Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supporting information

Zinc Peroxide as a Convenient and Recyclable Source of Anhydrous Hydrogen Peroxide and Its Application in the Peroxidation of Carbonyls

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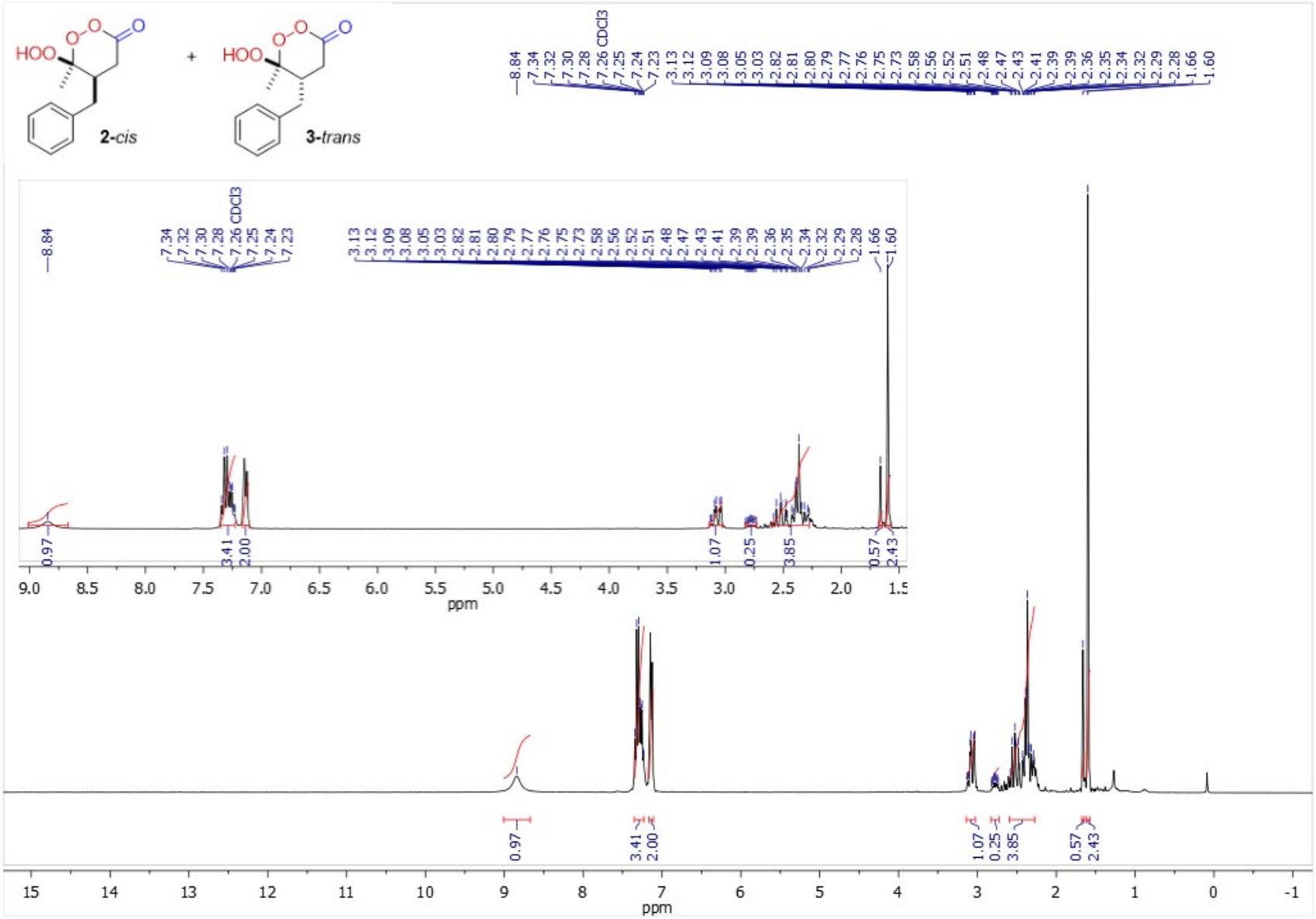
^{1}H NMR (300.13 MHz, $CDCl_3$). γ-Hydroperoxy-γ-peroxylactones 2+3



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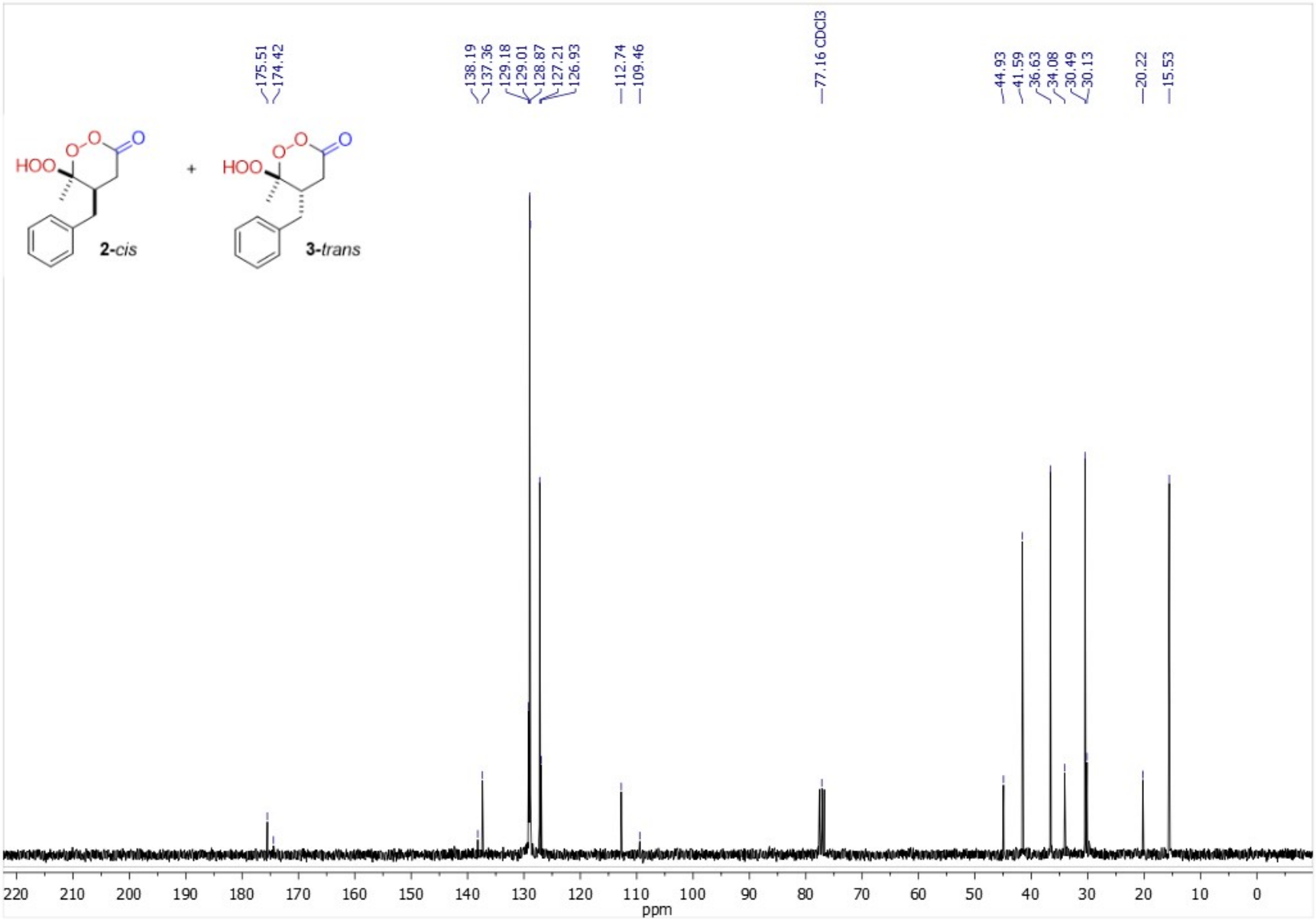
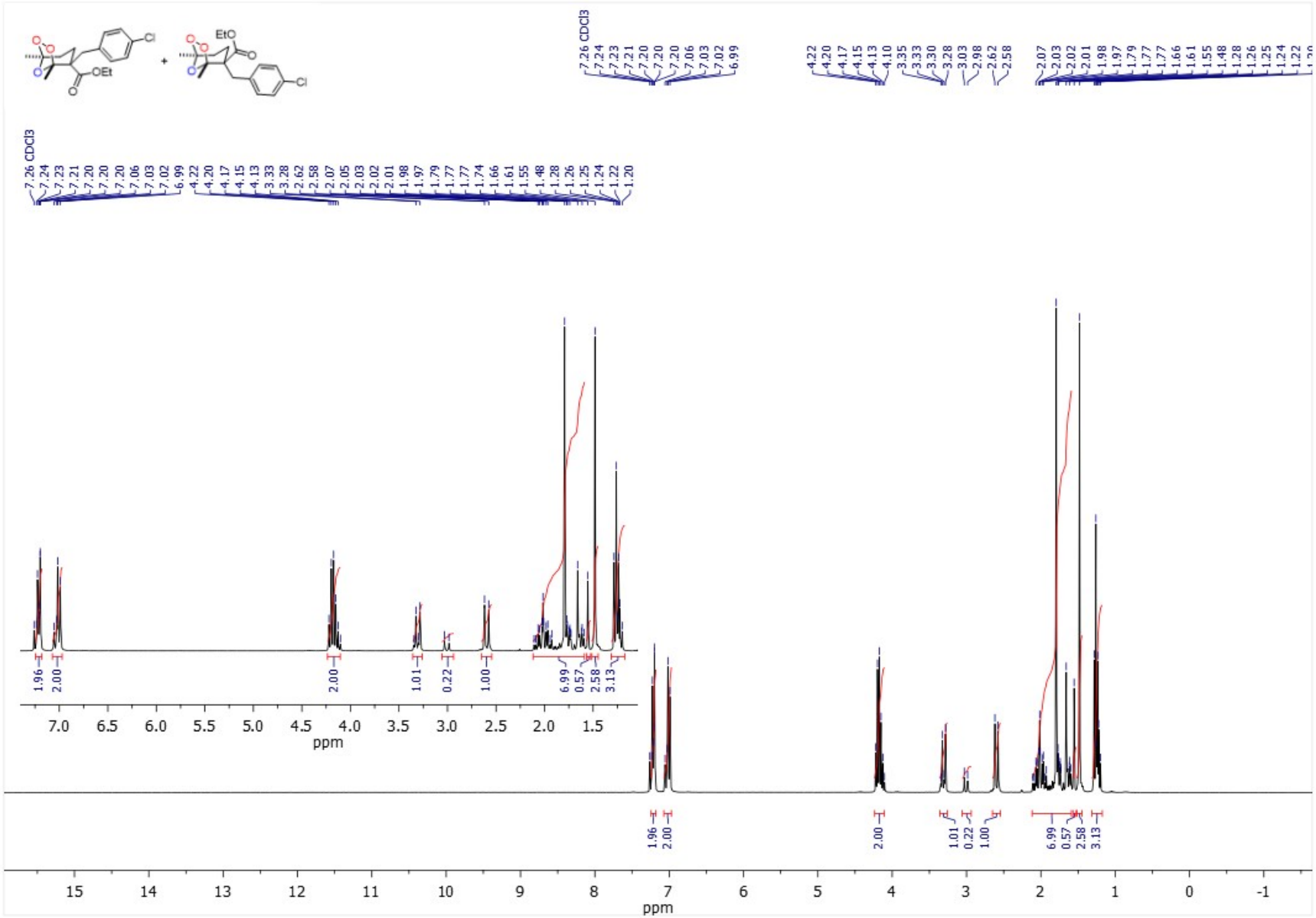


^{1}H NMR (300.13 MHz, $CDCl_3$). Ethyl 2-(4-chlorobenzyl)-1,5-dimethyl-6,7,8-trioxabicyclo[3.2.1]octane-2-carboxylate 5a + 6a



