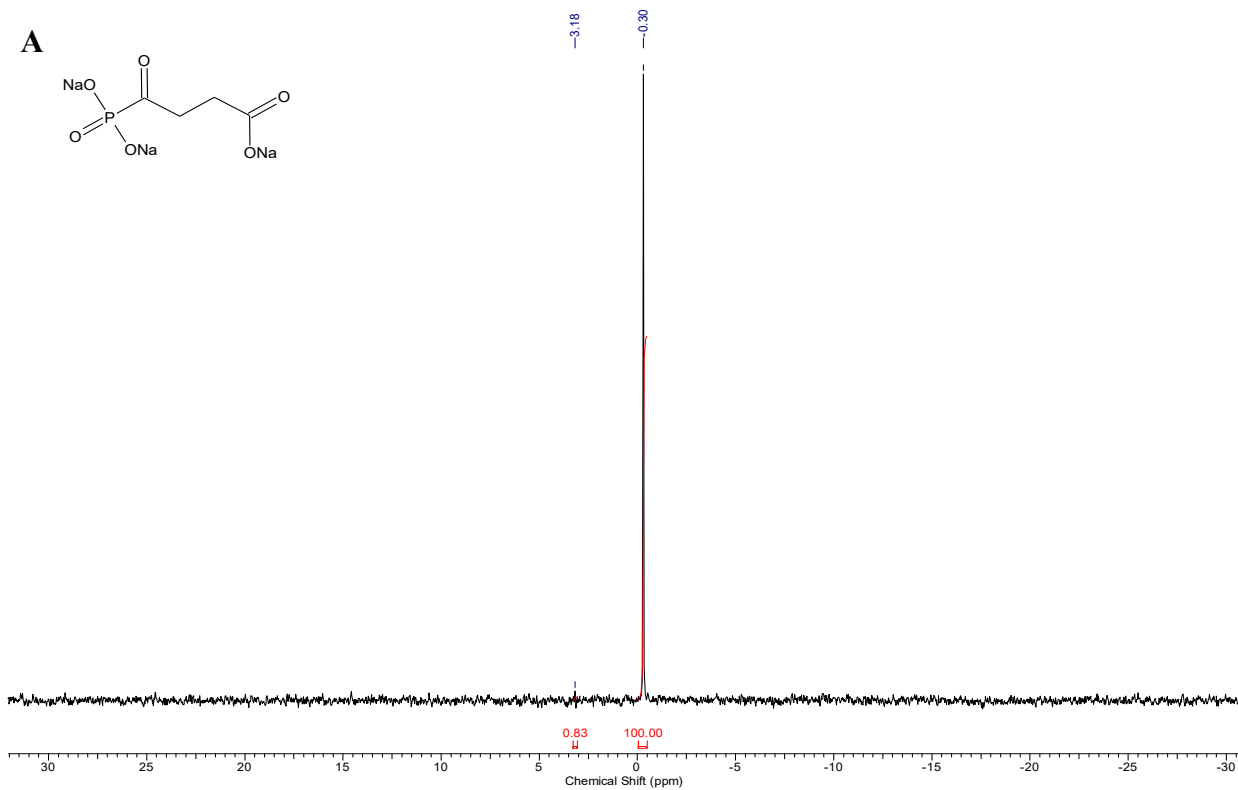
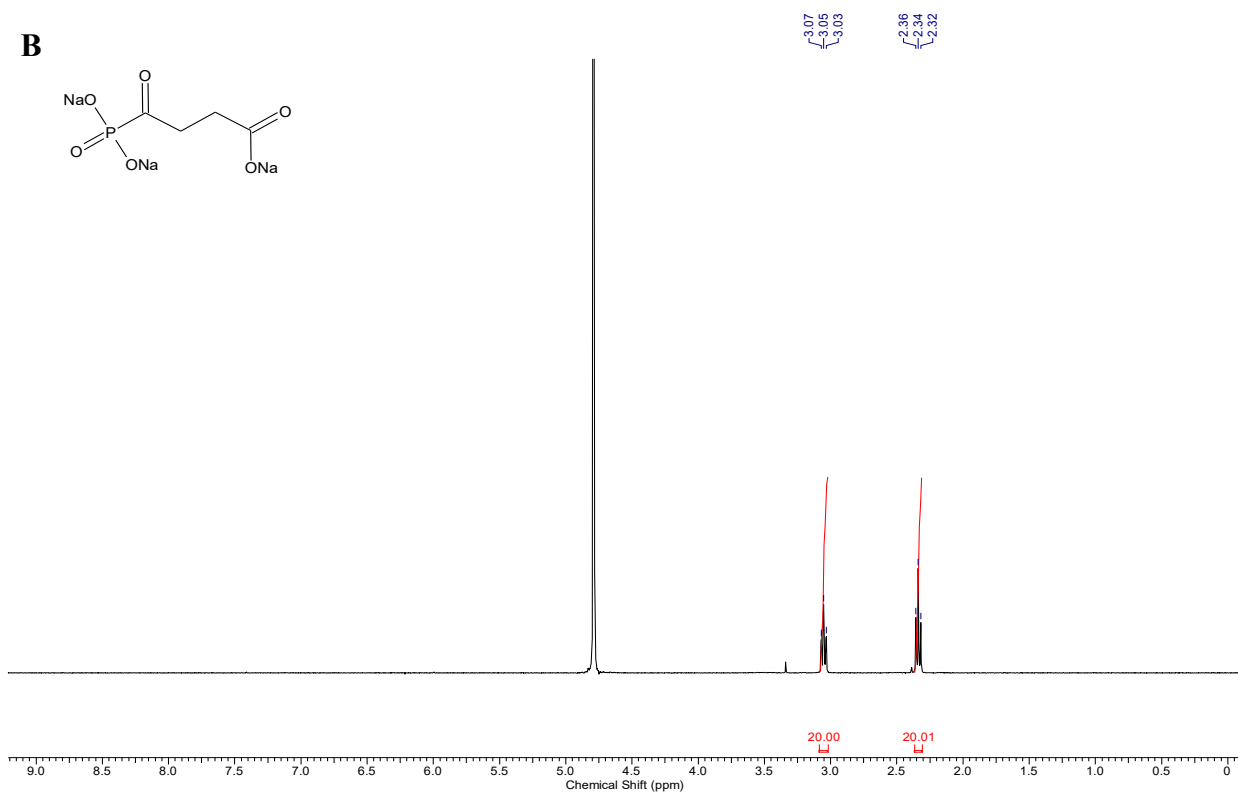
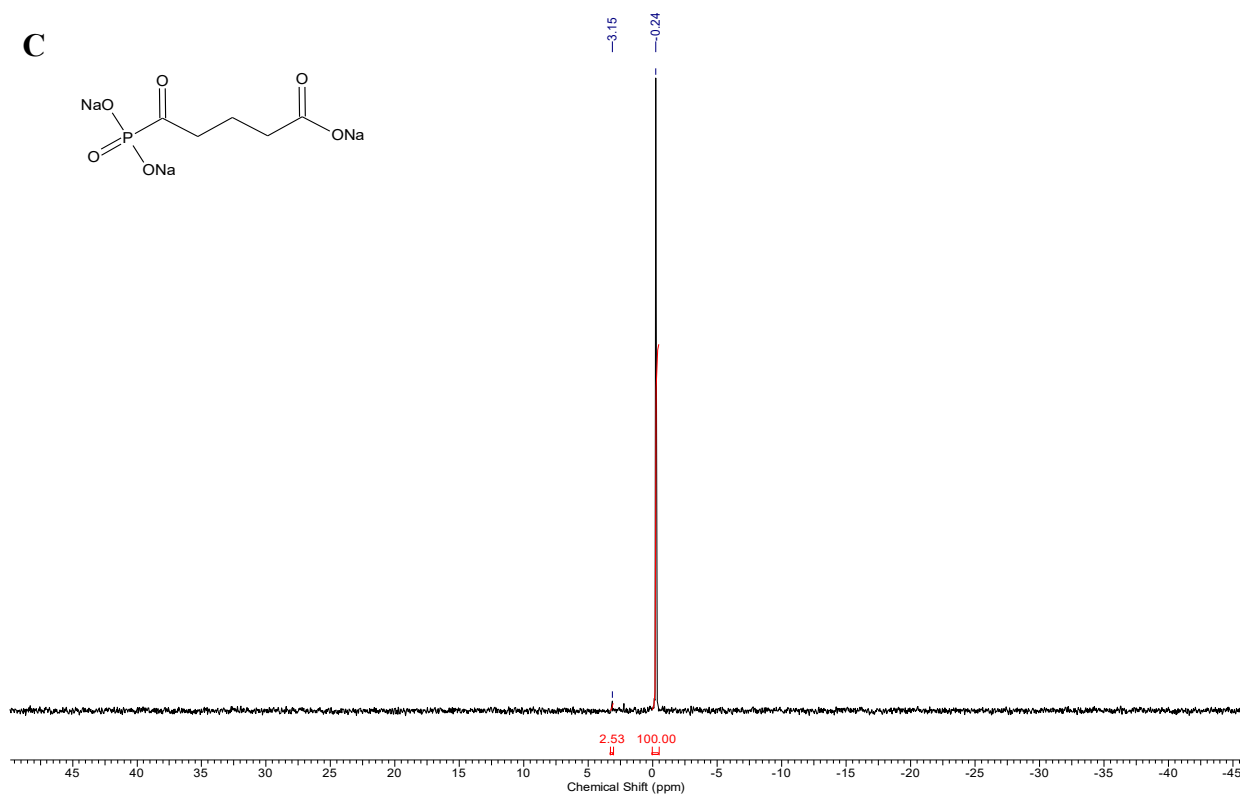


