

Supplementary Information for

A remarkable chiral recognition of racemic mosher's acid salt by naturally derived chiral ionic liquids using ^{19}F NMR

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1. Supplementary Methods

1.1 General Information

Solvents and Reagents

All the solvents were concentrated under reduced pressure was performed by rotary evaporation at the appropriate pressure and temperature. All the air and moisture sensitive reactions were performed using dry solvents, which were dried according to the procedures prior to use. Deuterated solvents were purchased from Sigma-Aldrich chemical Co. (USA) and used as supplied. Reagents used were obtained from commercial suppliers or purified according to standard procedures.

Chromatography

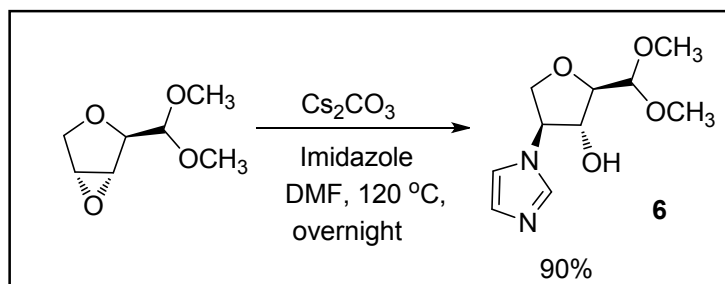
Reactions were monitored by thin layer chromatography (TLC) using Merck silica gel 60 F254 plates and TLC plates were stained with Phosphomolybdic acid solution. Column chromatography was performed on silica gel (100 -200 μm) and Aluminum Oxide (neutral) using technical grade solvents that were used as supplied.

Instrumentation

^1H , ^{13}C , ^{19}F and ^{31}P NMR spectra were recorded on Bruker 400, 100, 376.5 MHz and 160 Hz respectively. Chemical shifts are quoted in parts per million (δ) relative to tetramethyl silane or CHCl_3 (residual chloroform in CDCl_3). For ^{19}F NMR, trifluorotoluene in CDCl_3 were used as internal standards. Optical rotations were measured using Rudolph Digi Pol 781 M6U NOVA automatic polarimeter. Mass spectra were recorded on a High Resolution Q-TOF Mass Spectrometer (Model: QSTAR XL, Applied Bio systems, USA).

1.2 Synthesis and characterization of compound 6

(2R, 3R, 4S)-2-(dimethoxymethyl)-4-(1H-imidazol-1-yl) tetrahydrofuran-3-ol (6)



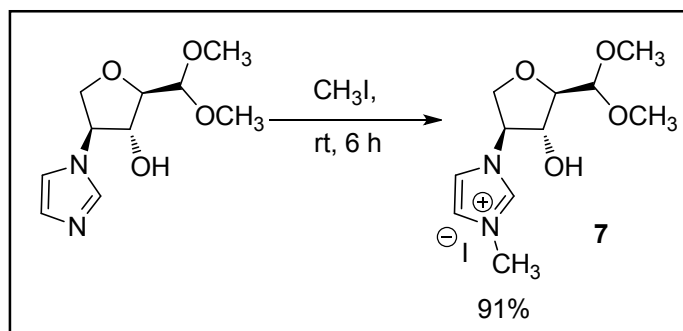
To a stirred solution of CsCO₃ (203 mg, 0.624 mmol) in dry DMF 3 mL, charged compound **5** (500 mg, 3.121 mmol) and imidazole 212 mg, 3.121 mmol) under nitrogen atmosphere. Heated the reaction mass at 120 °C overnight. After completion, removed the solvent by rotary evaporation under vacuum and the crude compound was purified using column chromatography (silica gel-100-200 mesh) eluted with 10% methanol/chloroform.

Yield: 90%, brown color liquid; $[\alpha]_D^{25} = 47.2$ (c 1, MeOH); ¹H NMR (400 MHz, Chloroform-*d*) δ 7.51 (d, *J* = 24.4 Hz, 1H), 7.05 (s, 1H), 6.98 (d, *J* = 17.6 Hz, 1H), 4.66 (dq, *J* = 5.1, 2.6 Hz, 1H), 4.51 – 4.44 (m, 1H), 4.37 (ddd, *J* = 25.7, 5.2, 2.6 Hz, 1H), 4.25 – 4.07 (m, 2H), 4.03 – 3.86 (m, 1H), 3.55 – 3.44 (m, 7H);

HRMS (ESI) exact calculated mass for [M+1] (C₁₀H₁₇O₄N₂) requires *m/z* 229.1183, found *m/z* 229.1179

1.3 Synthesis and Characterization of CCIL 7

1-((3*S*, 4*R*, 5*R*)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1*H*-imidazol-3-ium iodide (**7**)



To a stirred solution of compound **6** (641 mg, 2.808 mmol) in dry acetonitrile (2 mL), charged methyl iodide (598 mg/ 0.26 mL, 4.212 mmol). Stirred the reaction mass at room temperature for 6 h. Upon completion of the reaction, removed the solvent by vacuum distillation. The crude compound was dissolved in 50% methanol/chloroform and passed through neutral alumina, afforded colorless liquid compound **7** in 91% yield.

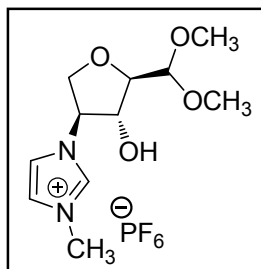
Yield: 90%, Light brown color liquid; $[\alpha]_D^{25} = +88.8$ (c 1, MeOH); ¹H NMR (400 MHz, Chloroform-*d*) δ 9.84 (s, 1H), 7.72 (t, *J* = 2.0 Hz, 1H), 7.17 (t, *J* = 2.0 Hz, 1H), 5.41 (d, *J* = 4.8 Hz, 1H), 4.61 (d, *J* = 4.8 Hz, 1H), 4.51 (d, *J* = 3.6 Hz, 1H), 4.30 (dd, *J* = 11.2, 4.8 Hz, 1H), 4.20 (d, *J* = 11.2 Hz, 1H), 4.00 (s, 3H), 3.98 (dd, *J* = 4.8, 3.2 Hz, 1H), 3.46 (s, 3H), 3.44 (s, 3H); ¹³C NMR (100 MHz, Chloroform-*d*) δ 137.50, 122.69, 121.37, 103.66, 85.67, 78.69, 70.92, 68.34, 55.99, 55.55, 36.91; HRMS (ESI) exact calculated mass for [M+] (C₁₁H₁₉O₄N₂) requires *m/z* 243.1339, found *m/z* 243.1336; LR-MS (ESI) ES⁺: 243.2, ES⁻: 126.9.

1.4 General procedure for the synthesis and Characterization of CCILs 8 to 11

To a stirred solution of CCIL **7** (0.270 mmol) in water (2 mL), charged LiX (0.324 mmol) and continued the reaction for 24 h at room temperature. Reaction mixture was concentrated under reduced pressure by rotary evaporation and the crude compounds were dissolved in

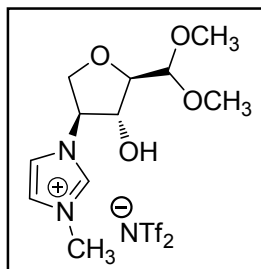
CHCl₃ washed with cold water (for CCILs **8** and **11**). For CCILs **9** and **10** the crude compounds were rinsed with CHCl₃ (3 x 5 mL) [CCILs **9** and **10** were in soluble in CHCl₃].

1.4.1 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium hexafluorophosphate (V) (8).



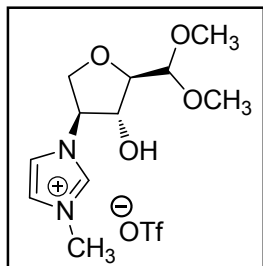
Yield: 72%, Light brown color liquid; $[\alpha]_D^{25} = +20.6$ (c 1, MeOH); ¹H NMR (400 MHz, Chloroform-*d*) δ 9.56 (s, 1H), 7.72 (t, *J* = 2.0 Hz, 1H), 7.27 (d, *J* = 2.0 Hz, 1H), 5.31 (d, *J* = 5.2 Hz, 1H), 4.59 (d, *J* = 6.0 Hz, 1H), 4.52 (d, *J* = 3.6 Hz, 1H), 4.29 (dd, *J* = 11.2, 4.8 Hz, 1H), 4.22 (dd, *J* = 10.8, 1.6 Hz, 1H), 4.01 (s, 3H), 3.95 (t, *J* = 4.0 Hz, 1H), 3.46 (s, 3H), 3.44 (s, 3H); ¹³C NMR (100 MHz, Chloroform-*d*) δ 136.85, 123.04, 121.59, 103.64, 85.53, 78.12, 71.04, 68.11, 56.24, 55.71, 37.10; ¹⁹F NMR (376.5 MHz, Chloroform-*d*) δ -66.71, -68.59; HRMS (ESI) exact calculated mass for [M⁺] (C₁₁H₁₉O₄N₂) requires *m/z* 243.13393, found *m/z* 243.13390

1.4.2 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium bis ((trifluoromethyl) sulfonyl) amide (9).



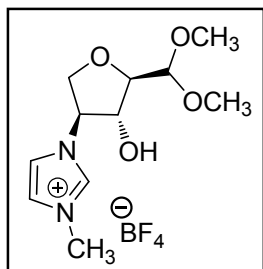
Yield: 82%, Light brown color liquid; $[\alpha]_D^{25} = +56.8$ (c 0.9, MeOH); ¹H NMR (400 MHz, Methanol-*d*₄) δ 7.68 (d, *J* = 2.0 Hz, 1H), 7.61 (d, *J* = 2.0 Hz, 1H), 4.78 (s, 1H), 4.52 (d, *J* = 3.6 Hz, 1H), 4.43 – 4.38 (m, 1H), 4.32 – 4.22 (m, 2H), 3.95 (s, 3H), 3.87 (t, *J* = 4.0 Hz, 1H), 3.46 (s, 3H), 3.45 (s, 3H); ¹³C NMR (100 MHz, Methanol-*d*₄) δ 125.02, 123.34, 122.60, 120.18, 105.29, 87.34, 78.86, 71.42, 69.26, 56.65, 55.84, 36.60; ¹⁹F NMR (376.5 MHz, Methanol-*d*₄) δ -80.73; HRMS (ESI) exact calculated mass for [M⁺] (C₁₁H₁₉O₄N₂) requires *m/z* 243.1339, found *m/z* 243.1335; LR-MS (ESI) ES⁺: 243.2, ES⁻: 279.9.

1.4.3 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium trifluoromethanesulfonate (10).



Yield: 76%, Light brown color liquid; $[\alpha]_D^{25} = +33.0$ (c1, MeOH); $^1\text{H NMR}$ (400 MHz, Methanol- d_4) δ 8.99 (s, 1H), 7.69 (t, $J = 1.6$ Hz, 1H), 7.62 (t, $J = 1.6$ Hz, 1H), 4.79 (s, 1H), 4.53 (d, $J = 3.6$ Hz, 1H), 4.44 – 4.40 (m, 1H), 4.28 (t, $J = 4.5$ Hz, 2H), 3.96 (s, 3H), 3.88 (t, $J = 4.0$ Hz, 1H), 3.47 (d, $J = 1.6$ Hz, 3H), 3.45 (d, $J = 1.6$ Hz, 3H); $^{13}\text{C NMR}$ (100 MHz, Methanol- d_4) δ 125.04, 122.79, 122.61, 119.61, 105.31, 87.37, 78.86, 71.42, 69.27, 56.66, 55.86, 36.64; $^{19}\text{F NMR}$ (376.5 MHz, Methanol- d_4) δ -80.14; **HRMS** (ESI) exact calculated mass for $[\text{M}^+]$ ($\text{C}_{11}\text{H}_{19}\text{O}_4\text{N}_2$) requires m/z 243.1339, found m/z 243.1340.

1.4.4 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium tetrafluoroborate (11).



Yield: 62%, Light brown color liquid; $[\alpha]_D^{25} = +18.2$ (c1, MeOH); $^1\text{H NMR}$ (400 MHz, Chloroform- d) δ 9.71 (s, 1H), 7.72 (d, $J = 1.6$ Hz, 1H), 7.18 (t, $J = 1.6$ Hz, 1H), 5.36 (d, $J = 5.2$ Hz, 1H), 4.61 (d, $J = 4.8$ Hz, 1H), 4.52 (d, $J = 3.2$ Hz, 1H), 4.30 (dd, $J = 10.8$, 4.8 Hz, 1H), 4.20 (d, $J = 11.2$ Hz, 1H), 4.00 (s, 3H), 3.97 (dd, $J = 4.8$, 3.6 Hz, 1H), 3.46 (s, 3H), 3.44 (s, 3H); $^{13}\text{C NMR}$ (100 MHz, Chloroform- d) δ 136.99, 122.90, 121.63, 103.63, 85.55, 78.18, 71.03, 68.17, 56.18, 55.69, 37.05; $^{19}\text{F NMR}$ (376.5 MHz, Chloroform- d) δ -151.06 (d, $J = 19.2$ Hz); **HRMS** (ESI) exact calculated mass for $[\text{M}^+]$ ($\text{C}_{11}\text{H}_{19}\text{O}_4\text{N}_2$) requires m/z 243.1339, found m/z 243.1340; LR-MS (ESI) ES^+ : 243.2, ES^- : 87.1.

1.5 Procedure for ^{19}F NMR Experiment for Chiral Recognition studies of CCILs

The racemic Mosher's acid silver salt (4.6 mg, 0.013 mmol) was mixed with CCIL **7** (10 mg, 0.027 mmol) in 0.6 mL of CD_3CN and stirred for 10 min at room temperature to exchange anions. The AgI precipitate thus formed was filtered and filtrate was analyzed by ^{19}F NMR (376.5 MHz). For CCILs **8-11**, the racemic salt (1 equiv.) was mixed with each CIL (10 mg, 2equiv.) separately in dry ACN and stirred for 10 min. Filtered the formed salts and concentrated the filtrate under

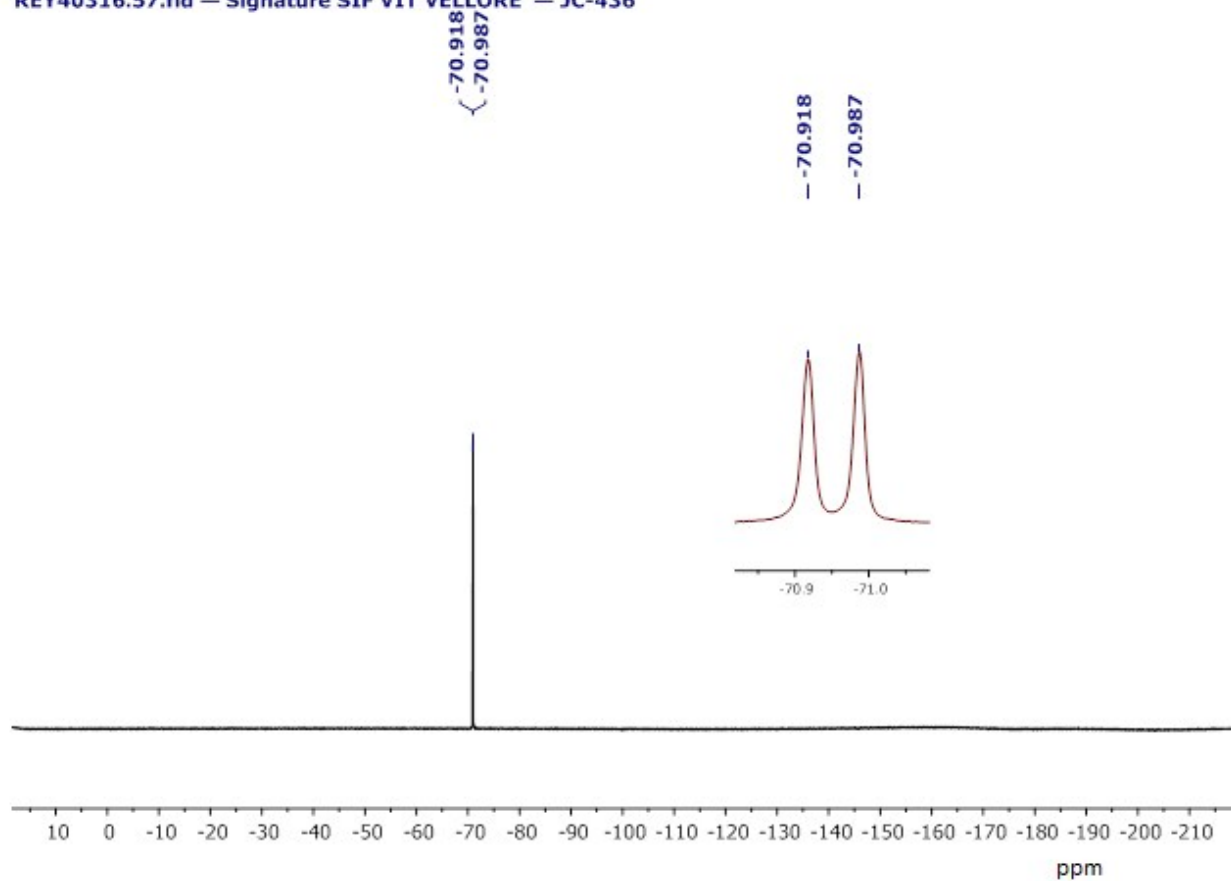
reduced pressure using rotary evaporator. The residual compound was dissolved in CDCl_3 , analyzed by ^{19}F NMR.