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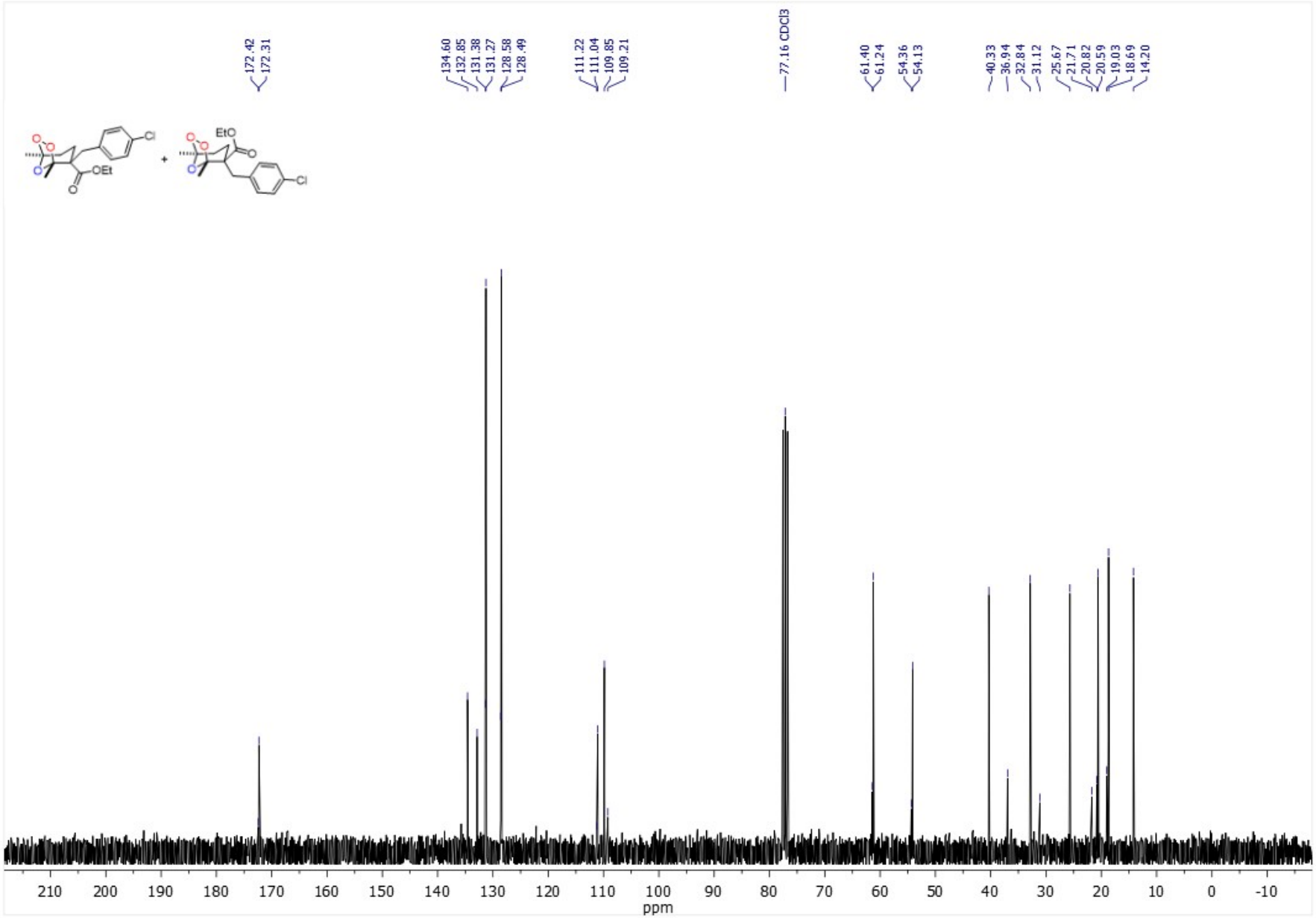
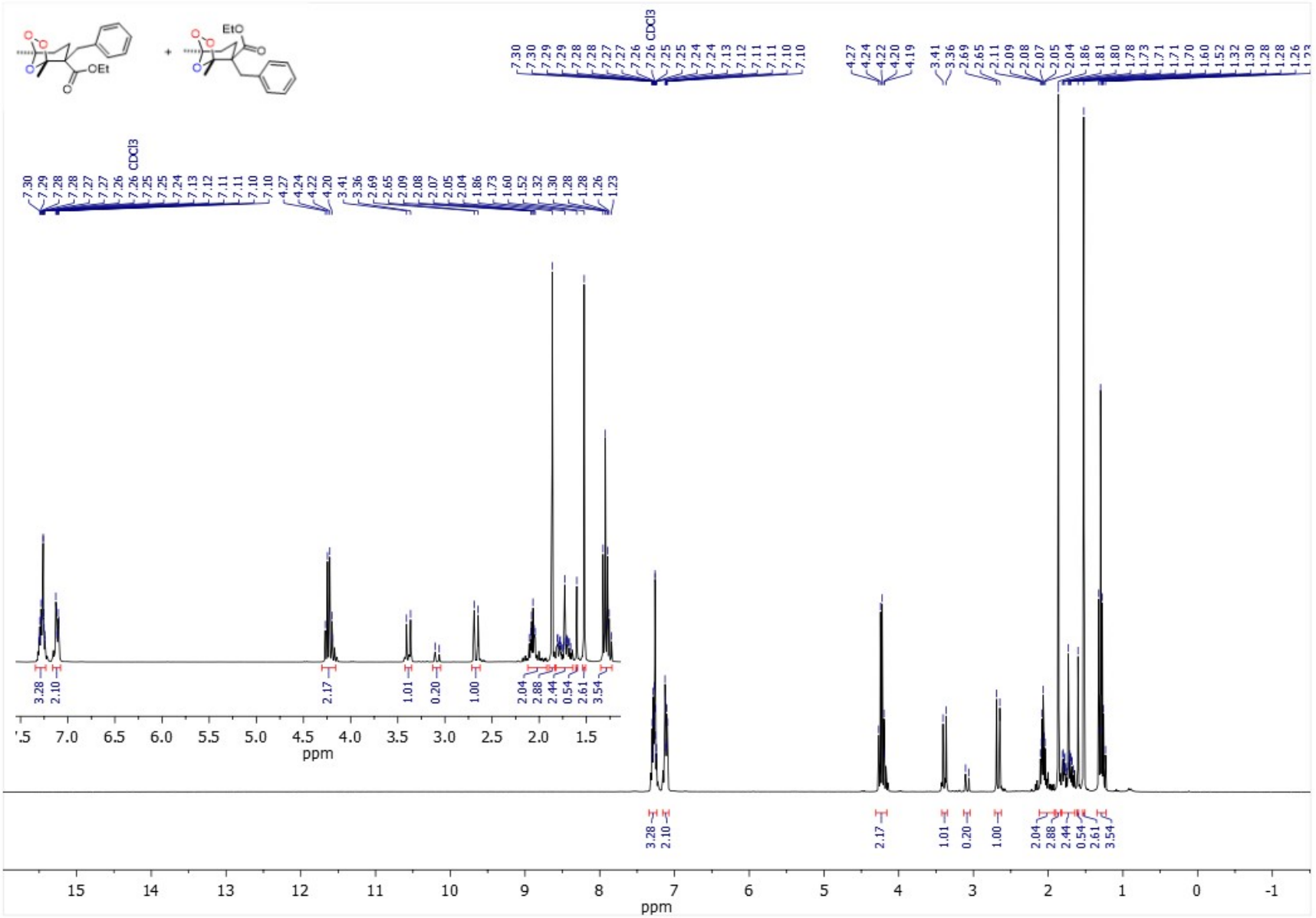


^{1}H NMR (300.13 MHz, $CDCl_3$). Ethyl 2-benzyl-1,5-dimethyl-6,7,8-trioxabicyclo[3.2.1]octane-2-carboxylate, 5b+6b



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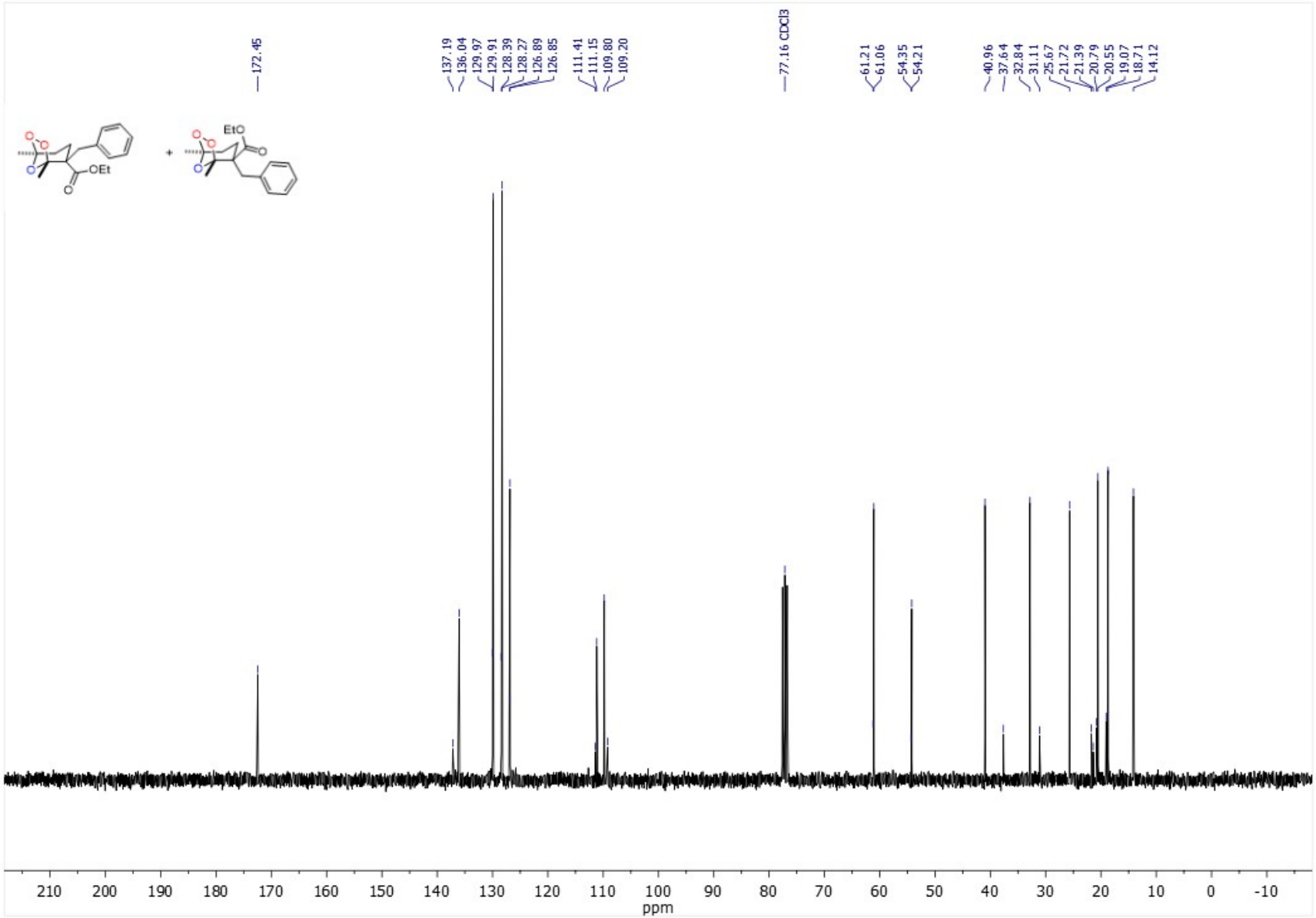
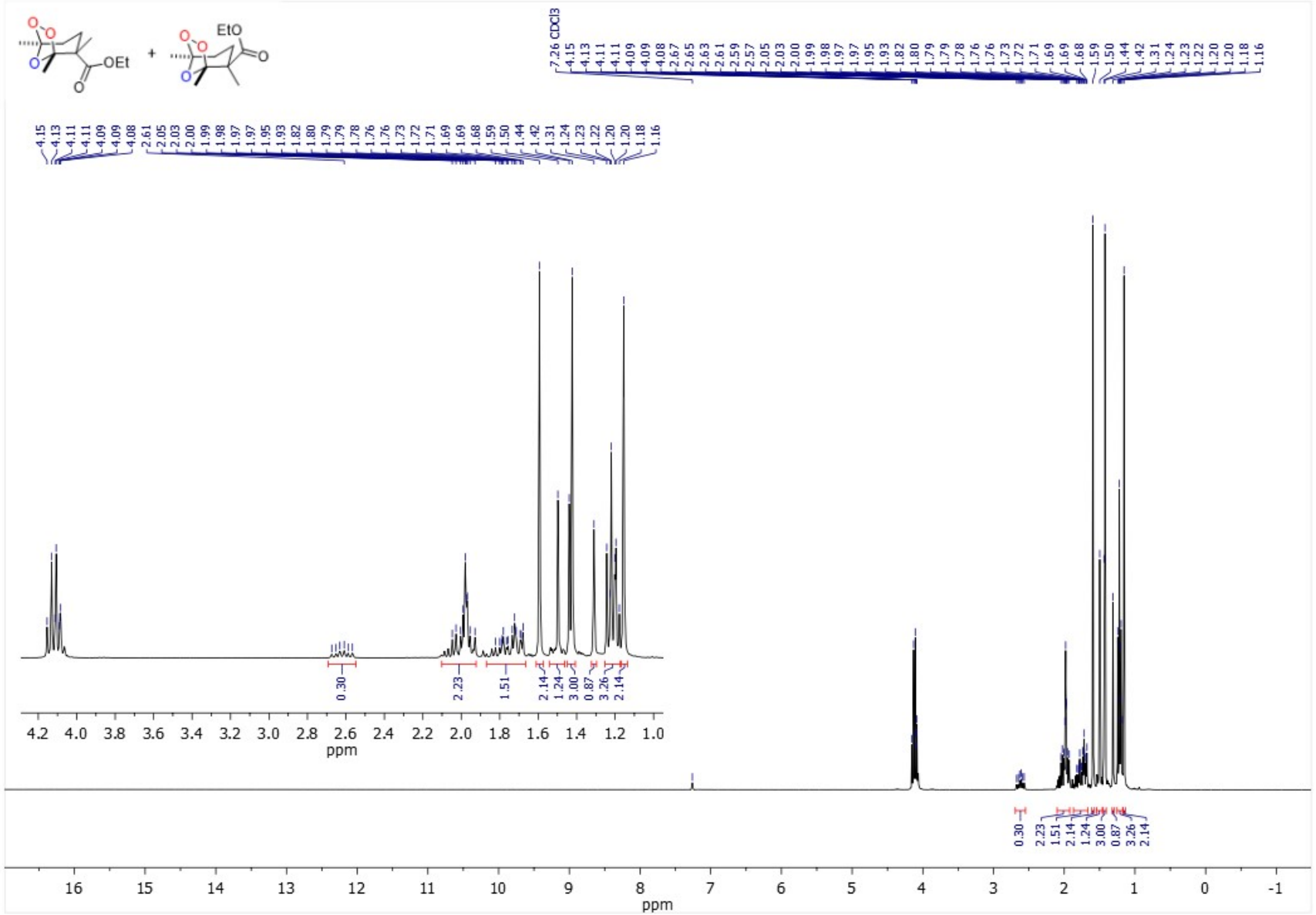


