

## Electronic Supplementary Information

### Thio-Michael addition of $\alpha,\beta$ -unsaturated amides catalyzed by Nmm-based ionic liquids

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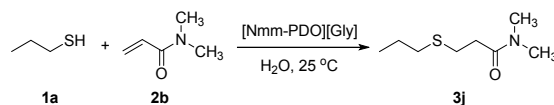
## General experimental procedures

The reaction is carried out at room temperature in water or solvent-free. NMR spectra were recorded on Bruker AVANCE III HD 400MHz; Proton and carbon magnetic resonance spectra ( $^1\text{H}$  NMR and  $^{13}\text{C}$  NMR) were recorded using tetramethylsilane (TMS) in the solvent of  $\text{CDCl}_3$  as the internal standard ( $^1\text{H}$  NMR: TMS at 0.00 ppm,  $\text{CHCl}_3$  at 7.26 ppm;  $^{13}\text{C}$  NMR:  $\text{CDCl}_3$  at 77.16 ppm) or were recorded using tetramethylsilane (TMS) in the solvent of  $\text{DMSO}-d_6$  as the internal standard ( $^1\text{H}$  NMR: TMS at 0.00 ppm, DMSO at 2.50 ppm;  $^{13}\text{C}$  NMR: DMSO at 39.51 ppm)

Compounds **2c**, **2e-2i** was synthesized by previous method.<sup>1</sup>

## Recycling of the catalyst [Nmm-PDO][Gly]

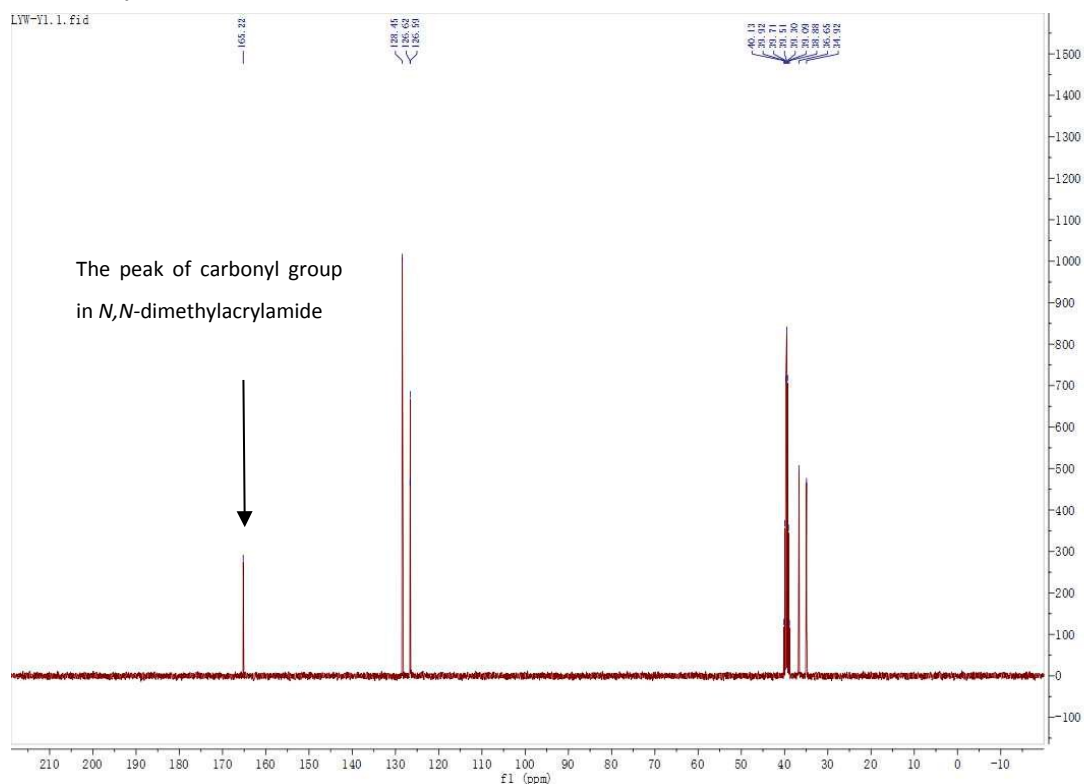
**Table S1.** Recycling of the catalyst in thio-Michael addition of *N,N*-dimethylacrylamide with propanethiol



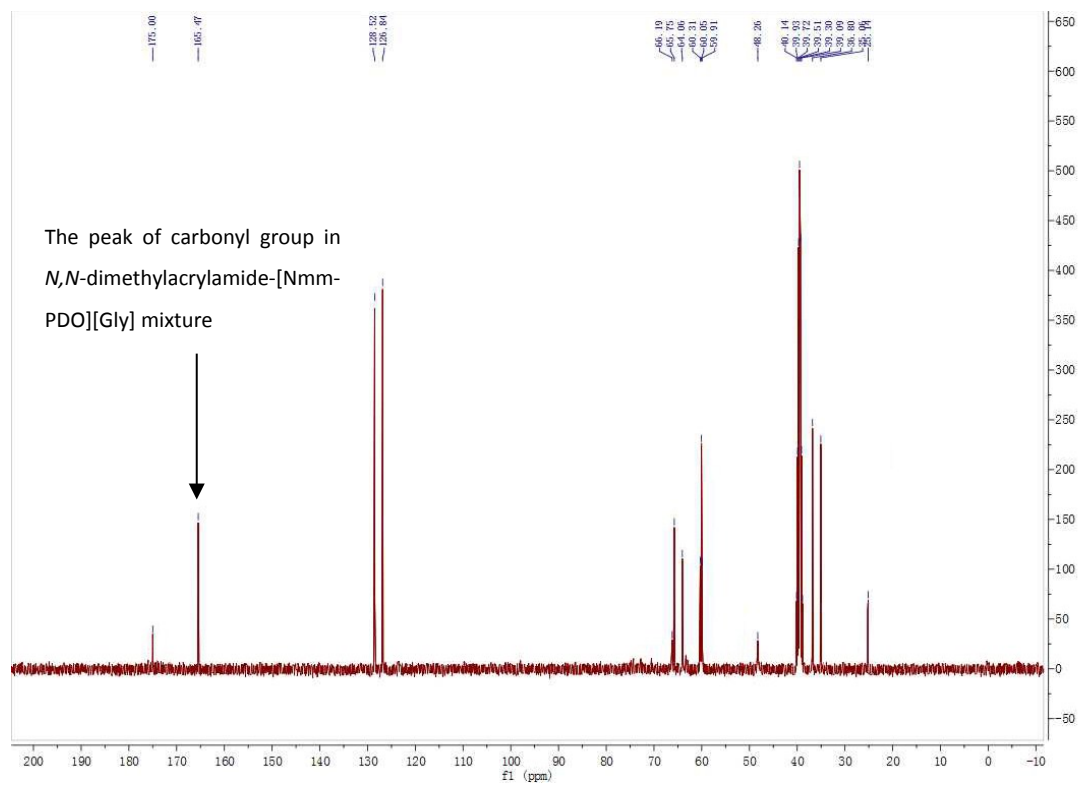
| Run            | Time/h | Yield (%) <sup>b</sup> |
|----------------|--------|------------------------|
| 1              | 6      | 90                     |
| 2 <sup>c</sup> | 15     | 84                     |
| 3 <sup>c</sup> | 30     | 79                     |

<sup>a</sup>Reaction conditions: propanethiol (0.5 mmol), *N,N*-dimethylacrylamide (0.5 mmol), catalyst [Nmm-PDO][Gly] (10 mol%), water (1 mL), room temperature. <sup>b</sup>Isolated yield. <sup>c</sup>Upon completion of the reaction, the solution was extracted with ethyl acetate. The residual IL-catalyst in aqueous phase was obtained just by concentration, and reused for next recycling.

**$^{13}\text{C}$  NMR spectrum of *N,N*-dimethylacrylamide and *N,N*-dimethylacrylamide-[Nmm-PDO][Gly] mixture**



**Figure S1.**  $^{13}\text{C}$  NMR of *N,N*-dimethylacrylamide (**2b**)

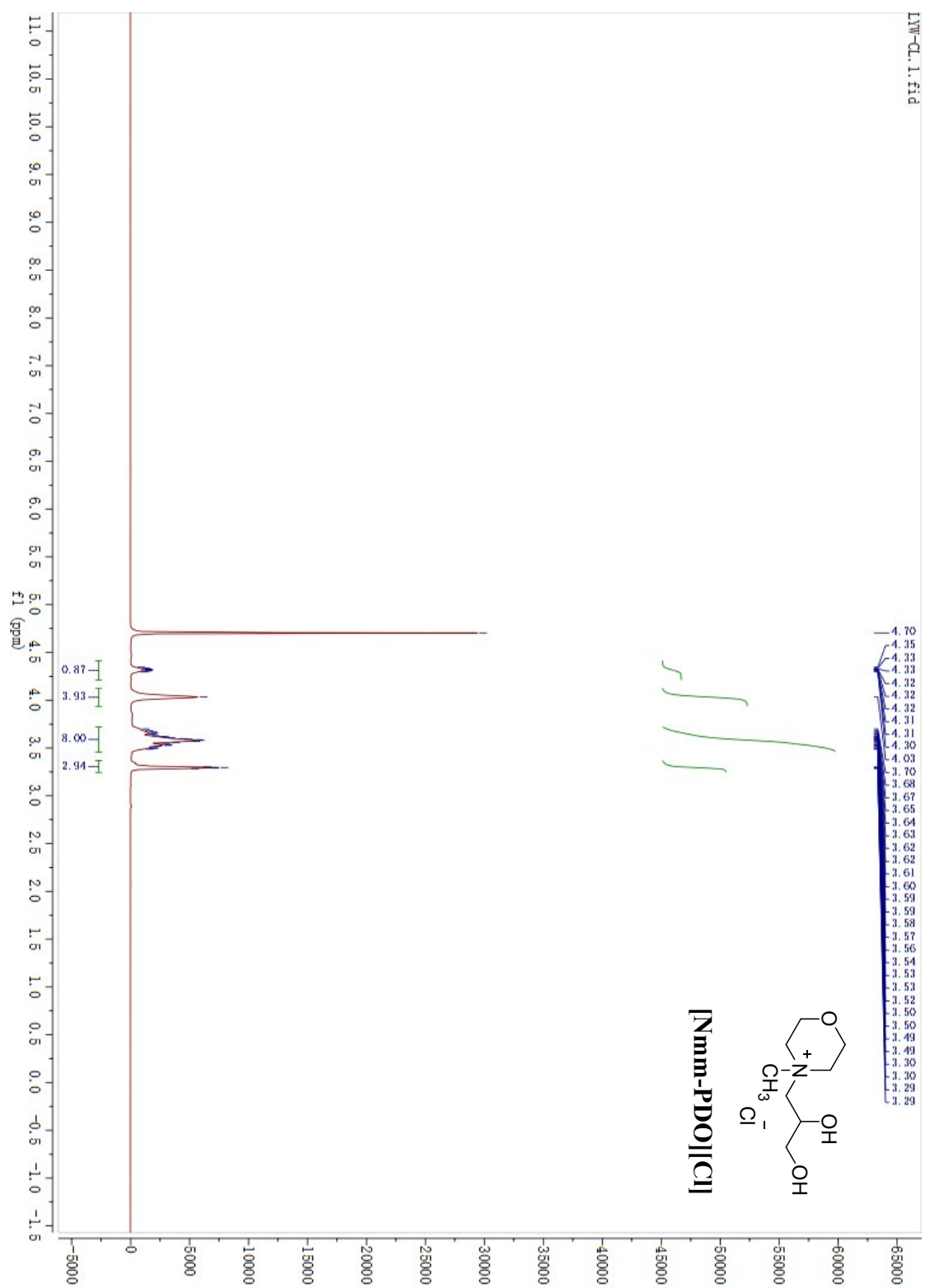


**Figure S2.**  $^{13}\text{C}$  NMR of *N,N*-dimethylacrylamide-[Nmm-PDO][Gly] mixture

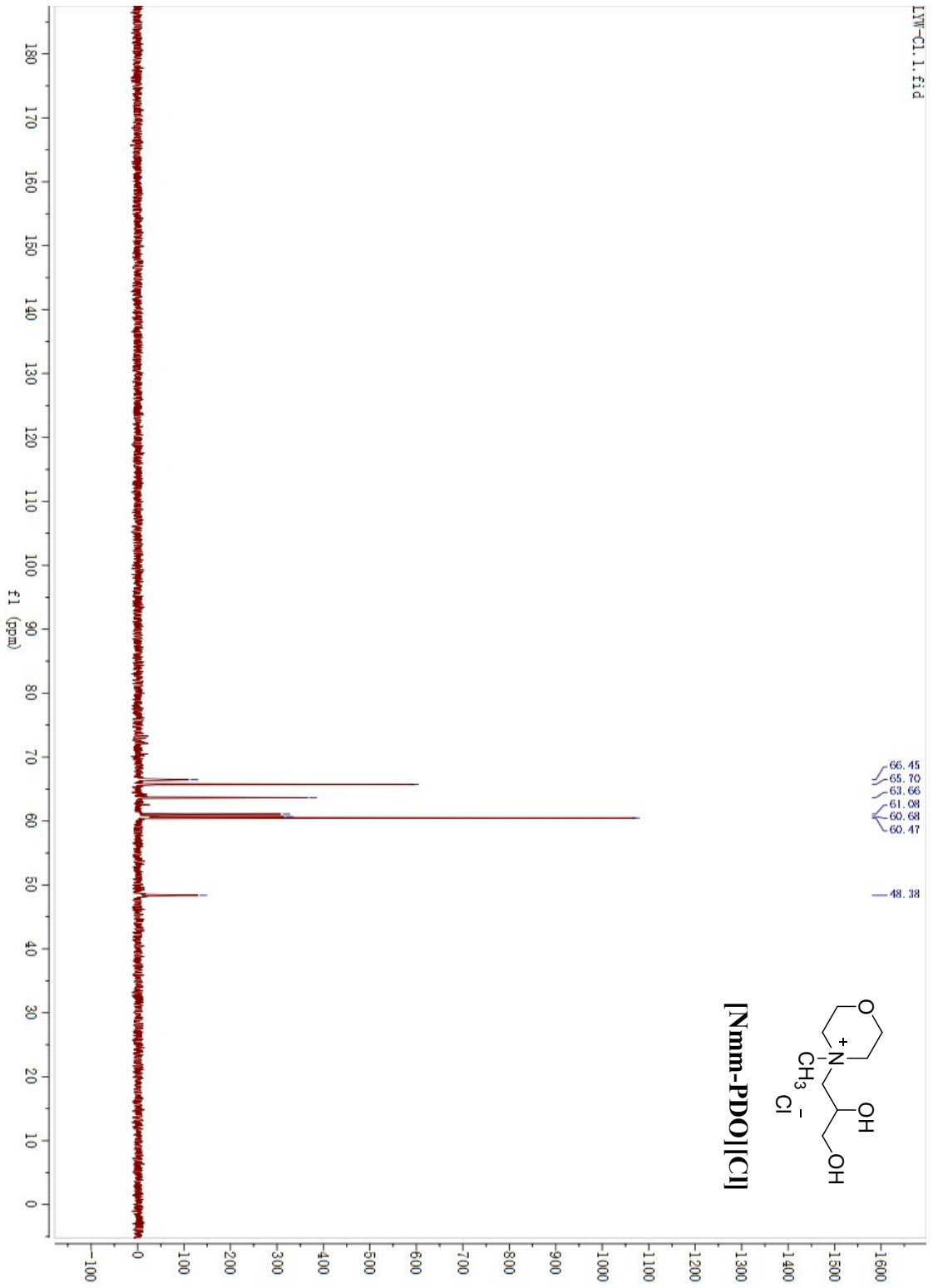
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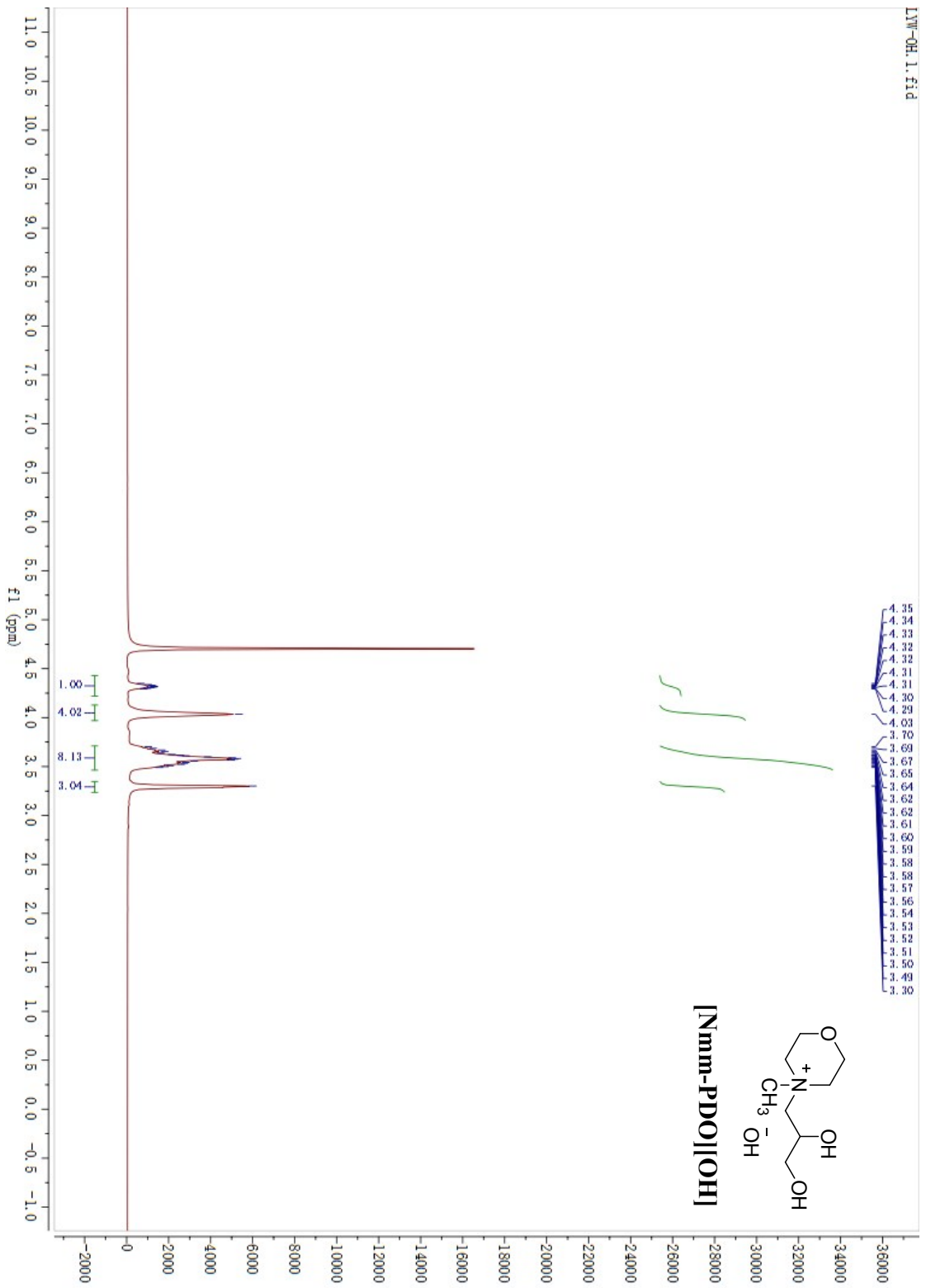
1. S. Chanthamath, S. Takaki, K. Shibatomi and S. Lwasa, *Angew. Chem., Int. Ed.*, 2013, **52**, 5818.

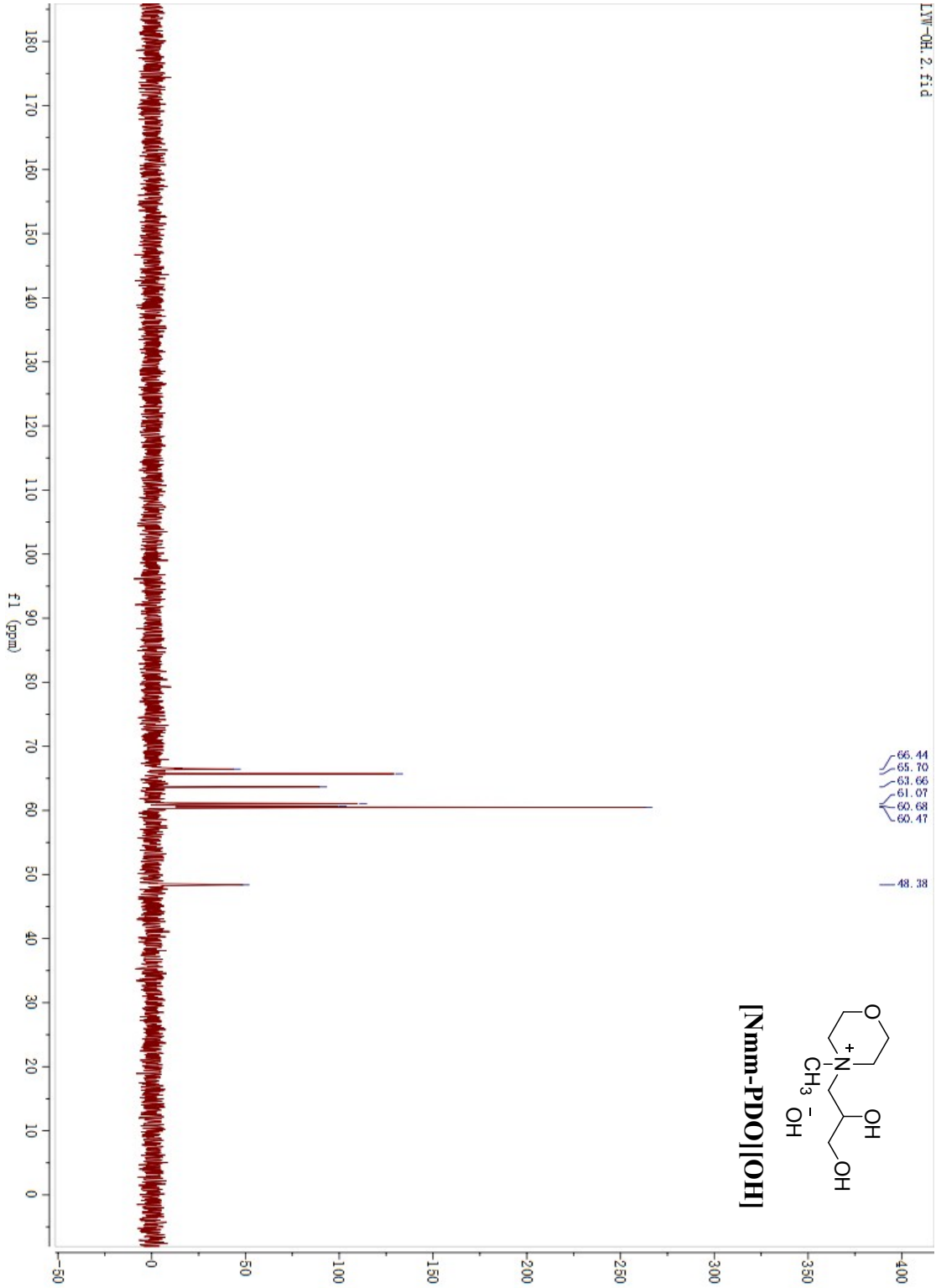
The  $^1\text{H}$  and  $^{13}\text{C}$  NMR spectra of compounds [Nmm-PDO][X] and [Nbmm][OAc]



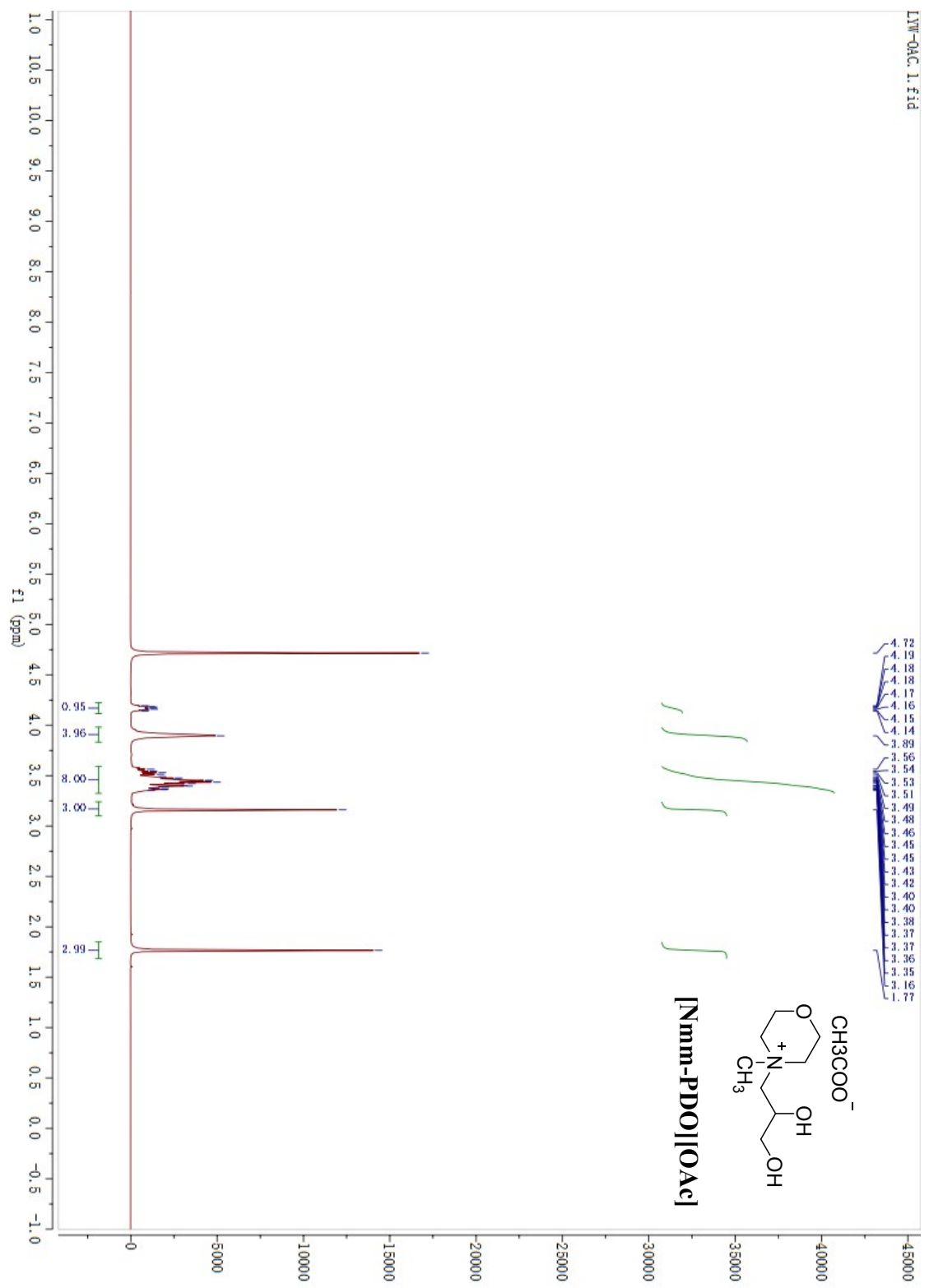
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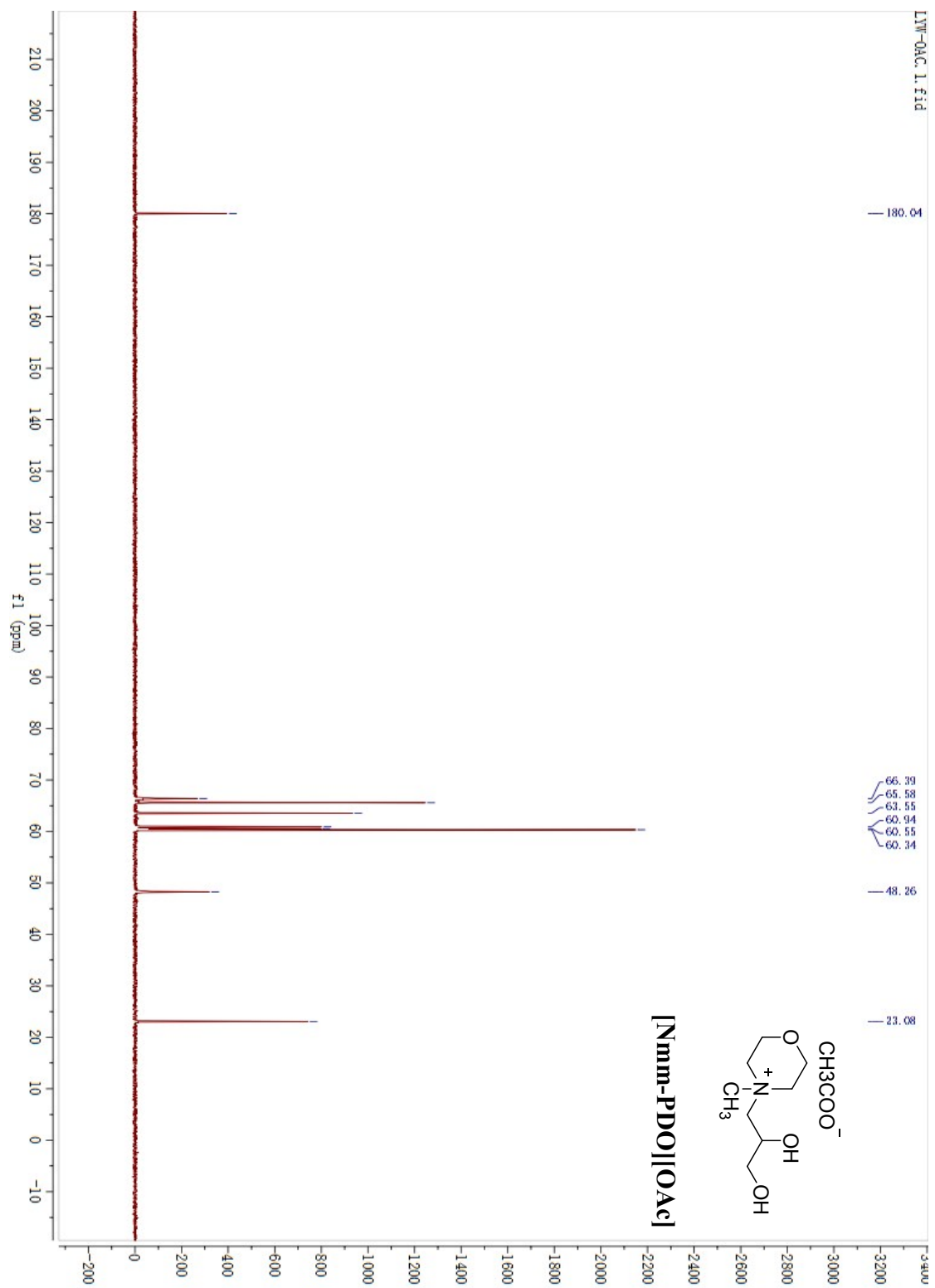


