

Electronic Supplementary Information for:

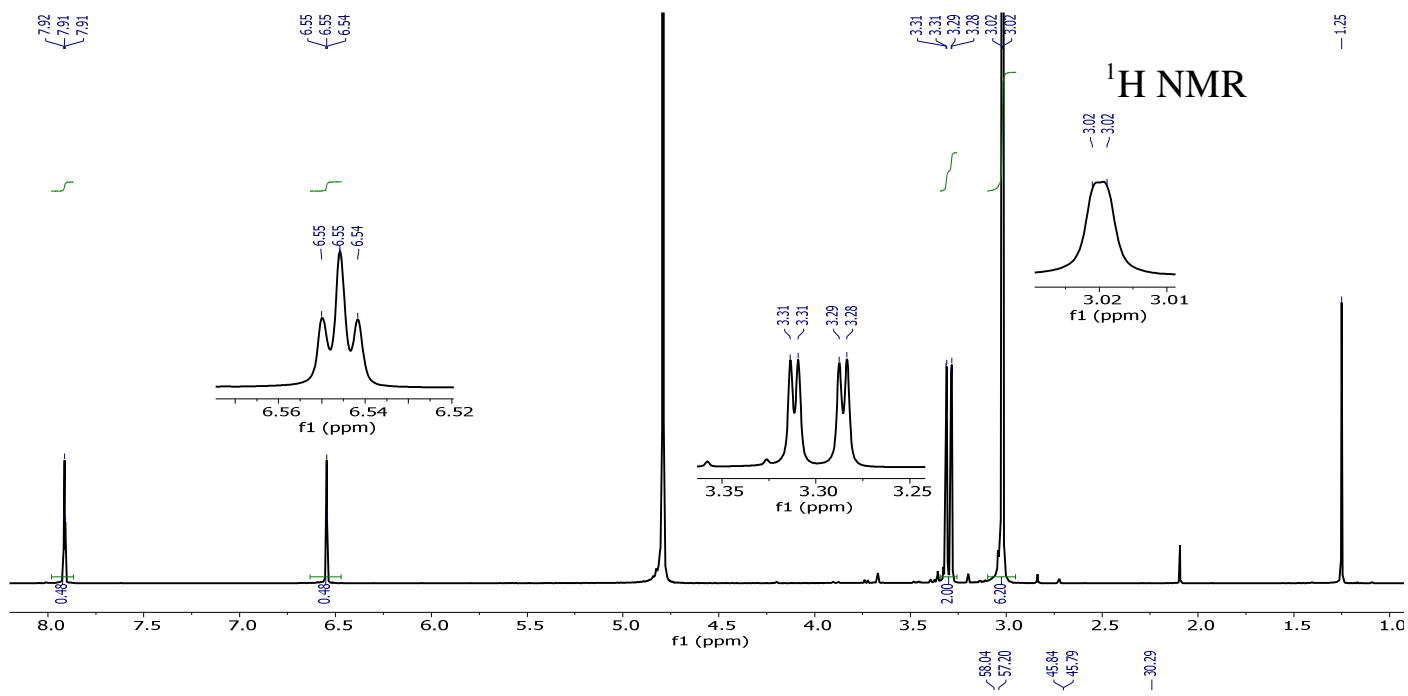
**Selective and clean synthesis of amino H-phosphinic acids from hypophosphorus acid by
phospha-Mannich reaction**

Peter Urbanovský, Jan Kotek, Ivana Císařová and Petr Hermann*

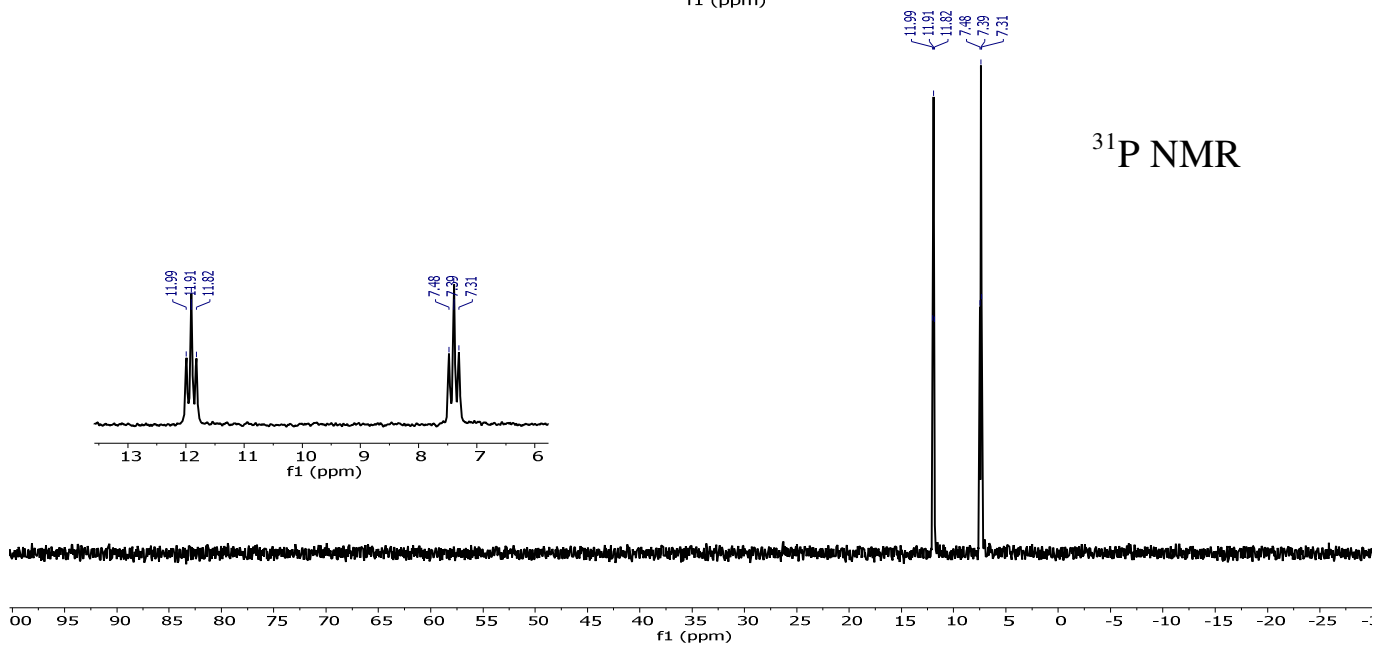
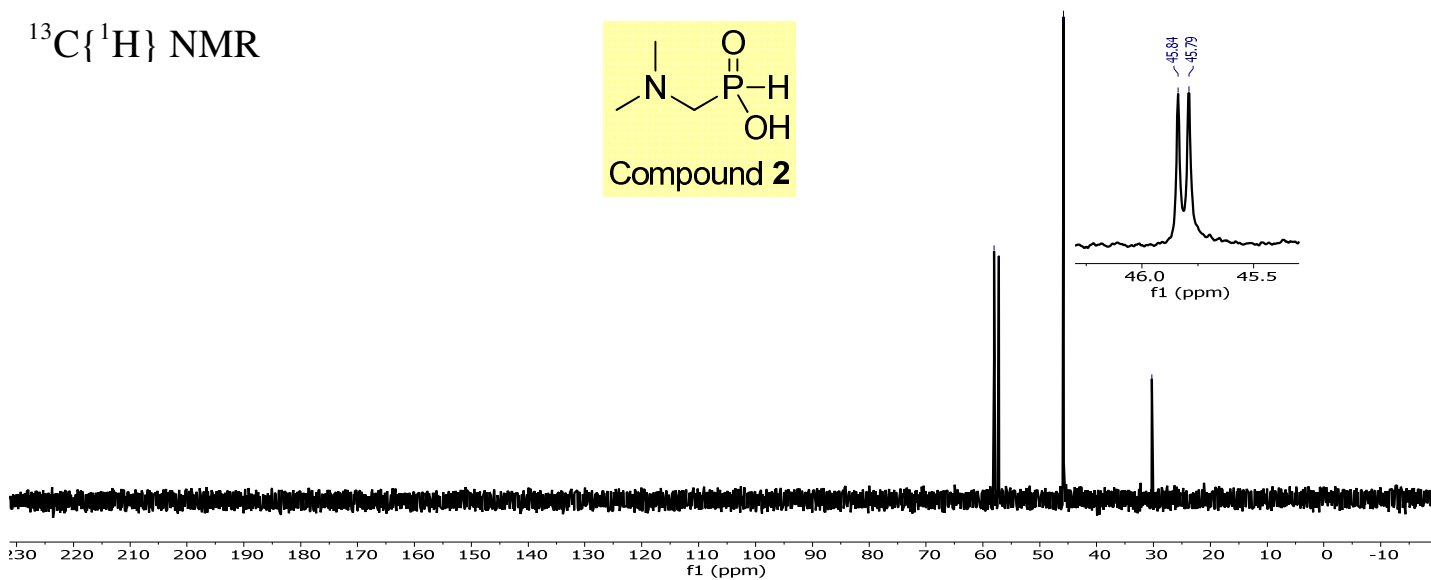
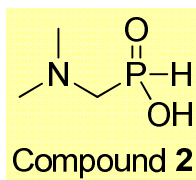
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12843 Prague 2, Czech Republic. Tel.: +420-22195-1263, fax: +420-22195-1253, e-mail: petrh@natur.cuni.cz

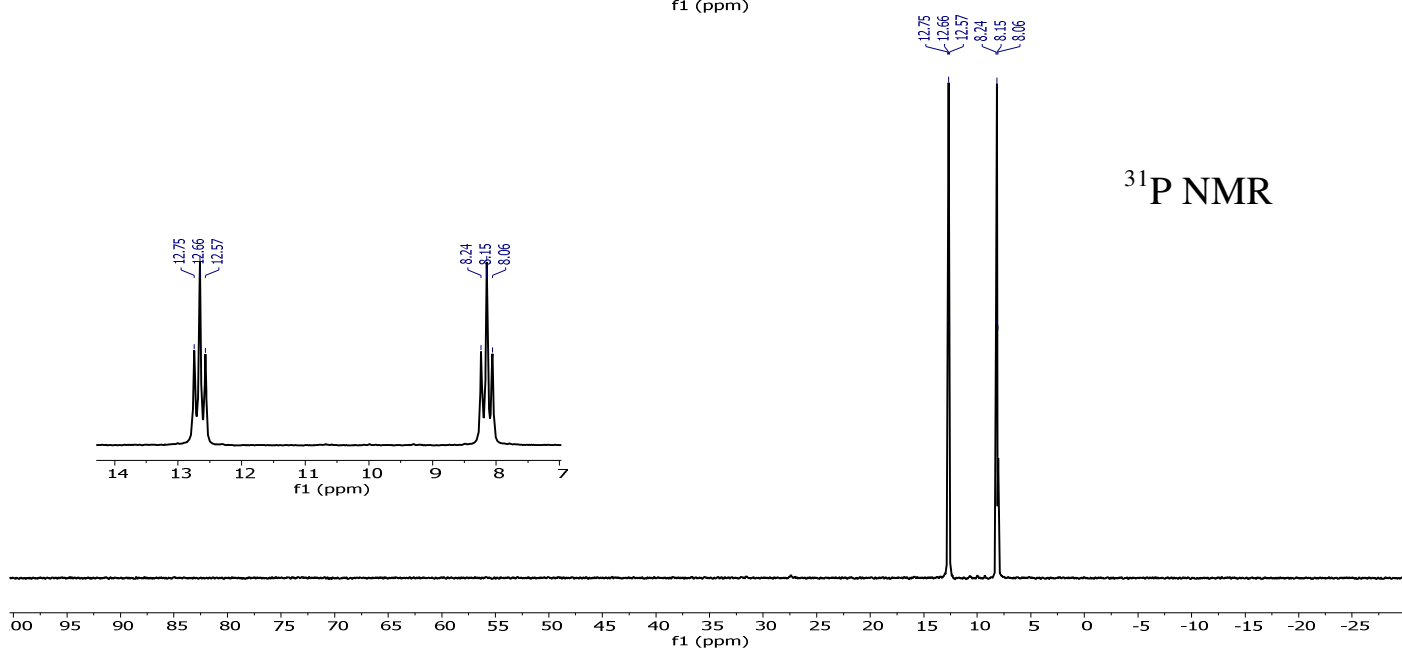
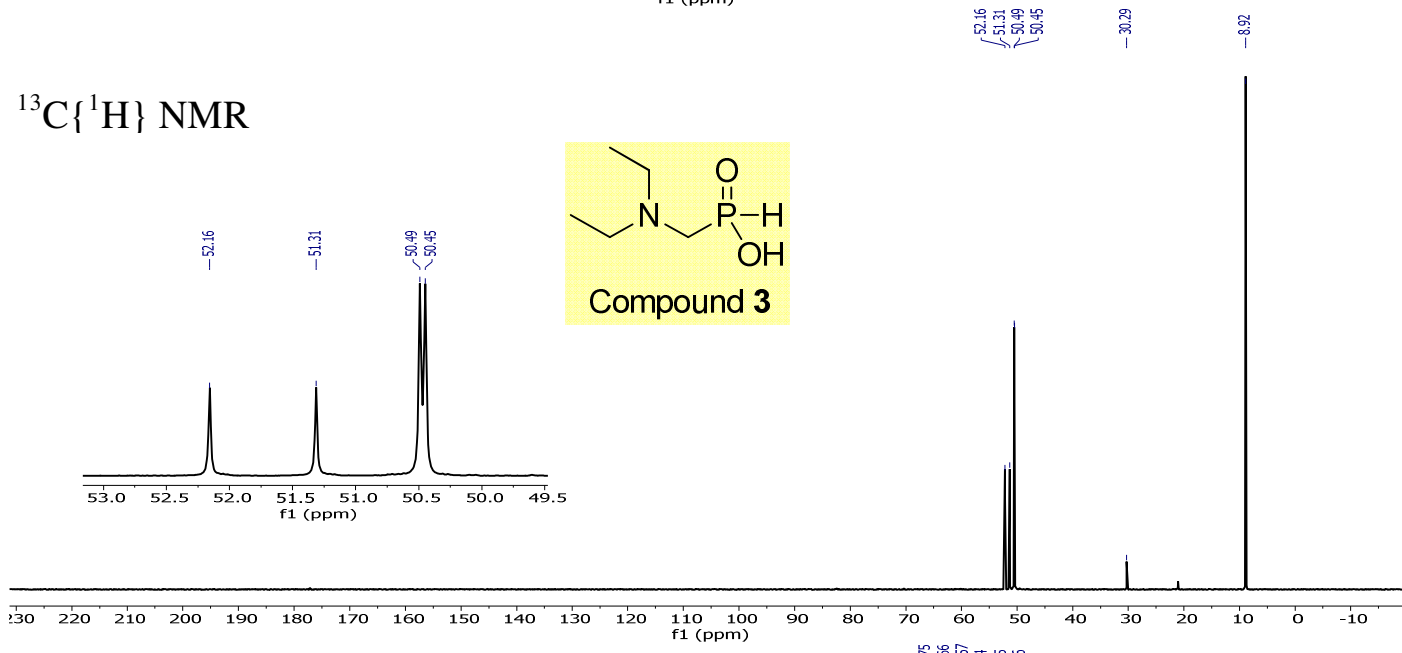
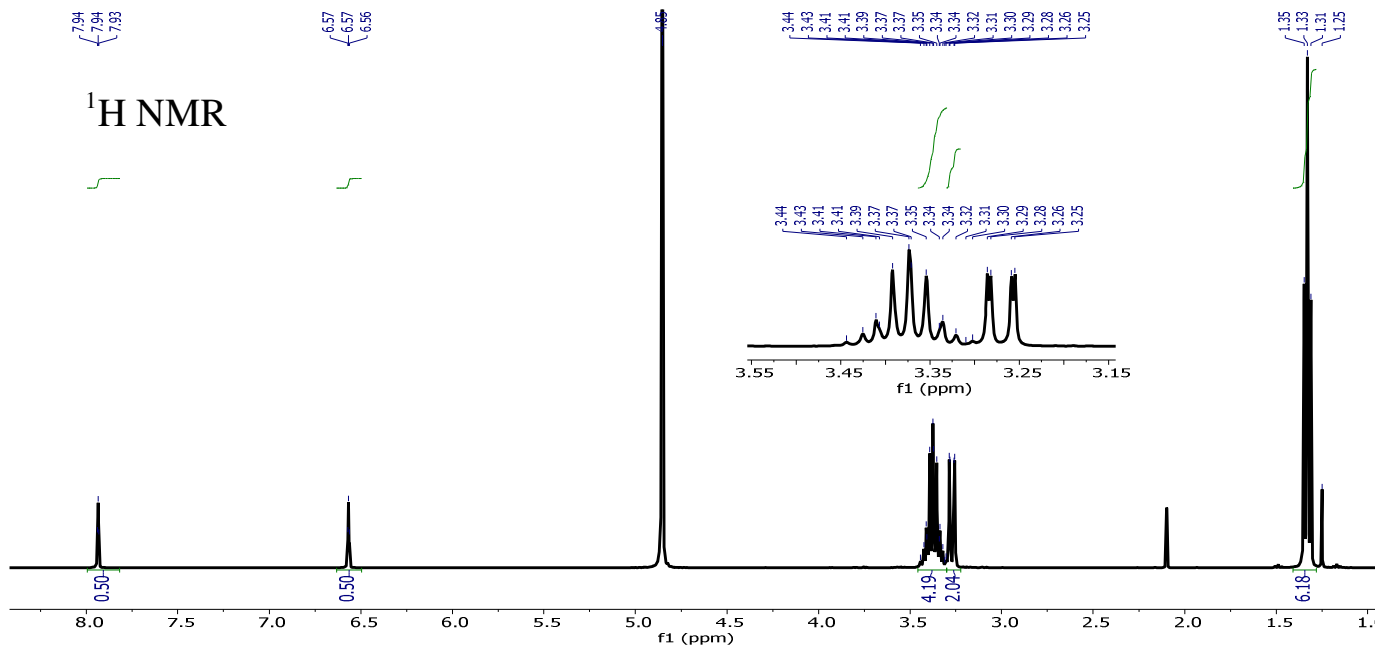
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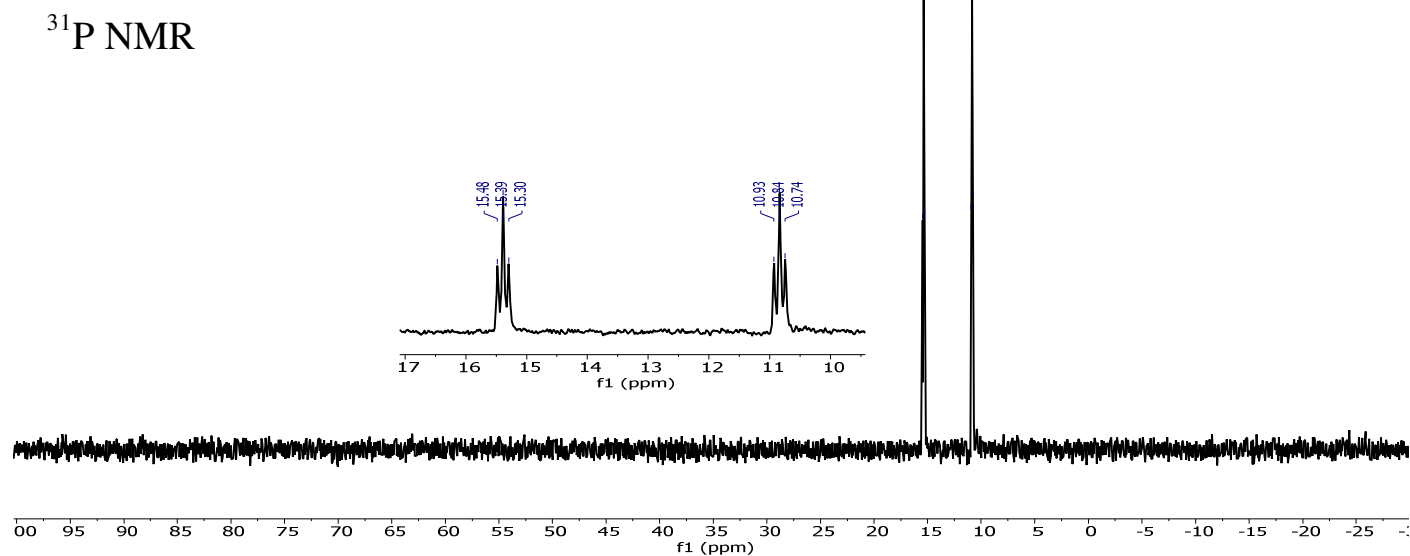
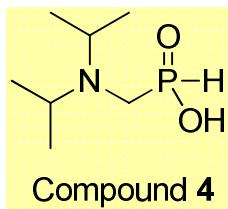
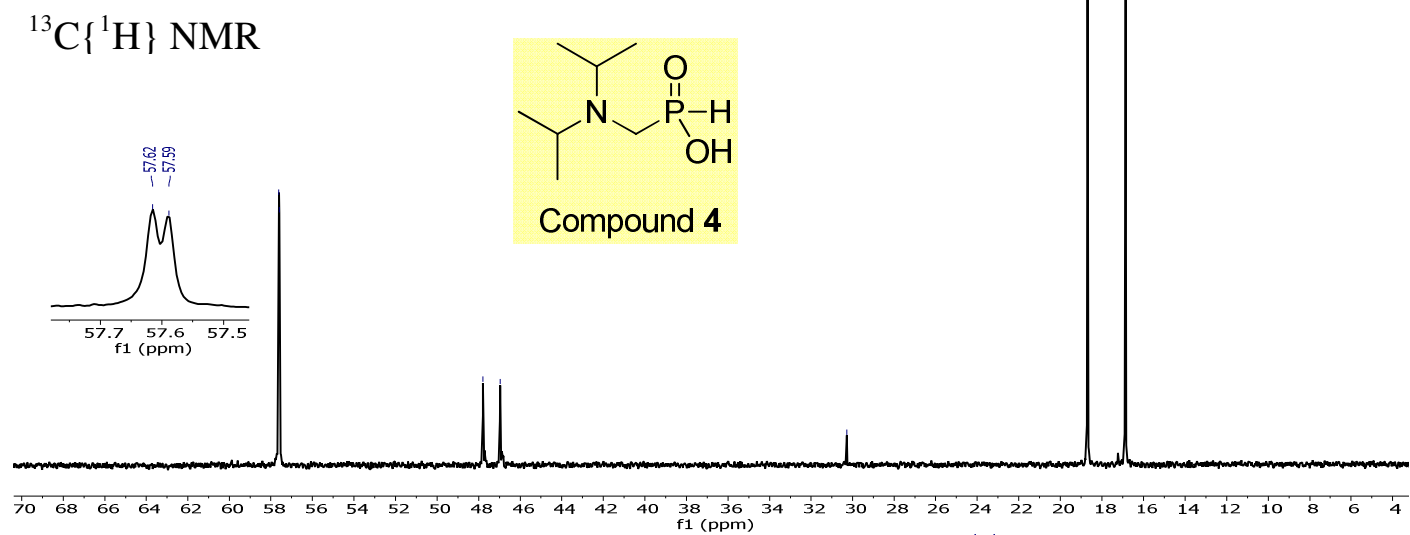
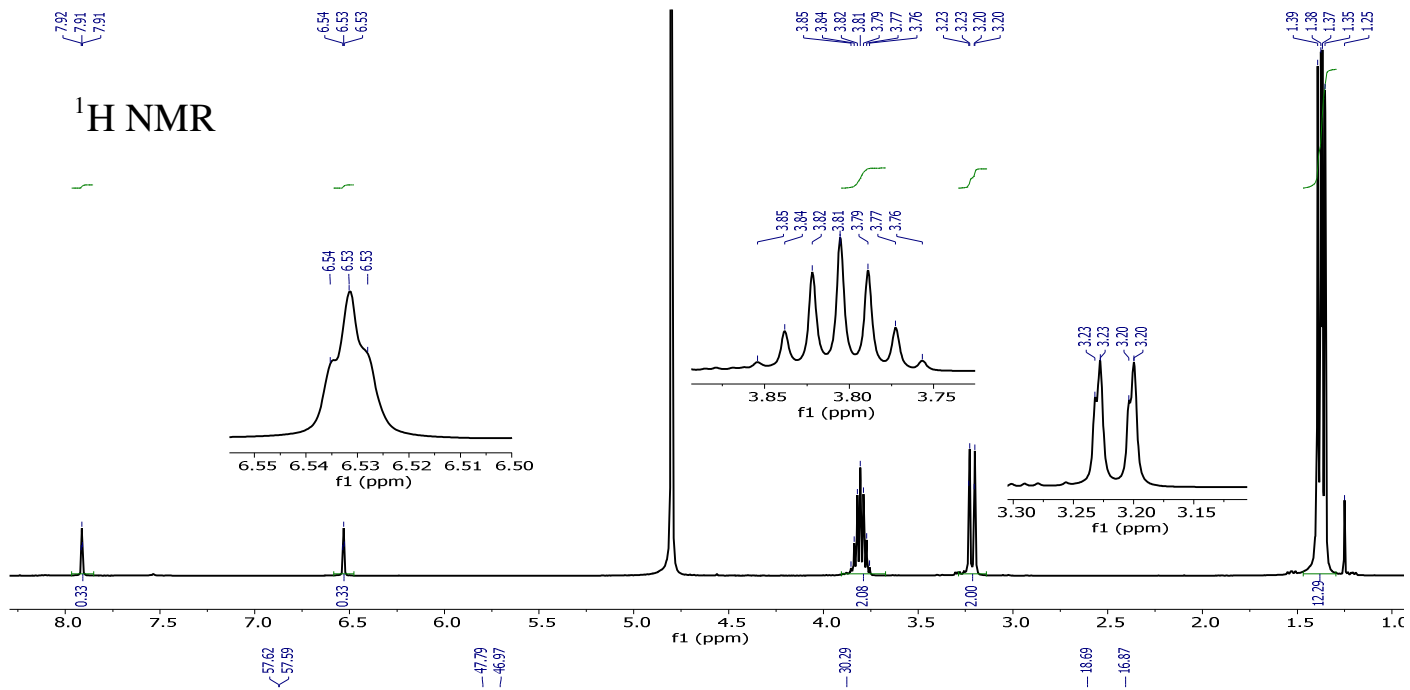
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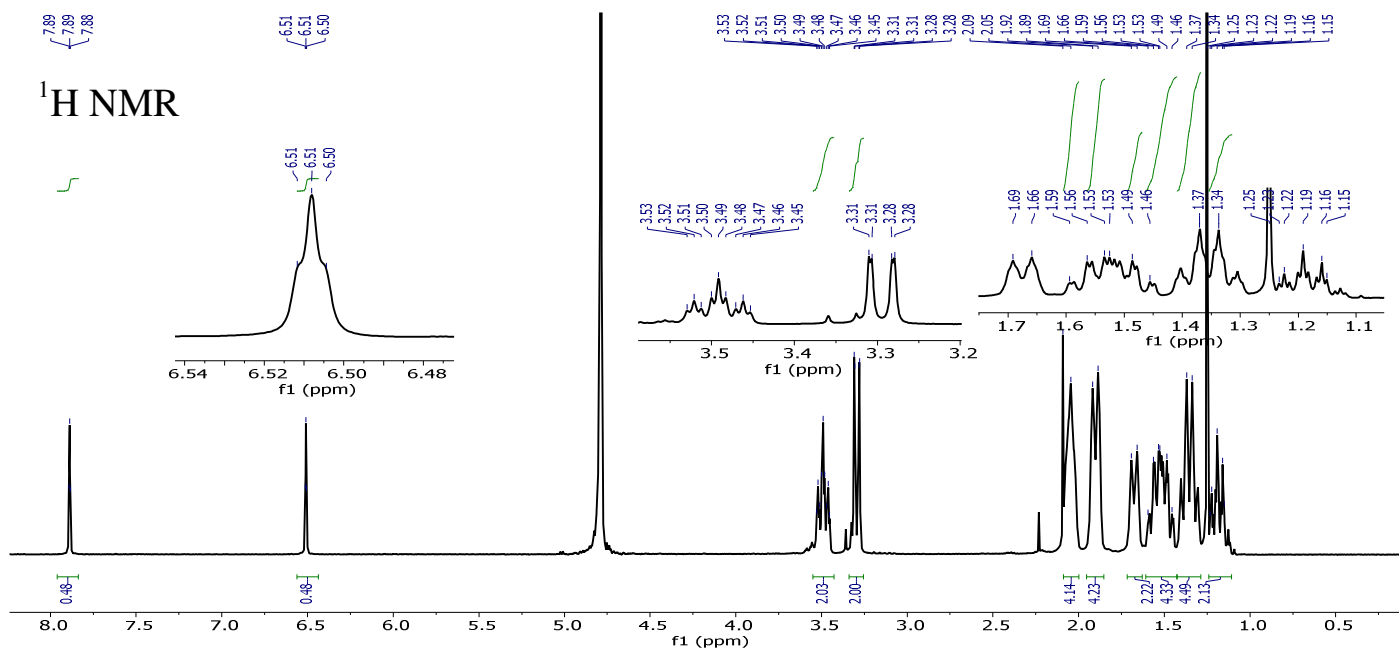


$^{13}\text{C}\{^1\text{H}\}$ NMR

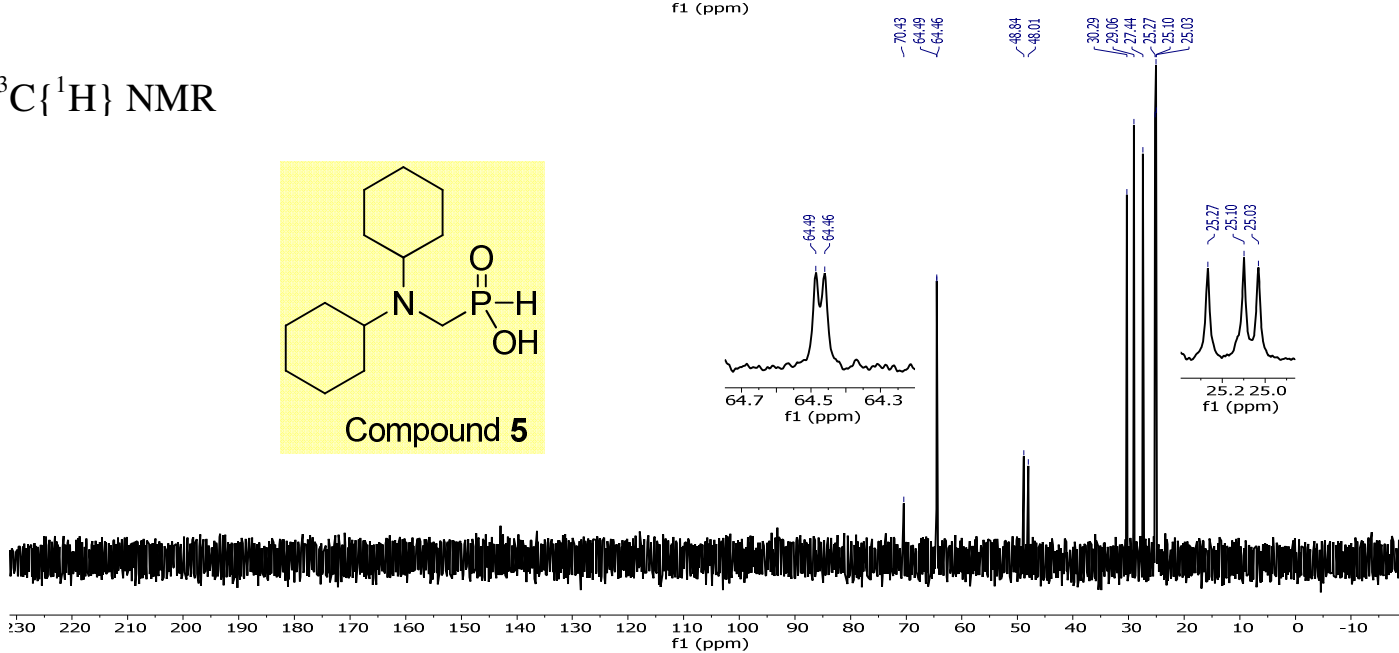
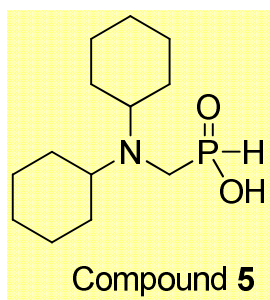




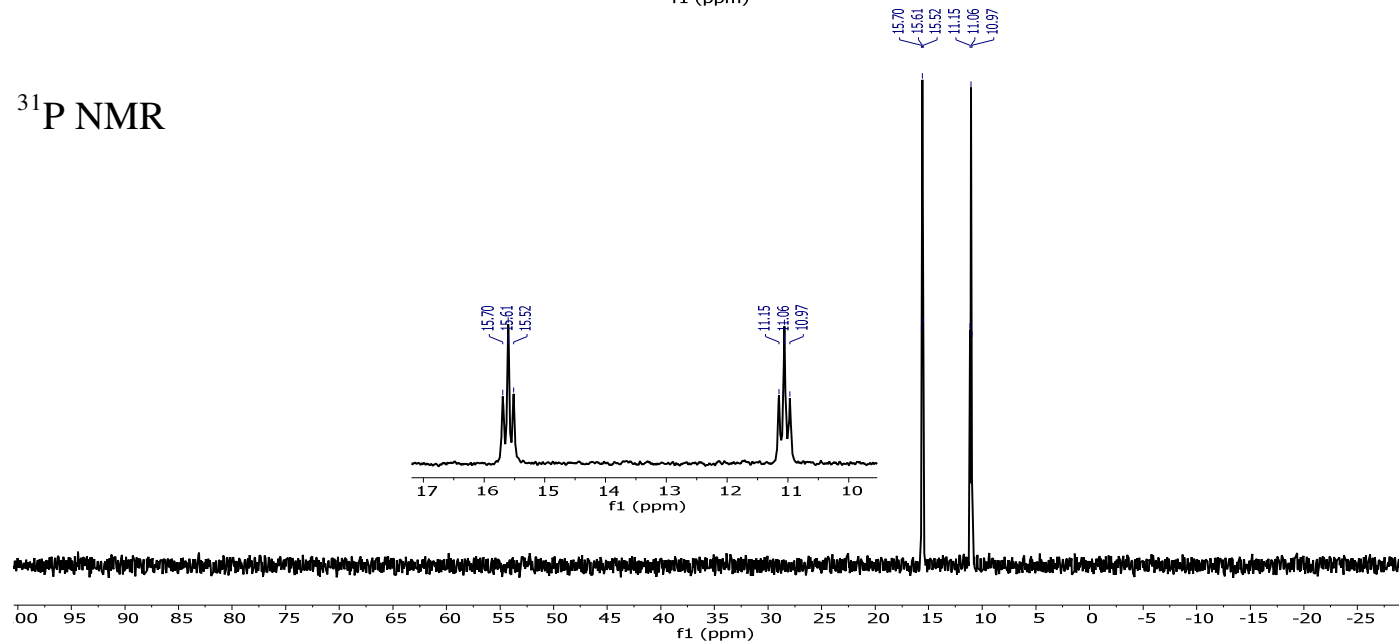


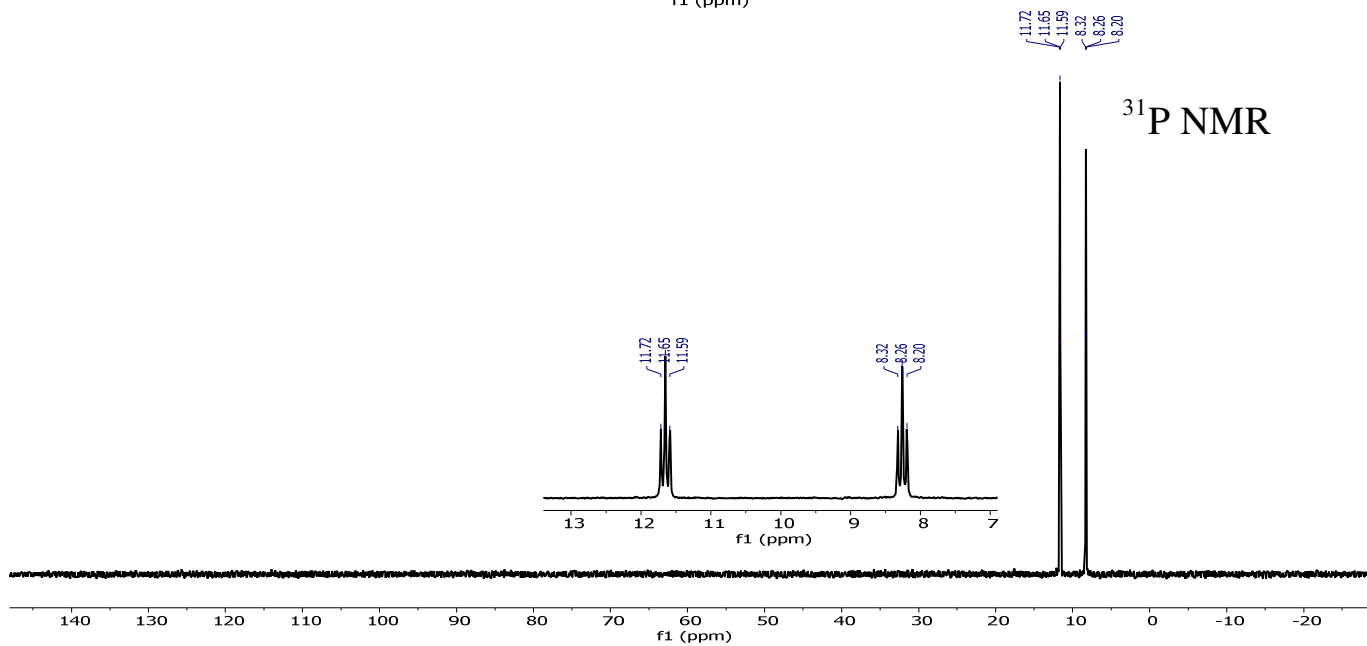
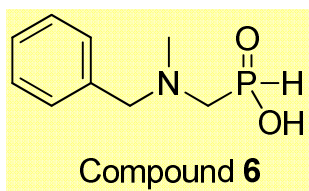
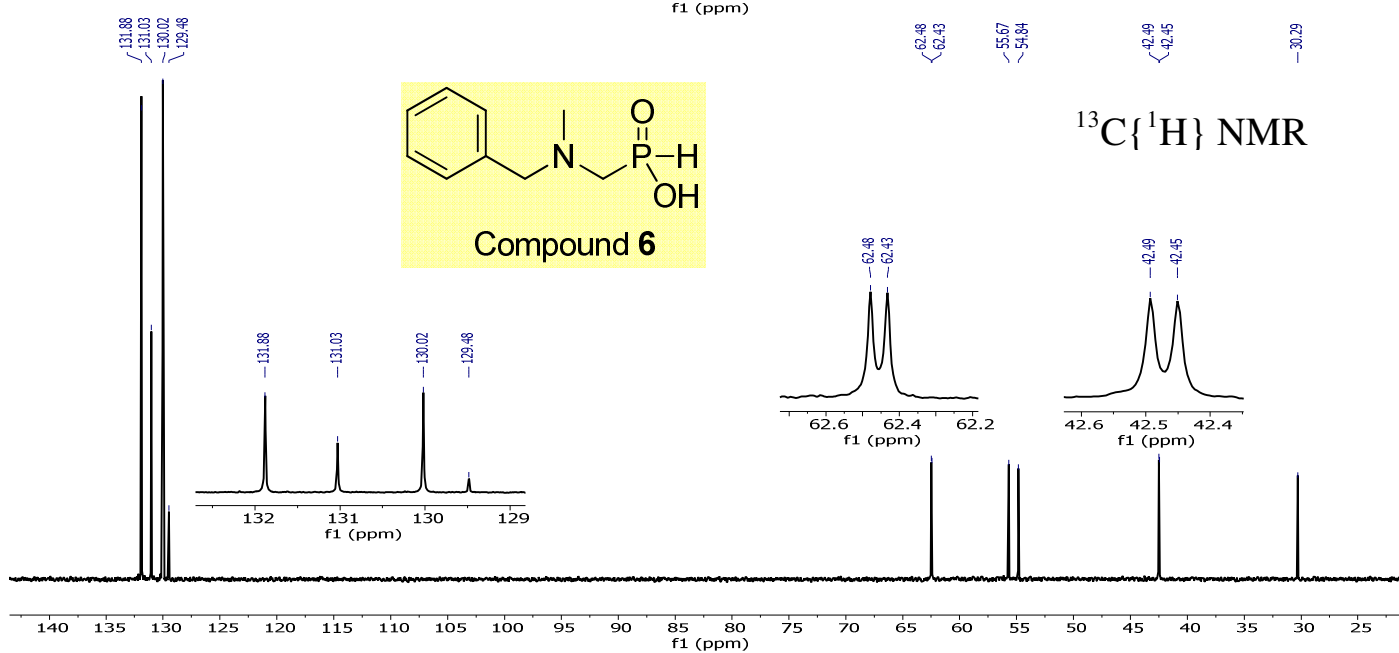
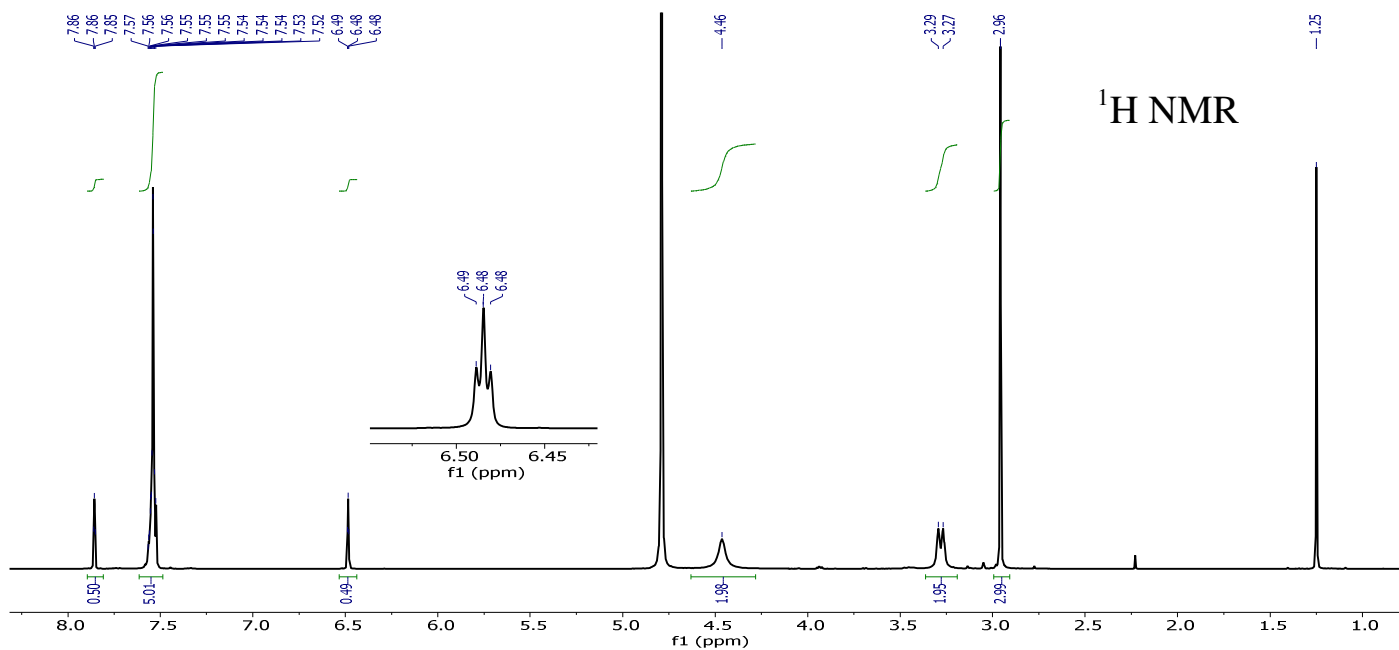


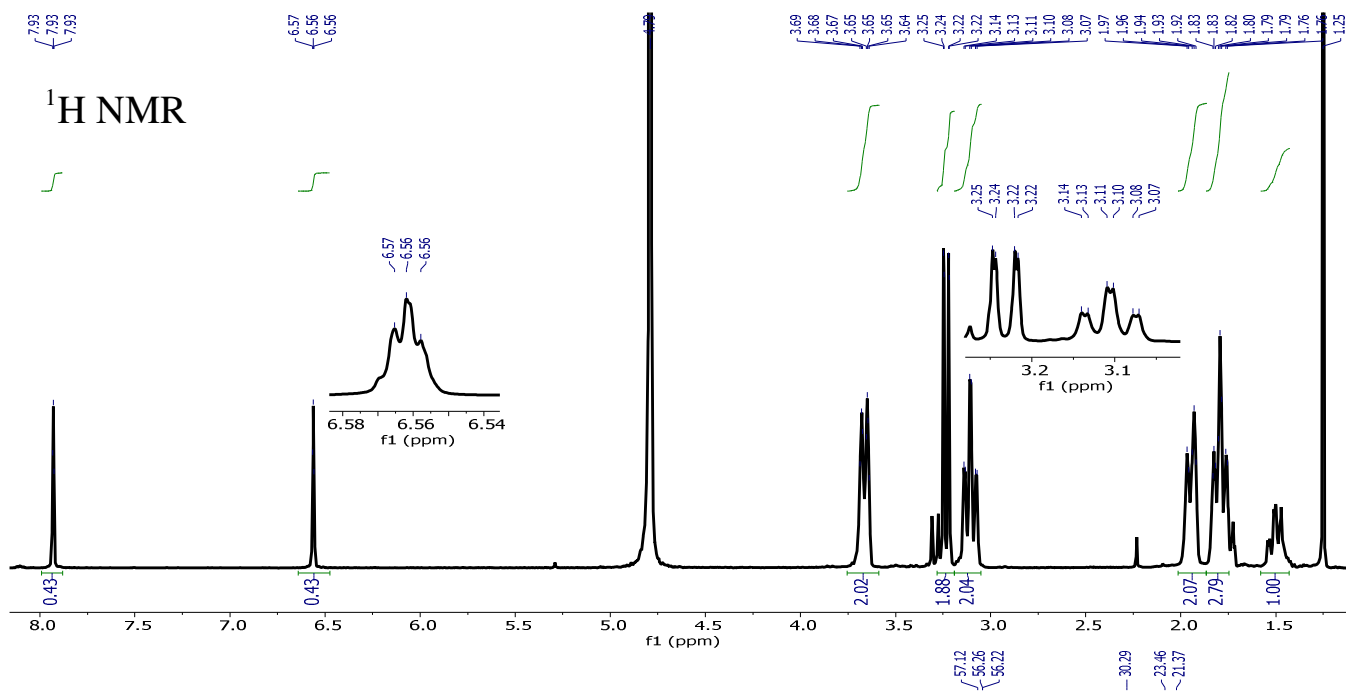
¹³C{¹H} NMR



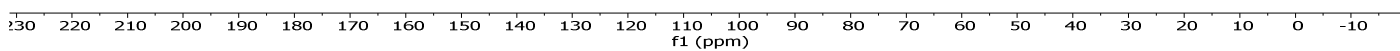
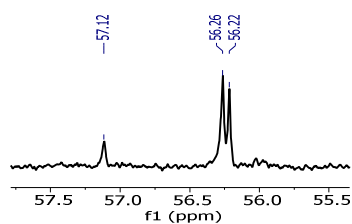
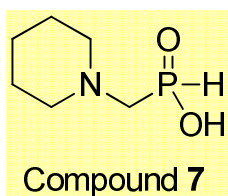
³¹P NMR



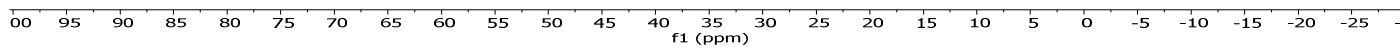
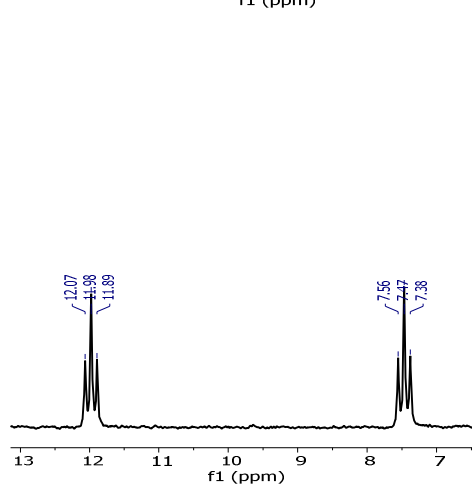


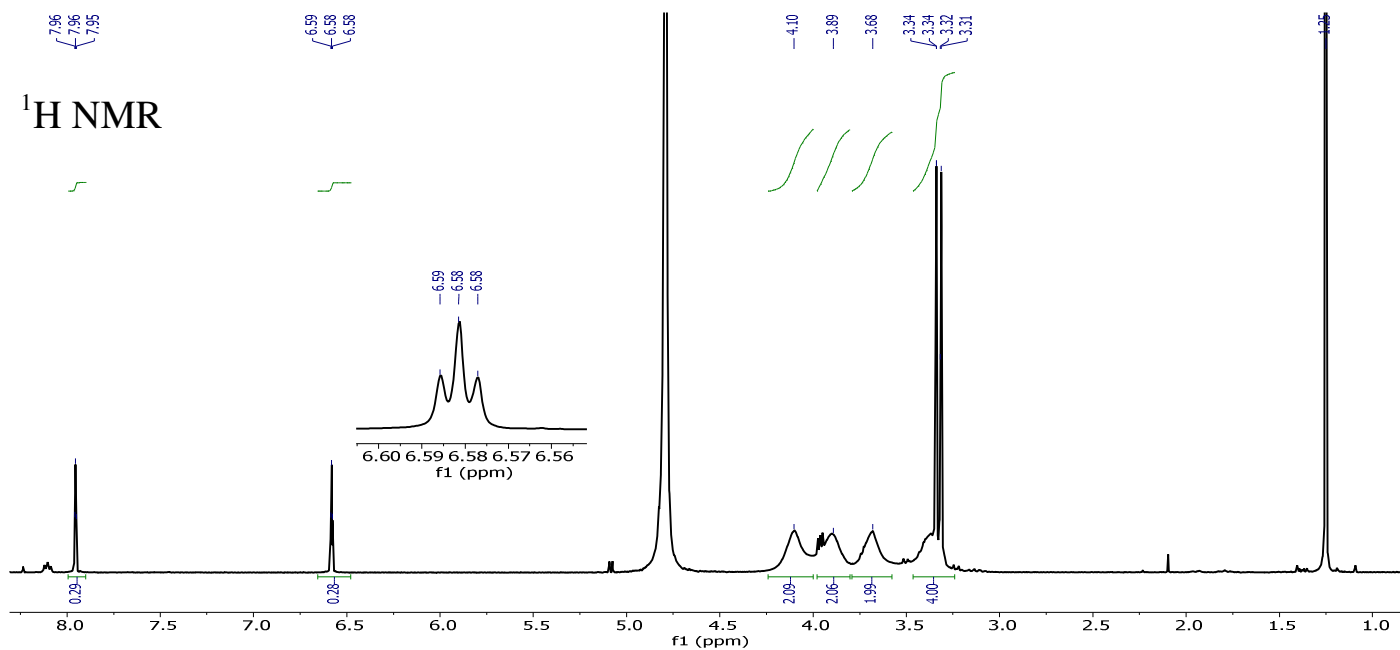


$^{13}\text{C}\{^1\text{H}\}$ NMR

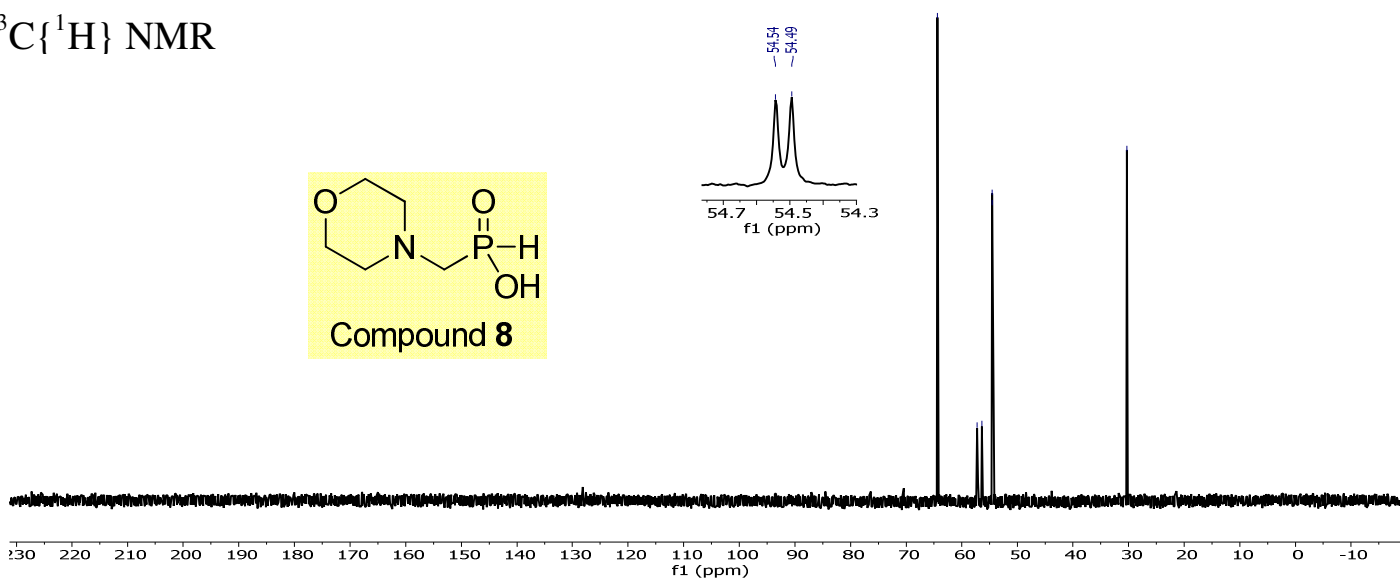
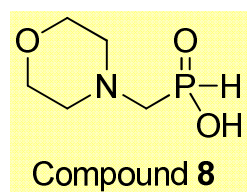


^{31}P NMR

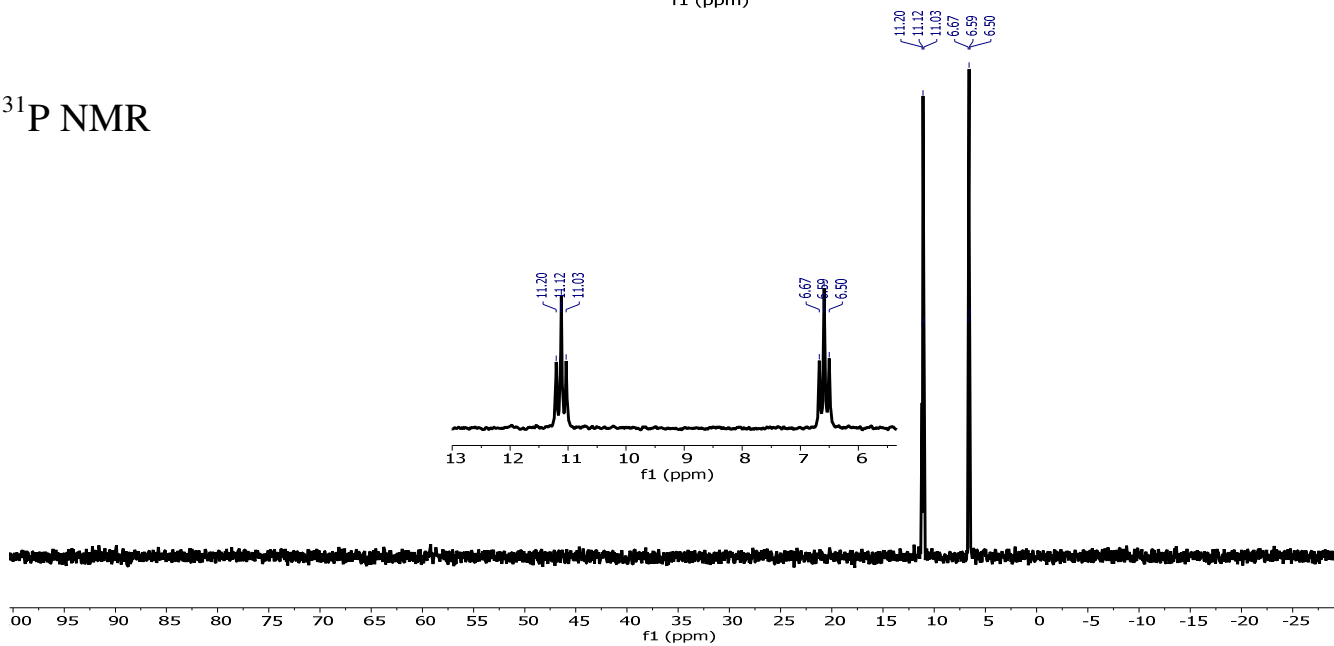


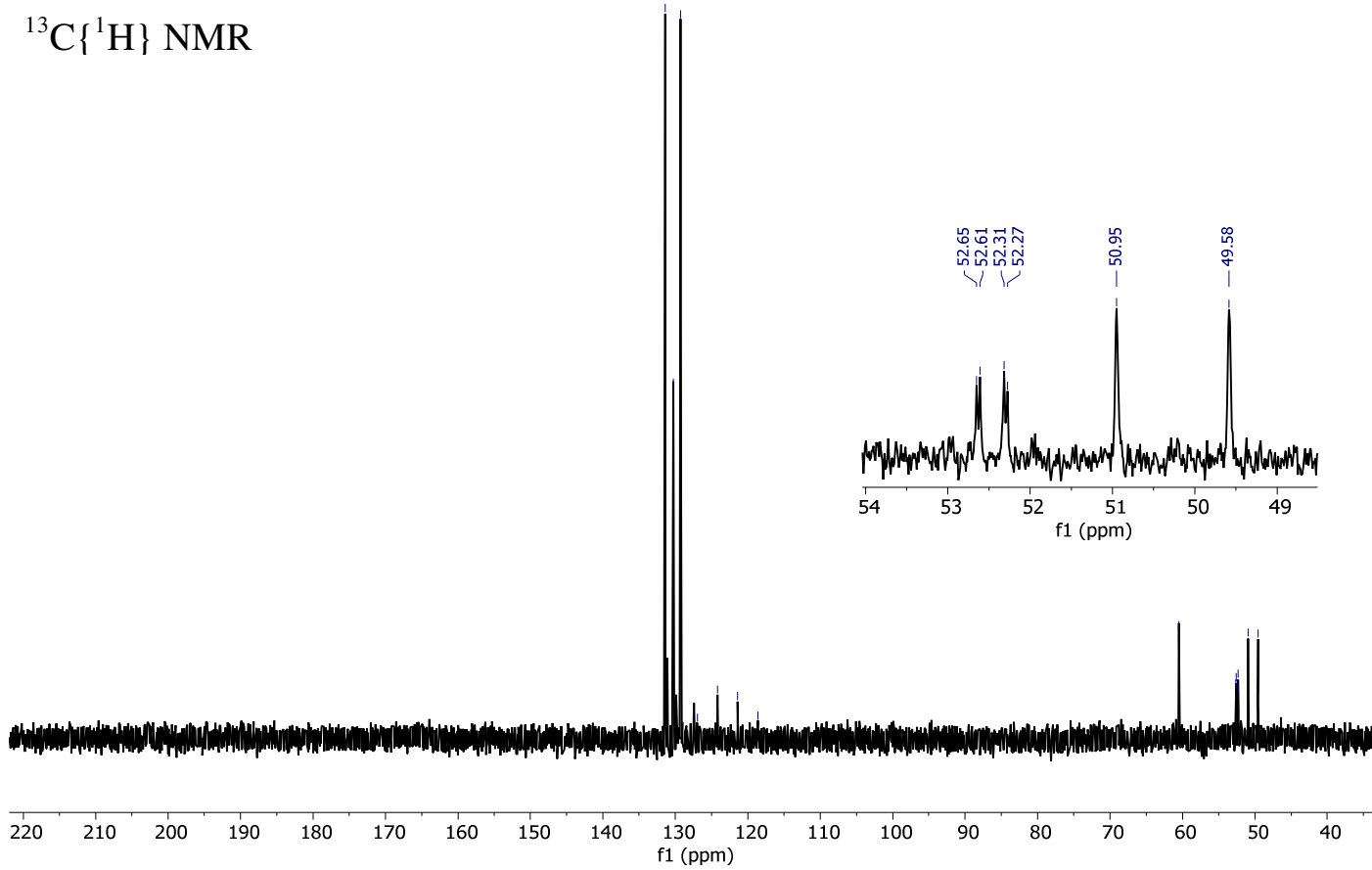
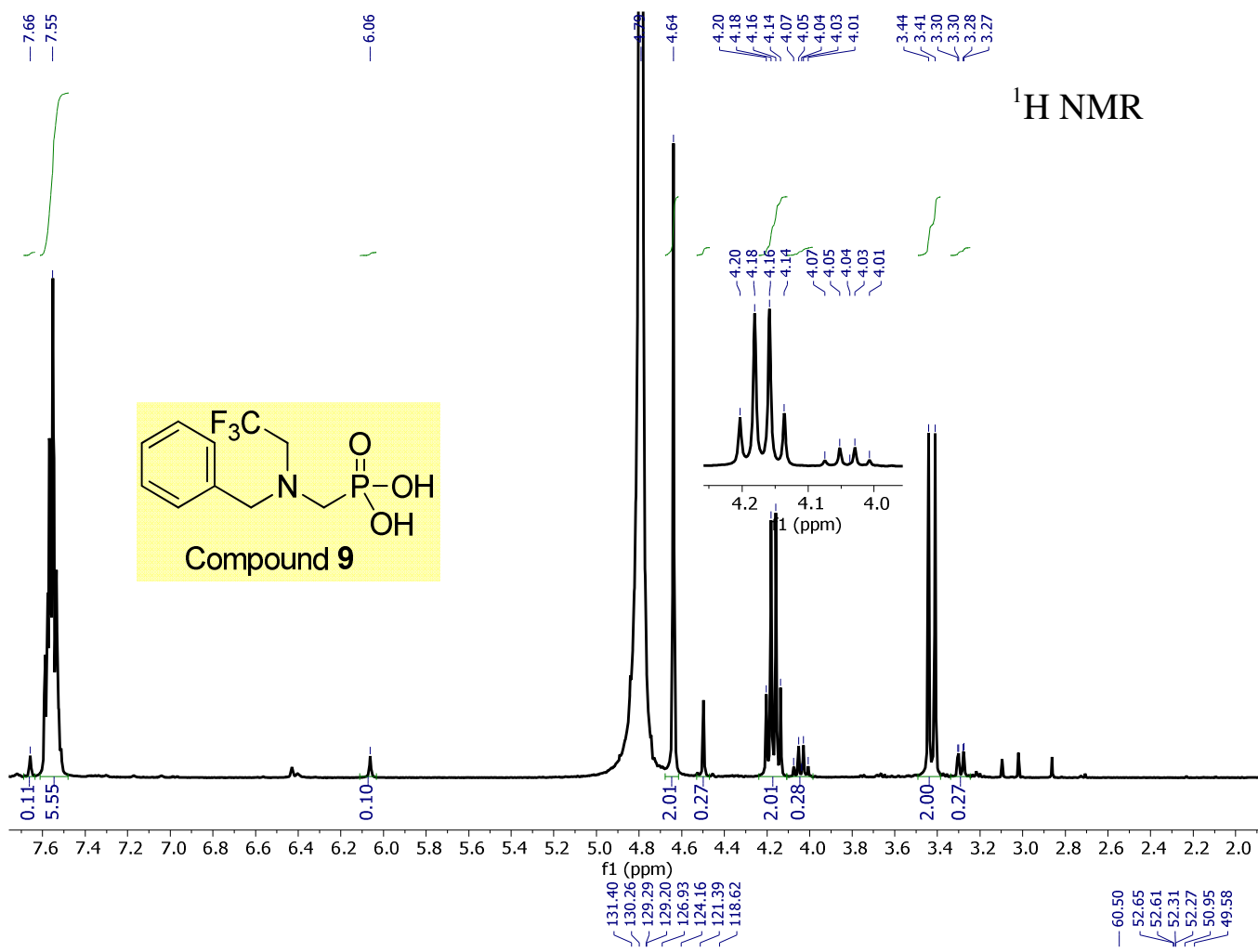


