.958  
0.955  
0.952  
0.949  
0.946  
0.943  
0.940  
0.937  
0.934  
0.931  
0.928  
0.925  
0.922  
0.919  
0.916  
0.913  
0.910  
0.907  
0.904  
0.901  
0.898  
0.895  
0.892  
0.889  
0.886  
0.883  
0.880  
0.877  
0.874  
0.871  
0.868  
0.865  
0.862  
0.859  
0.856  
0.853  
0.850  
0.847  
0.844  
0.841  
0.838  
0.835  
0.832  
0.829  
0.826  
0.823  
0.820  
0.817  
0.814  
0.811  
0.808  
0.805  
0.802  
0.799  
0.796  
0.793  
0.790  
0.787  
0.784  
0.781  
0.778  
0.775  
0.772  
0.769  
0.766  
0.763  
0.760  
0.757  
0.754  
0.751  
0.748  
0.745  
0.742  
0.739  
0.736  
0.733  
0.730  
0.727  
0.724  
0.721  
0.718  
0.715  
0.712  
0.709  
0.706  
0.703  
0.700  
0.697  
0.694  
0.691  
0.688  
0.685  
0.682  
0.679  
0.676  
0.673  
0.670  
0.667  
0.664  
0.661  
0.658  
0.655  
0.652  
0.649  
0.646  
0.643  
0.640  
0.637  
0.634  
0.631  
0.628  
0.625  
0.622  
0.619  
0.616  
0.613  
0.610  
0.607  
0.604  
0.601  
0.598  
0.595  
0.592  
0.589  
0.586  
0.583  
0.580  
0.577  
0.574  
0.571  
0.568  
0.565  
0.562  
0.559  
0.556  
0.553  
0.550  
0.547  
0.544  
0.541  
0.538  
0.535  
0.532  
0.529  
0.526  
0.523  
0.520  
0.517  
0.514  
0.511  
0.508  
0.505  
0.502  
0.499  
0.496  
0.493  
0.490  
0.487  
0.484  
0.481  
0.478  
0.475  
0.472  
0.469  
0.466  
0.463  
0.460  
0.457  
0.454  
0.451  
0.448  
0.445  
0.442  
0.439  
0.436  
0.433  
0.430  
0.427  
0.424  
0.421  
0.418  
0.415  
0.412  
0.409  
0.406  
0.403  
0.400  
0.397  
0.394  
0.391  
0.388  
0.385  
0.382  
0.379  
0.376  
0.373  
0.370  
0.367  
0.364  
0.361  
0.358  
0.355  
0.352  
0.349  
0.346  
0.343  
0.340  
0.337  
0.334  
0.331  
0.328  
0.325  
0.322  
0.319  
0.316  
0.313  
0.310  
0.307  
0.304  
0.301  
0.298  
0.295  
0.292  
0.289  
0.286  
0.283  
0.280  
0.277  
0.274  
0.271  
0.268  
0.265  
0.262  
0.259  
0.256  
0.253  
0.250  
0.247  
0.244  
0.241  
0.238  
0.235  
0.232  
0.229  
0.226  
0.223  
0.220  
0.217  
0.214  
0.211  
0.208  
0.205  
0.202  
0.199  
0.196  
0.193  
0.190  
0.187  
0.184  
0.181  
0.178  
0.175  
0.172  
0.169  
0.166  
0.163  
0.160  
0.157  
0.154  
0.151  
0.148  
0.145  
0.142  
0.139  
0.136  
0.133  
0.130  
0.127  
0.124  
0.121  
0.118  
0.115  
0.112  
0.109  
0.106  
0.103  
0.100  
0.097  
0.094  
0.091  
0.088  
0.085  
0.082  
0.079  
0.076  
0.073  
0.070  
0.067  
0.064  
0.061  
0.058  
0.055  
0.052  
0.049  
0.046  
0.043  
0.040  
0.037  
0.034  
0.031  
0.028  
0.025  
0.022  
0.019  
0.016  
0.013  
0.010  
0.007  
0.004  
0.001



36821.1.fid  
Name of Sample: CB-83-1  
Spectrum No : 36821



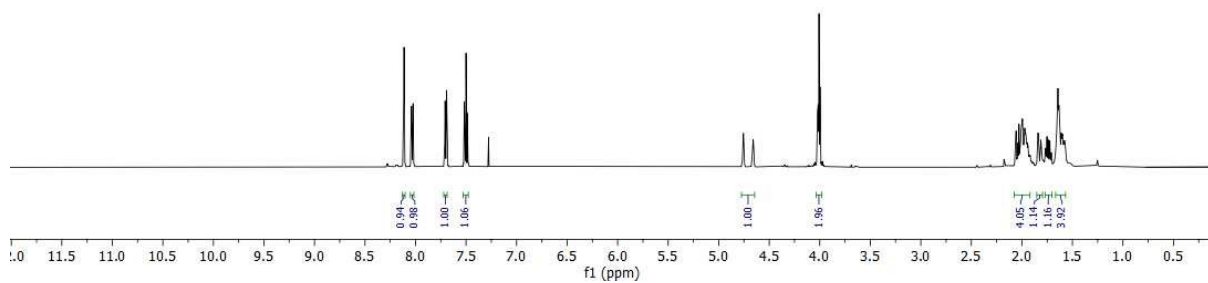
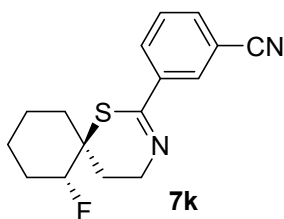


39343  
CB-102-1

8.117  
8.114  
8.110  
8.043  
8.040  
8.037  
8.027  
8.024  
8.011  
7.710  
7.707  
7.704  
7.695  
7.692  
7.689  
7.686  
7.683  
7.681  
7.485

4.761  
4.757  
4.754  
4.750  
4.663  
4.658  
4.654  
4.022  
4.018  
4.014  
4.007  
3.997

2.068  
2.066  
2.064  
2.058  
2.057  
2.054  
2.038  
2.028  
2.017  
2.001  
1.994  
1.972  
1.965  
1.946  
1.812  
1.752  
1.737  
1.723  
1.712  
1.708  
1.692  
1.685  
1.682  
1.600  
1.598  
1.579  
1.577



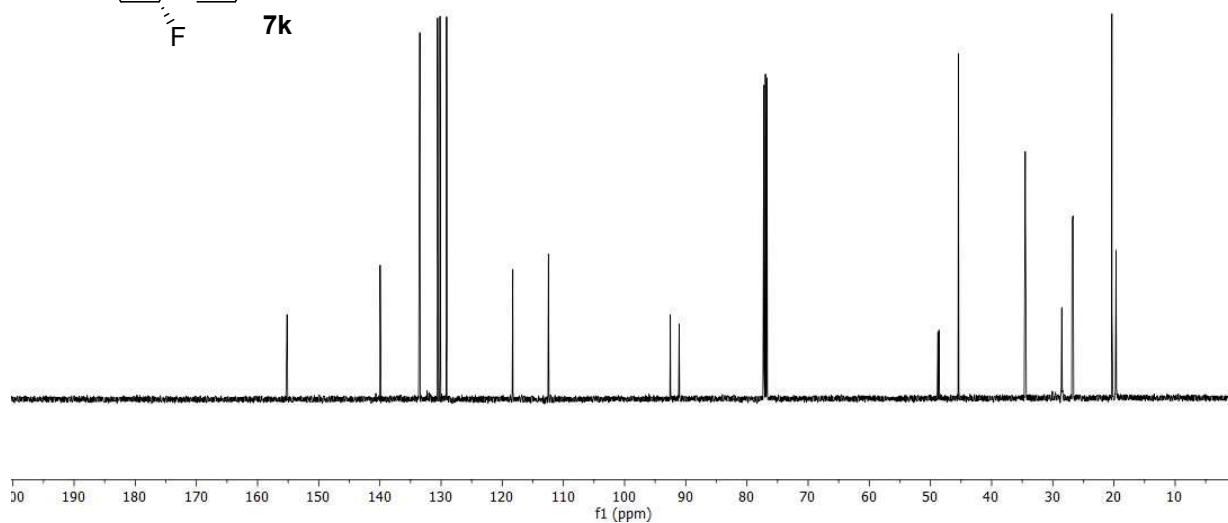
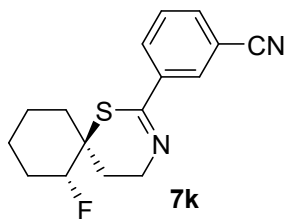
39352.1.fid  
39352  
CB-102-1

155.179  
139.963  
133.478  
130.577  
130.201  
130.181  
129.111  
129.092  
118.276  
112.460

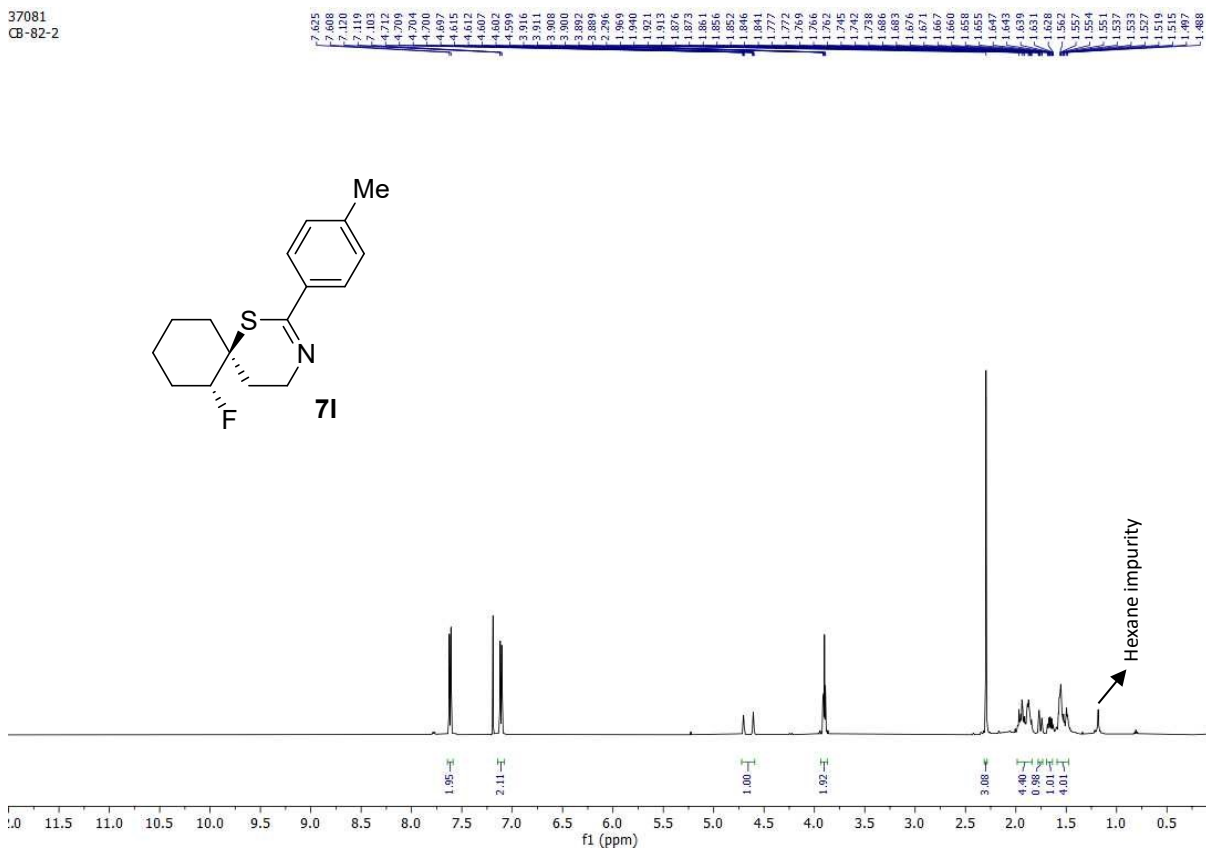
92.520  
91.076

48.278  
48.610  
45.766

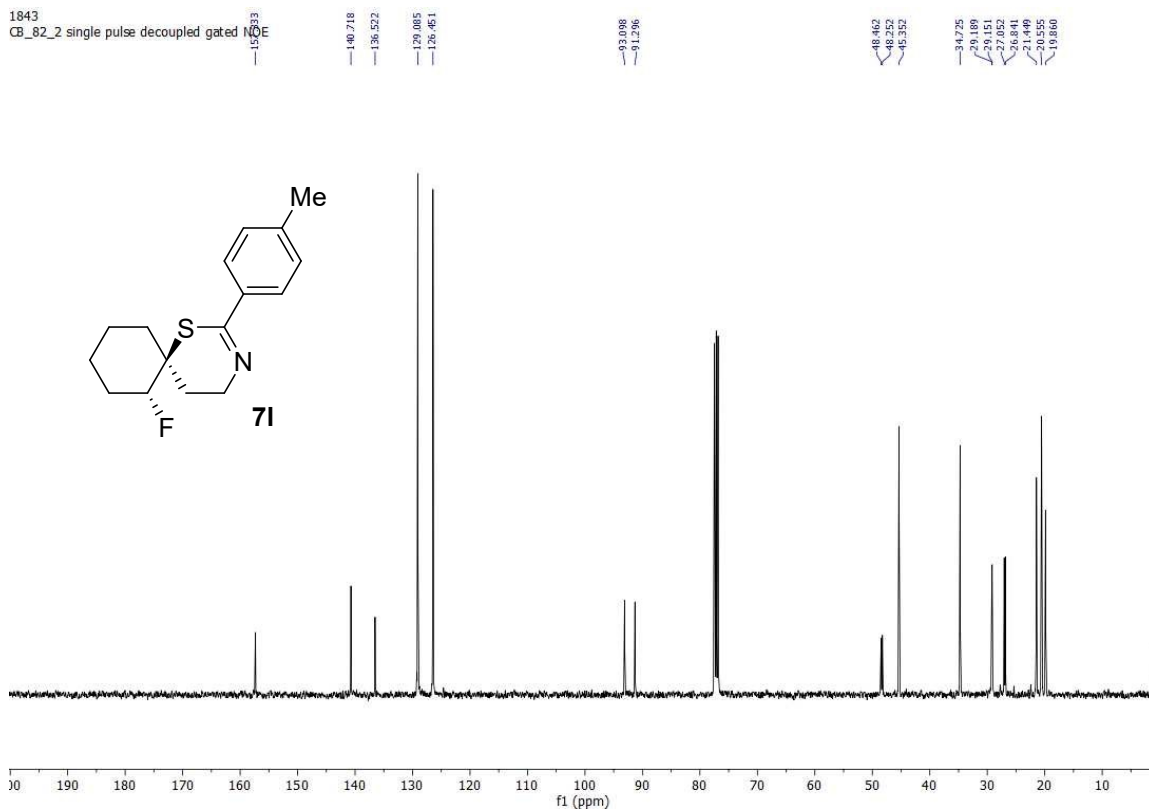
34.503  
28.555  
28.524  
26.032  
20.388  
19.672  
19.653



