

Supporting Information

Silver-catalyzed synthesis of 2-Arylvinylphosphonates by cross-coupling of β -nitrostyrenes with *H*-phosphites

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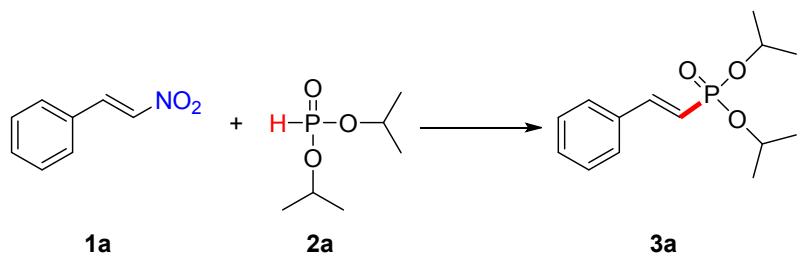
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Contents

1. Screening the reaction conditions
2. Copies of spectra of products

1. Screening the reaction conditions



(1) Screening the molar ratio of reaction substrates^a

Entr y	The molar ratio of 1a and 2a	Yields (%) ^b
1	2:1	28
2	1.5:1	36
3	1:1	48
4	1:1.5	56
5	1:2	55

^a Reaction conditions: (E)-β-nitrostyrene **1a** (0.3 mmol, 44.7 mg), diisopropyl *H*-phosphite **2a**, AgNO₃ (0.1 eq) as the catalyst in CH₃CN (3.0 mL) at 90 °C for 20 min.

^b Isolated yield.