Effect of CCIL 7 concentration: In another set of experiment, each time different concentrations of CCIL 7 (1 eq, 4 eq, and 6 eq) was mixed with racemic salt and studied the effect of concentration of CCIL 7 for chiral discrimination by ^{19}F NMR.

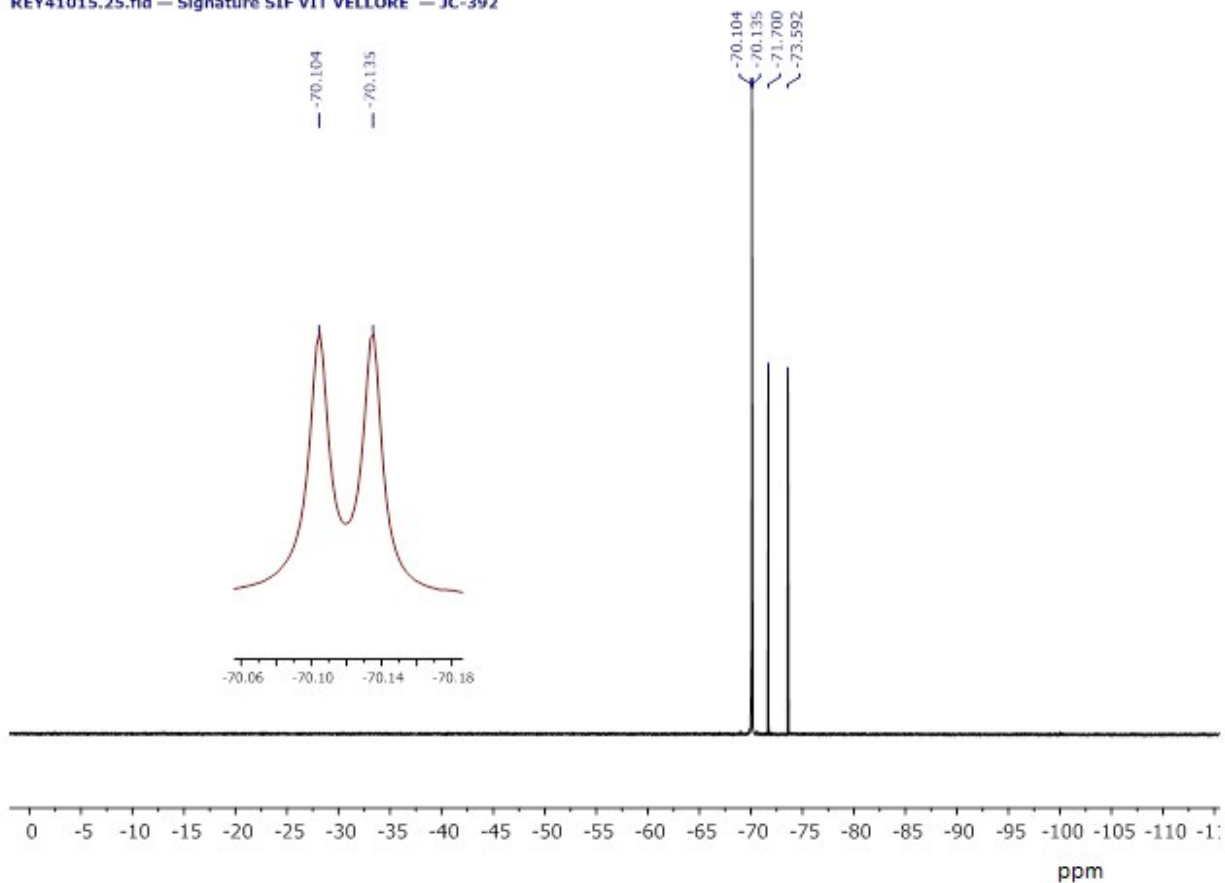
2. Supplementary Data

2.1 Copies of ^{19}F NMR Spectra for Chiral Recognition Experiments.

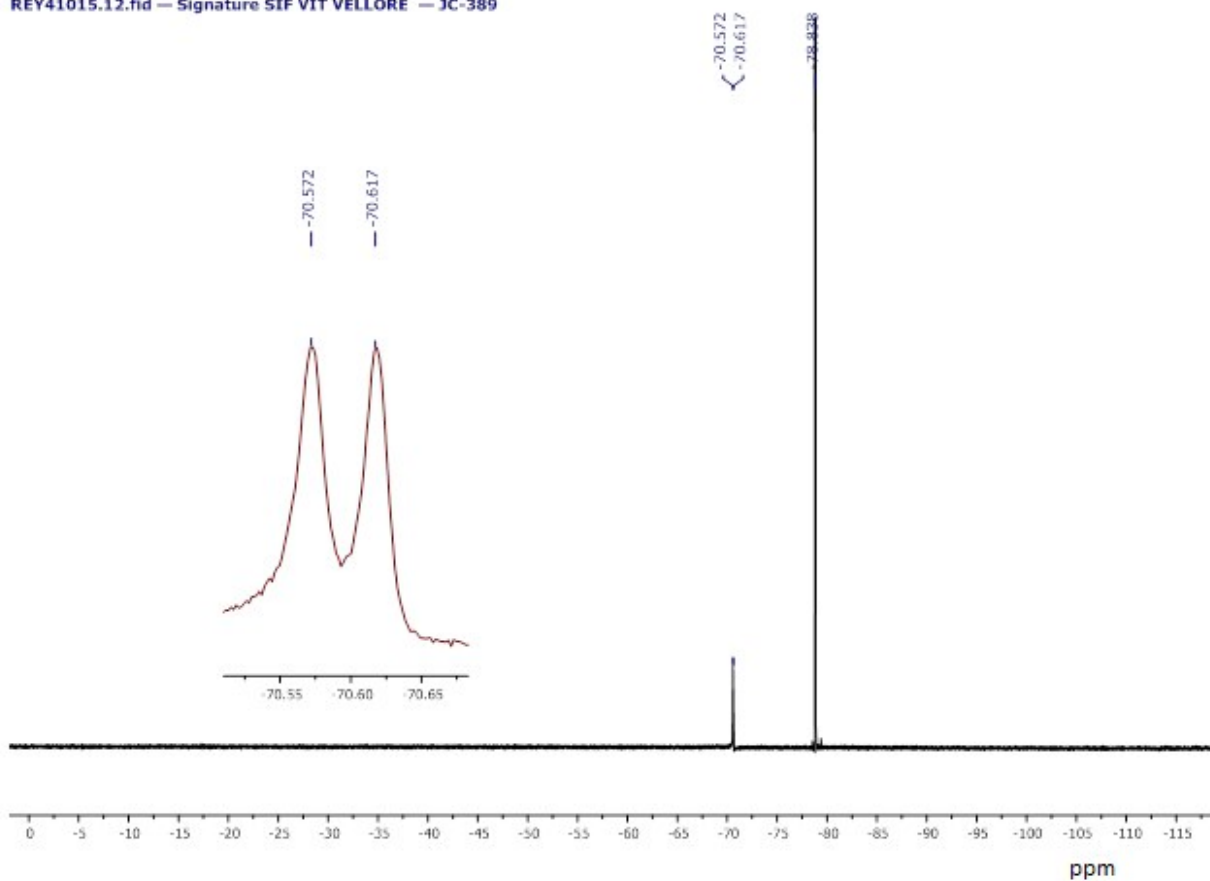
REY40316.57.fid — Signature SIF VIT VELLORE — JC-436



^{19}F NMR Spectrum for the Chiral Recognition Experiment between CCIL 7 (2 equiv.) and Mosher's acid salt.

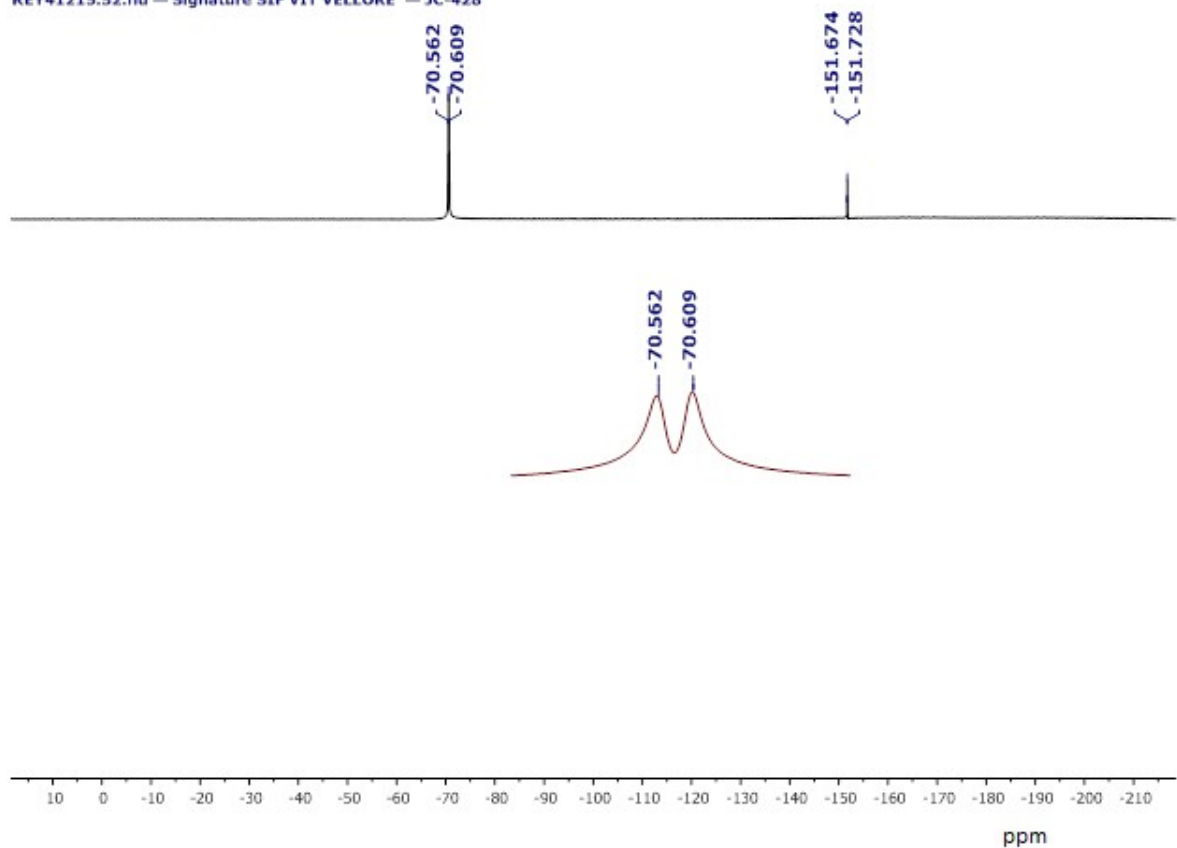


^{19}F NMR Spectrum for the Chiral Recognition Experiment between CCIL 8 (2 equiv.) and Mosher's acid salt.



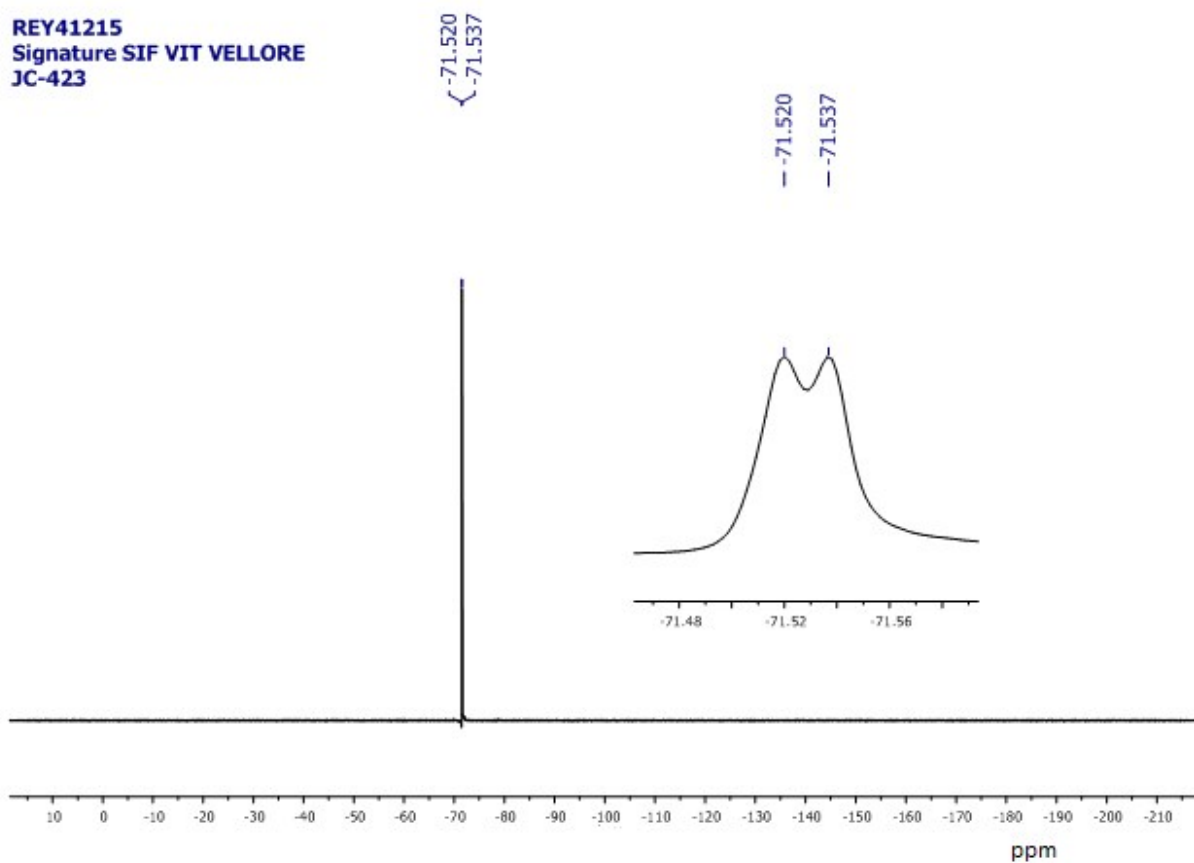
^{19}F NMR Spectrum for the Chiral Recognition Experiment between CCIL 9 (2 equiv.) and Mosher's acid salt.

REY41215.52.fid — Signature SIF VIT VELLORE — JC-428



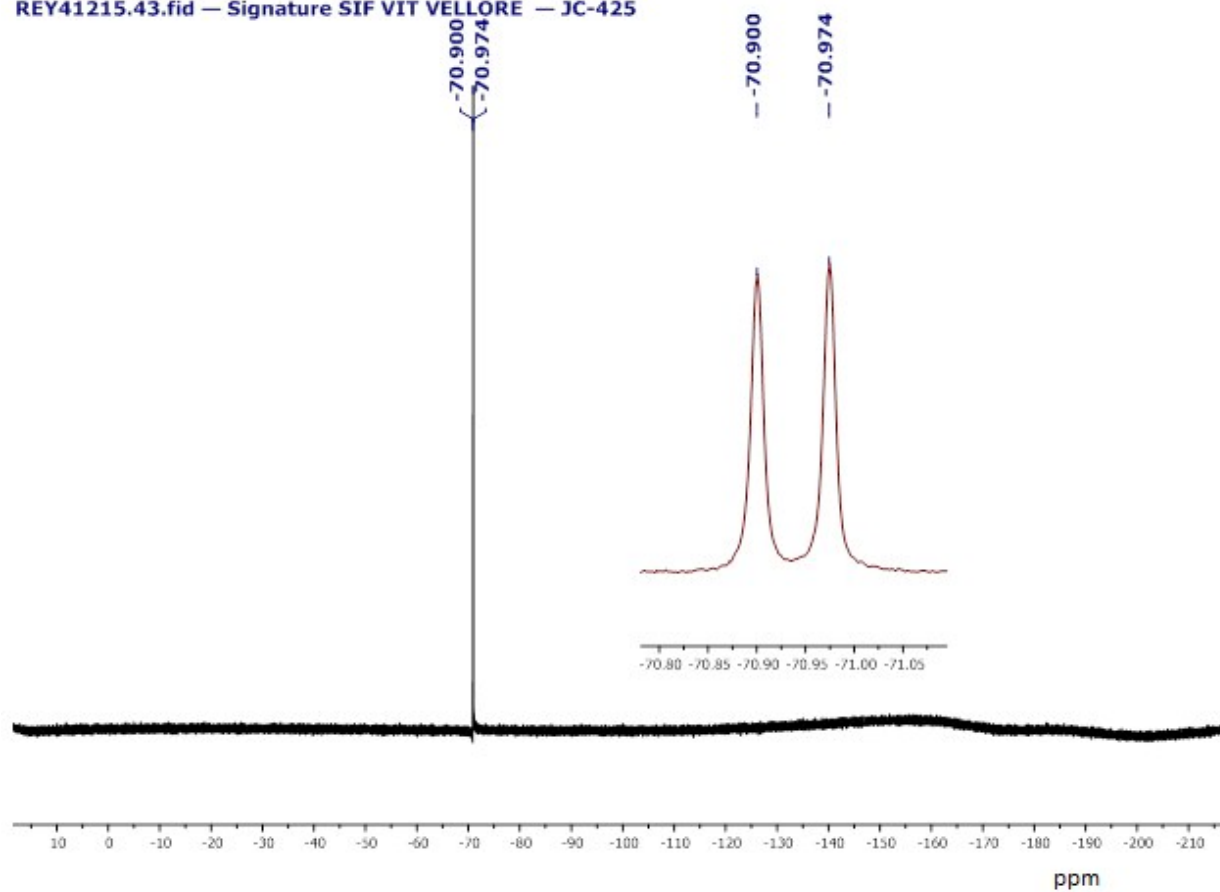
^{19}F NMR Spectrum for the Chiral Recognition Experiment between CCIL 11 (2 equiv.) and Mosher's acid salt.