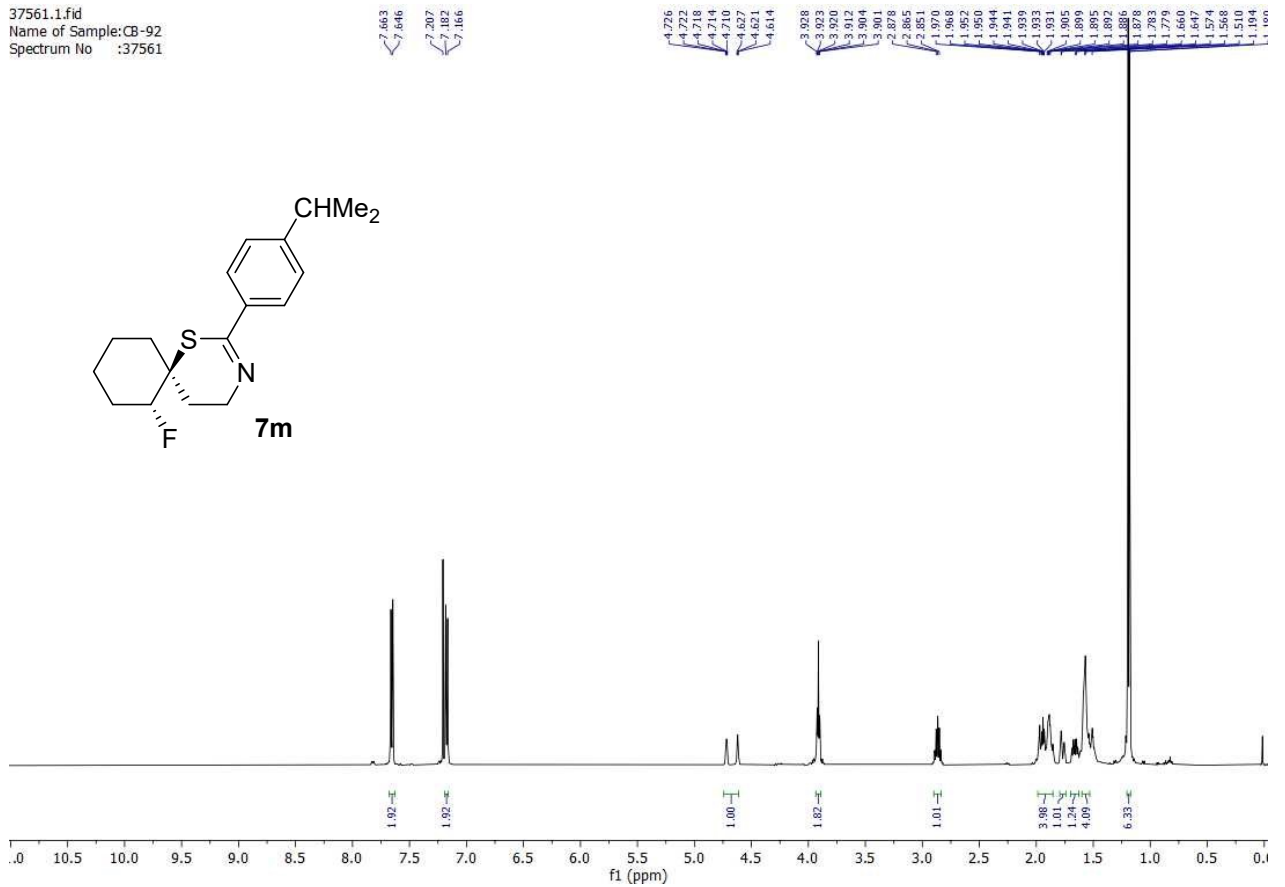
37081  
CB-82-2



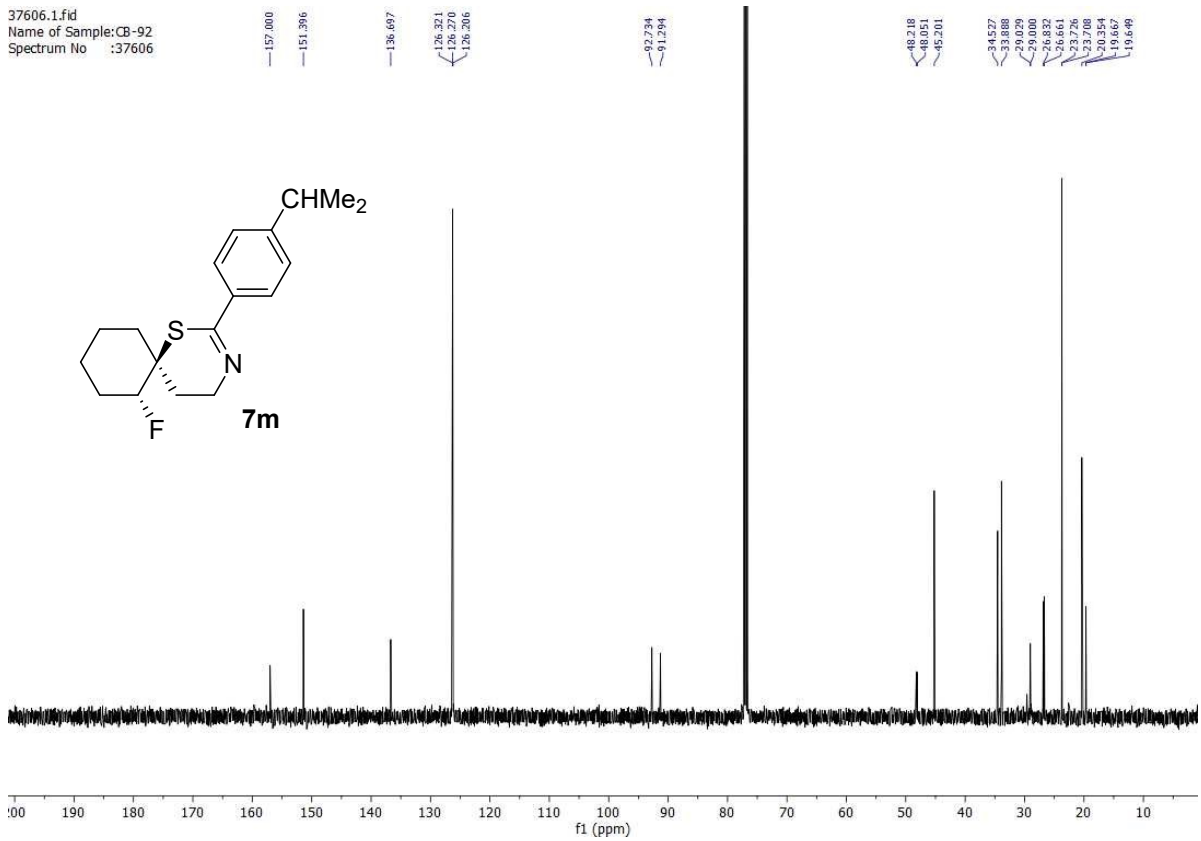
1843  
CB\_82\_2 single pulse decoupled gated NOE



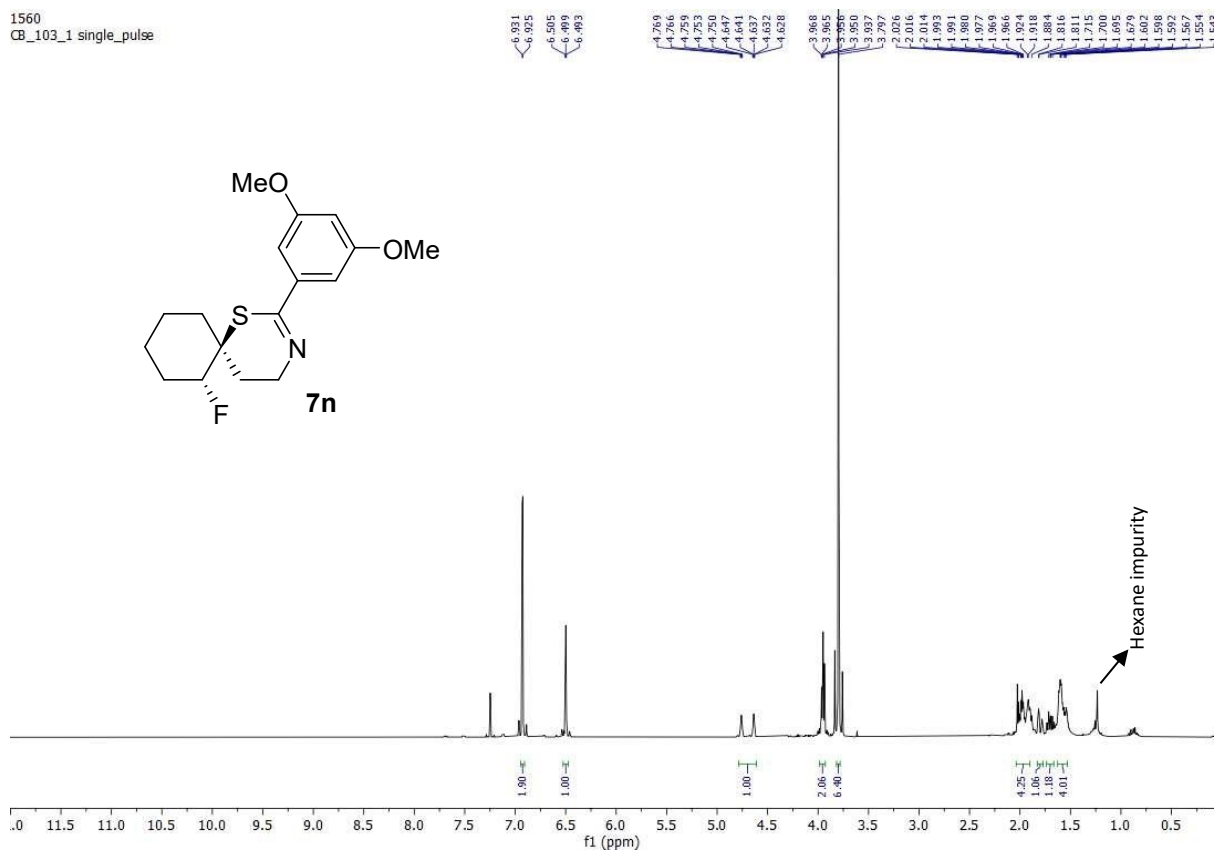
37561.1.fid  
 Name of Sample: CB-92  
 Spectrum No : 37561



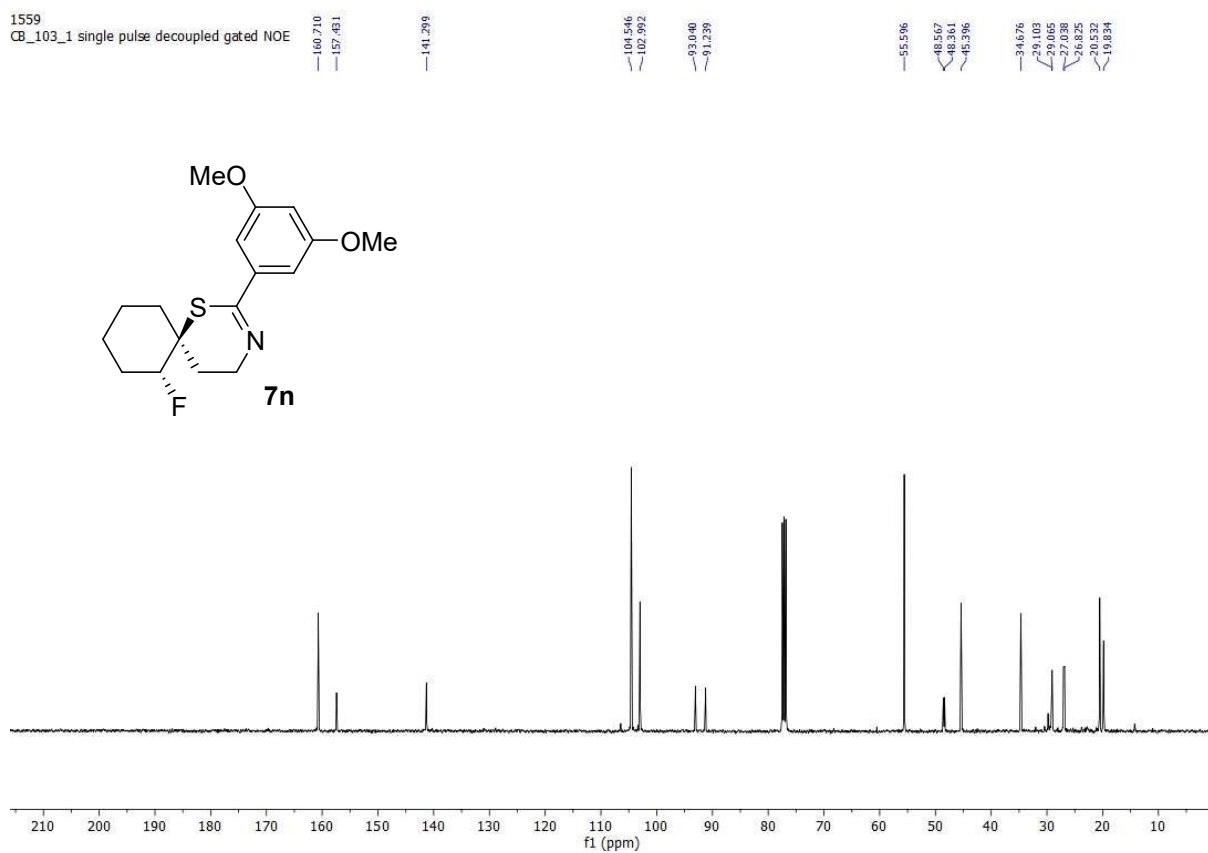
37606.1.fid  
 Name of Sample: CB-92  
 Spectrum No : 37606



1560  
CB\_103\_1\_single\_pulse

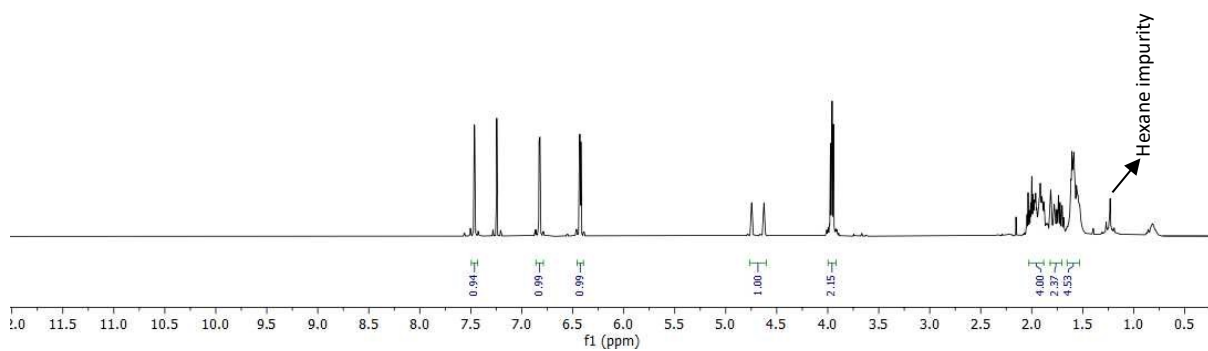
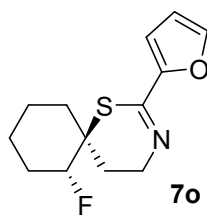


1559  
CB\_103\_1\_single\_pulse decoupled gated NOE



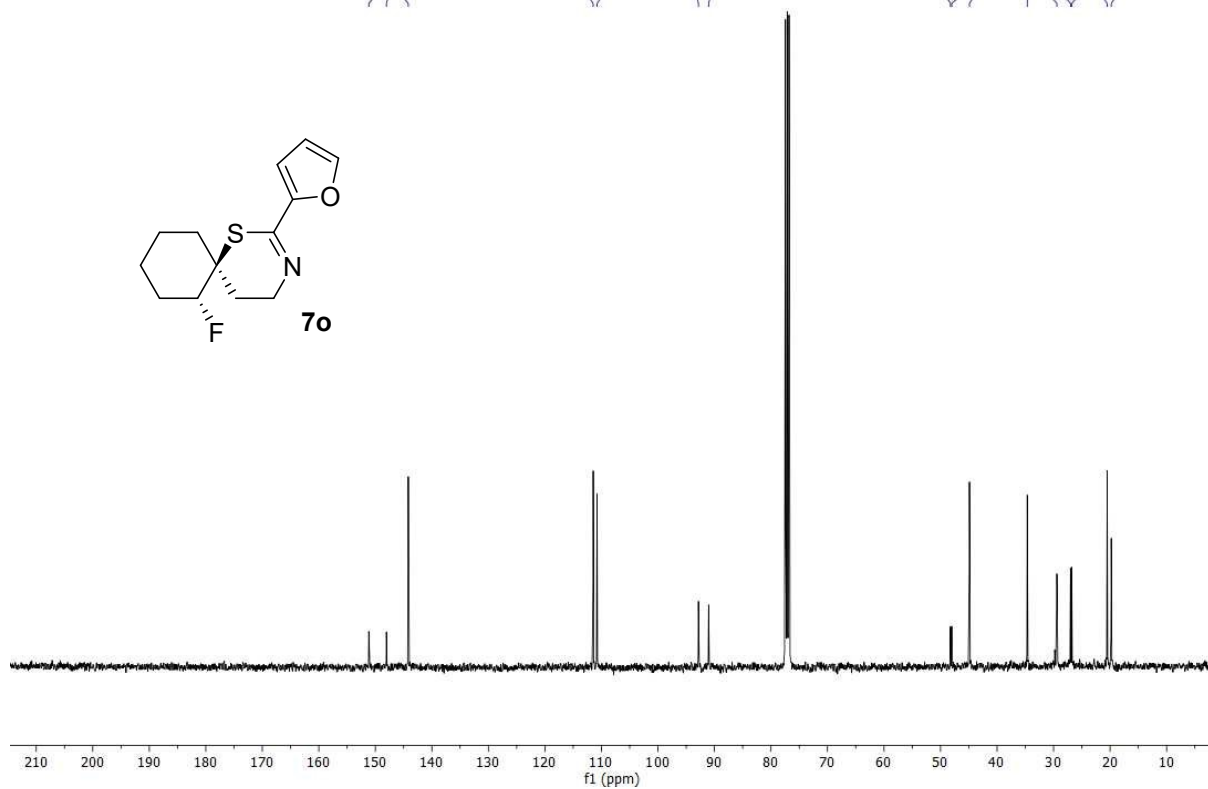
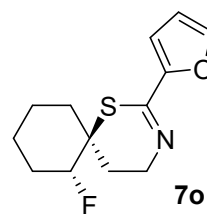
1090  
CB\_88\_2\_single\_pulse

