Supporting Information

The Scope of Direct Alkylation of Gold Surface with Solutions of C_1 - C_4 *n*-Alkylstannanes

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Table S1. Time dependence of thickness *d* of a monolayer deposited on a cleaned Au substrate from a 1×10^{-4} solution in THF.

t [min]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
10		0.0	0.4	0.2	1.1	1.4	0.8	0.7	0.8	0.7	0.4	0.7	0.5	1.1	0.9	19.0
30		0.0	1.1	1.0	3.0	2.6	1.1	1.1	1.1	1.1	1.1	1.3	1.1	1.4	1.2	20.0
60	0.3	0.4	1.5	1.7	3.5	3.0	1.3	1.7	1.5	1.7	1.6	1.6	1.8	2.0	1.8	20.5
120	0.4	0.6	2.5	2.4	4.1	3.9	2.6	3.3	2.6	3.8	2.6	2.7	2.7	2.7	2.6	21.8
180	0.6	0.8	2.4	2.5	4.1	4.5	3.5	4.1	3.5	4.4	3.3	3.4	3.4	3.4	3.1	22.0
300	0.5	0.9	2.8	2.9	4.1	4.5	3.5	4.4	3.5	4.4	3.8	4.3	4.1	4.1	4.0	21.8
1080	0.6	0.8	2.6	2.9	4.3	4.5	4.1	4.5	4.1	4.5	4.0	4.2	3.8	4.3	3.9	22.0

Table S2. The growth in time of ellipsometric thickness *d* of a monolayer grown on cleaned Au surface from 10^{-2} - 10^{-5} M THF solutions of **6**.

t [min]	**1×10^{-2}**	**1×10^{-3}**	**5×10^{-4}**	**1×10^{-4}**	**1×10^{-5}**
0.02	0.11	0.05	0.07	0.04	0.00
0.2	0.36	0.29	0.20	0.15	0.00
0.5	0.75	0.56	0.51	0.37	0.03
1	1.27	1.09	0.78	0.53	0.13
5	2.32	1.86	1.24	1.00	0.20
10	3.74	2.74	2.20	1.37	0.34
30	3.70	3.18	2.78	2.19	1.06
60	4.04	3.51	3.24	3.02	2.16
120	4.31	4.03	4.02	3.86	3.33

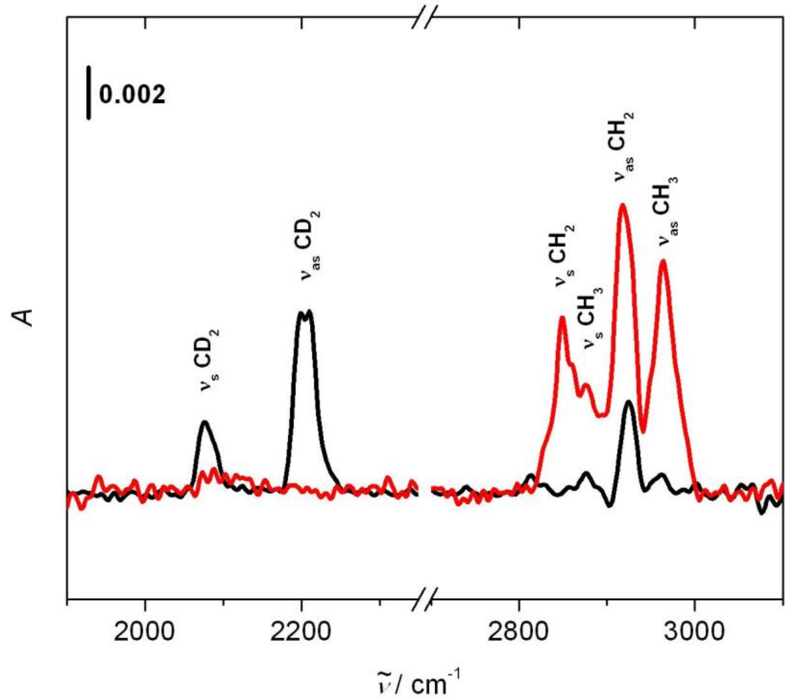


Figure S1: PM-IRRAS spectra of monolayers formed by treatment of gold surface with 1×10^{-4} M THF-d_8 solution of **6** (red) and THF-d_8 (black).

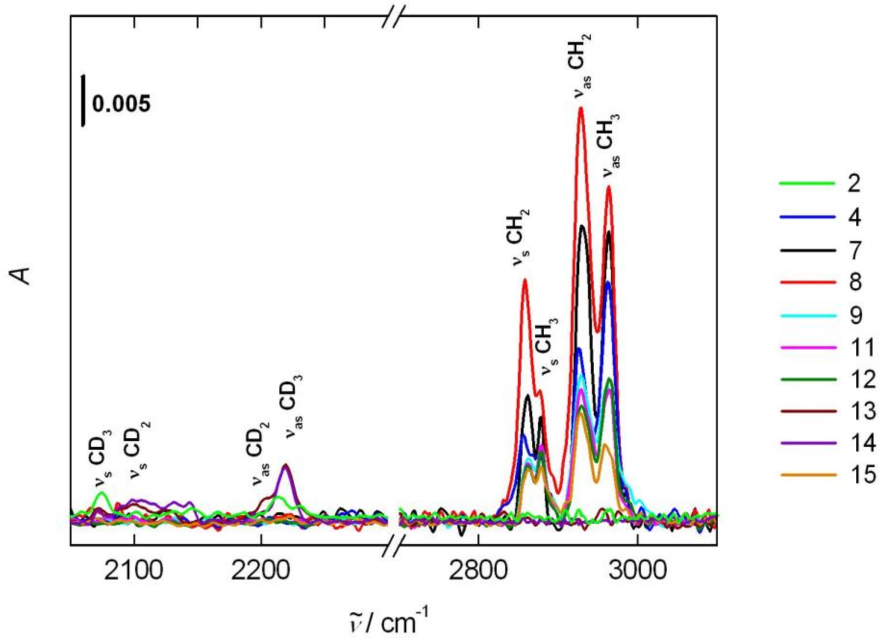


Figure S2: PM-IRRAS spectra of monolayers produced after 5 h from 1×10^{-4} M THF solution of **4** (blue), **7** (black), **8** (red), **9** (cyan), **11** (magenta), **12** (olive), **13** (wine), **14** (violet) and **15** (orange) on Au substrates. For the slowly reactiong stannane **2** (green), a 5×10^{-4} M solution was used.

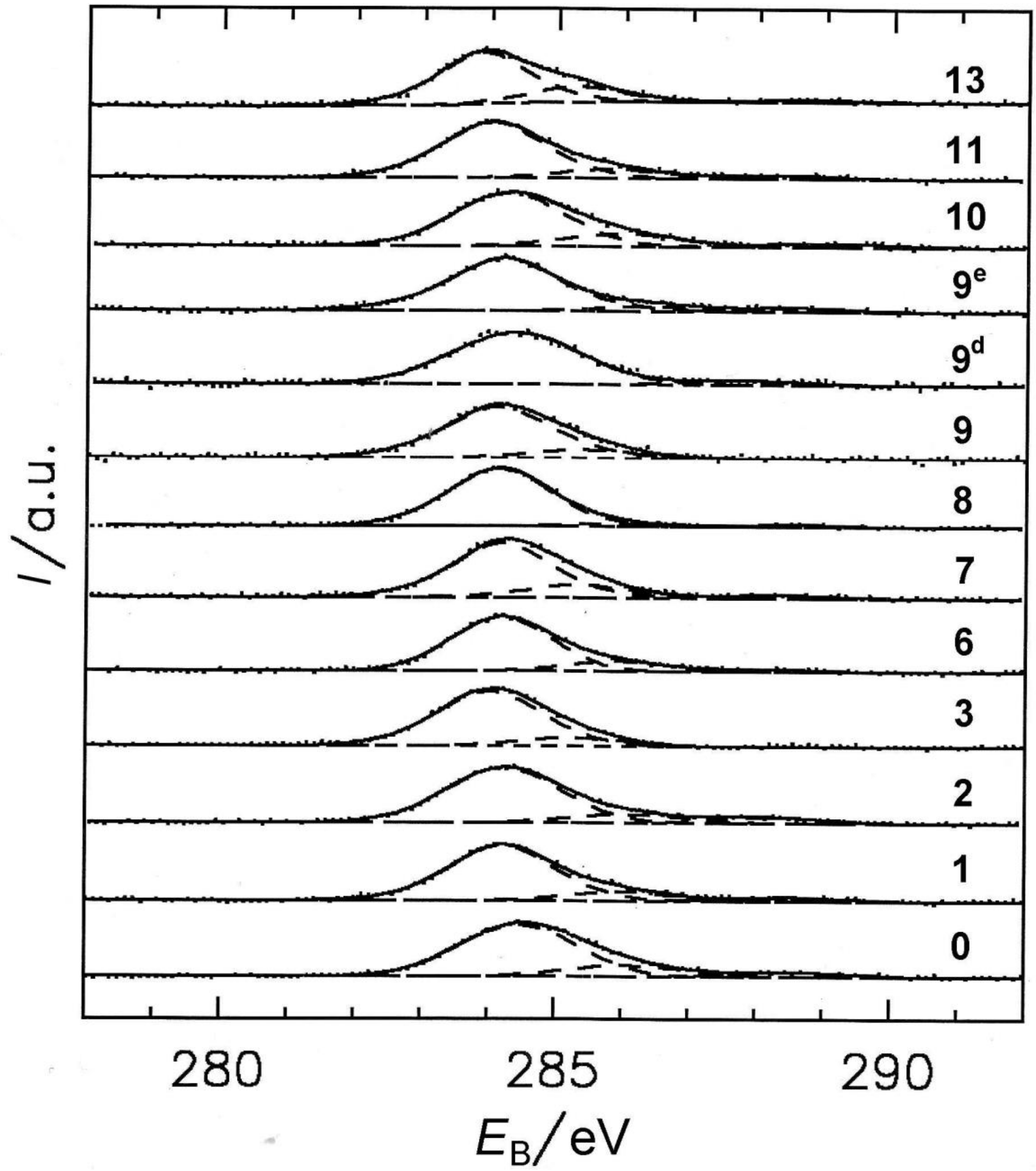


Figure S3: XPS of C 1s photoelectrons from cleaned gold surface treated with a 5×10^{-4} M THF solution of **1-3**, **6-11**, **13** and **0** (flame annealed gold film on mica immersed in THF for 4 h without any stannane added).

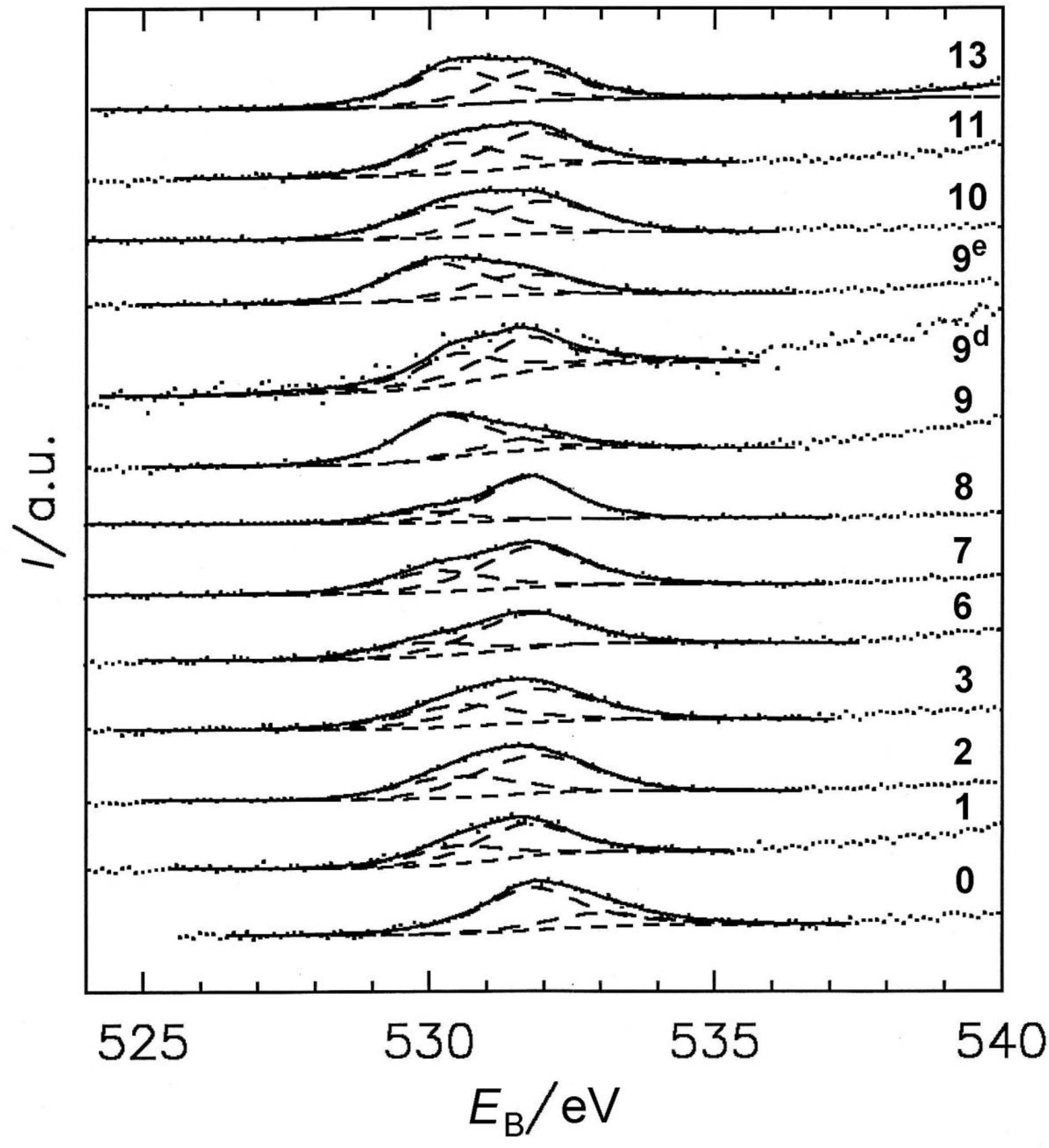


Figure S4: XPS of O 1s photoelectrons from cleaned gold surface treated with a 5×10^{-4} M THF solution of **1-3**, **6-11**, **13** and **0** (flame annealed gold film on mica immersed in THF for 4 h without any stannane added).

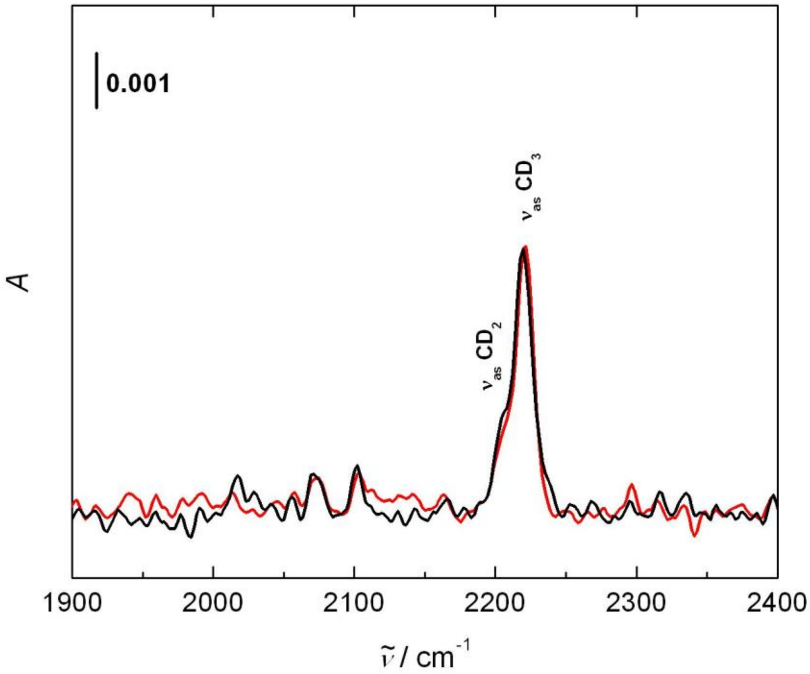


Figure S5: PM-IRRAS spectra of monolayers produced from **5** before (red) and after (black) immersion in pure THF for 18 h.