2. Copies of spectra of products

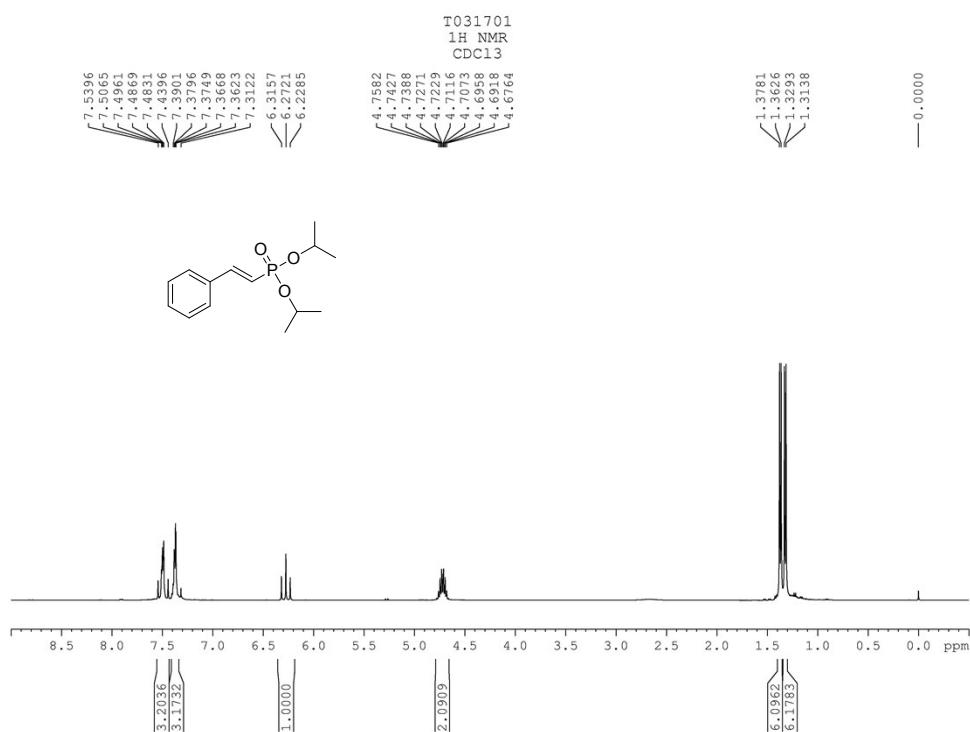


Fig. 1 ¹H NMR spectrum of compound 3a

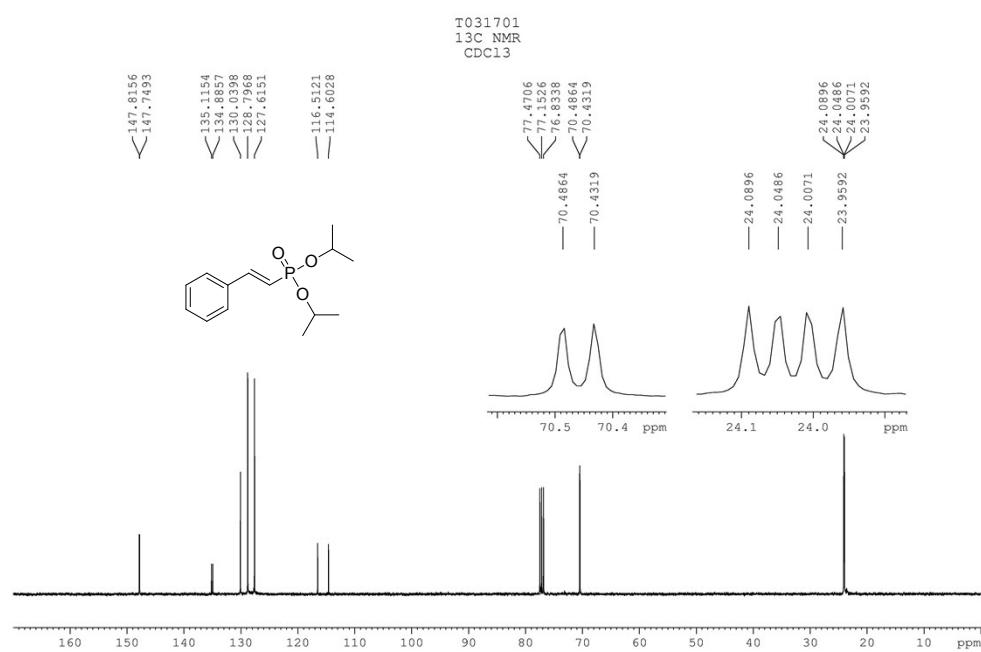


Fig. 2 ¹³C NMR spectrum of compound 3a

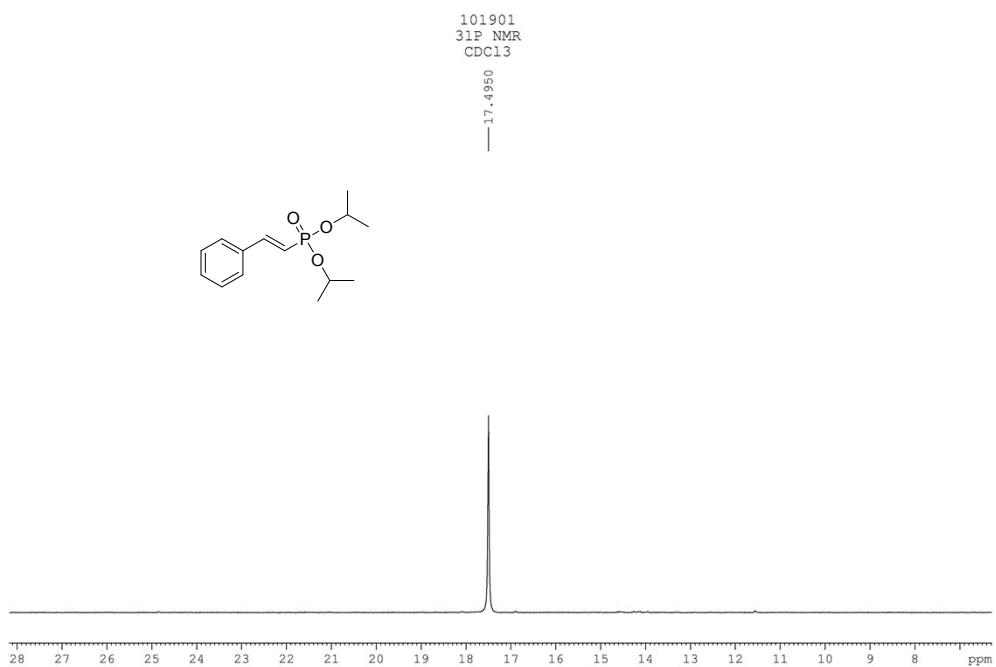


Fig. 3 ^{31}P NMR spectrum of compound **3a**

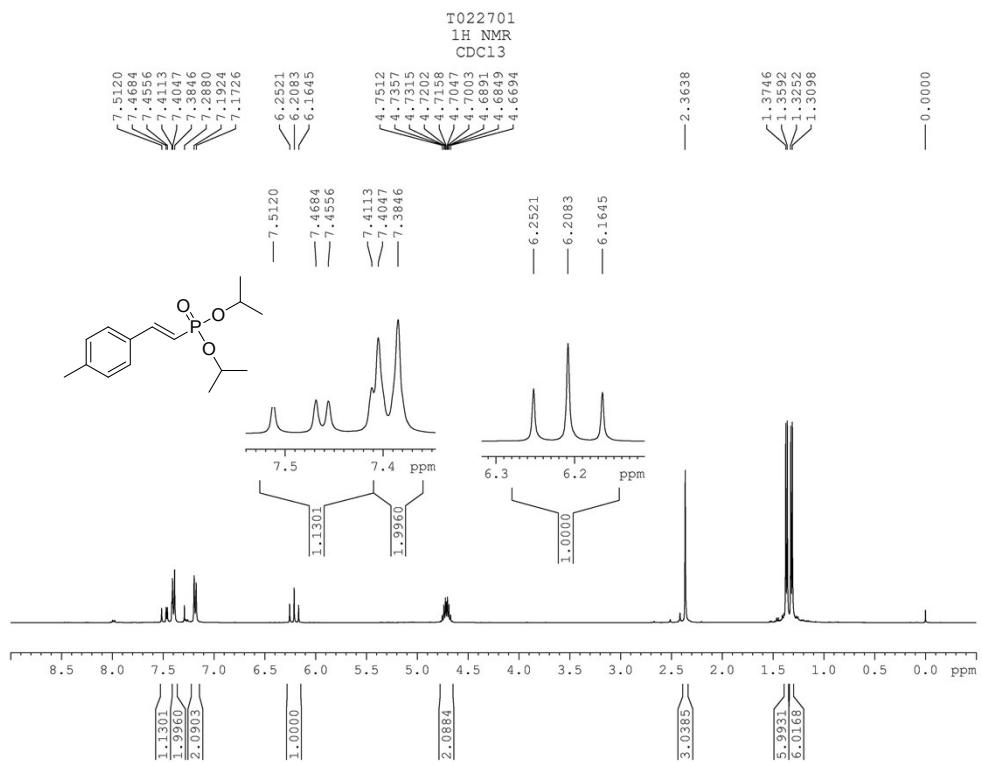