7.467  
7.465  
7.462  
7.461  
6.831  
6.829  
6.822  
6.820  
6.433  
6.429  
6.425  
6.420  
4.753  
4.746  
4.740  
4.634  
4.631  
4.628  
4.625  
4.618  
4.615  
3.973  
3.963  
3.960  
3.957  
3.945  
3.936  
2.033  
2.013  
2.010  
1.999  
1.988  
1.986  
1.982  
1.968  
1.961  
1.936  
1.927  
1.922  
1.916  
1.907  
1.907  
1.902  
1.896  
1.882  
1.818  
1.814  
1.810  
1.806  
1.790  
1.780  
1.738  
1.723  
1.718  
1.705  
1.700  
1.697  
1.688  
1.605  
1.598  
1.595  
1.591  
1.585  
1.564  
1.554  
1.555  
1.554  
1.543



1089  
CB\_88\_2\_single\_pulse\_decoupled\_gated\_NOE

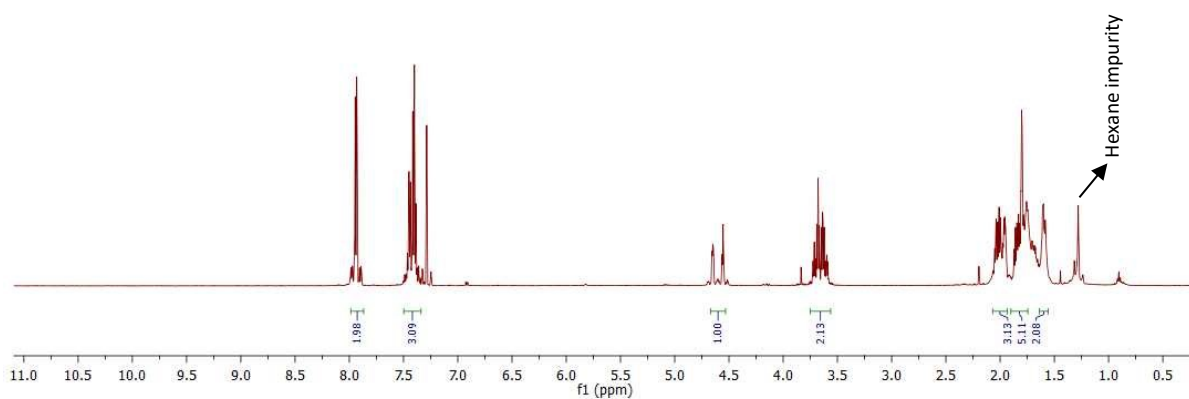
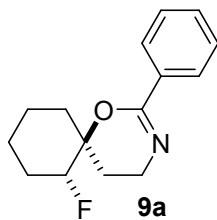
151.167  
148.600  
148.170  
111.455  
110.768  
92.833  
91.029  
48.232  
48.021  
44.885  
34.652  
29.405  
26.998  
26.784  
20.511  
19.791



6484  
6484  
UPS-105-5

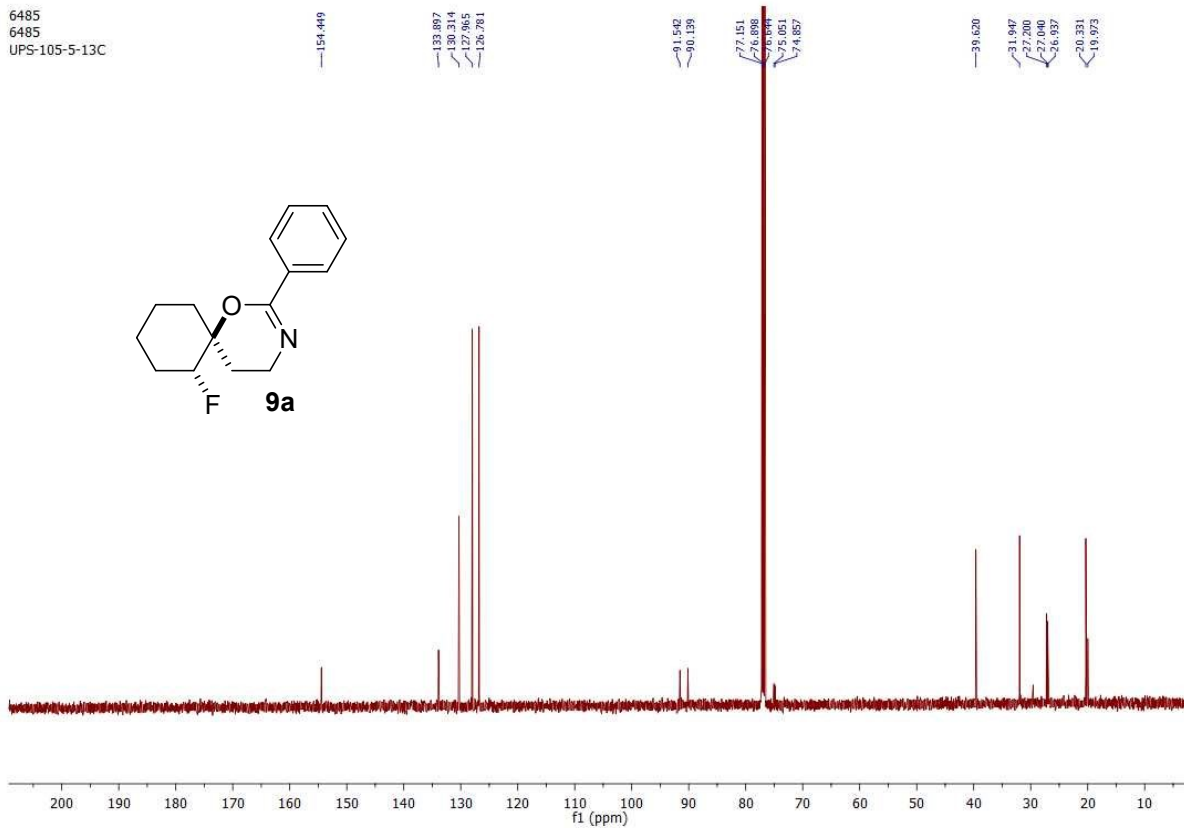
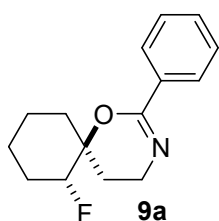
7.945  
7.931  
7.928  
7.449  
7.438  
7.435  
7.415  
7.403  
7.400  
7.386  
7.286

4.857  
4.852  
4.848  
4.843  
4.852  
4.354  
4.346  
3.713  
3.701  
3.690  
3.678  
3.666  
3.648  
3.637  
3.633  
3.622  
3.598  
2.037  
2.022  
2.013  
2.010  
2.007  
2.006  
1.985  
1.957  
1.895  
1.829  
1.802  
1.784  
1.781  
1.758  
1.755  
1.745  
1.609  
1.600  
1.594  
1.584



6485  
6485  
UPS-105-5-13C

154.449  
132.987  
130.314  
127.965  
126.781  
91.152  
90.139  
77.151  
74.198  
74.096  
75.051  
74.857  
39.620  
31.947  
27.200  
26.937  
20.331  
19.073



UPS-166-2  
19651

7.872  
7.789  
7.774  
7.386  
7.370  
7.307  
7.291  
7.246  
7.232

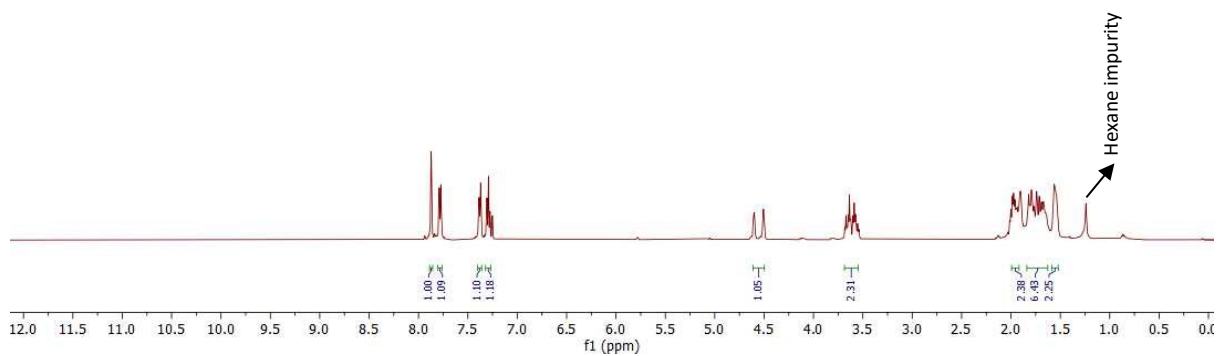
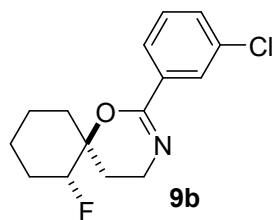
4.510  
4.492  
4.594  
4.515  
4.506  
4.497

3.636  
3.624  
3.587  
3.574  
3.564

1.997  
1.973  
1.959  
1.946  
1.935  
1.922  
1.910  
1.897

1.882  
1.888  
1.793  
1.781  
1.768  
1.752  
1.738  
1.713

1.691  
1.671  
1.662  
1.575  
1.564  
1.553  
1.537



19652  
19652  
UPS-166-2

153.688

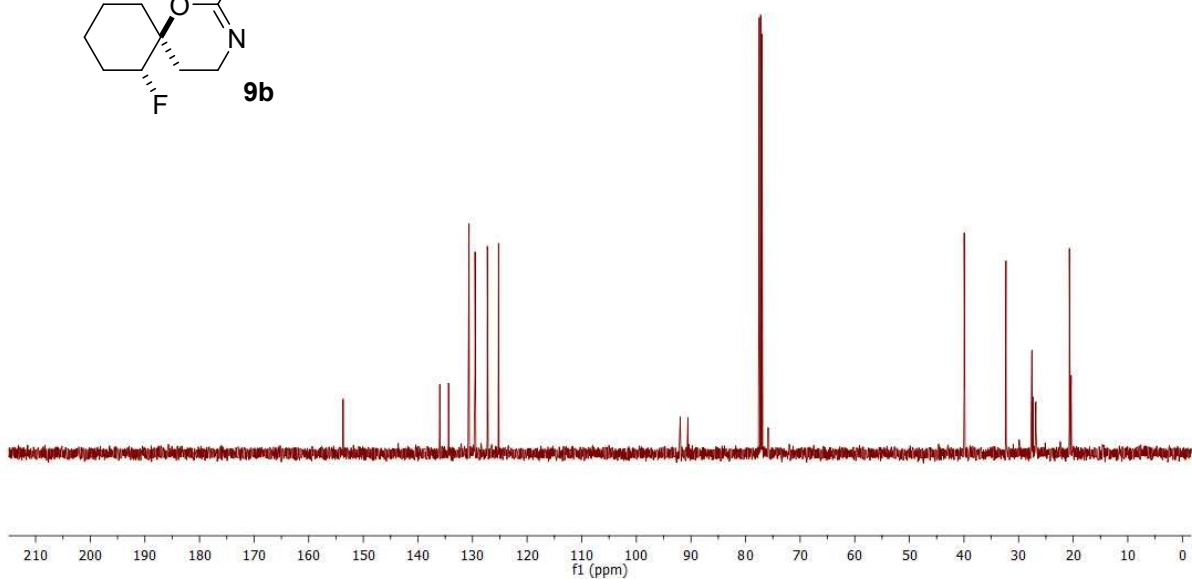
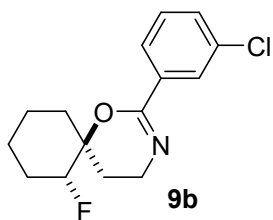
135.993  
134.381  
130.628  
129.535  
127.281  
125.236

91.861  
90.554

77.480  
77.265  
76.827  
75.921

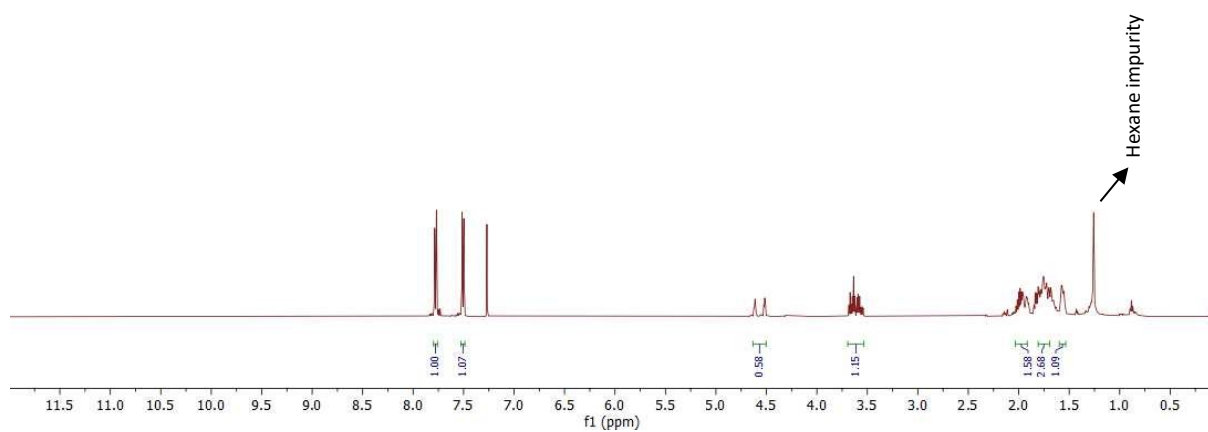
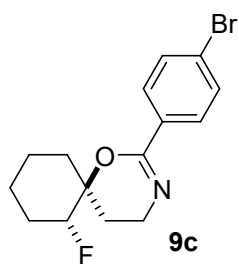
39.961

