Supporting Information

Content

Data of crystallography

Table 1. Data of crystal structure determination.

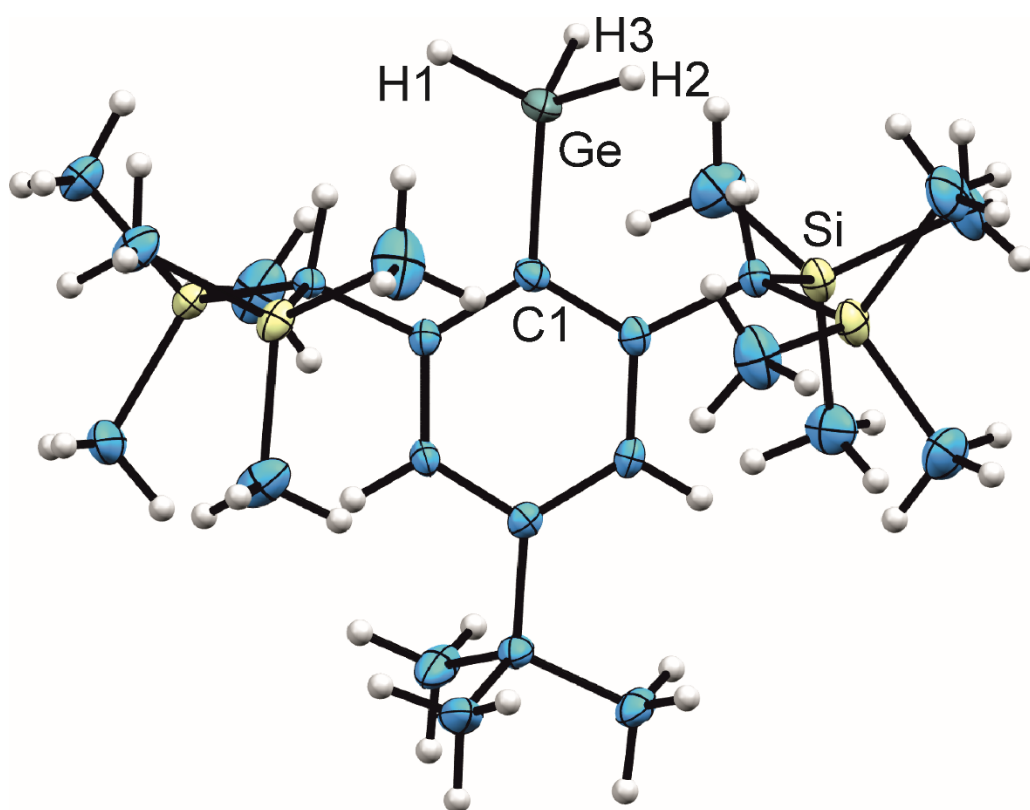|	3	4	5	7	8	9b	11b	13	14	16
Emp. formula	$C_{24}H_{52}GeSi_4$	$C_{32}H_{65}Br_2LiO_2Si_4Sn \cdot 0.5\,(C_6H_{14})$	$2\,(C_{32}H_{65}Br_2LiO_2PbSi_4),\ C_5H_{12}$	$C_{24}H_{52}Si_4Sn$	$C_{60}H_{126}Ge_2Li_2O_3Si_8$	$C_{40}H_{82}GeKO_7Si_4$	$C_{36}H_{75}KO_6Si_4Sn$	$C_{16}AlF_{36}O_4,\ C_{32}H_{67}O_2Si_4Sn$	$C_{48}H_{102}Si_8Sn_2,\ C_6H_6$	$C_{49}H_{68}GeN_2$
M [g/mol]	525.63	922.73	2008.43	571.73	1279.44	899.10	874.13	1682.07	1219.54	757.66
λ [Å]	0.71073	0.71073	0.71073	0.71073	0.71073	0.71073	0.71073	0.71073	0.71073	0.71073
T [K]	100(2)	100(2)	100(2)	130(2)	100(2)	117(2)	100(2)	100(2)	170(2)	100(2)
crystal system	triclinic	triclinic	triclinic	monoclinic	triclinic	monoclinic	orthorhombic	triclinic	triclinic	triclinic
space group	$P\text{-}1$	$P\text{-}1$	$P\text{-}1$	$P\,2_1/n$	$P\text{-}1$	$P\,2_1/c$	$P\,n\,a\,2_1$	$P\text{-}1$	$P\text{-}1$	$P\text{-}1$
Z	2	2	1	4	4	4	4	2	1	2
a [Å]	10.8467(4)	9.4333(3)	9.40780(10)	16.6242(4)	14.0474(4)	15.8808(5)	25.4342(3)	12.5225(4)	9.1345(2)	12.3798(4)
b [Å]	12.2159(4)	12.6264(4)	12.5125(2)	9.1360(2)	22.5485(6)	14.7774(5)	9.56500(10)	16.1355(5)	12.1875(3)	13.1930(4)
c [Å]	13.8073(4)	20.6027(6)	20.8396(3)	21.6779(5)	27.1022(7)	23.6977(8)	19.6290(3)	18.0799(5)	17.1264(3)	14.5014(5)
α [°]	66.376(2)	89.2150(10)	89.4300(10)	90	113.6040(10)	90	90	103.153(2)	108.1370(10)	76.764(2)
β [°]	75.966(2)	89.8210(10)	88.5550(10)	101.7770(10)	95.4590(10)	107.598(2)	90	100.644(2)	95.7350(10)	74.374(2)
γ [°]	76.691(2)	71.5940(10)	72.1210(10)	90	95.6420(10)	90	90	93.328(2)	104.1100(10)	86.728(2)
V [Å^3]	1607.83(10)	2328.20(13)	2333.92(6)	3223.10(13)	7742.6(4)	5301.0(3)	4775.31(10)	3476.95(19)	1724.96(7)	2220.31(13)
D_c [g/cm^3]	1.086	1.316	1.429	1.178	1.098	1.127	1.216	1.607	1.174	1.133
μ [mm^{-1}]	1.111	2.394	5.454	0.950	0.936	0.785	0.759	0.588	0.892	0.723
F(000)	568	954	1010	1208	2768	1940	1856	1692	644	816
crystal size [mm]	0.220x0.170x0.140	0.210x0.180x0.170	0.312x0.267x0.178	0.230x0.210x0.190	0.220x0.200x0.170	0.220x0.200x0.160	0.190x0.170x0.160	0.180x0.170x0.150	0.220x0.210x0.180	0.440x0.331x0.188
θ range [°]	1.633 − 27.156	2.966 − 27.266	2.561 − 30.541	2.819 − 27.366	2.224 − 31.494	1.803 − 27.490	1.601 − 29.611	1.664 − 24.640	2.912 − 28.152	1.923 − 27.979
limiting indices	−13 ≤ h ≤ 13	−12 ≤ h ≤ 11	−13 ≤ h ≤ 13	−21 ≤ h ≤ 21	−20 ≤ h ≤ 20	−20 ≤ h ≤ 19	−33 ≤ h ≤ 35	−14 ≤ h ≤ 14	−12 ≤ h ≤ 12	−16 ≤ h ≤ 16
	−15 ≤ k ≤ 15	−16 ≤ k ≤ 16	−17 ≤ k ≤ 17	−11 ≤ k ≤ 11	−33 ≤ k ≤ 33	−19 ≤ k ≤ 19	−13 ≤ k ≤ 13	−18 ≤ k ≤ 18	−16 ≤ k ≤ 15	−17 ≤ k ≤ 17
	−17 ≤ l ≤ 17	−26 ≤ l ≤ 26	−29 ≤ l ≤ 29	−27 ≤ l ≤ 27	−39 ≤ l ≤ 38	−30 ≤ l ≤ 29	−26 ≤ l ≤ 27	−21 ≤ l ≤ 20	−22 ≤ l ≤ 22	−19 ≤ l ≤ 19
refl. coll.	27919	62977	80930	53525	291213	131244	72216	59241	35182	61443
ind. refl.	6995	10379	14169	7226	50738	11810	12871	11672	8352	10590
R_{int}	0.0323	0.0215	0.0432	0.0364	0.0288	0.0234	0.0489	0.0424	0.0215	0.0263
completeness	99.1	99.4	99.7	99.8	99.7	99.9	99.8	99.4	99.7	99.6
abs. correction	multi-scan	multi-scan	multi-scan	multi-scan	multi-scan	multi-scan	multi-scan	multi-scan	multi-scan	multi-scan
max., min. trans.	0.7455, 0.6784	0.7455, 0.6413	0.7461, 0.5708	0.7456, 0.6442	0.7462, 0.6981	0.7456, 0.6921	0.7459, 0.7145	0.7451, 0.6928	0.7456, 0.6932	0.7456, 0.6618
Para./restr.	289/0	438/184	445/68	279/0	1466/0	549/0	455/1	888/2	312/0	489/0
$R1,\ wR2\ [I > 2\sigma(I)]$	0.0358, 0.0908	0.0298, 0.0761	0.0365, 0.0879	0.0402, 0.0816	0.0331, 0.0740	0.0300, 0.0747	0.0266, 0.0505	0.0546, 0.1339	0.0219, 0.0583	0.0288, 0.0667
$R1,\ wR2$ (all data)	0.0527, 0.0981	0.0359, 0.0792	0.0445, 0.0912	0.0529, 0.0849	0.0533, 0.0812	0.0420, 0.0816	0.0348, 0.0533	0.0739, 0.1469	0.0243, 0.0600	0.0361, 0.0704
Goof on F^2	1.060	1.018	1.049	1.122	1.008	1.055	1.018	1.032	1.065	1.037
peak / hole [$e \cdot$ Å^{-3}]	0.642, −0.744	1.219, −1.381	2.728, −2.238	0.881, −0.812	1.232, −0.854	0.496, −0.331	0.430, −0.247	1.707, −1.020	0.717, −0.536	0.462, −0.440
CCDC	2153532	2153539	2153540	2153561	2153534	2153536	2153537	2153538	2153535	2153533

Figure S1. ORTEP of **3**. Hydrogen atoms connected to the germanium atom were found in the difference Fourier map. Other hydrogen atoms were placed in idealized positions. Ellipsoids at 50 % probability. Interatomic distance [Å]: Ge-C1 1.955(2).
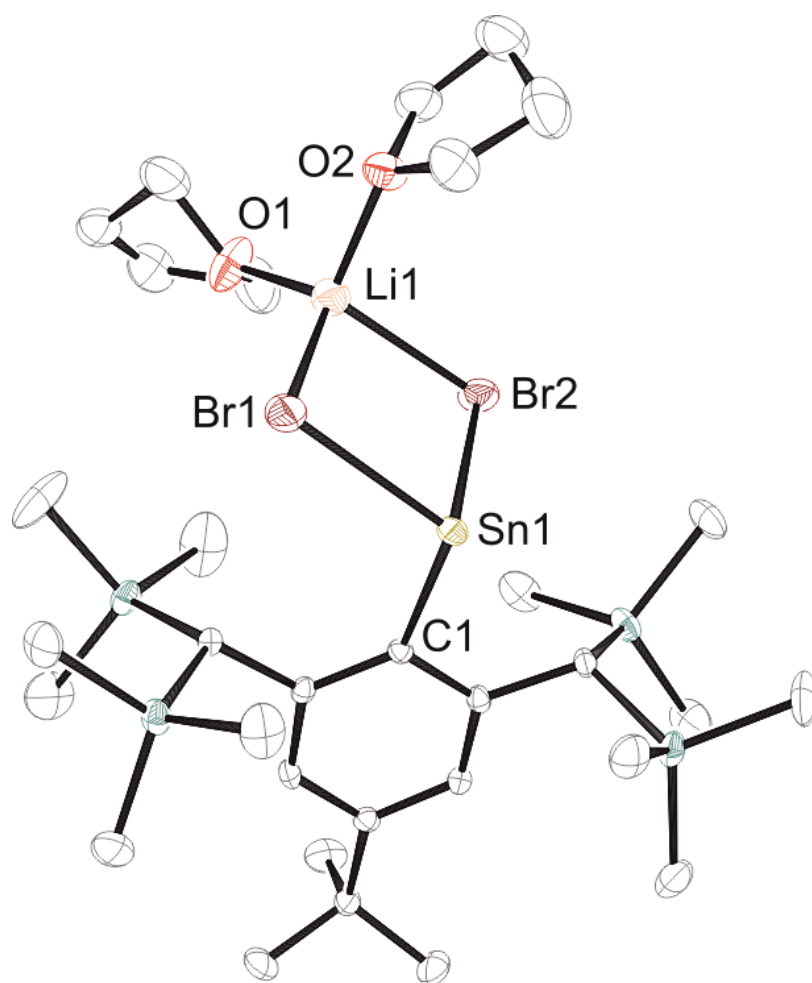
Figure S2. ORTEP of **4**. Hydrogen atoms, which are not shown, were placed in idealized positions. Ellipsoids at 50 % probability. Interatomic distance [Å], angles [°]: C1-Sn1 2.229(2), Br1-Sn1 2.7254(3), Br2-Sn1 2.7567(3), Li1-O1 1.874(5), Li1-O2 1.904(5), Li1-Br2 2.509(5), Li1-Br1 2.541(5), C1-Sn1-Br1 94.46(6), C1-Sn1-Br2 110.28(6), Br1-Sn1-Br2 87.48(1).
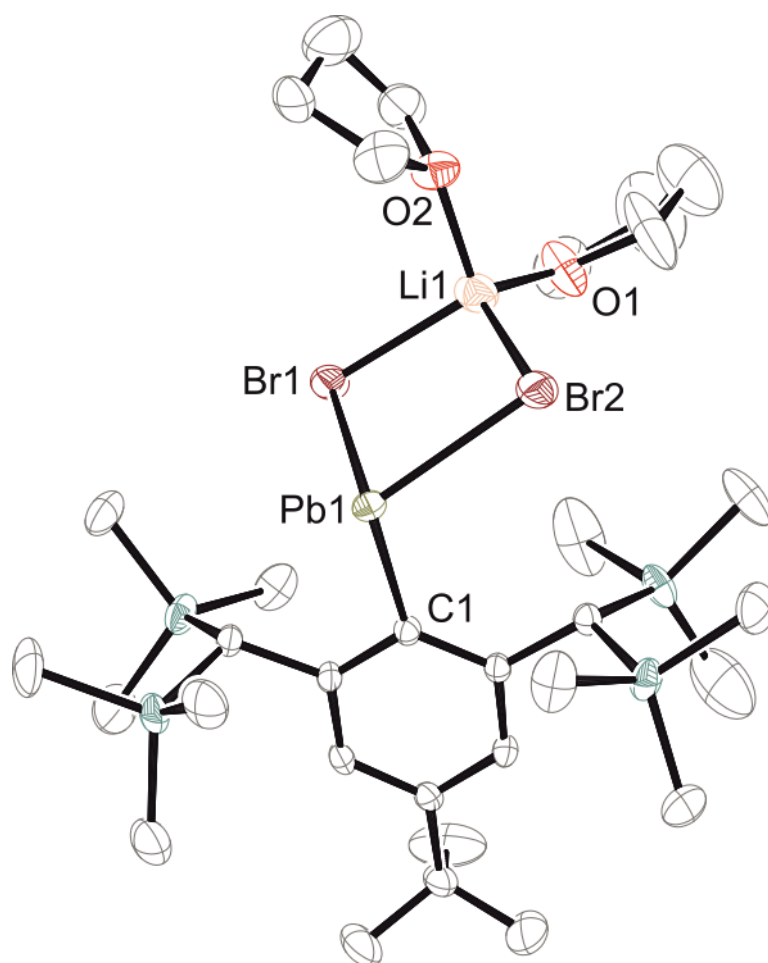
Figure S3. ORTEP of **5**. Hydrogen atoms, which are not shown, were placed in idealized positions. Ellipsoids at 50 % probability. Interatomic distance [Å], angles [°]: C1-Pb1 2.321(3), Pb1-Br1 2.8246(4), Pb1-Br2 2.8502(4), C1-Pb1-Br1 94.57(8), C1-Pb1-Br2 110.37(8), Br1-Pb1-Br2 86.74(1).

NMR spectra of compound 2

¹H-NMR of TbbGeX₃ in C₆D₆ (#) at rt

Peak labels: 6.91, 6.89, 6.88; 3.15, 3.03, 2.94; 1.18; 0.16, 0.15, 0.14

Integrations: 1.02, 2.01, 1.00; 0.98, 2.00, 1.03; 18.01; 18.04, 36.24, 18.02
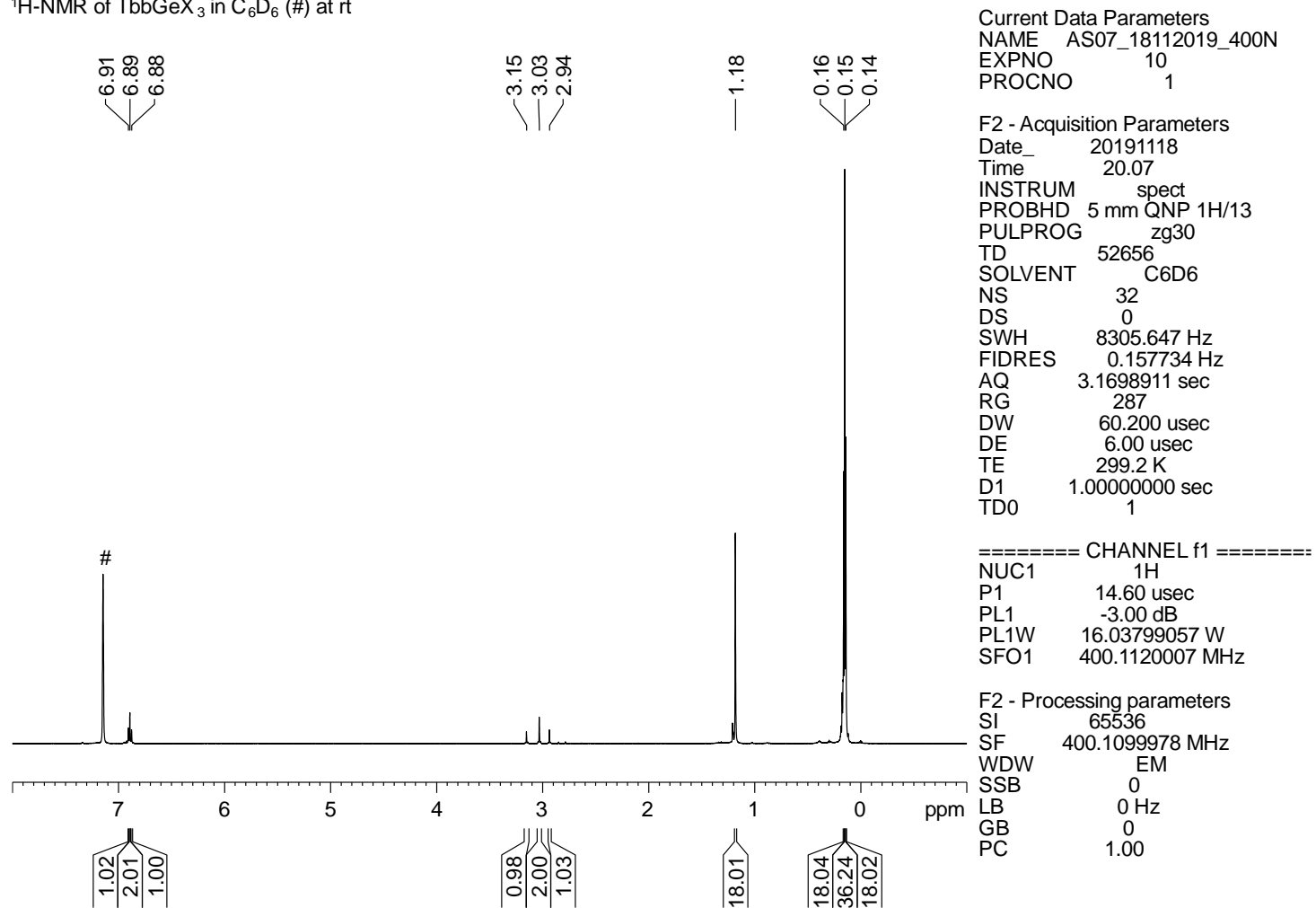
Figure S4. ¹H-NMR spectrum of compound 2.

^{13}C{^{1}H}-NMR of TbbGeX$_3$ in C$_6$D$_6$ (#) at rt

154.5
154.4
154.2
150.4
150.2
150.0

129.8
123.3
123.1
123.0
#

34.2
30.5
28.9
28.7
28.5

0.5
0.4
0.3

160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm

Figure S5. ^{13}C{^{1}H}-NMR spectrum of compound **2**.

^{29}Si-INEPTND-NMR of TbbGeX$_3$ in C$_6$D$_6$ at rt

— 3.9

Current Data Parameters
NAME   AS07_13112019_300
EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
Date_   20191113
Time   14.59 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   ineptnd
TD   39048
SOLVENT   C6D6
NS   320
DS   0
SWH   26315.789 Hz
FIDRES   1.347869 Hz
AQ   0.7419120 sec
RG   204.67
DW   19.000 usec
DE   6.50 usec
TE   298.0 K
CNST2   6.5999999
D1   2.00000000 sec
D4   0.03787879 sec
TD0   1
SFO1   59.6229159 MHz
NUC1   29Si
P1   10.30 usec
P2   20.60 usec
PLW1   50.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
P3   14.00 usec
P4   28.00 usec
PLW2   8.26509953 W

F2 - Processing parameters
SI   32768
SF   59.6273393 MHz
WDW   EM
SSB   0
LB   2.00 Hz
GB   0
PC   1.00

15   10   5   0   -5   ppm

Figure S6. ^{29}Si-INEPTND-NMR spectrum of compound **2**.

NMR spectra of compound **3**

¹H-NMR of TbbGeH$_3$ in C$_6$D$_6$ (#) at rt

6.90
4.40
2.11
1.28
0.12
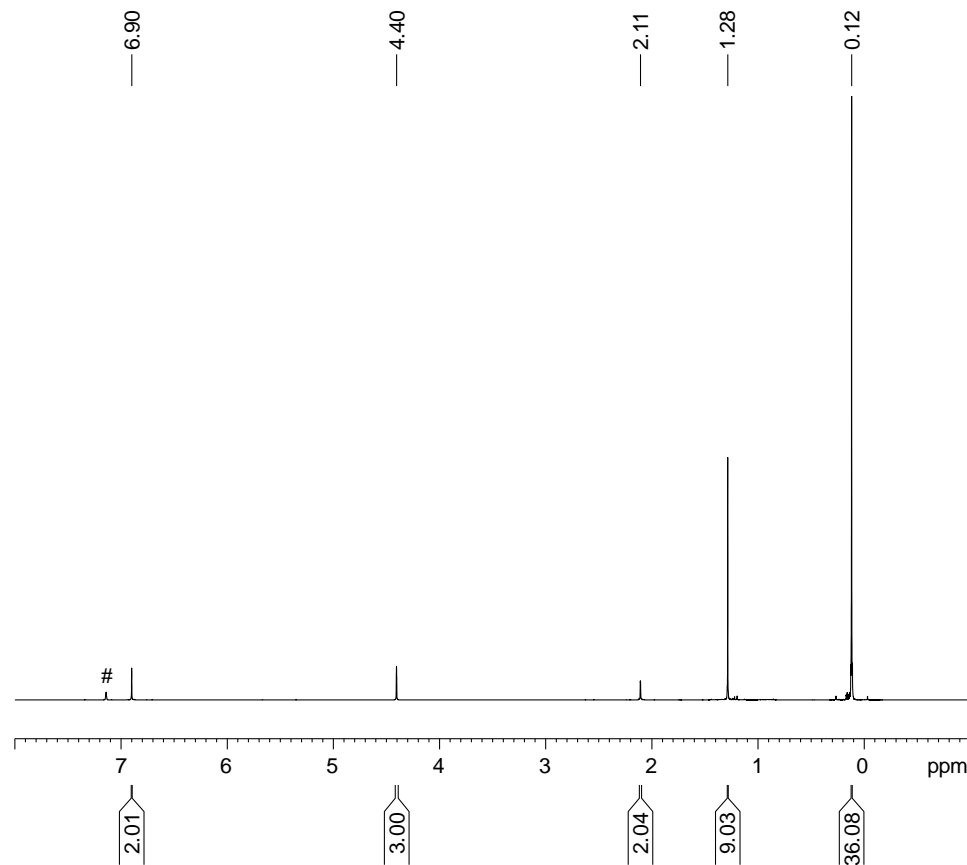
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EXPNO   10
PROCNO   1
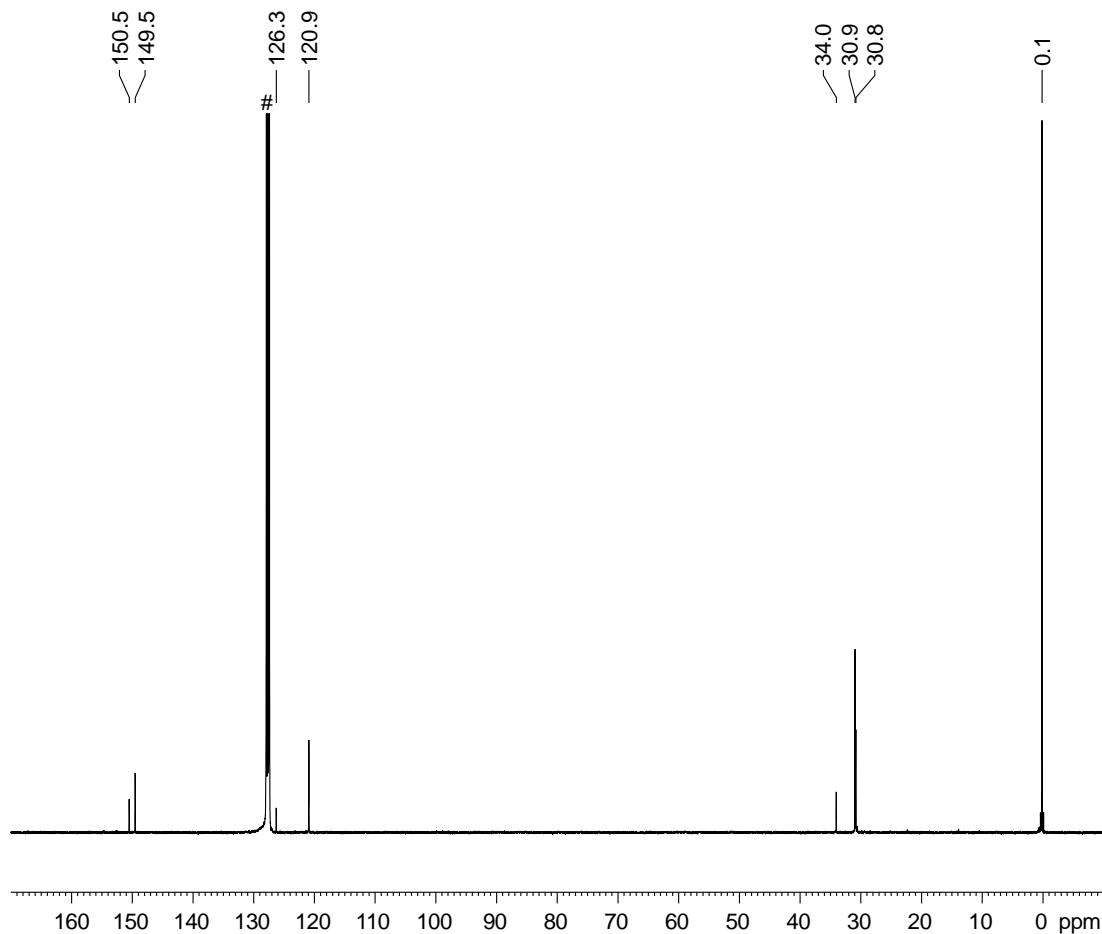
F2 - Acquisition Parameters
Date_   20191113
Time   20.05
INSTRUM   spect
PROBHD   5 mm QNP 1H/13
PULPROG   zg30
TD   52656
SOLVENT   C6D6
NS   32
DS   0
SWH   8305.647 Hz
FIDRES   0.157734 Hz
AQ   3.1698911 sec
RG   181
DW   60.200 usec
DE   6.00 usec
TE   299.2 K
D1   1.00000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   1H
P1   14.60 usec
PL1   -3.00 dB
PL1W   16.03799057 W
SFO1   400.1120007 MHz

F2 - Processing parameters
SI   65536
SF   400.1100000 MHz
WDW   EM
SSB   0
LB   0 Hz
GB   0
PC   1.00

#

7   6   5   4   3   2   1   0   ppm

2.01
3.00
2.04
9.03
36.08

Figure S7. ¹H-NMR spectrum of compound **3**.

$^{13}C\{^1H\}$-NMR of TbbGeH$_3$ in C$_6$D$_6$ (#) at rt

Figure S8. $^{13}C\{^1H\}$-NMR spectrum of compound **3**.

^{29}Si-INEPTND-NMR of TbbGeH$_3$ in C$_6$D$_6$ at rt

2.6
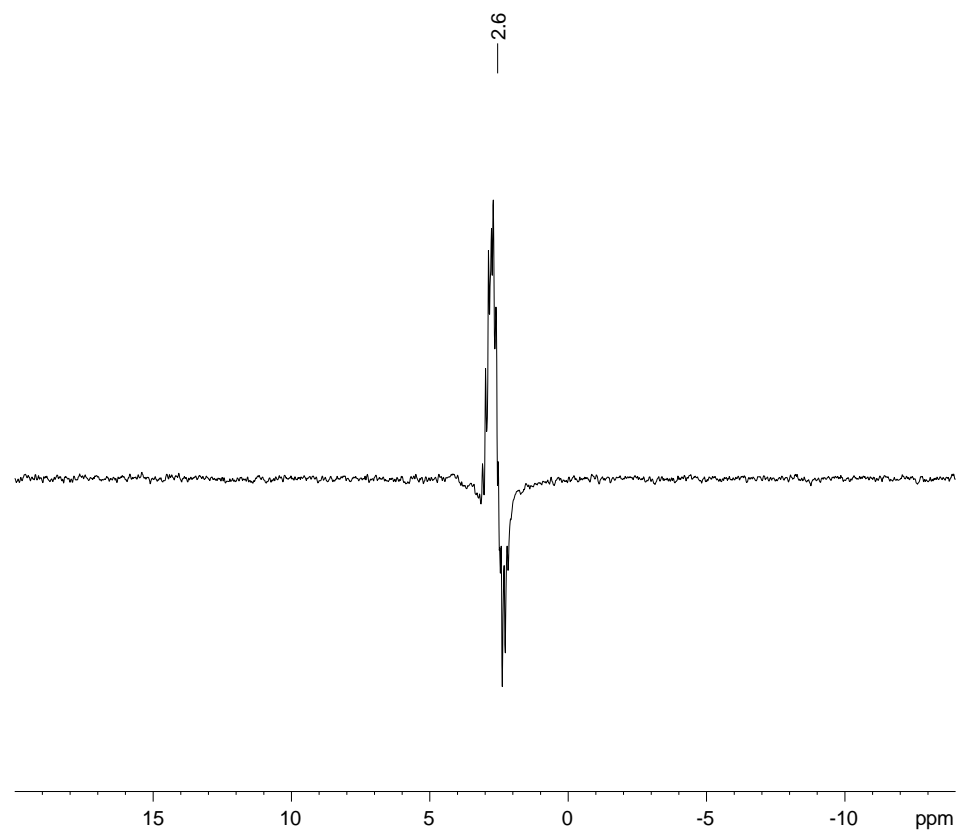
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EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
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Time   10.37 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   ineptnd
TD   39048
SOLVENT   C6D6
NS   320
DS   0
SWH   26315.789 Hz
FIDRES   1.347869 Hz
AQ   0.7419120 sec
RG   204.67
DW   19.000 usec
DE   6.50 usec
TE   298.0 K
CNST2   6.5999999
D1   2.00000000 sec
D4   0.03787879 sec
TD0   1
SFO1   59.6229159 MHz
NUC1   29Si
P1   10.30 usec
P2   20.60 usec
PLW1   50.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
P3   14.00 usec
P4   28.00 usec
PLW2   8.26509953 W

F2 - Processing parameters
SI   32768
SF   59.6273521 MHz
WDW   EM
SSB   0
LB   2.00 Hz
GB   0
PC   1.00

15   10   5   0   -5   -10   ppm

Figure S9. ^{29}Si-INEPTND-NMR spectrum of compound **3**.

NMR spectra of compound **4**

¹H-NMR of ([TbbSnBr₂][Li{thf}₂]) in C₆D₆ (#) at rt, *: *n*-hexane and unknown impurity

6.99
3.56
3.04
1.35
1.30
0.33

#

*

*

*

7 6 5 4 3 2 1 0 ppm

2.03

8.00

2.00

8.99
8.03

35.94
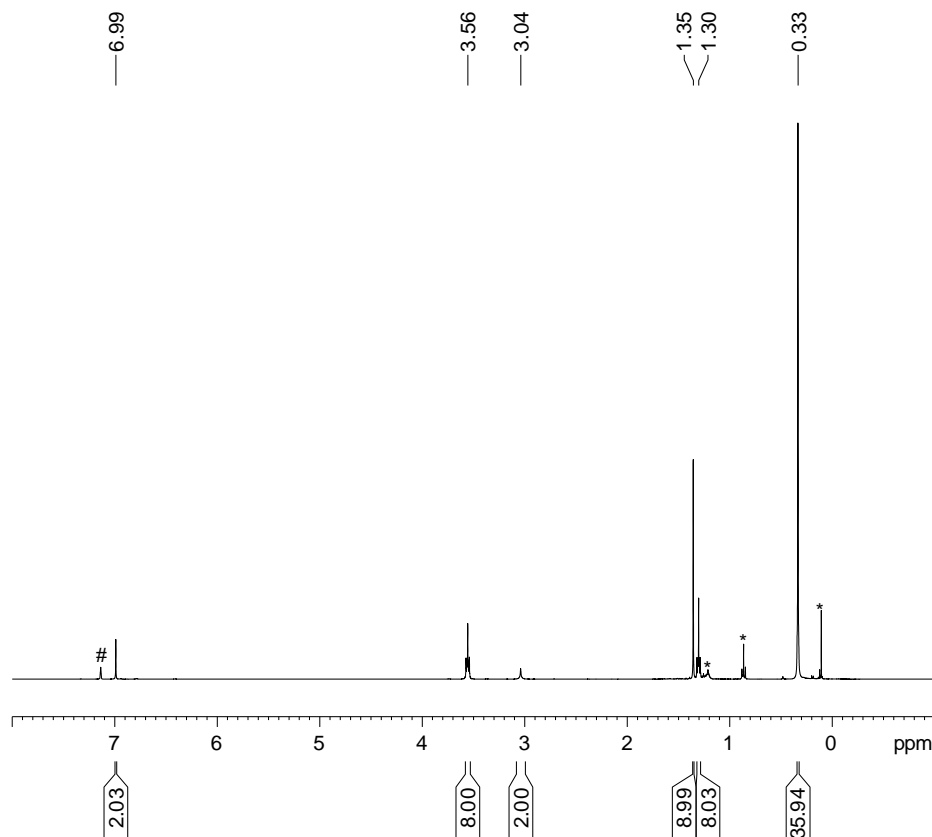
Current Data Parameters
NAME   MA150K_18102019_400N
EXPNO   10
PROCNO   1

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Date_   20191018
Time   20.05
INSTRUM   spect
PROBHD   5 mm QNP 1H/13
PULPROG   zg30
TD   52656
SOLVENT   C6D6
NS   32
DS   0
SWH   8305.647 Hz
FIDRES   0.157734 Hz
AQ   3.1698911 sec
RG   161
DW   60.200 usec
DE   6.00 usec
TE   299.2 K
D1   1.00000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   1H
P1   14.60 usec
PL1   -3.00 dB
PL1W   16.03799057 W
SFO1   400.1120007 MHz

F2 - Processing parameters
SI   65536
SF   400.1100018 MHz
WDW   EM
SSB   0
LB   0 Hz
GB   0
PC   1.00

Figure S10. ¹H-NMR spectrum of compound **4**.

^{7}Li-NMR of ([TbbSnBr$_2$][Li{thf}$_2$]) in C$_6$D$_6$ at rt

— 0.1

150   100   50   0   -50   -100   -150   ppm

Figure S11. ^{7}Li-NMR spectrum of compound **4**.

^{13}C{^{1}H}-NMR of ([TbbSnBr$_2$][Li{thf}$_2$]) in C$_6$D$_6$ (#) at rt, *: *n*-hexane and unknown impurity

169.6 · 149.8 · 149.2 · 122.5 (#) · 68.2 · 34.1 · 31.1 · 29.4 · 25.0 · 0.7

Current Data Parameters
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EXPNO   11
PROCNO   1
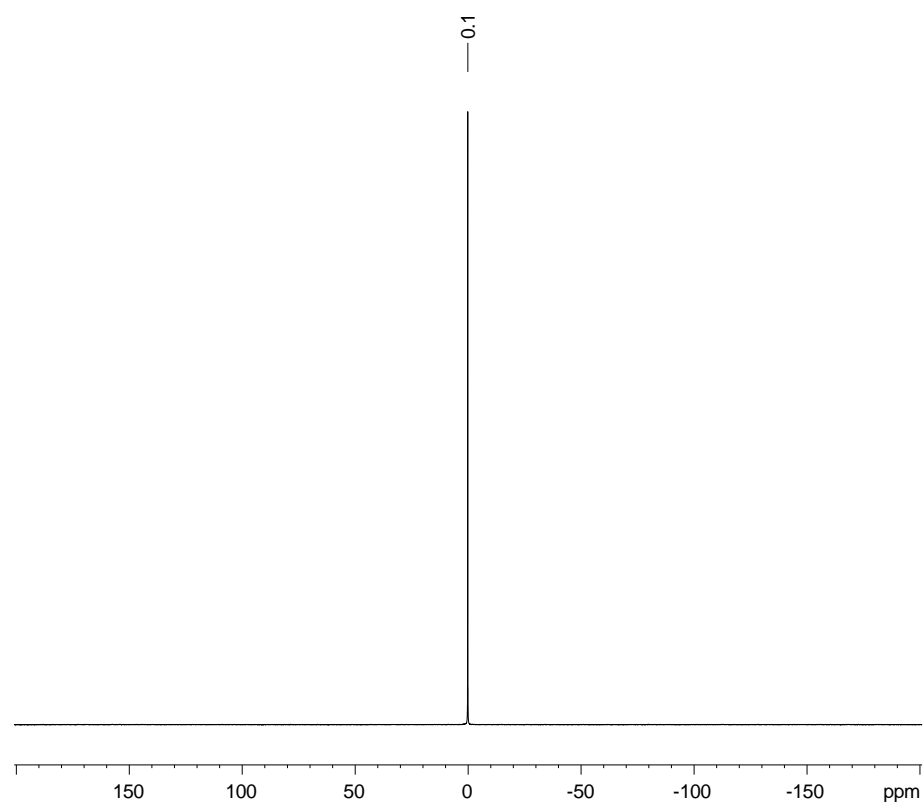
F2 - Acquisition Parameters
Date_   20191019
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INSTRUM   spect
PROBHD   5 mm QNP 1H/13
PULPROG   zgpg30
TD   53700
SOLVENT   C6D6
NS   14336
DS   0
SWH   30864.197 Hz
FIDRES   0.574752 Hz
AQ   0.8699400 sec
RG   32800
DW   16.200 usec
DE   6.00 usec
TE   299.2 K
D1   1.00000000 sec
D11   0.03000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   13C
P1   13.50 usec
PL1   -4.16 dB
PL1W   78.55633545 W
SFO1   100.6198135 MHz

======== CHANNEL f2 ========
CPDPRG[2   waltz16
NUC2   1H
PCPD2   80.00 usec
PL2   -3.00 dB
PL12   11.77 dB
PL13   13.14 dB
PL2W   16.03799057 W
PL12W   0.53474891 W
PL13W   0.39007664 W
SFO2   400.1120007 MHz

F2 - Processing parameters
SI   65536
SF   100.6077400 MHz
WDW   EM
SSB   0
LB   1.00 Hz
GB   0
PC   1.40

Figure S12. ^{13}C{^{1}H}-NMR spectrum of compound **4**.