REY41215
Signature SIF VIT VELLORE
JC-423

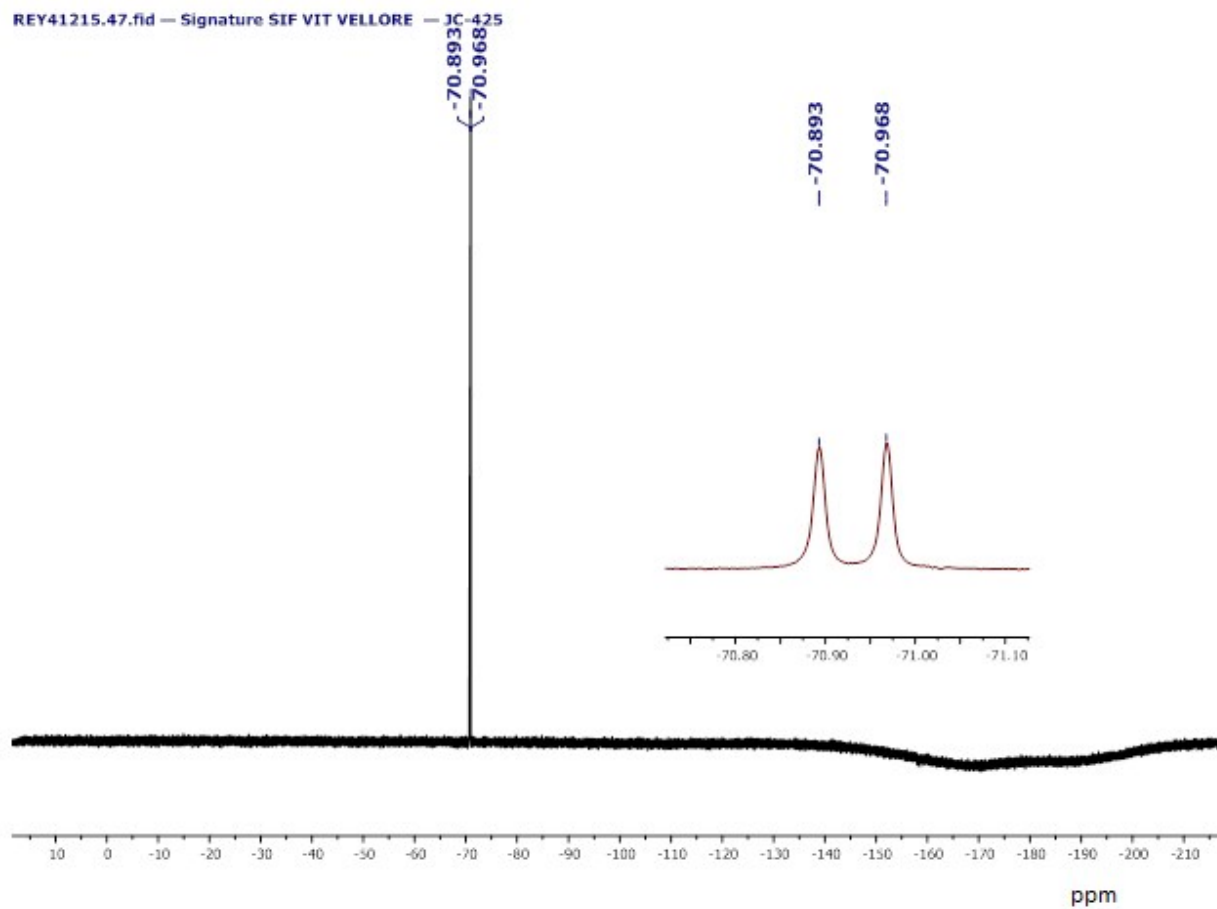


^{19}F NMR Spectrum for the Chiral Recognition Experiment between CCIL 7 (1 equiv.) and Mosher's acid salt.

REY41215.43.fid — Signature SIF VIT VELLORE — JC-425

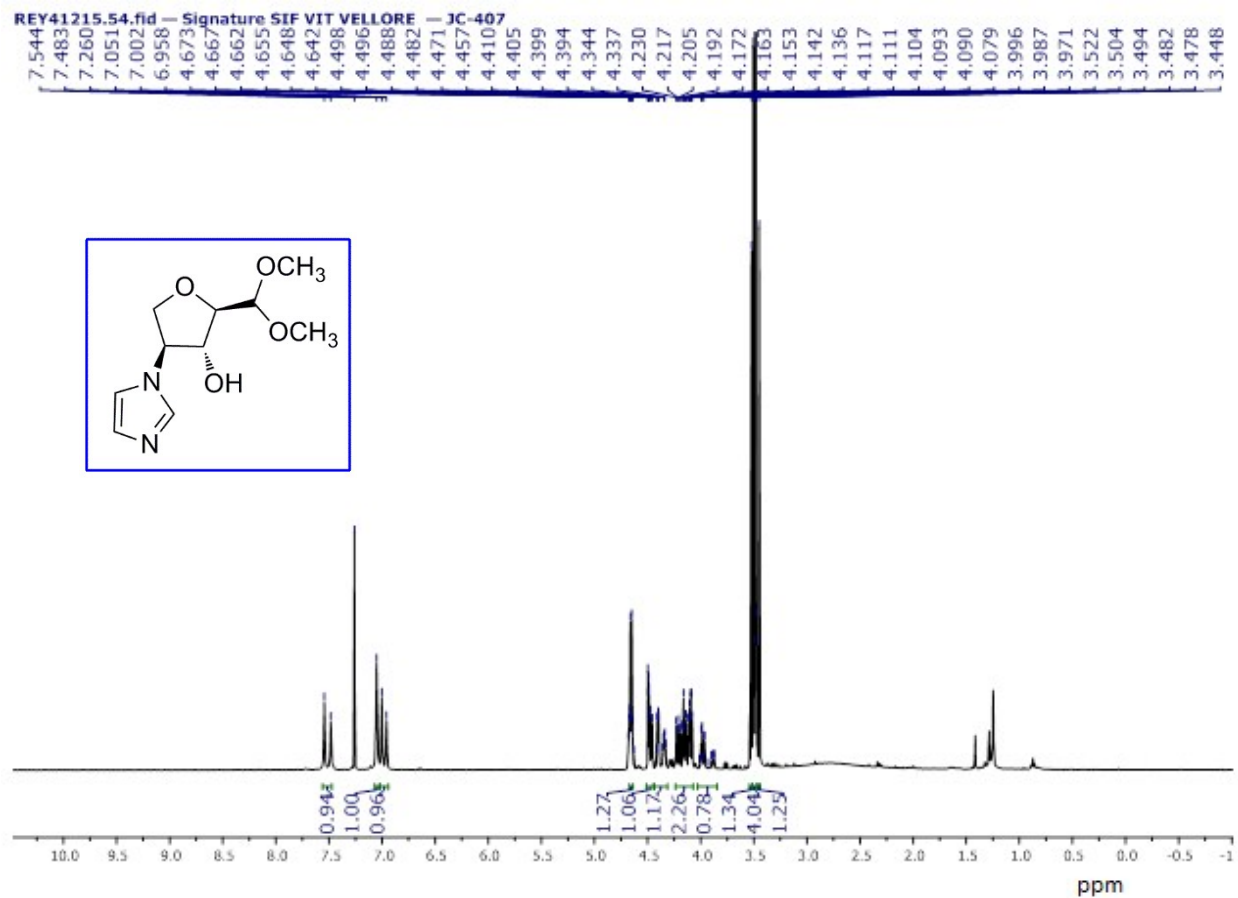


^{19}F NMR Spectrum for the Chiral Recognition Experiment between CCIL 7 (4 equiv.) and Mosher's acid salt.



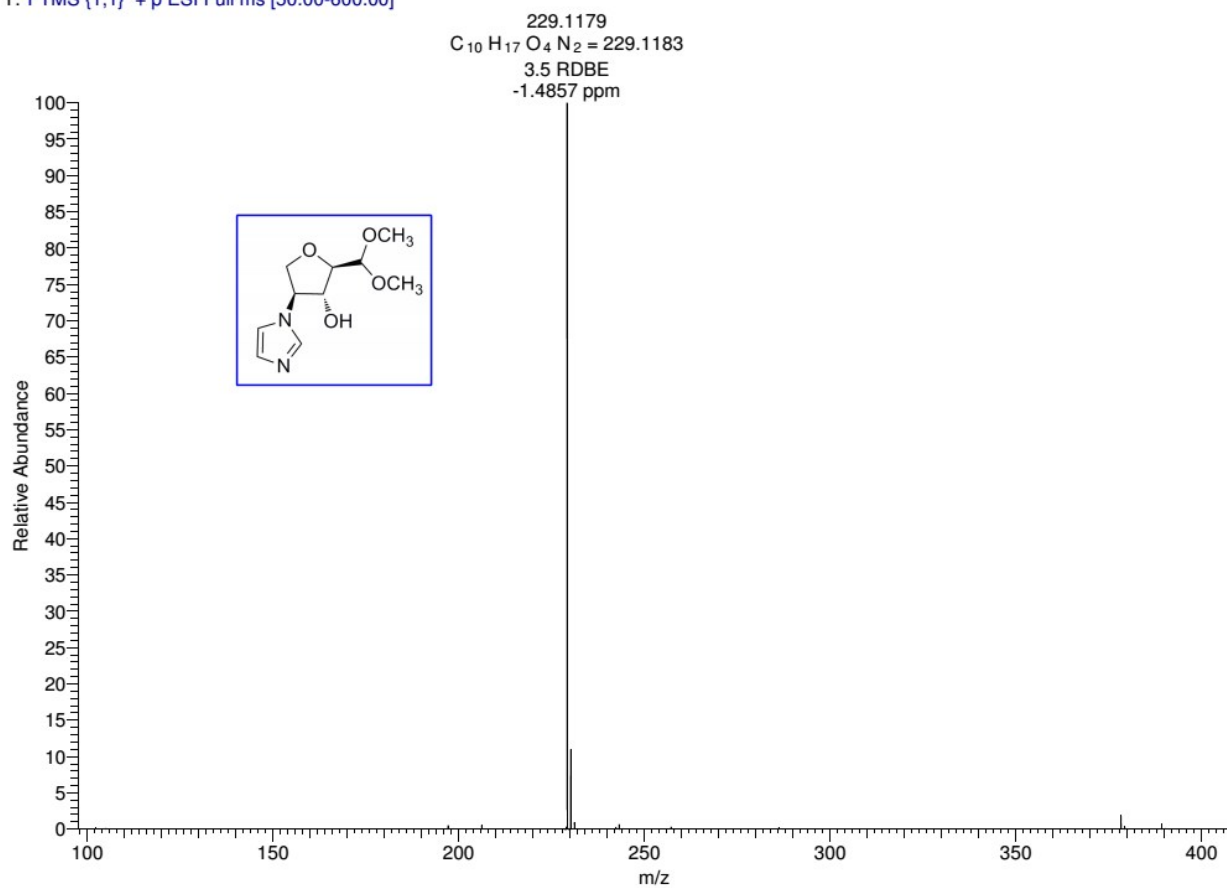
^{19}F NMR Spectrum for the Chiral Recognition Experiment between CCIL 7 (6 equiv.) and Mosher's acid salt.

2.2 Copies of NMR, ESI and HR-MS Spectra



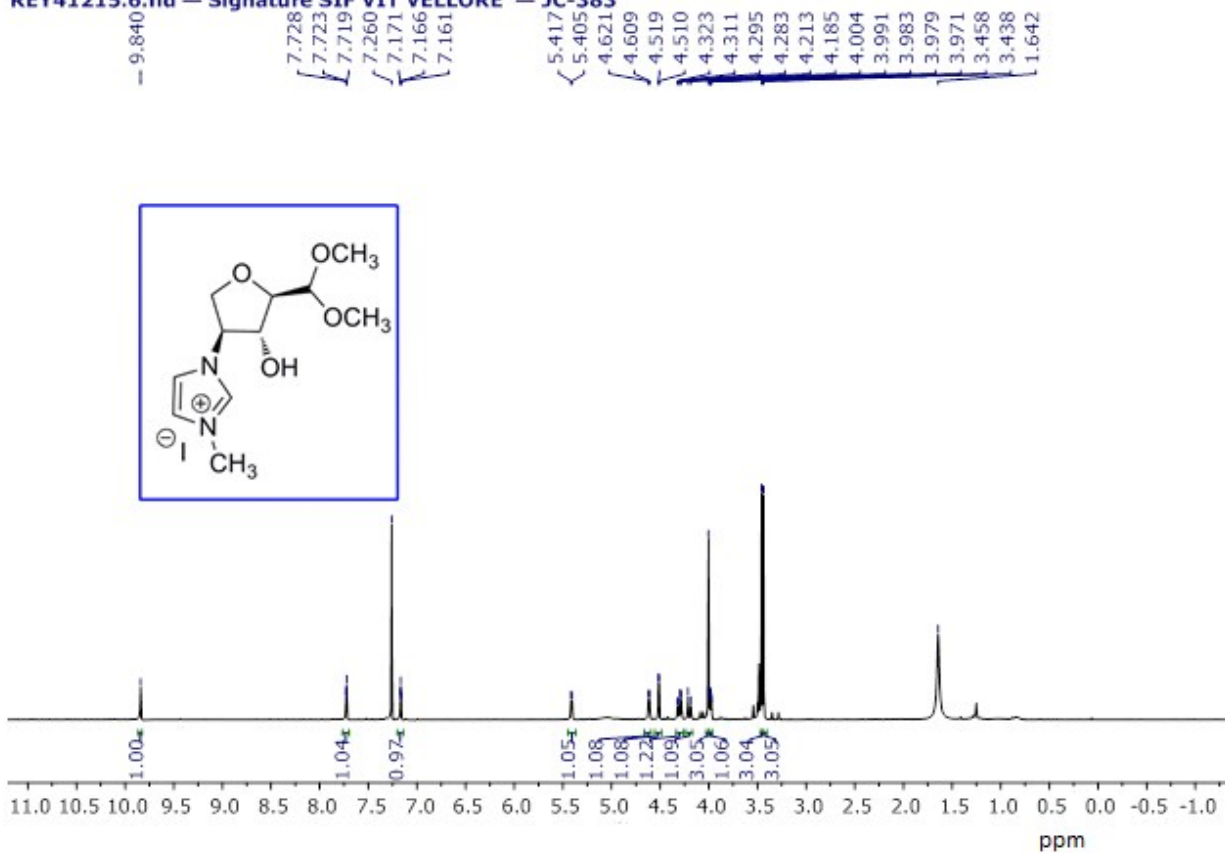
¹H NMR Spectrum of (2R, 3R, 4S)-2-(dimethoxymethyl)-4-(1H-imidazol-1-yl) tetrahydrofuran-3-ol (6).