Fig. 4 ^1H NMR spectrum of compound **3b**

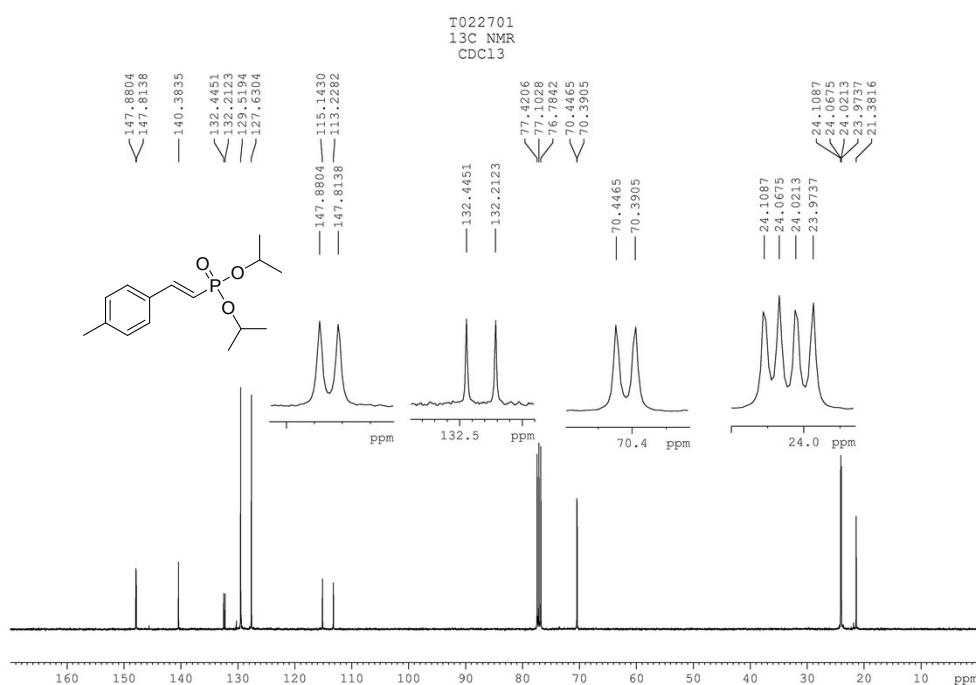


Fig. 5 ^{13}C NMR spectrum of compound **3b**

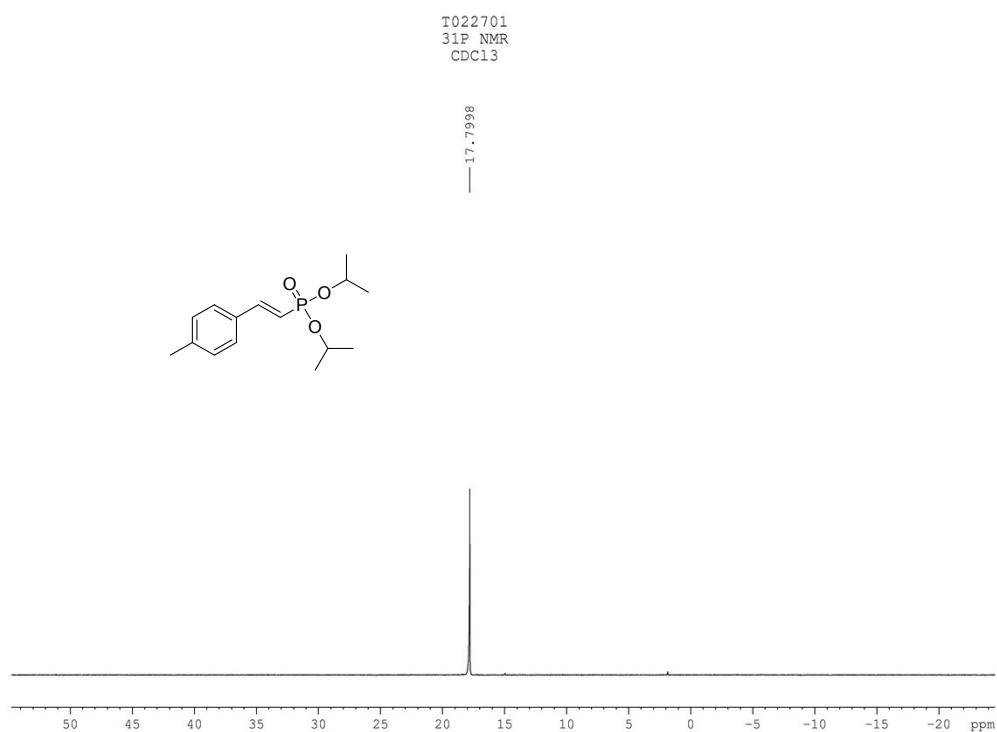


Fig. 6 ^{31}P NMR spectrum of compound **3b**

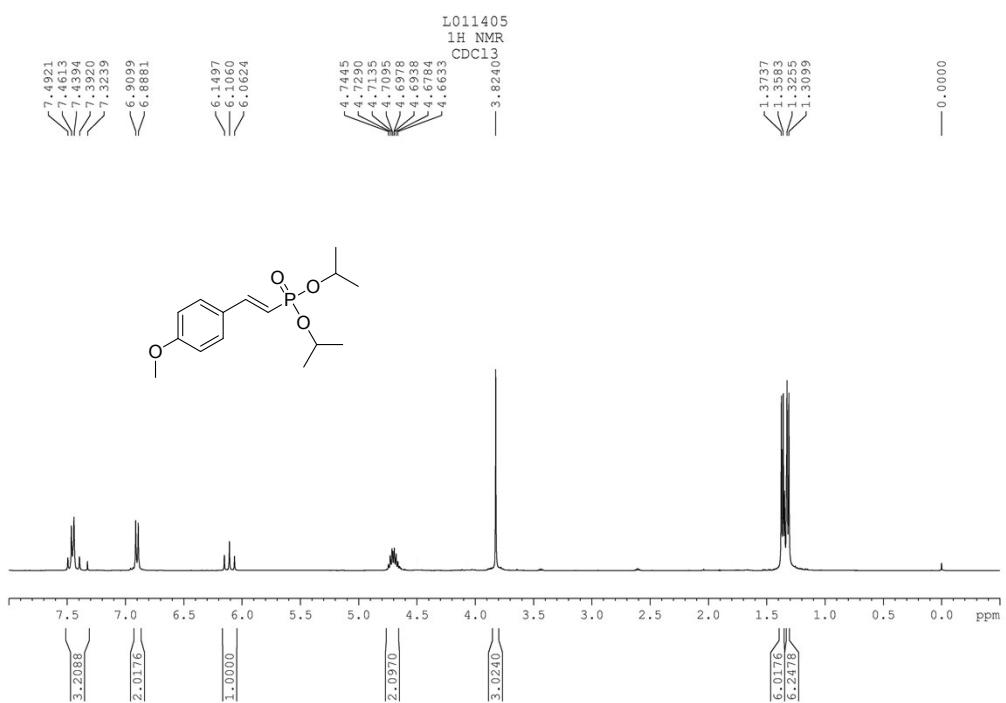


Fig. 7 ¹H NMR spectrum of compound 3c