$^{13}\text{C}\{^1\text{H}\}$ NMR

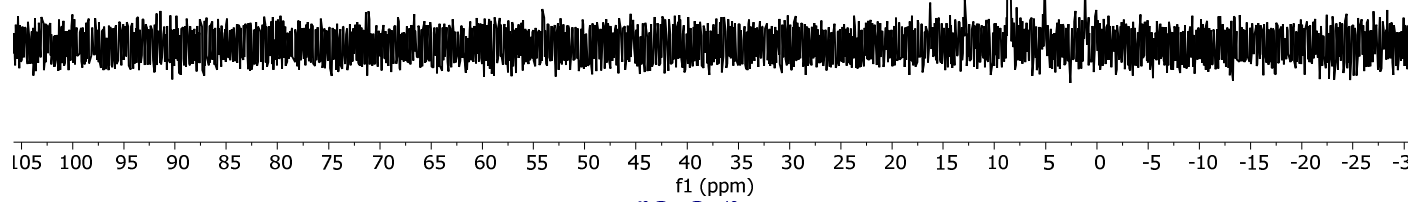
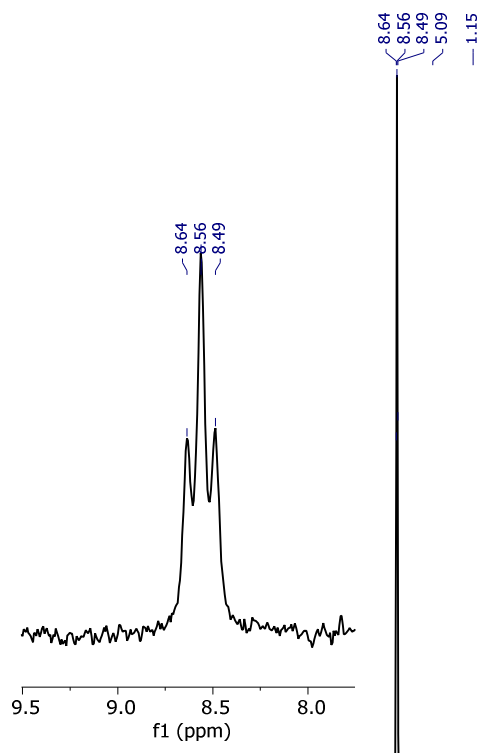
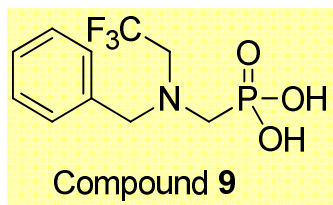


^{31}P NMR

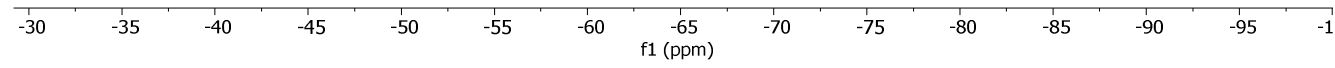
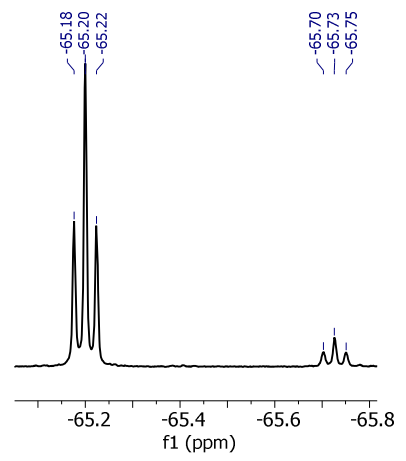


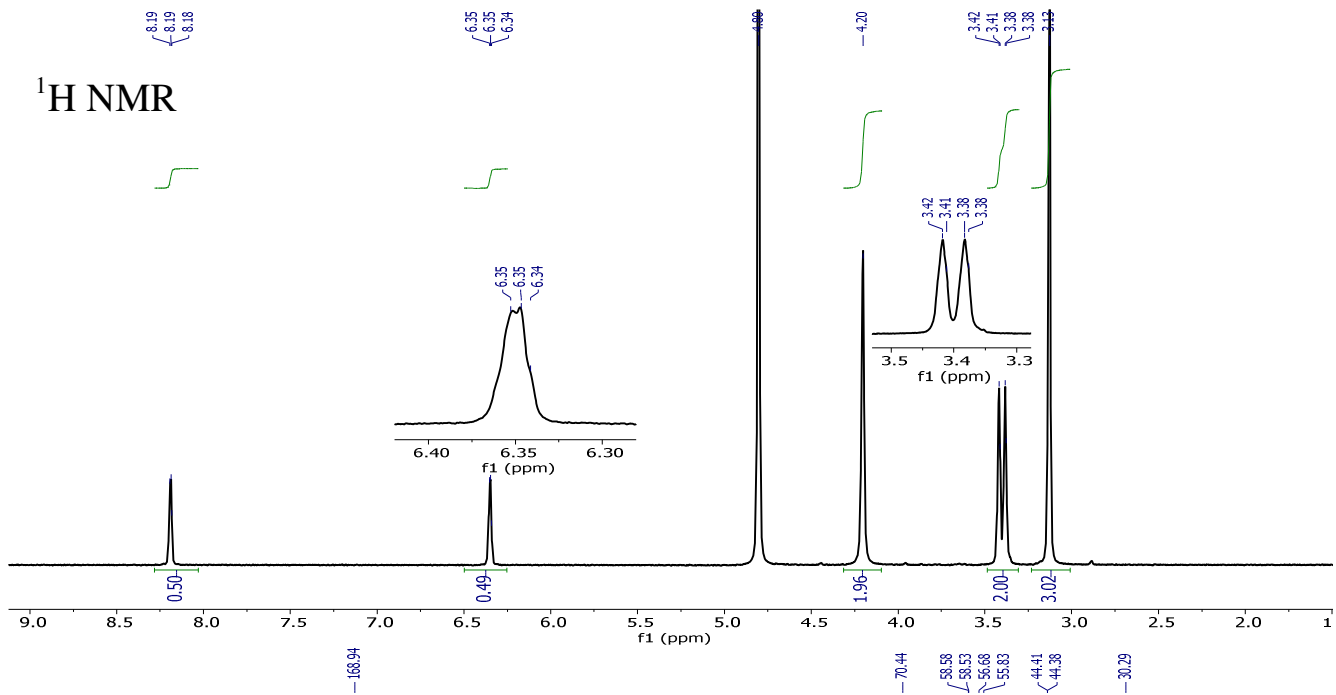


^{31}P NMR

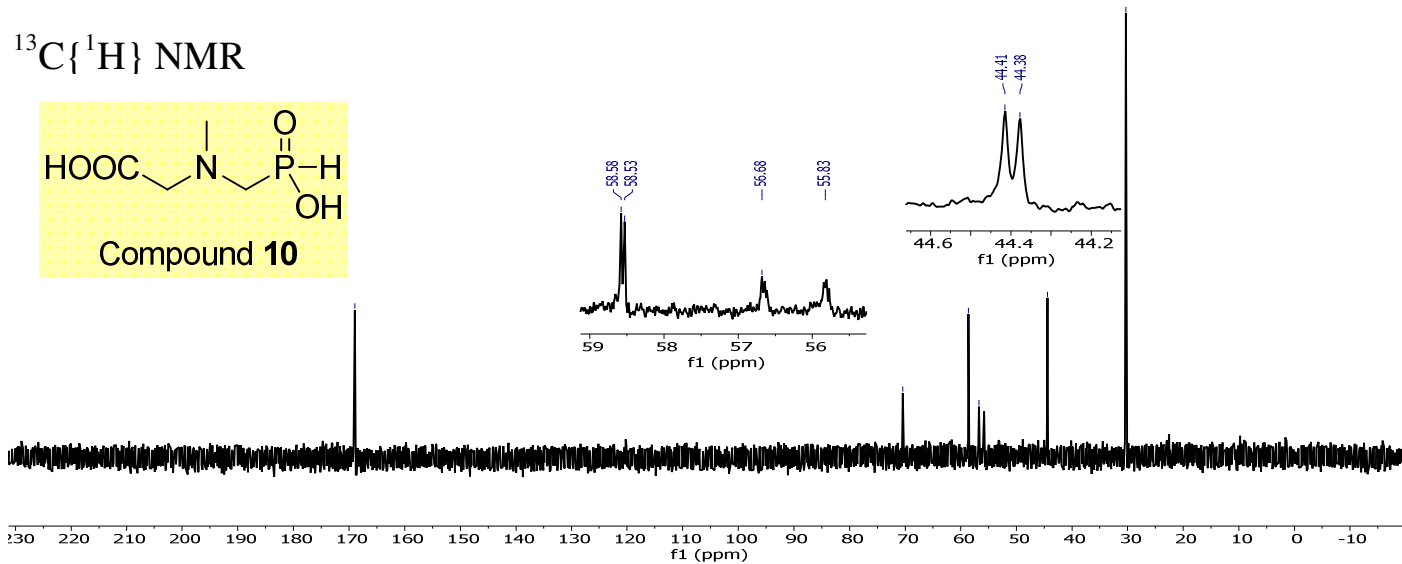
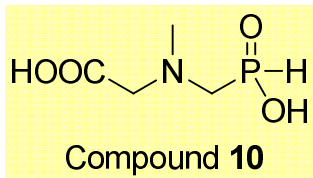


^{19}F NMR

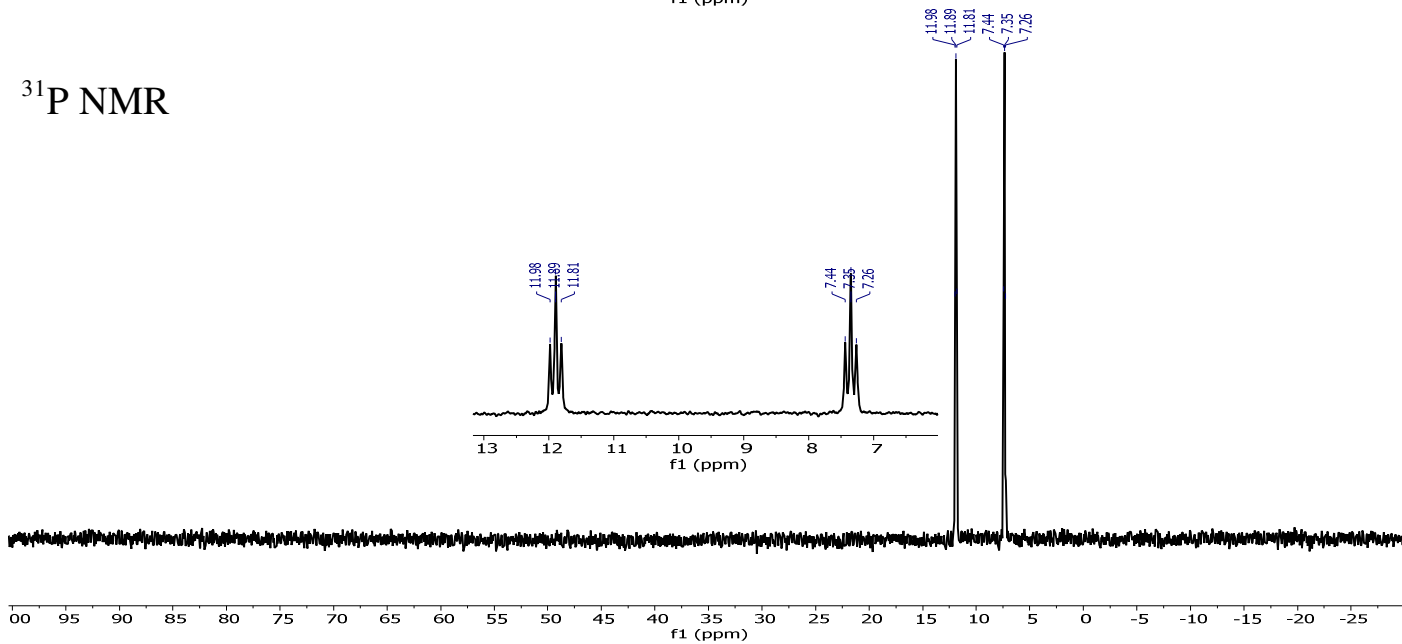


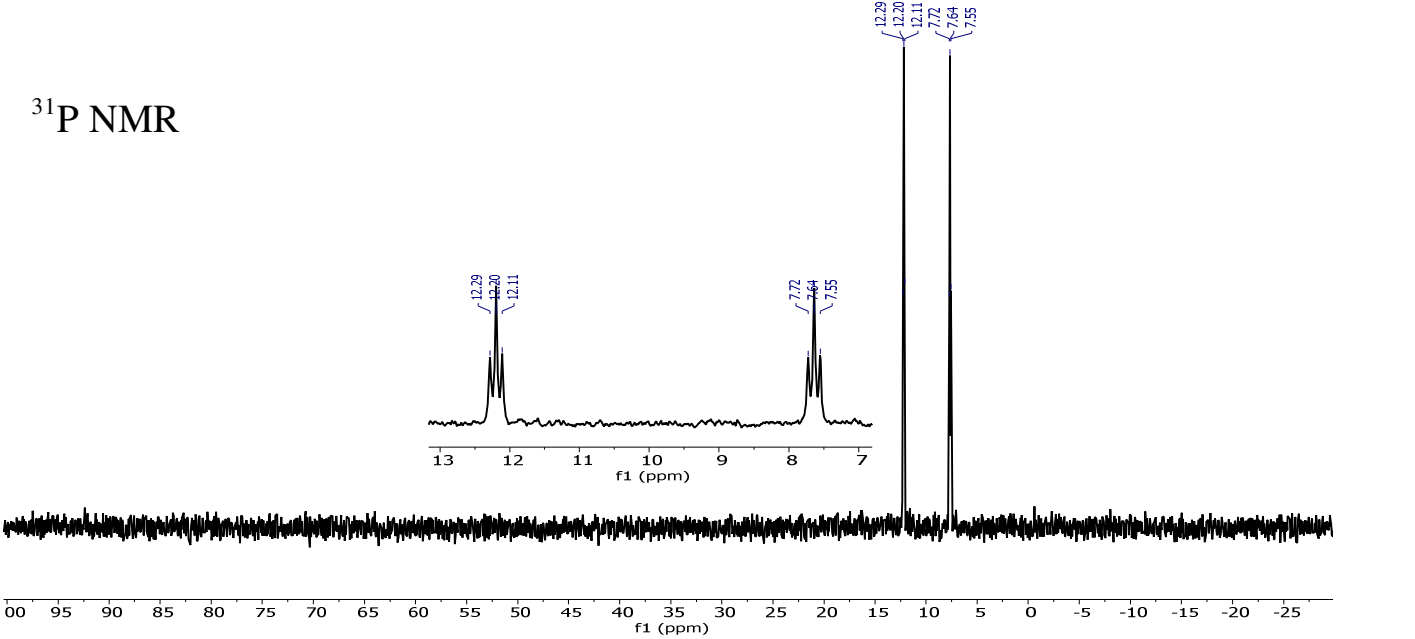
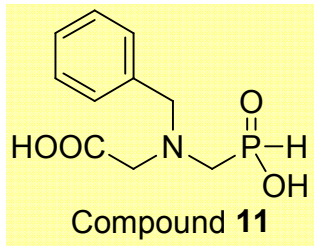
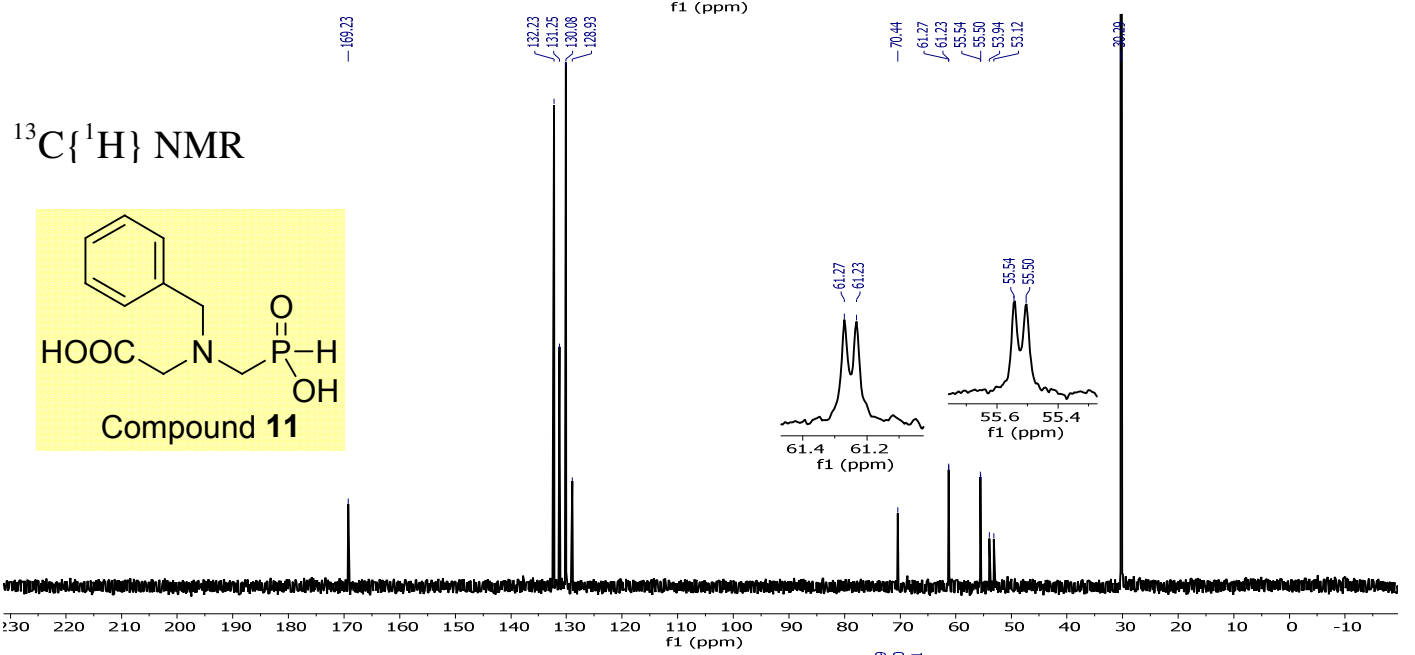
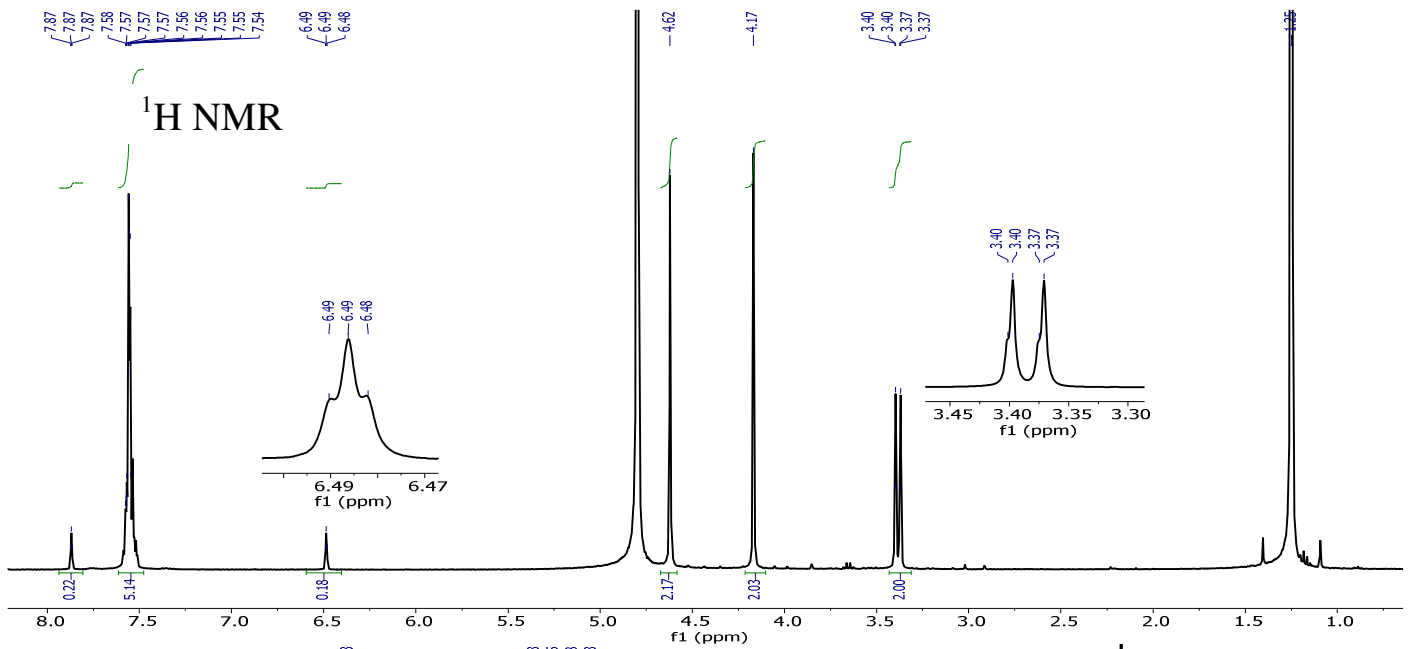


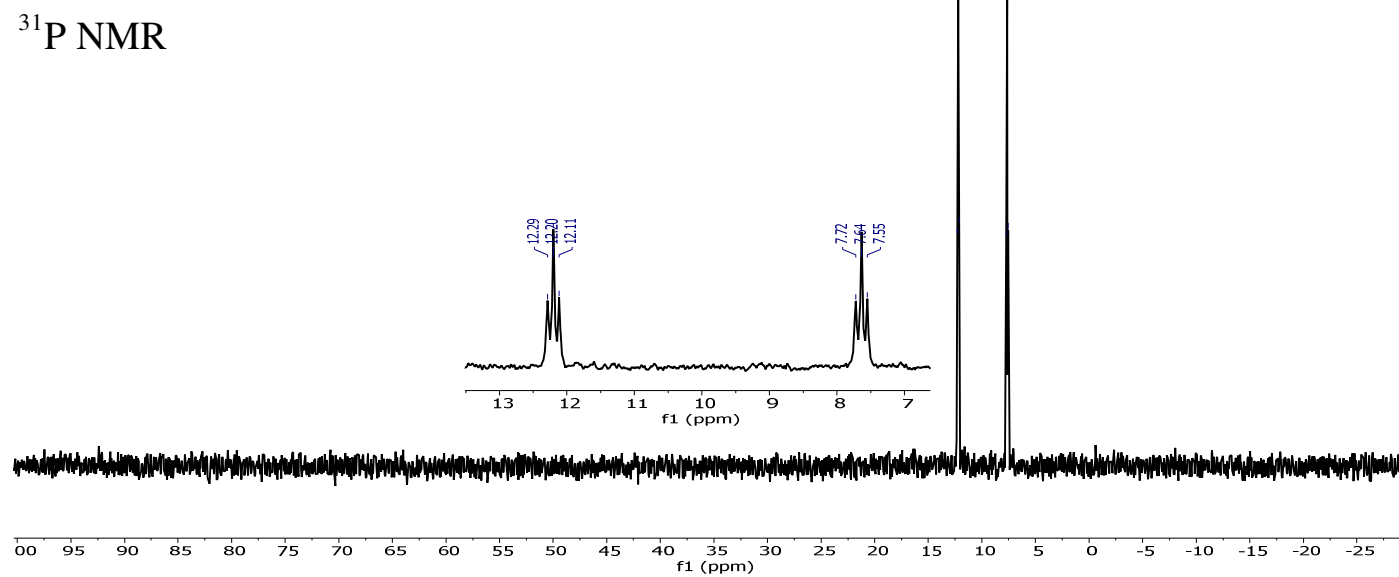
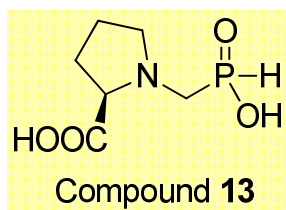
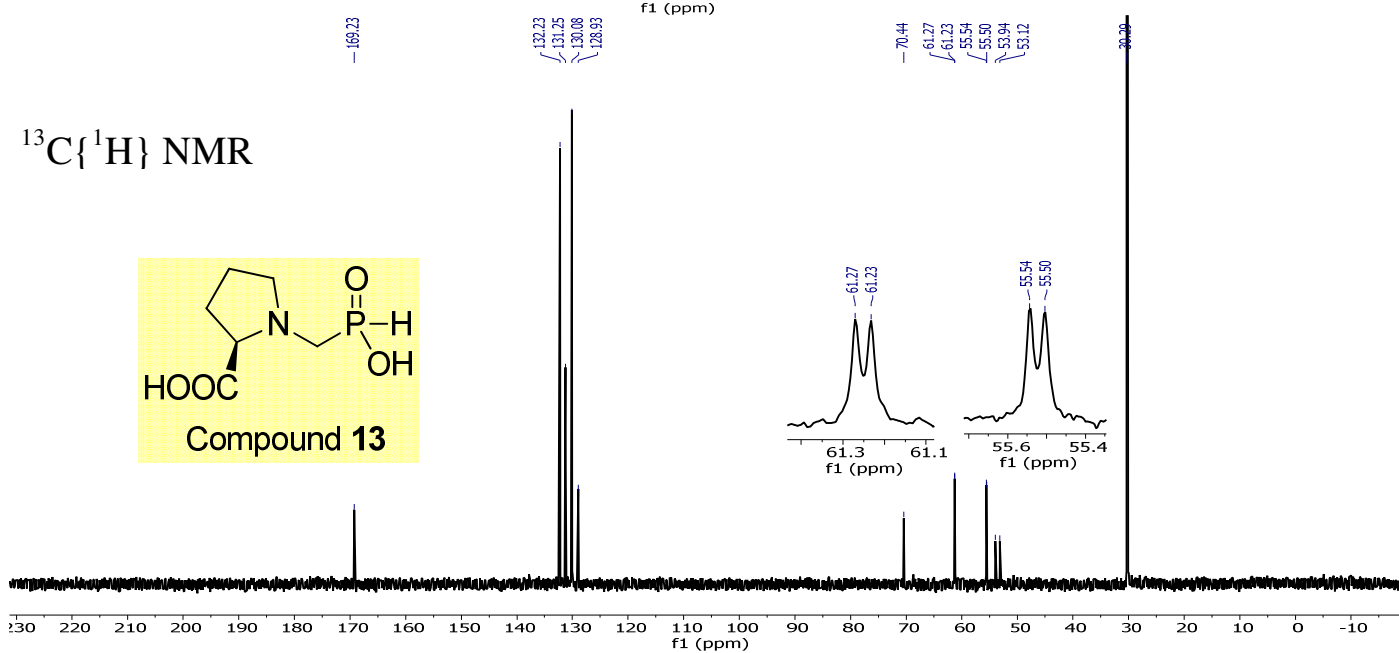
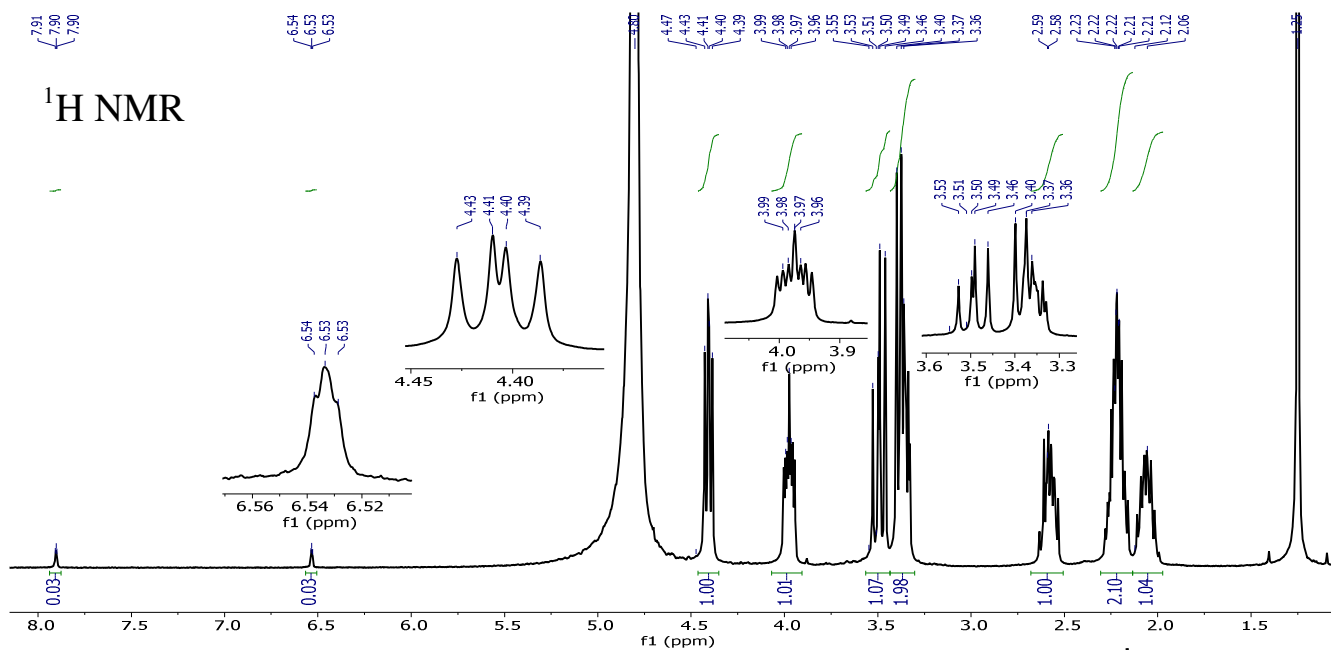
¹³C{¹H} NMR

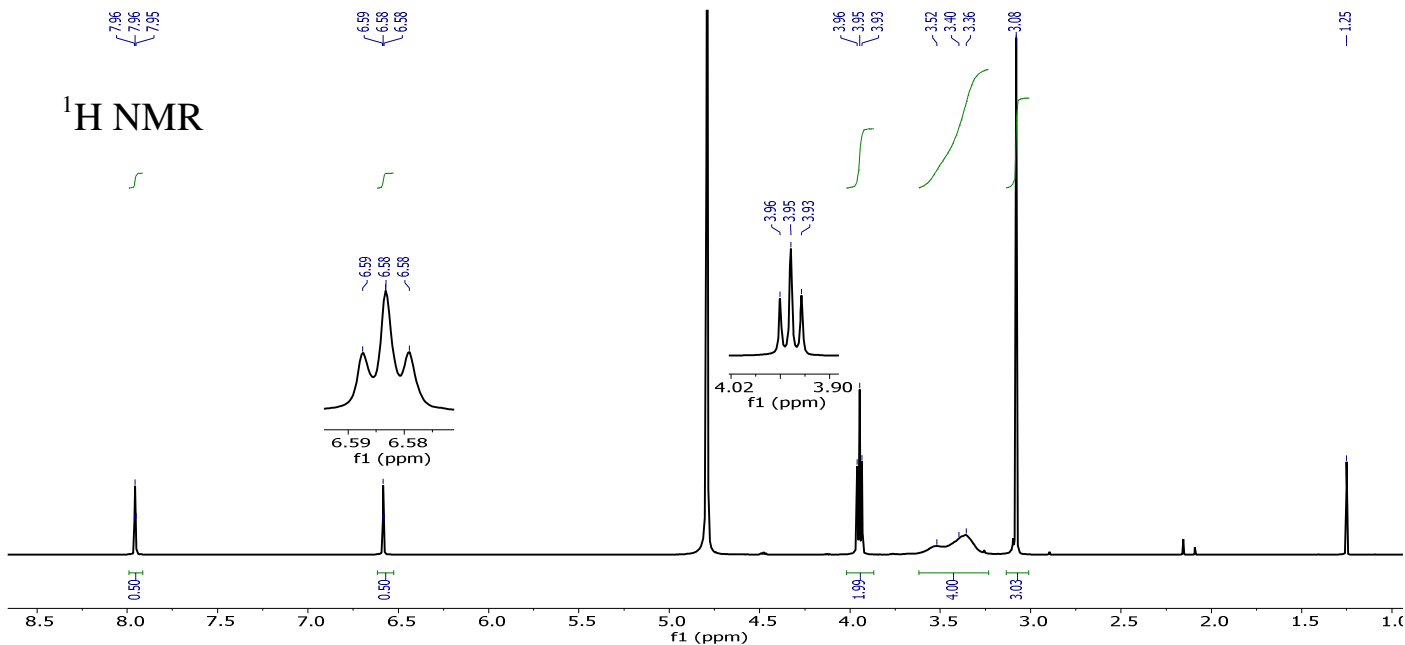


³¹P NMR

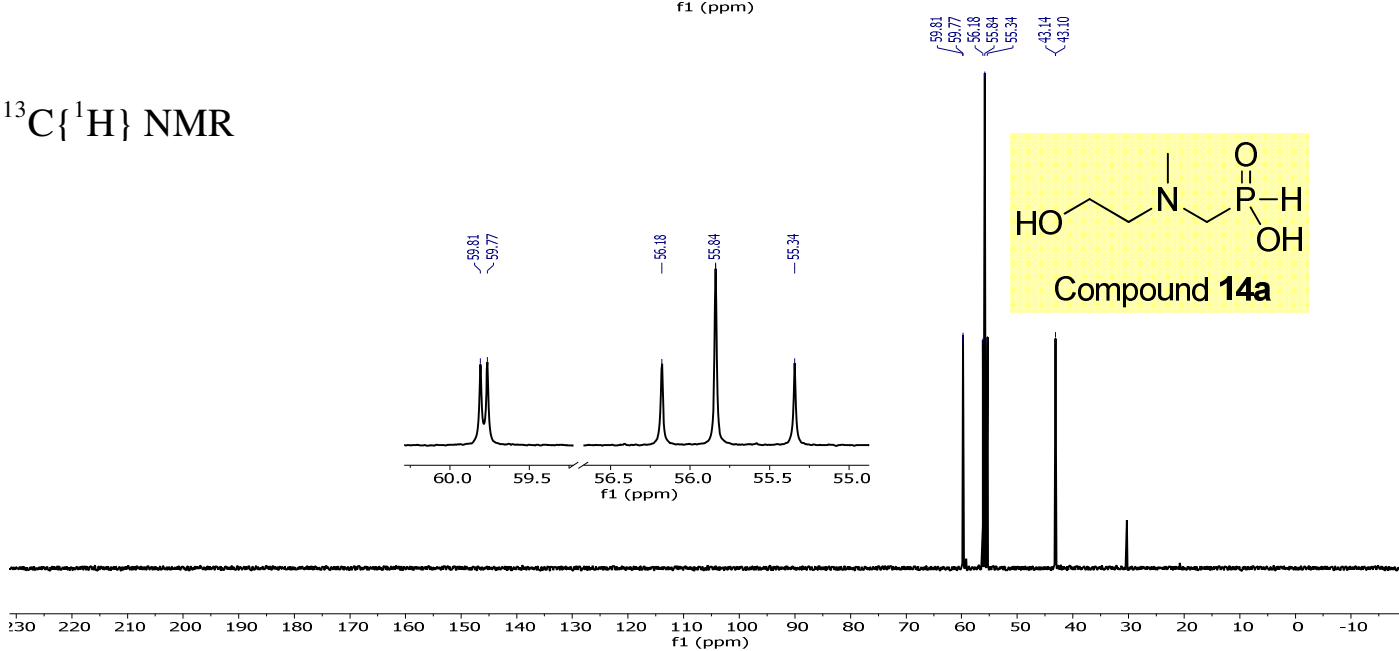




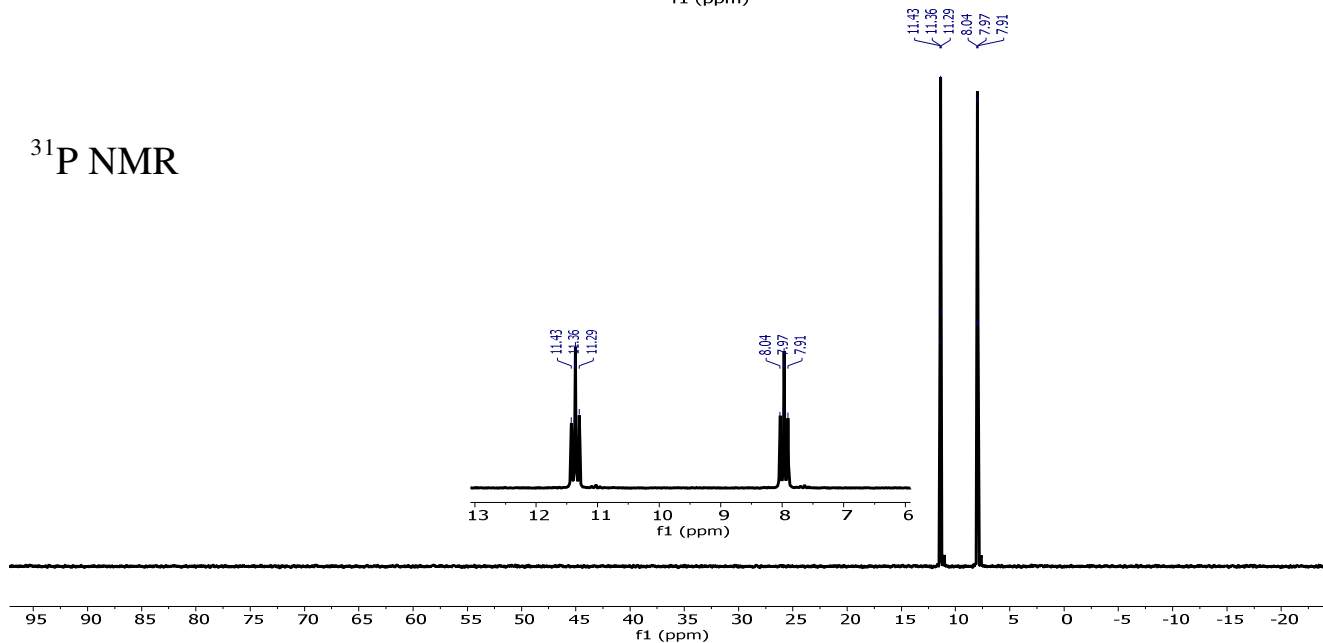


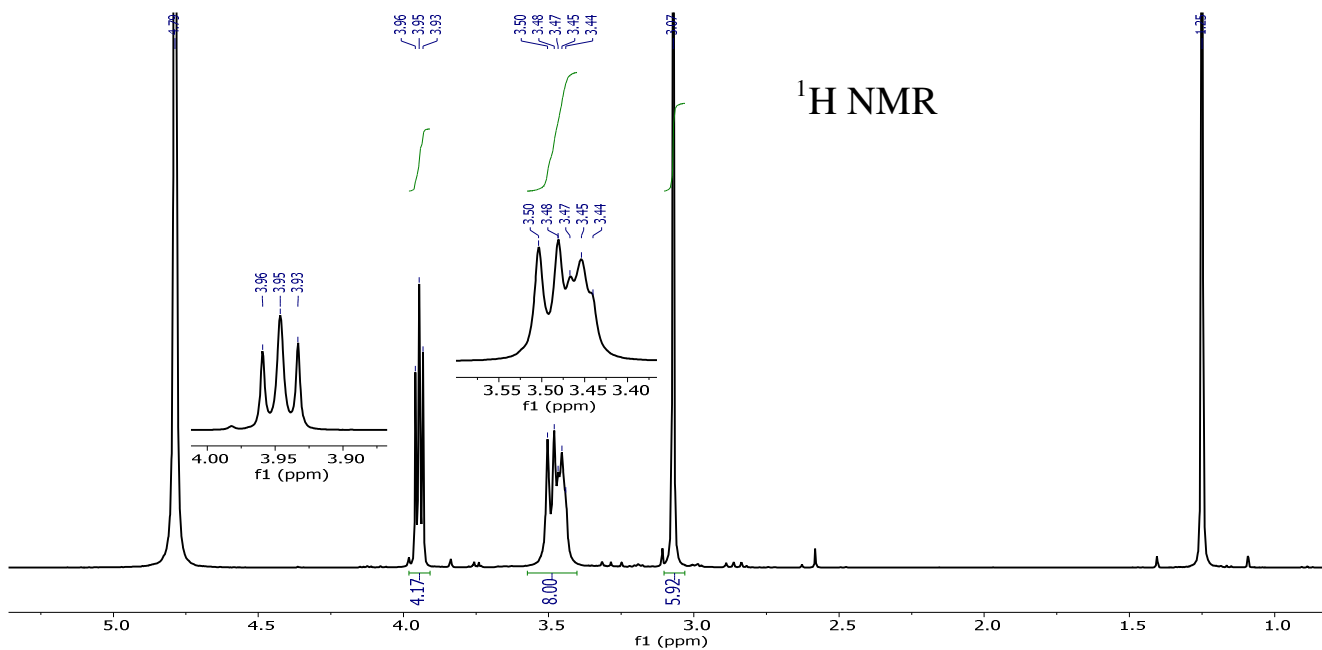


¹³C{¹H} NMR

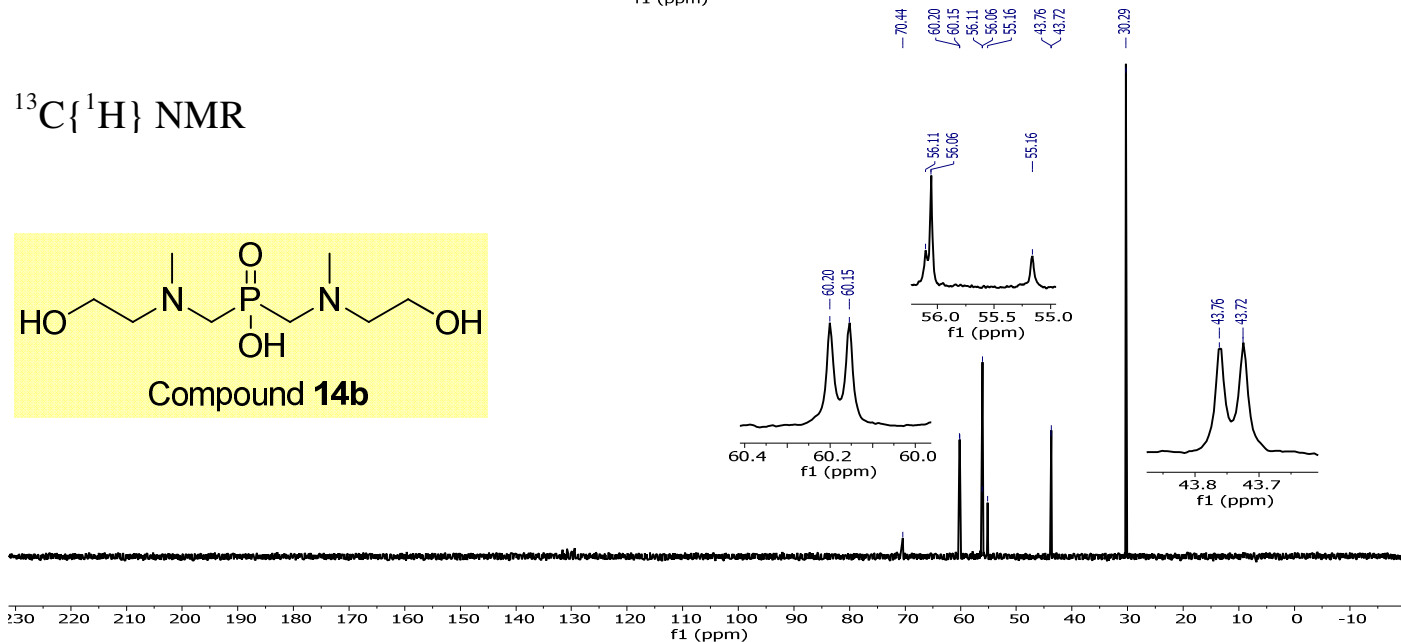
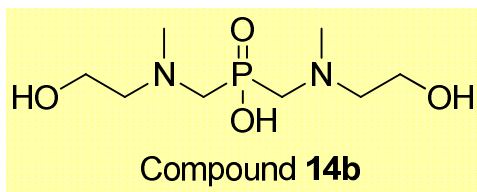


³¹P NMR

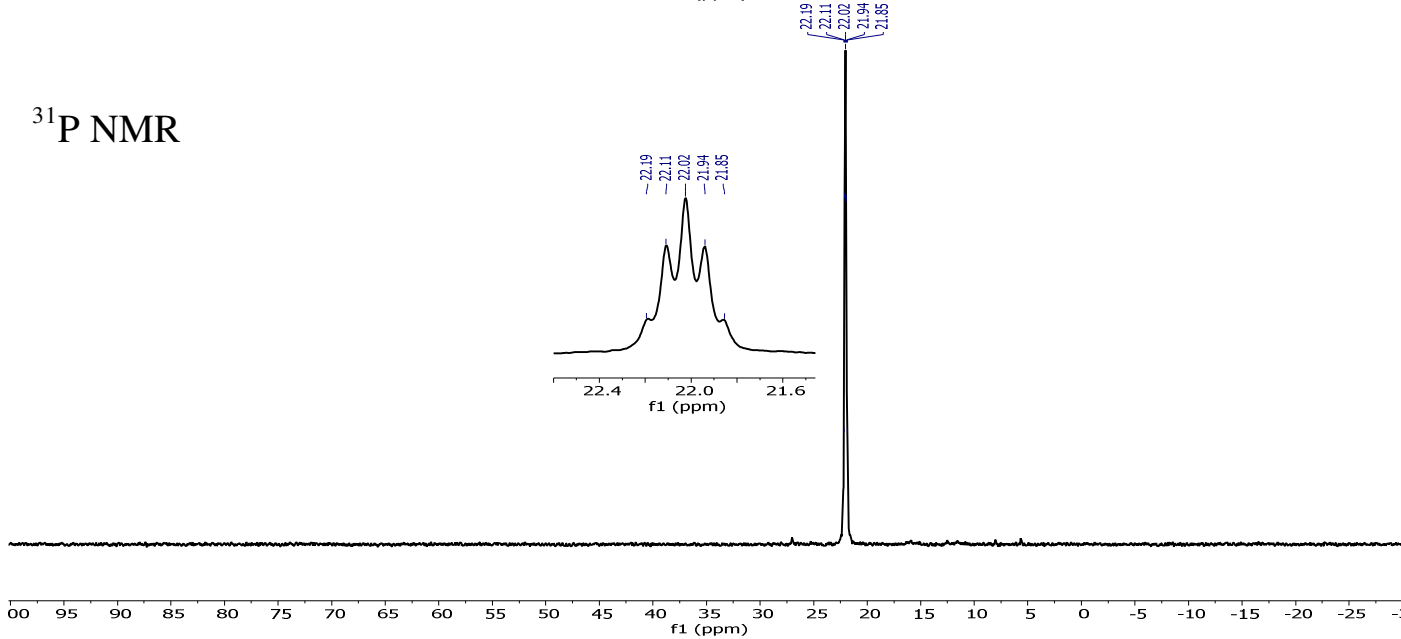




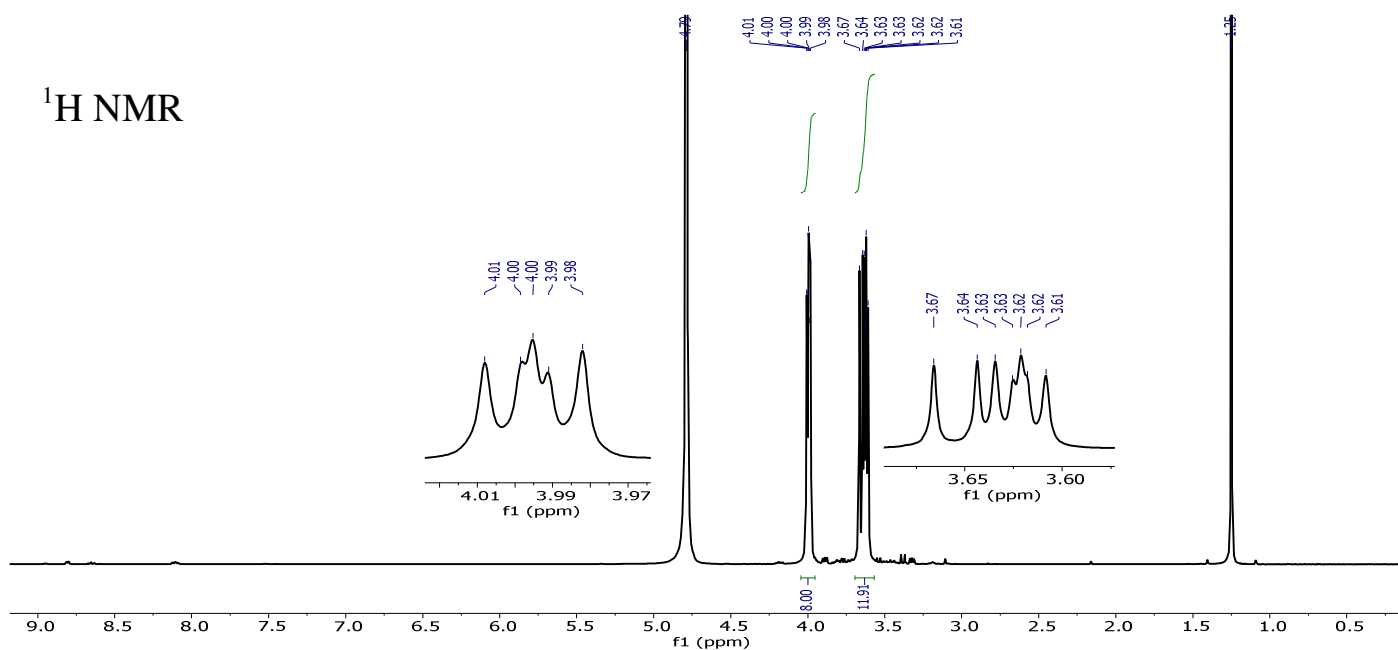
$^{13}\text{C}\{^1\text{H}\}$ NMR



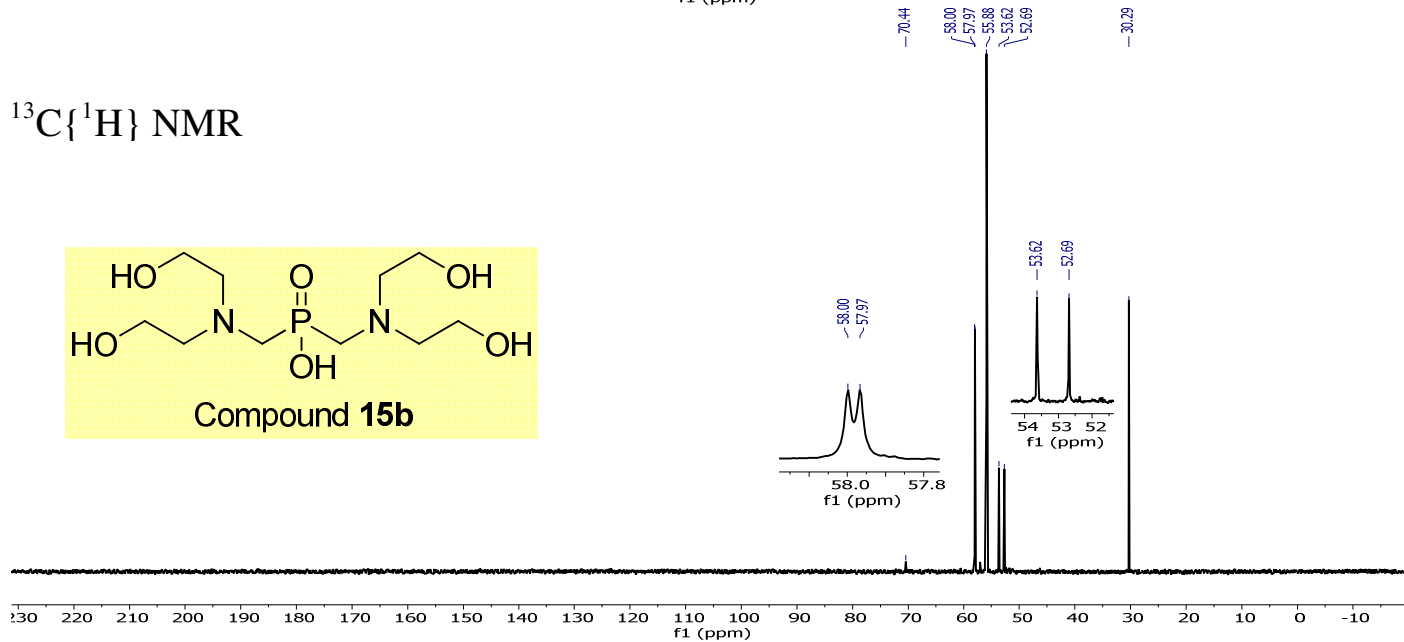
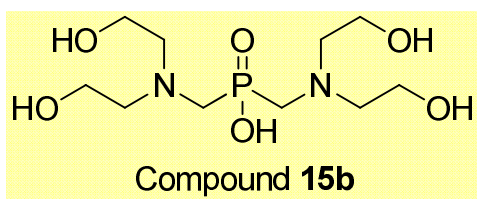
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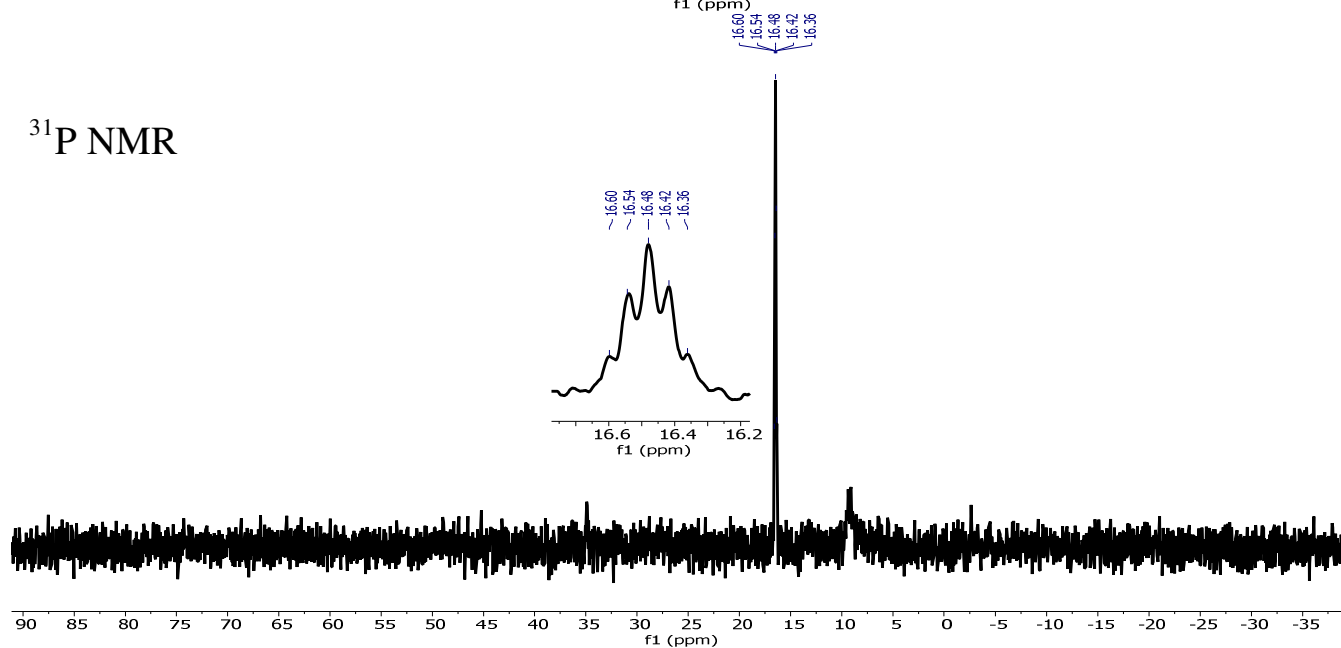
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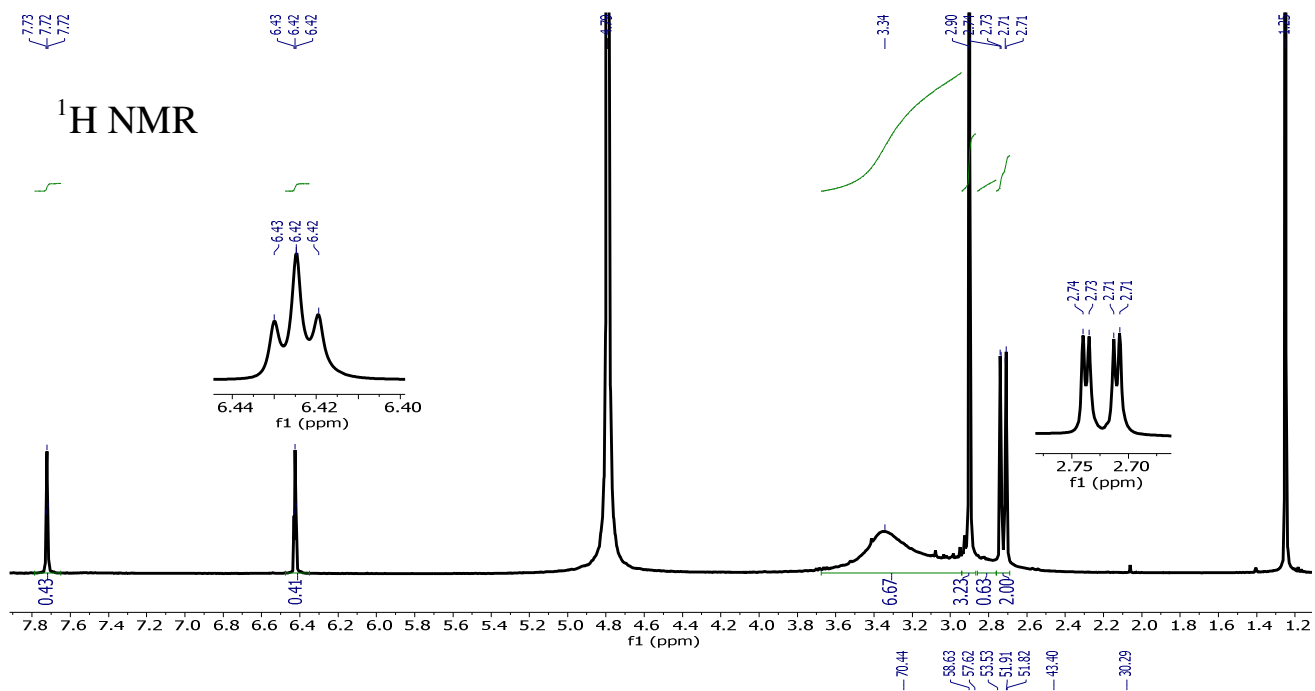