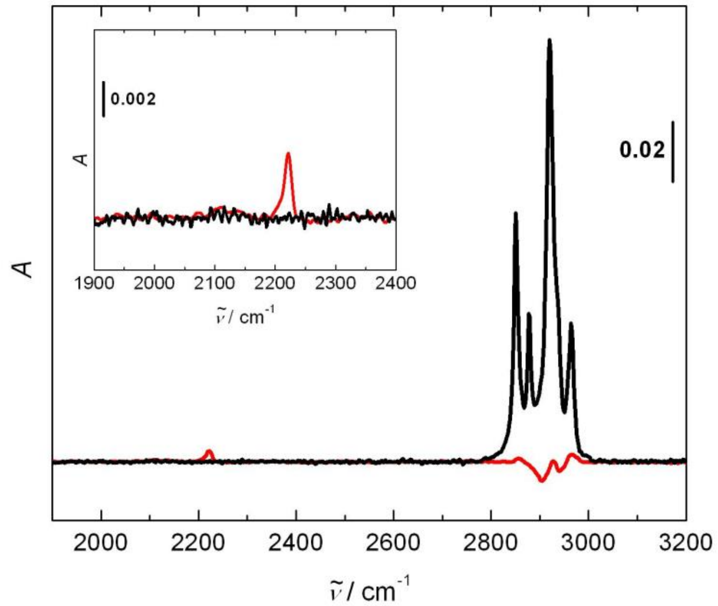
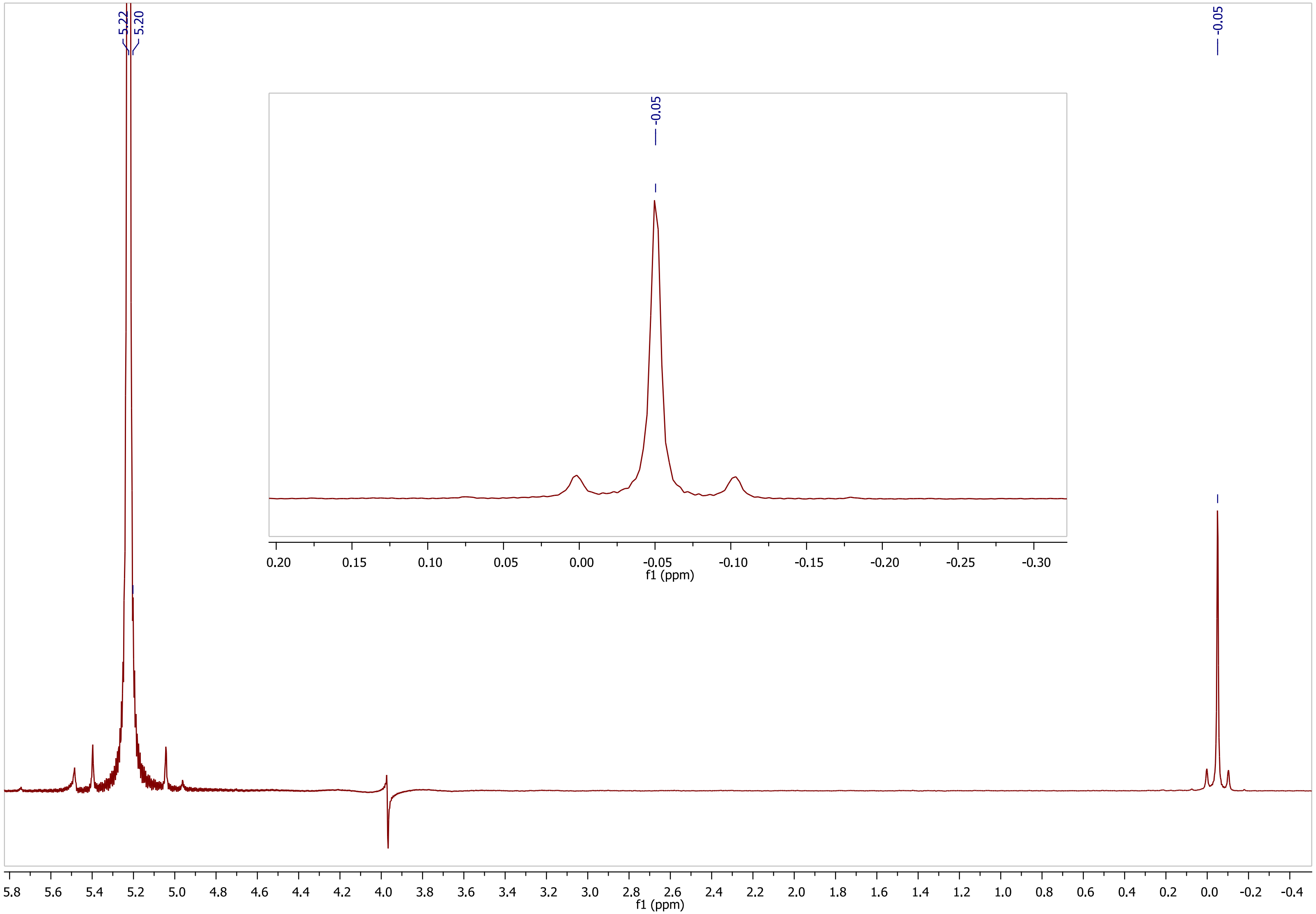
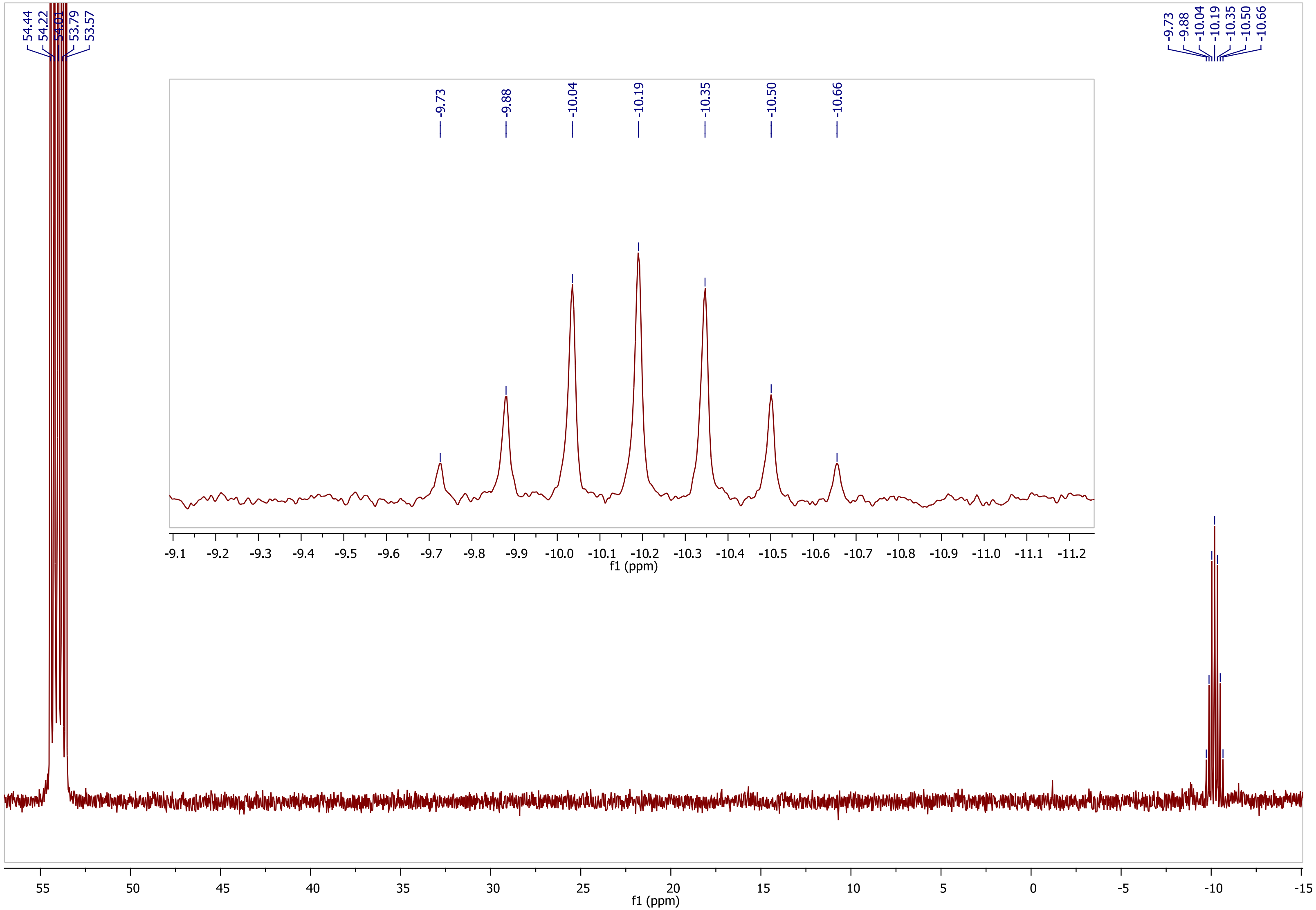


Figure S6: PM-IRRAS spectra of monolayers produced from **5** before (red) and after (black) treatment with 1×10^{-4} M solution of **16** in THF for 18 h.

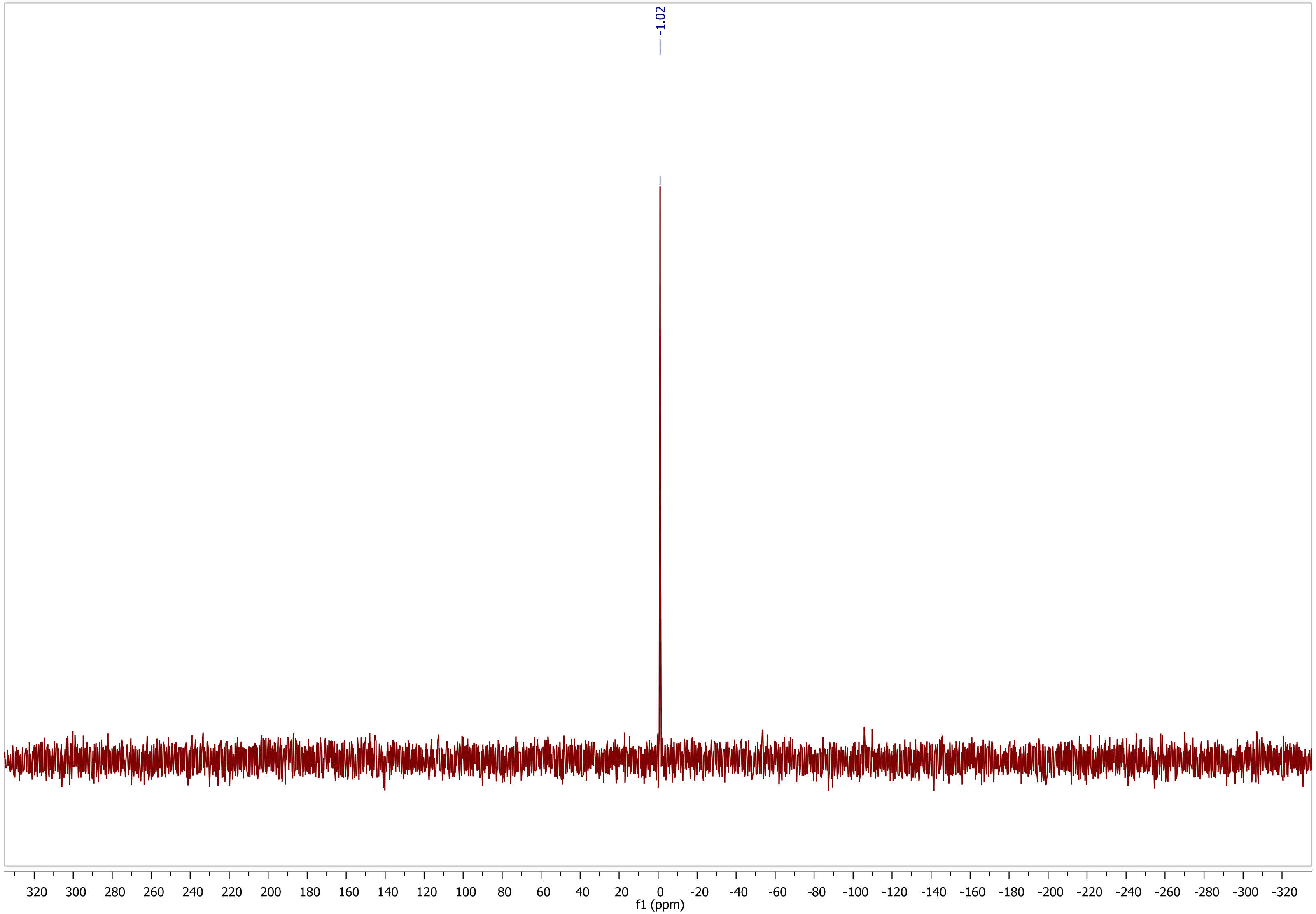
^{2}H NMR (76.7 MHz, CD_2Cl_2), tetramethylstannane-d_{12} (1)



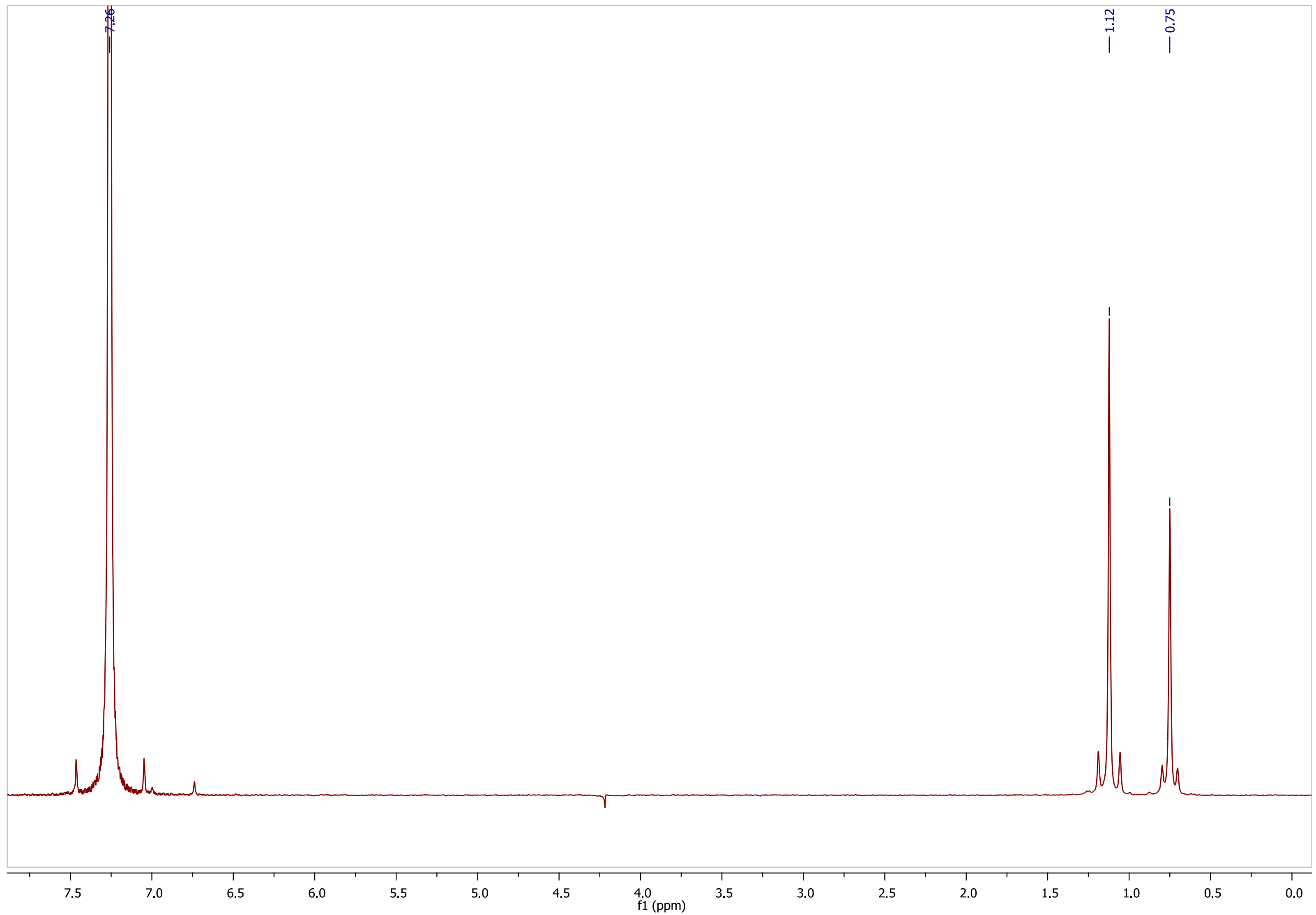
^{13}C NMR (125.7 MHz, CD_2Cl_2), tetramethylstannane-d_{12} (1)



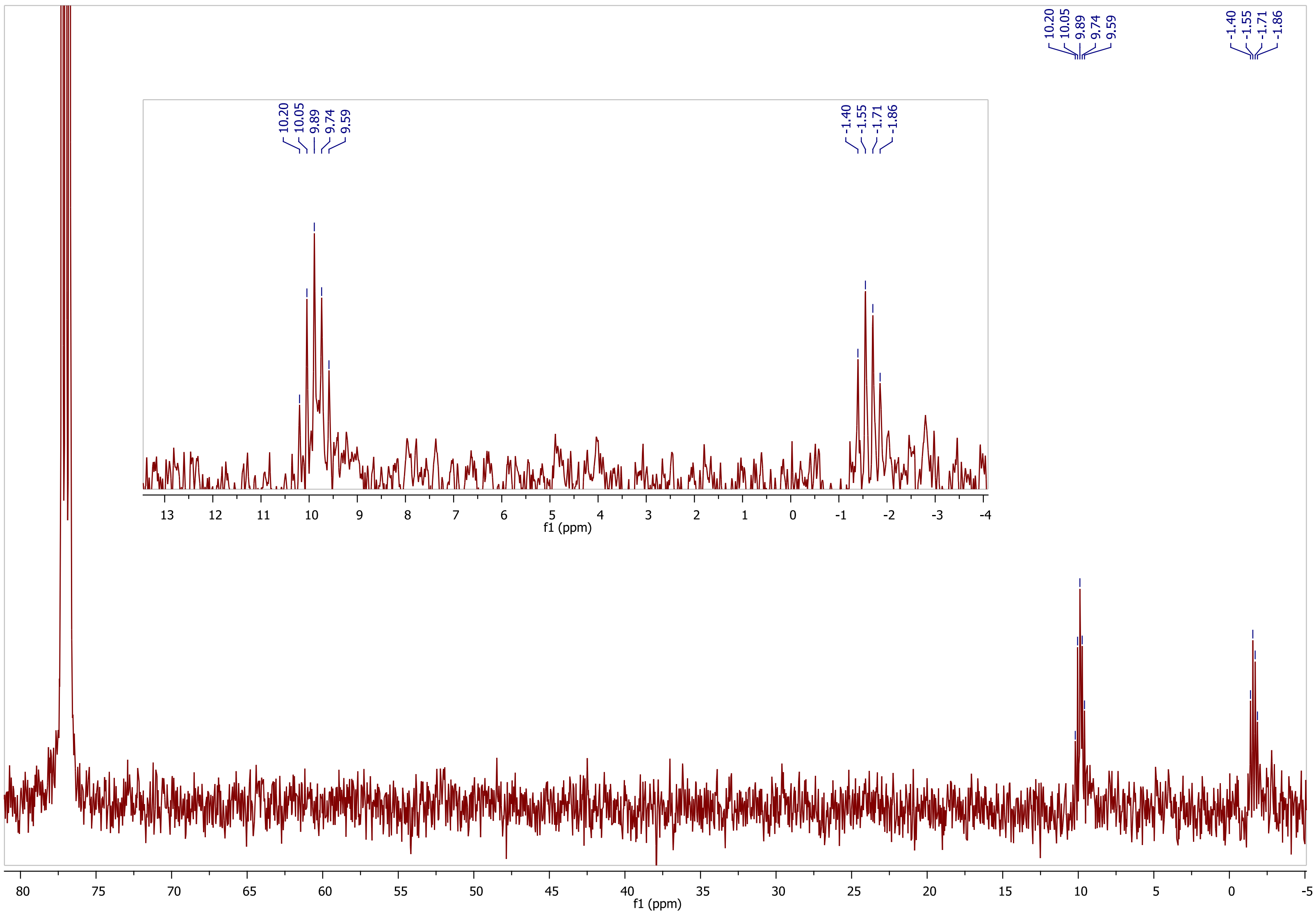
^{119}Sn NMR (186.4 MHz, CD_2Cl_2), tetramethylstannane-*d*$_{12}$ (1)