32.313  
27.570  
27.410  
26.838  
20.698  
20.374

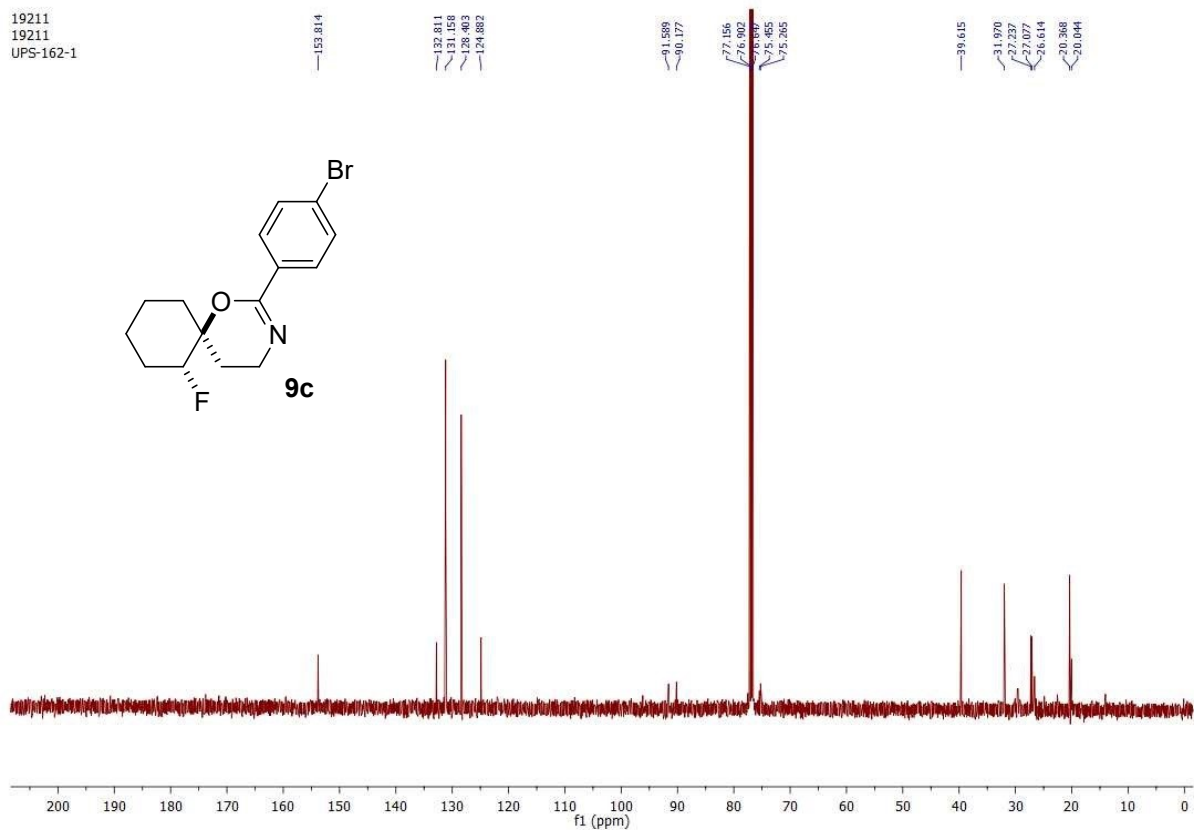
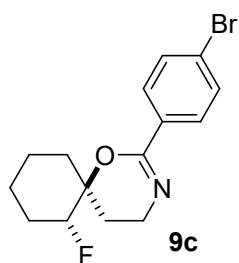


19210  
UPS-162-1

7.786  
7.769  
7.514  
7.511  
7.497  
7.269  
7.267  
7.265  
7.263  
7.261  
7.259  
7.257  
7.255  
7.253  
7.251  
7.249  
7.247  
7.245  
7.243  
7.241  
7.239  
7.237  
7.235  
7.233  
7.231  
7.229  
7.227  
7.225  
7.223  
7.221  
7.219  
7.217  
7.215  
7.213  
7.211  
7.209  
7.207  
7.205  
7.203  
7.201  
7.199  
7.197  
7.195  
7.193  
7.191  
7.189  
7.187  
7.185  
7.183  
7.181  
7.179  
7.177  
7.175  
7.173  
7.171  
7.169  
7.167  
7.165  
7.163  
7.161  
7.159  
7.157  
7.155  
7.153

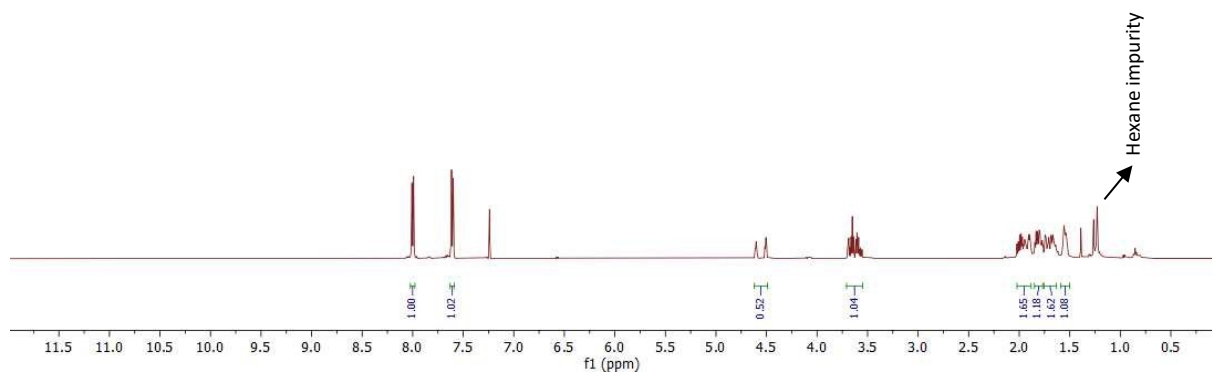
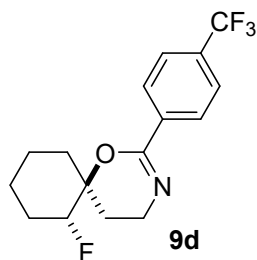


19211  
19211  
UPS-162-1

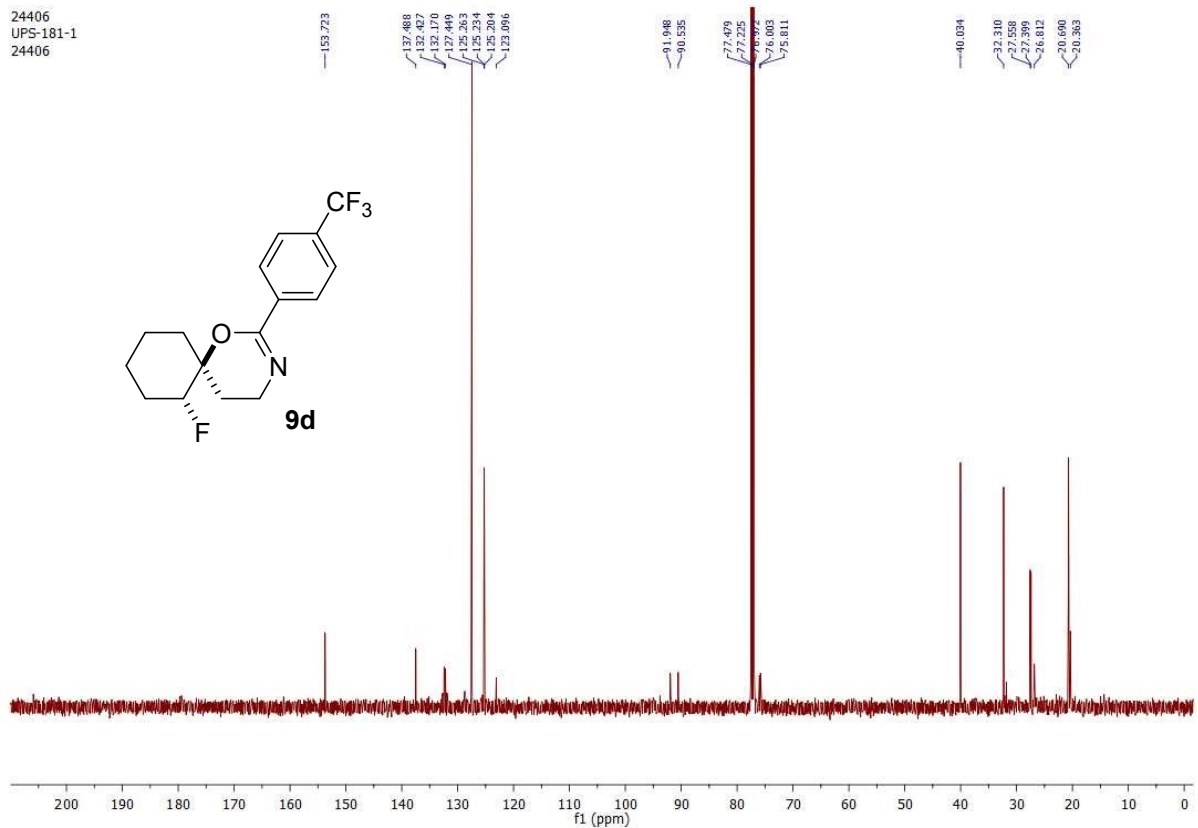
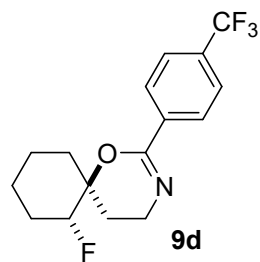




24405  
UPS-181-1

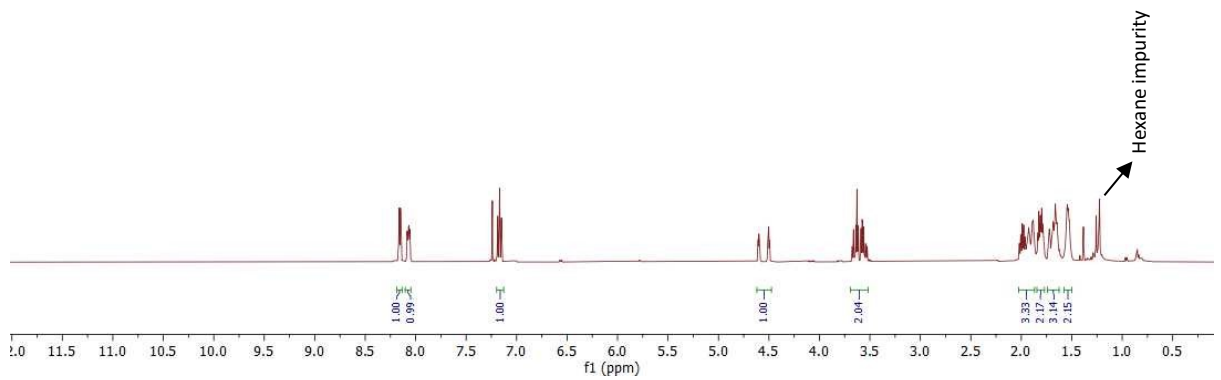
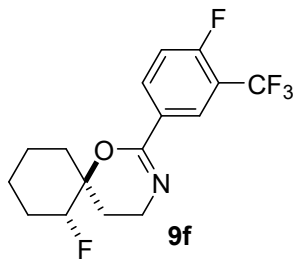


24406  
UPS-181-1  
24406



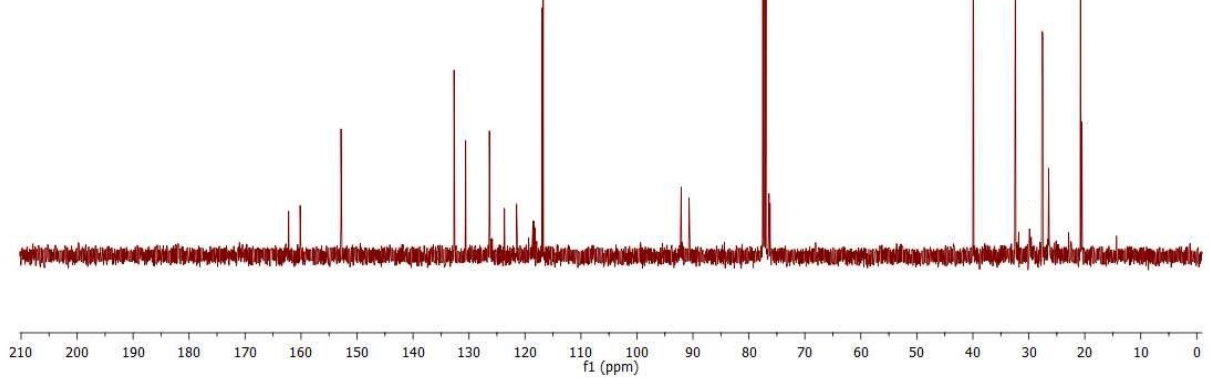
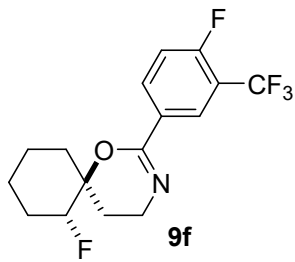


8.162  
8.146  
8.114  
8.114  
8.065  
8.052  
8.025  
8.025  
8.070  
8.067  
8.063  
8.053  
8.053  
7.887  
7.887  
7.169  
7.150  
4.660  
4.596  
4.502  
3.862  
3.828  
3.616  
3.588  
3.577  
3.572  
3.561  
2.019  
2.019  
2.004  
2.004  
2.001  
1.992  
1.989  
1.980  
1.976  
1.976  
1.965  
1.962  
1.938  
1.930  
1.928  
1.921  
1.916  
1.916  
1.899  
1.891  
1.881  
1.872  
1.872  
1.837  
1.834  
1.826  
1.822  
1.822  
1.810  
1.810  
1.806  
1.798  
1.794  
1.783  
1.783  
1.778  
1.772  
1.722  
1.716  
1.713  
1.703  
1.699  
1.696  
1.686  
1.683  
1.683  
1.678  
1.673  
1.666  
1.666  
1.663  
1.658  
1.650  
1.646  
1.641  
1.637  
1.565  
1.557  
1.549  
1.544  
1.530  
1.530  
1.528  
1.523  
1.517  
1.514



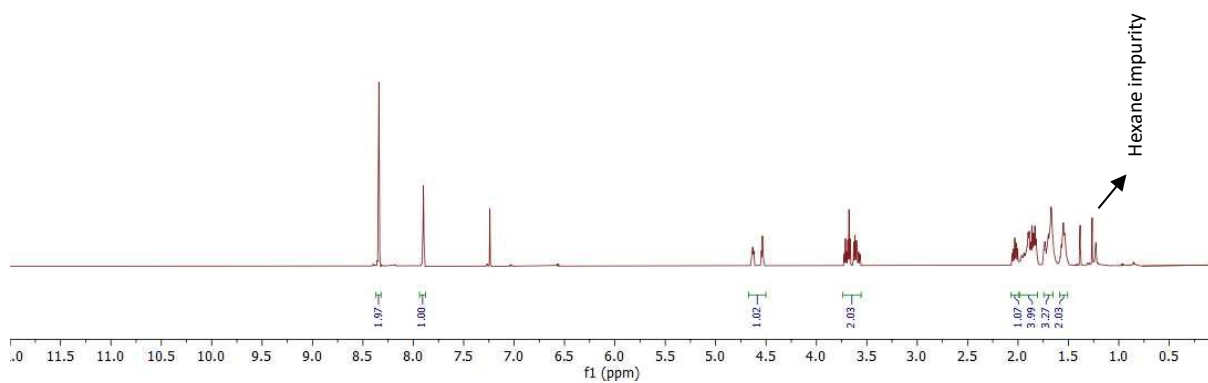
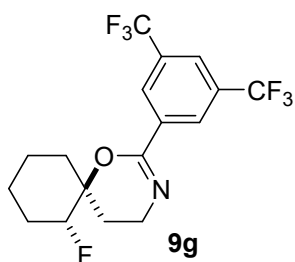
24404  
UPS-180-1  
24404

162.217  
160.165  
152.861  
132.679  
132.607  
130.625  
129.377  
129.377  
126.320  
123.665  
121.499  
118.546  
118.443  
118.283  
118.178  
116.988  
116.740  
92.095  
90.687  
77.498  
77.224  
76.407  
76.215  
39.918  
32.386  
27.643  
27.484  
26.442  
20.276  
20.506



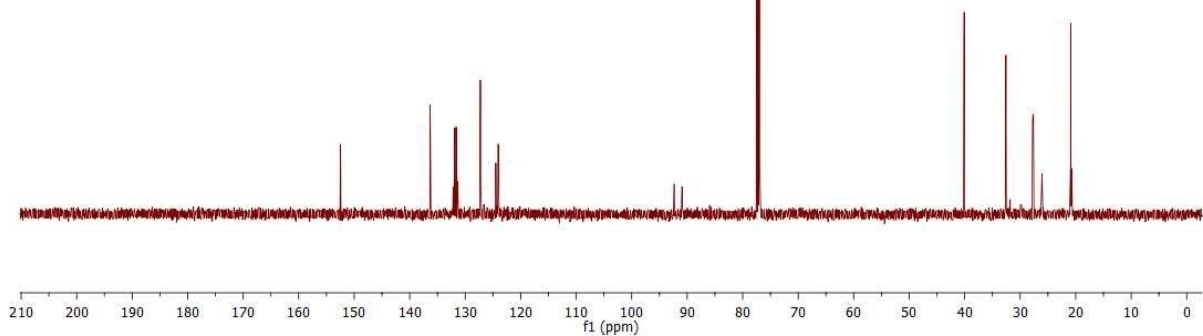
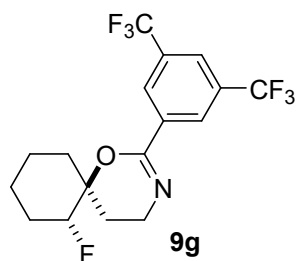
24401  
UPS-178-1