JRAO-407 #3-5 RT: 0.11-0.17 AV: 3 NL: 1.03E8
T: FTMS {1,1} + p ESI Full ms [50.00-600.00]

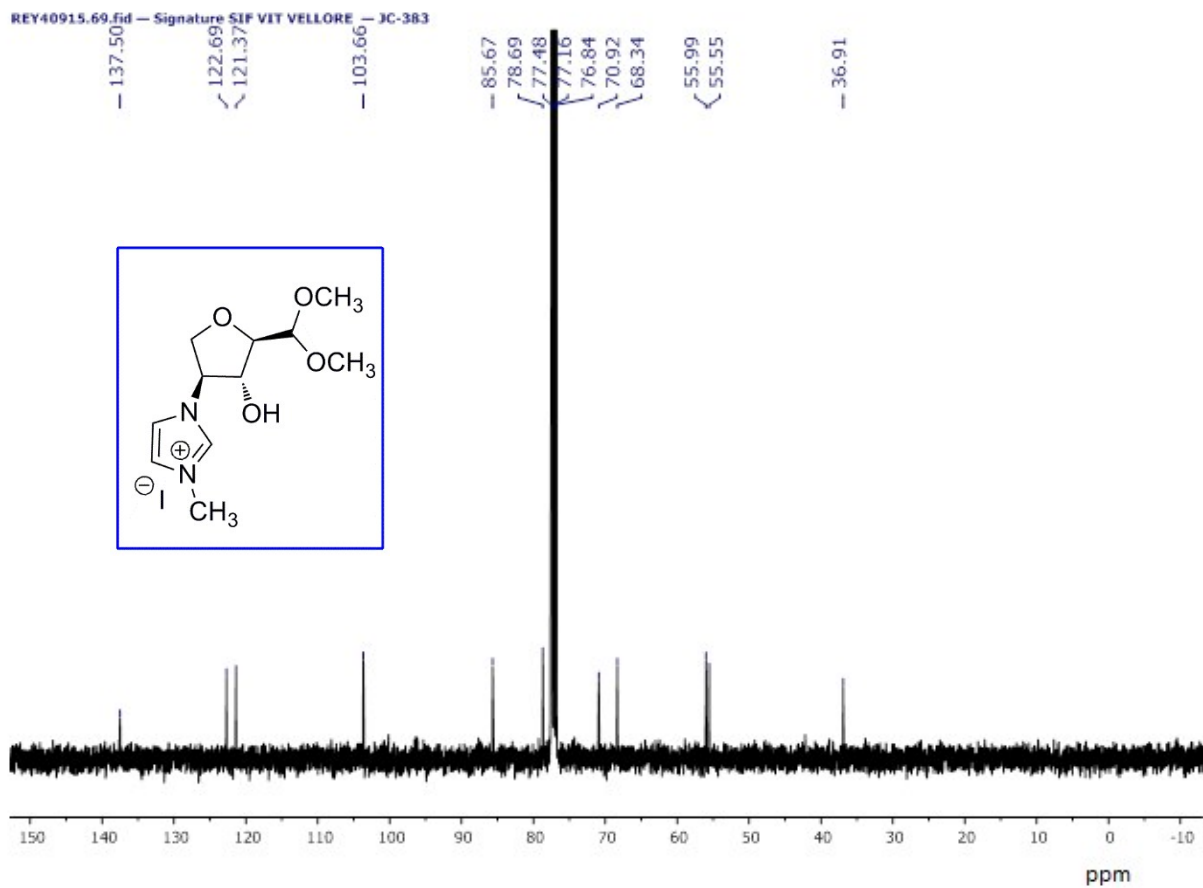


HR-MS Spectrum of (2R, 3R, 4S)-2-(dimethoxymethyl)-4-(1H-imidazol-1-yl) tetrahydrofuran-3-ol (6).

REY41215.6.fid — Signature SIF VIT VELLORE — JC-383

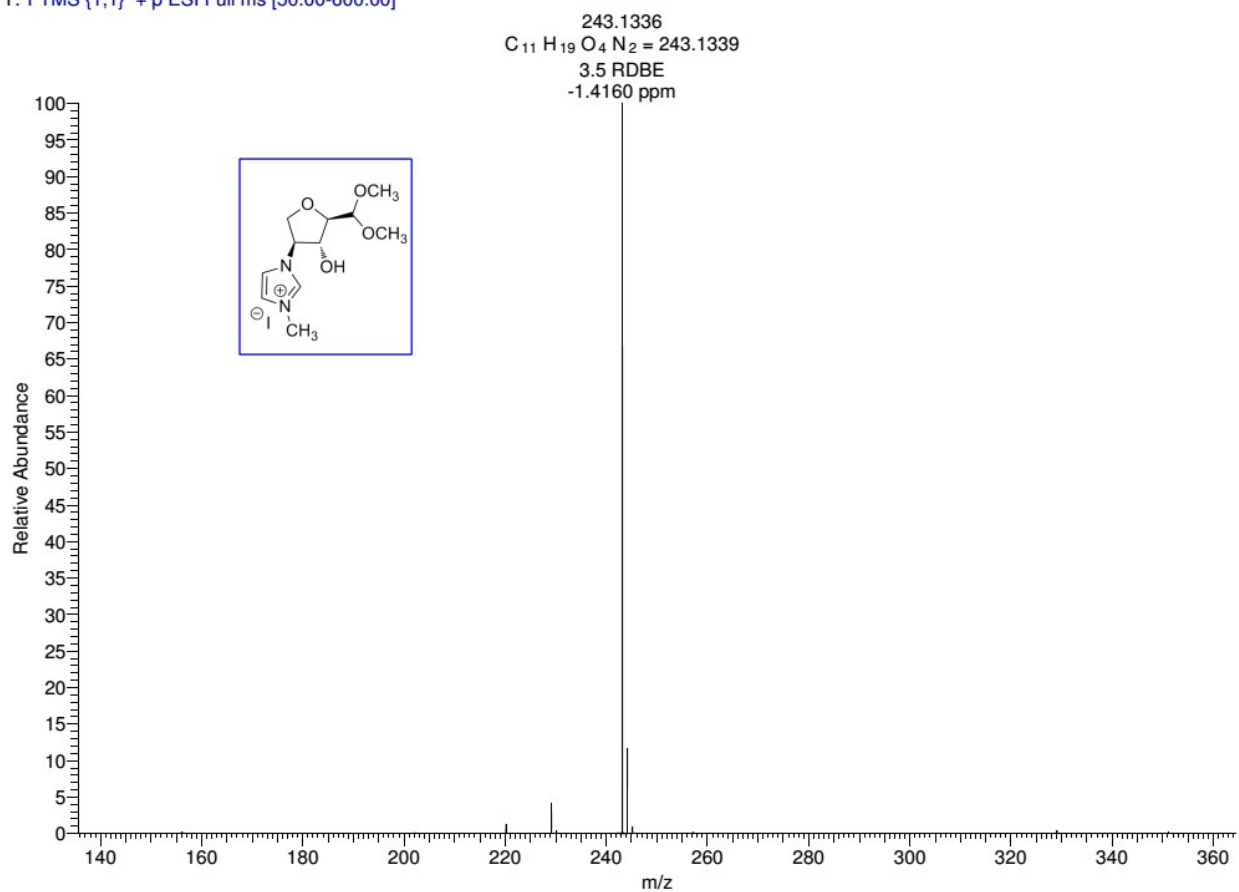


¹H NMR Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium iodide (7).



¹³C NMR Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium iodide (7).

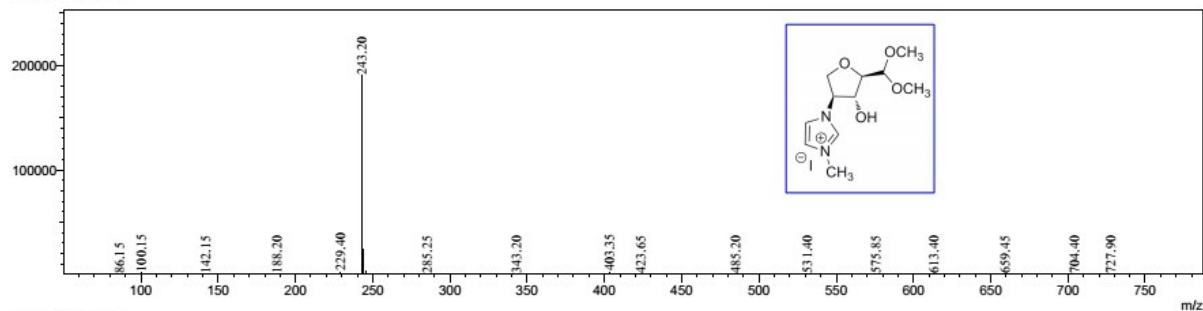
JRAO-383 #3-6 RT: 0.11-0.21 AV: 4 NL: 3.98E7
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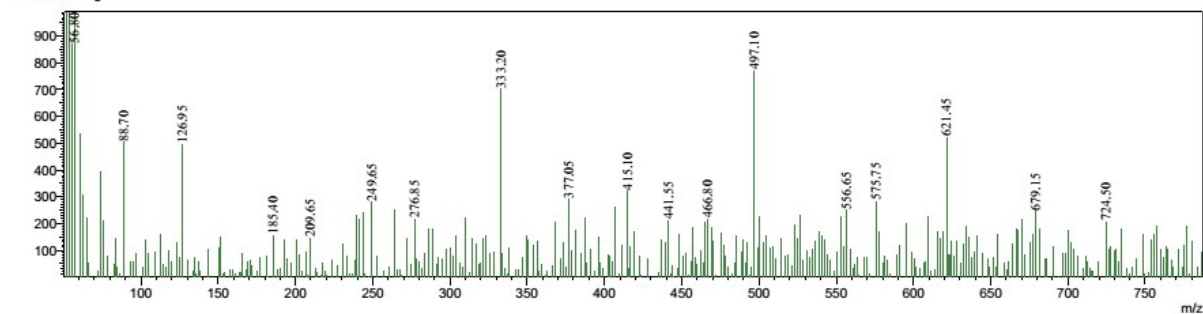
HR-MS Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium iodide (7)

Sample Name : Jayachandra
 Sample ID : jrao-283
 Original Data File : D:\LCMS\Data\ESI-APCI Mass\2015\November-15\26-11-2015\jrao-283.lcd

Mode: ESI Positive

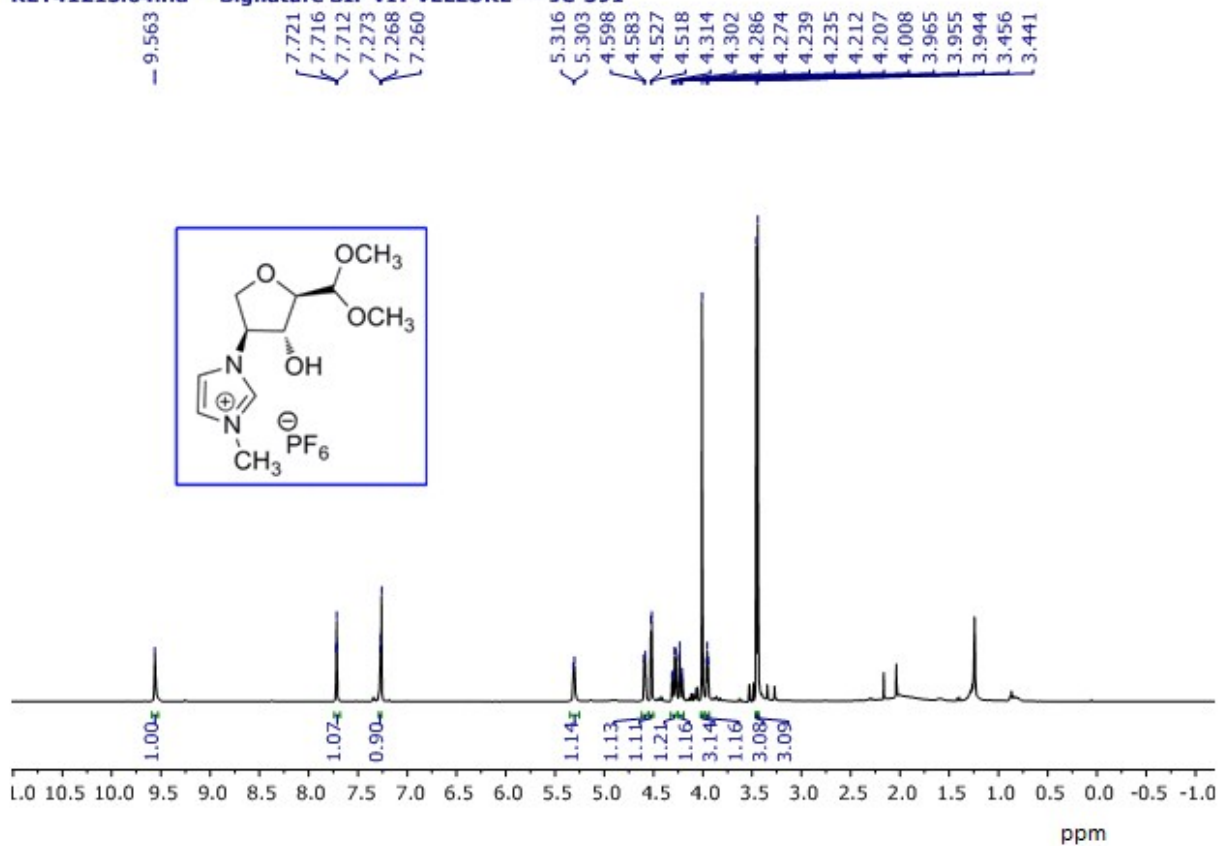


Mode: ESI Negative



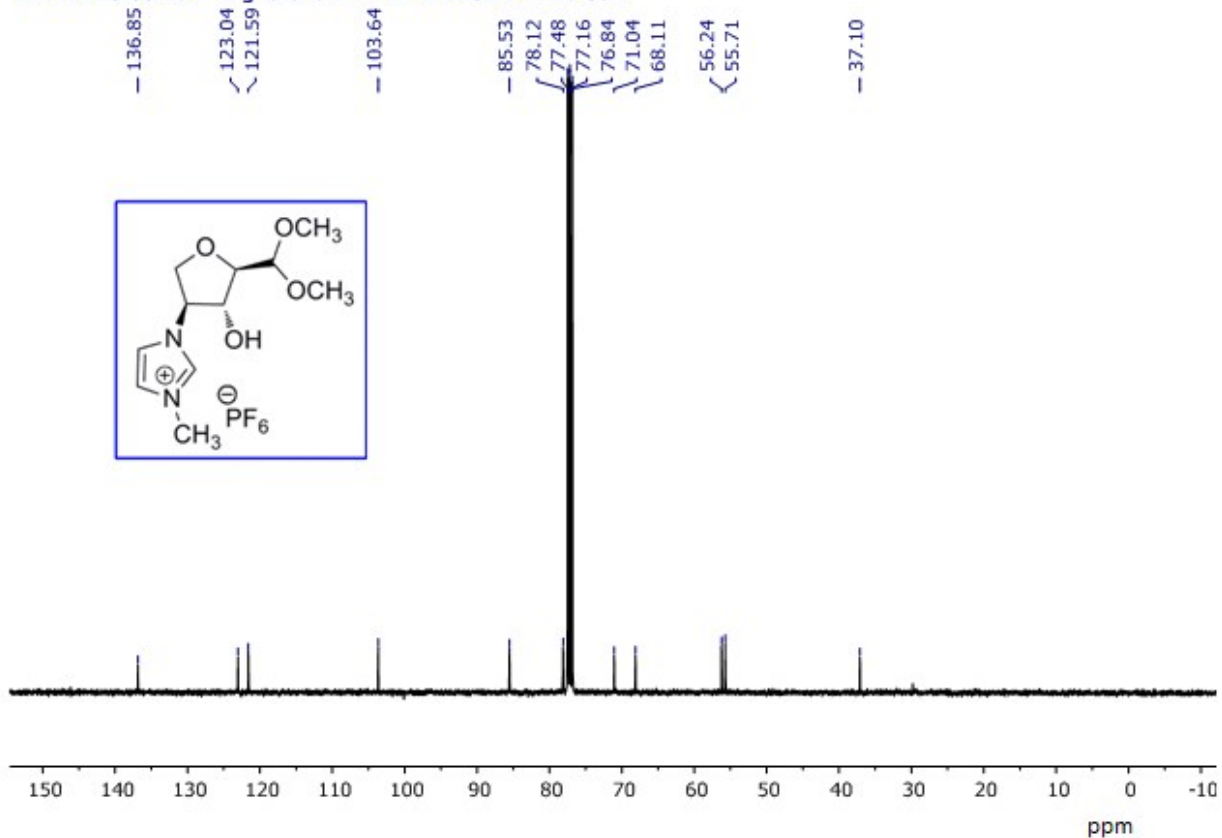
LR-MS (ESI) Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium iodide (7) (Positive and negative modes).