^{29}Si-INEPTND-NMR of ([TbbSnBr$_2$][Li{thf}$_2$]) in C$_6$D$_6$ at rt

1.5
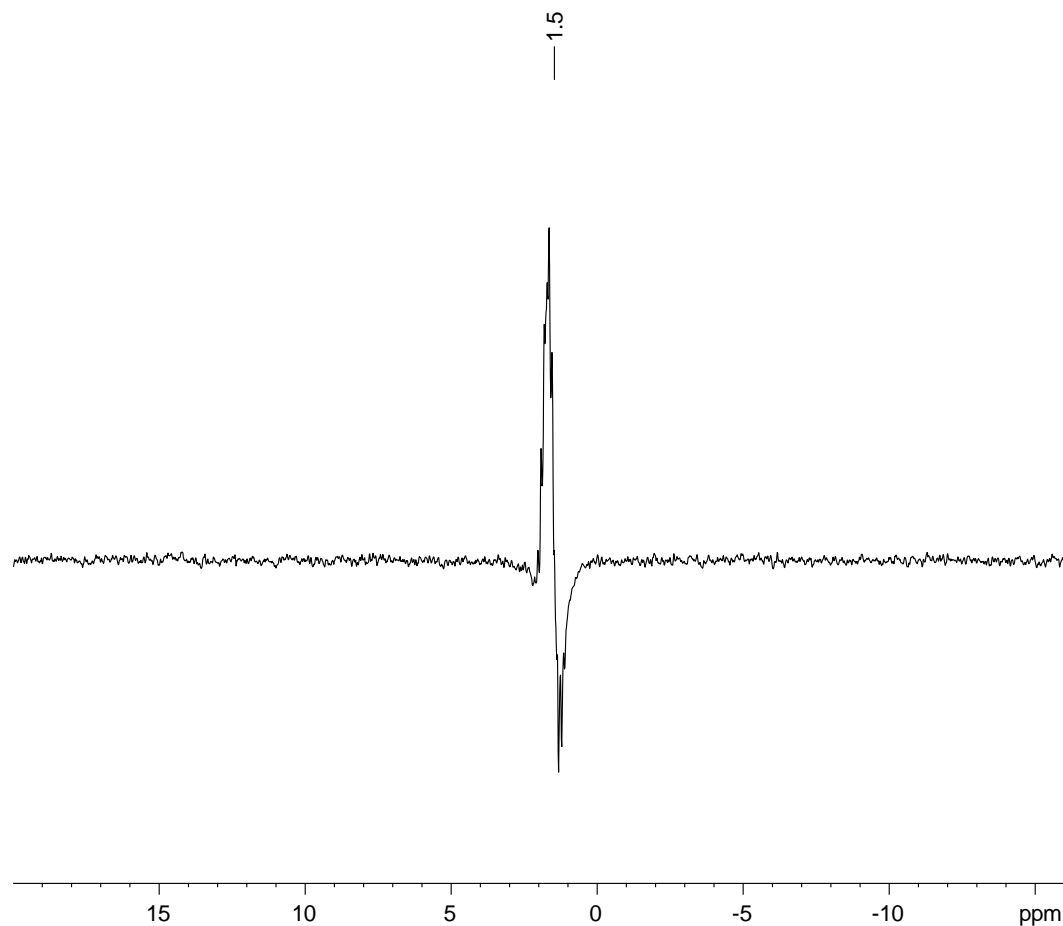
Current Data Parameters
NAME   MA150_13112019_300
EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
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INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   ineptnd
TD   39048
SOLVENT   C6D6
NS   320
DS   0
SWH   26315.789 Hz
FIDRES   1.347869 Hz
AQ   0.7419120 sec
RG   204.67
DW   19.000 usec
DE   6.50 usec
TE   298.0 K
CNST2   6.5999999
D1   2.00000000 sec
D4   0.03787879 sec
TD0   1
SFO1   59.6229159 MHz
NUC1   29Si
P1   10.30 usec
P2   20.60 usec
PLW1   50.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
P3   14.00 usec
P4   28.00 usec
PLW2   8.26509953 W

F2 - Processing parameters
SI   32768
SF   59.6273839 MHz
WDW   EM
SSB   0
LB   2.00 Hz
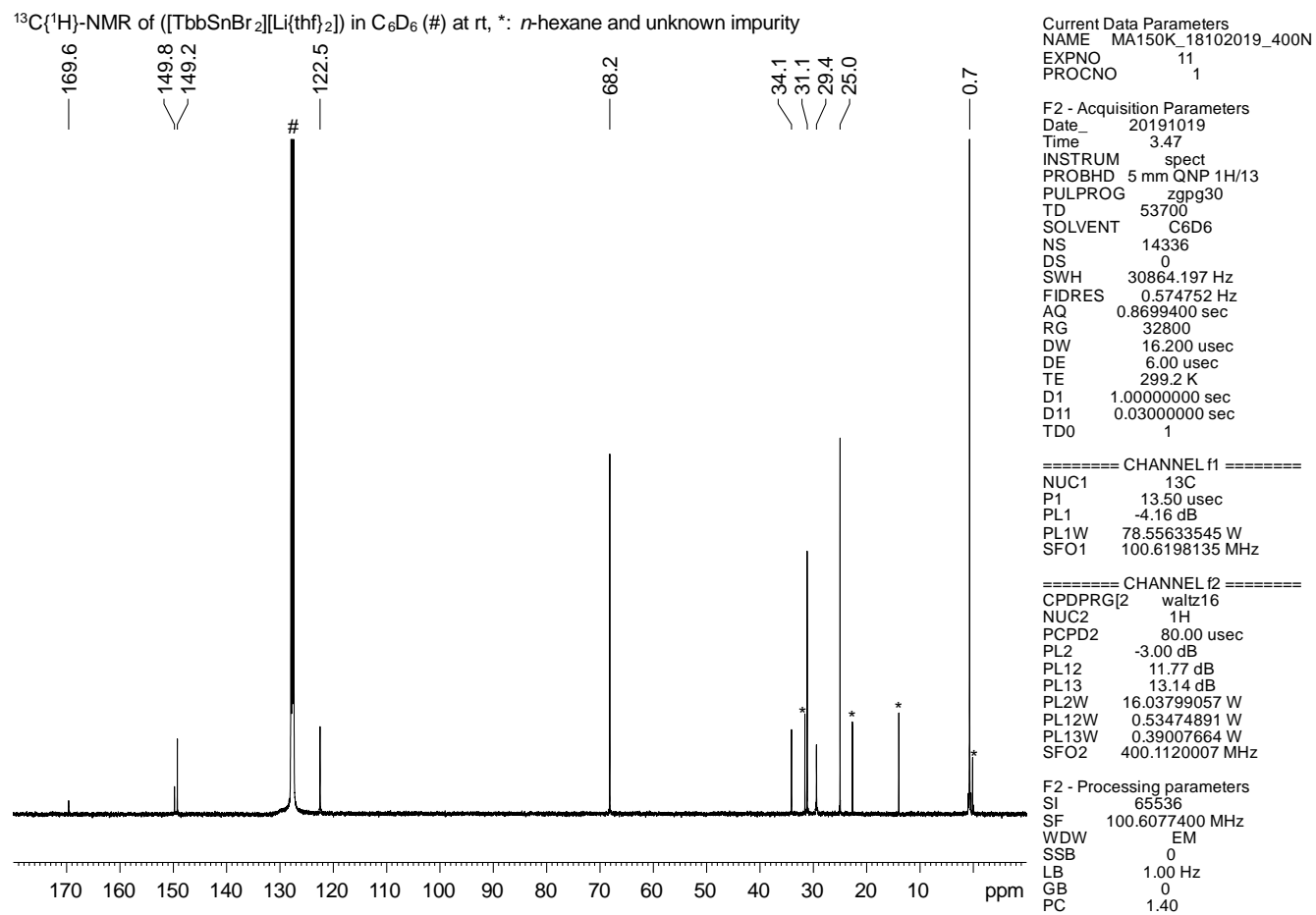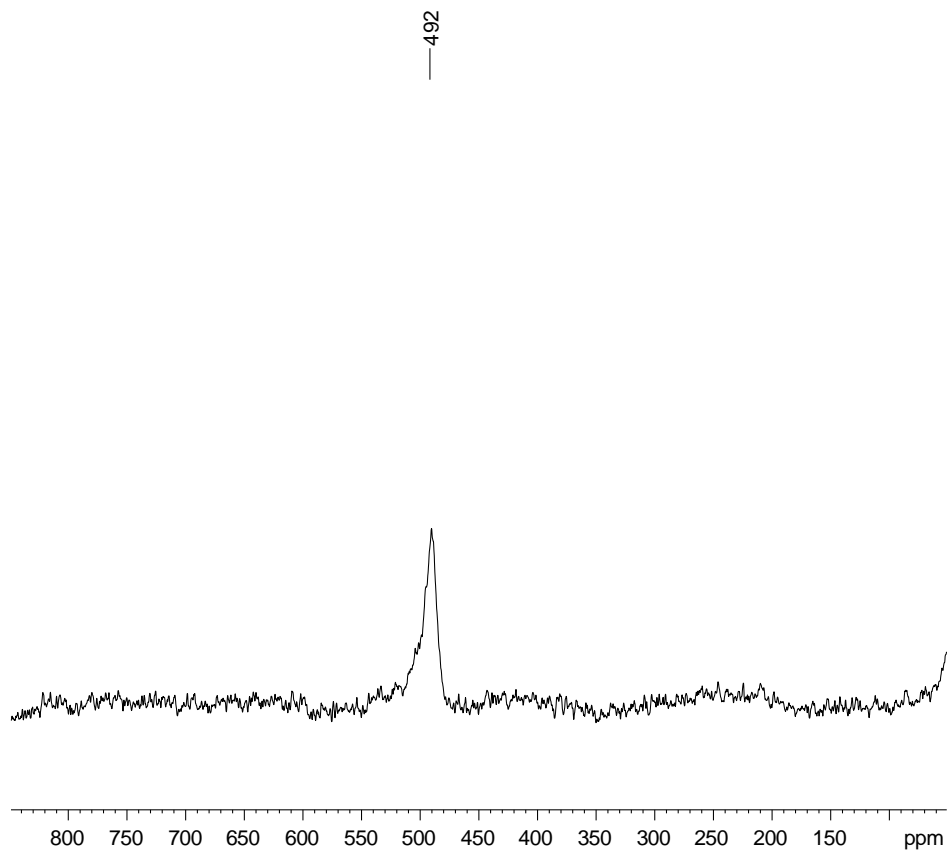GB   0
PC   1.00

Figure S13. ^{29}Si-INEPTND-NMR spectrum of compound **4**.

119Sn-NMR of ([TbbSnBr$_2$][Li{thf}$_2$]) in C$_6$D$_6$ at rt

—492

Current Data Parameters
NAME   MA150_15102019_300
EXPNO   12
PROCNO   1

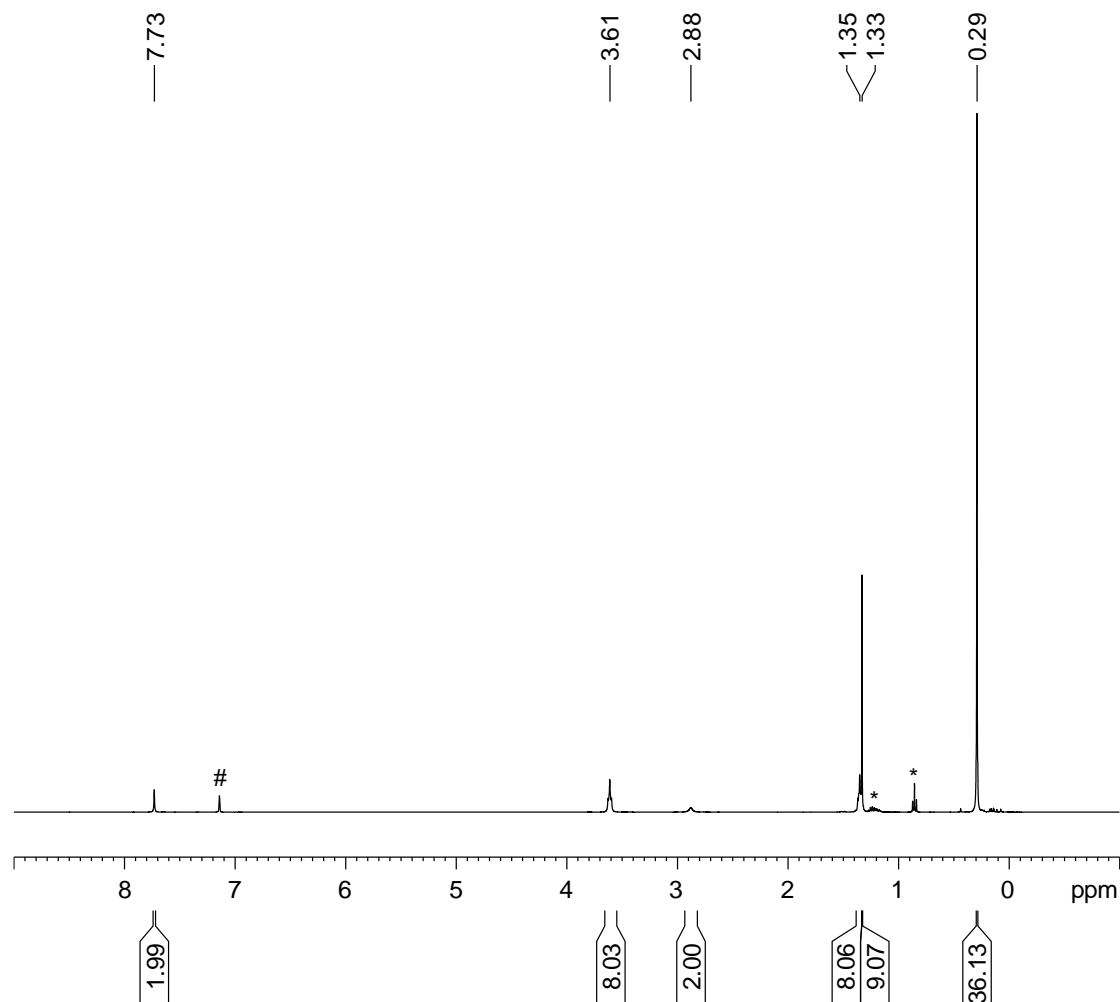F2 - Acquisition Parameters
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PROBHD   Z104275_0338 (
PULPROG   zg30
TD   4096
SOLVENT   C6D6
NS   20480
DS   1
SWH   89285.711 Hz
FIDRES   43.596539 Hz
AQ   0.0229376 sec
RG   204.67
DW   5.600 usec
DE   6.50 usec
TE   298.0 K
D1   0.02000000 sec
TD0   1
SFO1   111.9707380 MHz
NUC1   119Sn
P1   12.10 usec
PLW1   12.00000000 W

F2 - Processing parameters
SI   4096
SF   111.9203740 MHz
WDW   EM
SSB   0
LB   100.00 Hz
GB   0
PC   1.40

Figure S14. 119Sn-NMR spectrum of compound **4**.

NMR spectra of compound 5

^{1}H-NMR of ([TbbPbBr$_2$][Li{thf}$_2$]) in C$_6$D$_6$ (#) at rt, *: *n*-pentane

Current Data Parameters
NAME   MA445K_22122020_400N
EXPNO   10
PROCNO   1

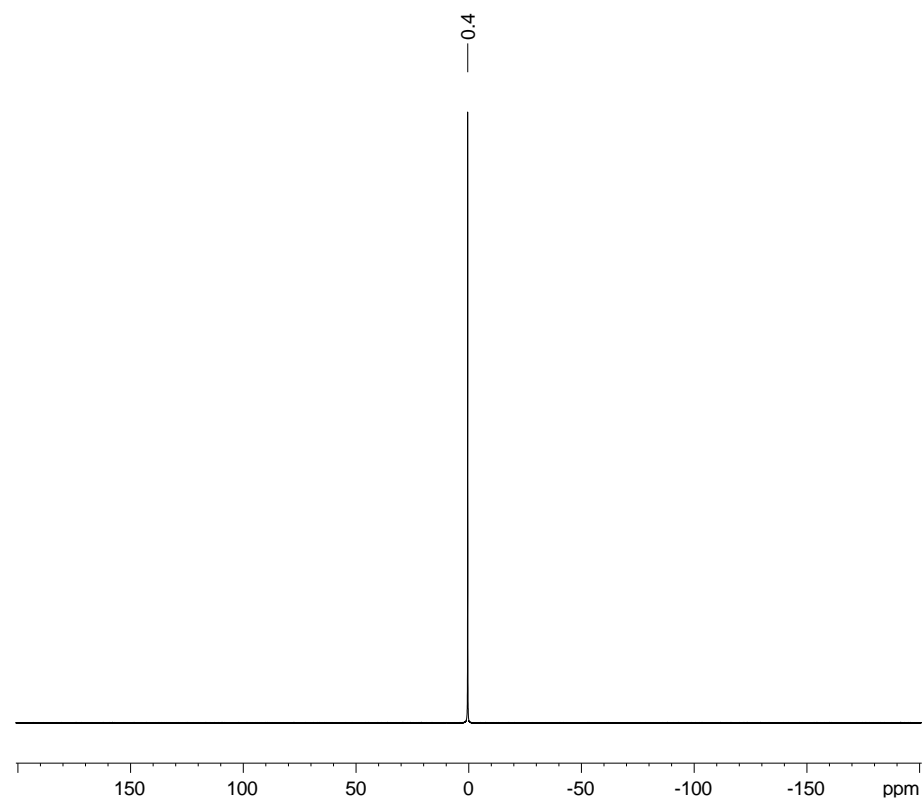F2 - Acquisition Parameters
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PULPROG   zg30
TD   52656
SOLVENT   C6D6
NS   32
DS   0
SWH   8305.647 Hz
FIDRES   0.157734 Hz
AQ   3.1698911 sec
RG   161
DW   60.200 usec
DE   6.00 usec
TE   299.2 K
D1   1.00000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   1H
P1   14.60 usec
PL1   -3.00 dB
PL1W   16.03799057 W
SFO1   400.1120007 MHz

F2 - Processing parameters
SI   65536
SF   400.1100000 MHz
WDW   EM
SSB   0
LB   0 Hz
GB   0
PC   1.00

Figure S15. ^{1}H-NMR spectrum of compound **5**.

^{7}Li-NMR of ([TbbPbBr$_2$][Li{thf}$_2$]) in C$_6$D$_6$ at rt
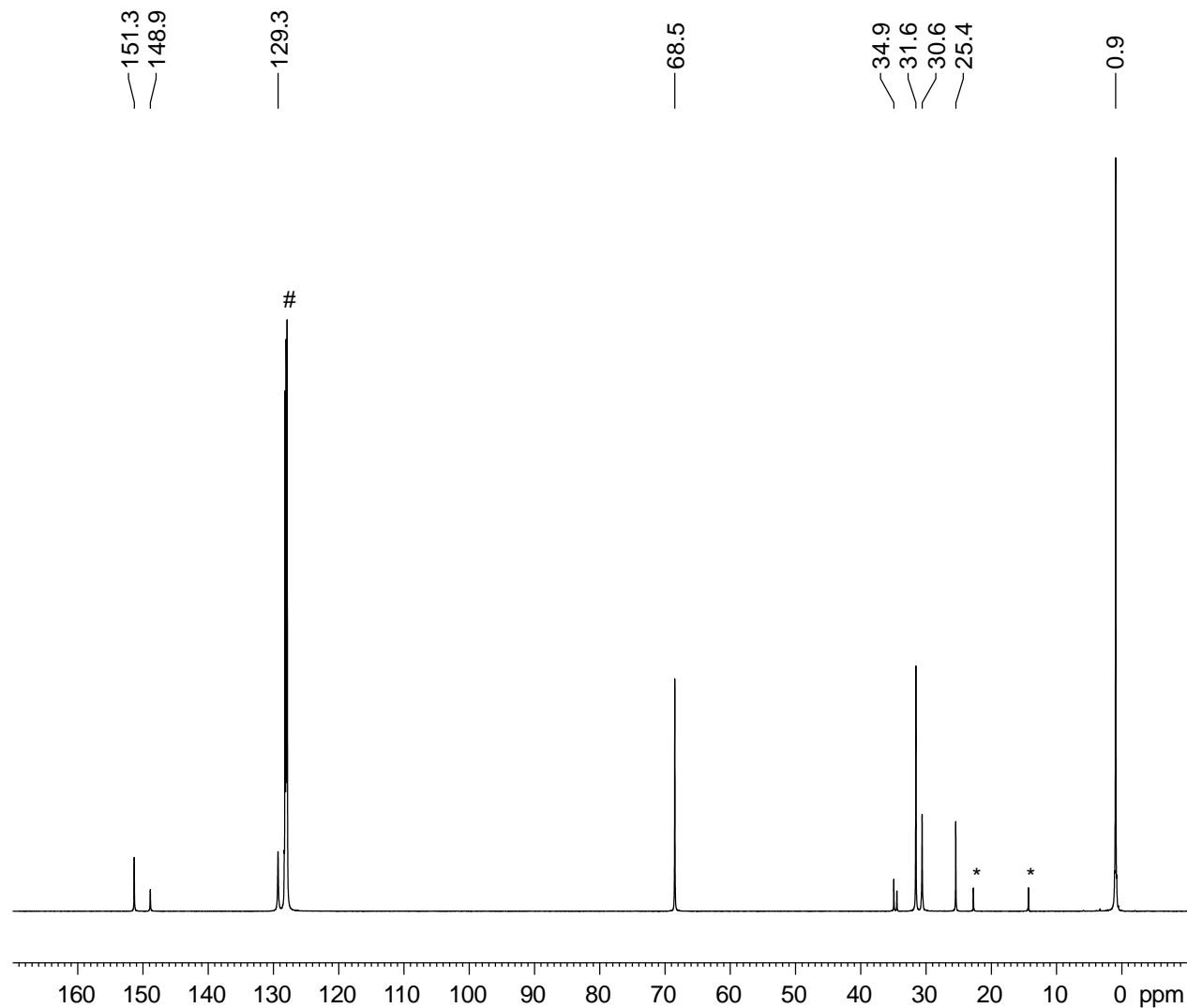

Current Data Parameters
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EXPNO   11
PROCNO   1

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Time   9.55 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zg30
TD   32050
SOLVENT   C6D6
NS   256
DS   0
SWH   46875.000 Hz
FIDRES   2.925117 Hz
AQ   0.3418667 sec
RG   204.67
DW   10.667 usec
DE   6.50 usec
TE   298.0 K
D1   0.20000000 sec
TD0   1
SFO1   116.6419139 MHz
NUC1   7Li
P0   2.94 usec
P1   8.81 usec
PLW1   34.00000000 W

F2 - Processing parameters
SI   32768
SF   116.6419139 MHz
WDW   EM
SSB   0
LB   1.00 Hz
GB   0
PC   1.40

Figure S16. ^{7}Li-NMR spectrum of compound **5**.

$^{13}C\{^1H\}$-NMR of ([TbbPbBr$_2$][Li{thf}$_2$]) in C$_6$D$_6$ (#) at rt, *: *n*-pentane

Peaks: 151.3, 148.9, 129.3 (#), 68.5, 34.9, 31.6, 30.6, 25.4, 0.9

Figure S17. $^{13}C\{^1H\}$-NMR spectrum of compound **5**.

$^{13}C\{^1H\}$-NMR of ([TbbPbBr$_2$][Li{thf}$_2$]) in C$_6$D$_6$ (#) at rt, *: *n*-pentane

275.4

151.3
148.9

129.3

#

68.5

34.9
31.6
30.6
25.4

* *
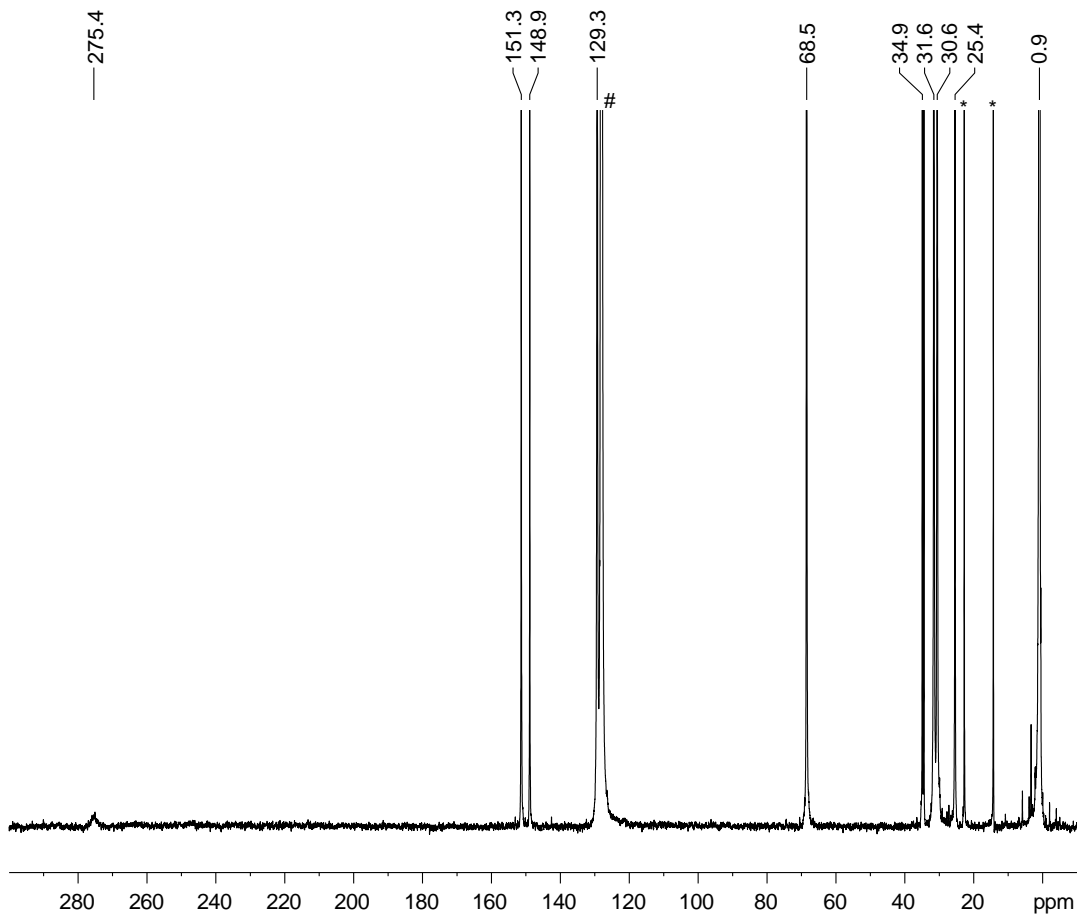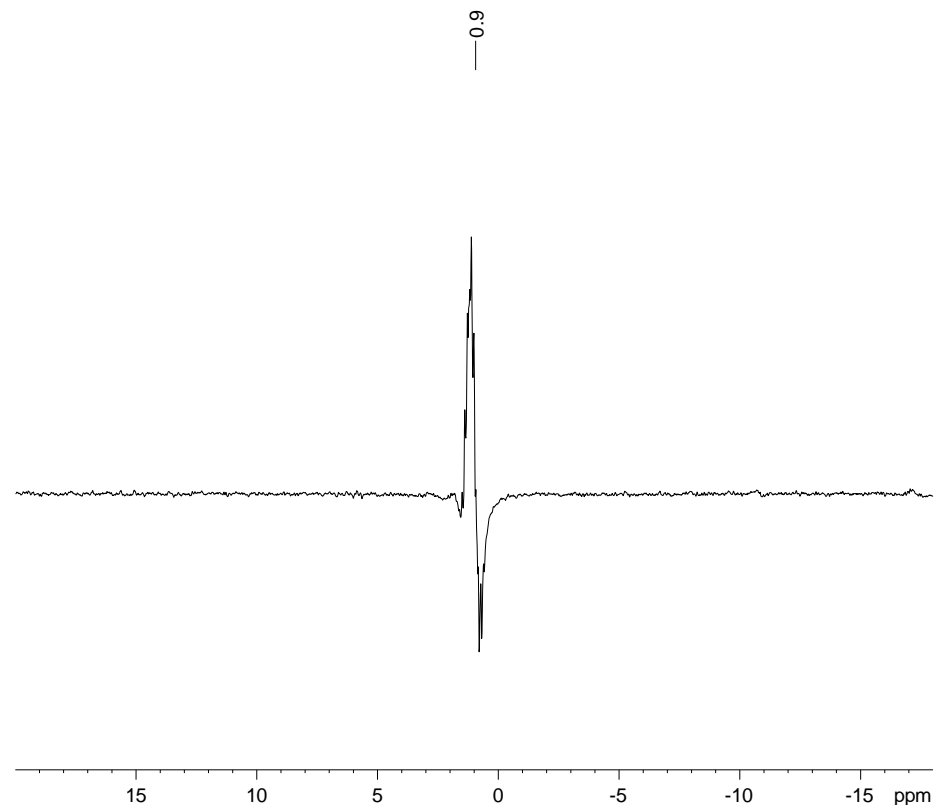
0.9

Current Data Parameters
NAME   MA714K_30092021_600
EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
Date_   20210930
Time   20.06 h
INSTRUM   spect
PROBHD   Z126545_0027 (
PULPROG   udeft
TD   32768
SOLVENT   C6D6
NS   4096
DS   0
SWH   53571.430 Hz
FIDRES   3.269741 Hz
AQ   0.3058347 sec
RG   189.6
DW   9.333 usec
DE   18.00 usec
TE   298.0 K
D1   4.00000000 sec
D12   0.00002000 sec
D20   20.00000000 sec
TD0   1
SFO1   150.9277075 MHz
NUC1   13C
P1   10.00 usec
P13   2000.00 usec
P26   500.00 usec
PLW1   57.02700043 W
SPNAM[5] Crp60comp.4
SPOAL5   0.500
SPOFFS5   0 Hz
SPW5   8.71310043 W
SPNAM[8] Crp60,0.5,20.1
SPOAL8   0.500
SPOFFS8   0 Hz
SPW8   8.71310043 W
SFO2   600.1324005 MHz
NUC2   1H
CPDPRG[2   waltz16
PCPD2   70.00 usec
PLW2   23.41200066 W
PLW12   0.68803000 W

F2 - Processing parameters
SI   131072
SF   150.9027510 MHz
WDW   EM
SSB   0
LB   7.00 Hz
GB   0
PC   1.40

280 260 240 220 200 180 160 140 120 100 80 60 40 20 ppm

Figure S18. $^{13}C\{^1H\}$-NMR spectrum of compound **5**.

^{29}Si-INEPTND-NMR of ([TbbPbBr$_2$][Li{thf}$_2$]) in C$_6$D$_6$ at rt

0.9

Current Data Parameters
NAME   MA445K_24112020_300
EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
Date_   20201124
Time   9.58 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   ineptnd
TD   39048
SOLVENT   C6D6
NS   320
DS   0
SWH   26315.789 Hz
FIDRES   1.347869 Hz
AQ   0.7419120 sec
RG   204.67
DW   19.000 usec
DE   6.50 usec
TE   298.0 K
CNST2   6.5999999
D1   2.00000000 sec
D4   0.03787879 sec
TD0   1
SFO1   59.6229159 MHz
NUC1   29Si
P1   10.30 usec
P2   20.60 usec
PLW1   50.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
P3   14.00 usec
P4   28.00 usec
PLW2   8.26509953 W

F2 - Processing parameters
SI   32768
SF   59.6273582 MHz
WDW   EM
SSB   0
LB   2.00 Hz
GB   0
PC   1.00

Figure S19. ^{29}Si-INEPTND-NMR spectrum of compound **5**.

207Pb-NMR of ([TbbPbBr$_2$][Li{thf}$_2$]) in C$_6$D$_6$ at rt
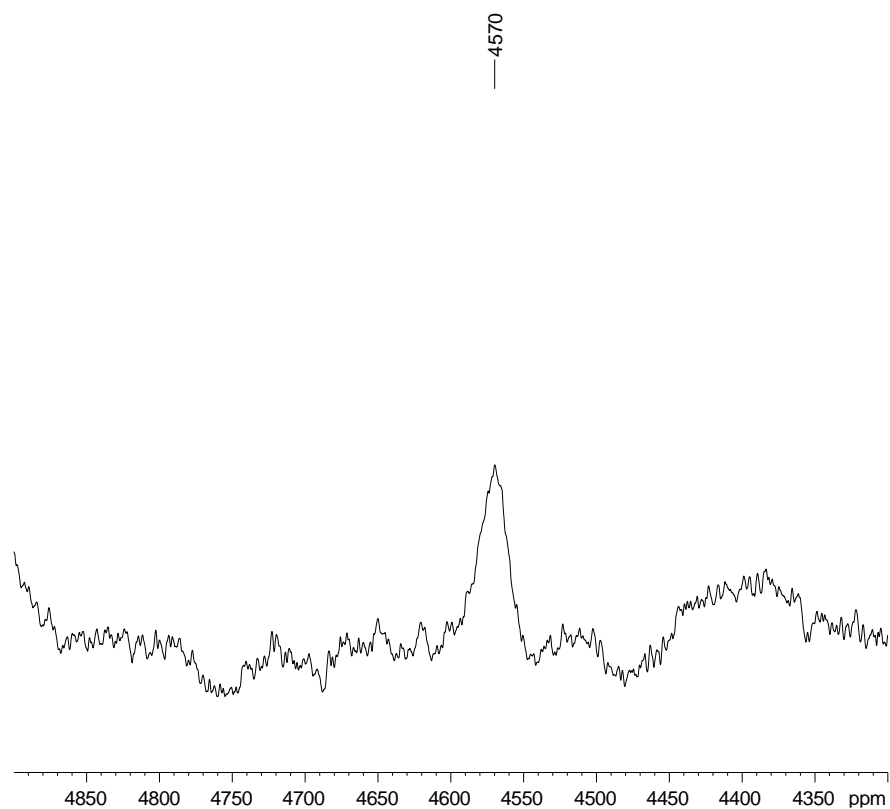
—4570

Current Data Parameters
NAME   MA445K_01032021_300N
EXPNO   18
PROCNO   1

F2 - Acquisition Parameters
Date_   20210301
Time   21.08 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zg30
TD   14998
SOLVENT   C6D6
NS   128000
DS   0
SWH   125000.000 Hz
FIDRES   16.668890 Hz
AQ   0.0599920 sec
RG   204.67
DW   4.000 usec
DE   10.00 usec
TE   298.0 K
D1   0.20000000 sec
TD0   1
SFO1   63.0401498 MHz
NUC1   207Pb
P0   4.17 usec
P1   12.50 usec
PLW1   40.00000000 W

F2 - Processing parameters
SI   65536
SF   62.7889938 MHz
WDW   EM
SSB   0
LB   100.00 Hz
GB   0
PC   3.00

4850   4800   4750   4700   4650   4600   4550   4500   4450   4400   4350 ppm

Figure S20. ^{207}Pb-NMR spectrum of compound **5**.

NMR spectra of compound 6

¹H-NMR of TbbSnBr₃ in C₆D₆ (#) at rt
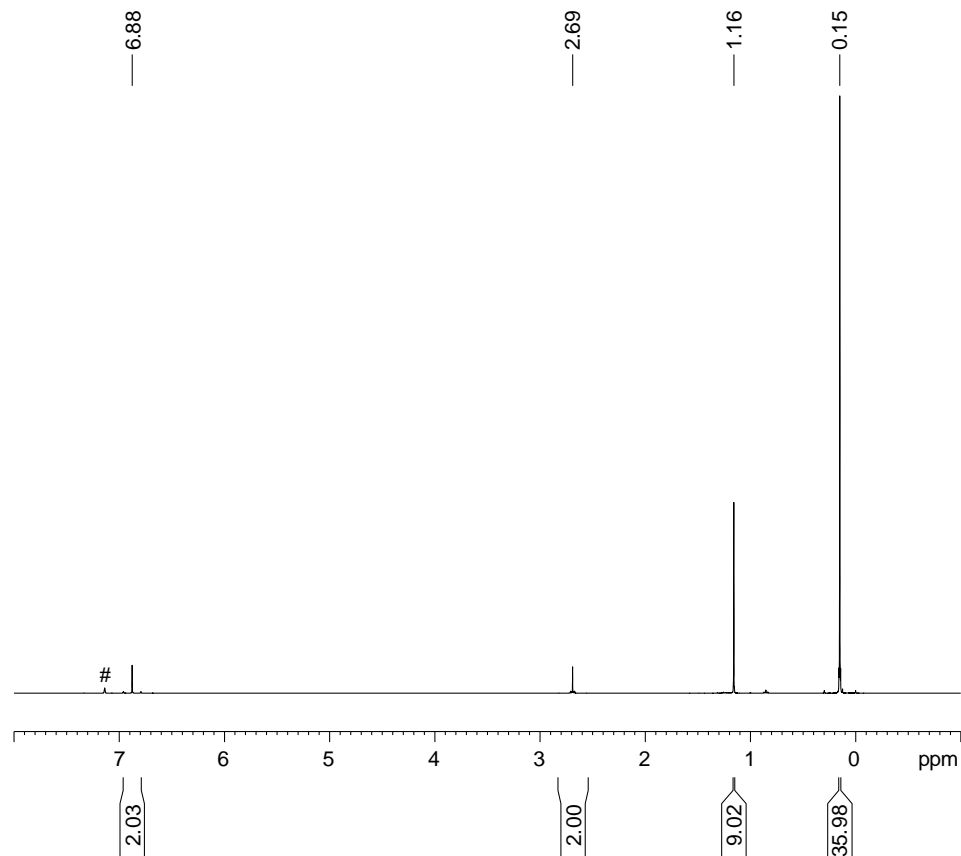
6.88   2.69   1.16   0.15

7   6   5   4   3   2   1   0   ppm

2.03   2.00   9.02   35.98

Figure S21. ¹H-NMR spectrum of compound **6**.

$^{13}C\{^1H\}$-NMR of TbbSnBr$_3$ in C$_6$D$_6$ (#) at rt, *: *n*-pentane

154.6
150.6
135.1
122.8
#
34.3
32.2
30.5
0.3

160   150   140   130   120   110   100   90   80   70   60   50   40   30   20   10   0 ppm

Figure S22. $^{13}C\{^1H\}$-NMR spectrum of compound **6**.

^{29}Si-INEPTND-NMR of TbbSnBr$_3$ in C$_6$D$_6$ at rt

3.8
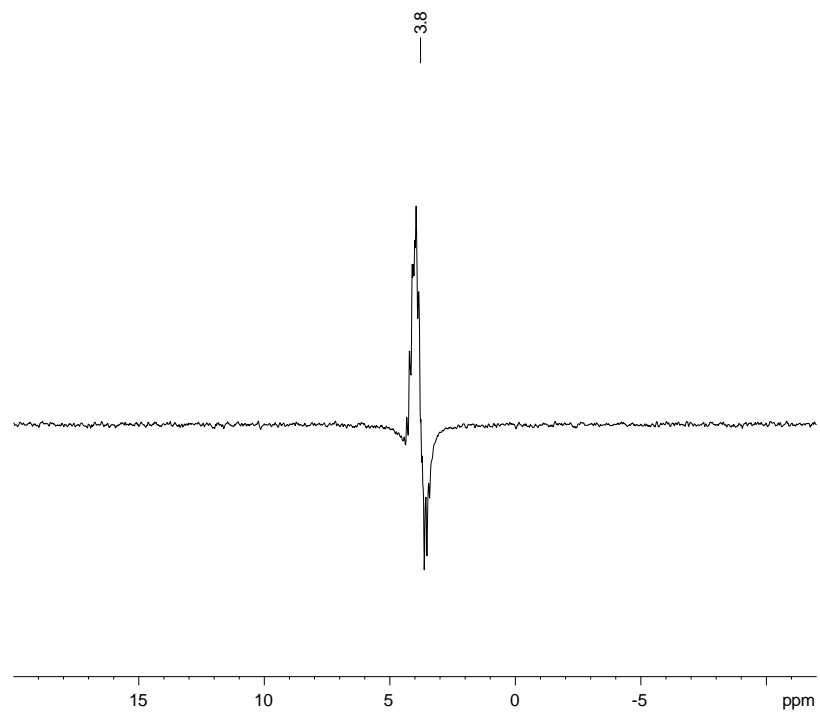
Current Data Parameters
NAME   MA164_13112019_300
EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
Date_   20191113
Time   11.35 h
INSTRUM   spect
PROBHD Z104275_0338 (
PULPROG   ineptnd
TD   39048
SOLVENT   C6D6
NS   320
DS   0
SWH   26315.789 Hz
FIDRES   1.347869 Hz
AQ   0.7419120 sec
RG   204.67
DW   19.000 usec
DE   6.50 usec
TE   298.0 K
CNST2   6.5999999
D1   2.00000000 sec
D4   0.03787879 sec
TD0   1
SFO1   59.6229159 MHz
NUC1   29Si
P1   10.30 usec
P2   20.60 usec
PLW1   50.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
P3   14.00 usec
P4   28.00 usec
PLW2   8.26509953 W

F2 - Processing parameters
SI   32768
SF   59.6273498 MHz
WDW   EM
SSB   0
LB   2.00 Hz
GB   0
PC   1.00

| 15 | 10 | 5 | 0 | -5 | ppm |

Figure S23. ^{29}Si-INEPTND-NMR spectrum of compound **6**.

^{119}Sn-NMR of TbbSnBr$_3$ in C$_6$D$_6$ at rt

−308
−308
−309
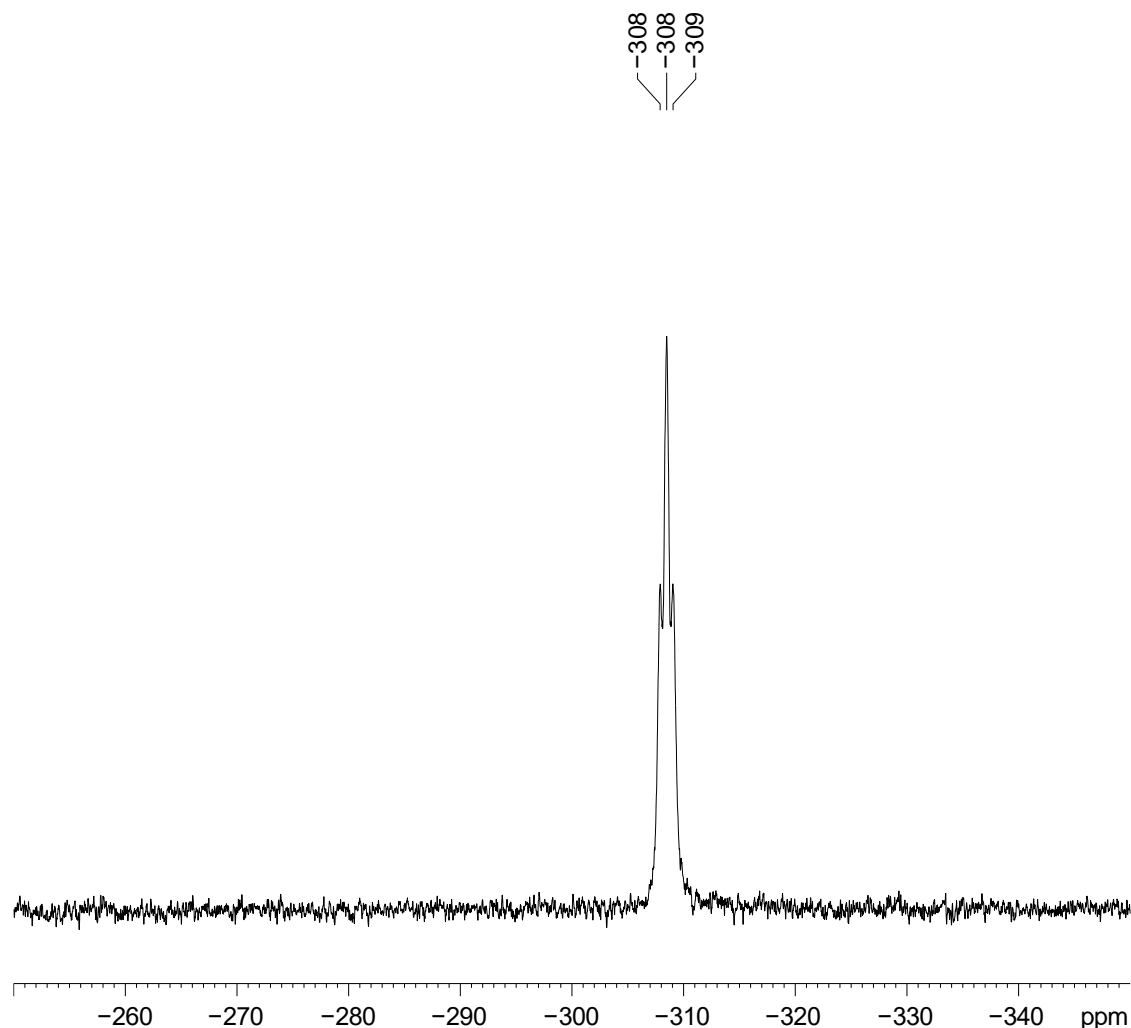
Current Data Parameters
NAME   MA164_30102019_300N
EXPNO   17
PROCNO   1

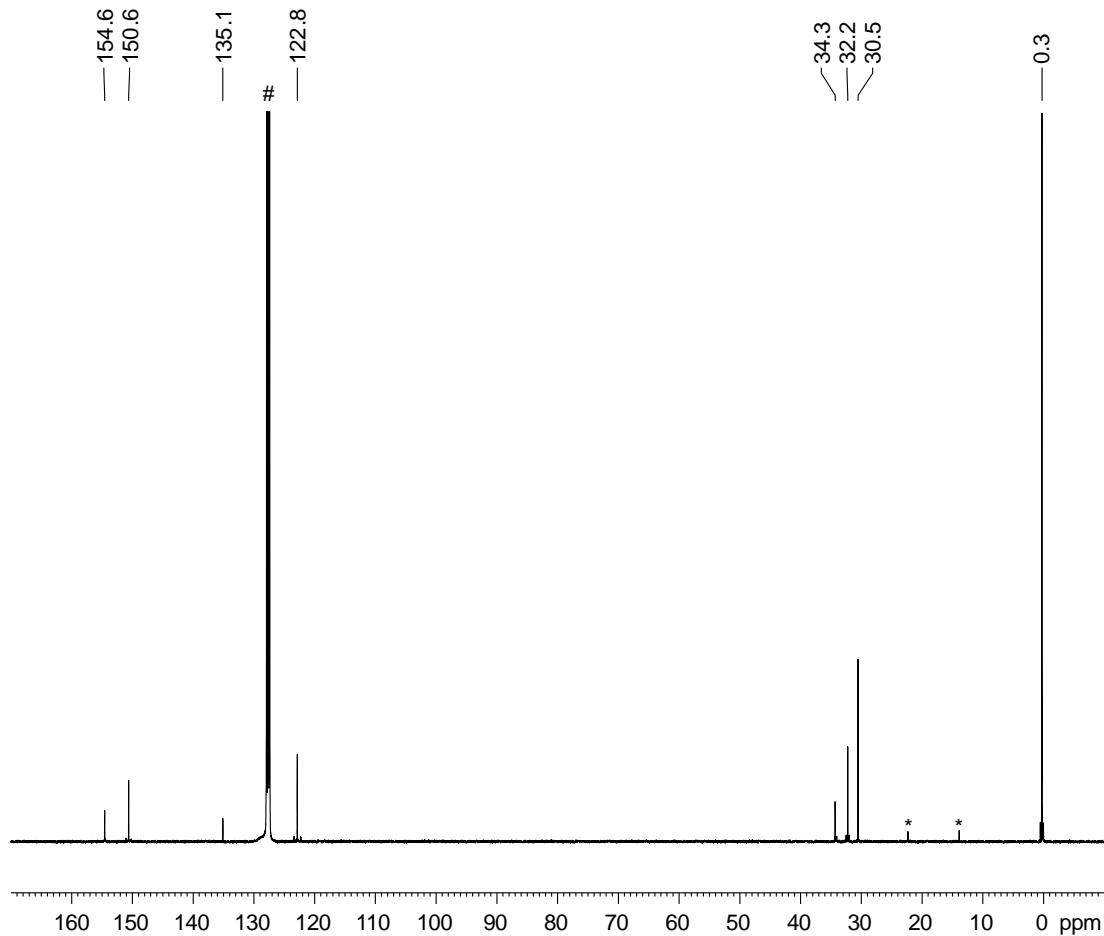F2 - Acquisition Parameters
Date_   20191030
Time   21.02 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zg30
TD   89276
SOLVENT   C6D6
NS   73728
DS   1
SWH   89285.711 Hz
FIDRES   2.000218 Hz
AQ   0.4999456 sec
RG   204.67
DW   5.600 usec
DE   6.50 usec
TE   298.0 K
D1   0.02000000 sec
TD0   1
SFO1   111.8979900 MHz
NUC1   119Sn
P1   12.10 usec
PLW1   12.00000000 W

F2 - Processing parameters
SI   65536
SF   111.9203740 MHz
WDW   EM
SSB   0
LB   5.00 Hz
GB   0
PC   1.40

−260   −270   −280   −290   −300   −310   −320   −330   −340   ppm

Figure S24. ^{119}Sn-NMR spectrum of compound **6**.