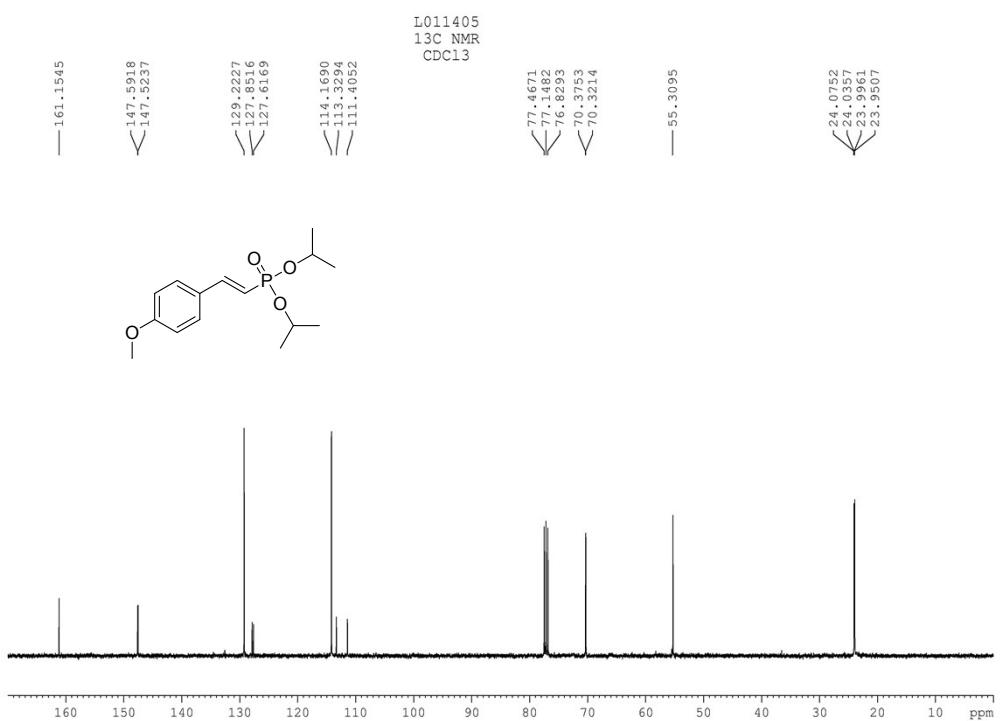


Fig. 8 ¹³C NMR spectrum of compound 3c

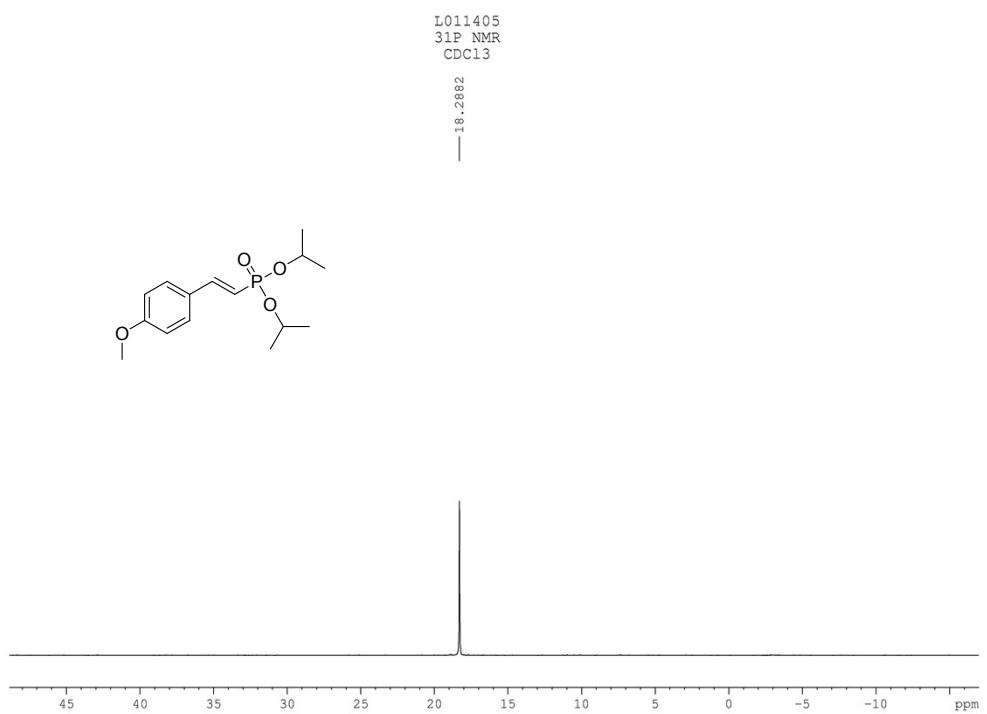


Fig. 9 ^{31}P NMR spectrum of compound **3c**

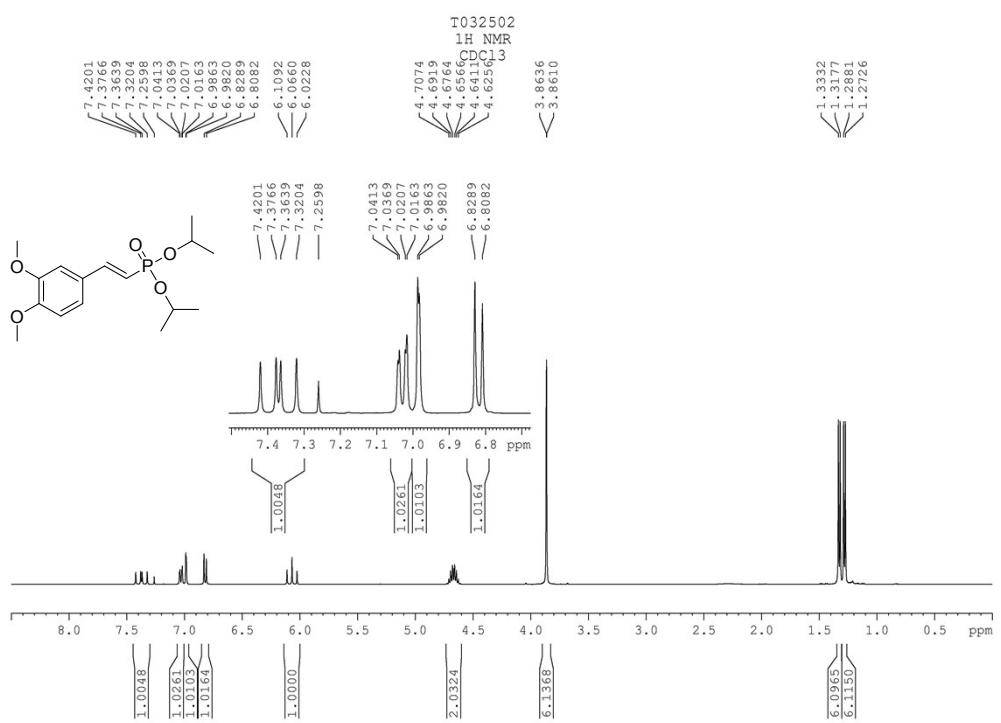


Fig. 10 ^1H NMR spectrum of compound **3d**

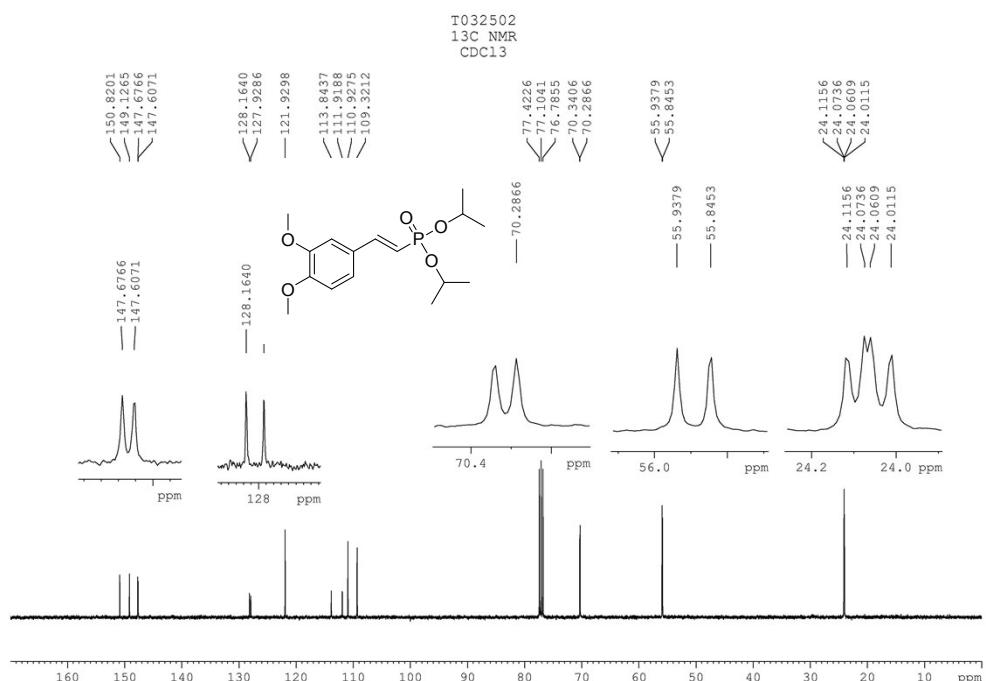


Fig. 11 ^{13}C NMR spectrum of compound 3d