REY41215.64.fid — Signature SIF VIT VELLORE — JC-391



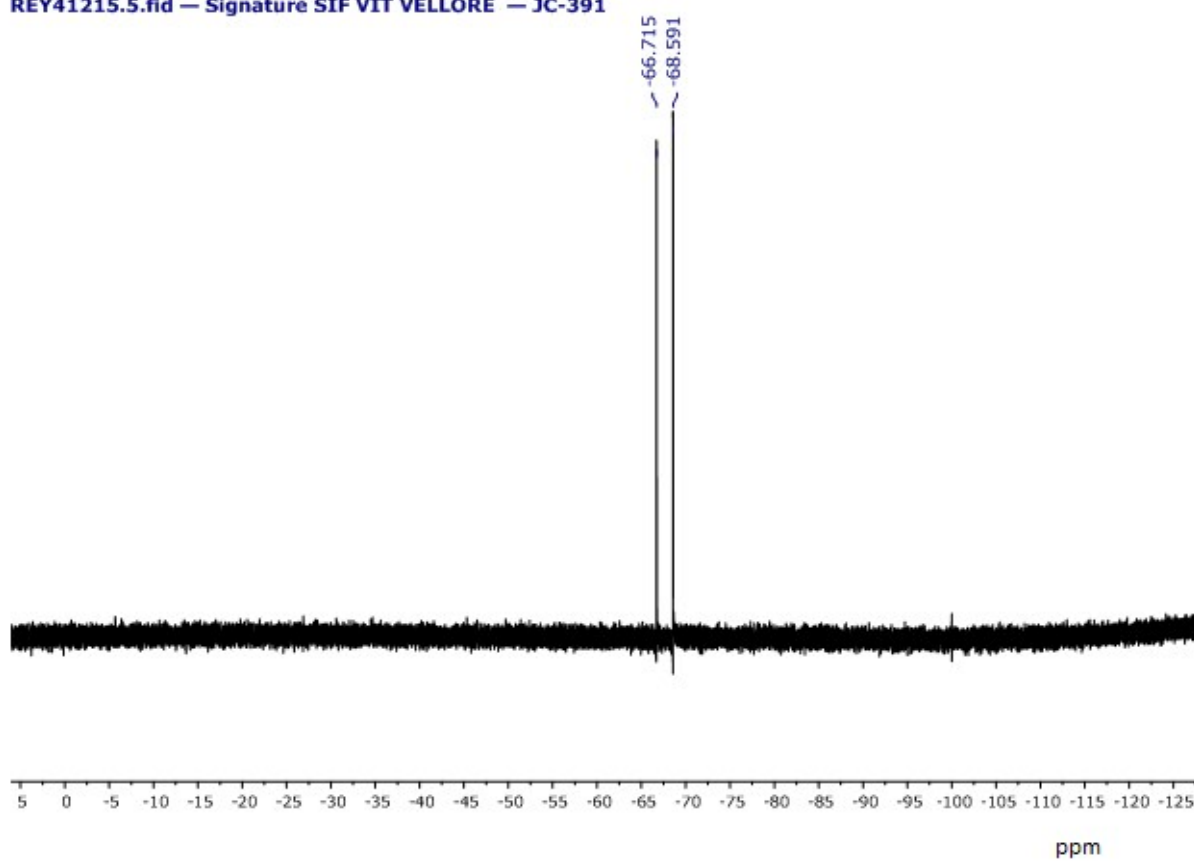
¹H NMR Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium hexafluorophosphate (V) (8).

REY41215.65.fid — Signature SIF VIT VELLORE — JC-391



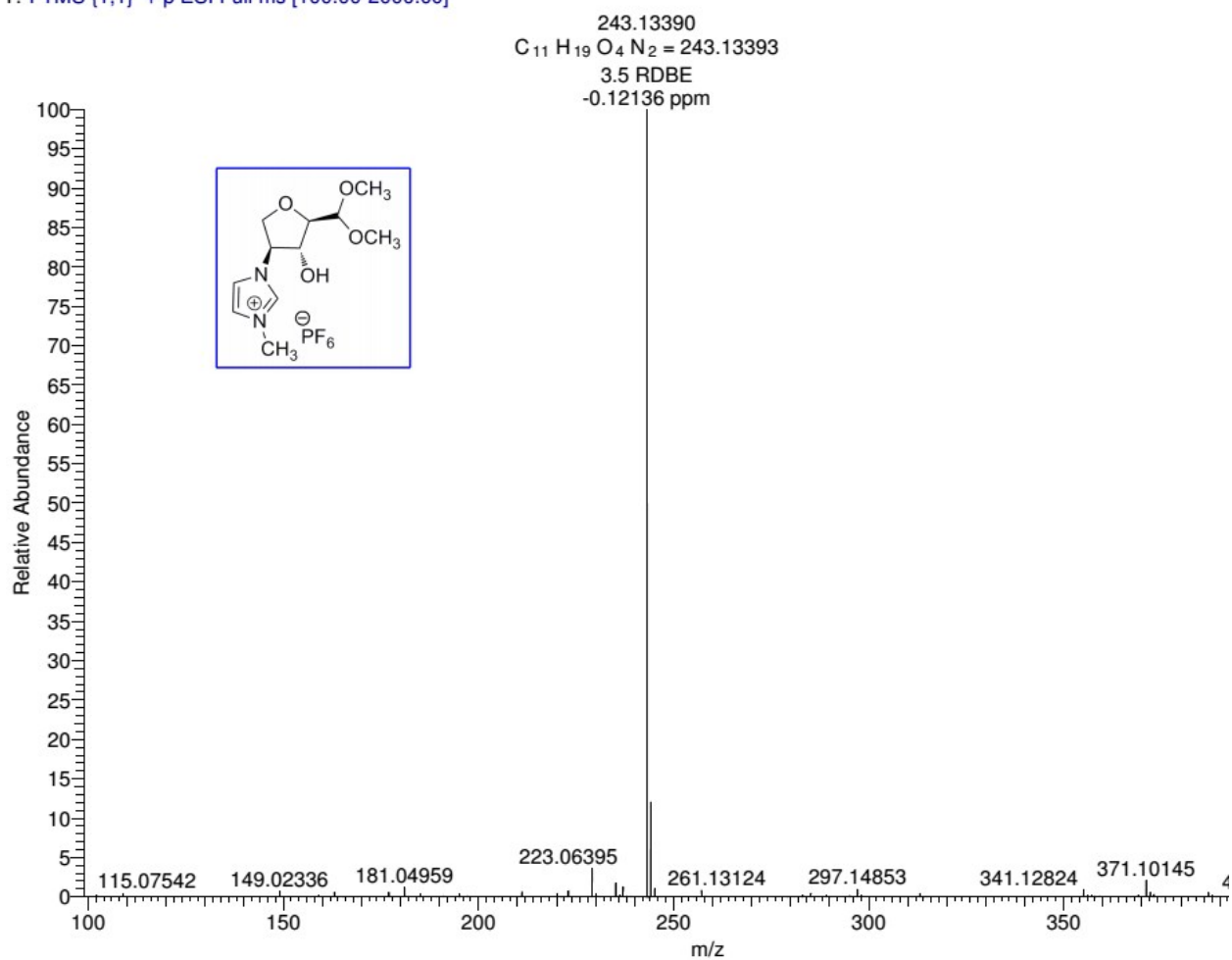
¹³C NMR Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium hexafluorophosphate (V) (8).

REY41215.5.fid — Signature SIF VIT VELLORE — JC-391



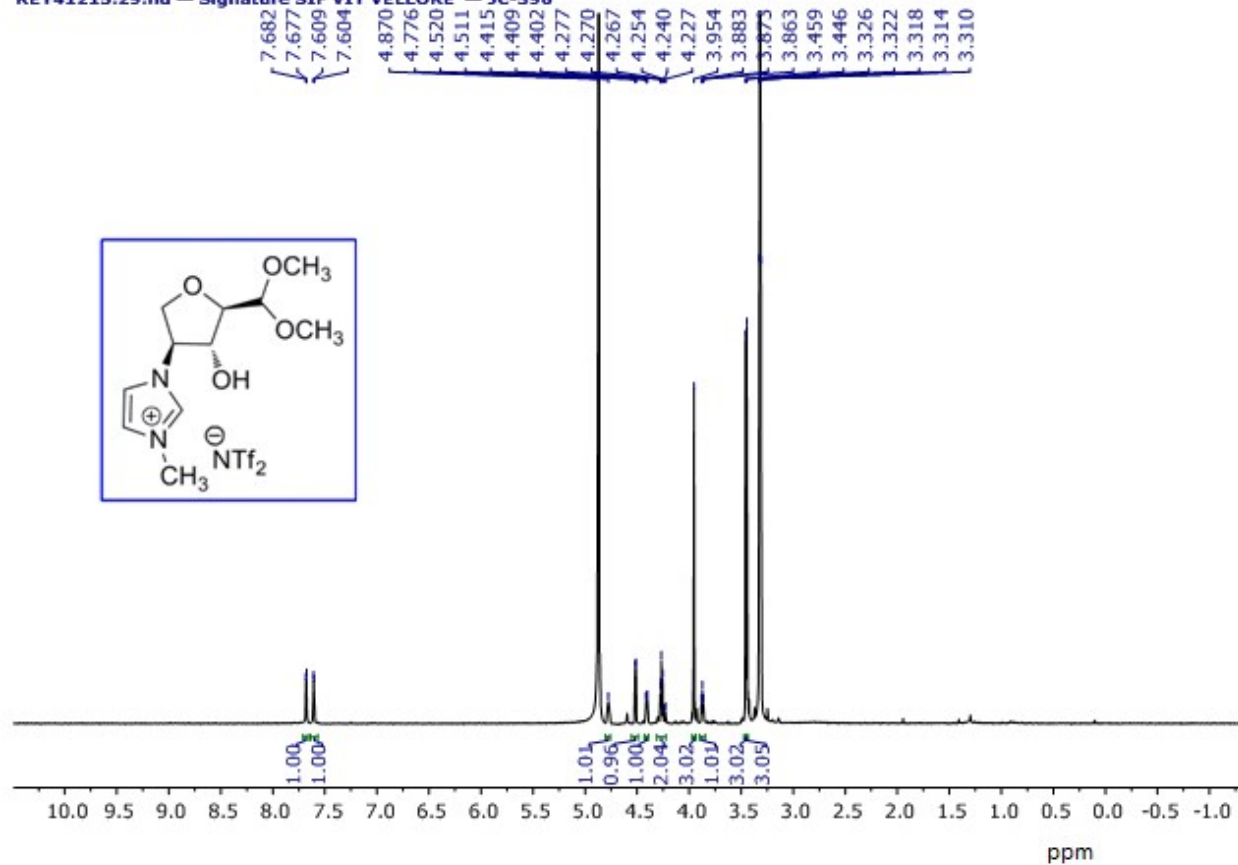
^{19}F NMR Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium hexafluorophosphate (V) (8).

T: FTMS {1,1} + p ESI Full ms [100.00-2000.00]



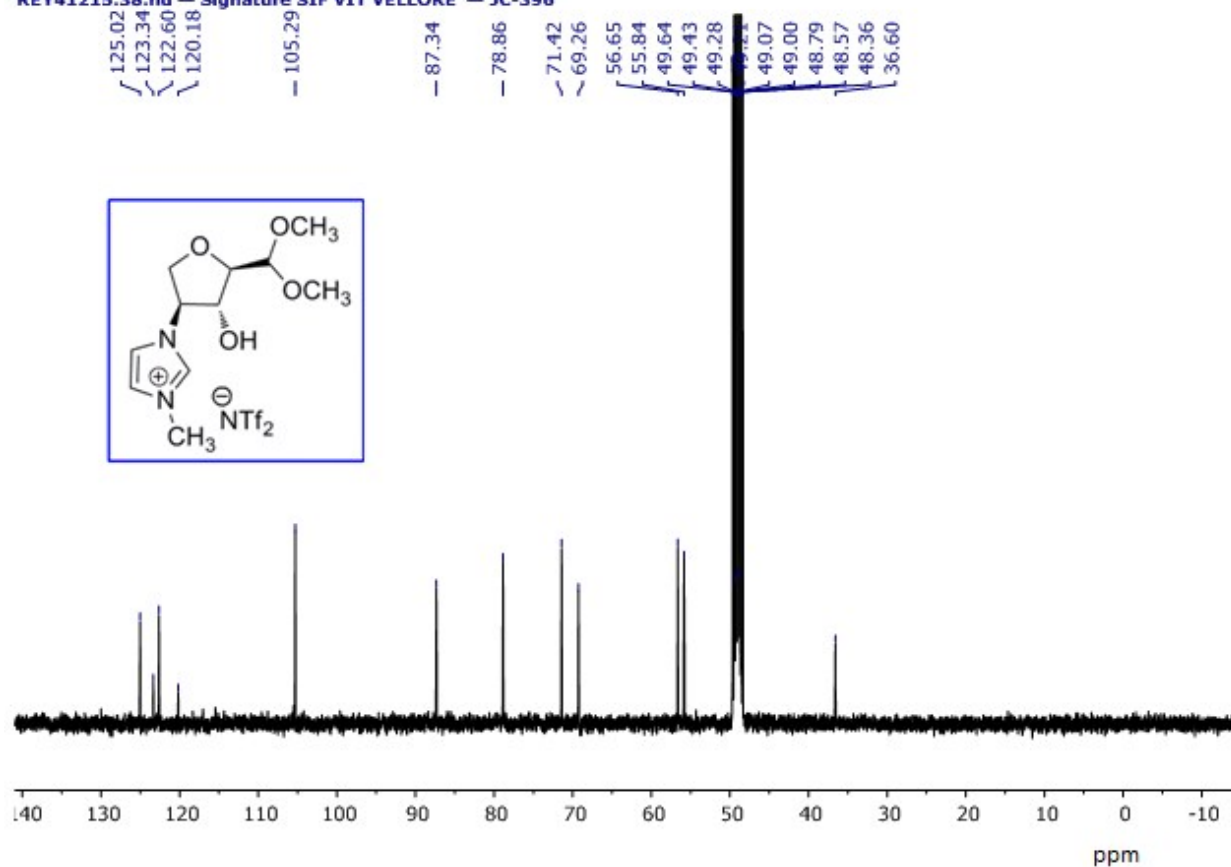
HR-MS Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium hexafluorophosphate (V) (8).

REY41215.29.fid — Signature SIF VIT VELLORE — JC-396

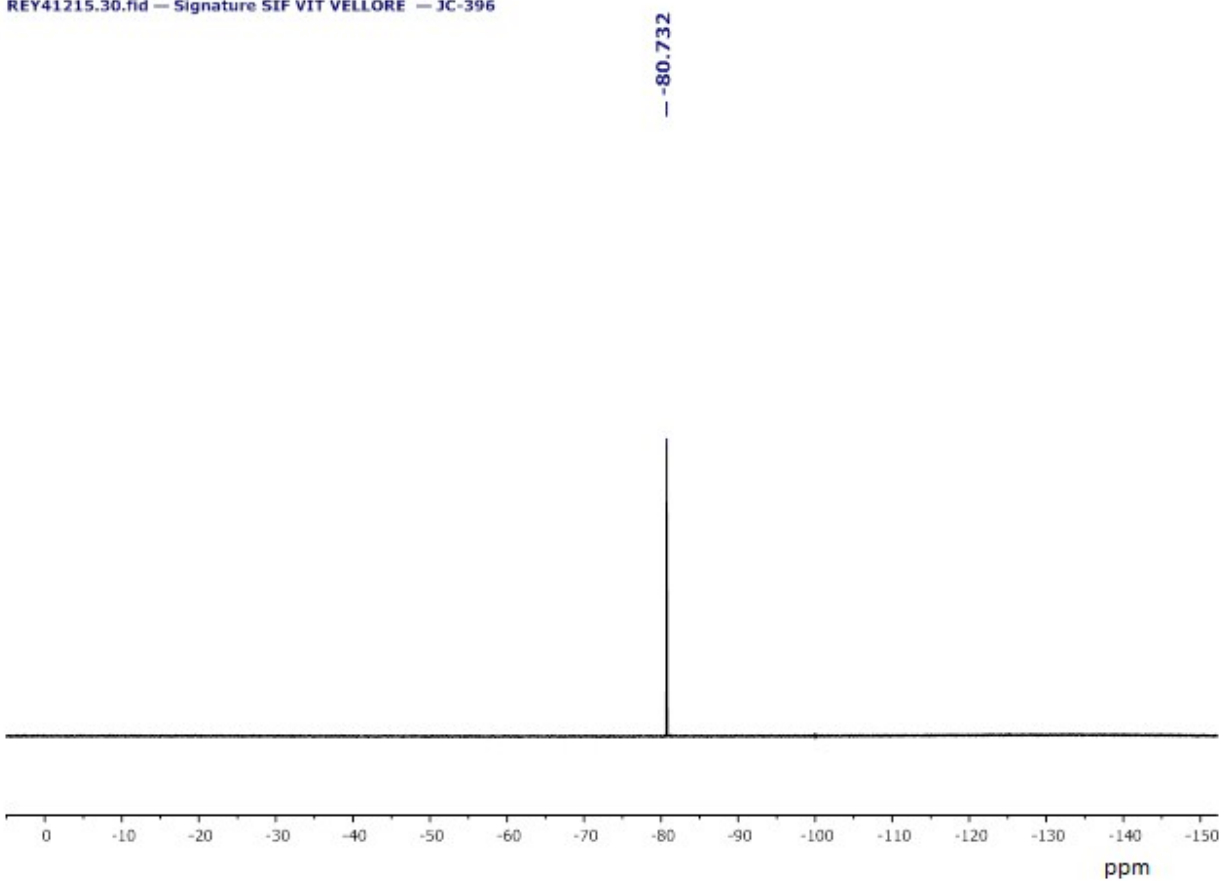


¹H NMR Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium bis ((trifluoromethyl) sulfonyl) amide (9).