^{119}Sn{^{1}H}-NMR of TbbSnBr$_3$ in C$_6$D$_6$ at rt

-308

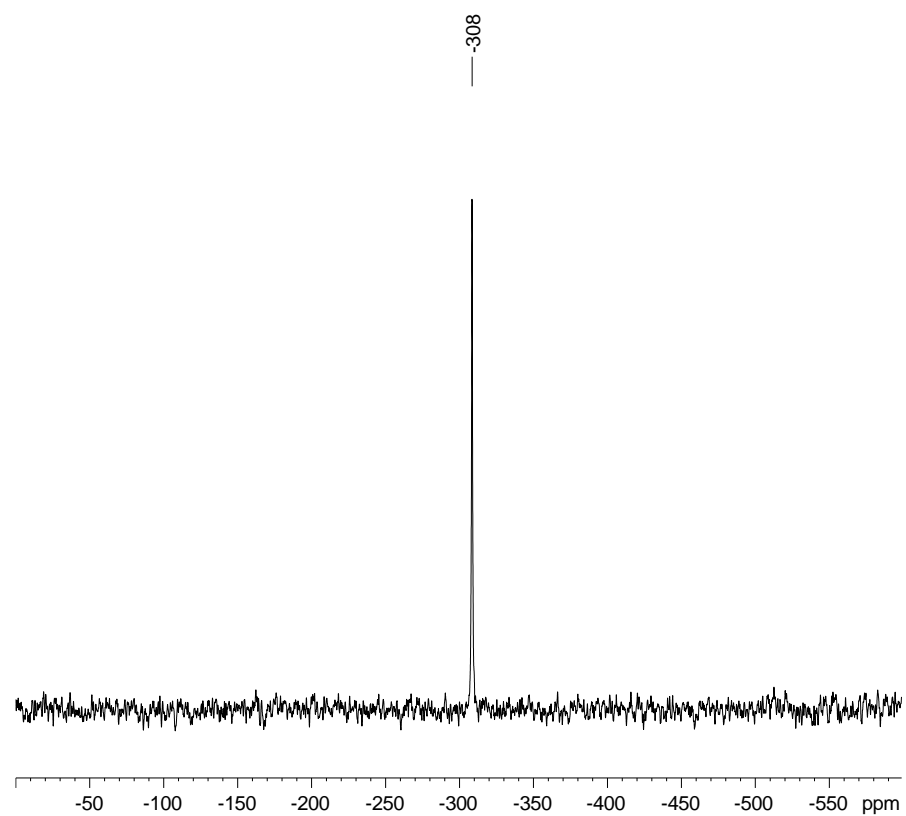| -50 | -100 | -150 | -200 | -250 | -300 | -350 | -400 | -450 | -500 | -550 ppm |

Current Data Parameters
NAME   MA164K_25112019_300
EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
Date_   20191125
Time   11.37 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zgig30
TD   39186
SOLVENT   C6D6
NS   4900
DS   4
SWH   89285.711 Hz
FIDRES   4.557021 Hz
AQ   0.2194416 sec
RG   204.67
DW   5.600 usec
DE   6.50 usec
TE   298.0 K
D1   0.10000000 sec
D11   0.03000000 sec
TD0   1
SFO1   111.8979898 MHz
NUC1   119Sn
P1   12.10 usec
PLW1   12.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
CPDPRG[2   waltz16
PCPD2   90.00 usec
PLW2   8.26509953 W
PLW12   0.20000000 W

F2 - Processing parameters
SI   65536
SF   111.9203738 MHz
WDW   EM
SSB   0
LB   50.00 Hz
GB   0
PC   1.40

Figure S25. ^{119}Sn{^{1}H}-NMR spectrum of compound **6**.

NMR spectra of compound 7

¹H-NMR of TbbSnH$_3$ in C$_6$D$_6$ (#) at rt
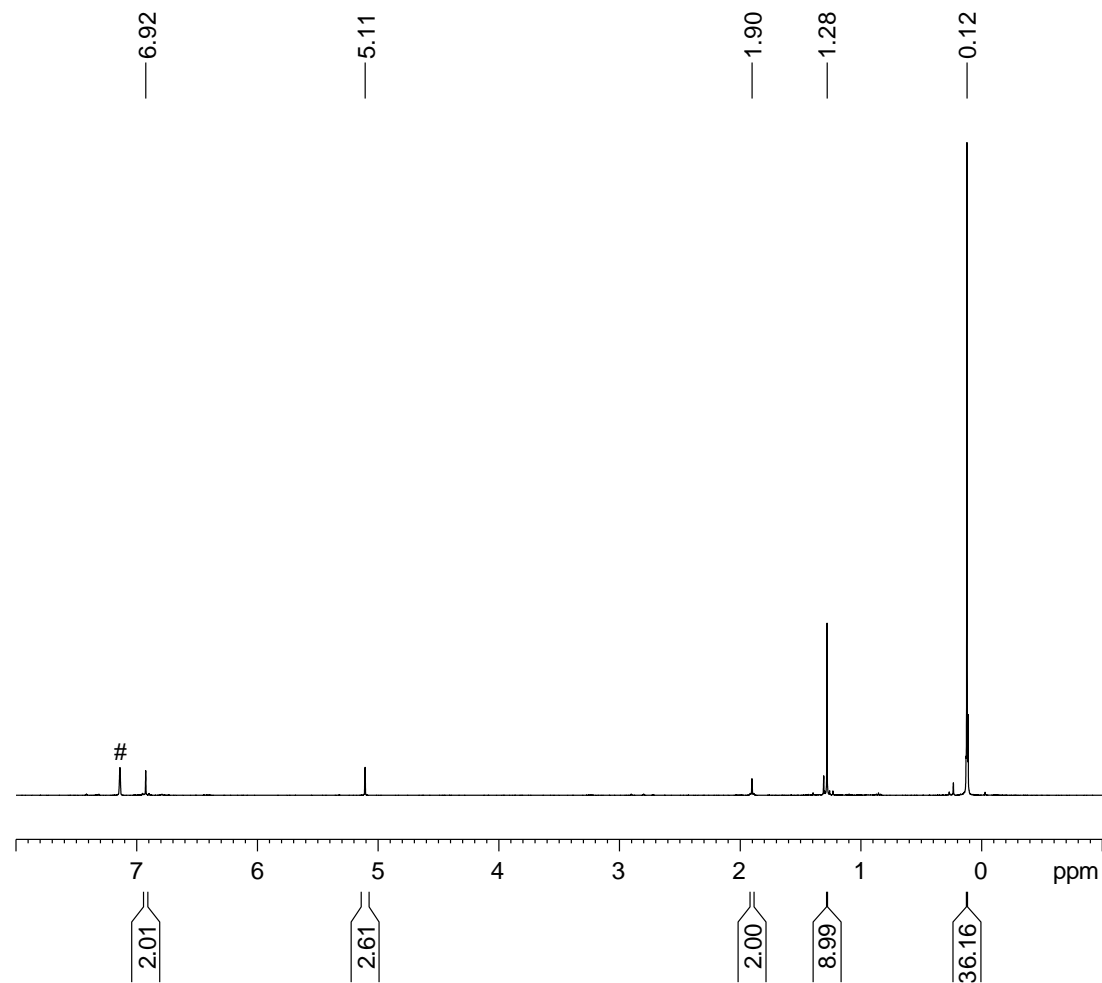
Current Data Parameters
NAME   MA232_10022020_400N
EXPNO   10
PROCNO   1

F2 - Acquisition Parameters
Date_   20200210
Time   20.06
INSTRUM   spect
PROBHD   5 mm QNP 1H/13
PULPROG   zg30
TD   52656
SOLVENT   C6D6
NS   32
DS   0
SWH   8305.647 Hz
FIDRES   0.157734 Hz
AQ   3.1698911 sec
RG   322
DW   60.200 usec
DE   6.00 usec
TE   299.2 K
D1   1.00000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   1H
P1   14.60 usec
PL1   -3.00 dB
PL1W   16.03799057 W
SFO1   400.1120007 MHz

F2 - Processing parameters
SI   65536
SF   400.1100000 MHz
WDW   EM
SSB   0
LB   0 Hz
GB   0
PC   1.00

Figure S26. ¹H NMR spectrum of compound **7**.

^{13}C{^{1}H}-NMR of TbbSnH$_3$ in C$_6$D$_6$ (#) at rt

150.8
150.7
132.2
120.5
34.1
34.0
31.0
0.1
#

160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm

Figure S27. ^{13}C{^{1}H}-NMR spectrum of compound **7**.

^{29}Si-INEPTND-NMR of TbbSnH$_3$ in toluene-d$_8$ at rt
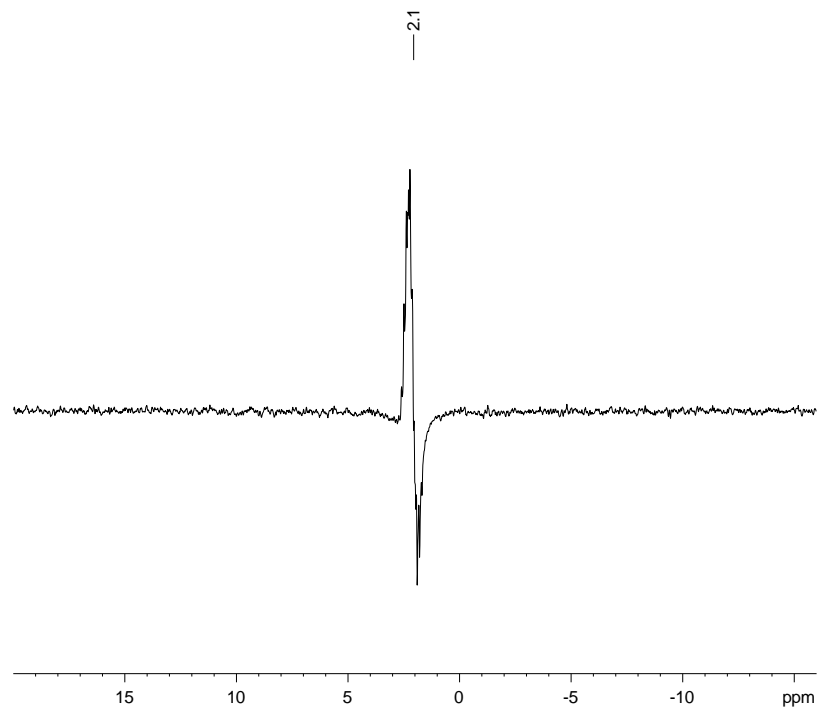
2.1

Current Data Parameters
NAME   MA192_28112019_300
EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
Date_   20191128
Time   15.20 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   ineptnd
TD   39048
SOLVENT   Tol
NS   320
DS   0
SWH   26315.789 Hz
FIDRES   1.347869 Hz
AQ   0.7419120 sec
RG   204.67
DW   19.000 usec
DE   6.50 usec
TE   298.0 K
CNST2   6.5999999
D1   2.00000000 sec
D4   0.03787879 sec
TD0   1
SFO1   59.6229159 MHz
NUC1   29Si
P1   10.30 usec
P2   20.60 usec
PLW1   50.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
P3   14.00 usec
P4   28.00 usec
PLW2   8.26509953 W

F2 - Processing parameters
SI   32768
SF   59.6273880 MHz
WDW   EM
SSB   0
LB   2.00 Hz
GB   0
PC   1.00

Figure S28. ^{29}Si-INEPTND-NMR spectrum of compound **7**.

^{119}Sn-NMR of TbbSnH$_3$ in toluene-d$_8$ at rt

−389
−405
−422
−438

Current Data Parameters
NAME   MA192_28112019_300
EXPNO   12
PROCNO   1

F2 - Acquisition Parameters
Date_   20191128
Time   15.55 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zg30
TD   8918
SOLVENT   Tol
NS   17408
DS   1
SWH   89285.711 Hz
FIDRES   20.023708 Hz
AQ   0.0499408 sec
RG   204.67
DW   5.600 usec
DE   6.50 usec
TE   298.0 K
D1   0.02000000 sec
TD0   1
SFO1   111.8867979 MHz
NUC1   119Sn
P1   12.10 usec
PLW1   12.00000000 W

F2 - Processing parameters
SI   4096
SF   111.9203740 MHz
WDW   EM
SSB   0
LB   0 Hz
GB   0
PC   1.40

−250   −300   −350   −400   −450   −500   −550   ppm

Figure S29. ^{119}Sn-NMR spectrum of compound **7**.

^{119}Sn{^{1}H}-NMR of TbbSnH$_3$ in toluene-d$_8$ at rt

—414

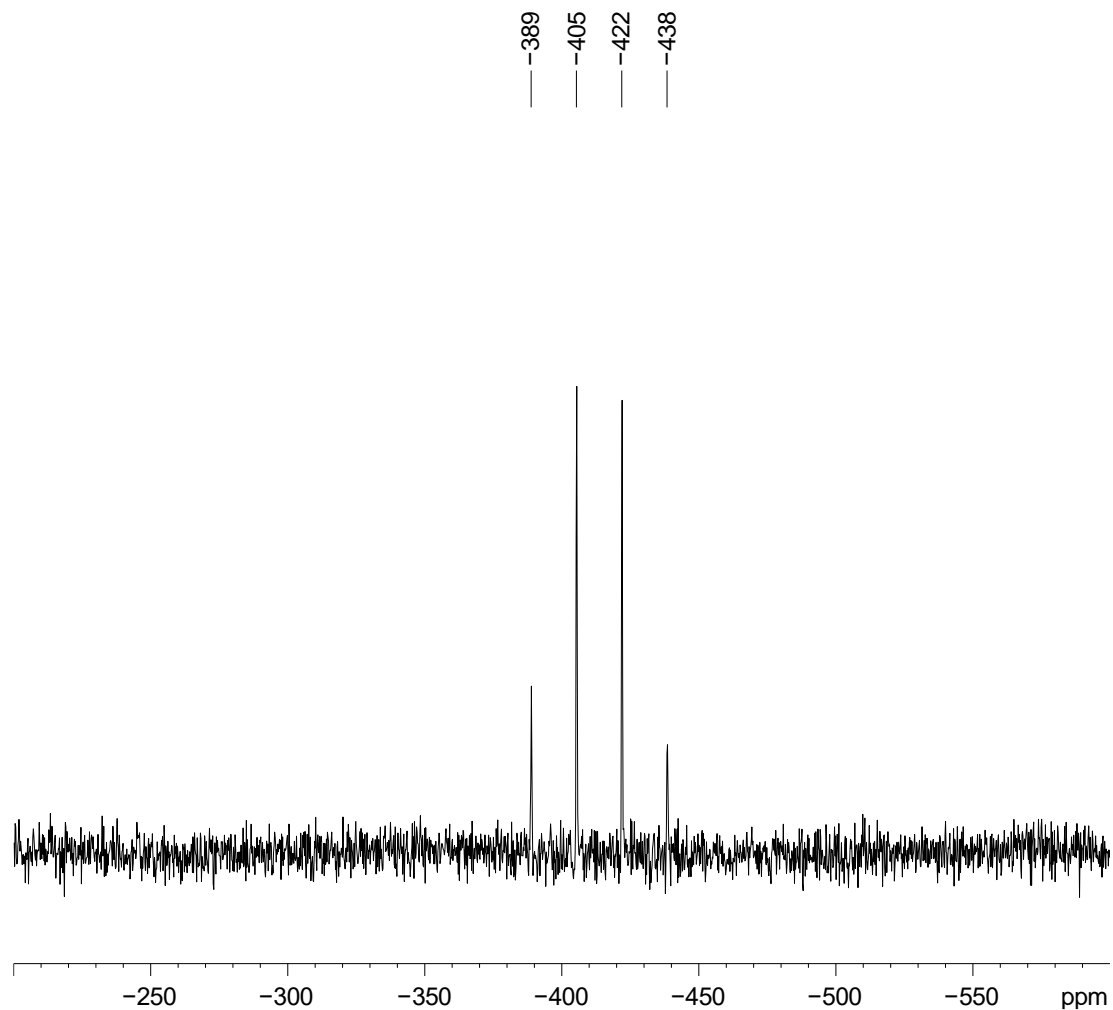Current Data Parameters
NAME   MA192_28112019_300
EXPNO   13
PROCNO   1

F2 - Acquisition Parameters
Date_   20191128
Time   20.17 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zgig30
TD   39186
SOLVENT   Tol
NS   5100
DS   4
SWH   89285.711 Hz
FIDRES   4.557021 Hz
AQ   0.2194416 sec
RG   204.67
DW   5.600 usec
DE   6.50 usec
TE   298.0 K
D1   0.10000000 sec
D11   0.03000000 sec
TD0   1
SFO1   111.8867977 MHz
NUC1   119Sn
P1   12.10 usec
PLW1   12.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
CPDPRG[2   waltz16
PCPD2   90.00 usec
PLW2   8.26509953 W
PLW12   0.20000000 W

F2 - Processing parameters
SI   65536
SF   111.9203738 MHz
WDW   EM
SSB   0
LB   50.00 Hz
GB   0
PC   1.40

Figure S30. ^{119}Sn{^{1}H}-NMR spectrum of compound **7**.

NMR spectra of compound **8**

^{1}H-NMR of ([TbbGeH$_2$][Li{thf}$_{1.5}$])$_2$ in C$_6$D$_6$ (#) at rt

6.93
3.72
3.13
2.74
1.43
1.43
0.29

#

7   6   5   4   3   2   1   0   ppm

4.03
12.03
4.00
4.02
30.08
72.06

Current Data Parameters
NAME   MA197_11122019_400N
EXPNO   10
PROCNO   1

F2 - Acquisition Parameters
Date_   20191211
Time   20.06
INSTRUM   spect
PROBHD   5 mm QNP 1H/13
PULPROG   zg30
TD   52656
SOLVENT   C6D6
NS   32
DS   0
SWH   8305.647 Hz
FIDRES   0.157734 Hz
AQ   3.1698911 sec
RG   144
DW   60.200 usec
DE   6.00 usec
TE   299.2 K
D1   1.00000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   1H
P1   14.60 usec
PL1   -3.00 dB
PL1W   16.03799057 W
SFO1   400.1120007 MHz

F2 - Processing parameters
SI   65536
SF   400.1100000 MHz
WDW   EM
SSB   0
LB   0 Hz
GB   0
PC   1.00

Figure S31. ^{1}H-NMR spectrum of compound **8**.

^{7}Li-NMR of ([TbbGeH$_2$][Li{thf}$_{1.5}$])$_2$ in C$_6$D$_6$ at rt

1.1
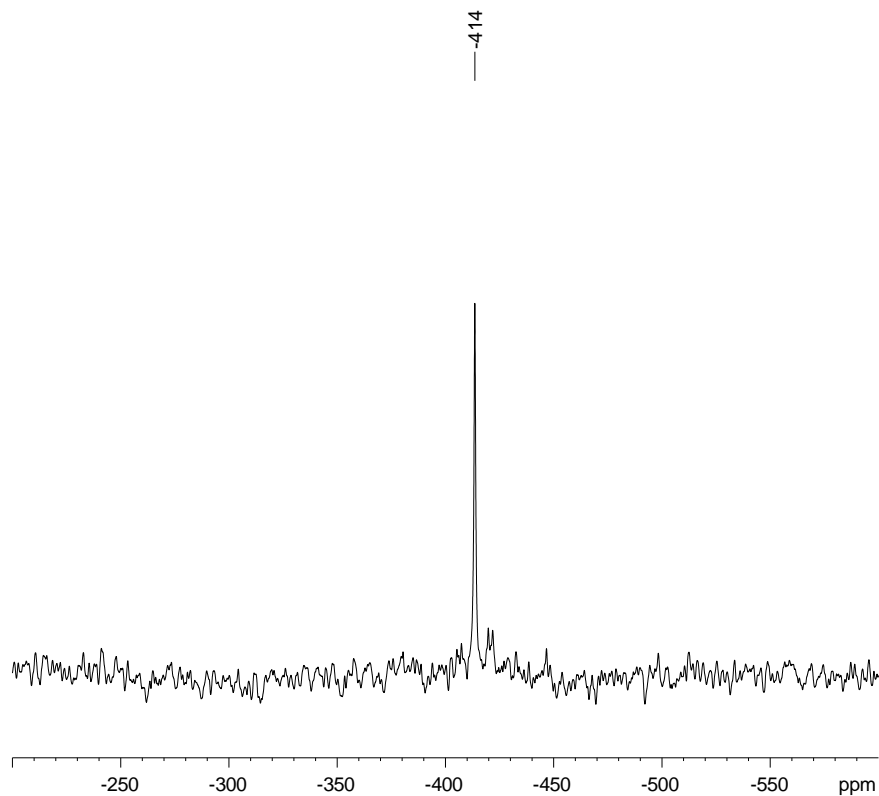
Current Data Parameters
NAME   MA197K_11122019_300
EXPNO   12
PROCNO   1
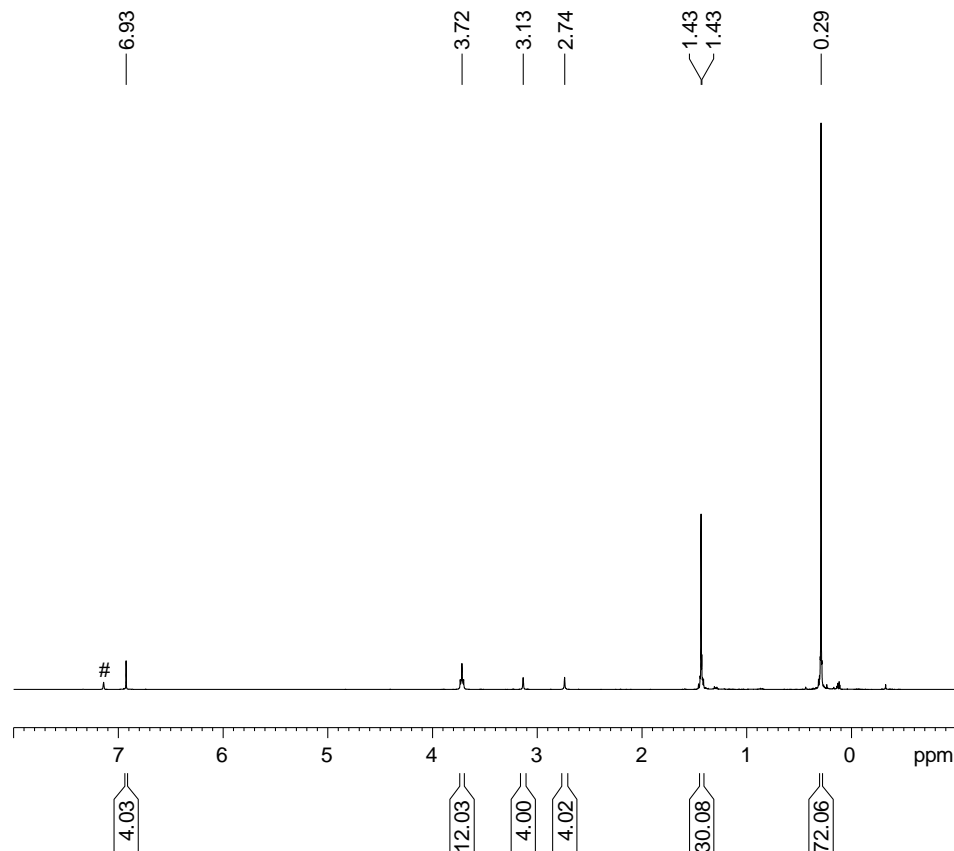
F2 - Acquisition Parameters
Date_   20191211
Time   14.42 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zg30
TD   32050
SOLVENT   C6D6
NS   256
DS   0
SWH   46875.000 Hz
FIDRES   2.925117 Hz
AQ   0.3418667 sec
RG   204.67
DW   10.667 usec
DE   6.50 usec
TE   298.0 K
D1   0.20000000 sec
TD0   1
SFO1   116.6419139 MHz
NUC1   7Li
P1   8.81 usec
PLW1   34.00000000 W

F2 - Processing parameters
SI   32768
SF   116.6419139 MHz
WDW   EM
SSB   0
LB   1.00 Hz
GB   0
PC   1.40

Figure S32. ^{7}Li-NMR spectrum of compound **8**.

$^{13}C\{^1H\}$-NMR of ([TbbGeH$_2$][Li{thf}$_{1.5}$])$_2$ in C$_6$D$_6$ (#) at rt

147.8
145.9
144.8
119.9
#
68.7
33.8
31.5
30.8
25.0
0.9

Current Data Parameters
NAME   MA197_11122019_400N
EXPNO   11
PROCNO   1
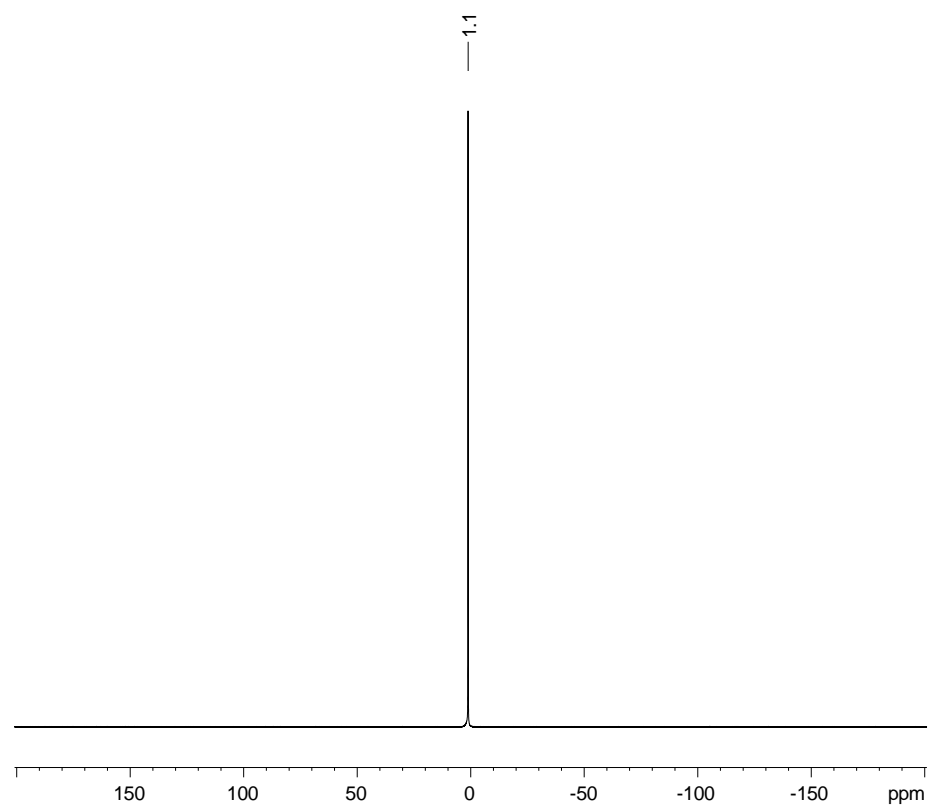
F2 - Acquisition Parameters
Date_   20191212
Time   2.09
INSTRUM   spect
PROBHD 5 mm QNP 1H/13
PULPROG   zgpg30
TD   53700
SOLVENT   C6D6
NS   11264
DS   0
SWH   30864.197 Hz
FIDRES   0.574752 Hz
AQ   0.8699400 sec
RG   32800
DW   16.200 usec
DE   6.00 usec
TE   299.2 K
D1   1.00000000 sec
D11   0.03000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   13C
P1   13.50 usec
PL1   -4.16 dB
PL1W   78.55633545 W
SFO1   100.6198135 MHz

======== CHANNEL f2 ========
CPDPRG[2   waltz16
NUC2   1H
PCPD2   80.00 usec
PL2   -3.00 dB
PL12   11.77 dB
PL13   13.14 dB
PL2W   16.03799057 W
PL12W   0.53474891 W
PL13W   0.39007664 W
SFO2   400.1120007 MHz

F2 - Processing parameters
SI   65536
SF   100.6077400 MHz
WDW   EM
SSB   0
LB   1.00 Hz
GB   0
PC   1.40

160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm

Figure S33. $^{13}C\{^1H\}$-NMR spectrum of compound **8**.
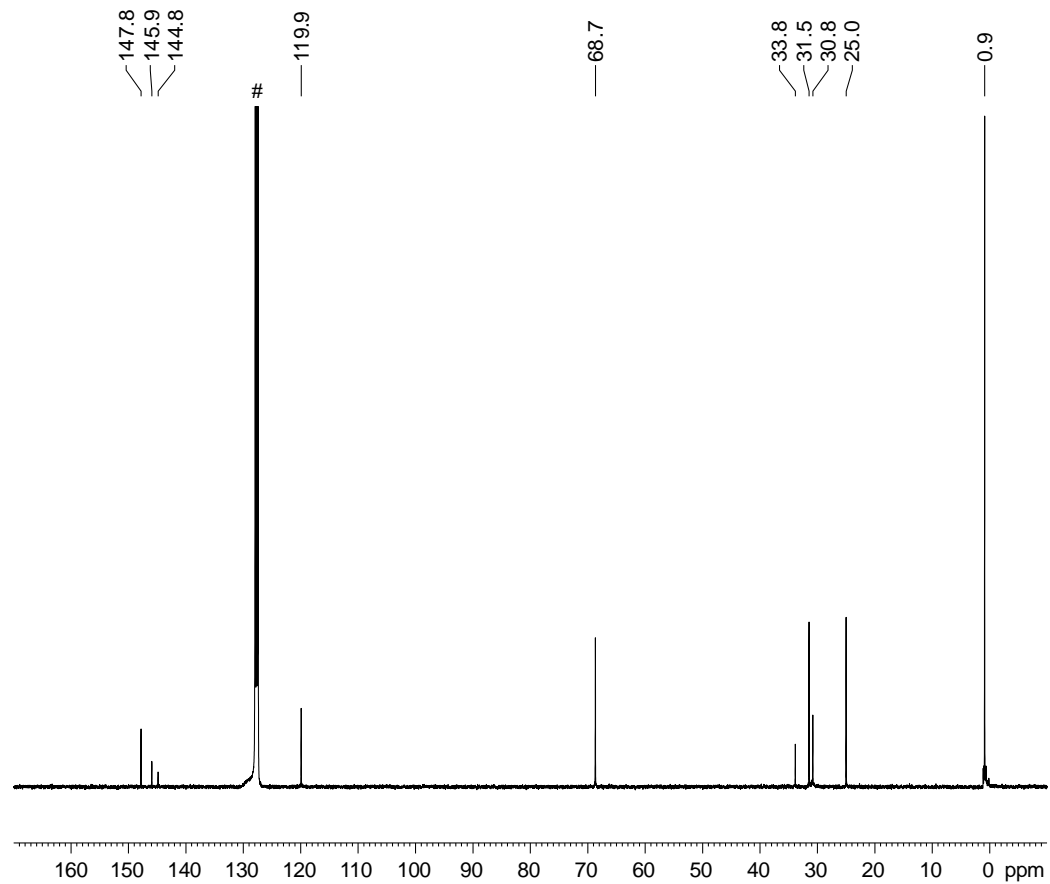
1.1
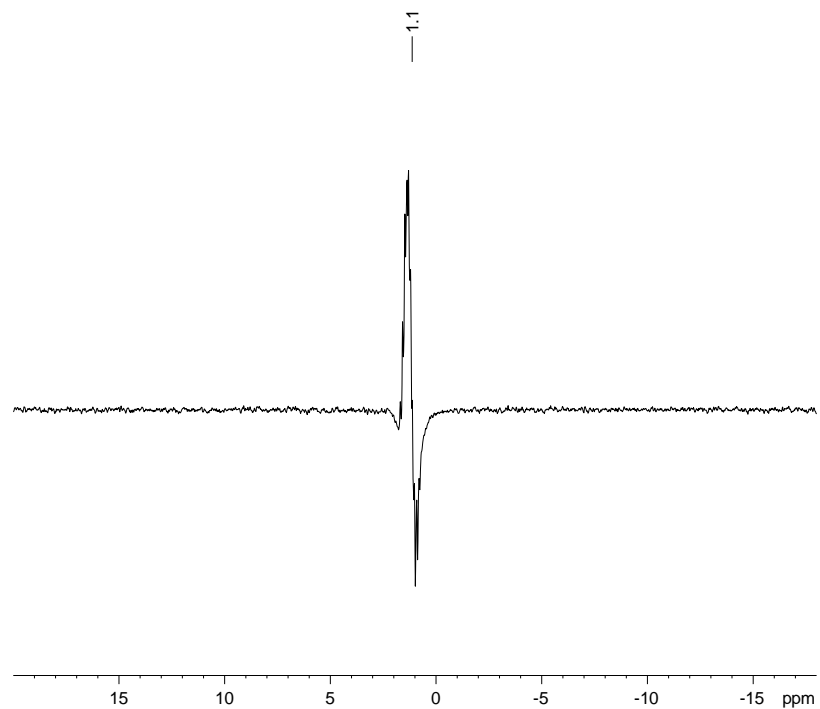
Current Data Parameters
NAME   MA197K_11122019_300
EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
Date_   20191211
Time   14.39 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   ineptnd
TD   39048
SOLVENT   C6D6
NS   320
DS   0
SWH   26315.789 Hz
FIDRES   1.347869 Hz
AQ   0.7419120 sec
RG   204.67
DW   19.000 usec
DE   6.50 usec
TE   298.0 K
CNST2   6.5999999
D1   2.00000000 sec
D4   0.03787879 sec
TD0   1
SFO1   59.6229159 MHz
NUC1   29Si
P1   10.30 usec
P2   20.60 usec
PLW1   50.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
P3   14.00 usec
P4   28.00 usec
PLW2   8.26509953 W

F2 - Processing parameters
SI   32768
SF   59.6273858 MHz
WDW   EM
SSB   0
LB   2.00 Hz
GB   0
PC   1.00

15   10   5   0   -5   -10   -15   ppm

Figure S34. ^{29}Si-INEPTND-NMR spectrum of compound **8**.

NMR spectra of compound **9a**

^{1}H-NMR of ([TbbGeH$_2$][K{thf}$_{0.5}$])$_4$ in C$_6$D$_6$ (#) at rt, *: *n*-pentane, +: unknown impurity

Peak labels: 6.88, 3.51, 2.94, 2.74, 1.43, 1.41, 0.30

Integrations: 8.00, 8.03, 8.00, 8.02, 36.01, 8.00, 144.16

Current Data Parameters
NAME   AS17F_27112019_300
EXPNO   10
PROCNO   1

F2 - Acquisition Parameters
Date_   20191127
Time   11.41
INSTRUM   spect
PROBHD   5 mm QNP 1H/13
PULPROG   zg30
TD   52656
SOLVENT   C6D6
NS   16
DS   0
SWH   8305.647 Hz
FIDRES   0.157734 Hz
AQ   3.1698911 sec
RG   90.5
DW   60.200 usec
DE   6.00 usec
TE   299.2 K
D1   1.00000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   1H
P1   14.60 usec
PL1   -3.00 dB
PL1W   16.03799057 W
SFO1   400.1120007 MHz

F2 - Processing parameters
SI   65536
SF   400.1100000 MHz
WDW   EM
SSB   0
LB   0 Hz
GB   0
PC   1.00

Figure S35. ^{1}H-NMR spectrum of compound **9a**.

$^{13}C\{^1H\}$-NMR of $([TbbGeH_2][K\{thf\}_{0.5}])_4$ in C_6D_6 (#) at rt

Figure S36. $^{13}C\{^1H\}$-NMR spectrum of compound **9a**.

^{29}Si-INEPTND-NMR of ([TbbGeH$_2$][K{thf}$_{0.5}$])$_4$ in C$_6$D$_6$ at rt
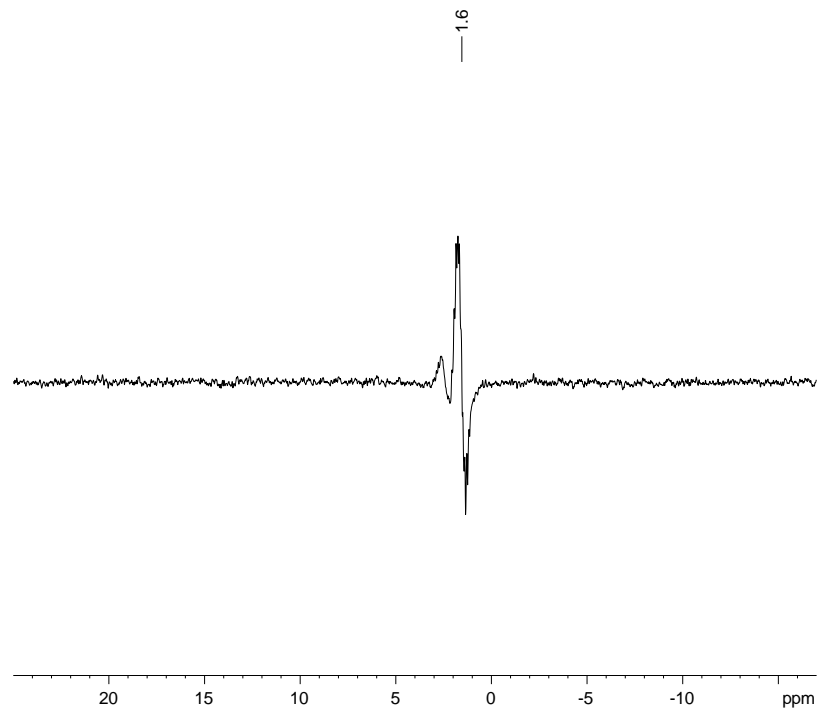
Current Data Parameters
NAME   MA649K_10082021_300N
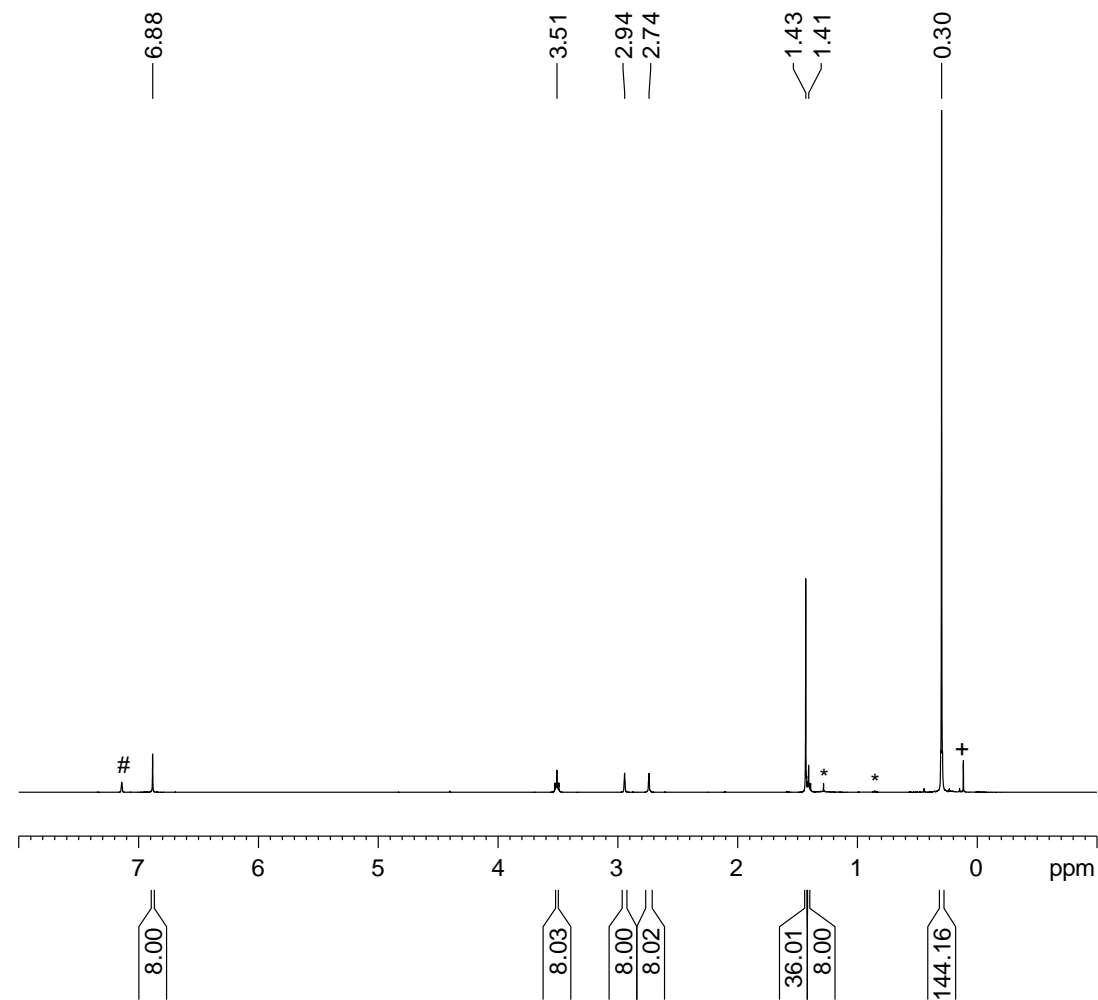EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
Date_   20210810
Time   14.37 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   ineptnd
TD   39048
SOLVENT   C6D6
NS   128
DS   0
SWH   26315.789 Hz
FIDRES   1.347869 Hz
AQ   0.7419120 sec
RG   204.67
DW   19.000 usec
DE   6.50 usec
TE   298.0 K
CNST2   6.5999999
D1   2.00000000 sec
D4   0.03787879 sec
TD0   1
SFO1   59.6229159 MHz
NUC1   29Si
P1   10.30 usec
P2   20.60 usec
PLW1   50.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
P3   14.00 usec
P4   28.00 usec
PLW2   8.26509953 W

F2 - Processing parameters
SI   32768
SF   59.6273579 MHz
WDW   EM
SSB   0
LB   2.00 Hz
GB   0
PC   1.00

Figure S37. ^{29}Si-INEPTND-NMR spectrum of compound **9a**.