^{1}H NMR (300.13 MHz, $CDCl_3$). Ethyl 1,2,5-trimethyl-6,7,8-trioxabicyclo[3.2.1]octane-2-carboxylate, 5c+6c



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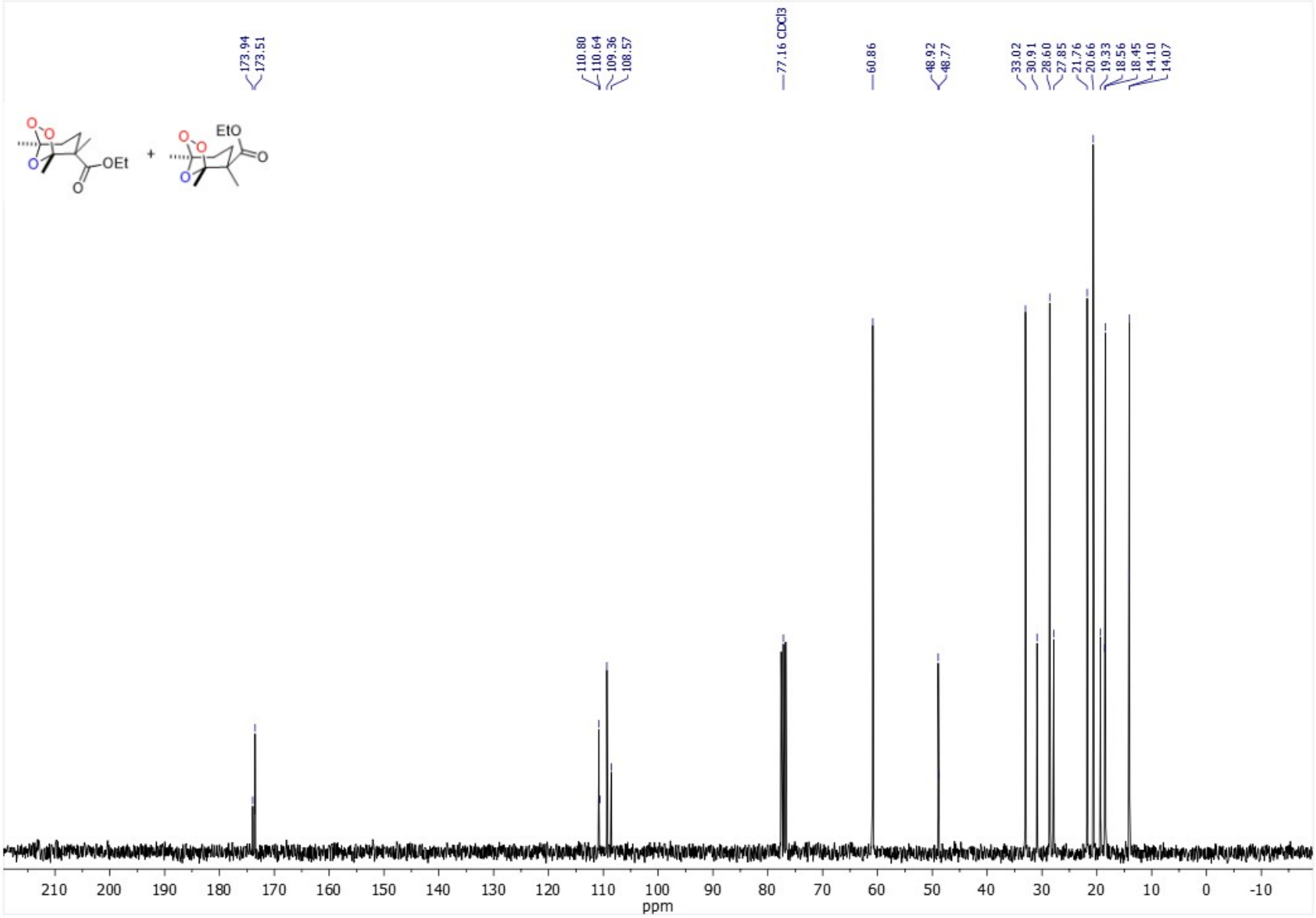
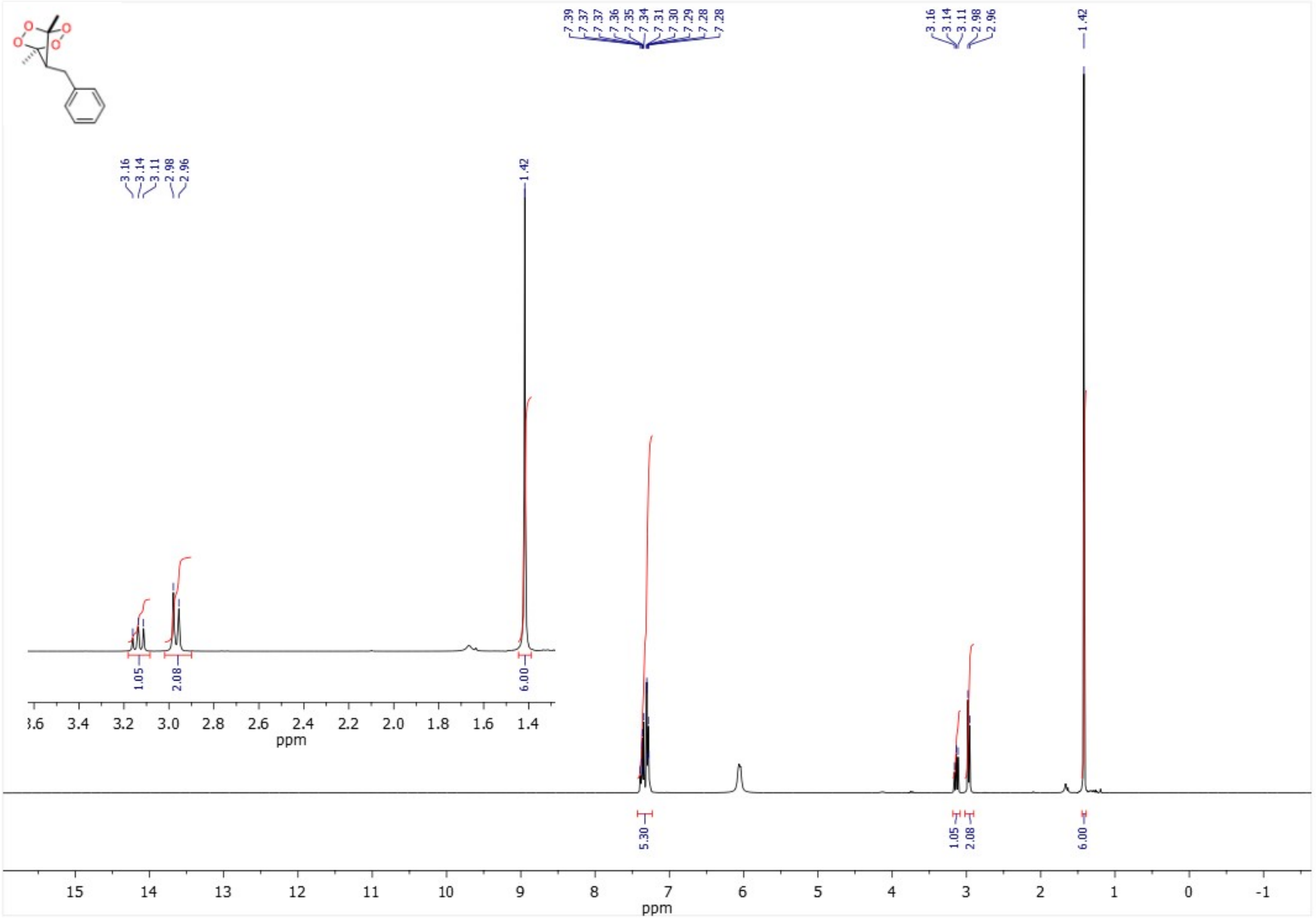


^{1}H NMR (300.13 MHz, $CDCl_3$). 7-Benzyl-1,4-dimethyl-2,3,5,6-tetraoxabicyclo[2.2.1]heptane, 8