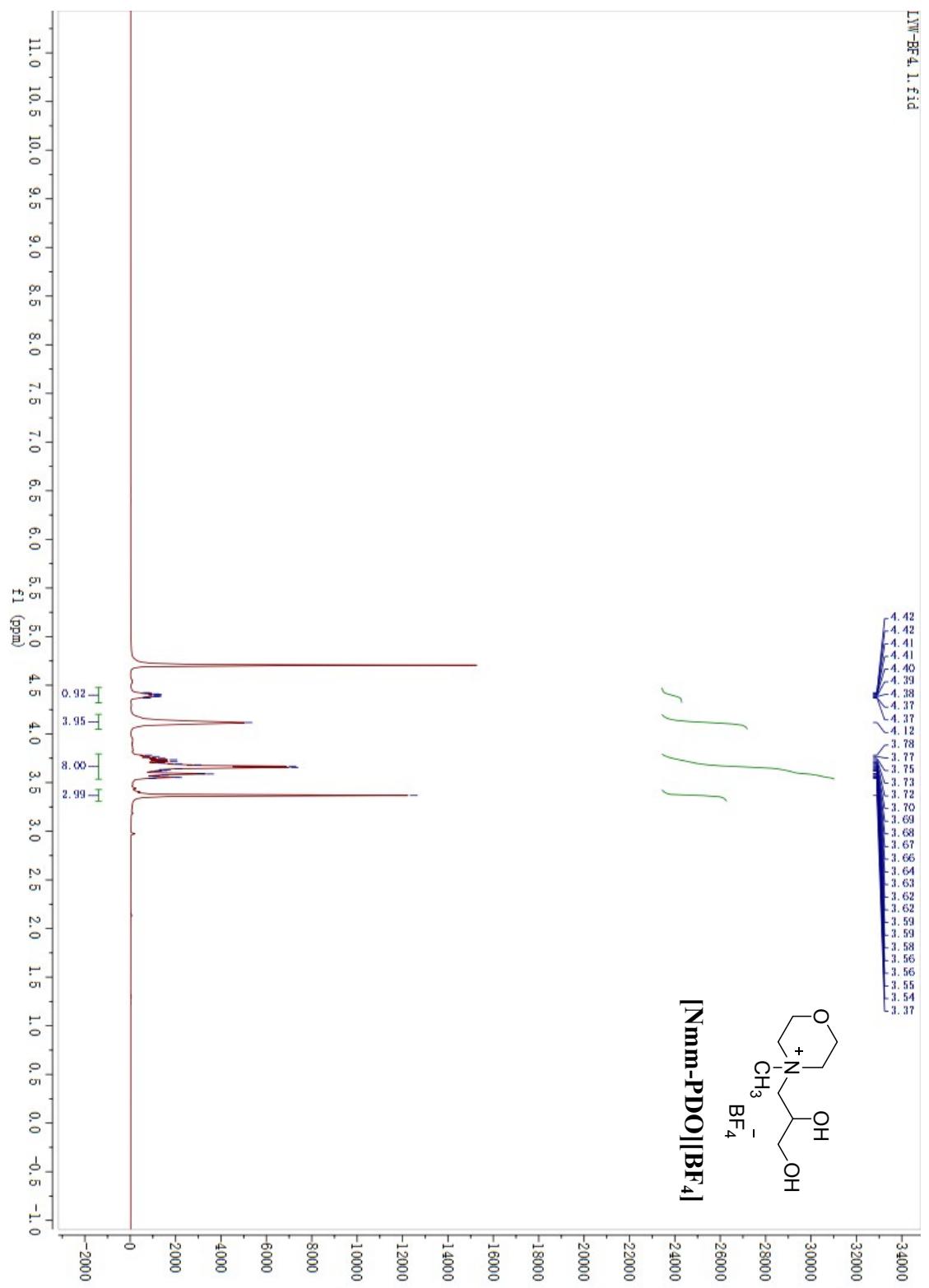




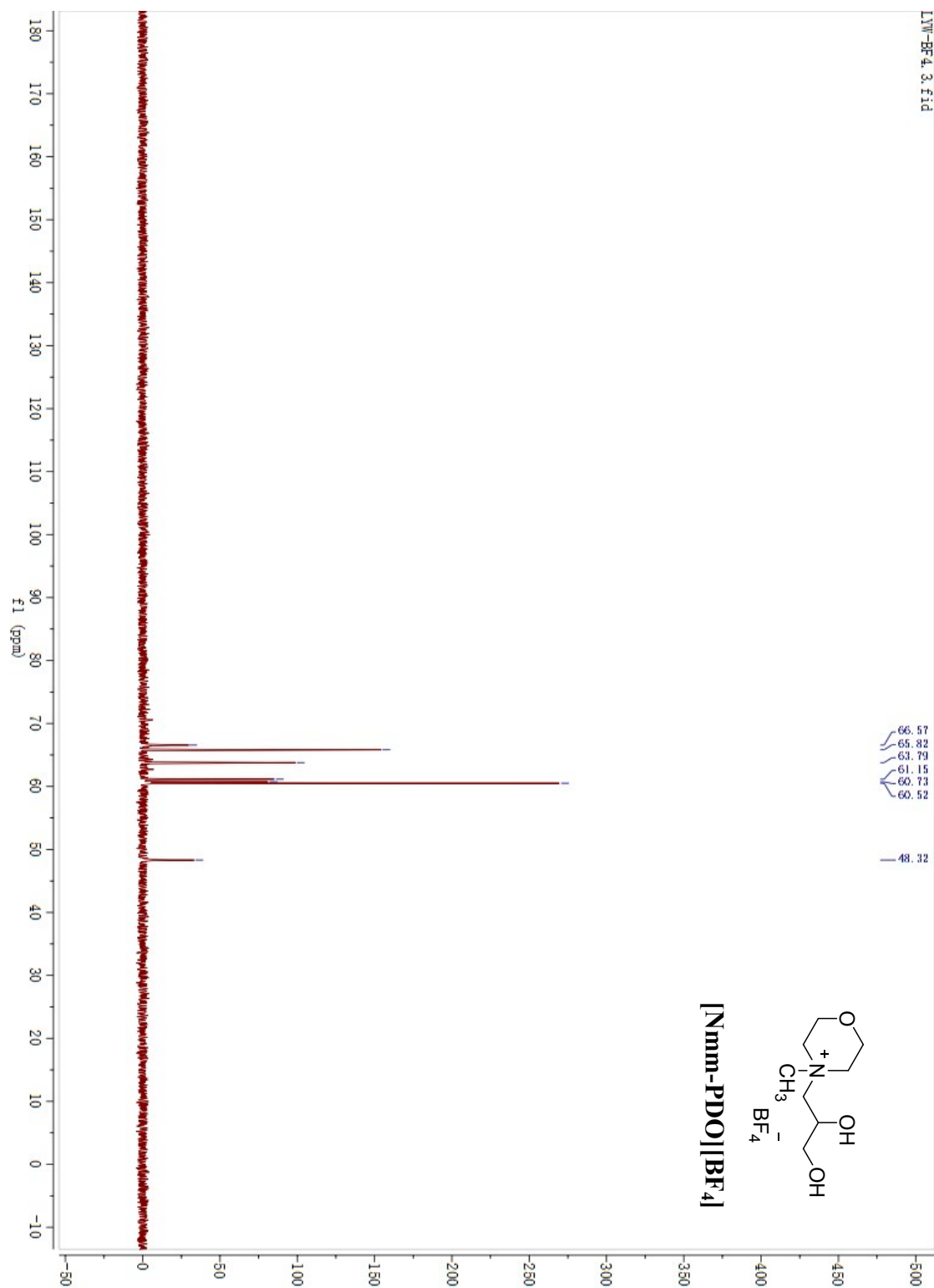


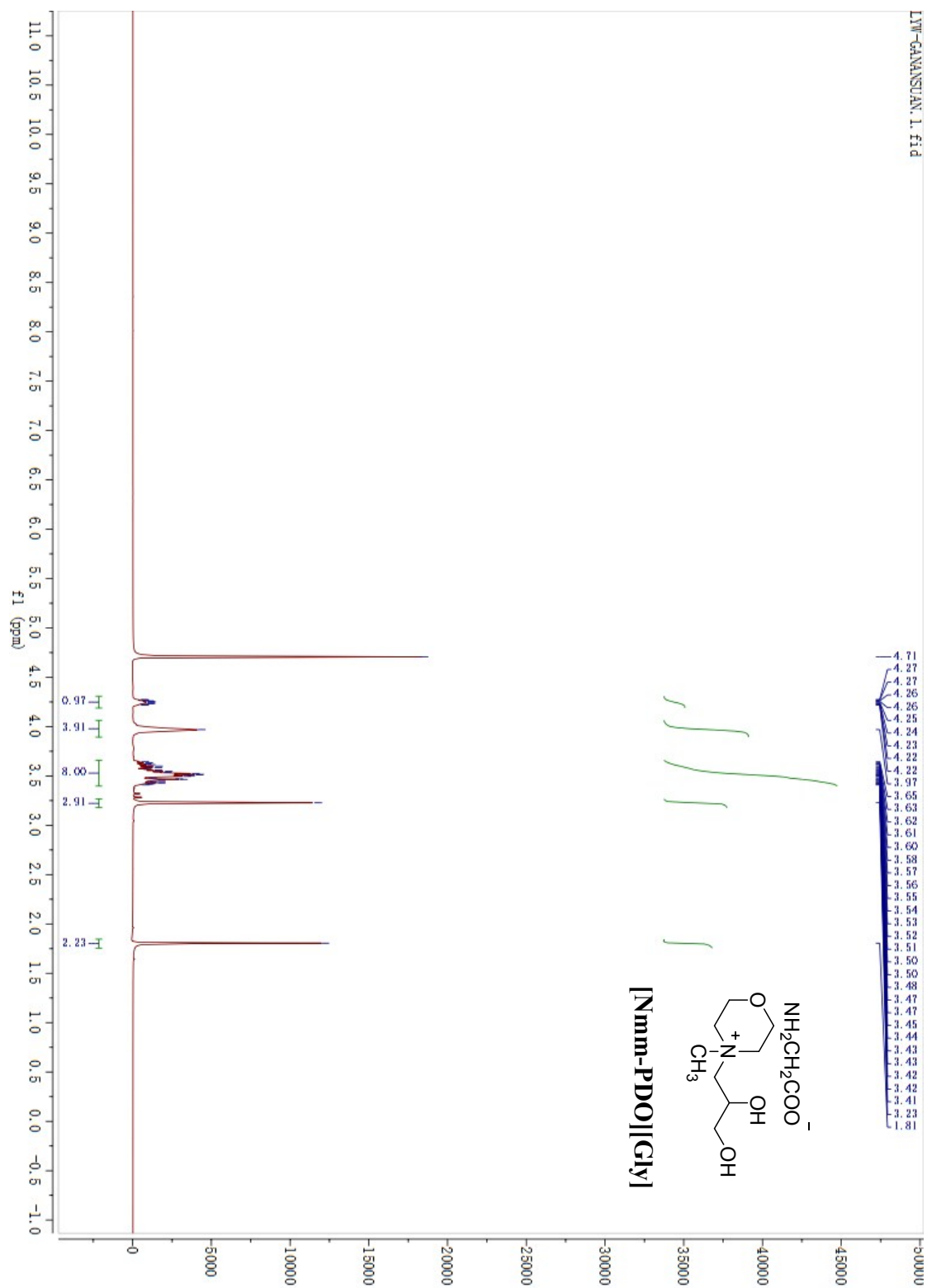


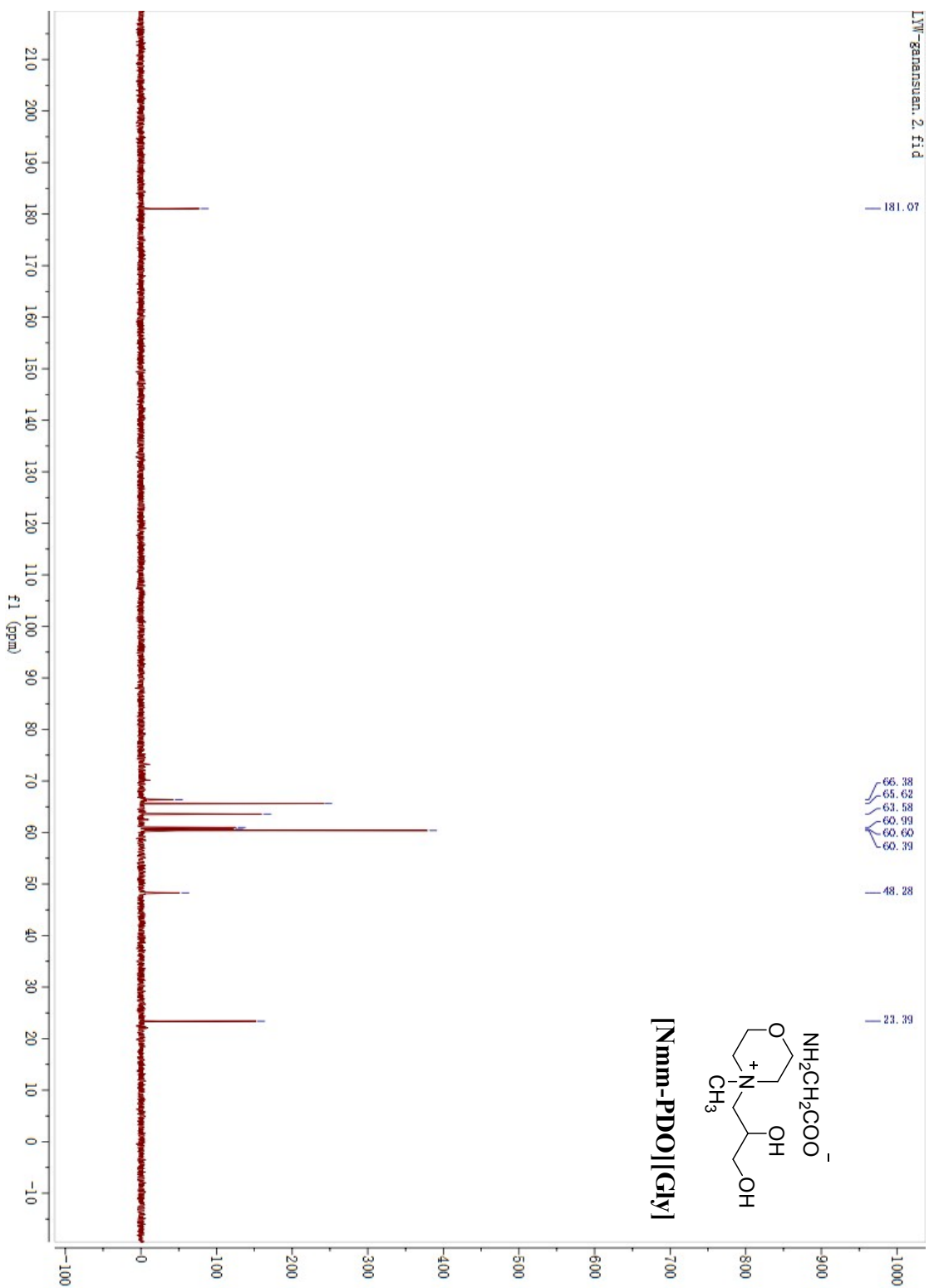


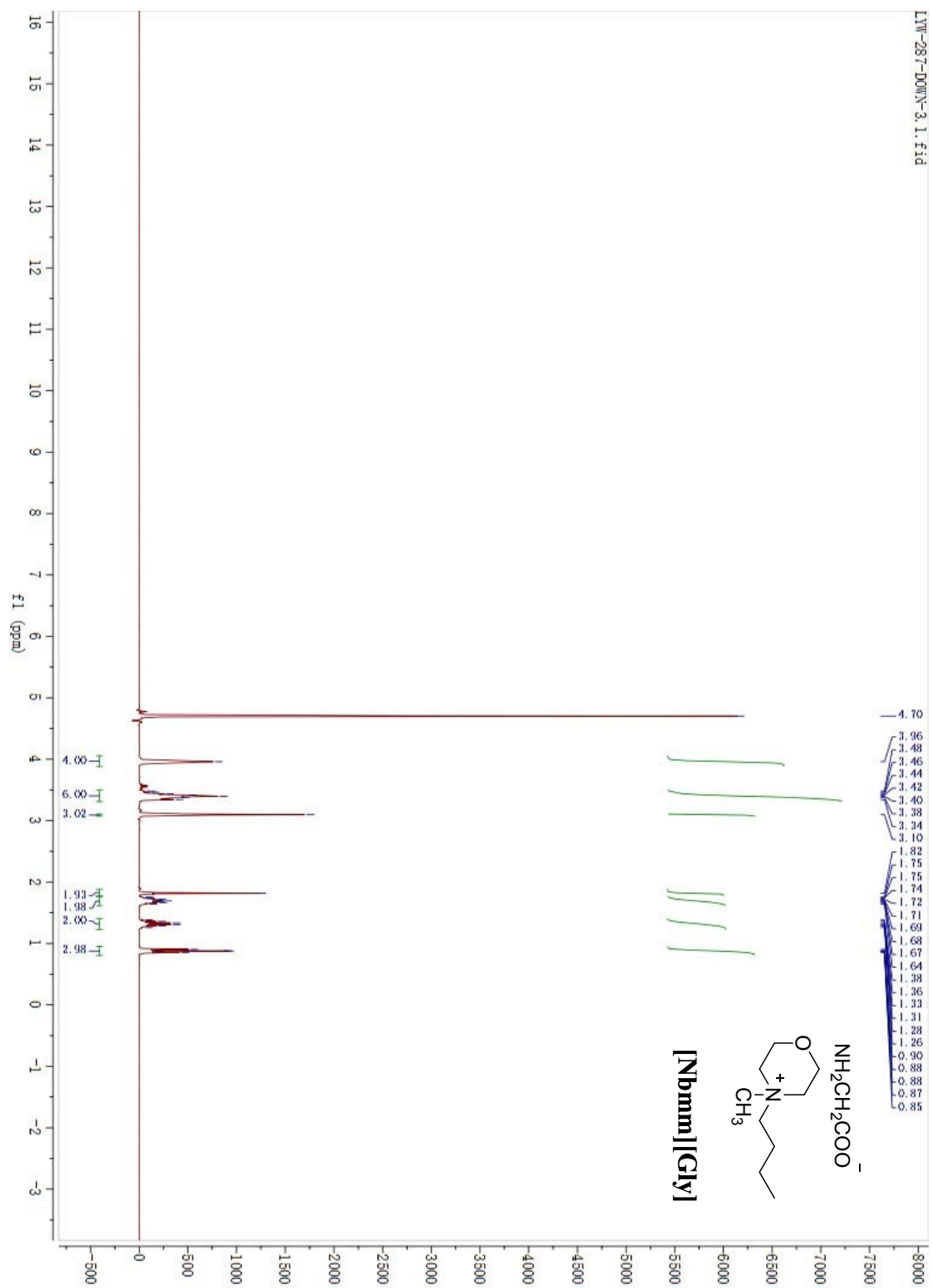


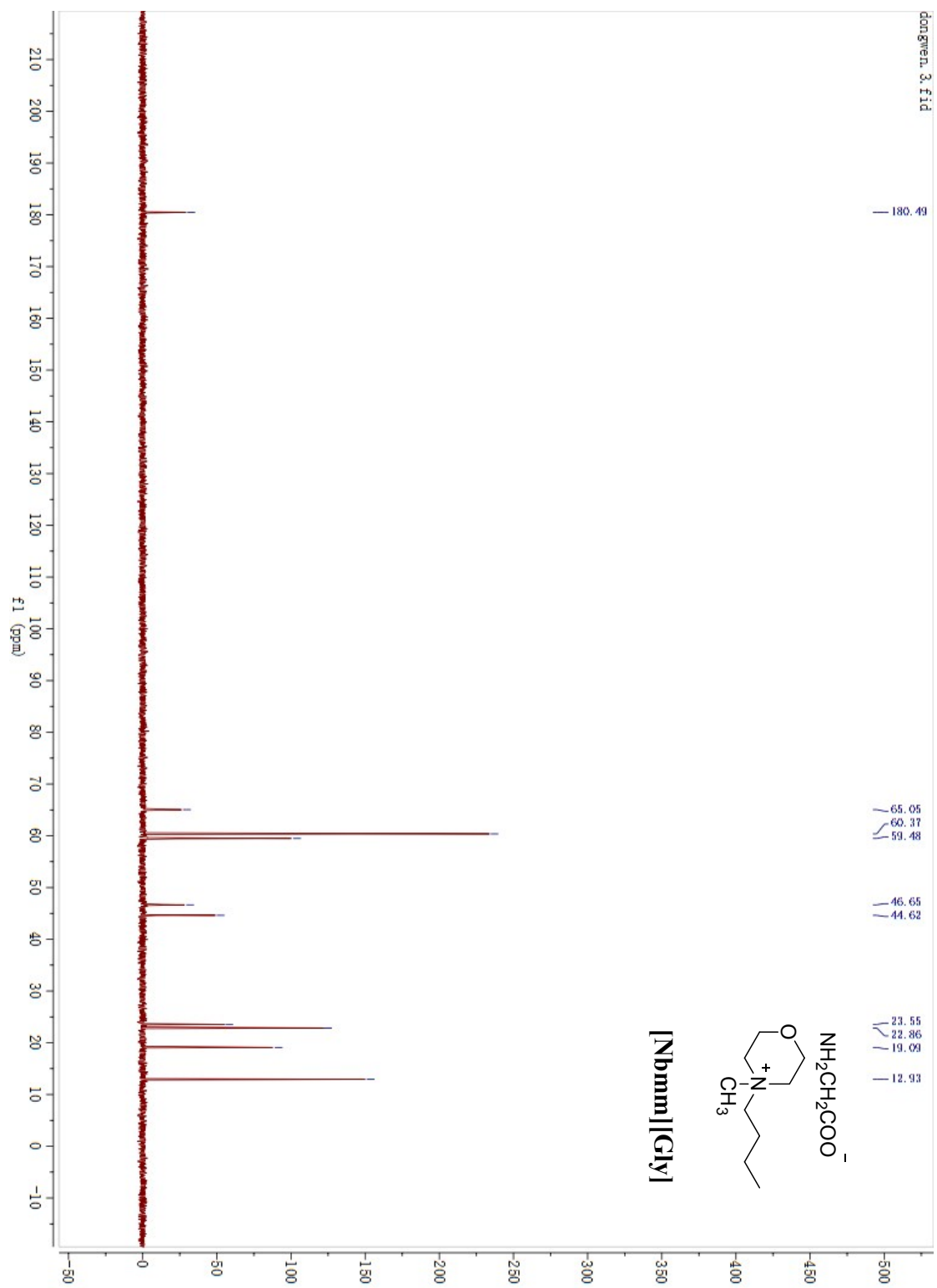
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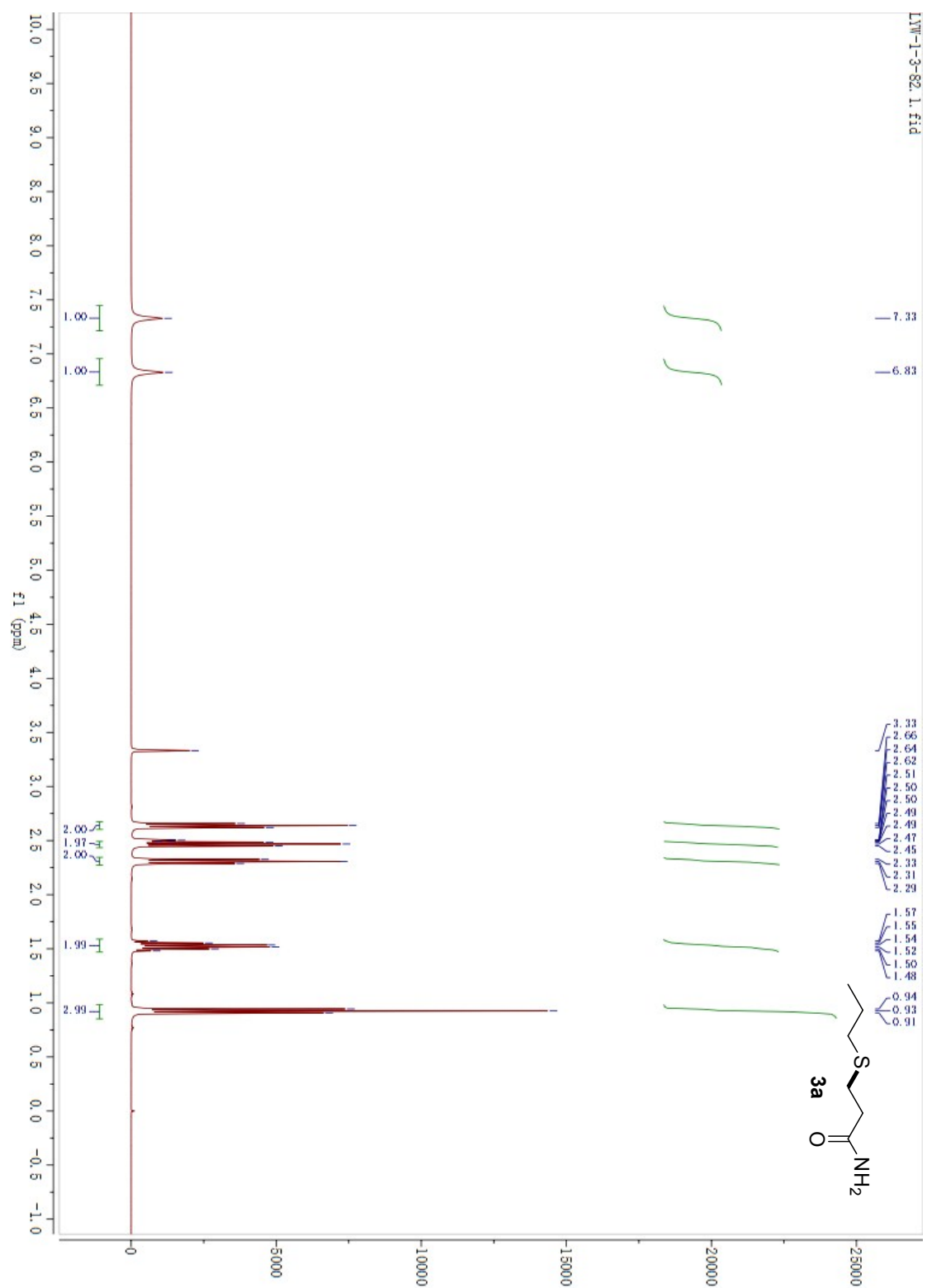