NMR spectra of compound 9b

¹H-NMR of ([TbbGeH$_2$][K{[18]-c-6}]) in C$_6$D$_6$ (#) at rt,*: *n*-hexane, +: unknown impurities
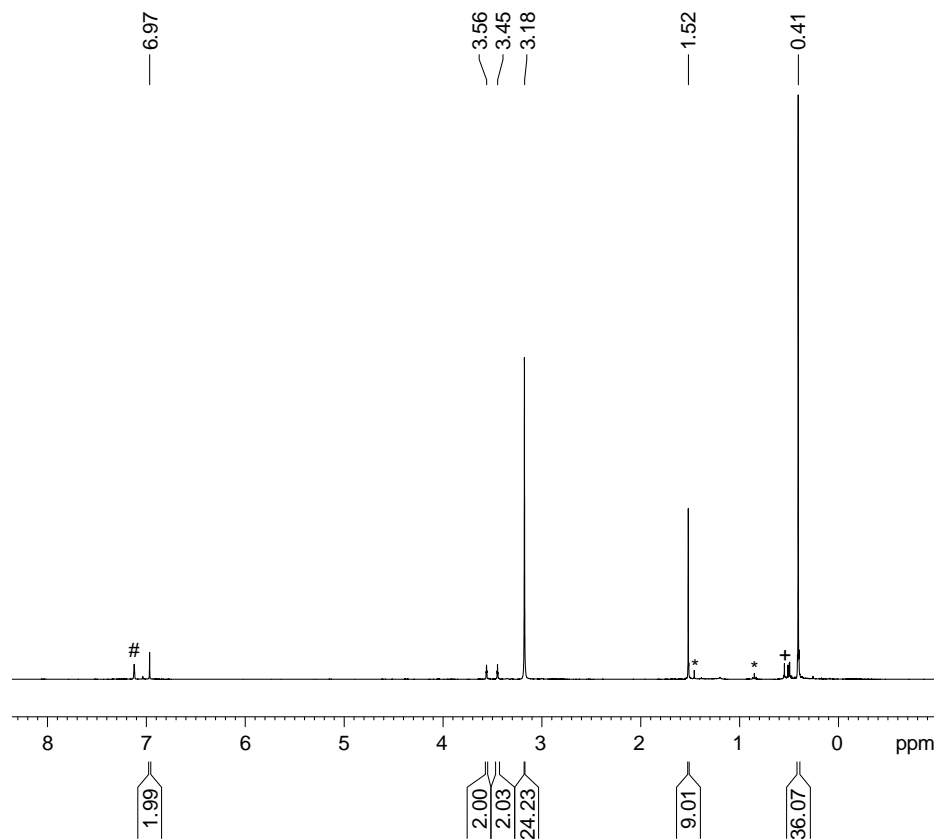
Figure S38. ¹H-NMR spectrum of compound **9b**.

^{13}C{^{1}H}-NMR of ([TbbGeH$_2$][K{[18]-c-6}]) in C$_6$D$_6$ (#) at rt, *: *n*-hexane

Figure S39. ^{13}C{^{1}H}-NMR spectrum of compound **9b**.

^{29}Si-INEPTND-NMR of ([TbbGeH$_2$][K{[18]-c-6}]) in C$_6$D$_6$ at rt

Figure S40. ^{29}Si-INEPTND-NMR spectrum of compound **9b**.

NMR spectra of compound 10

^{1}H-NMR of ([TbbSnH$_2$][Li{thf}$_x$]) in C$_6$D$_6$ (#) at rt

6.98
4.13
3.54
2.87
1.47
1.43
0.36

Current Data Parameters
NAME   MA332_15062020_400N
EXPNO   10
PROCNO   1

F2 - Acquisition Parameters
Date_   20200615
Time   20.05
INSTRUM   spect
PROBHD   5 mm QNP 1H/13
PULPROG   zg30
TD   52656
SOLVENT   C6D6
NS   32
DS   0
SWH   8305.647 Hz
FIDRES   0.157734 Hz
AQ   3.1698911 sec
RG   71.8
DW   60.200 usec
DE   6.00 usec
TE   299.2 K
D1   1.00000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   1H
P1   14.60 usec
PL1   -3.00 dB
PL1W   16.03799057 W
SFO1   400.1120007 MHz

F2 - Processing parameters
SI   65536
SF   400.1100003 MHz
WDW   EM
SSB   0
LB   0 Hz
GB   0
PC   1.00

\#

2.04
2.00
2.00
8.97
35.98

Figure S41. ^{1}H-NMR spectrum of compound **10**.

^{7}Li-NMR of ([TbbSnH$_2$][Li{thf}$_x$]) in thf-d$_8$ at rt
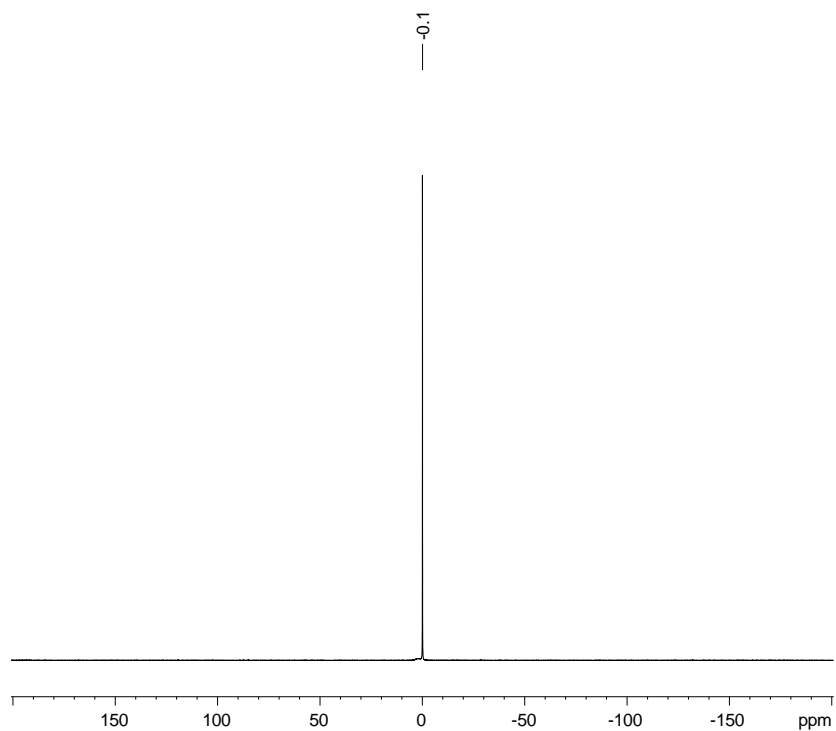
—-0.1

Current Data Parameters
NAME   MA320_28052020_300
EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
Date_   20200528
Time   8.44 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zg30
TD   32050
SOLVENT   THF
NS   256
DS   0
SWH   46875.000 Hz
FIDRES   2.925117 Hz
AQ   0.3418667 sec
RG   204.67
DW   10.667 usec
DE   6.50 usec
TE   298.0 K
D1   0.20000000 sec
TD0   1
SFO1   116.6419139 MHz
NUC1   7Li
P0   2.94 usec
P1   8.81 usec
PLW1   34.00000000 W

F2 - Processing parameters
SI   32768
SF   116.6419139 MHz
WDW   EM
SSB   0
LB   5.00 Hz
GB   0
PC   1.40

Figure S42. ^{7}Li-NMR spectrum of compound **10**.

^{13}C{^{1}H}-NMR of ([TbbSnH$_2$][Li{thf}$_x$]) in C$_6$D$_6$ (#) at rt

152.9
149.9
145.8

#

118.9

68.0

33.8
33.5
31.6
25.2

1.0

Current Data Parameters
NAME   MA332_15062020_400N
EXPNO   11
PROCNO   1

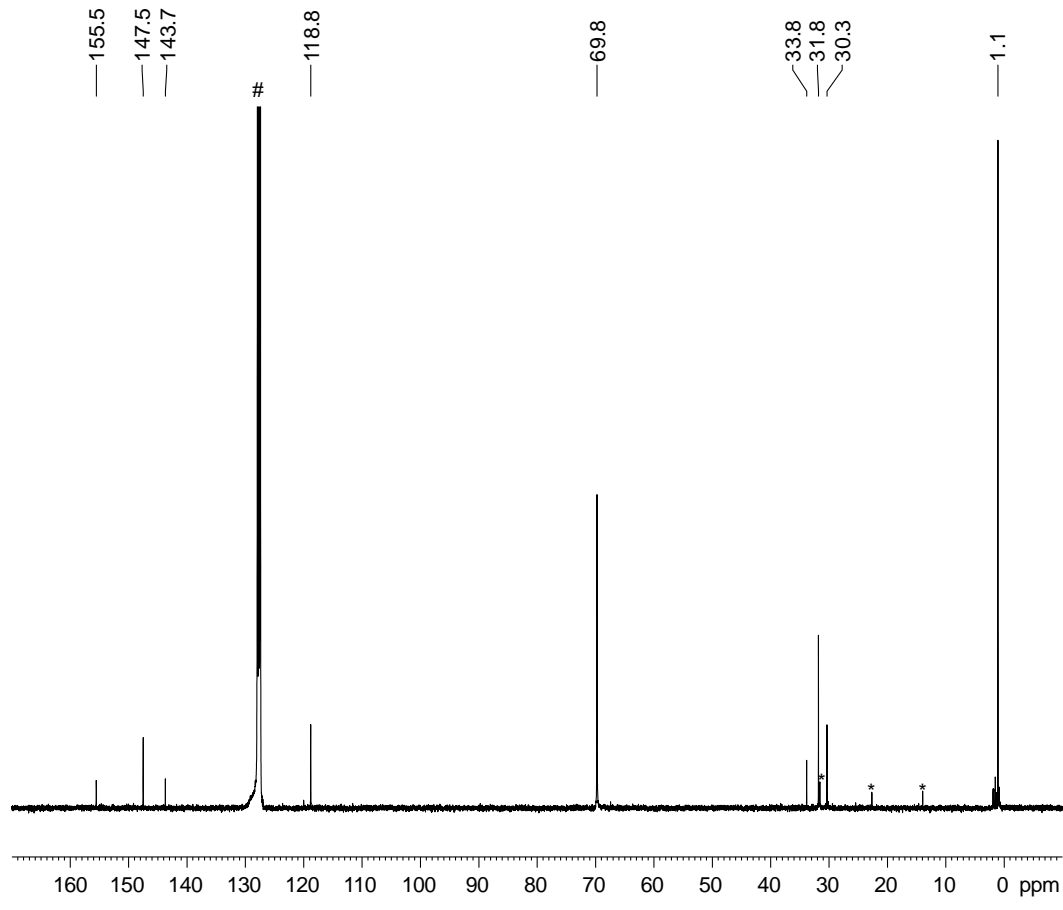F2 - Acquisition Parameters
Date_   20200616
Time   2.08
INSTRUM   spect
PROBHD   5 mm QNP 1H/13
PULPROG   zgpg30
TD   53700
SOLVENT   C6D6
NS   11264
DS   0
SWH   30864.197 Hz
FIDRES   0.574752 Hz
AQ   0.8699400 sec
RG   32800
DW   16.200 usec
DE   6.00 usec
TE   299.2 K
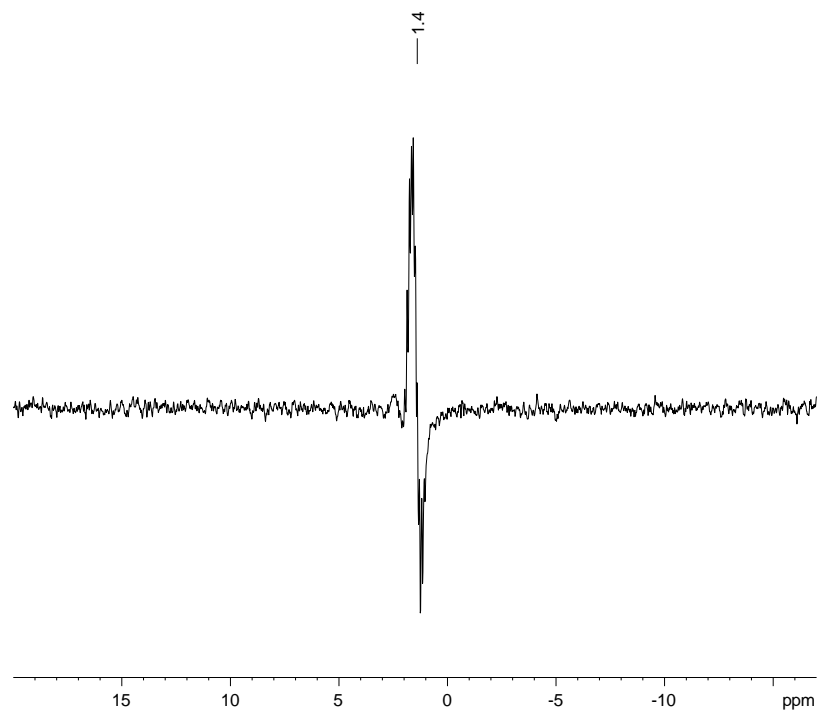D1   1.00000000 sec
D11   0.03000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   13C
P1   13.50 usec
PL1   -4.16 dB
PL1W   78.55633545 W
SFO1   100.6198135 MHz

======== CHANNEL f2 ========
CPDPRG[2   waltz16
NUC2   1H
PCPD2   80.00 usec
PL2   -3.00 dB
PL12   11.77 dB
PL13   13.14 dB
PL2W   16.03799057 W
PL12W   0.53474891 W
PL13W   0.39007664 W
SFO2   400.1120007 MHz

F2 - Processing parameters
SI   65536
SF   100.6077400 MHz
WDW   EM
SSB   0
LB   1.00 Hz
GB   0
PC   1.40

Figure S43. ^{13}C{^{1}H}-NMR spectrum of compound **10**.

²⁹Si-INEPTND-NMR of ([TbbSnH$_2$][Li{thf}$_x$]) in thf-d$_8$ at rt

— 0.4
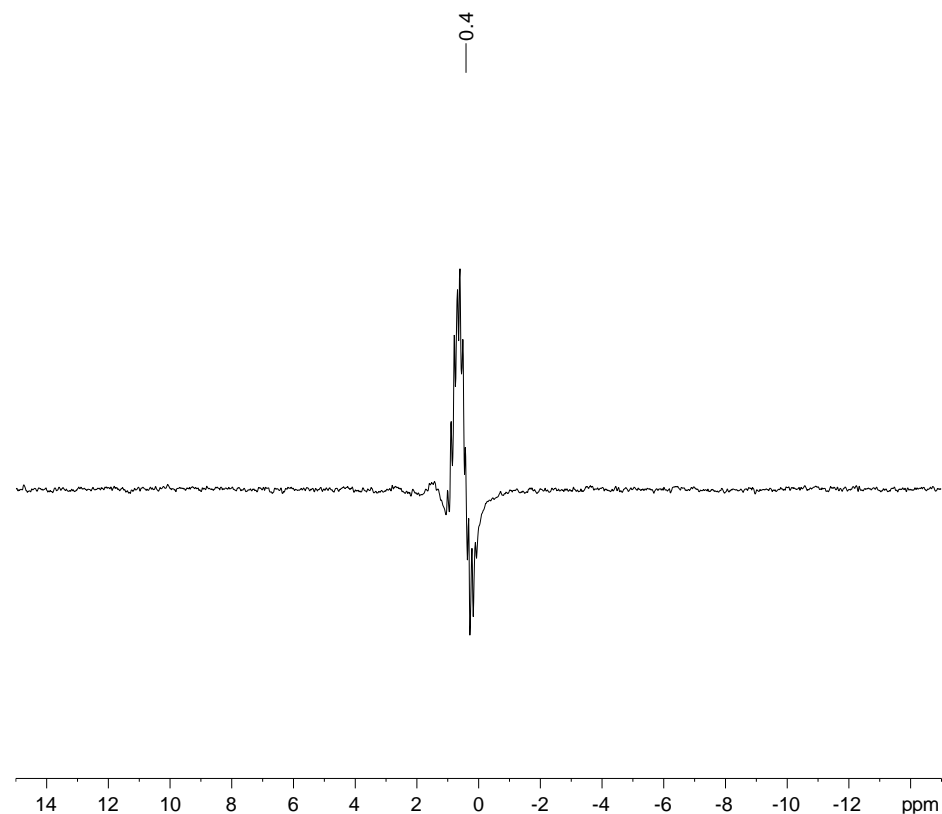
Current Data Parameters
NAME   MA320_28052020_300
EXPNO   21
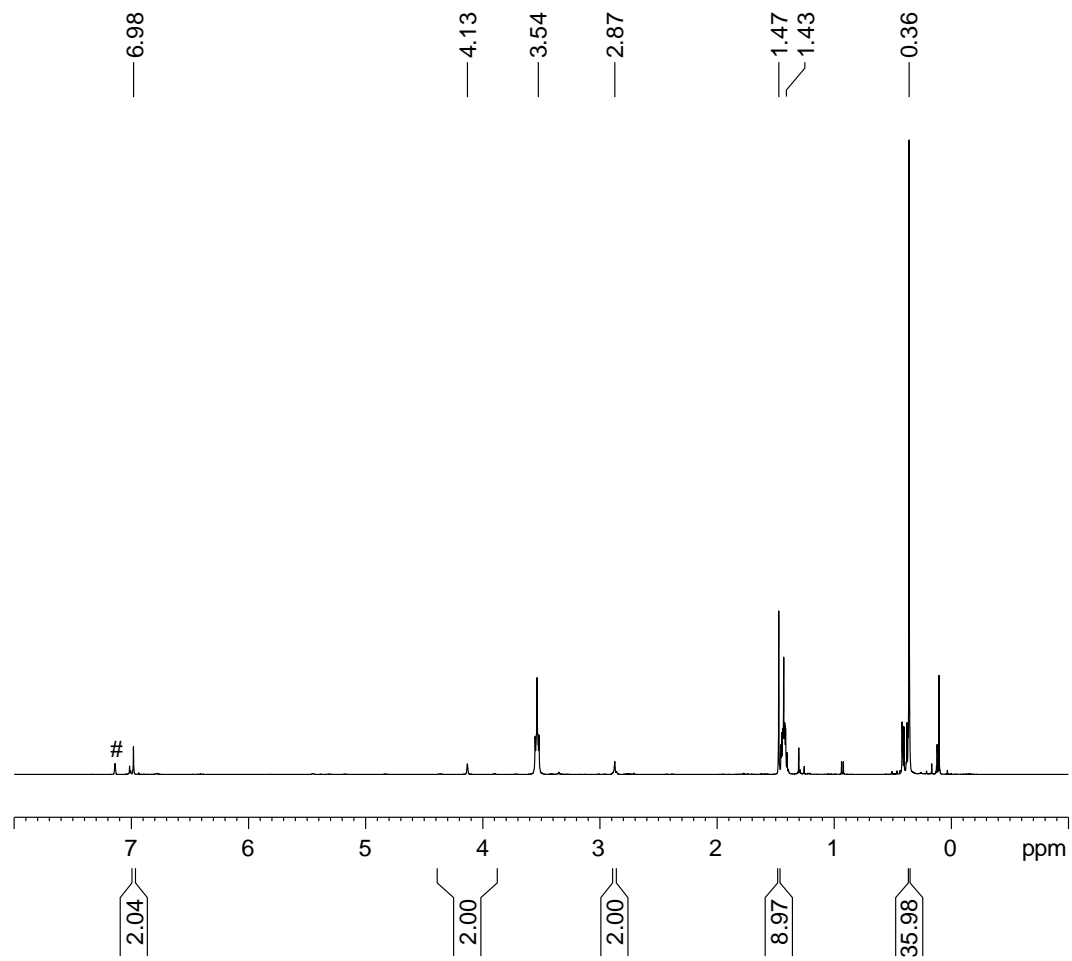PROCNO   1

F2 - Acquisition Parameters
Date_   20200528
Time   10.24 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   ineptnd
TD   39048
SOLVENT   THF
NS   320
DS   0
SWH   26315.789 Hz
FIDRES   1.347869 Hz
AQ   0.7419120 sec
RG   204.67
DW   19.000 usec
DE   6.50 usec
TE   298.0 K
CNST2   6.5999999
D1   2.00000000 sec
D4   0.03787879 sec
TD0   1
SFO1   59.6229159 MHz
NUC1   29Si
P1   10.30 usec
P2   20.60 usec
PLW1   50.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
P3   14.00 usec
P4   28.00 usec
PLW2   8.26509953 W

F2 - Processing parameters
SI   32768
SF   59.6273880 MHz
WDW   EM
SSB   0
LB   2.00 Hz
GB   0
PC   1.00

Figure S44. ²⁹Si-INEPTND-NMR spectrum of compound **10**.

^{119}Sn-NMR of ([TbbSnH$_2$][Li{thf}$_x$]) in thf-d$_8$ at rt

−527
−529
−530

Current Data Parameters
NAME   MA320_28052020_300
EXPNO   12
PROCNO   1

F2 - Acquisition Parameters
Date_   20200528
Time   9.11 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zg30
TD   8918
SOLVENT   THF
NS   15360
DS   1
SWH   89285.711 Hz
FIDRES   20.023708 Hz
AQ   0.0499408 sec
RG   204.67
DW   5.600 usec
DE   6.50 usec
TE   298.0 K
D1   0.02000000 sec
TD0   1
SFO1   111.8979900 MHz
NUC1   119Sn
P0   4.03 usec
P1   12.10 usec
PLW1   12.00000000 W

F2 - Processing parameters
SI   4096
SF   111.9203740 MHz
WDW   EM
SSB   0
LB   0 Hz
GB   0
PC   1.40

Figure S45. ^{119}Sn-NMR spectrum of compound **10**.

^{119}Sn{^{1}H}-NMR of ([TbbSnH$_2$][Li{thf}$_x$]) in thf-d$_8$ at rt

−529
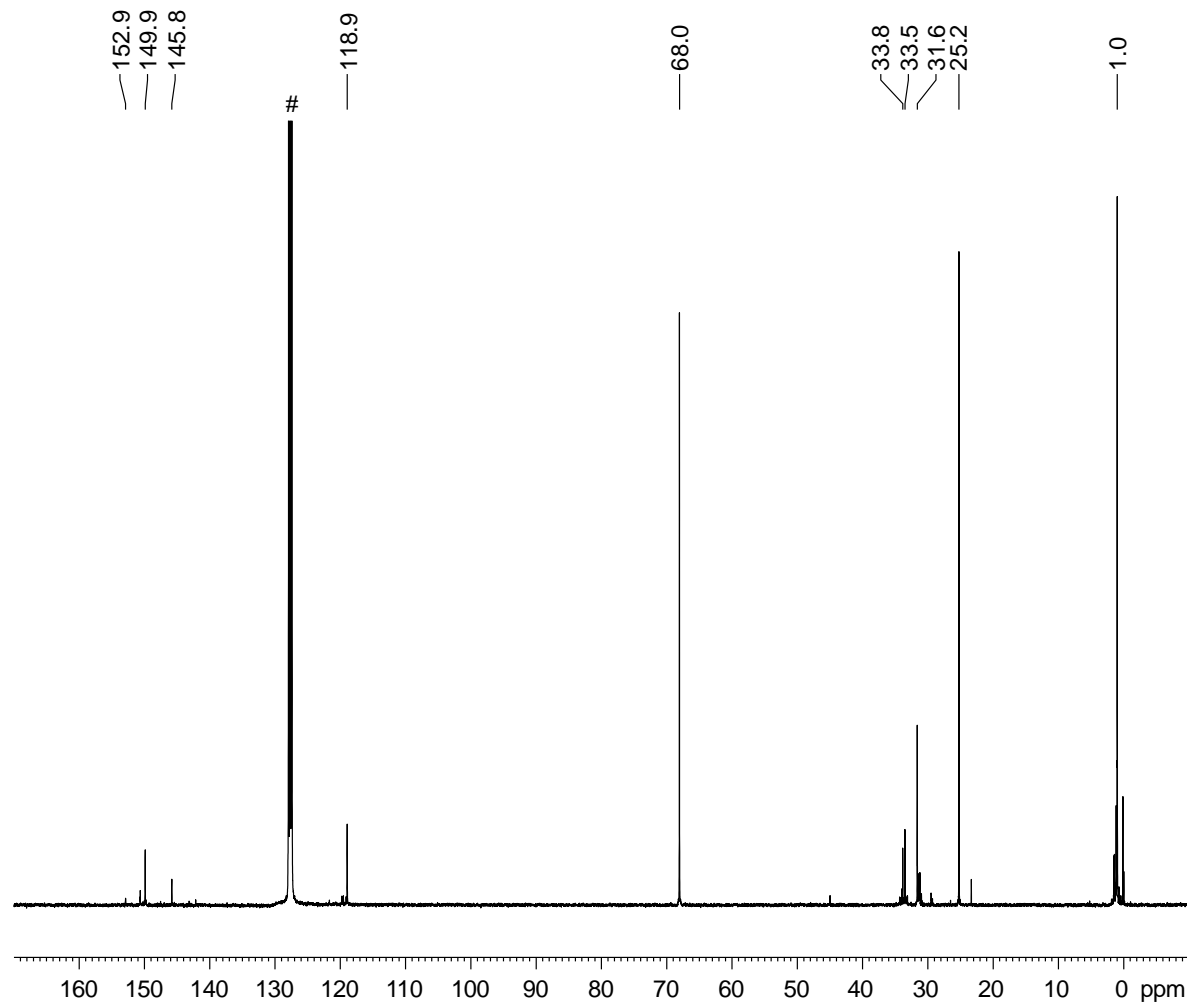
Current Data Parameters
NAME   MA320_28052020_300
EXPNO   22
PROCNO   1

F2 - Acquisition Parameters
Date_   20200528
Time   10.39 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zgig30
TD   39186
SOLVENT   THF
NS   2253
DS   4
SWH   89285.711 Hz
FIDRES   4.557021 Hz
AQ   0.2194416 sec
RG   204.67
DW   5.600 usec
DE   6.50 usec
TE   298.0 K
D1   0.10000000 sec
D11   0.03000000 sec
TD0   1
SFO1   111.8979898 MHz
NUC1   119Sn
P0   4.03 usec
P1   12.10 usec
PLW1   12.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
CPDPRG[2   waltz16
PCPD2   90.00 usec
PLW2   8.26509953 W
PLW12   0.20000000 W

F2 - Processing parameters
SI   65536
SF   111.9203738 MHz
WDW   EM
SSB   0
LB   100.00 Hz
GB   0
PC   1.40

-420 -440 -460 -480 -500 -520 -540 -560 -580 ppm

Figure S46. ^{119}Sn{^{1}H}-NMR spectrum of compound **10**.

NMR spectra of compound **11a**

6.91

3.82
3.49

2.55

1.41
1.39

0.30

2.02

2.00

2.00

9.02

36.05

7   6   5   4   3   2   1   0   ppm

Figure S47. ¹H-NMR spectrum of compound **11a**.

$^{13}C\{^1H\}$-NMR of ([TbbSnH$_2$][K{thf}$_x$]) in C$_6$D$_6$ (#) at rt

152.0
150.2
146.7
119.6
#
67.5
33.8
33.3
31.5
25.3
1.1

160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm

Figure S48. $^{13}C\{^1H\}$-NMR spectrum of compound **11a**.

²⁹Si-INEPTND-NMR of ([TbbSnH$_2$][K{thf}$_x$]) in thf-d$_8$ at rt

0.5
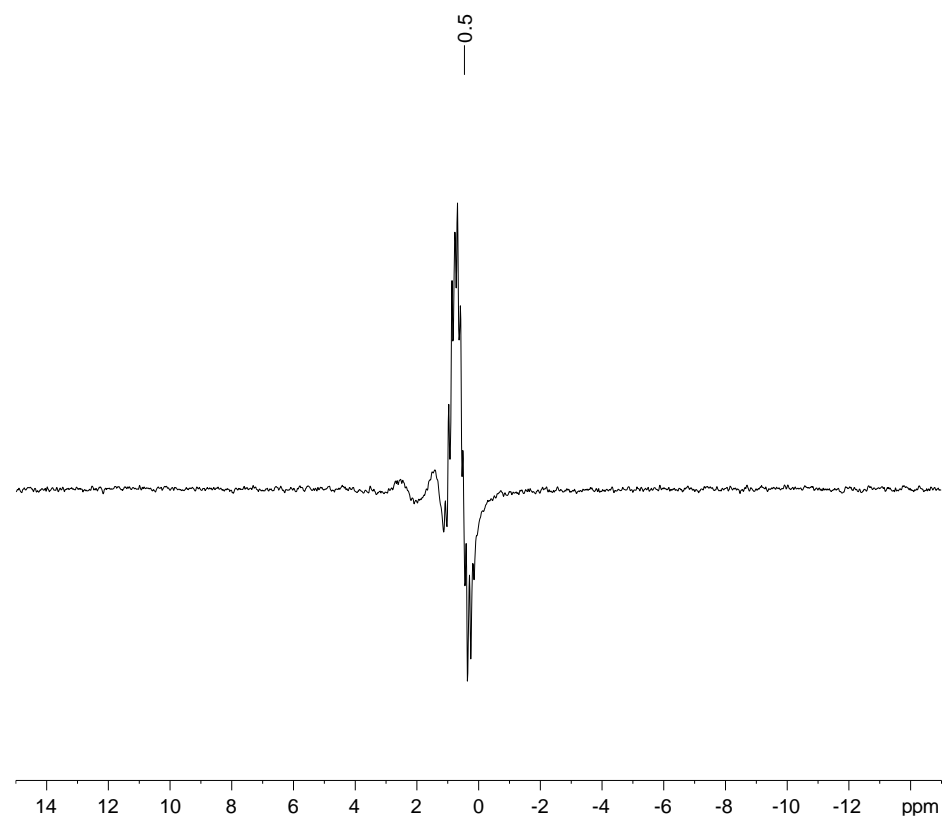
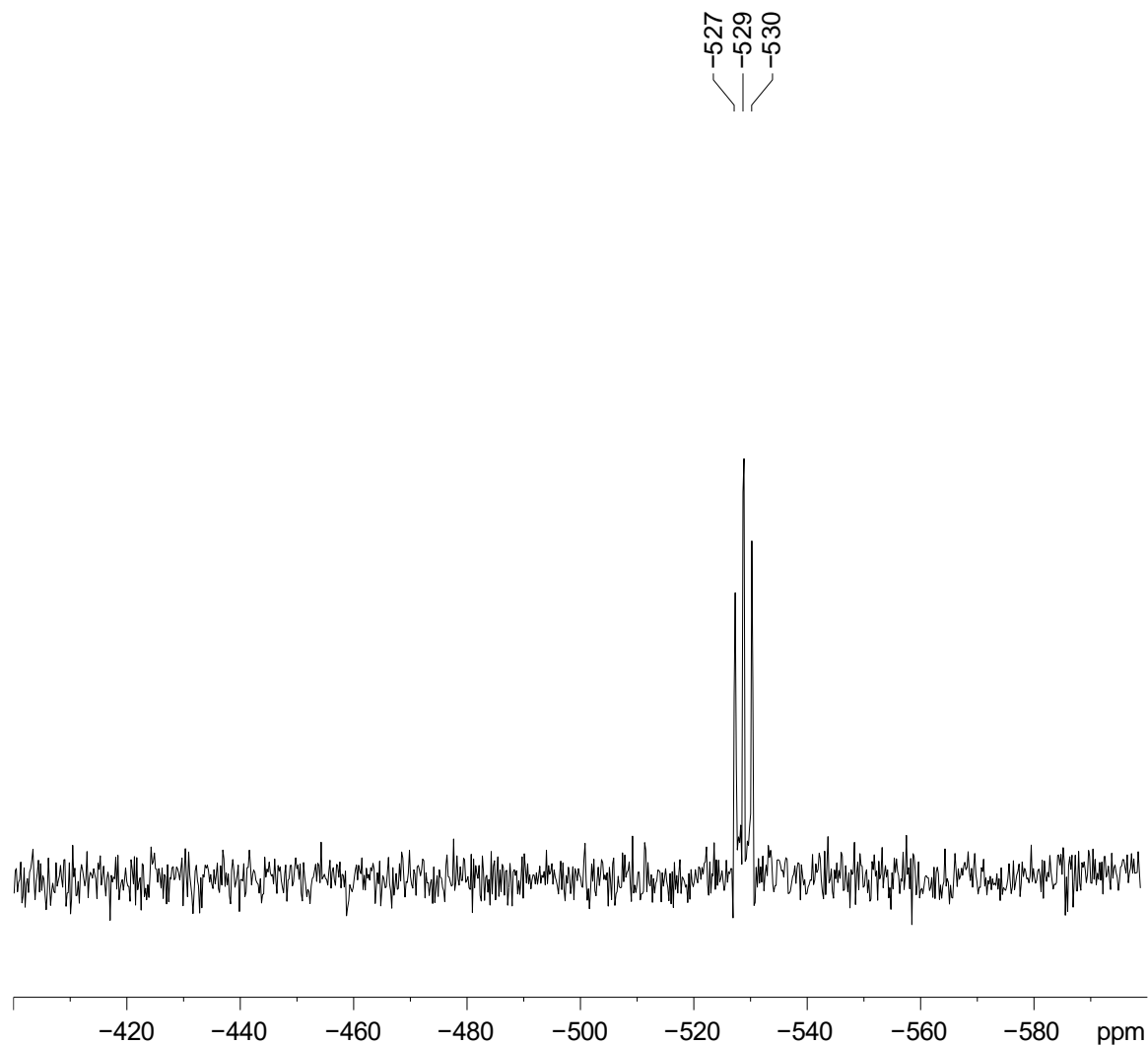Current Data Parameters
NAME   MA340_23062020_300
EXPNO   22
PROCNO   1

F2 - Acquisition Parameters
Date_   20200623
Time   11.25 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   ineptnd
TD   39048
SOLVENT   THF
NS   300
DS   0
SWH   26315.789 Hz
FIDRES   1.347869 Hz
AQ   0.7419120 sec
RG   204.67
DW   19.000 usec
DE   6.50 usec
TE   298.0 K
CNST2   6.5999999
D1   2.00000000 sec
D4   0.03787879 sec
TD0   1
SFO1   59.6229159 MHz
NUC1   29Si
P1   10.30 usec
P2   20.60 usec
PLW1   50.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
P3   14.00 usec
P4   28.00 usec
PLW2   8.26509953 W

F2 - Processing parameters
SI   32768
SF   59.6273880 MHz
WDW   EM
SSB   0
LB   2.00 Hz
GB   0
PC   1.00

Figure S49. ²⁹Si-INEPTND-NMR spectrum of compound **11a**.

^{119}Sn-NMR of ([TbbSnH$_2$][K{thf}$_x$]) in thf-d$_8$ at rt

−533
−534
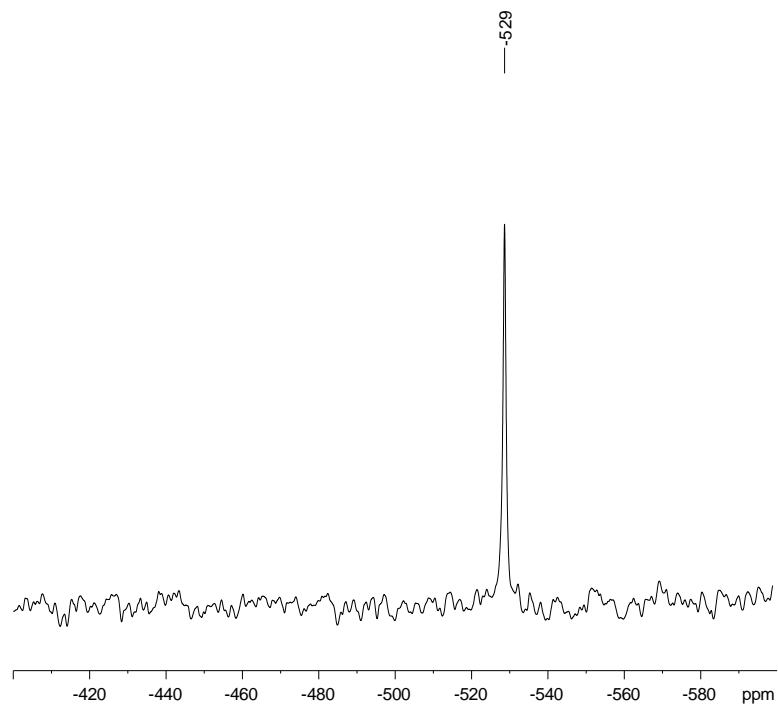−535

Current Data Parameters
NAME   MA340_23062020_300
EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
Date_   20200623
Time   9.26 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zg30
TD   8918
SOLVENT   THF
NS   16384
DS   1
SWH   89285.711 Hz
FIDRES   20.023708 Hz
AQ   0.0499408 sec
RG   204.67
DW   5.600 usec
DE   6.50 usec
TE   298.0 K
D1   0.02000000 sec
TD0   1
SFO1   111.8867979 MHz
NUC1   119Sn
P0   4.03 usec
P1   12.10 usec
PLW1   12.00000000 W

F2 - Processing parameters
SI   4096
SF   111.9203740 MHz
WDW   EM
SSB   0
LB   5.00 Hz
GB   0
PC   1.40

Figure S50. ^{119}Sn-NMR spectrum of compound **11a**.

$^{119}Sn\{^1H\}$-NMR of ($[TbbSnH_2][K\{thf\}_x]$) in thf-d_8 at rt

—534

Current Data Parameters
NAME   MA340_23062020_300
EXPNO   21
PROCNO   1

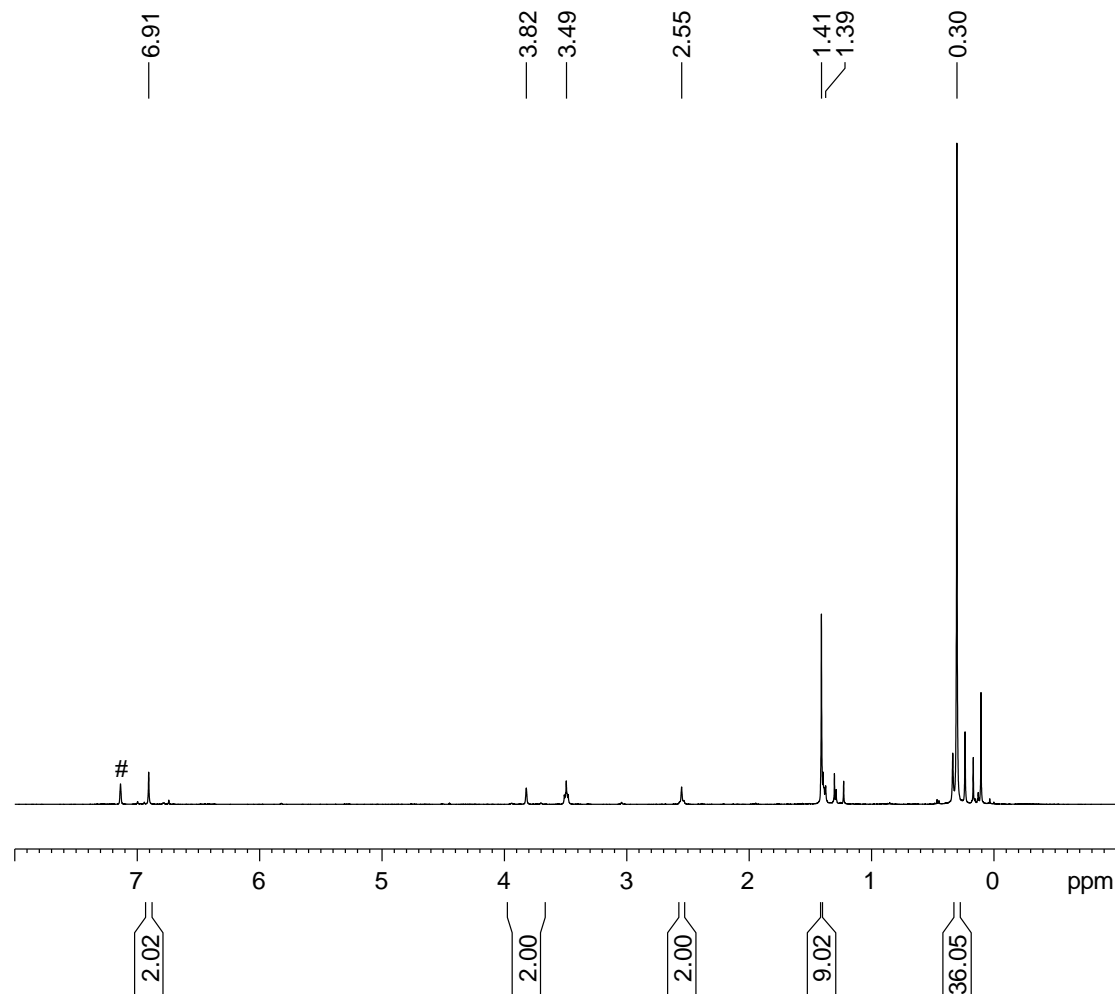F2 - Acquisition Parameters
Date_   20200623
Time   11.09 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zgig30
TD   39186
SOLVENT   THF
NS   2458
DS   4
SWH   89285.711 Hz
FIDRES   4.557021 Hz
AQ   0.2194416 sec
RG   204.67
DW   5.600 usec
DE   6.50 usec
TE   298.0 K
D1   0.10000000 sec
D11   0.03000000 sec
TD0   1
SFO1   111.8867977 MHz
NUC1   119Sn
P0   4.03 usec
P1   12.10 usec
PLW1   12.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
CPDPRG[2   waltz16
PCPD2   90.00 usec
PLW2   8.26509953 W
PLW12   0.20000000 W

F2 - Processing parameters
SI   65536
SF   111.9203738 MHz
WDW   EM
SSB   0
LB   100.00 Hz
GB   0
PC   1.40

-400   -450   -500   -550   -600   -650   ppm

Figure S51. $^{119}Sn\{^1H\}$-NMR spectrum of compound **11a**.