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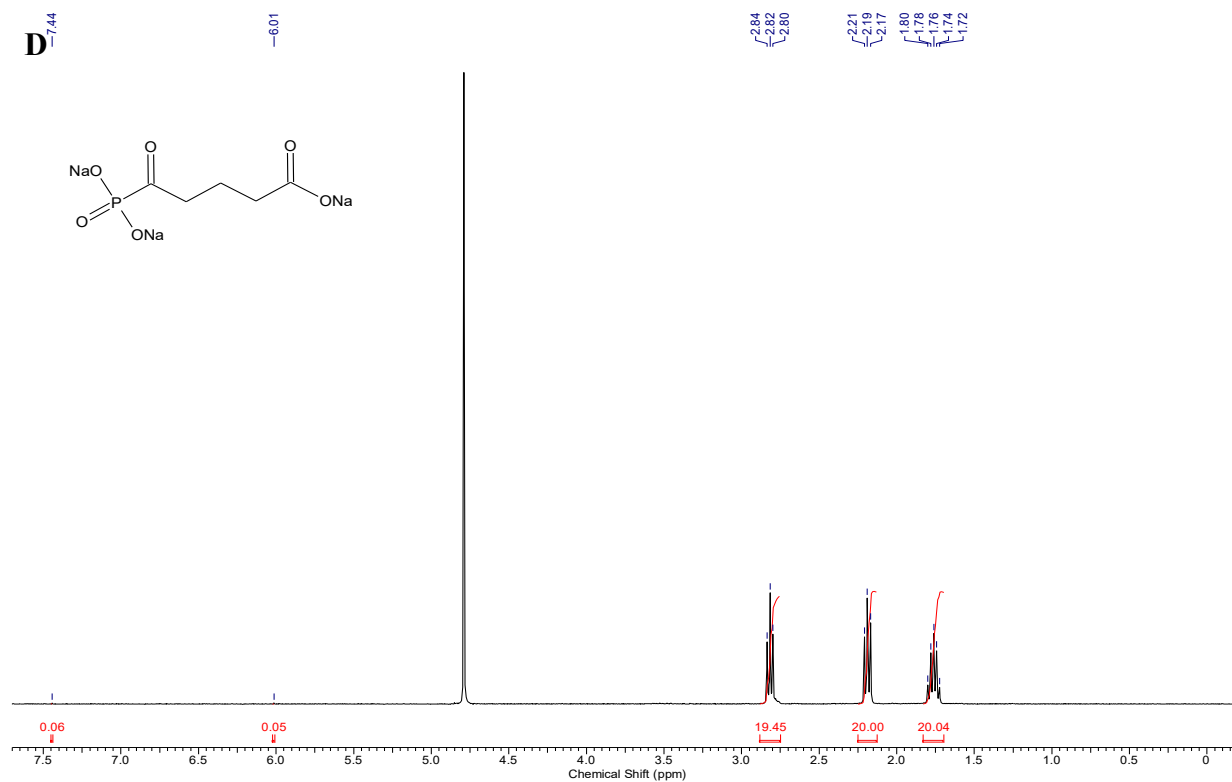
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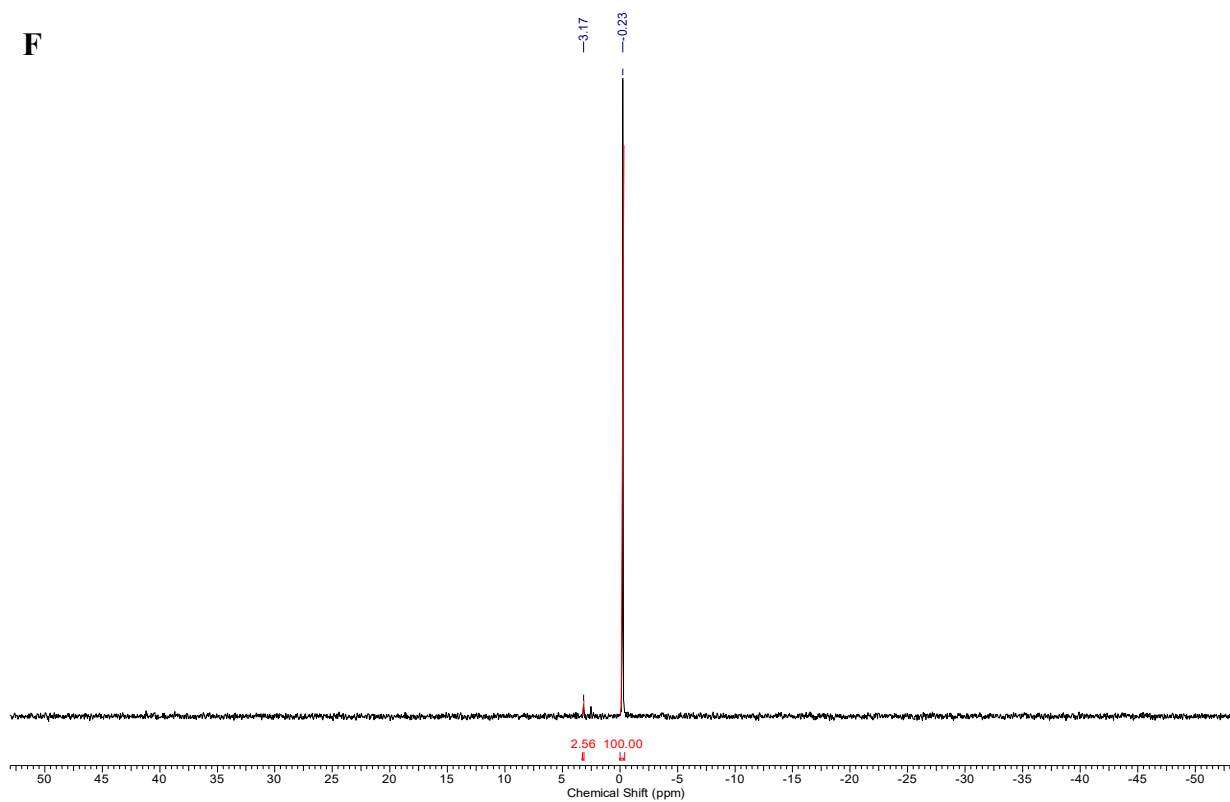
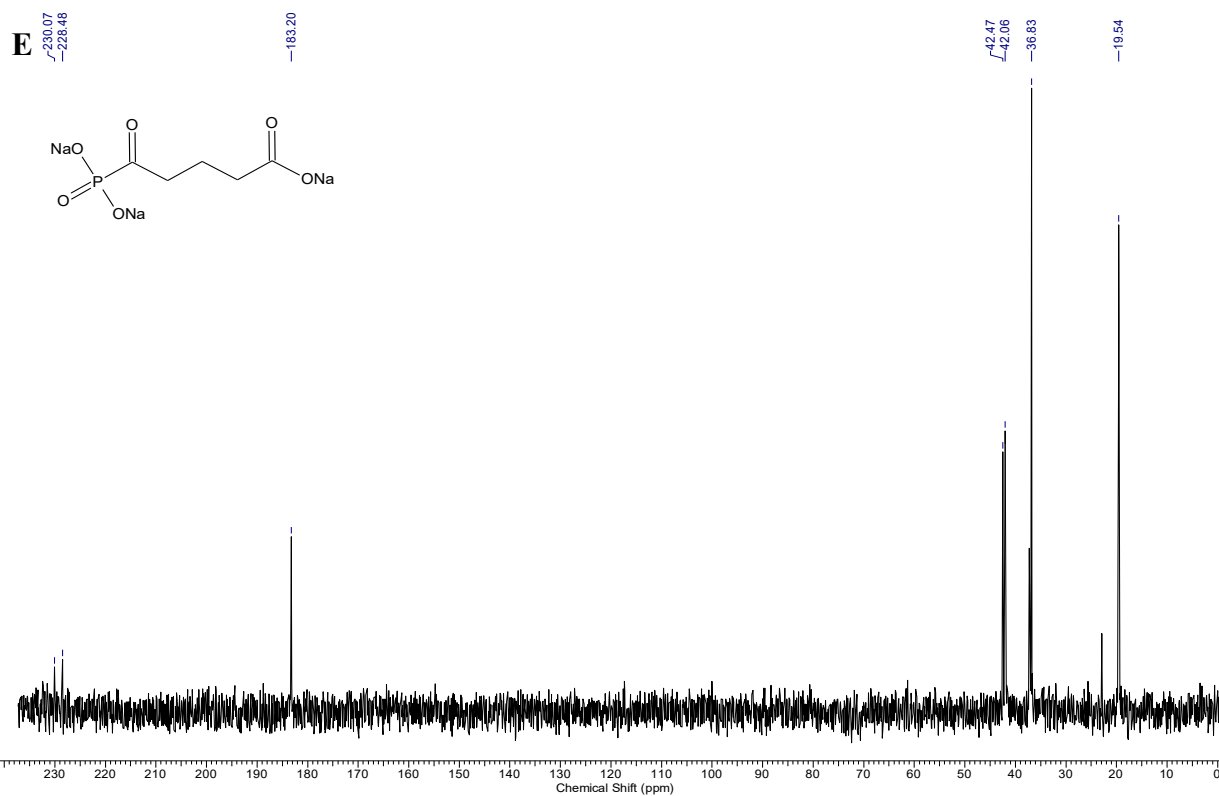
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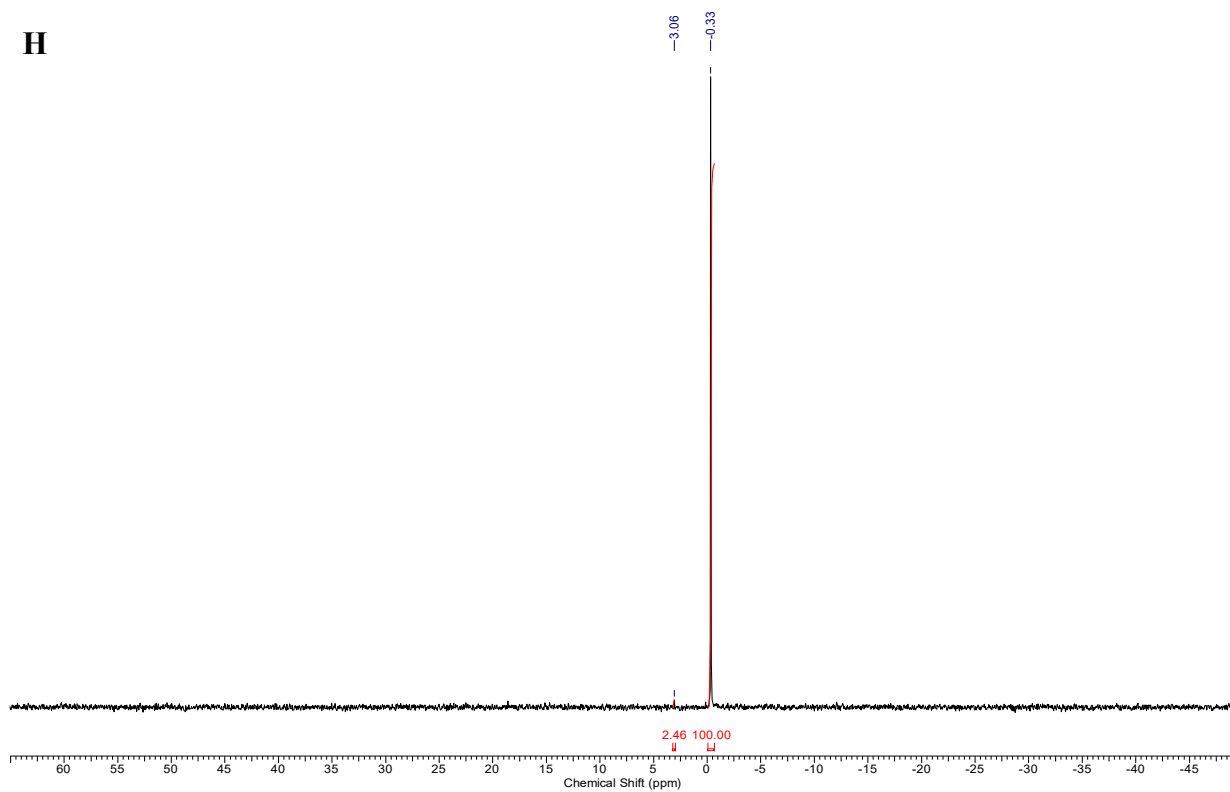
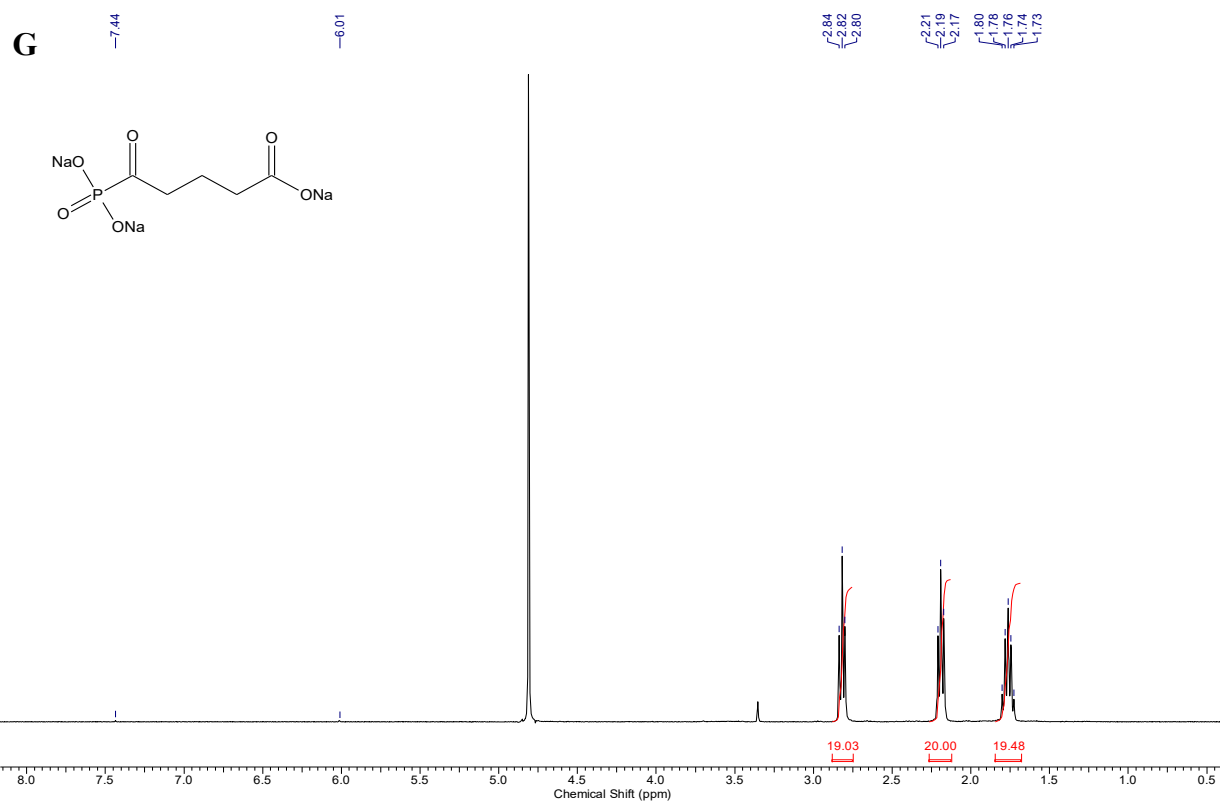
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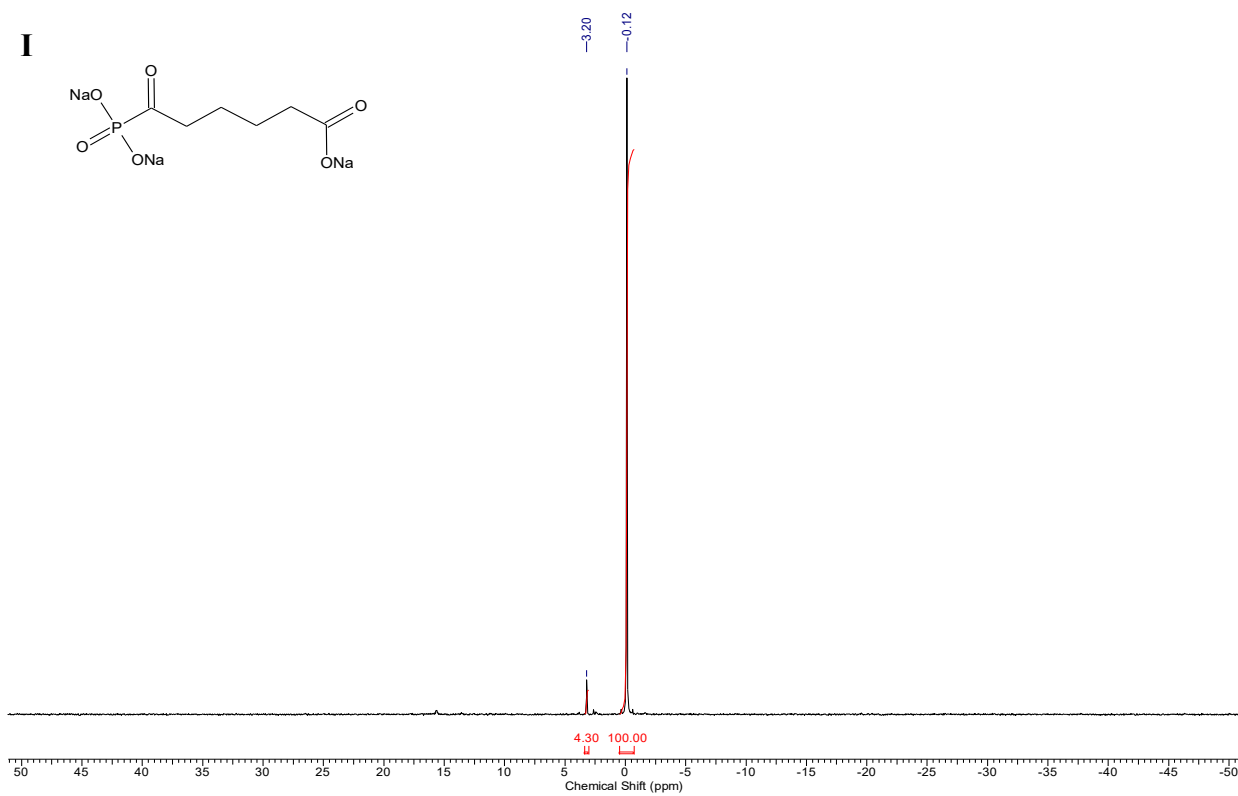
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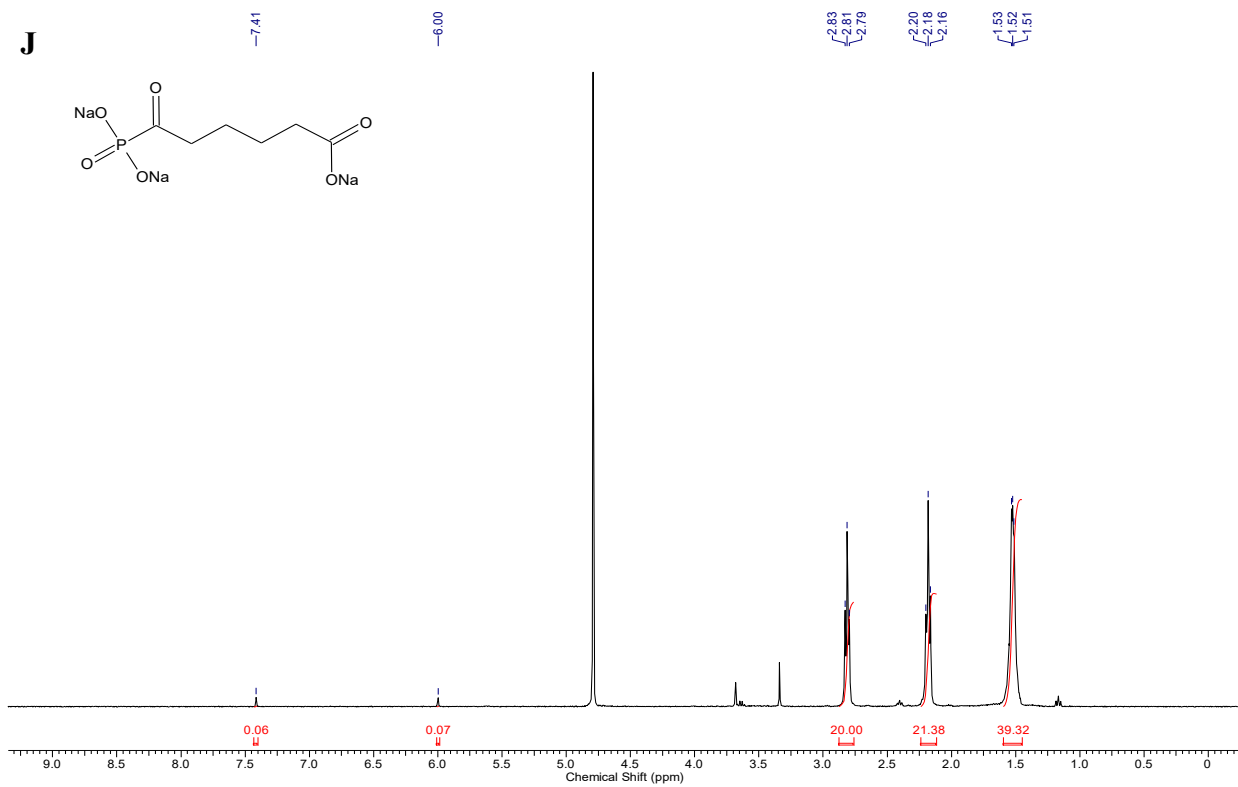
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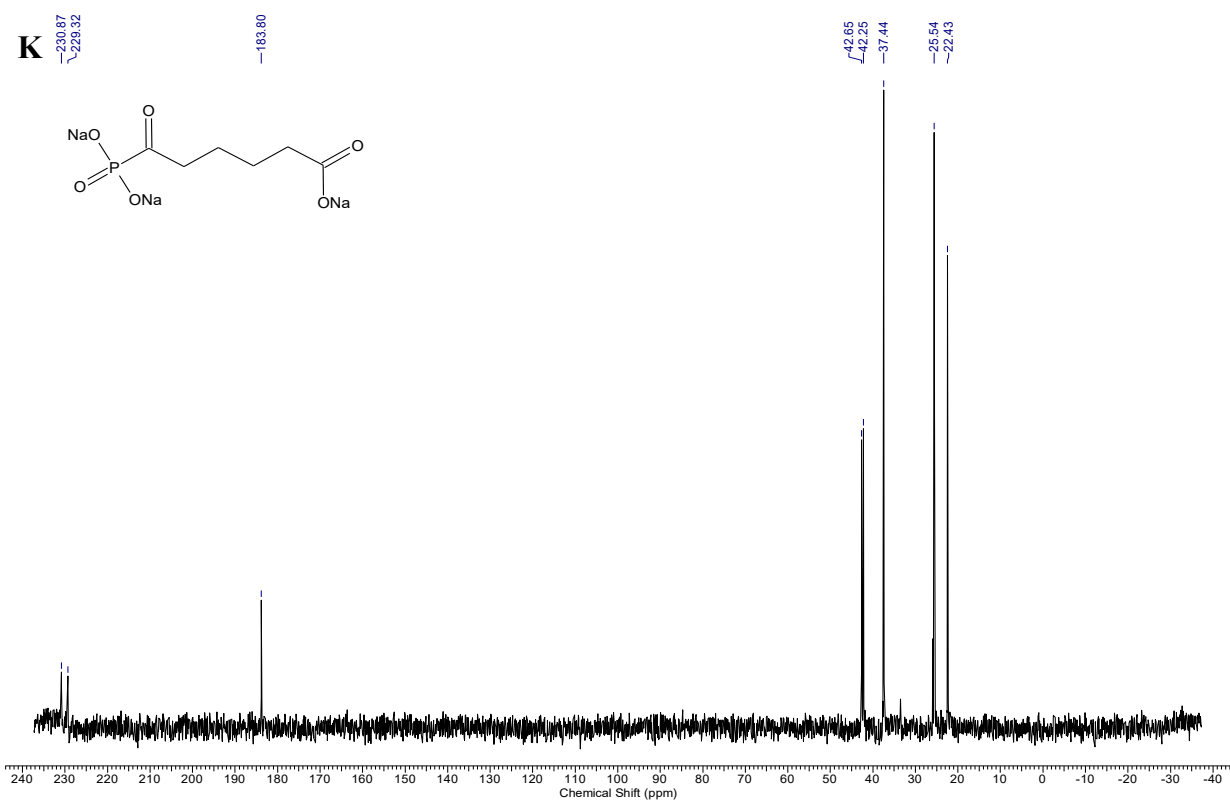