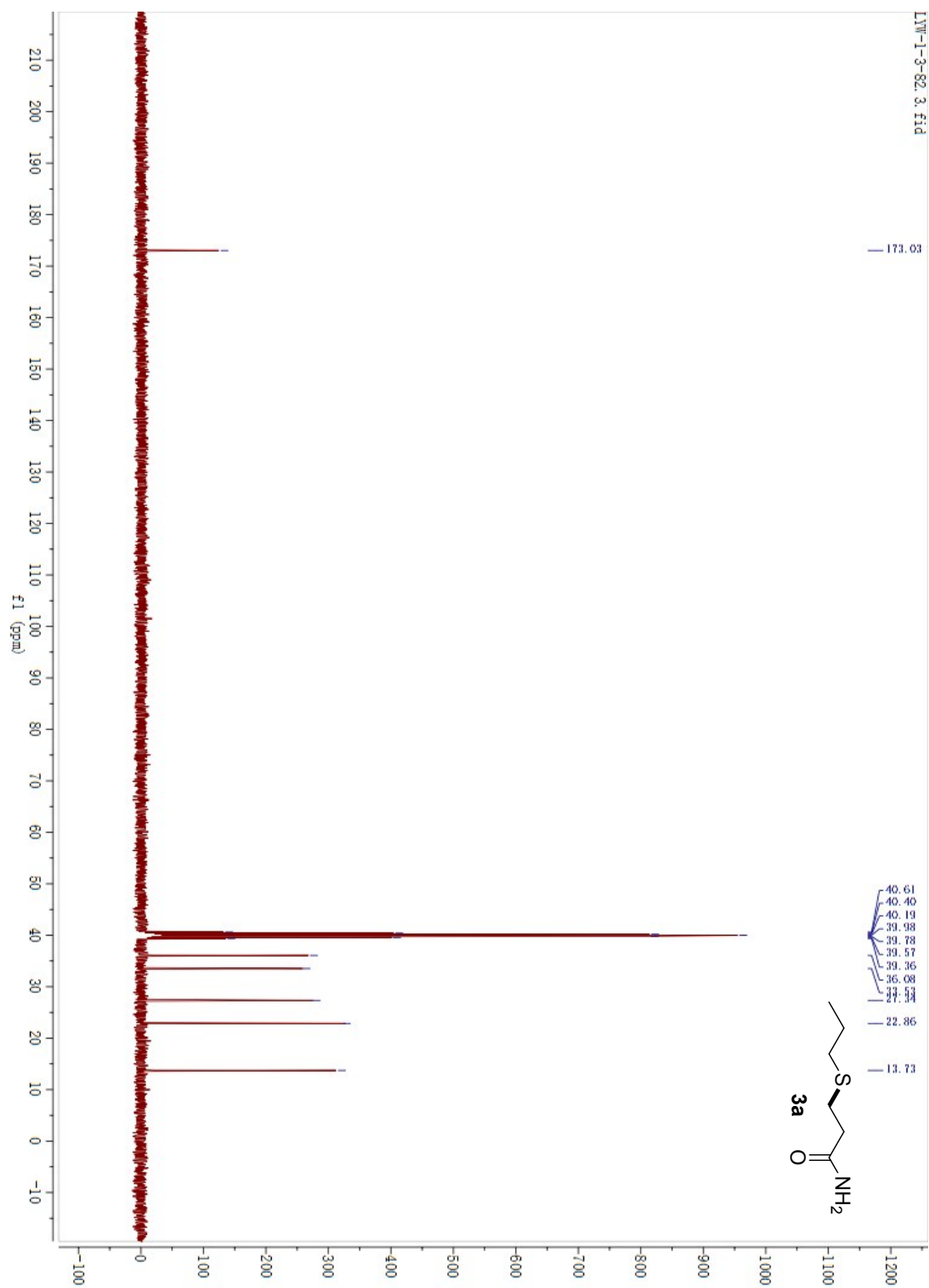


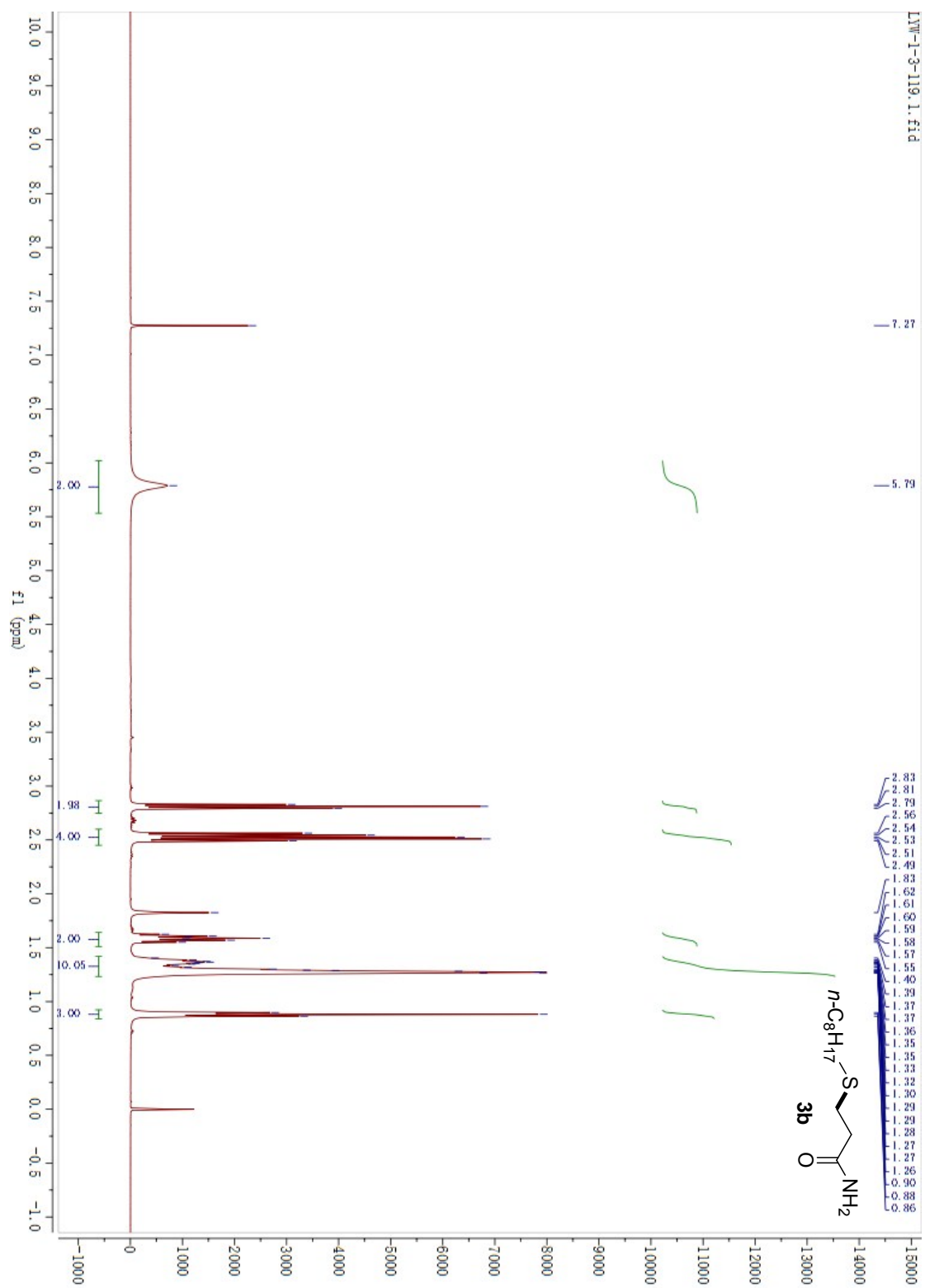


The  $^1\text{H}$  and  $^{13}\text{C}$  NMR spectra of compounds 3a-3f

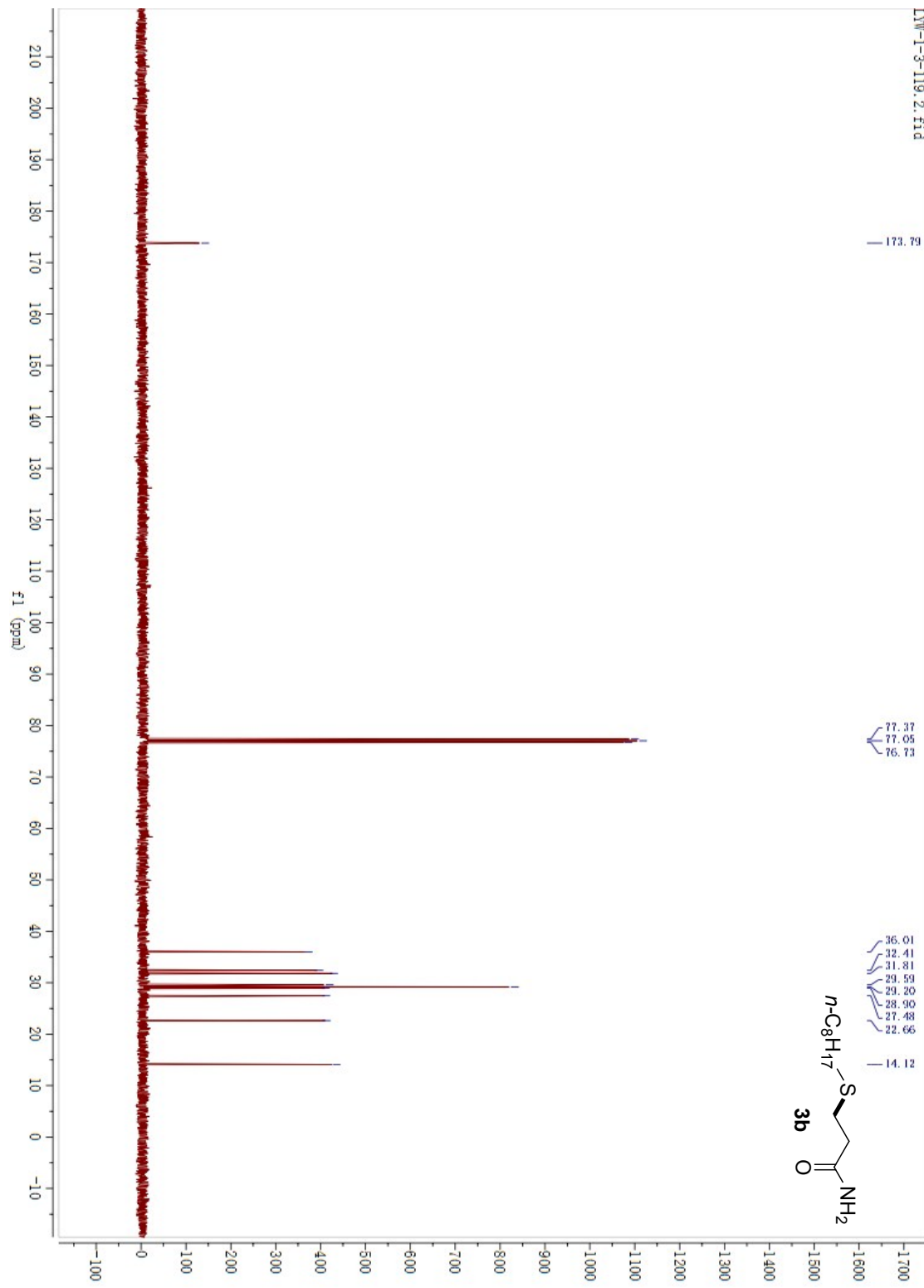


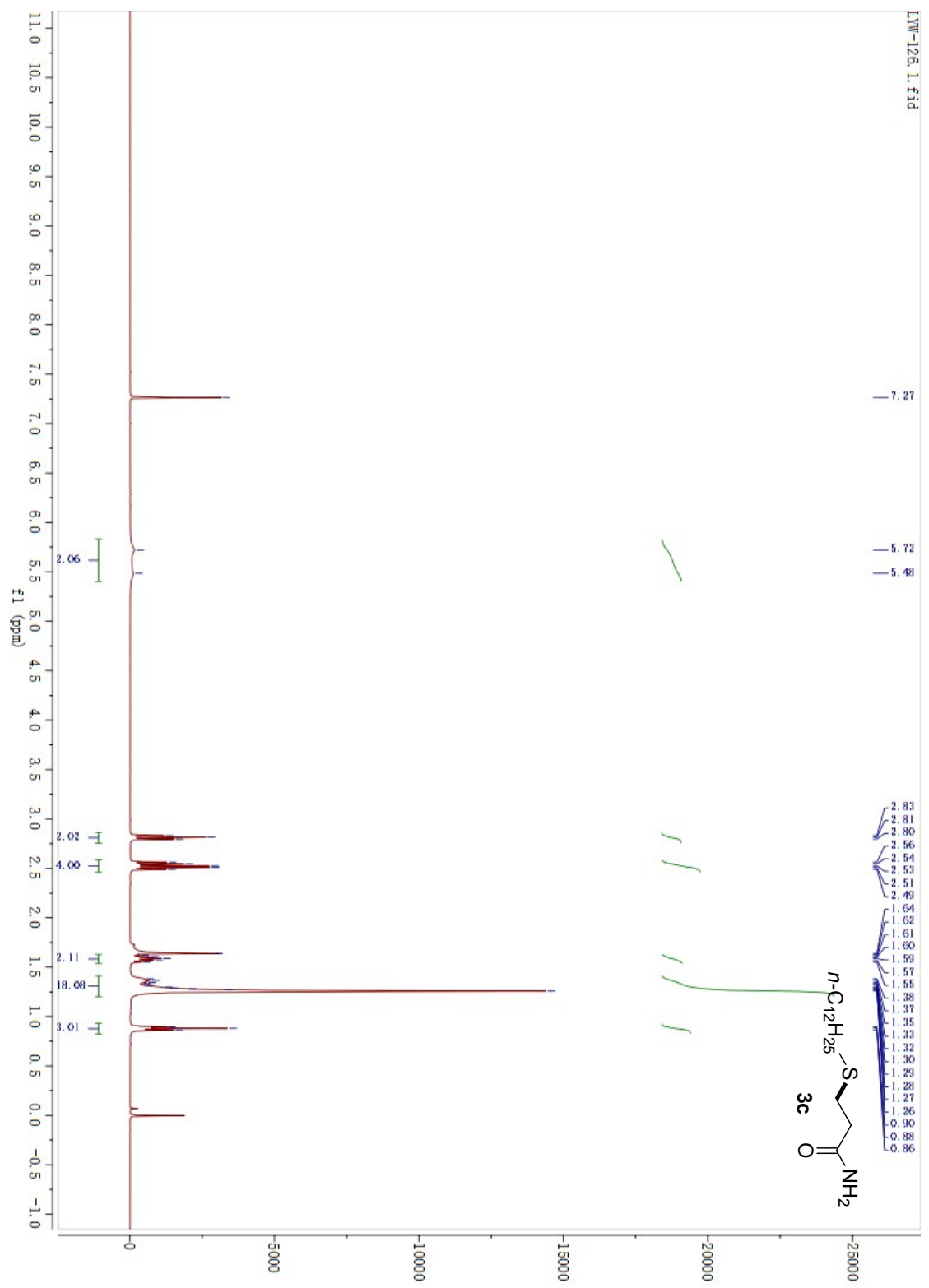
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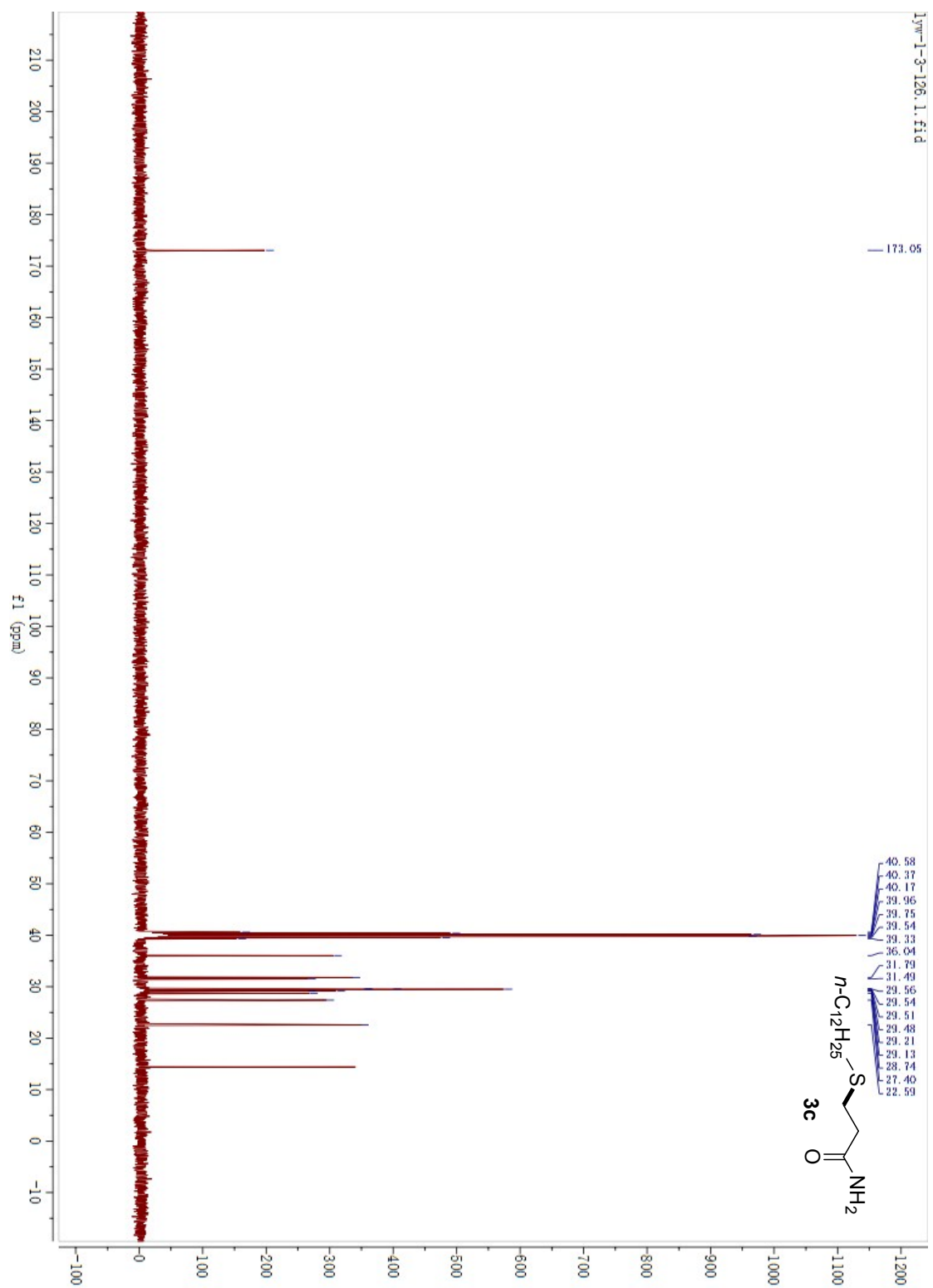


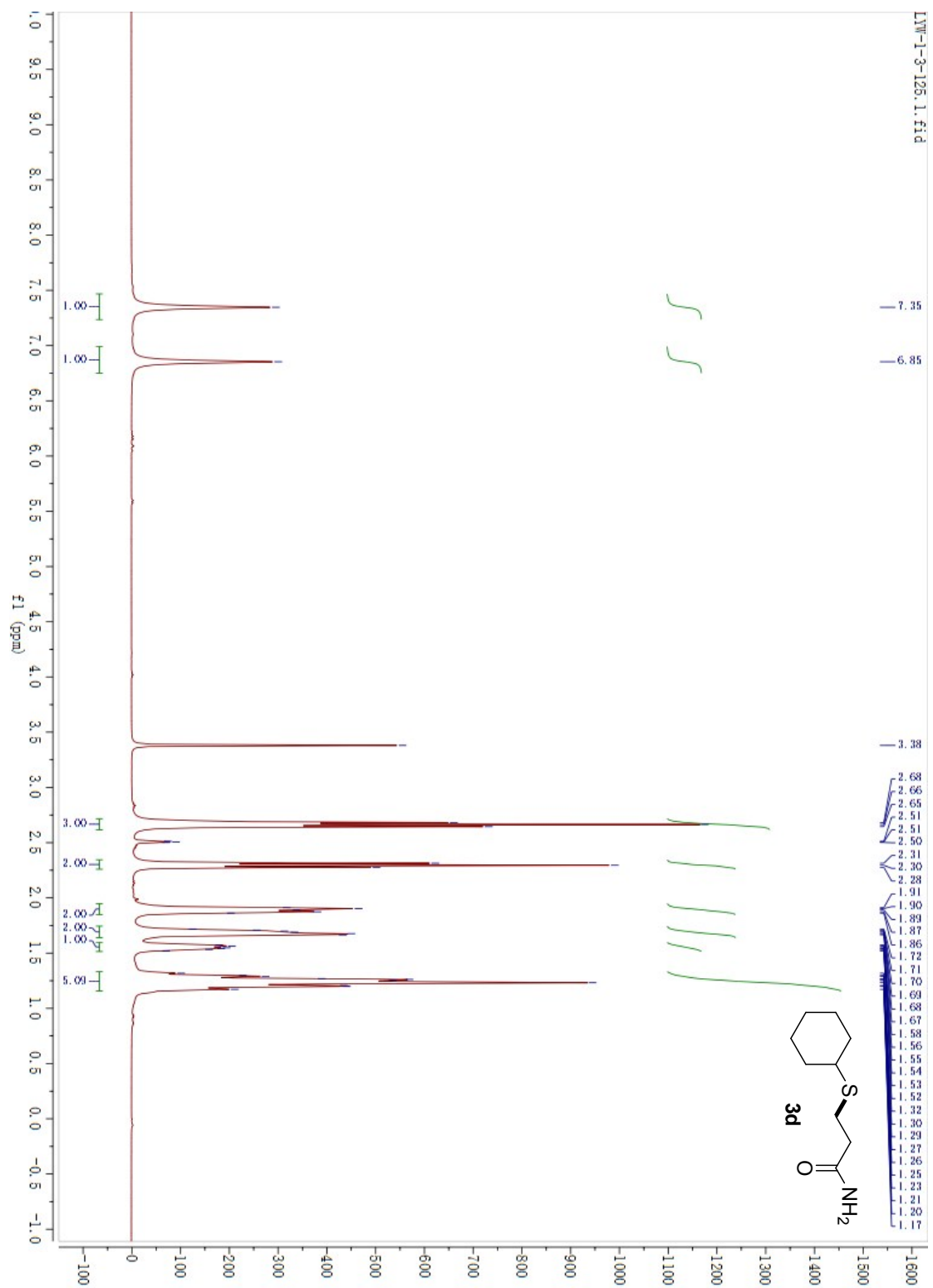


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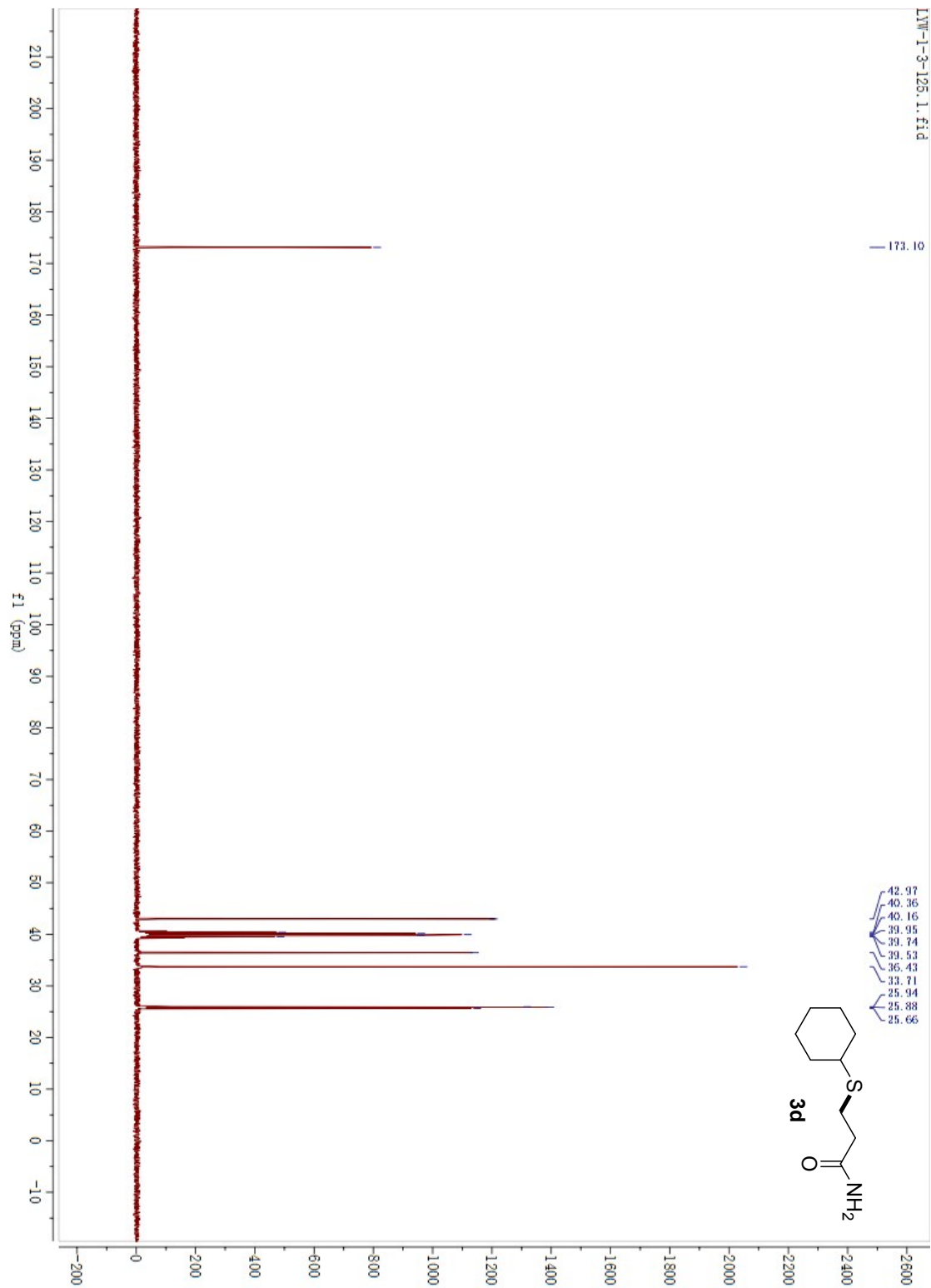




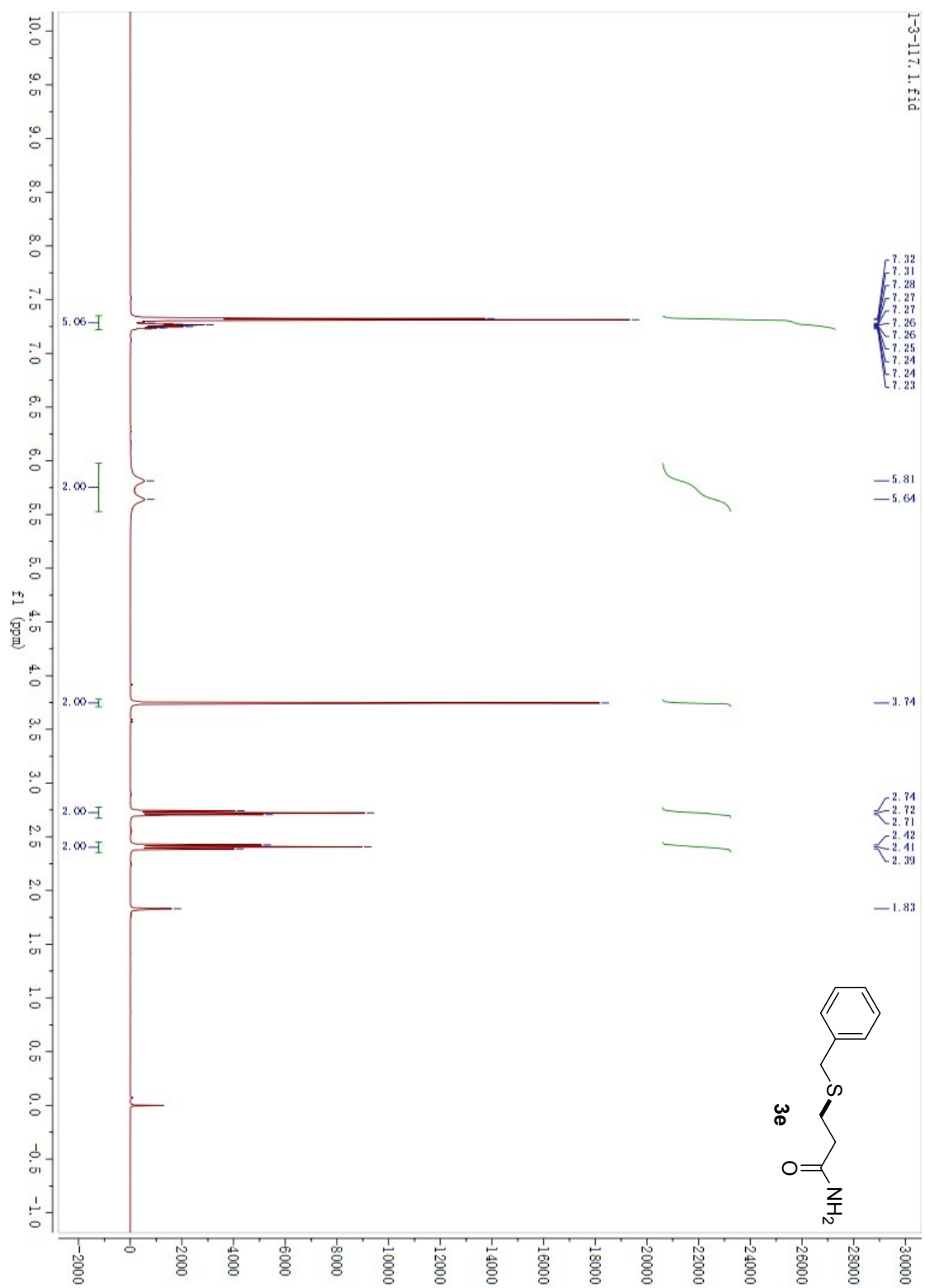


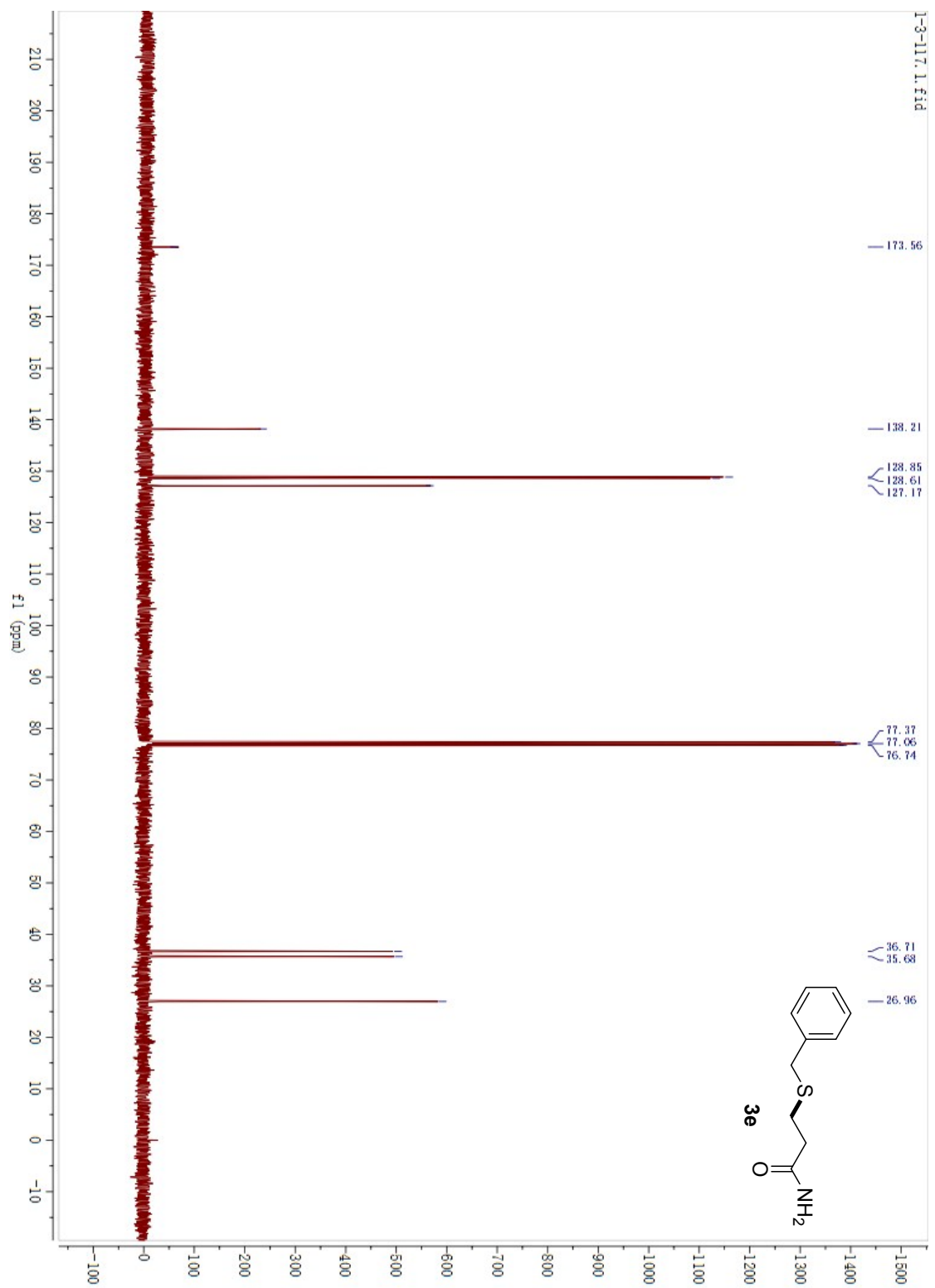


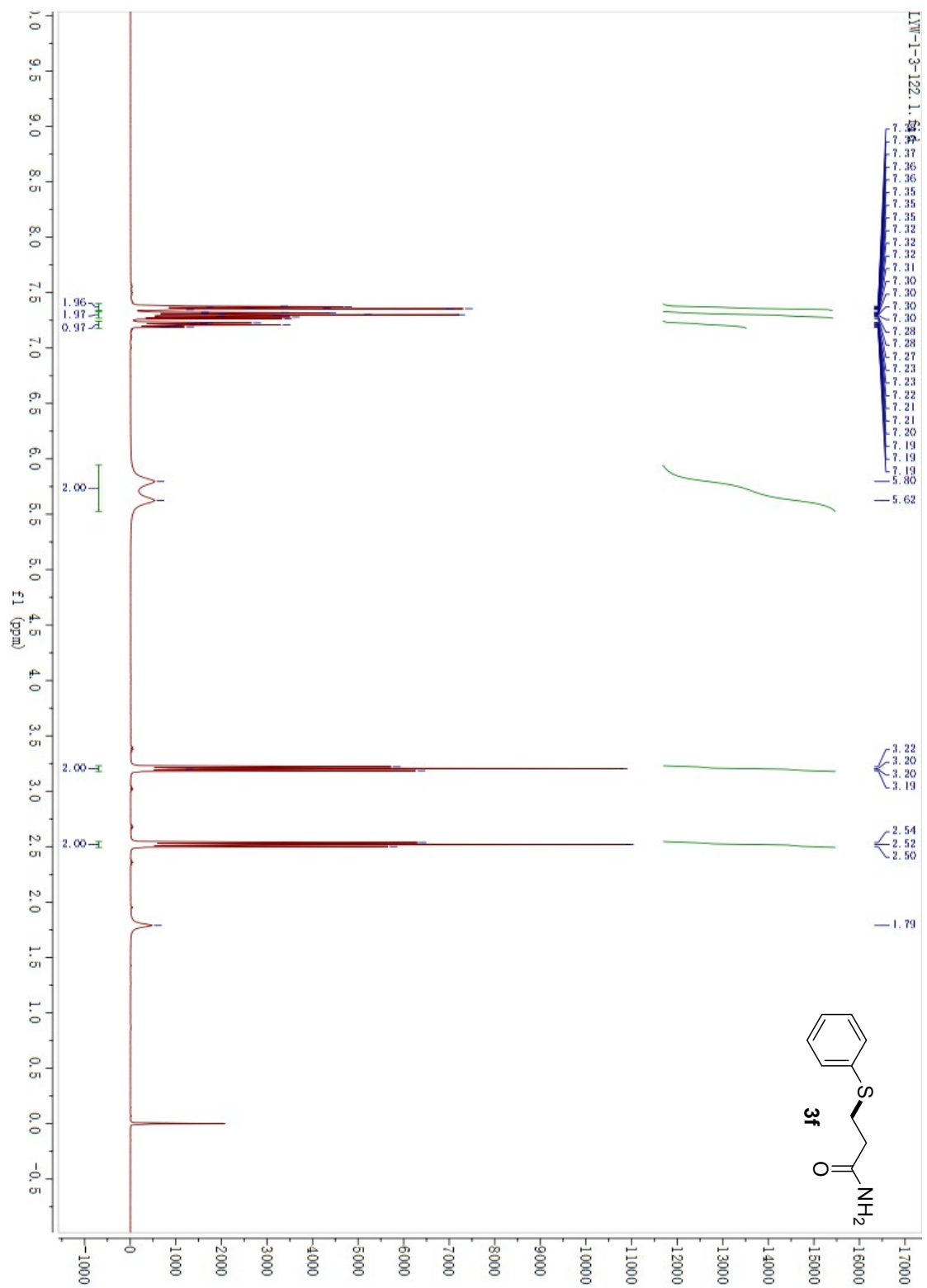
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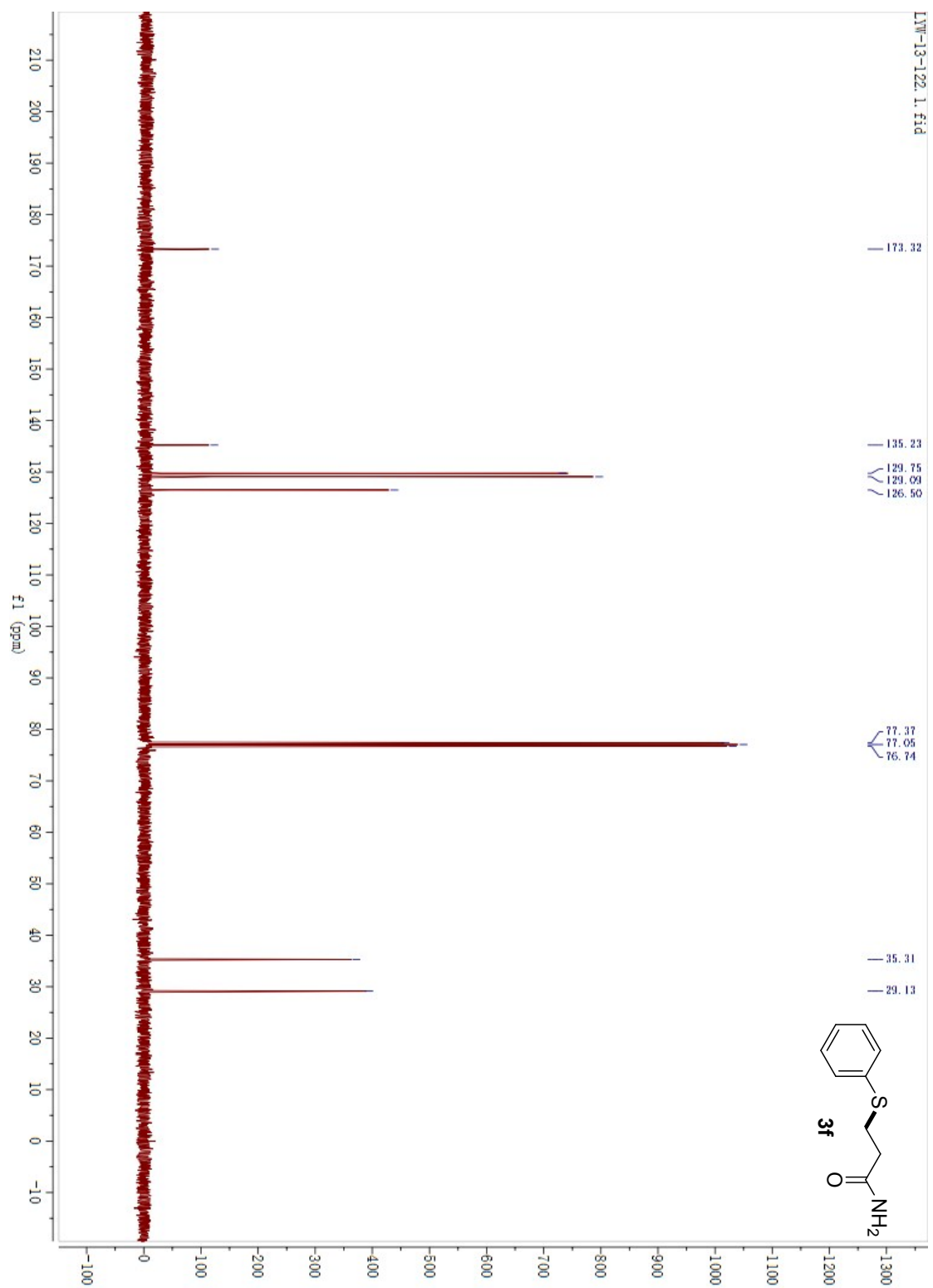