8.343  
8.339  
7.899  
7.240  
4.694  
4.694  
4.622  
4.595  
4.536  
4.526  
3.723  
3.712  
3.701  
3.696  
3.627  
3.666  
3.666  
3.630  
3.619  
3.614  
3.603  
3.595  
3.595  
3.579  
3.568  
3.568  
2.060  
2.057  
2.049  
2.044  
2.044  
2.044  
2.032  
2.029  
2.029  
2.021  
2.016  
2.013  
2.005  
2.005  
2.002  
2.002  
1.996  
1.990  
1.889  
1.878  
1.872  
1.869  
1.865  
1.861  
1.858  
1.858  
1.846  
1.846  
1.841  
1.841  
1.833  
1.830  
1.822  
1.818  
1.818  
1.774  
1.772  
1.768  
1.701  
1.697  
1.691  
1.687  
1.683  
1.683  
1.672  
1.666  
1.658  
1.649  
1.570  
1.561  
1.557  
1.550  
1.540  
1.535  
1.530  
1.527

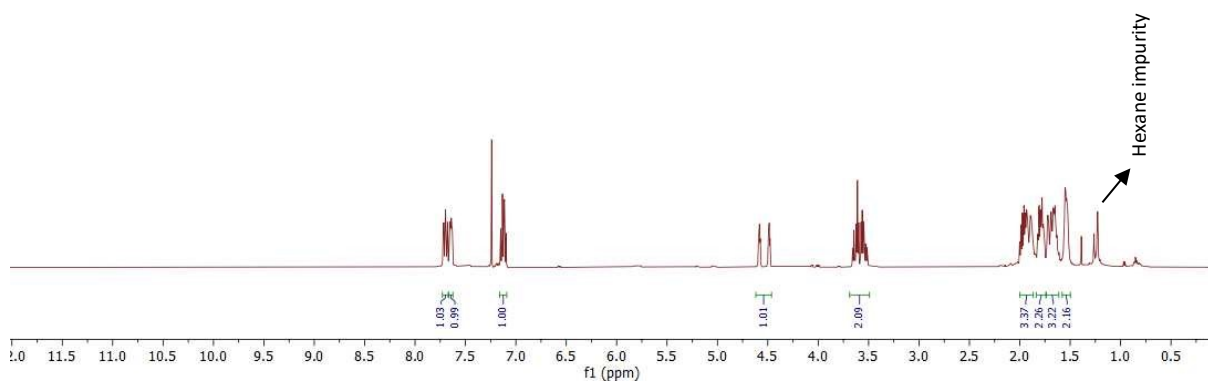
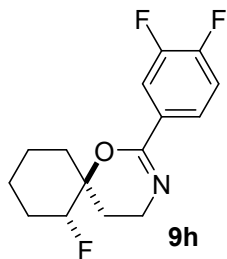


24402  
UPS-178-1  
24402

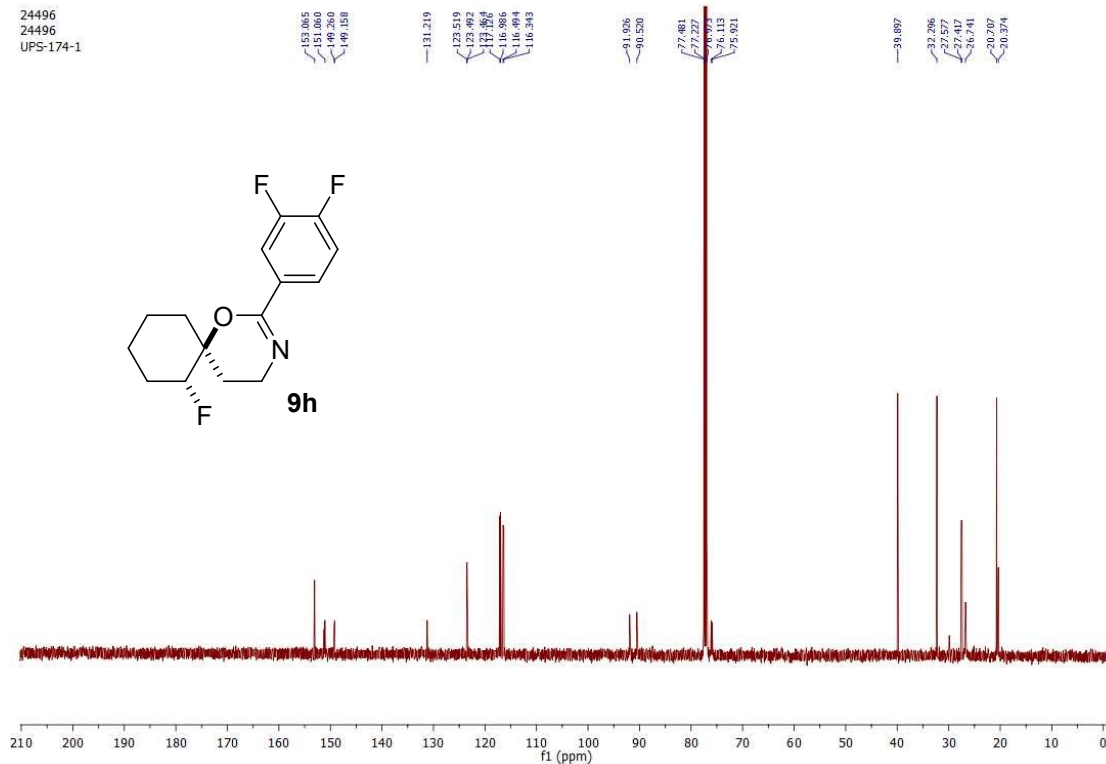
152.461  
136.317  
132.156  
131.889  
131.623  
131.623  
127.262  
124.479  
124.042  
124.012  
82.348  
80.921  
77.481  
77.077  
76.672  
76.857  
40.086  
32.573  
27.771  
27.614  
26.081  
20.898  
20.750



7.899  
 7.895  
 7.880  
 7.876  
 7.661  
 7.657  
 7.649  
 7.644  
 7.635  
 7.631  
 7.240  
 7.150  
 7.133  
 7.129  
 7.115  
 7.113  
 7.097  
 4.591  
 4.583  
 4.574  
 4.495  
 4.486  
 4.476  
 3.645  
 3.622  
 3.611  
 3.599  
 3.525  
 3.564  
 3.520  
 3.474  
 1.990  
 1.987  
 1.983  
 1.974  
 1.971  
 1.962  
 1.952  
 1.955  
 1.947  
 1.944  
 1.932  
 1.923  
 1.919  
 1.913  
 1.898  
 1.886  
 1.886  
 1.878  
 1.873  
 1.822  
 1.818  
 1.811  
 1.807  
 1.790  
 1.795  
 1.790  
 1.783  
 1.779  
 1.771  
 1.769  
 1.759  
 1.750  
 1.722  
 1.714  
 1.688  
 1.689  
 1.684  
 1.676  
 1.667  
 1.661  
 1.651  
 1.642  
 1.631  
 1.588  
 1.572  
 1.536  
 1.536  
 1.526  
 1.519  
 1.516

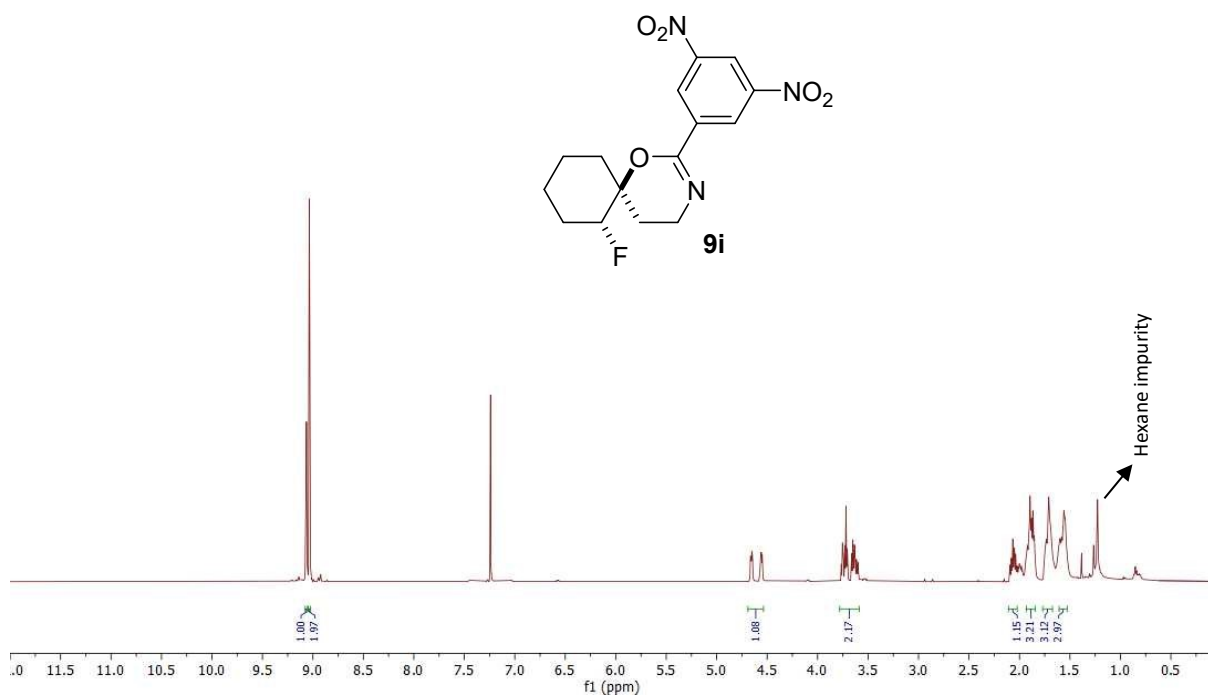


24496  
 24496  
 UPS-174-1

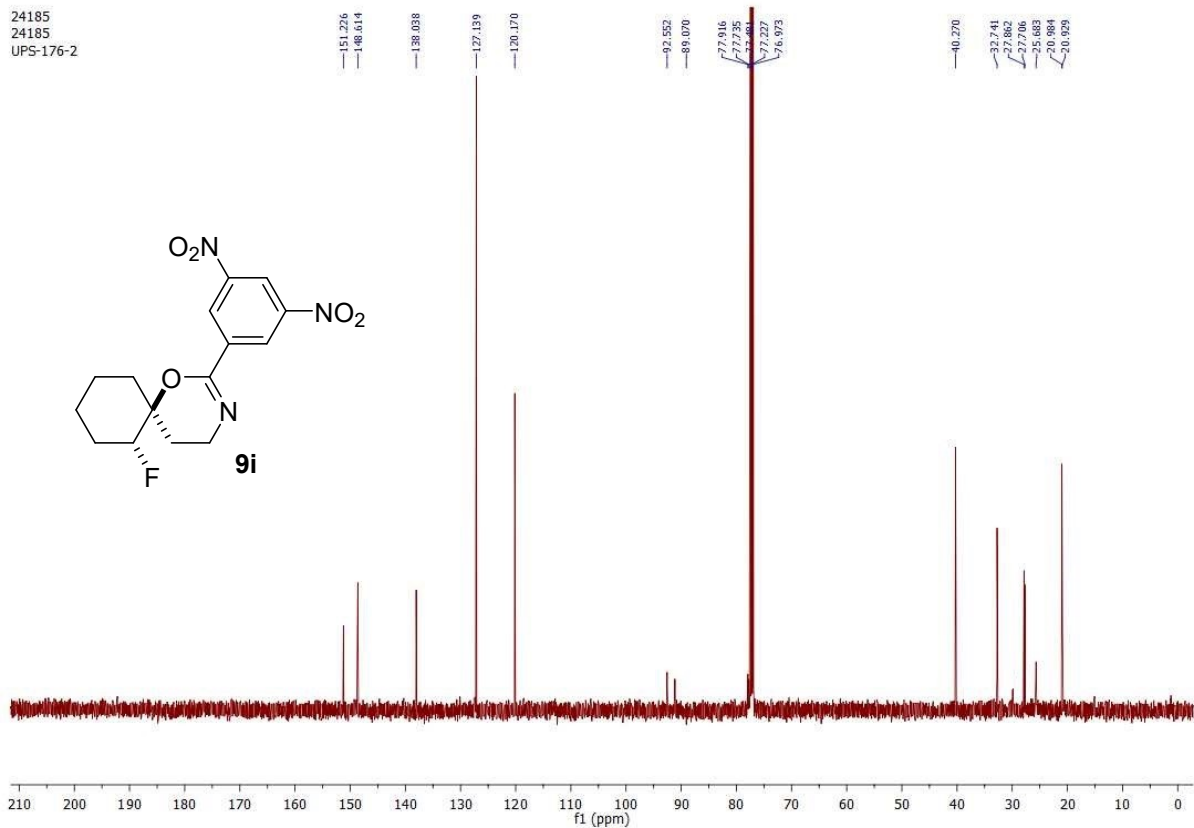


24184  
UPS-176-2

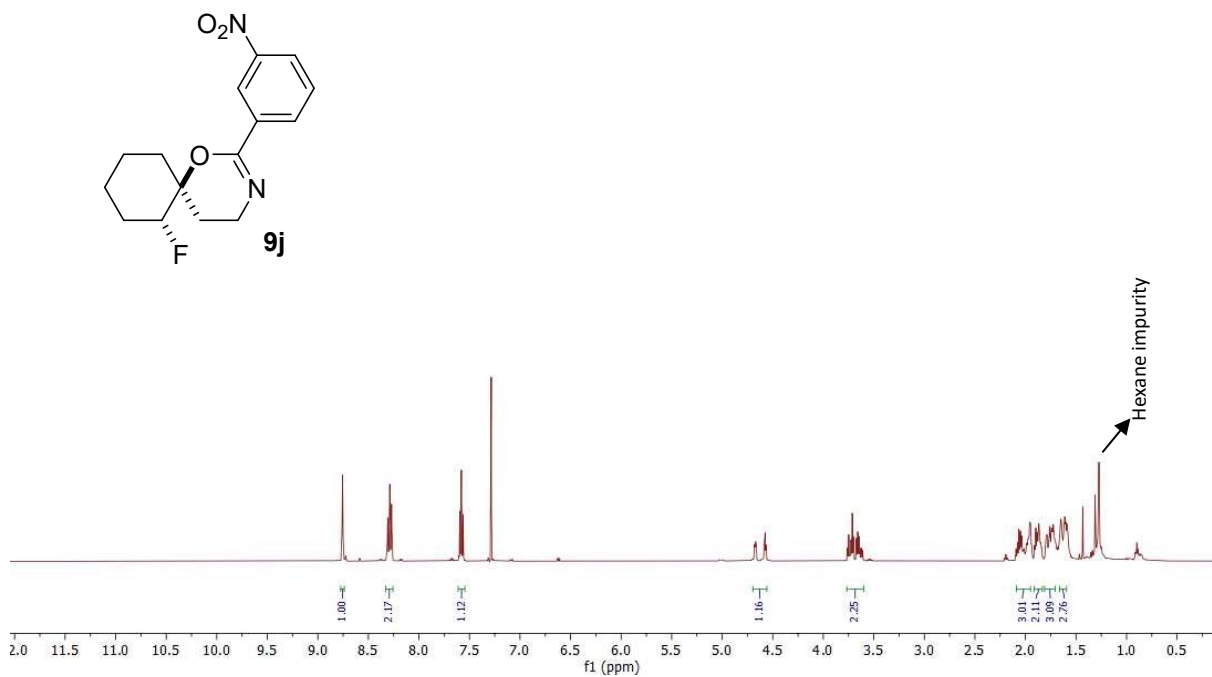
9.068  
9.064  
9.060  
9.056  
9.052  
7.240  
4.665  
4.662  
4.655  
4.556  
4.549  
3.765  
3.754  
3.743  
3.729  
3.707  
3.662  
3.651  
3.645  
3.634  
3.626  
3.616  
3.610  
3.599  
2.994  
2.991  
2.983  
2.980  
2.978  
2.976  
2.966  
2.966  
2.954  
2.955  
2.952  
2.949  
2.947  
2.938  
2.938  
2.927  
2.927  
2.922  
2.908  
1.988  
1.988  
1.981  
1.981  
1.977  
1.907  
1.903  
1.896  
1.892  
1.885  
1.885  
1.875  
1.875  
1.868  
1.864  
1.864  
1.857  
1.853  
1.853  
1.731  
1.731  
1.702  
1.697  
1.691  
1.684  
1.580  
1.576  
1.566  
1.561  
1.557  
1.552  
1.545