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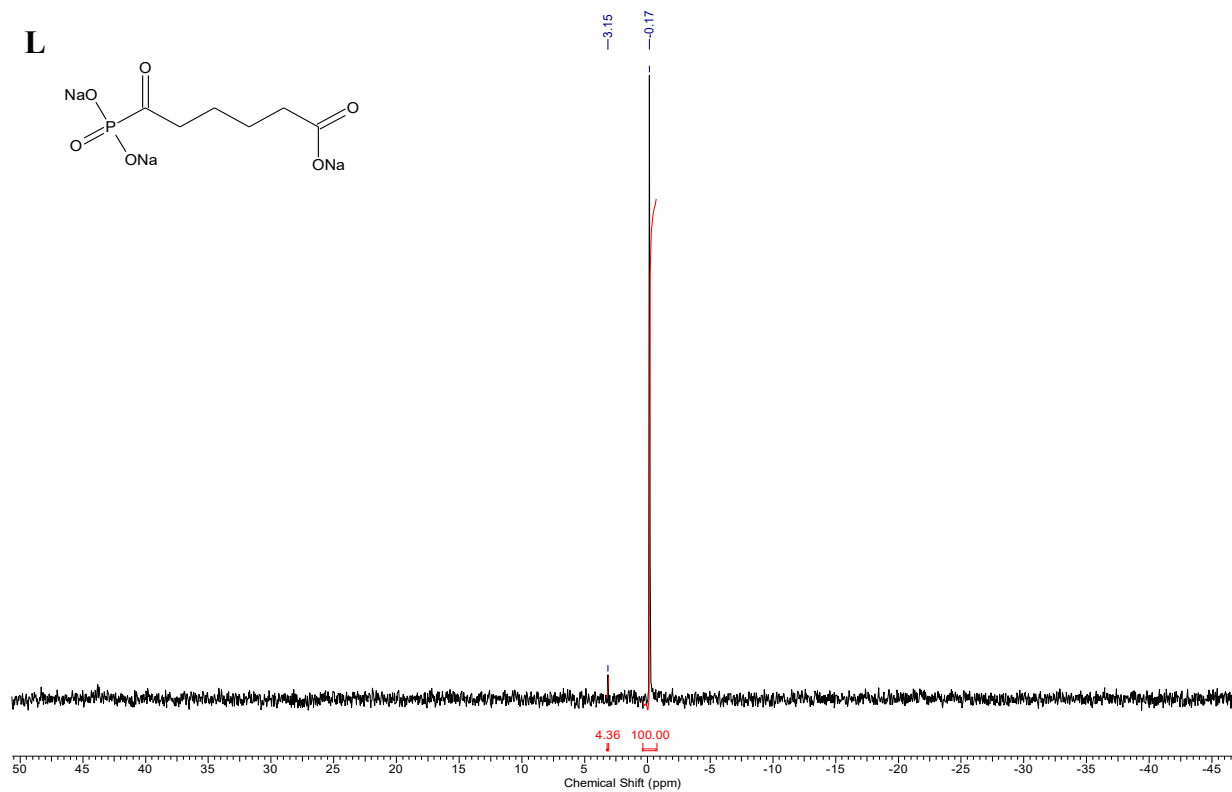
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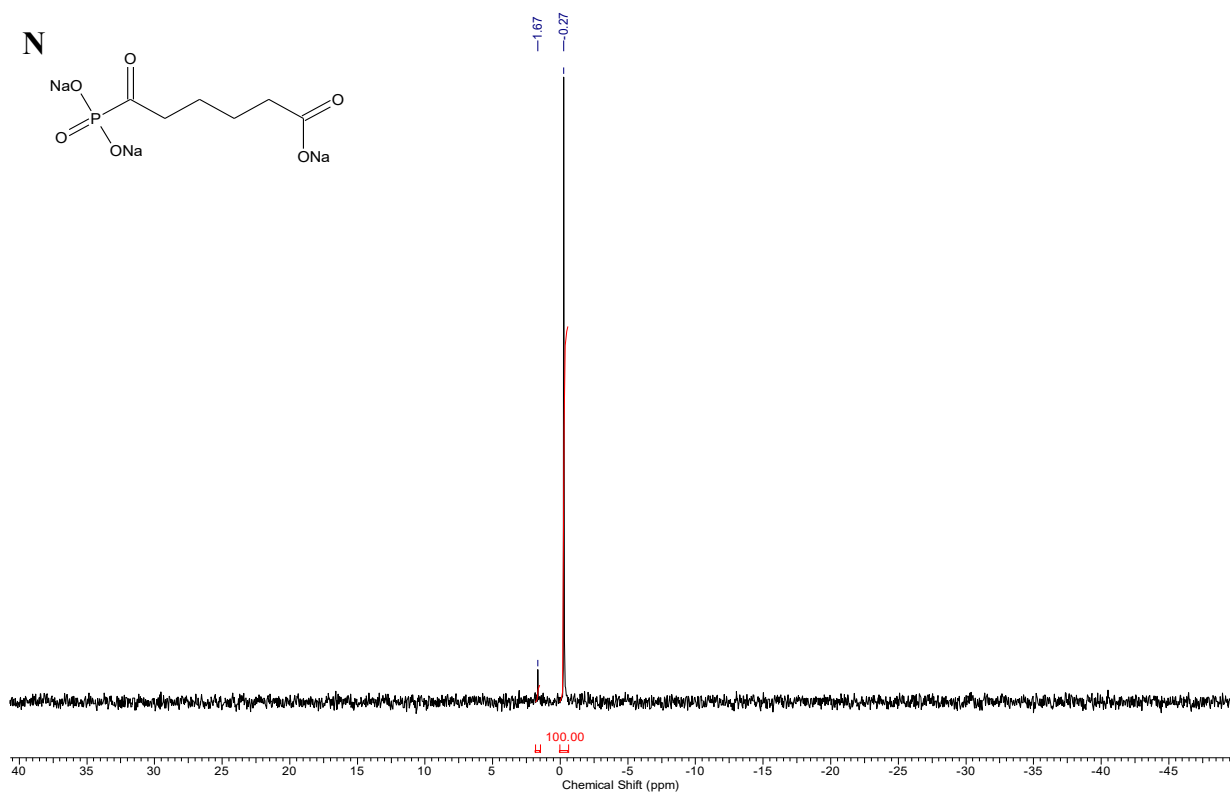
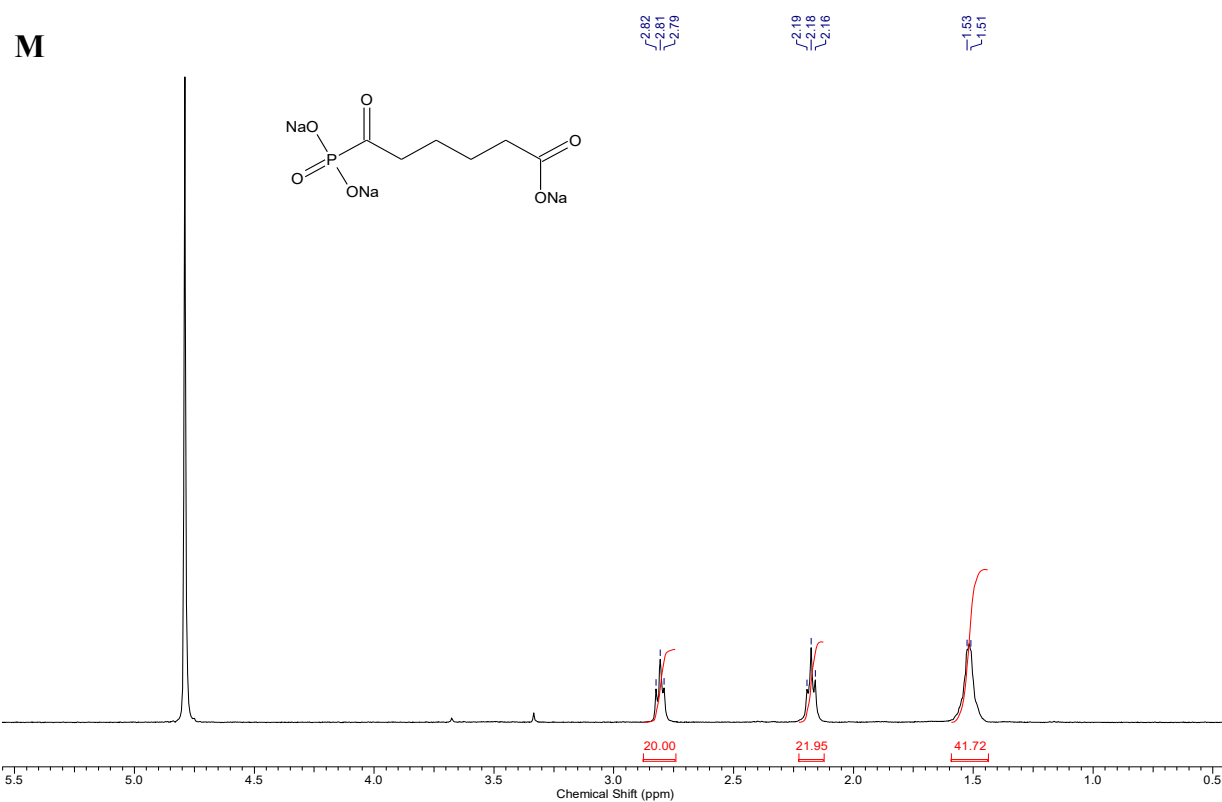
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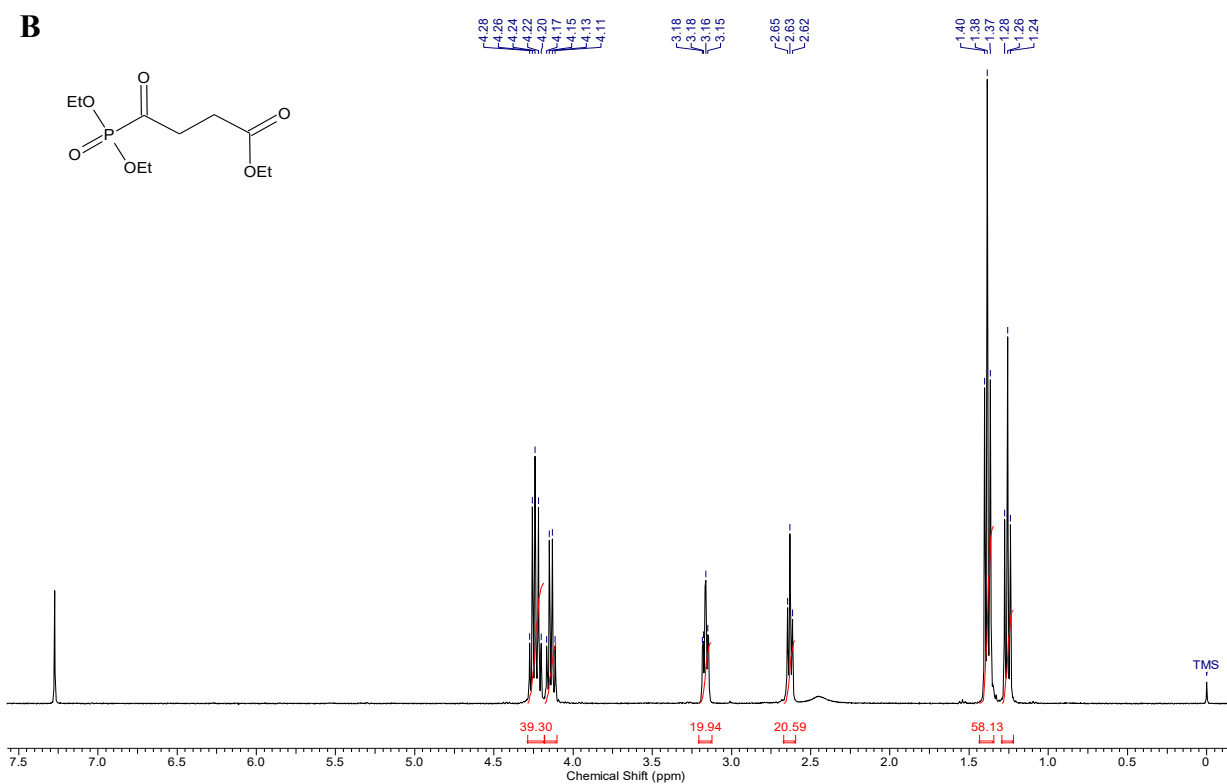
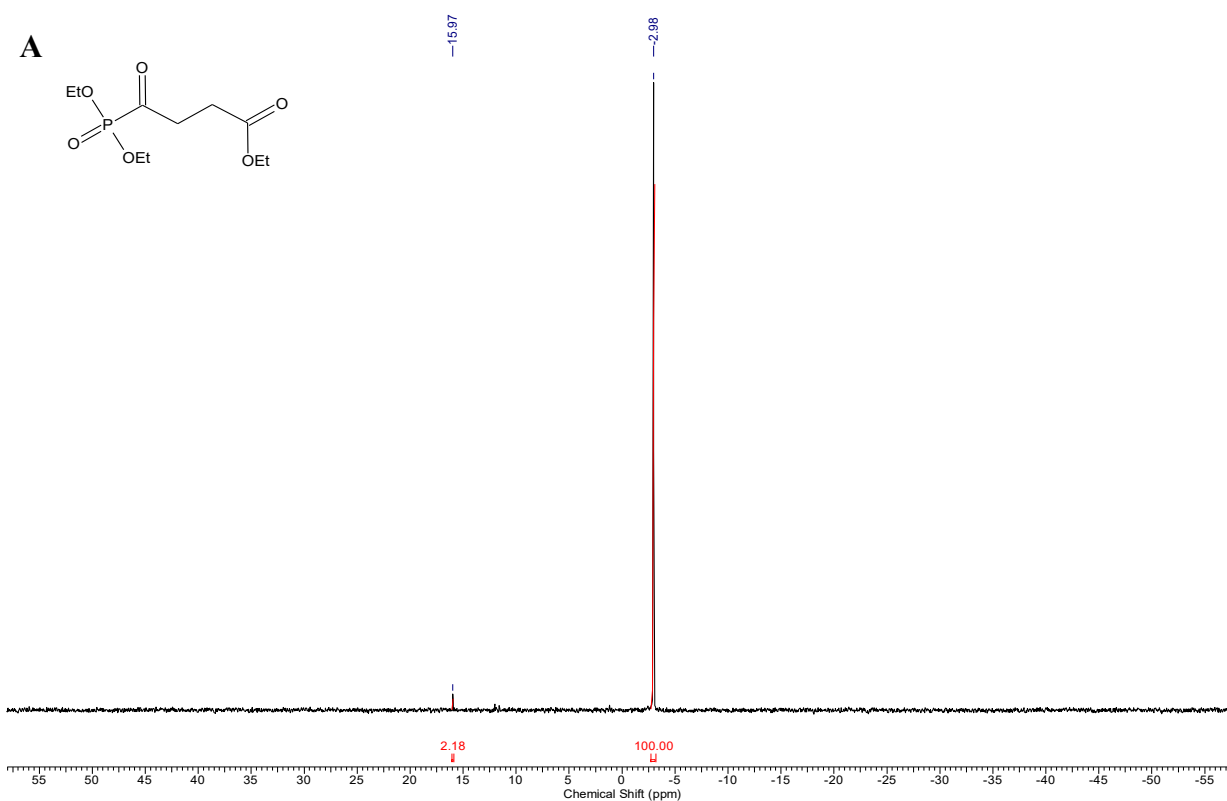