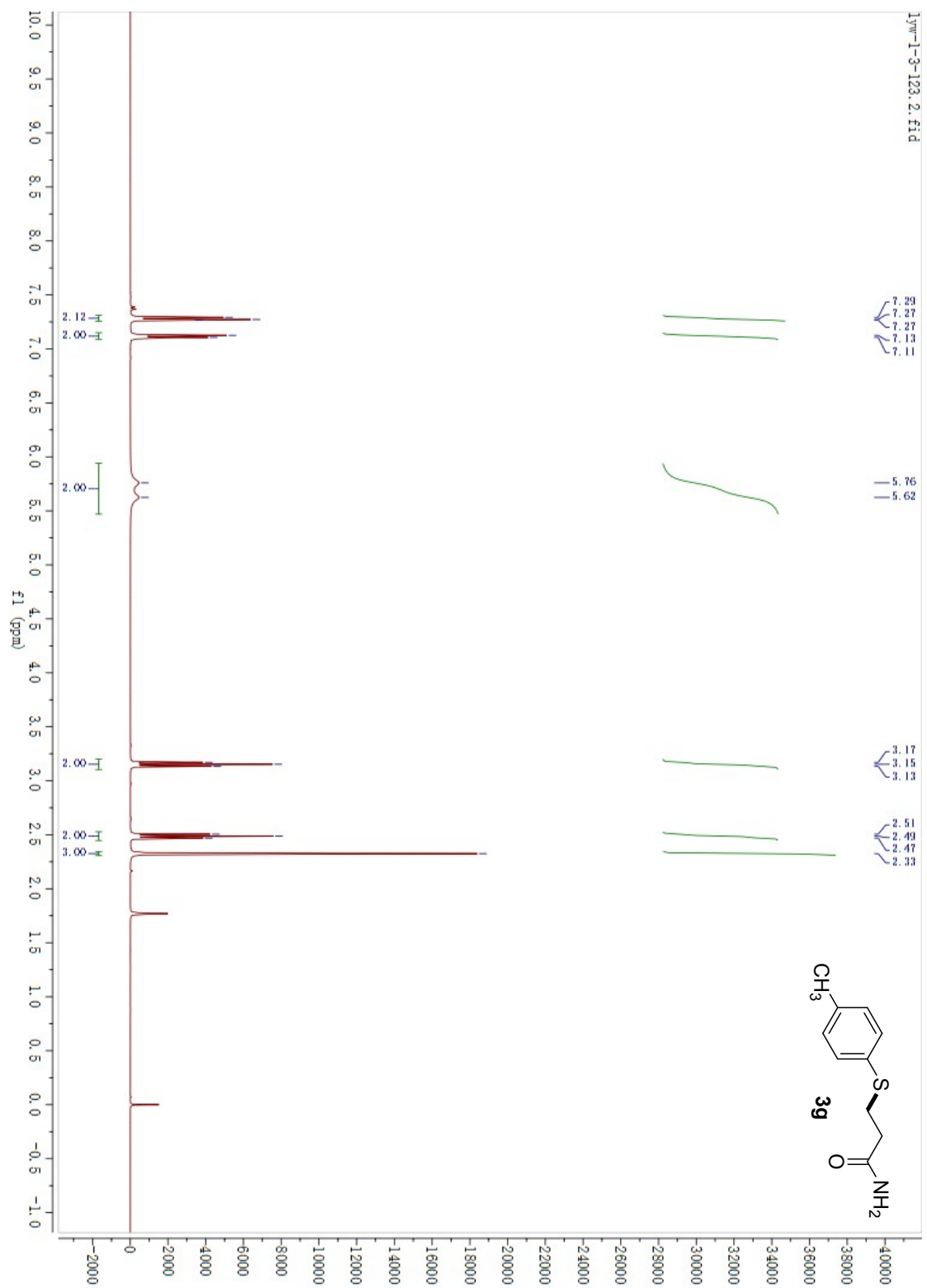


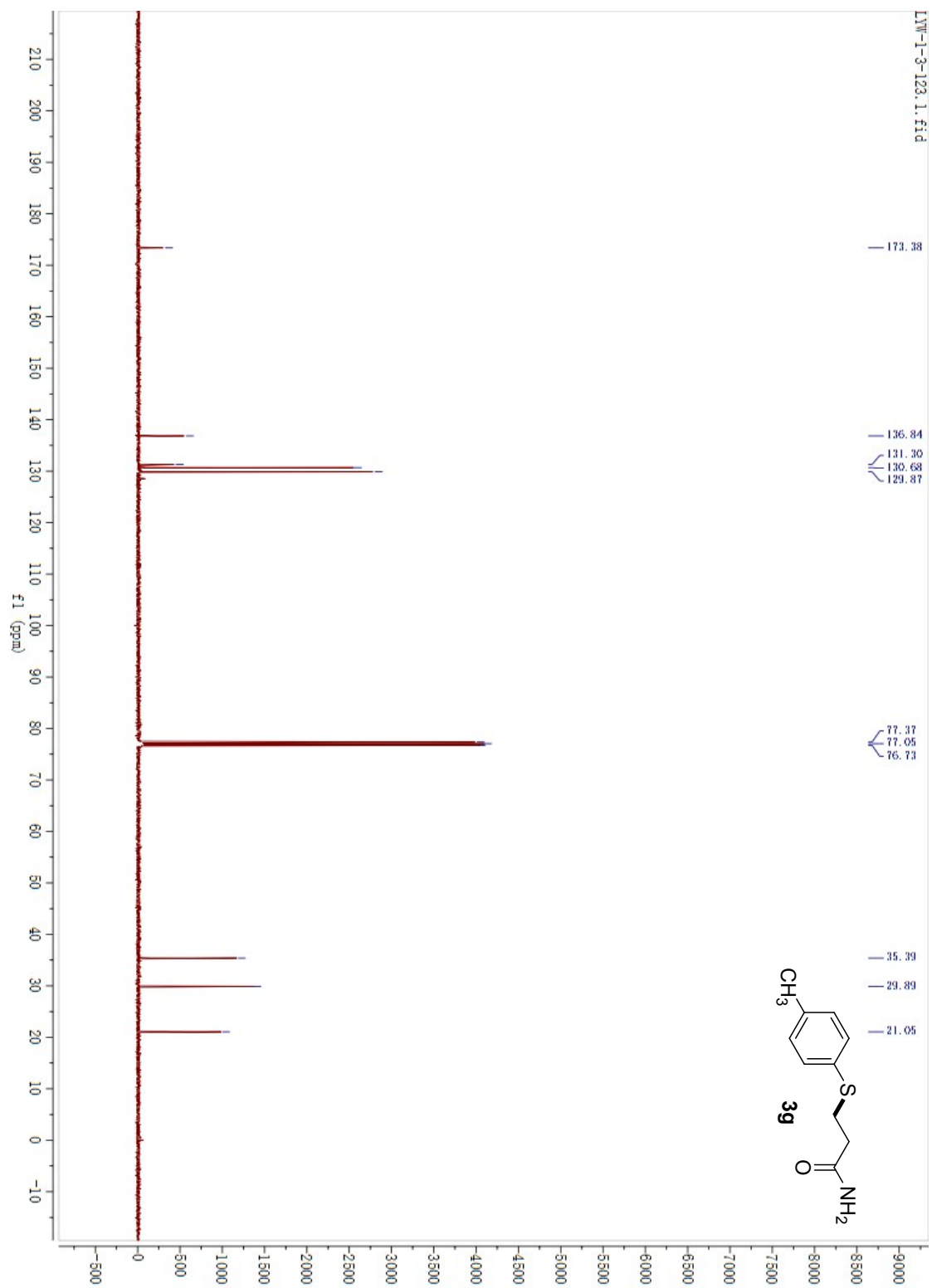


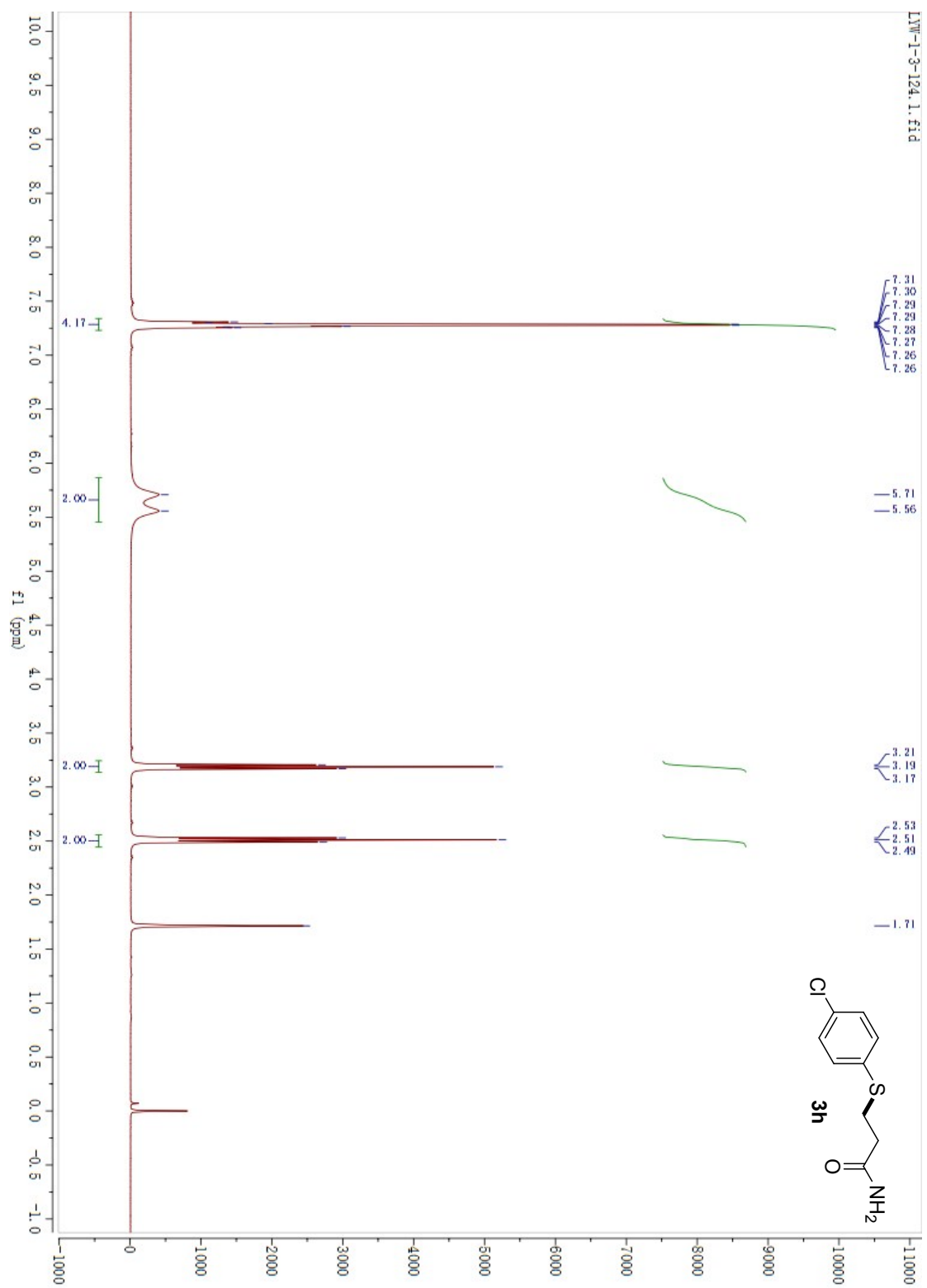


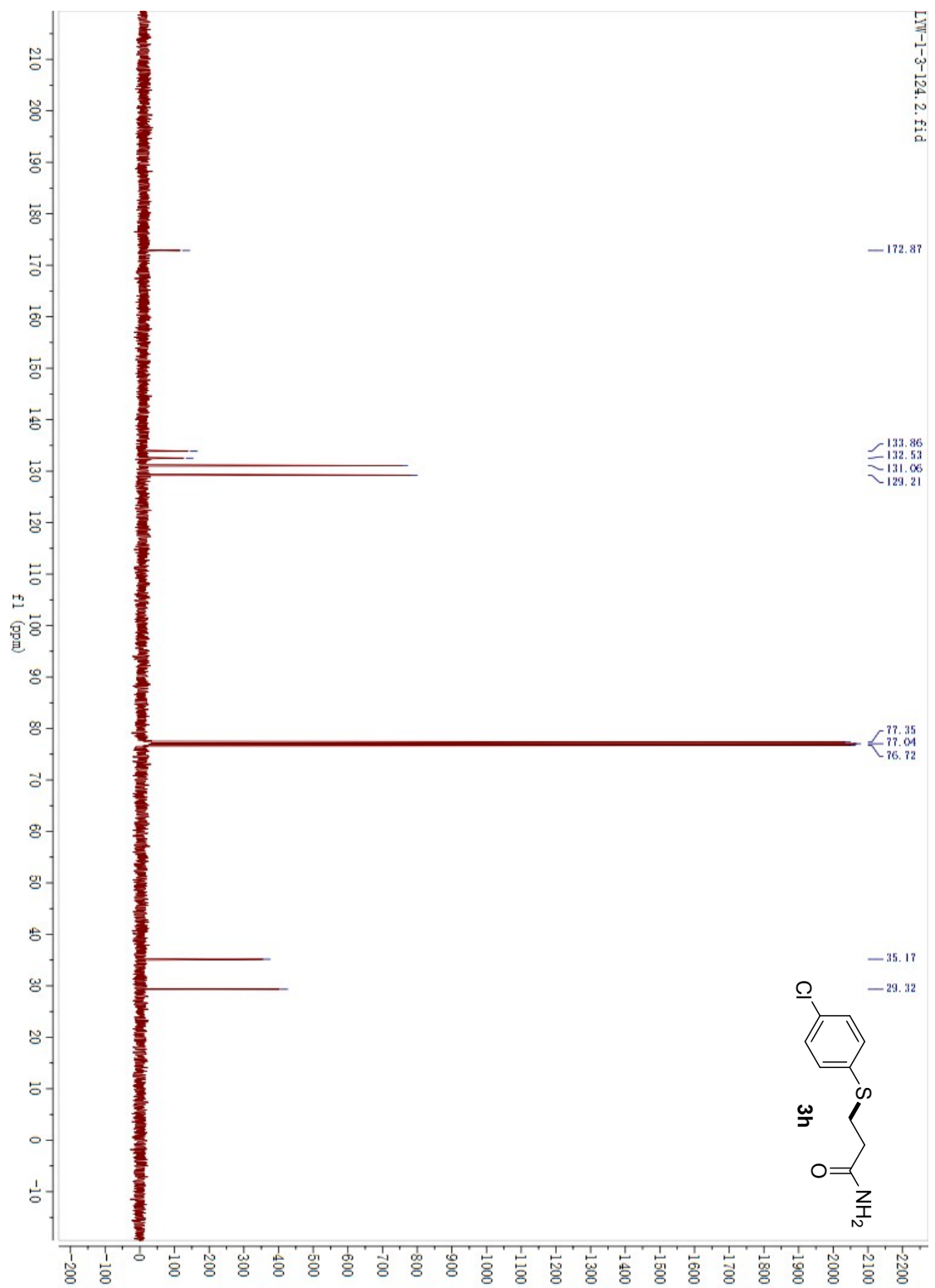




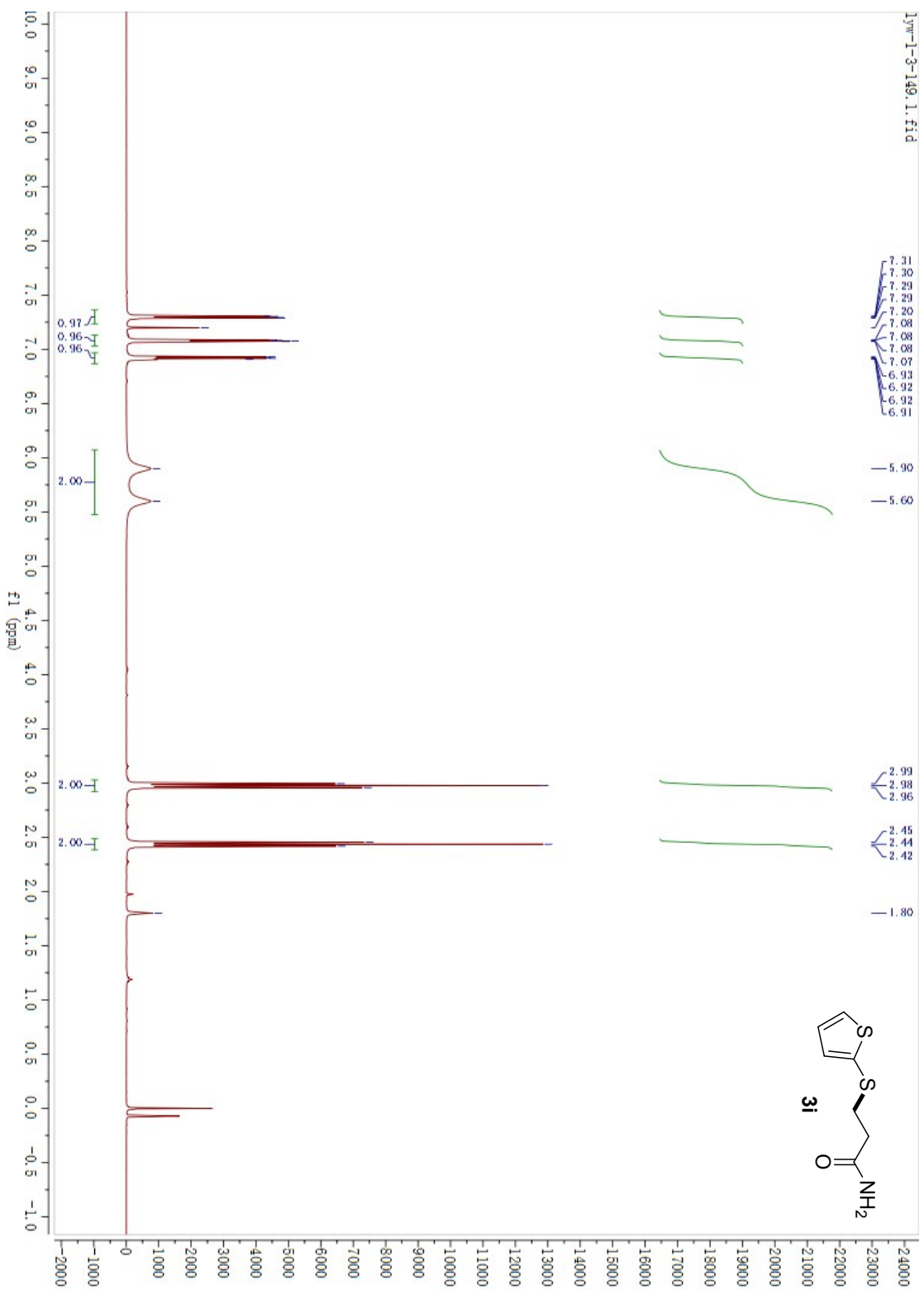


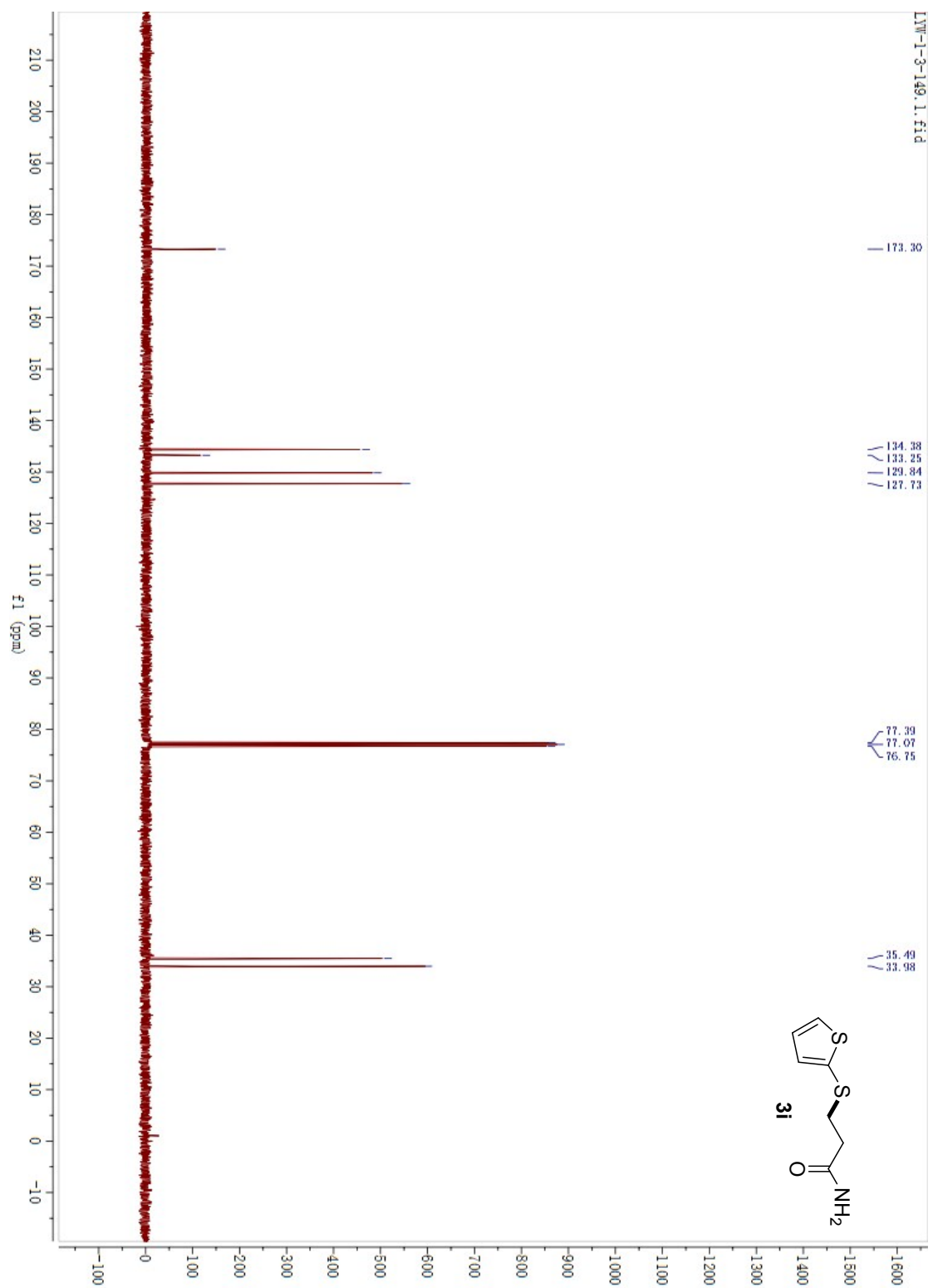






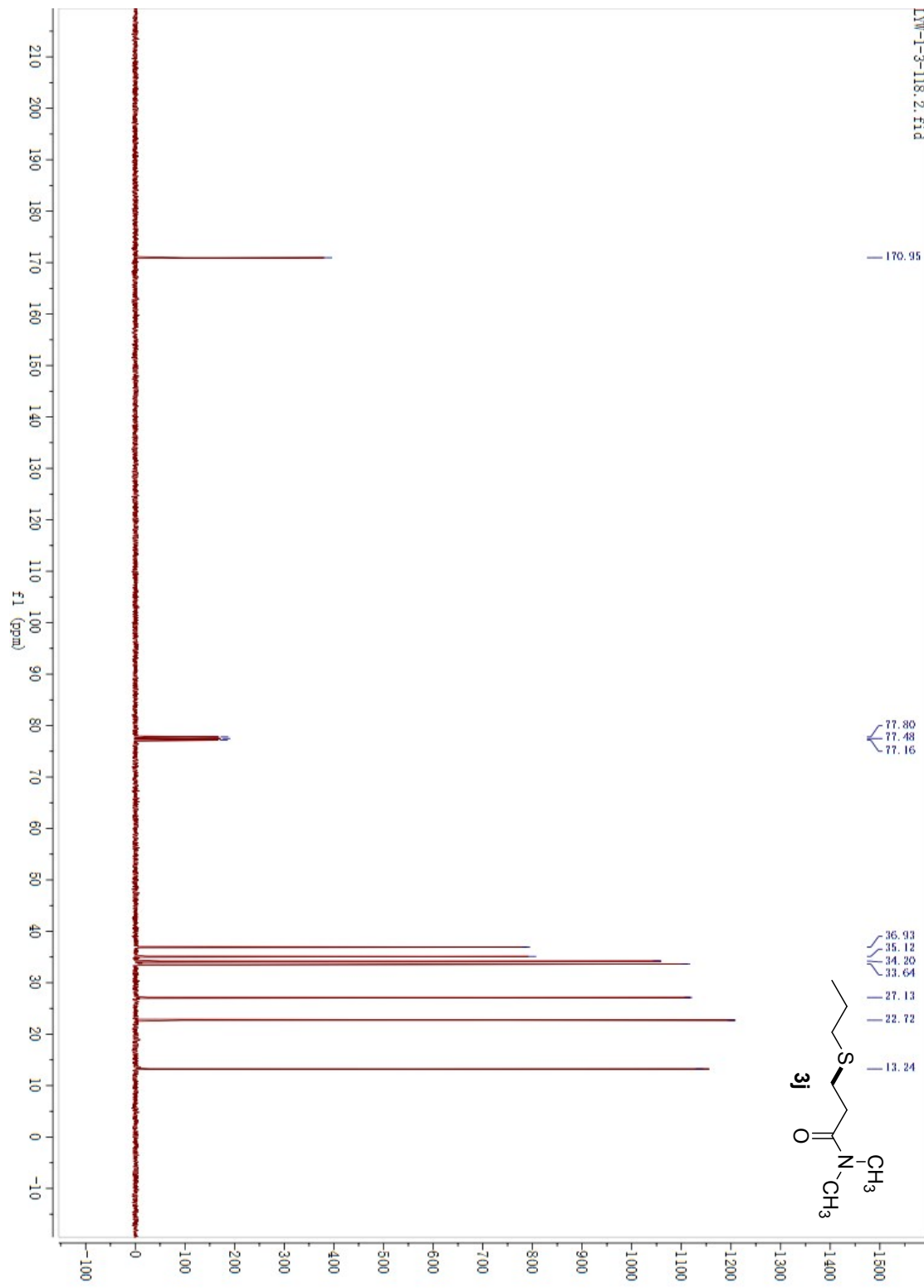


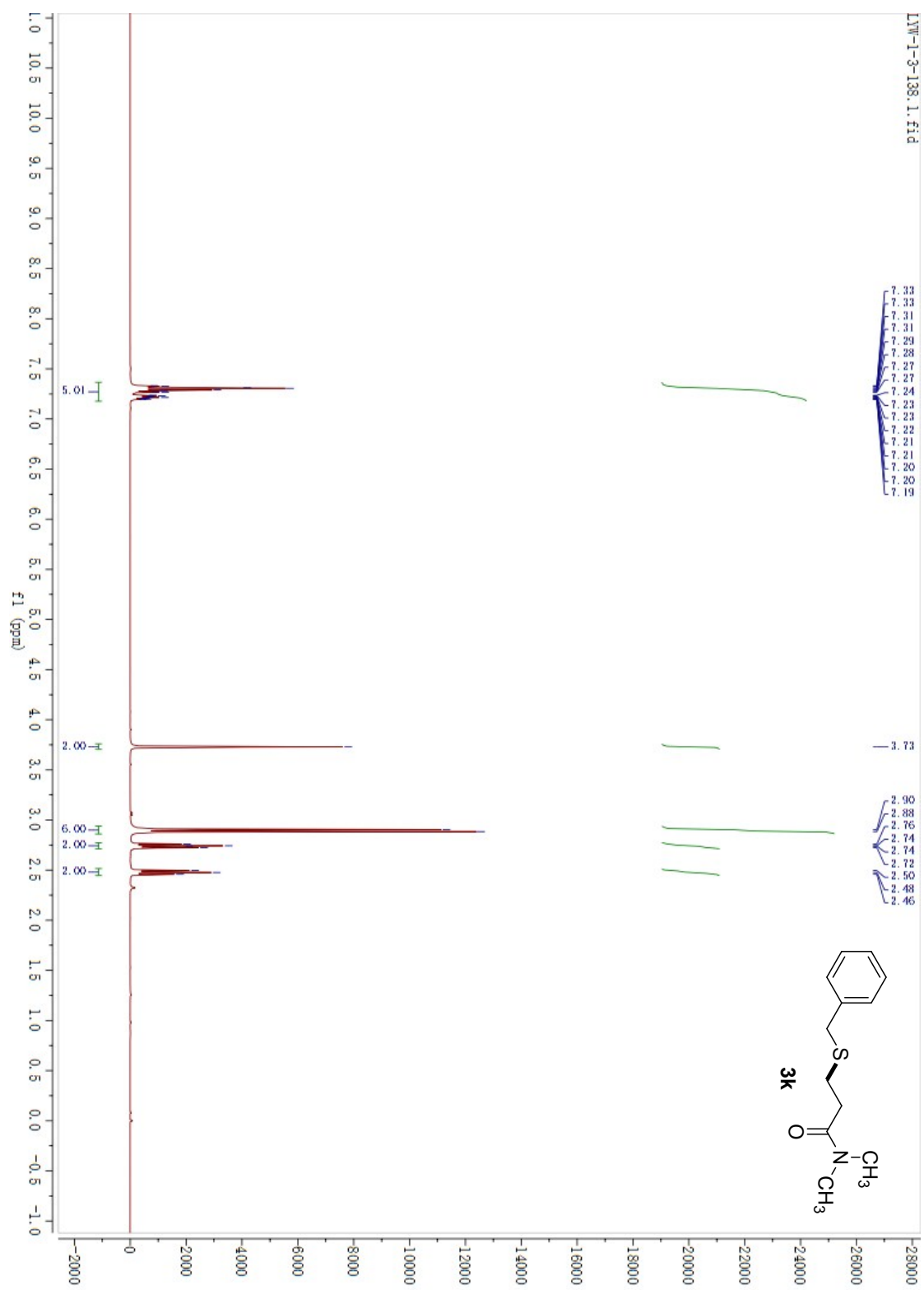


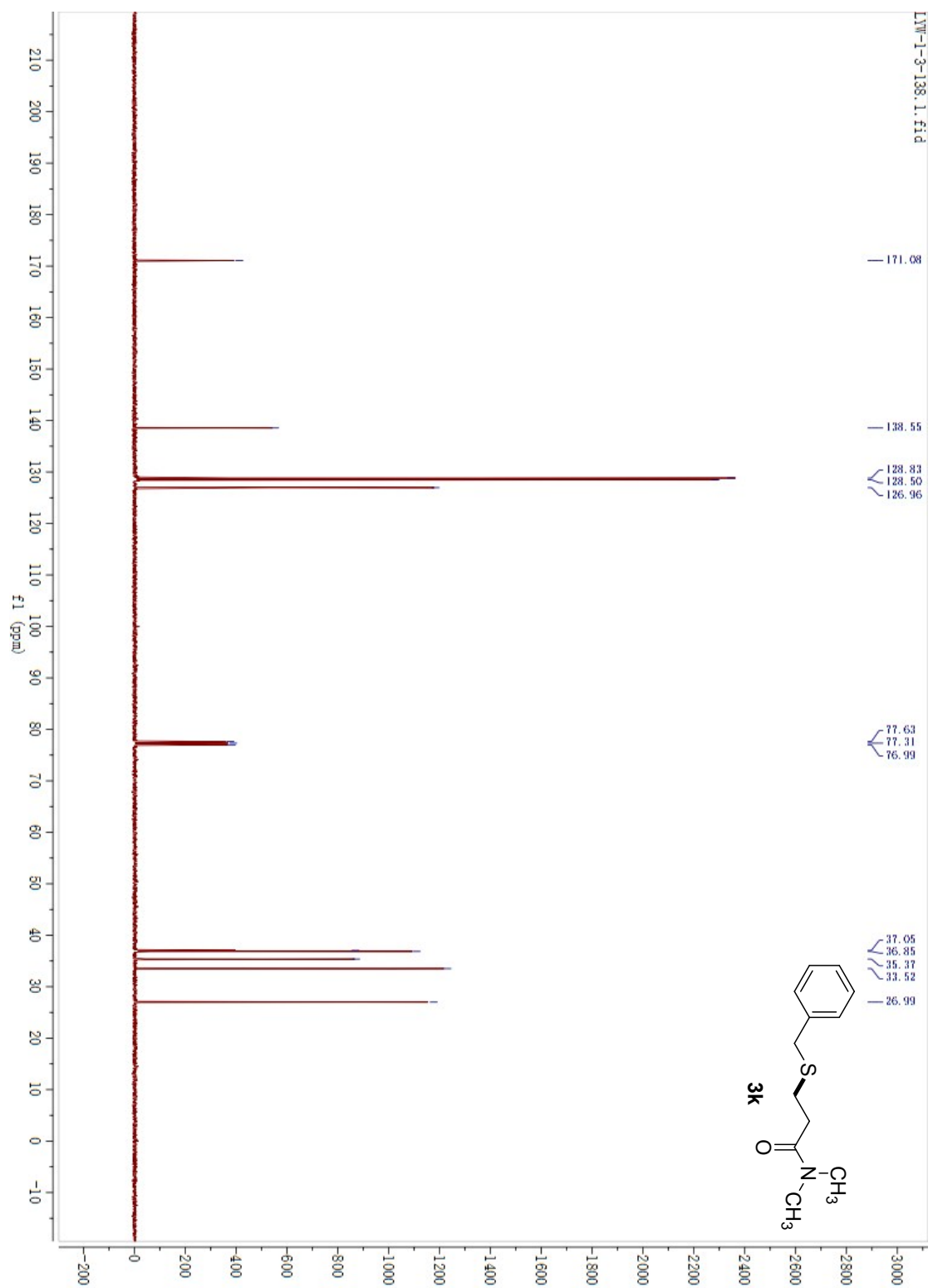


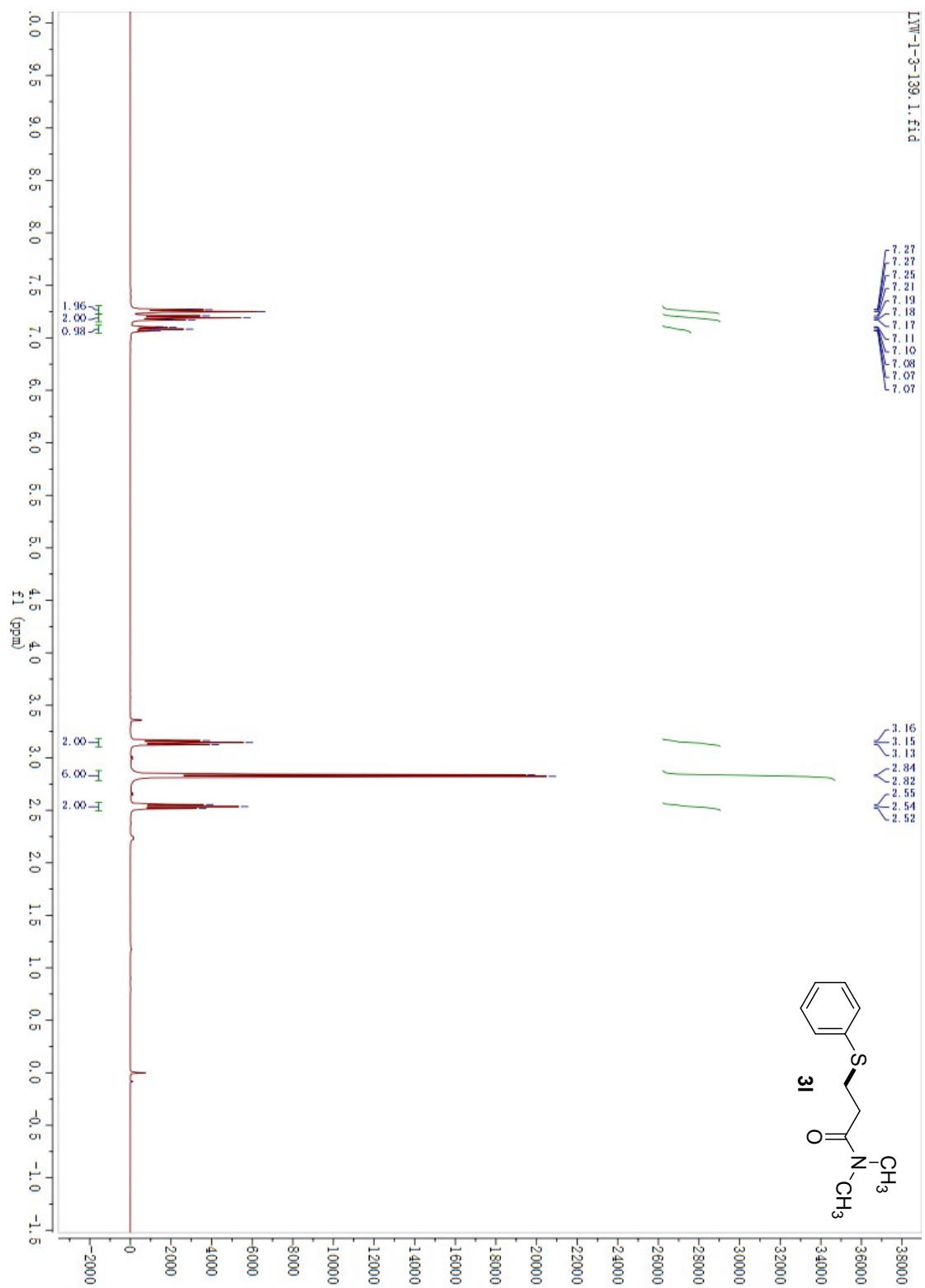


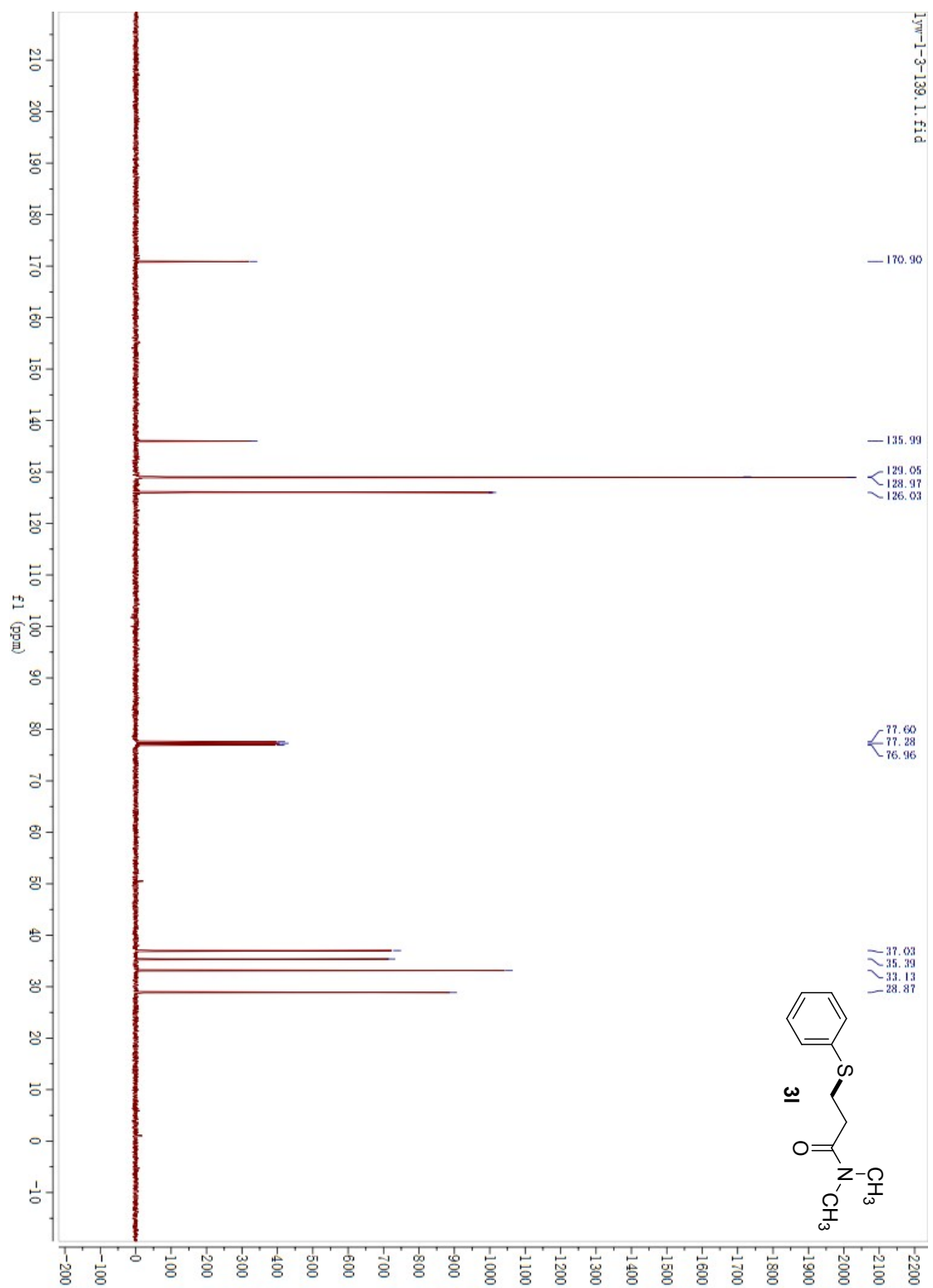
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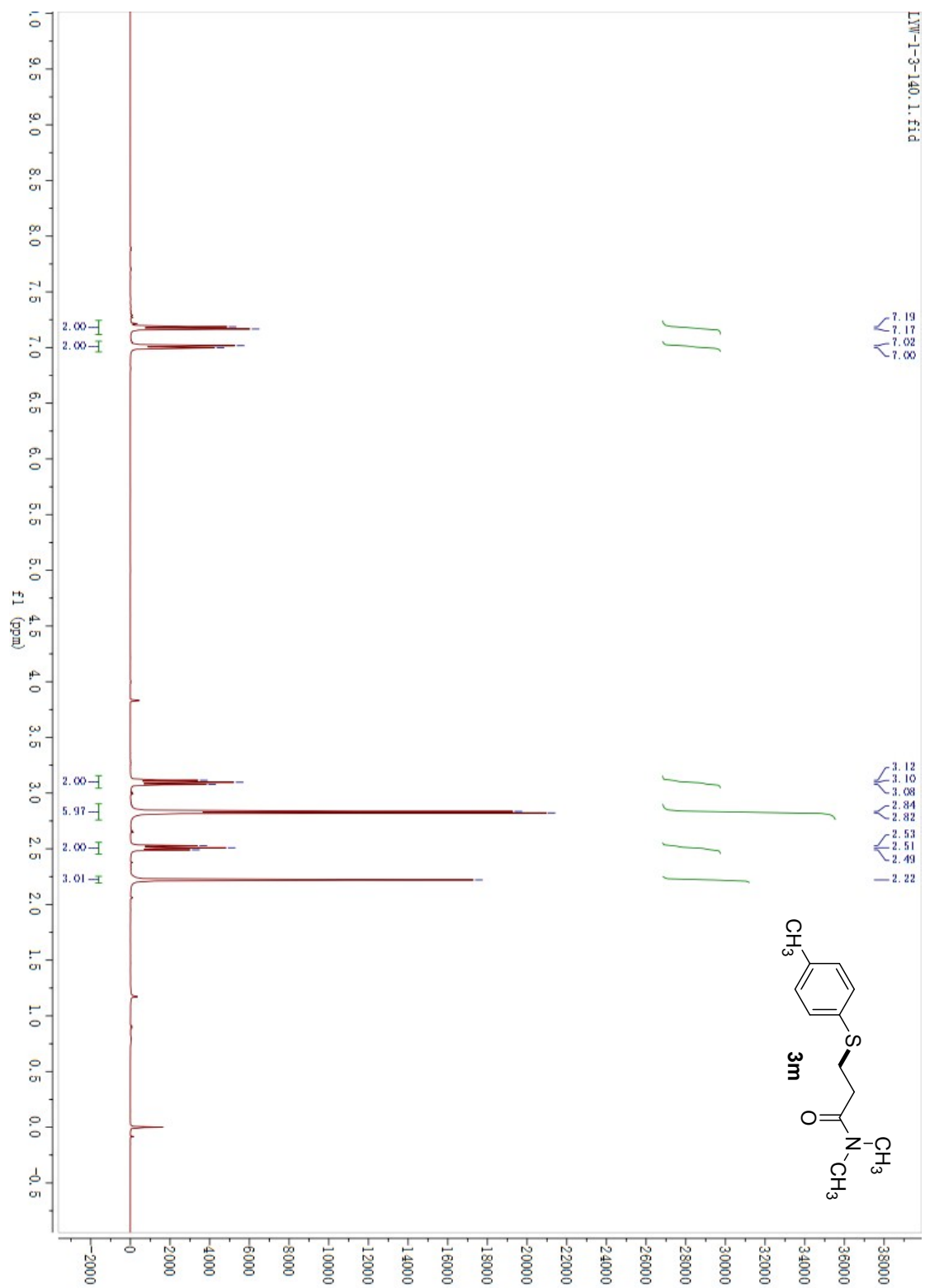