$^{13}\text{C}\{^1\text{H}\}$ NMR

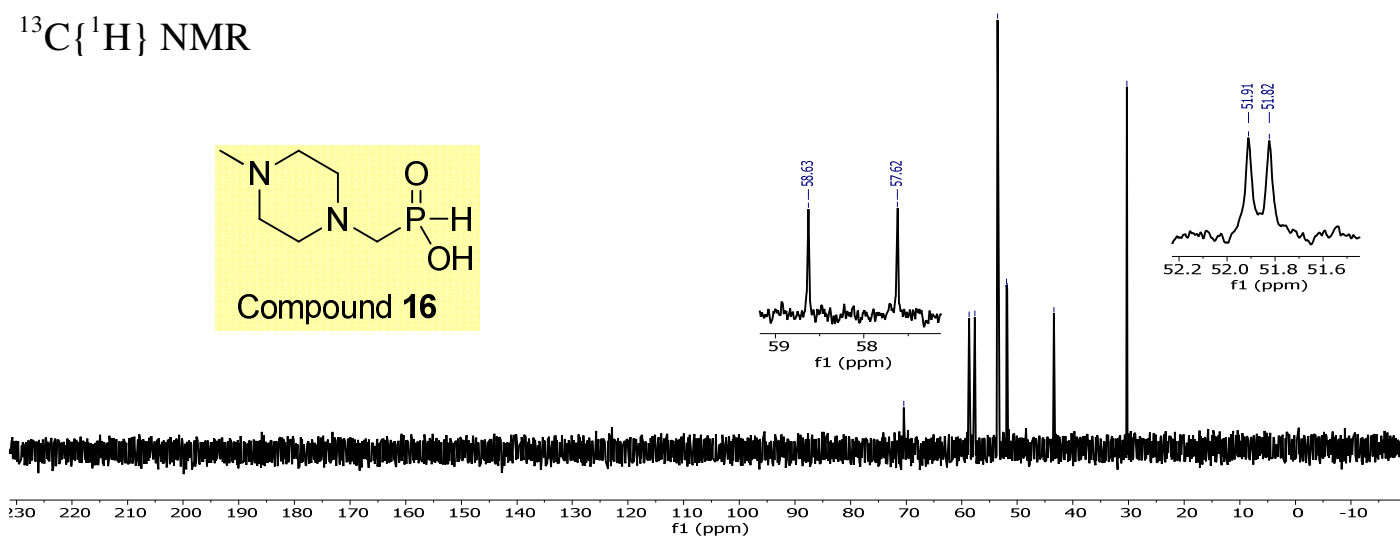
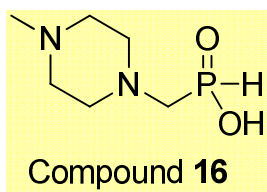


^{31}P NMR

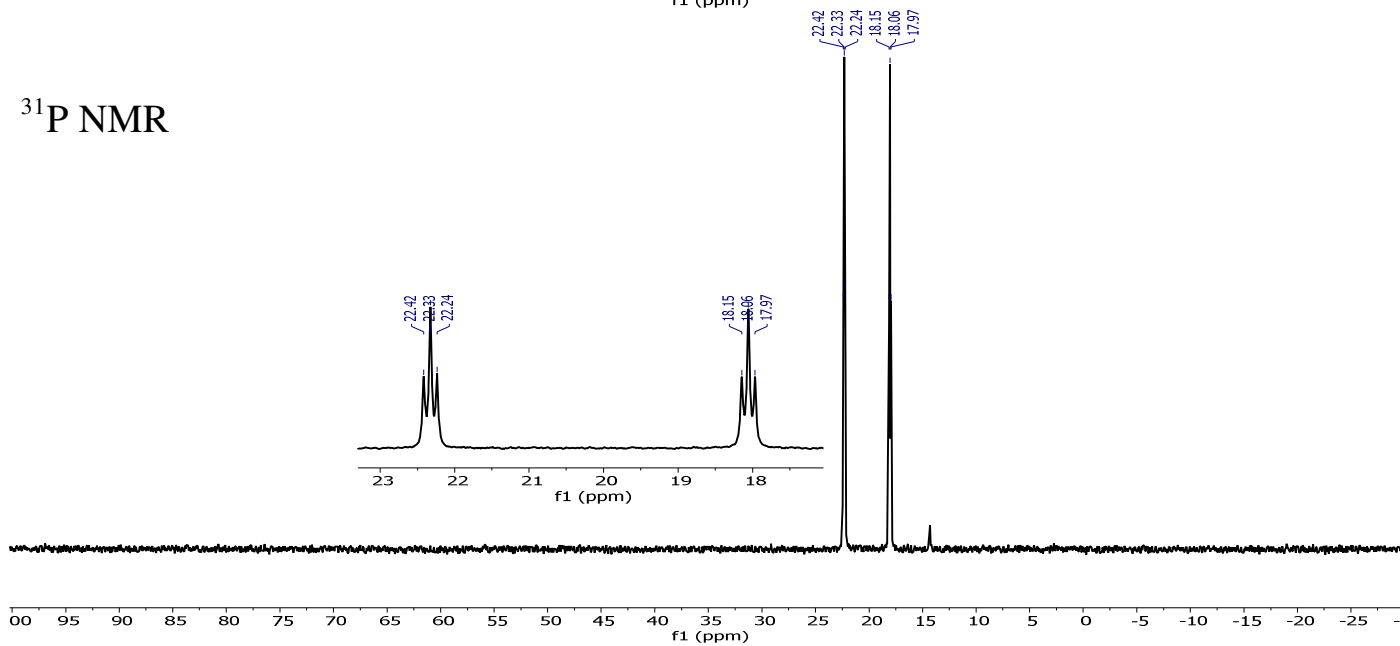


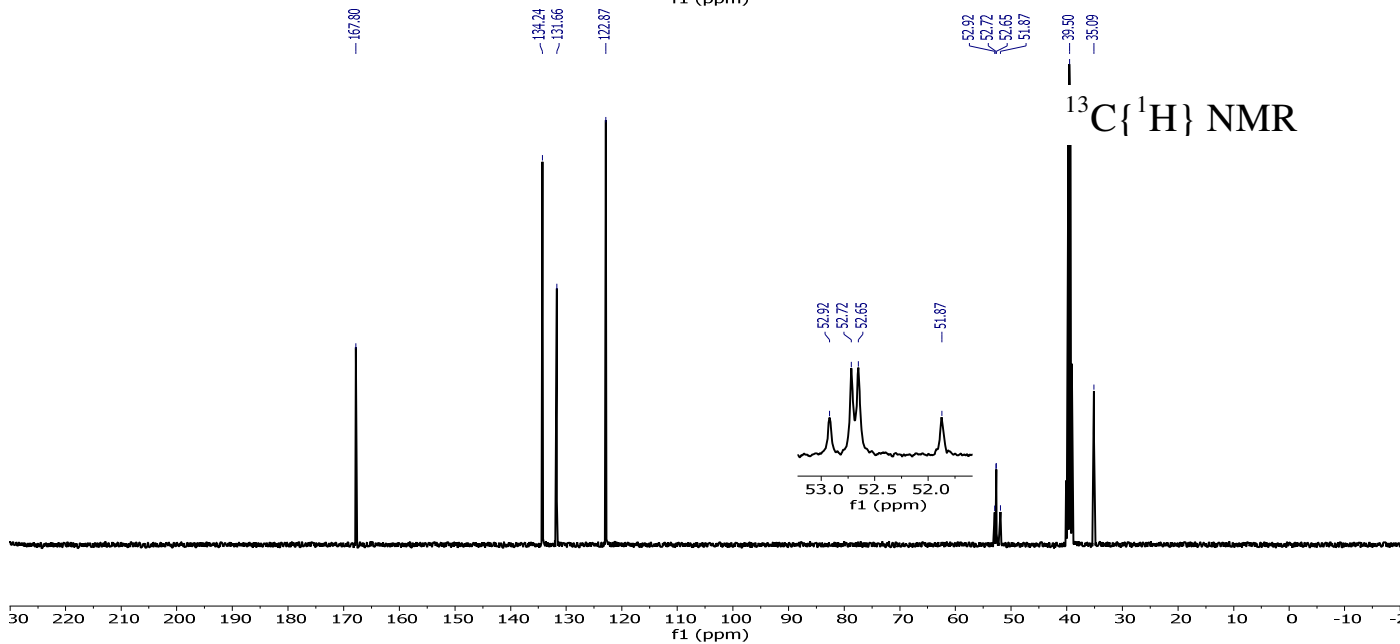
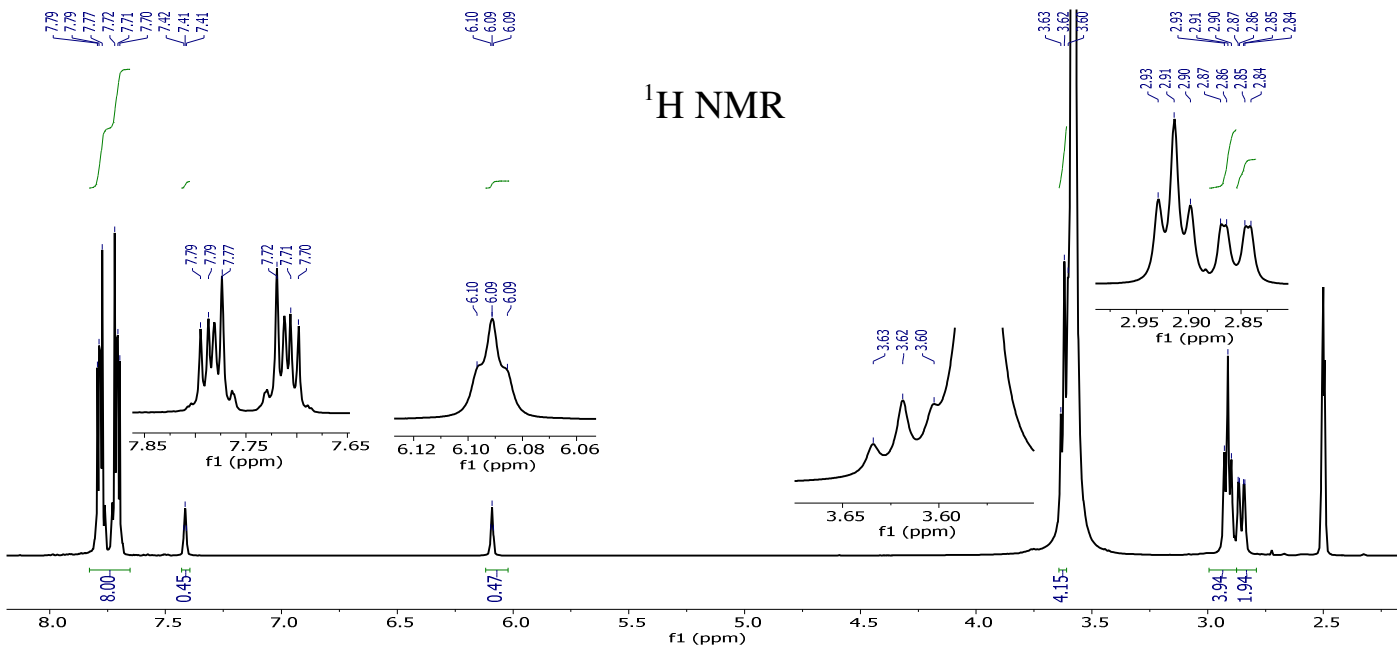


¹³C{¹H} NMR

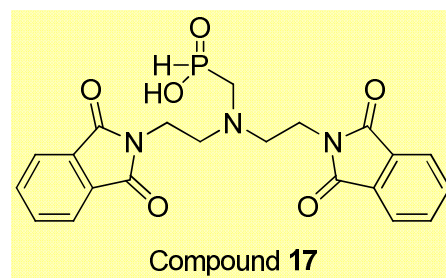
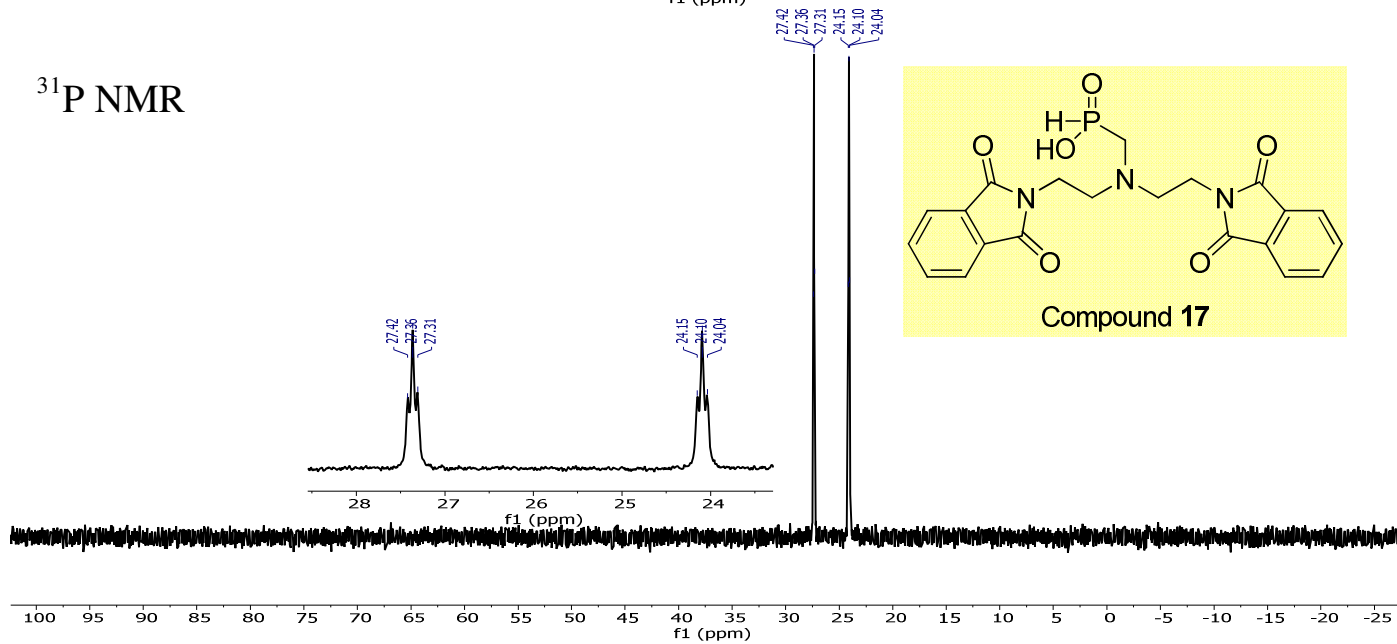


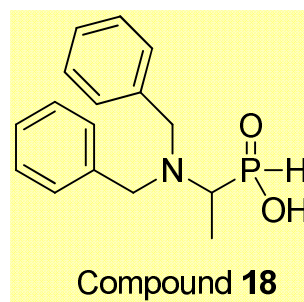
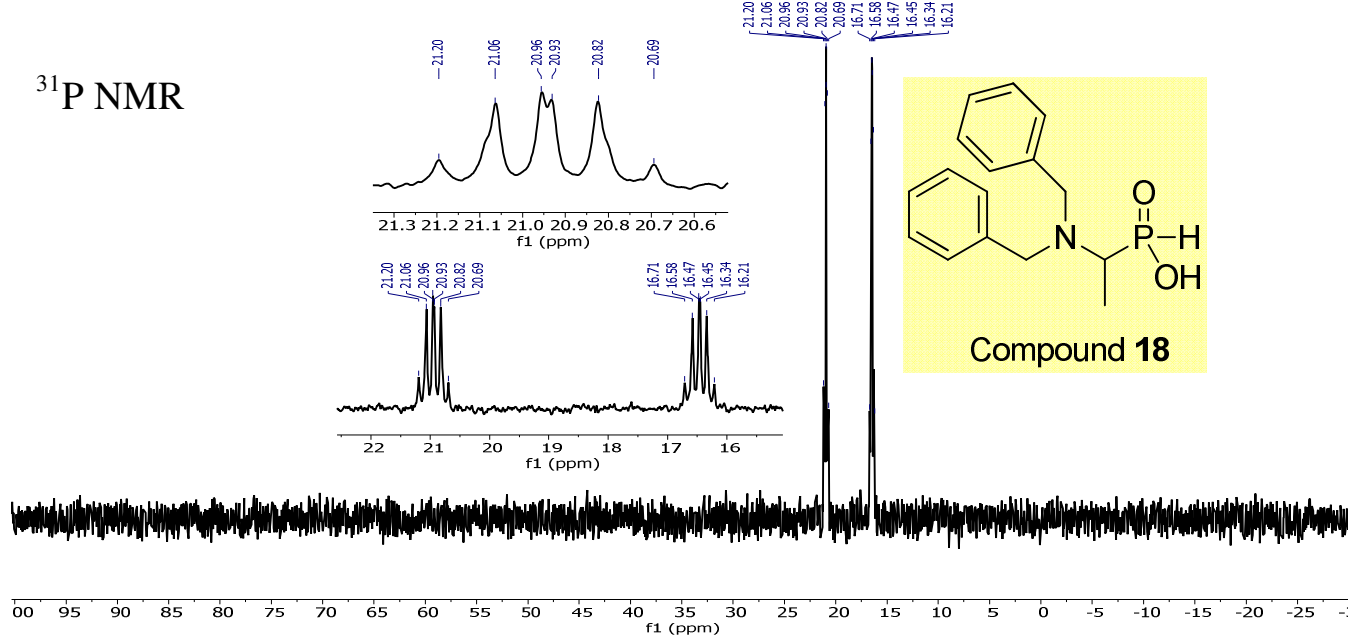
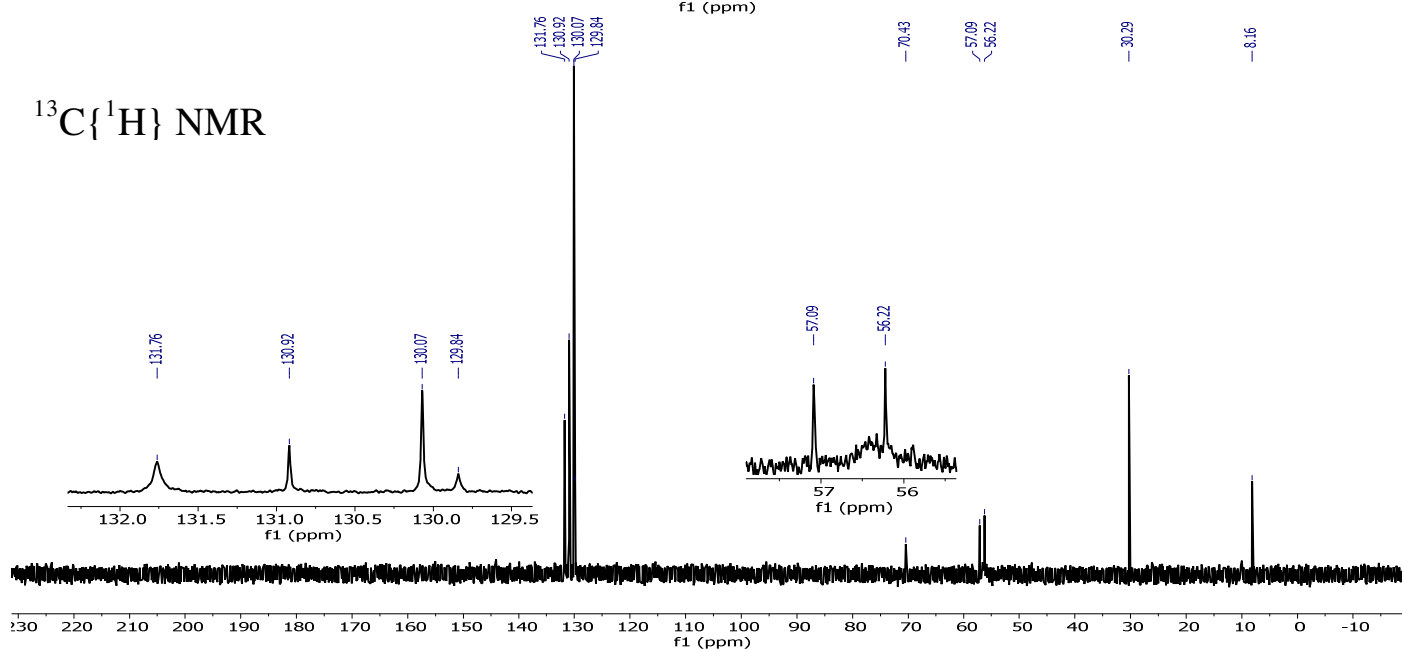
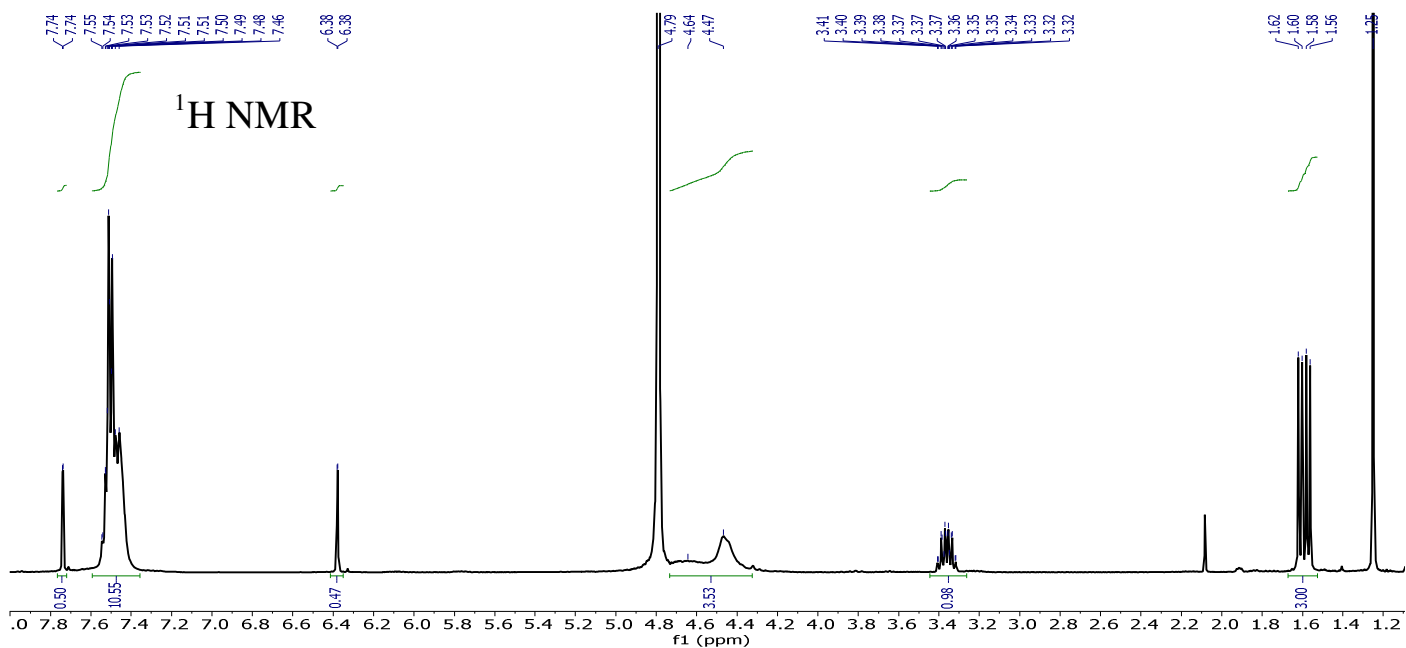
³¹P NMR

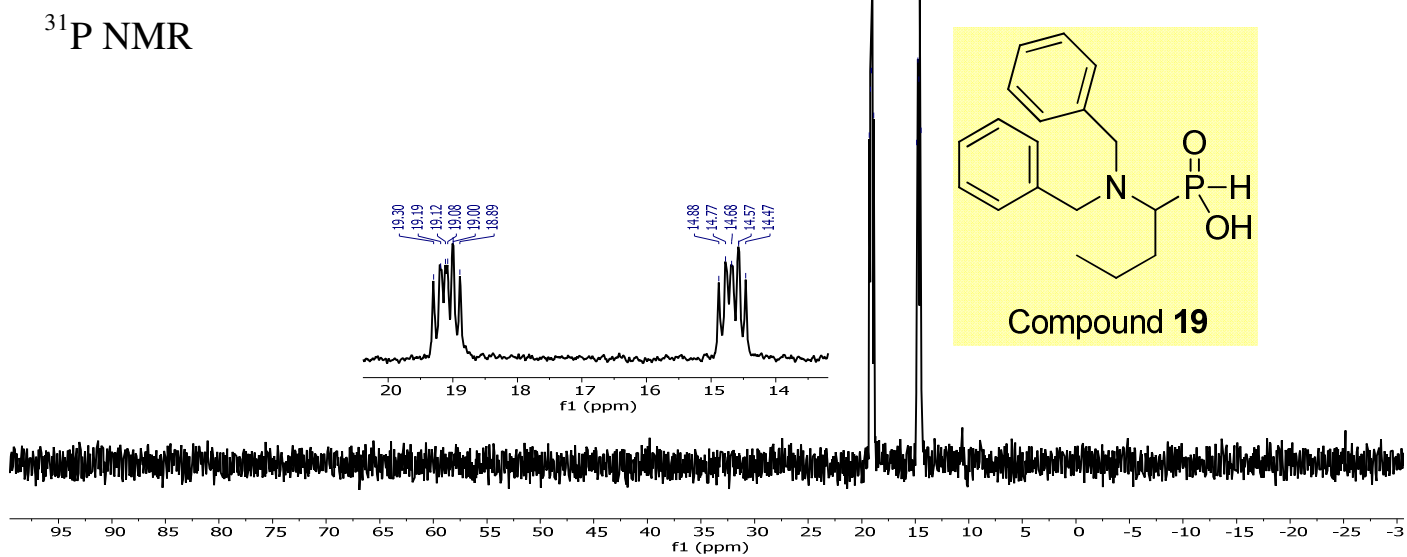
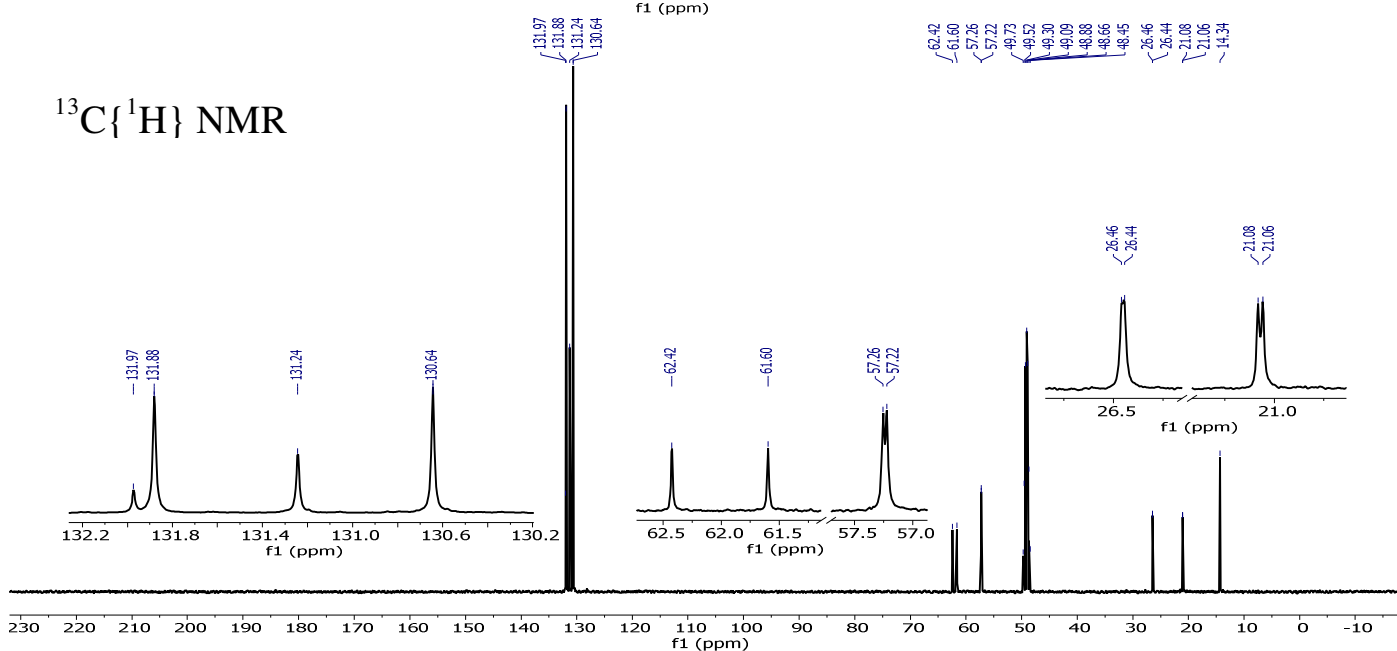
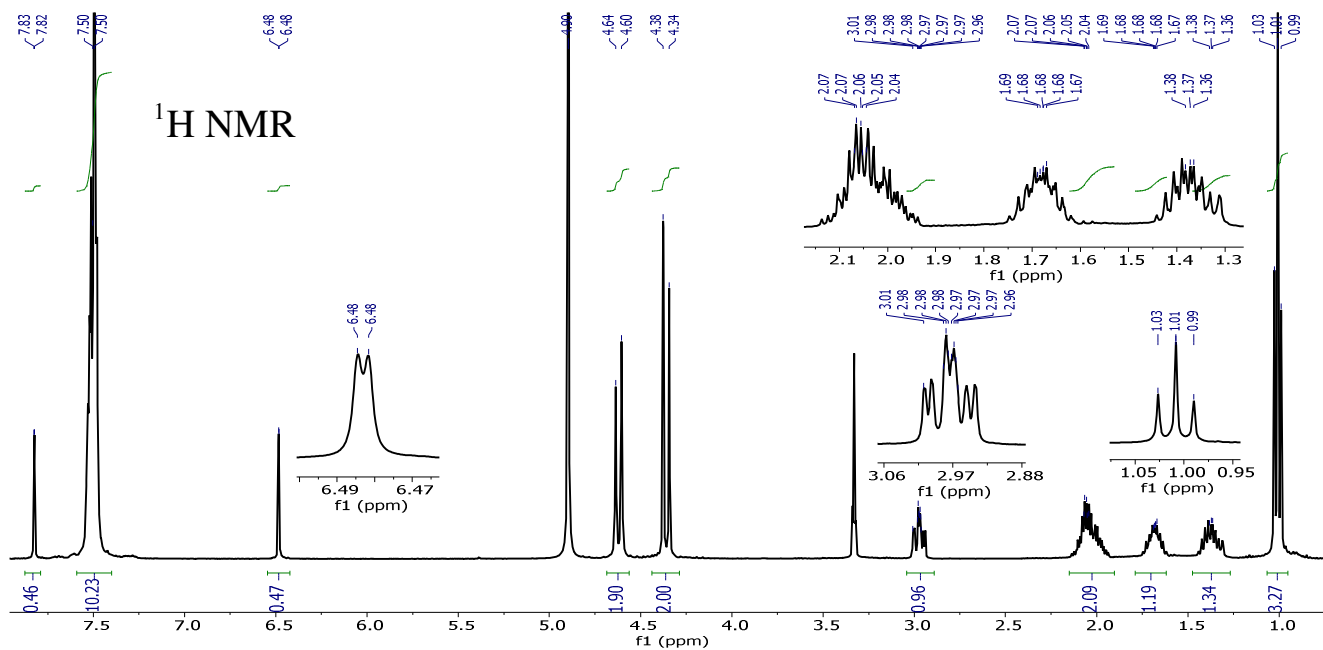


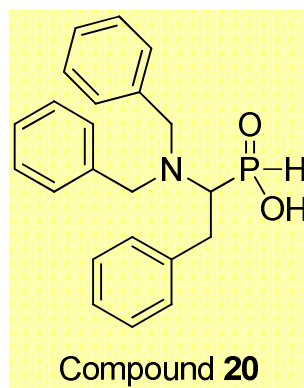
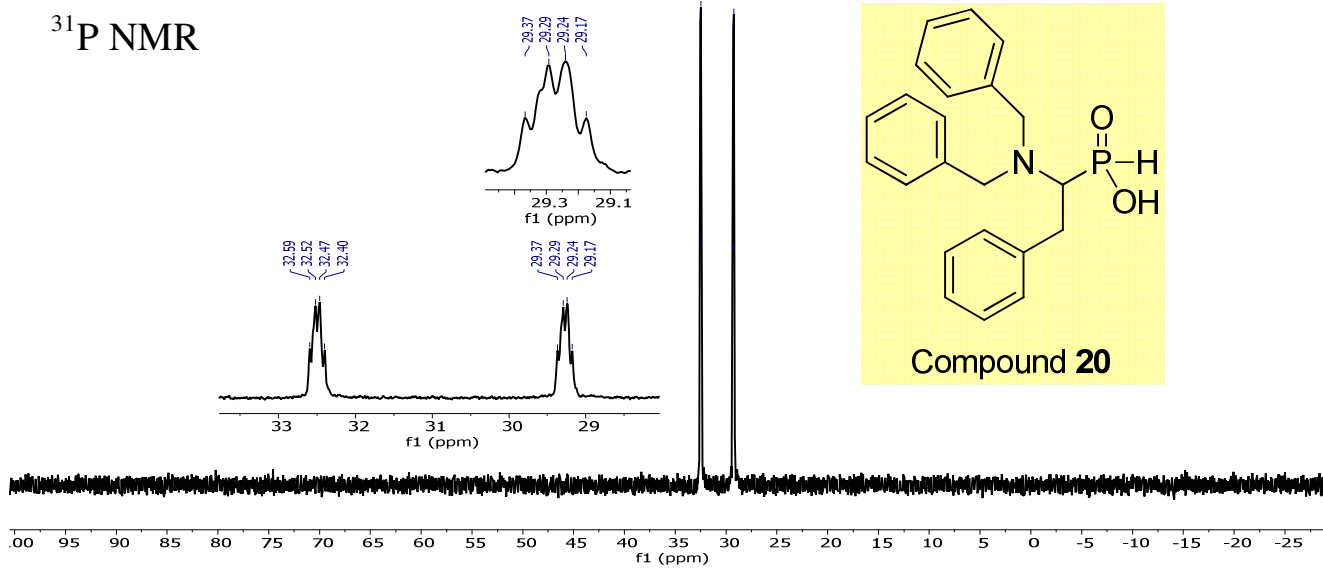
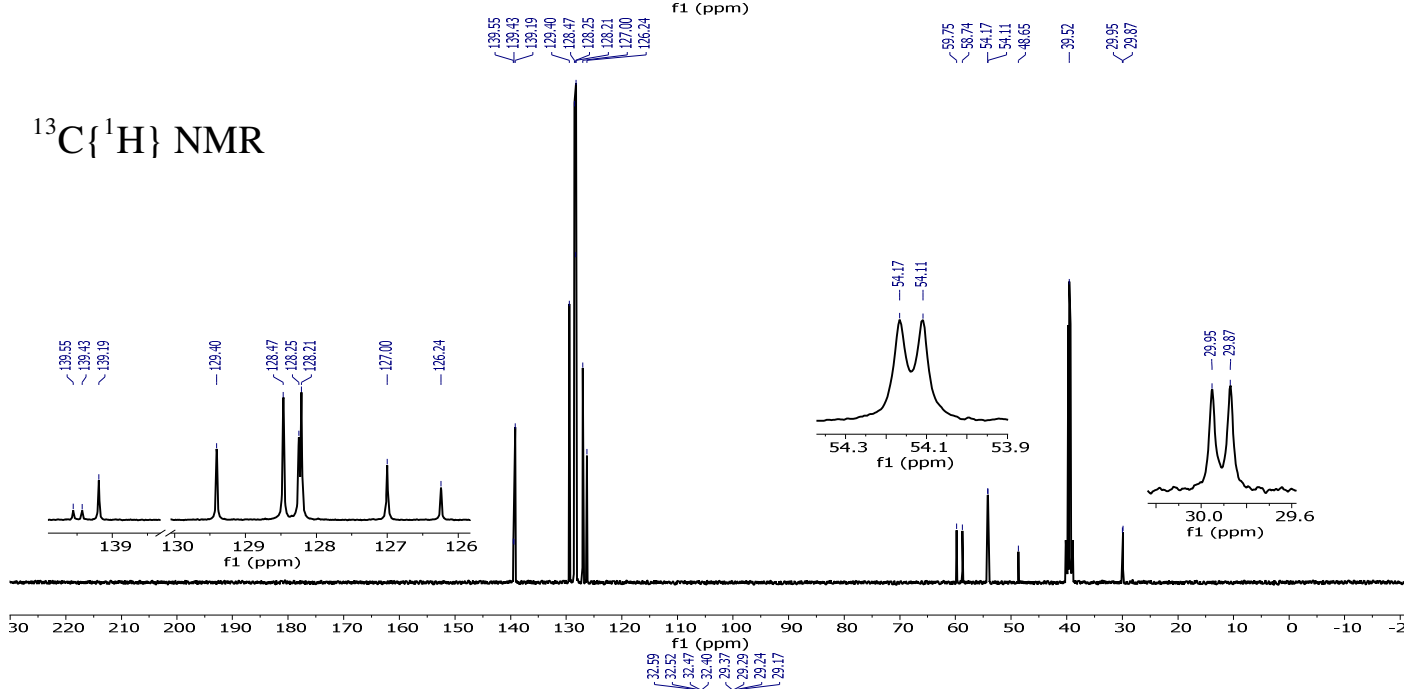
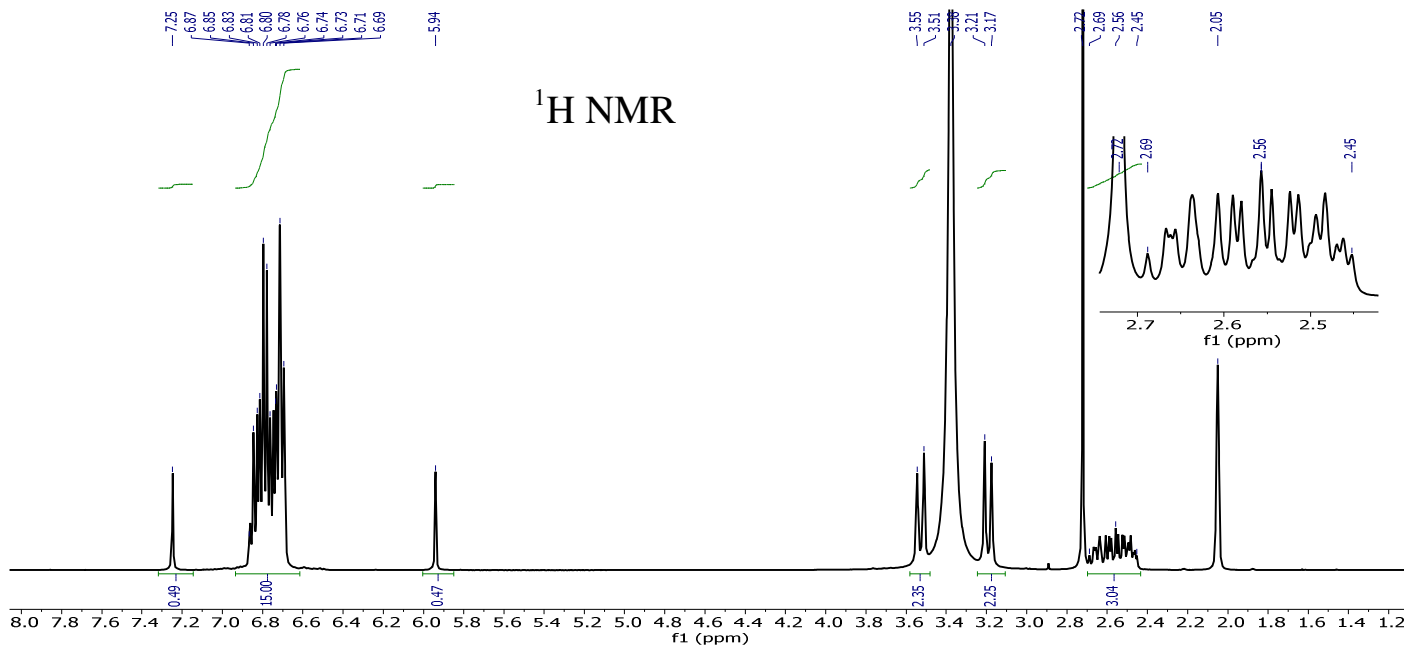


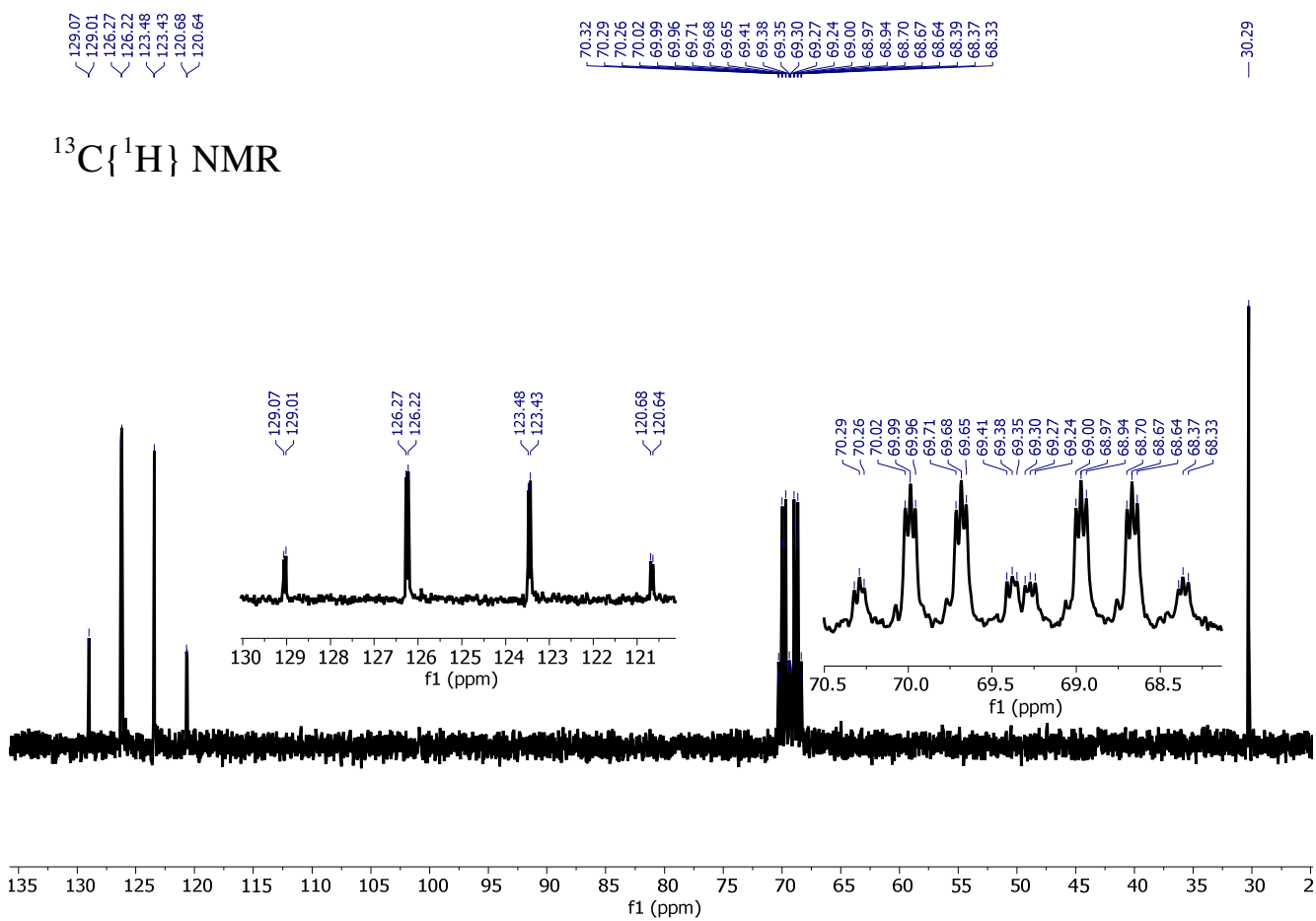
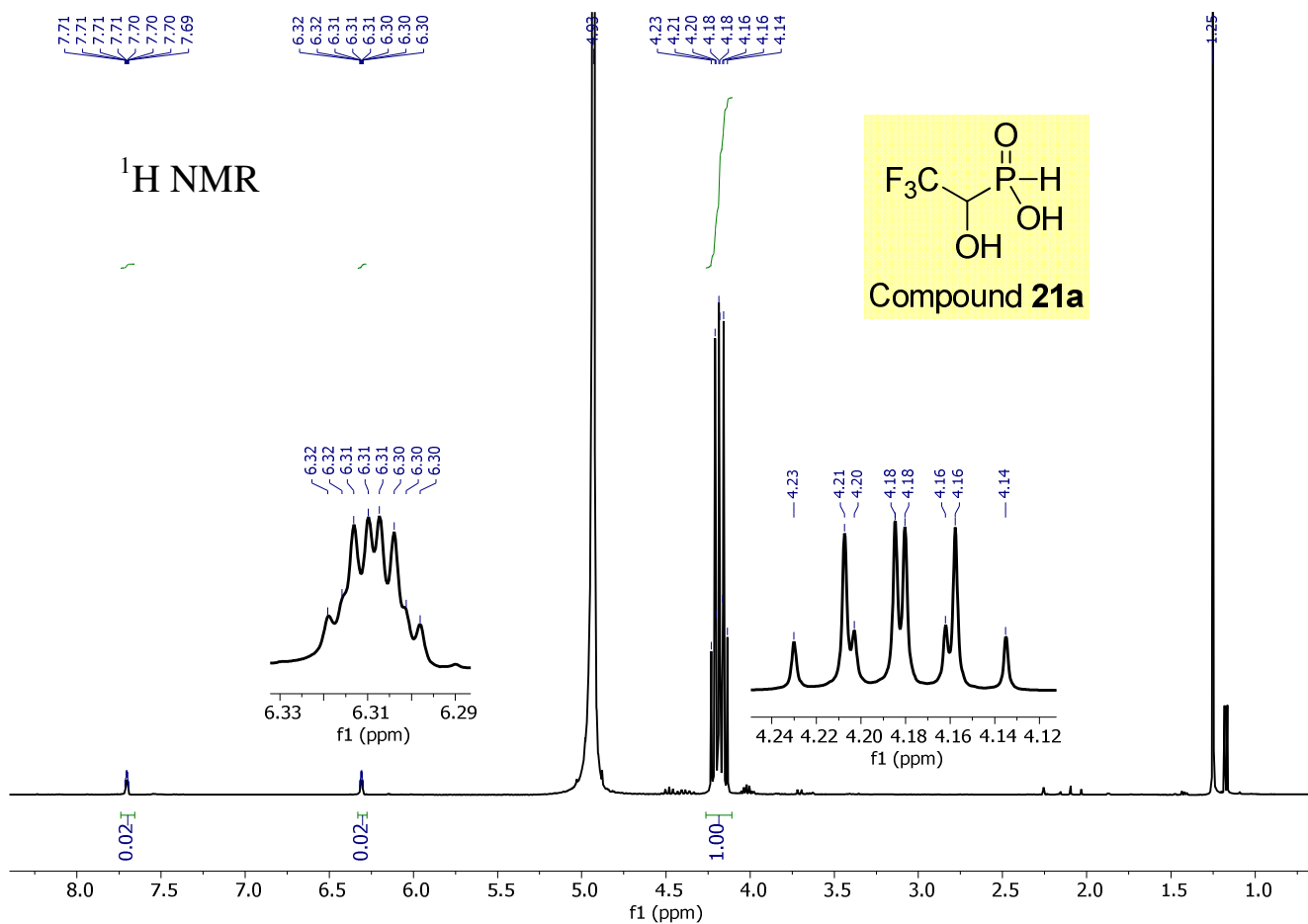
³¹P NMR



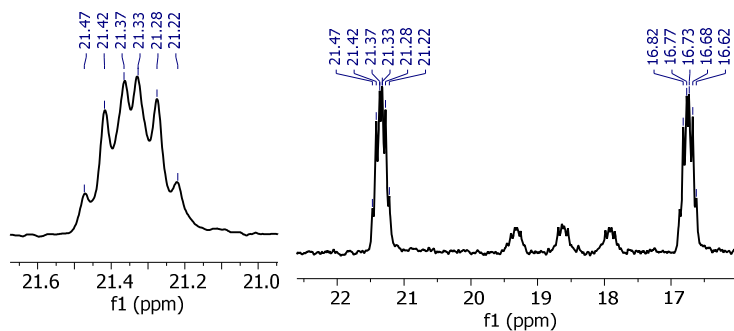
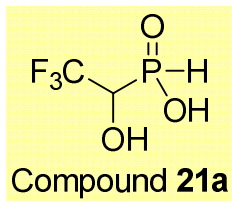






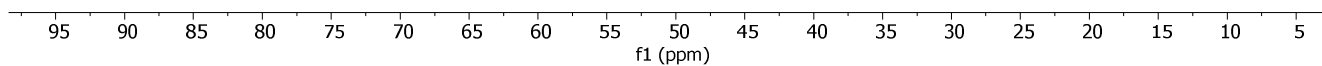


^{31}P NMR

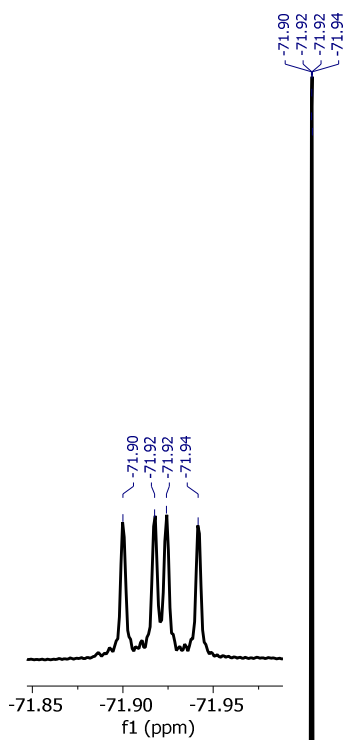


21.47
21.42
21.37
21.33
21.28
21.22

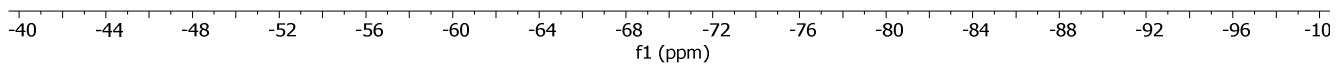
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16.77
16.73
16.68
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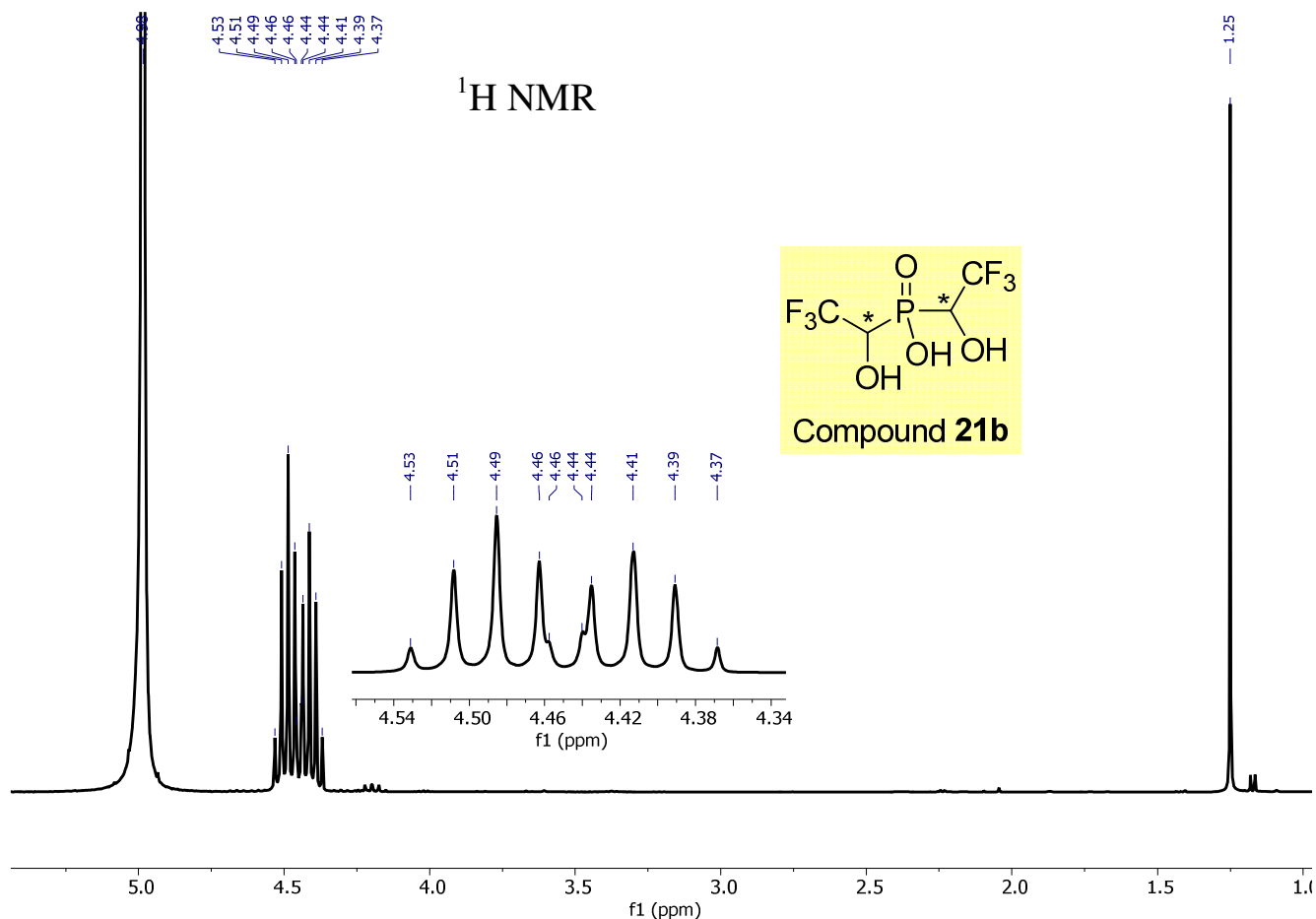
^{19}F NMR