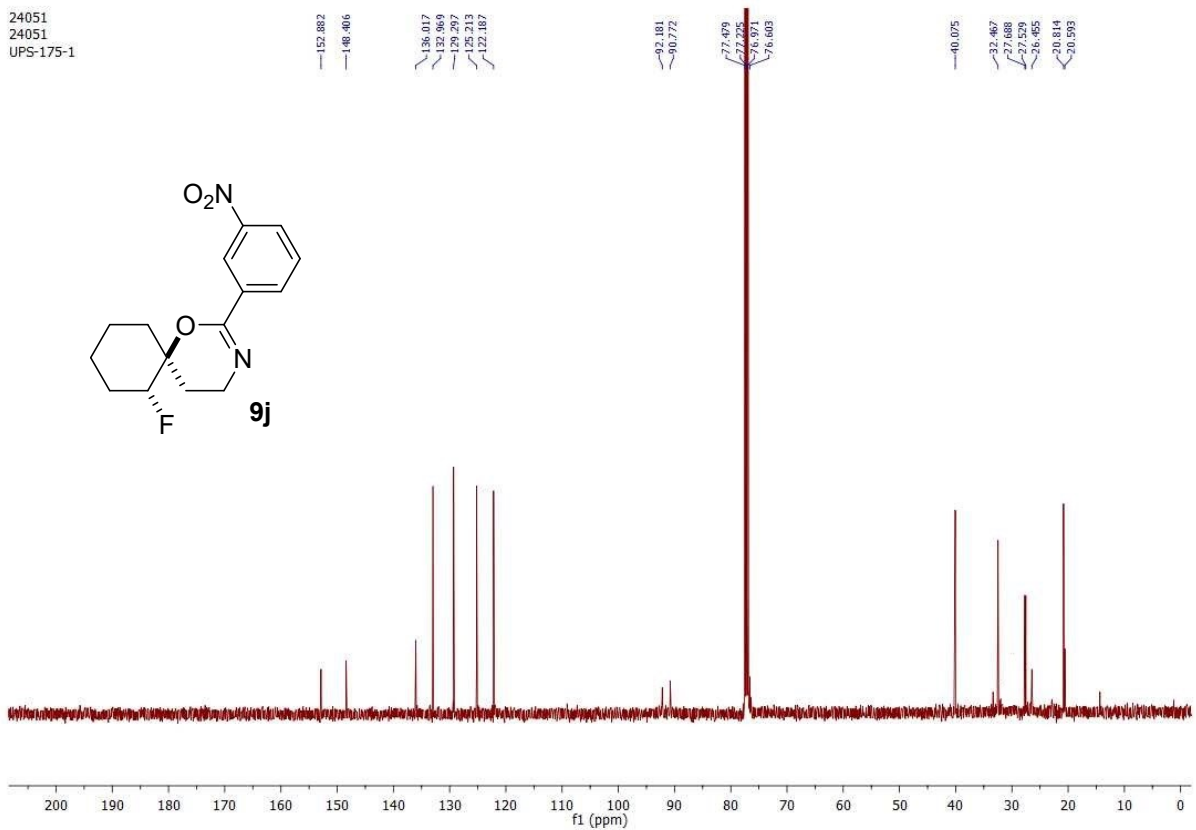
24185  
24185  
UPS-176-2



UPS-175-  
24050

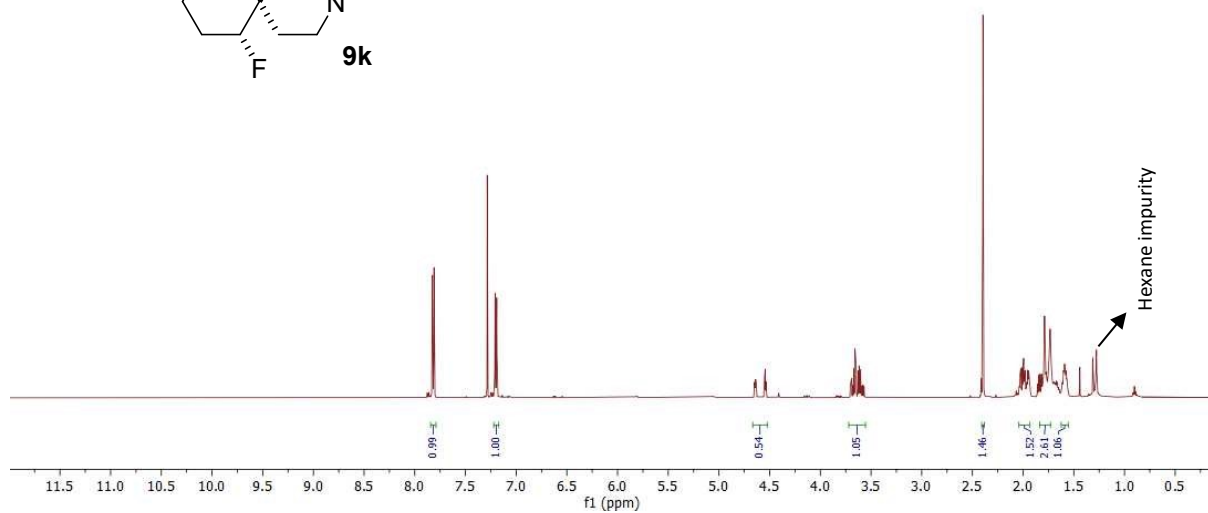
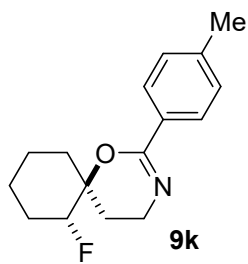


24051  
24051  
UPS-175-1



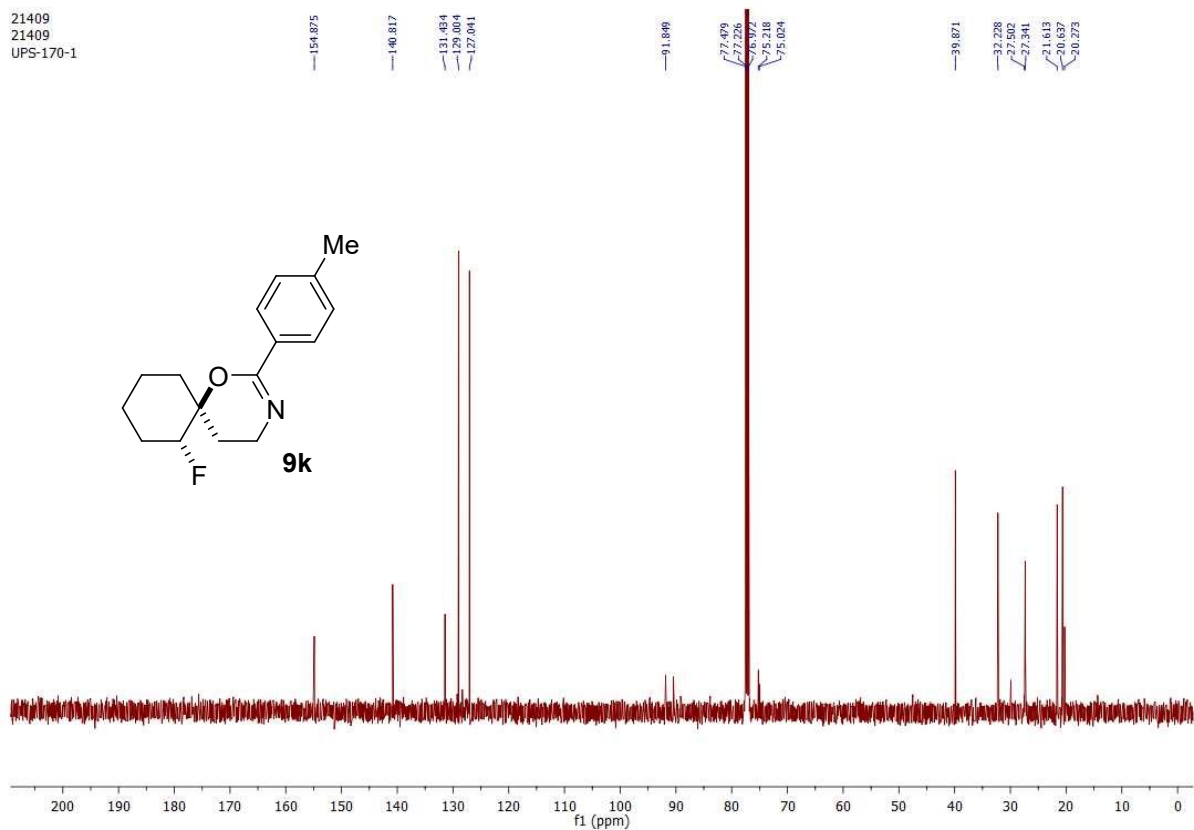
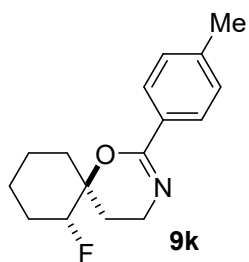
21408  
UPS-170-1

7.810  
7.806  
7.295  
7.209  
7.208  
7.193  
7.192  
7.191  
4.888  
4.886  
4.638  
4.632  
4.552  
4.544  
4.537  
3.693  
3.659  
3.658  
3.646  
3.629  
3.618  
3.614  
3.603  
3.580  
3.576  
3.030  
2.023  
2.009  
2.007  
1.999  
1.995  
1.992  
1.982  
1.981  
1.981  
1.954  
1.946  
1.832  
1.817  
1.815  
1.815  
1.792  
1.789  
1.784  
1.773  
1.773  
1.769  
1.753  
1.748  
1.741  
1.733  
1.601  
1.596  
1.590  
1.587  
1.576  
1.576



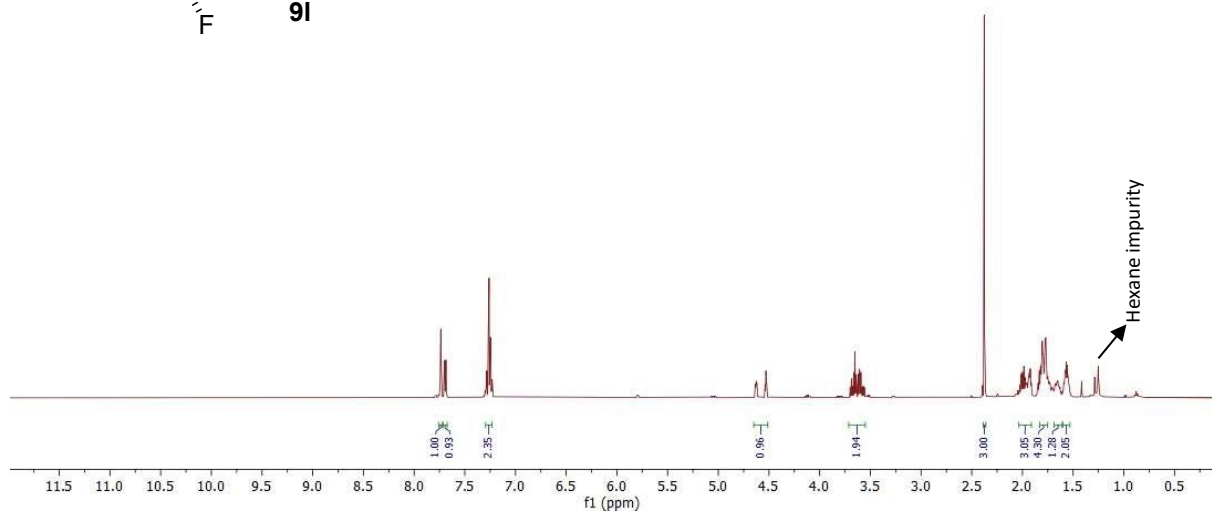
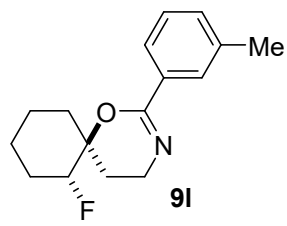
21409  
21409  
UPS-170-1

154.875  
140.817  
131.484  
129.004  
127.891  
91.898  
77.479  
77.226  
76.972  
75.218  
75.024  
39.871  
37.228  
37.041  
27.341  
21.613  
20.637  
20.273

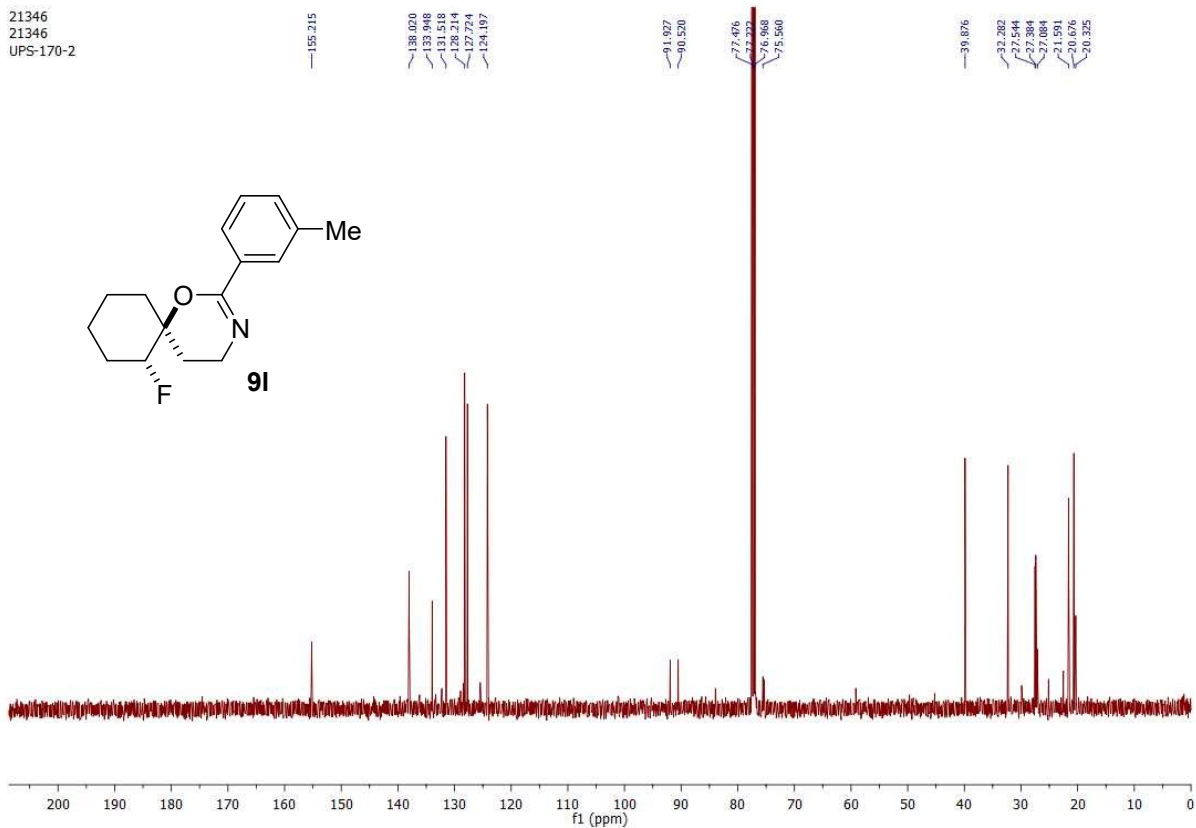
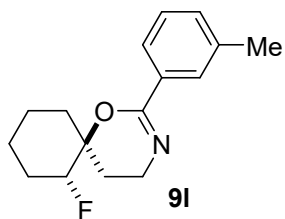