NMR spectra of compound 11b

^{1}H-NMR of ([TbbSnH$_2$][K{[18]crown-6}]) in C$_6$D$_6$ (#) at rt

7.01

4.41

3.20
3.18

1.52

0.42

#

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | ppm |

2.02

2.00

2.03
24.00

9.06

36.08

Current Data Parameters
NAME   MA346_01072020_400N
EXPNO   10
PROCNO   1

F2 - Acquisition Parameters
Date_   20200701
Time   15.20
INSTRUM   spect
PROBHD   5 mm QNP 1H/13
PULPROG   zg30
TD   52656
SOLVENT   C6D6
NS   16
DS   0
SWH   8305.647 Hz
FIDRES   0.157734 Hz
AQ   3.1698911 sec
RG   90.5
DW   60.200 usec
DE   6.00 usec
TE   299.2 K
D1   1.00000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   1H
P1   14.60 usec
PL1   -3.00 dB
PL1W   16.03799057 W
SFO1   400.1120007 MHz

F2 - Processing parameters
SI   65536
SF   400.1100000 MHz
WDW   EM
SSB   0
LB   0 Hz
GB   0
PC   1.00

Figure S52. ^{1}H-NMR spectrum of compound **11b**.

$^{13}C\{^1H\}$-NMR of ([TbbSnH$_2$][K{[18]crown-6}]) in C$_6$D$_6$ (#) at rt

157.9
149.8
144.9
118.4
#
69.7
33.8
33.3
31.8
1.1
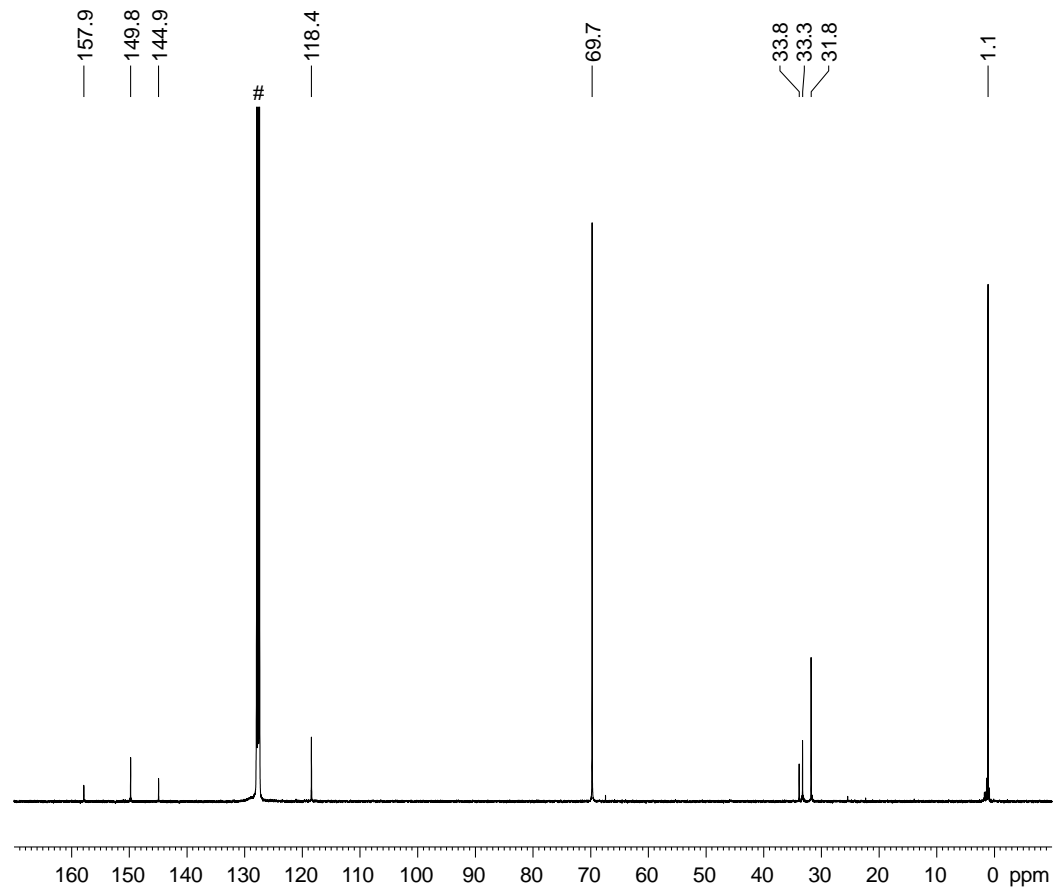
Current Data Parameters
NAME   MA346_01072020_400N
EXPNO   12
PROCNO   1

F2 - Acquisition Parameters
Date_   20200702
Time   2.09
INSTRUM   spect
PROBHD 5 mm QNP 1H/13
PULPROG   zgpg30
TD   53700
SOLVENT   C6D6
NS   11264
DS   0
SWH   30864.197 Hz
FIDRES   0.574752 Hz
AQ   0.8699400 sec
RG   32800
DW   16.200 usec
DE   6.00 usec
TE   299.2 K
D1   1.00000000 sec
D11   0.03000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   13C
P1   13.50 usec
PL1   -4.16 dB
PL1W   78.55633545 W
SFO1   100.6198135 MHz

======== CHANNEL f2 ========
CPDPRG[2   waltz16
NUC2   1H
PCPD2   80.00 usec
PL2   -3.00 dB
PL12   11.77 dB
PL13   13.14 dB
PL2W   16.03799057 W
PL12W   0.53474891 W
PL13W   0.39007664 W
SFO2   400.1120007 MHz

F2 - Processing parameters
SI   65536
SF   100.6077400 MHz
WDW   EM
SSB   0
LB   1.00 Hz
GB   0
PC   1.40

Figure S53. $^{13}C\{^1H\}$-NMR spectrum of compound **11b**.

^{29}Si-INEPTND-NMR of ([TbbSnH$_2$][K{[18]crown-6}]) in C$_6$D$_6$ at rt
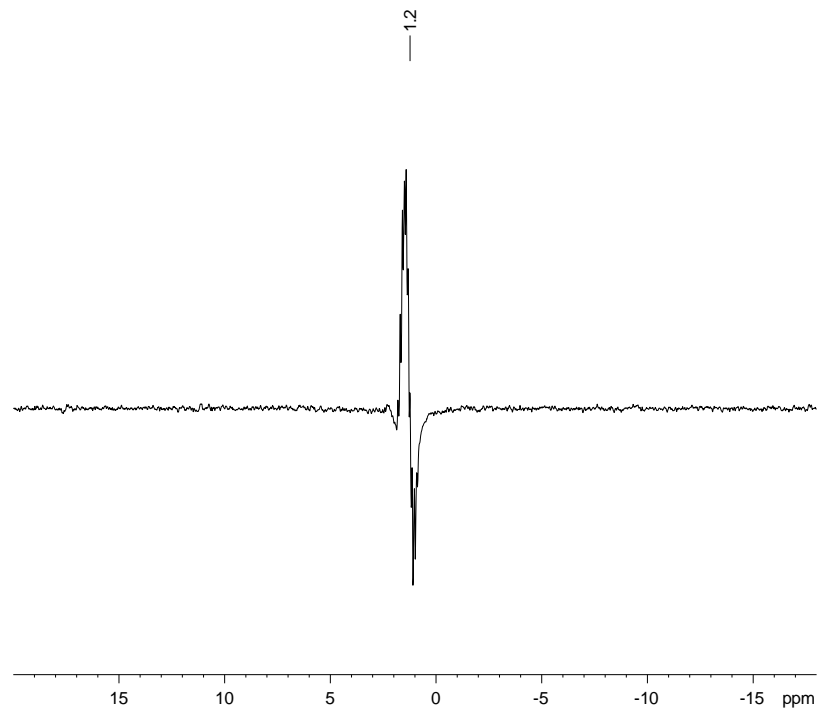
1.2

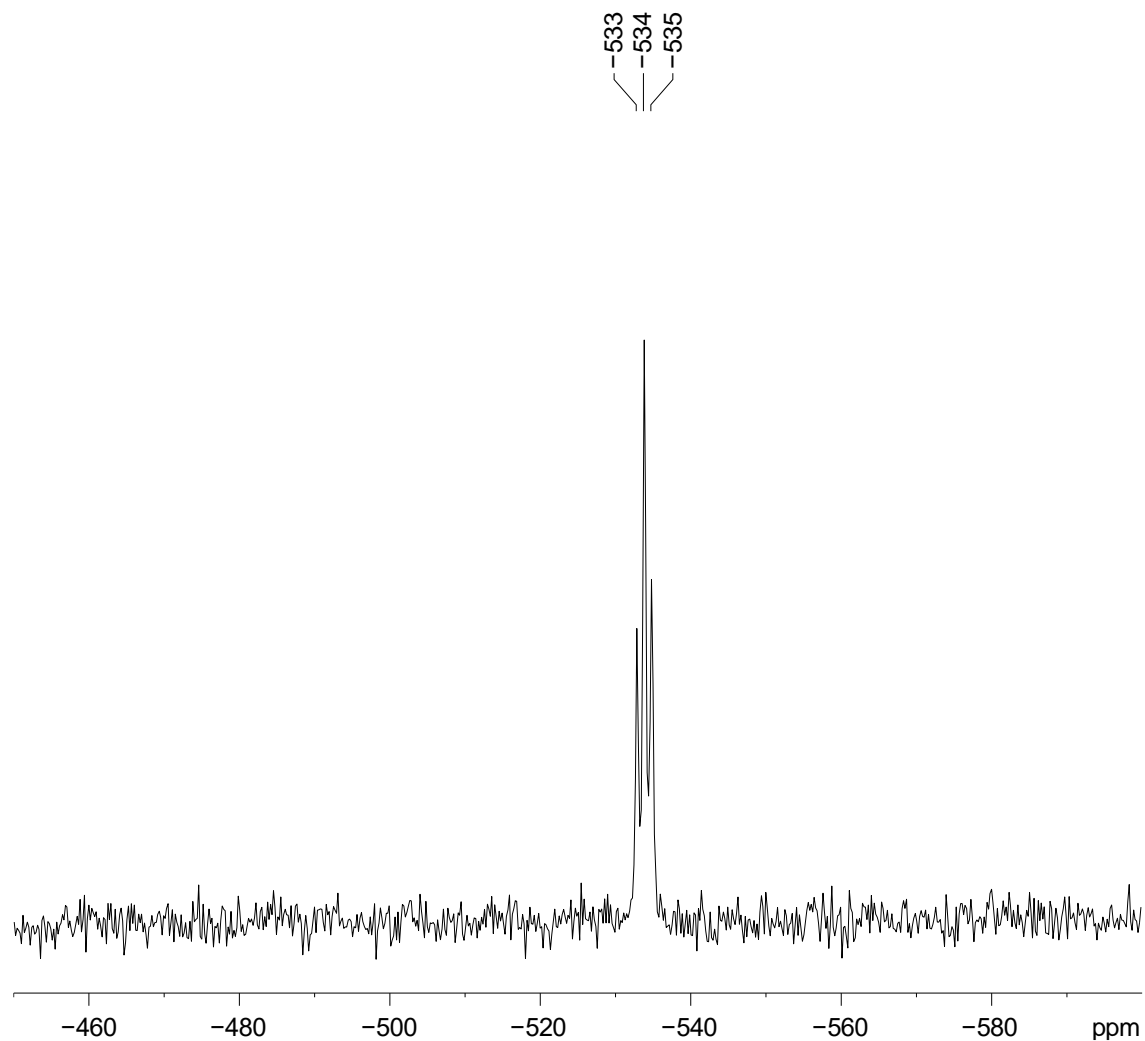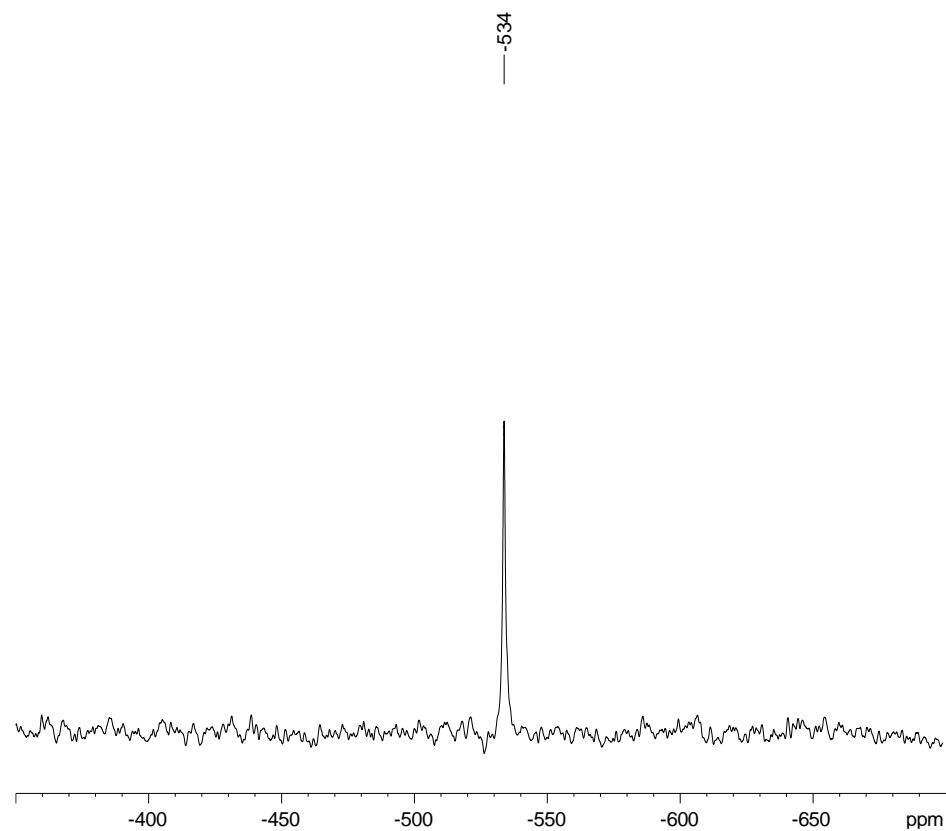Current Data Parameters
NAME   MA346_02072020_300
EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
Date_   20200702
Time   8.13 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   ineptnd
TD   39048
SOLVENT   C6D6
NS   320
DS   0
SWH   26315.789 Hz
FIDRES   1.347869 Hz
AQ   0.7419120 sec
RG   204.67
DW   19.000 usec
DE   6.50 usec
TE   298.0 K
CNST2   6.5999999
D1   2.00000000 sec
D4   0.03787879 sec
TD0   1
SFO1   59.6229159 MHz
NUC1   29Si
P1   10.30 usec
P2   20.60 usec
PLW1   50.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
P3   14.00 usec
P4   28.00 usec
PLW2   8.26509953 W

F2 - Processing parameters
SI   32768
SF   59.6273582 MHz
WDW   EM
SSB   0
LB   2.00 Hz
GB   0
PC   1.00

Figure S54. ^{29}Si-INEPTND-NMR spectrum of compound **11b**.

^{119}Sn-NMR of ([TbbSnH$_2$][K{[18]crown-6}]) in C$_6$D$_6$ at rt

−523
−524
−525

Current Data Parameters
NAME   MA346_01072020_300
EXPNO   11
PROCNO   1
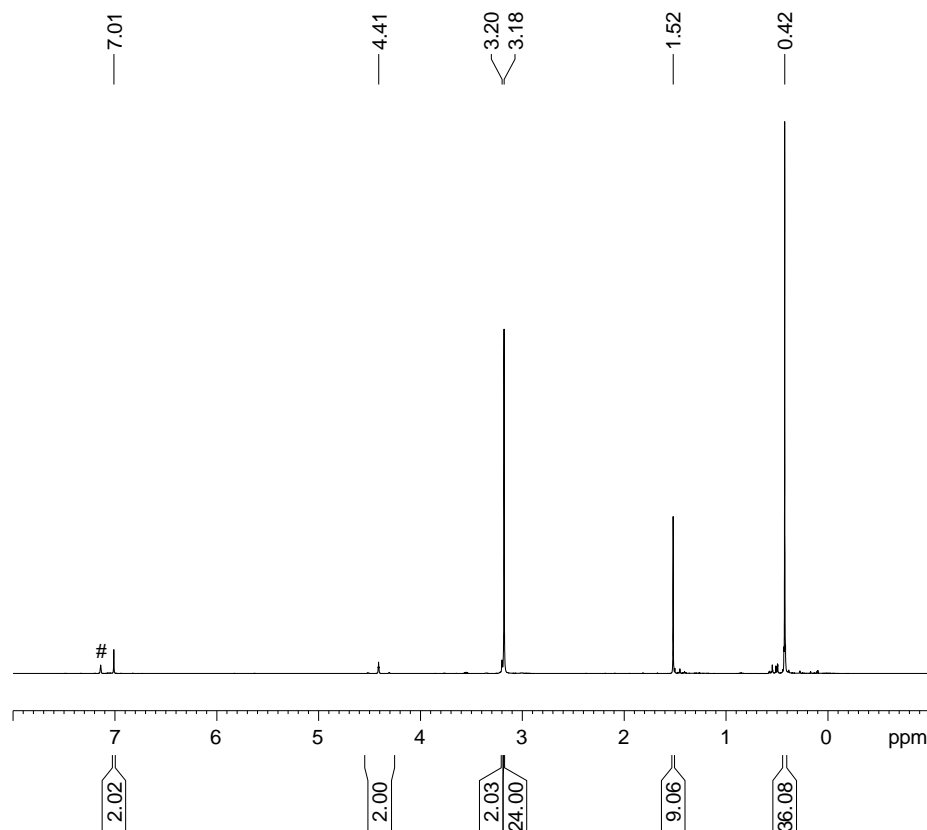
F2 - Acquisition Parameters
Date_   20200701
Time   14.31 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zg30
TD   8918
SOLVENT   C6D6
NS   16384
DS   1
SWH   89285.711 Hz
FIDRES   20.023708 Hz
AQ   0.0499408 sec
RG   204.67
DW   5.600 usec
DE   6.50 usec
TE   298.0 K
D1   0.02000000 sec
TD0   1
SFO1   111.8867979 MHz
NUC1   119Sn
P0   4.03 usec
P1   12.10 usec
PLW1   12.00000000 W

F2 - Processing parameters
SI   4096
SF   111.9203740 MHz
WDW   EM
SSB   0
LB   3.00 Hz
GB   0
PC   1.40

−460   −480   −500   −520   −540   −560   −580   ppm

Figure S55. ^{119}Sn-NMR spectrum of compound **11b**.

^{119}Sn{^{1}H}-NMR of ([TbbSnH$_2$][K{[18]crown-6}]) in C$_6$D$_6$ at rt

−524

Current Data Parameters
NAME   MA346_02072020_300
EXPNO   10
PROCNO   1

F2 - Acquisition Parameters
Date_   20200702
Time   7.57 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zgig30
TD   39186
SOLVENT   C6D6
NS   2458
DS   4
SWH   89285.711 Hz
FIDRES   4.557021 Hz
AQ   0.2194416 sec
RG   204.67
DW   5.600 usec
DE   6.50 usec
TE   298.0 K
D1   0.10000000 sec
D11   0.03000000 sec
TD0   1
SFO1   111.8867977 MHz
NUC1   119Sn
P0   4.03 usec
P1   12.10 usec
PLW1   12.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
CPDPRG[2   waltz16
PCPD2   90.00 usec
PLW2   8.26509953 W
PLW12   0.20000000 W

F2 - Processing parameters
SI   65536
SF   111.9203738 MHz
WDW   EM
SSB   0
LB   100.00 Hz
GB   0
PC   1.40

-400   -450   -500   -550   -600   -650   ppm

Figure S56. ^{119}Sn{^{1}H}-NMR spectrum of compound **11b**.

NMR spectra of compound 12

^{1}H-NMR of [TbbSnH$_2$][Al(OC{CF$_3$}$_3$)$_4$] in toluene-d$_8$ (#) + 1,2-difluorobenzene (*) at −40 °C, +: HCPh$_3$
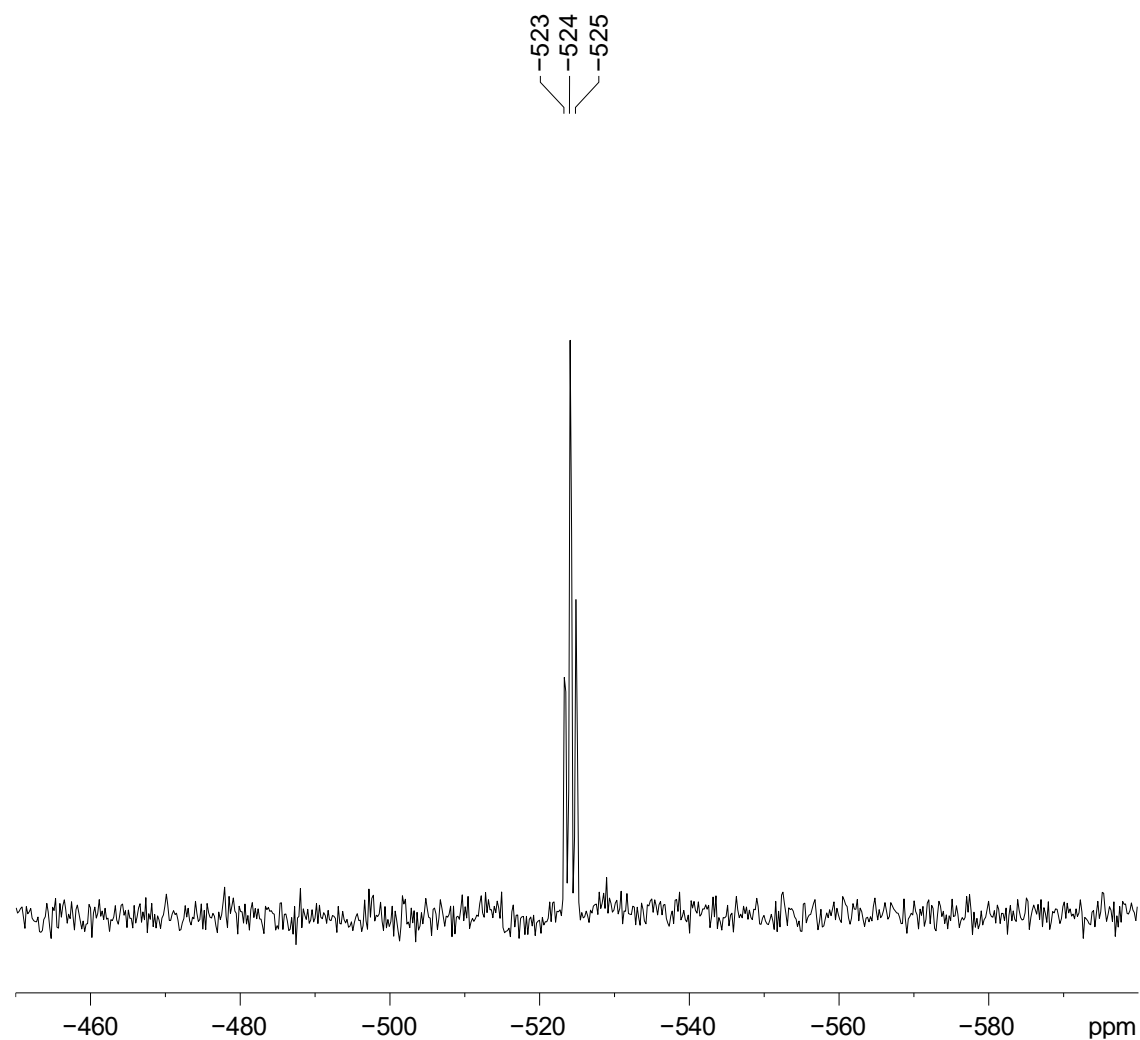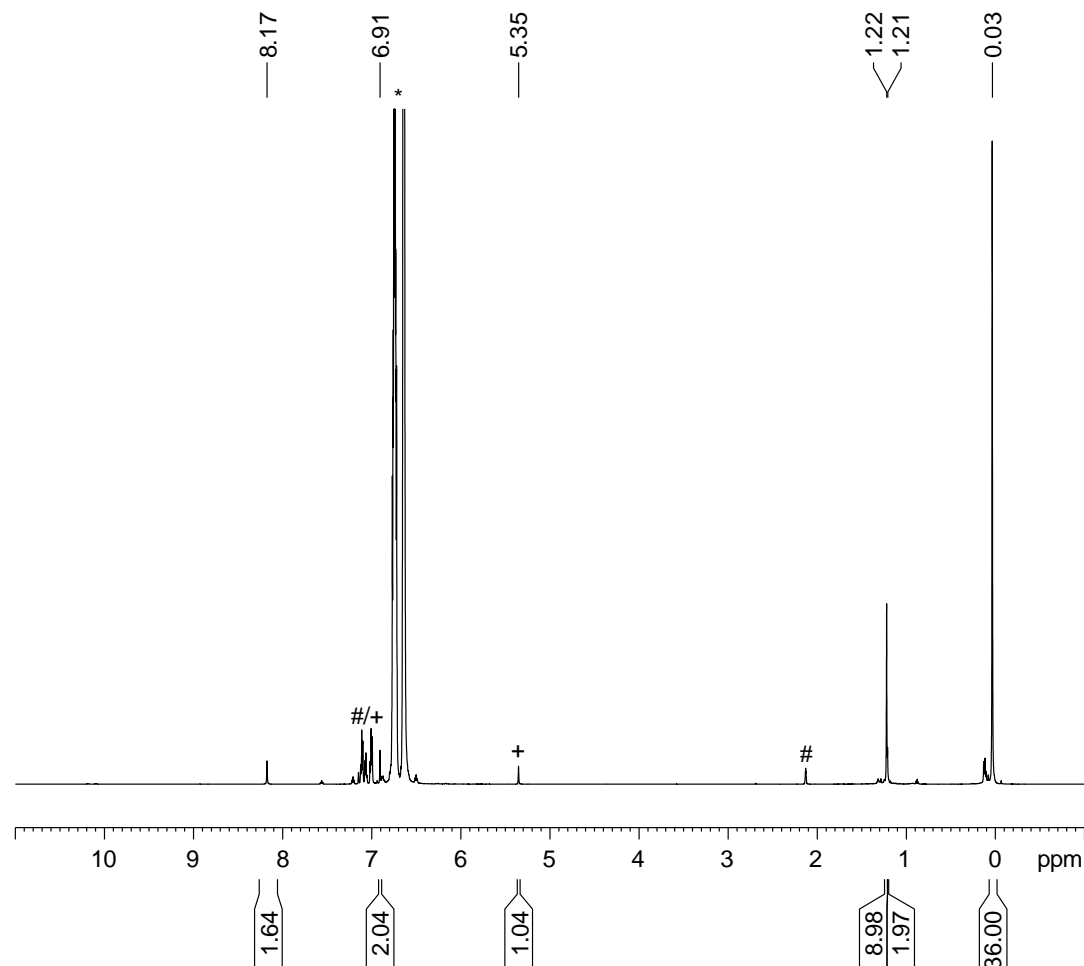

Current Data Parameters
NAME   MA241_18022020_600TT
EXPNO   10
PROCNO   1

F2 - Acquisition Parameters
Date_   20200218
Time   9.03 h
INSTRUM   spect
PROBHD   Z126545_0027 (
PULPROG   zg30
TD   65536
SOLVENT   Tol
NS   32
DS   2
SWH   12019.230 Hz
FIDRES   0.366798 Hz
AQ   2.7262976 sec
RG   8.13
DW   41.600 usec
DE   10.00 usec
TE   234.1 K
D1   1.00000000 sec
TD0   1
SFO1   600.1337058 MHz
NUC1   1H
P1   12.00 usec
PLW1   23.41200066 W

F2 - Processing parameters
SI   65536
SF   600.1300000 MHz
WDW   EM
SSB   0
LB   0.30 Hz
GB   0
PC   1.00

Figure S57. ^{1}H-NMR spectrum of compound **12**.

^{13}C{^{1}H}-NMR of [TbbSnH$_2$][Al(OC{CF$_3$}$_3$)$_4$] in toluene-d$_8$ (#) + 1,2-difluorobenzene (*) at −40 °C, +: HCPh$_3$

Peak labels: 156.5, 151.0, 136.3, 122.3, 121.8, 79.4, 34.5, 33.9, 30.1, −0.5
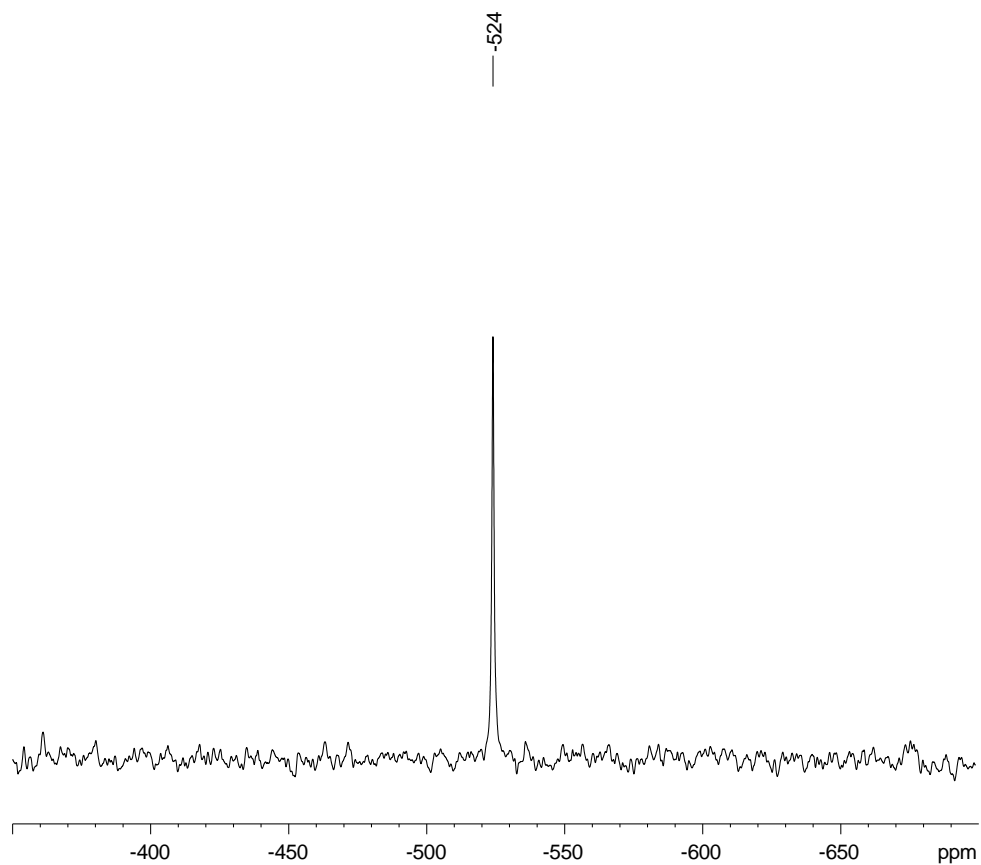
Current Data Parameters
NAME   MA241_18022020_600T
EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
Date_   20200218
Time   10.33 h
INSTRUM   spect
PROBHD Z126545_0027 (
PULPROG   udeft
TD   25902
SOLVENT   Tol
NS   1024
DS   8
SWH   36231.883 Hz
FIDRES   2.797613 Hz
AQ   0.3574476 sec
RG   189.6
DW   13.800 usec
DE   18.00 usec
TE   234.1 K
D1   4.00000000 sec
D12   0.00002000 sec
D20   20.00000000 sec
TD0   1
SFO1   150.9178988 MHz
NUC1   13C
P1   10.00 usec
P13   2000.00 usec
P26   500.00 usec
PLW1   57.02700043 W
SPNAM[5]   Crp60comp.4
SPOAL5   0.500
SPOFFS5   0 Hz
SPW5   8.71310043 W
SPNAM[8] Crp60,0.5,20.1
SPOAL8   0.500
SPOFFS8   0 Hz
SPW8   8.71310043 W
SFO2   600.1324005 MHz
NUC2   1H
CPDPRG[2   waltz16
PCPD2   70.00 usec
PLW2   23.41200066 W
PLW12   0.68803000 W

F2 - Processing parameters
SI   131072
SF   150.9028085 MHz
WDW   EM
SSB   0
LB   2.00 Hz
GB   0
PC   1.40

Figure S58. ^{13}C{^{1}H}-NMR spectrum of compound **12**.

^{19}F{^{1}H}-NMR of [TbbSnH$_2$][Al(OC{CF$_3$}$_3$)$_4$] in toluene-d$_8$ + 1,2-difluorobenzene (#) at −40 °C

−-75.1

\#

Current Data Parameters
NAME   MA241_18022020_600TT
EXPNO   17
PROCNO   1

F2 - Acquisition Parameters
Date_   20200218
Time   14.43 h
INSTRUM   spect
PROBHD   Z126545_0027 (
PULPROG   zgflqn
TD   131072
SOLVENT   Tol
NS   32
DS   4
SWH   133928.578 Hz
FIDRES   2.043588 Hz
AQ   0.4893355 sec
RG   116.78
DW   3.733 usec
DE   18.00 usec
TE   234.0 K
D1   1.00000000 sec
TD0   1
SFO1   564.6299196 MHz
NUC1   19F
P1   15.00 usec
PLW1   27.71999931 W

F2 - Processing parameters
SI   65536
SF   564.6863882 MHz
WDW   EM
SSB   0
LB   0.30 Hz
GB   0
PC   1.00

-40	-60	-80	-100	-120	-140	-160	ppm

Figure S59. ^{19}F{^{1}H}-NMR spectrum of compound **12**.

^{27}Al-NMR of [TbbSnH$_2$][Al(OC{CF$_3$}$_3$)$_4$] in toluene-d$_8$ + 1,2-difluorobenzene at −40 °C

37.1

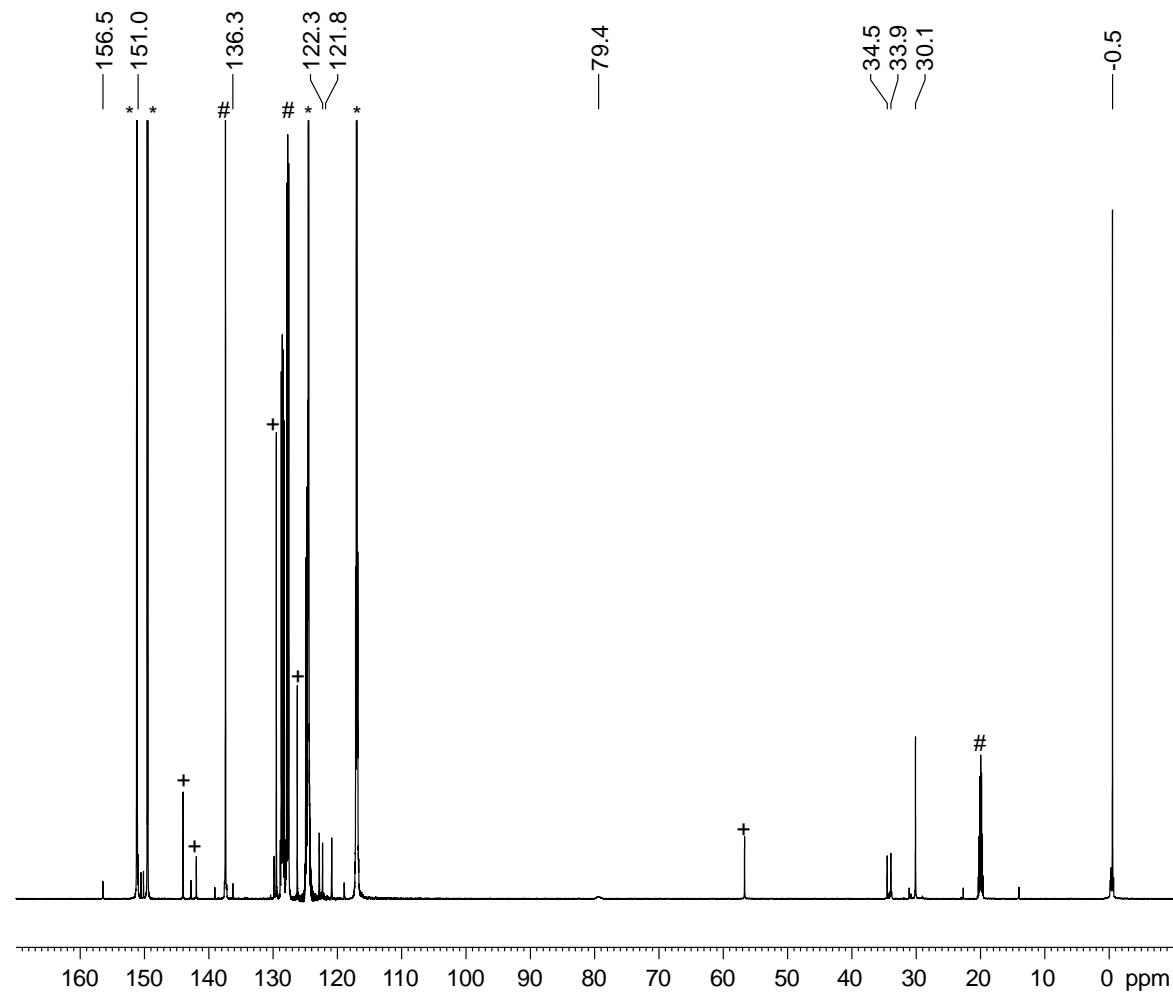Current Data Parameters
NAME   MA241_18022020_600TT
EXPNO   18
PROCNO   1

F2 - Acquisition Parameters
Date_   20200218
Time   14.45 h
INSTRUM   spect
PROBHD Z126545_0027 (
PULPROG   zg
TD   16384
SOLVENT   Tol
NS   32
DS   4
SWH   62500.000 Hz
FIDRES   7.629395 Hz
AQ   0.1310720 sec
RG   189.6
DW   8.000 usec
DE   18.00 usec
TE   233.9 K
D1   1.00000000 sec
TD0   1
SFO1   156.3750279 MHz
NUC1   27Al
P1   11.50 usec
PLW1   60.00000000 W

F2 - Processing parameters
SI   32768
SF   156.3750279 MHz
WDW   EM
SSB   0
LB   1.00 Hz
GB   0
PC   1.40

Figure S60. ^{27}Al-NMR spectrum of compound **12**.

²⁹Si-INEPTND-NMR of [TbbSnH$_2$][Al(OC{CF$_3$}$_3$)$_4$] in toluene-d$_8$ + 1,2-difluorobenzene at −40 °C
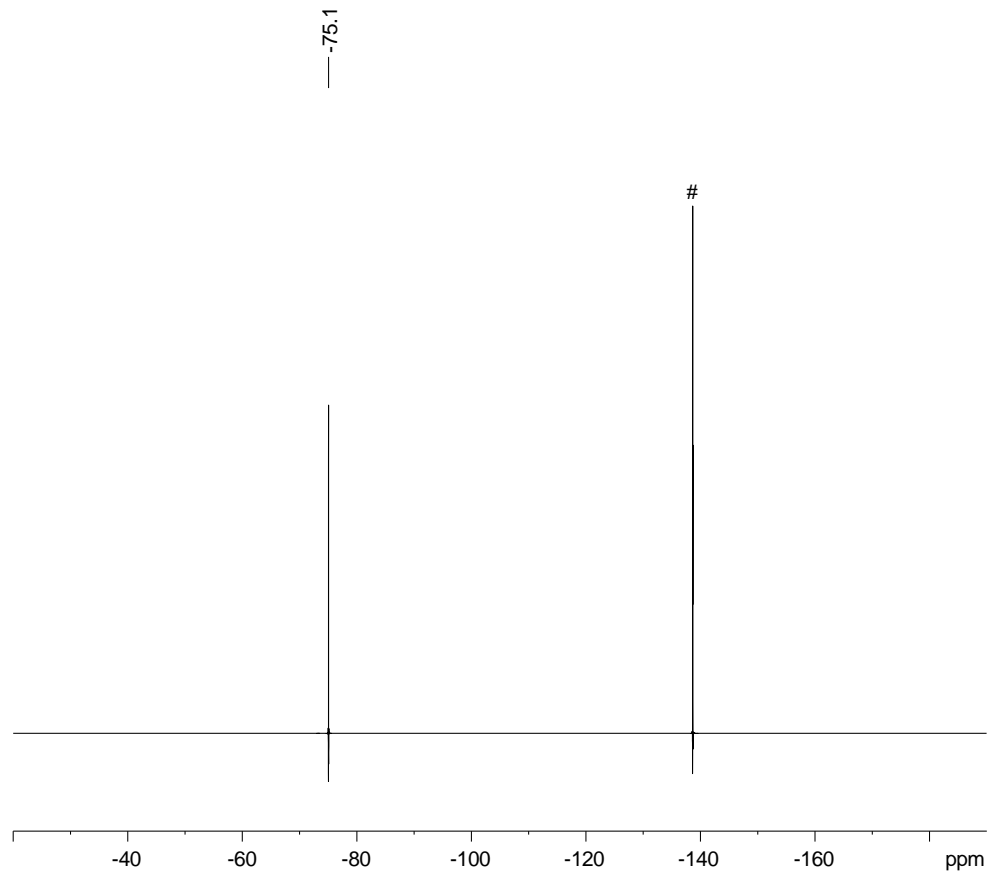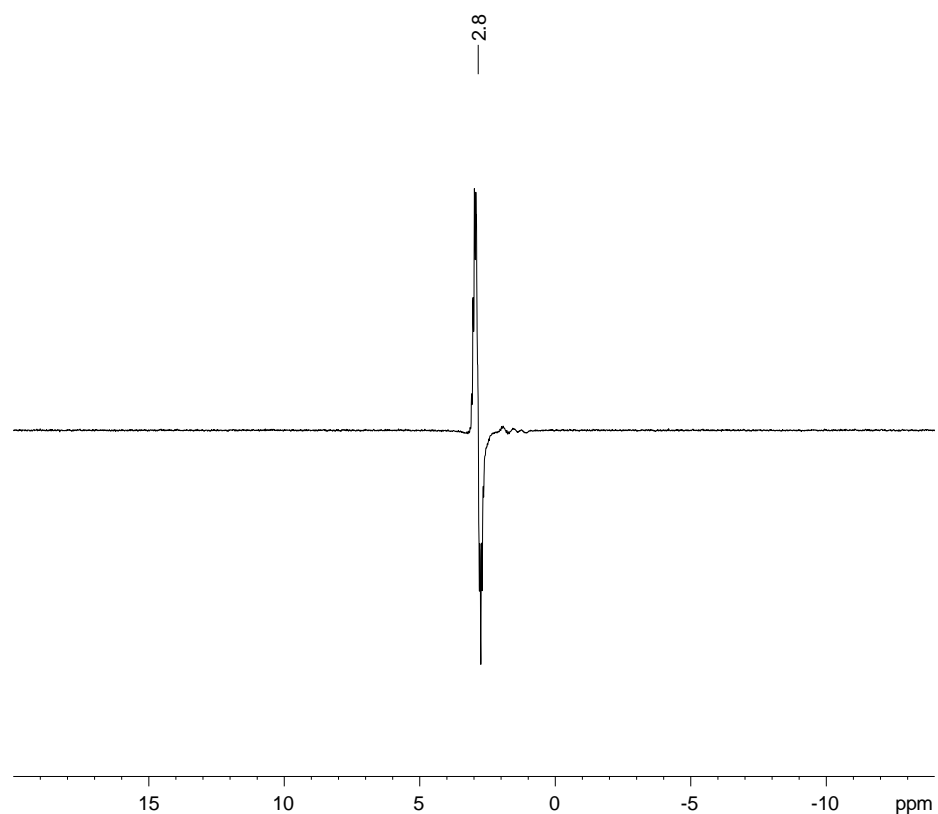

Current Data Parameters
NAME   MA241_18022020_600TT
EXPNO   16
PROCNO   1

F2 - Acquisition Parameters
Date_   20200218
Time   14.40 h
INSTRUM   spect
PROBHD Z126545_0027 (
PULPROG   ineptnd
TD   16384
SOLVENT   Tol
NS   128
DS   16
SWH   19132.652 Hz
FIDRES   2.335529 Hz
AQ   0.4281685 sec
RG   189.6
DW   26.133 usec
DE   18.00 usec
TE   233.9 K
CNST2   6.5999999
D1   5.00000000 sec
D4   0.03787879 sec
TD0   1
SFO1   119.2289493 MHz
NUC1   29Si
P1   14.50 usec
P2   29.00 usec
PLW1   50.00000000 W
SFO2   600.1324005 MHz
NUC2   1H
P3   12.00 usec
P4   24.00 usec
PLW2   23.41200066 W

F2 - Processing parameters
SI   32768
SF   119.2289493 MHz
WDW   EM
SSB   0
LB   1.00 Hz
GB   0
PC   4.00

Figure S61. ²⁹Si-INEPTND-NMR spectrum of compound **12**.