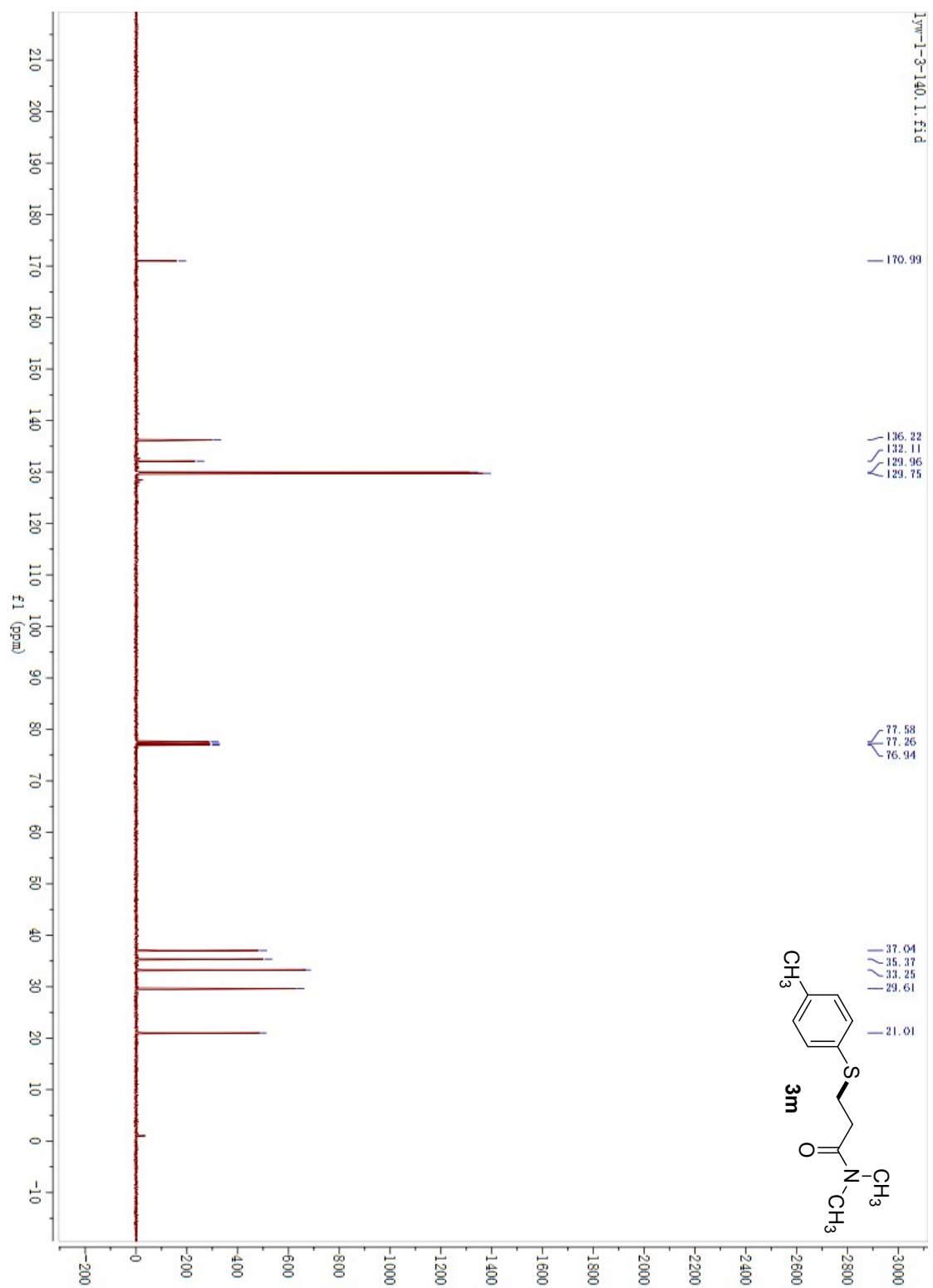


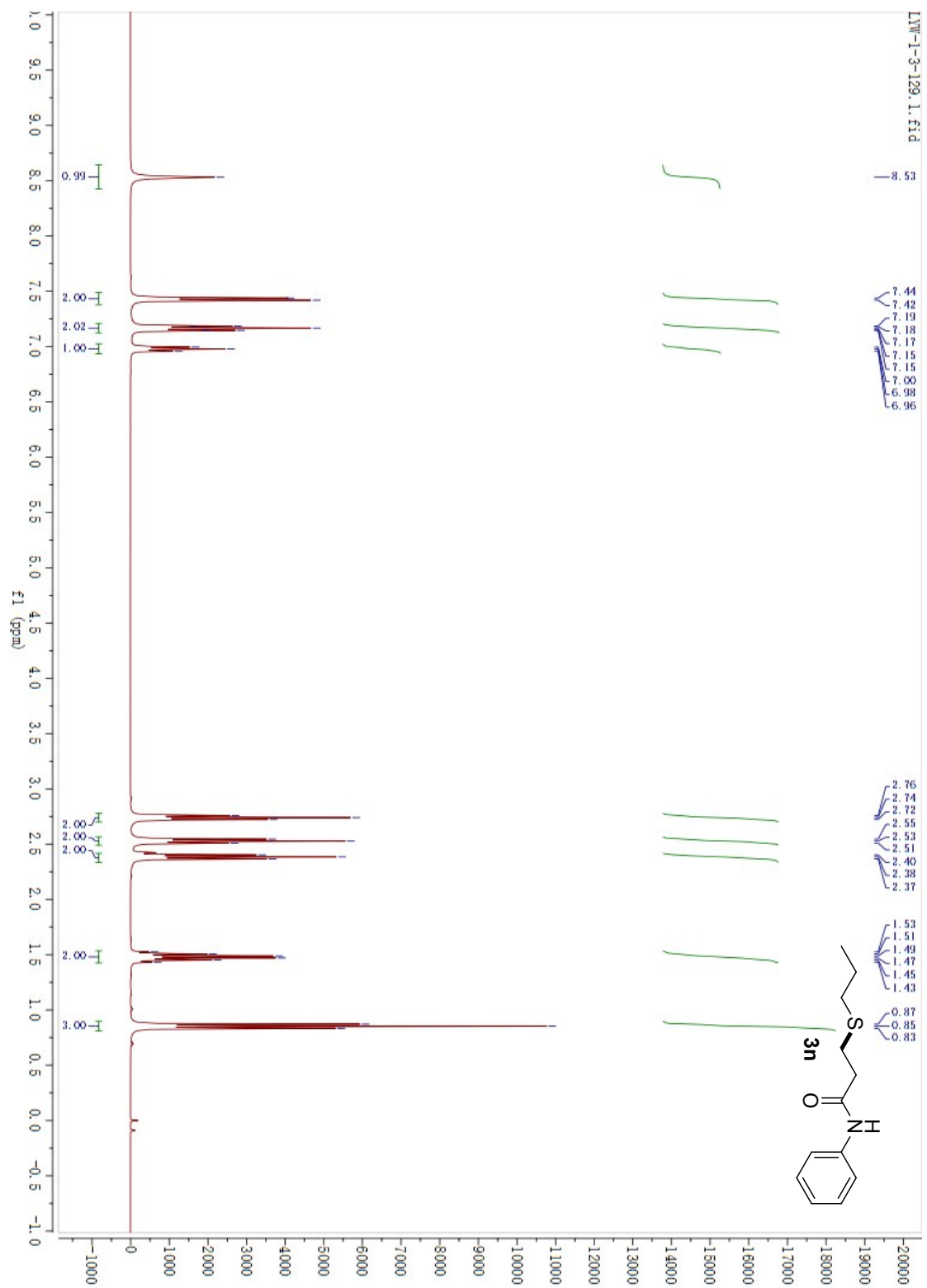


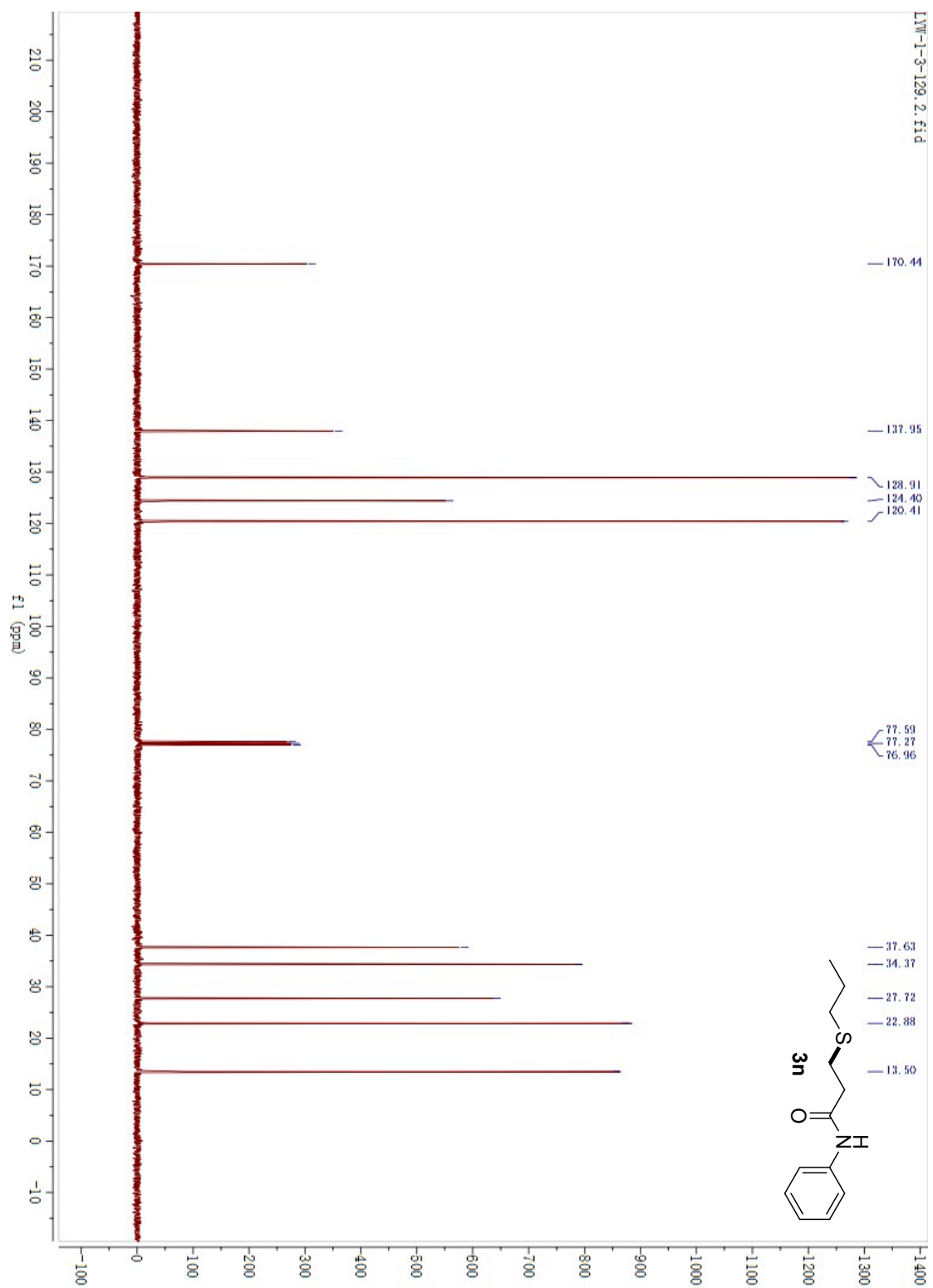




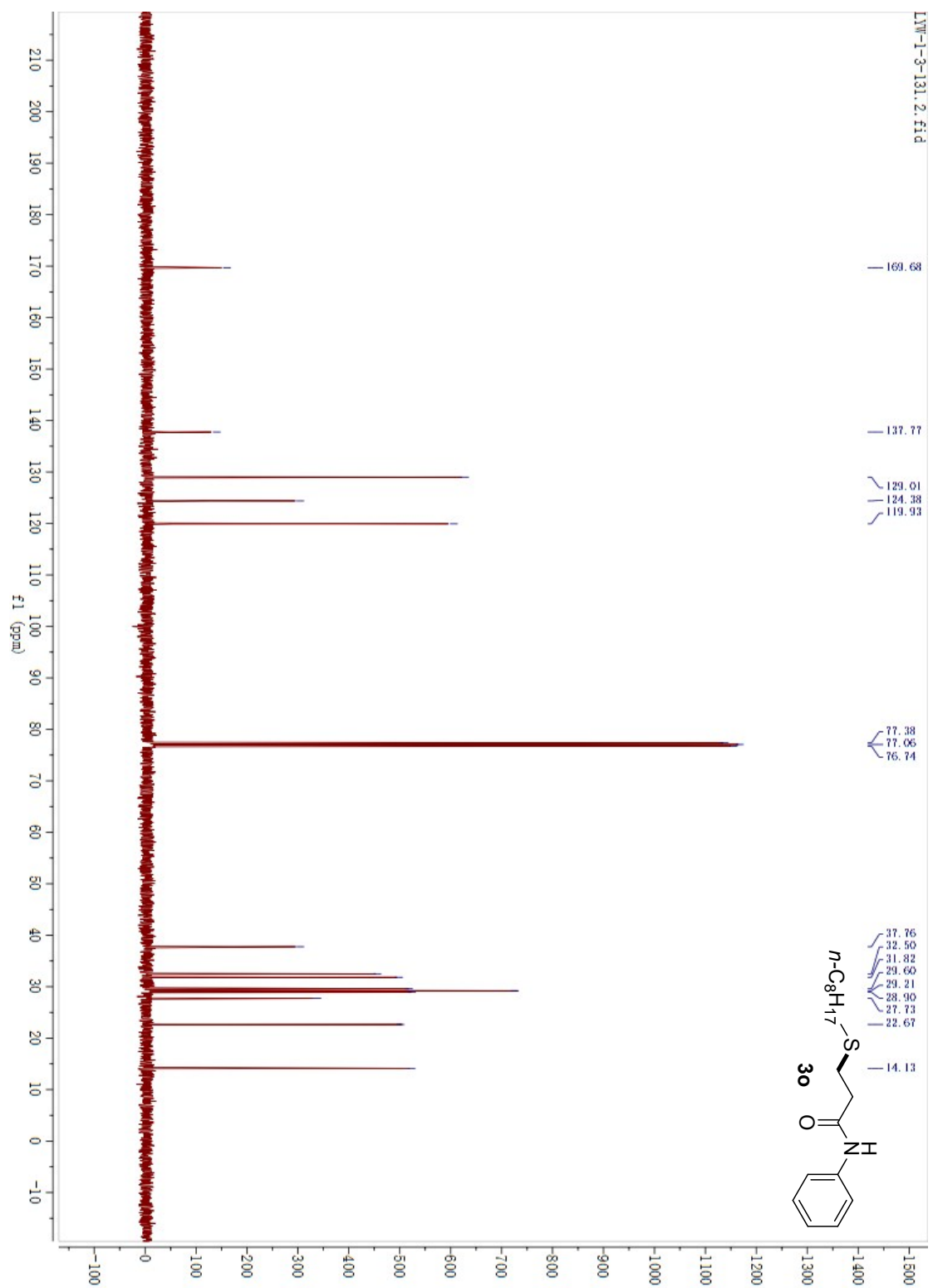


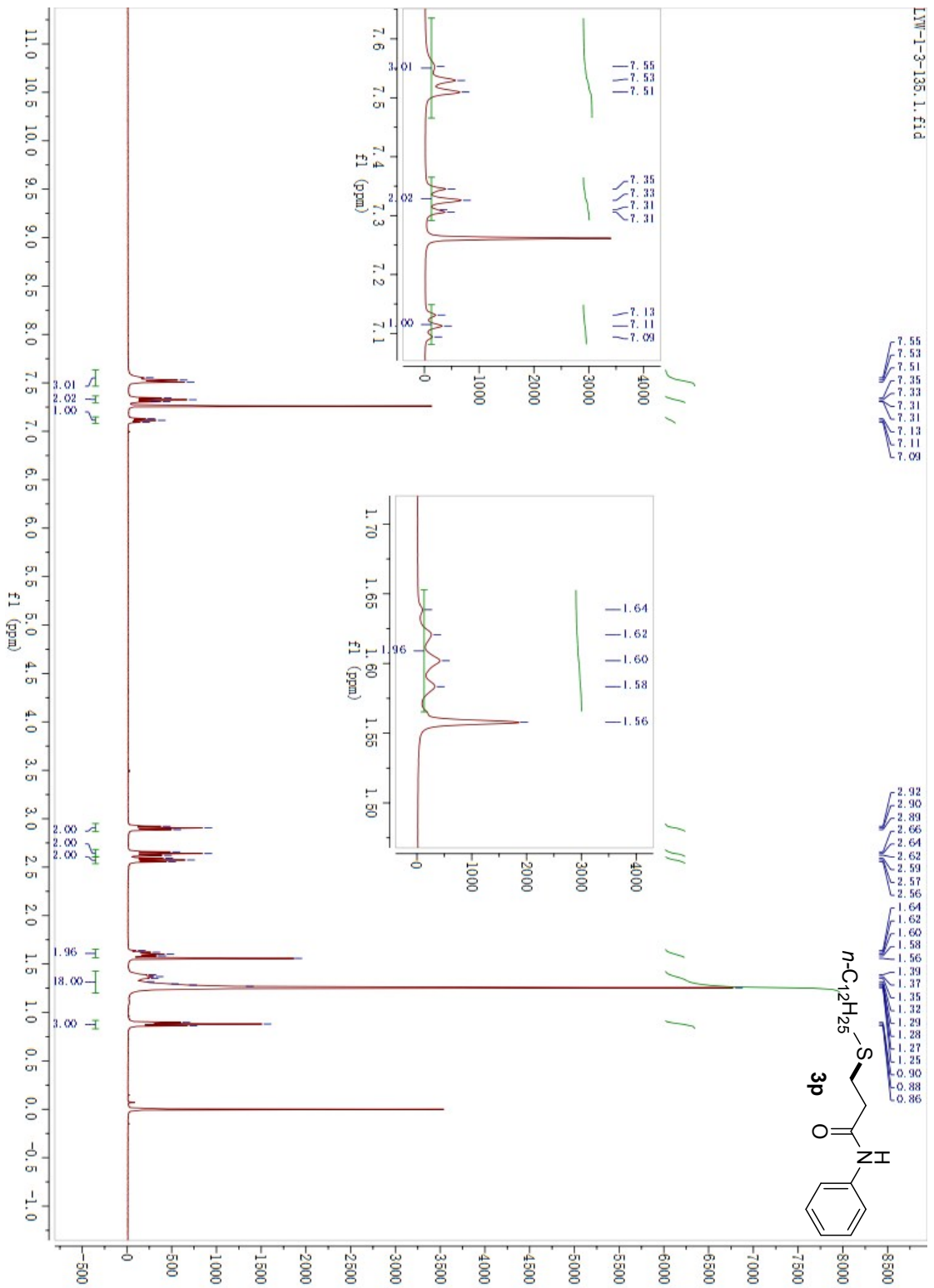


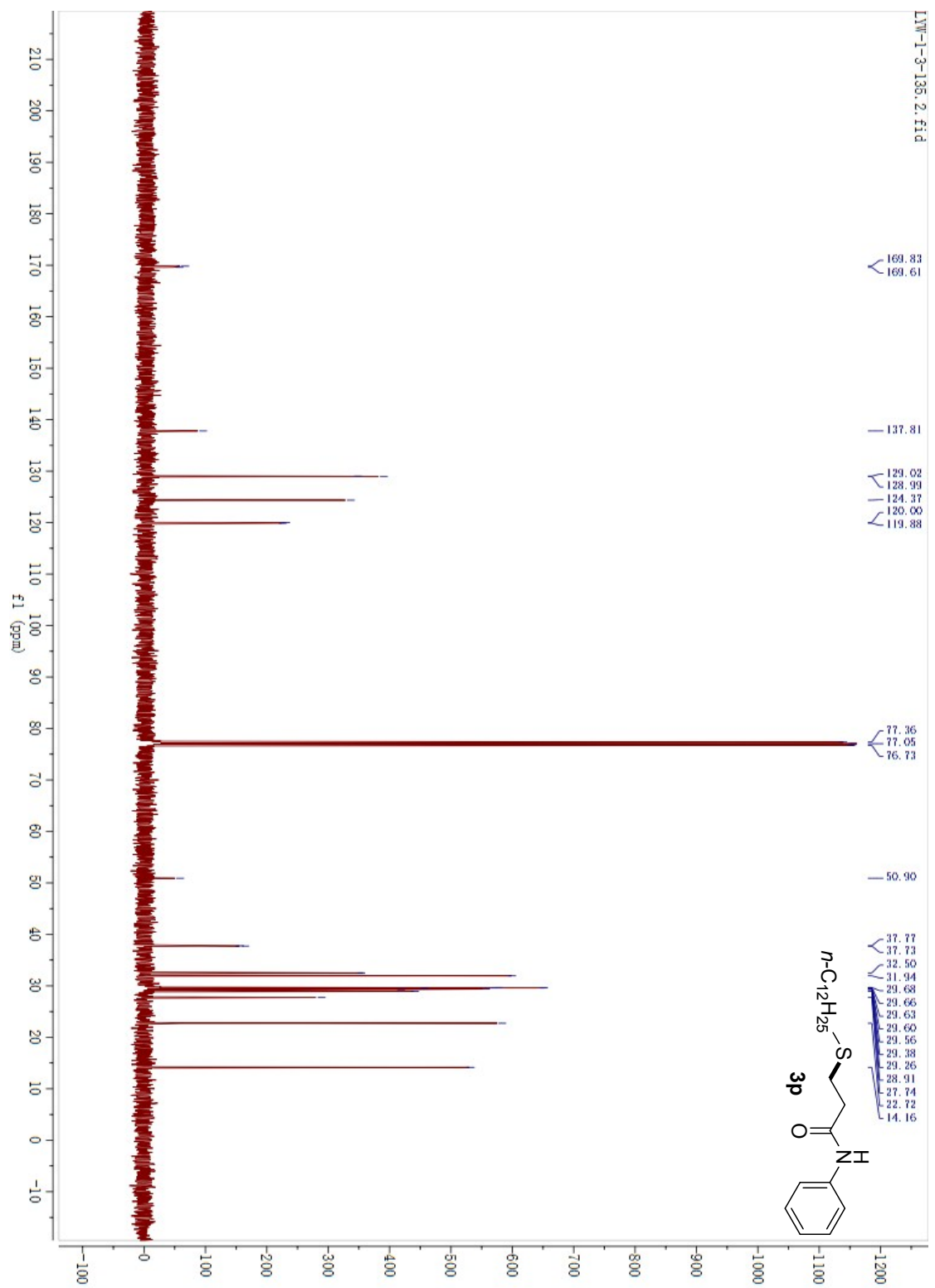




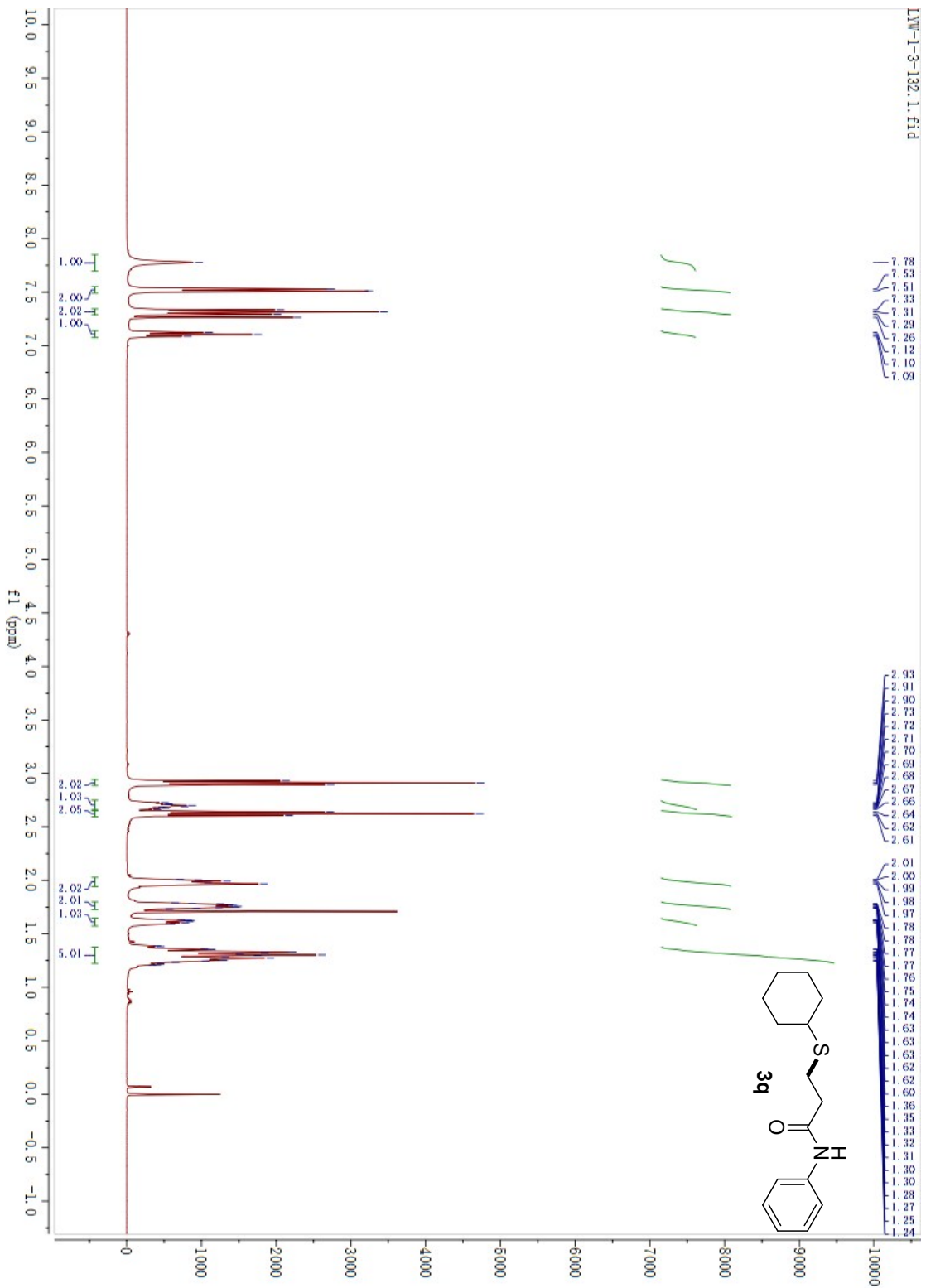


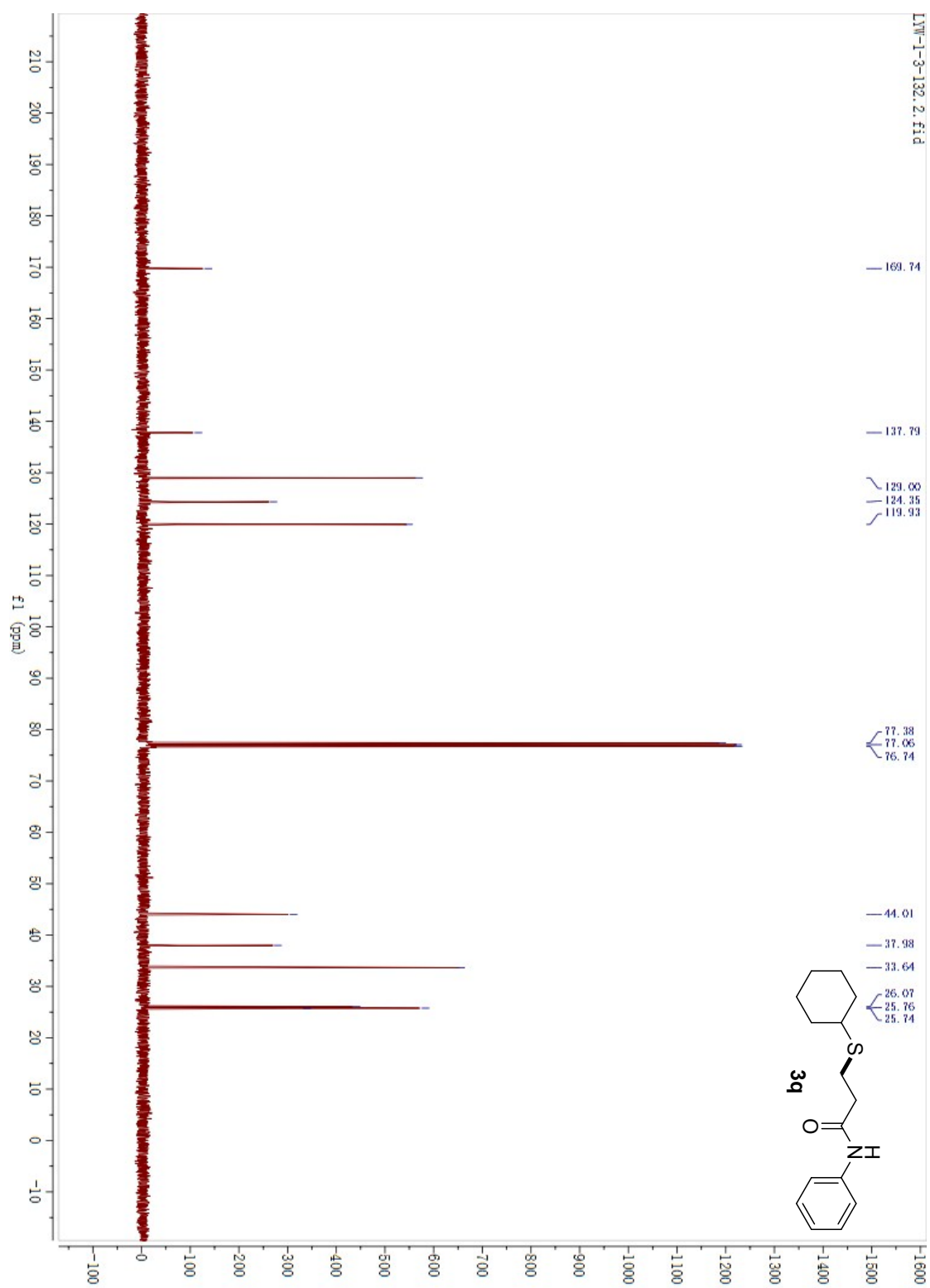


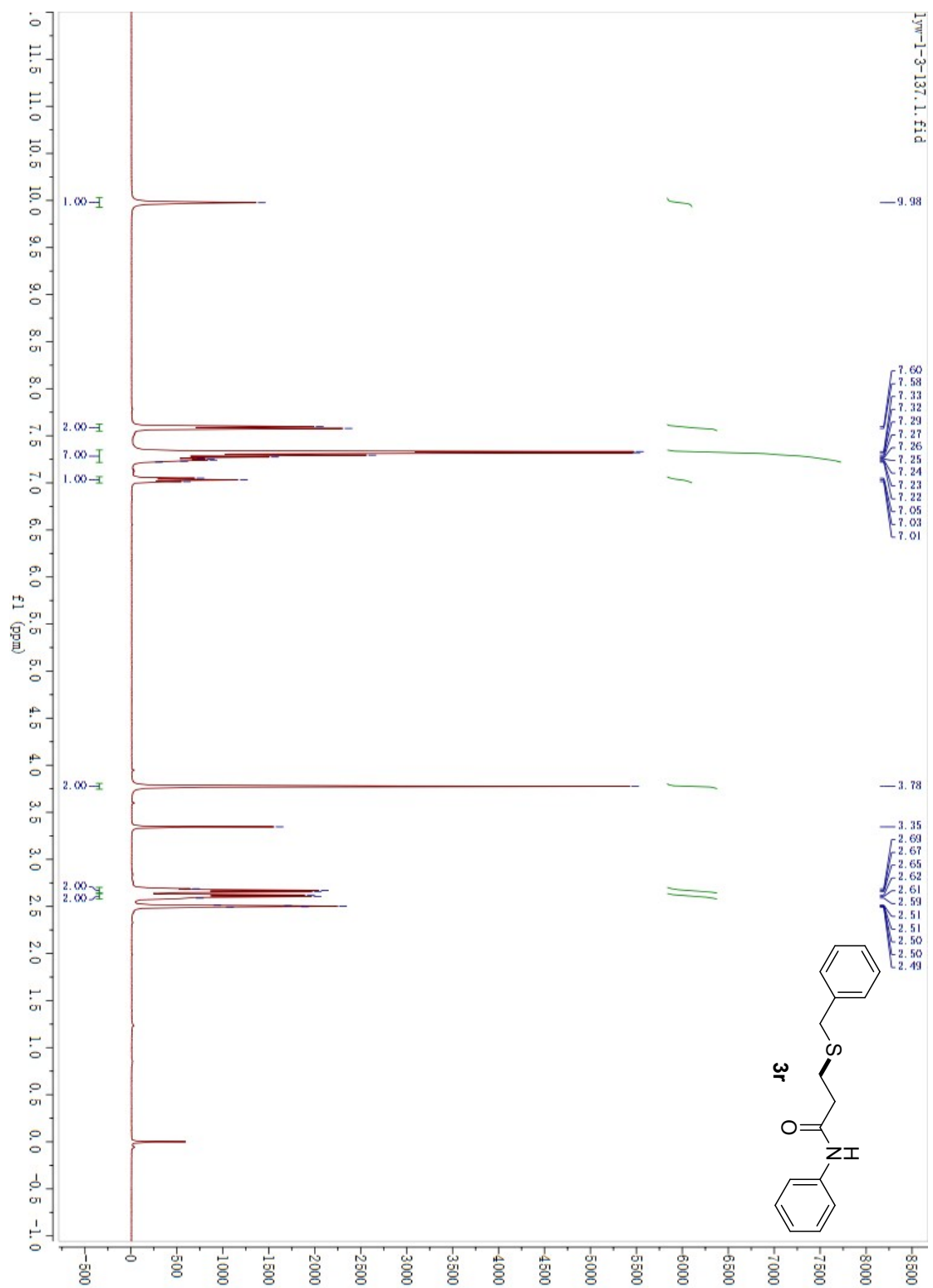


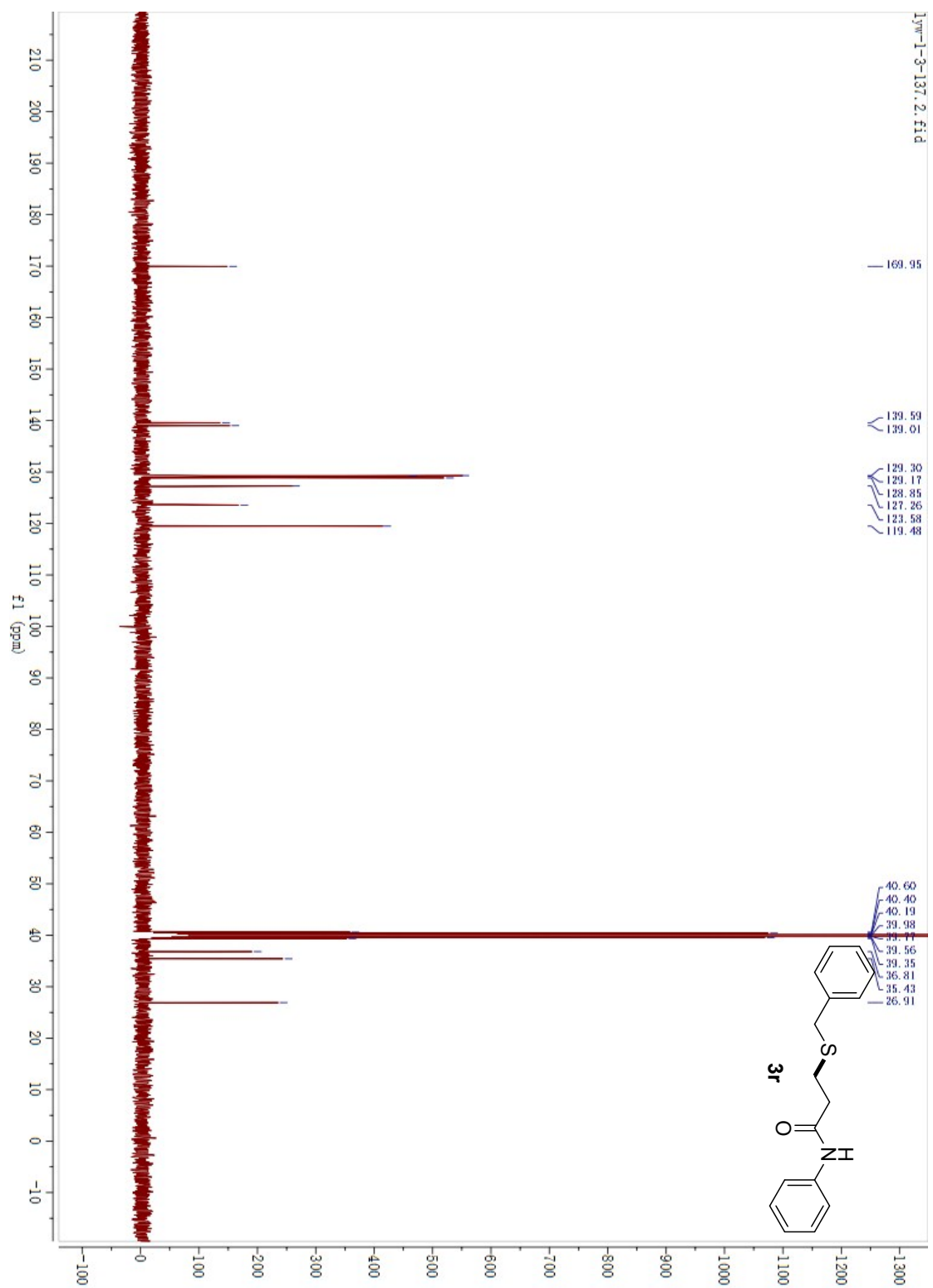


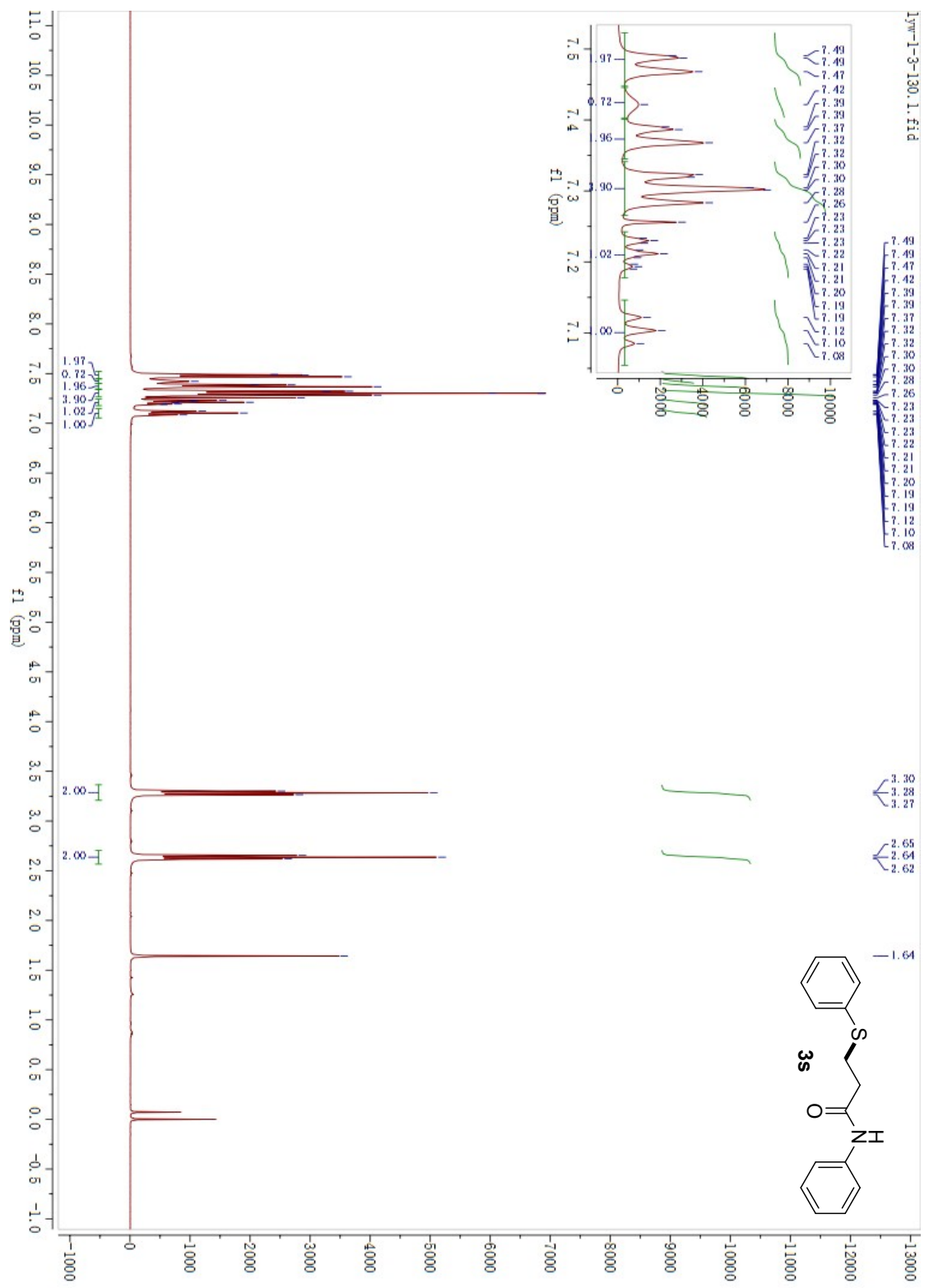


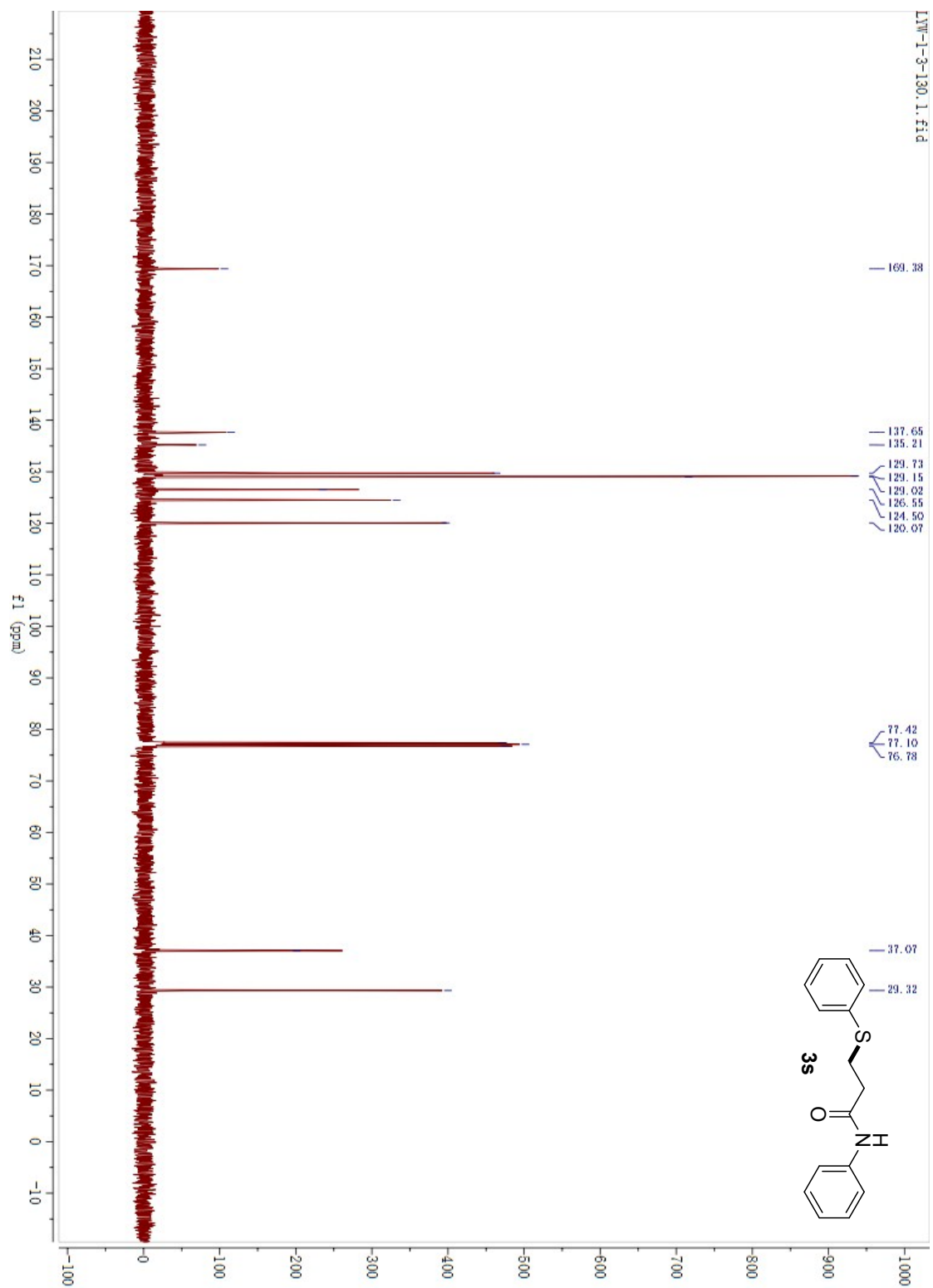