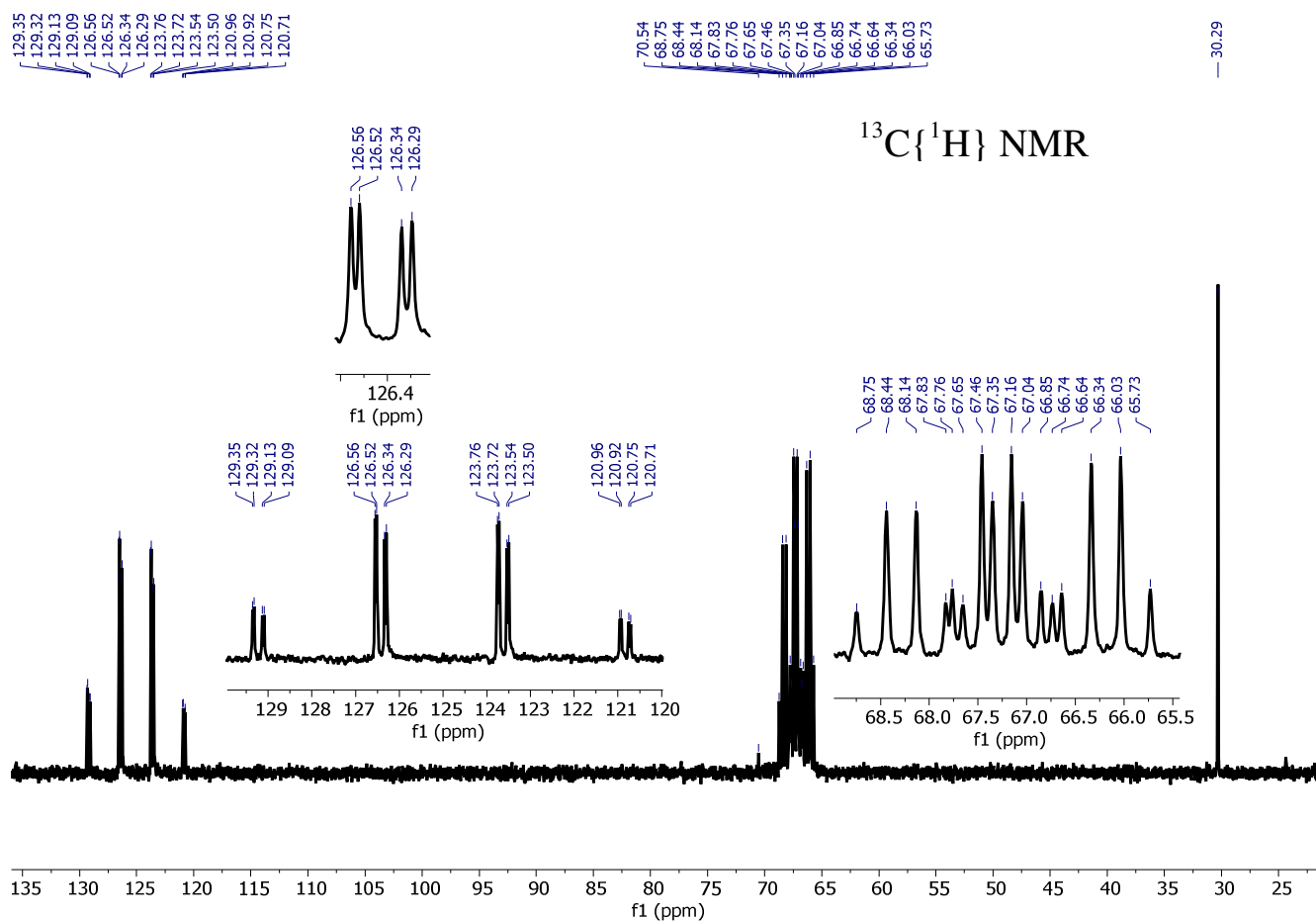
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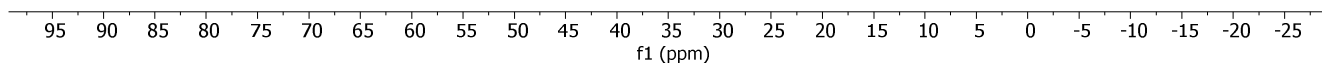
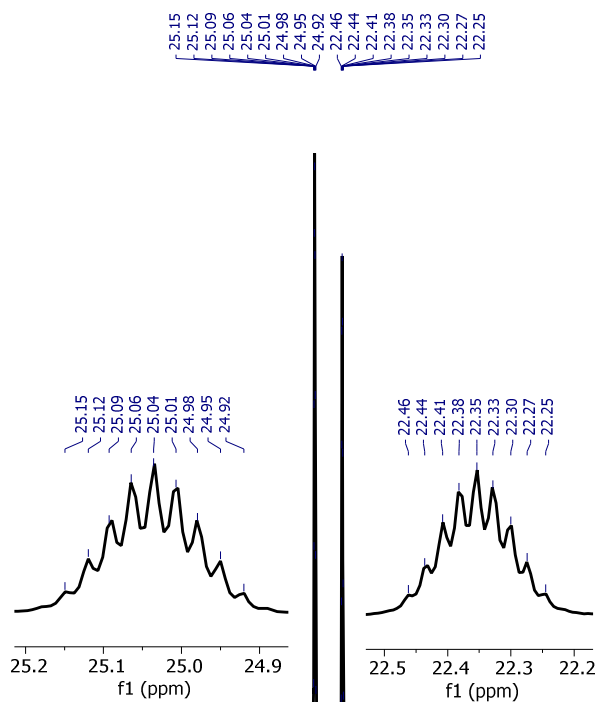
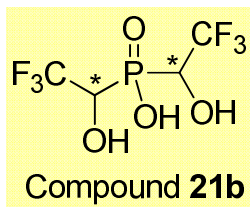
^1H NMR



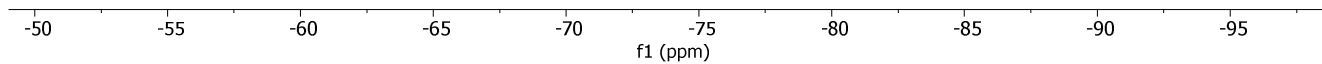
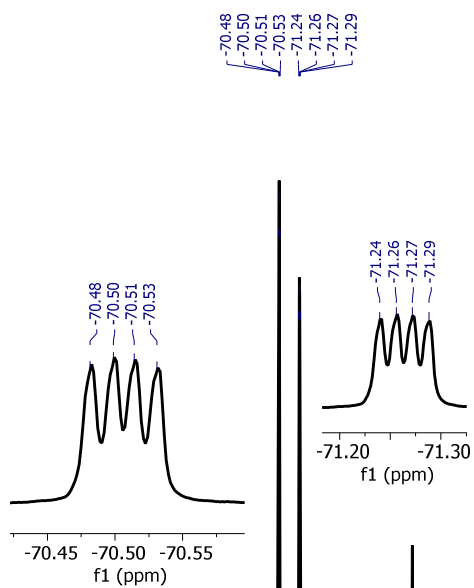
$^{13}\text{C}\{^1\text{H}\}$ NMR

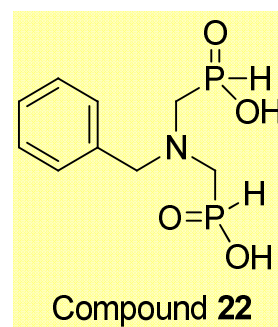
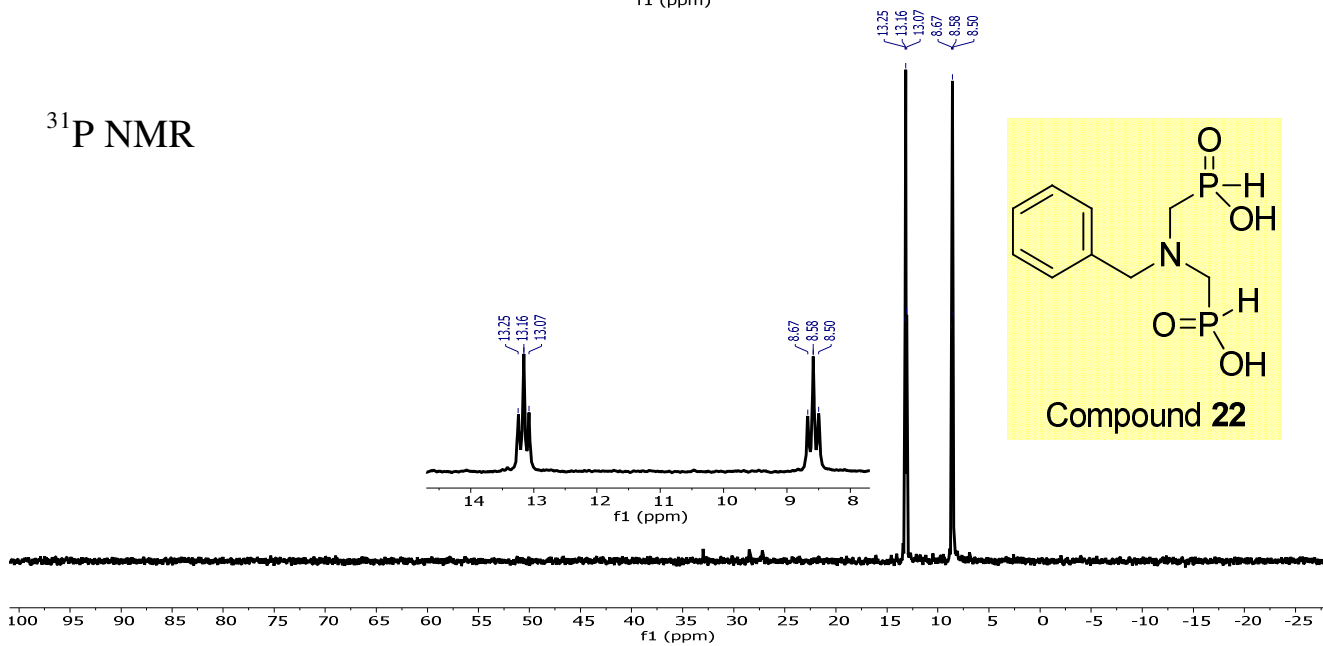
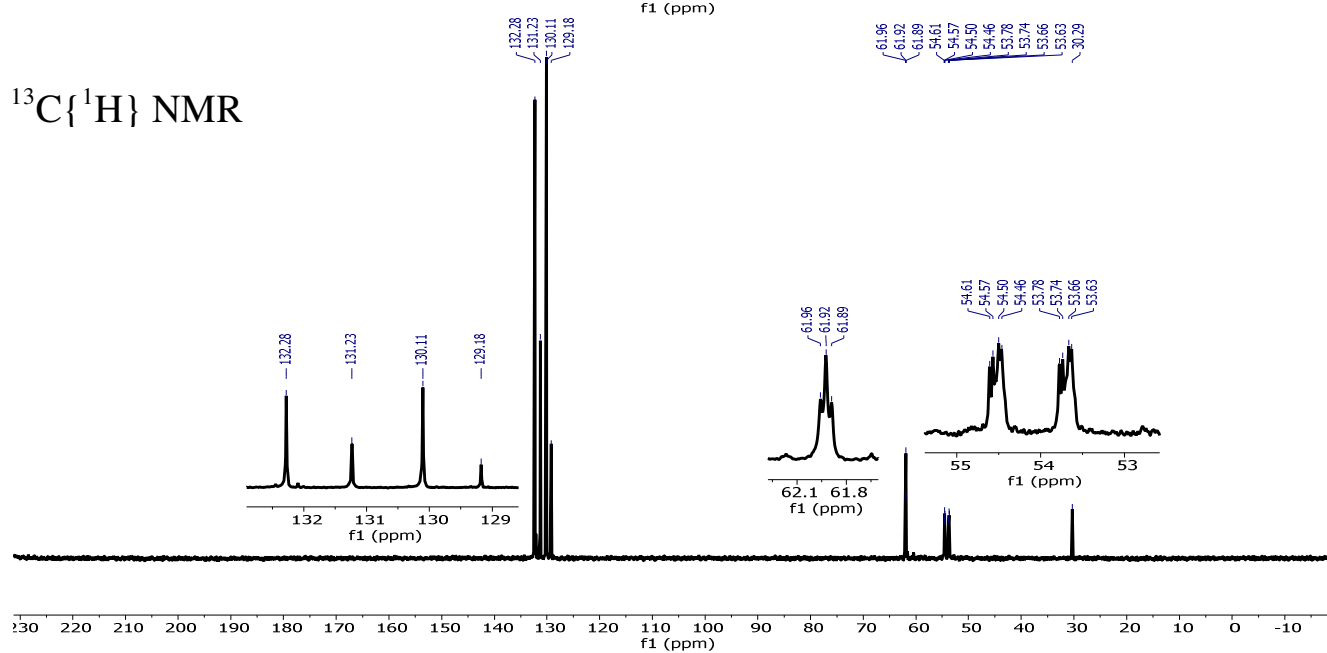
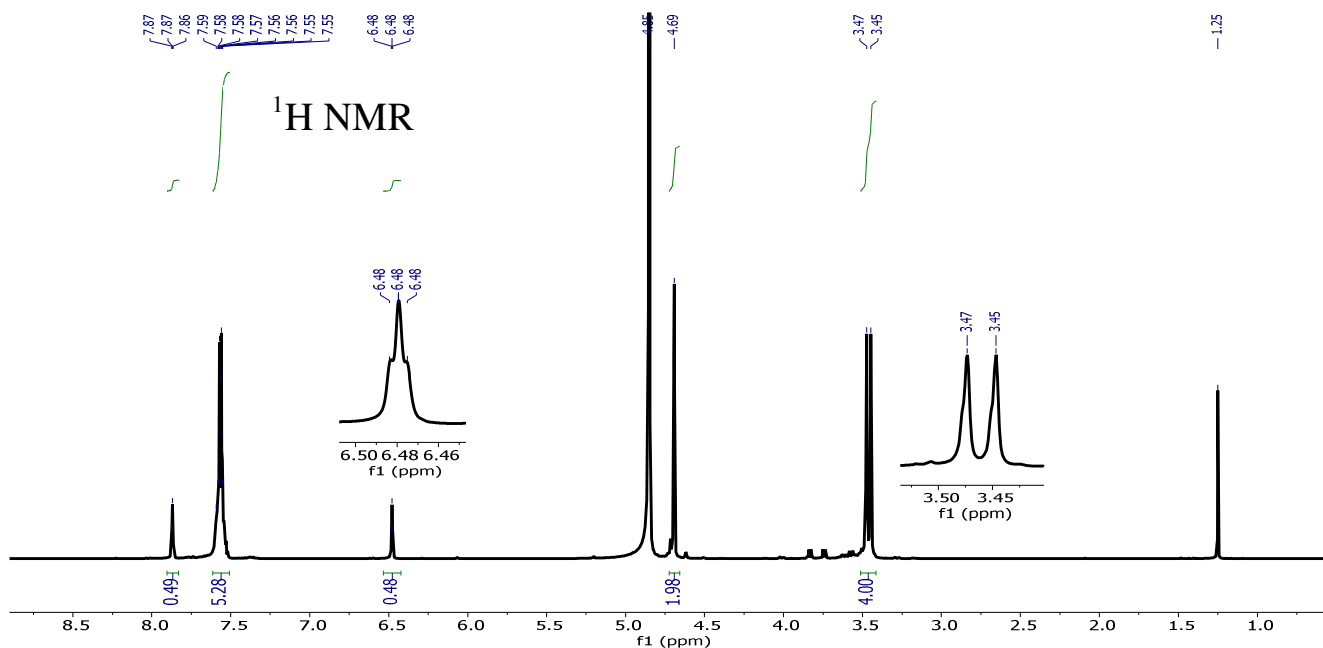


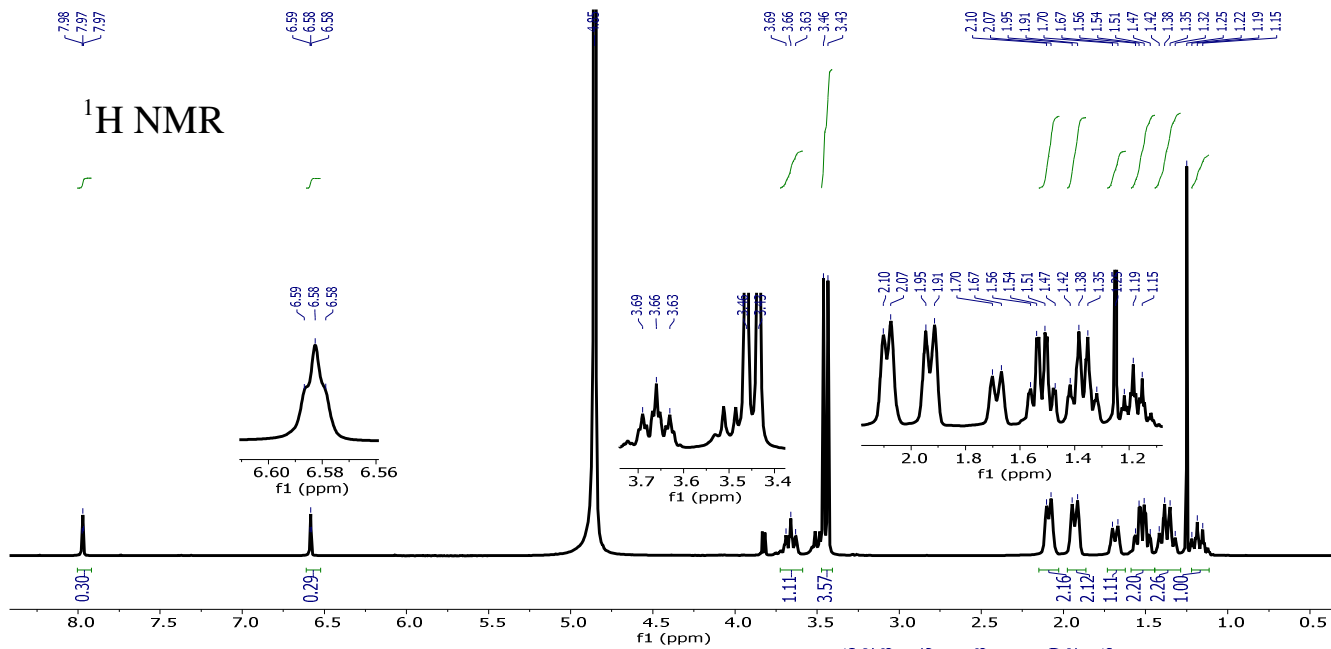
^{31}P NMR



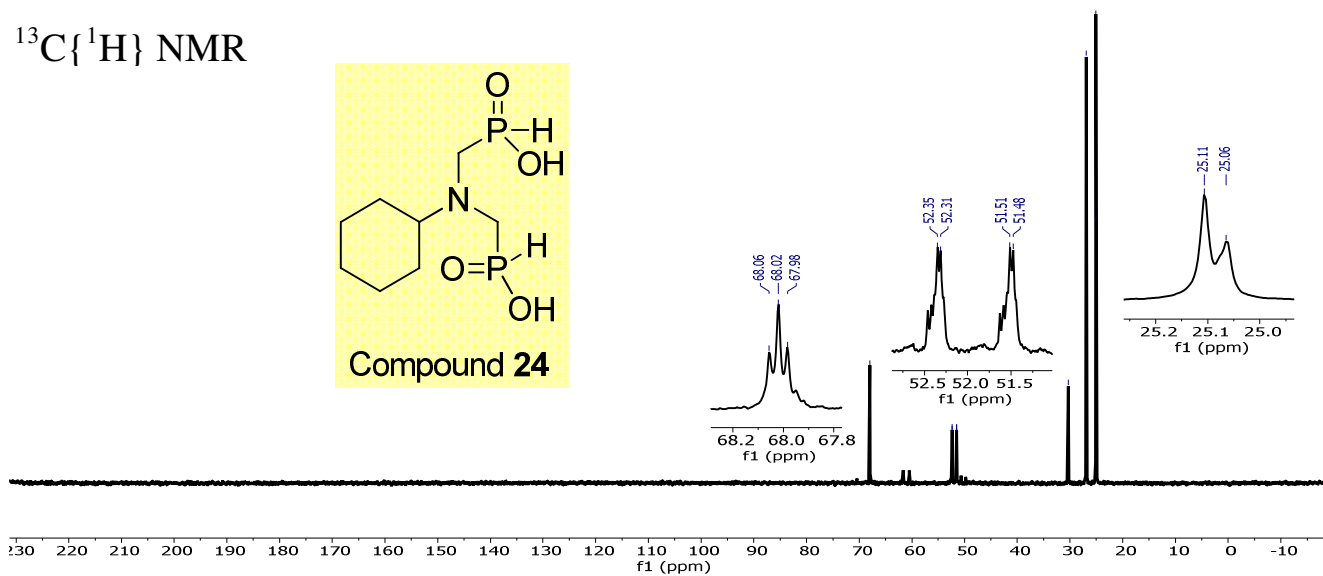
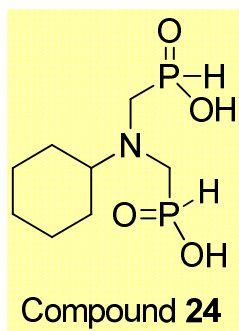
^{19}F NMR



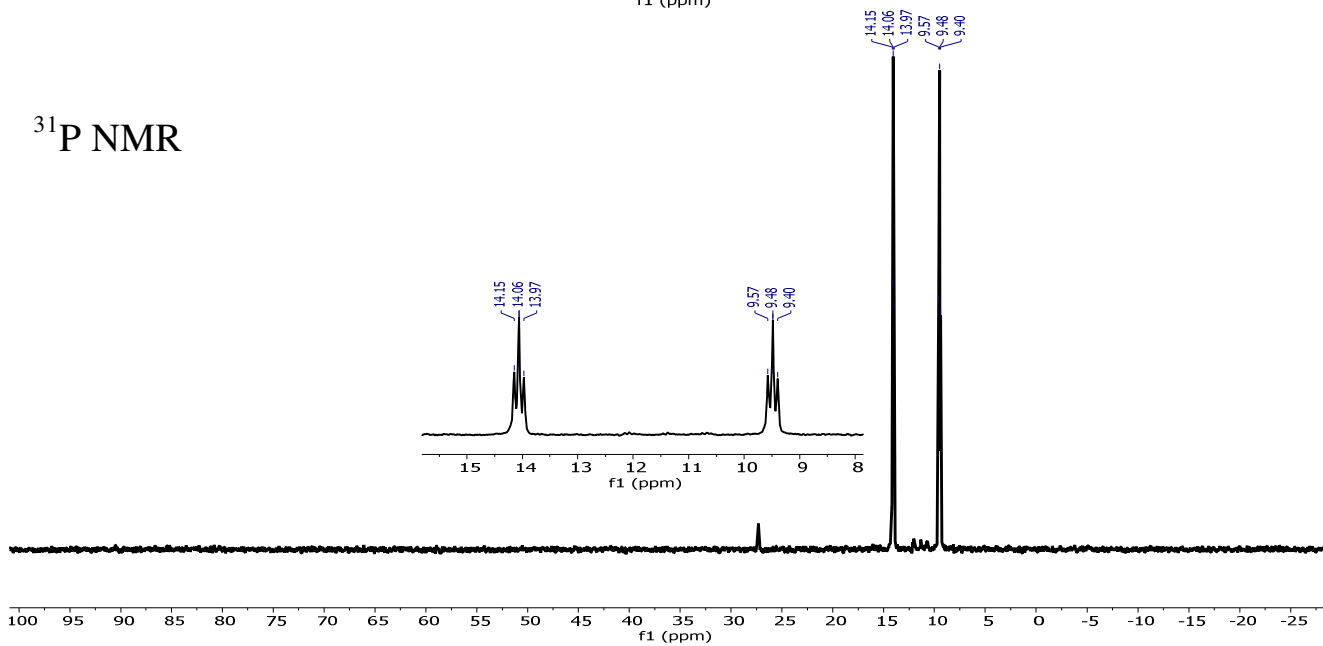


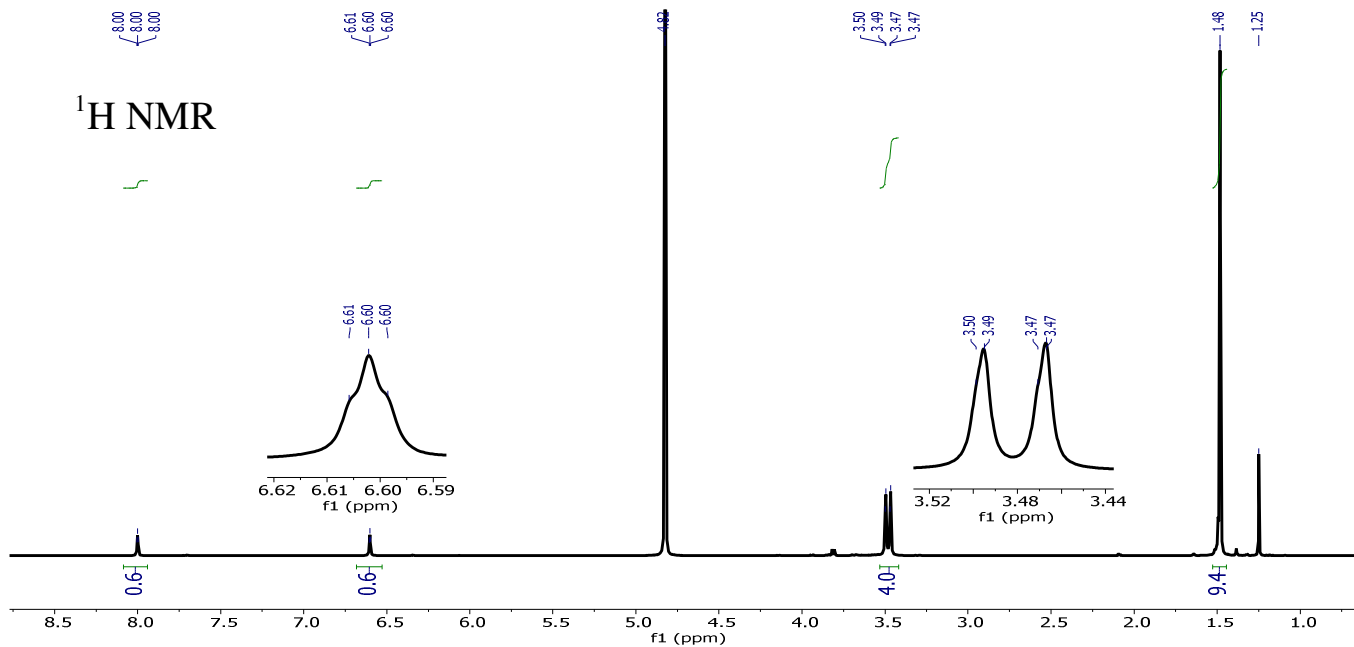


$^{13}\text{C}\{^1\text{H}\}$ NMR

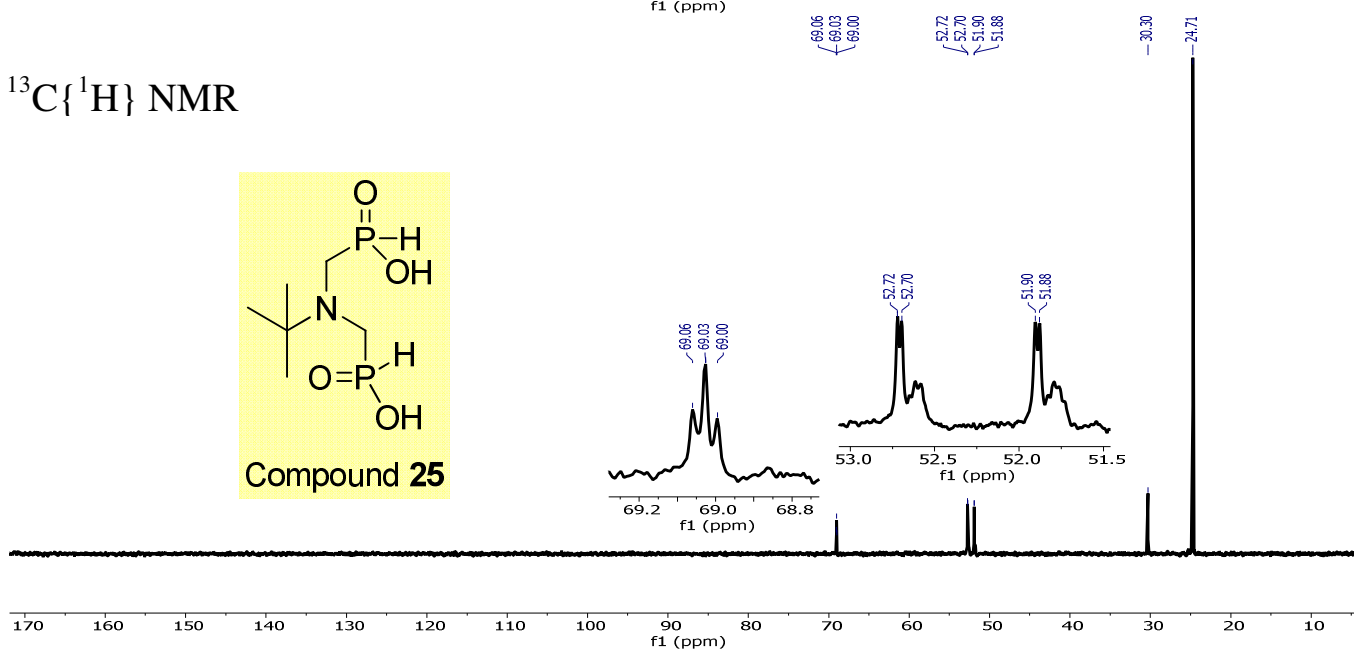
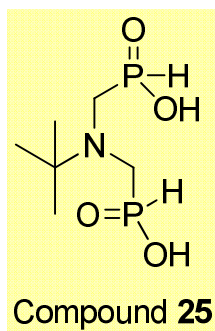


^{31}P NMR

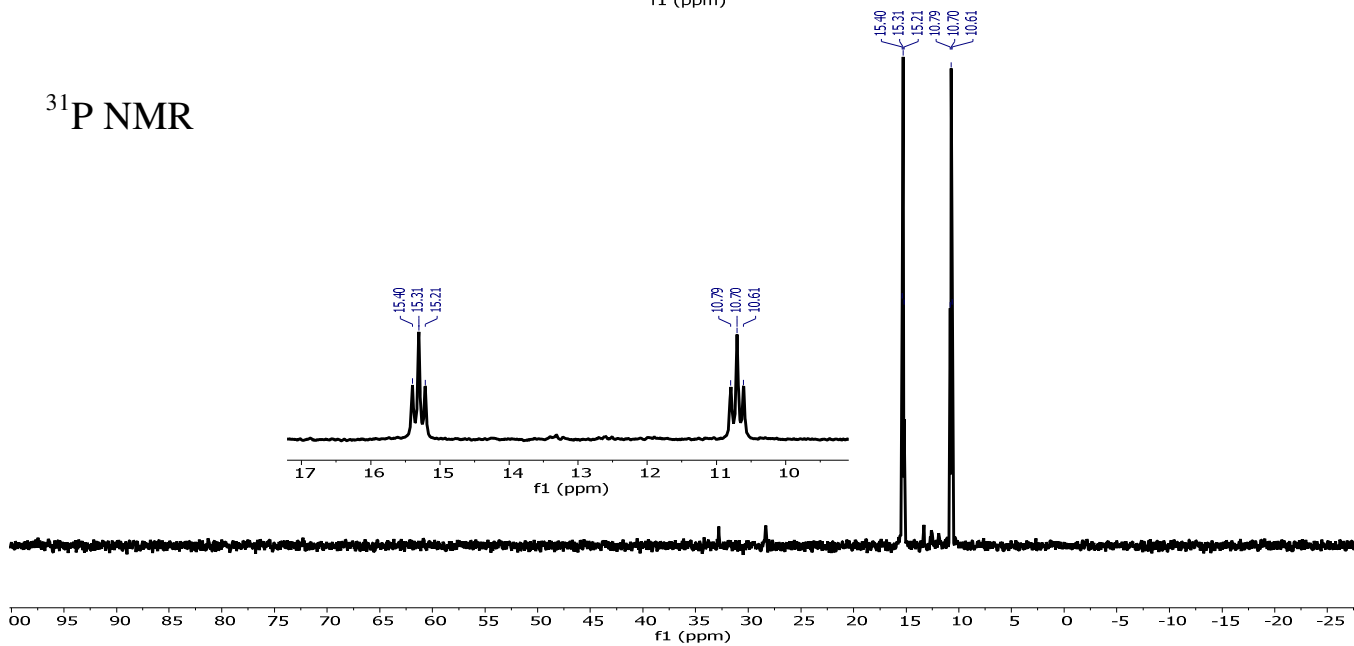


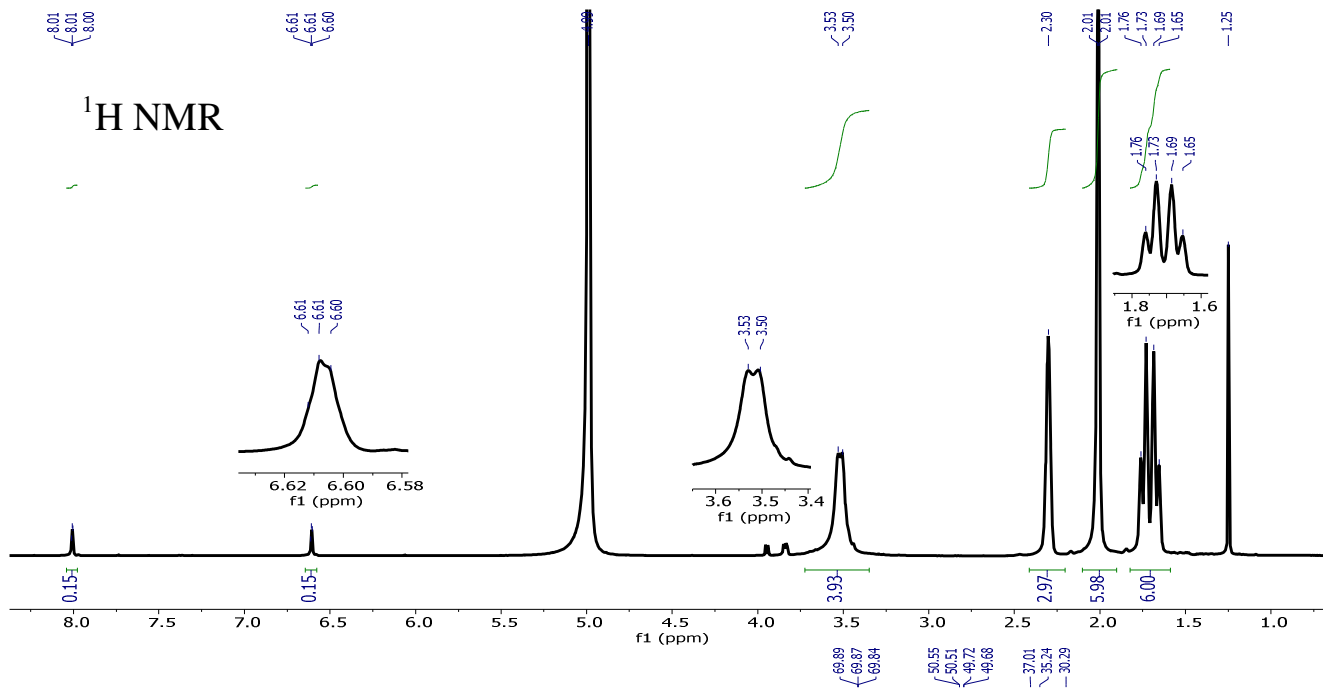


$^{13}\text{C}\{^1\text{H}\}$ NMR

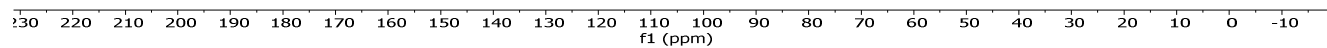
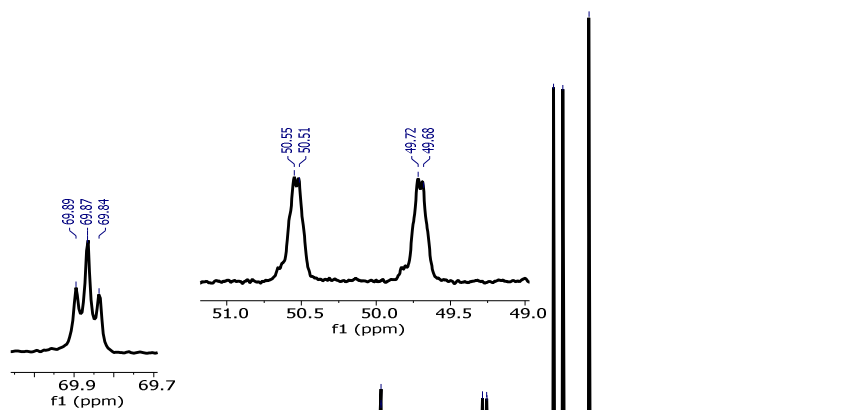
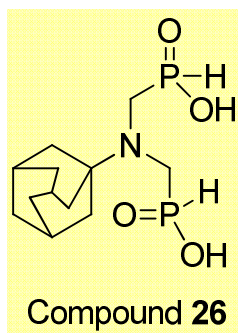


^{31}P NMR

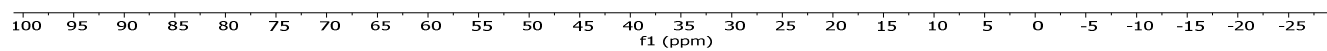
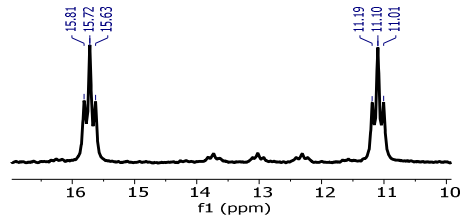


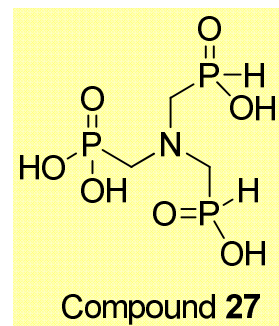
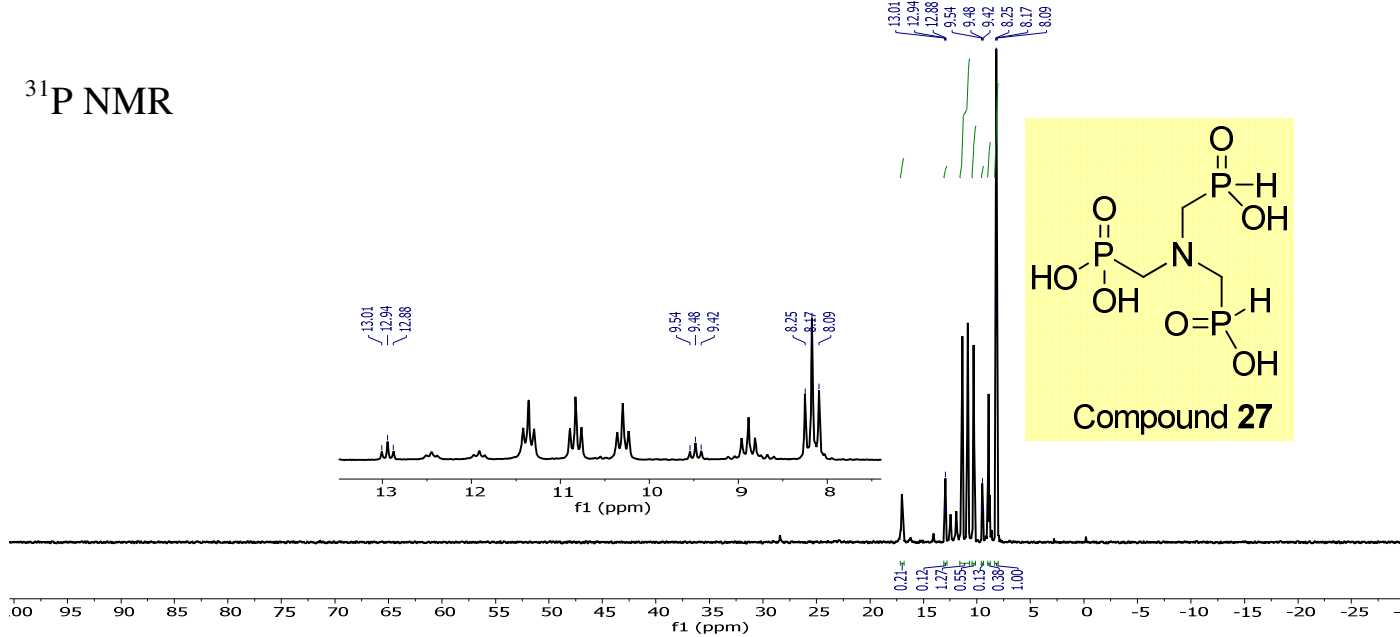
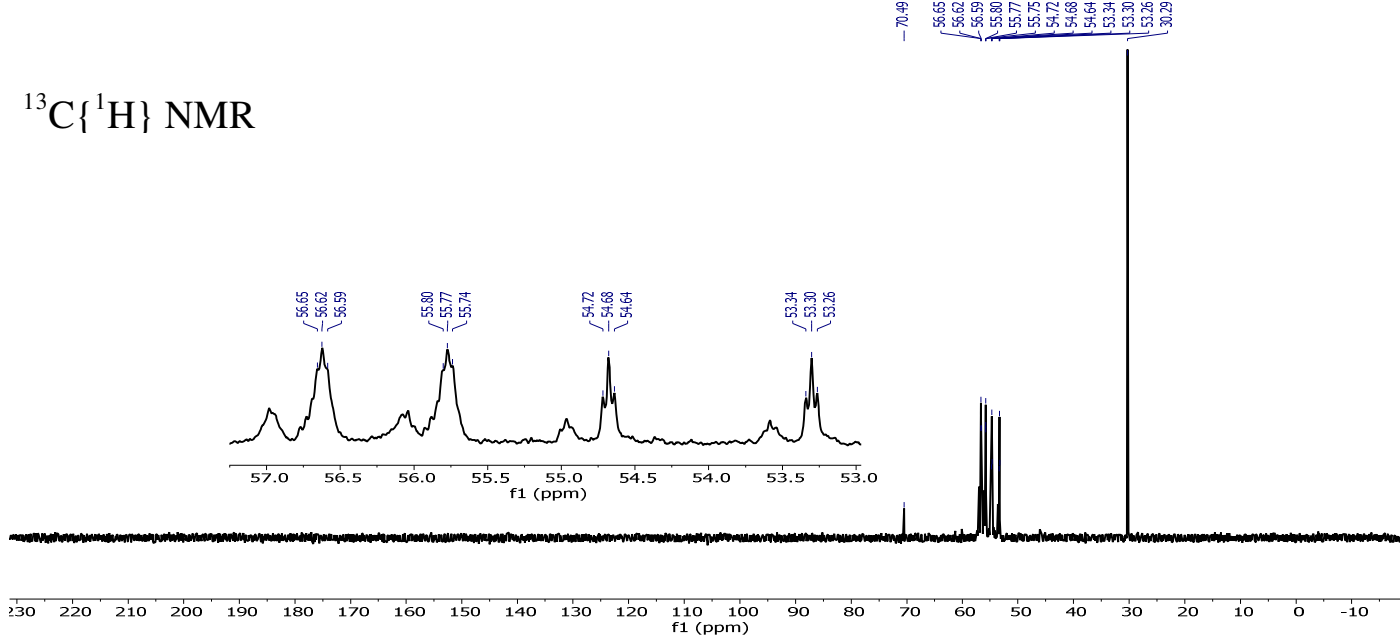
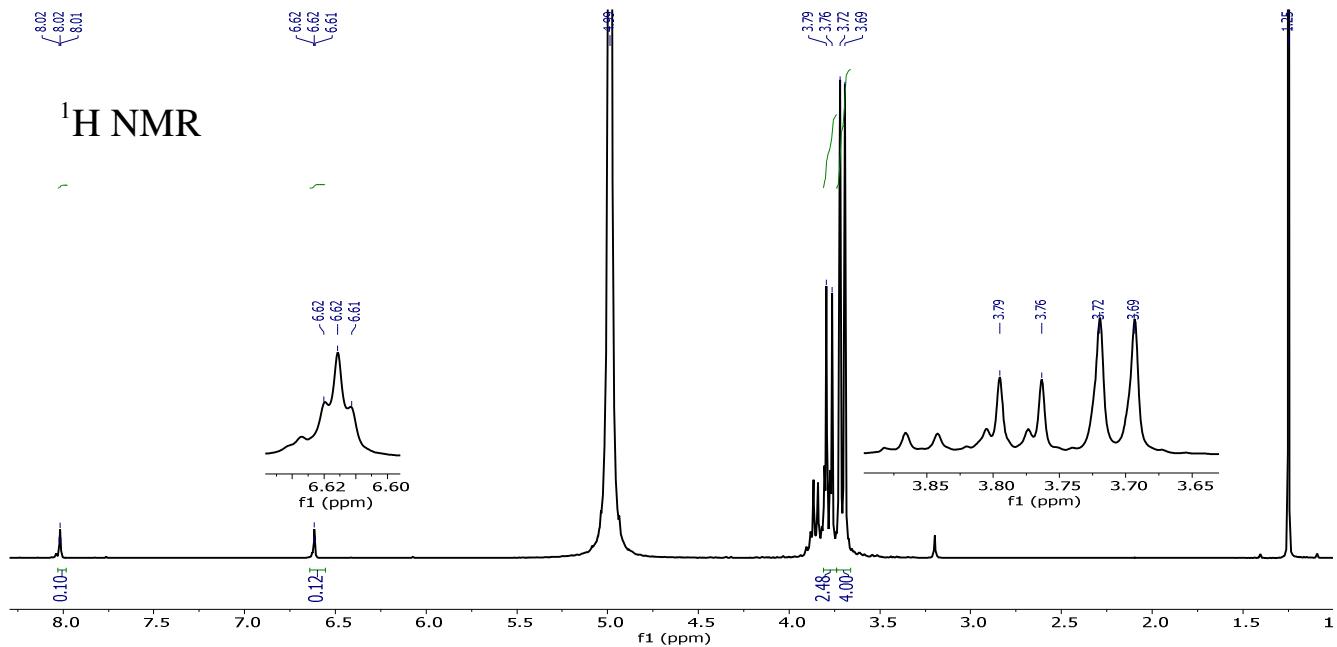


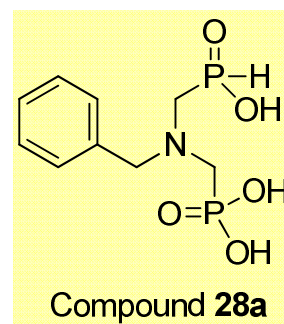
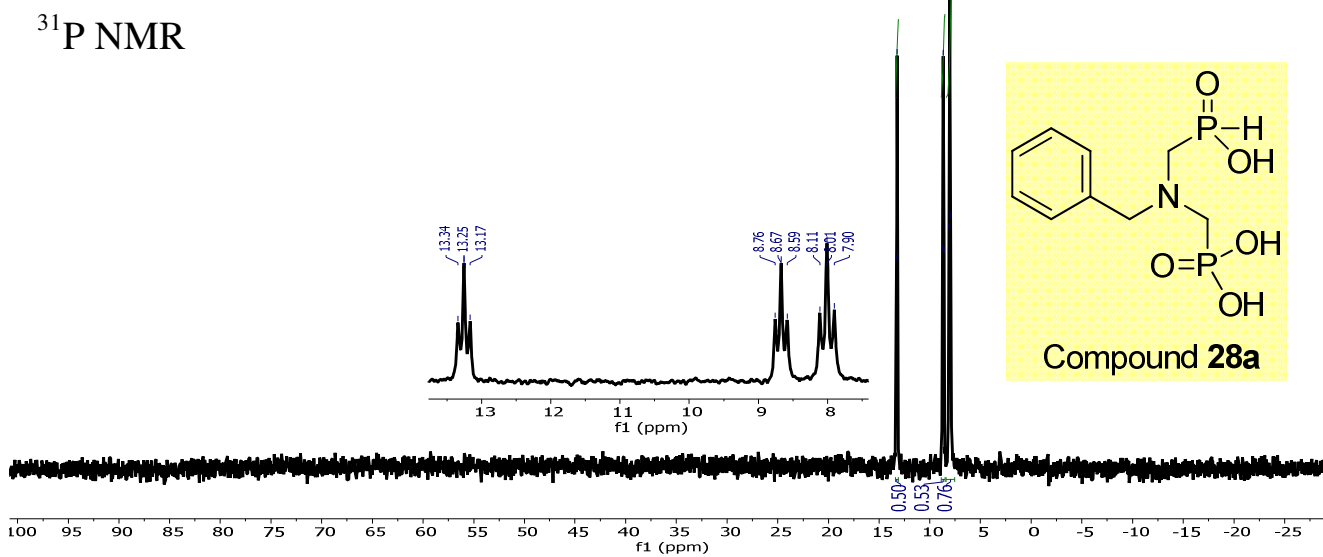
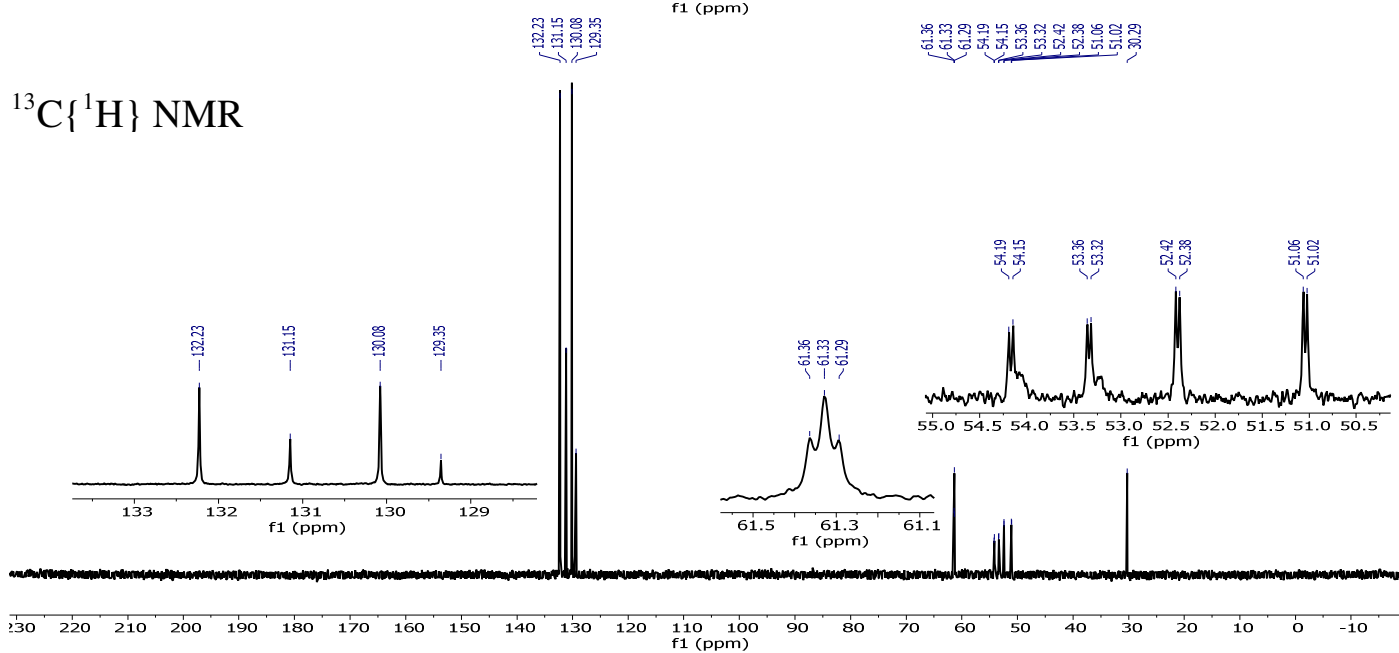
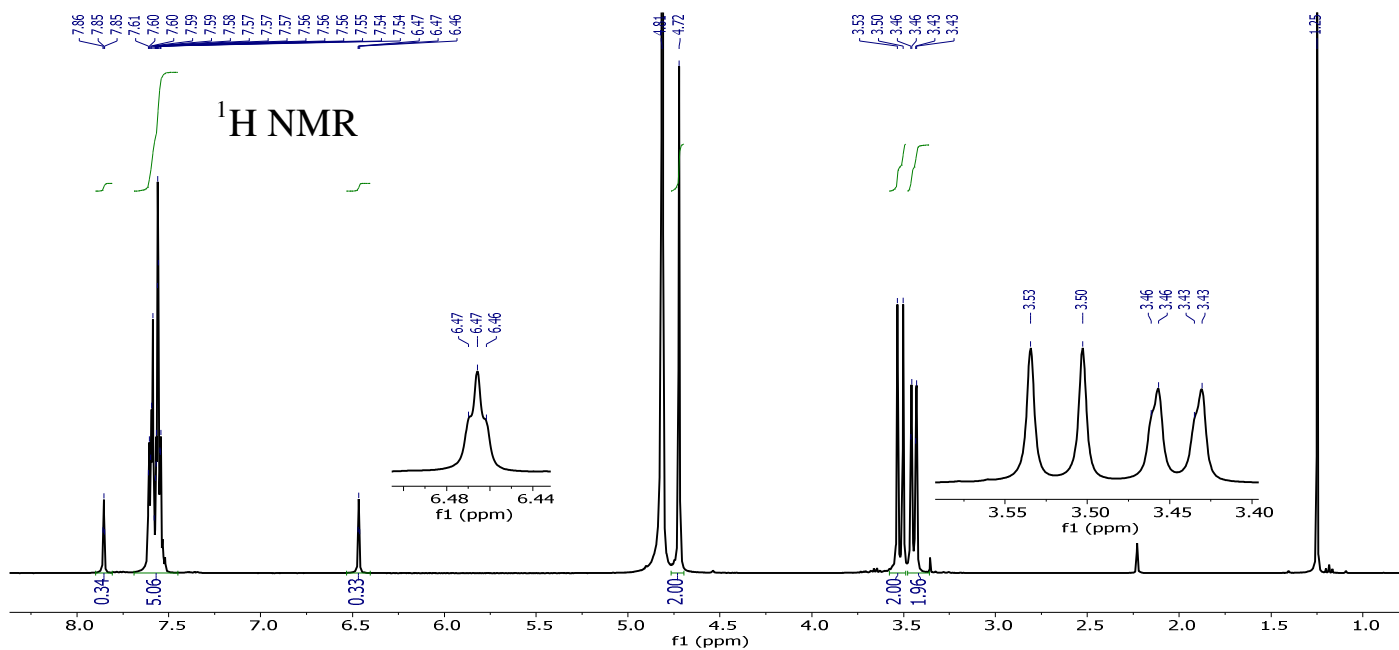
$^{13}\text{C}\{^1\text{H}\}$ NMR

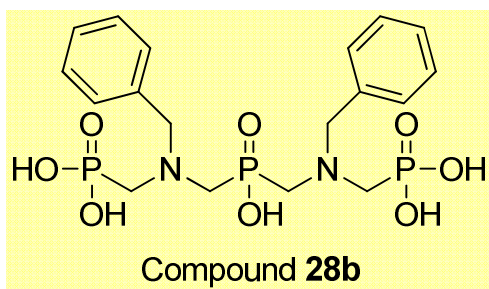
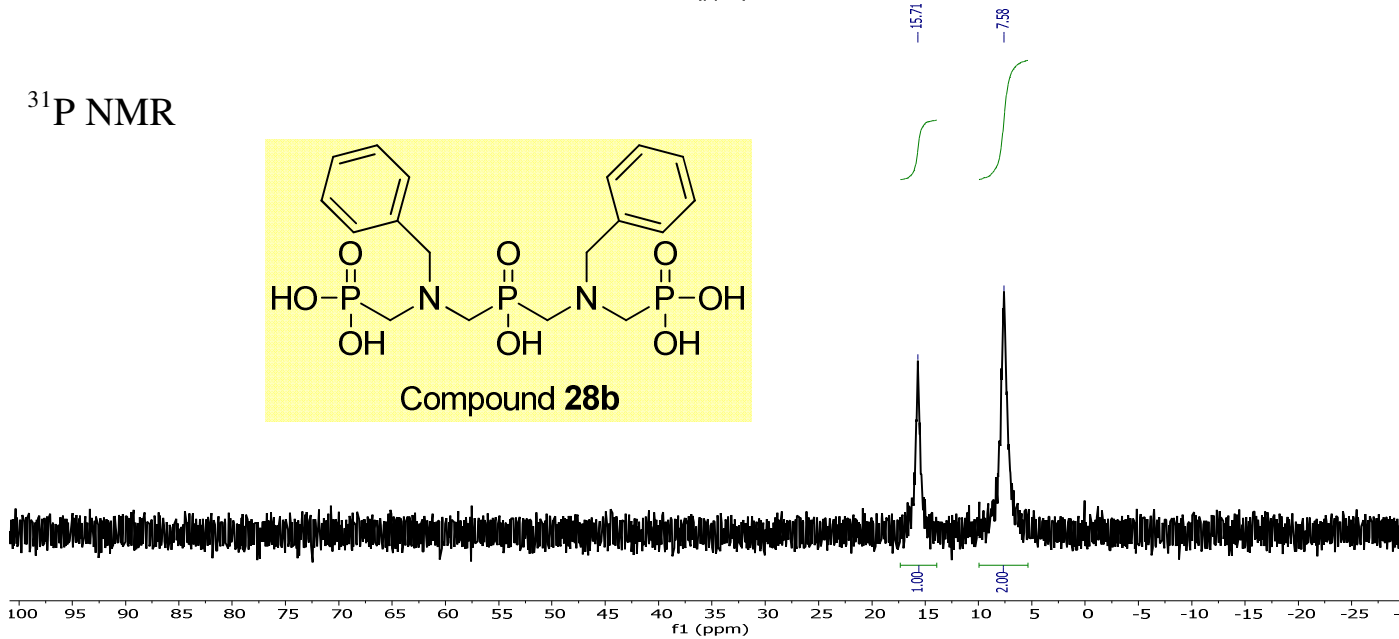
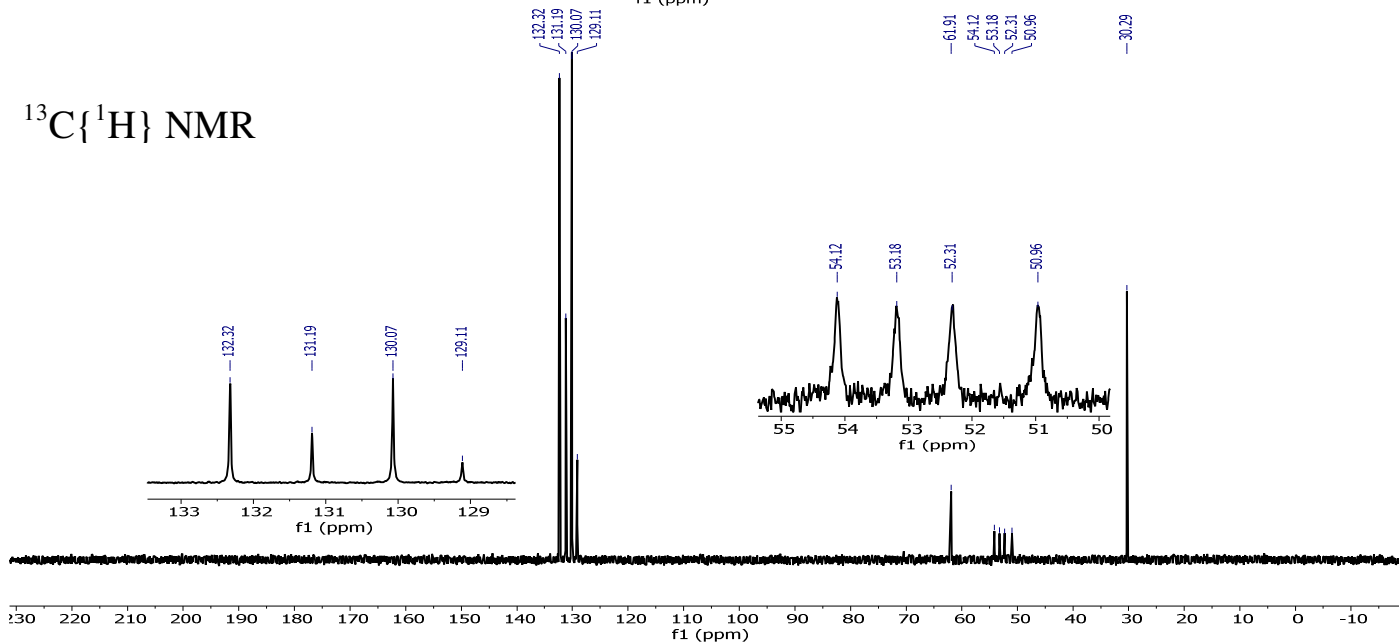
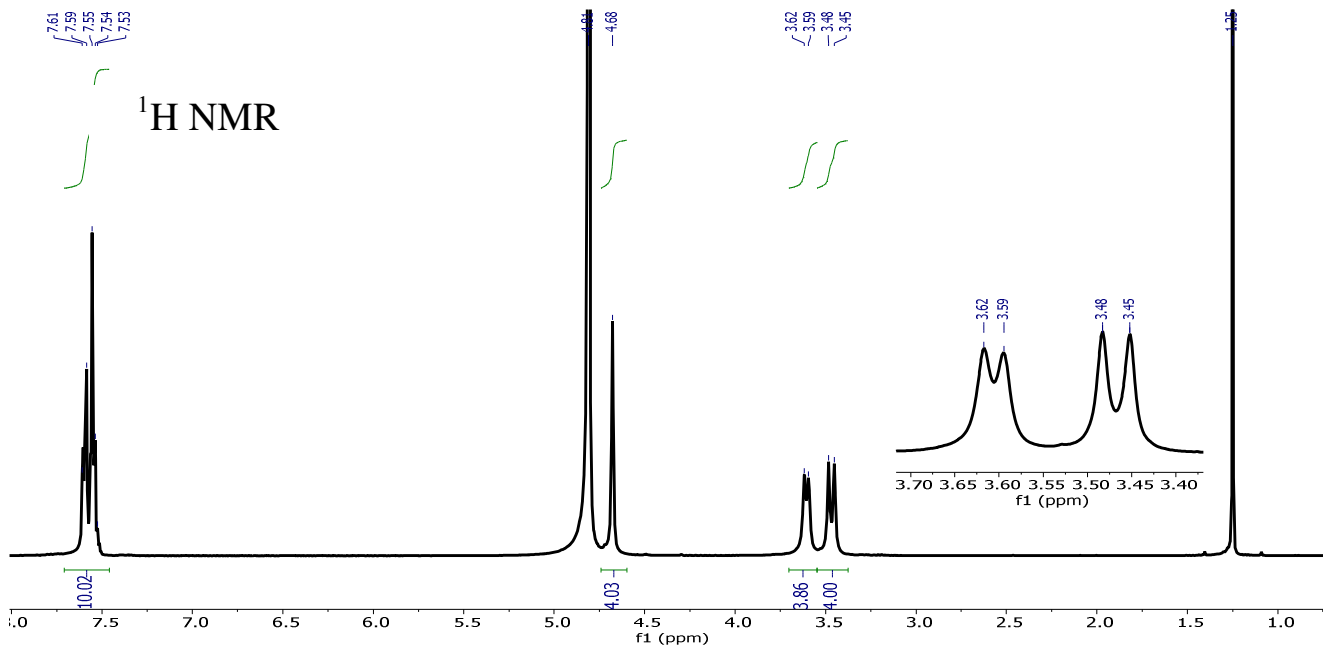