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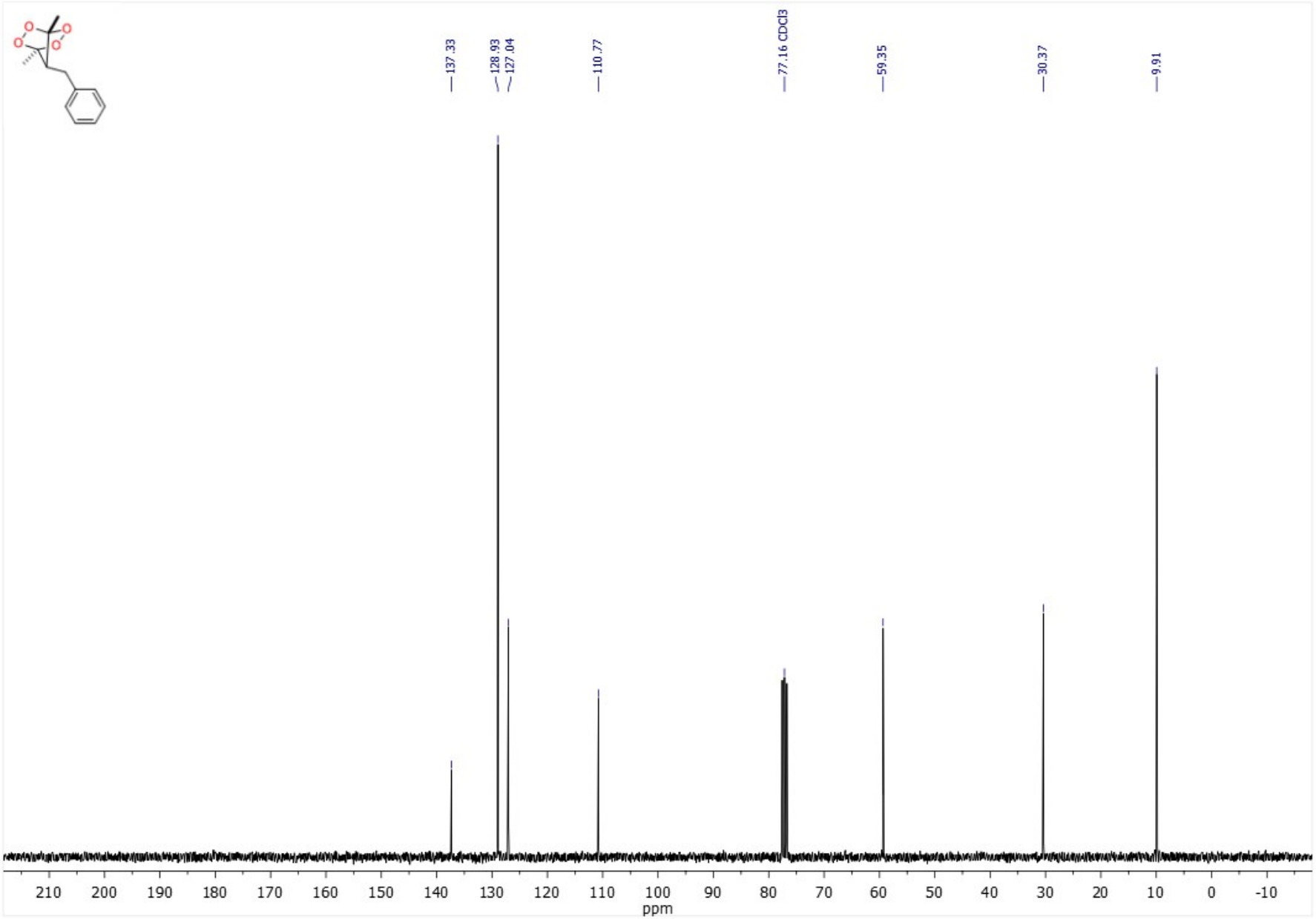
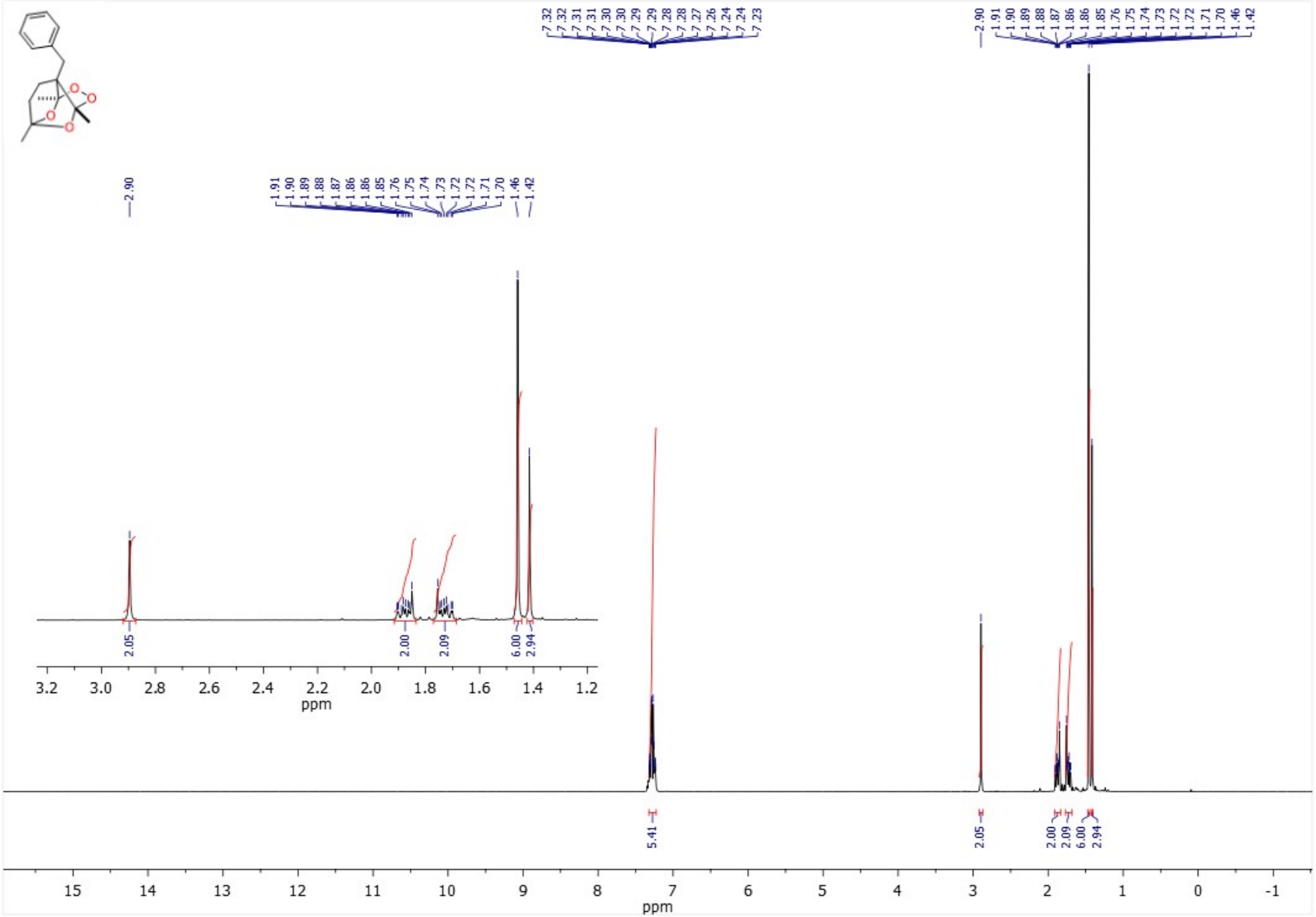


^{1}H NMR (300.13 MHz, $CDCl_3$). 3a-Benzyl-3,6,7a-trimethyltetrahydro-3H,4H-3,6-epoxy[1,2]dioxolo[3,4-b]pyran, 10a



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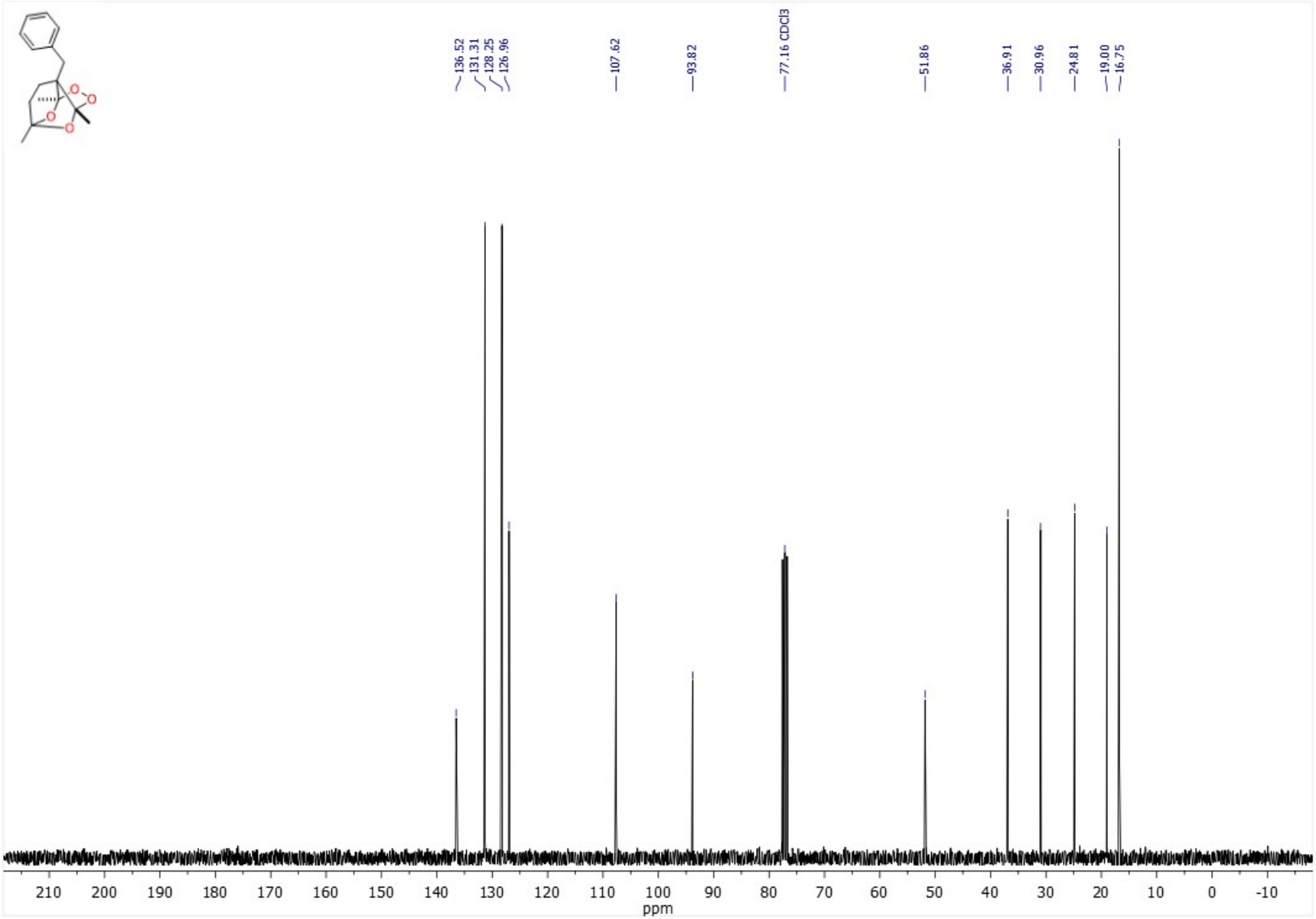
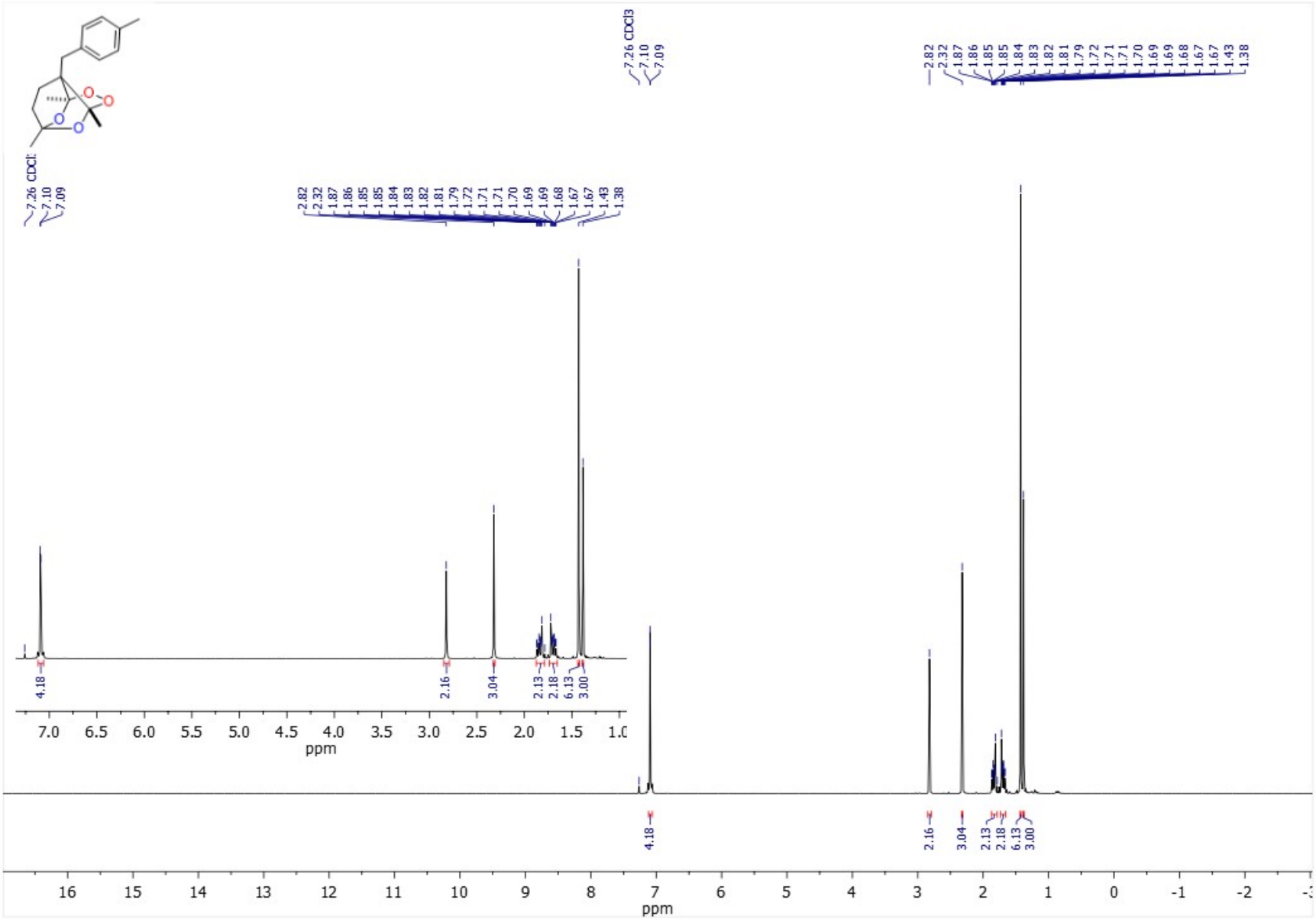


^{1}H NMR (300.13 MHz, $CDCl_3$). 3,6,7a-Trimethyl-3a-(4-methylbenzyl)tetrahydro-3H,4H-3,6-epoxy[1,2]dioxolo[3,4-b]pyran, 10b