REY41215.38.fid — Signature SIF VIT VELLORE — JC-396

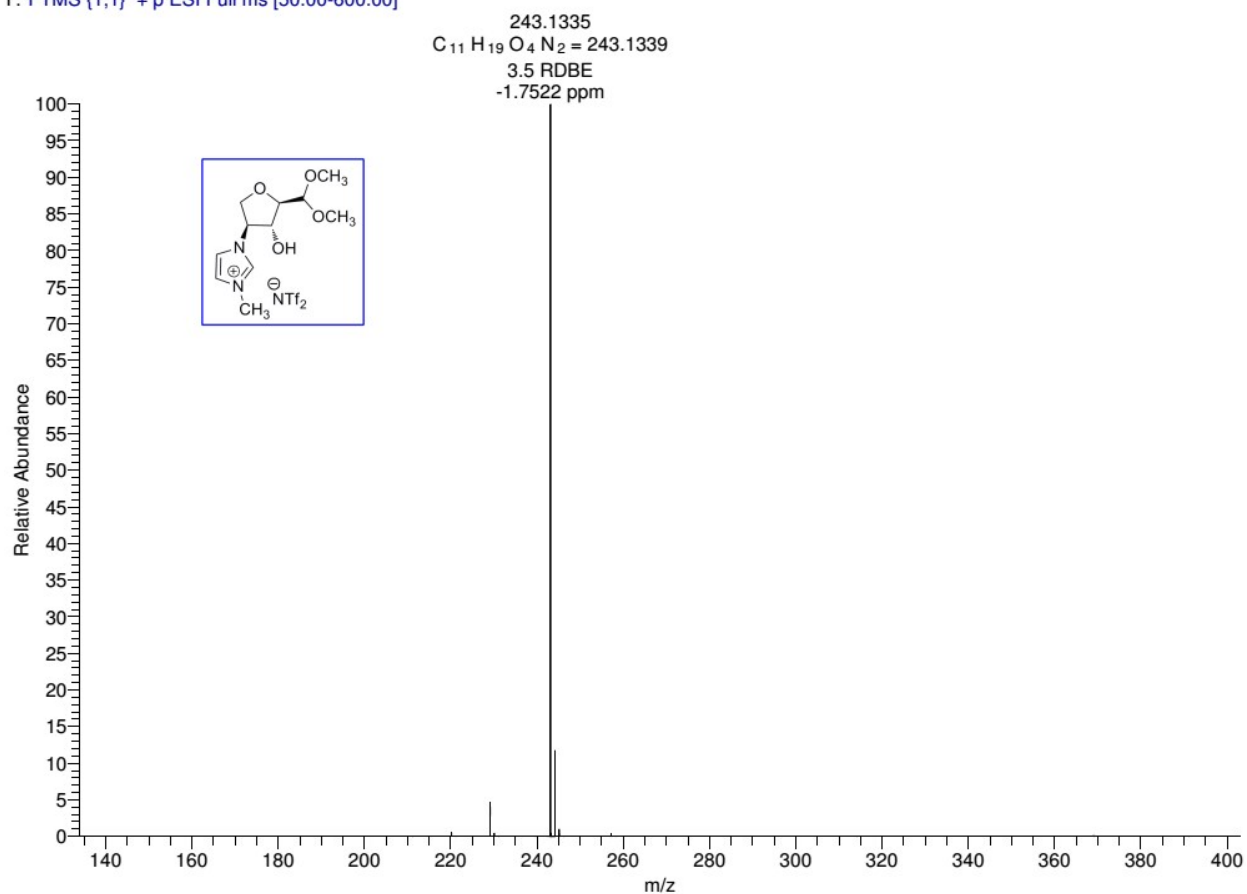


¹³C NMR Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium bis ((trifluoromethyl) sulfonyl) amide (9).



^{19}F NMR Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium bis ((trifluoromethyl) sulfonyl) amide (9).

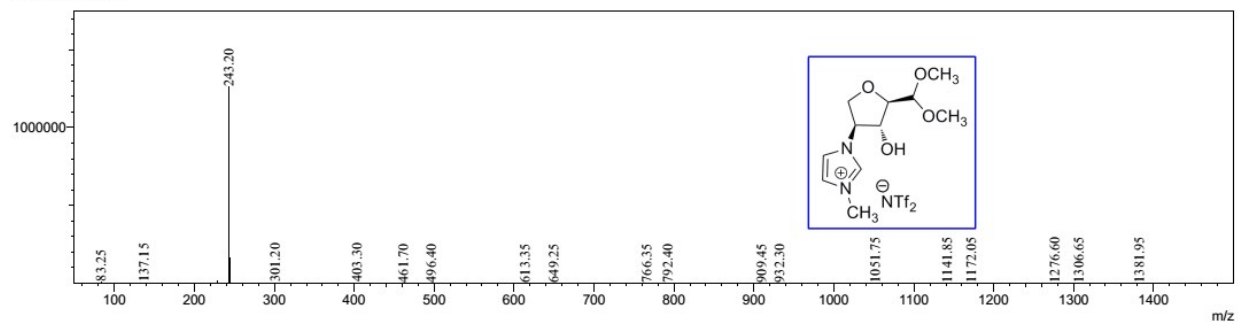
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T: FTMS {1,1} + p ESI Full ms [50.00-600.00]



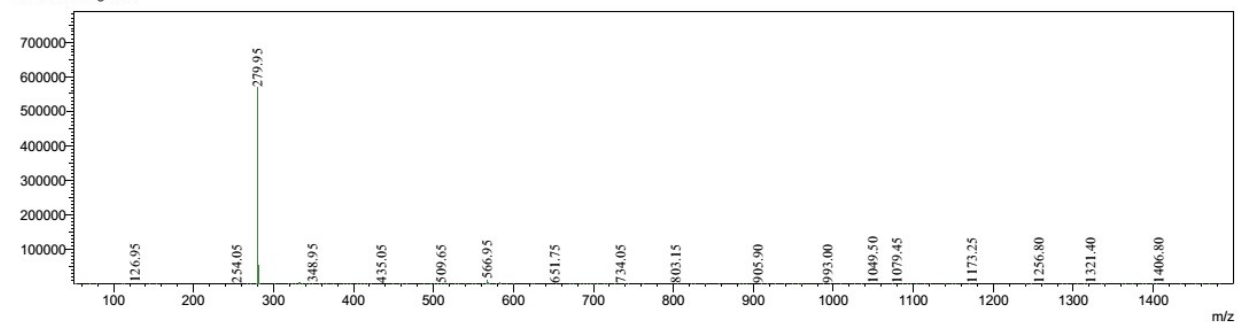
HR-MS (ESI) Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium bis ((trifluoromethyl) sulfonyl) amide (9).

Sample Name : Jayachandra
 Sample ID : jrao-jc-396a
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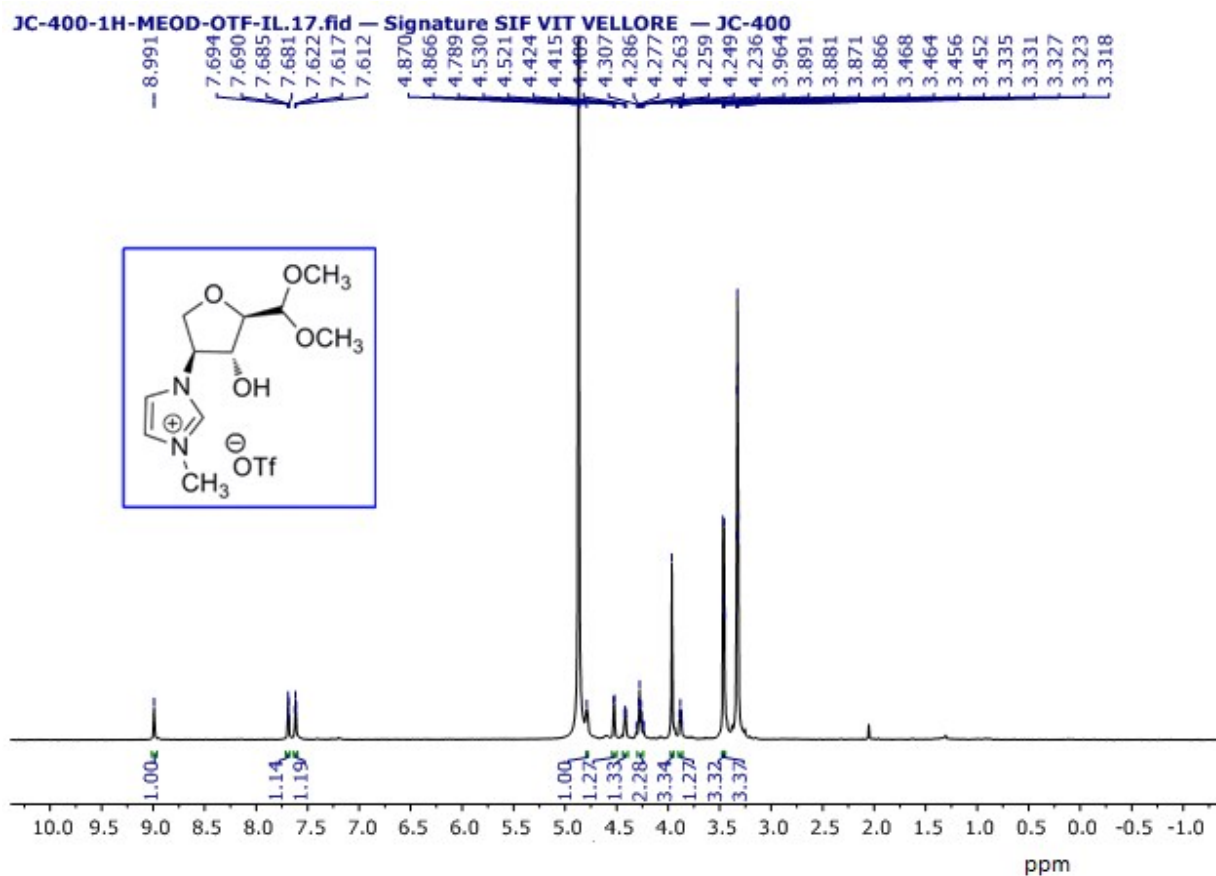
Mode: ESI Positive



Mode: ESI Negative

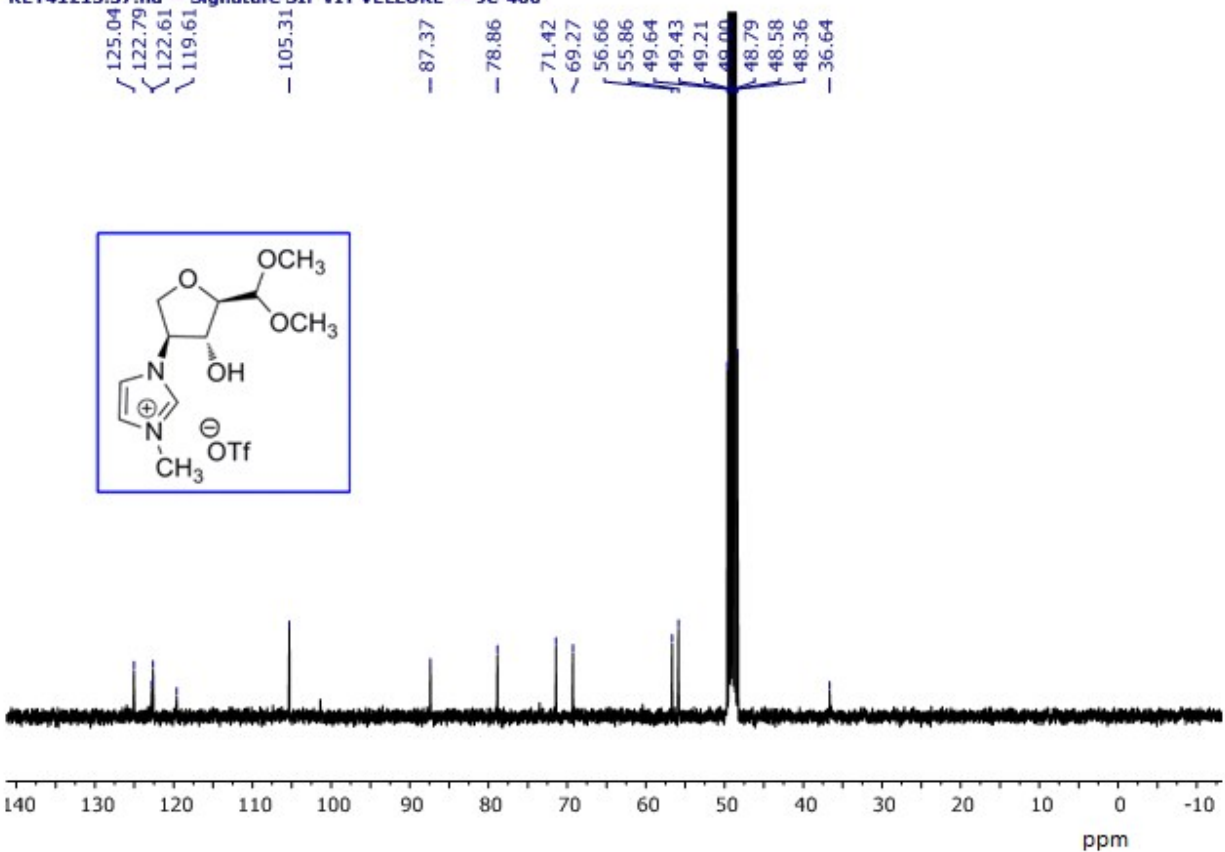


LR-MS (ESI) Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium bis ((trifluoromethyl) sulfonyl) amide (9) (Positive and negative modes).

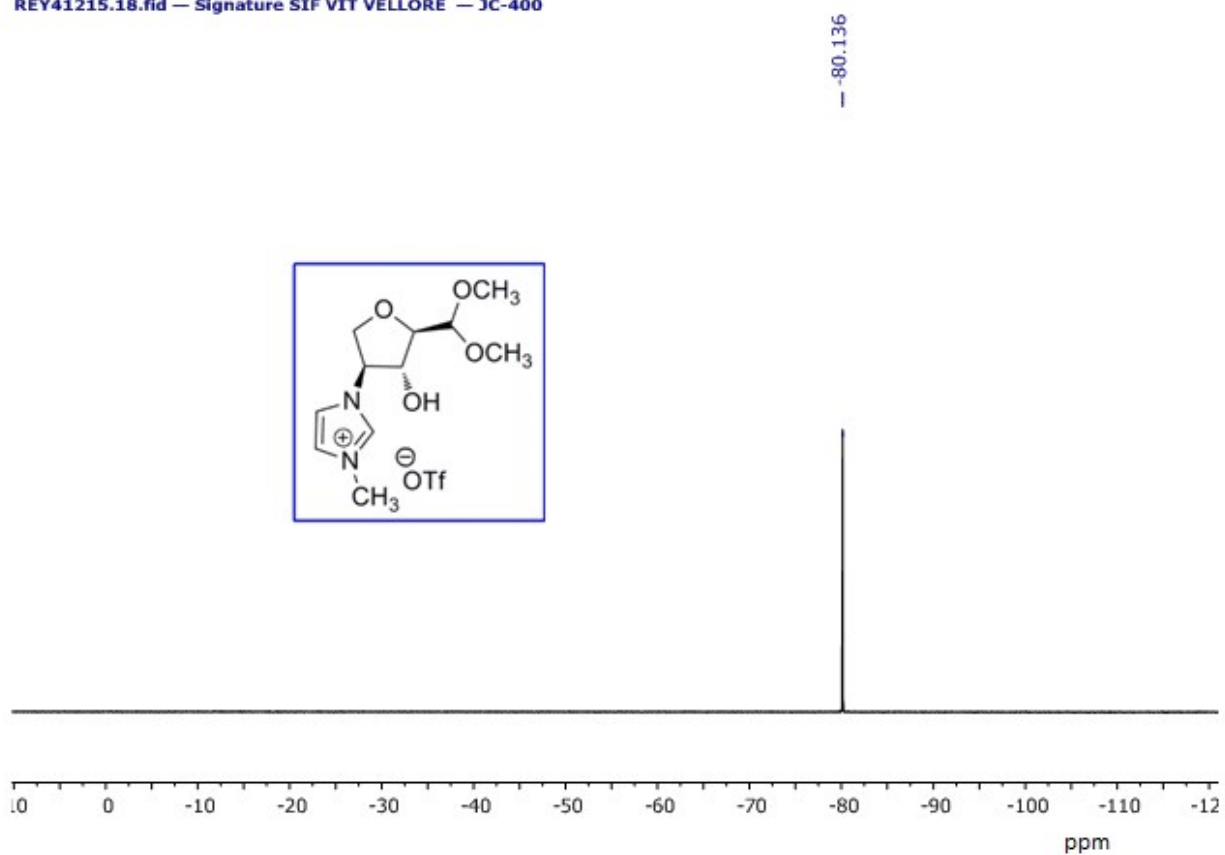


^1H NMR Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium trifluoromethanesulfonate (10).