¹¹⁹Sn-NMR of [TbbSnH$_2$][Al(OC{CF$_3$}$_3$)$_4$] in toluene-d$_8$ + 1,2-difluorobenzene at −40 °C

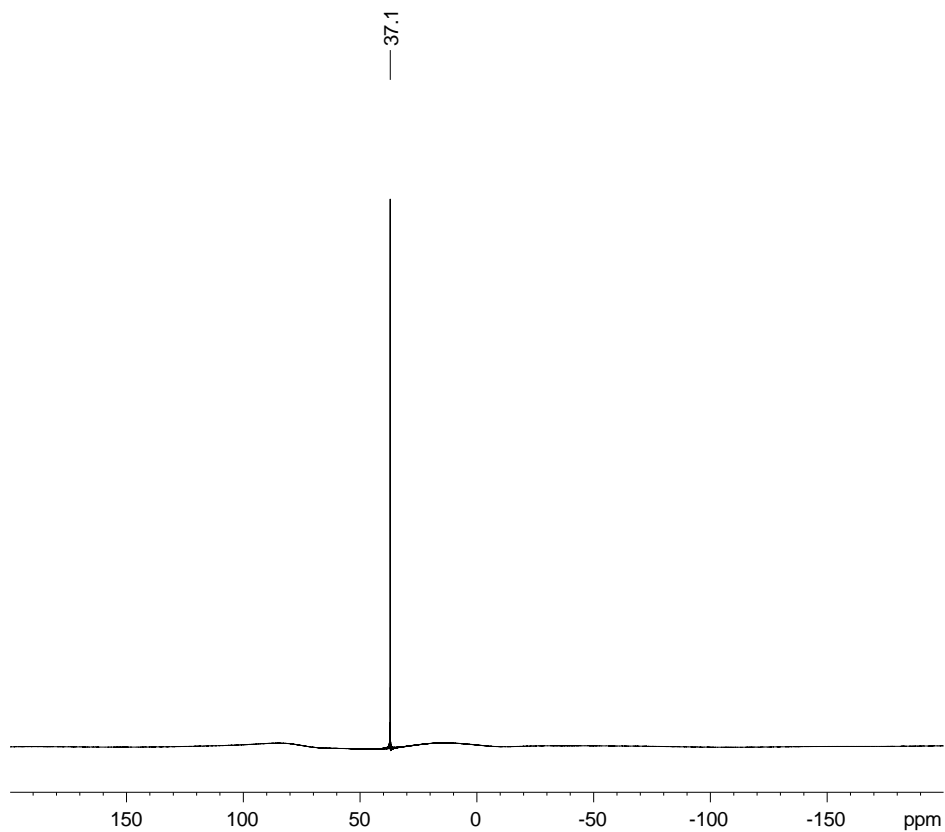

Current Data Parameters
NAME   MA241_17022020_500TT
EXPNO   8
PROCNO   1

F2 - Acquisition Parameters
Date_   20200217
Time   12.14
INSTRUM   spect
PROBHD   5 mm TBO BB-1H
PULPROG   zg30
TD   65536
SOLVENT   Tol
NS   32893
DS   0
SWH   93750.000 Hz
FIDRES   1.430511 Hz
AQ   0.3495253 sec
RG   2050
DW   5.333 usec
DE   6.00 usec
TE   233.1 K
D1   0.20000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   119Sn
P1   11.93 usec
PL1   3.00 dB
PL1W   45.32131577 W
SFO1   186.5389383 MHz

F2 - Processing parameters
SI   131072
SF   186.5016380 MHz
WDW   EM
SSB   0
LB   350.00 Hz
GB   0
PC   1.40

Figure S62. ¹¹⁹Sn-NMR spectrum of compound **12**.

^{119}Sn{^{1}H}-NMR of [TbbSnH$_2$][Al(OC{CF$_3$}$_3$)$_4$] in toluene-d$_8$ + 1,2-difluorobenzene at −40 °C

96

Current Data Parameters
NAME   MA241_24022020_500
EXPNO   5
PROCNO   1

F2 - Acquisition Parameters
Date_   20200224
Time   15.11
INSTRUM   spect
PROBHD   5 mm TBO BB-1H
PULPROG   zgig30
TD   65536
SOLVENT   Tol
NS   16279
DS   0
SWH   150000.000 Hz
FIDRES   2.288818 Hz
AQ   0.2184533 sec
RG   2050
DW   3.333 usec
DE   6.00 usec
TE   233.4 K
D1   0.20000000 sec
D11   0.03000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   119Sn
P1   11.93 usec
PL1   3.00 dB
PL1W   45.32131577 W
SFO1   186.5296132 MHz

======== CHANNEL f2 ========
CPDPRG[2   waltz16
NUC2   1H
PCPD2   80.00 usec
PL2   -0.52 dB
PL12   15.00 dB
PL2W   24.34997177 W
PL12W   0.68312228 W
SFO2   500.1320005 MHz

F2 - Processing parameters
SI   65536
SF   186.5016380 MHz
WDW   EM
SSB   0
LB   350.00 Hz
GB   0
PC   1.40

350   300   250   200   150   100   50   0   -50   ppm

Figure S63. ^{119}Sn{^{1}H}-NMR spectrum of compound **12**.

NMR spectra of compound **13**

^{1}H-NMR of [TbbSnH$_2$(thf)$_2$][Al(OC{CF$_3$}$_3$)$_4$] in C$_6$D$_6$(#) + 1,2-difluorobenzene (*) at rt
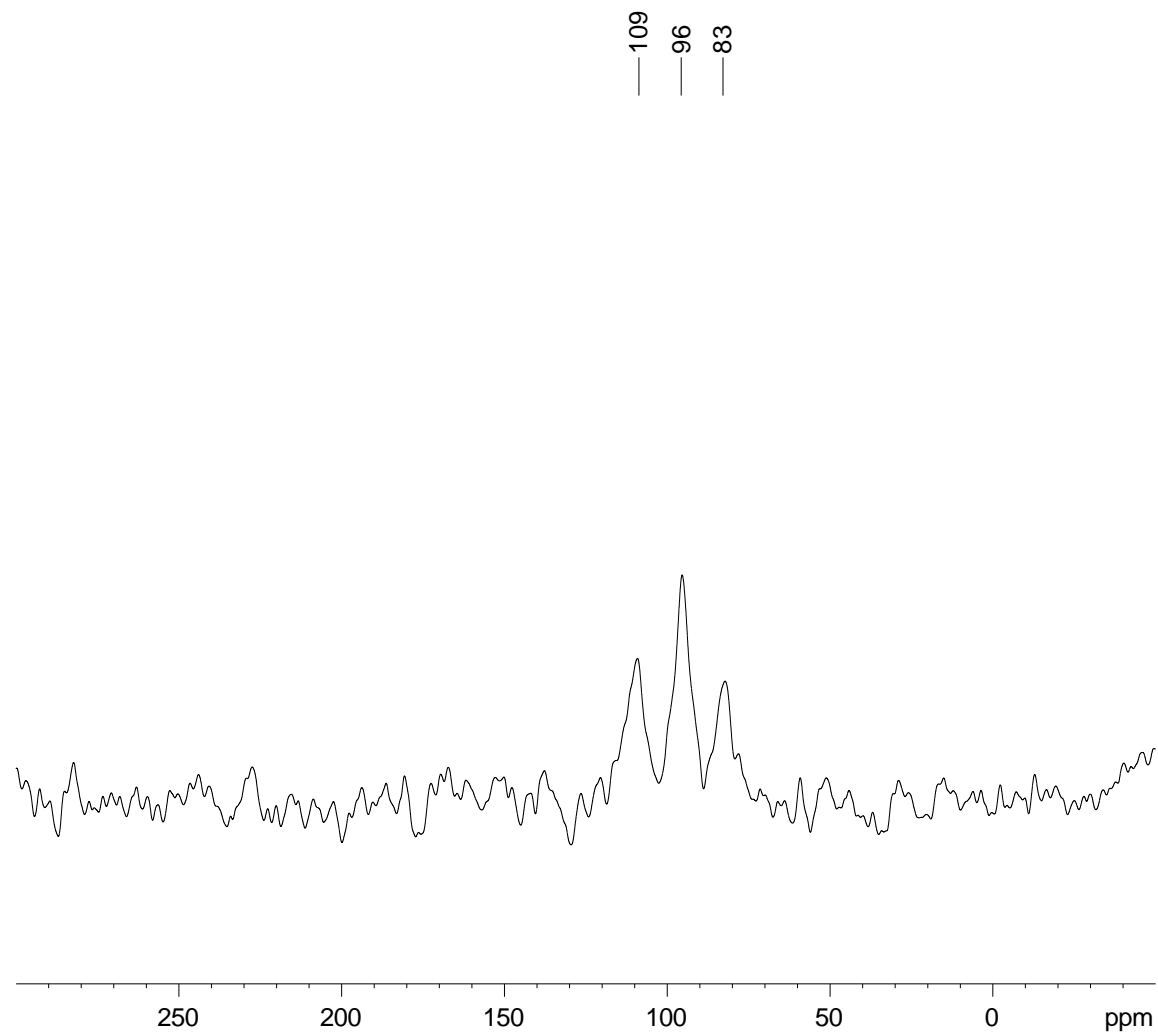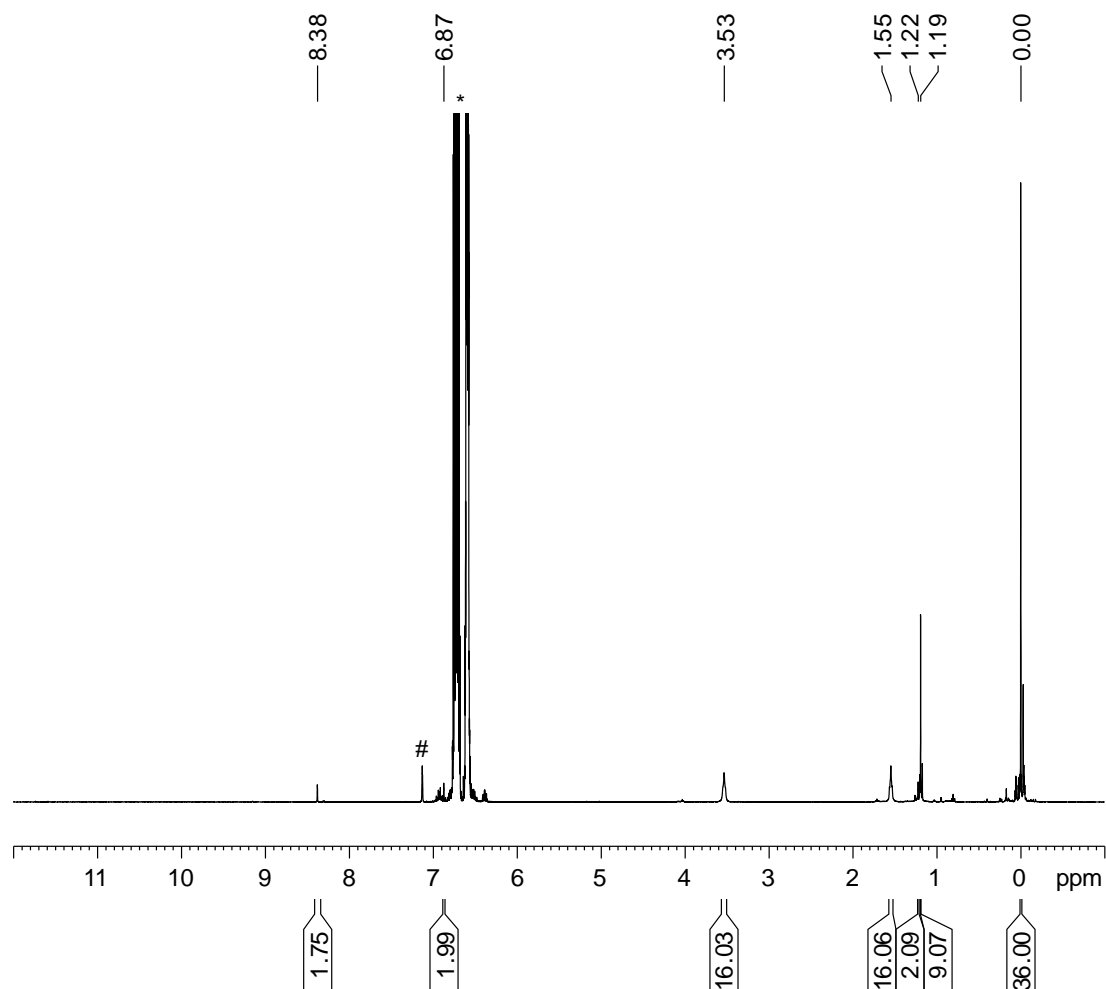
Current Data Parameters
NAME   MA246_08042020_400N
EXPNO   16
PROCNO   1
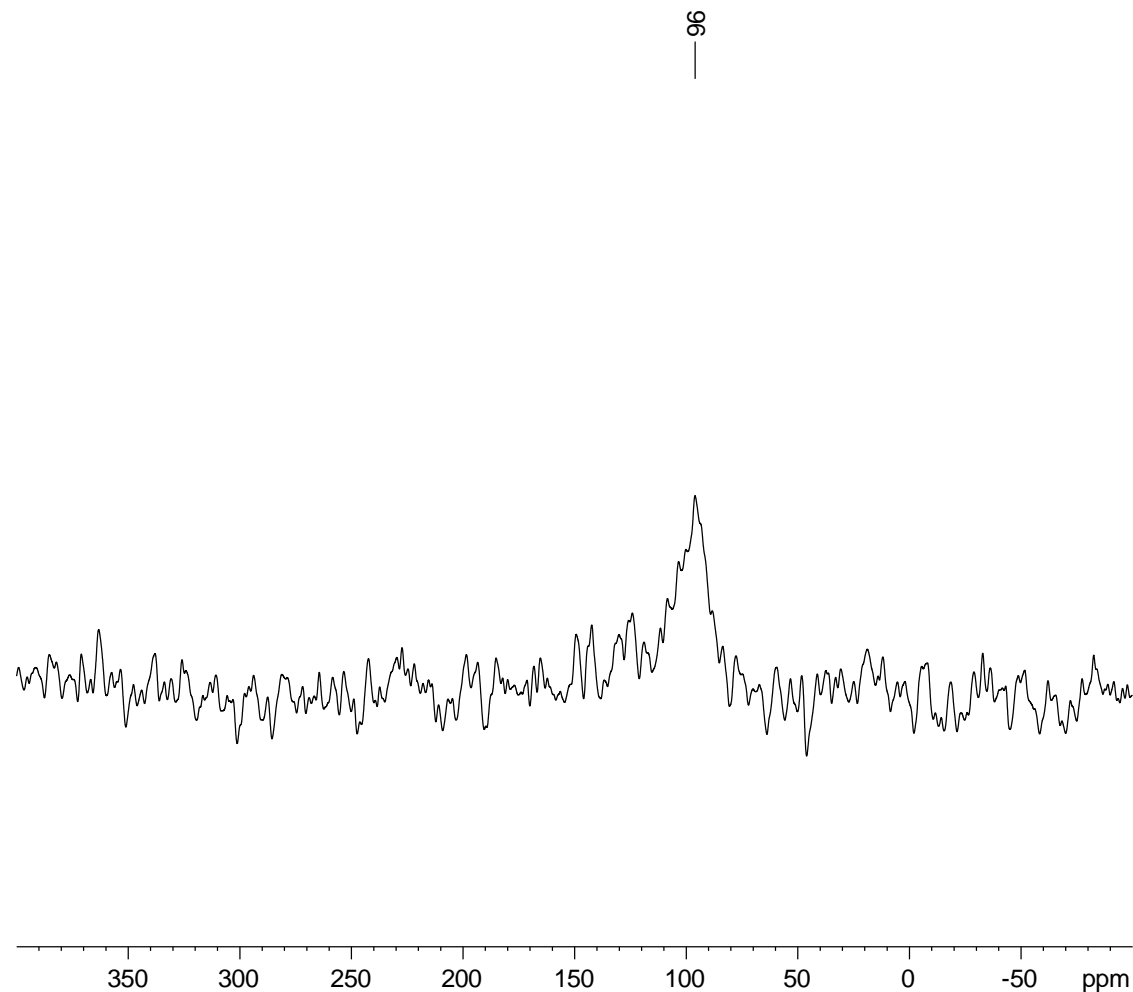
F2 - Acquisition Parameters
Date_   20200409
Time   7.33
INSTRUM   spect
PROBHD   5 mm QNP 1H/13
PULPROG   zg30
TD   52656
SOLVENT   C6D6
NS   32
DS   0
SWH   8305.647 Hz
FIDRES   0.157734 Hz
AQ   3.1698911 sec
RG   71.8
DW   60.200 usec
DE   6.00 usec
TE   299.2 K
D1   1.00000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   1H
P1   14.60 usec
PL1   -3.00 dB
PL1W   16.03799057 W
SFO1   400.1120007 MHz

F2 - Processing parameters
SI   65536
SF   400.1100032 MHz
WDW   EM
SSB   0
LB   0 Hz
GB   0
PC   1.00

Figure S64. ^{1}H-NMR spectrum of compound **13**.

^{13}C{^{1}H}-NMR of [TbbSnH$_2$(thf)$_2$][Al(OC{CF$_3$}$_3$)$_4$] in C$_6$D$_6$ (#) + 1,2-difluorobenzene (*) at rt
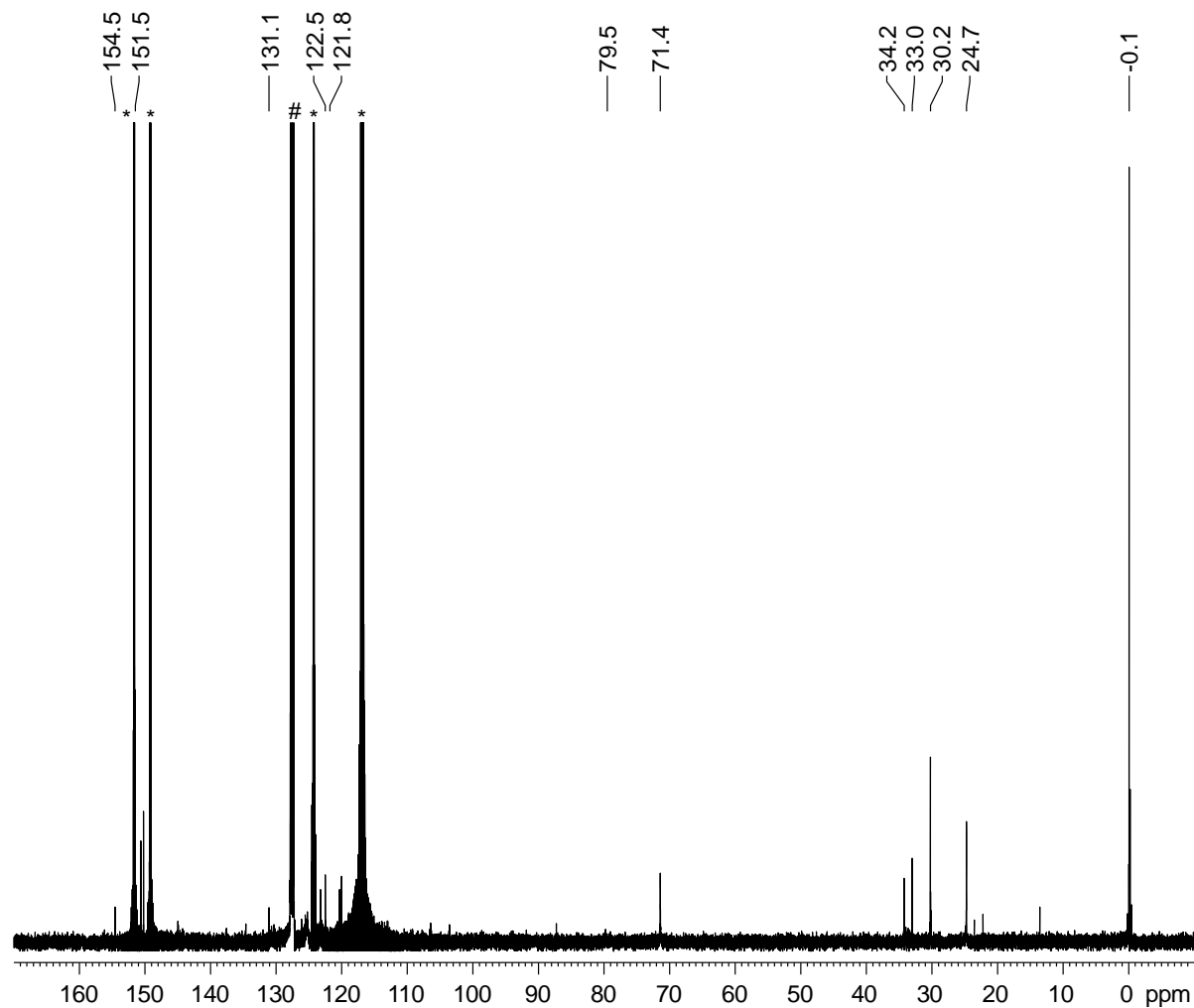
Current Data Parameters
NAME   MA246_08042020_400N
EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
Date_   20200409
Time   2.07
INSTRUM   spect
PROBHD   5 mm QNP 1H/13
PULPROG   zgpg30
TD   53700
SOLVENT   C6D6
NS   11264
DS   0
SWH   30864.197 Hz
FIDRES   0.574752 Hz
AQ   0.8699400 sec
RG   32800
DW   16.200 usec
DE   6.00 usec
TE   299.2 K
D1   1.00000000 sec
D11   0.03000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   13C
P1   13.50 usec
PL1   -4.16 dB
PL1W   78.55633545 W
SFO1   100.6198135 MHz

======== CHANNEL f2 ========
CPDPRG[2   waltz16
NUC2   1H
PCPD2   80.00 usec
PL2   -3.00 dB
PL12   11.77 dB
PL13   13.14 dB
PL2W   16.03799057 W
PL12W   0.53474891 W
PL13W   0.39007664 W
SFO2   400.1120007 MHz

F2 - Processing parameters
SI   65536
SF   100.6077400 MHz
WDW   EM
SSB   0
LB   0 Hz
GB   0
PC   1.40

Figure S65. $^{13}C\{^1H\}$-NMR spectrum of compound **13**.

$^{19}F\{^1H\}$-NMR of [TbbSnH$_2$(thf)$_2$][Al(OC{CF$_3$}$_3$)$_4$] in C$_6$D$_6$+ 1,2-difluorobenzene (#) at rt

-75.1

#

| 0 | -20 | -40 | -60 | -80 | -100 | -120 | -140 | -160 | -180 | -200 | ppm |

Current Data Parameters
NAME   MA246_08042020_300
EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
Date_   20200408
Time   8.06 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zgbs
TD   262144
SOLVENT   C6D6
NS   16
DS   4
SWH   66964.289 Hz
FIDRES   0.510897 Hz
AQ   1.9573419 sec
RG   204.67
DW   7.467 usec
DE   6.50 usec
TE   298.0 K
D1   1.00000000 sec
TD0   1
SFO1   282.3761148 MHz
NUC1   19F
P1   15.00 usec
P2   30.00 usec
PLW1   6.86250019 W

F2 - Processing parameters
SI   65536
SF   282.4043552 MHz
WDW   EM
SSB   0
LB   0.30 Hz
GB   0
PC   1.00

Figure S66. $^{19}F\{^1H\}$-NMR spectrum of compound **13**.

27Al-NMR of [TbbSnH$_2$(thf)$_2$][Al(OC{CF$_3$}$_3$)$_4$] in C$_6$D$_6$ + 1,2-difluorobenzene at rt

35.1
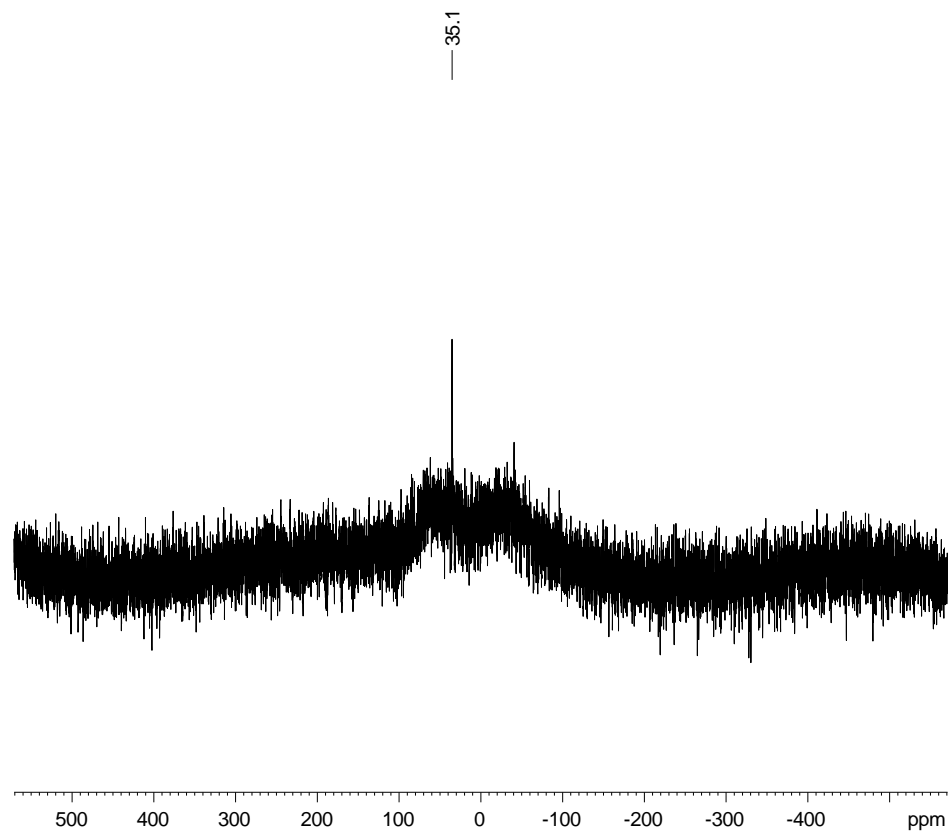
Current Data Parameters
NAME   MA246_08042020_300
EXPNO   12
PROCNO   1

F2 - Acquisition Parameters
Date_   20200408
Time   8.08 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zg30
TD   16384
SOLVENT   C6D6
NS   512
DS   0
SWH   89285.711 Hz
FIDRES   10.899135 Hz
AQ   0.0917504 sec
RG   204.67
DW   5.600 usec
DE   6.50 usec
TE   298.0 K
D1   0.10000000 sec
TD0   1
SFO1   78.2044509 MHz
NUC1   27Al
P0   3.40 usec
P1   10.19 usec
PLW1   34.00000000 W

F2 - Processing parameters
SI   32768
SF   78.2044509 MHz
WDW   EM
SSB   0
LB   5.00 Hz
GB   0
PC   1.40

500 400 300 200 100   0   -100 -200 -300 -400   ppm

Figure S67. ^{27}Al-NMR spectrum of compound **13**.

^{119}Sn-NMR of [TbbSnH$_2$(thf)$_2$][Al(OC{CF$_3$}$_3$)$_4$] in toluene-d$_8$ + 1,2-difluorobenzene at rt

−123
−138
−152

Current Data Parameters
NAME   MA242_24022020_500
EXPNO   2
PROCNO   1

F2 - Acquisition Parameters
Date_   20200225
Time   1.55
INSTRUM   spect
PROBHD   5 mm TBO BB-1H
PULPROG   zg30
TD   65536
SOLVENT   Tol
NS   65000
DS   0
SWH   150000.000 Hz
FIDRES   2.288818 Hz
AQ   0.2184533 sec
RG   2050
DW   3.333 usec
DE   6.00 usec
TE   299.2 K
D1   0.20000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   119Sn
P1   11.93 usec
PL1   3.00 dB
PL1W   45.32131577 W
SFO1   186.5016380 MHz

F2 - Processing parameters
SI   131072
SF   186.5016380 MHz
WDW   EM
SSB   0
LB   100.00 Hz
GB   0
PC   1.40

Figure S68. ^{119}Sn-NMR spectrum of compound **13**.

^{119}Sn{^{1}H}-NMR of [TbbSnH$_2$(thf)$_2$][Al(OC{CF$_3$}$_3$)$_4$] in toluene-d$_8$ + 1,2-difluorobenzene at rt
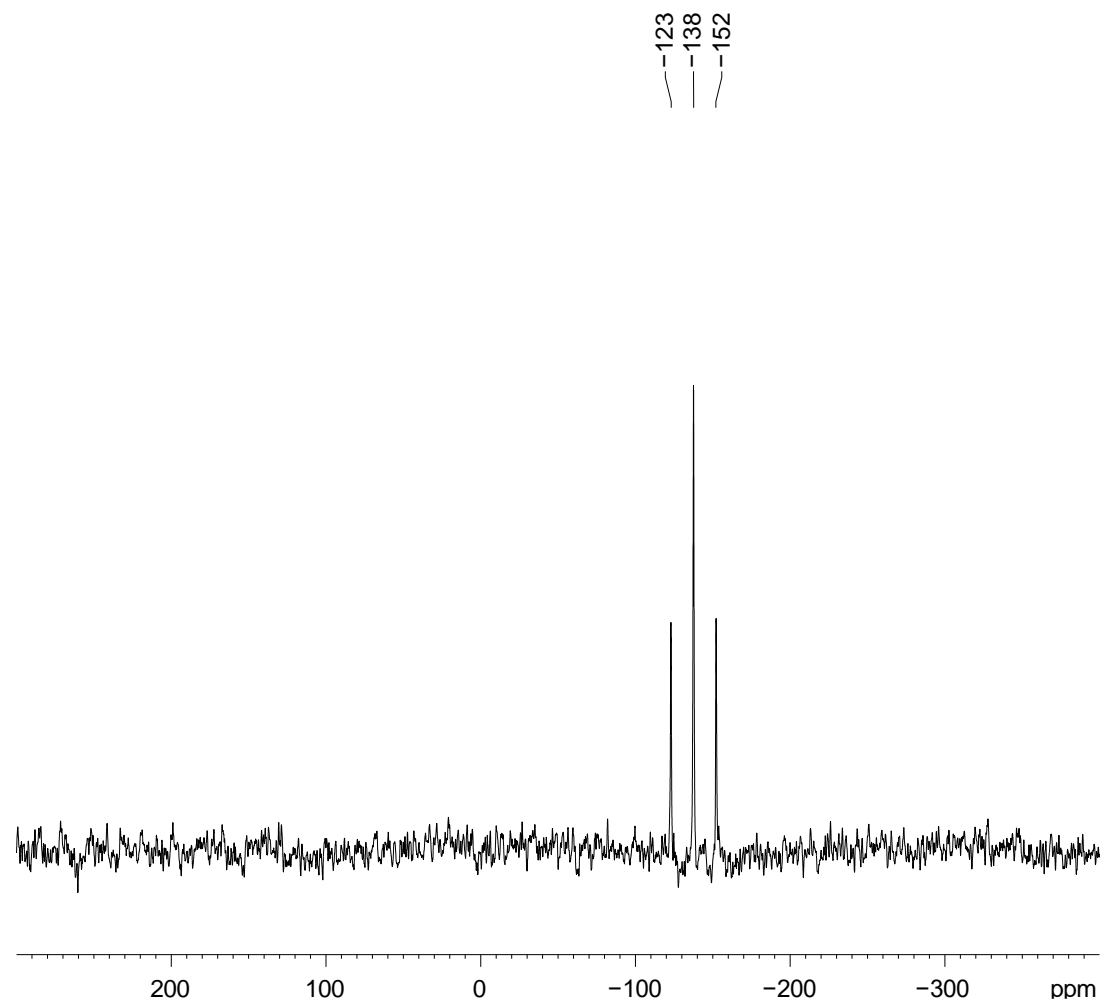
-138

Current Data Parameters
NAME   MA242_24022020_500
EXPNO   3
PROCNO   1

F2 - Acquisition Parameters
Date_   20200225
Time   8.12
INSTRUM   spect
PROBHD 5 mm TBO BB-1H
PULPROG   zgig30
TD   65536
SOLVENT   Tol
NS   50000
DS   0
SWH   150000.000 Hz
FIDRES   2.288818 Hz
AQ   0.2184533 sec
RG   2050
DW   3.333 usec
DE   6.00 usec
TE   299.2 K
D1   0.20000000 sec
D11   0.03000000 sec
TD0   1

======== CHANNEL f1 =======:
NUC1   119Sn
P1   11.93 usec
PL1   3.00 dB
PL1W   45.32131577 W
SFO1   186.5016380 MHz

======== CHANNEL f2 =======:
CPDPRG[2   waltz16
NUC2   1H
PCPD2   80.00 usec
PL2   -0.52 dB
PL12   15.00 dB
PL2W   24.34997177 W
PL12W   0.68312228 W
SFO2   500.1320005 MHz

F2 - Processing parameters
SI   65536
SF   186.5016380 MHz
WDW   EM
SSB   0
LB   50.00 Hz
GB   0
PC   1.40

-50   -100   -150   -200   -250   ppm

Figure S69. ^{119}Sn{^{1}H}-NMR spectrum of compound **13**.

NMR spectra of compound 14

^{1}H-NMR of [TbbSnH$_2$]$_2$ in toluene-d$_8$ (#) at rt
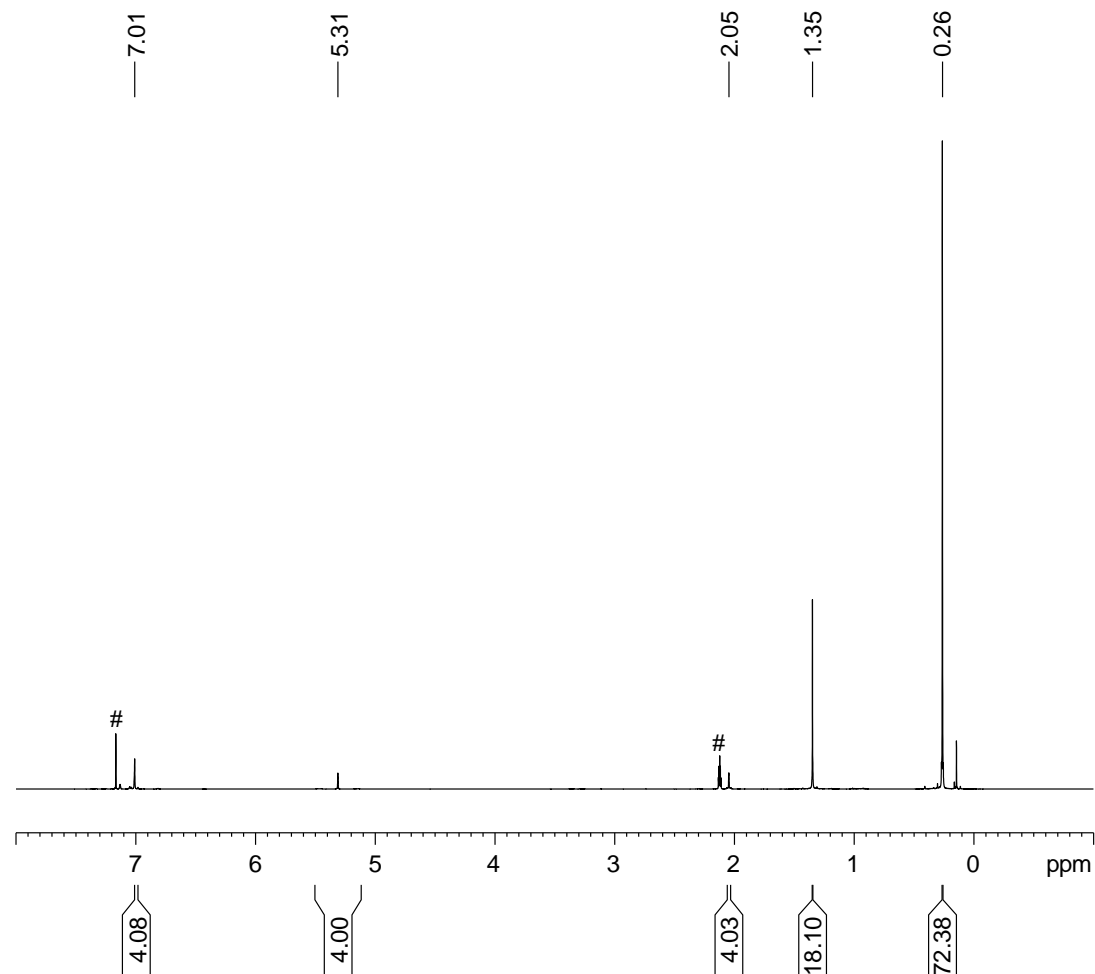
7.01
5.31
2.05
1.35
0.26

#
#

4.08
4.00
4.03
18.10
72.38

7 6 5 4 3 2 1 0 ppm

Current Data Parameters
NAME   MA263_06042020_400N
EXPNO   11
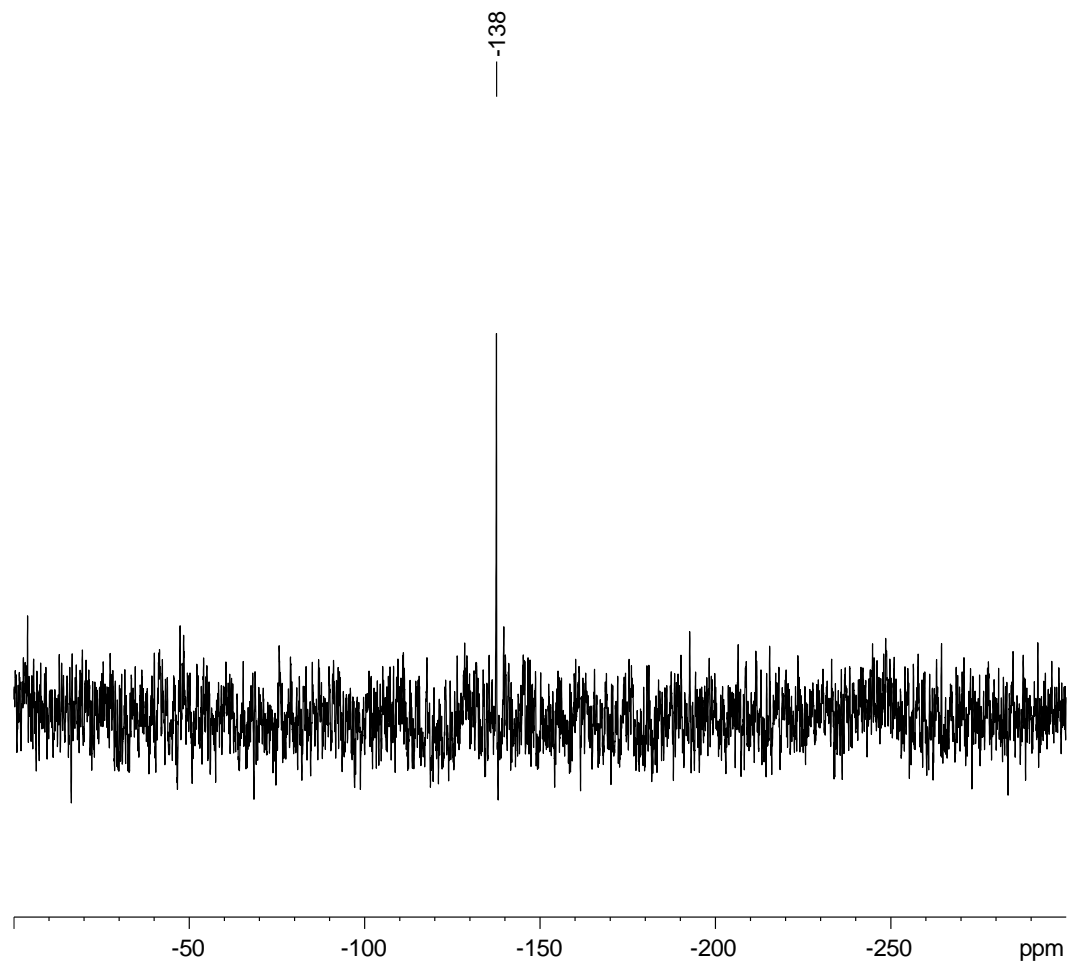PROCNO   1

F2 - Acquisition Parameters
Date_   20200406
Time   20.05
INSTRUM   spect
PROBHD   5 mm QNP 1H/13
PULPROG   zg30
TD   52656
SOLVENT   Tol
NS   32
DS   0
SWH   8305.647 Hz
FIDRES   0.157734 Hz
AQ   3.1698911 sec
RG   287
DW   60.200 usec
DE   6.00 usec
TE   299.2 K
D1   1.00000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   1H
P1   14.60 usec
PL1   -3.00 dB
PL1W   16.03799057 W
SFO1   400.1120007 MHz

F2 - Processing parameters
SI   65536
SF   400.1100000 MHz
WDW   EM
SSB   0
LB   0 Hz
GB   0
PC   1.00

Figure S70. ^{1}H-NMR spectrum of compound **14**.