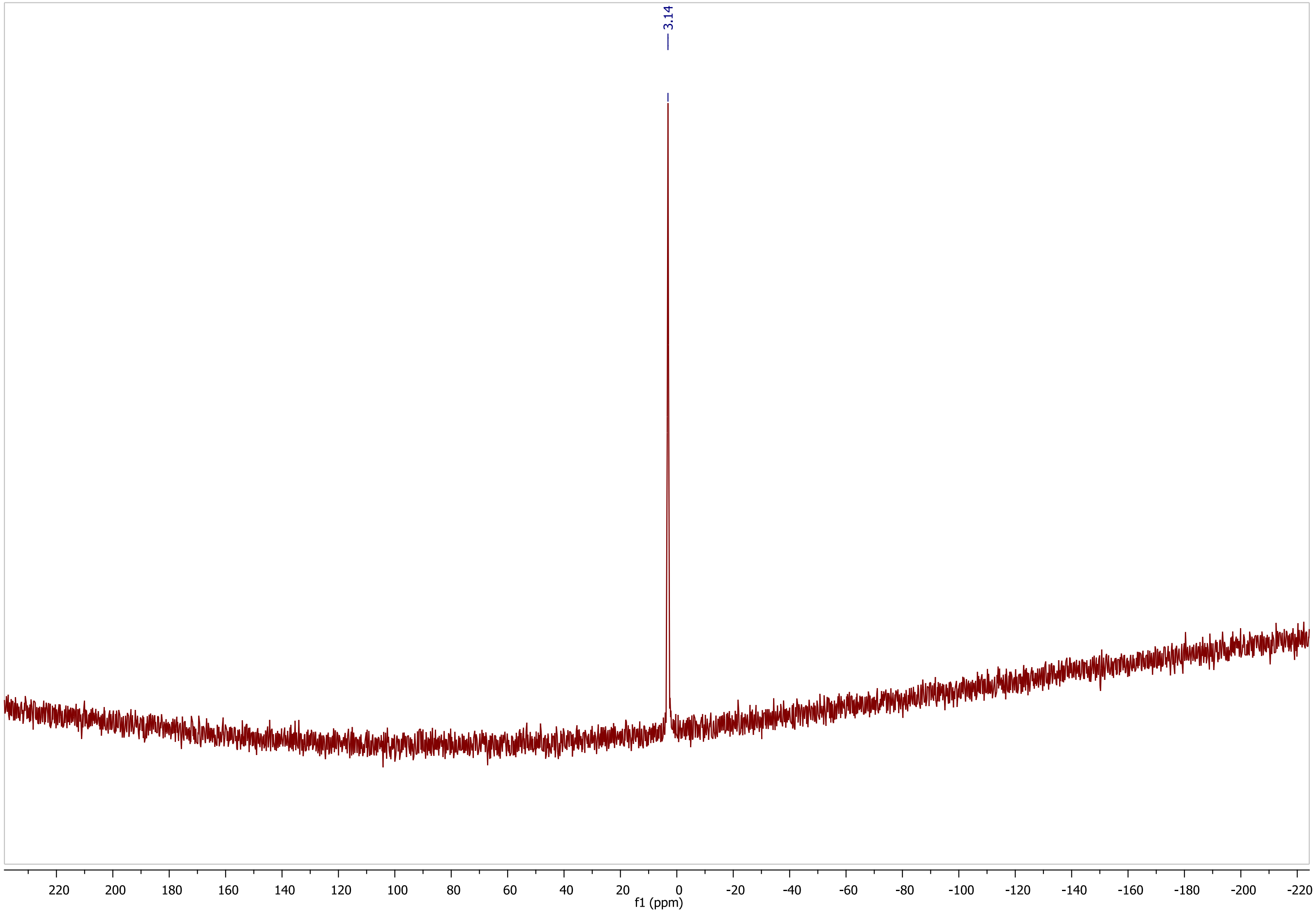
[2]H NMR (76.7 MHz, $CDCl_3$), tetra(ethyl-*d*$_5$)stannane (2)



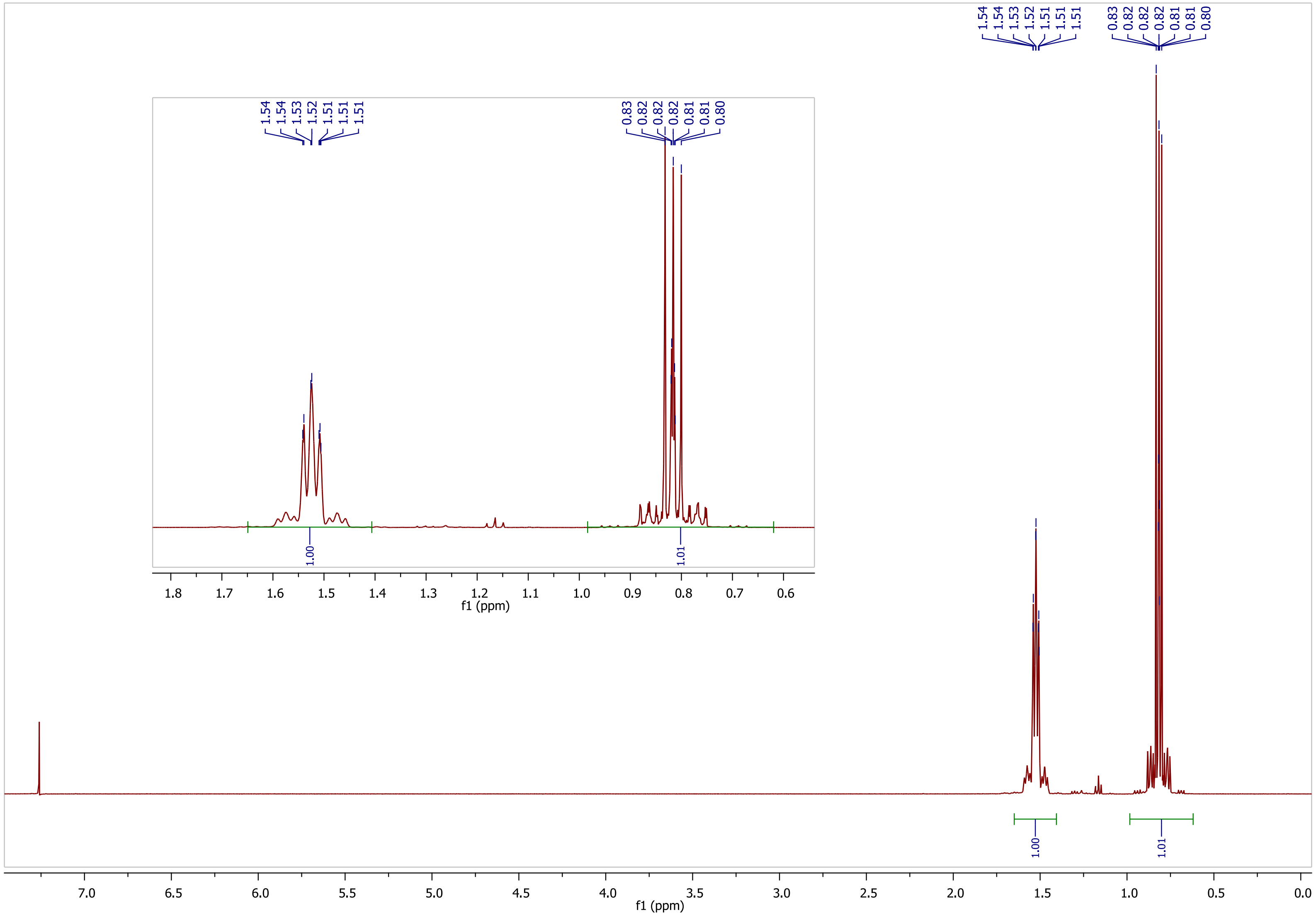
^{13}C NMR (125.7 MHz, $CDCl_3$), tetra(ethyl-*d*$_5$)stannane (2)



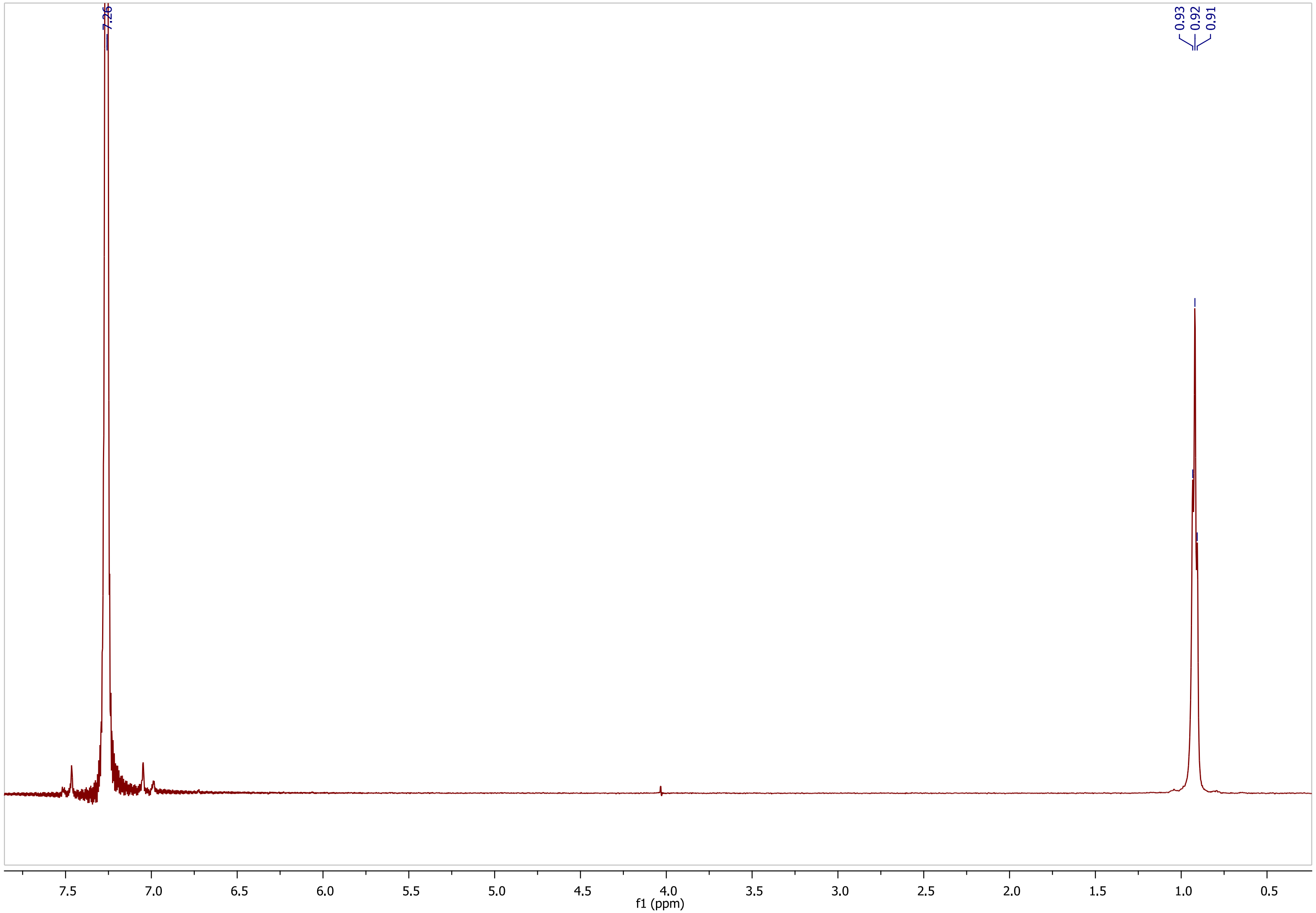
^{119}Sn NMR (186.4 MHz, $CDCl_3$), tetra(ethyl-*d*$_5$)stannane (2)



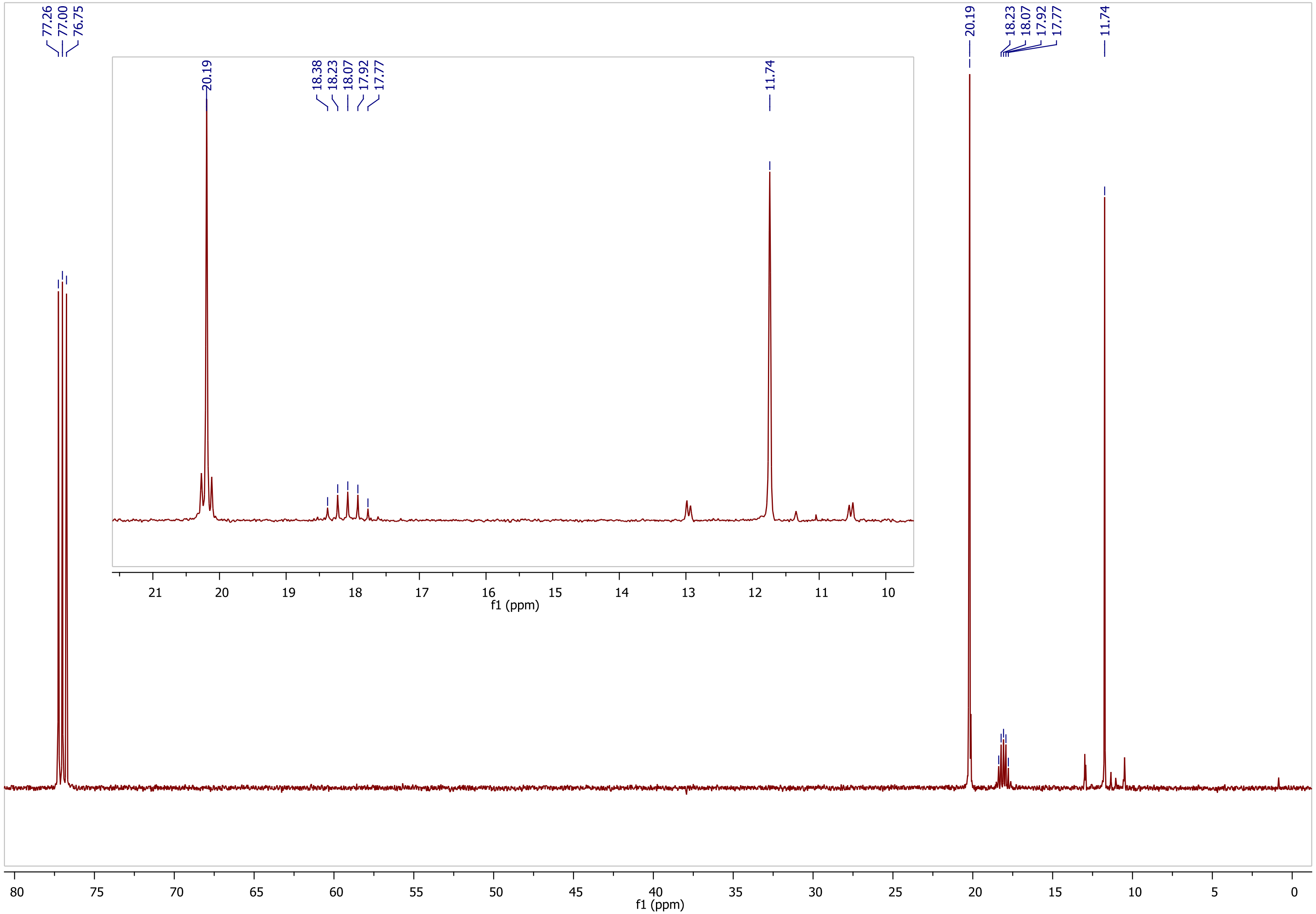
[1]H NMR (500 MHz, CDCl$_3$), tetra(*n*-propyl-3,3,3-d_3)stannane (3)



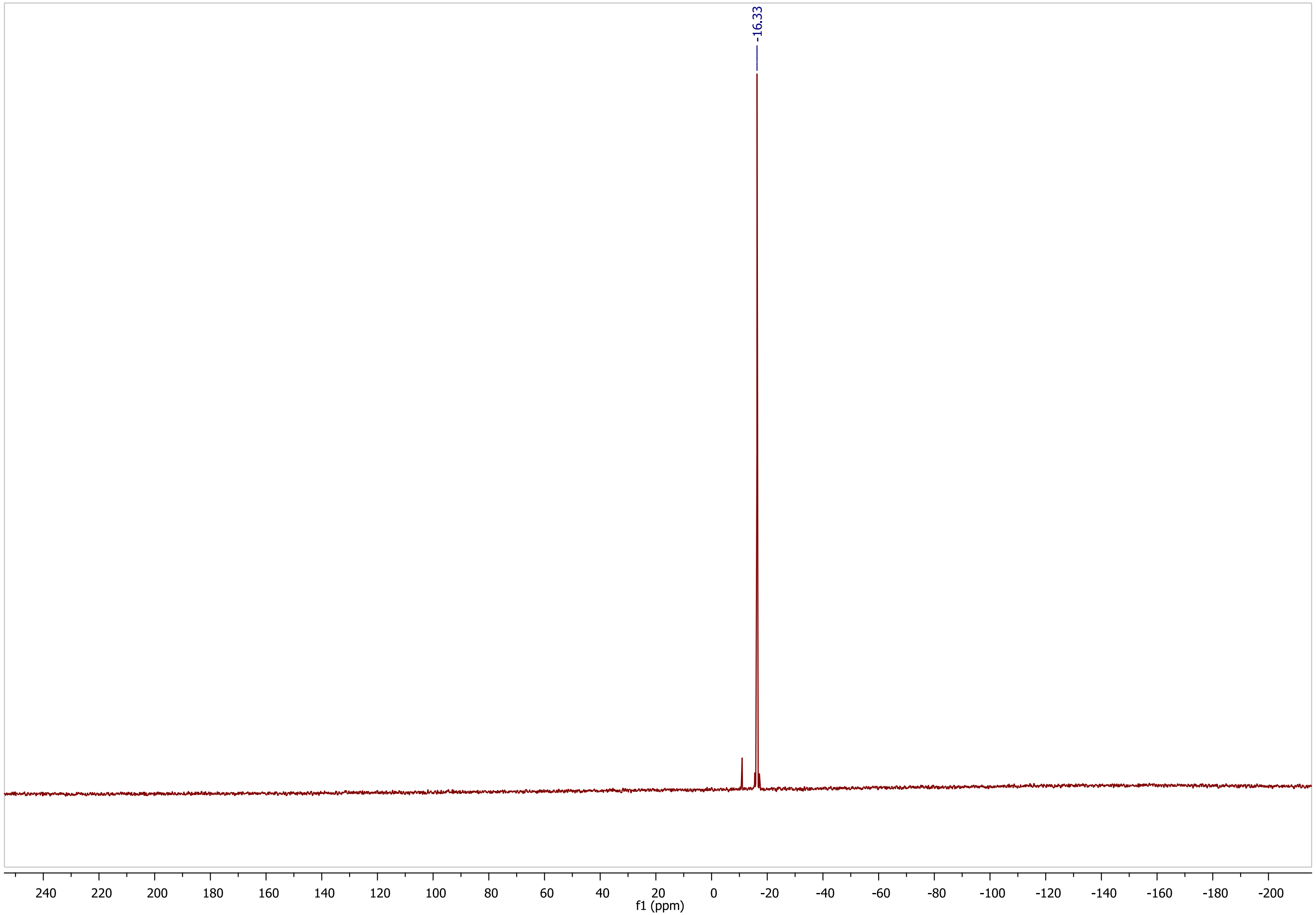
^{2}H NMR (76.7 MHz, $CDCl_3$), tetra(*n*-propyl-3,3,3-d_3)stannane (3)