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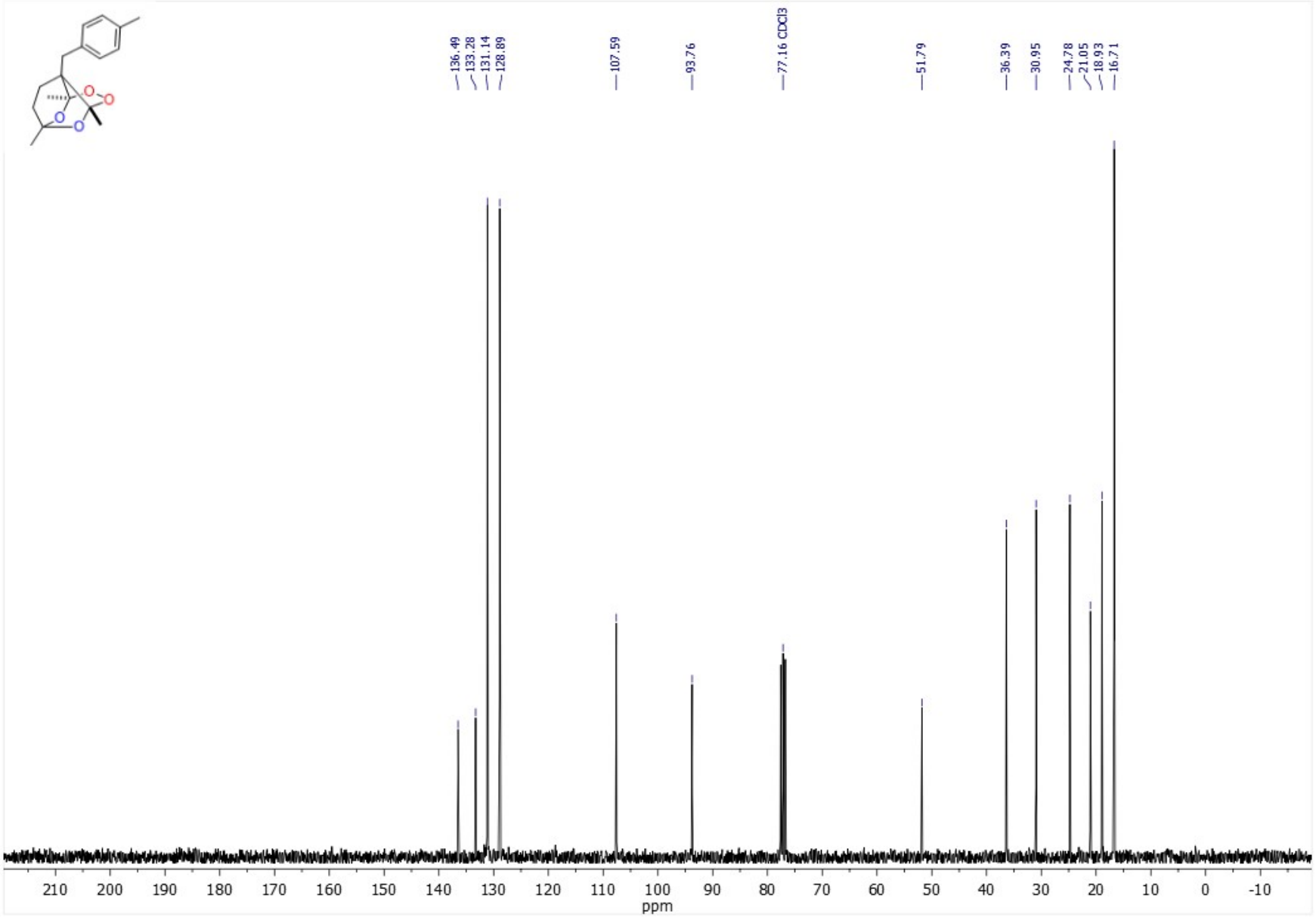
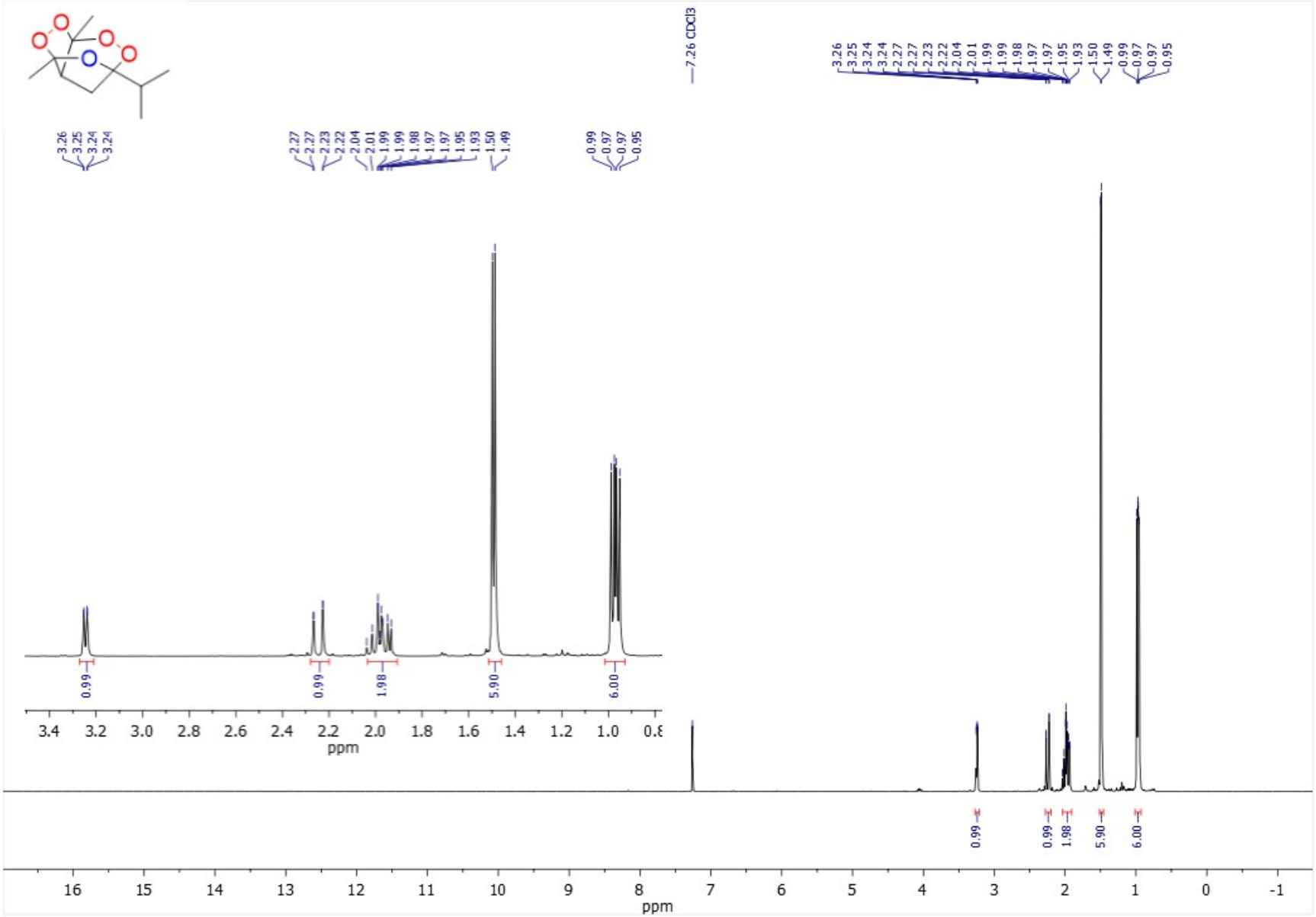


^{1}H NMR (300.13 MHz, $CDCl_3$). 5-isopropyl-3,7a-dimethyltetrahydro-3H-3,5-epoxy[1,2]dioxolo[3,4-c][1,2]dioxine, 12



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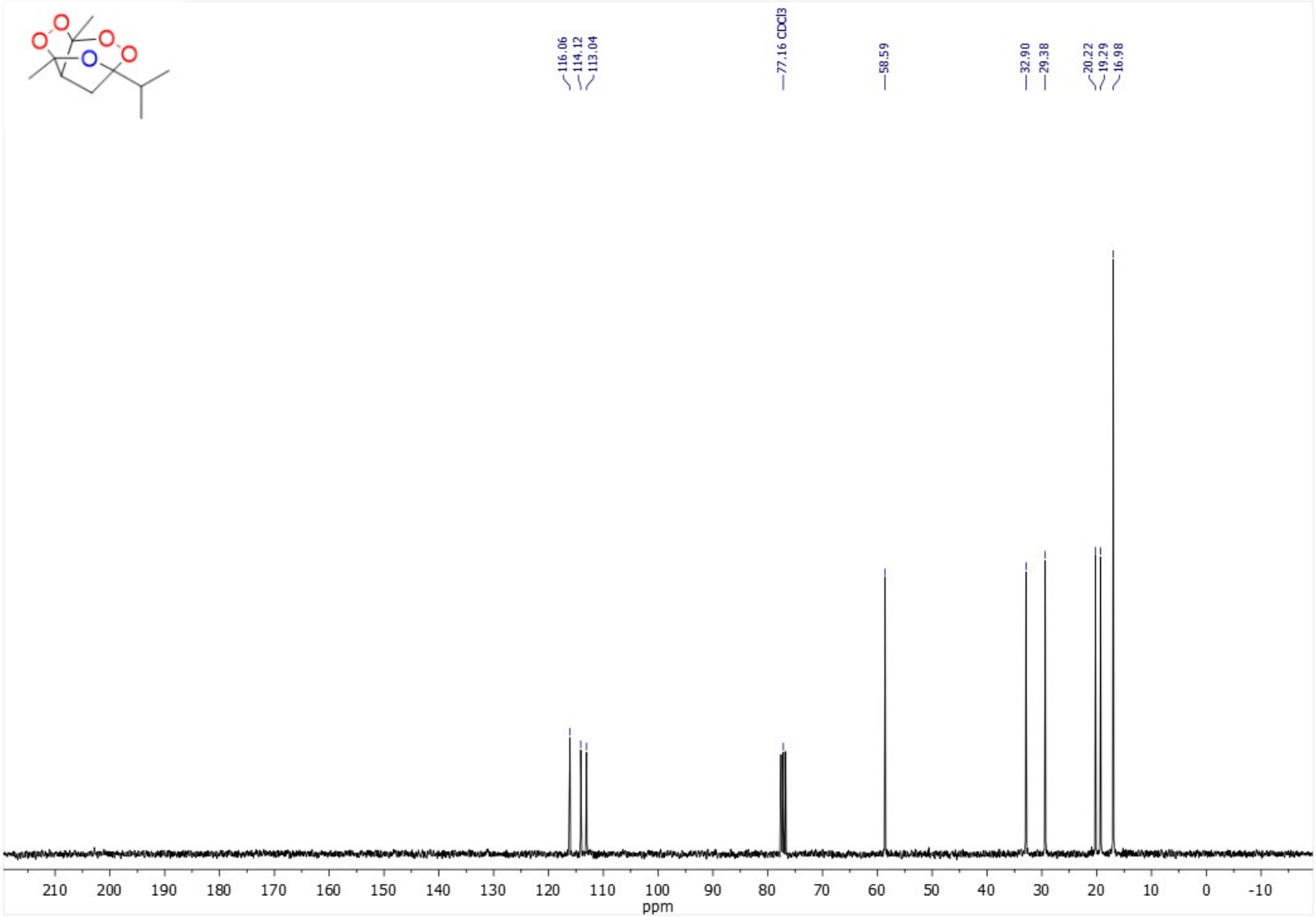
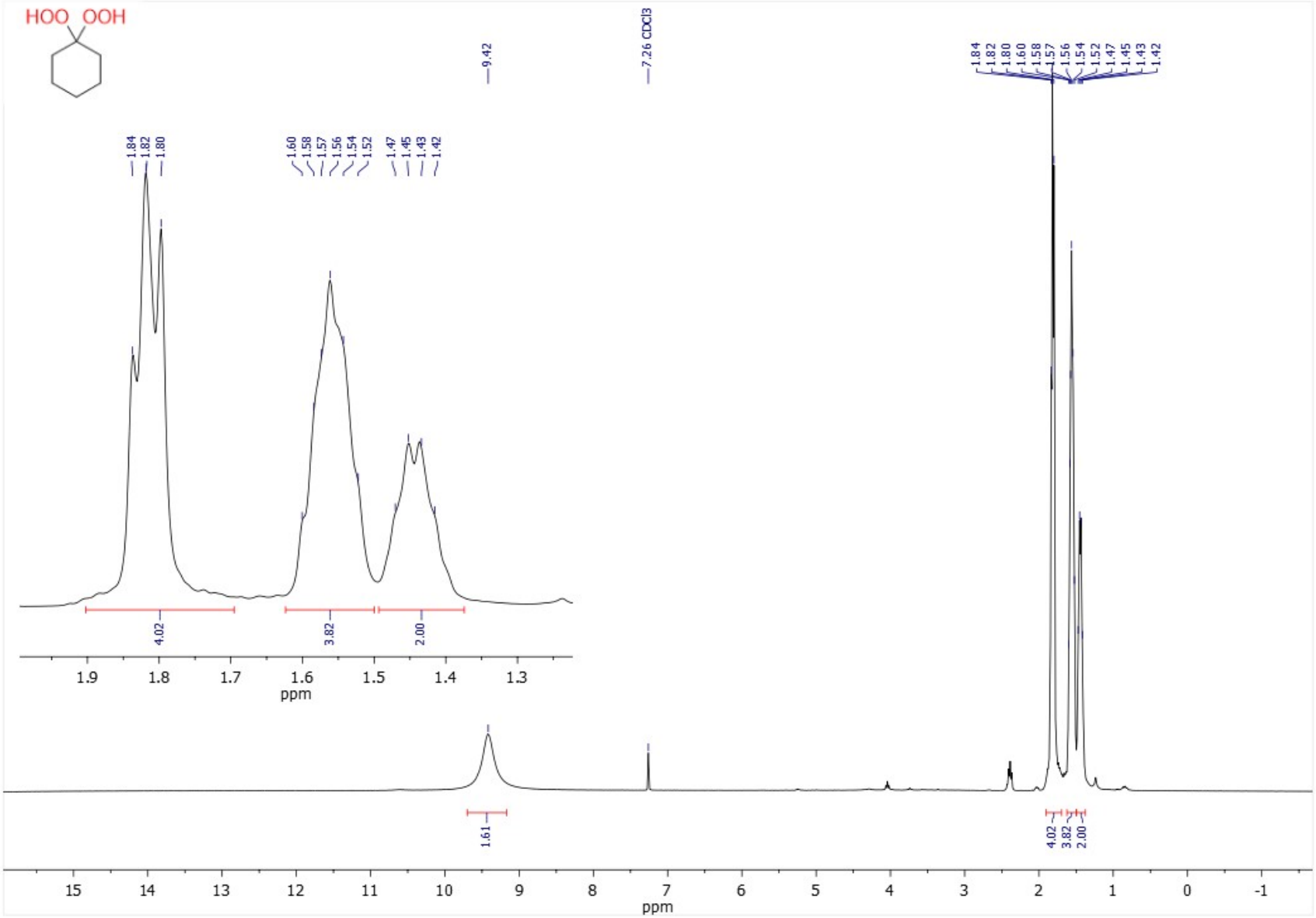