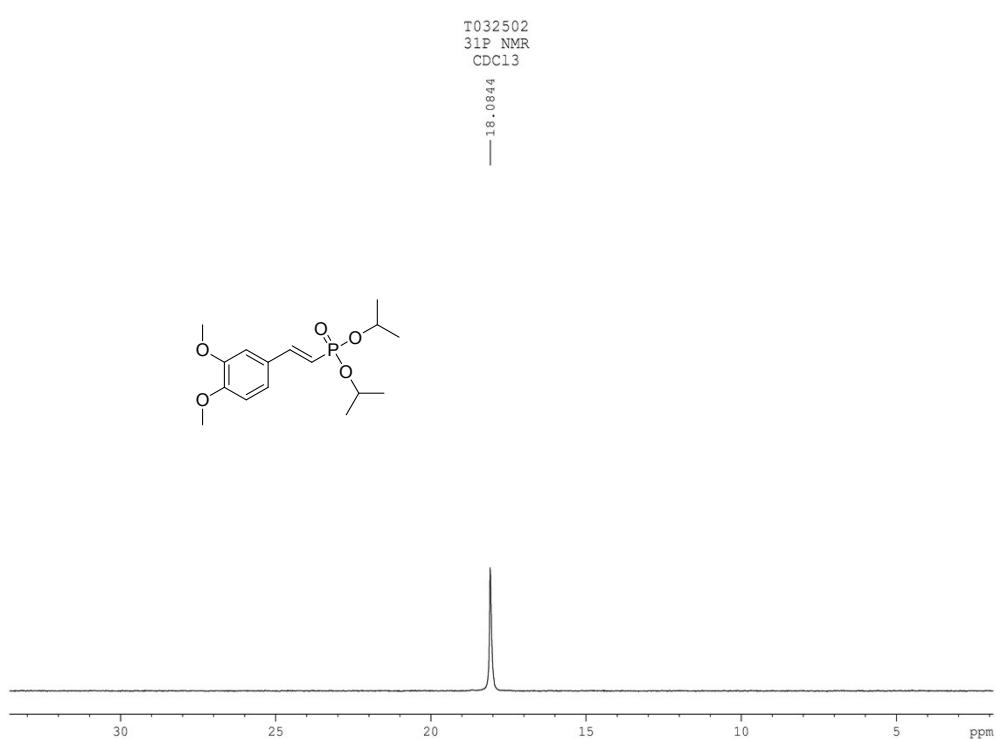


Fig. 12 ^{31}P NMR spectrum of compound 3d

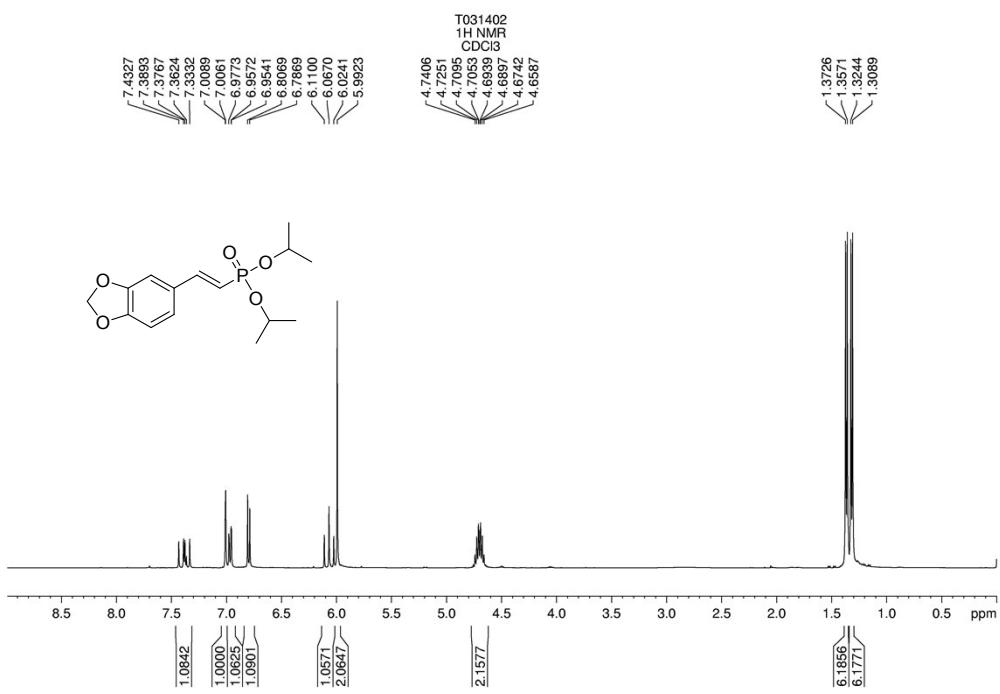


Fig. 13 ¹H NMR spectrum of compound 3e

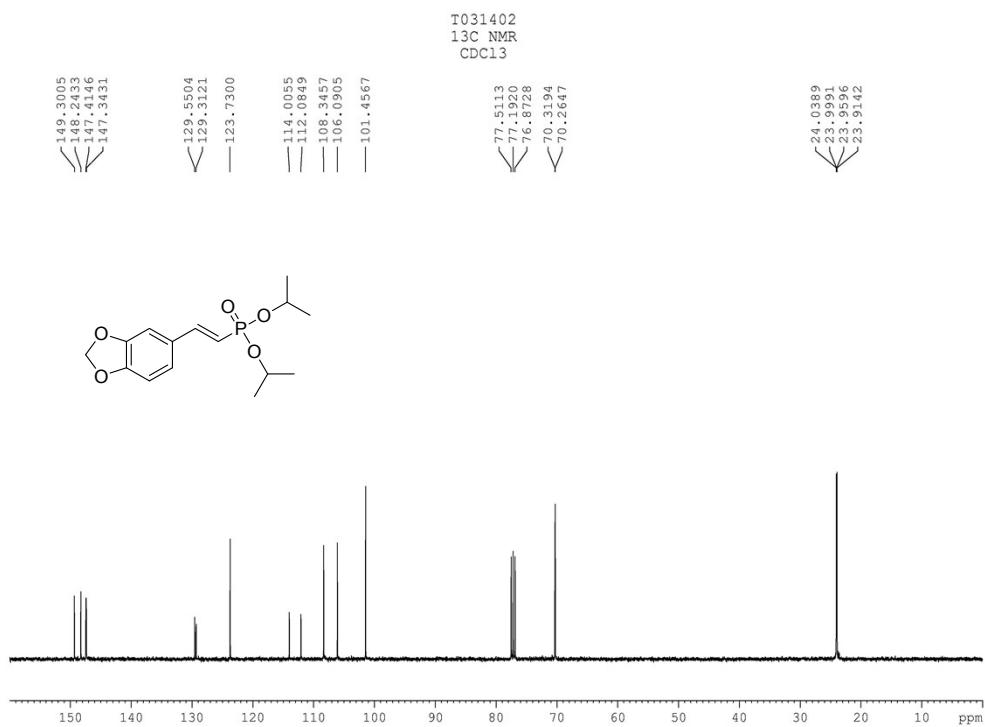


Fig. 14 ¹³C NMR spectrum of compound 3e

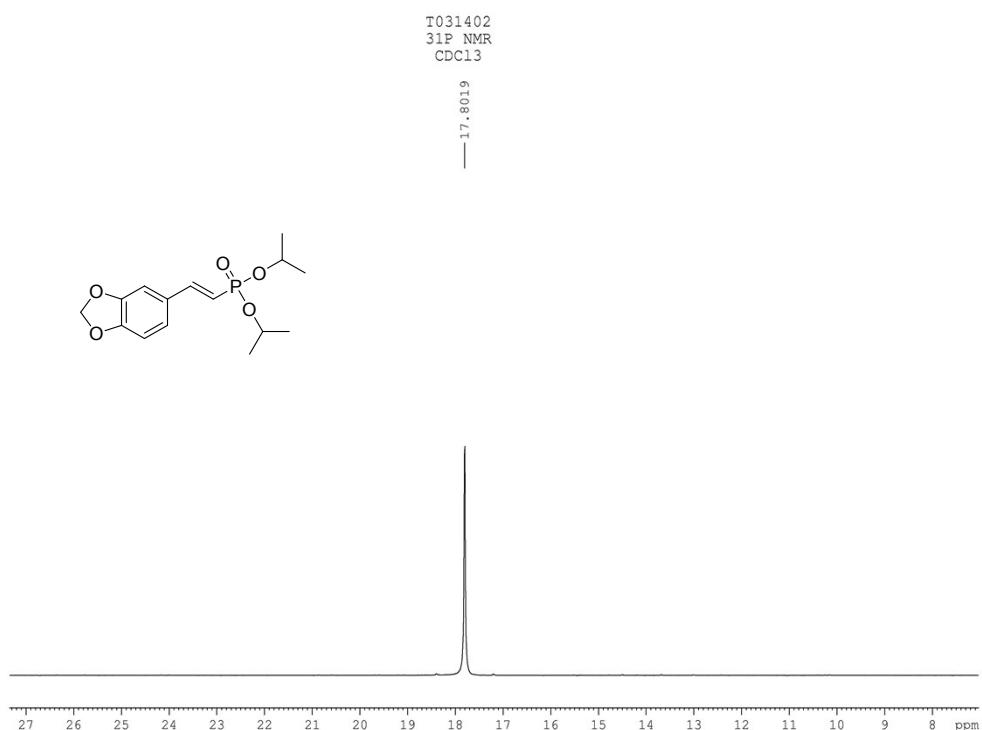


Fig. 15 ³¹P NMR spectrum of compound **3e**