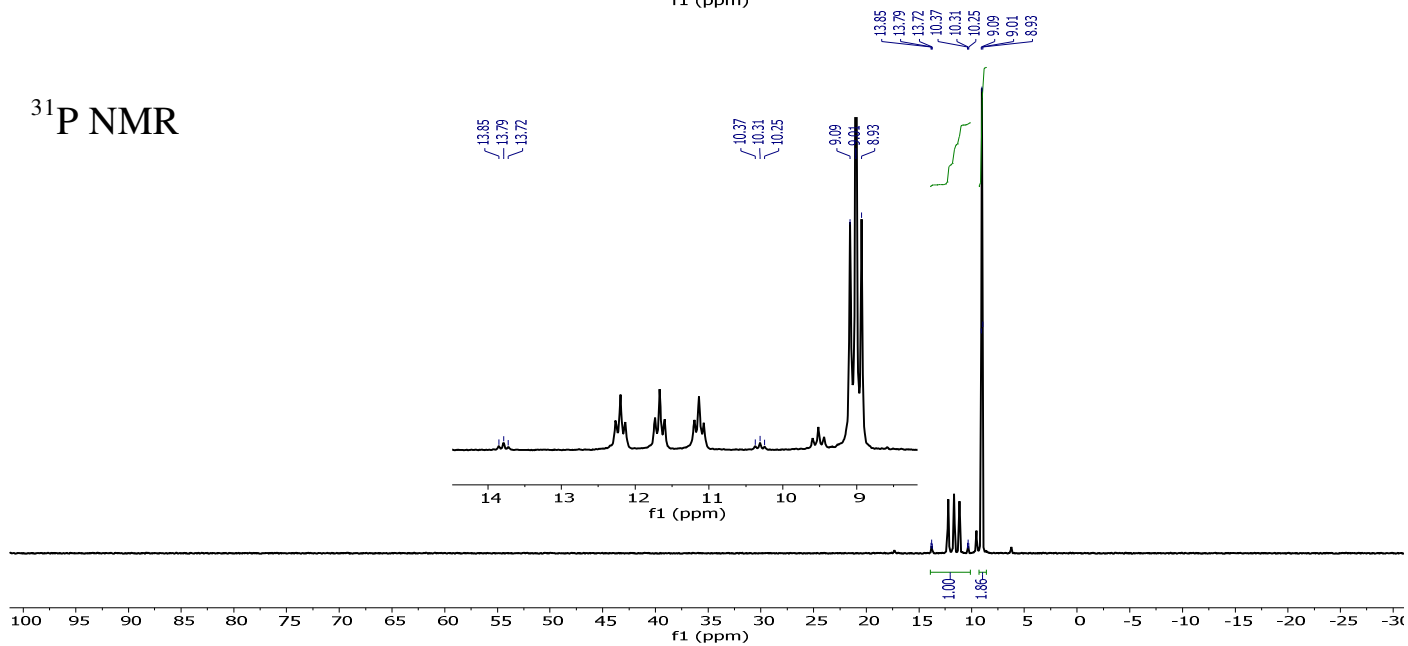
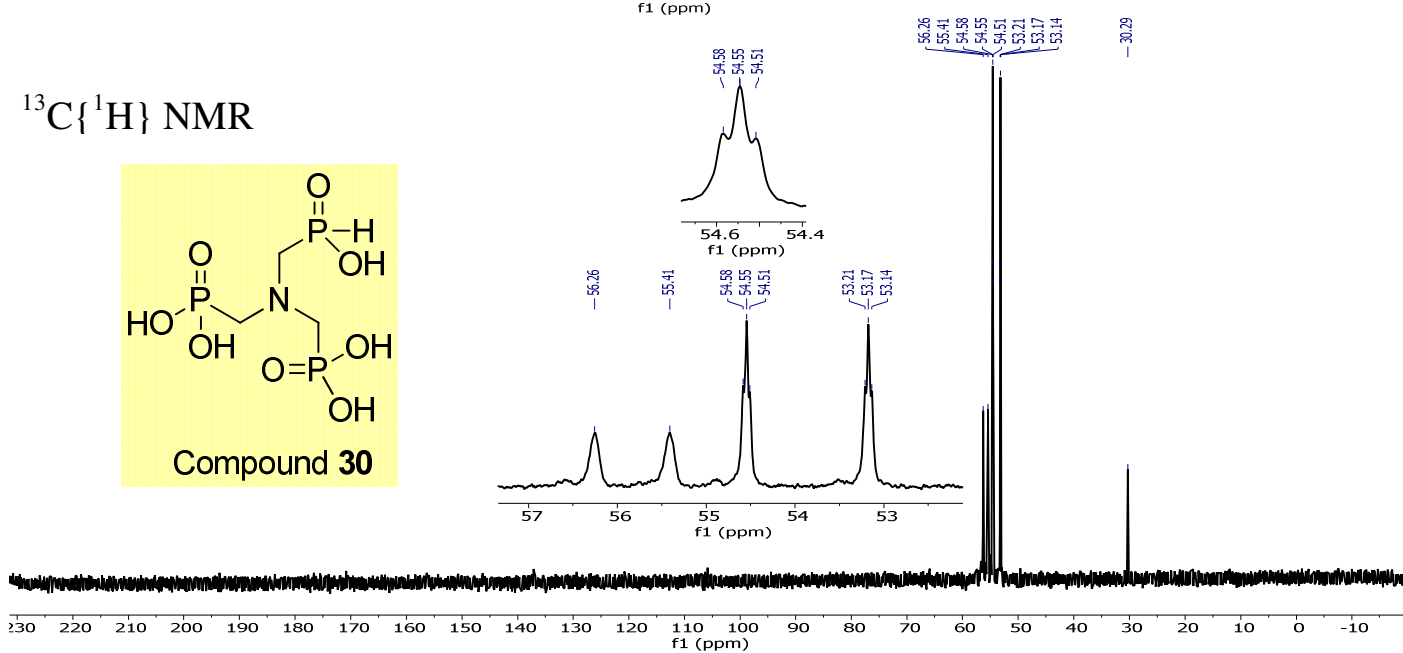
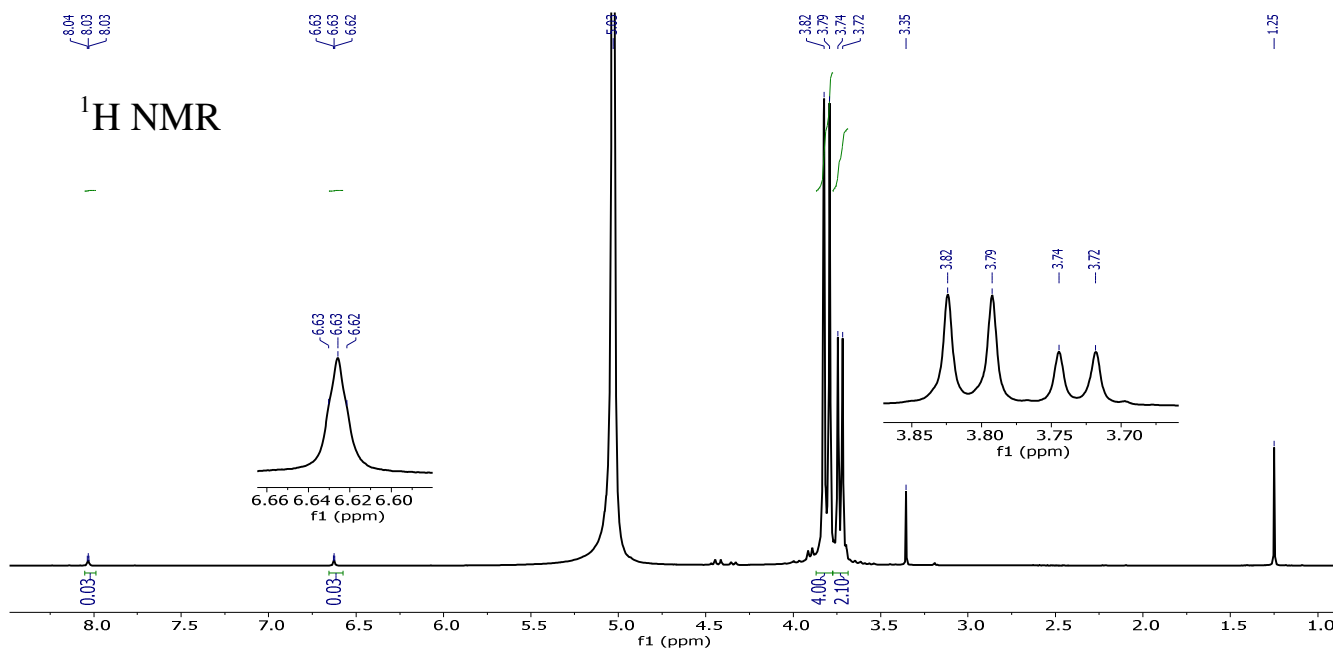
^{31}P NMR

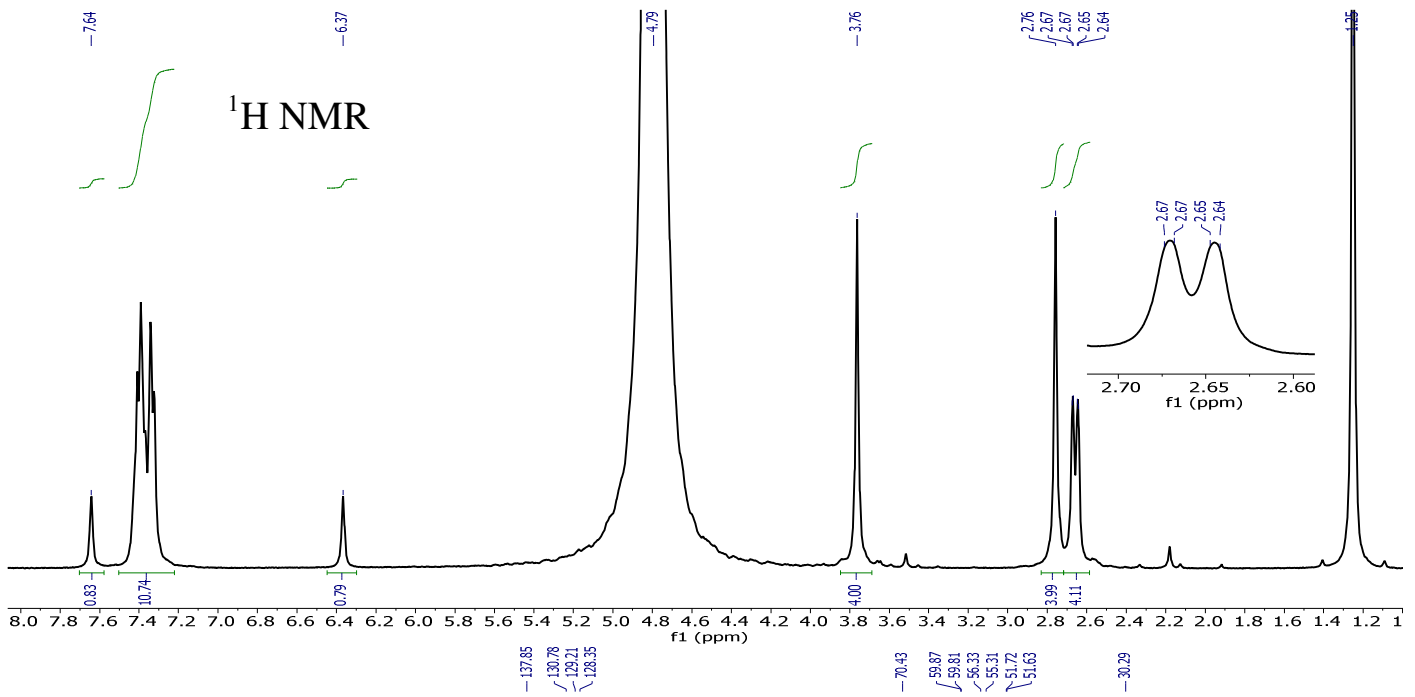




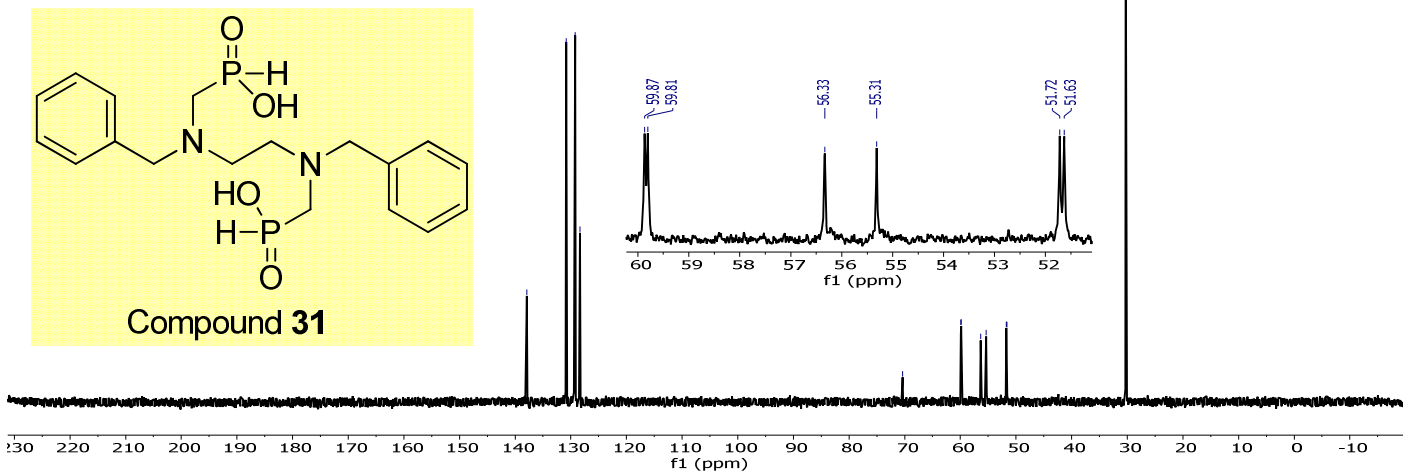






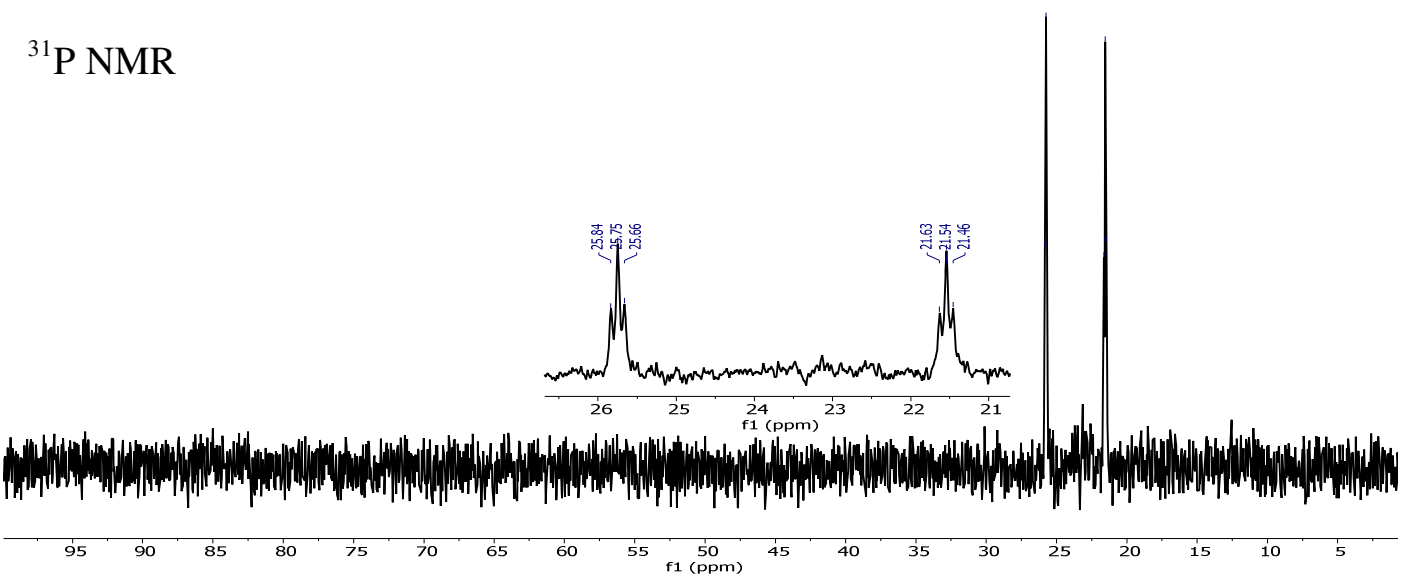


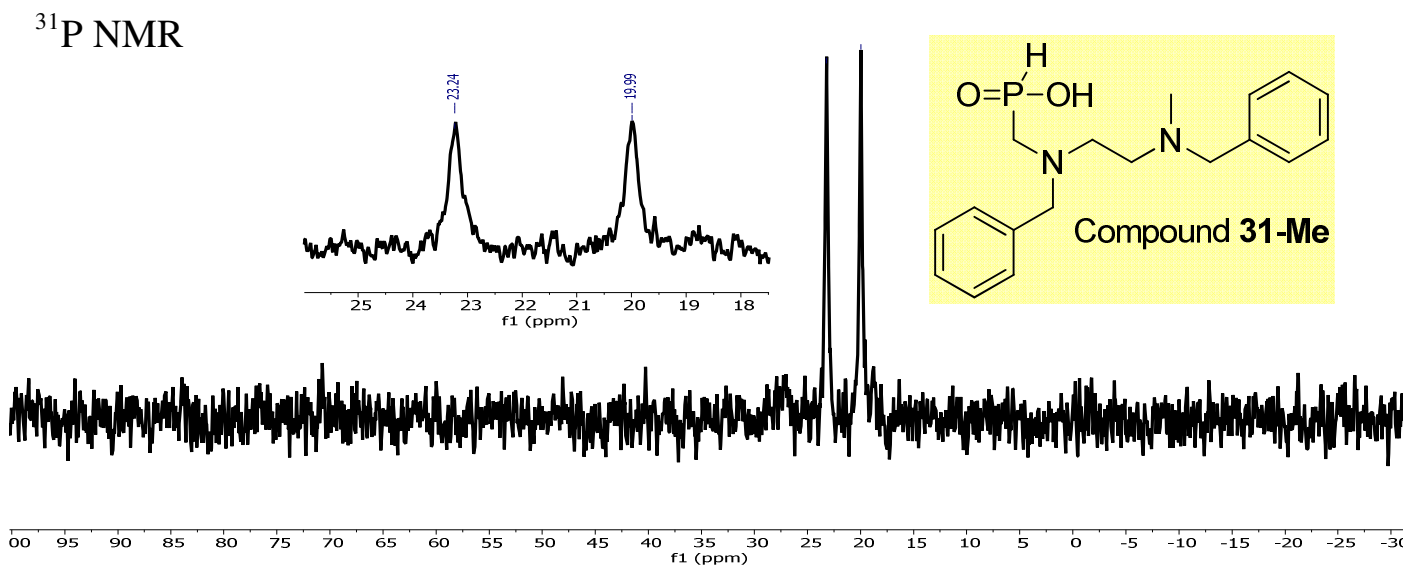
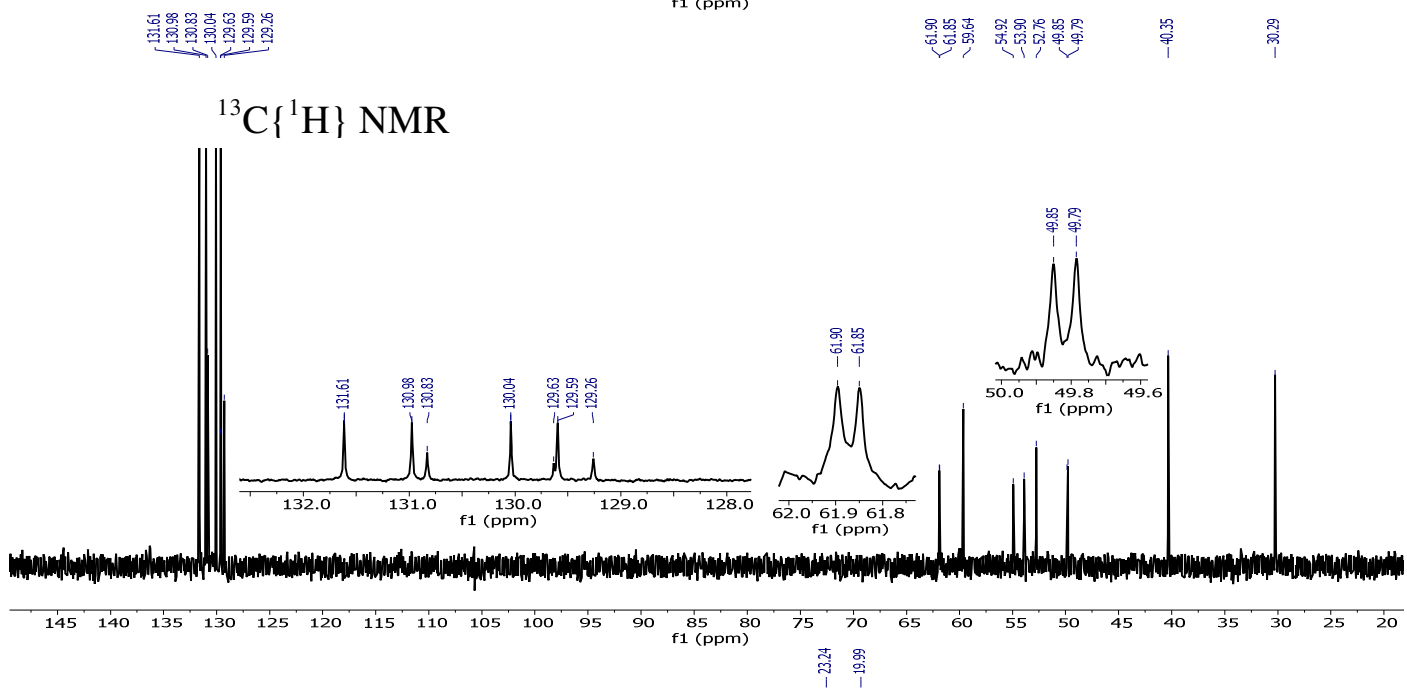
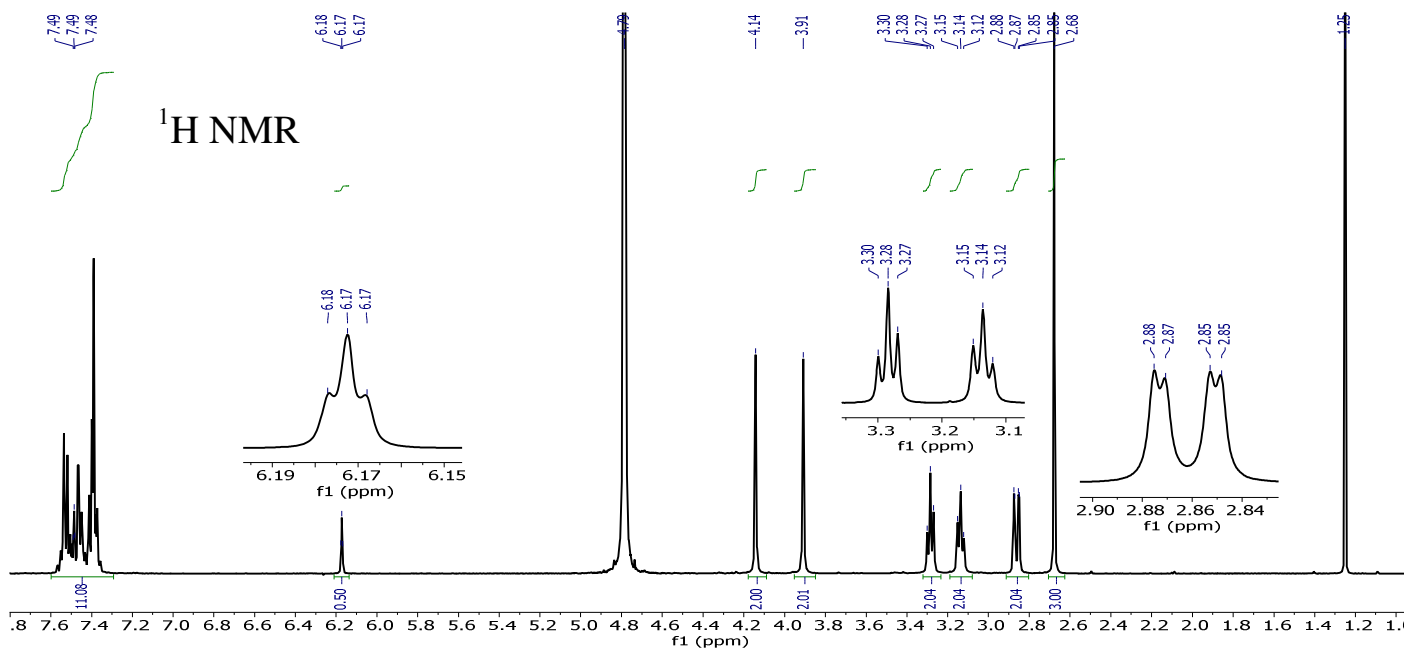
¹³C{¹H} NMR

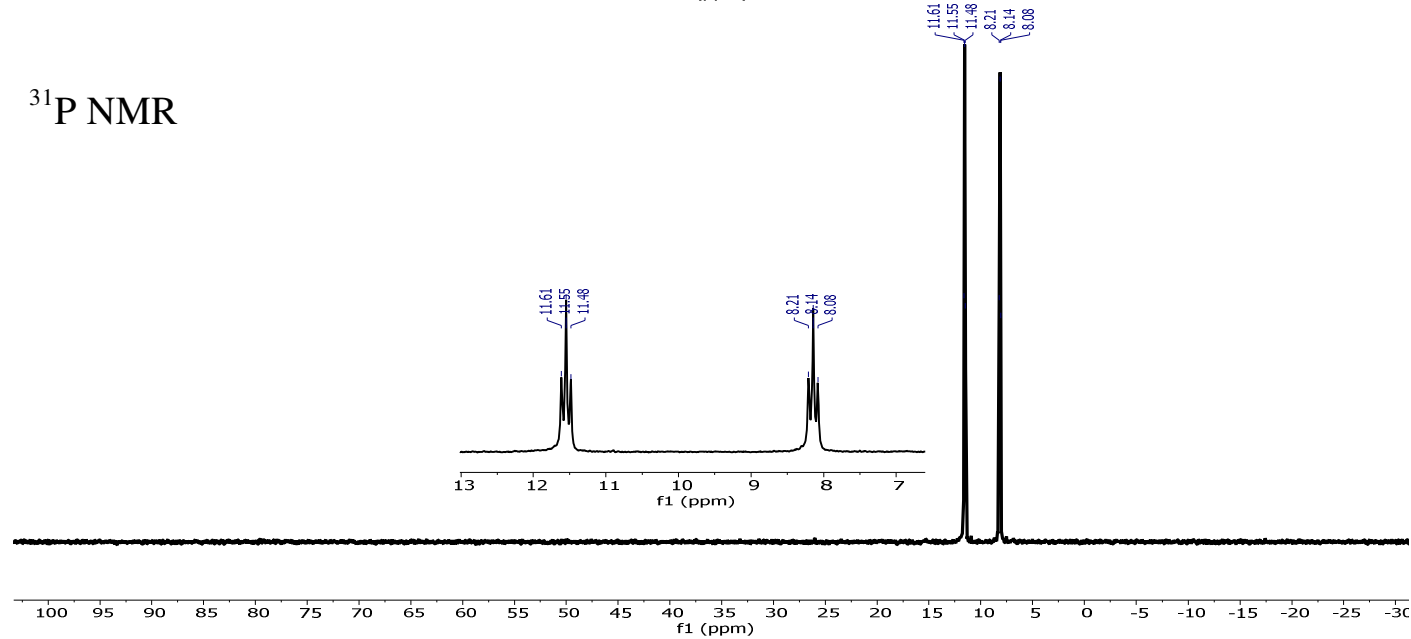
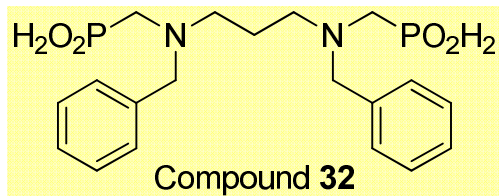
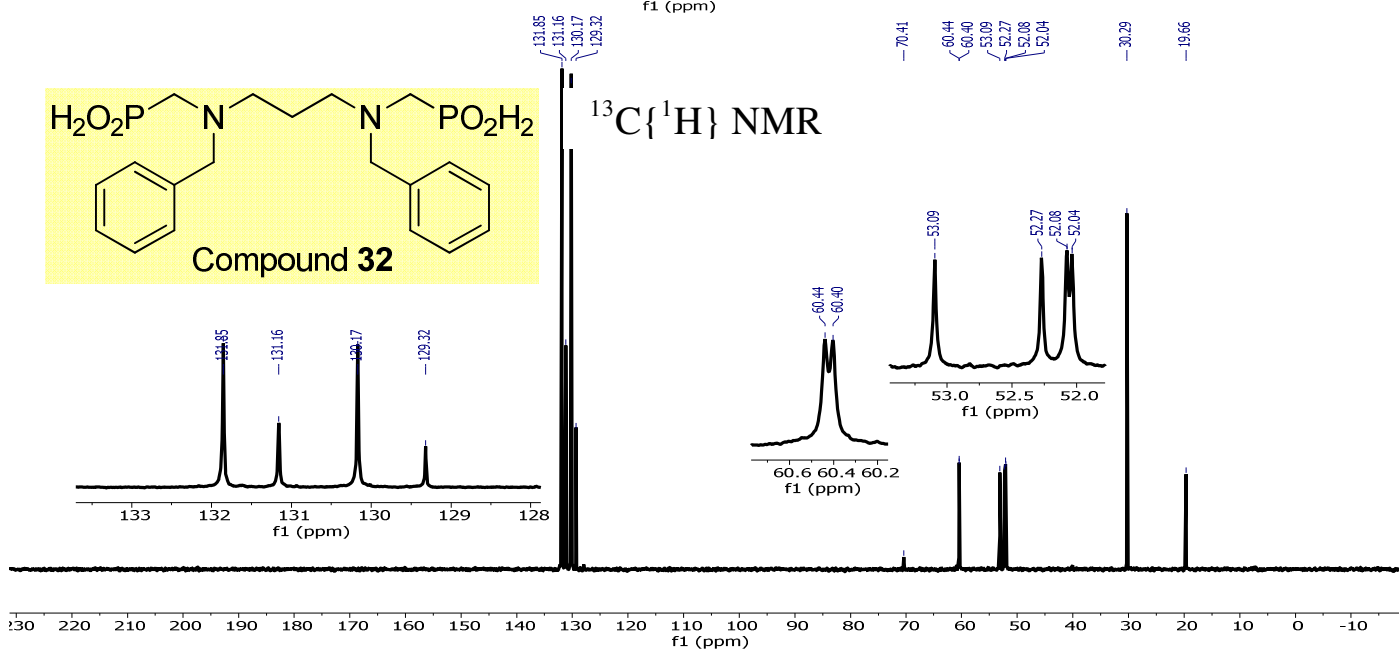
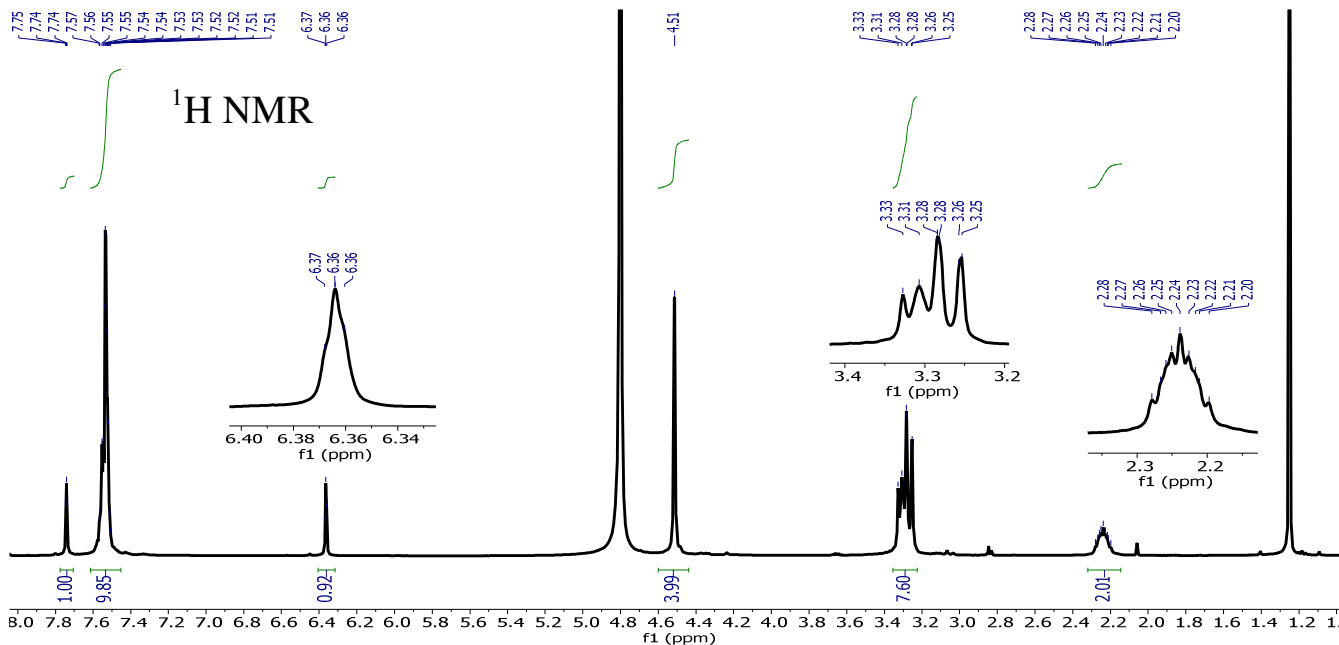


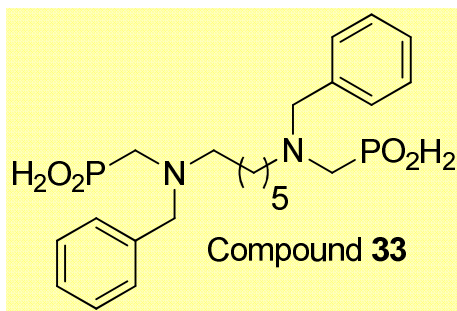
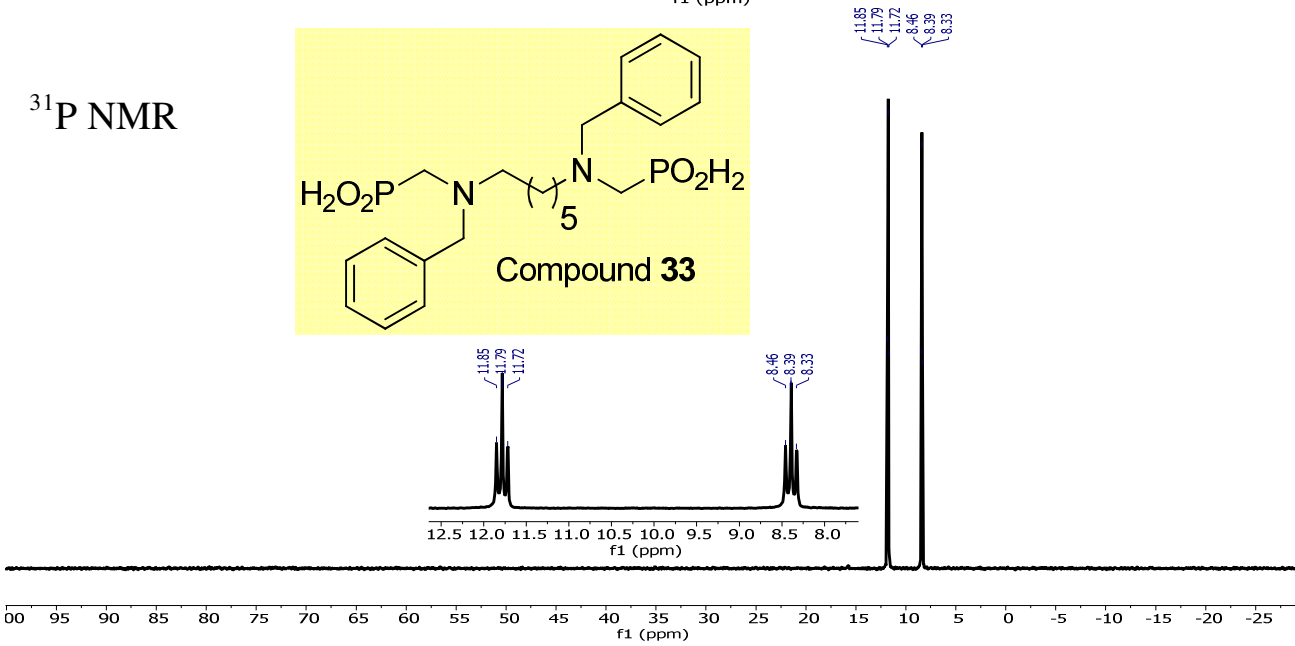
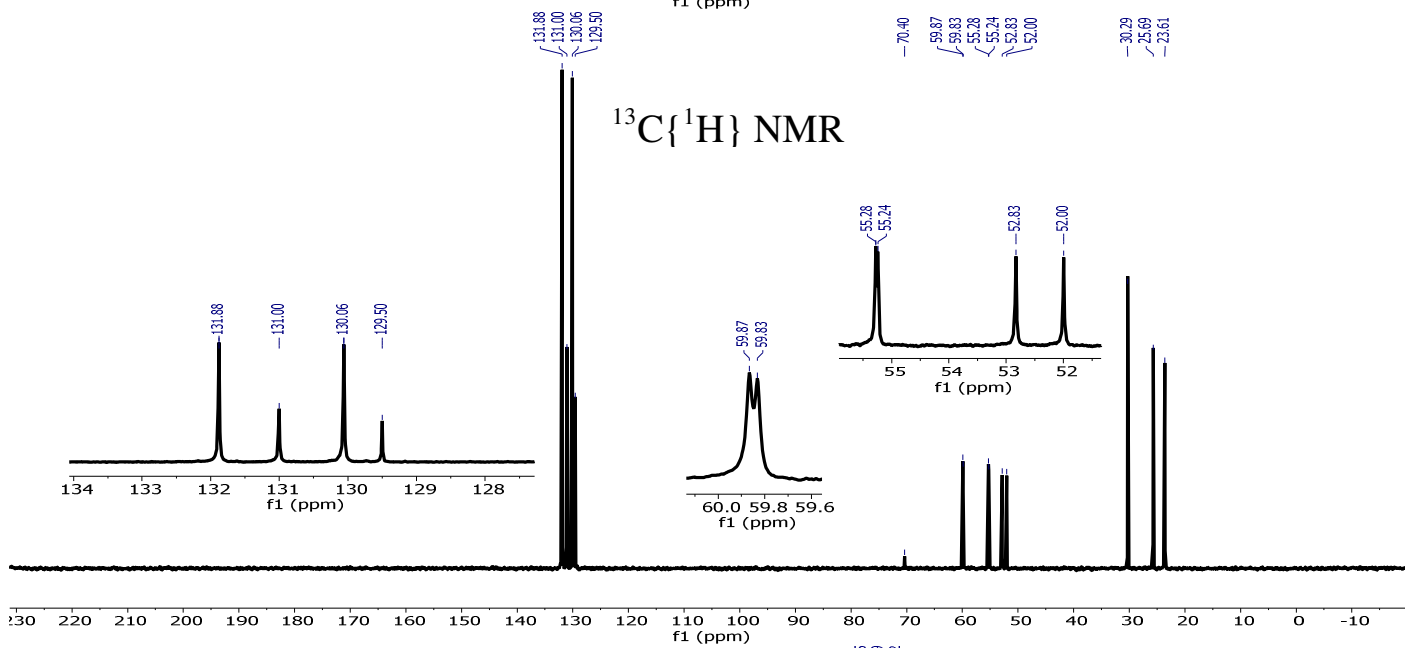
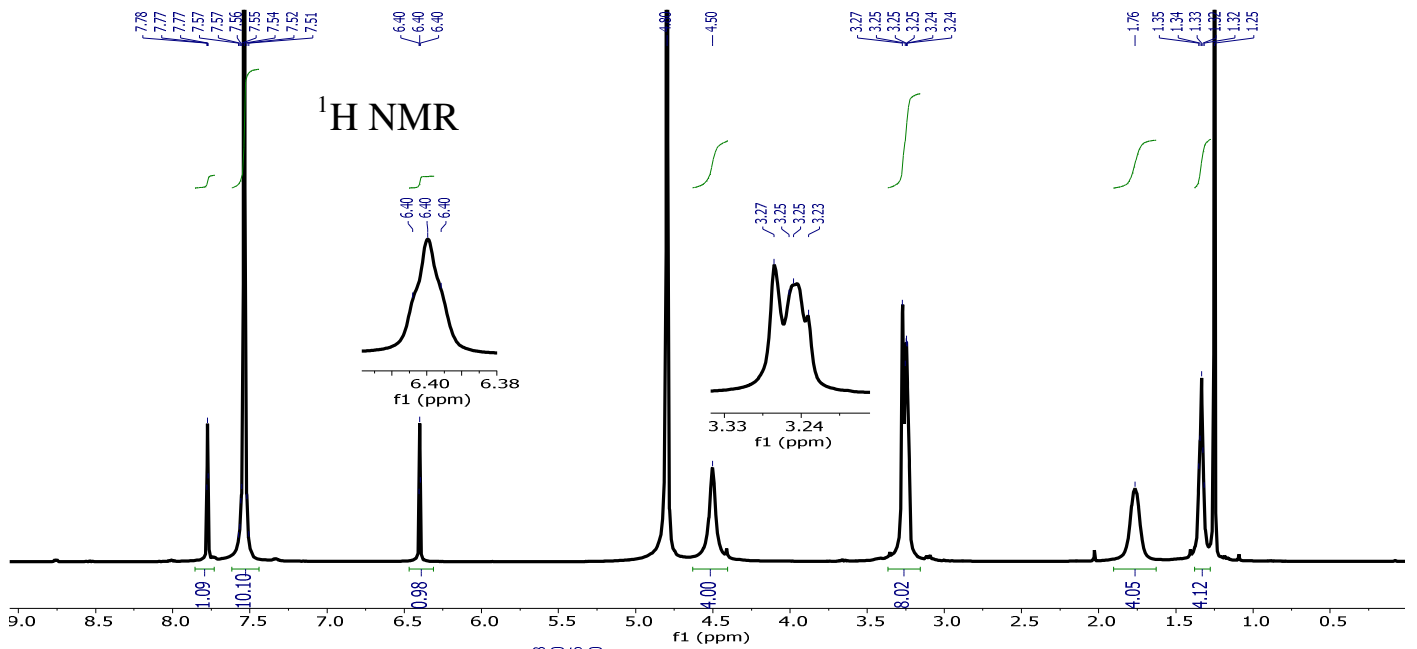
Compound 31

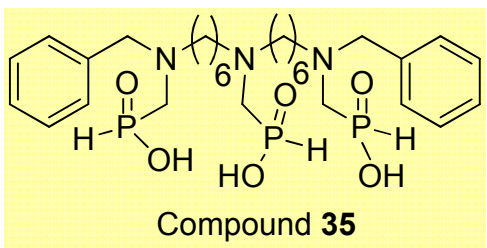
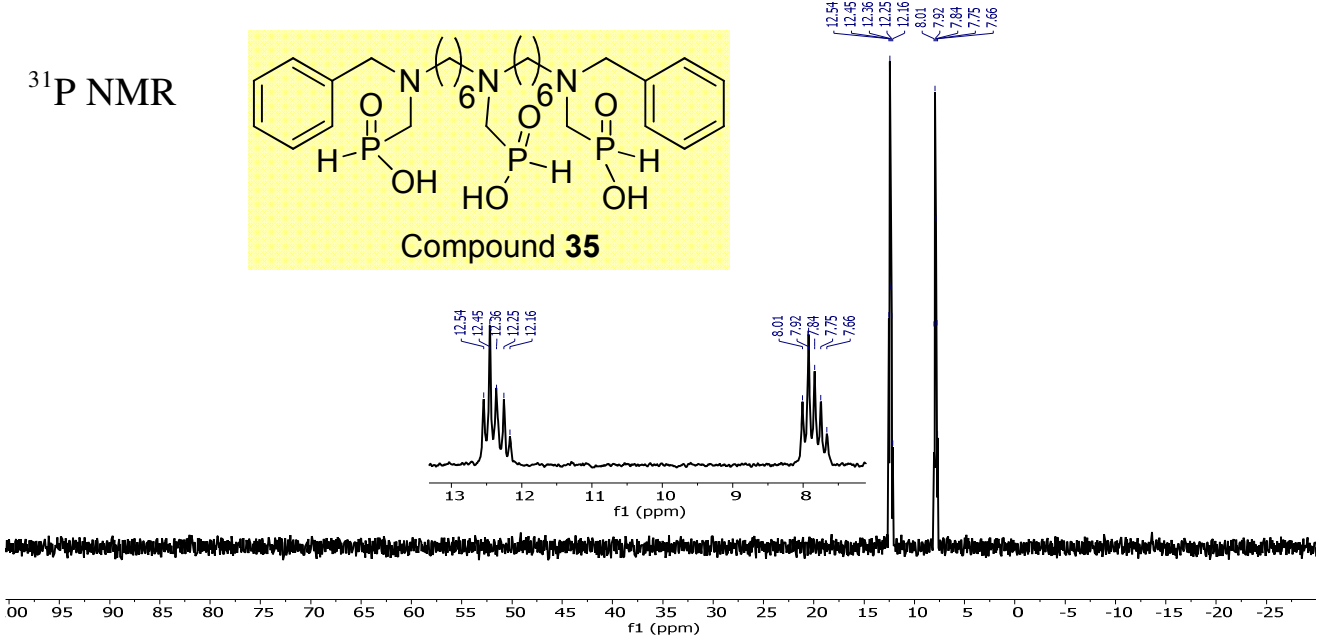
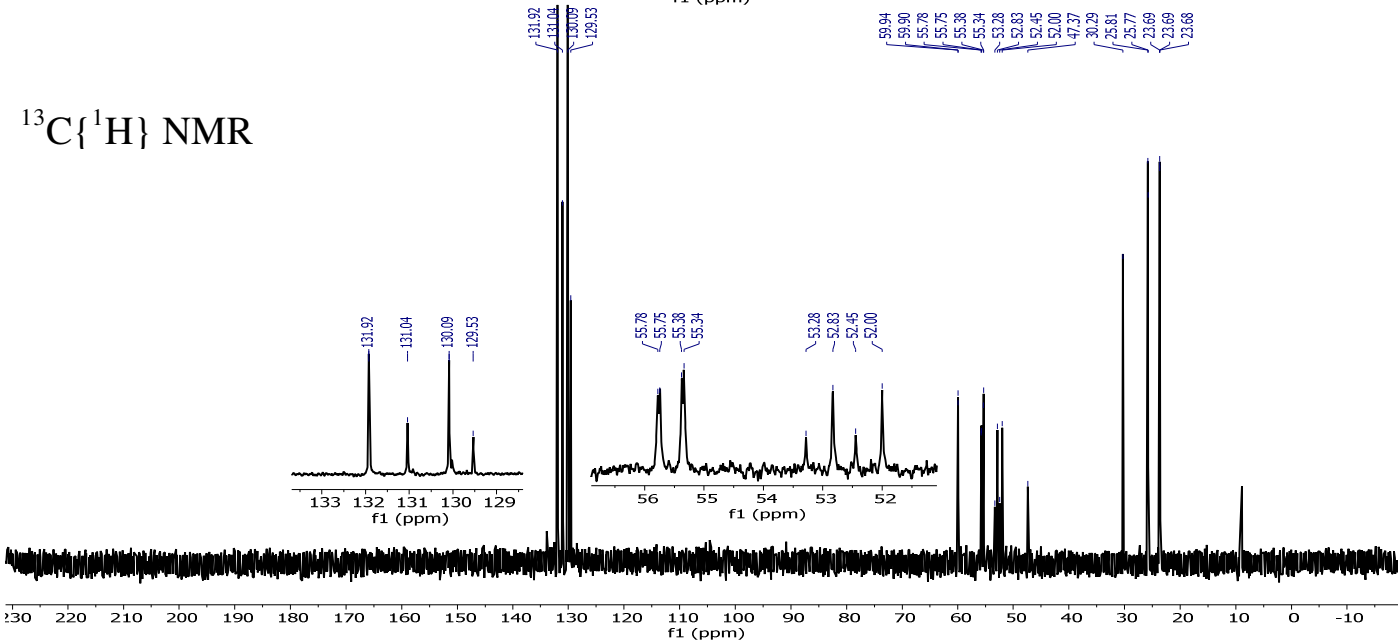
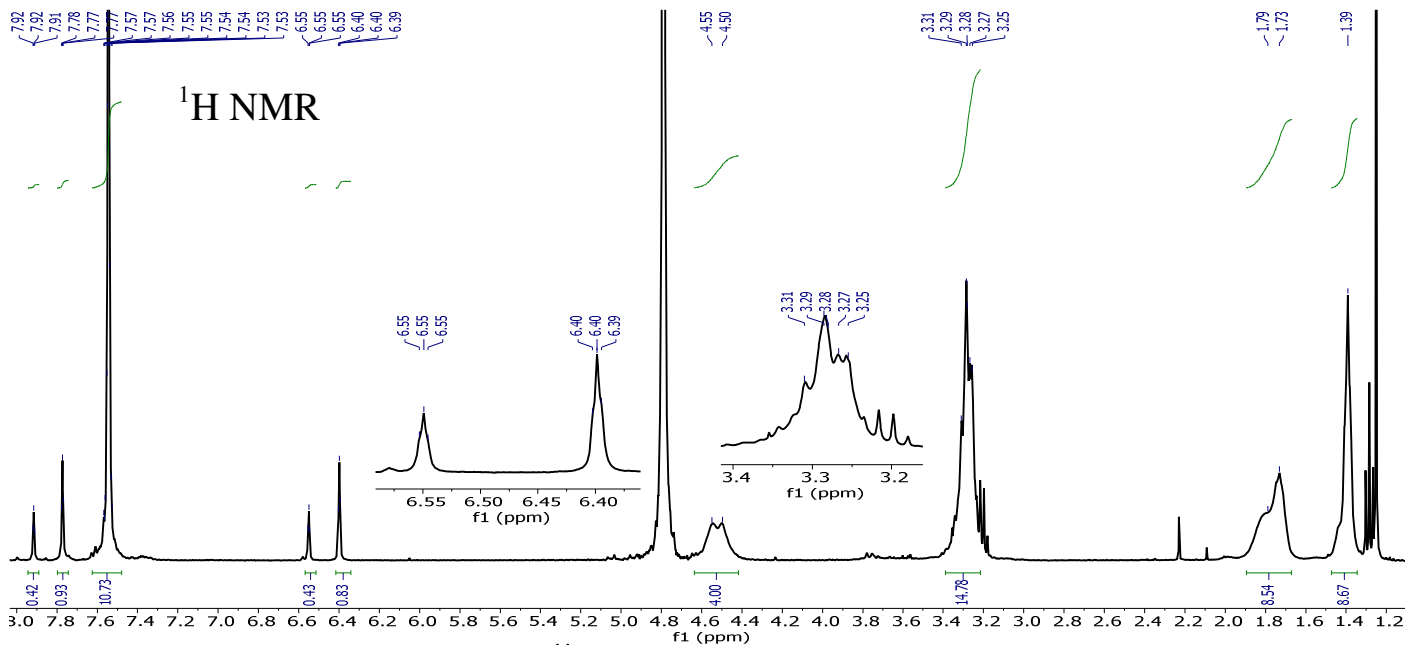
³¹P NMR

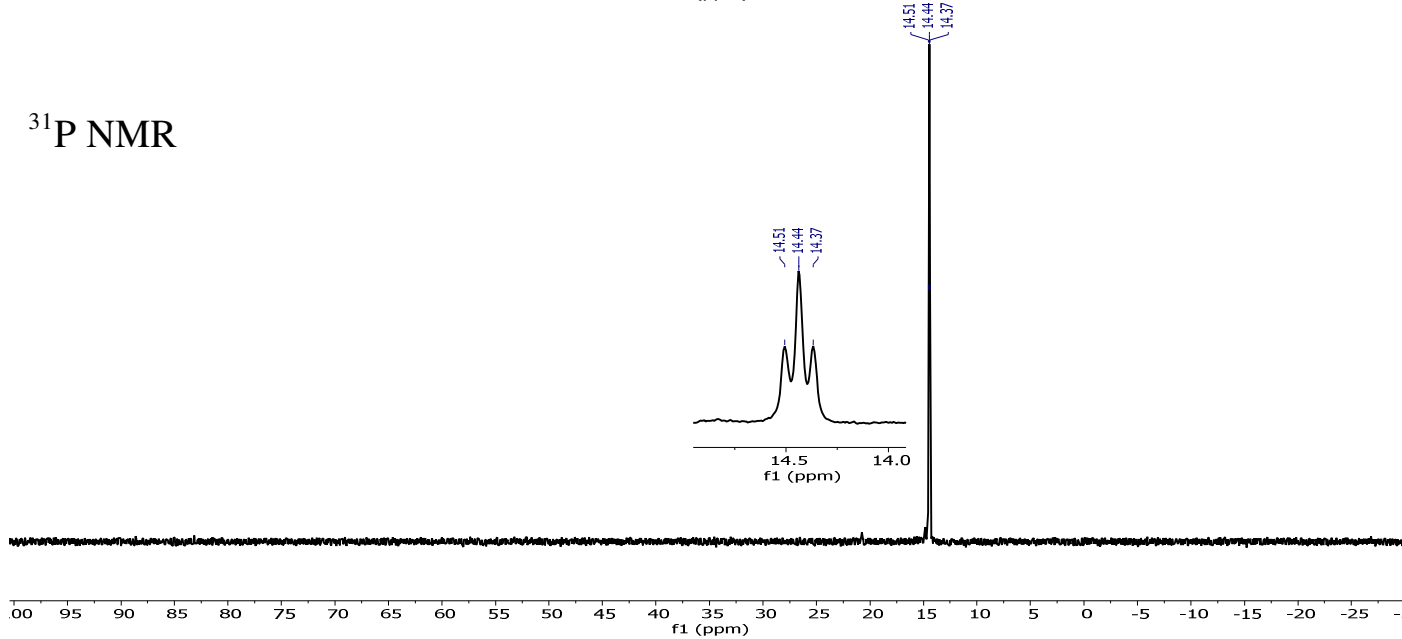
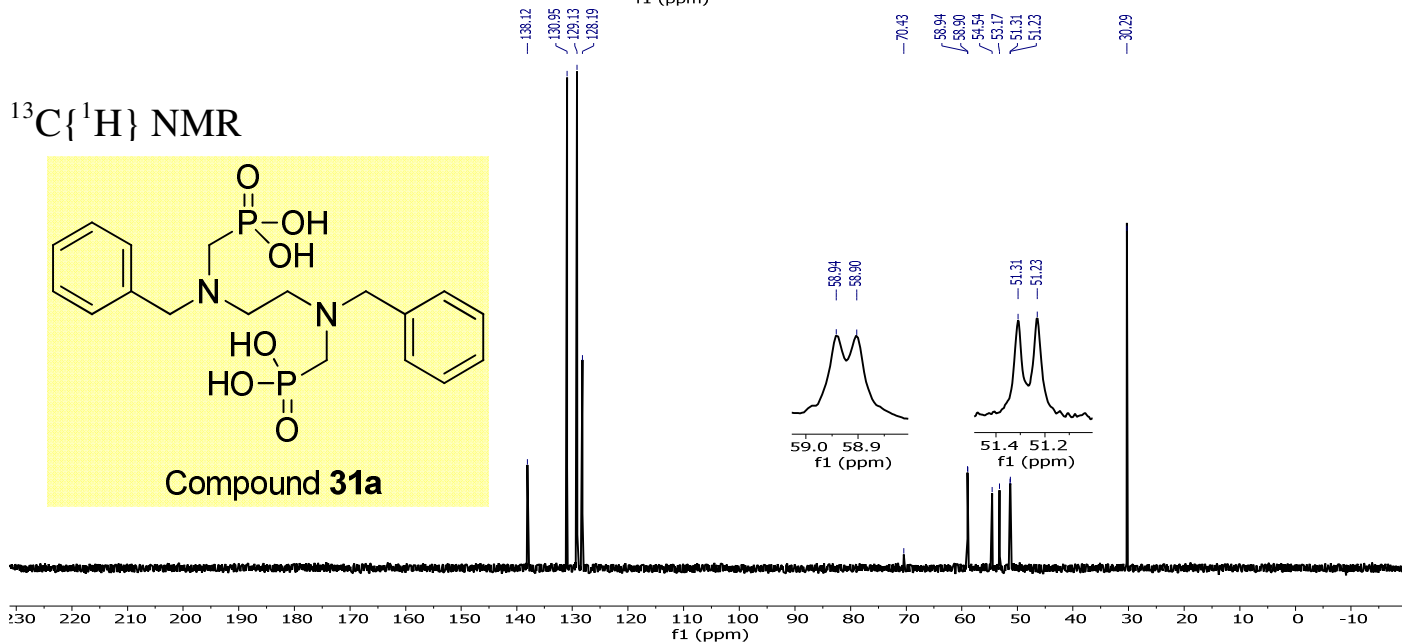
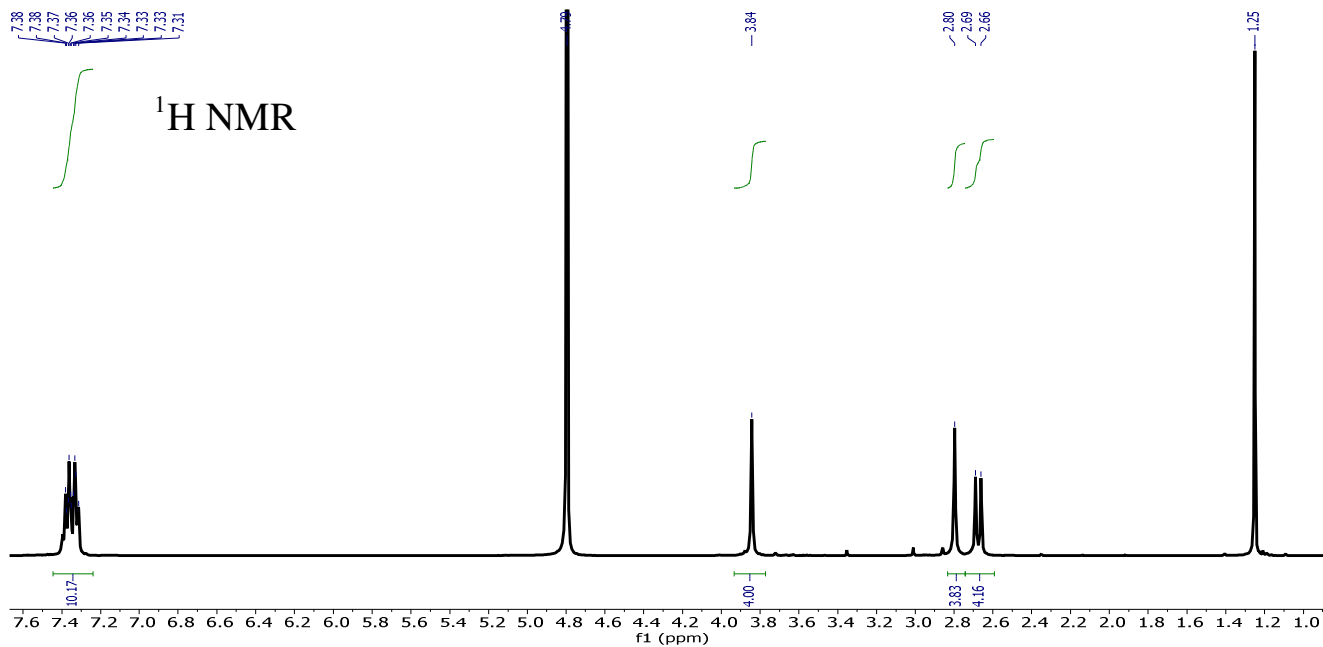