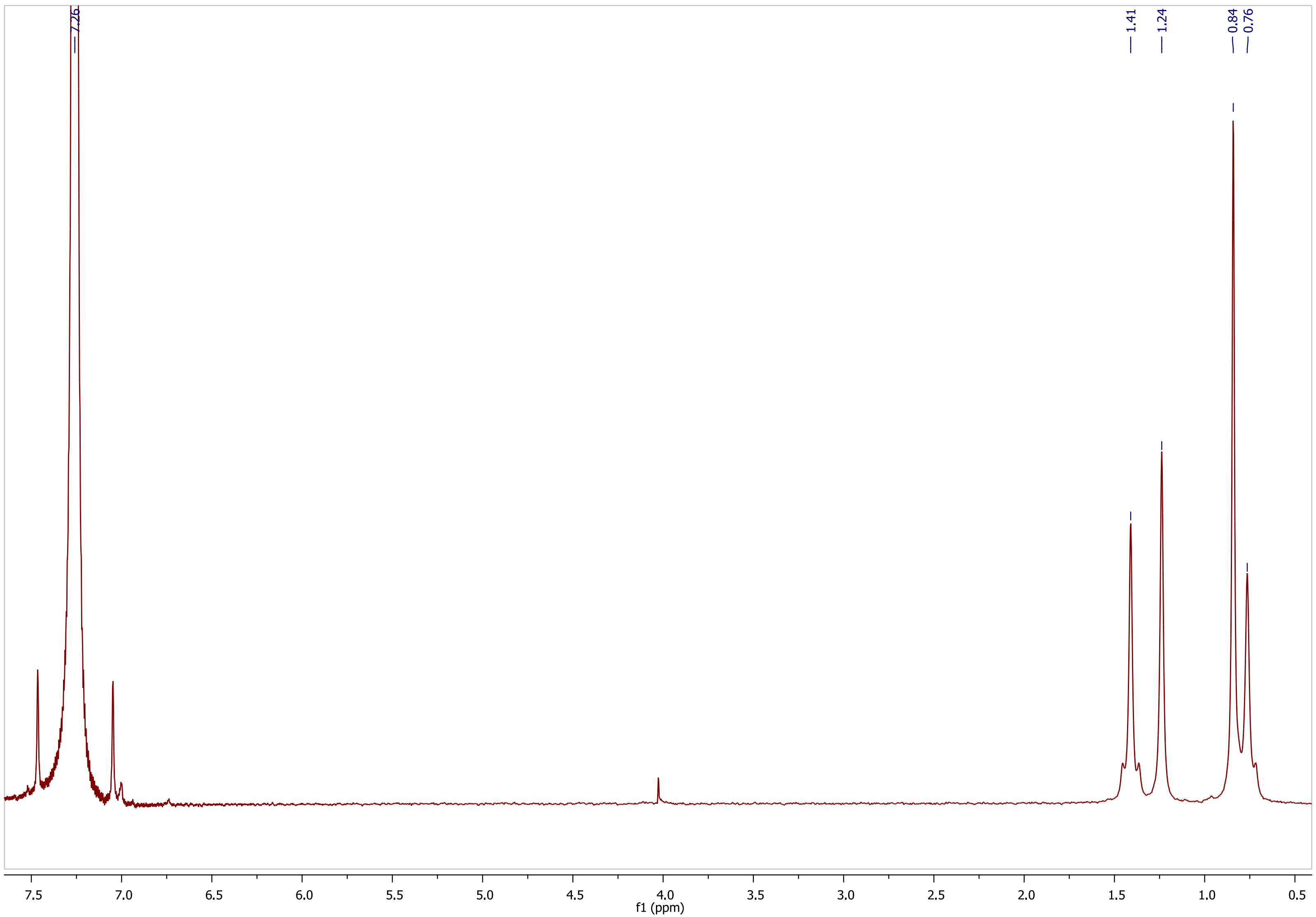
^{13}C NMR (125.7 MHz, $CDCl_3$), tetra(*n*-propyl-3,3,3-d_3)stannane (3)



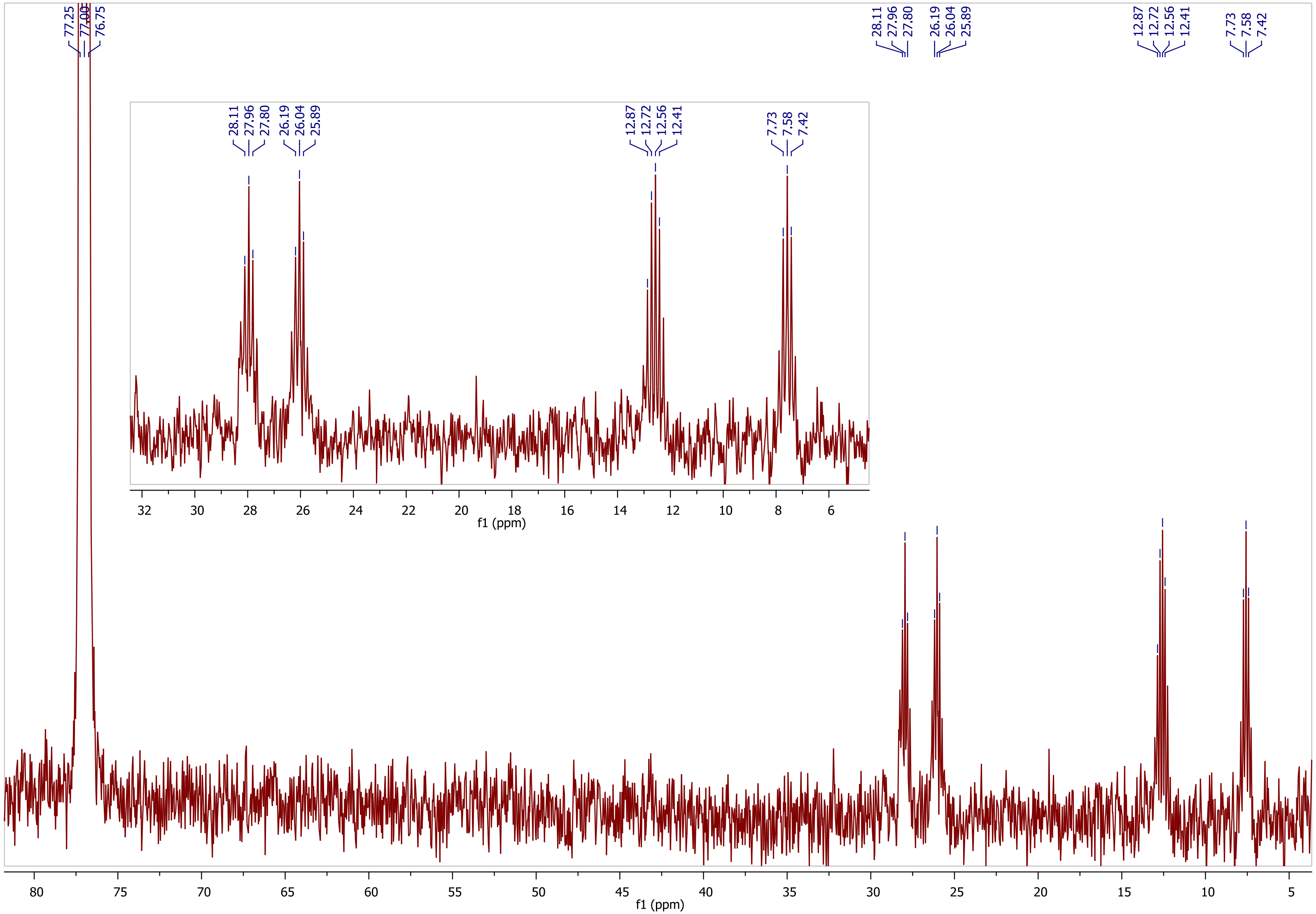
^{119}Sn NMR (186.4 MHz, CDCl$_3$), tetra(*n*-propyl-3,3,3-*d*$_3$)stannane (3)



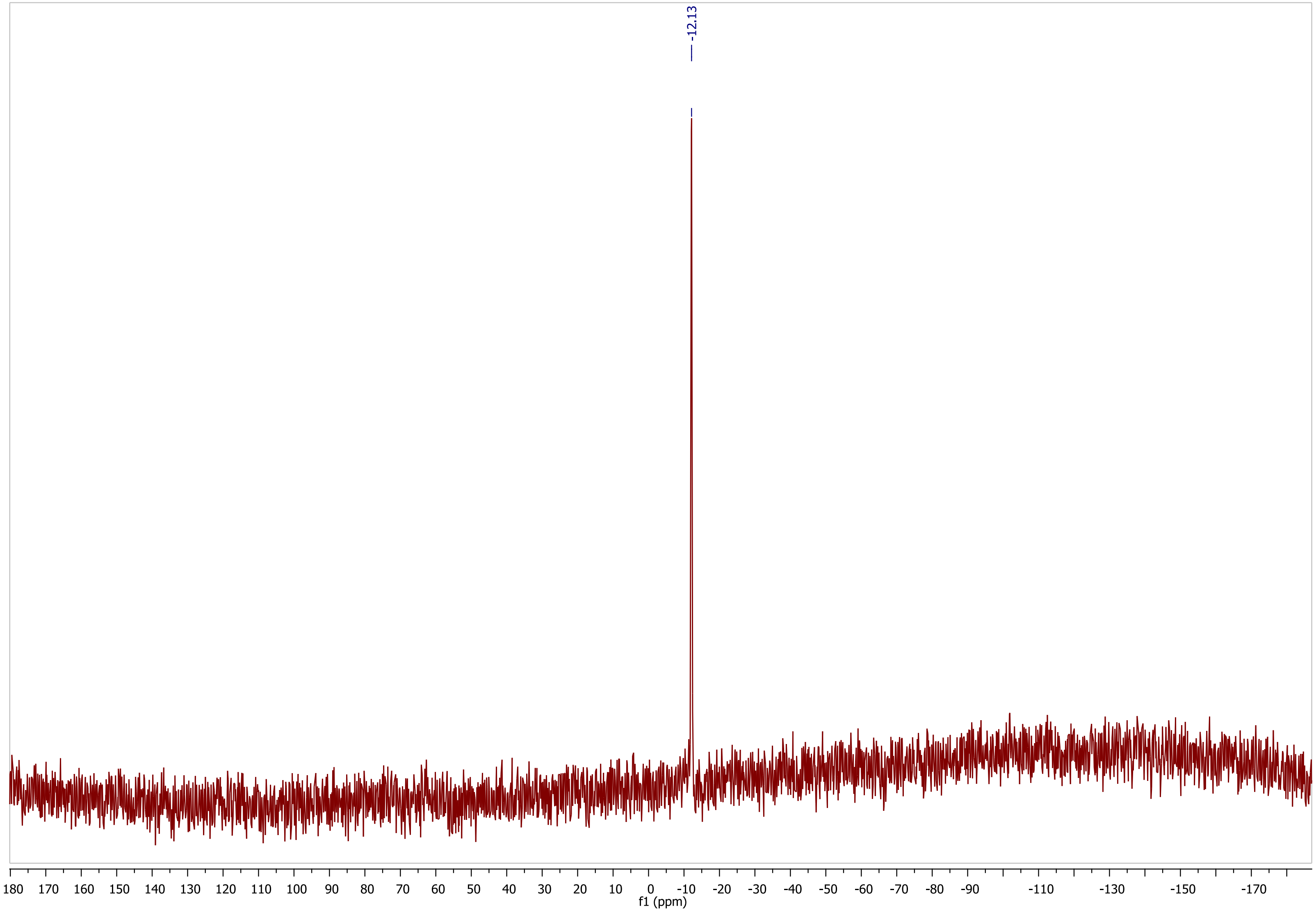
^{2}H NMR (76.7 MHz, CDCl$_3$), tetra(*n*-butyl-d_9)stannane (5)



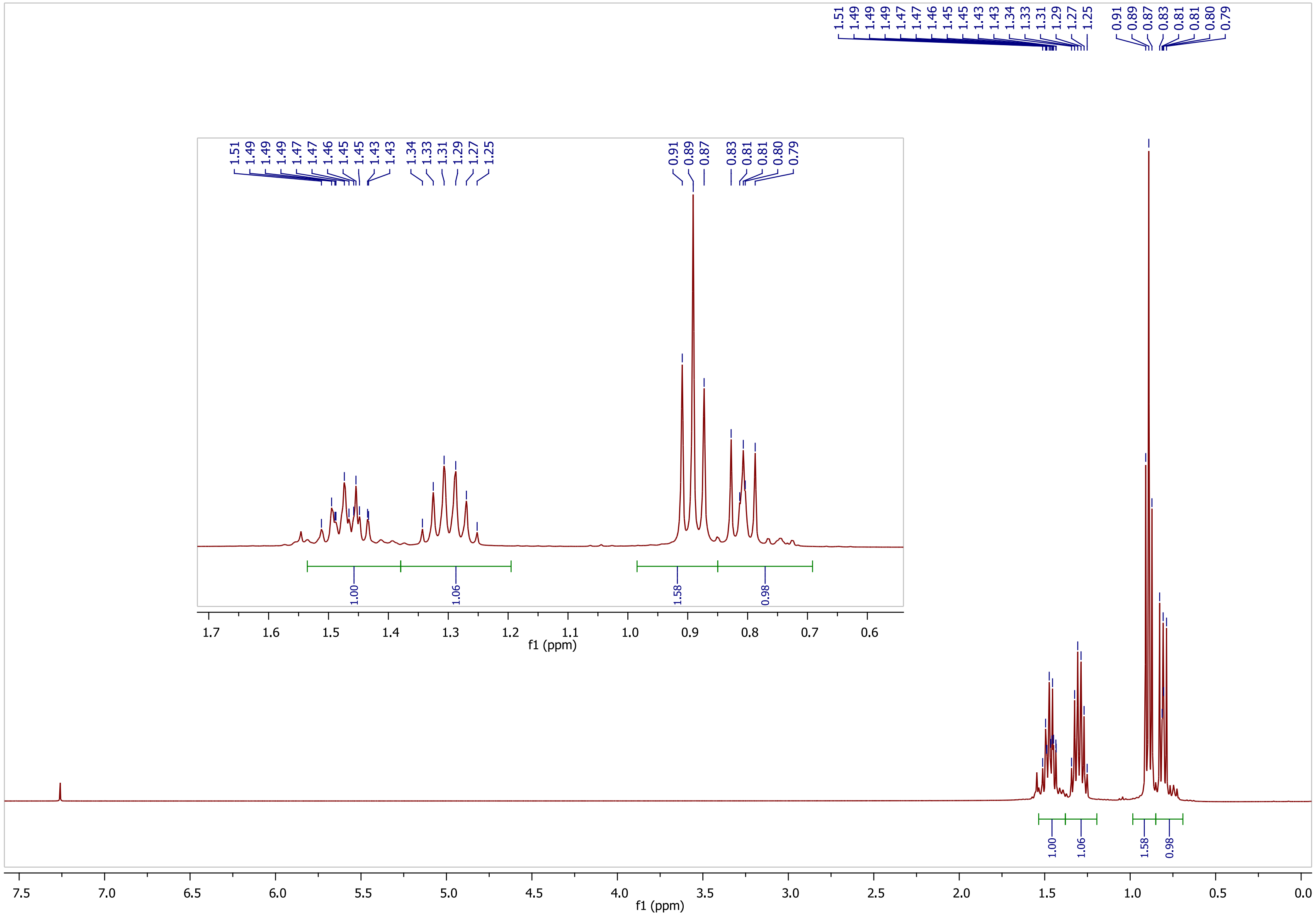
^{13}C NMR (125.7 MHz, $CDCl_3$), tetra(*n*-butyl-d_9)stannane (5)



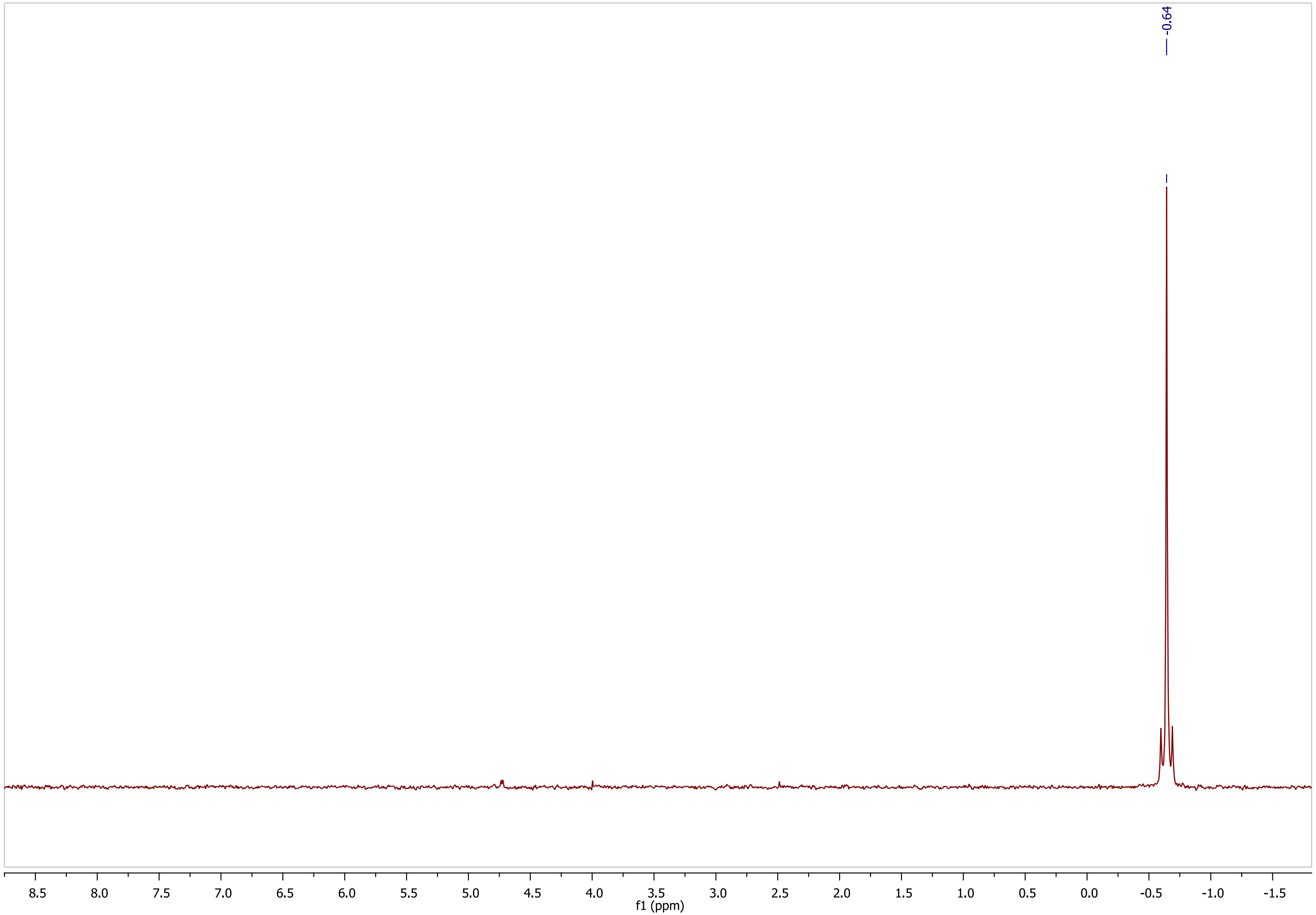
^{119}Sn NMR (186.4 MHz, CDCl$_3$), tetra(*n*-butyl-*d$_9$*)stannane (5)