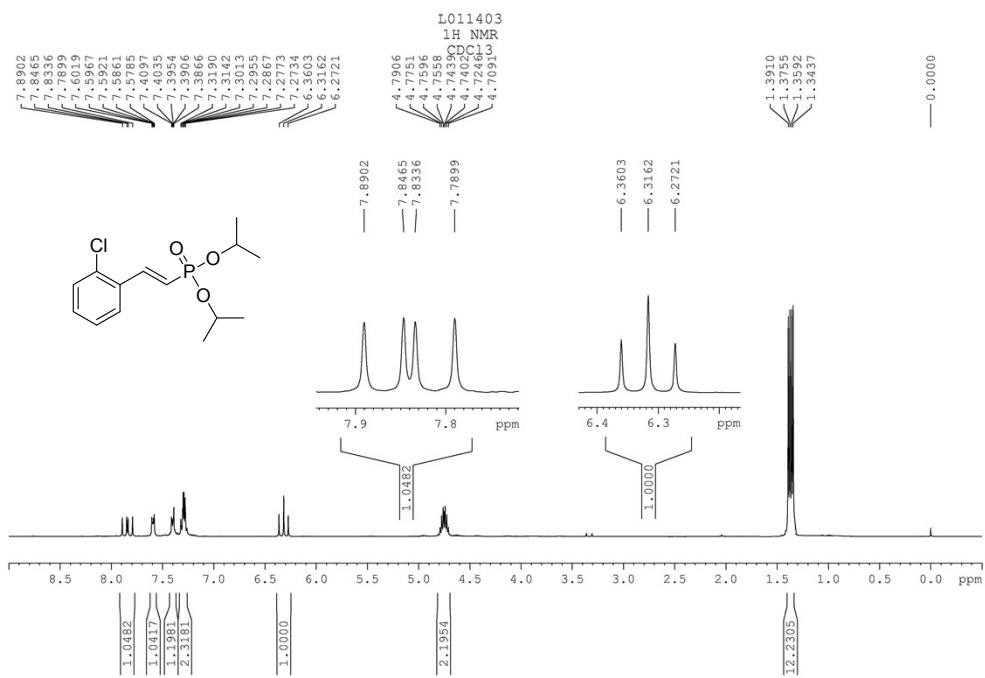


Fig. 16 ¹H NMR spectrum of compound **3f**

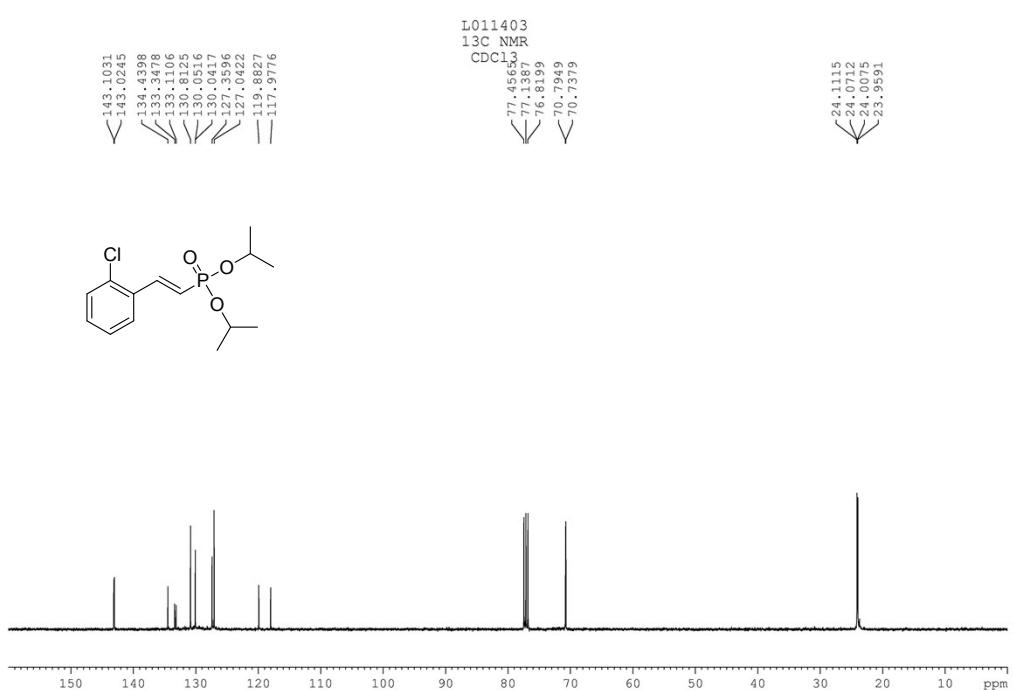


Fig. 17 ¹³C NMR spectrum of compound **3f**

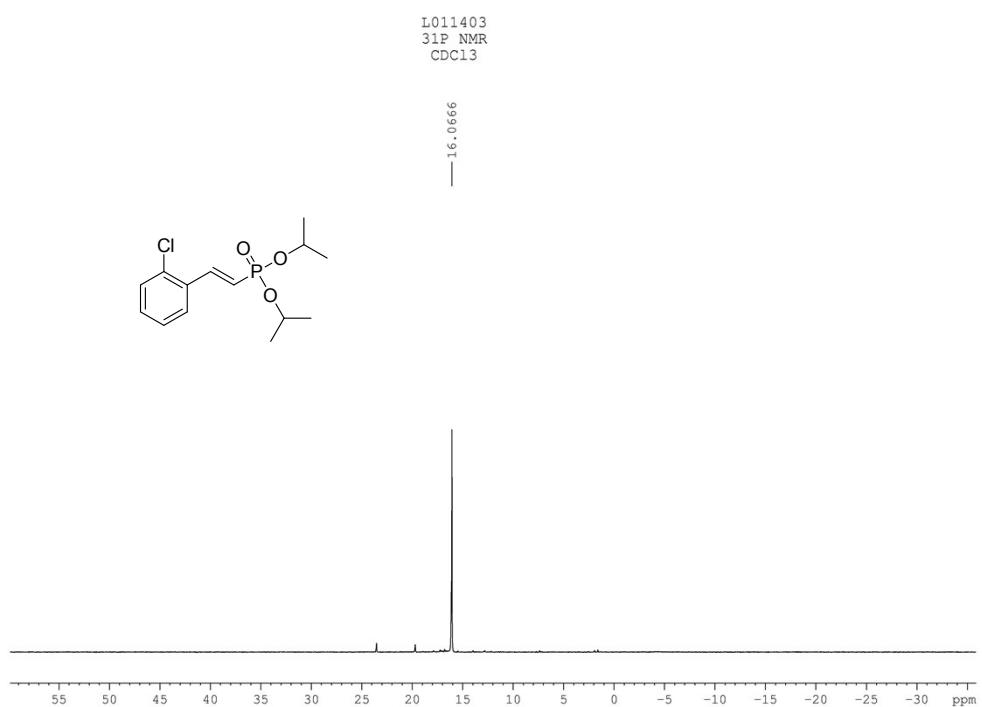


Fig. 18 ³¹P NMR spectrum of compound **3f**

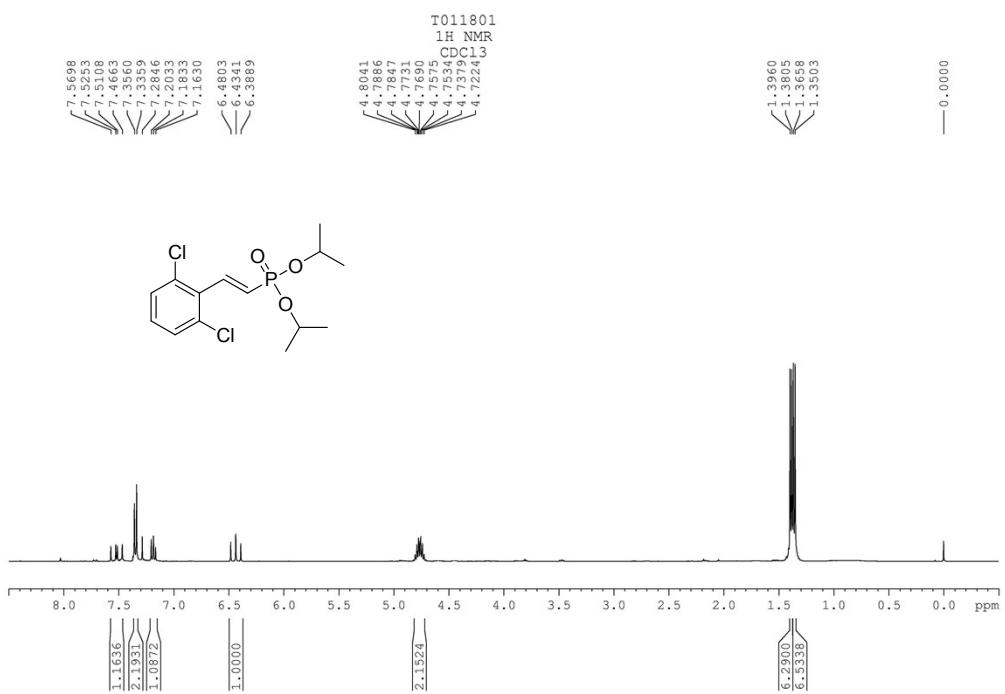