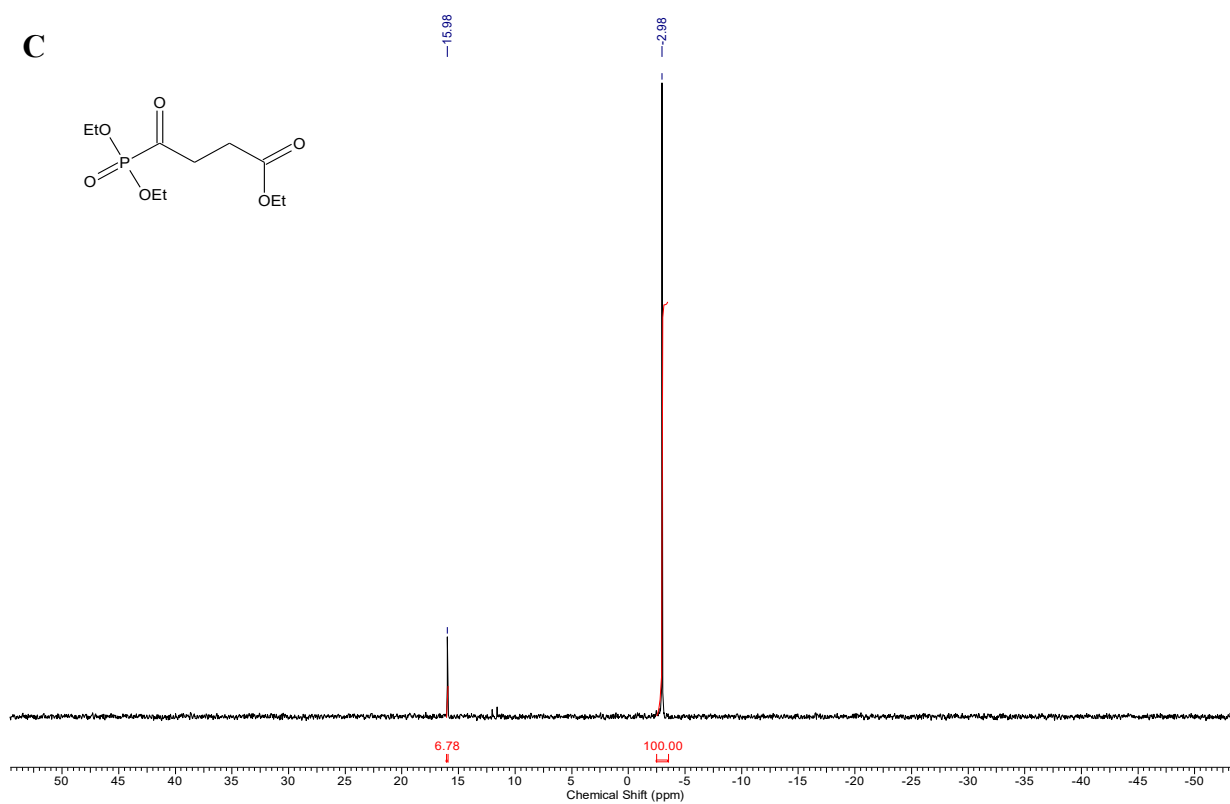
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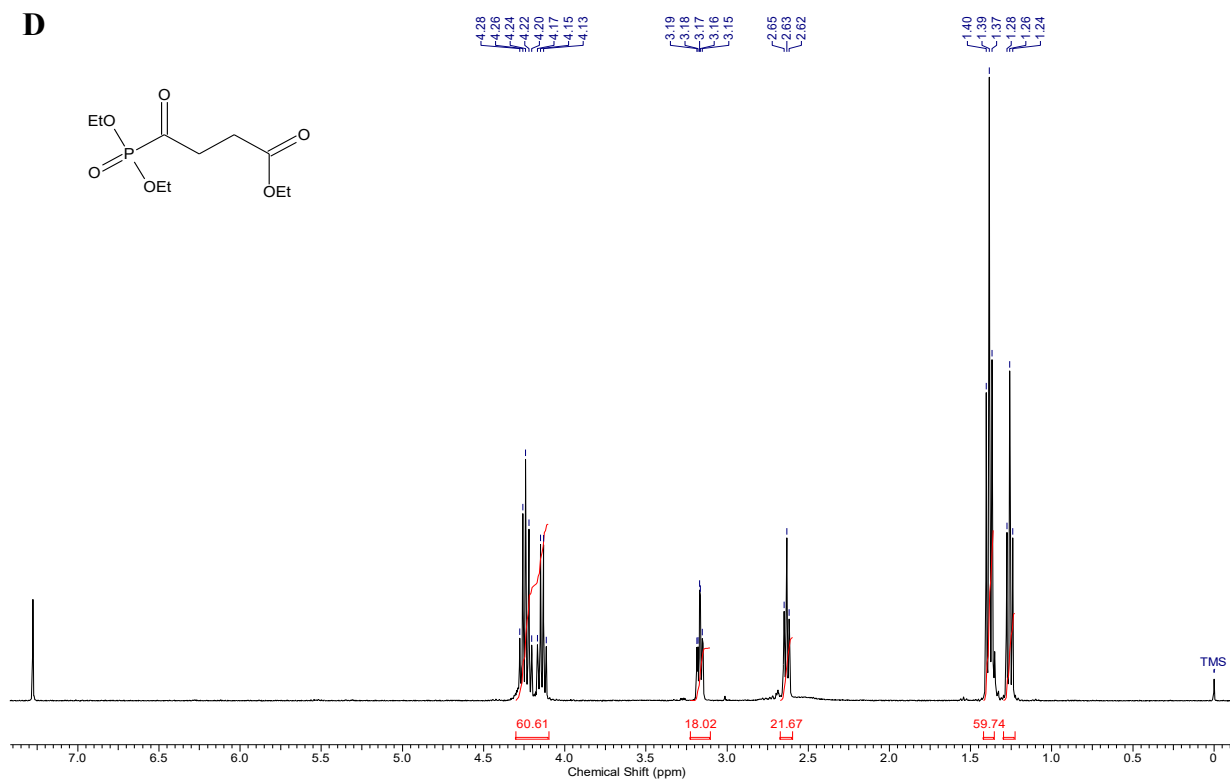
Supplementary Figure 1. NMR analysis of the stability of the 2-oxo phosphonates in the form of trisodium salts. The ^{31}P (A, C, F, H-I, L, N), ^1H (B, D, G, J, M) and ^{13}C (E, K) spectra of succinyl (SP; A-B), glutaryl (GP; C-H) and adipoyl (AP; I-K) phosphonates were obtained right after the synthesis (A-E, I-K),