^{1}H NMR (300.13 MHz, $CDCl_3$). 1,1-dihydroperoxycyclohexane, 14



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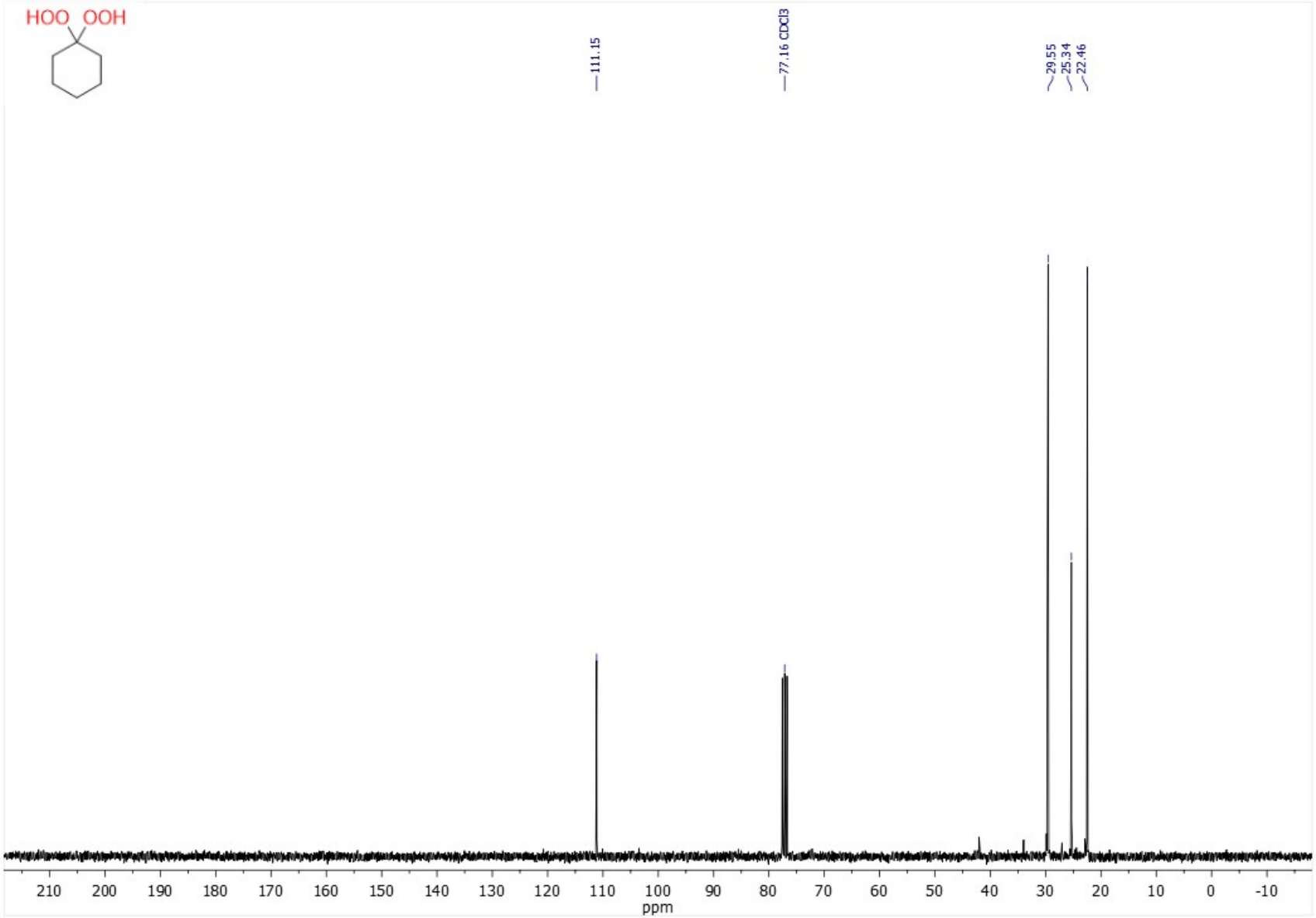
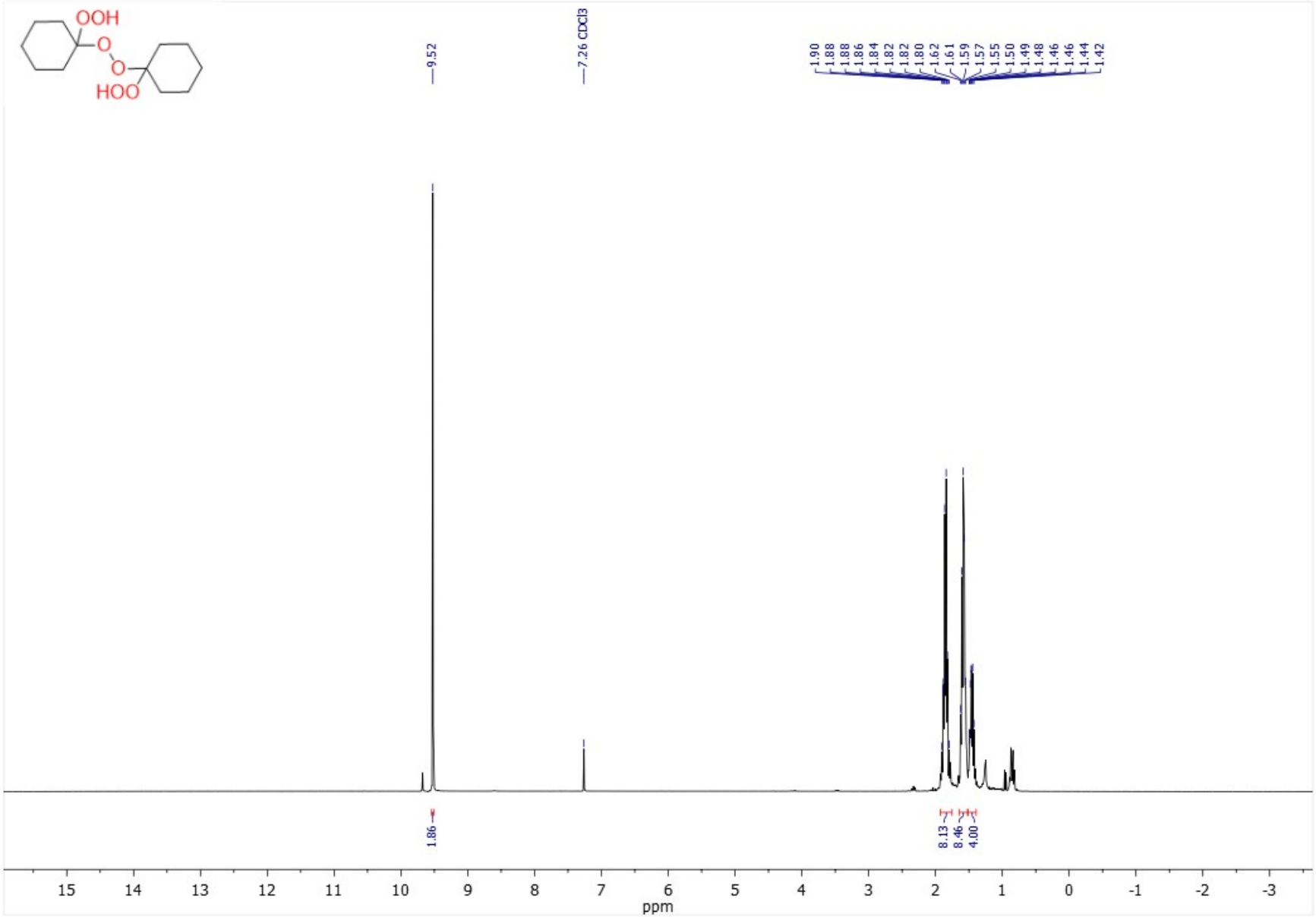


^{1}H NMR (300.13 MHz, $CDCl_3$). 1,1'-peroxybis(1-hydroperoxycyclohexane), 15



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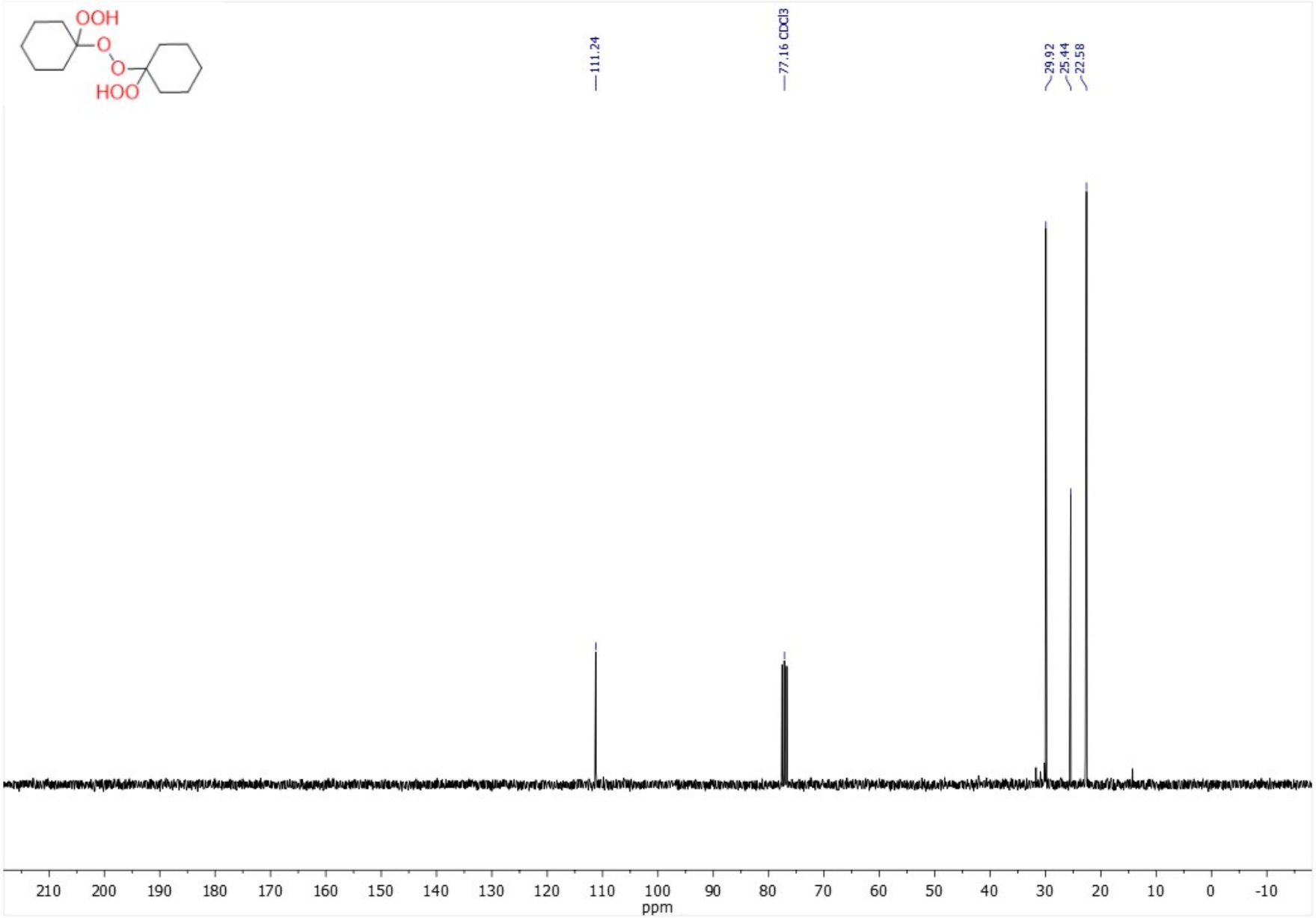
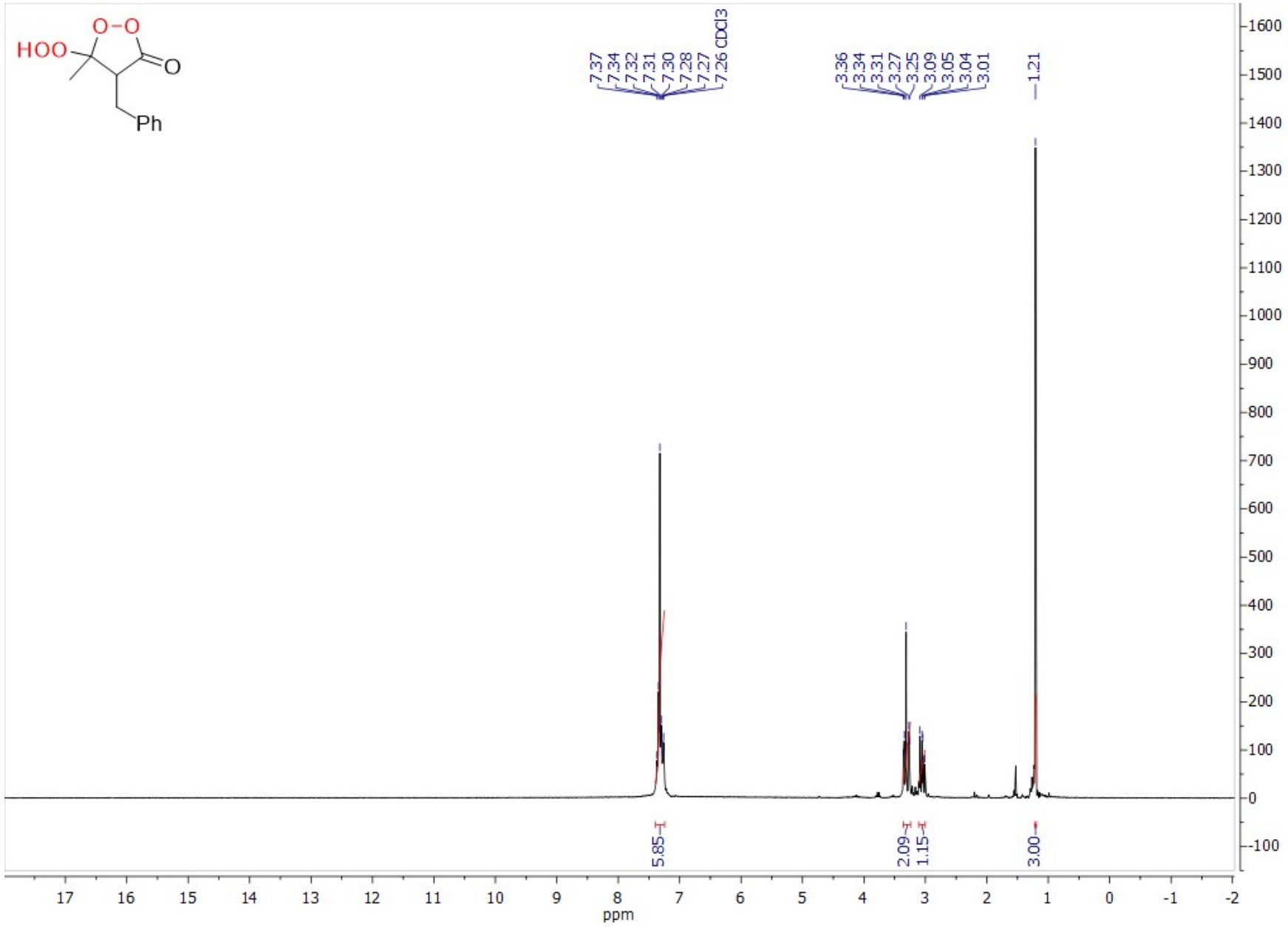