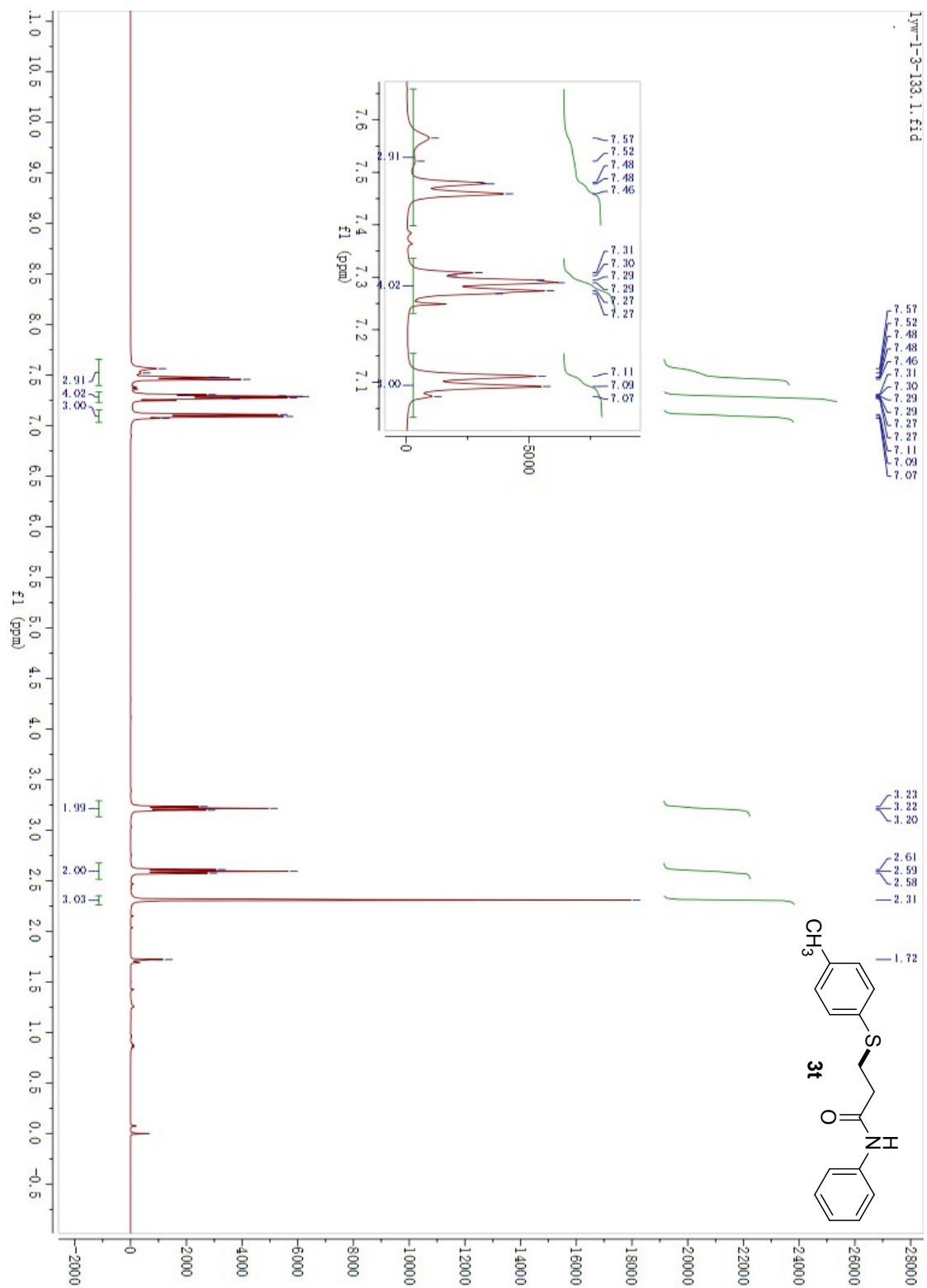


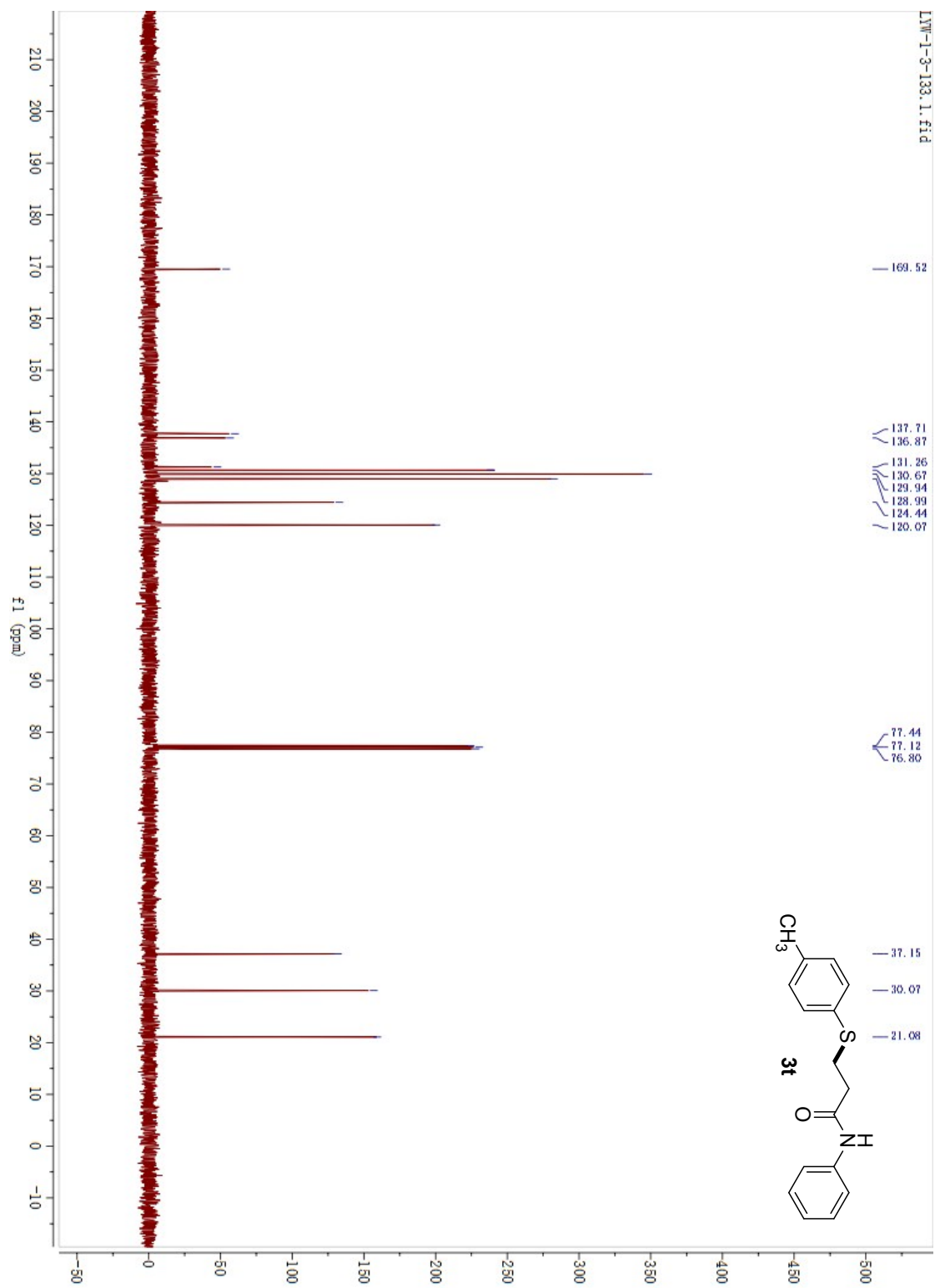




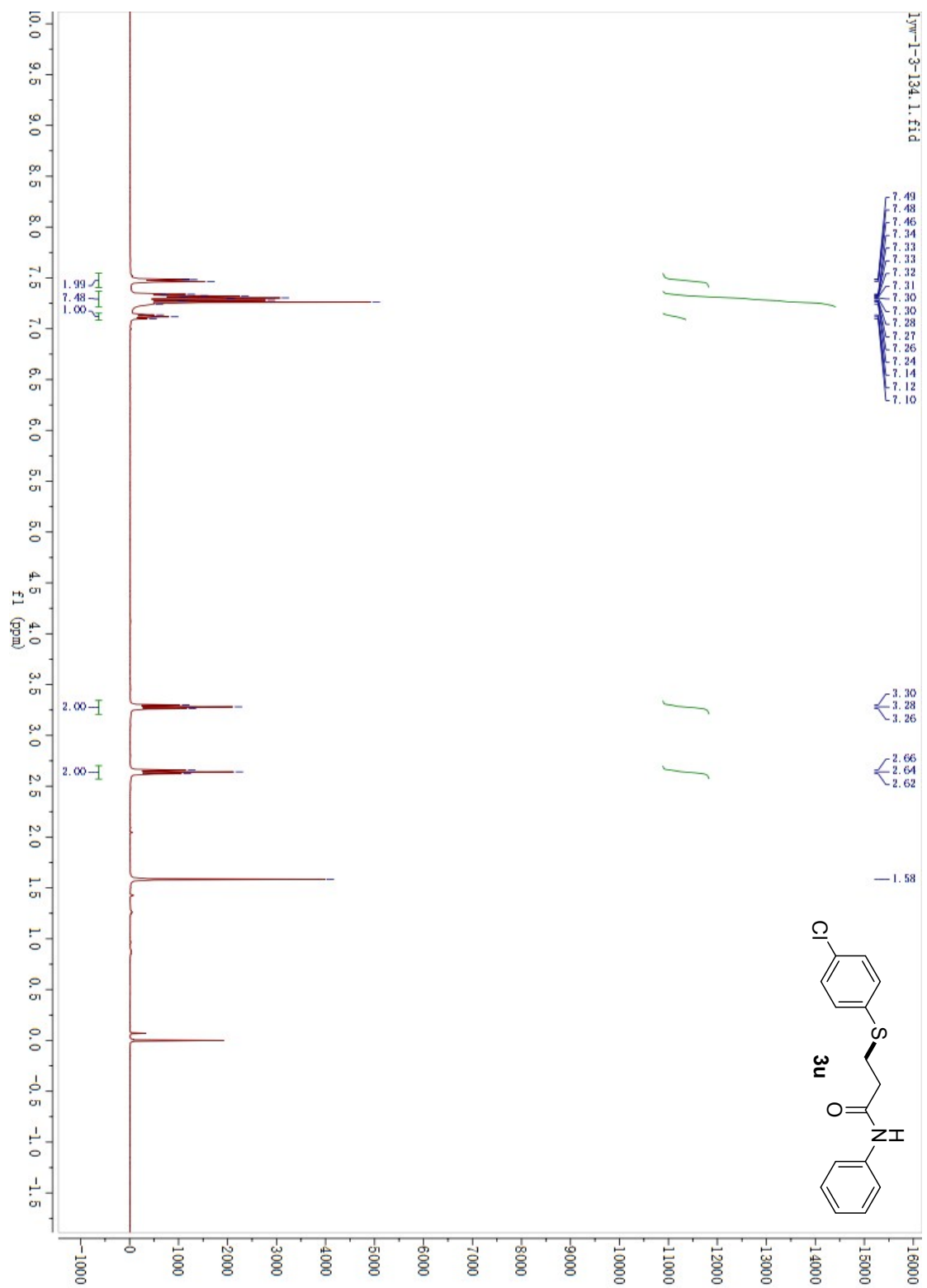


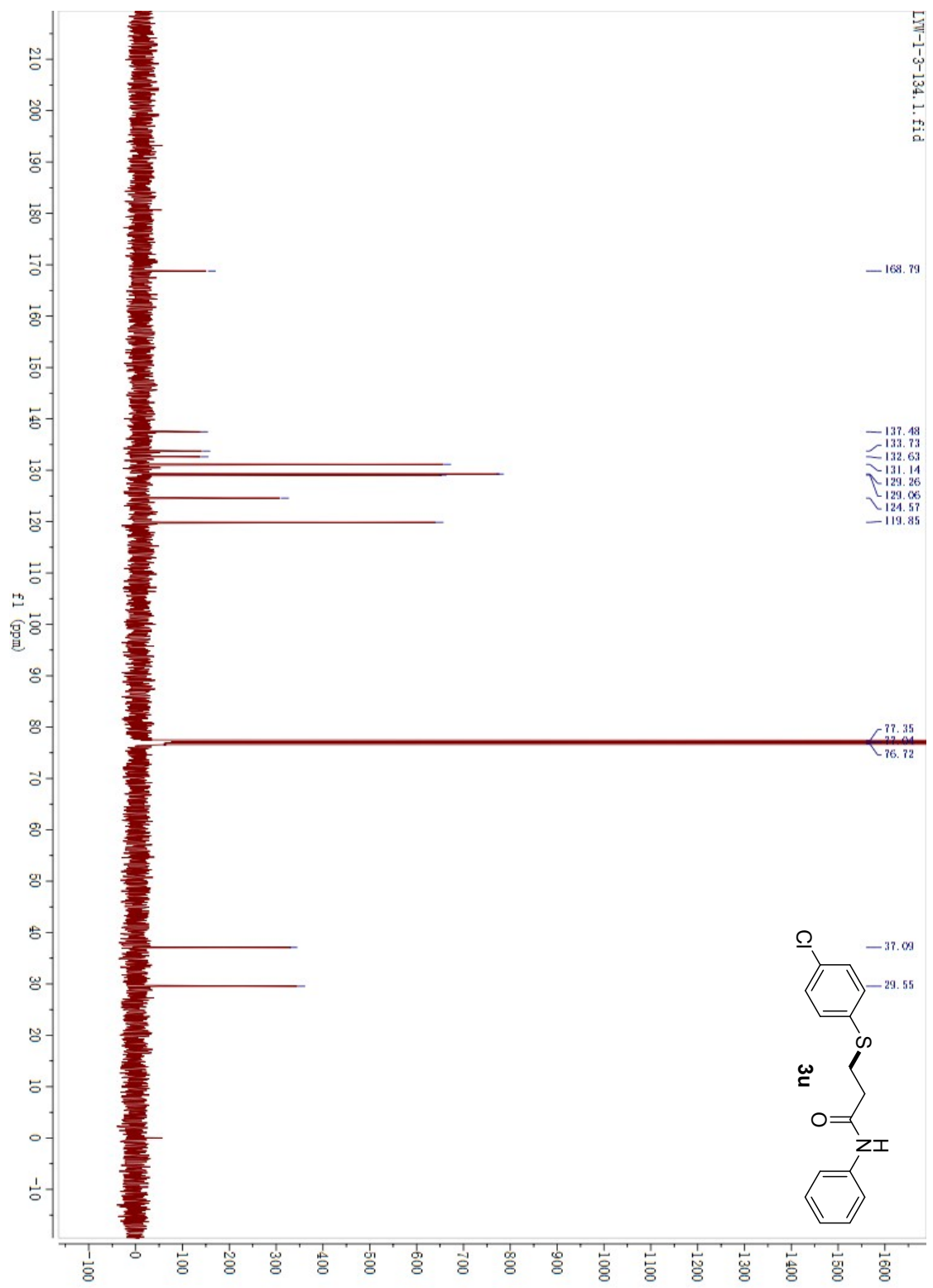


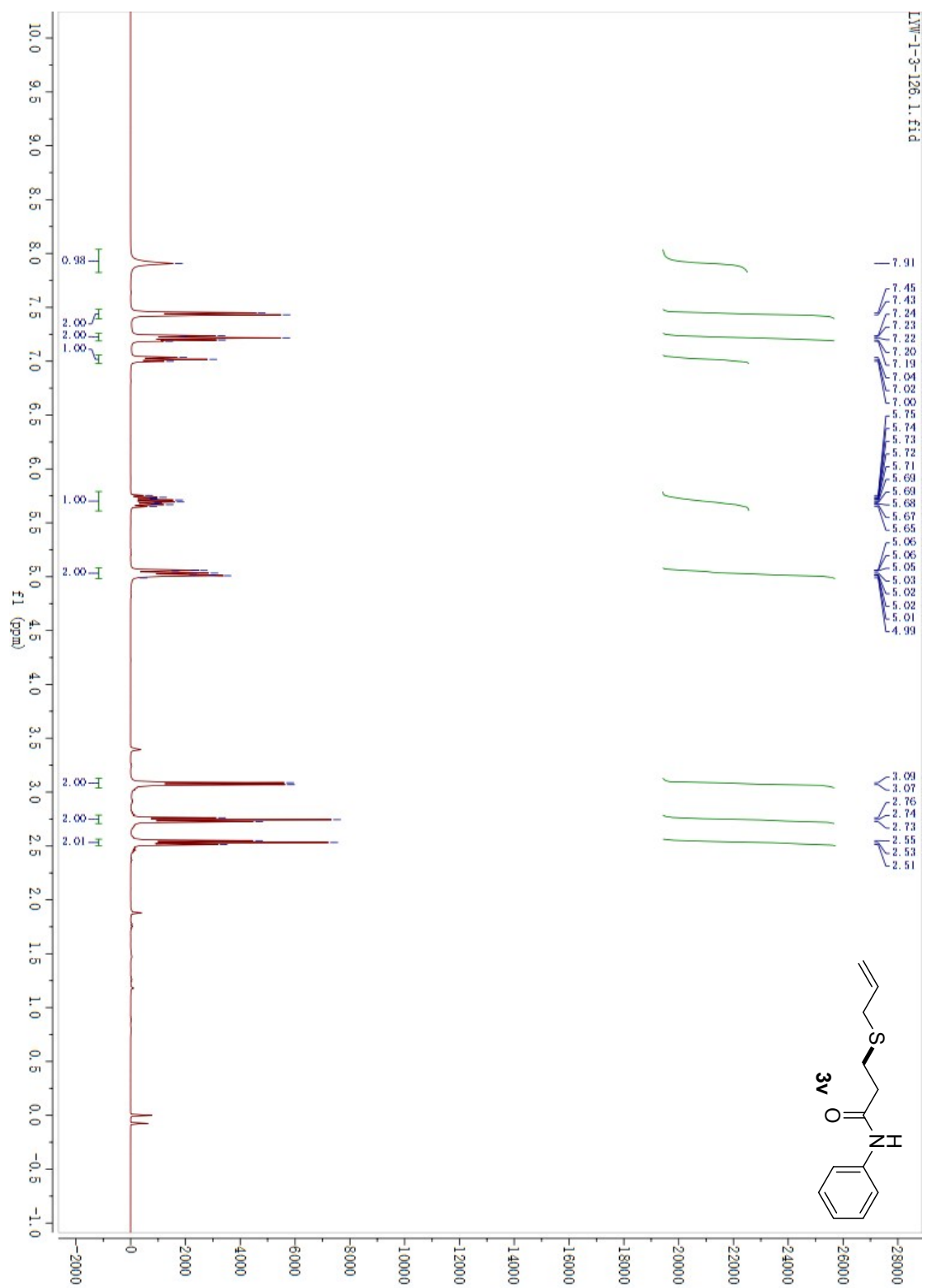




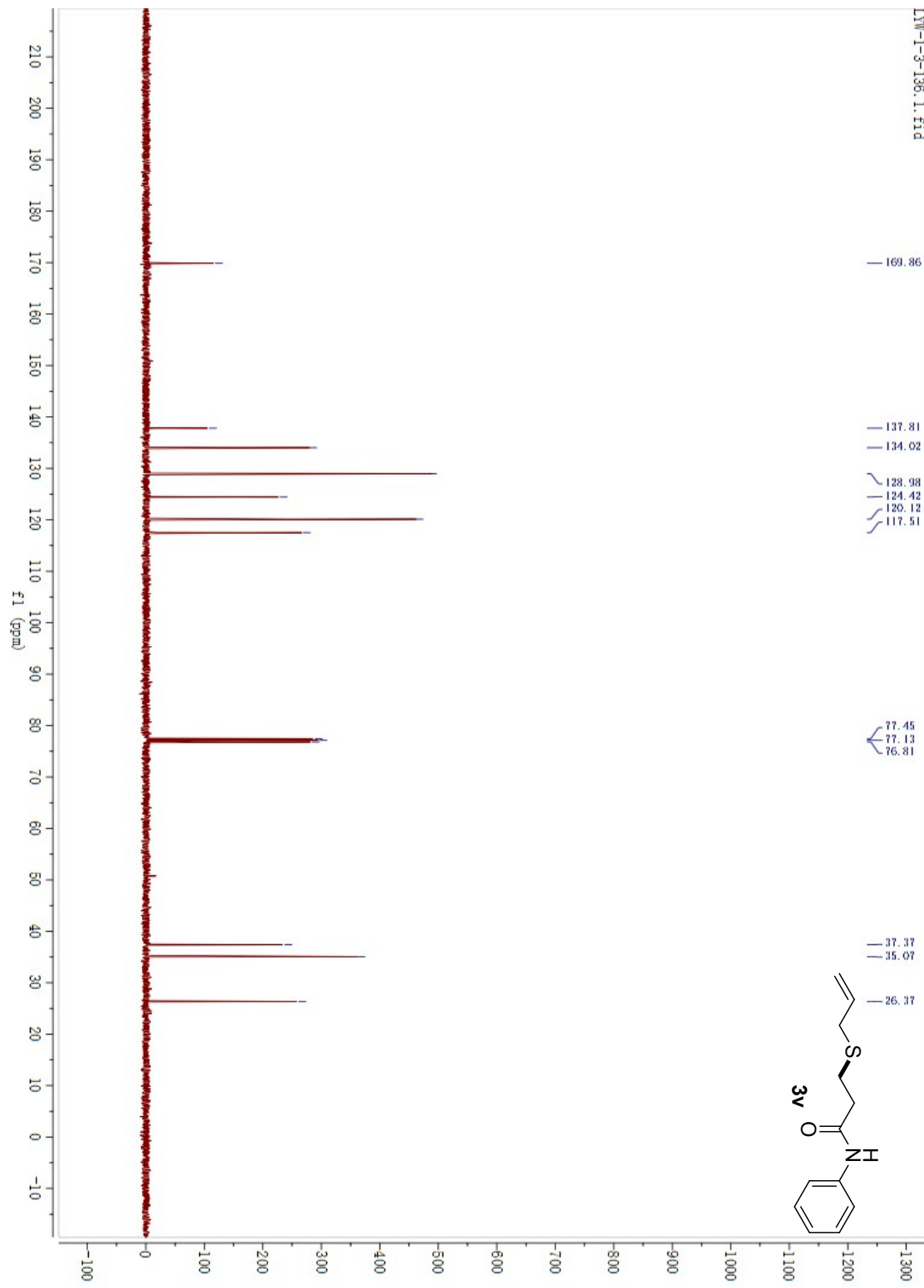


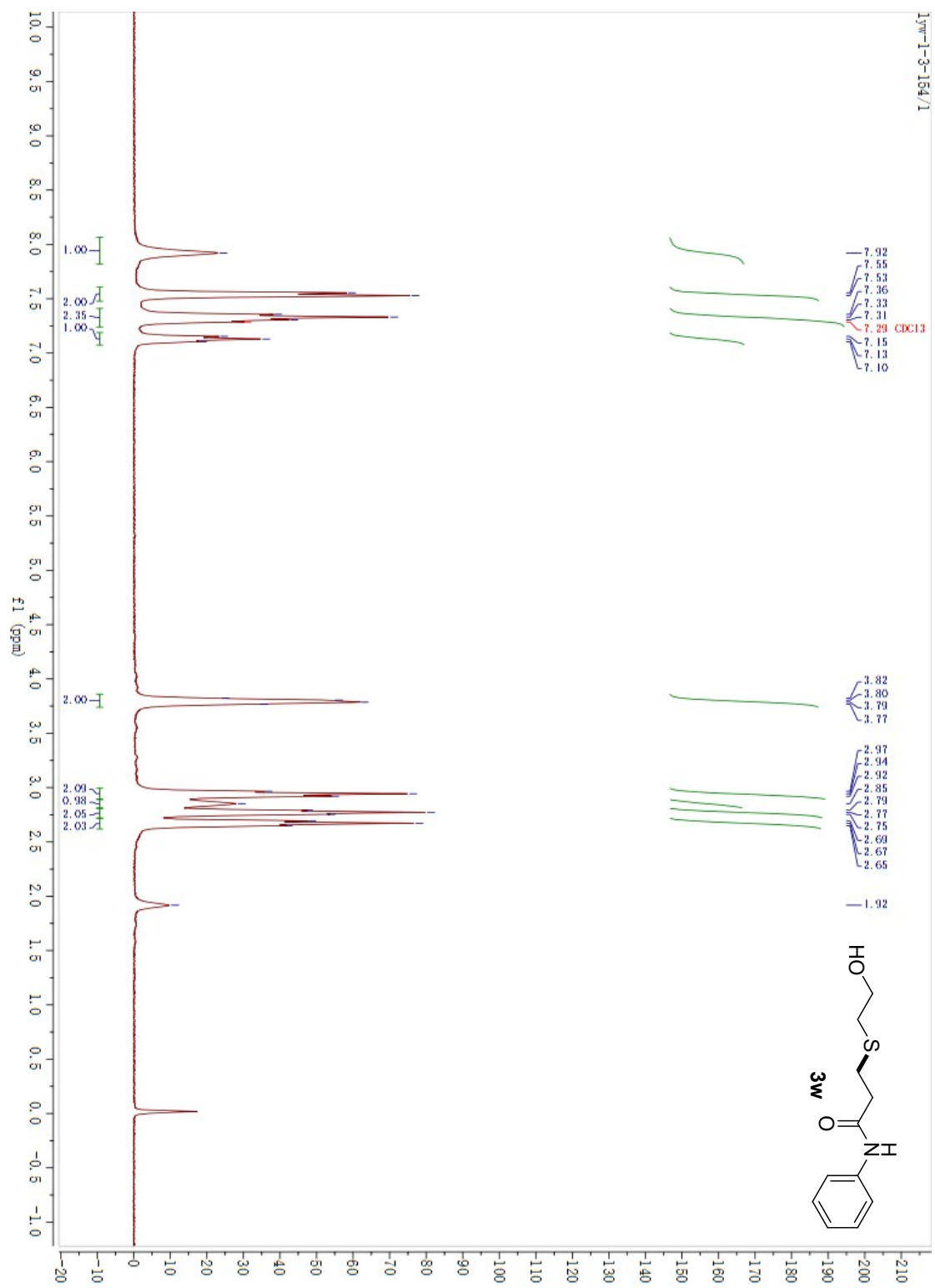


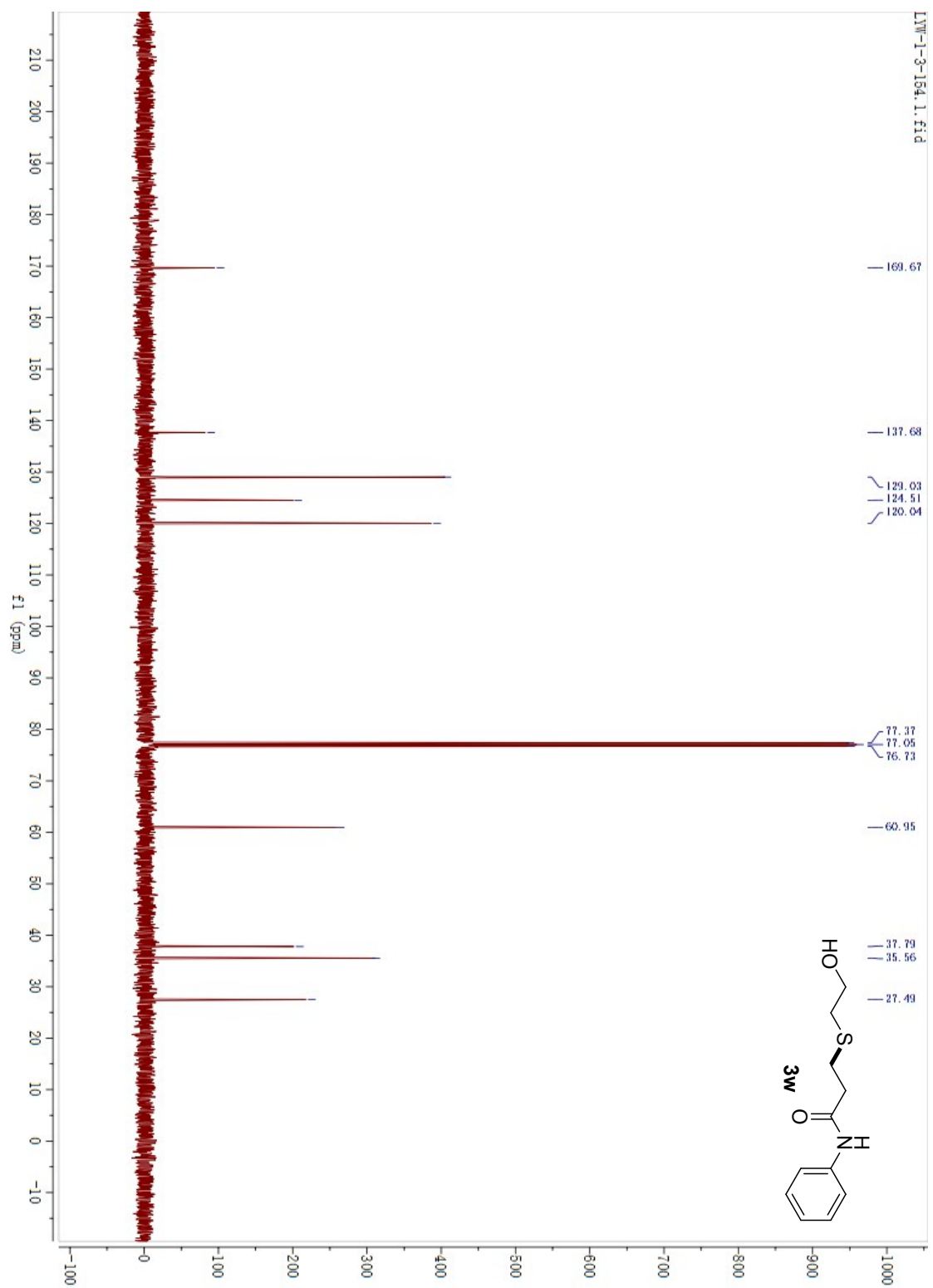


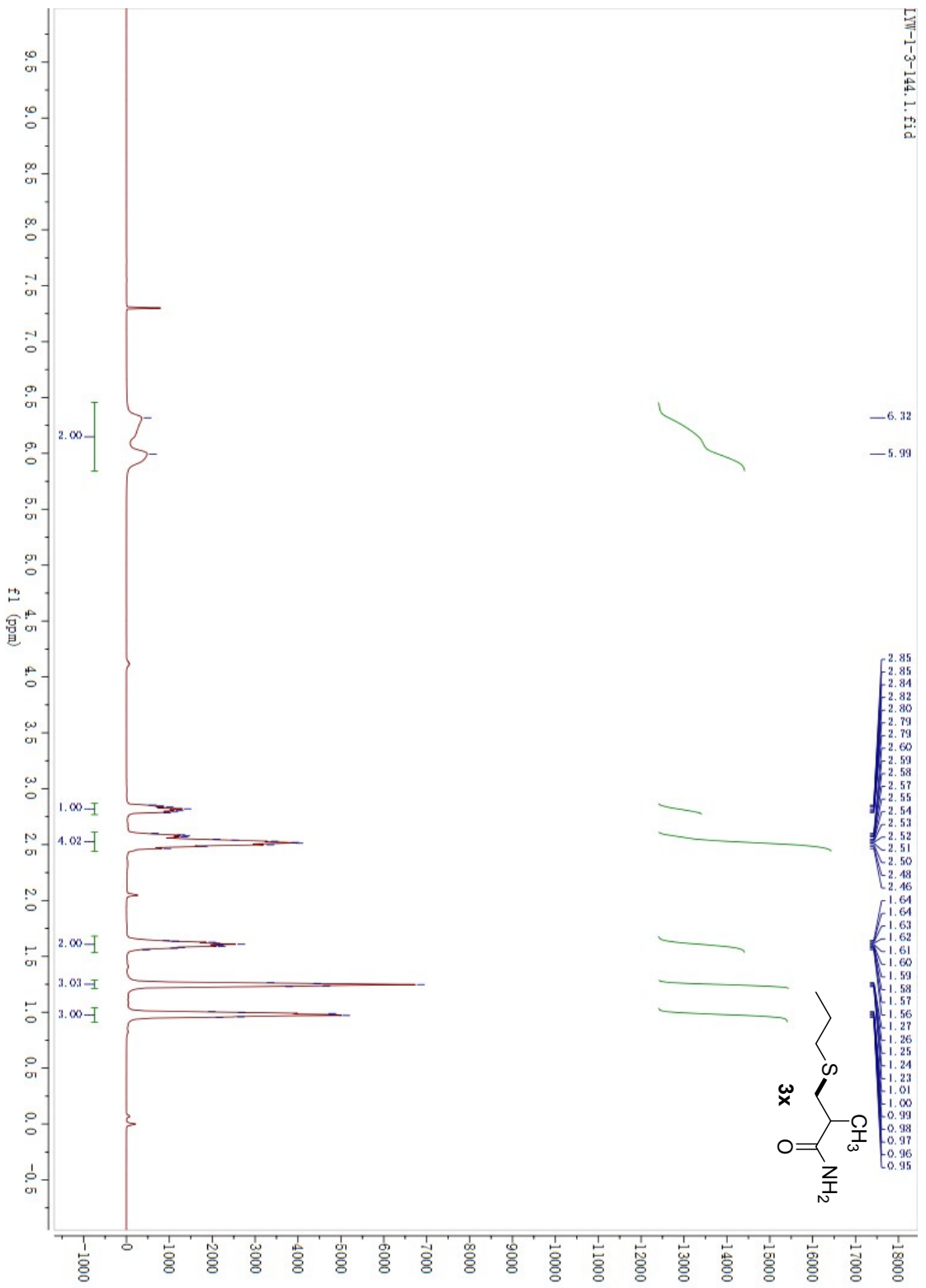


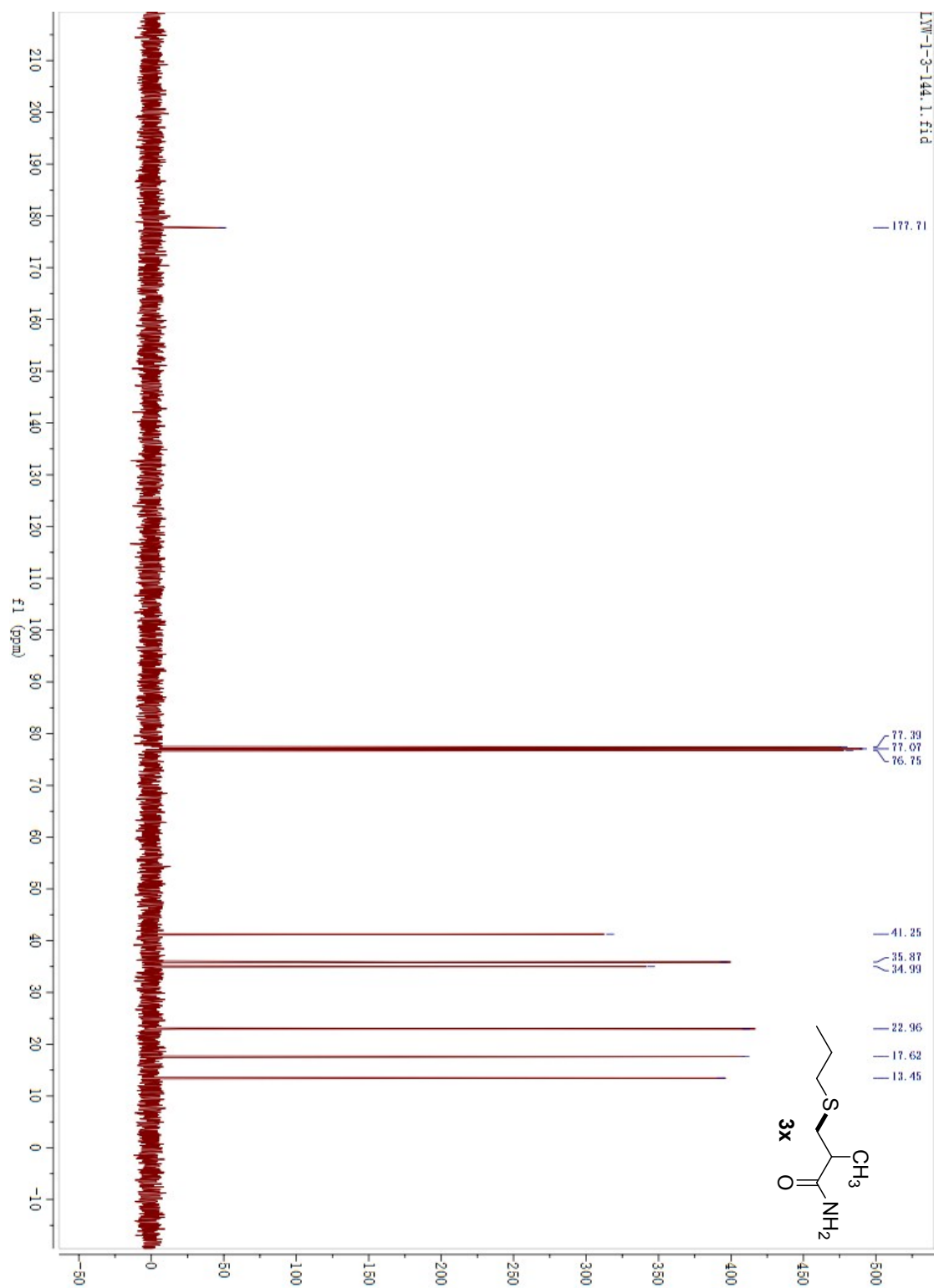
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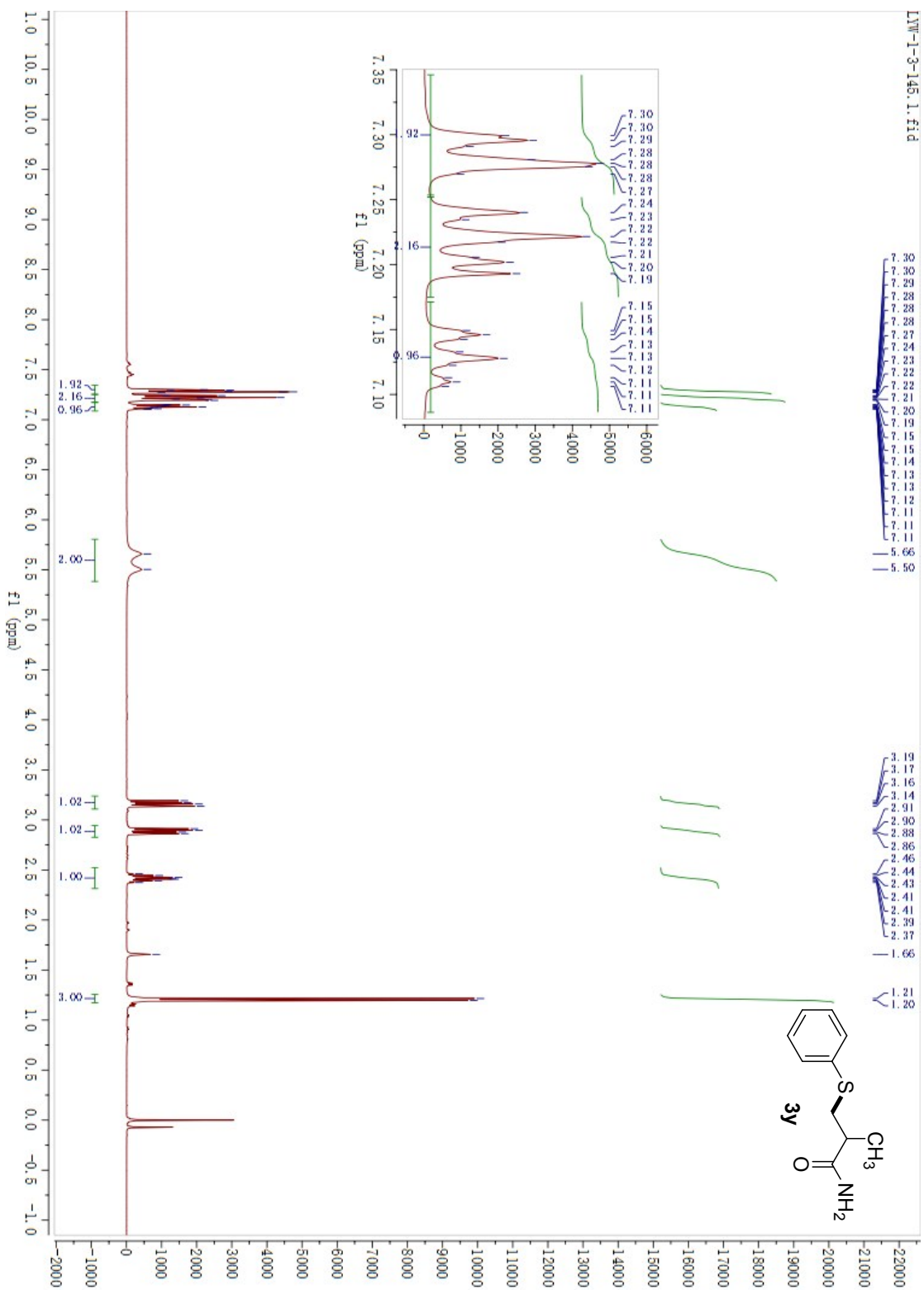