$^{13}C\{^1H\}$-NMR of [TbbSnH$_2$]$_2$ in toluene-d$_8$ (#) at rt

151.3
151.1
134.4
120.9
35.1
34.4
31.4
0.9

Current Data Parameters
NAME   MA263_06042020_400N
EXPNO   12
PROCNO   1

F2 - Acquisition Parameters
Date_   20200407
Time   2.09
INSTRUM   spect
PROBHD   5 mm QNP 1H/13
PULPROG   zgpg30
TD   53700
SOLVENT   Tol
NS   11264
DS   0
SWH   30864.197 Hz
FIDRES   0.574752 Hz
AQ   0.8699400 sec
RG   32800
DW   16.200 usec
DE   6.00 usec
TE   299.2 K
D1   1.00000000 sec
D11   0.03000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   13C
P1   13.50 usec
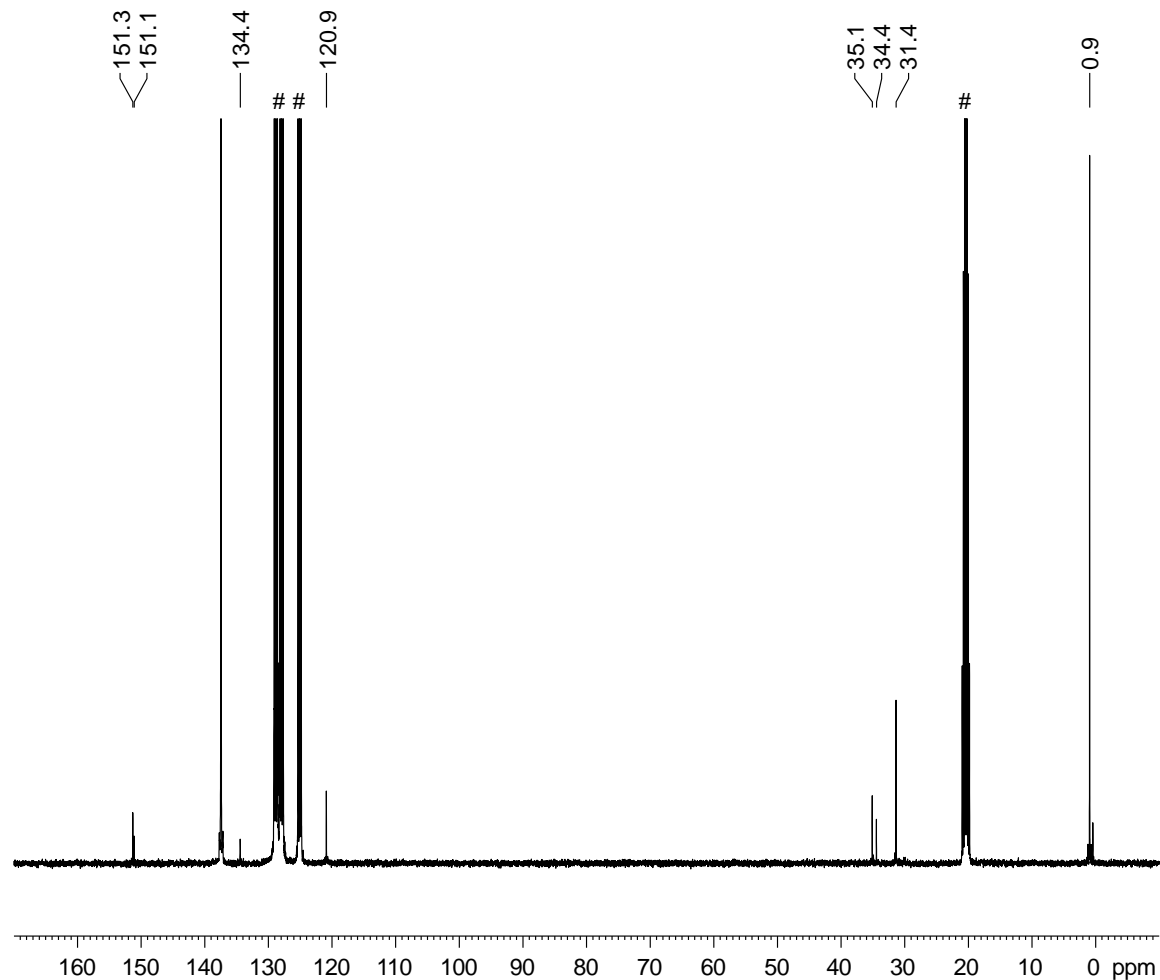PL1   -4.16 dB
PL1W   78.55633545 W
SFO1   100.6198135 MHz

======== CHANNEL f2 ========
CPDPRG[2   waltz16
NUC2   1H
PCPD2   80.00 usec
PL2   -3.00 dB
PL12   11.77 dB
PL13   13.14 dB
PL2W   16.03799057 W
PL12W   0.53474891 W
PL13W   0.39007664 W
SFO2   400.1120007 MHz

F2 - Processing parameters
SI   65536
SF   100.6077048 MHz
WDW   EM
SSB   0
LB   1.00 Hz
GB   0
PC   1.40

160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm

Figure S71. $^{13}C\{^1H\}$-NMR spectrum of compound **14**.

^{29}Si-INEPTND-NMR of [TbbSnH$_2$]$_2$ in toluene-d$_8$ at rt

— 2.1
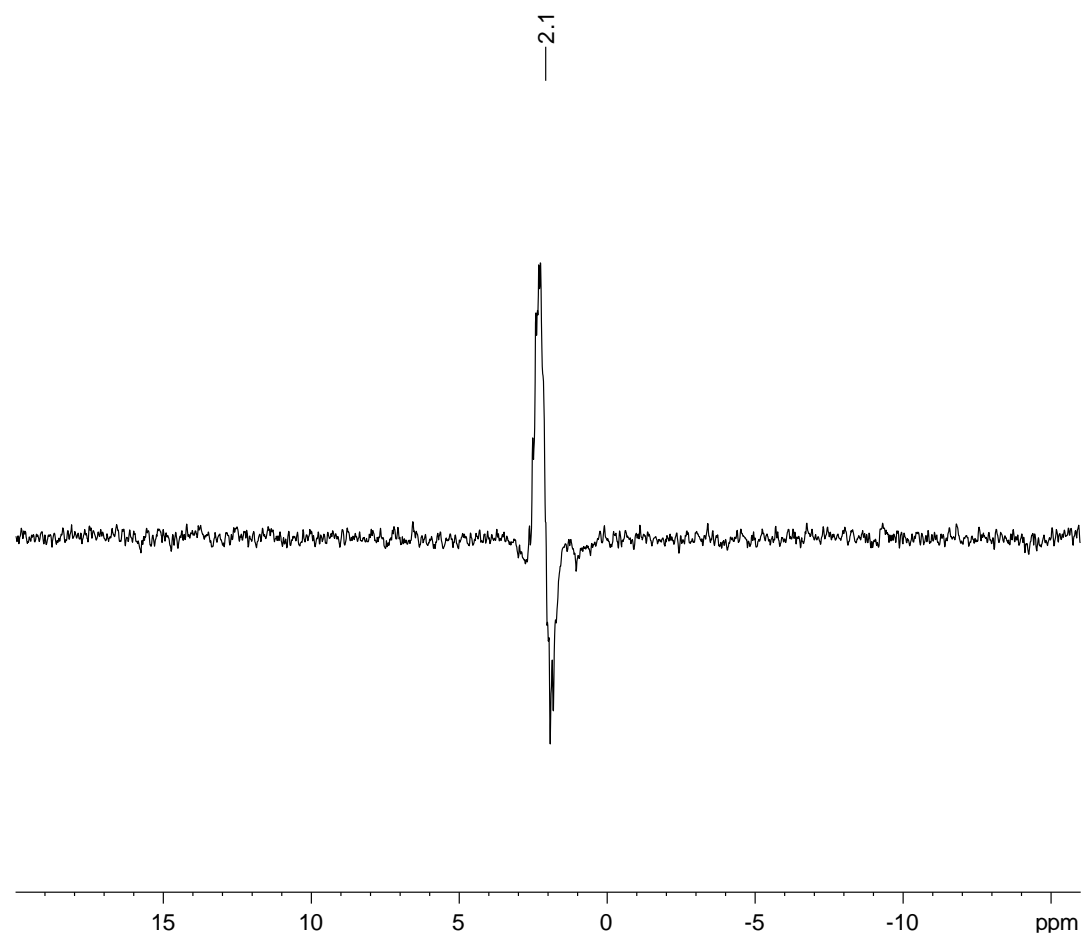
Current Data Parameters
NAME   MA263_07042020_300
EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
Date_   20200407
Time   13.00 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   ineptnd
TD   39048
SOLVENT   Tol
NS   320
DS   0
SWH   26315.789 Hz
FIDRES   1.347869 Hz
AQ   0.7419120 sec
RG   204.67
DW   19.000 usec
DE   6.50 usec
TE   298.0 K
CNST2   6.5999999
D1   2.00000000 sec
D4   0.03787879 sec
TD0   1
SFO1   59.6229159 MHz
NUC1   29Si
P1   10.30 usec
P2   20.60 usec
PLW1   50.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
P3   14.00 usec
P4   28.00 usec
PLW2   8.26509953 W

F2 - Processing parameters
SI   32768
SF   59.6273880 MHz
WDW   EM
SSB   0
LB   2.00 Hz
GB   0
PC   1.00

15   10   5   0   -5   -10   ppm

Figure S72. ^{29}Si-INEPTND-NMR spectrum of compound **14**.

^{119}Sn-NMR of [TbbSnH$_2$]$_2$ in thf-d$_8$ at rt

−407
−408
−409
−421
−423
−424
−436
−437
−438

−410   −420   −430   −440   ppm

−100   −200   −300   −400   −500   −600   −700   ppm

Current Data Parameters
NAME   MA815_03022022_300N
EXPNO   24
PROCNO   1

F2 − Acquisition Parameters
Date_   20220203
Time   20.35 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zg30
TD   8918
SOLVENT   THF
NS   204800
DS   1
SWH   89285.711 Hz
FIDRES   20.023708 Hz
AQ   0.0499408 sec
RG   204.67
DW   5.600 usec
DE   6.50 usec
TE   298.0 K
D1   0.02000000 sec
TD0   1
SFO1   111.8722484 MHz
NUC1   119Sn
P0   4.03 usec
P1   12.10 usec
PLW1   12.00000000 W

F2 − Processing parameters
SI   4096
SF   111.9203740 MHz
WDW   EM
SSB   0
LB   10.00 Hz
GB   0
PC   1.40

Figure S73. ^{119}Sn-NMR spectrum of compound **14**.

^{119}Sn{^{1}H}-NMR of [TbbSnH$_2$]$_2$ in thf-d$_8$ at rt

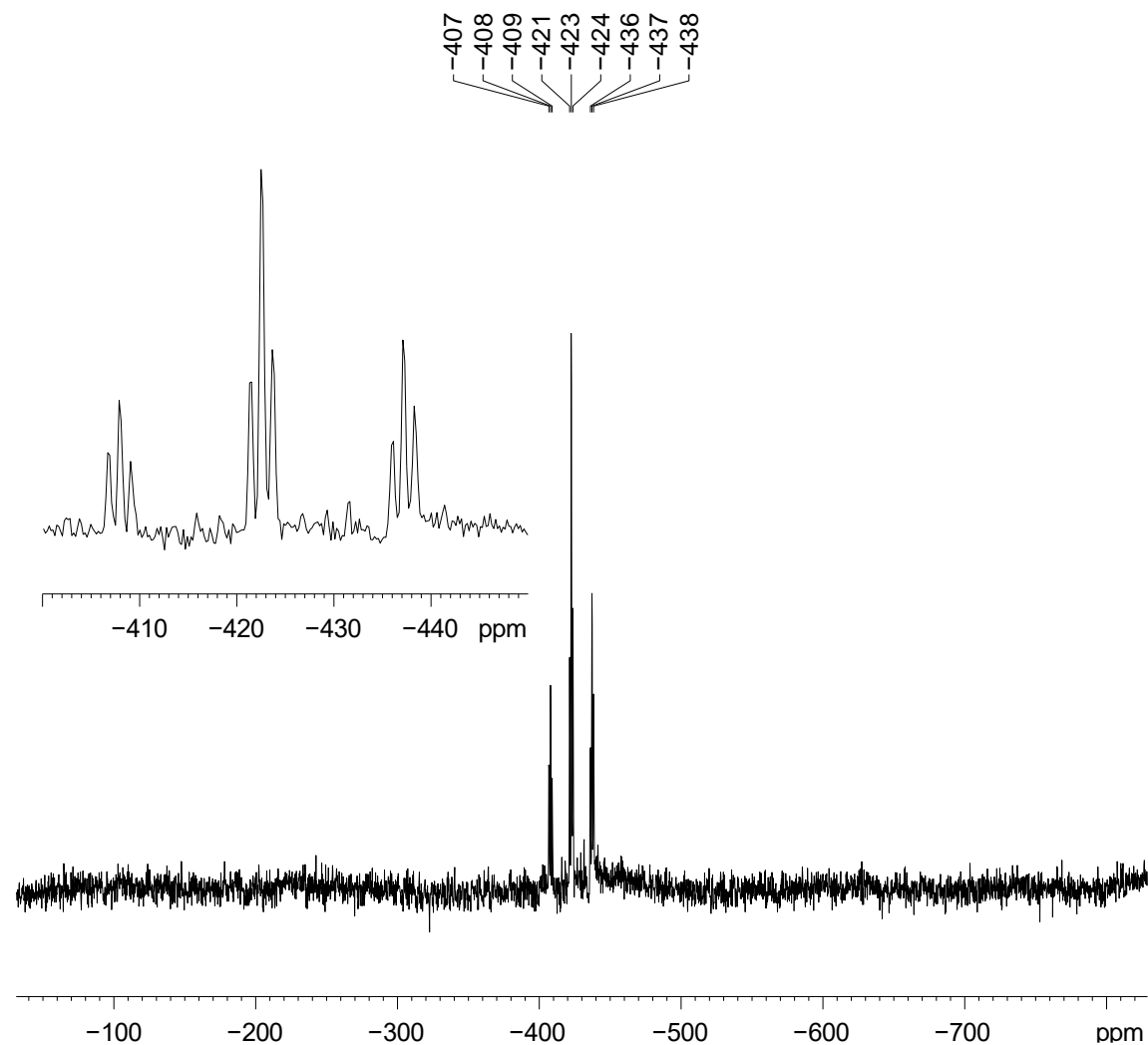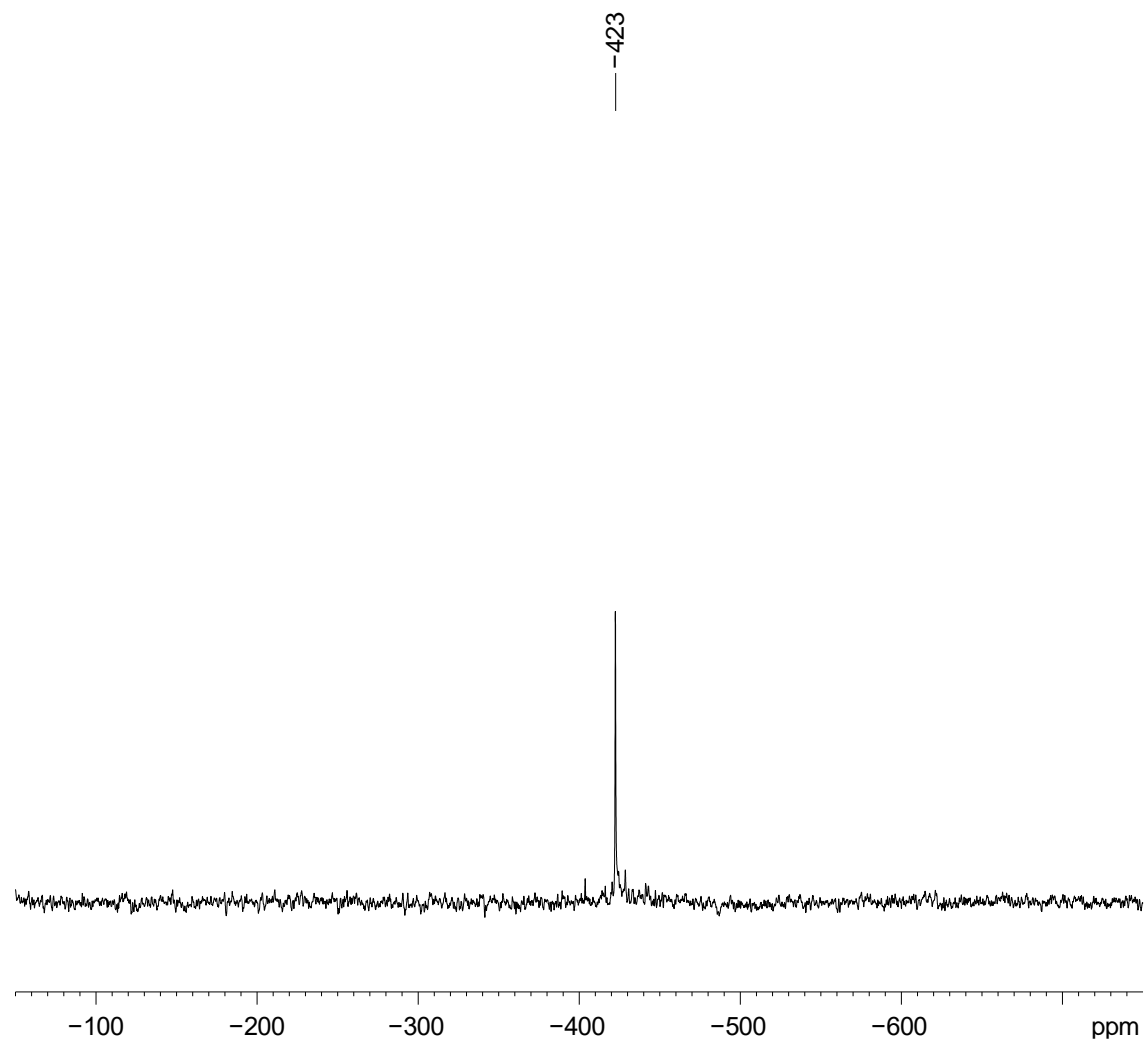−423

Current Data Parameters
NAME   MA815_03022022_300N
EXPNO   34
PROCNO   1

F2 − Acquisition Parameters
Date_   20220204
Time   2.26 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zgig30
TD   39186
SOLVENT   THF
NS   57344
DS   4
SWH   89285.711 Hz
FIDRES   4.557021 Hz
AQ   0.2194416 sec
RG   204.67
DW   5.600 usec
DE   6.50 usec
TE   298.0 K
D1   0.10000000 sec
D11   0.03000000 sec
TD0   1
SFO1   111.8722482 MHz
NUC1   119Sn
P0   4.03 usec
P1   12.10 usec
PLW1   12.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
CPDPRG[2   waltz16
PCPD2   90.00 usec
PLW2   8.26509953 W
PLW12   0.20000000 W

F2 − Processing parameters
SI   65536
SF   111.9203738 MHz

−100   −200   −300   −400   −500   −600   ppm

Figure S74. ^{119}Sn{^{1}H}-NMR spectrum of compound **14**.

NMR spectra of compound 15

^{1}H-NMR of TbbSnH(iPr-NHC) in C$_6$D$_6$ (#) at rt, *: iPr-NHC-H$_2$ + unknown impurity
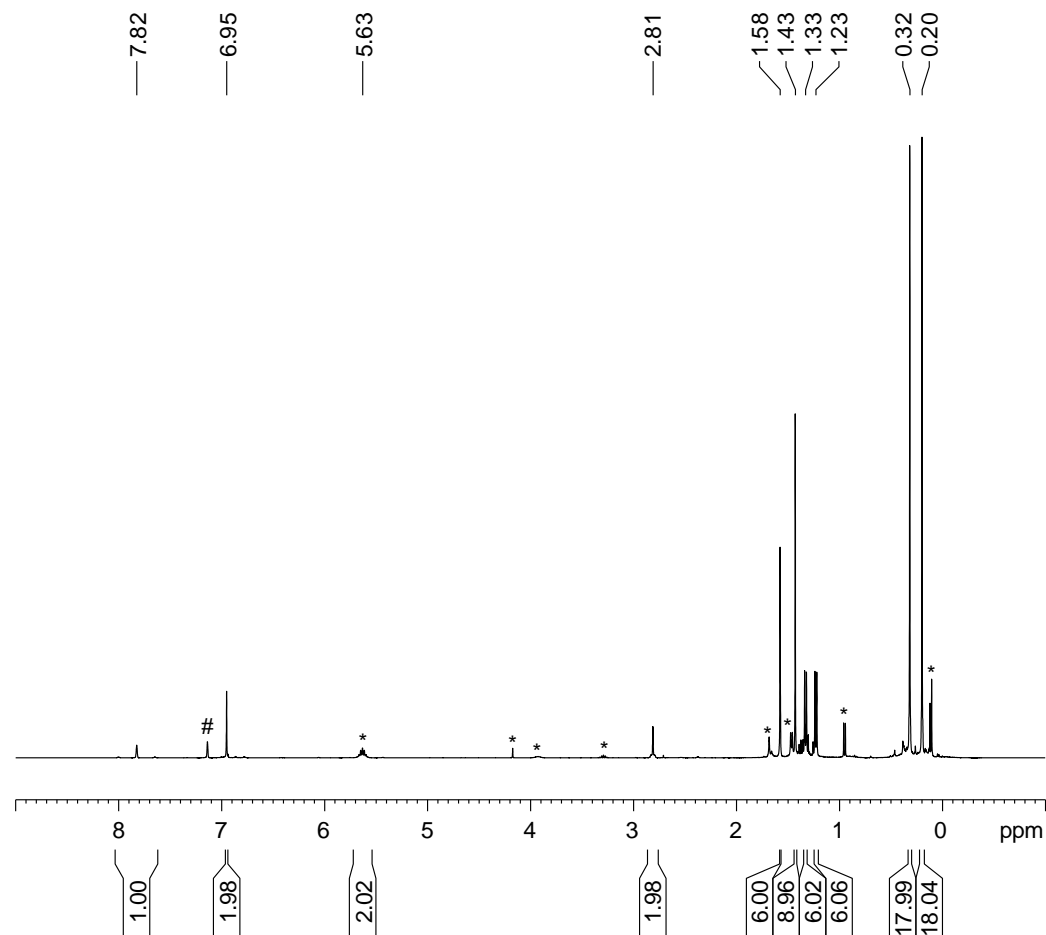
Current Data Parameters
NAME   MA305_19052020_400N
EXPNO   10
PROCNO   1

F2 - Acquisition Parameters
Date_   20200519
Time   12.56
INSTRUM   spect
PROBHD   5 mm QNP 1H/13
PULPROG   zg30
TD   52656
SOLVENT   C6D6
NS   32
DS   0
SWH   8305.647 Hz
FIDRES   0.157734 Hz
AQ   3.1698911 sec
RG   64
DW   60.200 usec
DE   6.00 usec
TE   299.2 K
D1   1.00000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   1H
P1   14.60 usec
PL1   -3.00 dB
PL1W   16.03799057 W
SFO1   400.1120007 MHz

F2 - Processing parameters
SI   65536
SF   400.1100011 MHz
WDW   EM
SSB   0
LB   0 Hz
GB   0
PC   1.00

Figure S75. ^{1}H-NMR spectrum of compound **15**.

$^{13}C\{^1H\}$-NMR of TbbSnH(iPr-NHC) in C_6D_6 (#) at rt, *: iPr-NHC-H_2 + unknown impurity

174.9
155.6
150.3
146.7
#
125.9
120.4
54.2
33.9
33.2
31.4
21.9
21.7
10.0
1.3
1.2

Current Data Parameters
NAME   MA305_19052020_400N
EXPNO   12
PROCNO   1
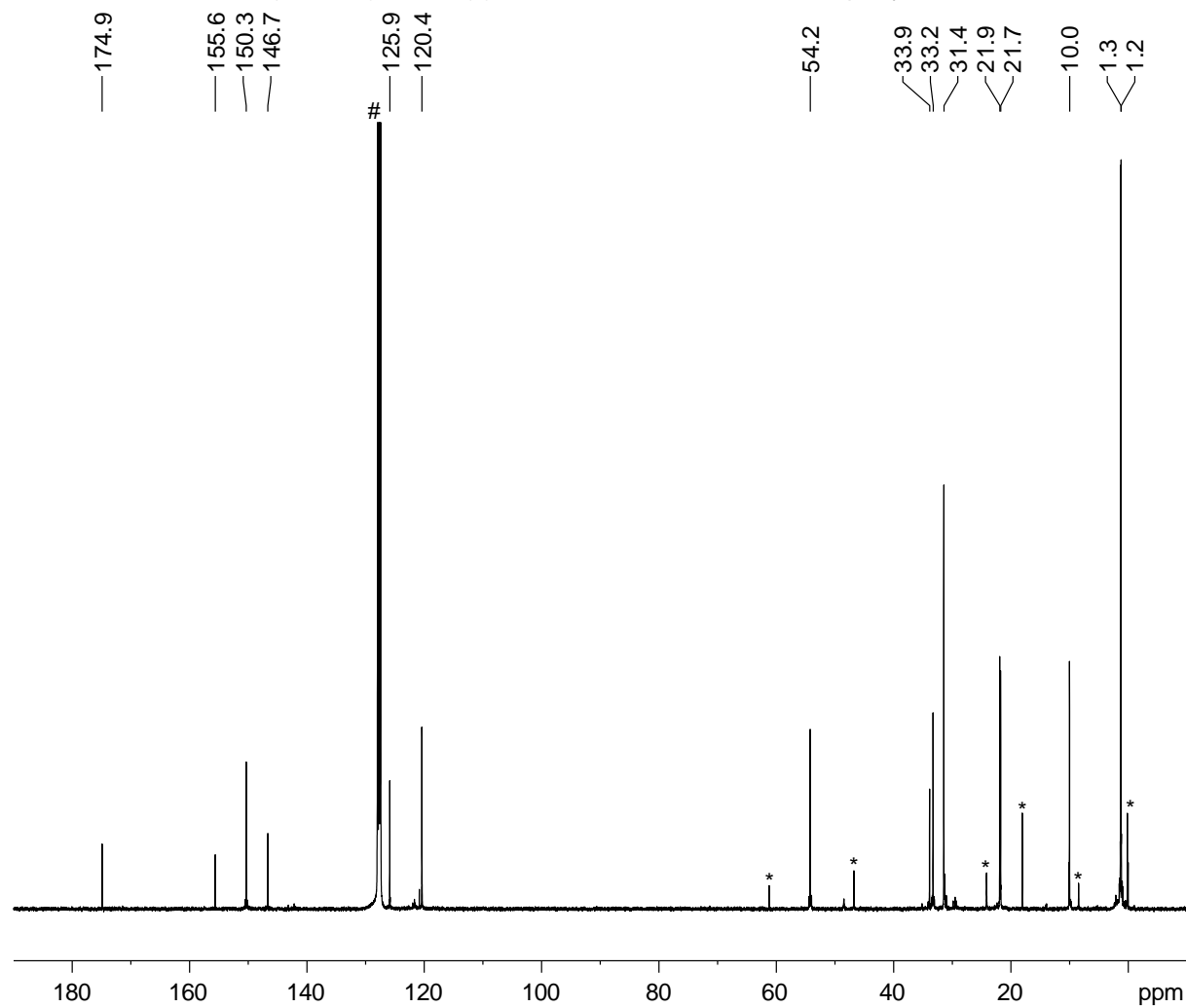
F2 - Acquisition Parameters
Date_   20200520
Time   2.08
INSTRUM   spect
PROBHD 5 mm QNP 1H/13
PULPROG   zgpg30
TD   53700
SOLVENT   C6D6
NS   11264
DS   0
SWH   30864.197 Hz
FIDRES   0.574752 Hz
AQ   0.8699400 sec
RG   32800
DW   16.200 usec
DE   6.00 usec
TE   299.2 K
D1   1.00000000 sec
D11   0.03000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   13C
P1   13.50 usec
PL1   -4.16 dB
PL1W   78.55633545 W
SFO1   100.6198135 MHz

======== CHANNEL f2 ========
CPDPRG[2   waltz16
NUC2   1H
PCPD2   80.00 usec
PL2   -3.00 dB
PL12   11.77 dB
PL13   13.14 dB
PL2W   16.03799057 W
PL12W   0.53474891 W
PL13W   0.39007664 W
SFO2   400.1120007 MHz

F2 - Processing parameters
SI   65536
SF   100.6077392 MHz
WDW   EM
SSB   0
LB   1.00 Hz
GB   0
PC   1.40

180   160   140   120   100   80   60   40   20   ppm

Figure S76. $^{13}C\{^1H\}$-NMR spectrum of compound **15**.

^{29}Si-INEPTND-NMR of TbbSnH(*i*Pr-NHC) in C_6D_6 at rt

Figure S77. ^{29}Si-INEPTND-NMR spectrum of compound **15**.
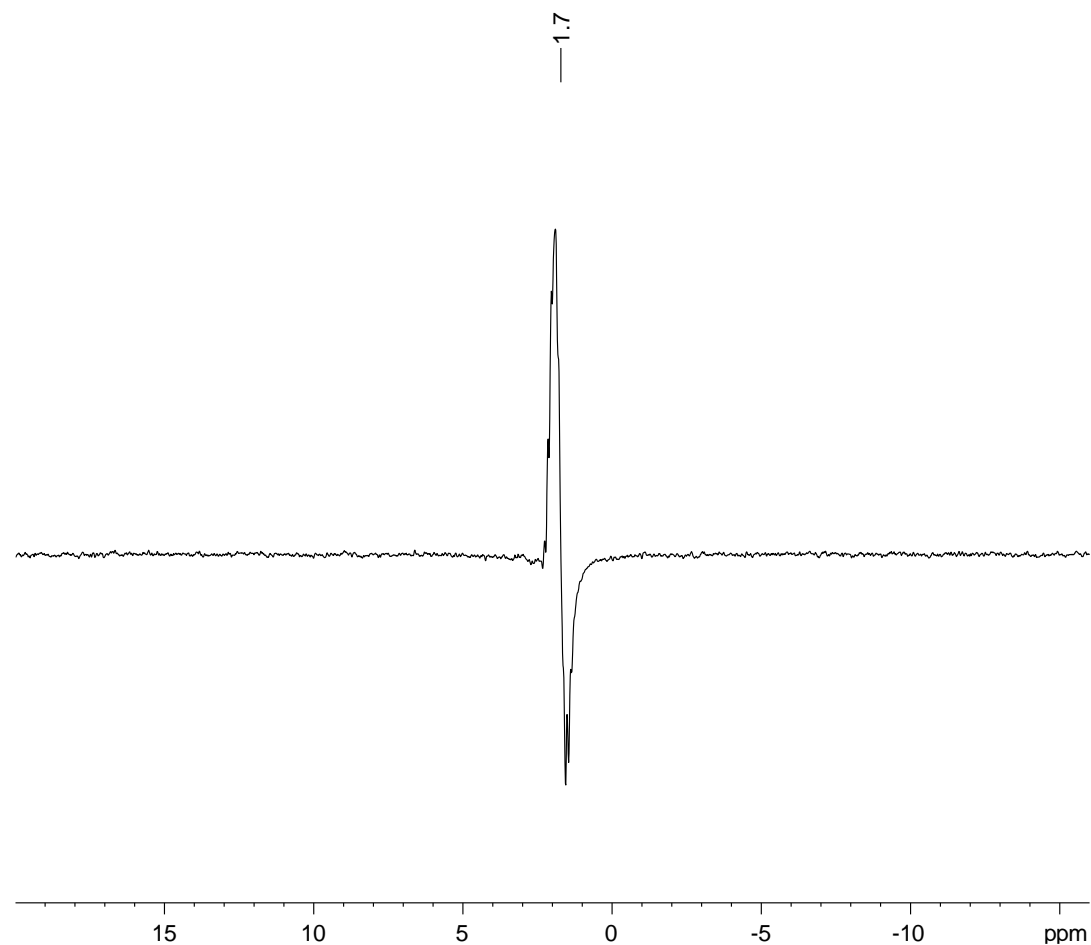
Current Data Parameters
NAME   MA305_20052020_300
EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
Date_   20200520
Time   8.48 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   ineptnd
TD   39048
SOLVENT   C6D6
NS   320
DS   0
SWH   26315.789 Hz
FIDRES   1.347869 Hz
AQ   0.7419120 sec
RG   204.67
DW   19.000 usec
DE   6.50 usec
TE   298.0 K
CNST2   6.5999999
D1   2.00000000 sec
D4   0.03787879 sec
TD0   1
SFO1   59.6229159 MHz
NUC1   29Si
P1   10.30 usec
P2   20.60 usec
PLW1   50.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
P3   14.00 usec
P4   28.00 usec
PLW2   8.26509953 W

F2 - Processing parameters
SI   32768
SF   59.6273589 MHz
WDW   EM
SSB   0
LB   2.00 Hz
GB   0
PC   1.00

^{119}Sn-NMR of TbbSnH(*i*Pr-NHC) in C$_6$D$_6$ at rt
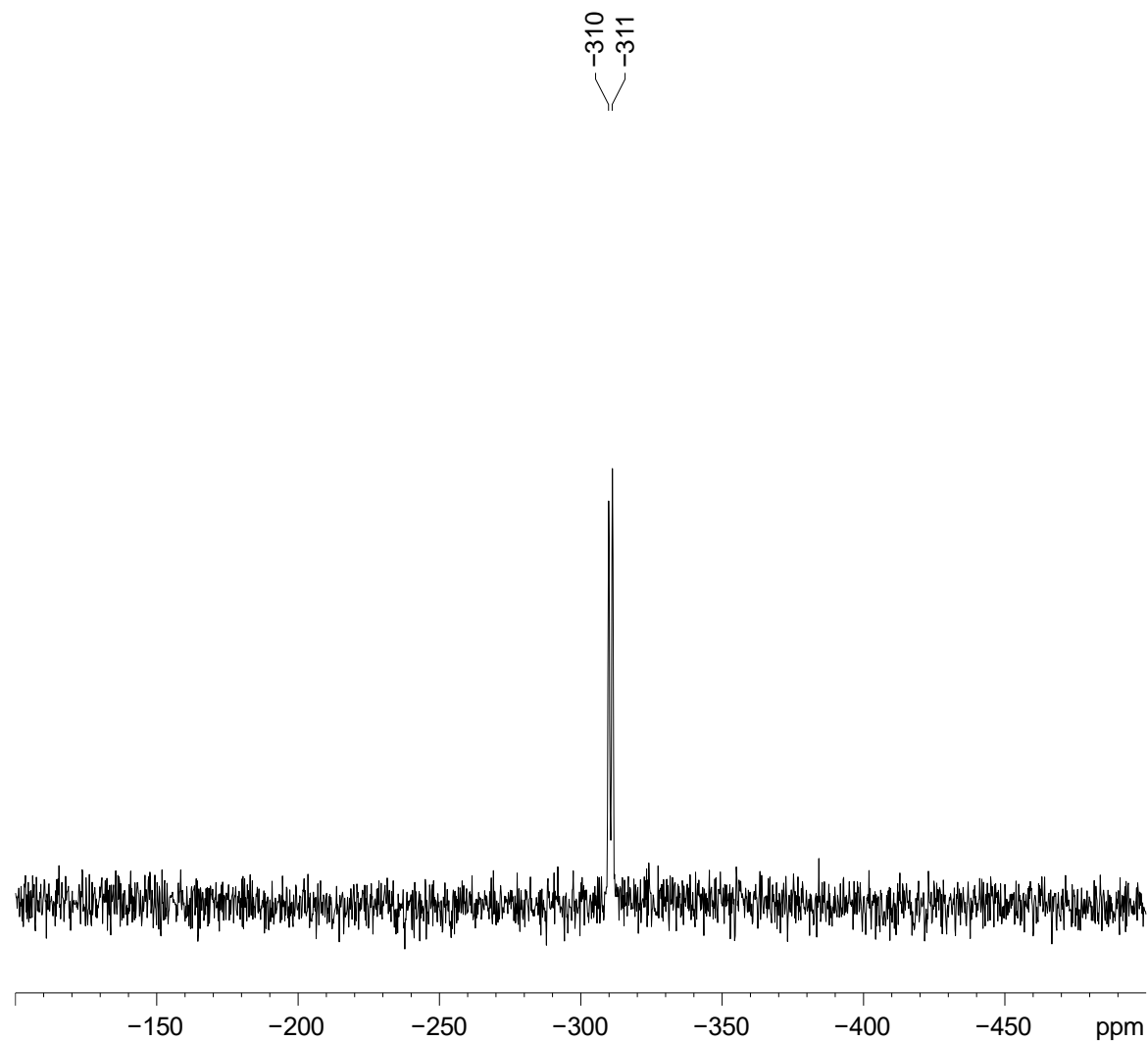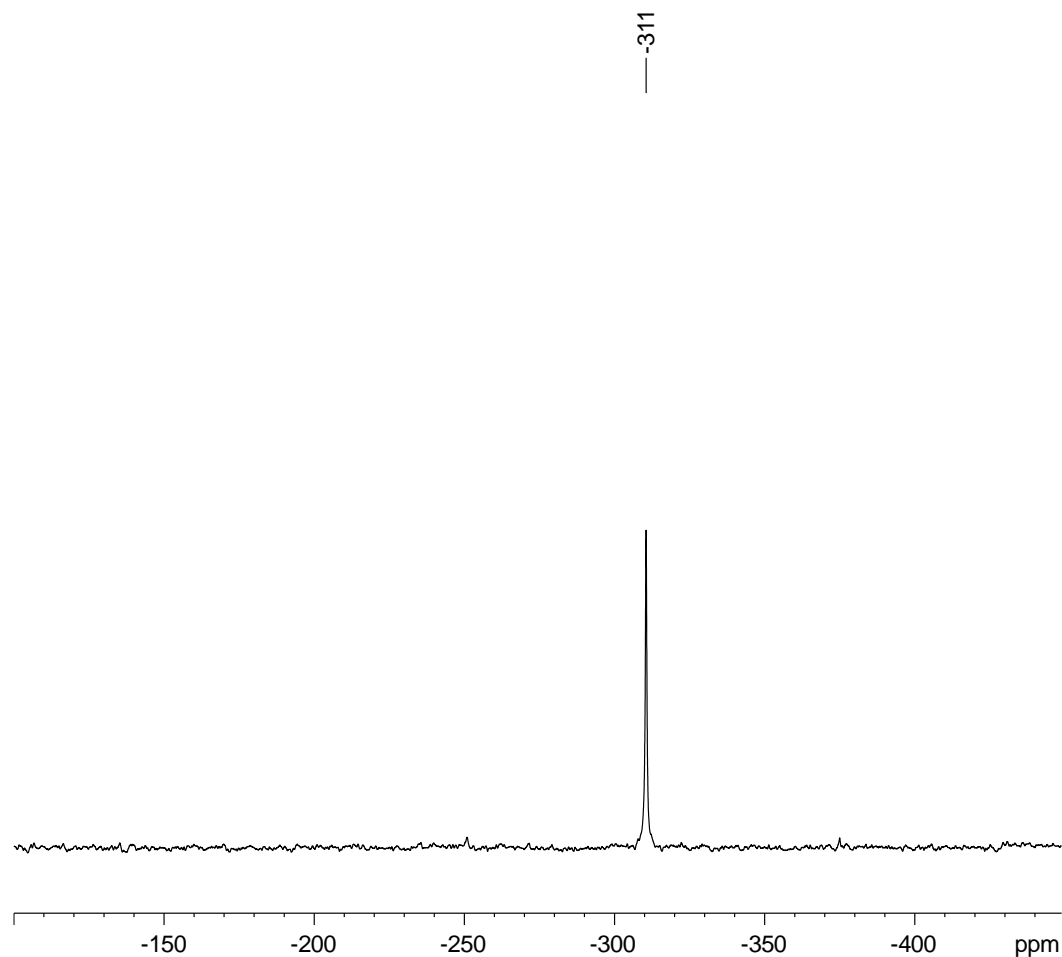
−310
−311

Current Data Parameters
NAME   MA236_05022020_300
EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
Date_   20200205
Time   14.12 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zg30
TD   8918
SOLVENT   C6D6
NS   16384
DS   1
SWH   89285.711 Hz
FIDRES   20.023708 Hz
AQ   0.0499408 sec
RG   204.67
DW   5.600 usec
DE   6.50 usec
TE   298.0 K
D1   0.02000000 sec
TD0   1
SFO1   111.8867979 MHz
NUC1   119Sn
P1   12.10 usec
PLW1   12.00000000 W

F2 - Processing parameters
SI   4096
SF   111.9203740 MHz
WDW   EM
SSB   0
LB   5.00 Hz
GB   0
PC   1.40

Figure S78. ^{119}Sn-NMR spectrum of compound **15**.

^{119}Sn{^{1}H}-NMR of TbbSnH(*i*Pr-NHC) in C$_6$D$_6$ at rt

—-311

Current Data Parameters
NAME   MA305_20052020_300
EXPNO   20
PROCNO   1

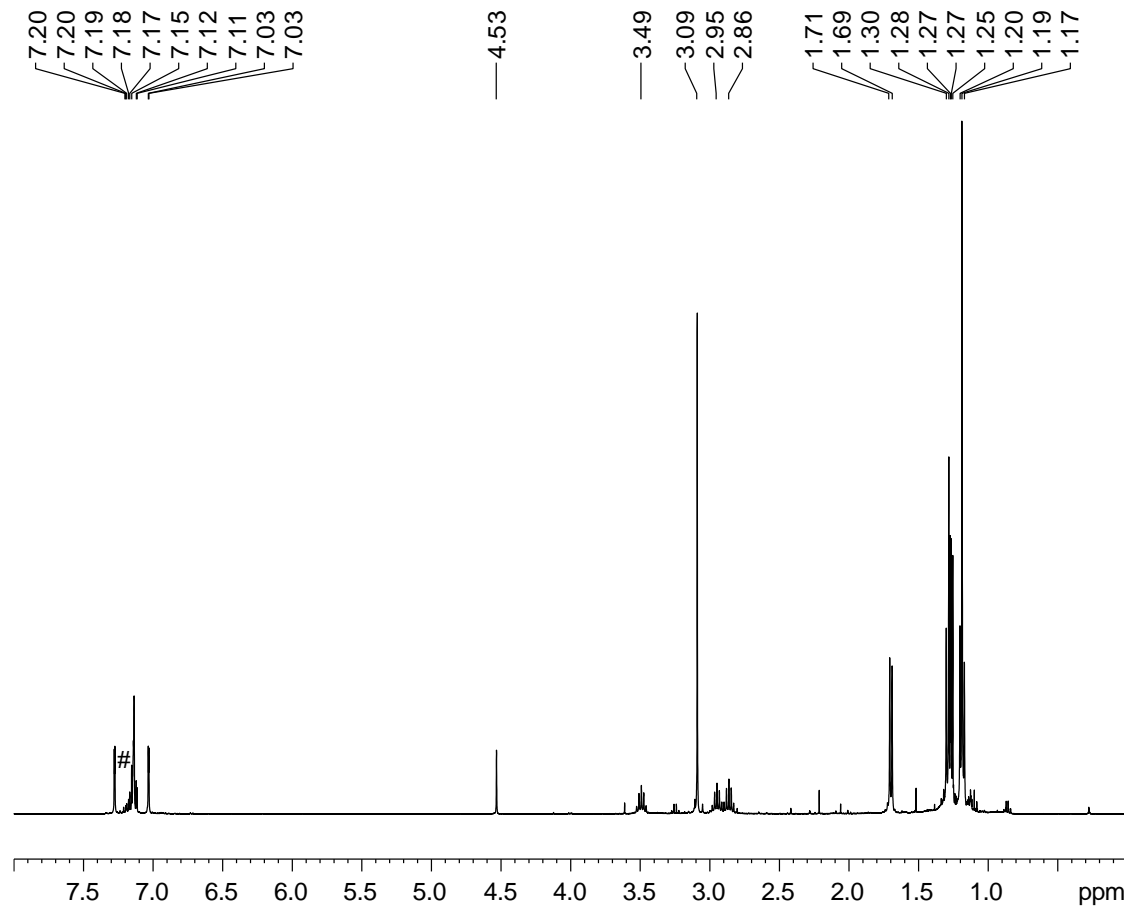F2 - Acquisition Parameters
Date_   20200520
Time   10.43 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zgig30
TD   39186
SOLVENT   C6D6
NS   5120
DS   4
SWH   89285.711 Hz
FIDRES   4.557021 Hz
AQ   0.2194416 sec
RG   204.67
DW   5.600 usec
DE   6.50 usec
TE   298.0 K
D1   0.10000000 sec
D11   0.03000000 sec
TD0   1
SFO1   111.9147778 MHz
NUC1   119Sn
P0   4.03 usec
P1   12.10 usec
PLW1   12.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
CPDPRG[2   waltz16
PCPD2   90.00 usec
PLW2   8.26509953 W
PLW12   0.20000000 W

F2 - Processing parameters
SI   65536
SF   111.9203738 MHz
WDW   EM
SSB   0
LB   50.00 Hz
GB   0
PC   1.40

-150   -200   -250   -300   -350   -400   ppm

Figure S79. ^{119}Sn{^{1}H}-NMR spectrum of compound **15**.