18 after the shelf storage for 6 months (F-G, L-M) or after the storage of 0.2 M aqueous solutions at -20 °C for 2
 19 months (H, N).

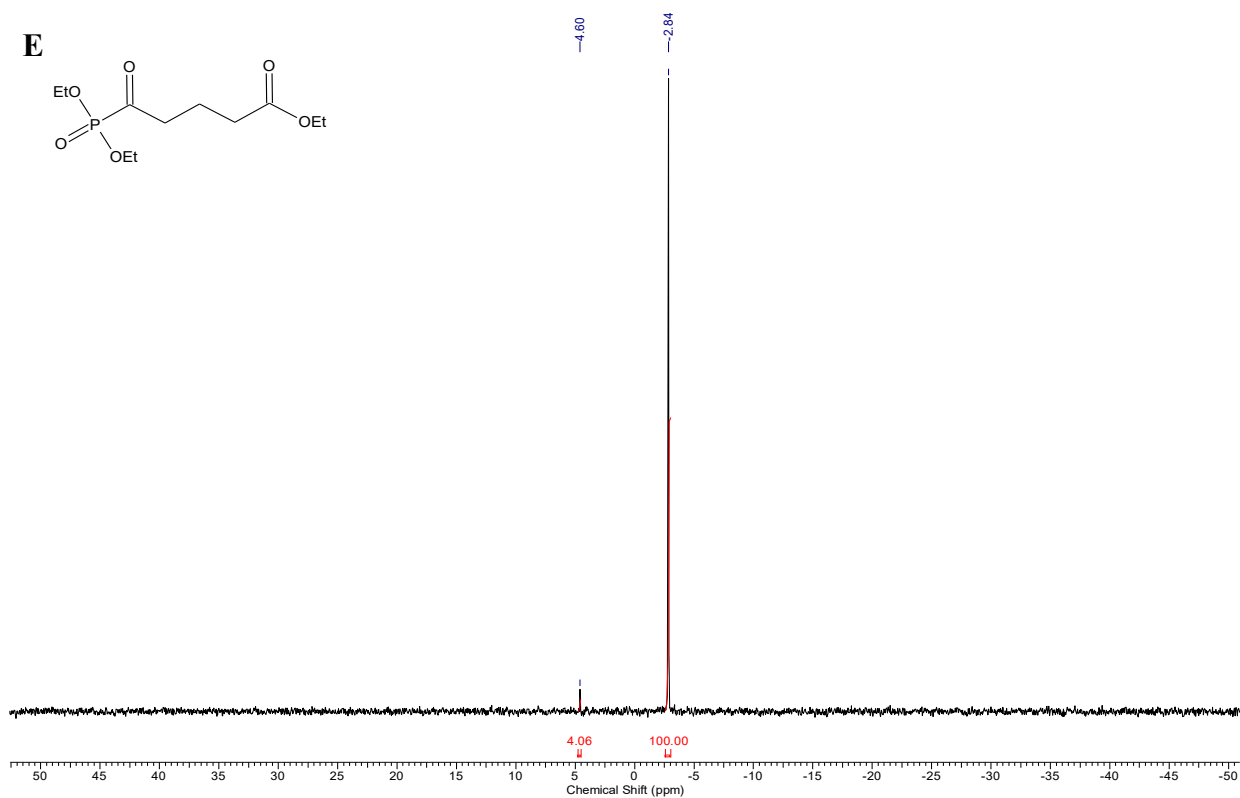


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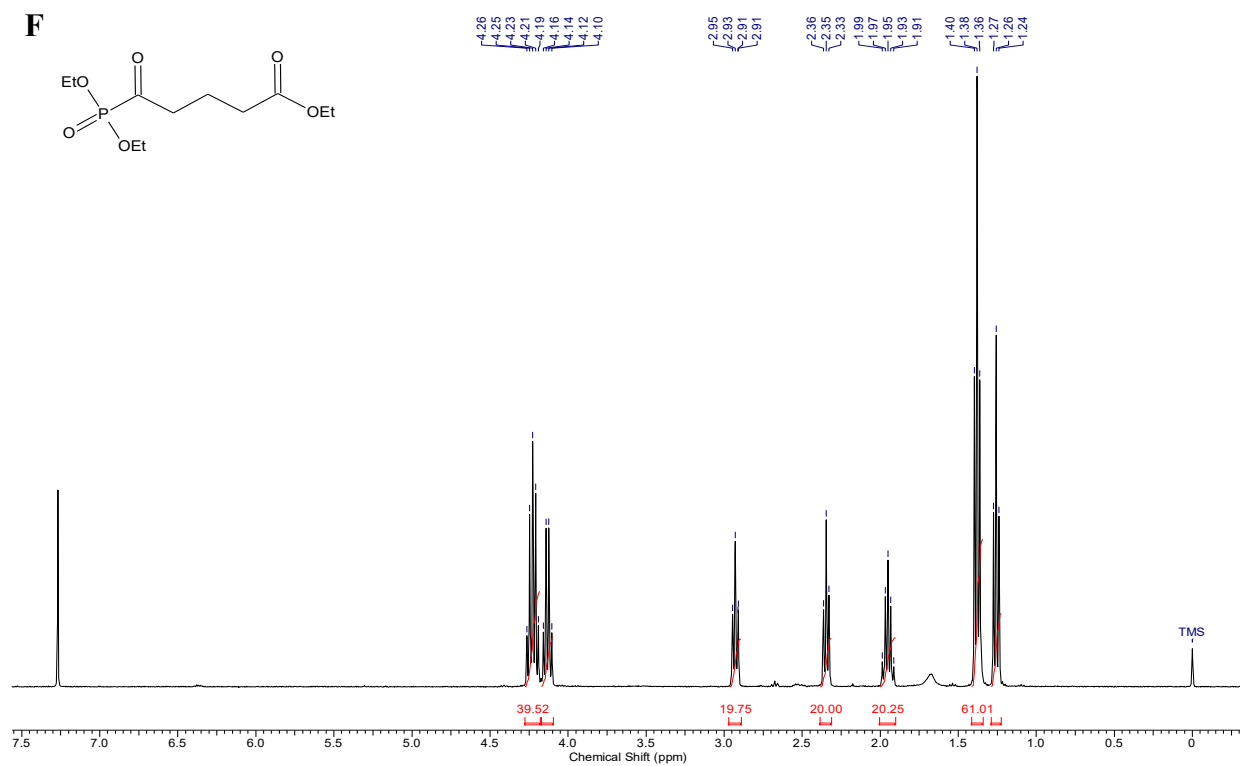
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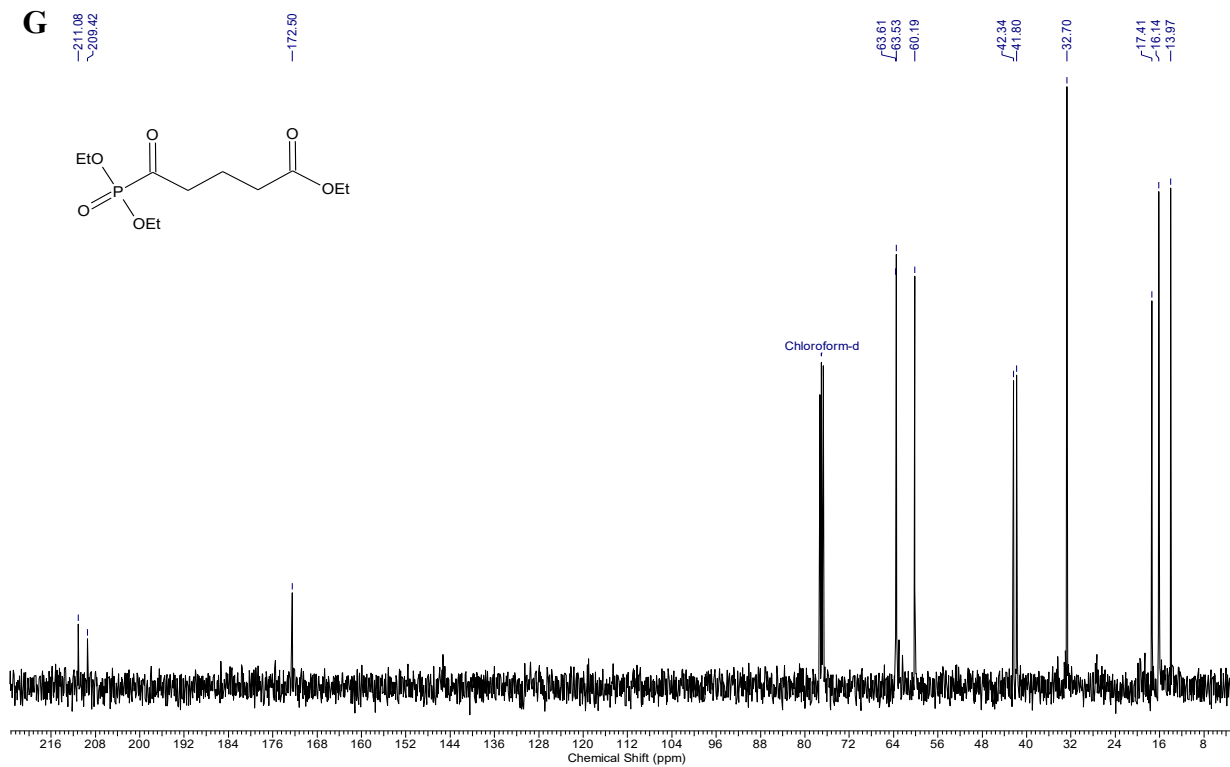
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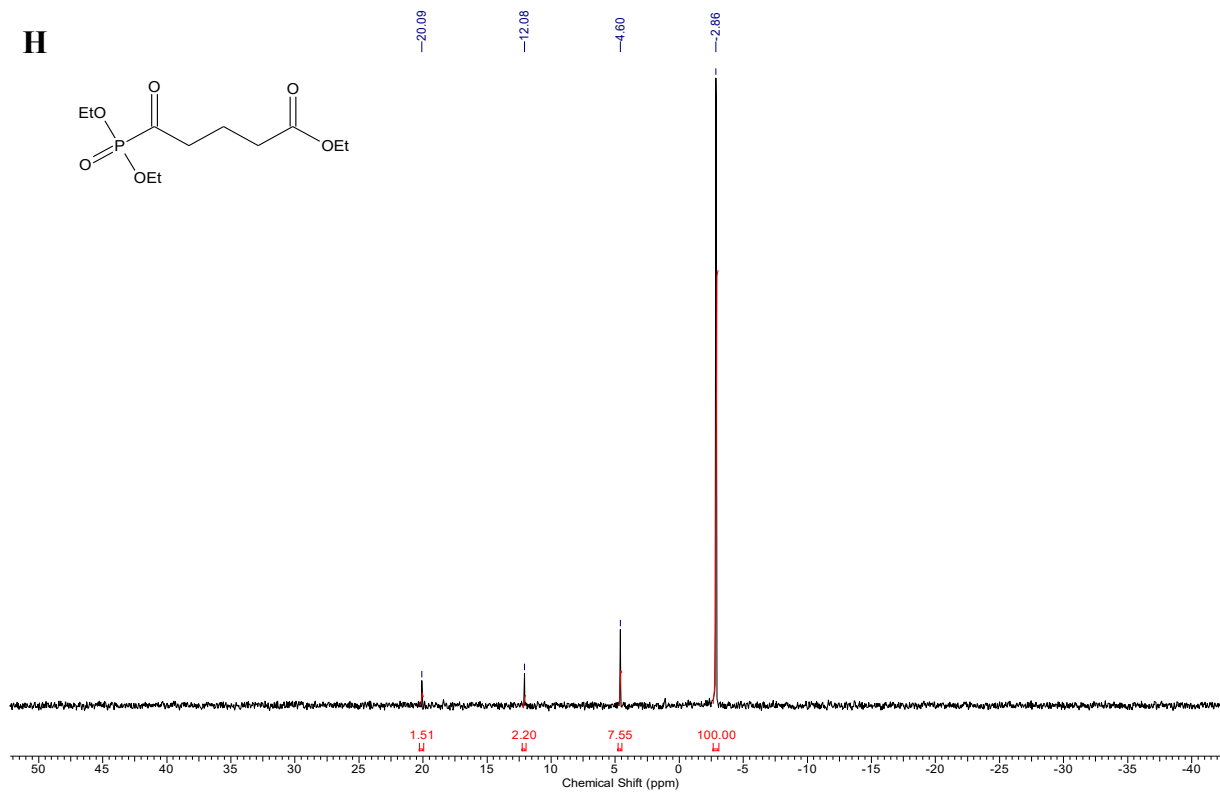
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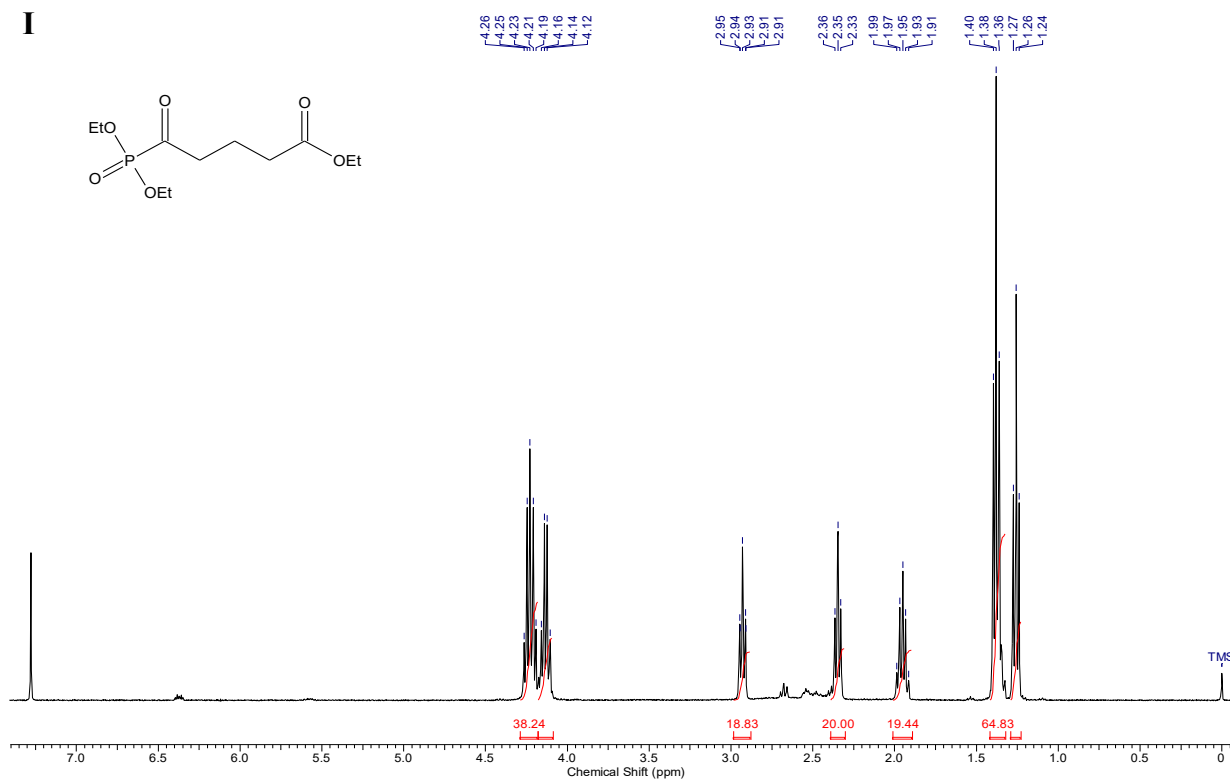
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G