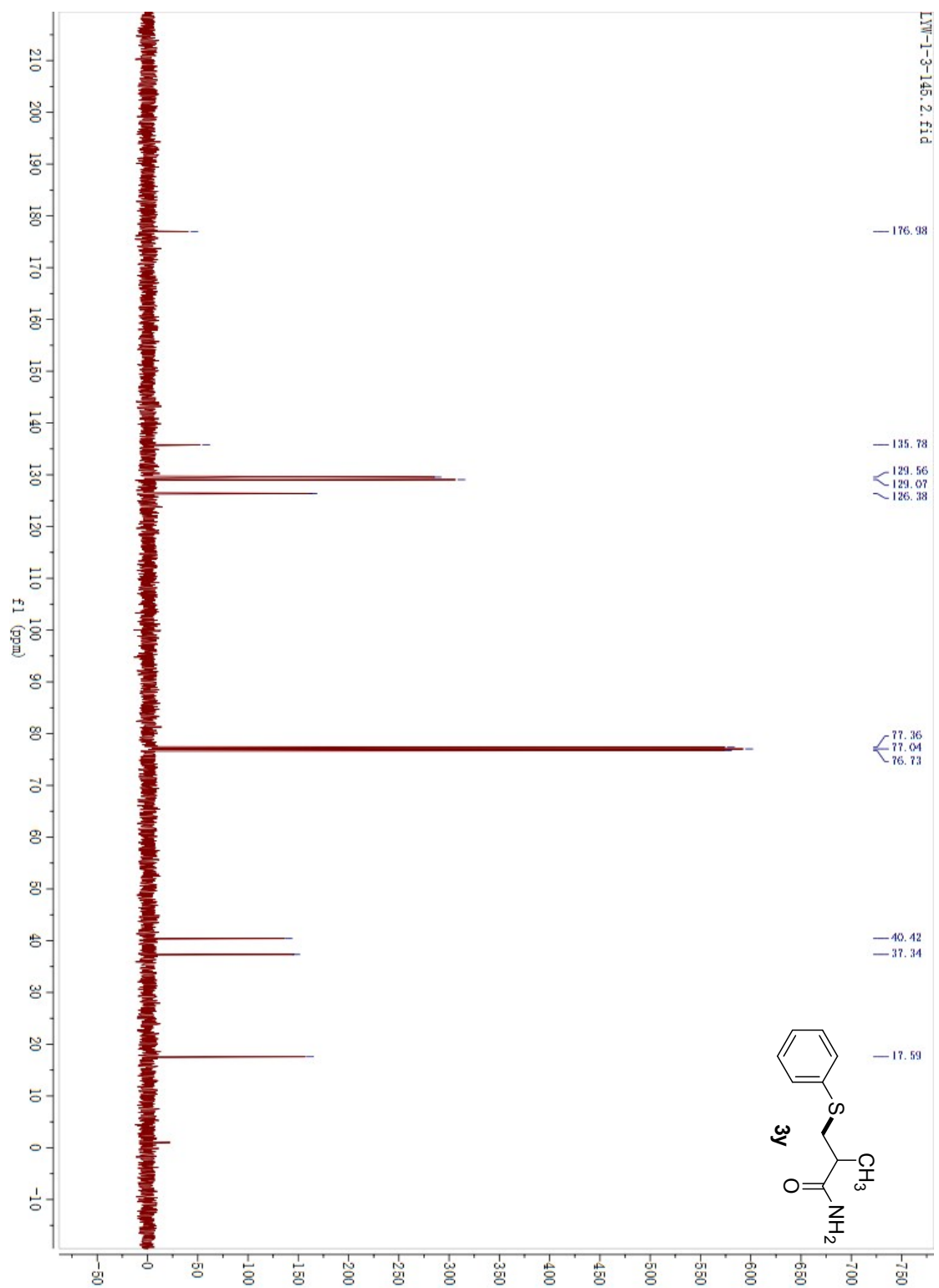


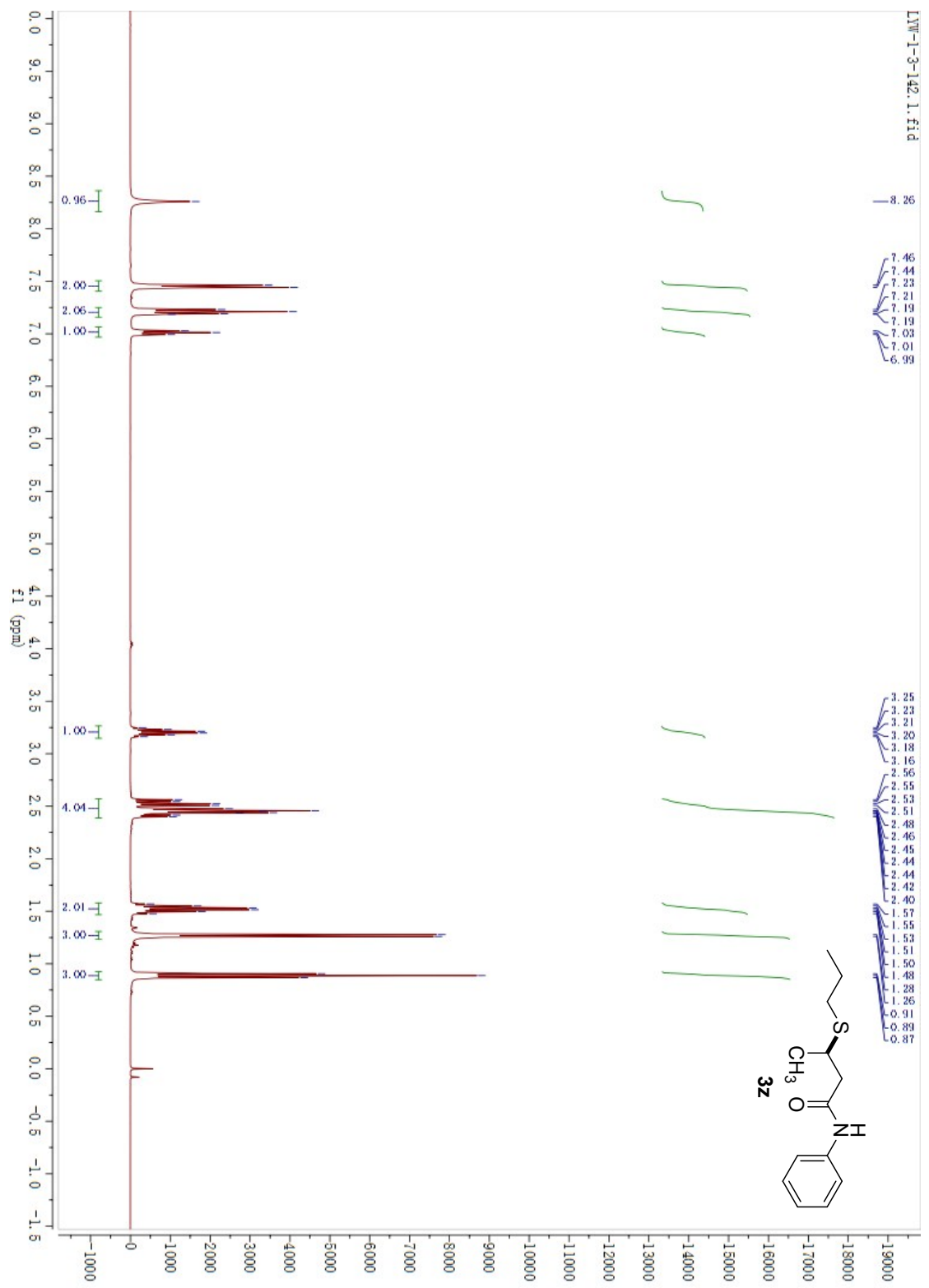


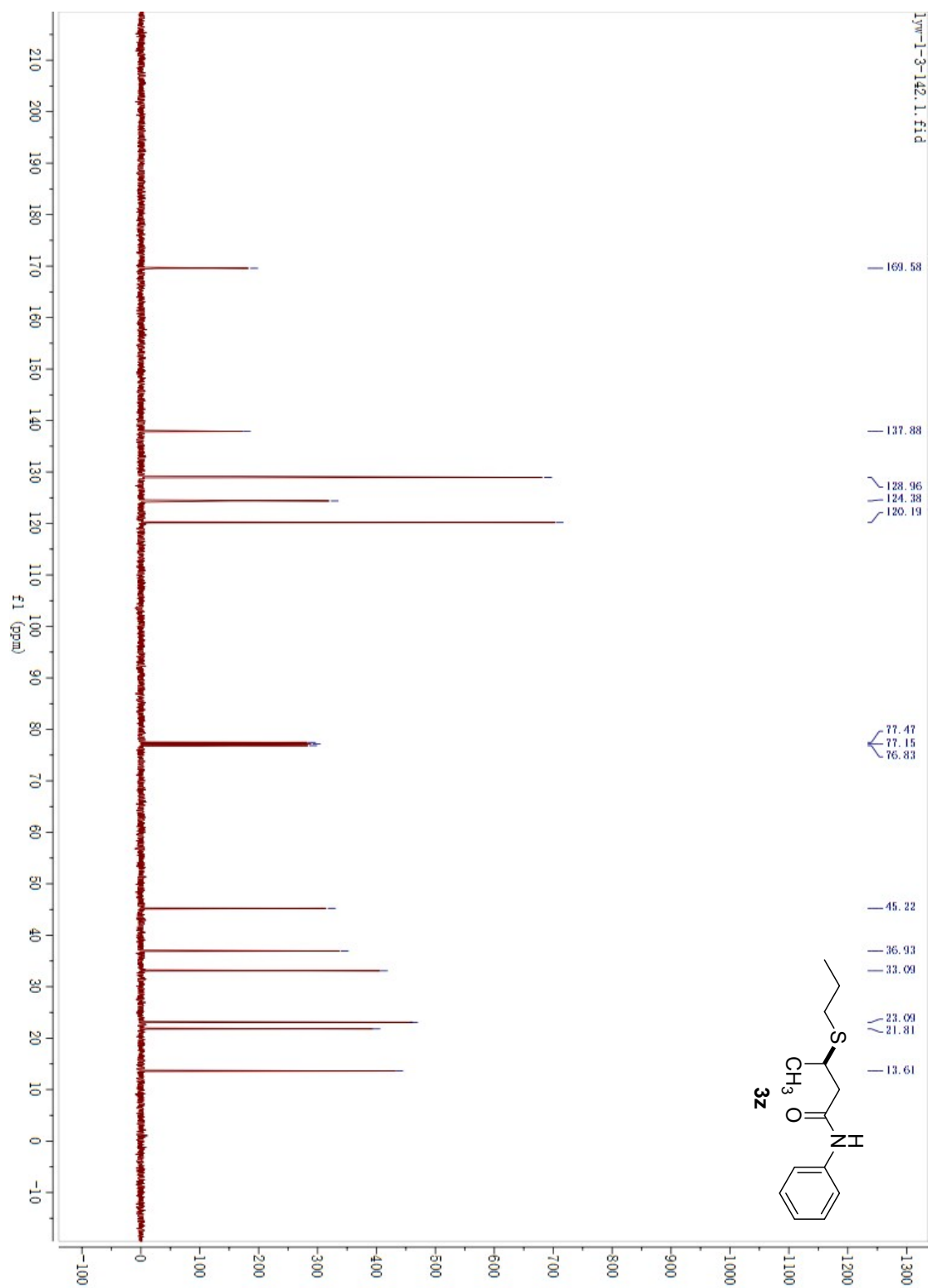


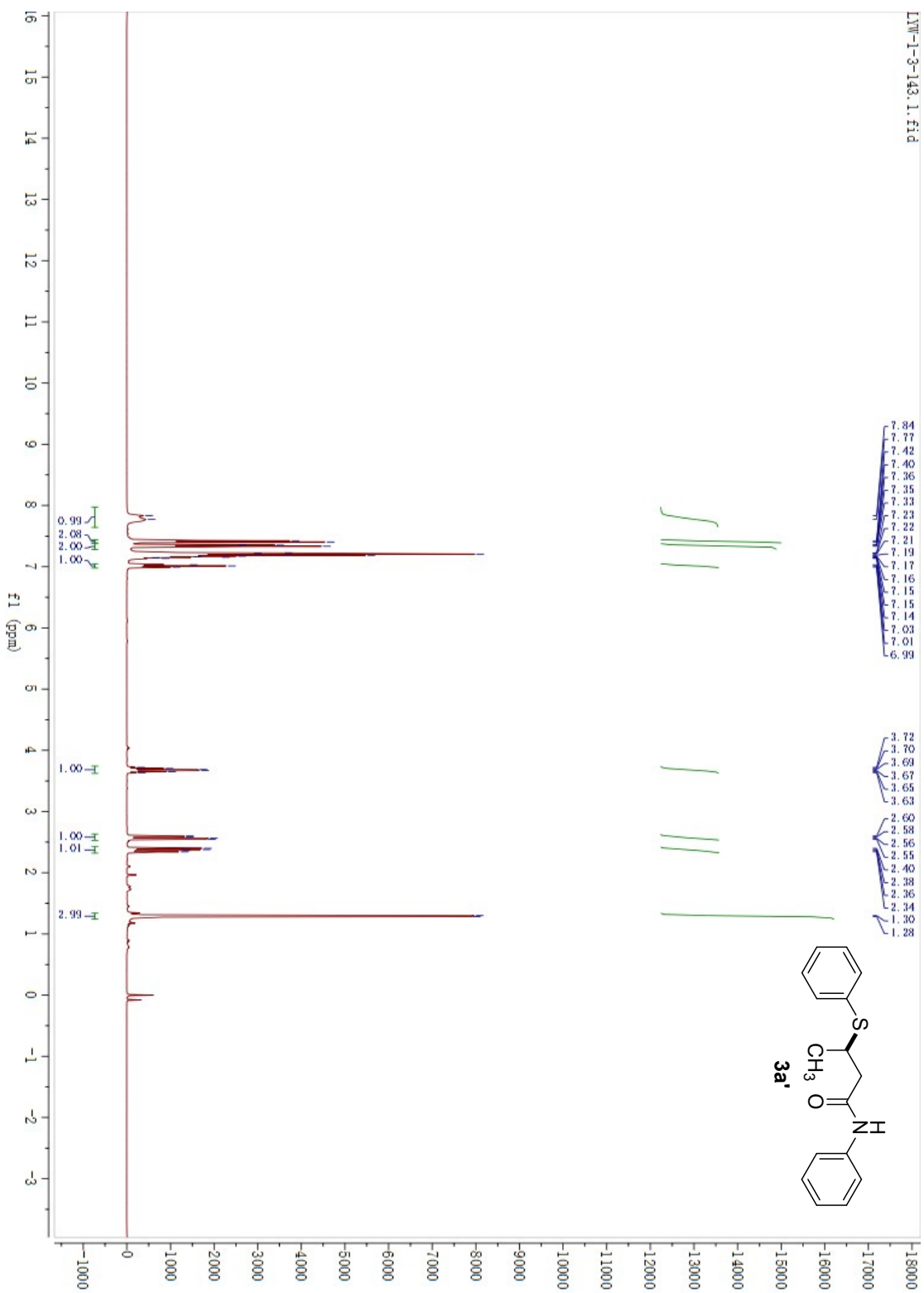


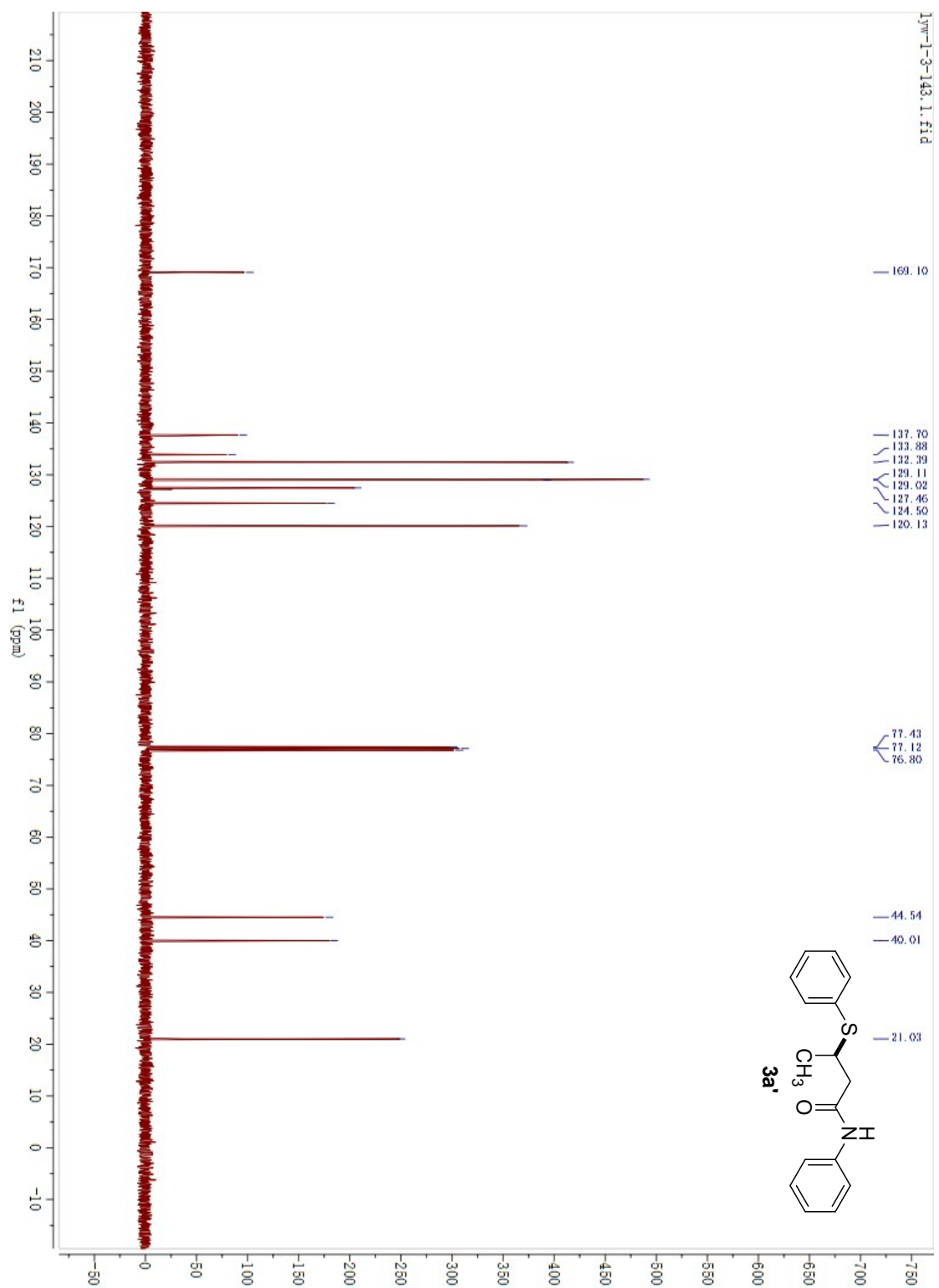


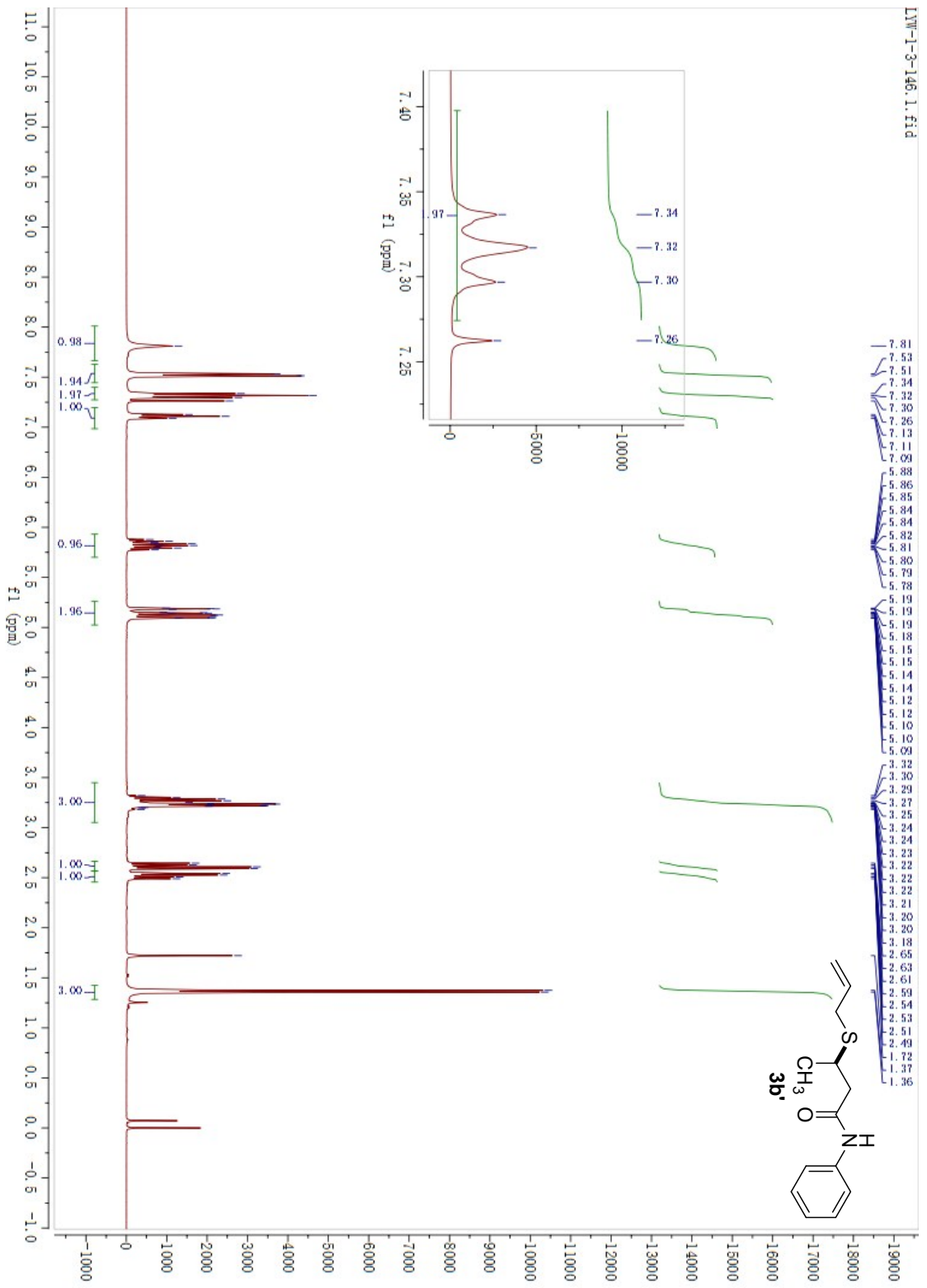


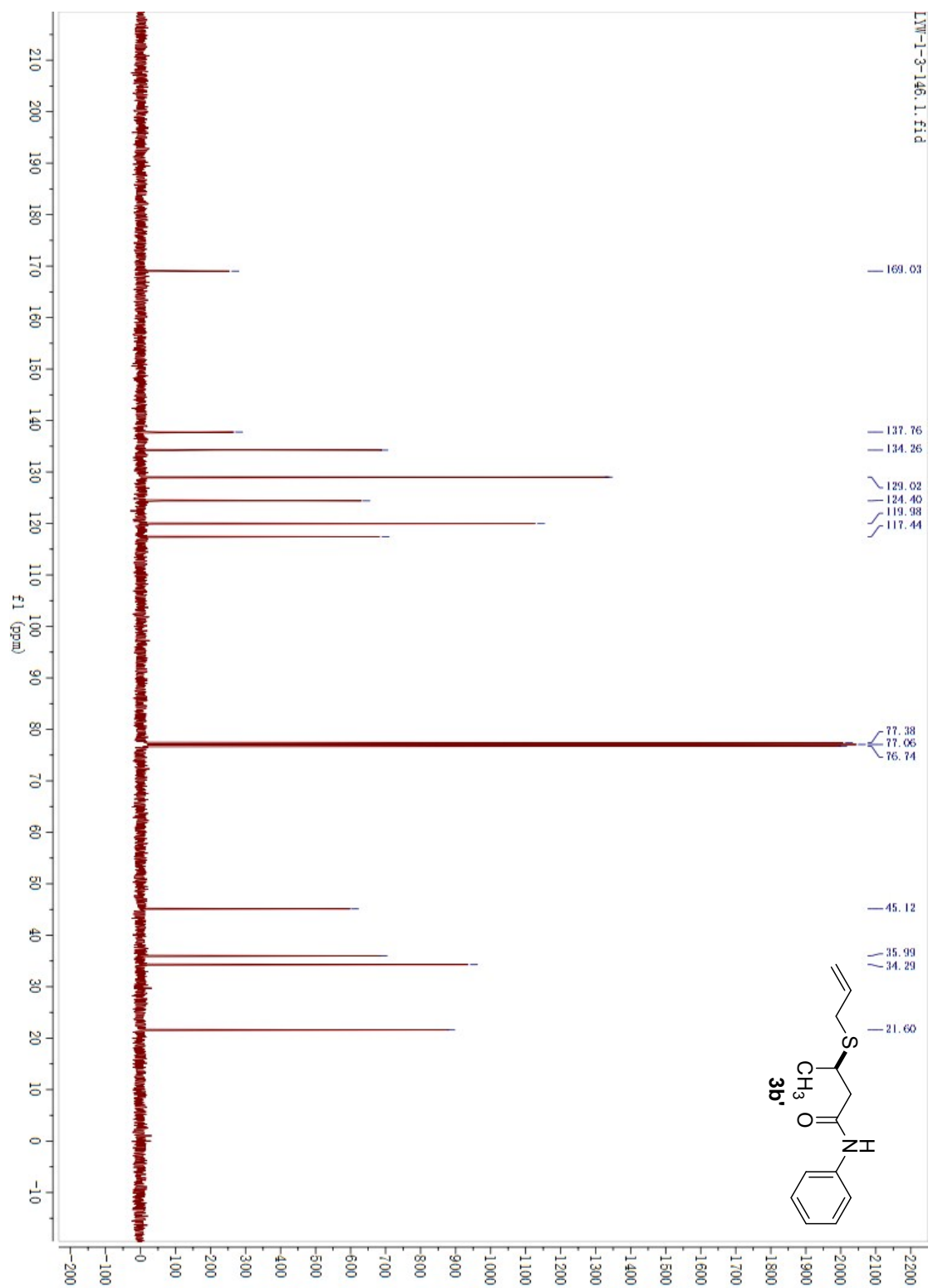




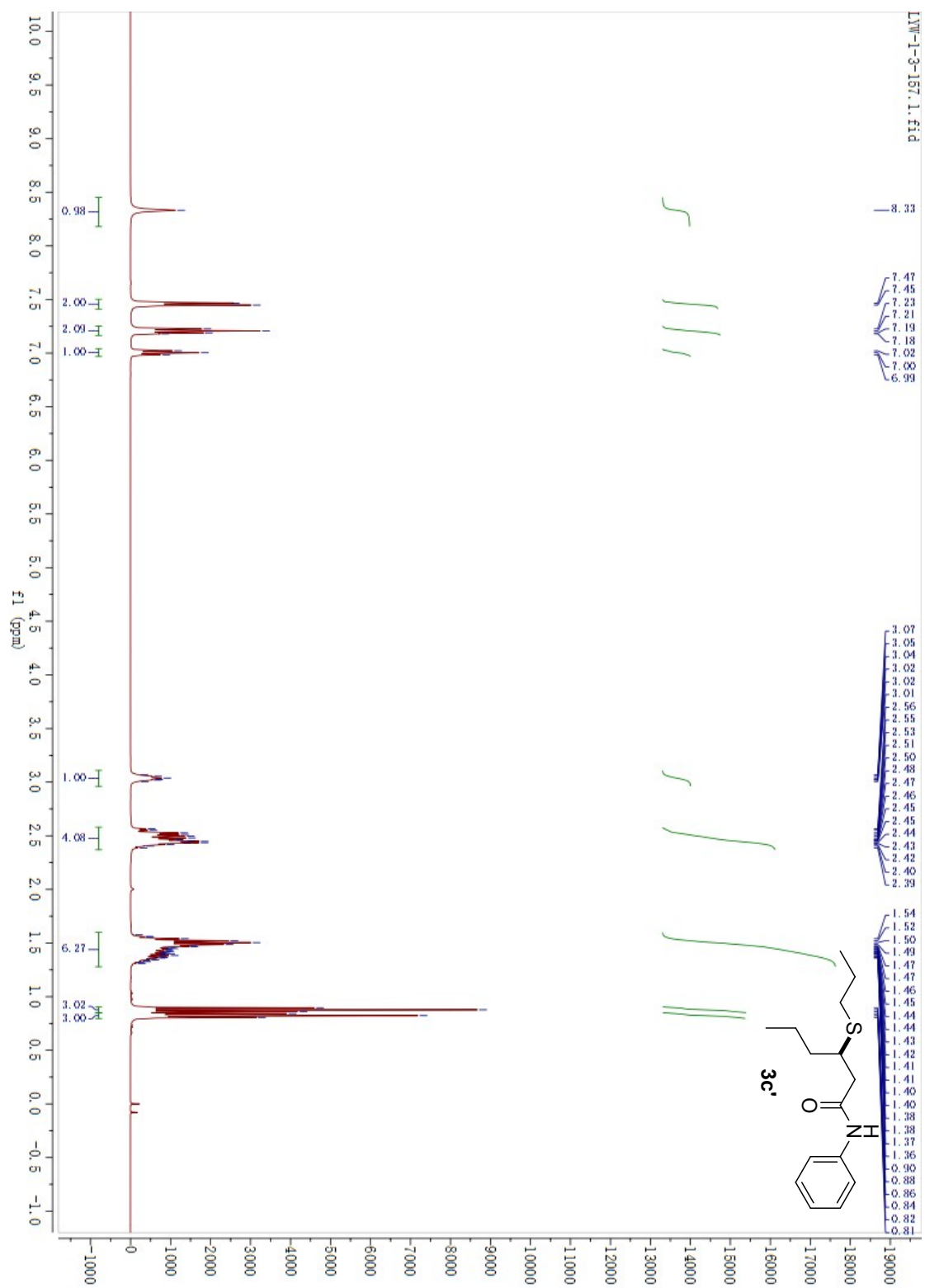