Fig. 19 ^1H NMR spectrum of compound **3g**

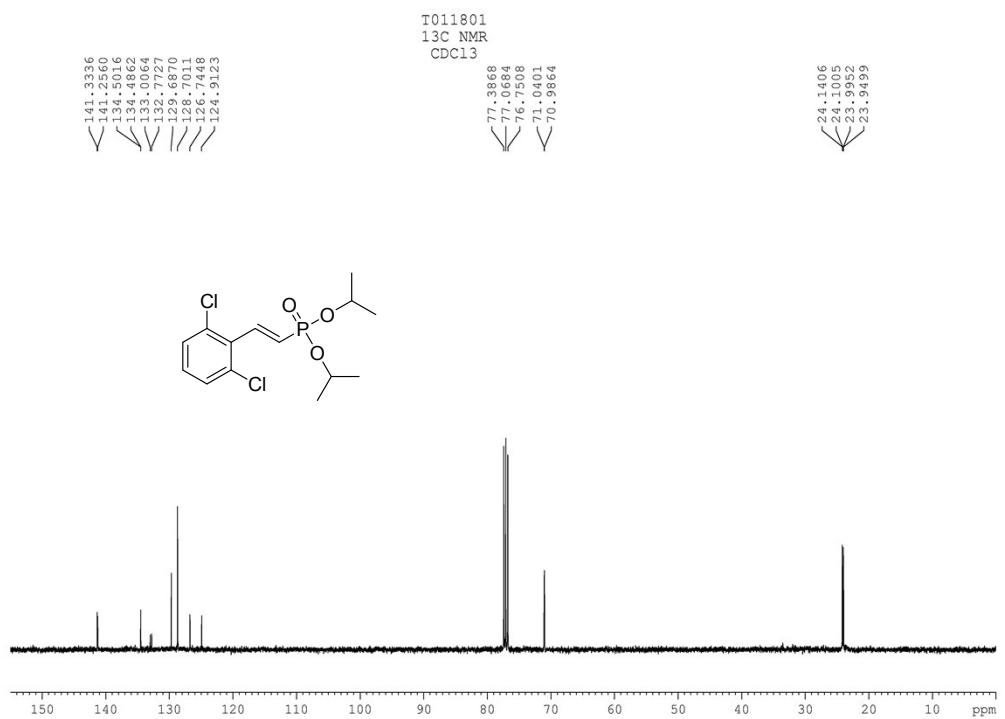


Fig. 20 ^{13}C NMR spectrum of compound **3g**

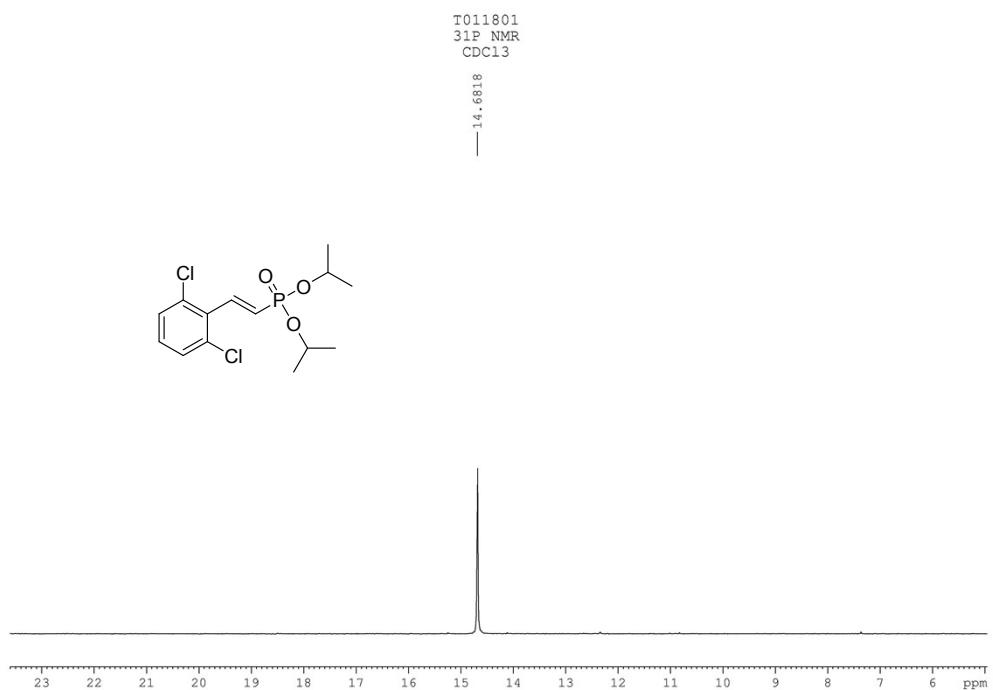


Fig. 21 ³¹P NMR spectrum of compound **3g**

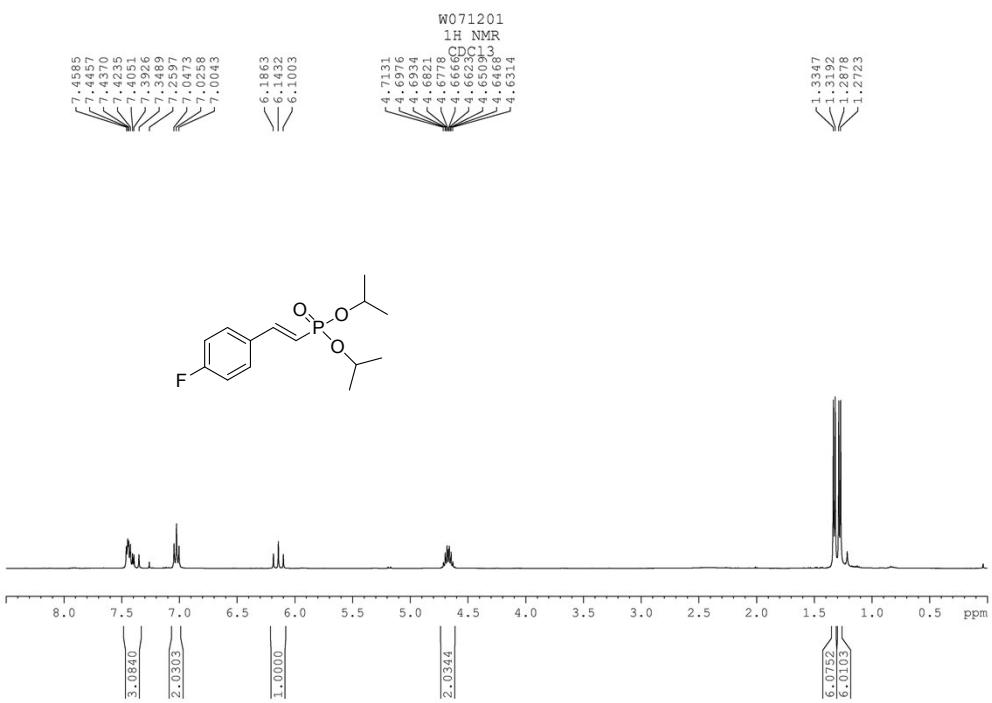


Fig. 22 ¹H NMR spectrum of compound **3h**

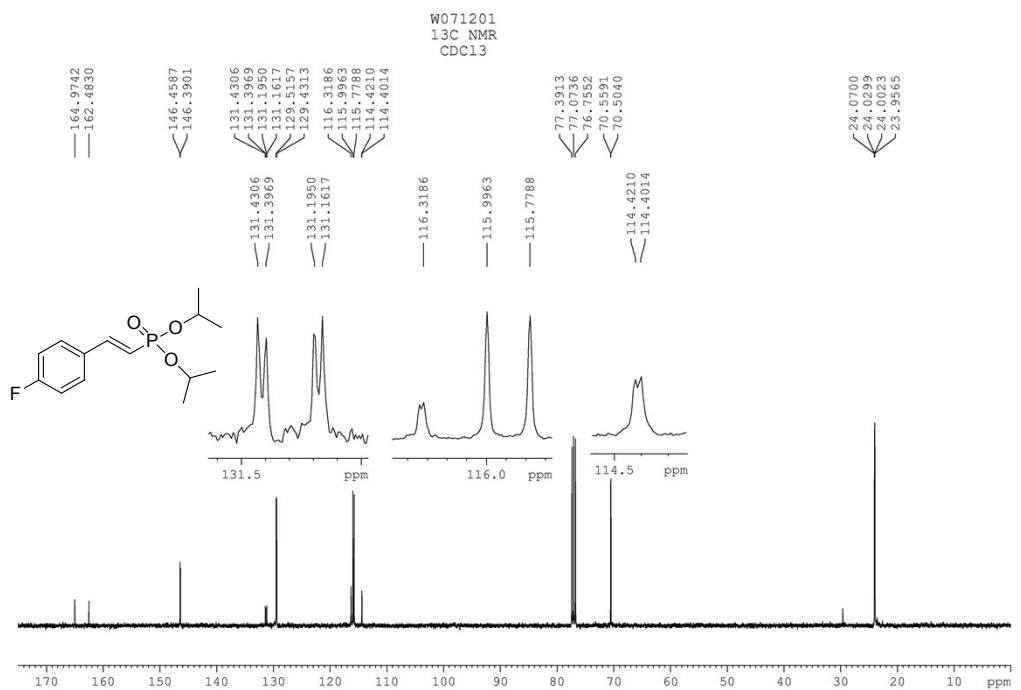