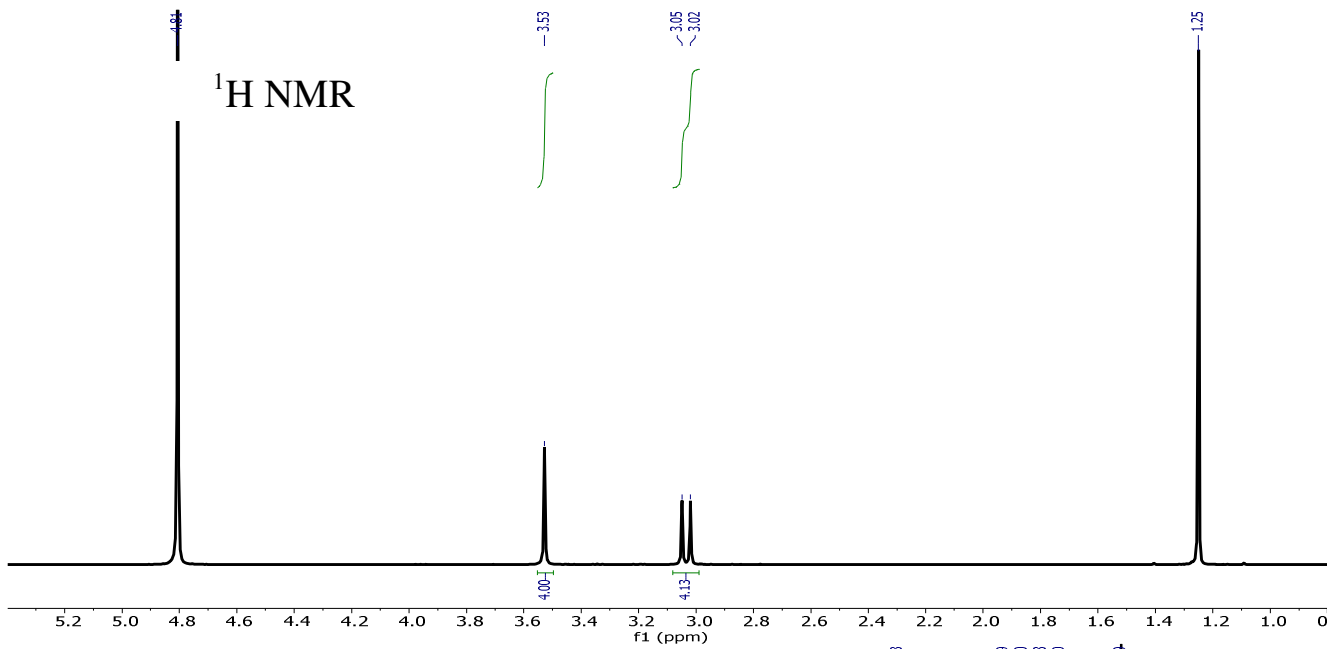




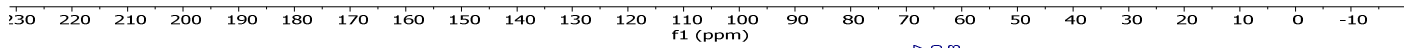
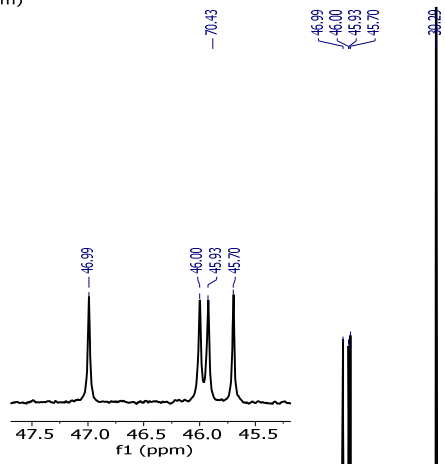
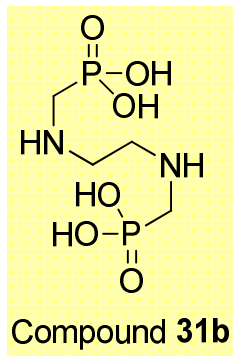




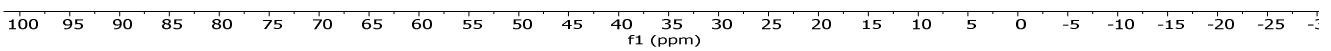
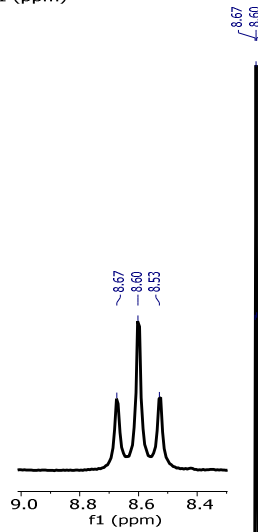


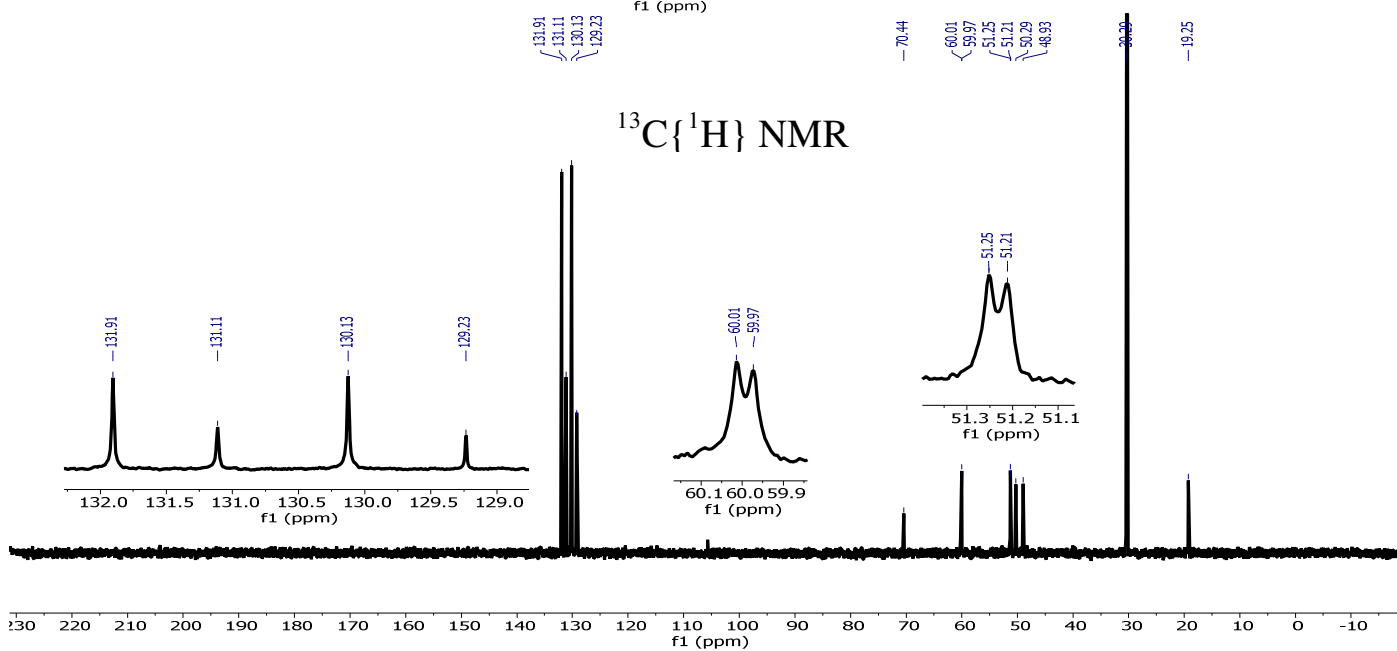
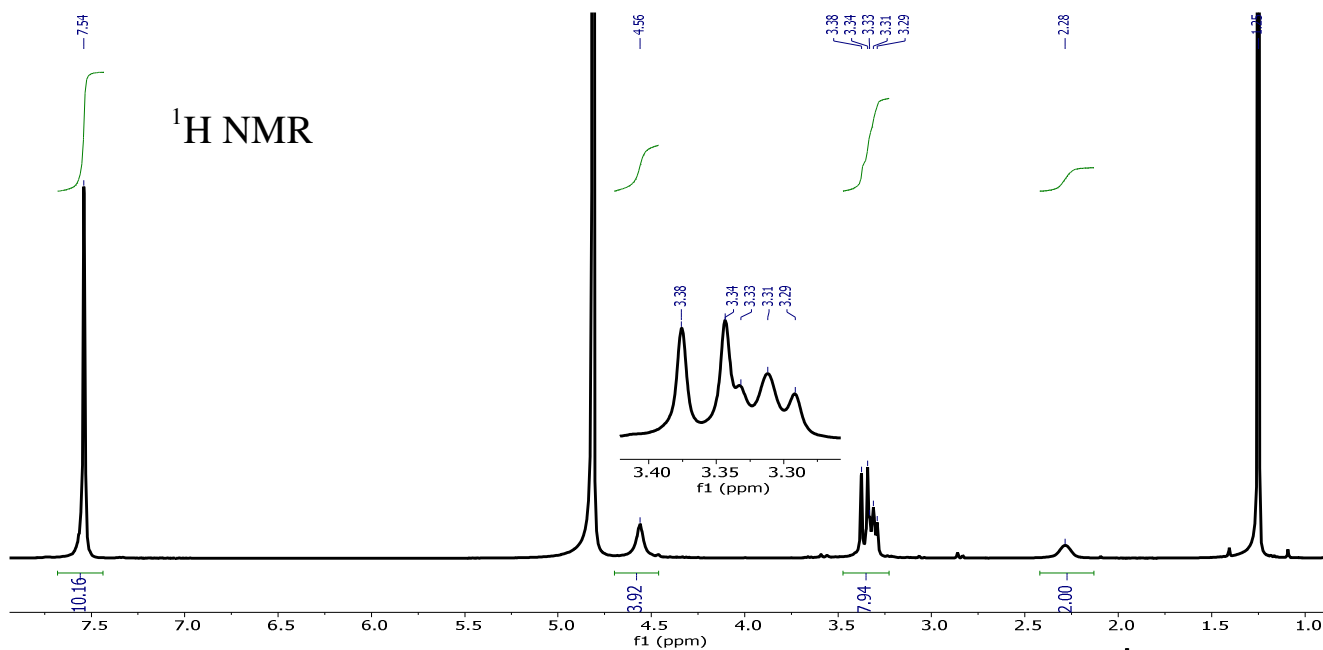


$^{13}\text{C}\{^1\text{H}\}$ NMR

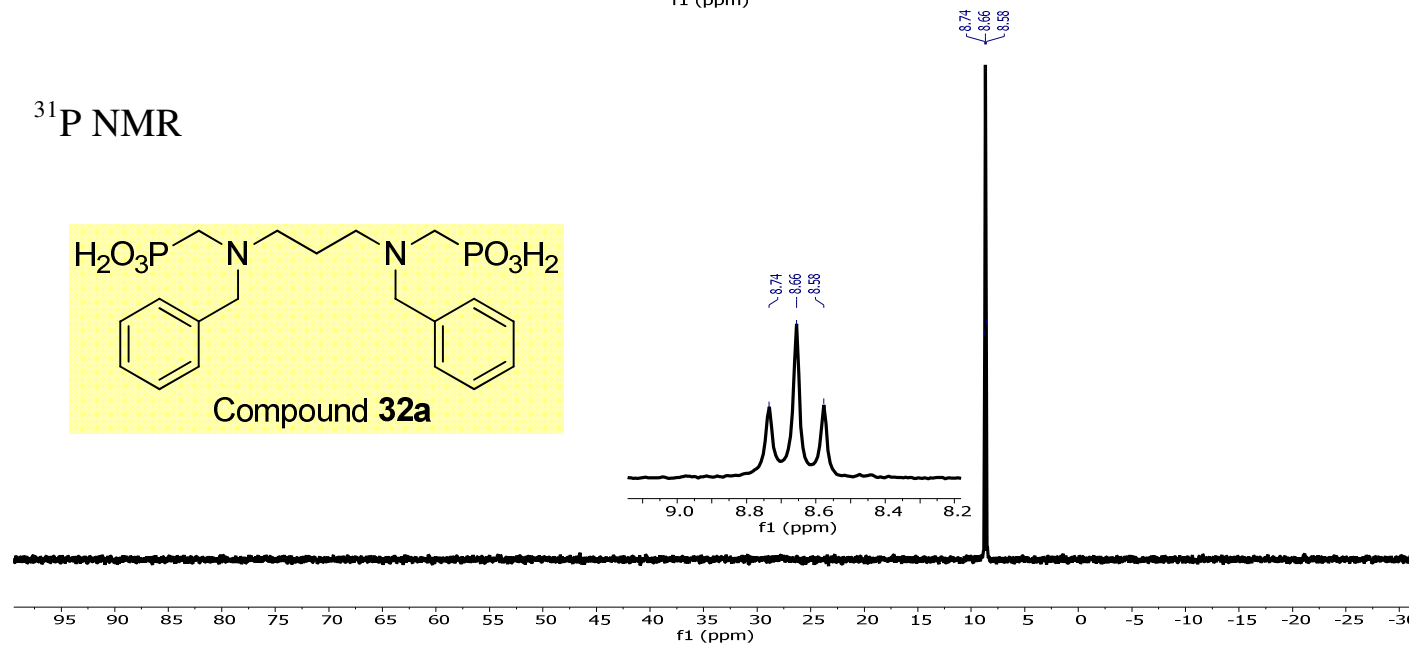
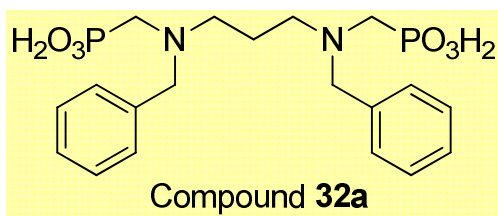


^{31}P NMR

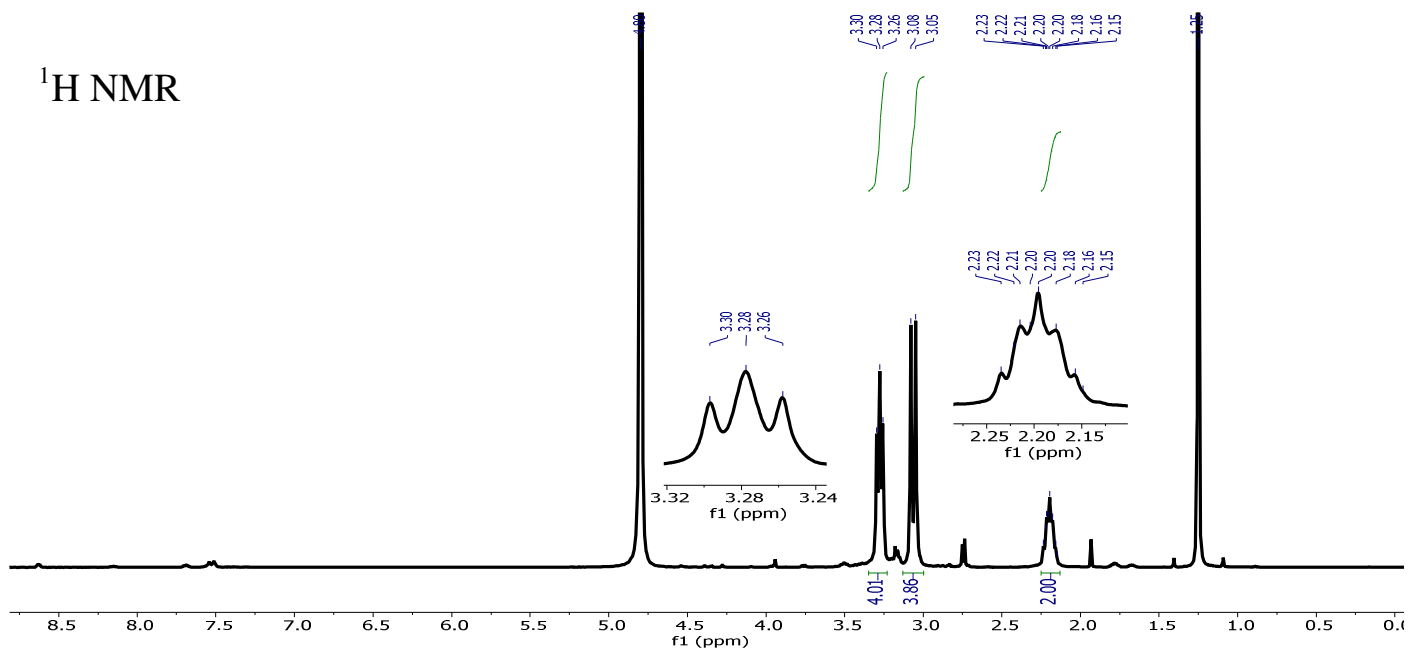




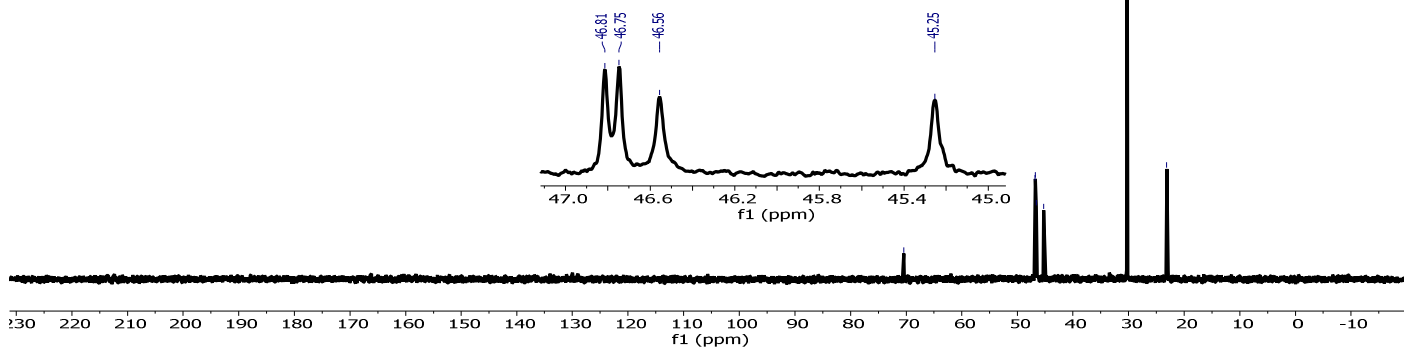
³¹P NMR



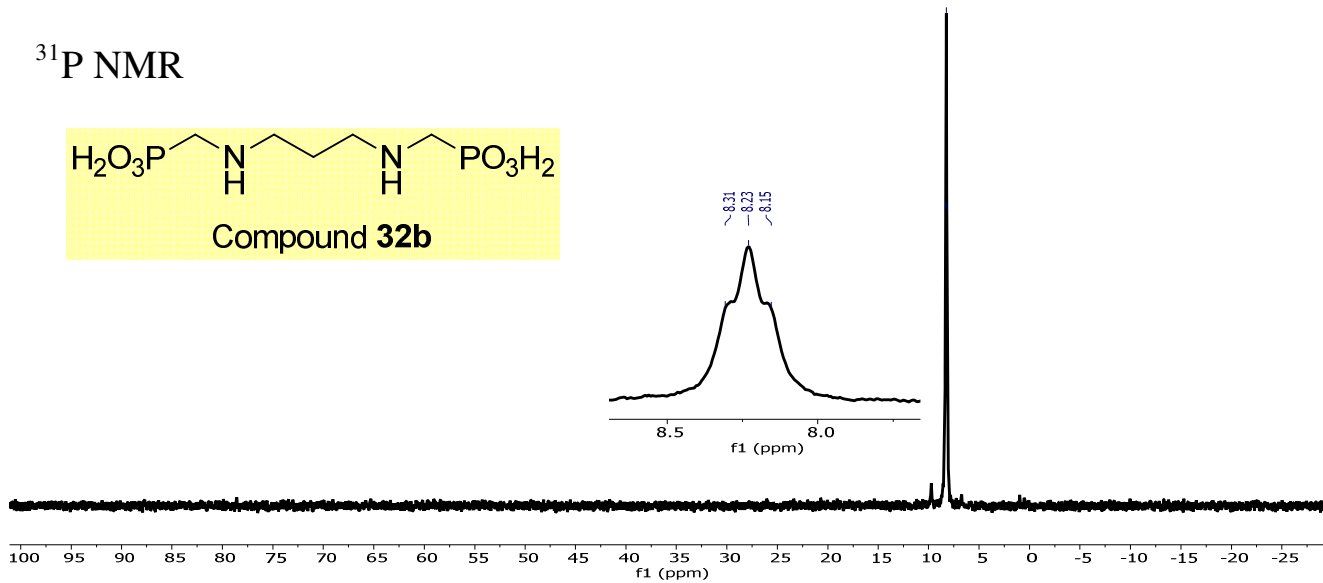
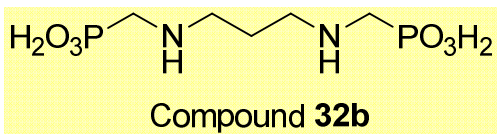
^1H NMR

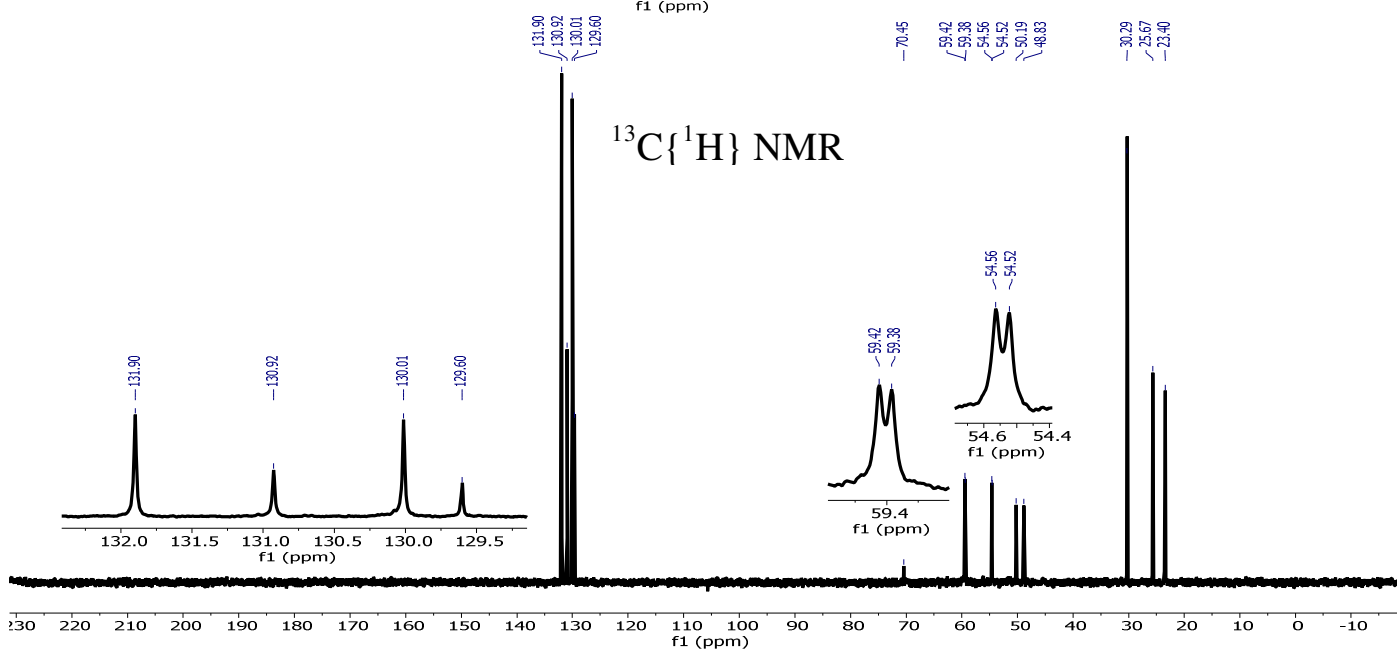
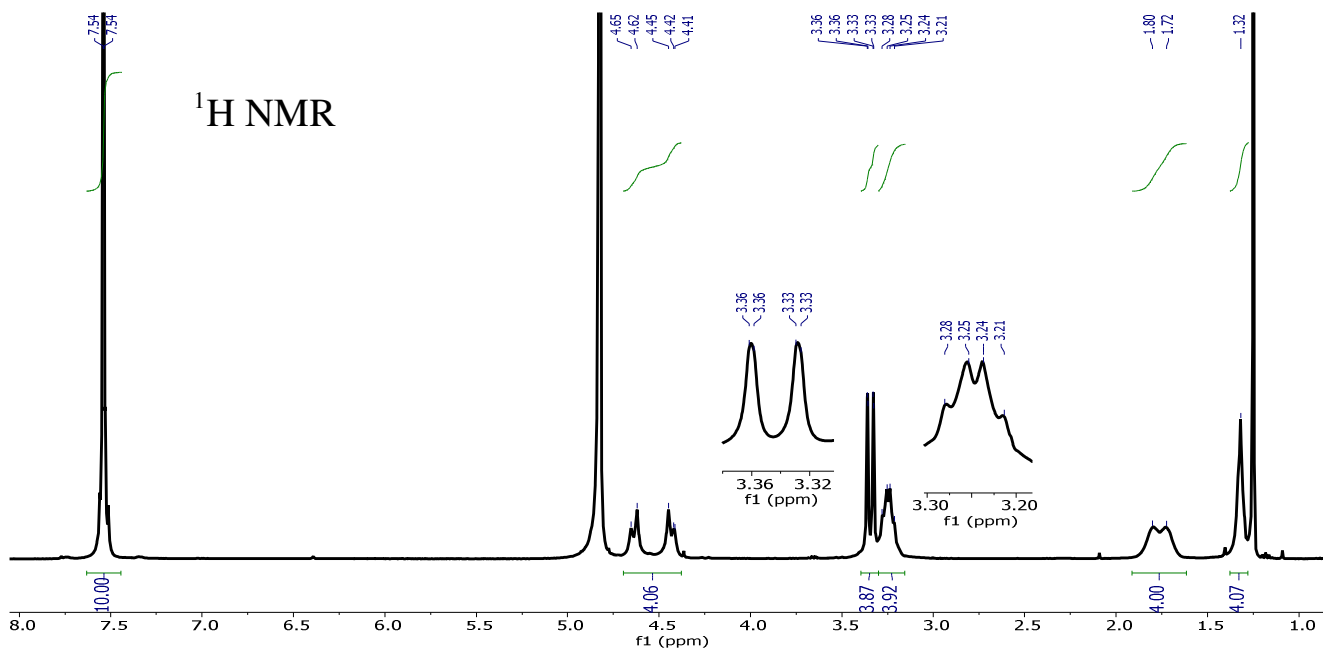


$^{13}\text{C}\{^1\text{H}\}$ NMR

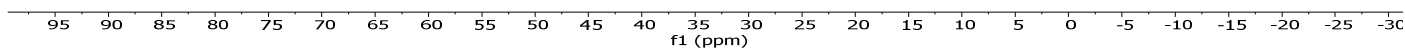
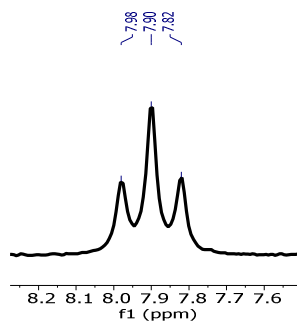
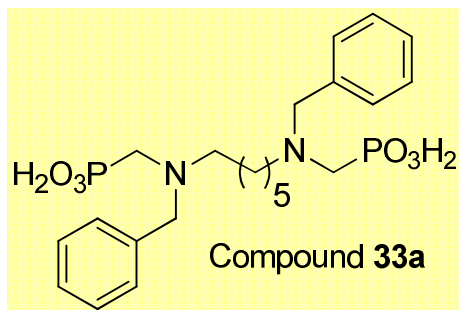


^{31}P NMR

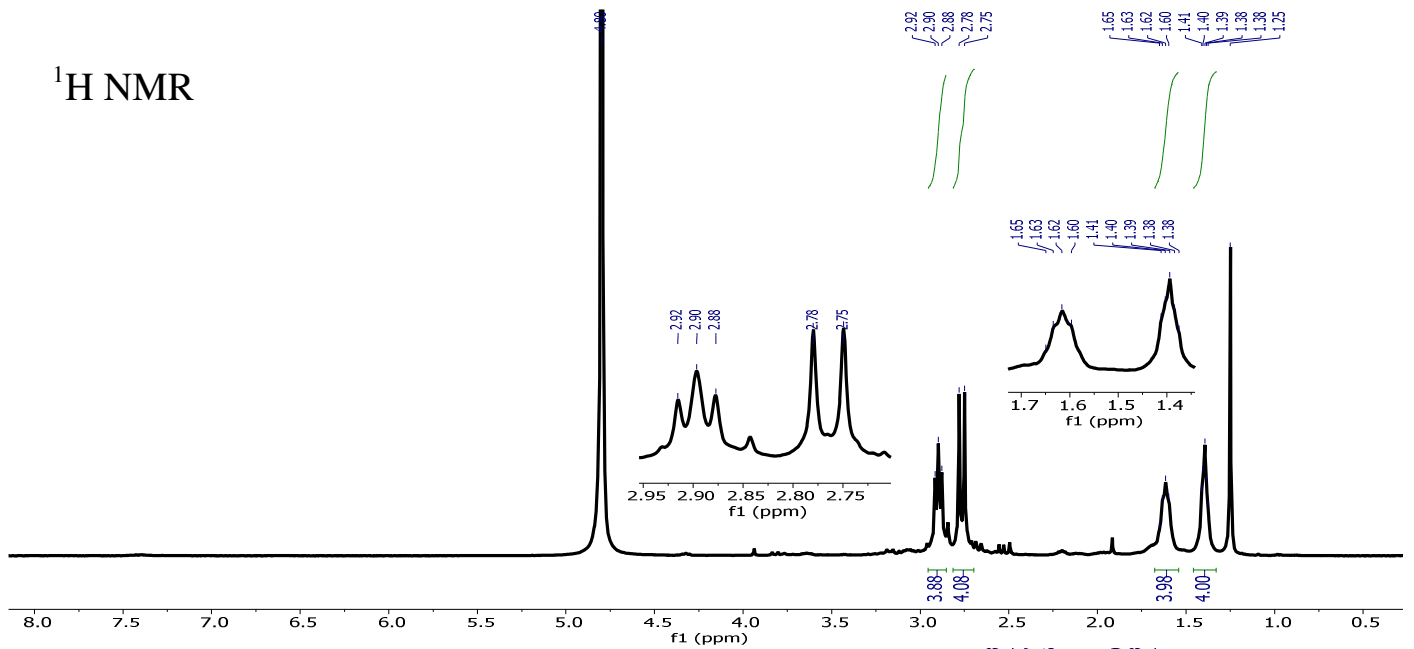




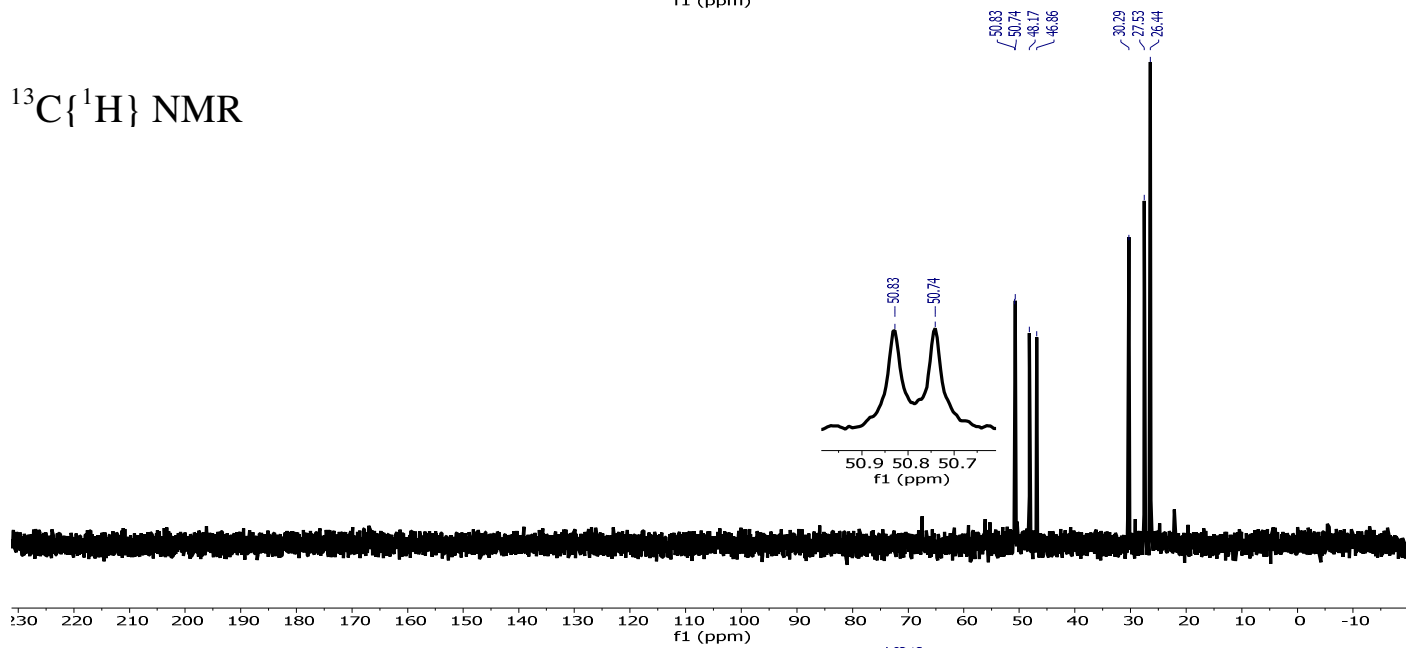
³¹P NMR



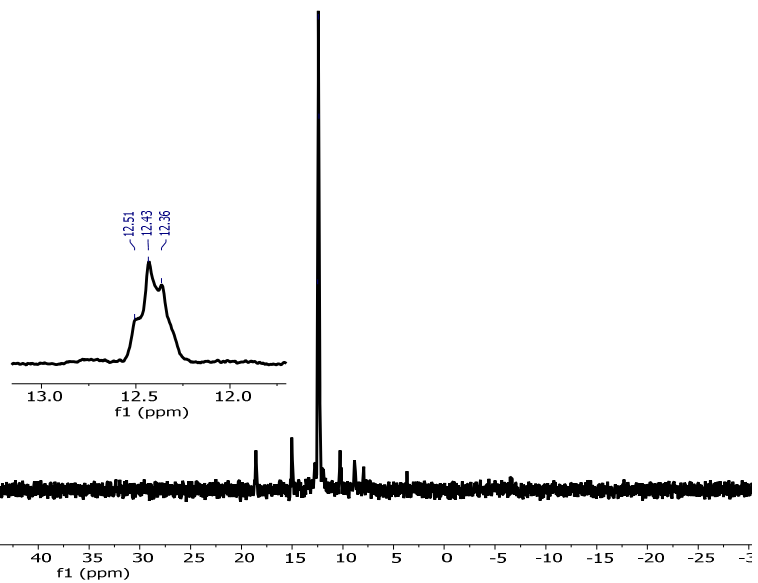
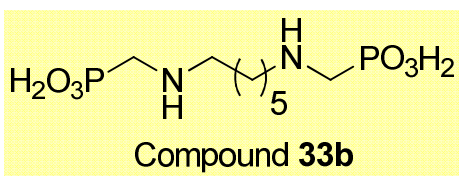
^1H NMR

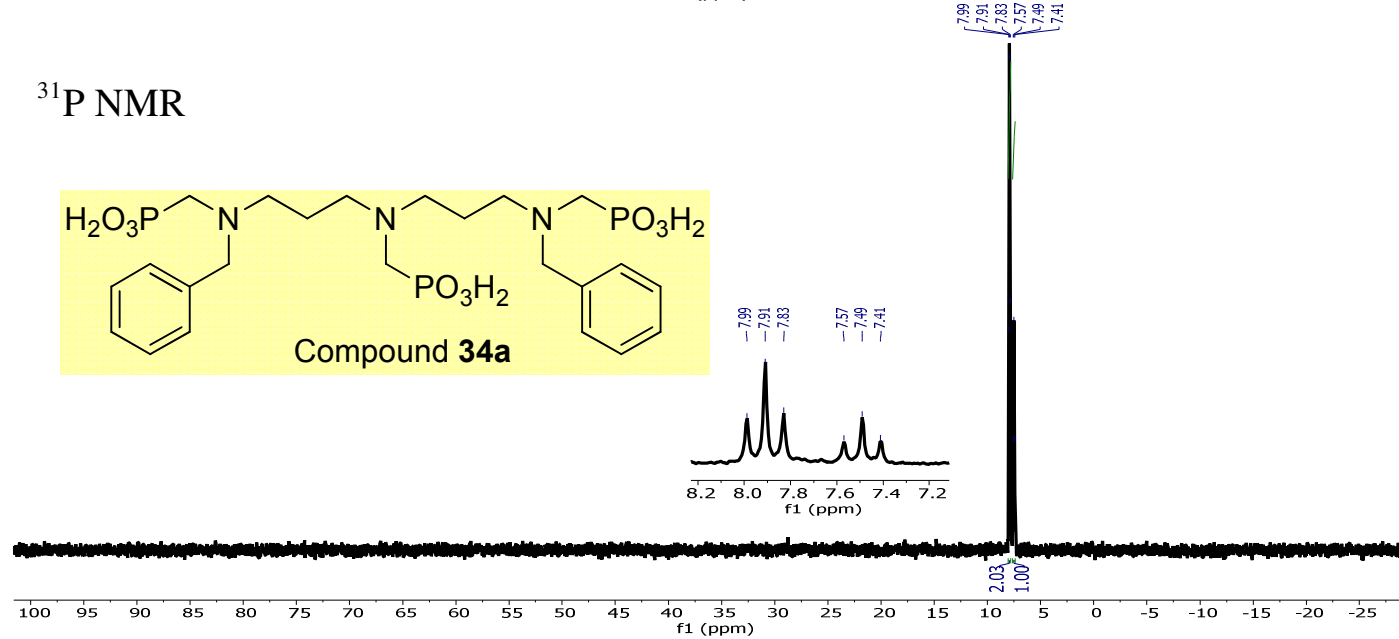
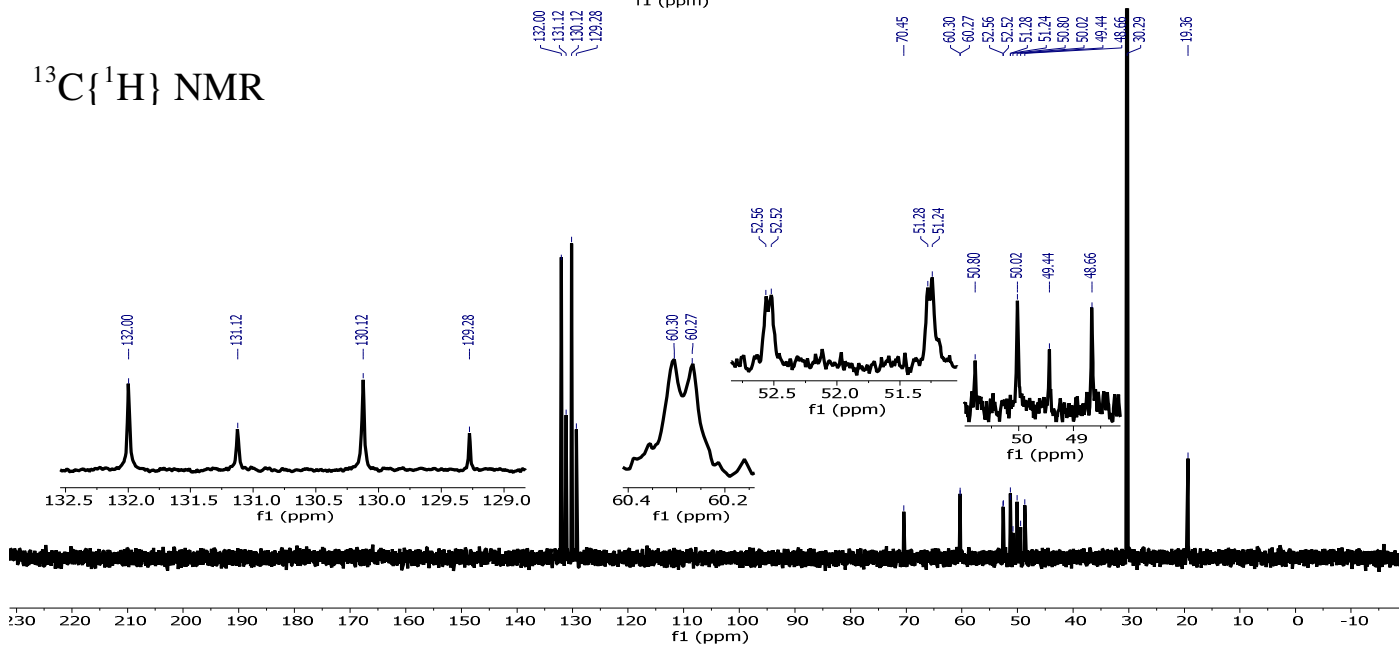
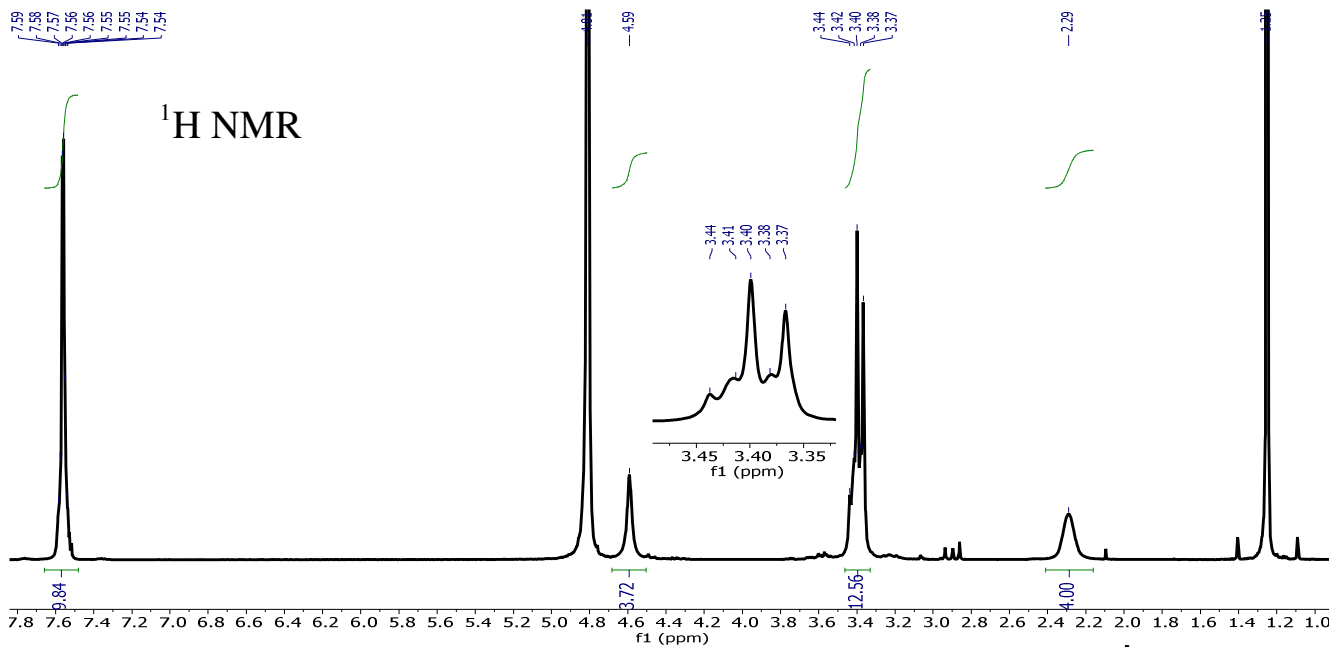


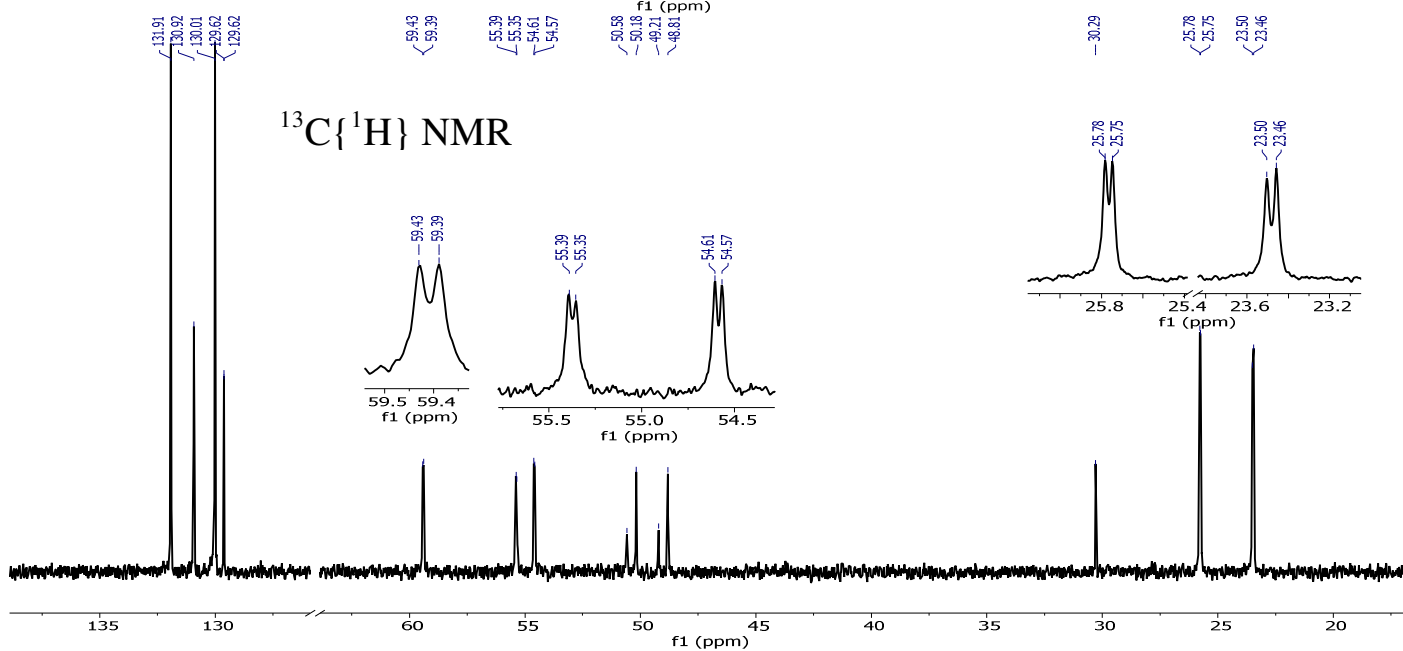
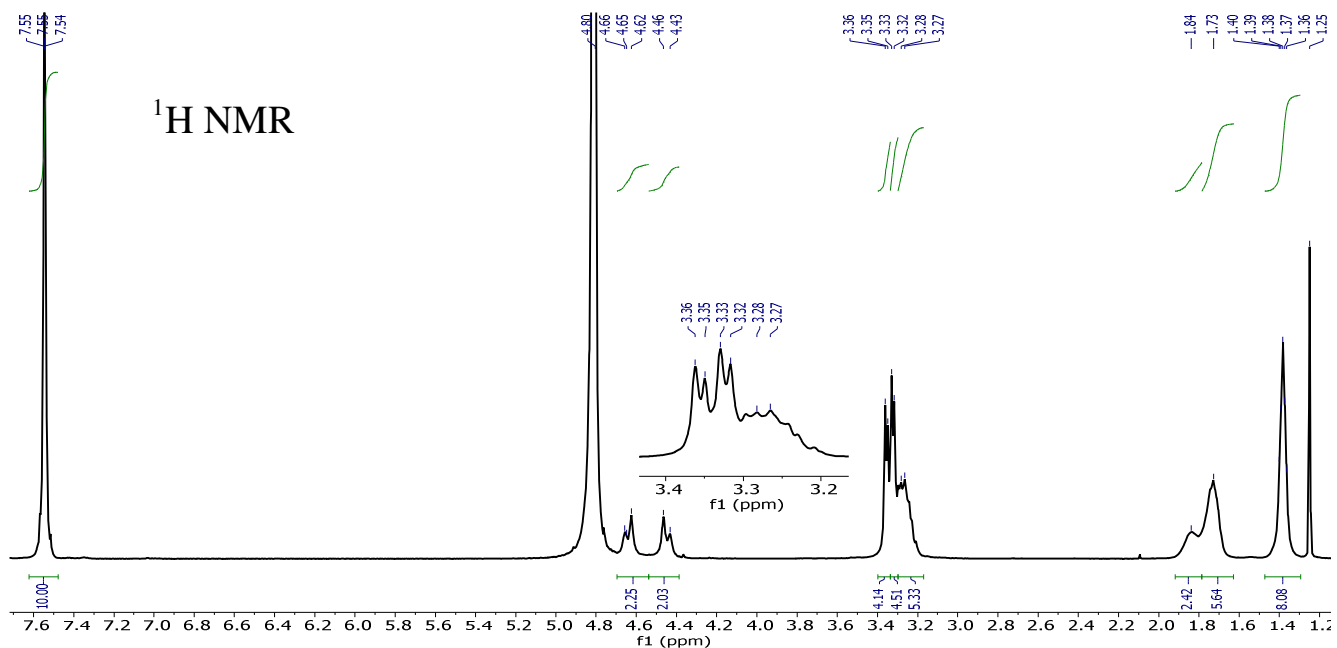
$^{13}\text{C}\{^1\text{H}\}$ NMR



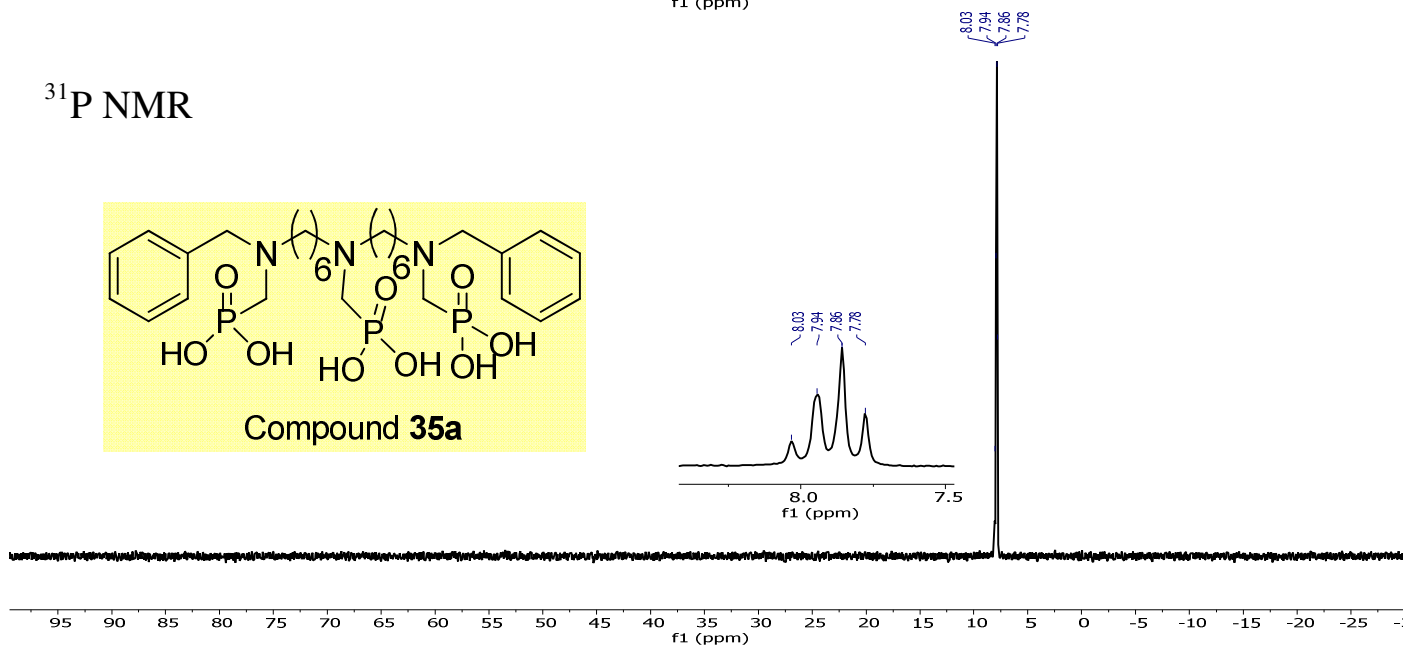
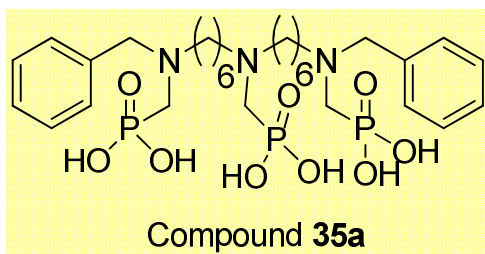
^{31}P NMR