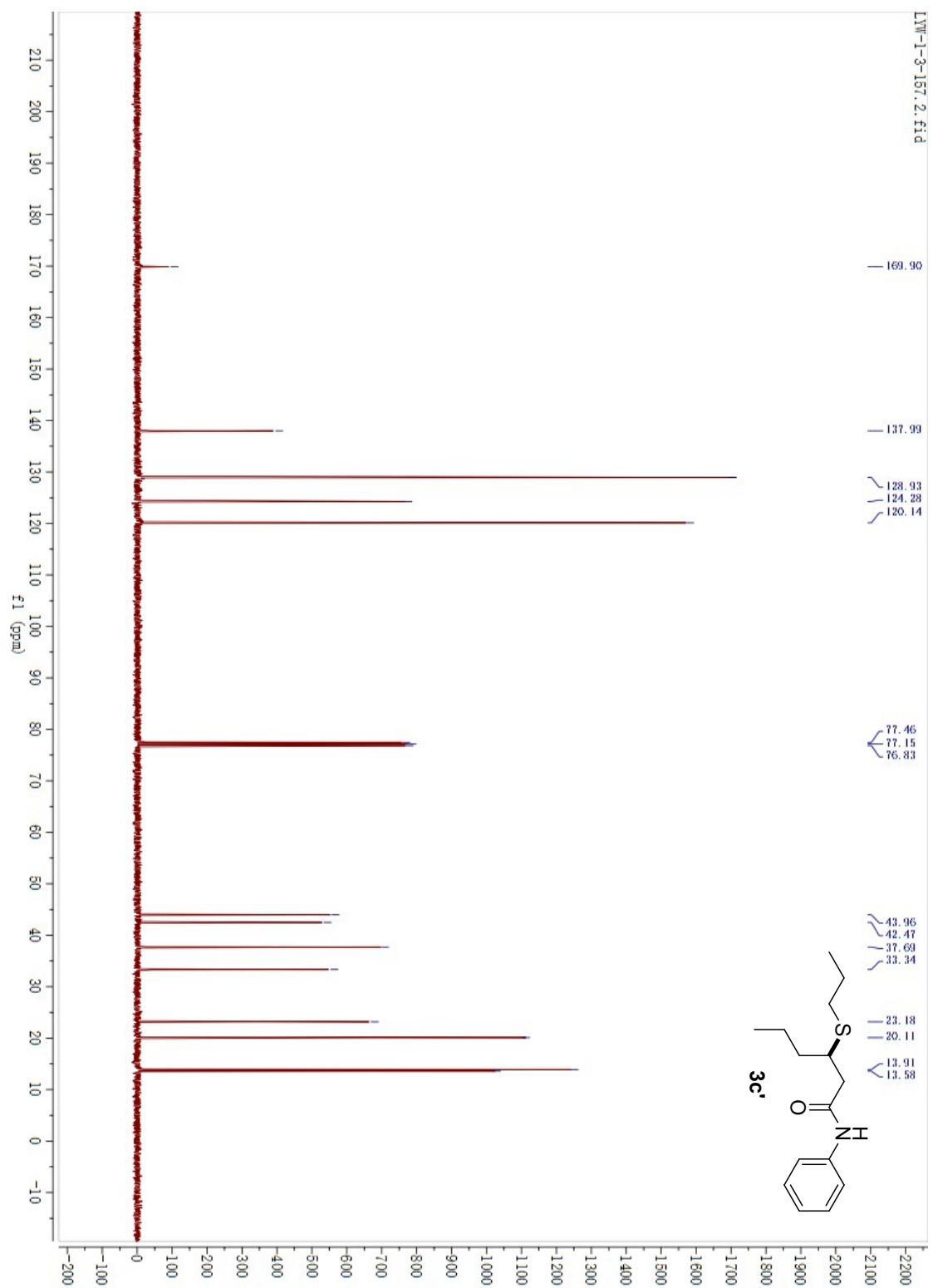


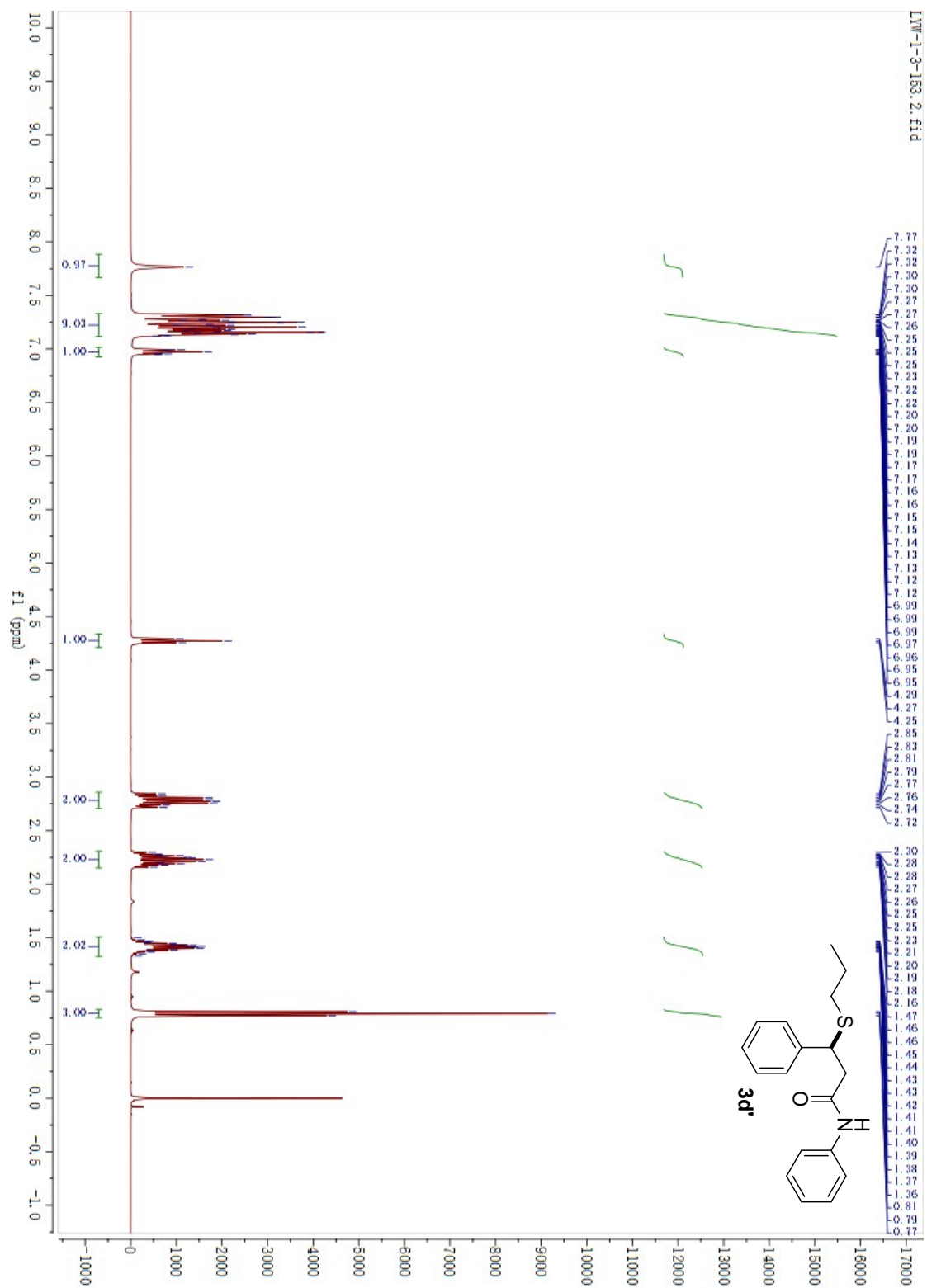


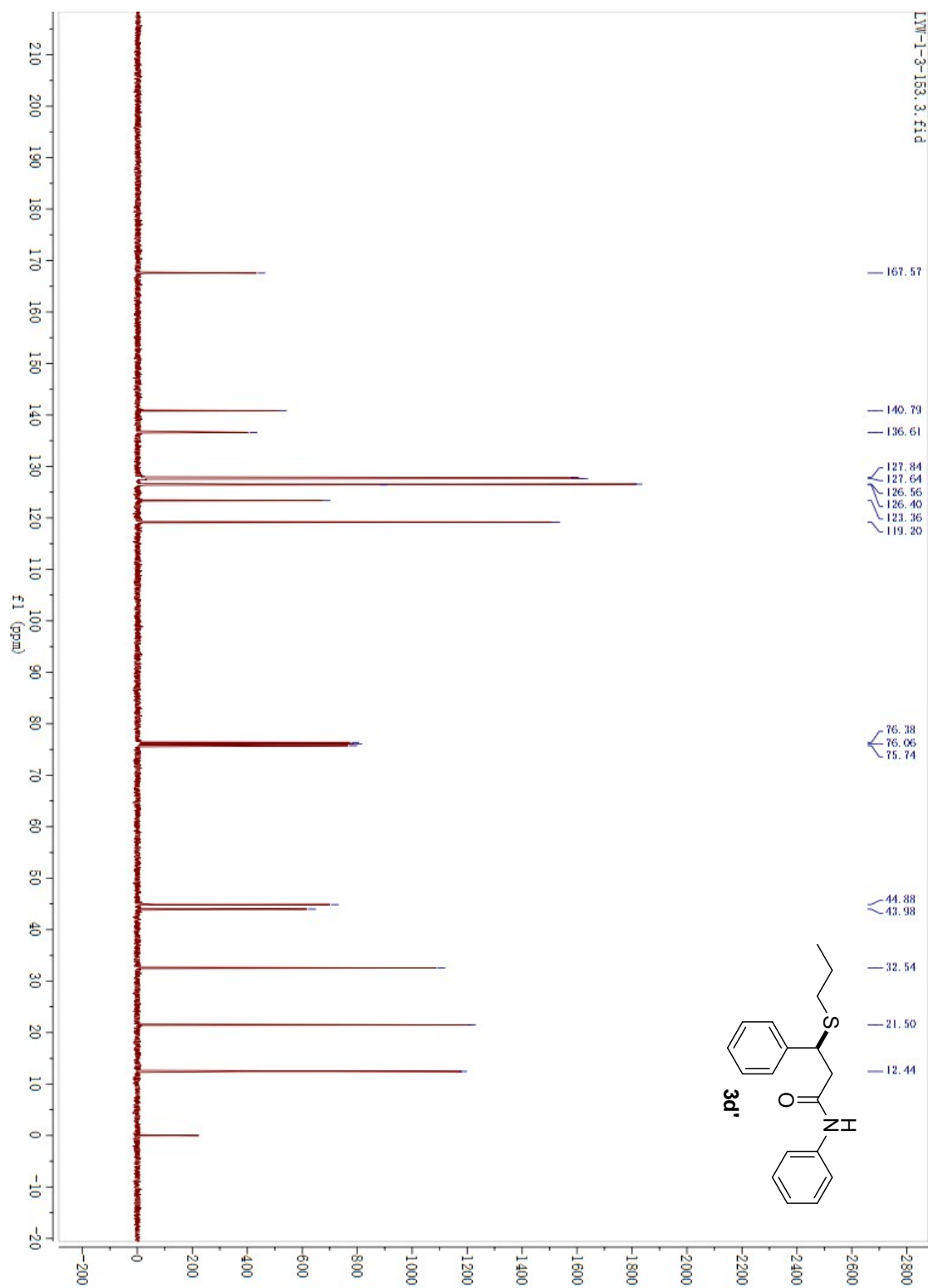


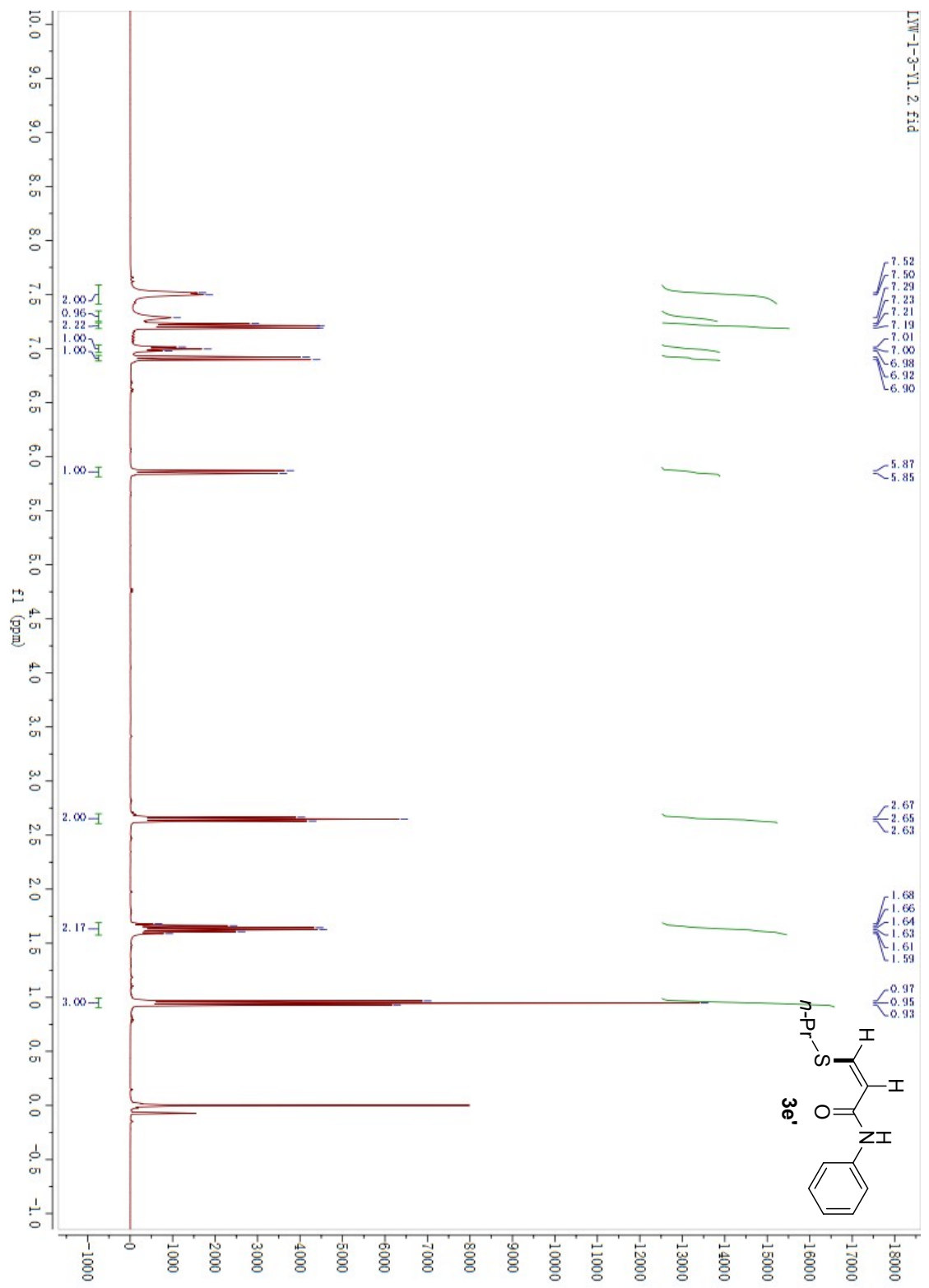


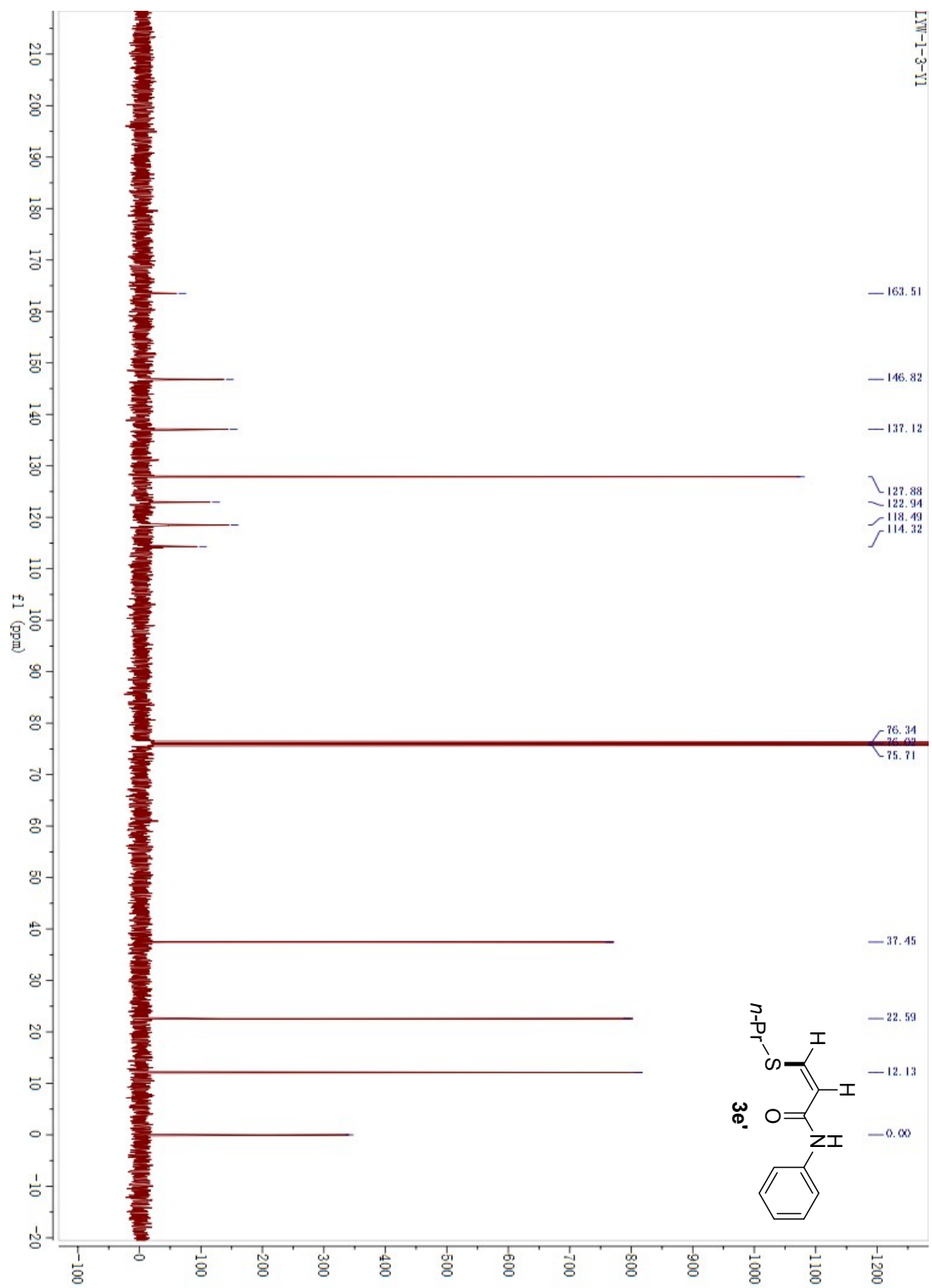


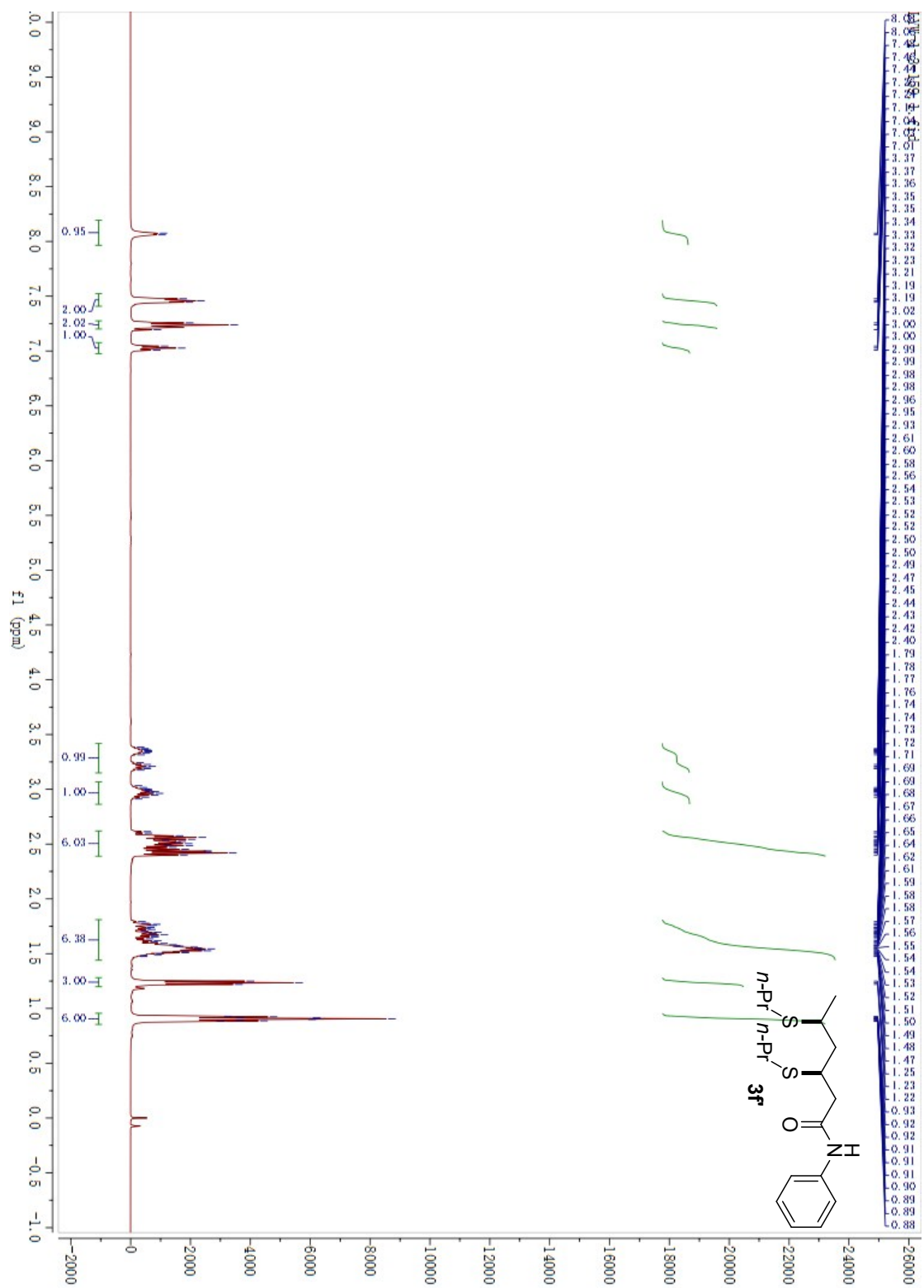












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