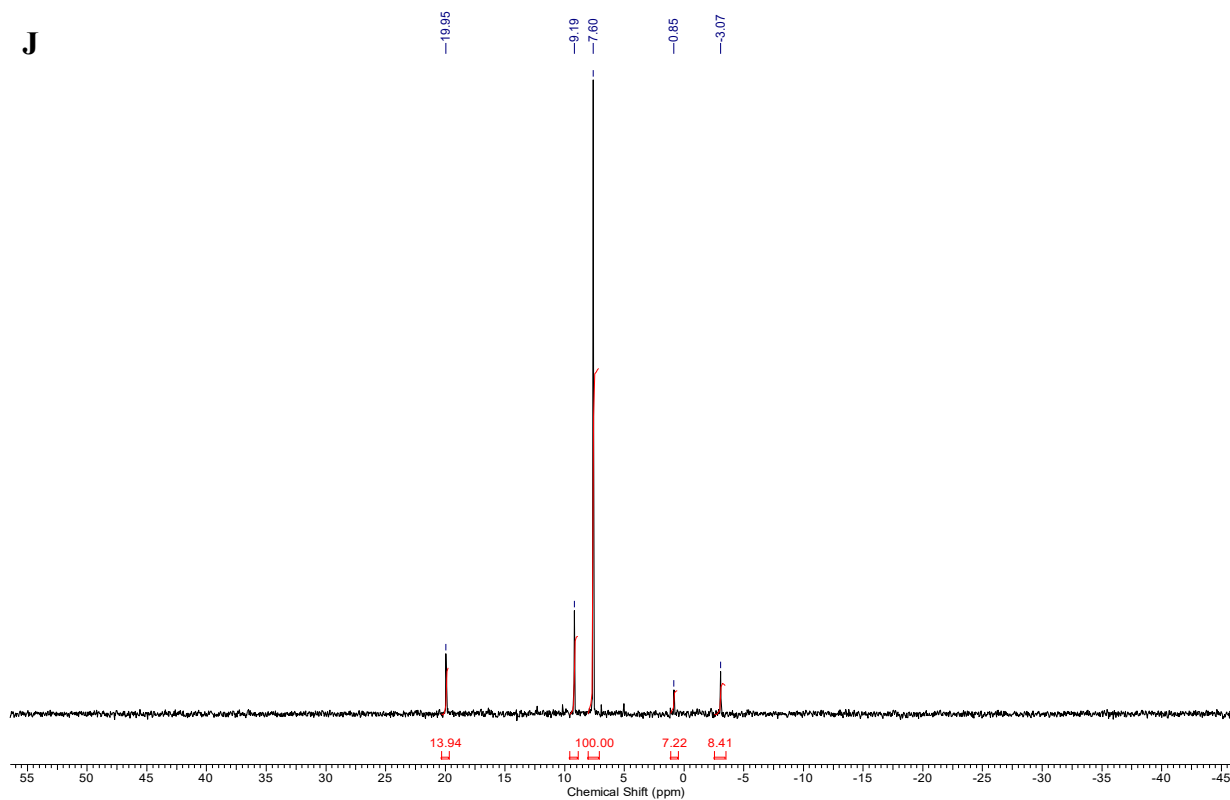
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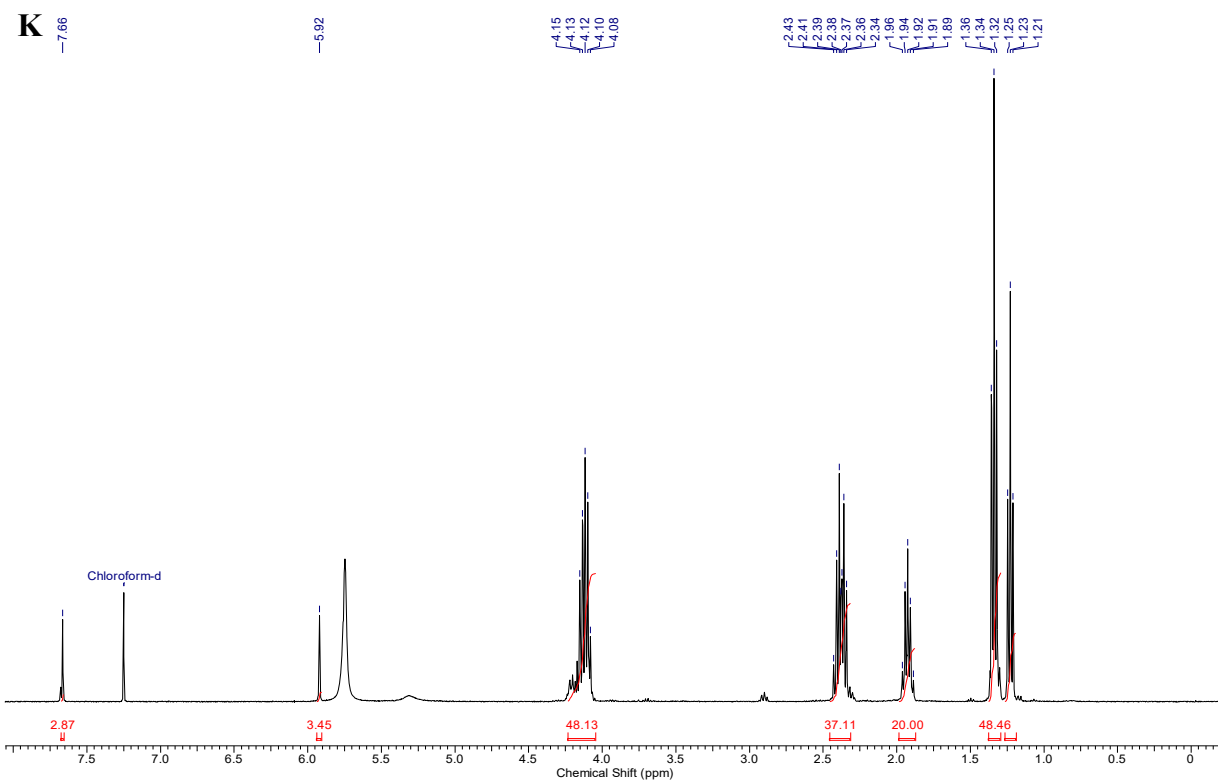
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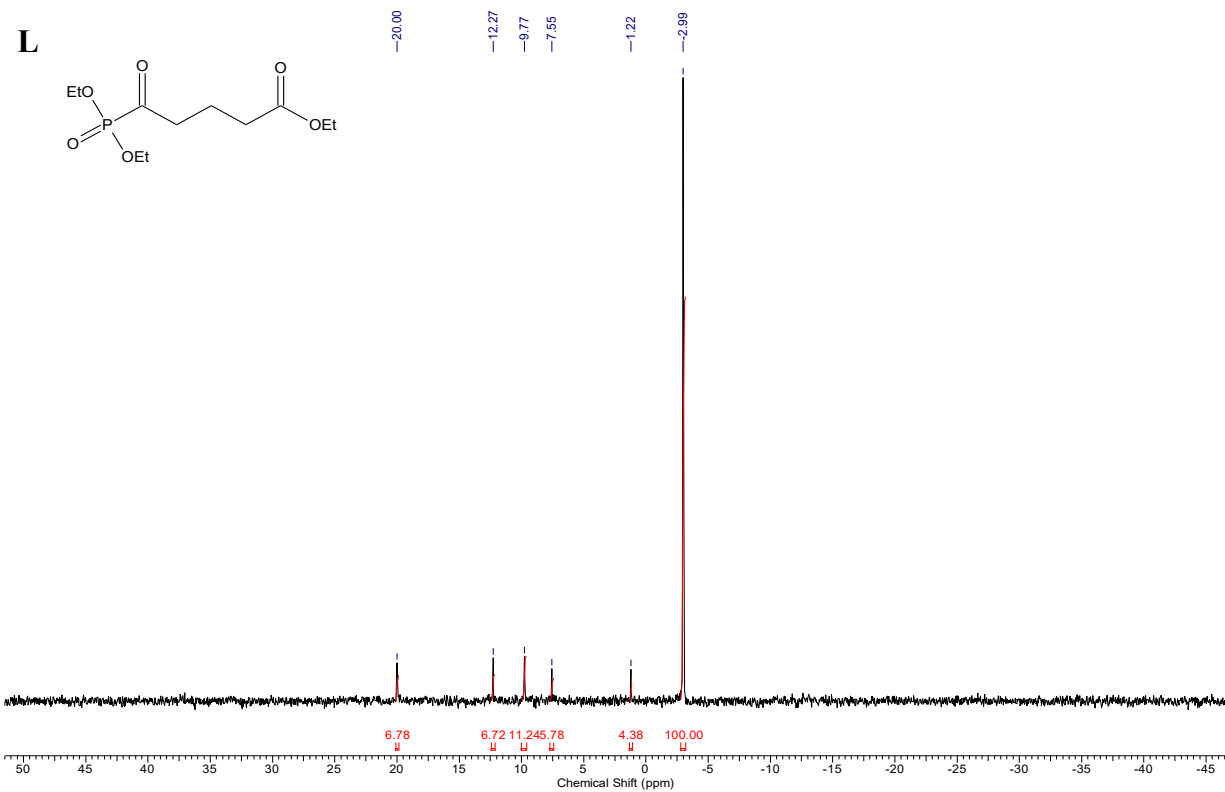
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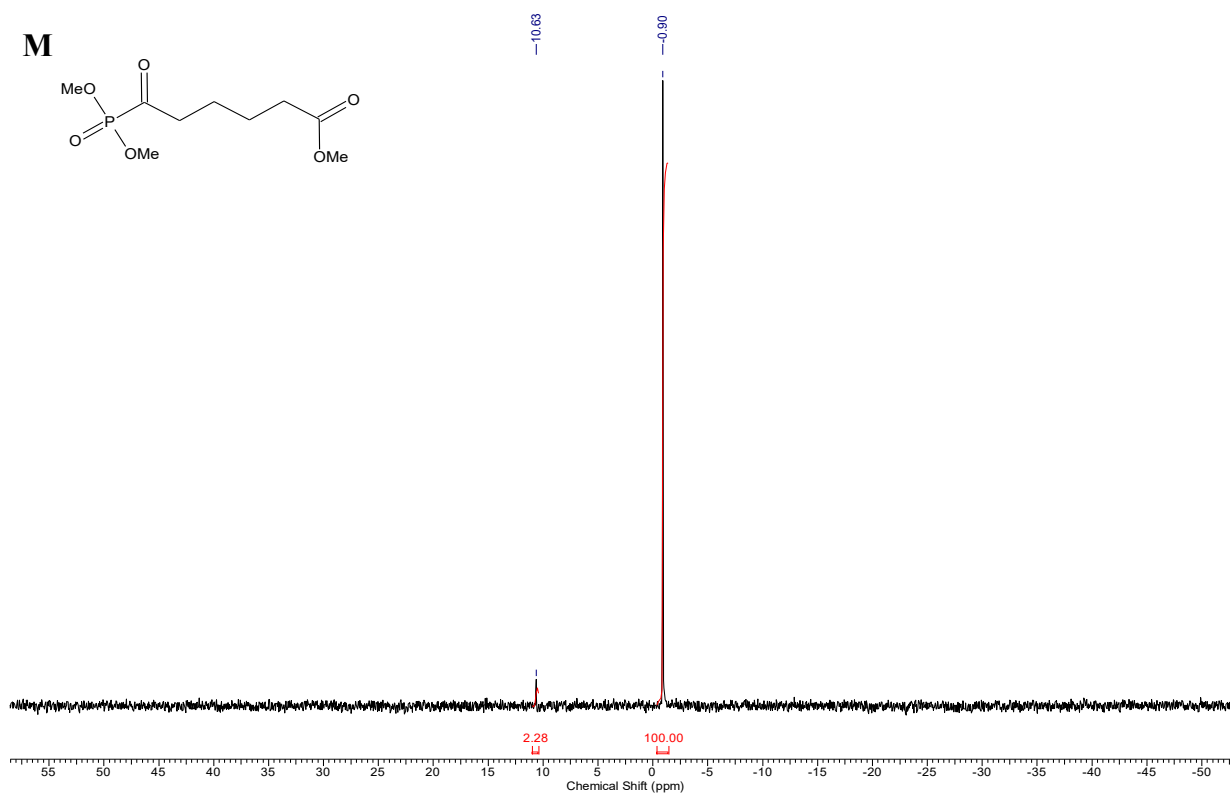
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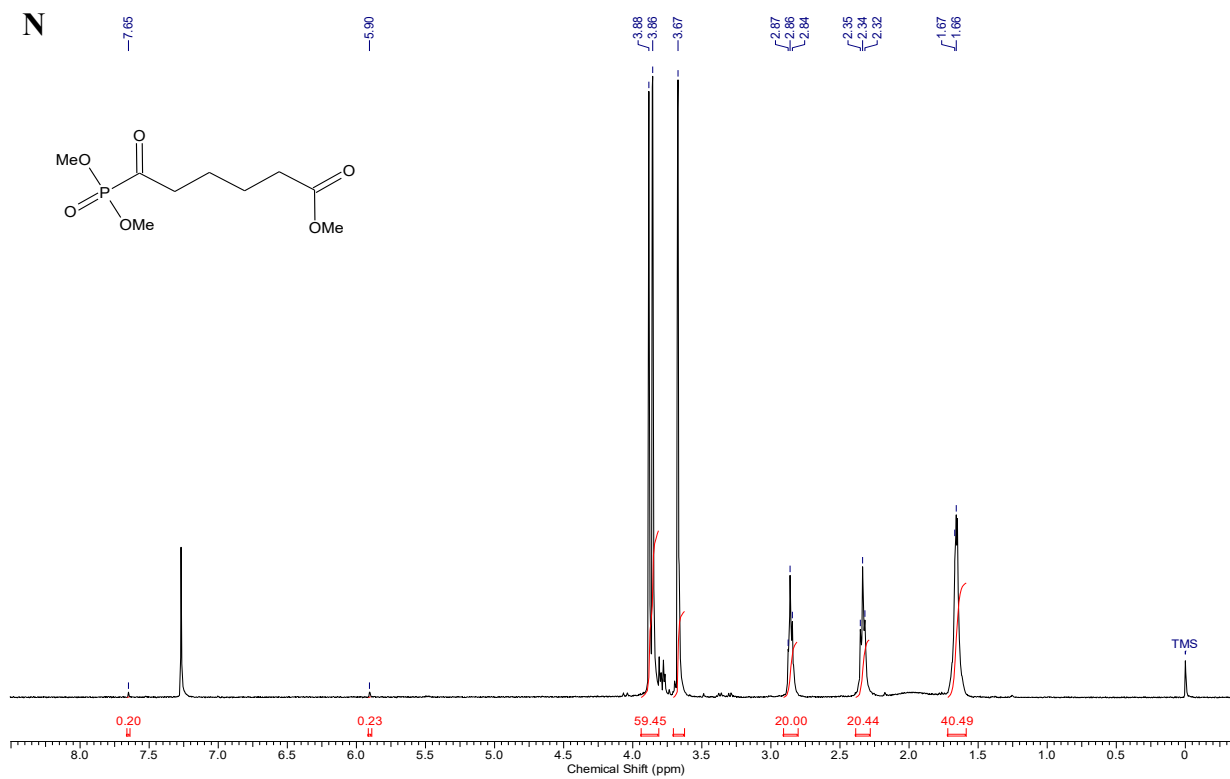
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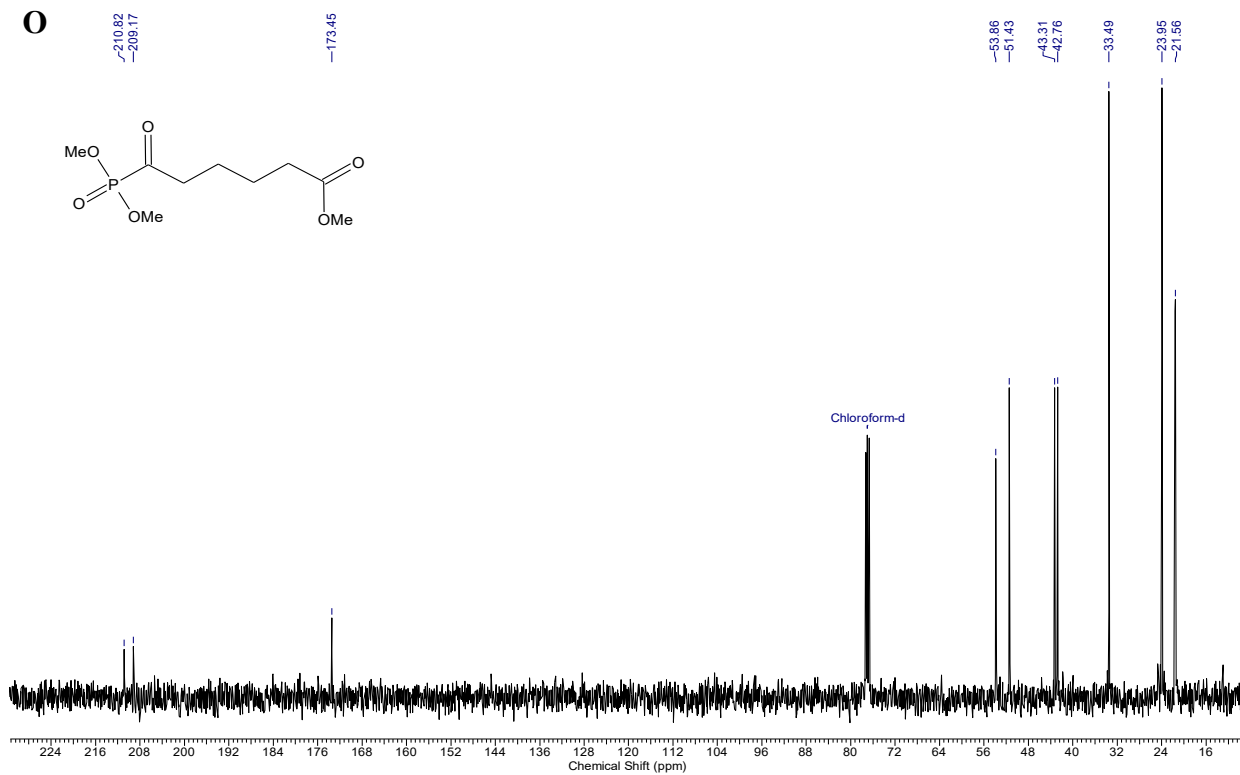
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M