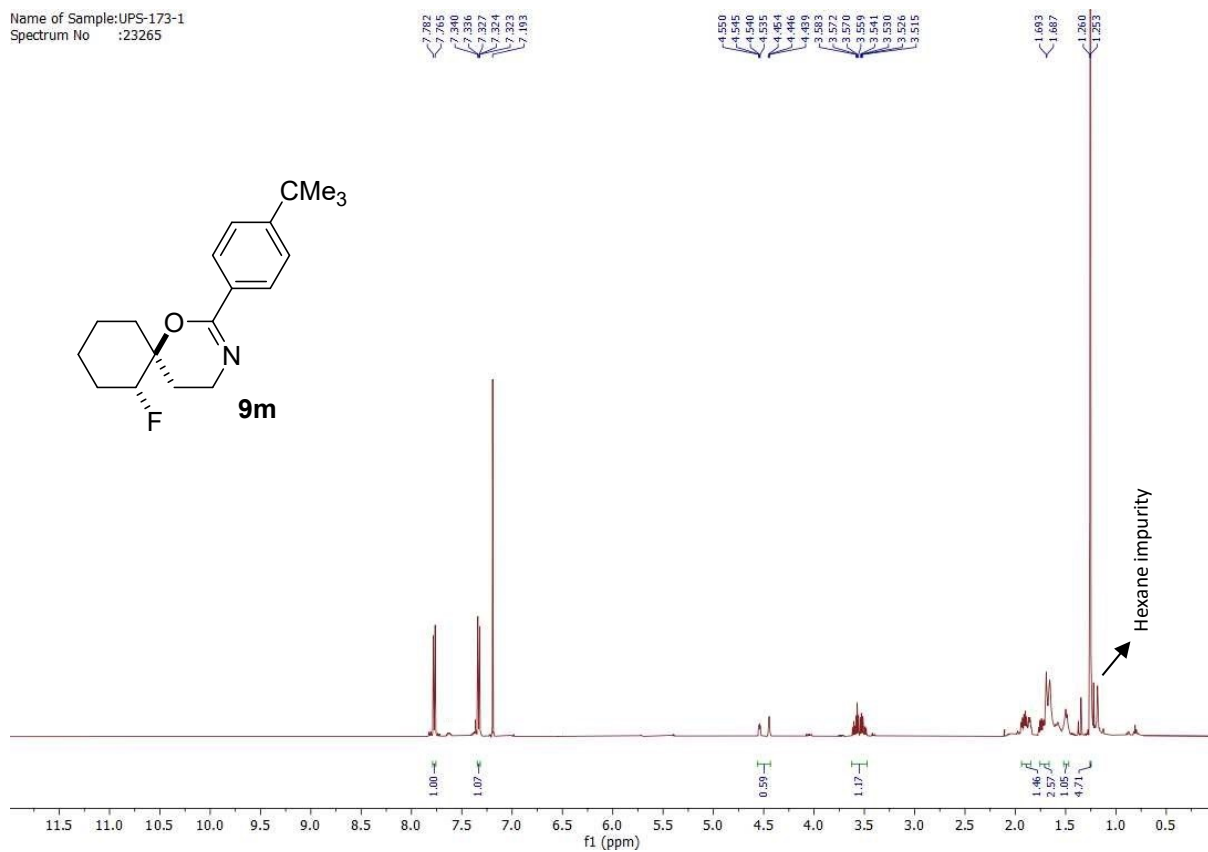
21345  
UPS-170-2



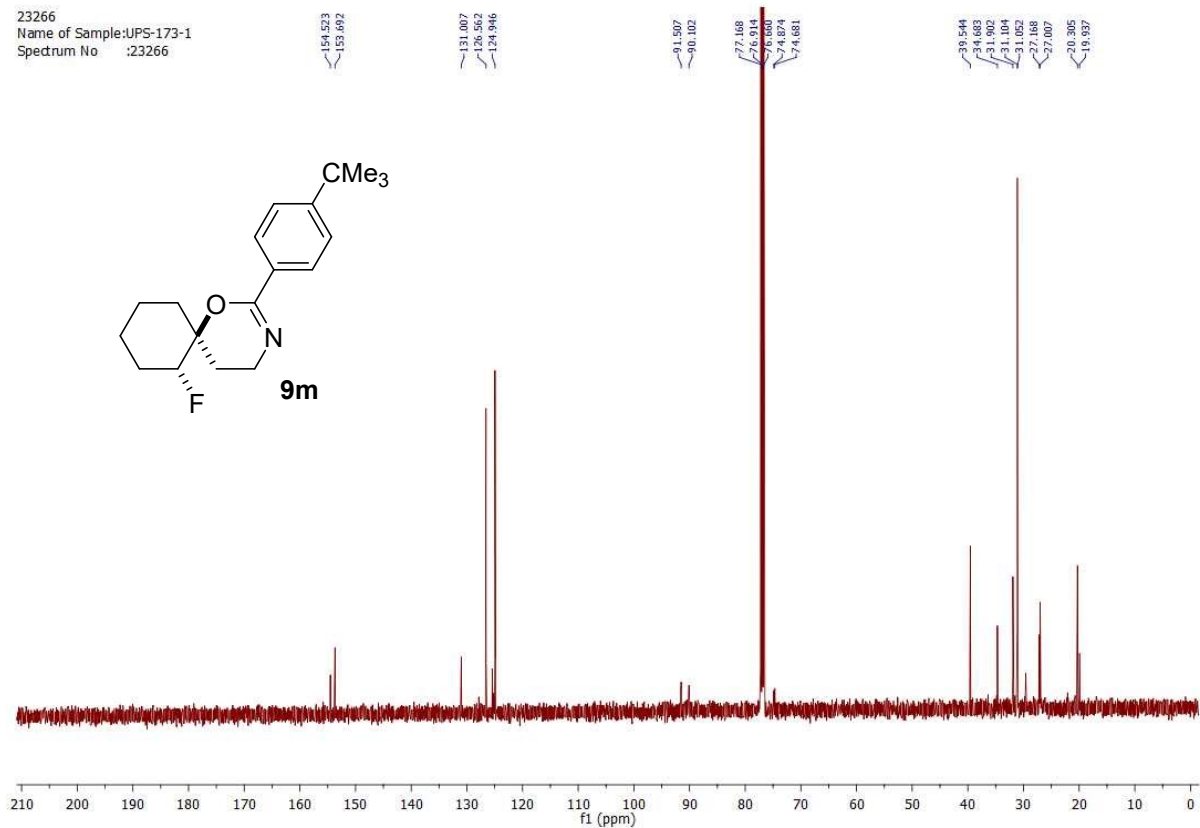
21346  
21346  
UPS-170-2



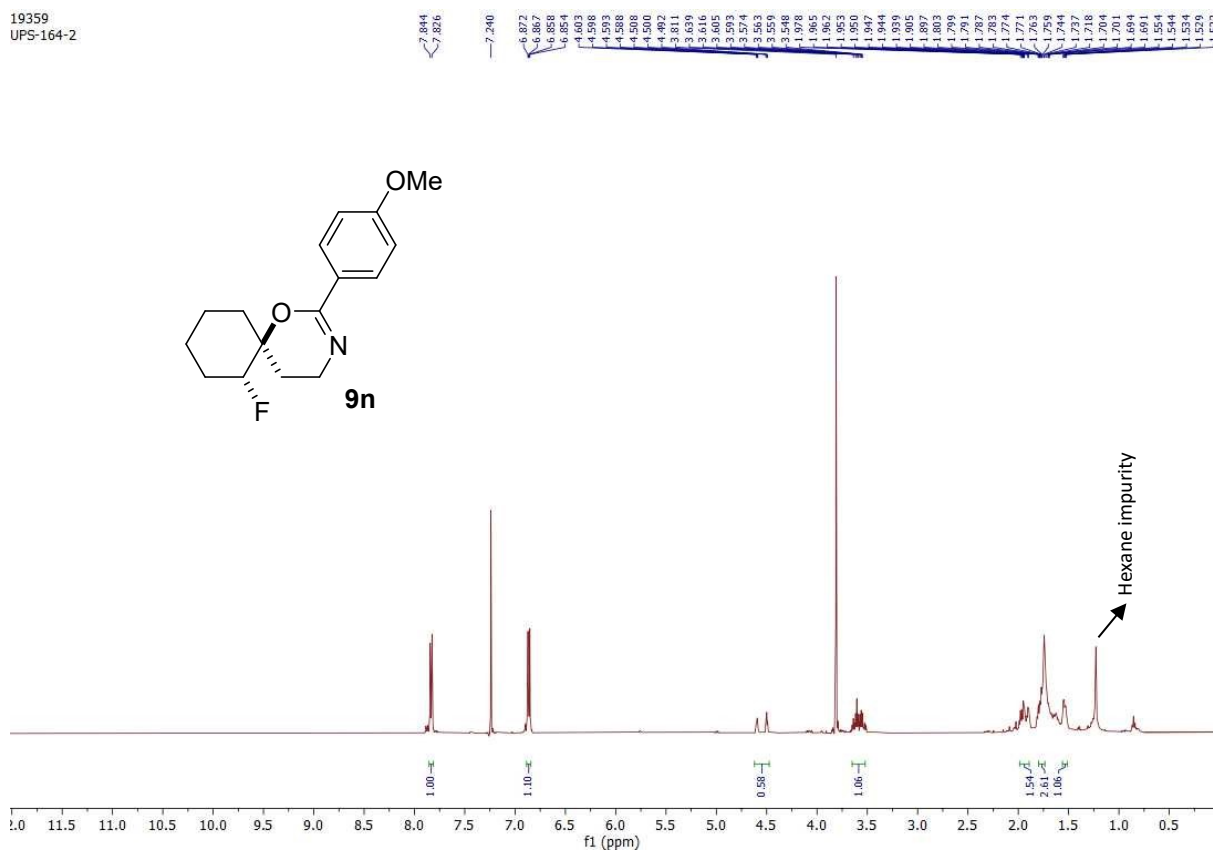
Name of Sample: UPS-173-1  
Spectrum No :23265



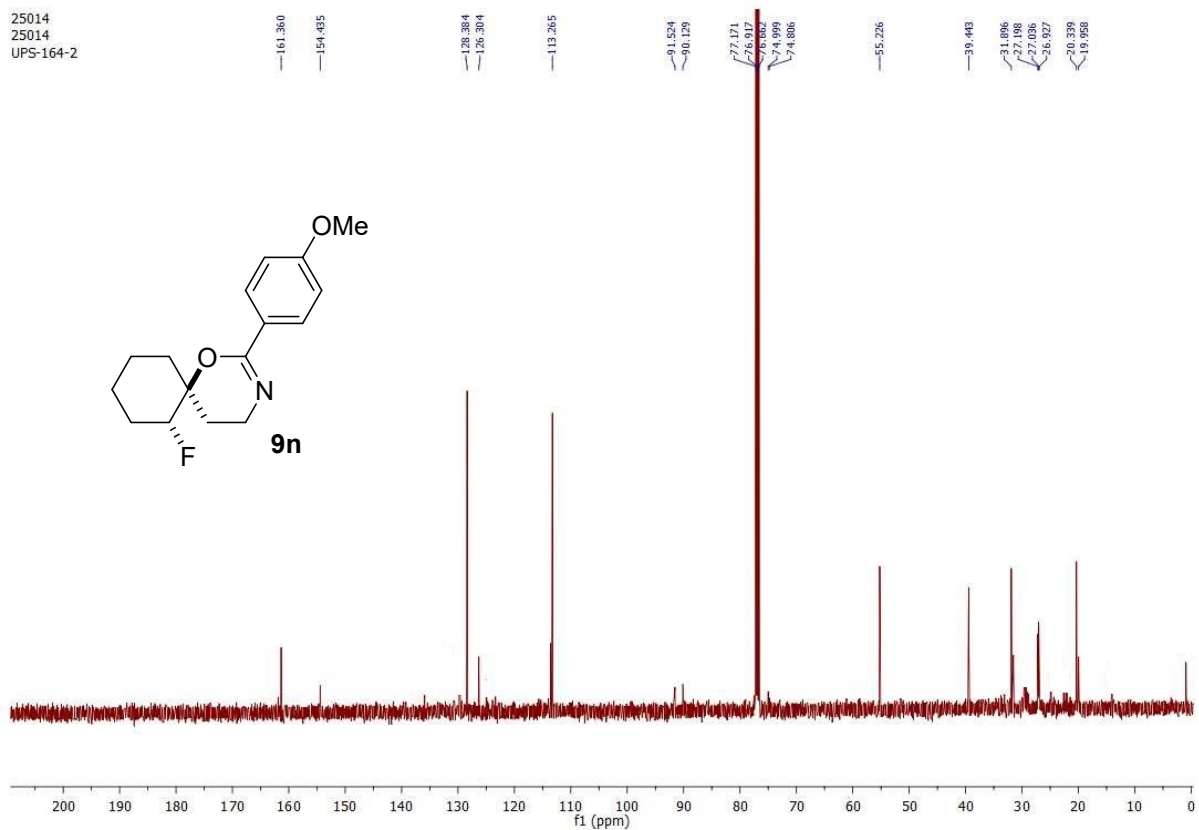
23266  
Name of Sample: UPS-173-1  
Spectrum No :23266