NMR spectra of compound 16

¹H-NMR of Ar*GeH(Me-NHC) in C_6D_6 (#) at rt

7.20
7.20
7.19
7.18
7.17
7.15
7.12
7.11
7.03
7.03

4.53

3.49
3.09
2.95
2.86

1.71
1.69
1.30
1.28
1.27
1.27
1.25
1.20
1.19
1.17

Current Data Parameters
NAME   FD033_9-20160909-LW_Diab
EXPNO   10
PROCNO   1

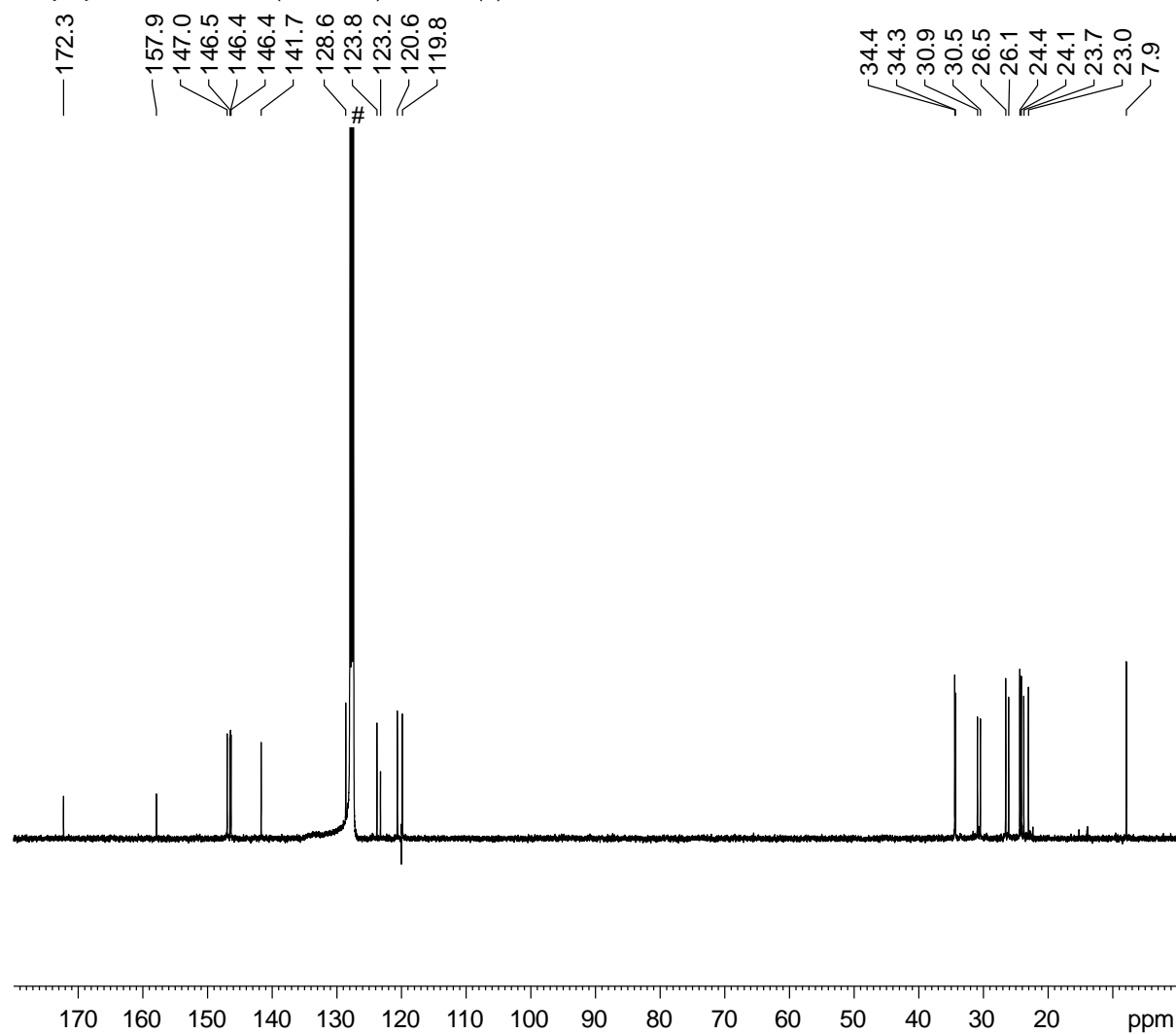F2 - Acquisition Parameters
Date_   20160909
Time   20.06
INSTRUM   spect
PROBHD   5 mm QNP 1H/13
PULPROG   zg30
TD   52656
SOLVENT   C6D6
NS   32
DS   0
SWH   8305.647 Hz
FIDRES   0.157734 Hz
AQ   3.1698911 sec
RG   228
DW   60.200 usec
DE   6.00 usec
TE   299.2 K
D1   1.00000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   1H
P1   14.60 usec
PL1   -3.00 dB
PL1W   16.03799057 W
SFO1   400.1120007 MHz

F2 - Processing parameters
SI   65536
SF   400.1100000 MHz
WDW   EM
SSB   0
LB   0 Hz
GB   0
PC   1.00

Figure S80. ¹H-NMR spectrum of compound **16**.

^{13}C{^{1}H}-NMR of Ar*GeH(Me-NHC) in C$_6$D$_6$ (#) at rt

172.3
157.9
147.0
146.5
146.4
146.4
141.7
128.6
123.8
123.2
120.6
119.8
34.4
34.3
30.9
30.5
26.5
26.1
24.4
24.1
23.7
23.0
7.9

Current Data Parameters
NAME   FD033_9-20160909-LW_Diab
EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
Date_   20160910
Time   5.14
INSTRUM   spect
PROBHD   5 mm QNP 1H/13
PULPROG   zgpg30
TD   53700
SOLVENT   C6D6
NS   17000
DS   0
SWH   30864.197 Hz
FIDRES   0.574752 Hz
AQ   0.8699400 sec
RG   32800
DW   16.200 usec
DE   6.00 usec
TE   299.2 K
D1   1.00000000 sec
D11   0.03000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   13C
P1   13.50 usec
PL1   -4.16 dB
PL1W   78.55633545 W
SFO1   100.6198135 MHz

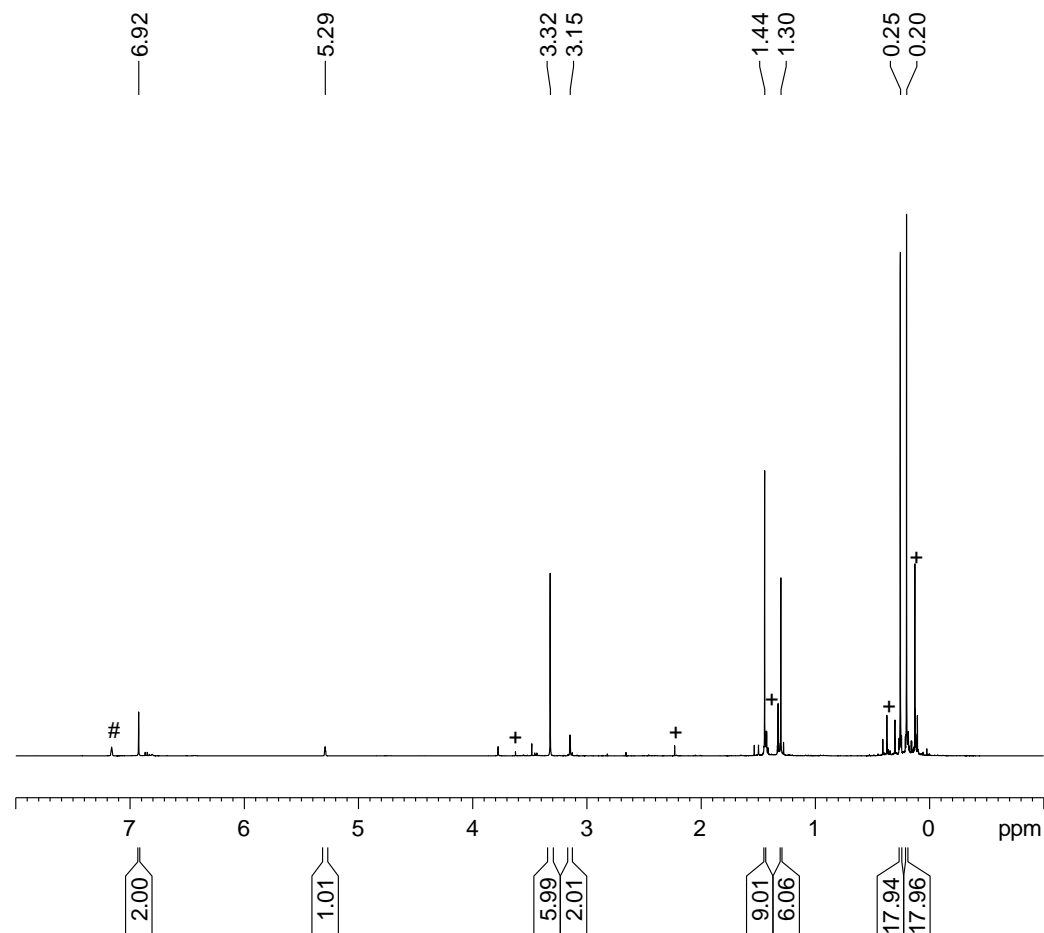======== CHANNEL f2 ========
CPDPRG[2   waltz16
NUC2   1H
PCPD2   80.00 usec
PL2   -3.00 dB
PL12   11.77 dB
PL13   13.14 dB
PL2W   16.03799057 W
PL12W   0.53474891 W
PL13W   0.39007664 W
SFO2   400.1120007 MHz

F2 - Processing parameters
SI   65536
SF   100.6077400 MHz
WDW   EM
SSB   0
LB   1.00 Hz
GB   0
PC   1.40

170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

Figure S81. ^{13}C{^{1}H}-NMR spectrum of compound **16**.

NMR spectra of compound 17

^{1}H-NMR of TbbGeH(Me-NHC) in C$_6$D$_6$ (#) at rt, +: unknown impurities

6.92
5.29
3.32
3.15
1.44
1.30
0.25
0.20

2.00
1.01
5.99
2.01
9.01
6.06
17.94
17.96

#
+
+
+
+

7 6 5 4 3 2 1 0 ppm
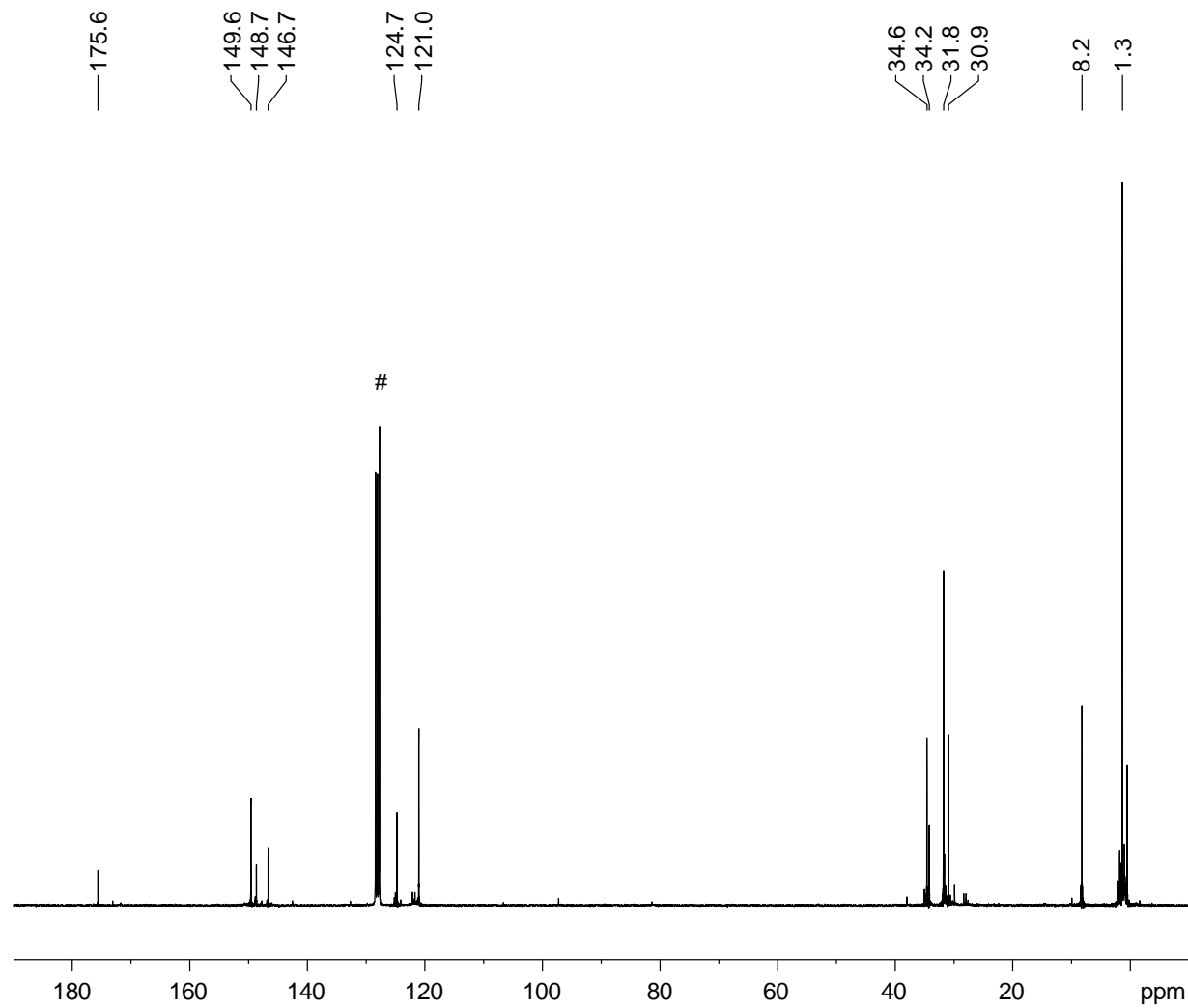
Current Data Parameters
NAME   MA427_30102020_300N
EXPNO   10
PROCNO   1

F2 - Acquisition Parameters
Date_   20201030
Time   16.41 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   zg30
TD   38044
SOLVENT   C6D6
NS   32
DS   0
SWH   6009.615 Hz
FIDRES   0.315930 Hz
AQ   3.1652608 sec
RG   100.47
DW   83.200 usec
DE   6.50 usec
TE   298.0 K
D1   1.00000000 sec
TD0   1
SFO1   300.1318533 MHz
NUC1   1H
P0   4.67 usec
P1   14.00 usec
PLW1   8.26509953 W

F2 - Processing parameters
SI   32768
SF   300.1299975 MHz
WDW   EM
SSB   0
LB   0 Hz
GB   0
PC   1.00

Figure S82. ^{1}H-NMR spectrum of compound **17**.

$^{13}C\{^1H\}$-NMR of TbbGeH(Me-NHC) in C_6D_6 (#) at rt

175.6

149.6
148.7
146.7

124.7
121.0

34.6
34.2
31.8
30.9

8.2
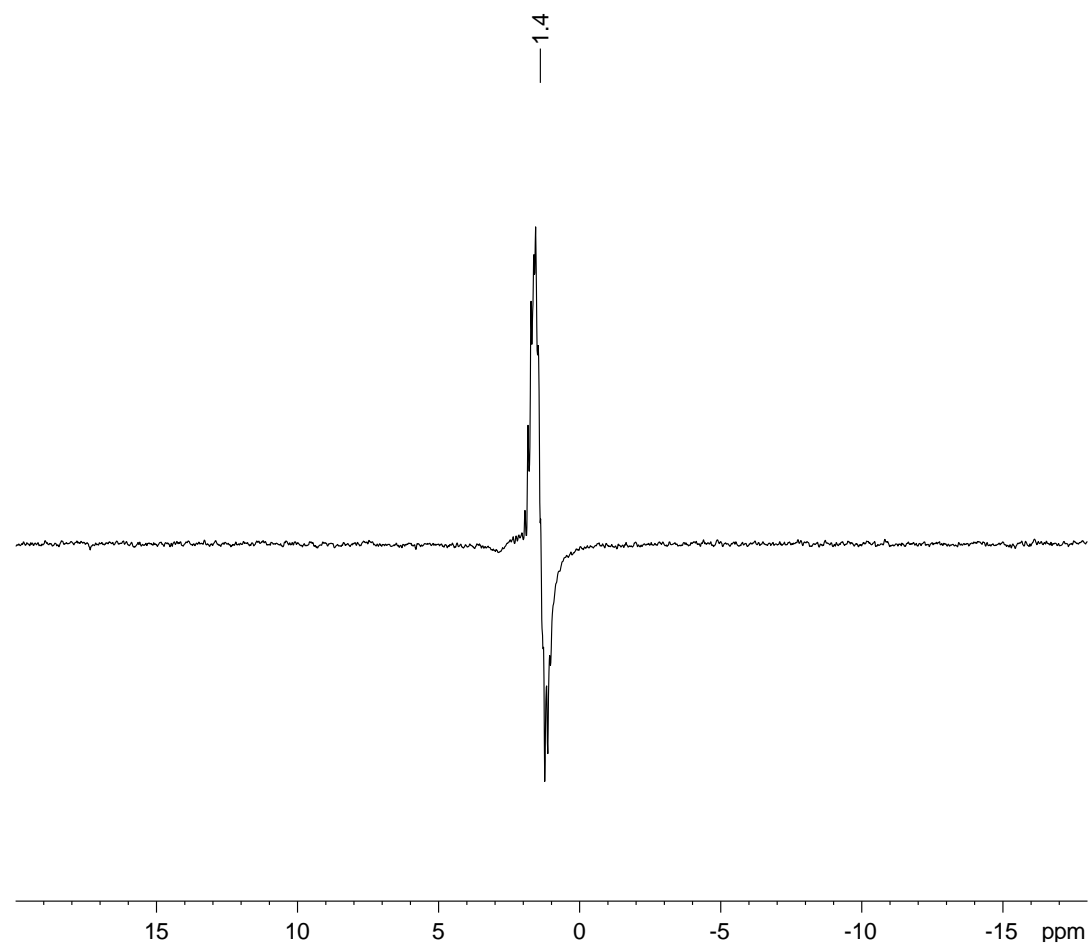
1.3

#

Current Data Parameters
NAME   MA427_30102020_300I
EXPNO   13
PROCNO   1

F2 - Acquisition Parameters
Date_   20201031
Time   0.09 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   udeft
TD   13040
SOLVENT   C6D6
NS   4608
DS   4
SWH   18115.941 Hz
FIDRES   2.778519 Hz
AQ   0.3599040 sec
RG   204.67
DW   27.600 usec
DE   6.50 usec
TE   298.0 K
D1   4.00000000 sec
D12   0.00002000 sec
D20   20.00000000 sec
TD0   1
SFO1   75.4752953 MHz
NUC1   13C
P1   10.00 usec
P13   2000.00 usec
P26   500.00 usec
PLW1   33.55099869 W
SPNAM[5]   Crp60comp.4
SPOAL5   0.500
SPOFFS5   0 Hz
SPW5   5.12620020 W
SPNAM[8] Crp60,0.5,20.1
SPOAL8   0.500
SPOFFS8   0 Hz
SPW8   5.12620020 W
SFO2   300.1312005 MHz
NUC2   1H
CPDPRG[2   waltz16
PCPD2   90.00 usec
PLW2   8.26509953 W
PLW12   0.20000000 W

F2 - Processing parameters
SI   32768
SF   75.4677196 MHz
WDW   EM
SSB   0
LB   1.00 Hz
GB   0
PC   1.40

180   160   140   120   100   80   60   40   20   ppm

Figure S83. $^{13}C\{^1H\}$-NMR spectrum of compound **17**.

^{29}Si-INEPTND-NMR of TbbGeH(Me-NHC) in C_6D_6 at rt

1.4

Current Data Parameters
NAME   MA427_30102020_300N
EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
Date_   20201030
Time   16.57 h
INSTRUM   spect
PROBHD   Z104275_0338 (
PULPROG   ineptnd
TD   39048
SOLVENT   C6D6
NS   320
DS   0
SWH   26315.789 Hz
FIDRES   1.347869 Hz
AQ   0.7419120 sec
RG   204.67
DW   19.000 usec
DE   6.50 usec
TE   298.0 K
CNST2   6.5999999
D1   2.00000000 sec
D4   0.03787879 sec
TD0   1
SFO1   59.6229159 MHz
NUC1   29Si
P1   10.30 usec
P2   20.60 usec
PLW1   50.00000000 W
SFO2   300.1312005 MHz
NUC2   1H
P3   14.00 usec
P4   28.00 usec
PLW2   8.26509953 W

F2 - Processing parameters
SI   32768
SF   59.6273759 MHz
WDW   EM
SSB   0
LB   2.00 Hz
GB   0
PC   1.00

Figure S84. ^{29}Si-INEPTND-NMR spectrum of compound **17**.

NMR spectroscopic analysis of distannanes ArSnH$_2$-SnH$_2$Ar

Molecules RH$_2$SnSnH$_2$R containing at least one NMR active tin atom constitute higher order spin systems due to the magnetic non-equivalence of the tin hydride protons. However, because the ^1J(Sn,H) and ^2J(Sn,H) coupling constants are much greater than the H,H coupling constants, the error is insignificant if their contributions to the multiplets are analyzed according to first-order rules (i.e., the two "doublets" of ^{119}Sn satellites in the ^{1}H NMR spectrum, Fig. S85, or the "triplet of triplets" of the major isotopologue in the ^{119}Sn NMR spectrum, Fig. S85, an A$_2$XB$_2$ spin system). An exception is the isotopologue containing two ^{119}Sn nuclei, an A$_2$XX'A'$_2$ spin system. Its subspectrum completely differs from the ^{119}Sn,^{117}Sn isotopologue, which constitutes an A$_2$XYB$_2$ spin system. The ^1J(^{119}Sn,^{117}Sn) coupling constant can be obtained from the ^{119}Sn{^{1}H} NMR spectrum independently.
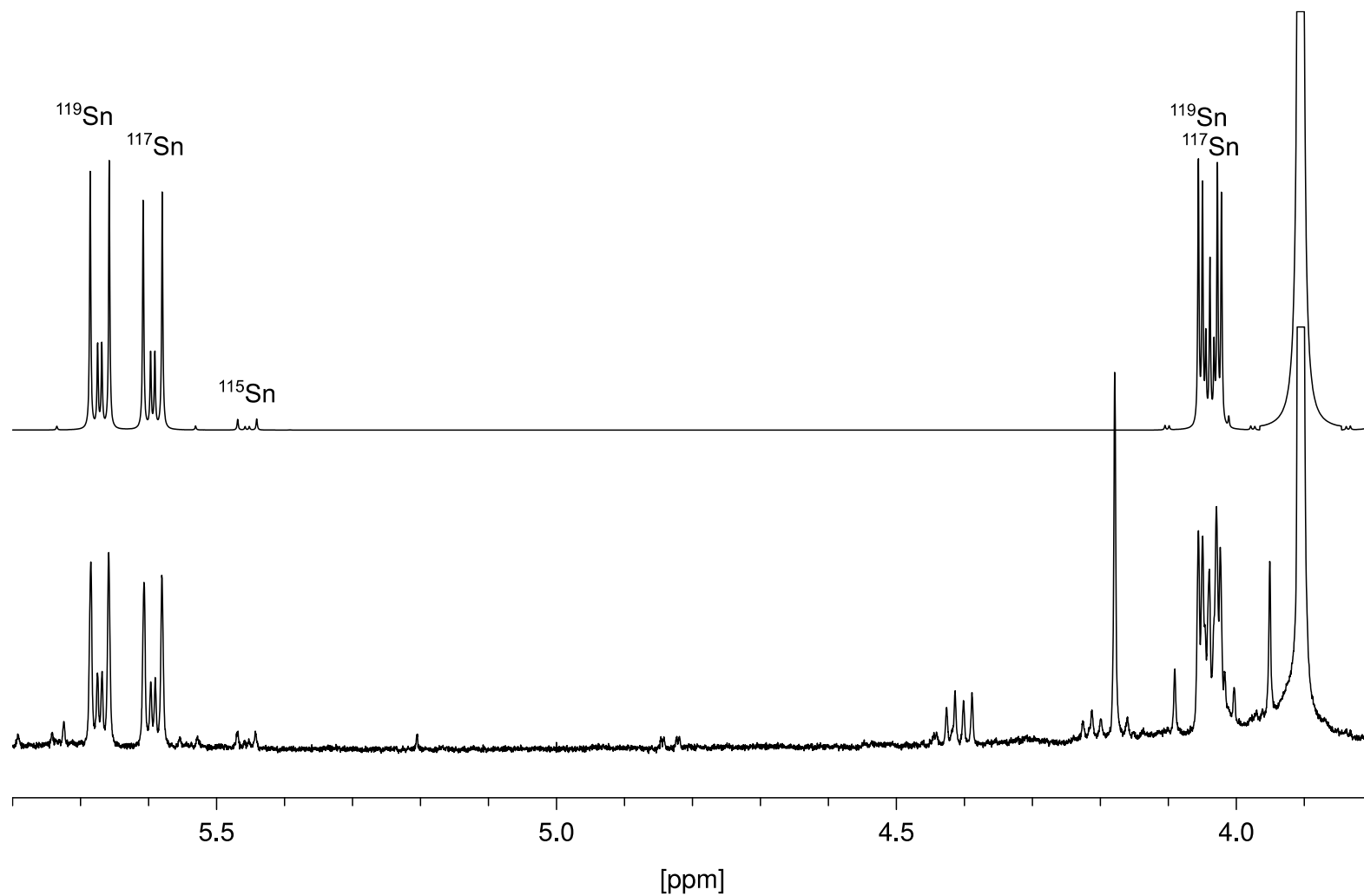
Figure S85. High-frequency half of the experimental and simulated ^{1}H NMR spectra due to the Sn-H protons of [Ar'SnH$_2$]$_2$ at 3.91 ppm, obtained at 500.13 MHz (r.t.). The satellites due to ^{119}Sn, ^{117}Sn or ^{115}Sn show the effect of ^{1}H-^{1}H couplings.
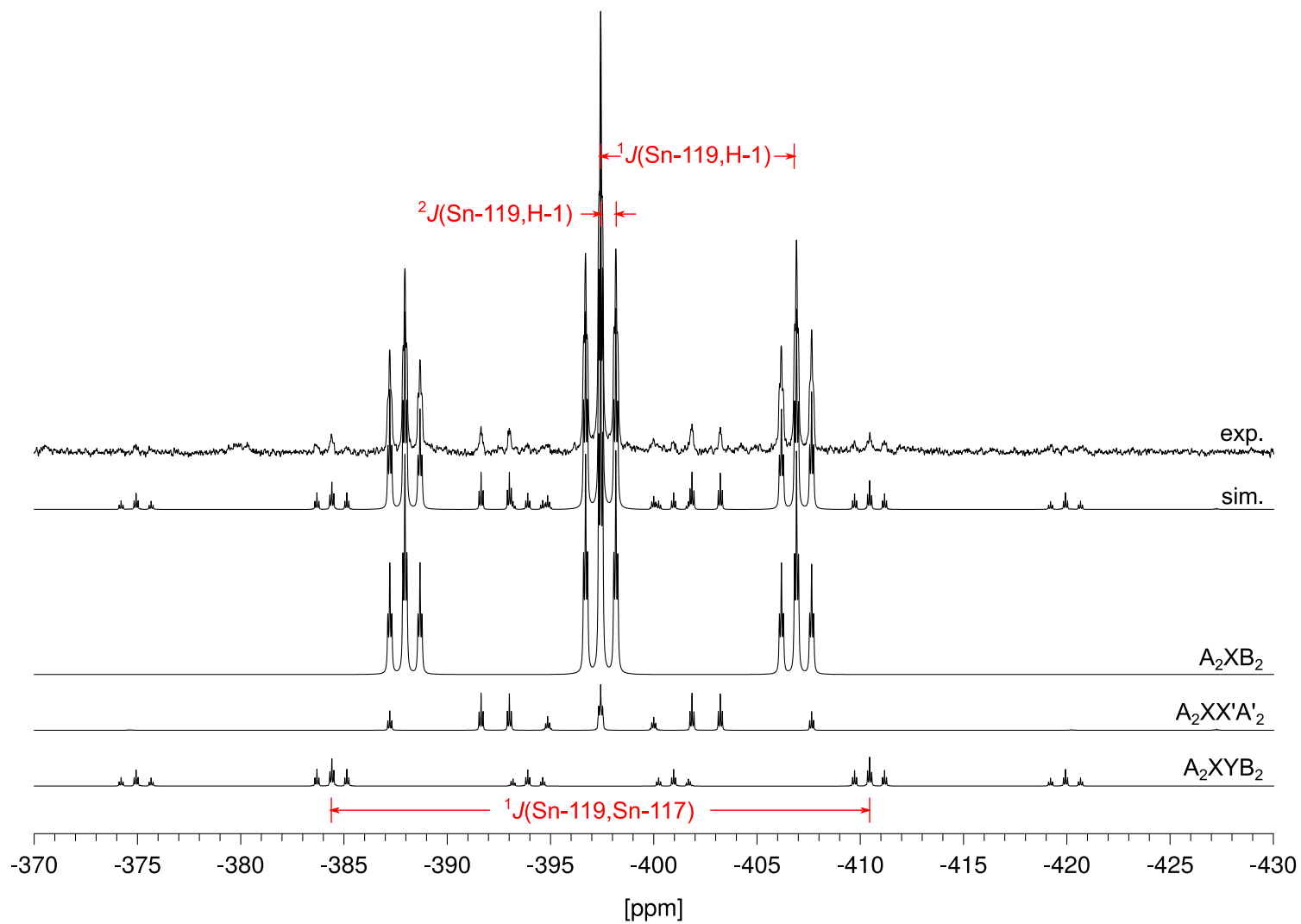
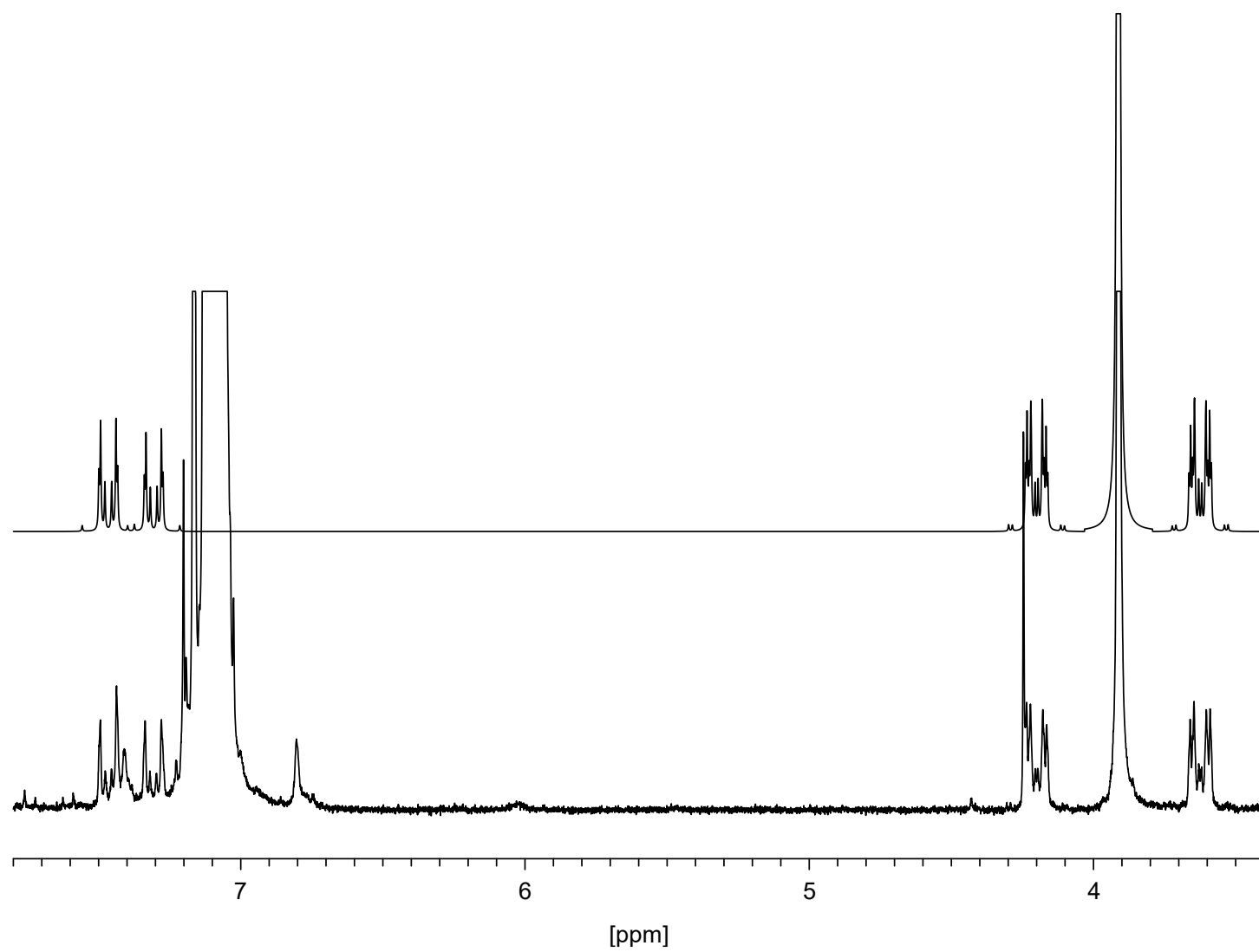Figure S86. Experimental and calculated ^{119}Sn NMR spectra of [Ar'SnH$_2$]$_2$ obtained at 186.50 MHz (r.t.).
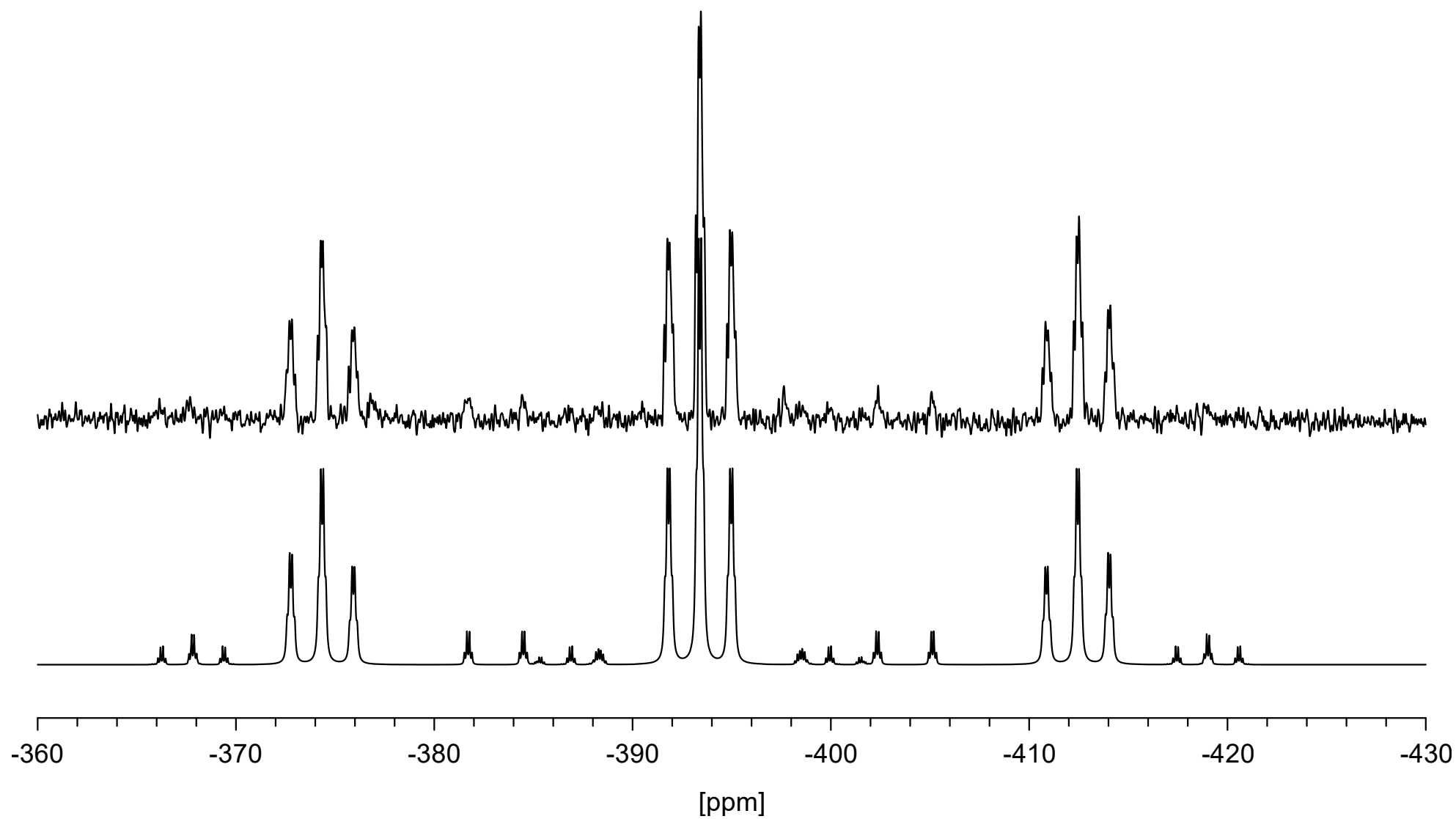
Figure S87. Experimental and calculated ^{1}H-NMR of (Ar*SnH)$_2$.

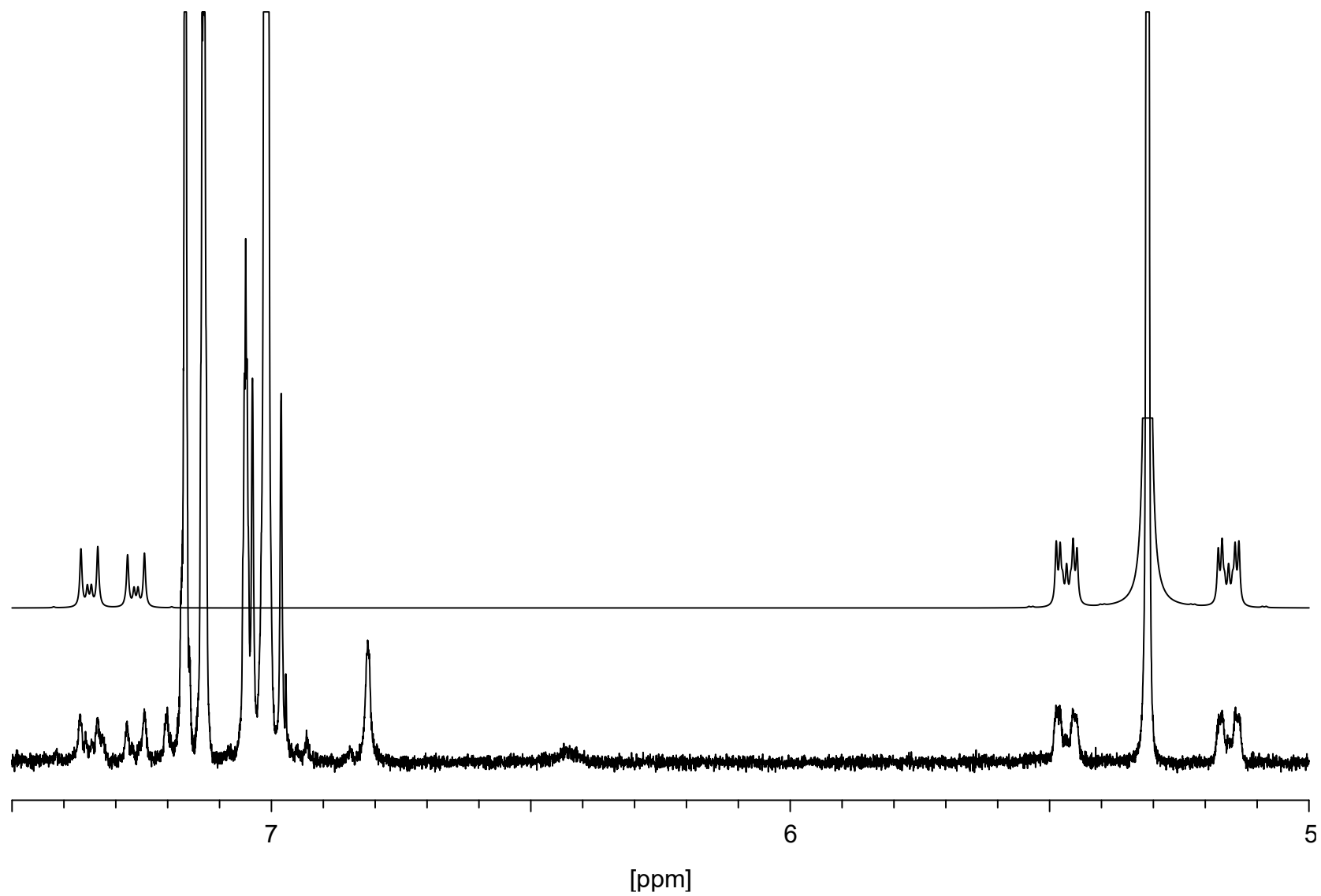Figure S88. Experimental and calculated ^{119}Sn-NMR of (Ar*SnH)$_2$.

Figure S89. Experimental and calculated ^{1}H-NMR of (TbbSnH)$_2$.