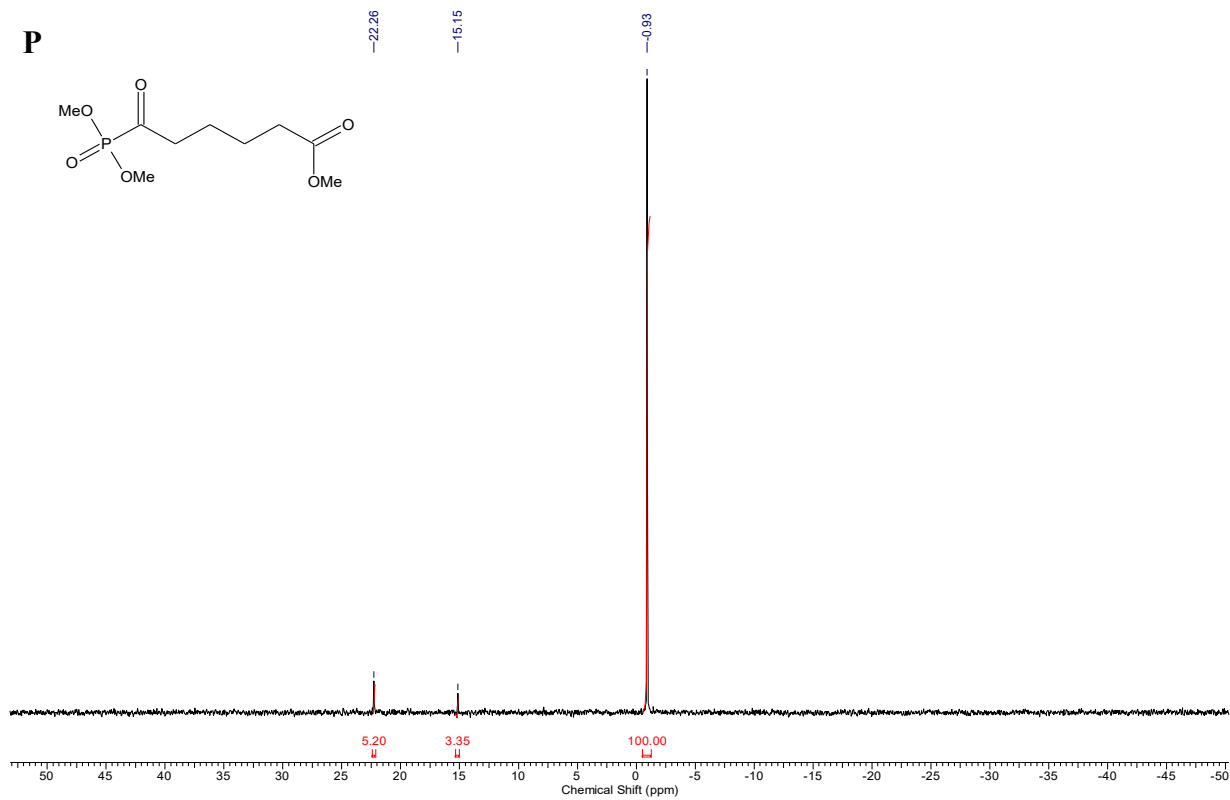
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N