^{1}H NMR (300.13 MHz, $CDCl_3$). 4-Benzyl-5-hydroperoxy-5-methyl-1,2-dioxolan-3-one, 17a



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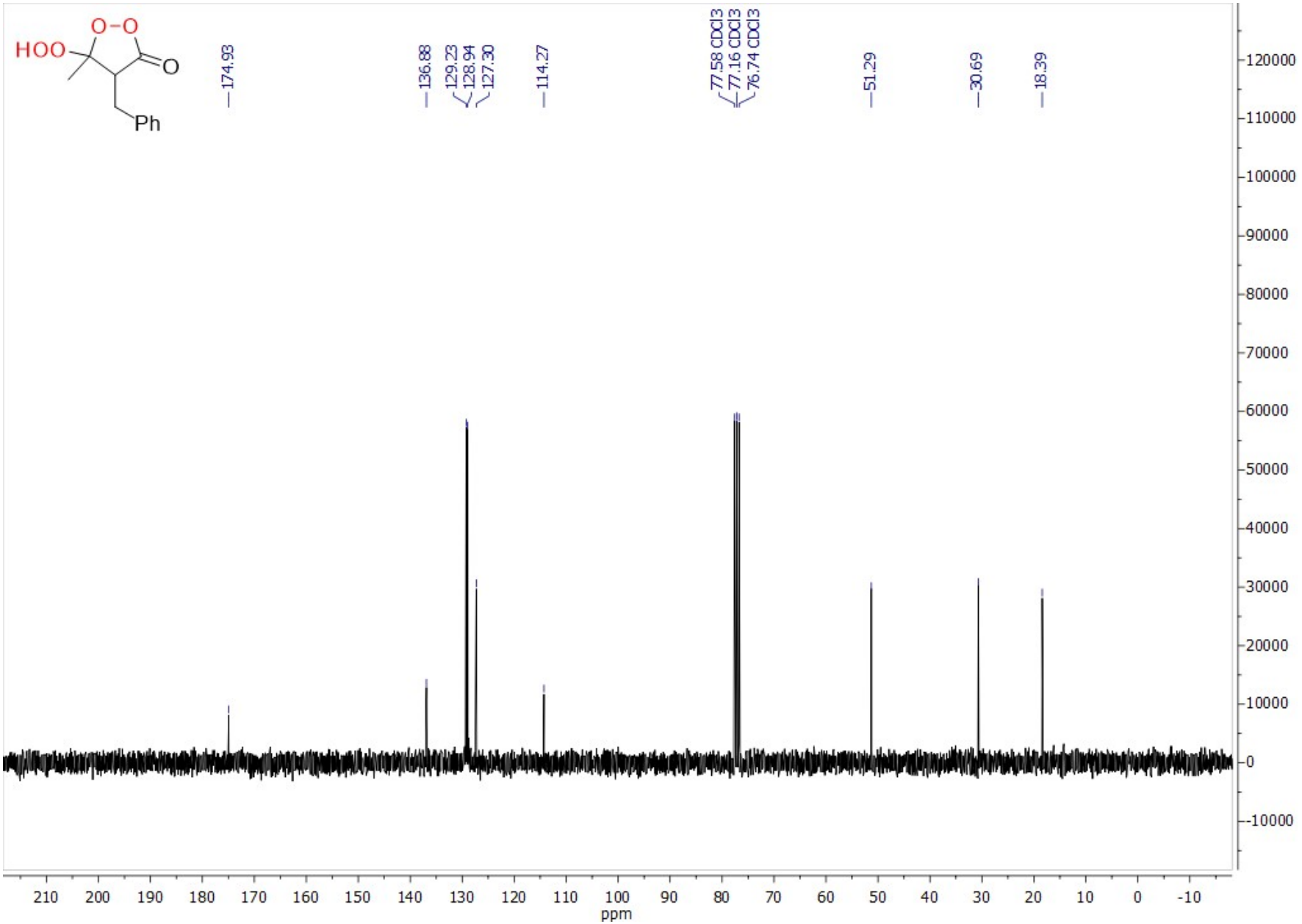
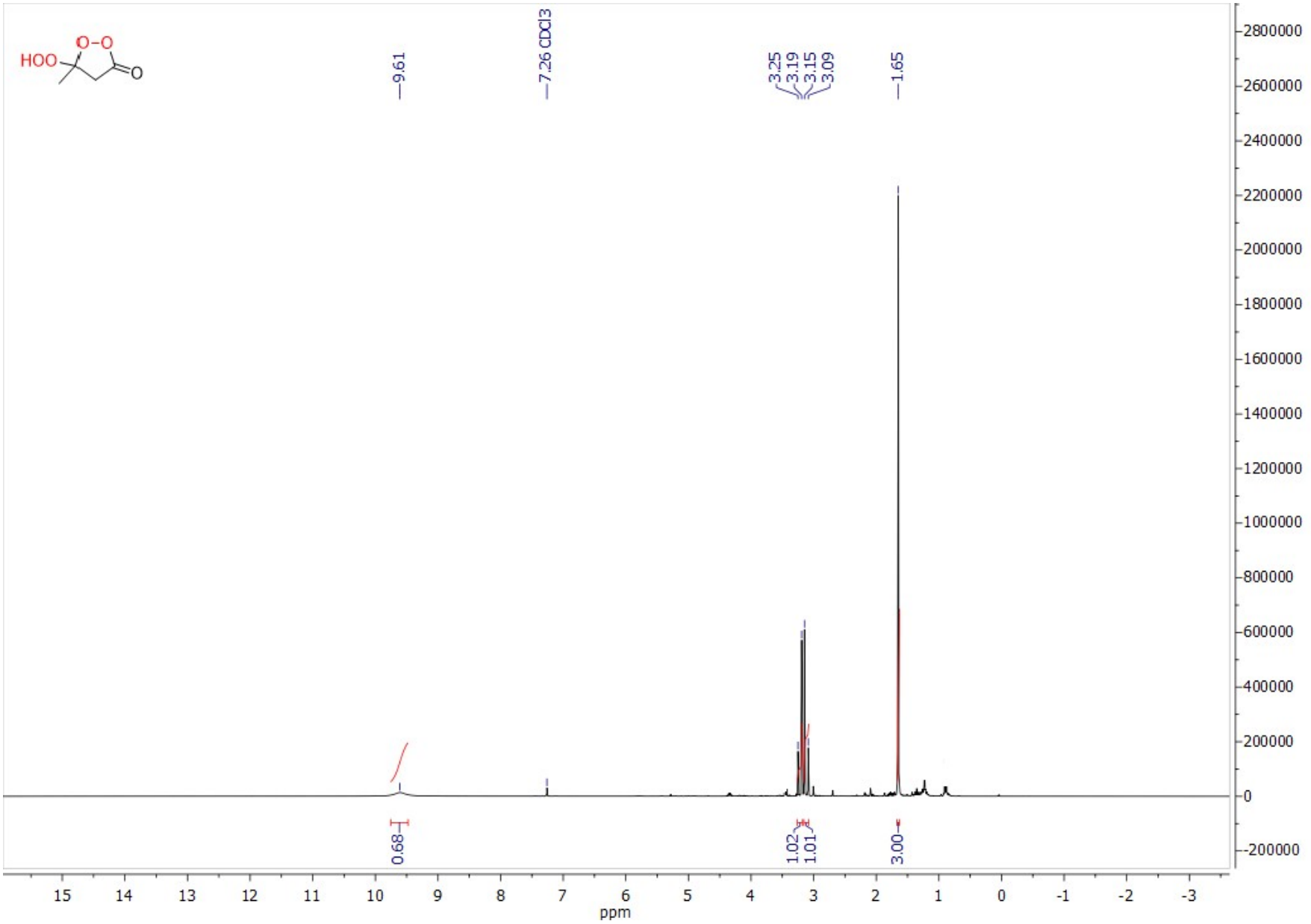