[1]H NMR (400 MHz, CDCl$_3$), tri-*n*-butyl(methyl–*d*$_3$)stannane (8)



^{2}H NMR (76.7 MHz, $CDCl_3$), tri-*n*-butyl(methyl–*d*$_3$)stannane (8)



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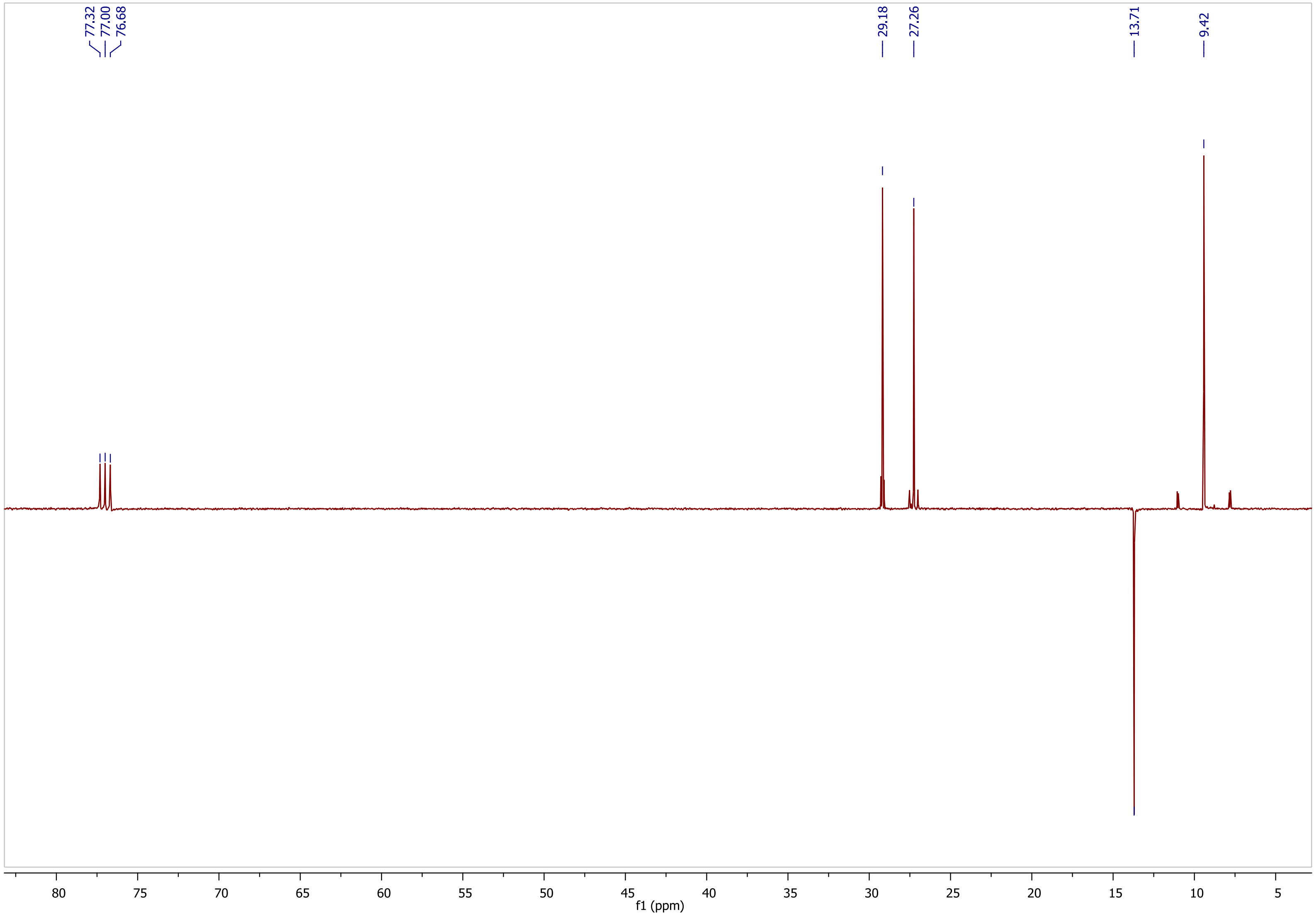
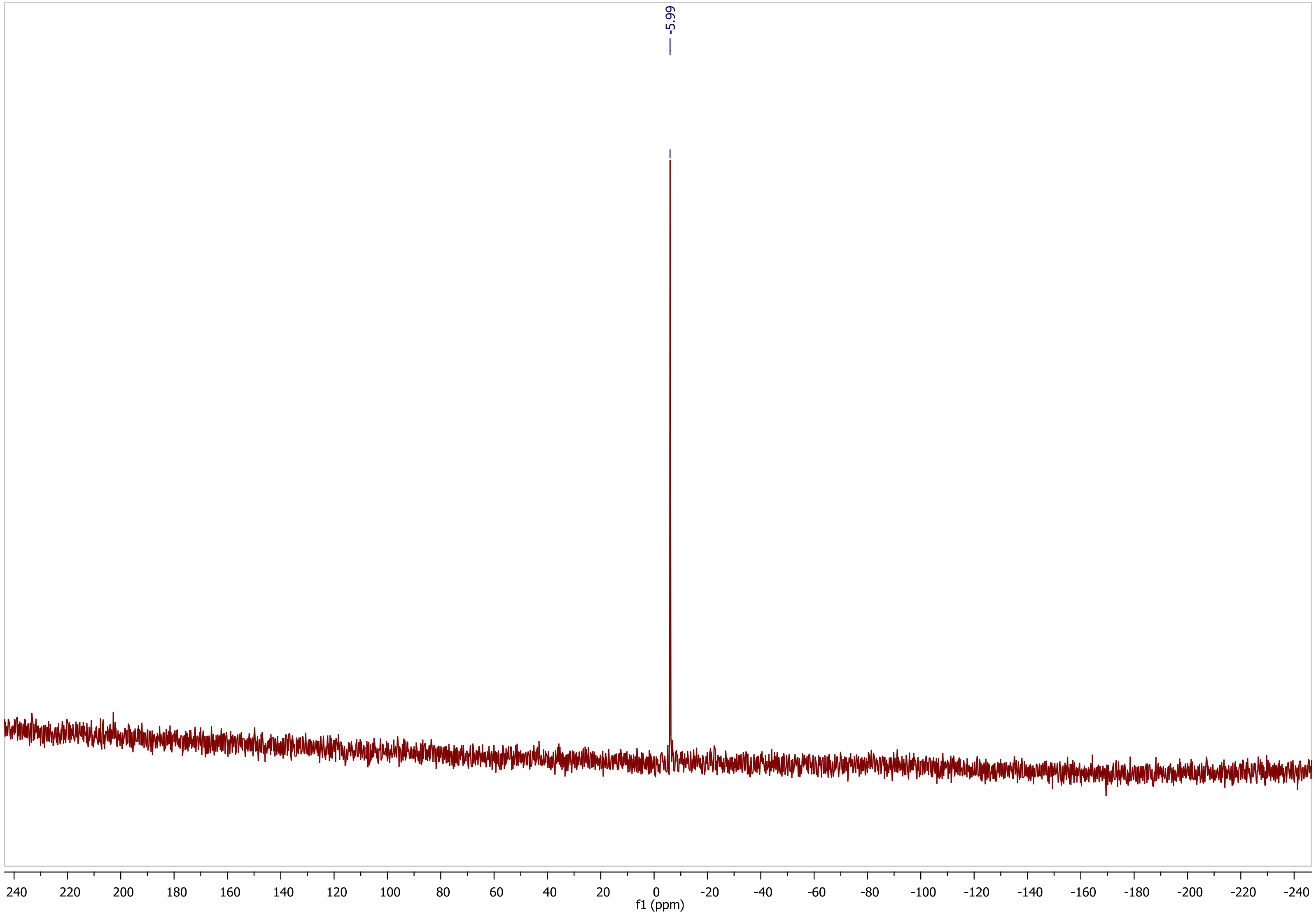
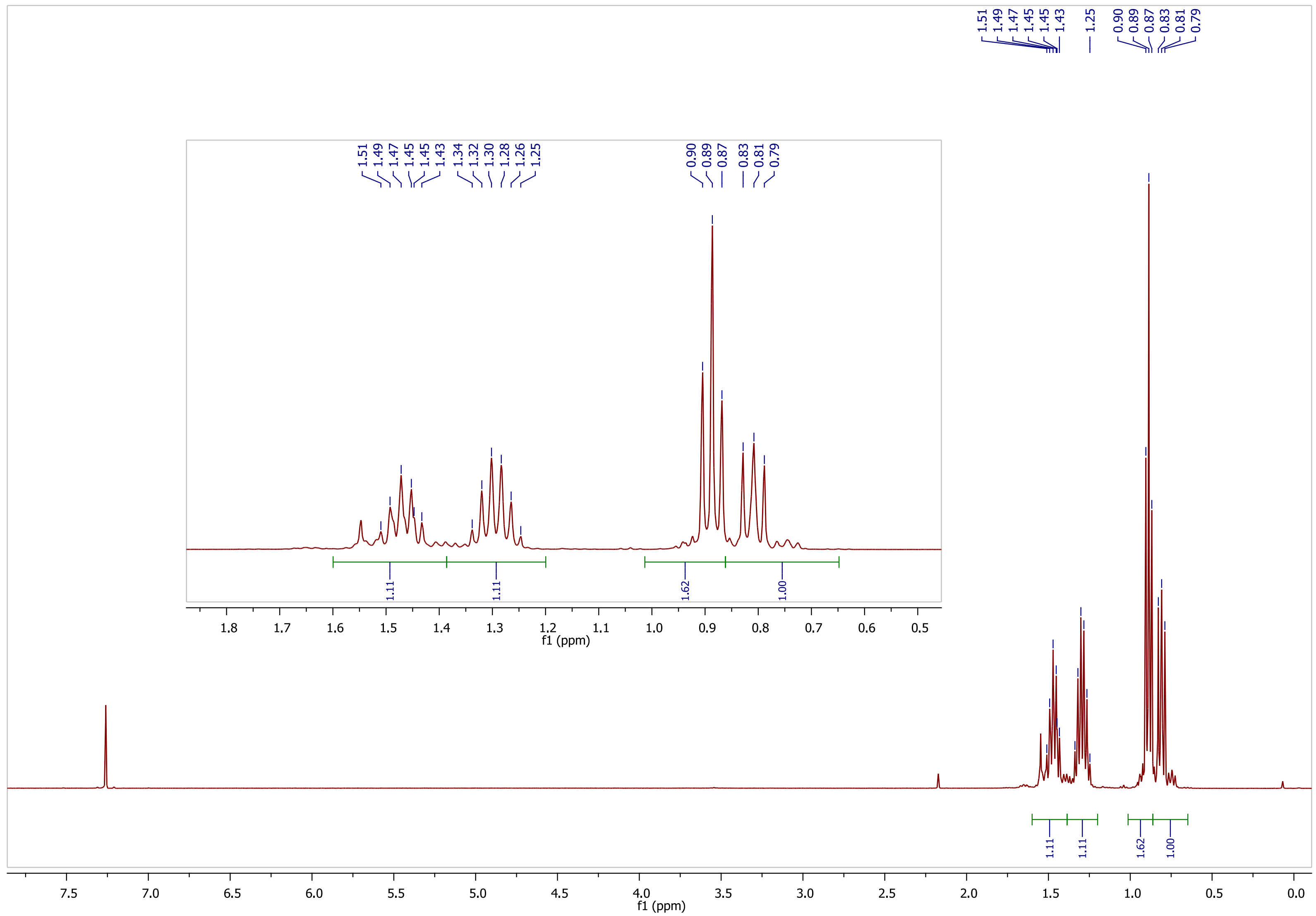


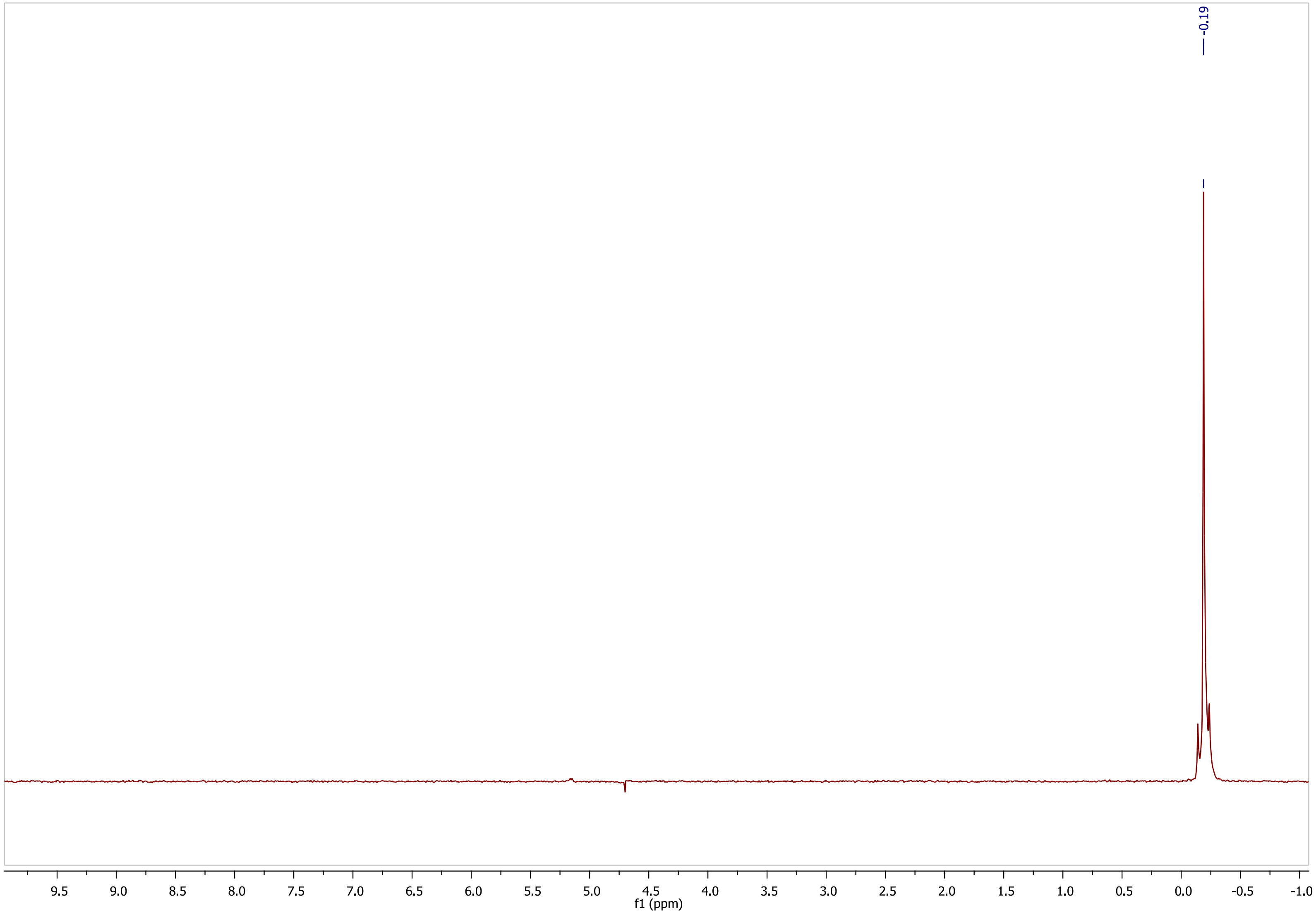
^{119}Sn NMR (186.4 MHz, $CDCl_3$), tri-*n*-butyl(methyl–*d*$_3$)stannane (8)



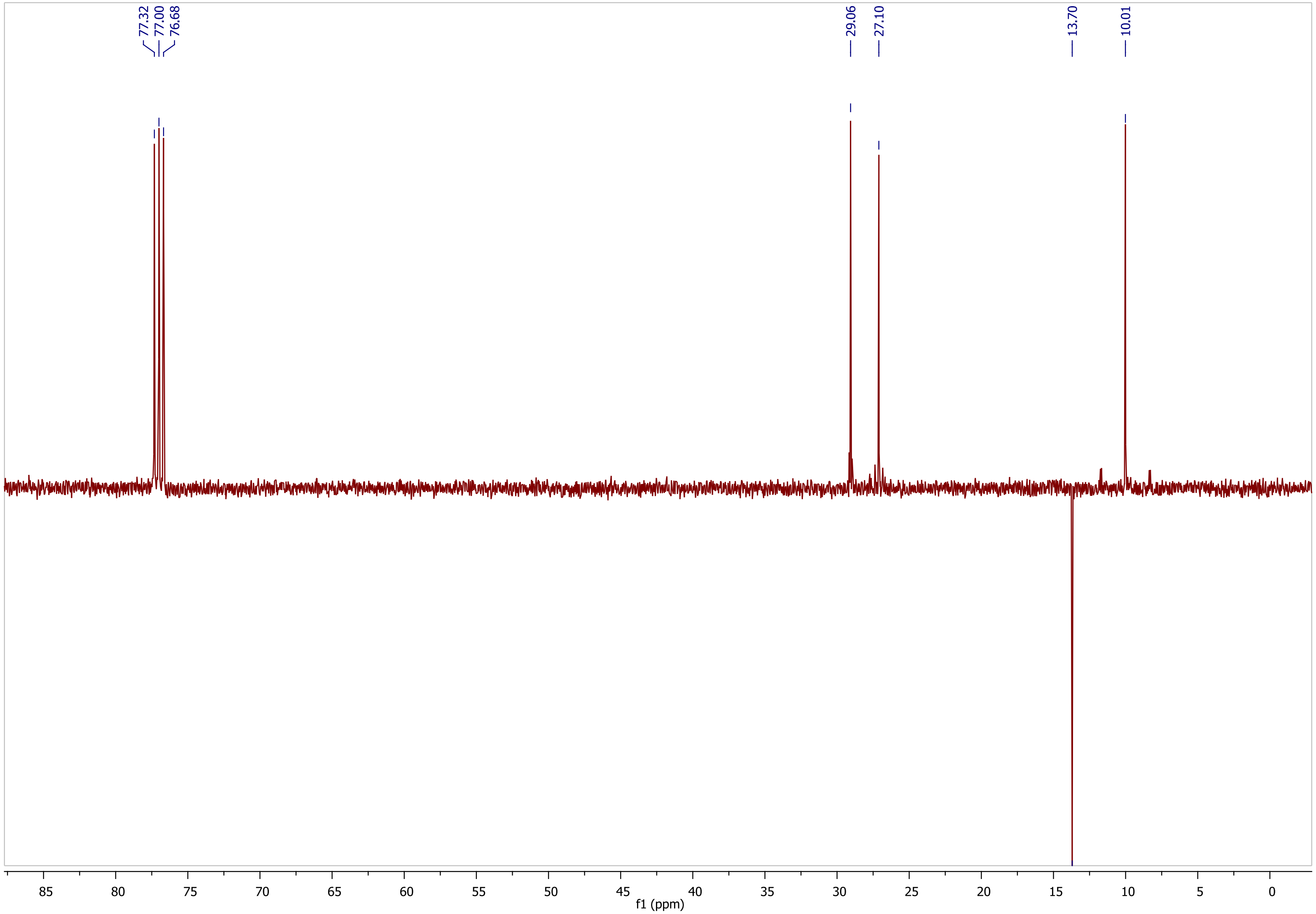
[1]H NMR (400 MHz, $CDCl_3$), di-*n*-butyldi(methyl–d_3)stannane (10)