19359  
UPS-164-2



25014  
25014  
UPS-164-2



1.567  
1.586  
1.595  
1.603  
1.652  
1.659  
1.664  
1.673  
1.685  
1.693  
1.702  
1.712  
1.720  
1.776  
1.790  
1.797  
1.805  
1.825  
1.832  
1.836  
1.848  
1.860  
1.864  
1.884  
1.894  
1.963  
1.965  
1.969  
1.974  
1.982  
2.003  
2.014  
2.018  
2.022  
2.031  
2.042  
2.045  
2.089  
2.095  
2.097  
3.613  
3.618  
3.629  
3.637  
3.648  
3.653  
3.659  
3.685  
3.685  
3.696  
3.708  
3.719  
3.731  
4.566  
4.576  
4.582  
4.662  
4.673  
4.678  
4.684  
4.689  
4.693  
4.747  
4.748  
4.748  
4.784  
4.784  
4.814  
4.814  
4.821  
4.828  
4.832  
4.837  
4.884  
4.884  
4.903  
4.907  
4.989  
4.989  
5.014  
5.014  
5.018  
5.022  
5.031  
5.042  
5.045  
5.089  
5.095  
5.097  
5.613  
5.618  
5.629  
5.637  
5.648  
5.653  
5.659  
5.685  
5.685  
5.696  
5.708  
5.719  
5.731  
6.566  
6.576  
6.582  
6.662  
6.673  
6.678  
6.684  
6.689  
6.693  
6.747  
6.748  
6.748  
6.784  
6.784  
6.814  
6.814  
6.821  
6.828  
6.832  
6.837  
6.884  
6.884  
6.903  
6.907  
6.989  
6.989  
7.014  
7.014  
7.018  
7.022  
7.031  
7.042  
7.045  
7.089  
7.095  
7.097  
7.613  
7.618  
7.629  
7.637  
7.648  
7.653  
7.659  
7.685  
7.685  
7.696  
7.708  
7.719  
7.731  
8.566  
8.576  
8.582  
8.662  
8.673  
8.678  
8.684  
8.689  
8.693  
8.747  
8.748  
8.748  
8.784  
8.784  
8.814  
8.814  
8.821  
8.828  
8.832  
8.837  
8.884  
8.884  
8.903  
8.907  
8.989  
8.989  
9.014  
9.014  
9.018  
9.022  
9.031  
9.042  
9.045  
9.089  
9.095  
9.097  
9.613  
9.618  
9.629  
9.637  
9.648  
9.653  
9.659  
9.685  
9.685  
9.696  
9.708  
9.719  
9.731  
10.566  
10.576  
10.582  
10.662  
10.673  
10.678  
10.684  
10.689  
10.693  
10.747  
10.748  
10.748  
10.784  
10.784  
10.814  
10.814  
10.821  
10.828  
10.832  
10.837  
10.884  
10.884  
10.903  
10.907  
10.989  
10.989  
11.014  
11.014  
11.018  
11.022  
11.031  
11.042  
11.045  
11.089  
11.095  
11.097  
11.613  
11.618  
11.629  
11.637  
11.648  
11.653  
11.659  
11.685  
11.685  
11.696  
11.708  
11.719  
11.731  
12.566  
12.576  
12.582  
12.662  
12.673  
12.678  
12.684  
12.689  
12.693  
12.747  
12.748  
12.748  
12.784  
12.784  
12.814  
12.814  
12.821  
12.828  
12.832  
12.837  
12.884  
12.884  
12.903  
12.907  
12.989  
12.989  
13.014  
13.014  
13.018  
13.022  
13.031  
13.042  
13.045  
13.089  
13.095  
13.097  
13.613  
13.618  
13.629  
13.637  
13.648  
13.653  
13.659  
13.685  
13.685  
13.696  
13.708  
13.719  
13.731  
14.566  
14.576  
14.582  
14.662  
14.673  
14.678  
14.684  
14.689  
14.693  
14.747  
14.748  
14.748  
14.784  
14.784  
14.814  
14.814  
14.821  
14.828  
14.832  
14.837  
14.884  
14.884  
14.903  
14.907  
14.989  
14.989  
15.014  
15.014  
15.018  
15.022  
15.031  
15.042  
15.045  
15.089  
15.095  
15.097  
15.613  
15.618  
15.629  
15.637  
15.648  
15.653  
15.659  
15.685  
15.685  
15.696  
15.708  
15.719  
15.731  
16.566  
16.576  
16.582  
16.662  
16.673  
16.678  
16.684  
16.689  
16.693  
16.747  
16.748  
16.748  
16.784  
16.784  
16.814  
16.814  
16.821  
16.828  
16.832  
16.837  
16.884  
16.884  
16.903  
16.907  
16.989  
16.989  
17.014  
17.014  
17.018  
17.022  
17.031  
17.042  
17.045  
17.089  
17.095  
17.097  
17.613  
17.618  
17.629  
17.637  
17.648  
17.653  
17.659  
17.685  
17.685  
17.696  
17.708  
17.719  
17.731  
18.566  
18.576  
18.582  
18.662  
18.673  
18.678  
18.684  
18.689  
18.693  
18.747  
18.748  
18.748  
18.784  
18.784  
18.814  
18.814  
18.821  
18.828  
18.832  
18.837  
18.884  
18.884  
18.903  
18.907  
18.989  
18.989  
19.014  
19.014  
19.018  
19.022  
19.031  
19.042  
19.045  
19.089  
19.095  
19.097  
19.613  
19.618  
19.629  
19.637  
19.648  
19.653  
19.659  
19.685  
19.685  
19.696  
19.708  
19.719  
19.731  
20.566  
20.576  
20.582  
20.662  
20.673  
20.678  
20.684  
20.689  
20.693  
20.747  
20.748  
20.748  
20.784  
20.784  
20.814  
20.814  
20.821  
20.828  
20.832  
20.837  
20.884  
20.884  
20.903  
20.907  
20.989  
20.989  
21.014  
21.014  
21.018  
21.022  
21.031  
21.042  
21.045  
21.089  
21.095  
21.097  
21.613  
21.618  
21.629  
21.637  
21.648  
21.653  
21.659  
21.685  
21.685  
21.696  
21.708  
21.719  
21.731  
22.566  
22.576  
22.582  
22.662  
22.673  
22.678  
22.684  
22.689  
22.693  
22.747  
22.748  
22.748  
22.784  
22.784  
22.814  
22.814  
22.821  
22.828  
22.832  
22.837  
22.884  
22.884  
22.903  
22.907  
22.989  
22.989  
23.014  
23.014  
23.018  
23.022  
23.031  
23.042  
23.045  
23.089  
23.095  
23.097  
23.613  
23.618  
23.629  
23.637  
23.648  
23.653  
23.659  
23.685  
23.685  
23.696  
23.708  
23.719  
23.731  
24.566  
24.576  
24.582  
24.662  
24.673  
24.678  
24.684  
24.689  
24.693  
24.747  
24.748  
24.748  
24.784  
24.784  
24.814  
24.814  
24.821  
24.828  
24.832  
24.837  
24.884  
24.884  
24.903  
24.907  
24.989  
24.989  
25.014  
25.014  
25.018  
25.022  
25.031  
25.042  
25.045  
25.089  
25.095  
25.097  
25.613  
25.618  
25.629  
25.637  
25.648  
25.653  
25.659  
25.685  
25.685  
25.696  
25.708  
25.719  
25.731  
26.566  
26.576  
26.582  
26.662  
26.673  
26.678  
26.684  
26.689  
26.693  
26.747  
26.748  
26.748  
26.784  
26.784  
26.814  
26.814  
26.821  
26.828  
26.832  
26.837  
26.884  
26.884  
26.903  
26.907  
26.989  
26.989  
27.014  
27.014  
27.018  
27.022  
27.031  
27.042  
27.045  
27.089  
27.095  
27.097  
27.613  
27.618  
27.629  
27.637  
27.648  
27.653  
27.659  
27.685  
27.685  
27.696  
27.708  
27.719  
27.731  
28.566  
28.576  
28.582  
28.662  
28.673  
28.678  
28.684  
28.689  
28.693  
28.747  
28.748  
28.748  
28.784  
28.784  
28.814  
28.814  
28.821  
28.828  
28.832  
28.837  
28.884  
28.884  
28.903  
28.907  
28.989  
28.989  
29.014  
29.014  
29.018  
29.022  
29.031  
29.042  
29.045  
29.089  
29.095  
29.097  
29.613  
29.618  
29.629  
29.637  
29.648  
29.653  
29.659  
29.685  
29.685  
29.696  
29.708  
29.719  
29.731  
30.566  
30.576  
30.582  
30.662  
30.673  
30.678  
30.684  
30.689  
30.693  
30.747  
30.748  
30.748  
30.784  
30.784  
30.814  
30.814  
30.821  
30.828  
30.832  
30.837  
30.884  
30.884  
30.903  
30.907  
30.989  
30.989  
31.014  
31.014  
31.018  
31.022  
31.031  
31.042  
31.045  
31.089  
31.095  
31.097  
31.613  
31.618  
31.629  
31.637  
31.648  
31.653  
31.659  
31.685  
31.685  
31.696  
31.708  
31.719  
31.731  
32.566  
32.576  
32.582  
32.662  
32.673  
32.678  
32.684  
32.689  
32.693  
32.747  
32.748  
32.748  
32.784  
32.784  
32.814  
32.814  
32.821  
32.828  
32.832  
32.837  
32.884  
32.884  
32.903  
32.907  
32.989  
32.989  
33.014  
33.014  
33.018  
33.022  
33.031  
33.042  
33.045  
33.089  
33.095  
33.097  
33.613  
33.618  
33.629  
33.637  
33.648  
33.653  
33.659  
33.685  
33.685  
33.696  
33.708  
33.719  
33.731  
34.566  
34.576  
34.582  
34.662  
34.673  
34.678  
34.684  
34.689  
34.693  
34.747  
34.748  
34.748  
34.784  
34.784  
34.814  
34.814  
34.821  
34.828  
34.832  
34.837  
34.884  
34.884  
34.903  
34.907  
34.989  
34.989  
35.014  
35.014  
35.018  
35.022  
35.031  
35.042  
35.045  
35.089  
35.095  
35.097  
35.613  
35.618  
35.629  
35.637  
35.648  
35.653  
35.659  
35.685  
35.685  
35.696  
35.708  
35.719  
35.731  
36.566  
36.576  
36.582  
36.662  
36.673  
36.678  
36.684  
36.689  
36.693  
36.747  
36.748  
36.748  
36.784  
36.784  
36.814  
36.814  
36.821  
36.828  
36.832  
36.837  
36.884  
36.884  
36.903  
36.907  
36.989  
36.989  
37.014  
37.014  
37.018  
37.022  
37.031  
37.042  
37.045  
37.089  
37.095  
37.097  
37.613  
37.618  
37.629  
37.637  
37.648  
37.653  
37.659  
37.685  
37.685  
37.696  
37.708  
37.719  
37.731  
38.566  
38.576  
38.582  
38.662  
38.673  
38.678  
38.684  
38.689  
38.693  
38.747  
38.748  
38.748  
38.784  
38.784  
38.814  
38.814  
38.821  
38.828  
38.832  
38.837  
38.884  
38.884  
38.903  
38.907  
38.989  
38.989  
39.014  
39.014  
39.018  
39.022  
39.031  
39.042  
39.045  
39.089  
39.095  
39.097  
39.613  
39.618  
39.629  
39.637  
39.648  
39.653  
39.659  
39.685  
39.685  
39.696  
39.708  
39.719  
39.731  
40.566  
40.576  
40.582  
40.662  
40.673  
40.678  
40.684  
40.689  
40.693  
40.747  
40.748  
40.748  
40.784  
40.784  
40.814  
40.814  
40.821  
40.828  
40.832  
40.837  
40.884  
40.884  
40.903  
40.907  
40.989  
40.989  
41.014  
41.014  
41.018  
41.022  
41.031  
41.042  
41.045  
41.089  
41.095  
41.097  
41.613  
41.618  
41.629  
41.637  
41.648  
41.653  
41.659  
41.685  
41.685  
41.696  
41.708  
41.719  
41.731  
42.566  
42.576  
42.582  
42.662  
42.673  
42.678  
42.684  
42.689  
42.693  
42.747  
42.748  
42.748  
42.784  
42.784  
42.814  
42.814  
42.821  
42.828  
42.832  
42.837  
42.884  
42.884  
42.903  
42.907  
42.989  
42.989  
43.014  
43.014  
43.018  
43.022  
43.031  
43.042  
43.045  
43.089  
43.095  
43.097  
43.613  
43.618  
43.629  
43.637  
43.648  
43.653  
43.659  
43.685  
43.685  
43.696  
43.708  
43.719  
43.731  
44.566  
44.576  
44.582  
44.662  
44.673  
44.678  
44.684  
44.689  
44.693  
44.747  
44.748  
44.748  
44.784  
44.784  
44.814  
44.814  
44.821  
44.828  
44.832  
44.837  
44.884  
44.884  
44.903  
44.907  
44.989  
44.989  
45.014  
45.014  
45.018  
45.022  
45.031  
45.042  
45.045  
45.089  
45.095  
45.097  
45.613  
45.618  
45.629  
45.637  
45.648  
45.653  
45.659  
45.685  
45.685  
45.696  
45.708  
45.719  
45.731  
46.566  
46.576  
46.582  
46.662  
46.673  
46.678  
46.684  
46.689  
46.693  
46.747  
46.748  
46.748  
46.784  
46.784  
46.814  
46.814  
46.821  
46.828  
46.832  
46.837  
46.884  
46.884  
46.903  
46.907  
46.989  
46.989  
47.014  
47.014  
47.018  
47.022  
47.031  
47.042  
47.045  
47.089  
47.095  
47.097  
47.613  
47.618  
47.629  
47.637  
47.648  
47.653  
47.659  
47.685  
47.685  
47.696  
47.708  
47.719  
47.731  
48.566  
48.576  
48.582  
48.662  
48.673  
48.678  
48.684  
48.689  
48.693  
48.747  
48.748  
48.748  
48.784  
48.784  
48.814  
48.814  
48.821  
48.828  
48.832  
48.837  
48.884  
48.884  
48.903  
48.907  
48.989  
48.989  
49.014  
49.014  
49.018  
49.022  
49.031  
49.042  
49.045  
49.089  
49.095  
49.097  
49.613  
49.618  
49.629  
49.637  
49.648  
49.653  
49.659  
49.685  
49.685  
49.696  
49.708  
49.719  
49.731  
50.566  
50.576  
50.582  
50.662  
50.673  
50.678  
50.684  
50.689  
50.693  
50.747  
50.748  
50.748  
50.784  
50.784  
50.814  
50.814  
50.821  
50.828  
50.832  
50.837  
50.884  
50.884  
50.903  
50.907  
50.989  
50.989  
51.014  
51.014  
51.018  
51.022  
51.031  
51.042  
51.045  
51.089  
51.095  
51.097  
51.613  
51.618  
51.629  
51.637  
51.648  
51.653  
51.659  
51.685  
51.685  
51.696  
51.708  
51.719  
51.731  
52.566  
52.576  
52.582  
52.662  
52.673  
52.678  
52.684  
52.689  
52.693  
52.747  
52.748  
52.748  
52.784  
52.784  
52.814  
52.814  
52.821  
52.828  
52.832  
52.837  
52.884  
52.884  
52.903  
52.907  
52.989  
52.989  
53.014  
53.014  
53.018  
53.022  
53.031  
53.042  
53.045  
53.089  
53.095  
53.097  
53.613  
53.618  
53.629  
53.637  
53.648  
53.653  
53.659  
53.685  
53.685  
53.696  
53.708  
53.719  
53.731  
54.566  
54.576  
54.582  
54.662  
54.673  
54.678  
54.684  
54.689  
54.693  
54.747  
54.748  
54.748  
54.784  
54.784  
54.814  
54.814  
54.821  
54.828  
54.832  
54.837  
54.884  
54.884  
54.903  
54.907  
54.989  
54.989  
55.014  
55.014  
55.018  
55.022  
55.031  
55.042  
55.045  
55.089  
55.095  
55.097  
55.613  
55.618  
55.629  
55.637  
55.648  
55.653  
55.659  
55.685  
55.685  
55.696  
55.708  
55.719  
55.731  
56.566  
56.576  
56.582  
56.662  
56.673  
56.678  
56.684  
56.689  
56.693  
56.747  
56.748  
56.748  
56.784  
56.784  
56.814  
56.814  
56.821  
56.828  
56.832  
56.837  
56.884  
56.884  
56.903  
56.907  
56.989  
56.989  
57.014  
57.014  
57.018  
57.022  
57.031  
57.042  
57.045  
57.089  
57.095  
57.097  
57.613  
57.618  
57.629  
57.637  
57.648  
57.653  
57.659  
57.685  
57.685  
57.696  
57.708  
57.719  
57.731  
58.566  
58.576  
58.582  
58.662  
58.673  
58.678  
58.684  
58.689  
58.693  
58.747  
58.748  
58.748  
58.784  
58.784  
58.814  
58.814  
58.821  
58.828  
58.832  
58.837  
58.884  
58.884  
58.903  
58.907  
58.989  
58.989  
59.014  
59.014  
59.018  
59.022  
59.031  
59.042  
59.045  
59.089  
59.095  
59.097  
59.613  
59.618  
59.629  
59.637  
59.648  
59.653  
59.659  
59.685  
59.685  
59.696  
59.708  
59.719  
59.731  
60.566  
60.576  
60.582  
60.662  
60.673  
60.678  
60.684  
60.689  
60.693  
60.747  
60.748  
60.748  
60.784  
60.784  
60.814  
60.814  
60.821  
60.828  
60.832  
60.837  
60.884  
60.884  
60.903  
60.907  
60.989  
60.989  
61.014  
61.014  
61.018  
61.022  
61.031  
61.042  
61.045  
61.089  
61.095  
61.097  
61.613  
61.618  
61.629  
61.637  
61.648  
61.653  
61.659  
61.685  
61.685  
61.696  
61.708  
61.719  
61.731  
62.566  
62.576  
62.582  
62.662  
62.673  
62.678  
62.684  
62.689  
62.693  
62.747  
62.748  
62.748  
62.784  
62.784  
62.814  
62.814  
62.821  
62.828  
62.832  
62.837  
62.884  
62.884  
62.903  
62.907  
62.989  
62.989  
63.014  
63.014  
63.018  
63.022  
63.031  
63.042  
63.045  
63.089  
63.095  
63.097  
63.613  
63.618  
63.629  
63.637  
63.648  
63.653  
63.659  
63.685  
63.685  
63.696  
63.708  
63.719  
63.731  
64.566  
64.576  
64.582  
64.662  
64.673  
64.678  
64.684  
64.689  
64.693  
64.747  
64.748  
64.748  
64.784  
64.784  
64.814  
64.814  
64.821  
64.828  
64.832  
64.837  
64.884  
64.884  
64.903  
64.907  
64.989  
64.989  
65.014  
65.014  
65.018  
65.022  
65.031  
65.042  
65.045  
65.089  
65.095  
65.097  
65.613  
65.618  
65.629  
65.637  
65.648  
65.653  
65.659  
65.685  
65.685  
65.696