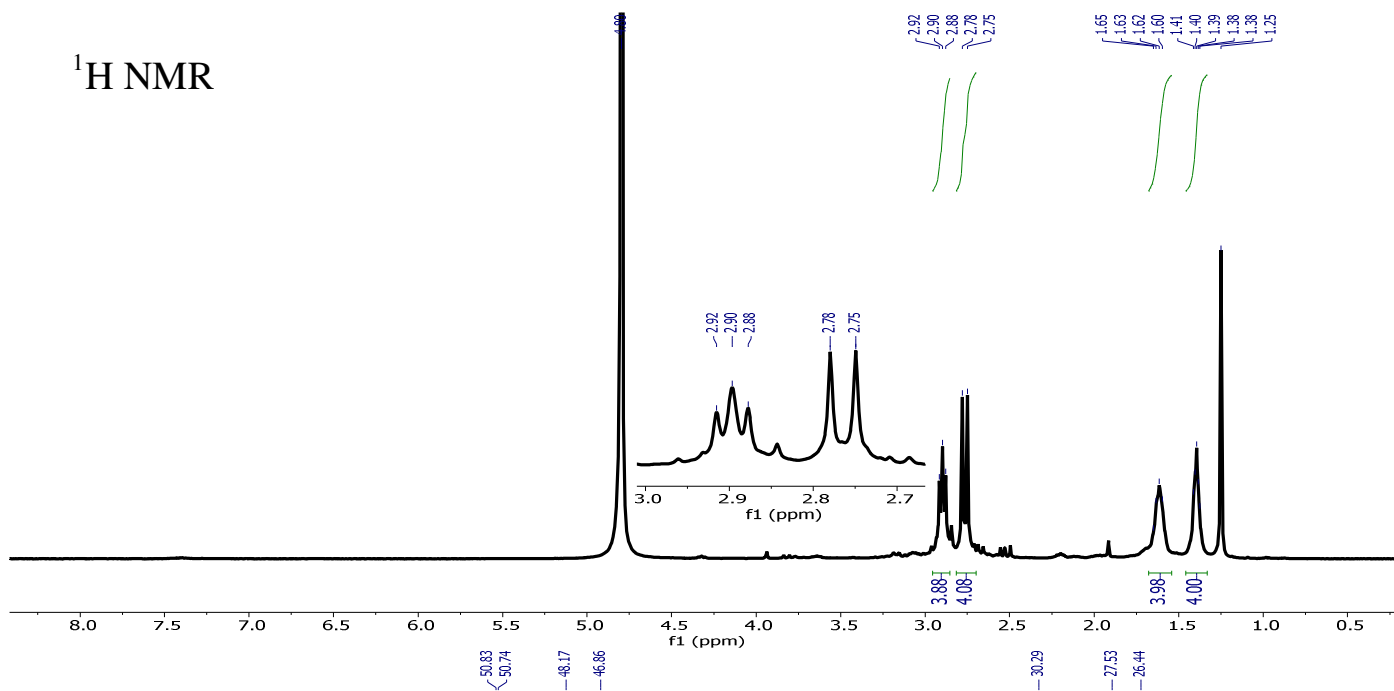




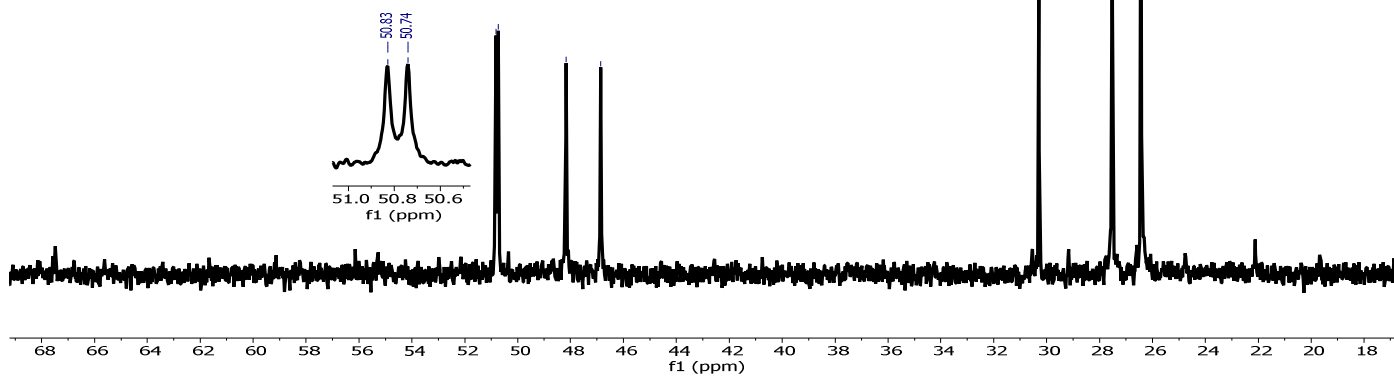
^{31}P NMR



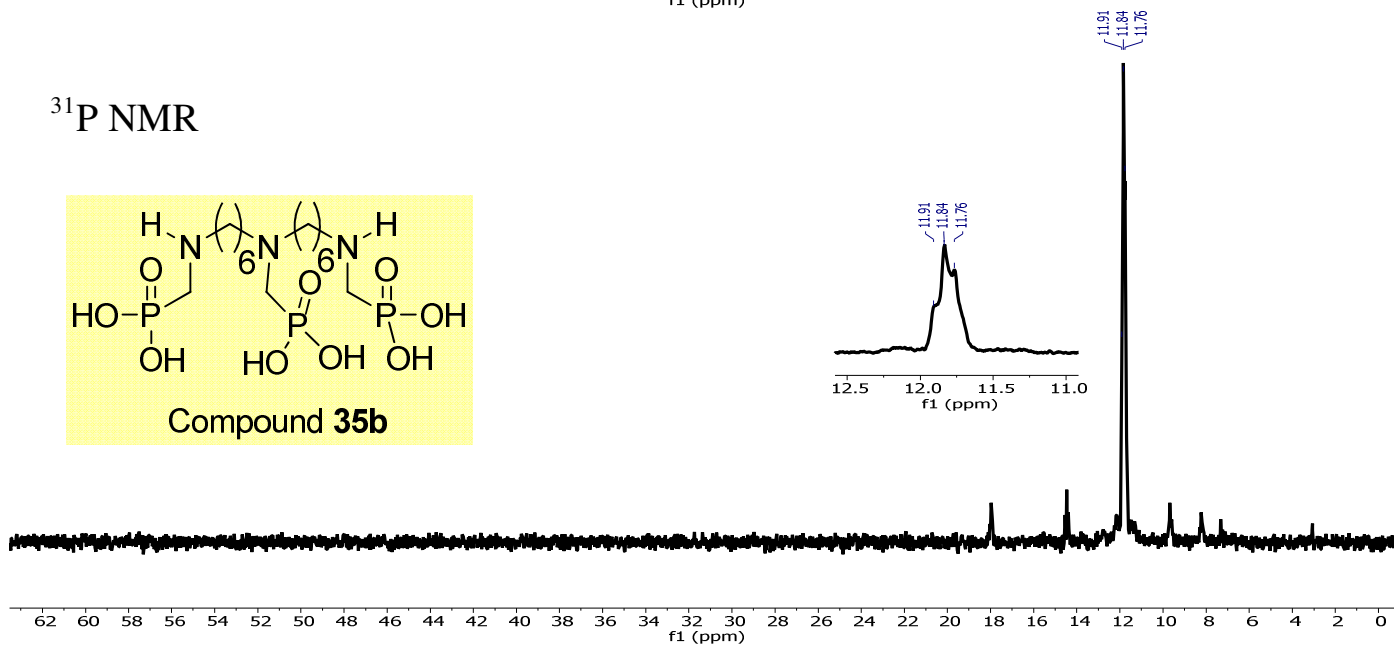
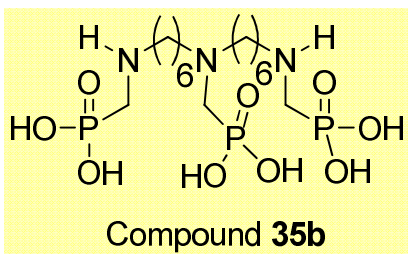
^1H NMR

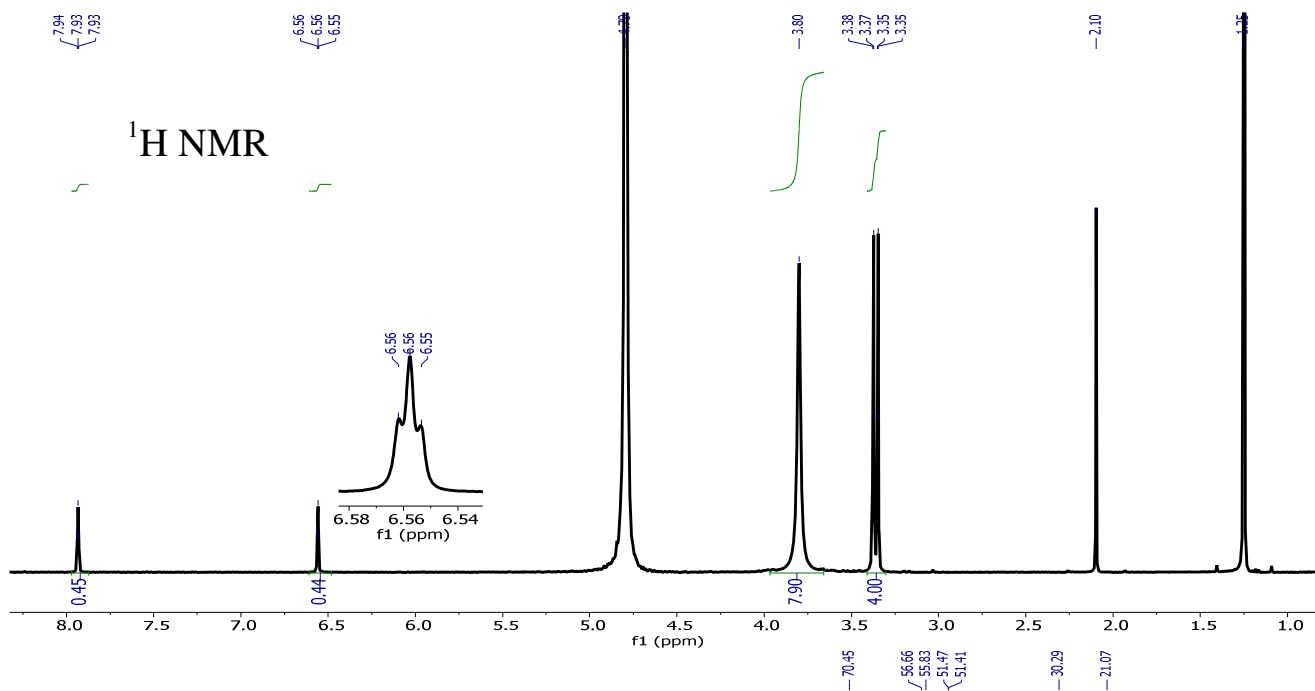


$^{13}\text{C}\{^1\text{H}\}$ NMR

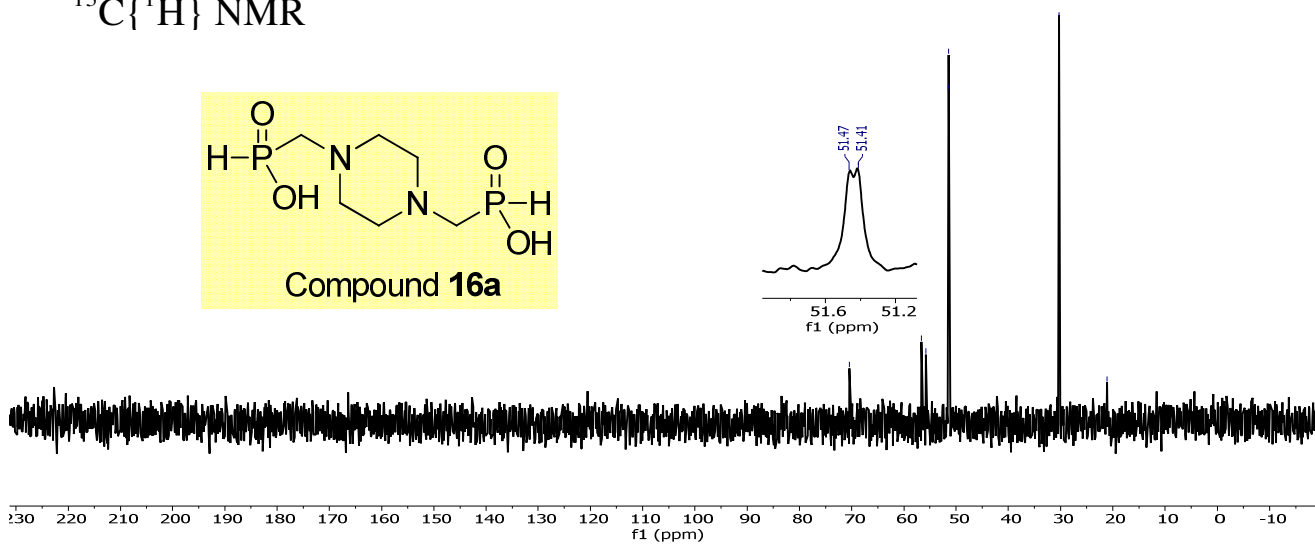
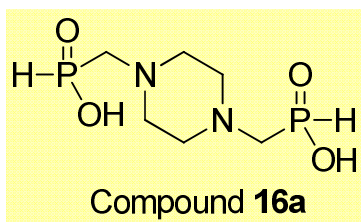


^{31}P NMR

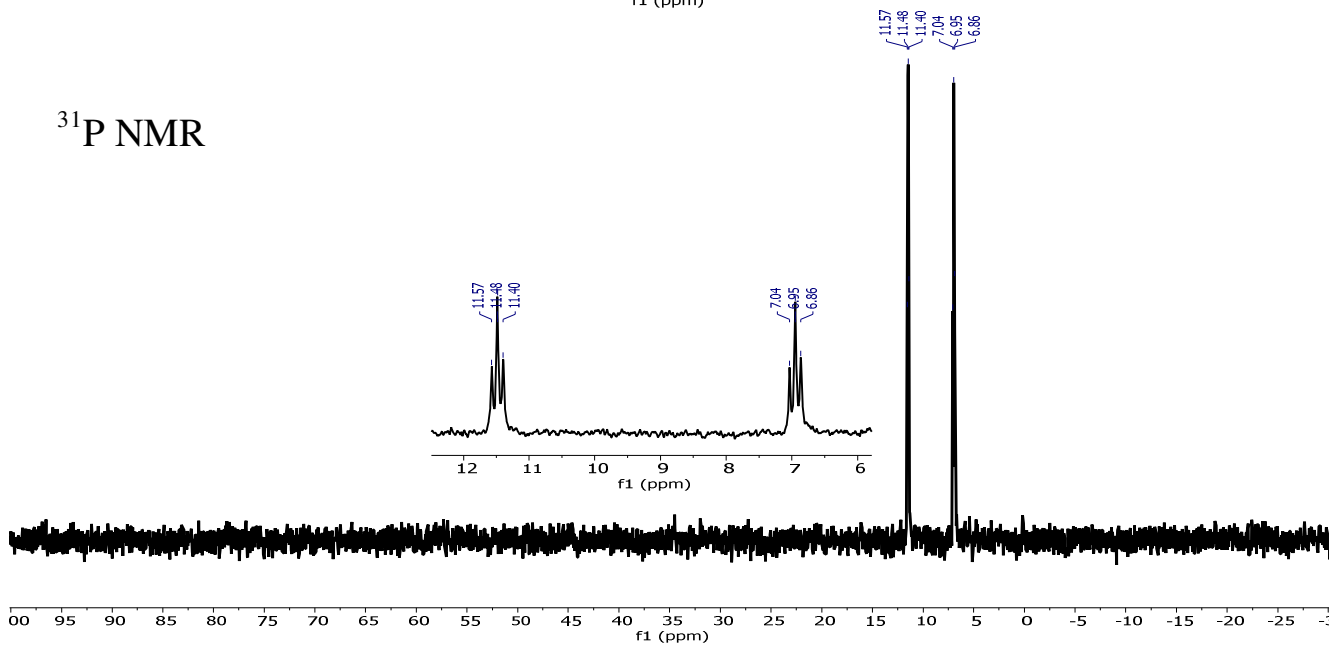


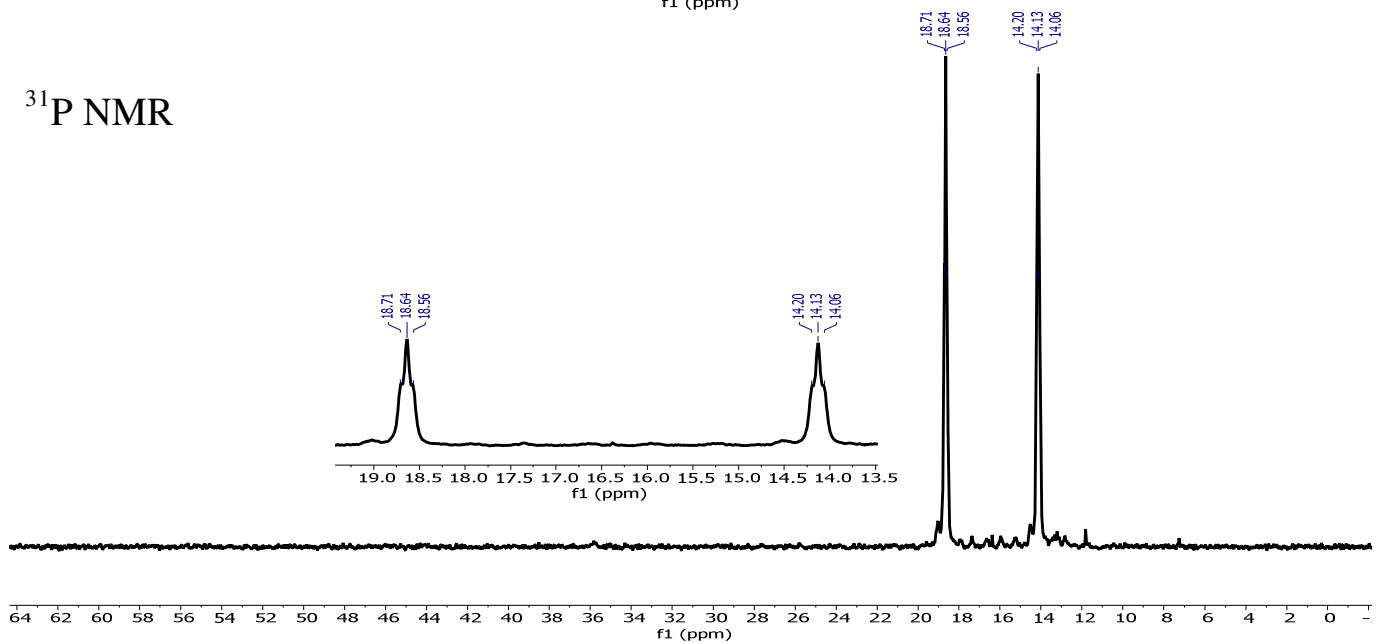
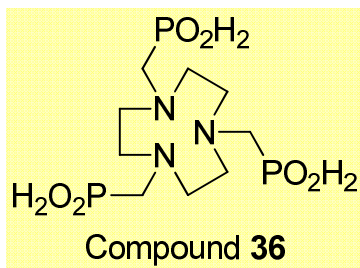
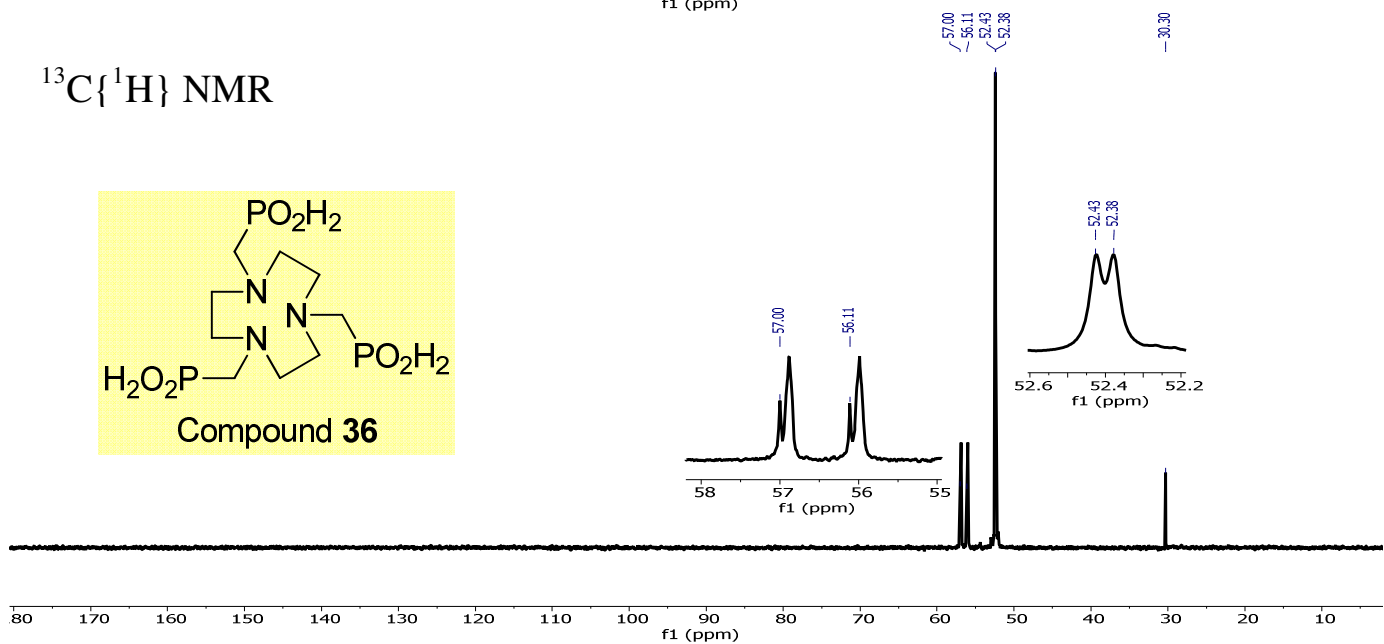
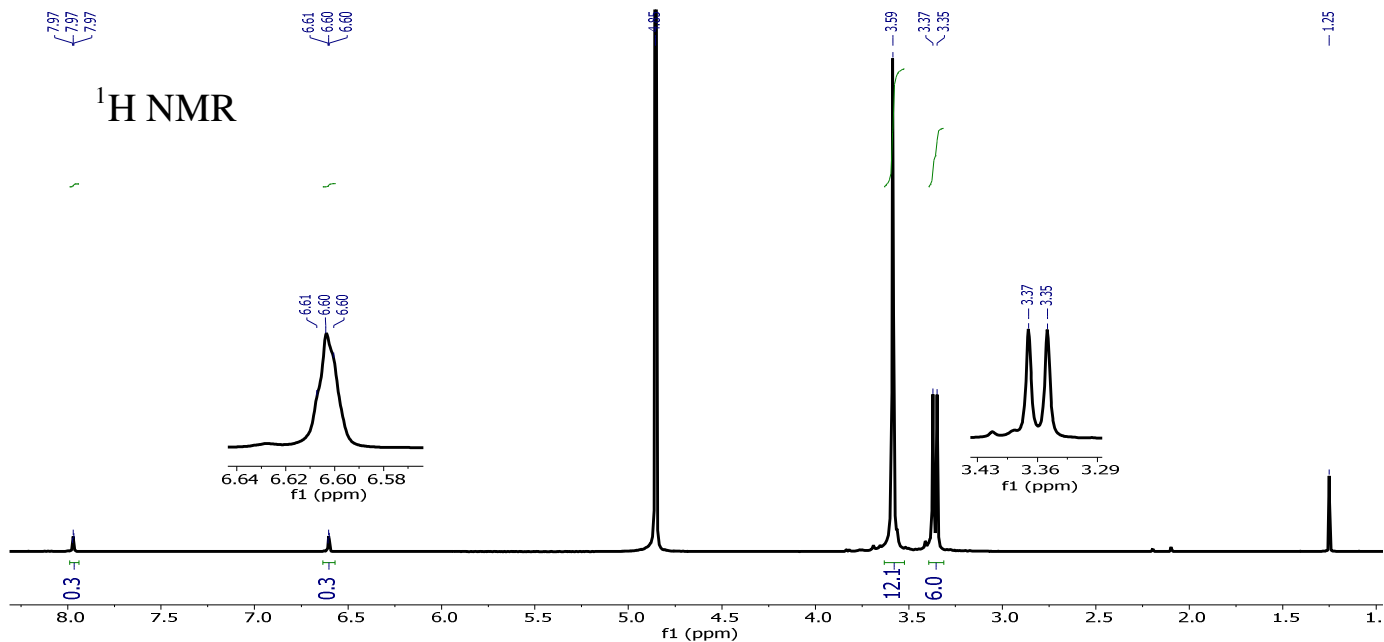


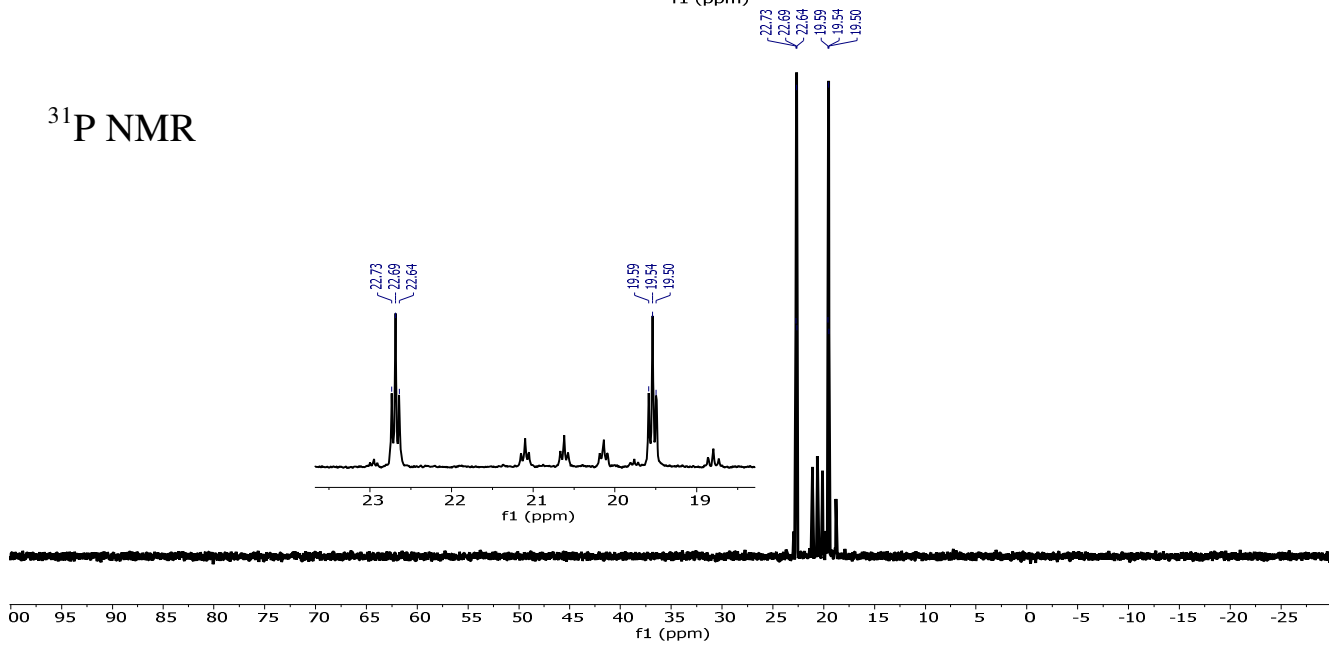
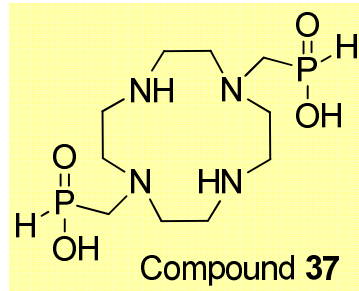
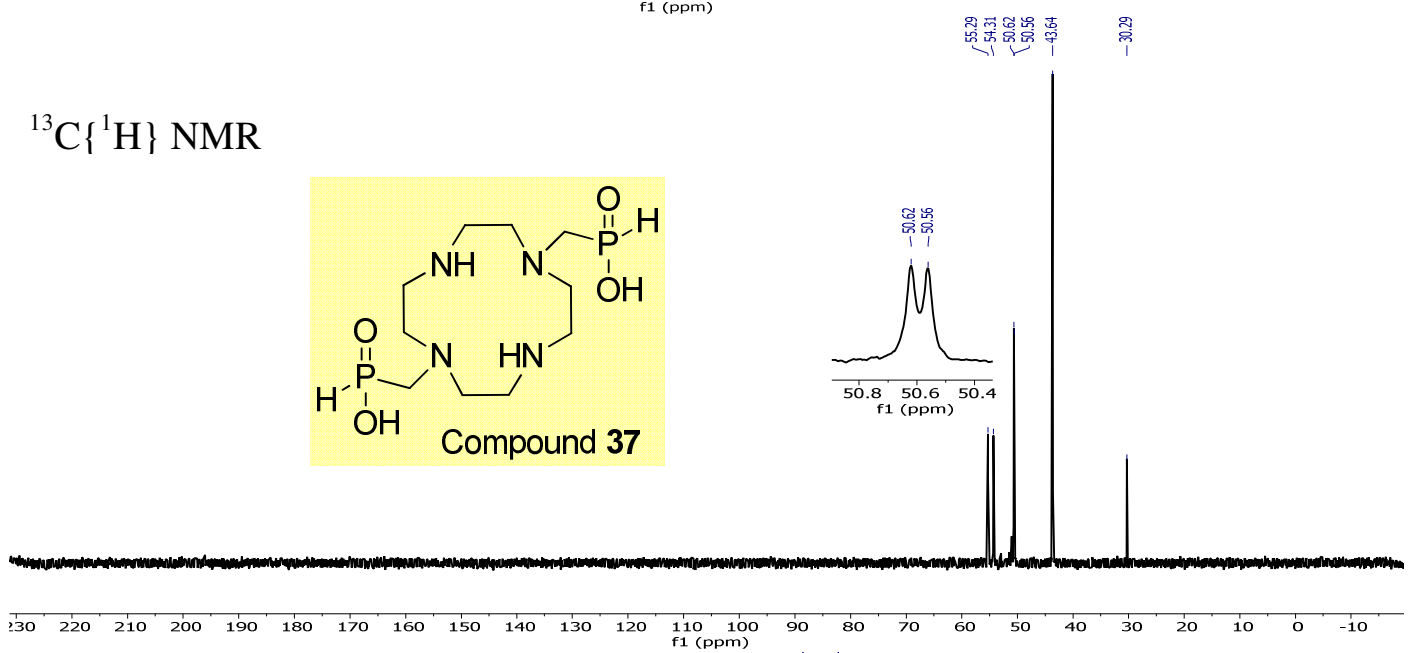
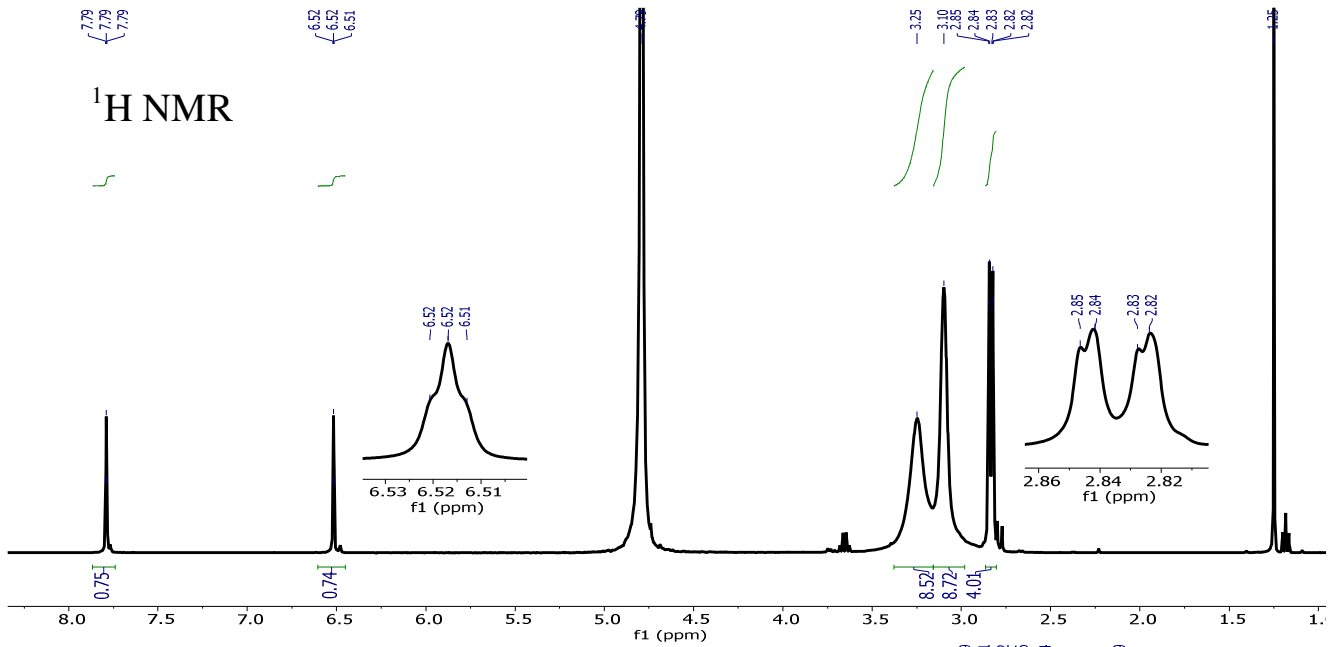
¹³C{¹H} NMR

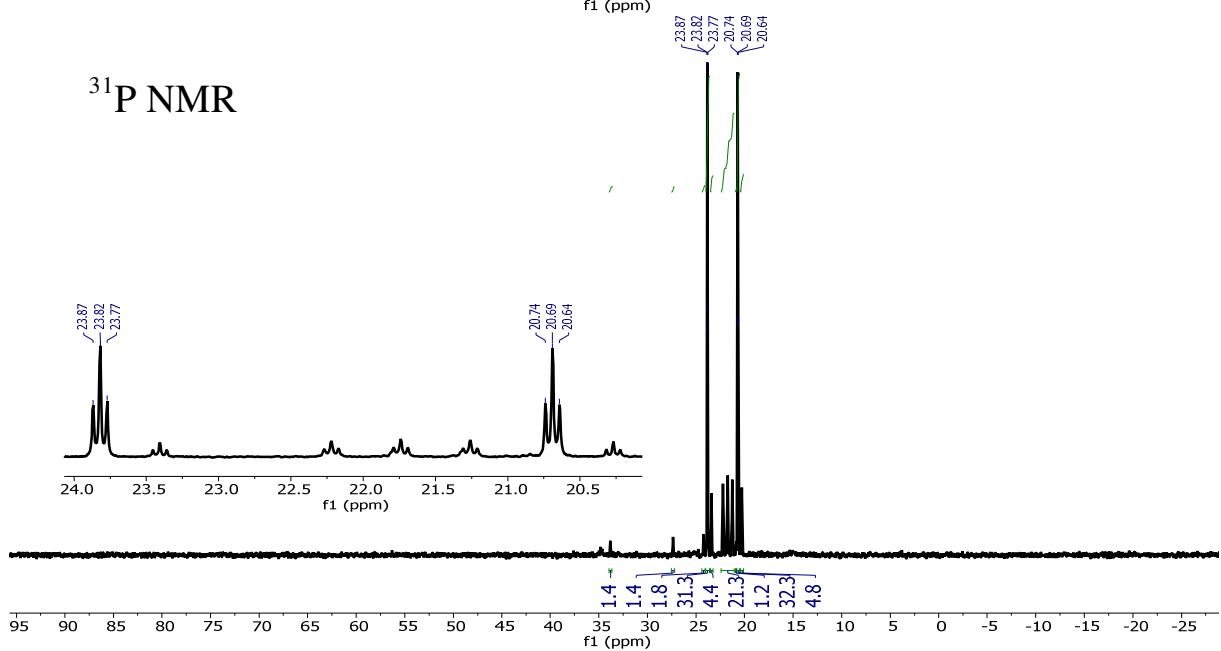
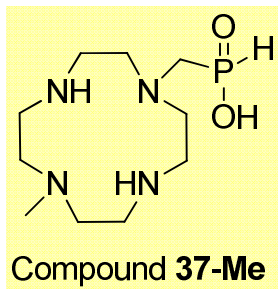
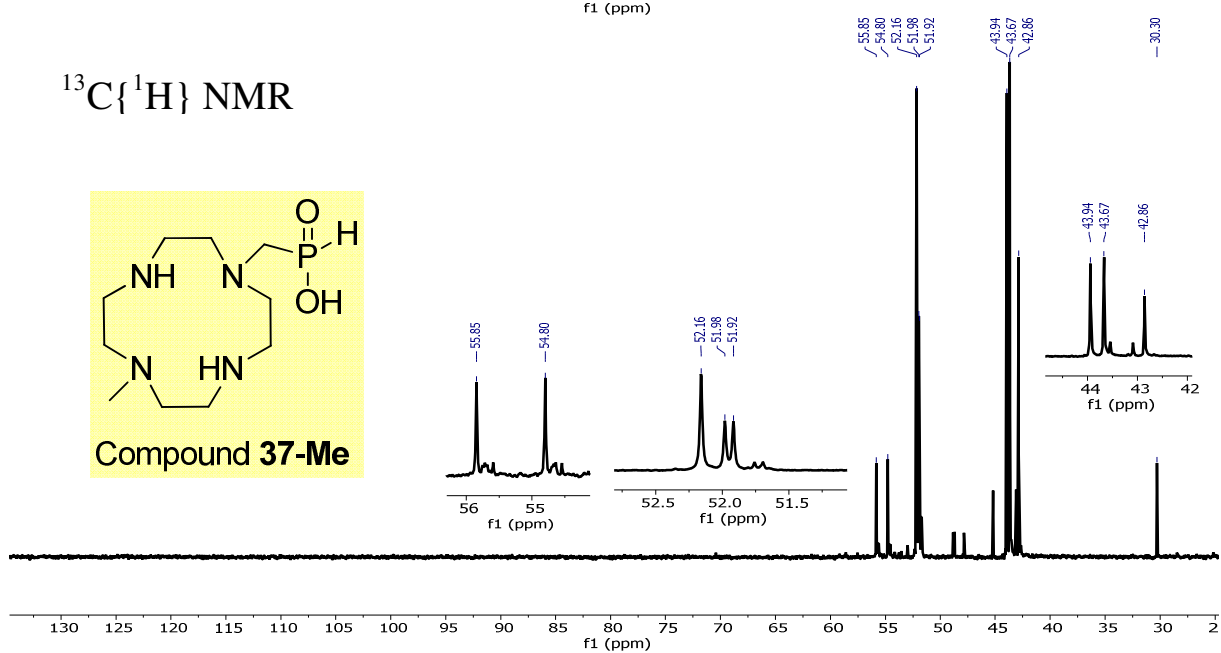
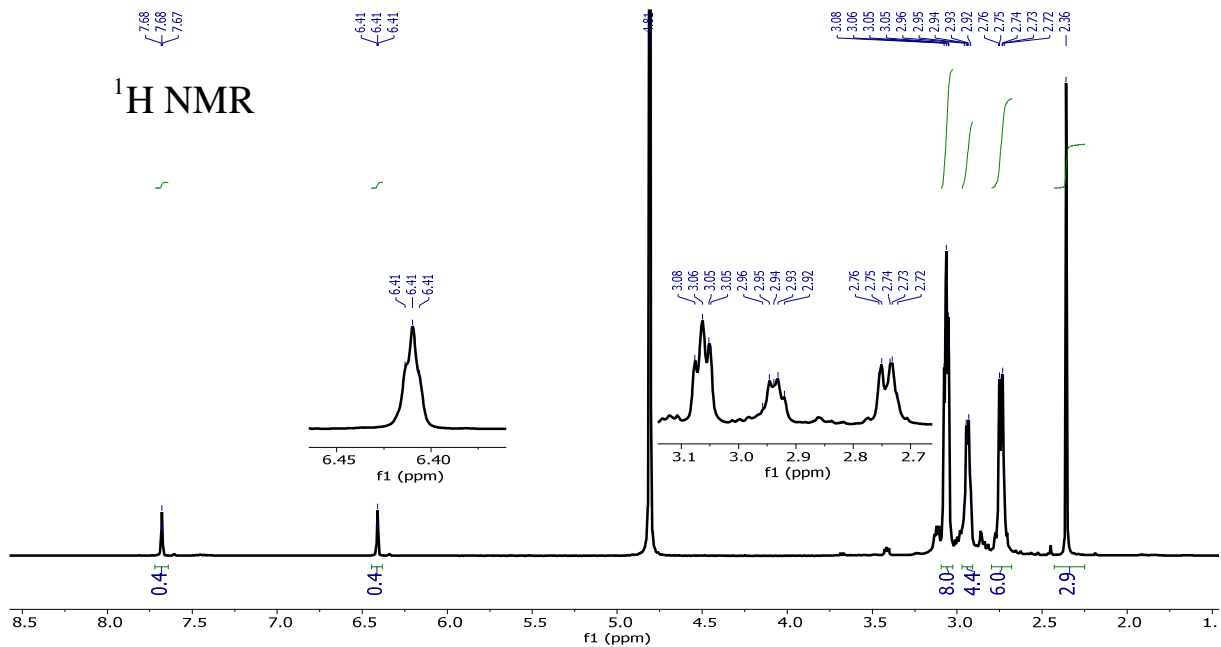


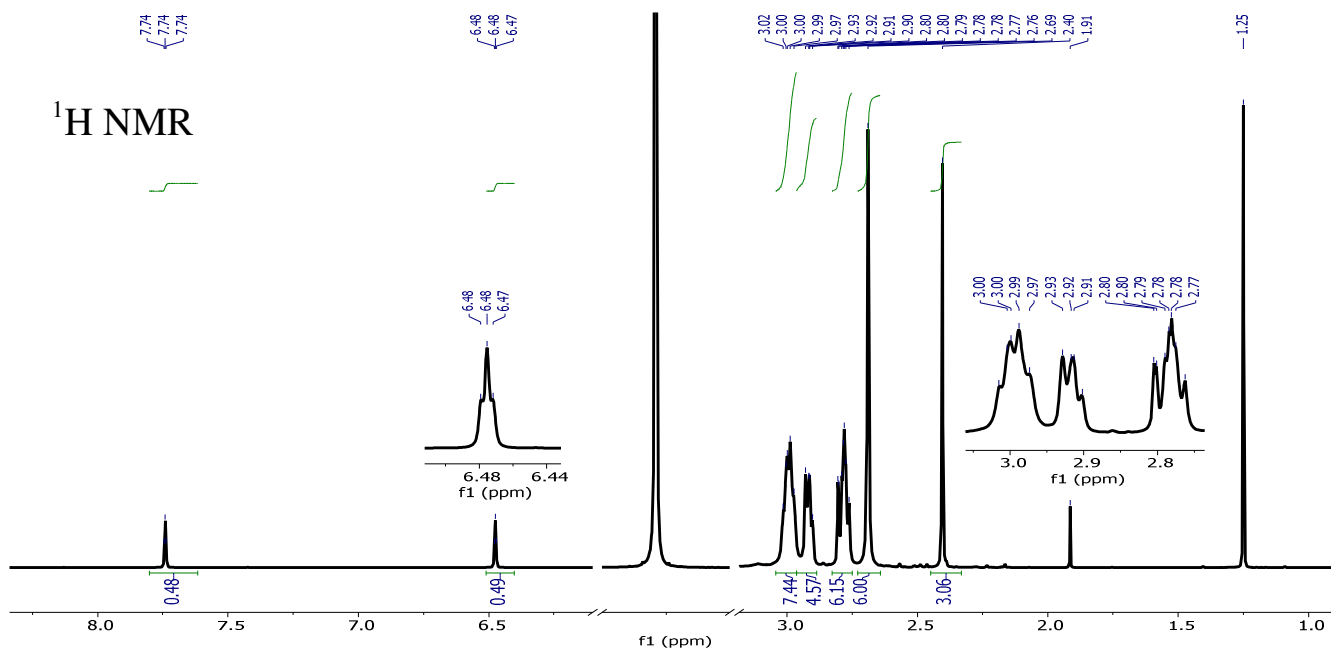
³¹P NMR



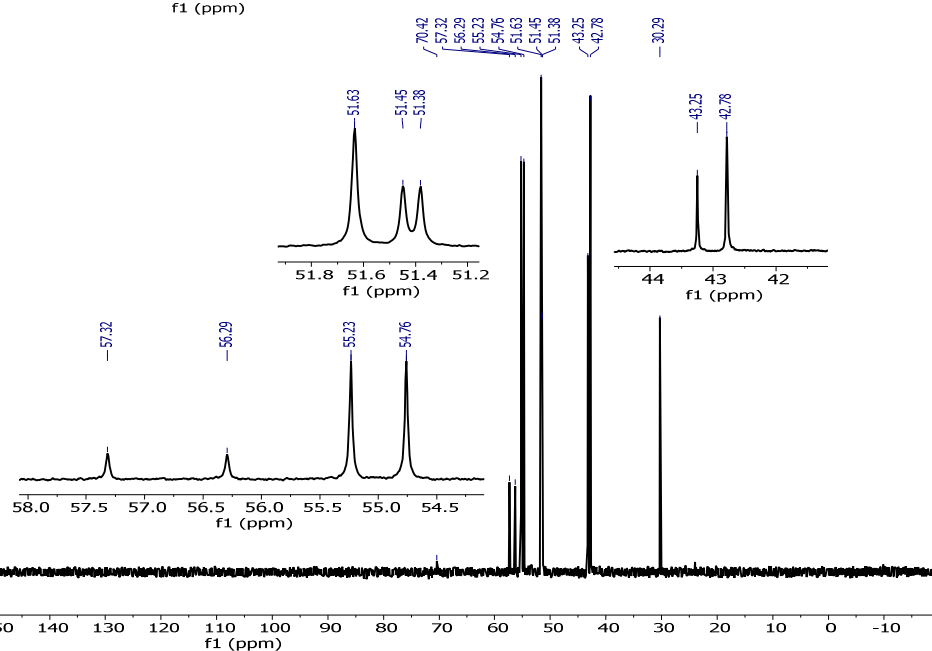
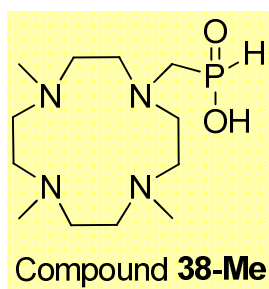




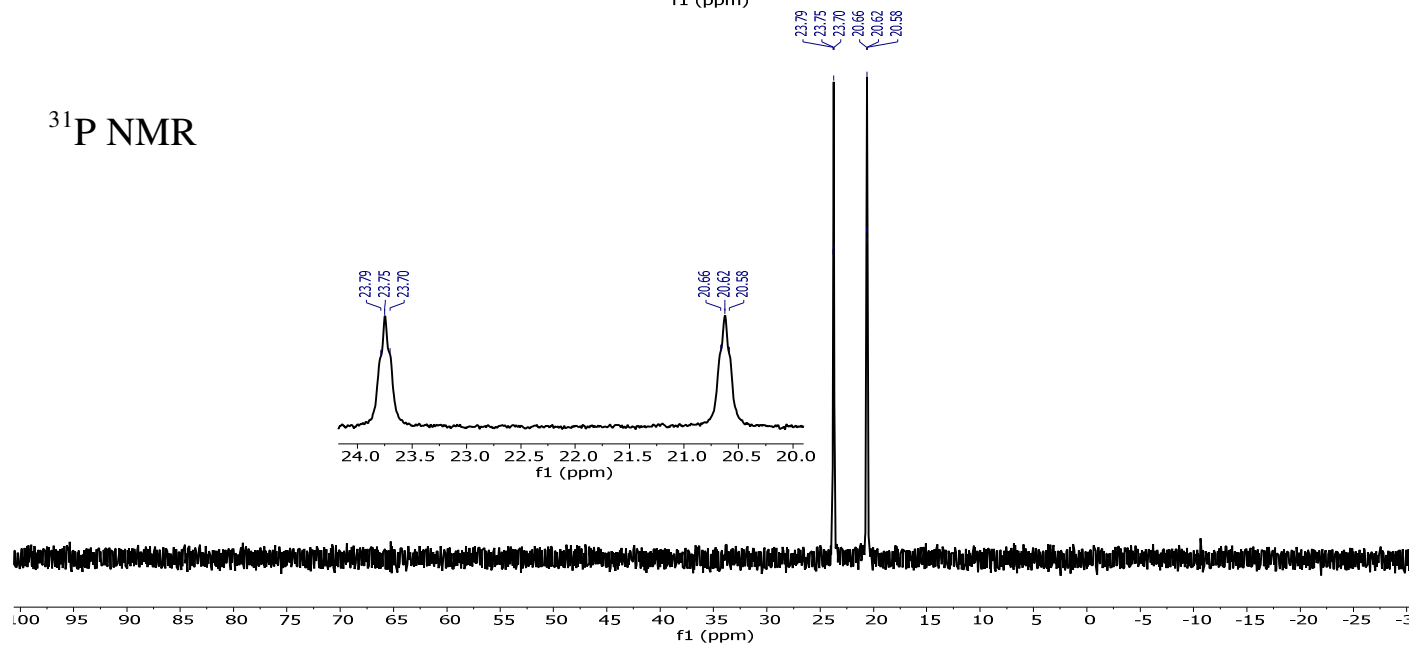


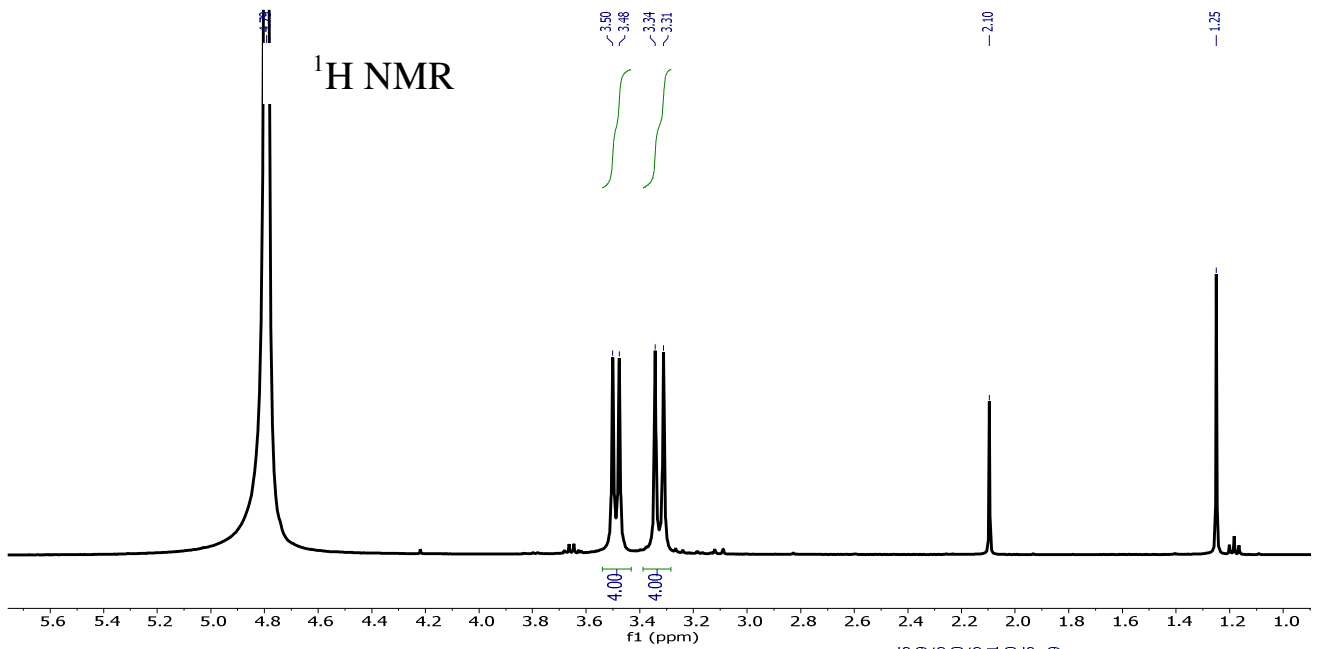


$^{13}\text{C}\{^1\text{H}\}$ NMR

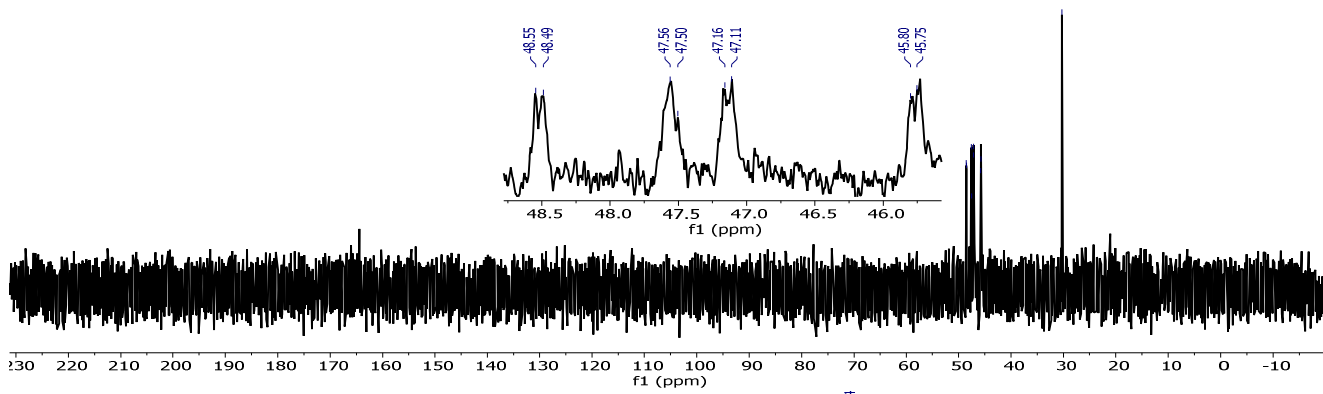


^{31}P NMR

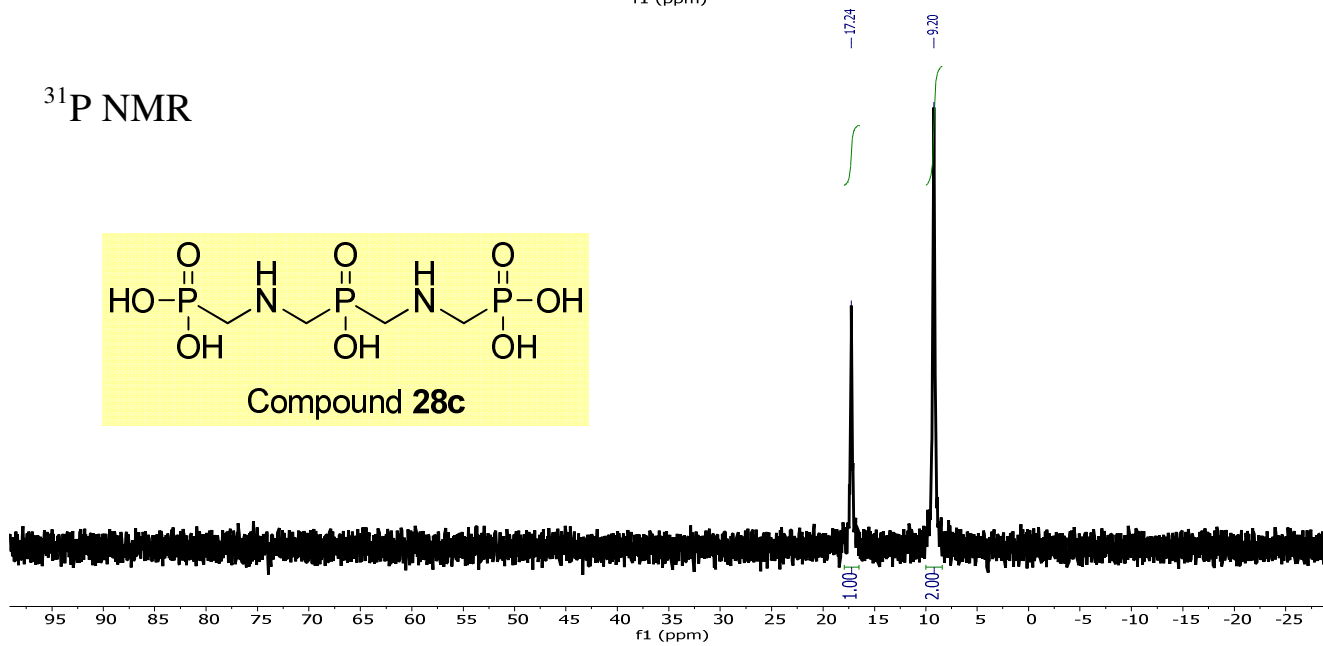
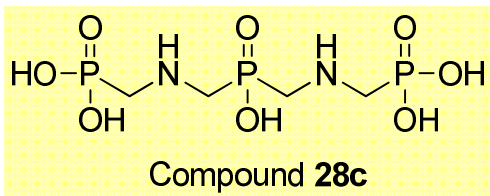


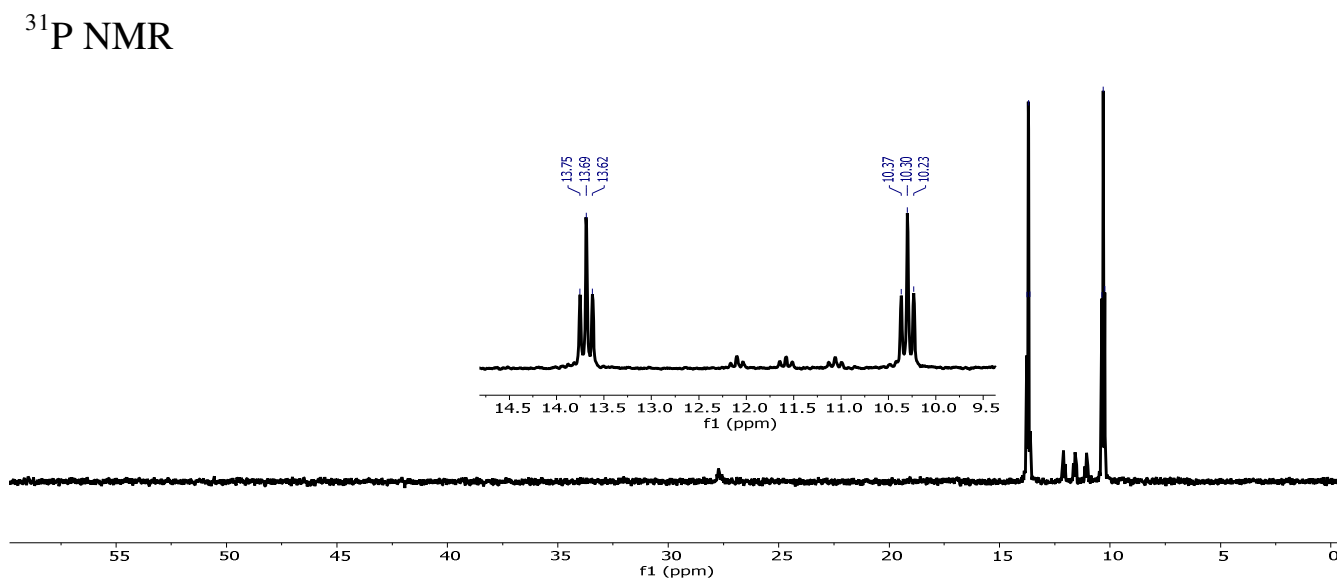
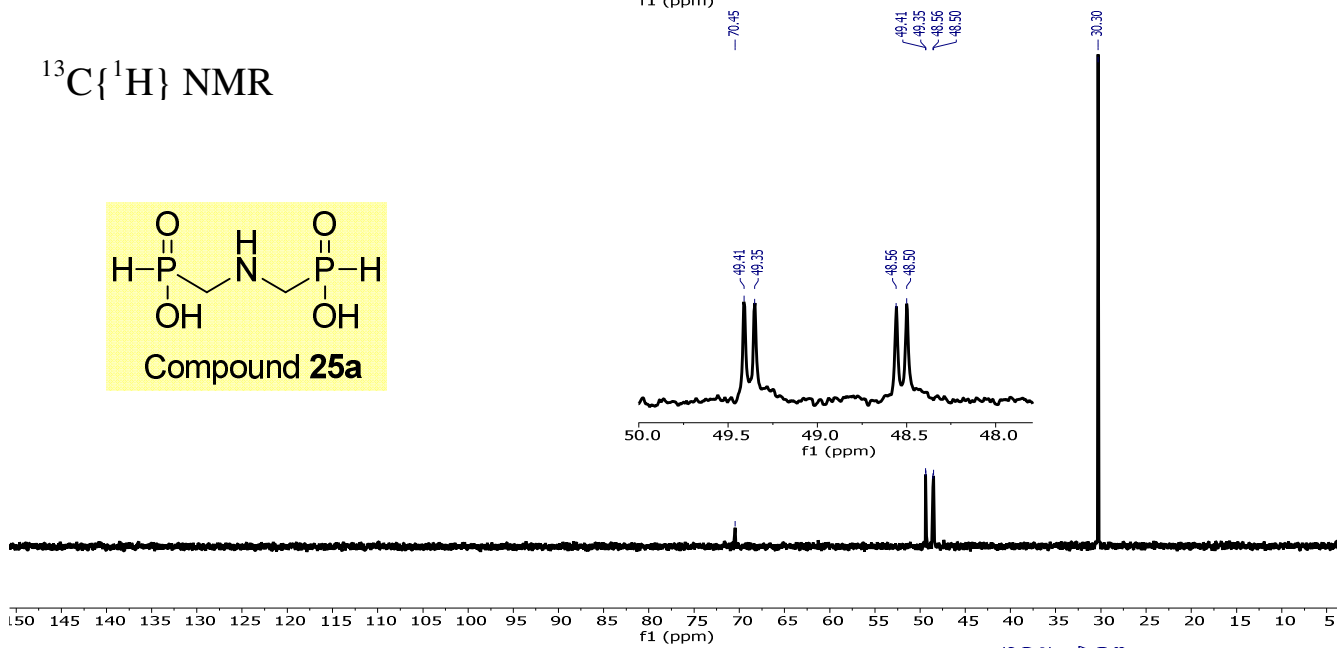
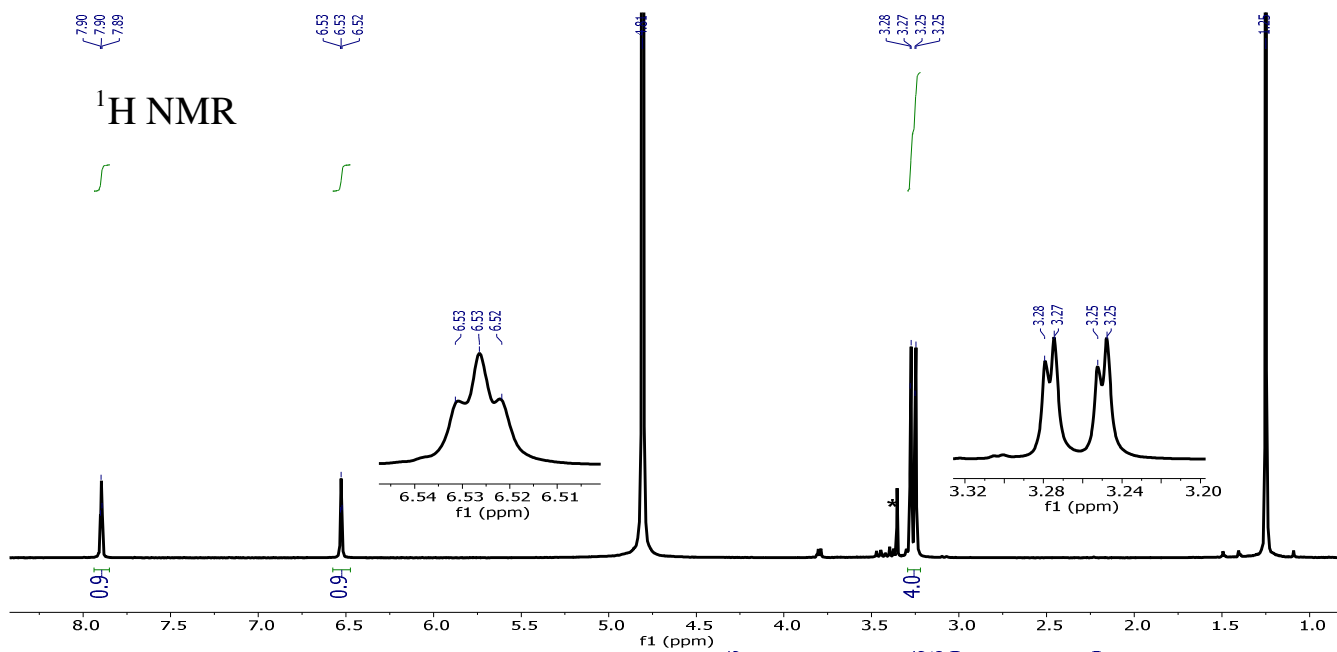