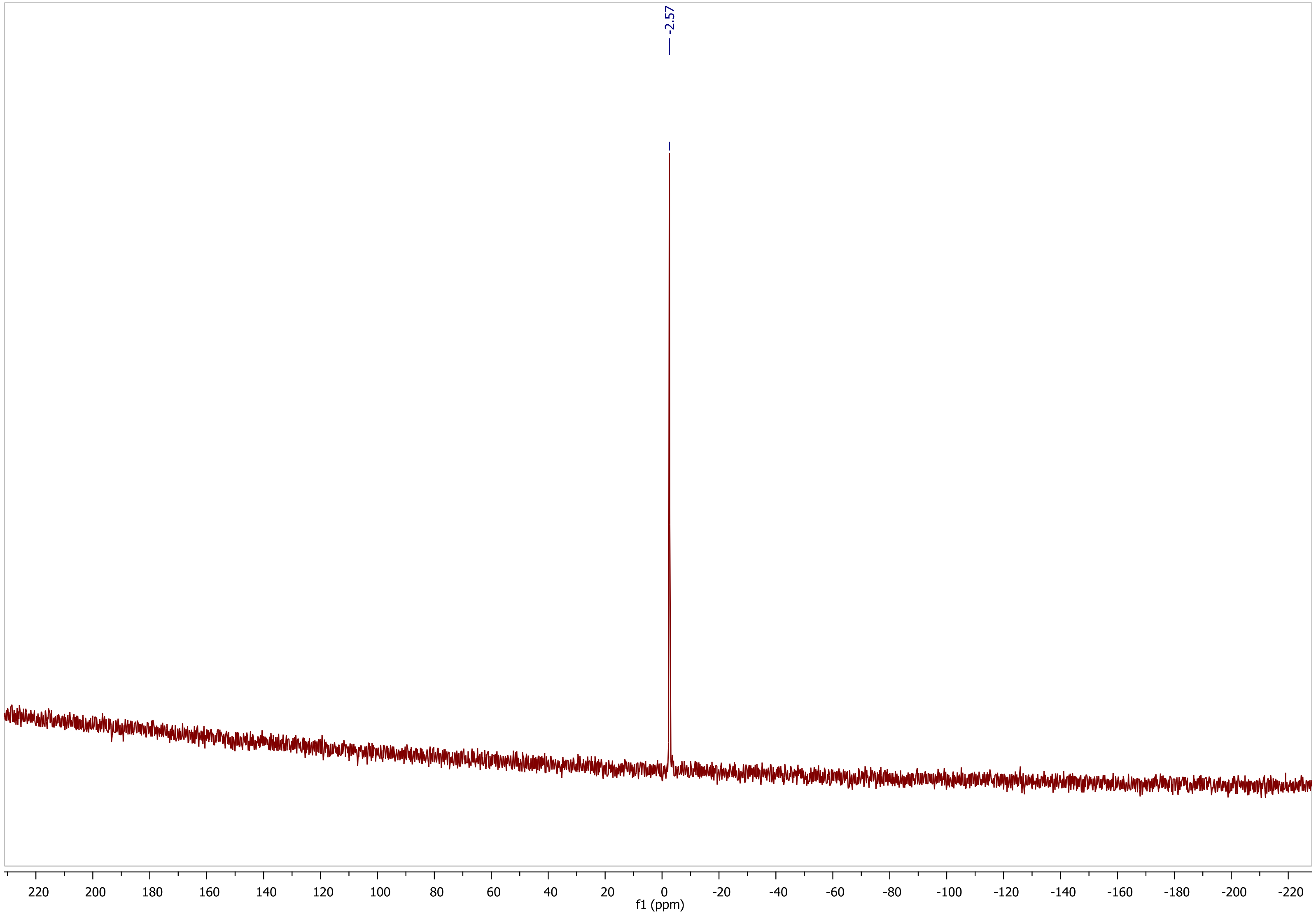
[2]H NMR (76.7 MHz, $CDCl_3$), di-*n*-butyldi(methyl–d_3)stannane (10)



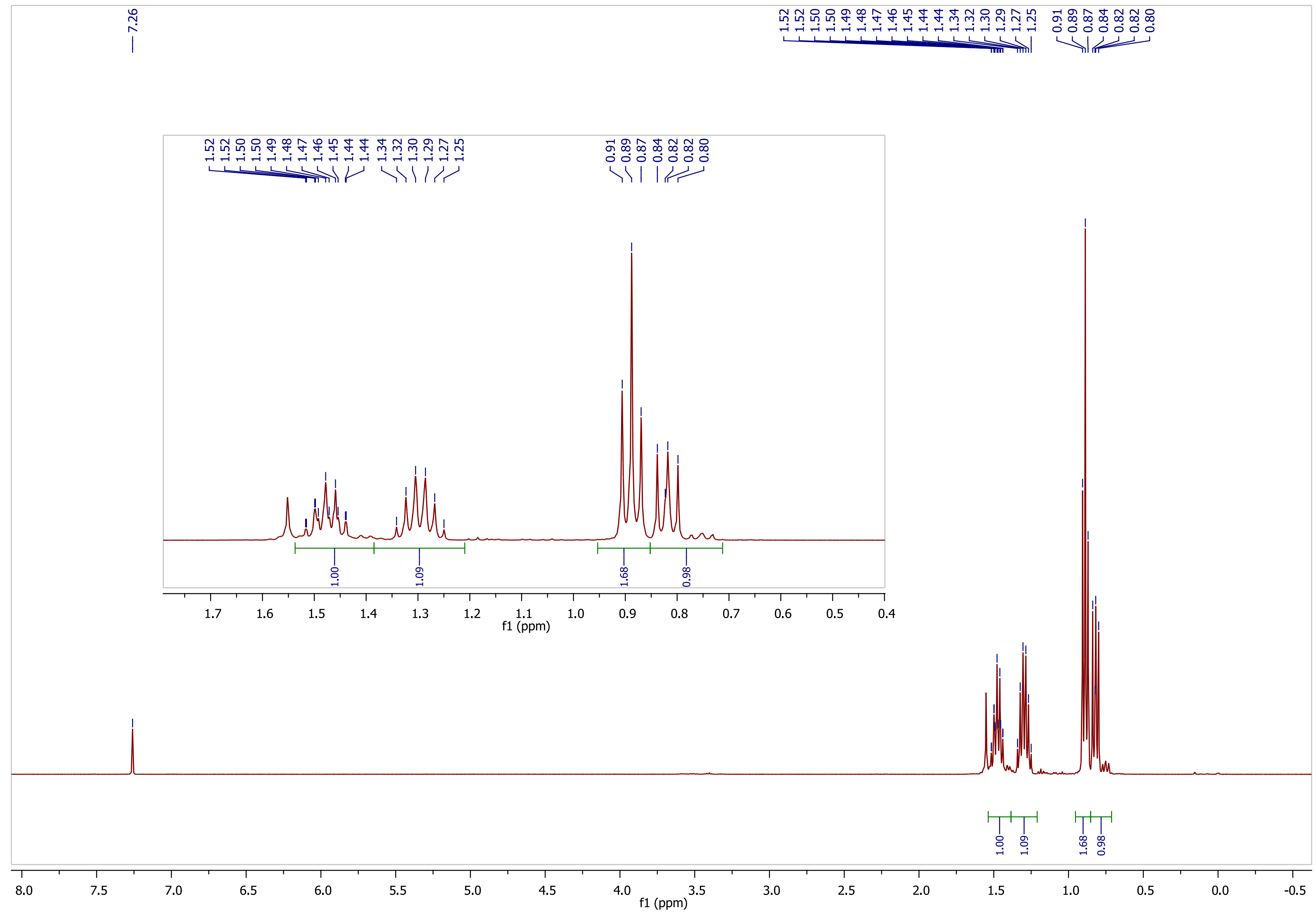
[13]C NMR (100 MHz, $CDCl_3$), di-*n*-butyldi(methyl–d_3)stannane (10)



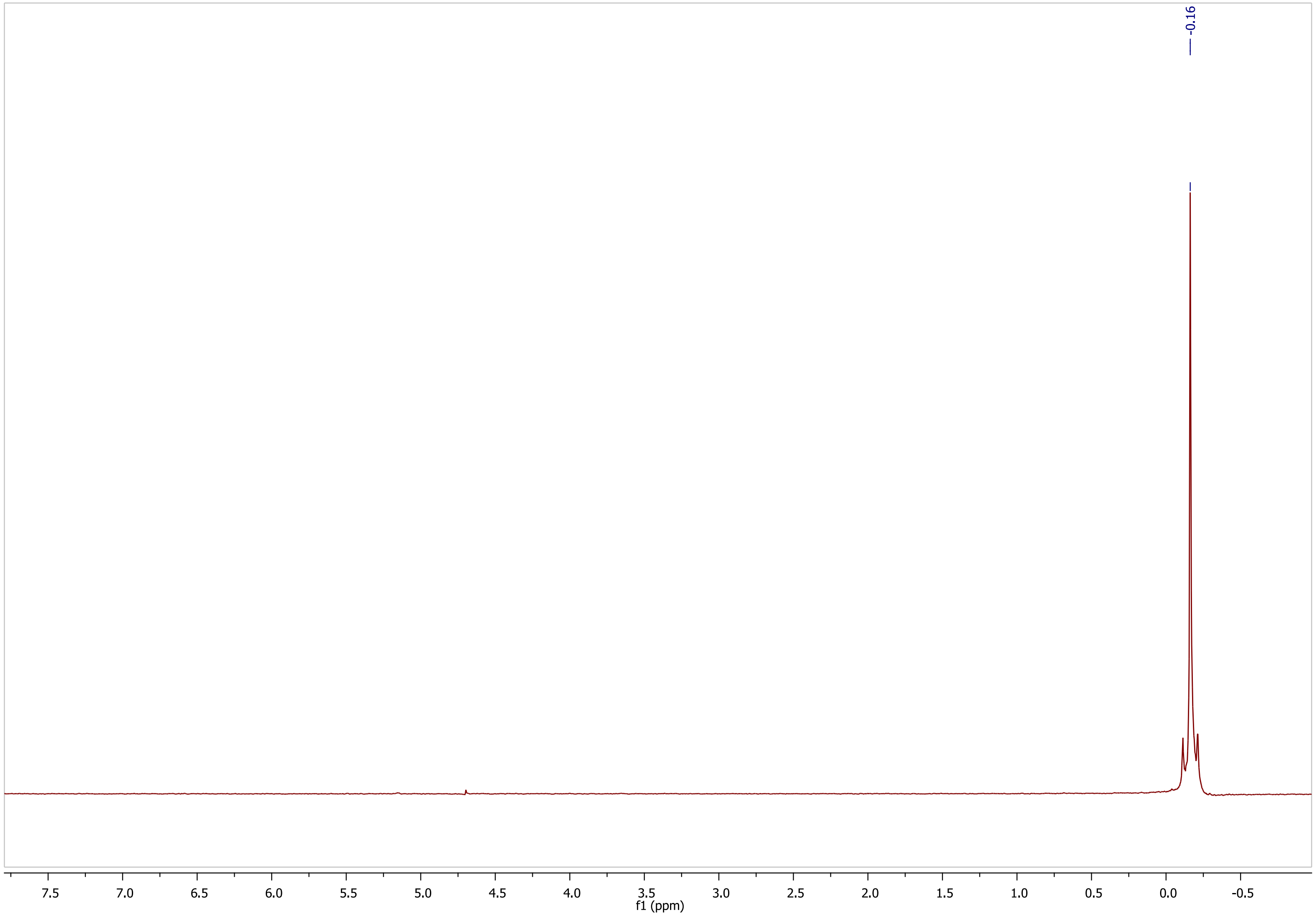
^{119}Sn NMR (186.4 MHz, CDCl$_3$), di-*n*-butyldi(methyl–*d*$_3$)stannane (10)



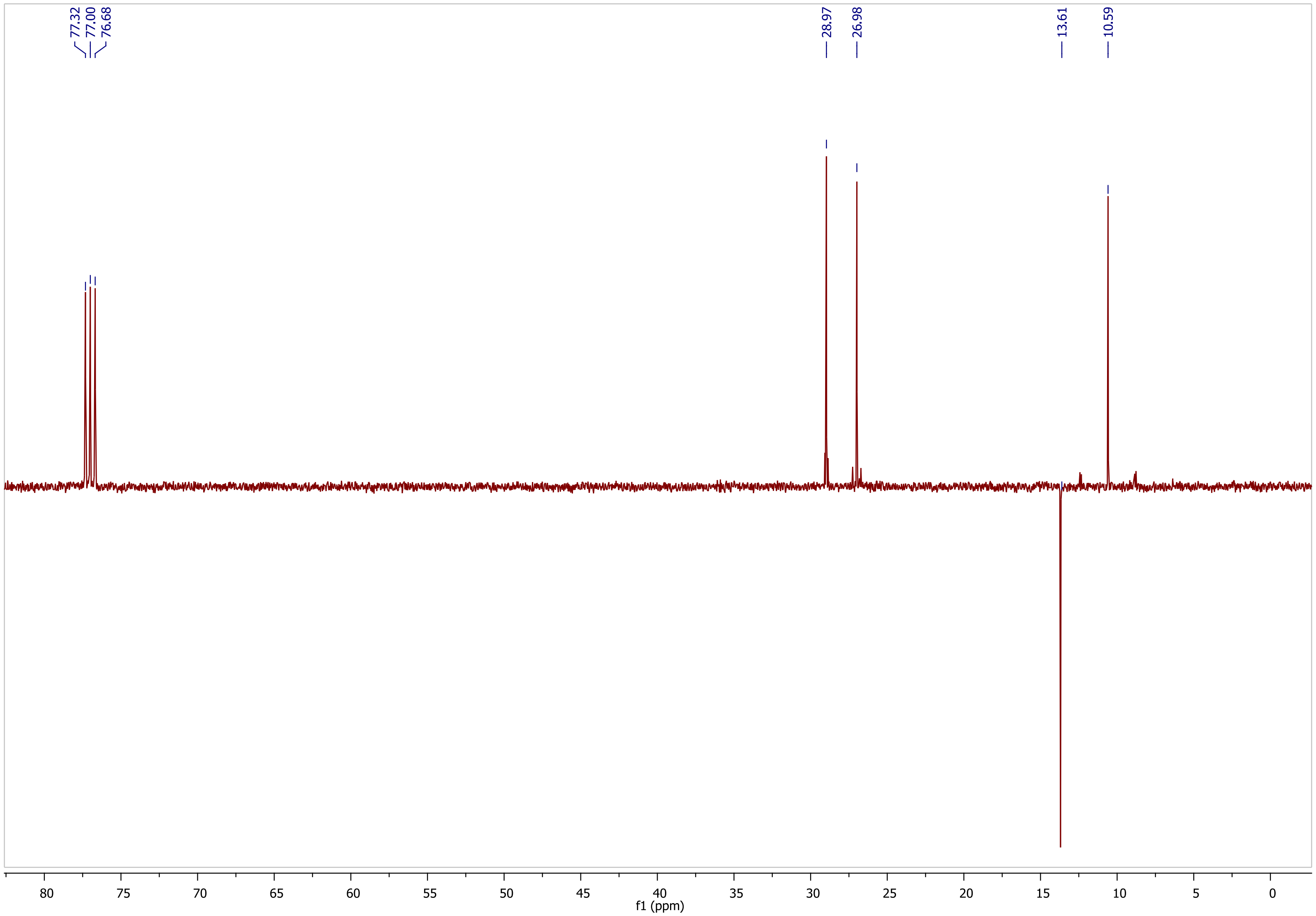
[1]H NMR (400 MHz, $CDCl_3$), *n*-butyltri(methyl–*d*$_3$)stannane (12)