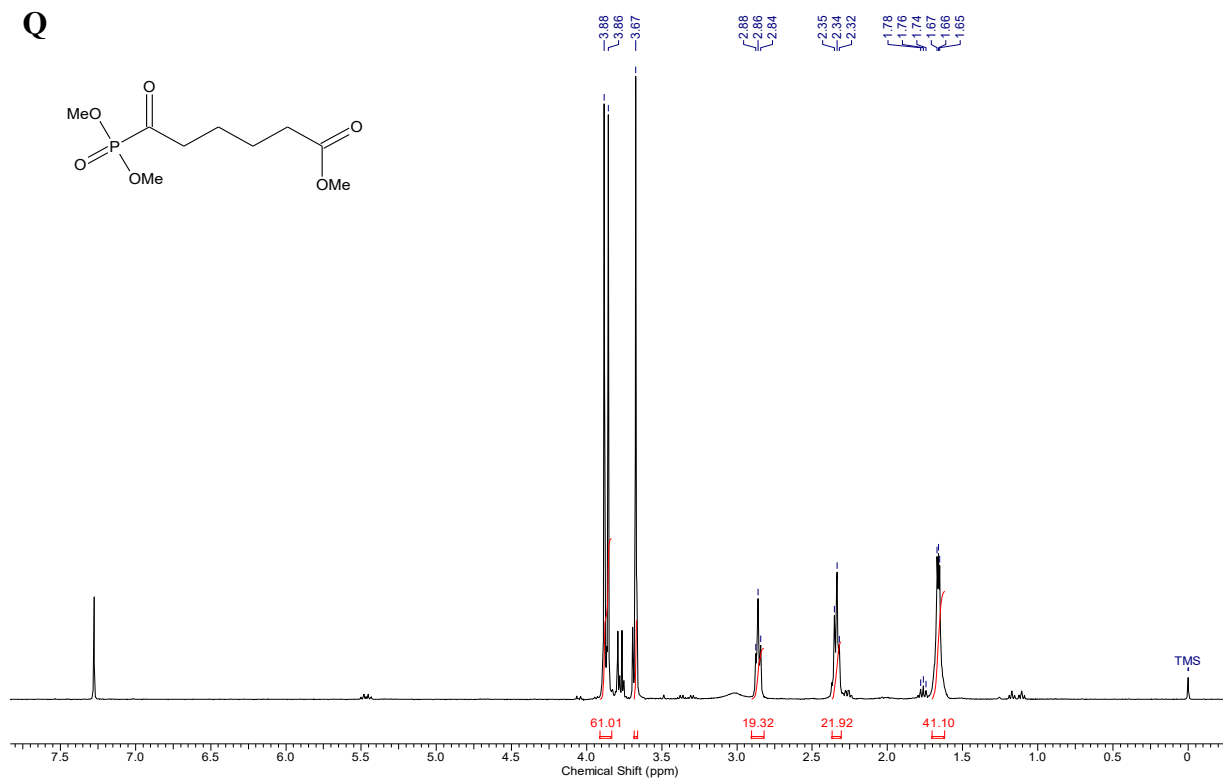
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O

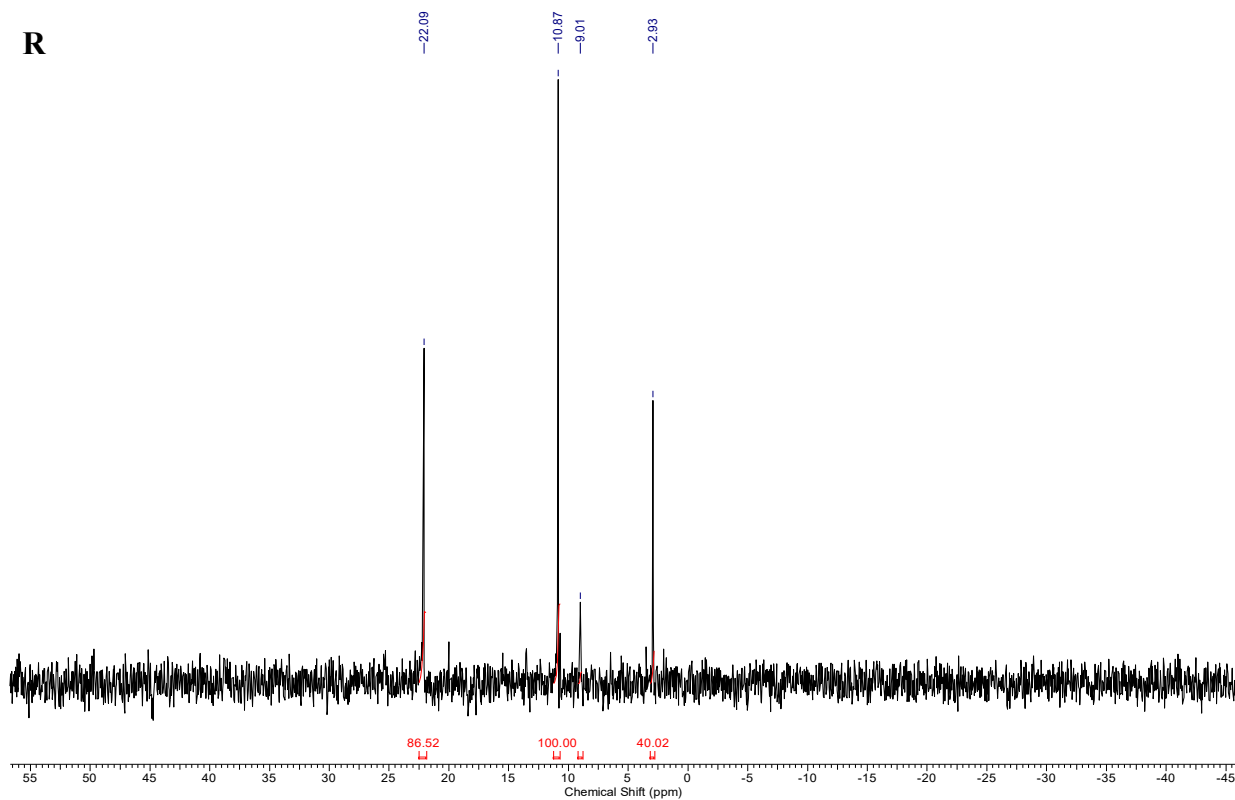
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P

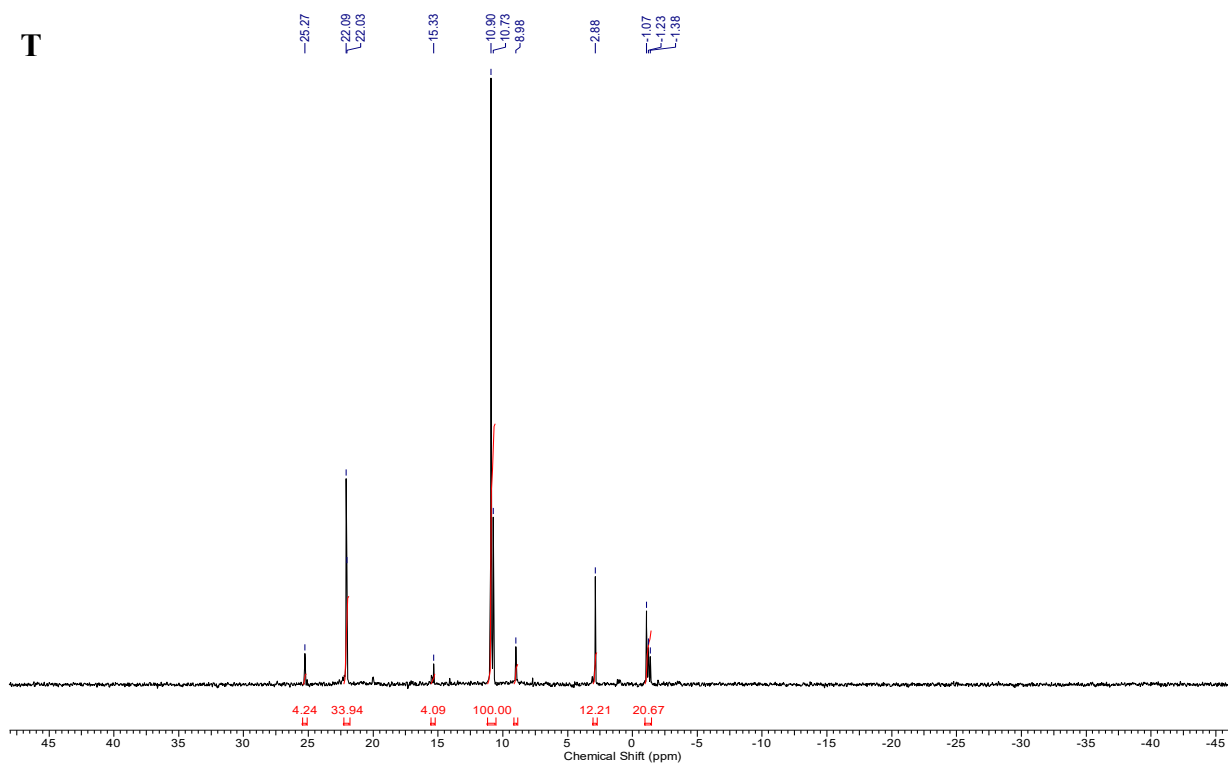
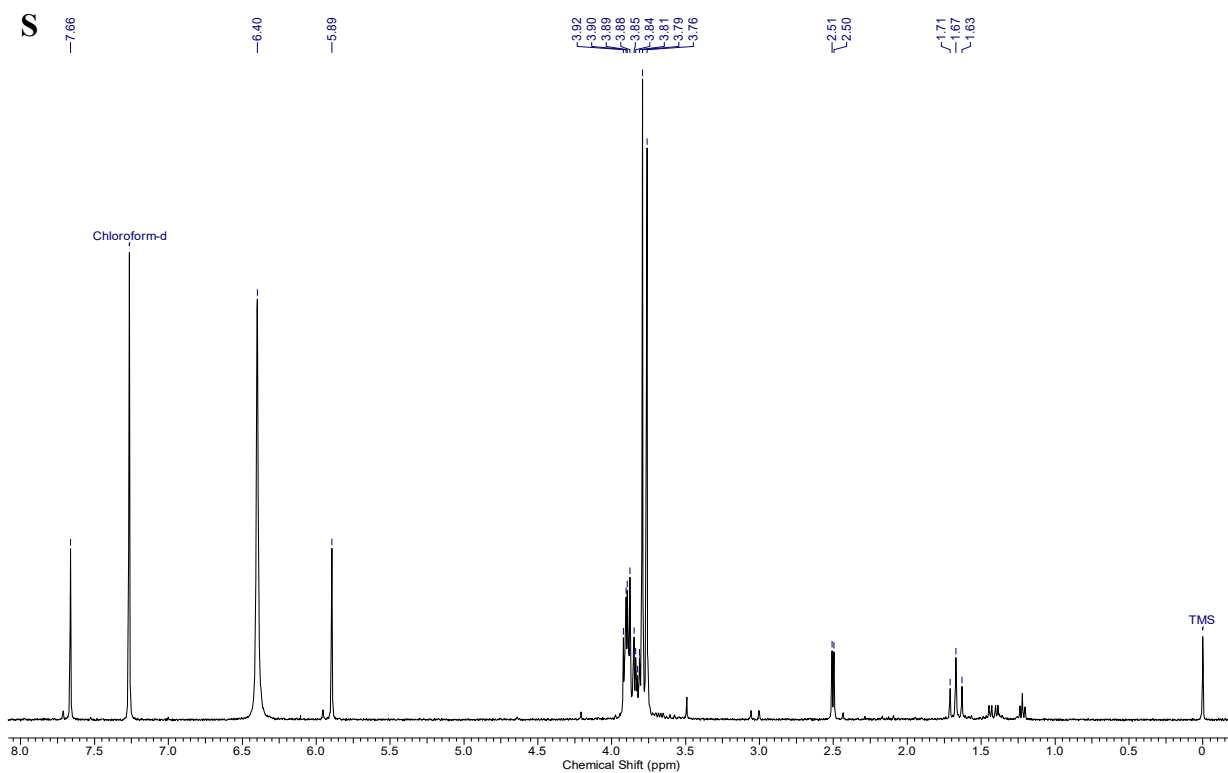
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Q

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R

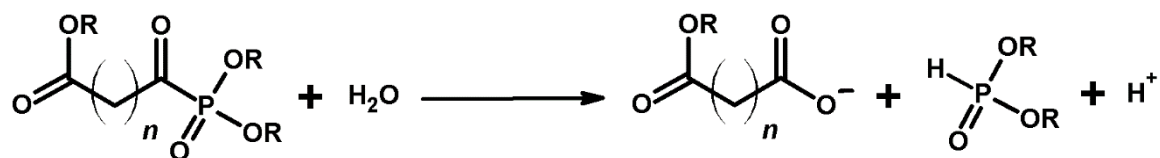
37



Supplementary Figure 2. NMR analysis of the stability of the 2-oxo phosphonates in their esterified forms. The ^{31}P (A, C, E, H, J, L-M, P, R, T), ^1H (B, D, F, I, K, N, Q, S) and ^{13}C (G, O) spectra of triethyl ester of succinyl phosphonate (TESP; A-D), triethyl ester of glutaryl phosphonate (TEGP; E-L) and trimethyl ester of adipoyl phosphonate (TMAP; M-T) were obtained right after the synthesis (A-B, E-G, M-O), after storage

44 for 6 months under argon (C-D, H-I, P-Q), for 5 days after exposure to air (J-K, R-S) or for 5 days as 0.2 M
 45 solutions in water (L, T).

46



47

48 **Supplementary Figure 3. Scheme of the decomposition of phosphonate esters during storage.** For triethyl
 49 succinyl phosphonate: R- = CH₃CH₂-, n = 2; for triethyl glutaryl phosphonate: R- = CH₃CH₂-, n = 3; for
 50 trimethyl adipoyl phosphonate: R- = CH₃-, n = 4.