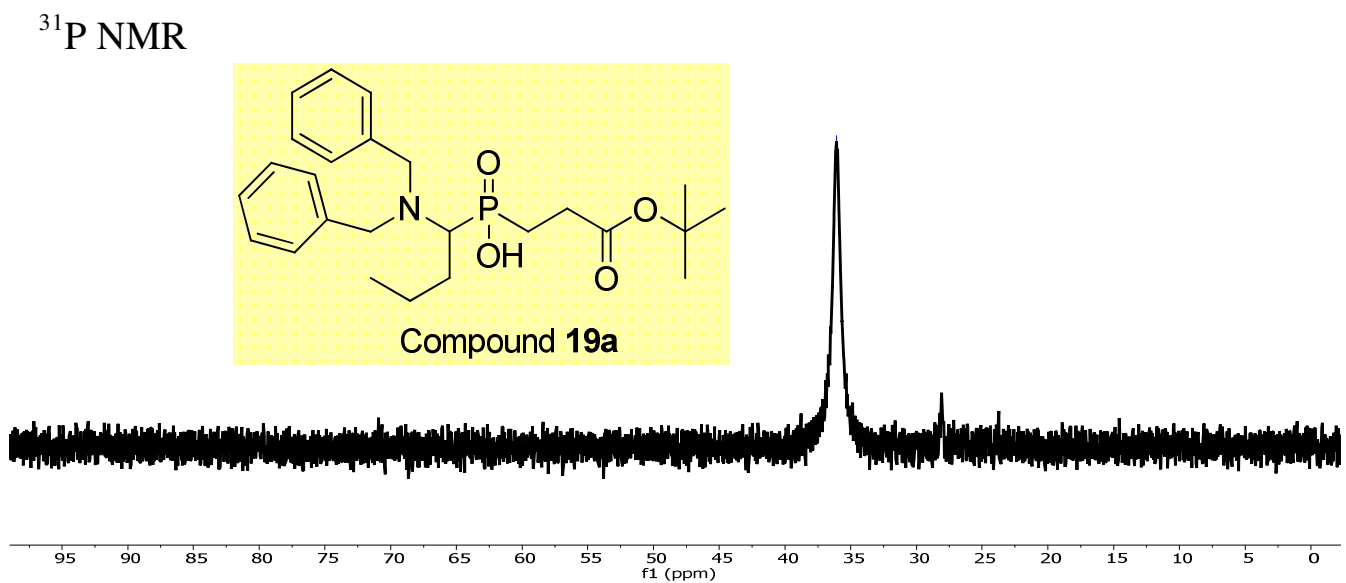
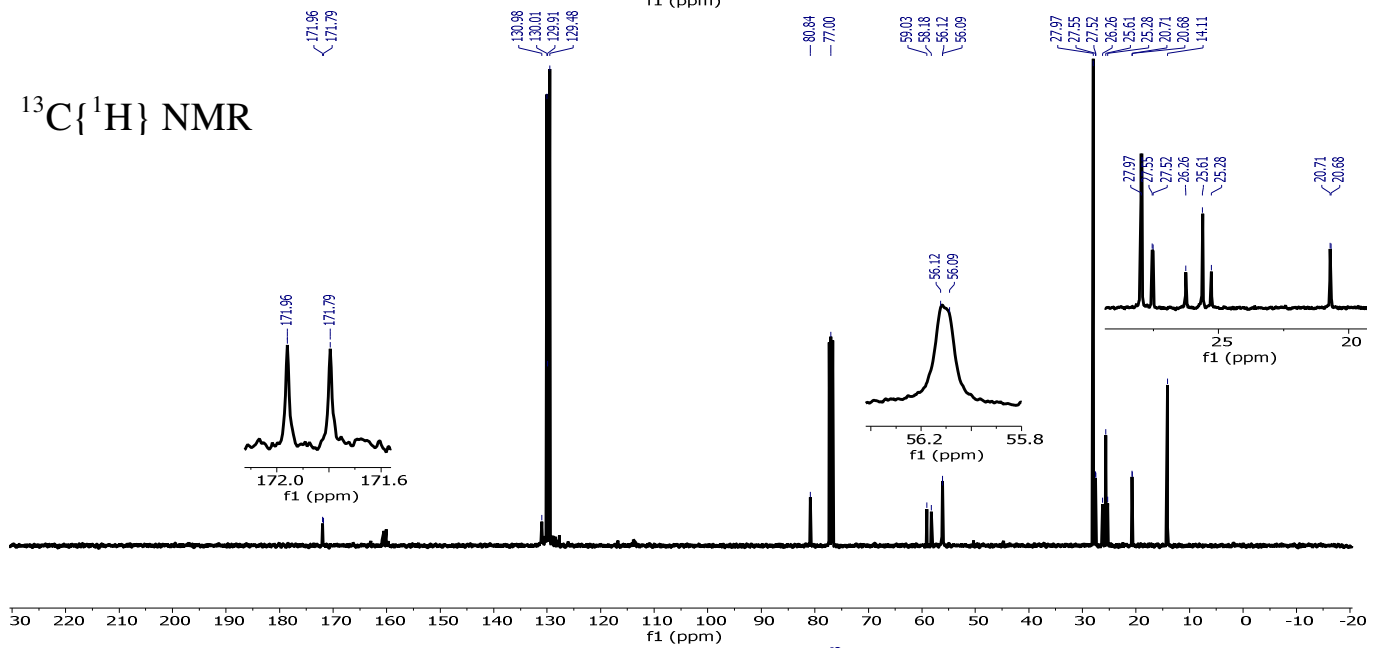
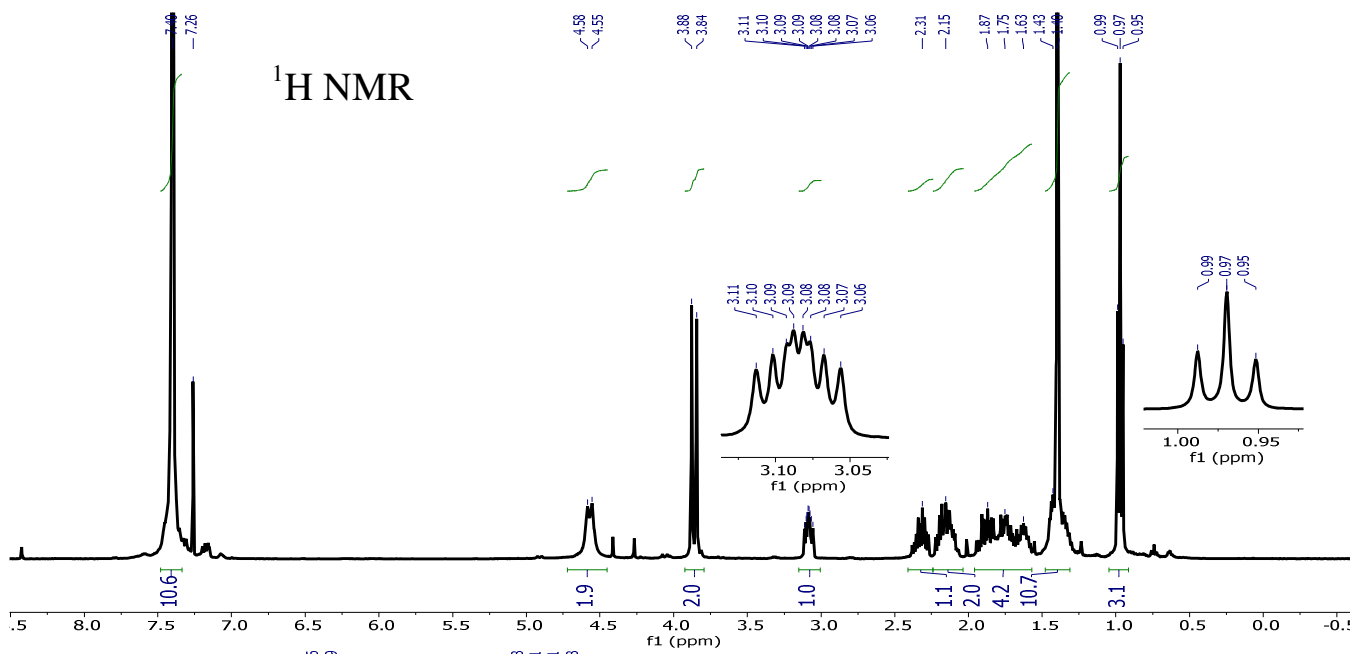
¹³C{¹H} NMR

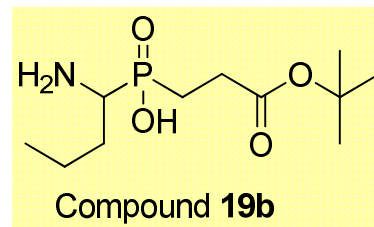
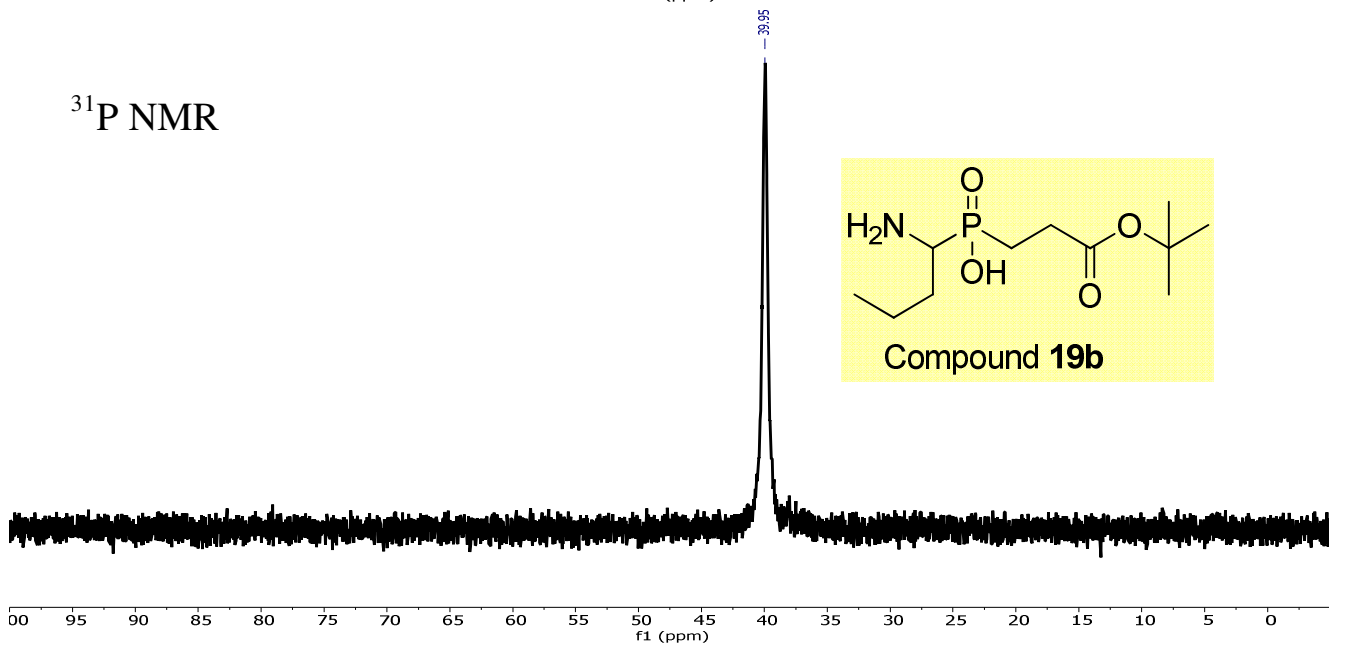
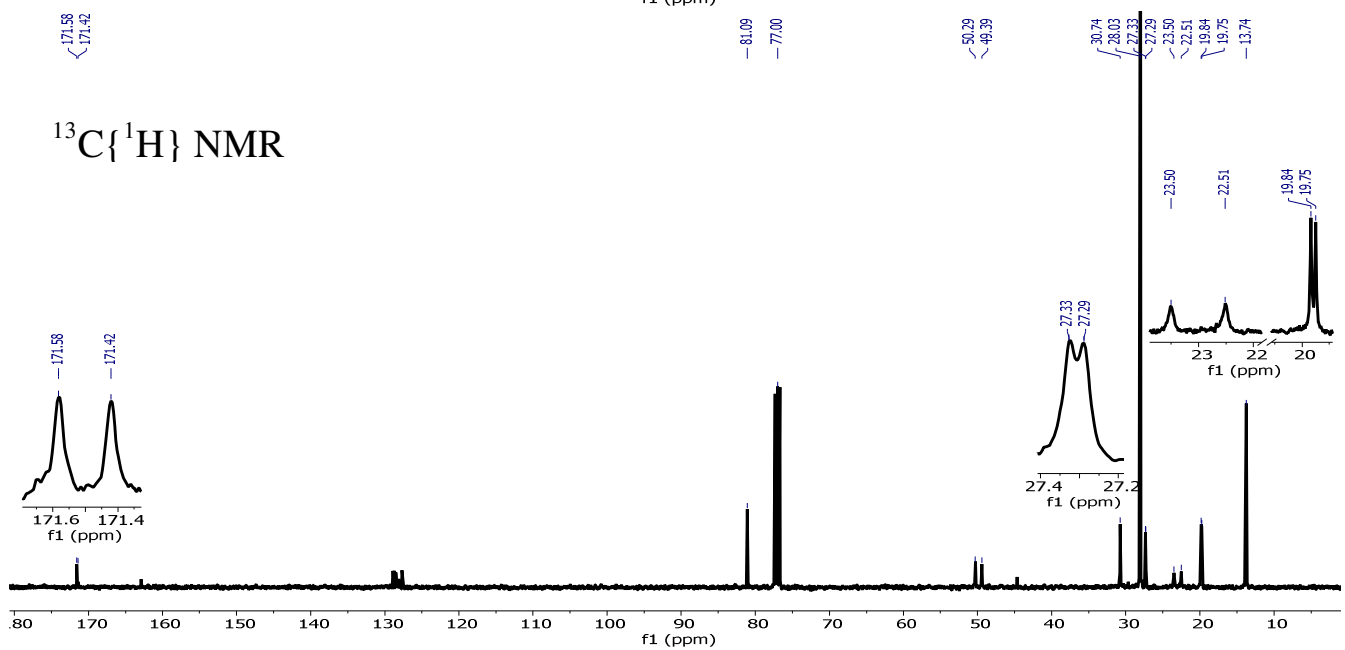
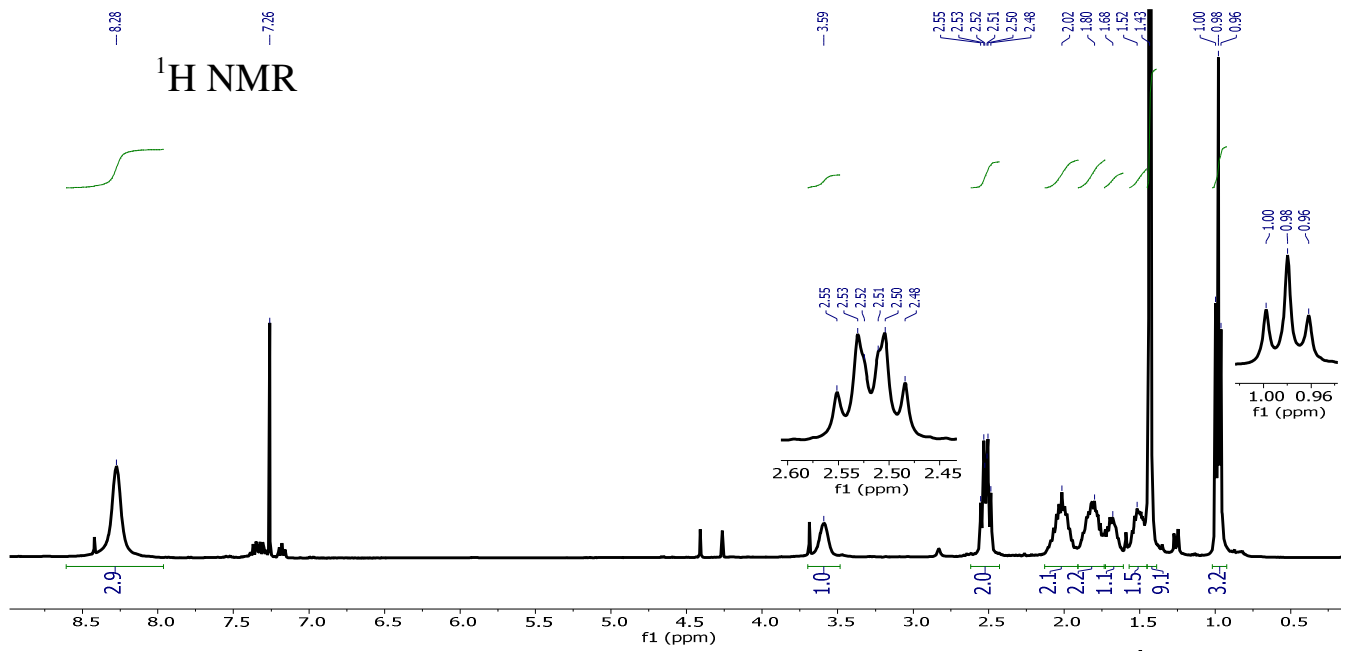


³¹P NMR

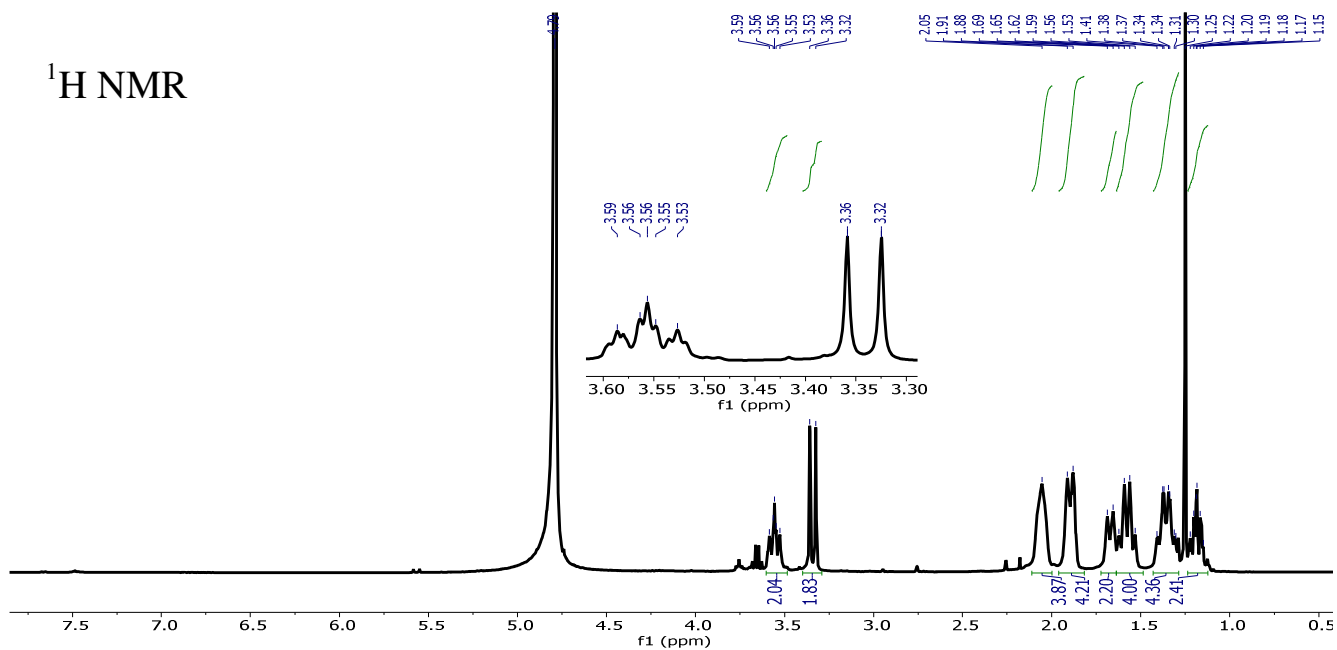




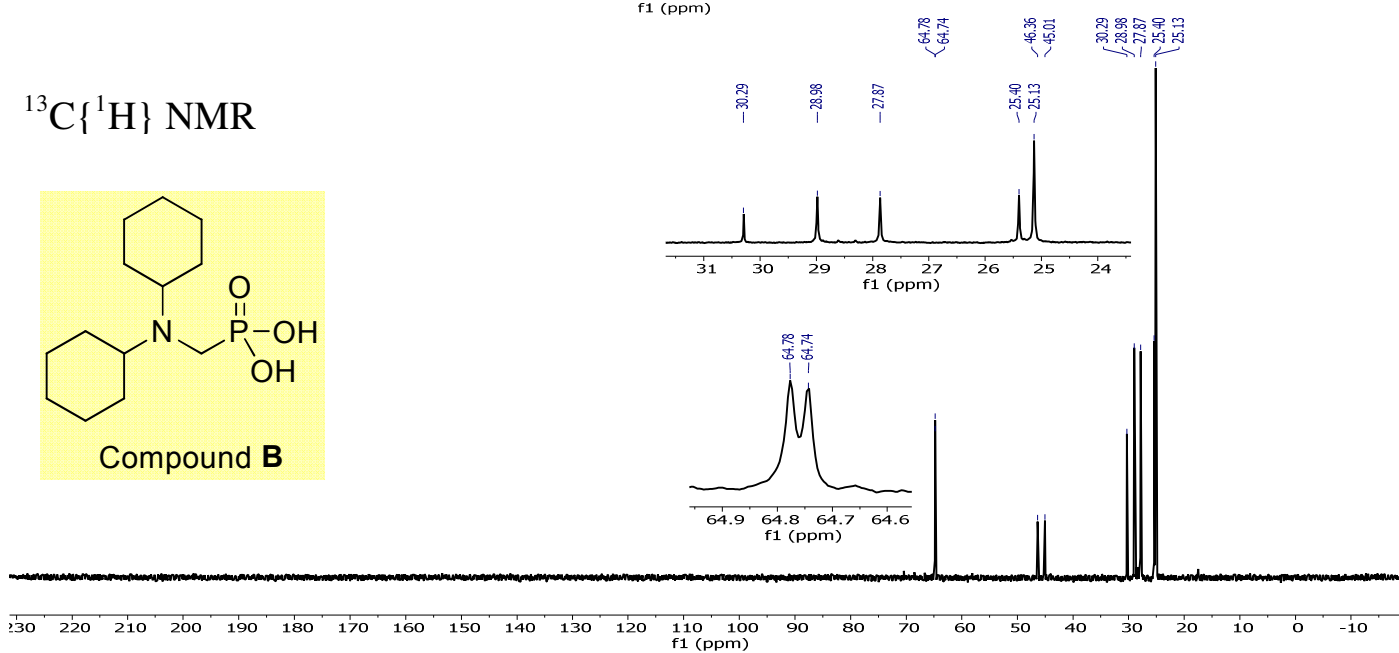
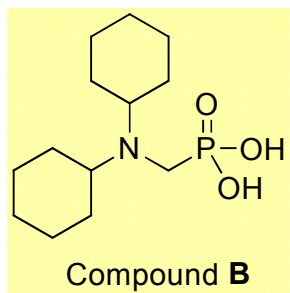




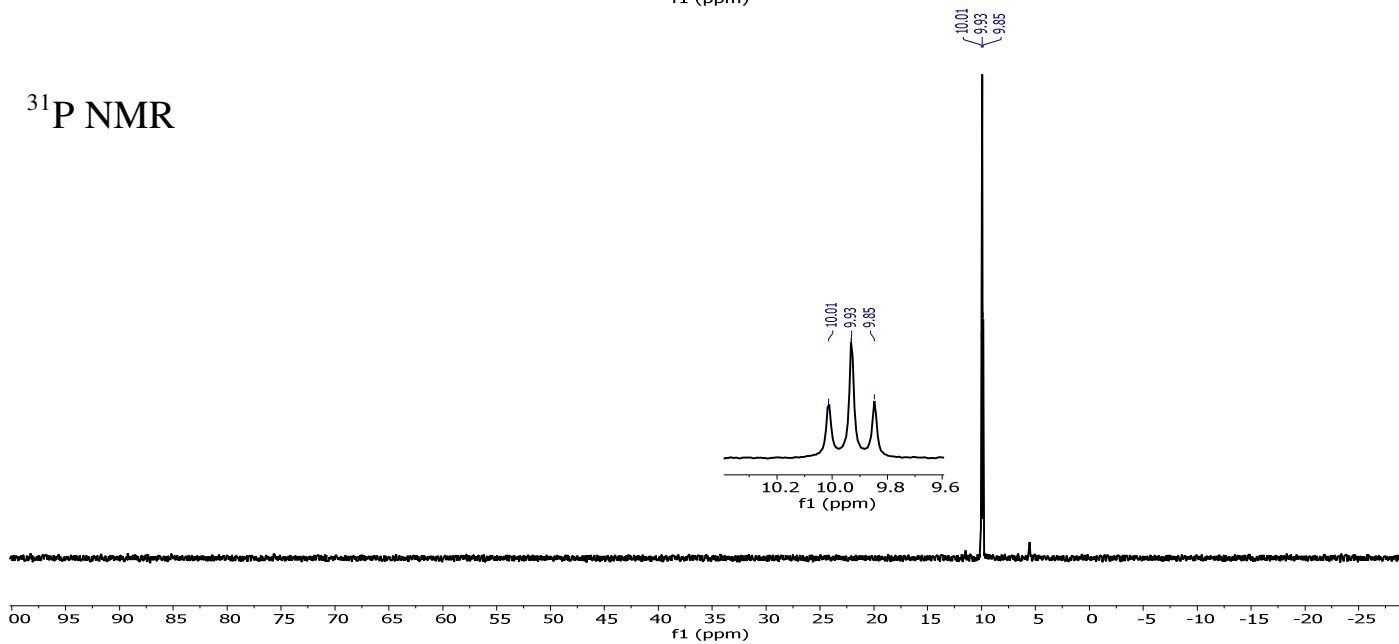
^1H NMR

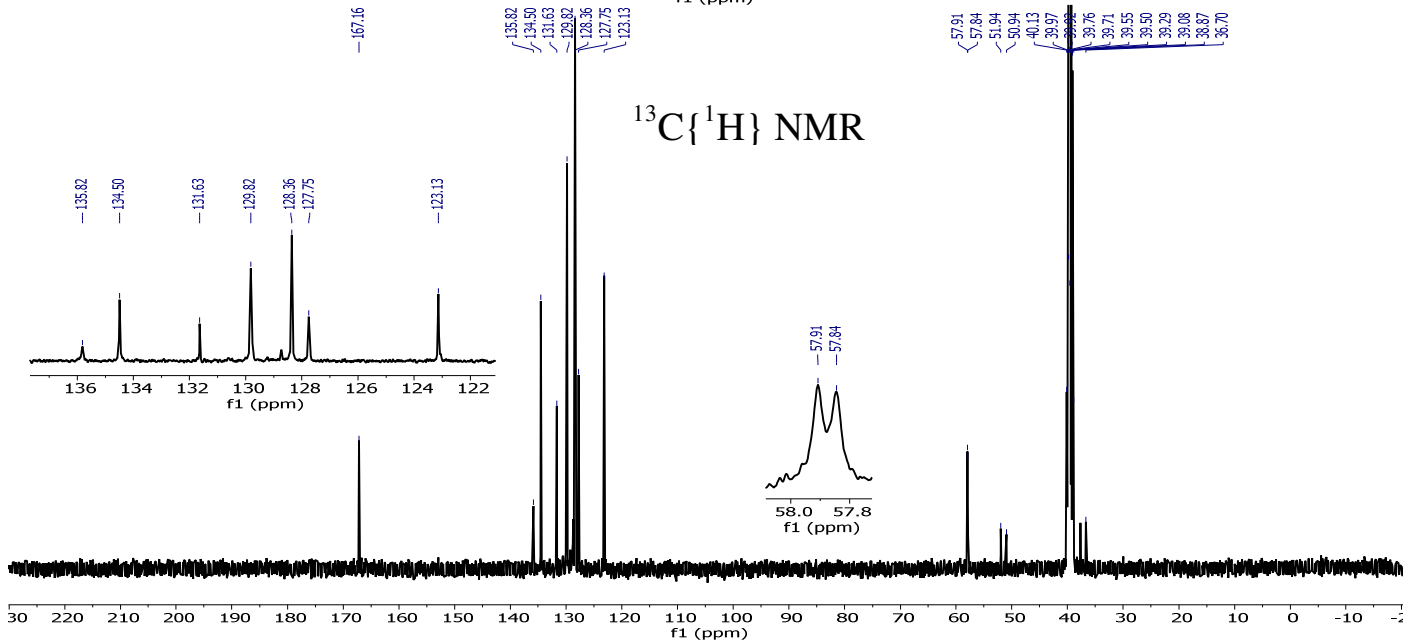
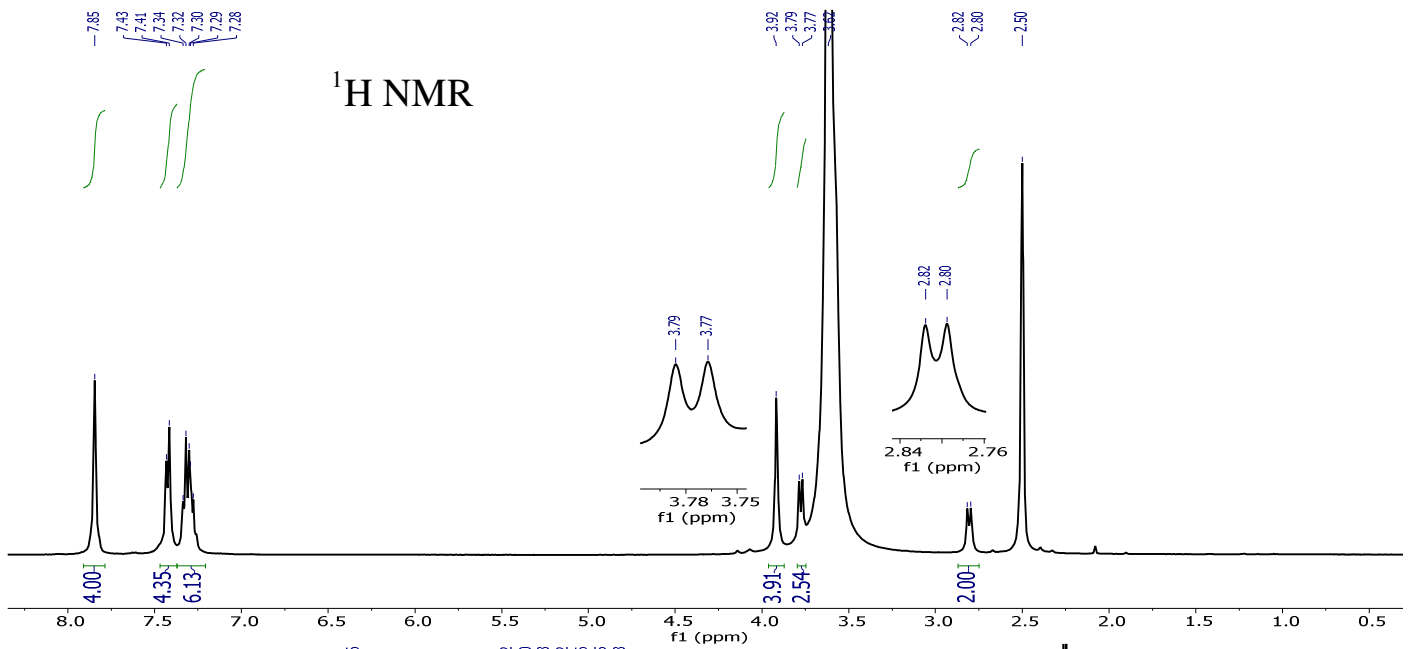


$^{13}\text{C}\{^1\text{H}\}$ NMR

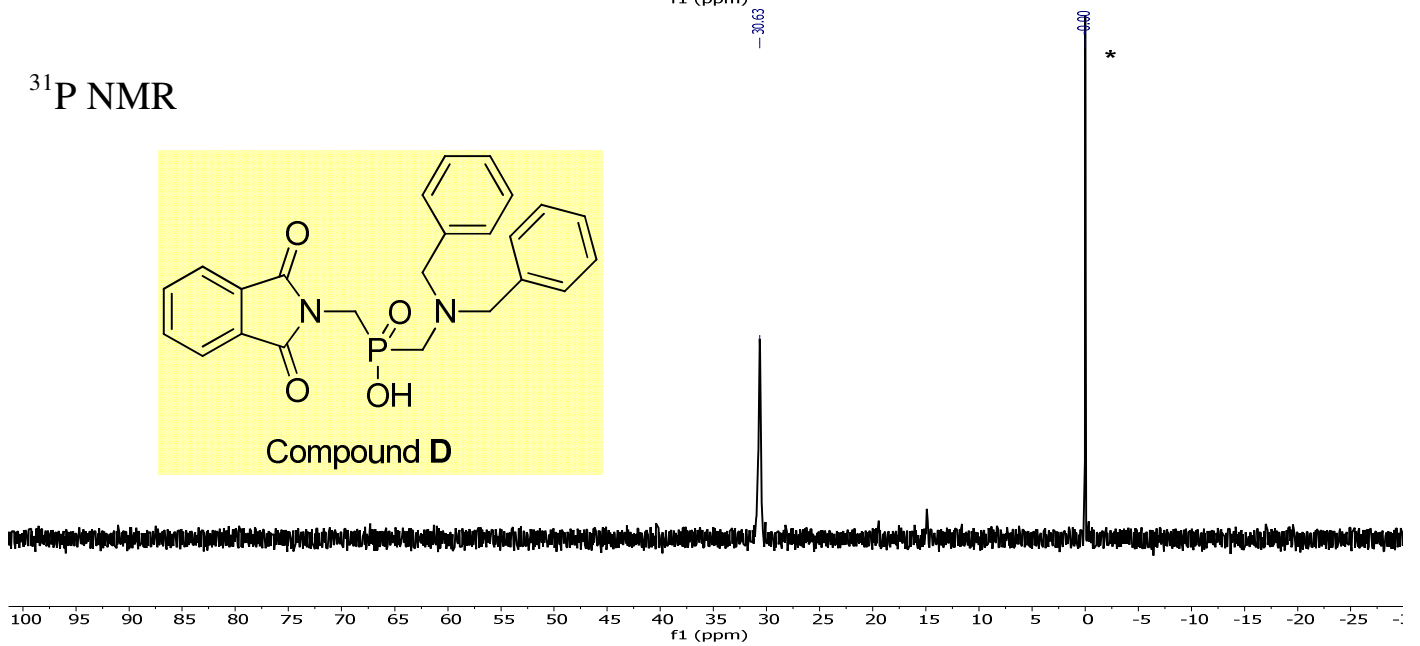
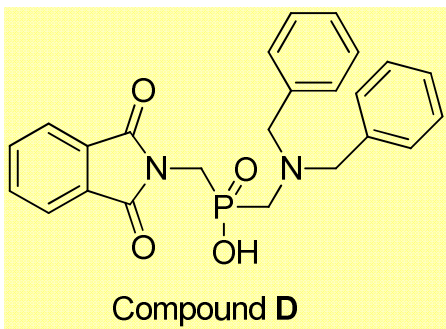


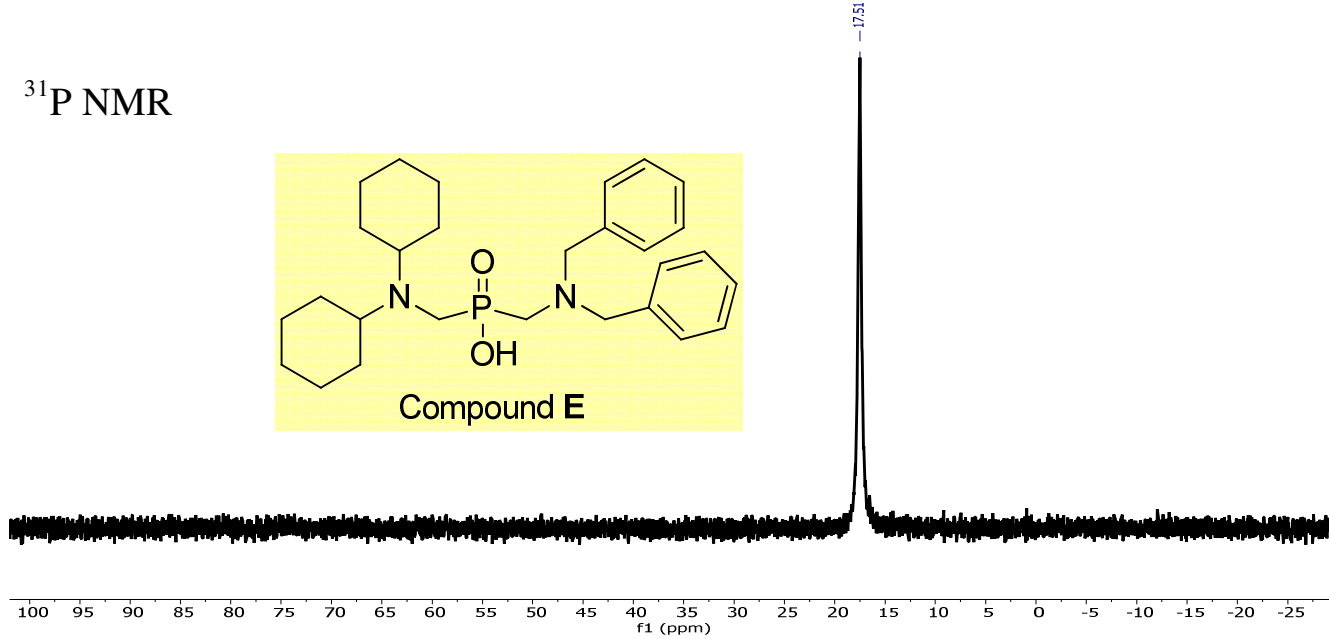
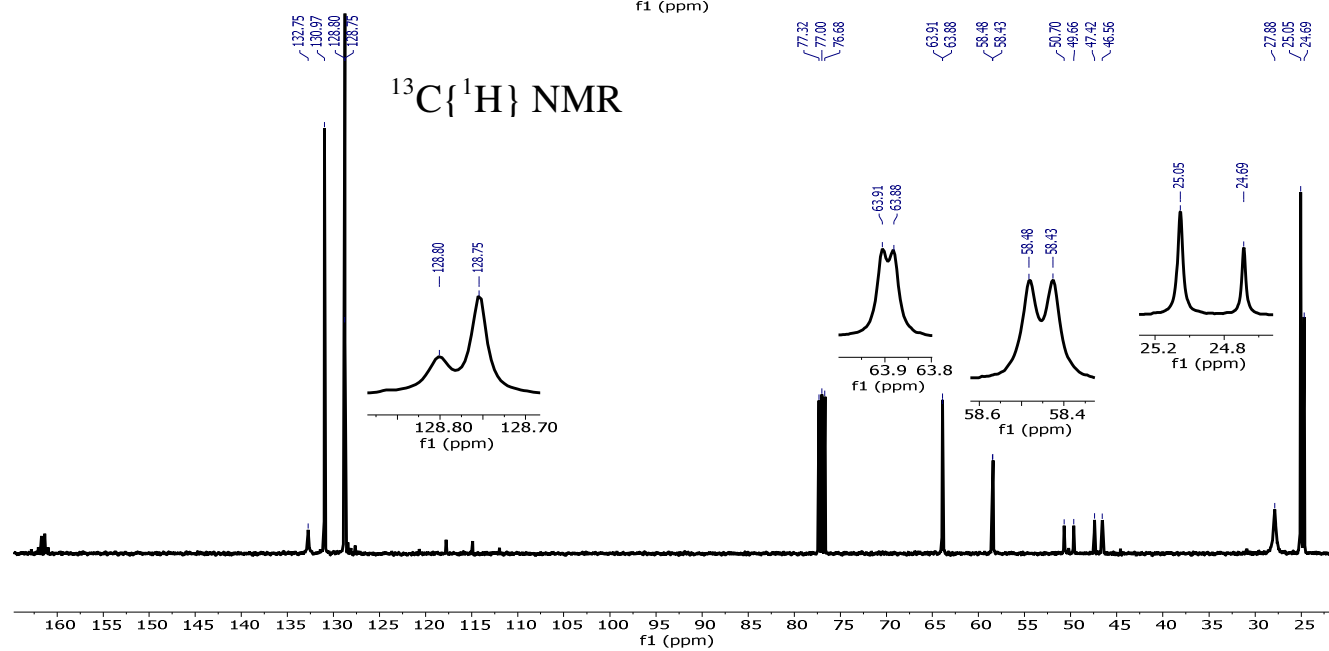
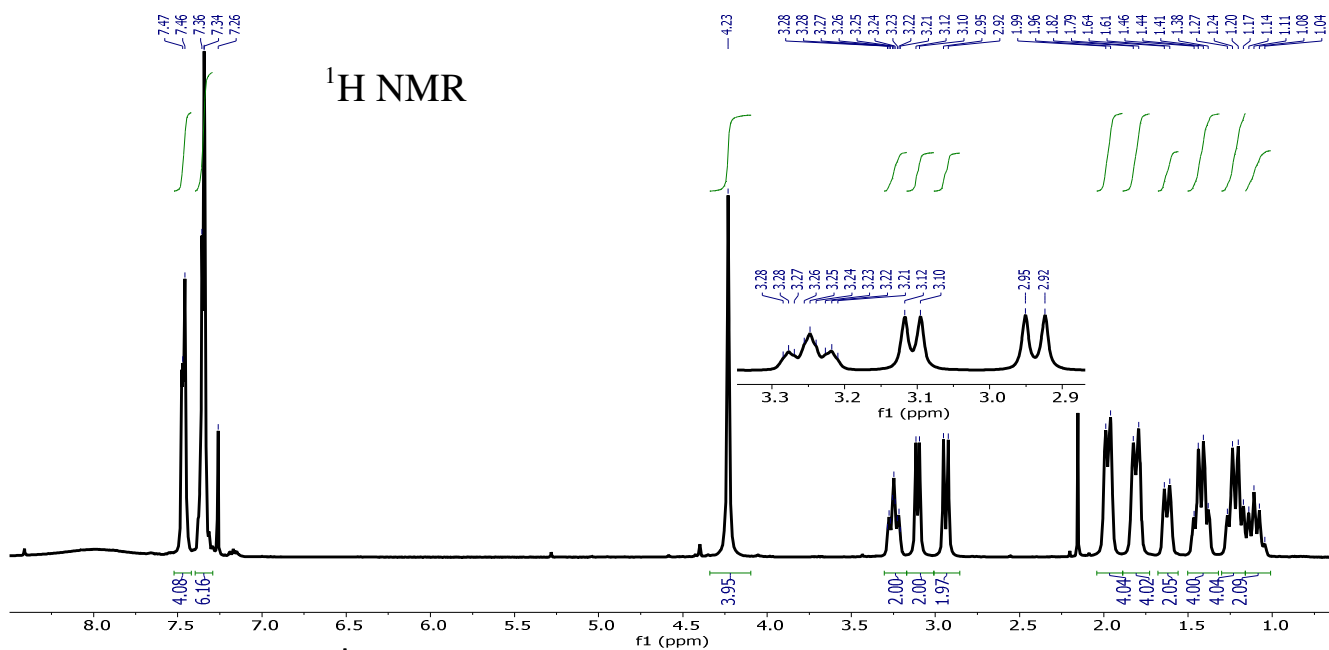
^{31}P NMR

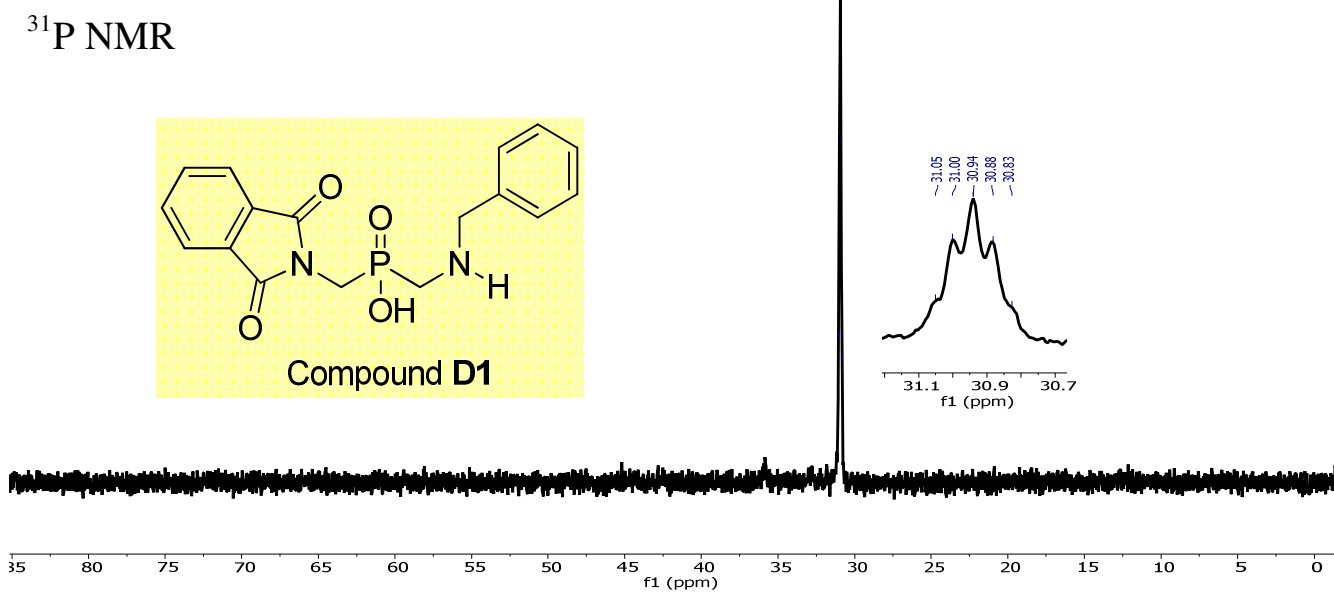
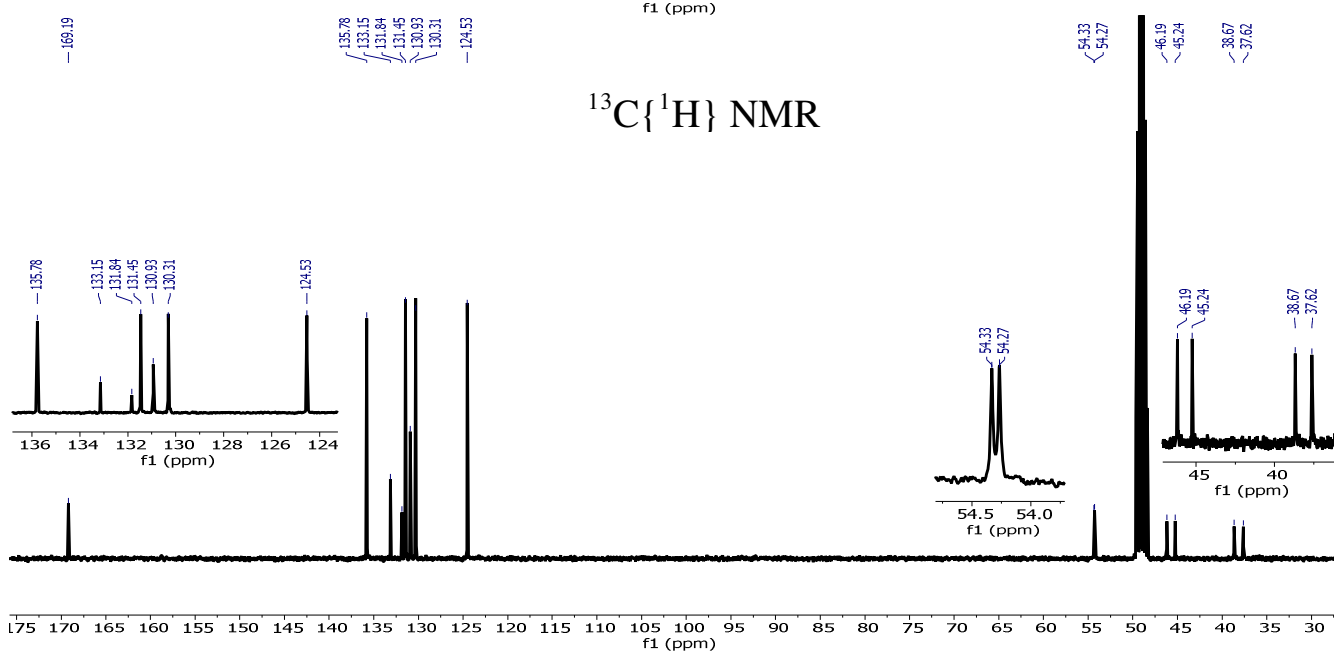
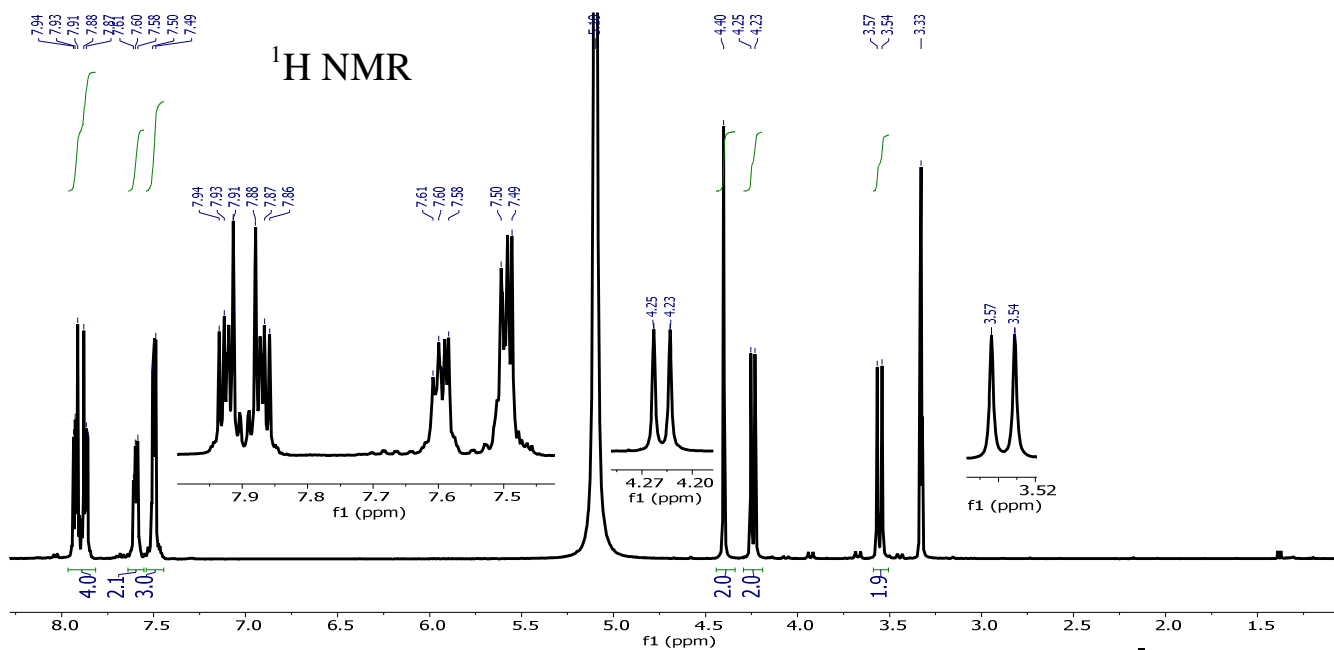


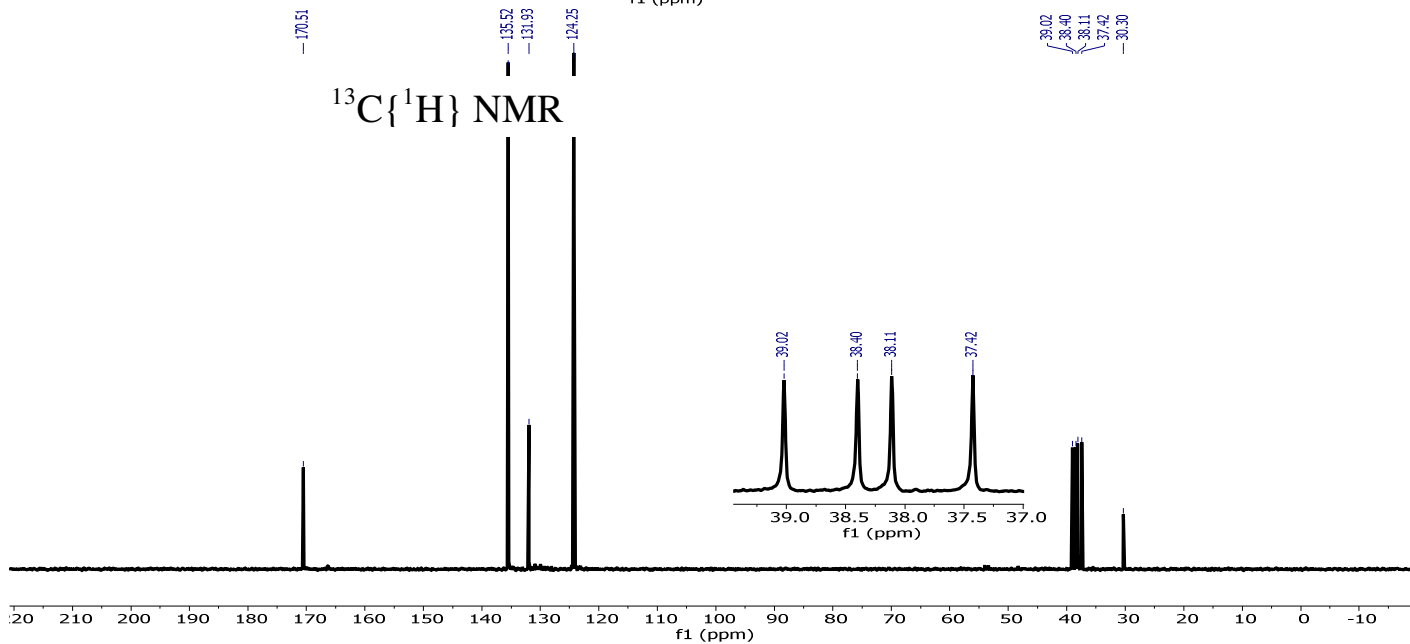
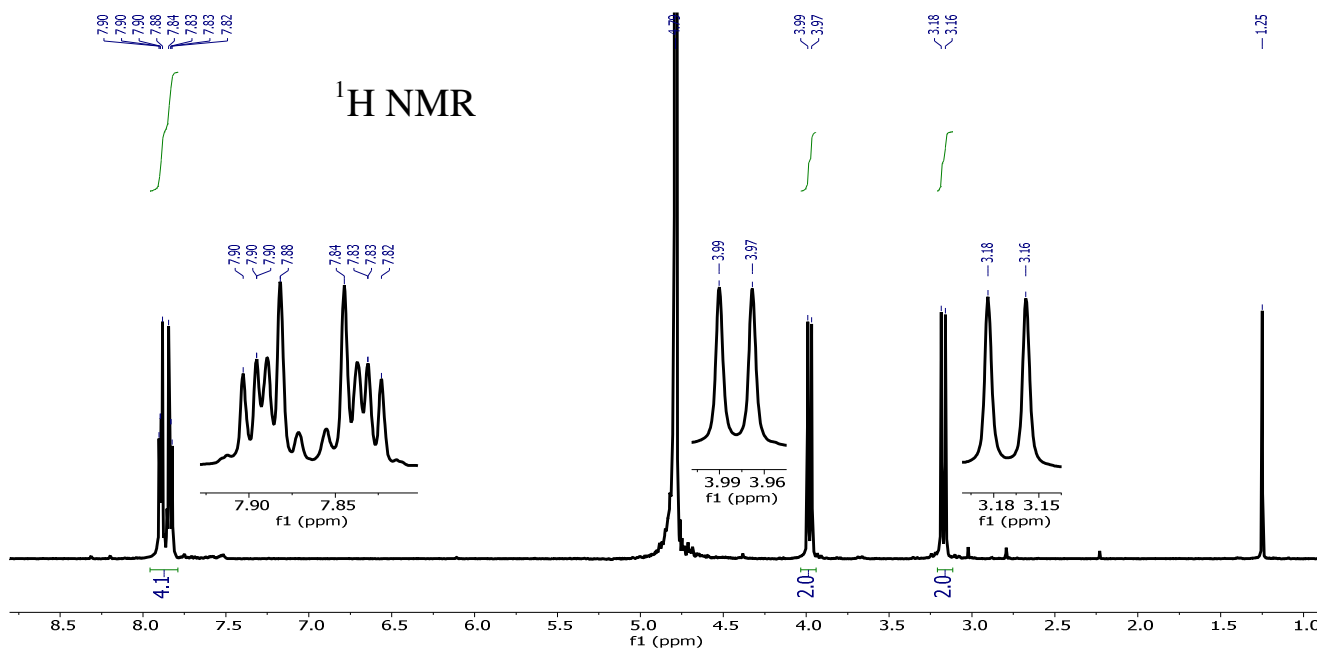


³¹P NMR









³¹P NMR