REY41215.37.fid — Signature SIF VIT VELLORE — JC-400

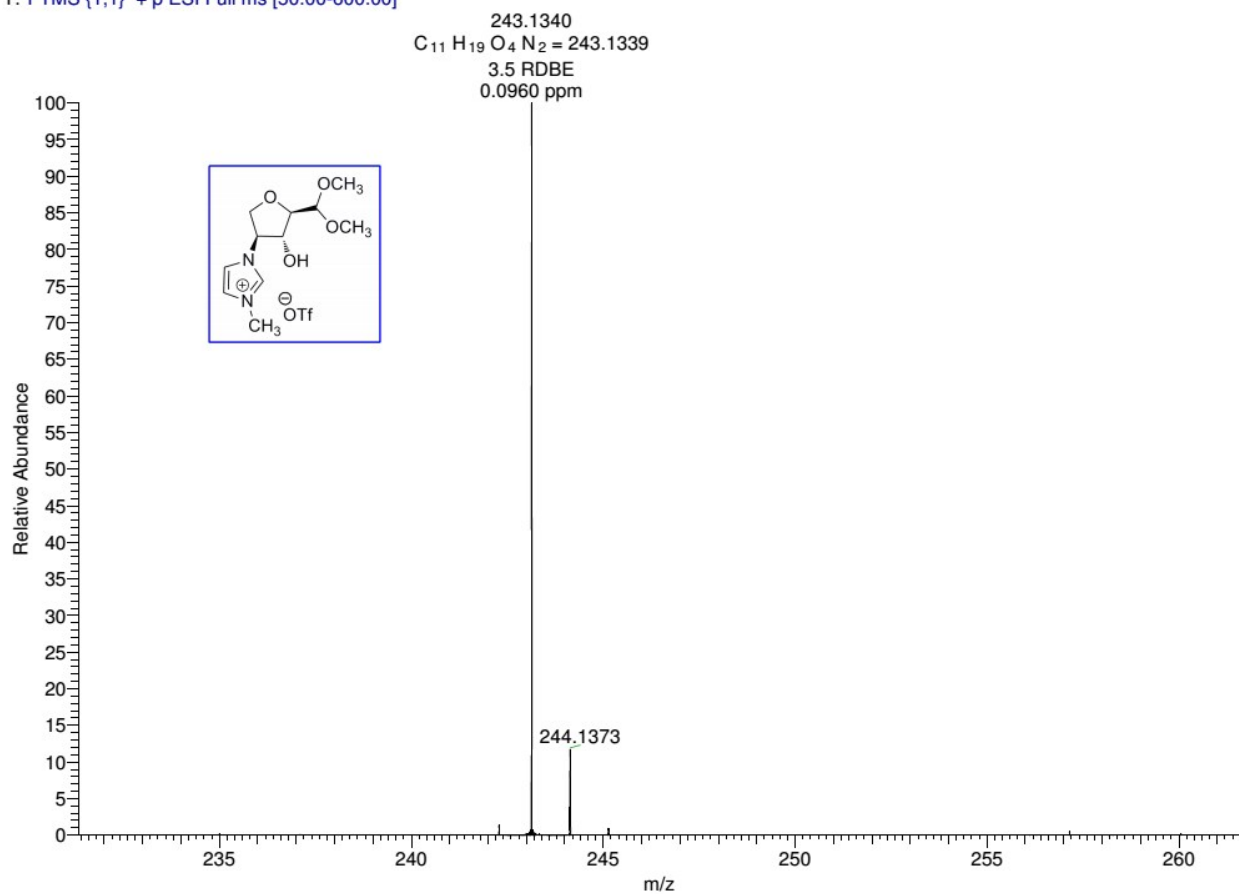


¹³C NMR Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium trifluoromethanesulfonate (10).



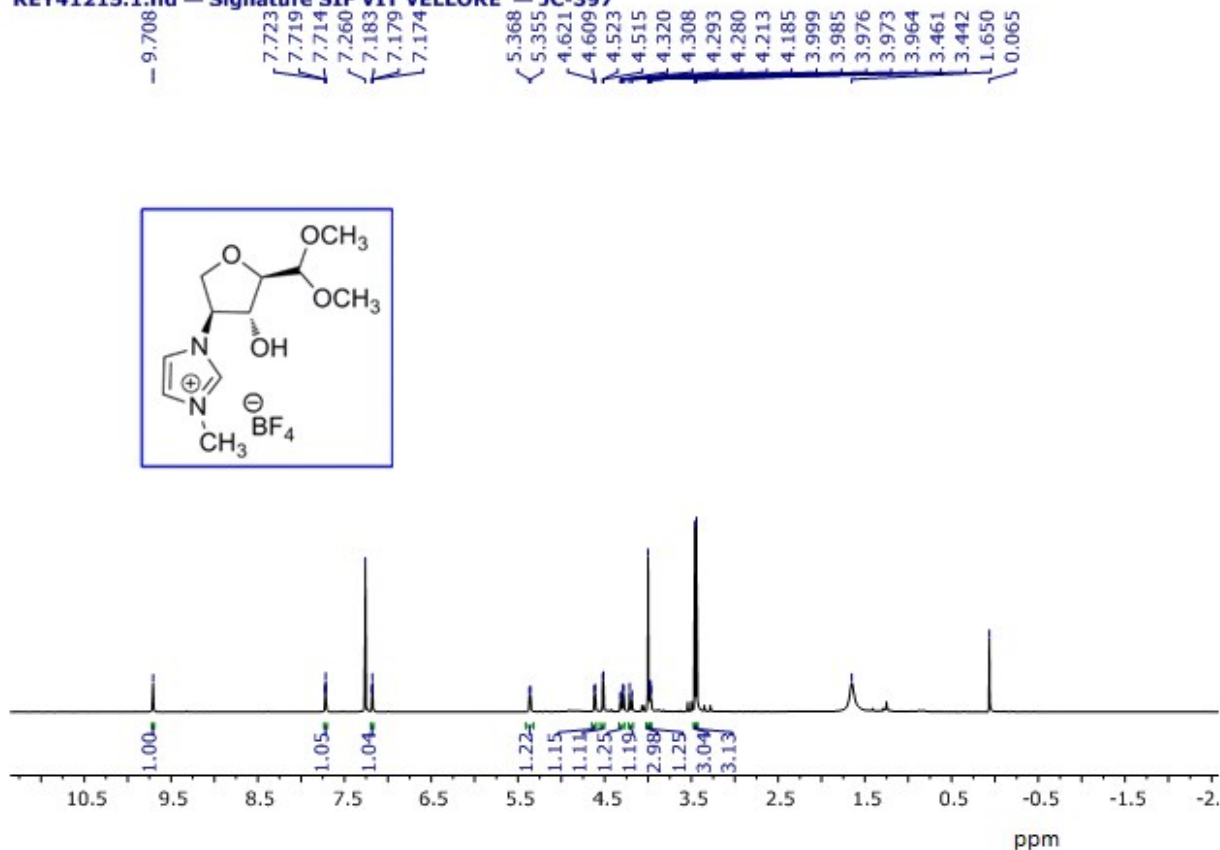
^{19}F NMR Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium trifluoromethanesulfonate (10).

JRAO-400 #1 RT: 0.04 AV: 1 NL: 2.04E6
T: FTMS {1,1} + p ESI Full ms [50.00-600.00]



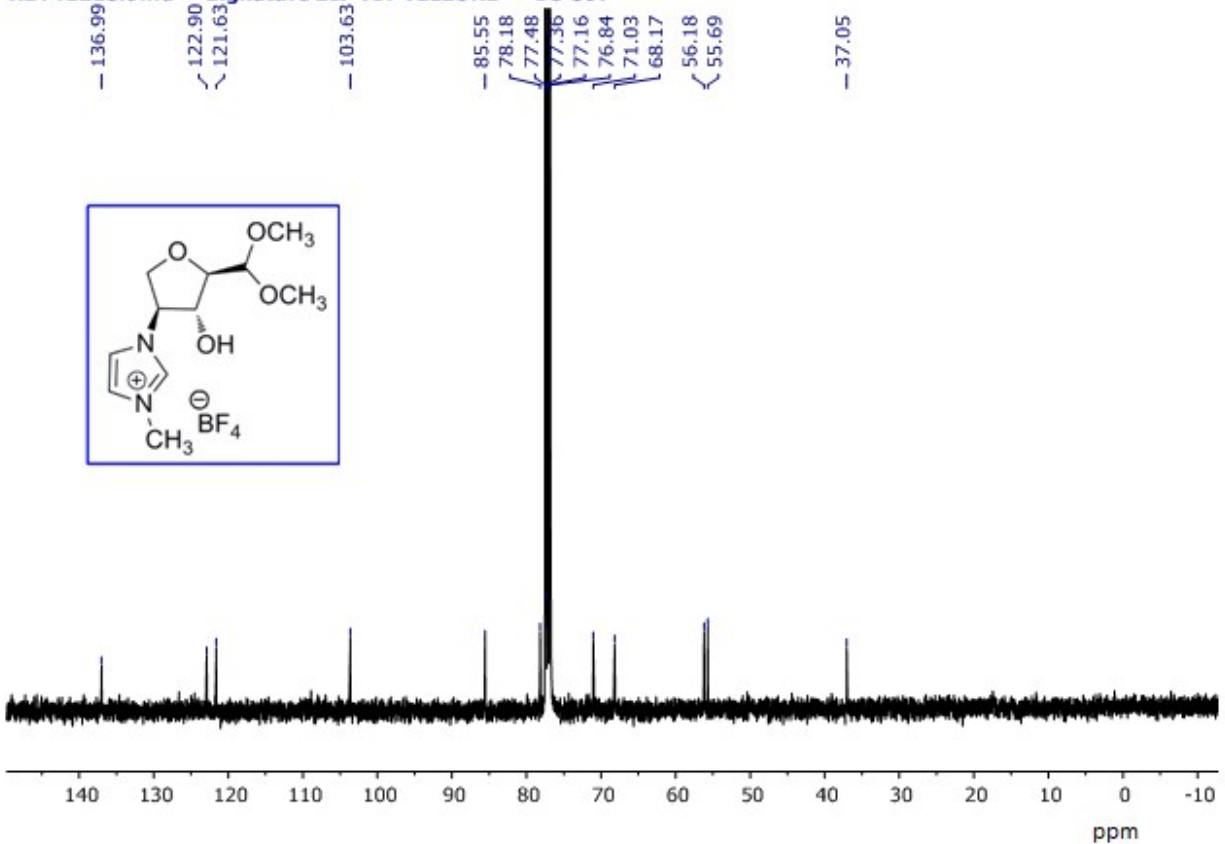
HR-MS Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium trifluoromethanesulfonate (10).

REY41215.1.fid — Signature SIF VIT VELLORE — JC-397



¹H NMR Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium tetrafluoroborate (11).

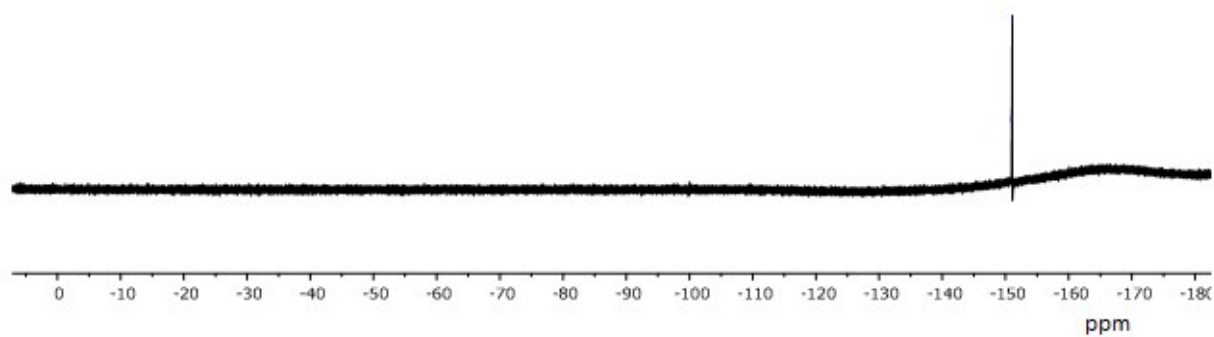
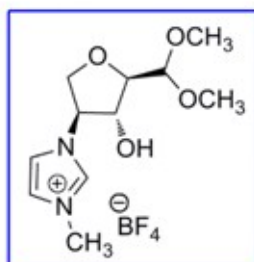
REY41215.9.fid — Signature SIF VIT VELLORE — JC-397



¹³C NMR Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium tetrafluoroborate (11).

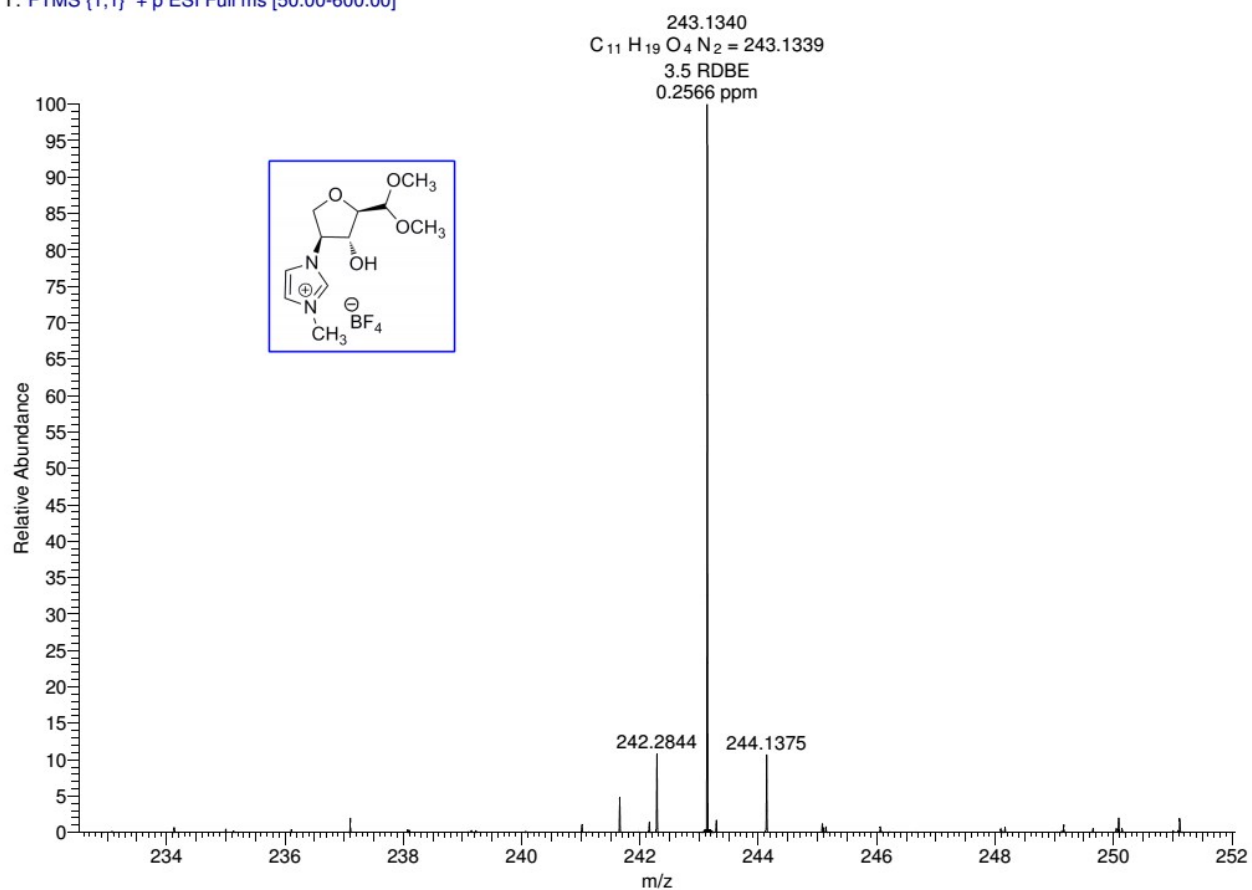
REY41215.2.fid — Signature SIF VIT VELLORE — JC-397

-151.032
-151.083



¹⁹F NMR Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium tetrafluoroborate (11).