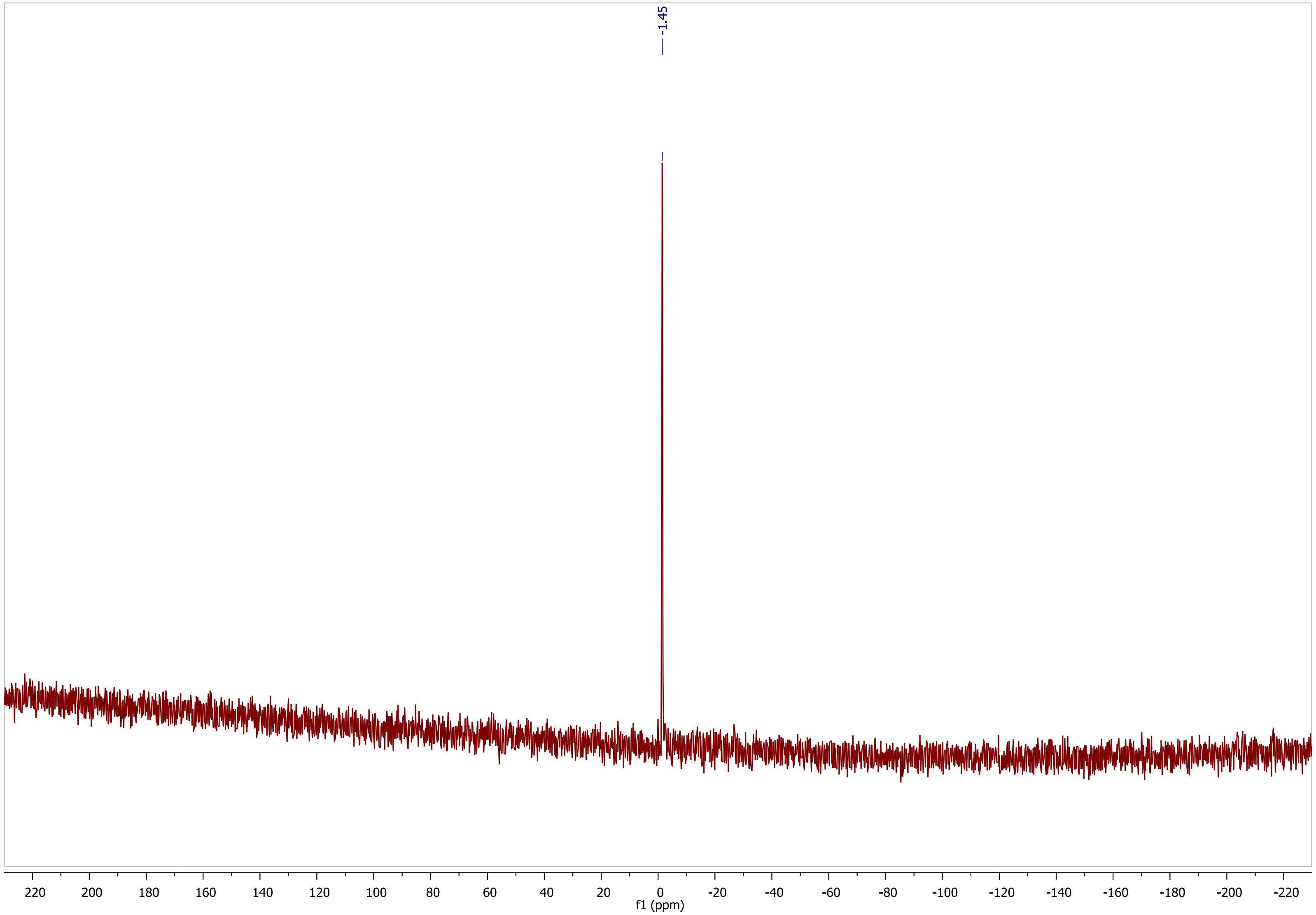
^{2}H NMR (76.7 MHz, $CDCl_3$), *n*-butyltri(methyl–*d_3*)stannane (12)



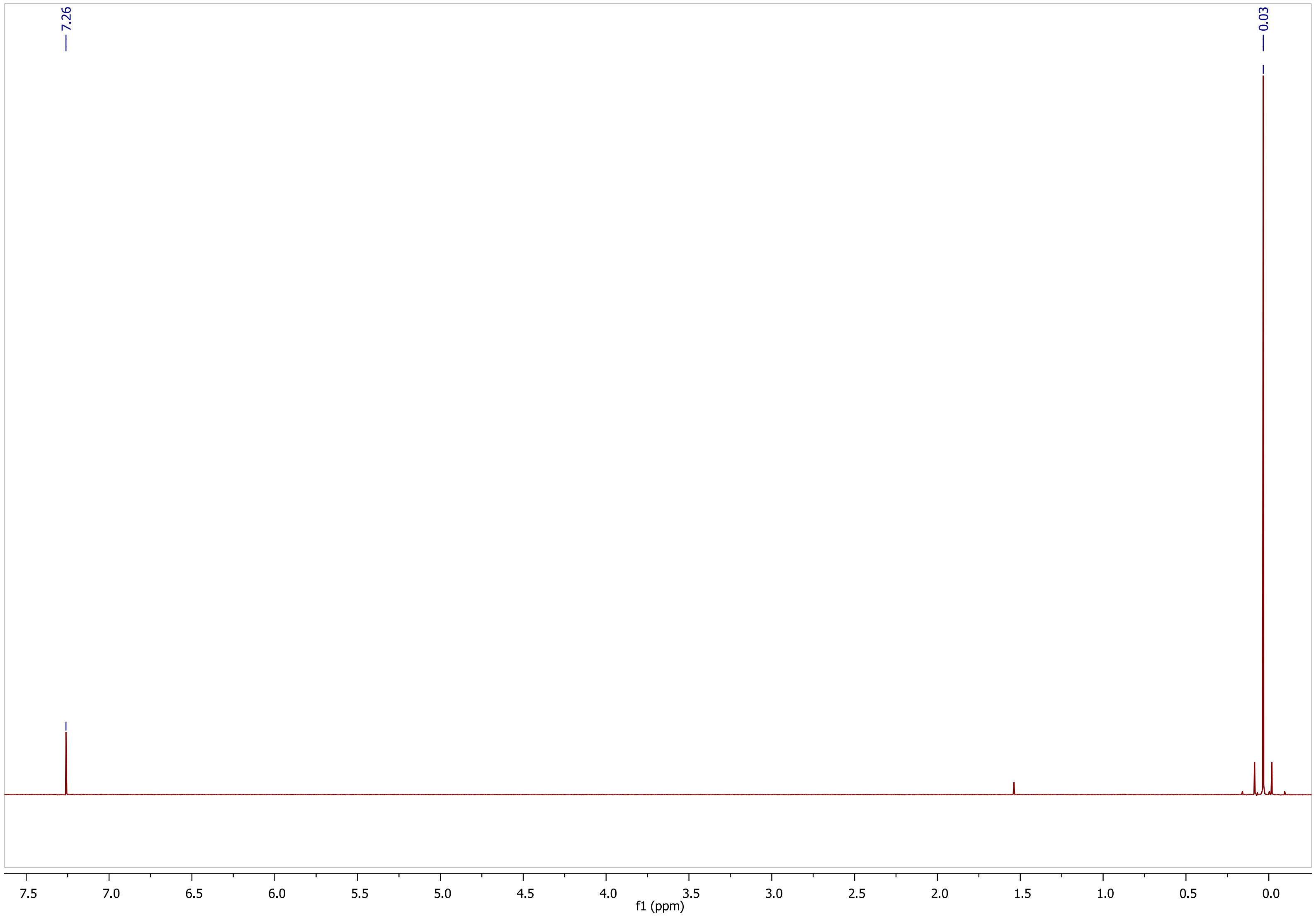
^{13}C NMR (100 MHz, $CDCl_3$), *n*-butyltri(methyl–*d*$_3$)stannane (12)



^{119}Sn NMR (186.4 MHz, $CDCl_3$), *n*-butyltri(methyl–d_3)stannane (12)



^{1}H NMR (500 MHz, $CDCl_3$), *n*-butyl-d_9-trimethylstannane (13)



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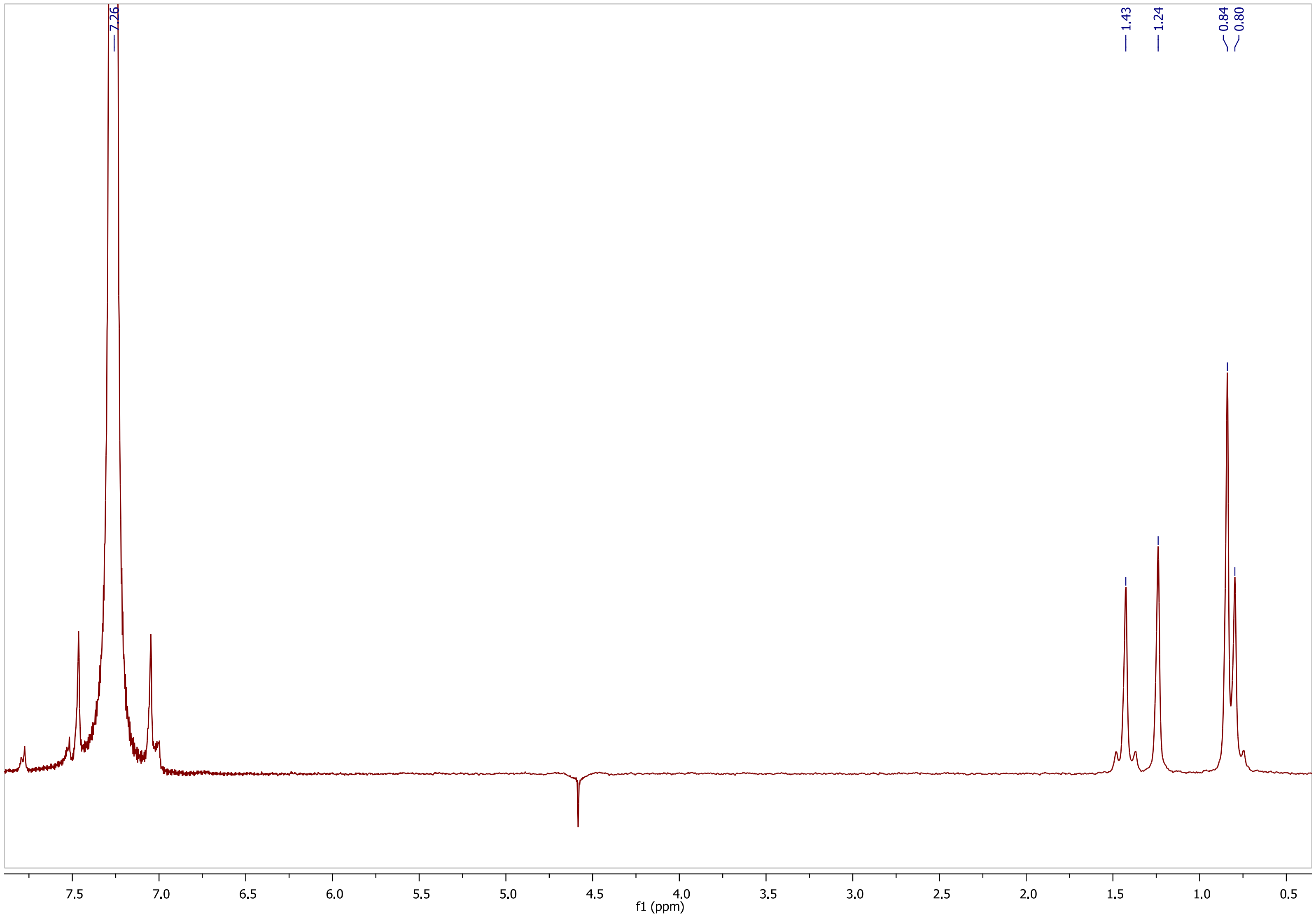

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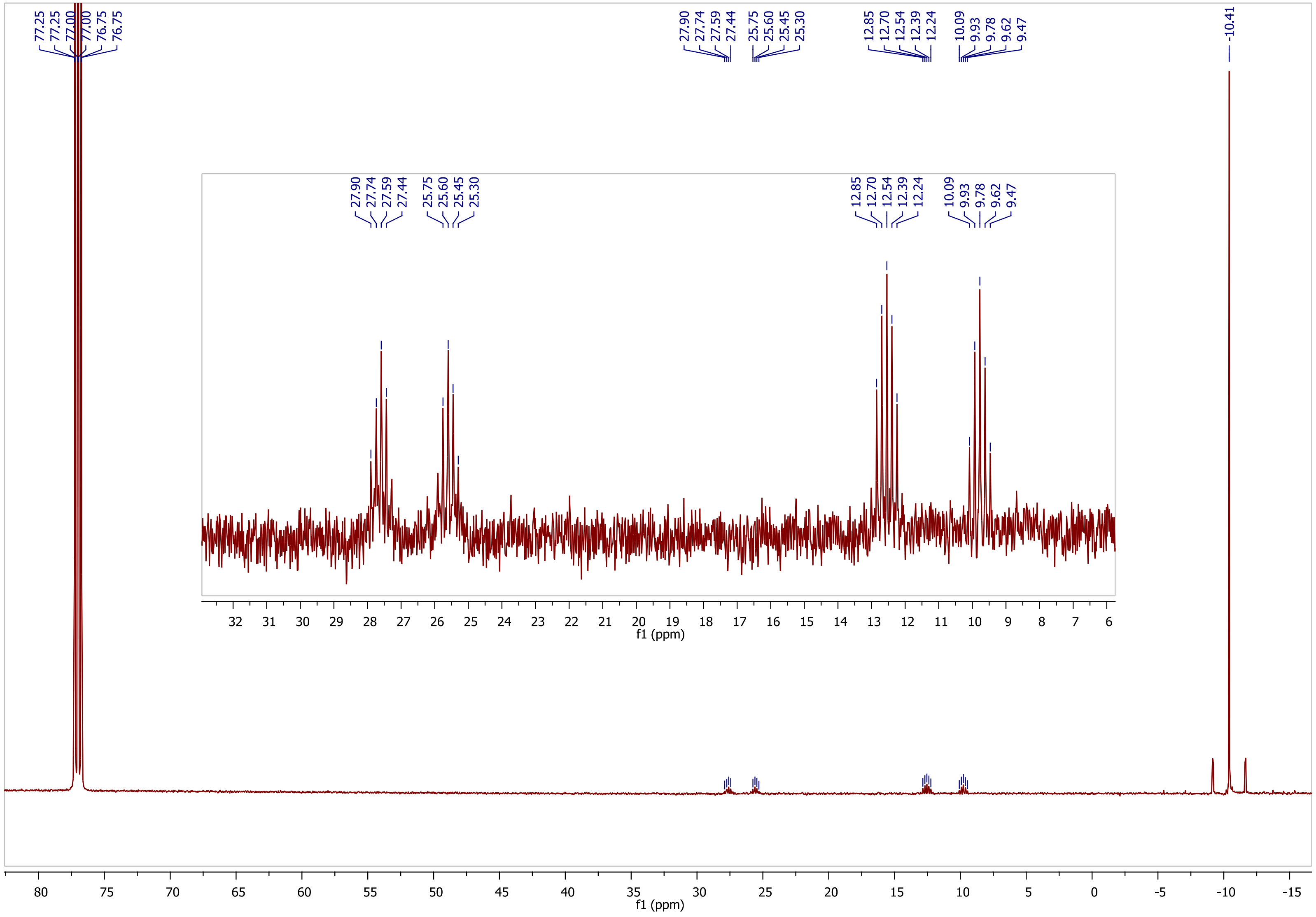