^{1}H NMR (300.13 MHz, $CDCl_3$). 5-Hydroperoxy-5-methyl-1,2-dioxolan-3-one, 17b



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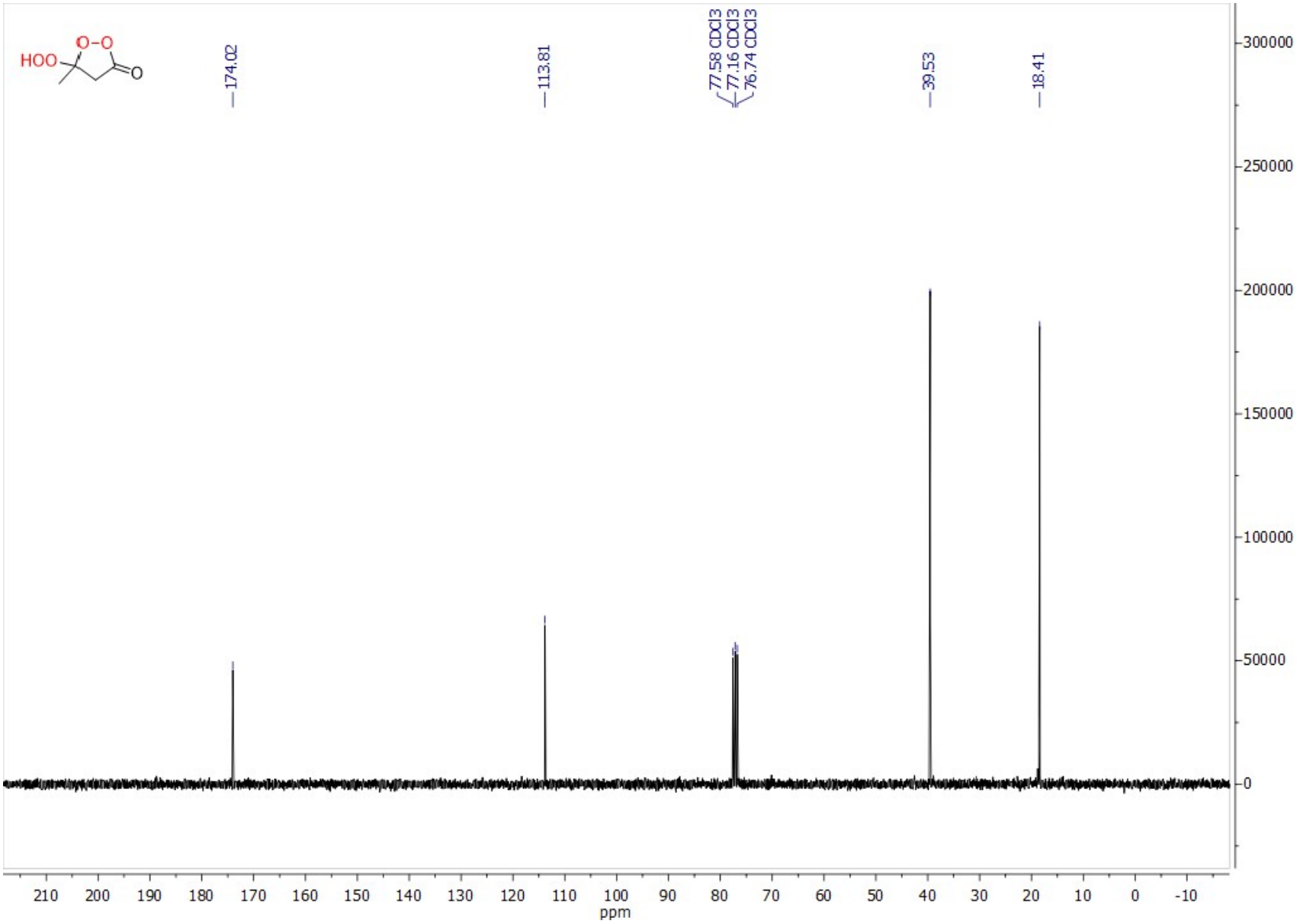

Fig. S1 SEM images of zinc sulfate monohydrate obtained from zinc peroxide on the 1st (a-c) and 5th (d-f) cycles.

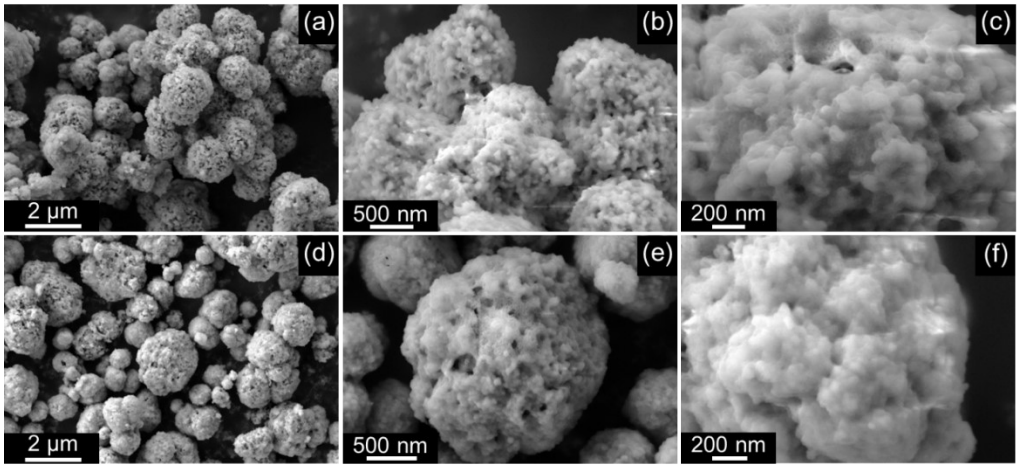

Fig. S2 ^{1}H NMR spectra of anhydrous, 8% hydrogen peroxide- acetonitrile solution prepared, from zinc peroxide before (curve a) and after (curve b) water addition.

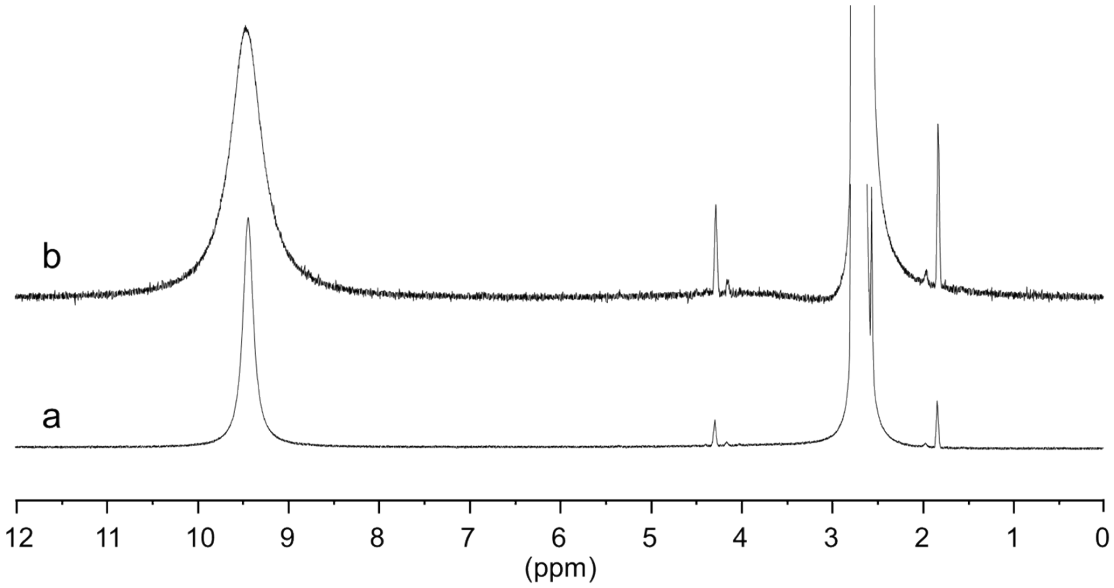

Fig. S3 ^{1}H NMR spectra of dry acetonitrile (a) and acetonitrile after addition of water (b).

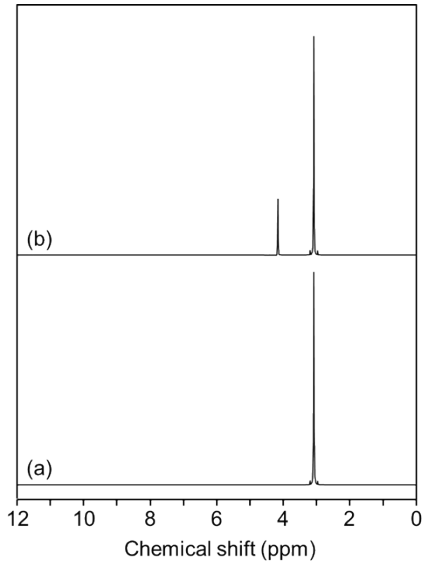

Fig. S4 ^{17}O NMR spectra of diethyl ether (a) and 29% hydrogen peroxide- diethyl ether solution, prepared from zinc peroxide.

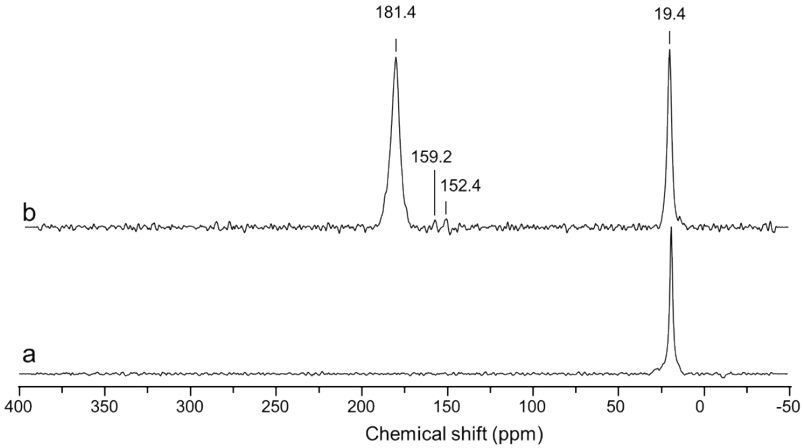

Fig. S5 ^{1}H NMR spectra of diethyl ether (a) and 29% hydrogen peroxide- diethyl ether solution, prepared from zinc peroxide.

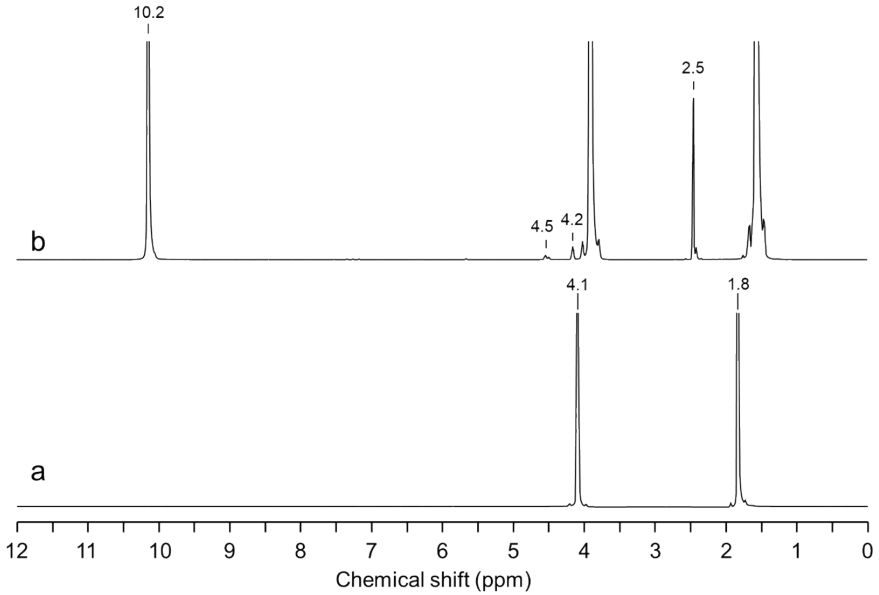

Fig. S6 SEM images of $ZnSO_4 \cdot H_2O$ obtained during reaction of ZnO_2 with H_2SO_4 in diethyl ether media (synthesis of 2+3).

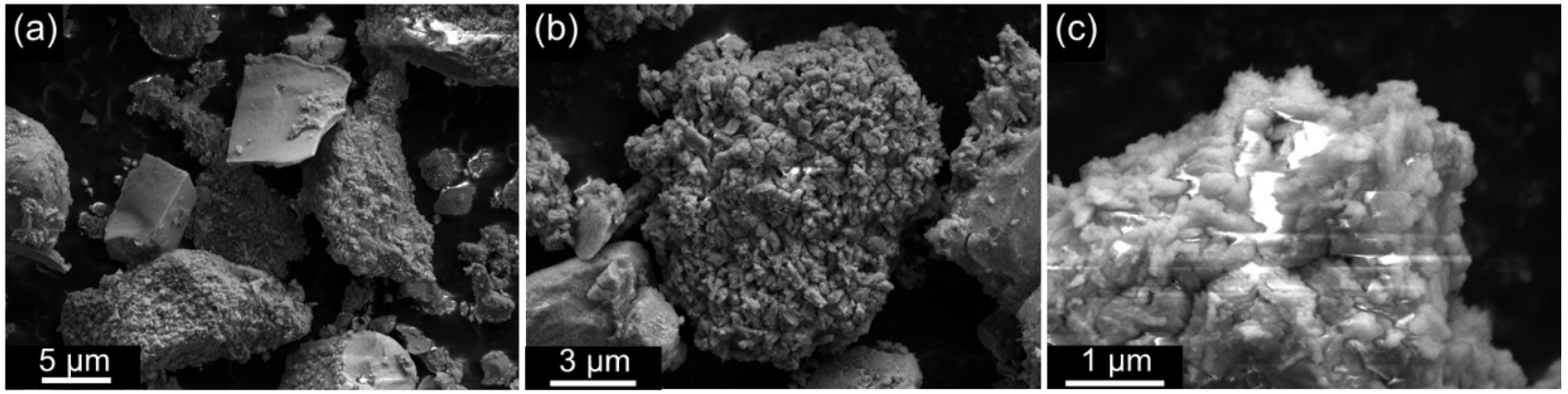

Fig. S*7* Diffractograms of $ZnSO_4 \cdot H_2O$ powders obtained from ZnO_2 in Et_2O media in presence of organic substrate (synthesis of 2+3) (a) and without (b).