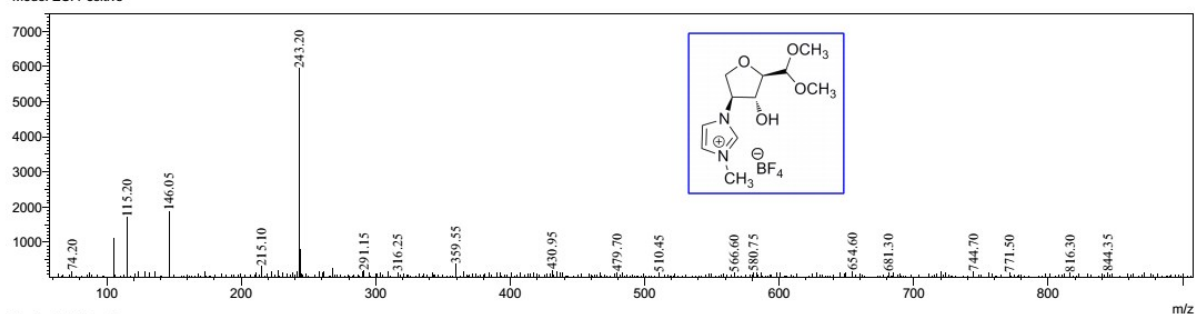
JRAO-397 #2-5 RT: 0.07-0.17 AV: 4 NL: 4.14E5
T: FTMS {1,1} + p ESI Full ms [50.00-600.00]



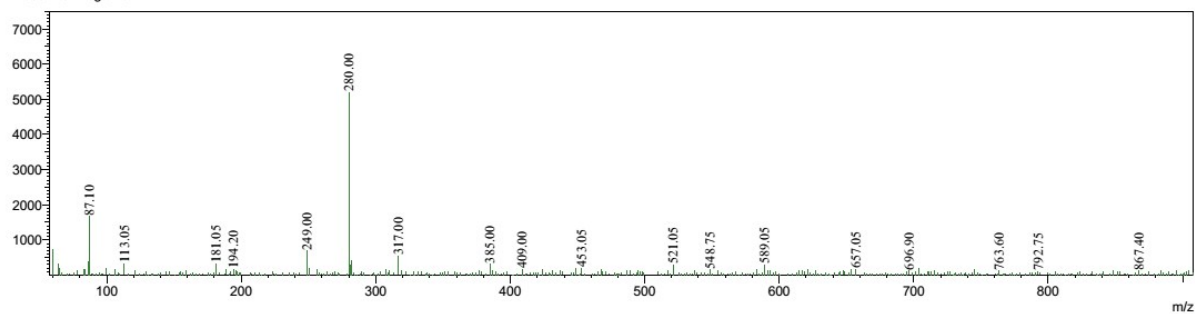
HR-MS (ESI) Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium tetrafluoroborate (11).

Sample Name : Jayachandra
 Sample ID : jrao-jc-397
 Original Data File : D:\LCMS\Data\ESI-APCI Mass\2015\November-15\06-11-2015\jrao-jc-397.lcd

Mode: ESI Positive

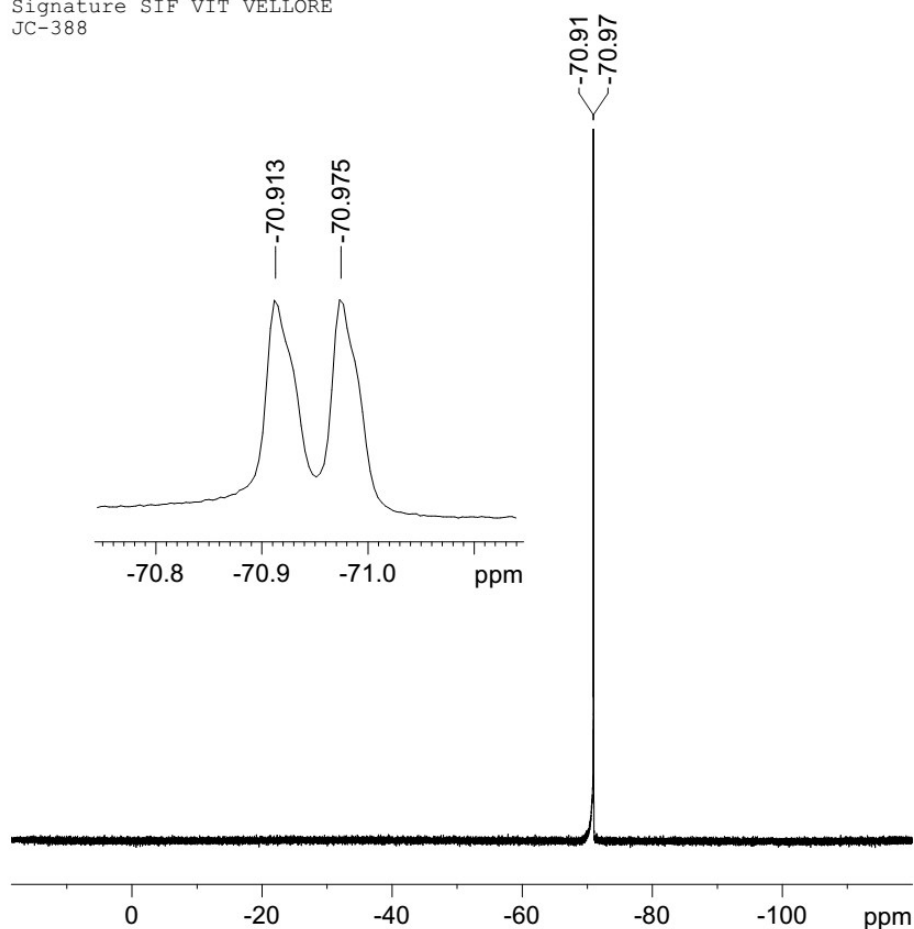


Mode: ESI Negative



LR-MS (ESI) Spectrum of 1-((3S, 4R, 5R)-5-(dimethoxymethyl)-4-hydroxytetrahydrofuran-3-yl)-3-methyl-1H-imidazol-3-ium tetrafluoroborate (11) (Positive and negative modes).

Signature SIF VIT VELLORE
JC-388



Current Data Parameters
NAME JC-388-19F-CHIRAL DIS-
EXPNO 2
PROCNO 1

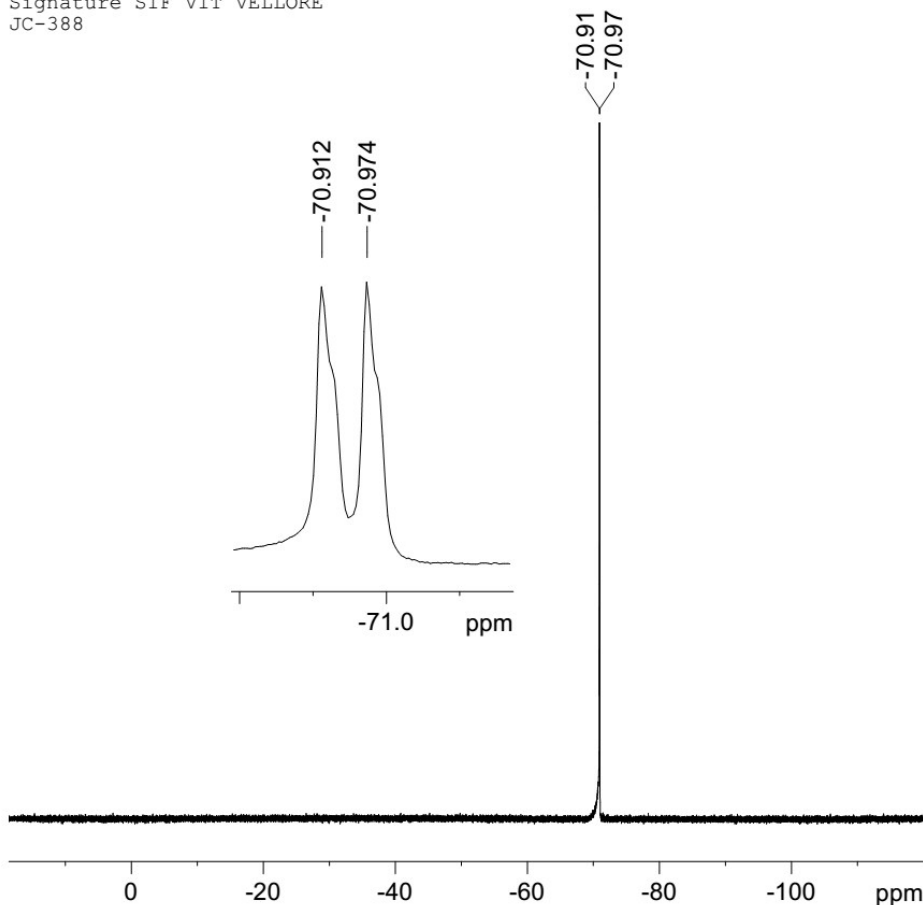
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PULPROG zgpg30
TD 131072
SOLVENT CD3CN
NS 16
DS 4
SWH 89285.711 Hz
FIDRES 0.681196 Hz
AQ 0.7340032 sec
RG 199.6
DW 5.600 usec
DE 6.50 usec
TE 301.0 K
D1 1.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 ^{19}F
P1 14.75 usec
PLW1 19.00000000 W
SFO1 376.5811447 MHz

F2 - Processing parameters
SI 65536
SF 376.6188070 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

^{19}F NMR Spectrum for the Chiral Recognition Experiment between CCIL 7 (2 equiv.) and Mosher's acid salt (Proton Half decoupled spectrum).

Signature SIF VIT VELLORE
JC-388



Current Data Parameters
NAME JC-388-19F-CHIRAL DIS
EXPNO 1
PROCNO 1

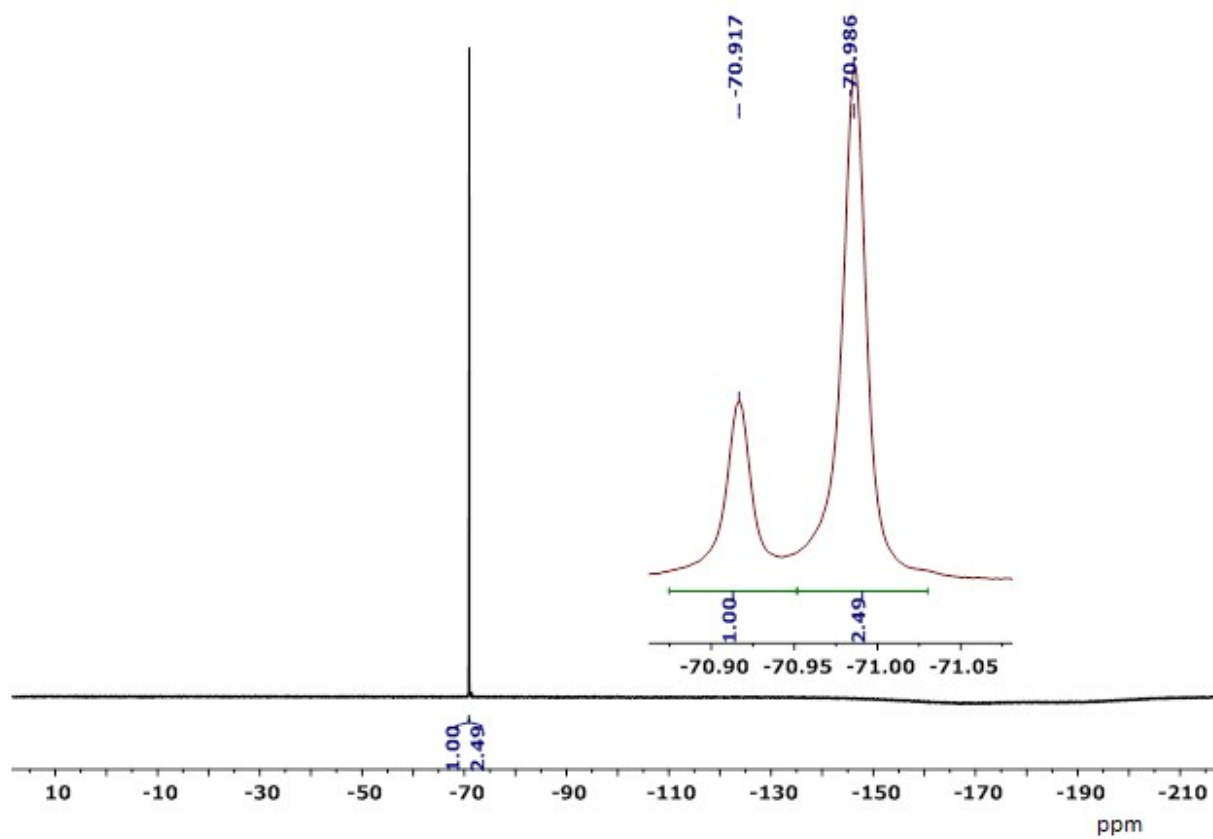
F2 - Acquisition Parameters
Date_ 20151008
Time 14.53
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PULPROG zgpg30
TD 131072
SOLVENT CD3CN
NS 16
DS 4
SWH 89285.711 Hz
FIDRES 0.681196 Hz
AQ 0.7340032 sec
RG 199.6
DW 5.600 usec
DE 6.50 usec
TE 301.1 K
D1 1.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec
TD0 1

===== CHANNEL f1 =====
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PLW1 19.00000000 W
SFO1 376.5811447 MHz

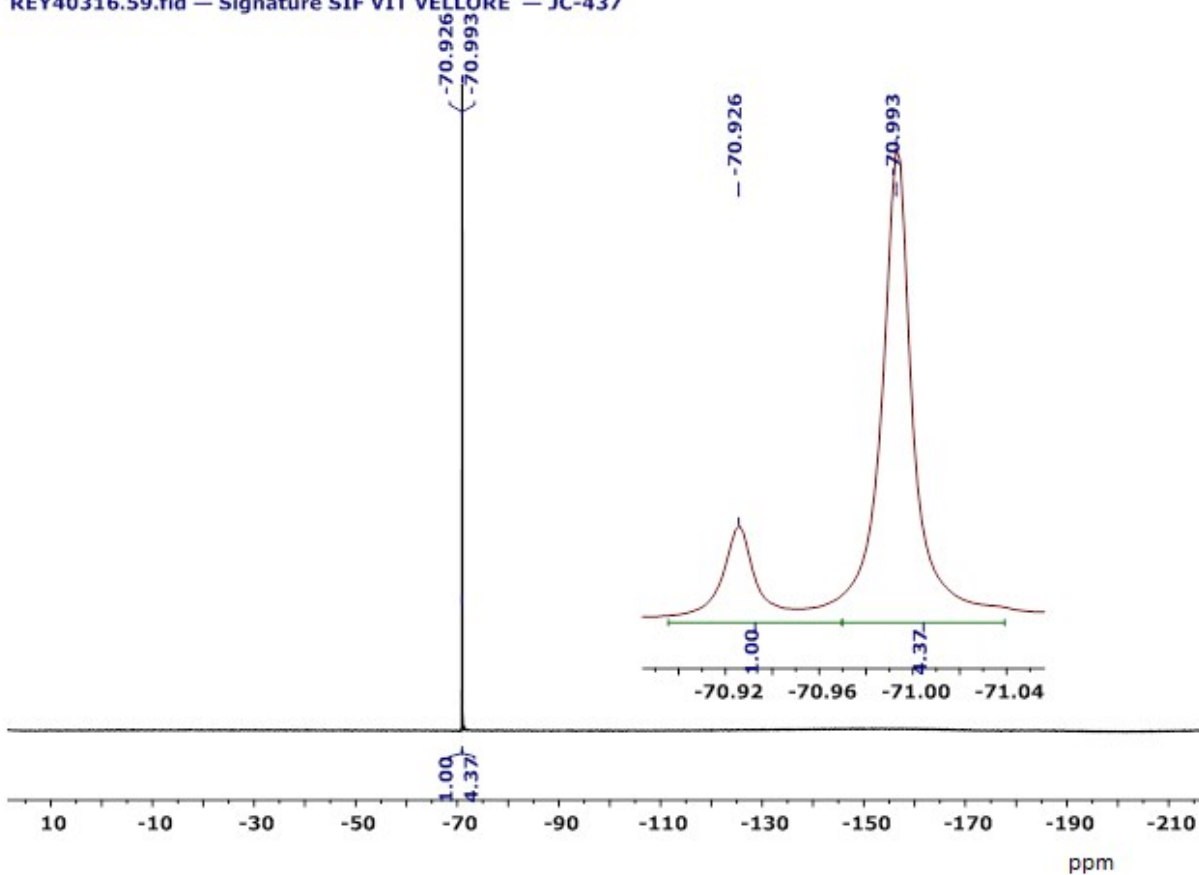
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PCPD2 90.00 usec
PLW2 14.00000000 W
PLW12 0.35097000 W
SFO2 400.2596010 MHz

F2 - Processing parameters
SI 65536
SF 376.6188070 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

^{19}F NMR Spectrum for the Chiral Recognition Experiment between CCIL 7 (2 equiv.) and Mosher's acid salt (Completely Proton decoupled spectrum).



^{19}F NMR spectrum for non-racemic Mosher's acid salt for the calculation of ee.



^{19}F NMR spectrum for non-racemic Mosher's acid salt for the calculation of ee.

LIST OF ABBREVIATIONS

CCIL	CARBOHYDRATE BASED CHIRAL IONIC LIQUID
CIL	CHIRAL IONIC LIQUID
IL	IONIC LIQUID
CuSO ₄	COPPER SULPHATE
H ₂ SO ₄	SULPHURIC ACID
Me ₂ CO	ACETONE
DCM	DICHLOROMETHANE
HCl	HYDROCHLORIC ACID
TsCl	<i>p</i> -TOLUENE SULPHONYL CHLORIDE
TEA	TRIETHYLAMINE
TFA	TRIFLUOROACETIC ACID
MeOH	METHANOL
K ₂ CO ₃	POTASSIUM CARBONATE
Cs ₂ CO ₃	CESIUM CARBONATE
DMF	DIMETHYLFORMAMIDE
CH ₃ I	METHYL IODIDE
Li	LITHIUM