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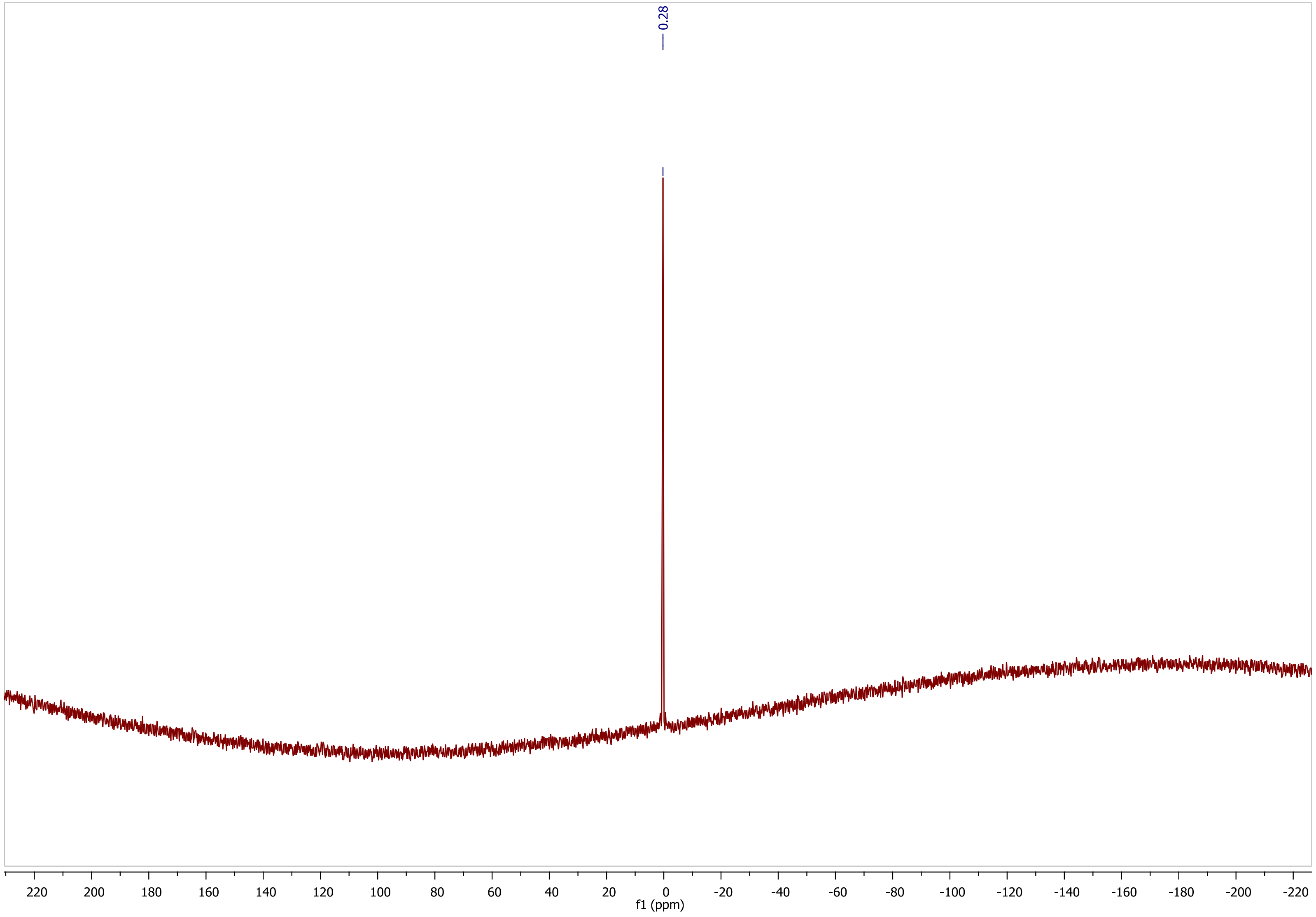
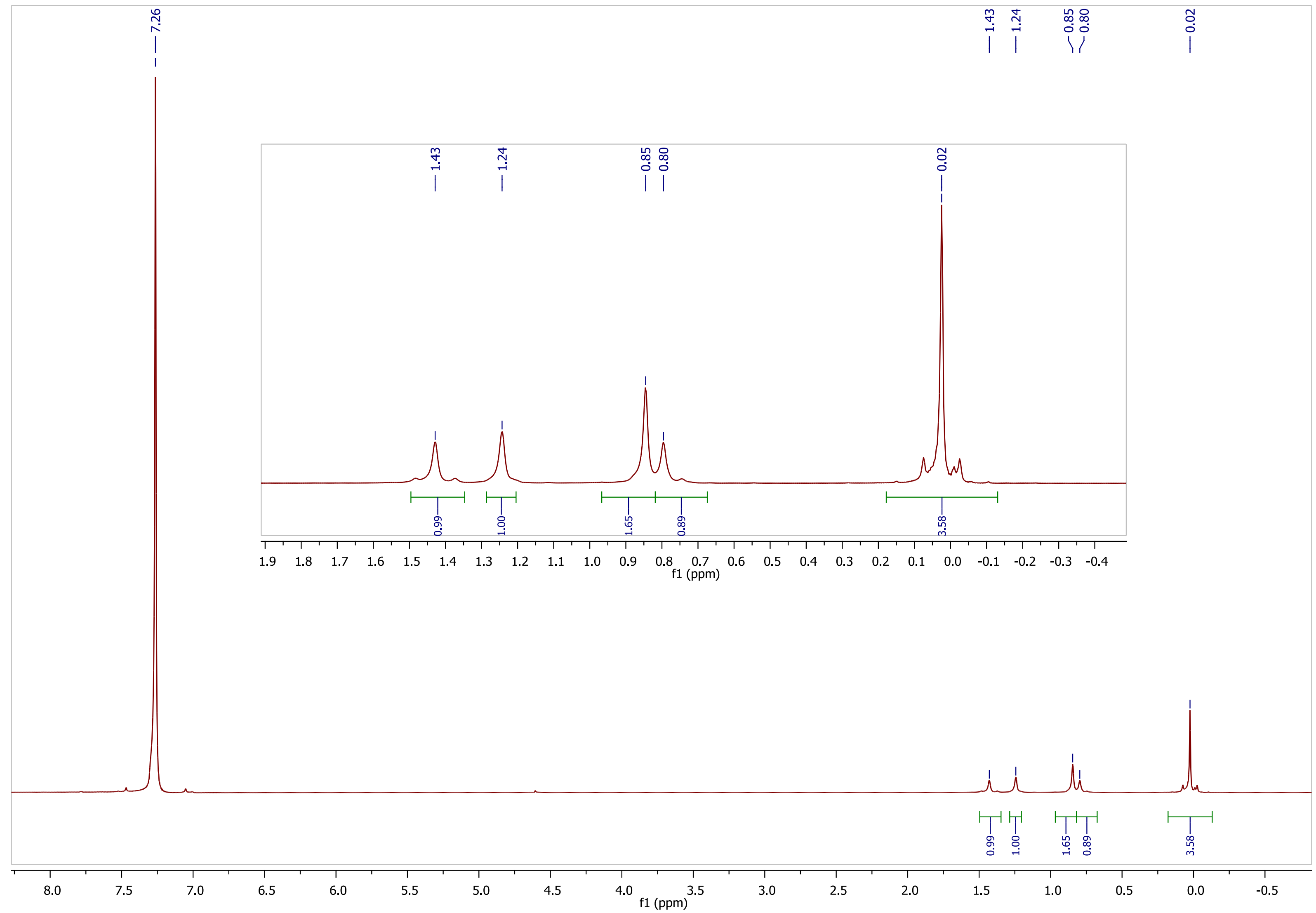
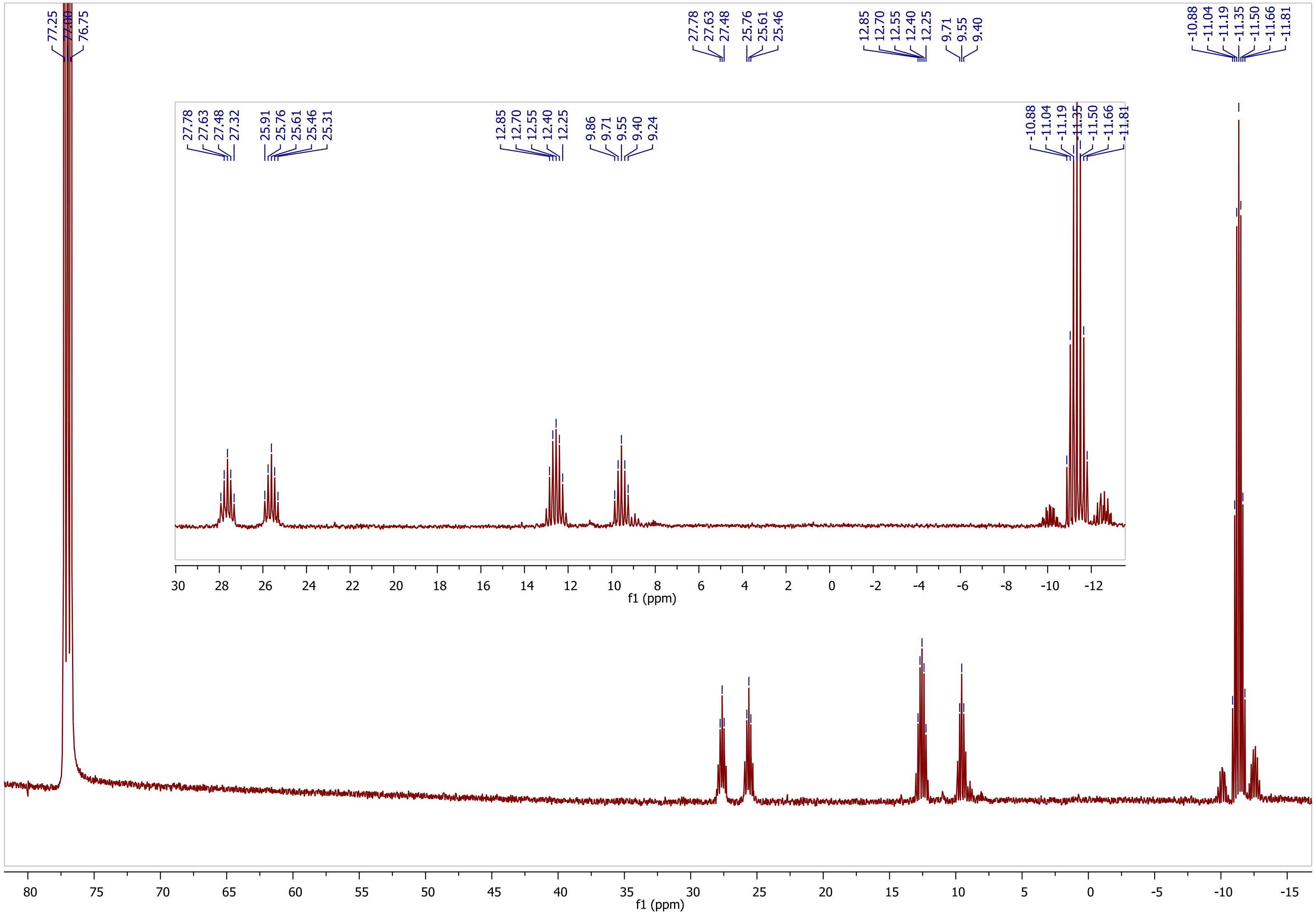


[2]H NMR (76.7 MHz, $CDCl_3$), *n*-butyl-*d*$_9$-tri(methyl-*d*$_3$)-stannane (14)



^{13}C NMR (125.7 MHz, $CDCl_3$), *n*-butyl-d_9-tri(methyl-d_3)-stannane (14)



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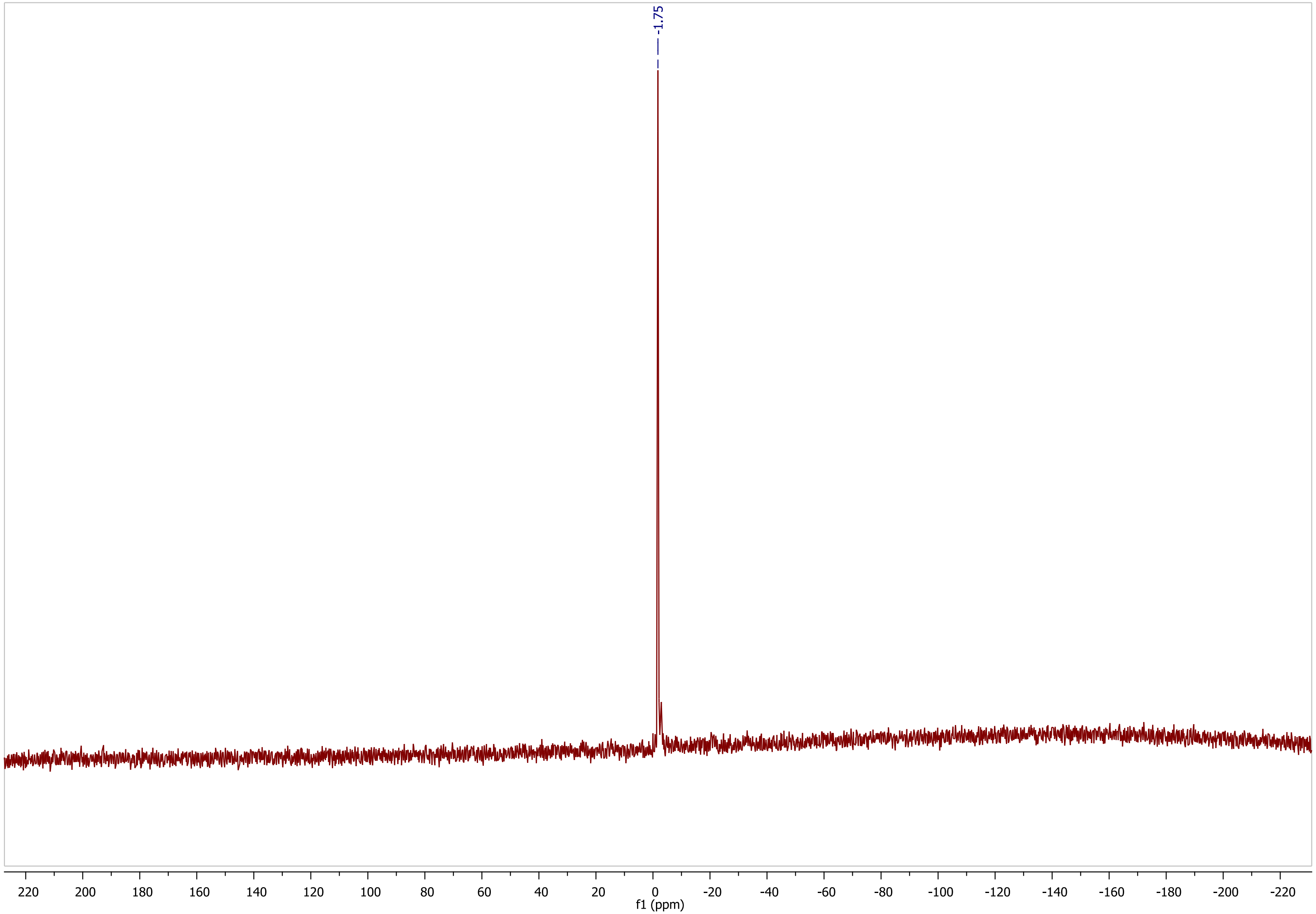
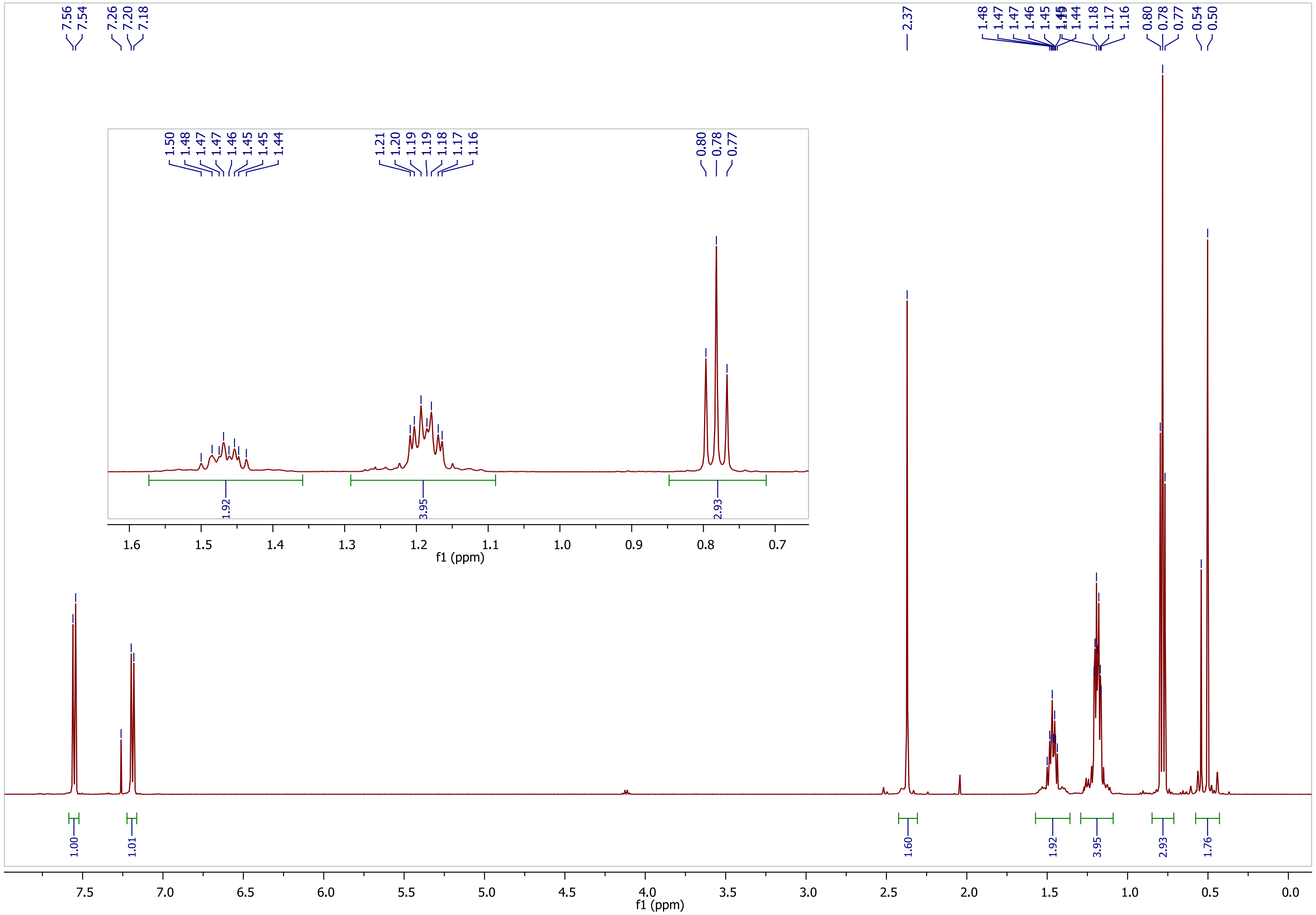
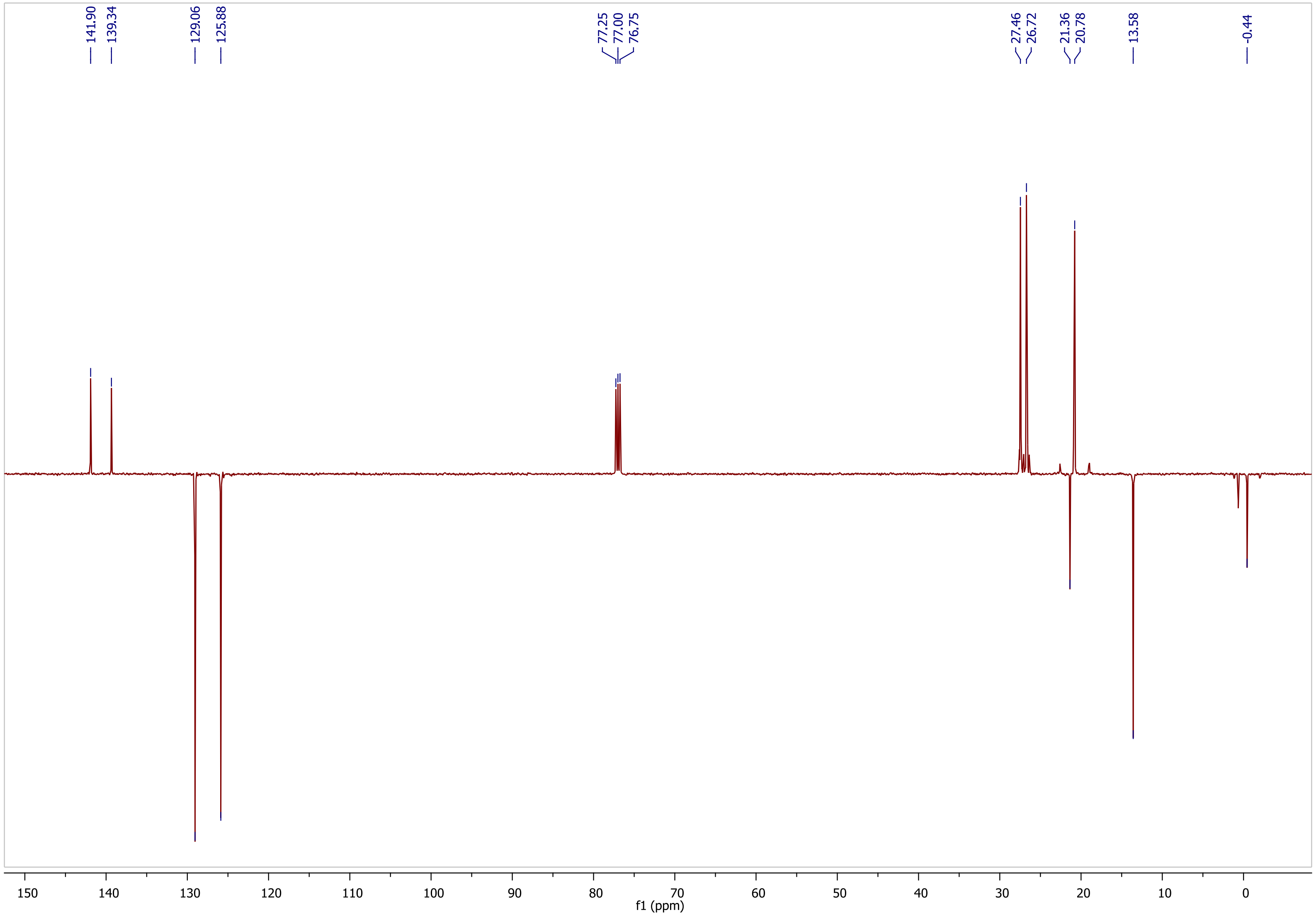


[1]H NMR (500 MHz, CDCl₃), di-*n*-butylmethylstannyl *p*-toluenesulfonate (15)



^{13}C NMR (125.7 MHz, $CDCl_3$), di-*n*-butylmethylstannyl *p*-toluenesulfonate (15)



^{119}Sn NMR (186.4 MHz, $CDCl_3$), di-*n*-butylmethylstannyl *p*-toluenesulfonate (15)