Fig. 23 ^{13}C NMR spectrum of compound **3h**

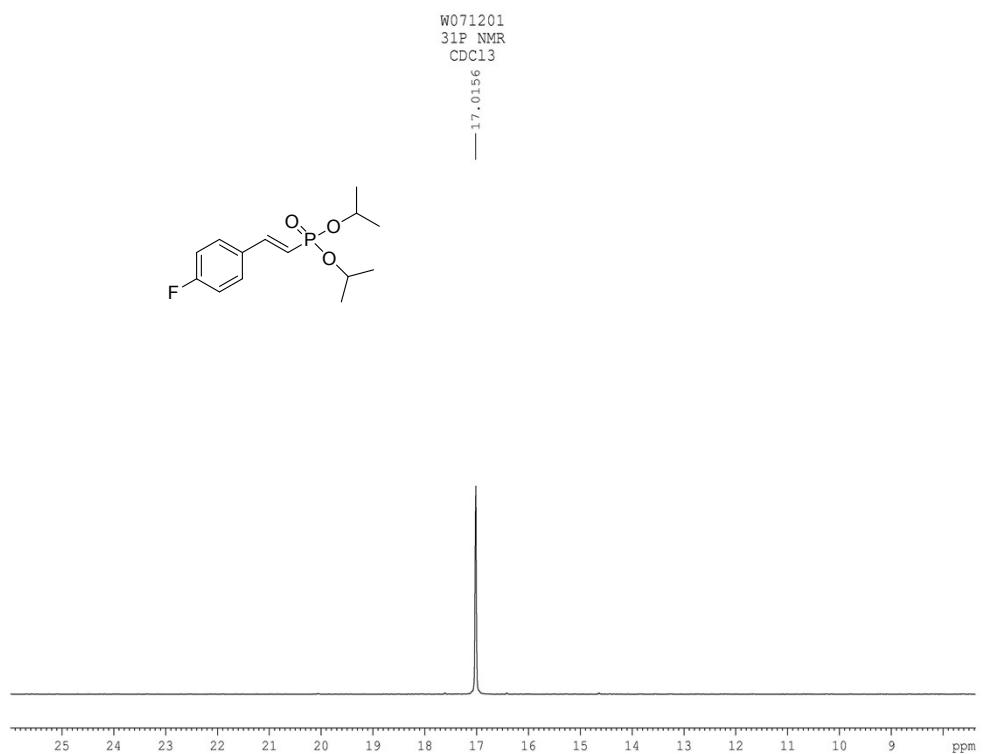


Fig. 24 ^{31}P NMR spectrum of compound **3h**

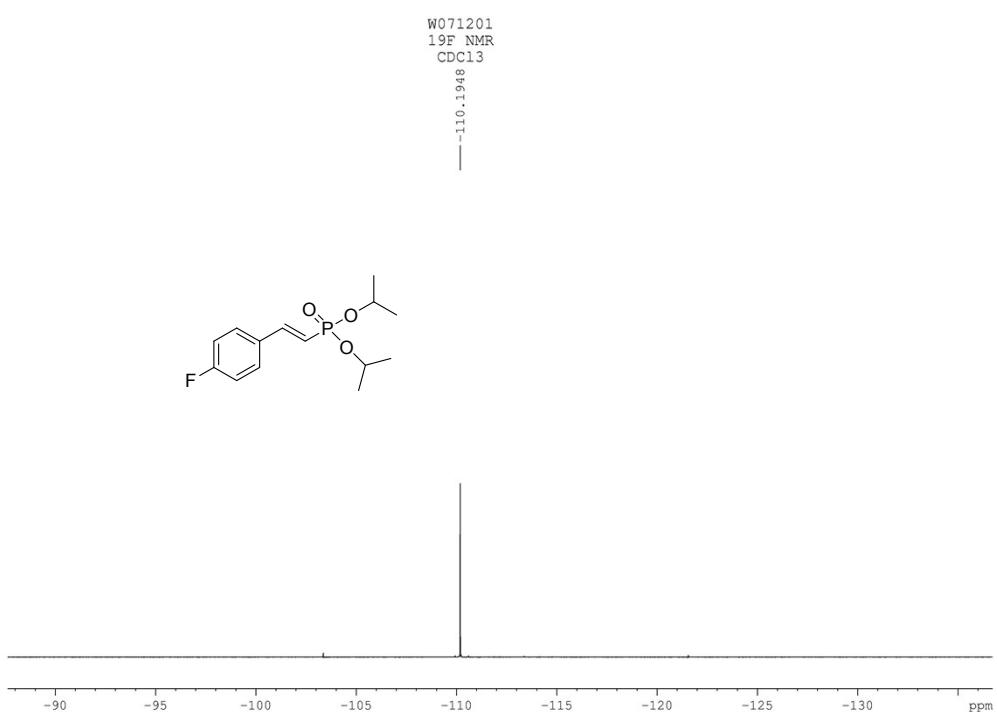


Fig. 25 ¹⁹F NMR spectrum of compound **3h**

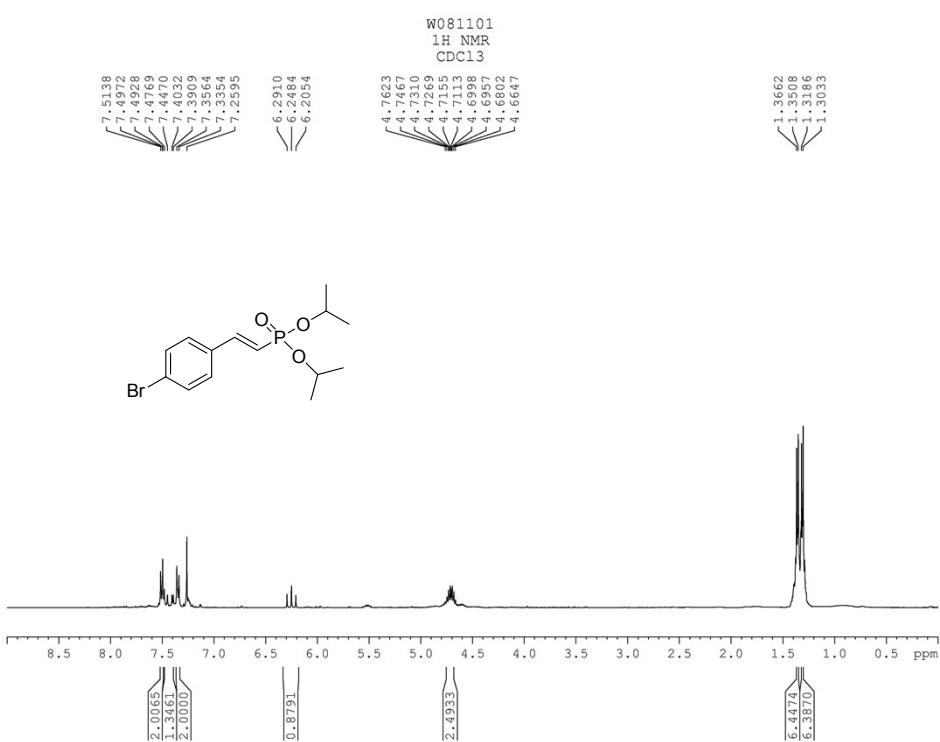


Fig. 26 ¹H NMR spectrum of compound **3i**

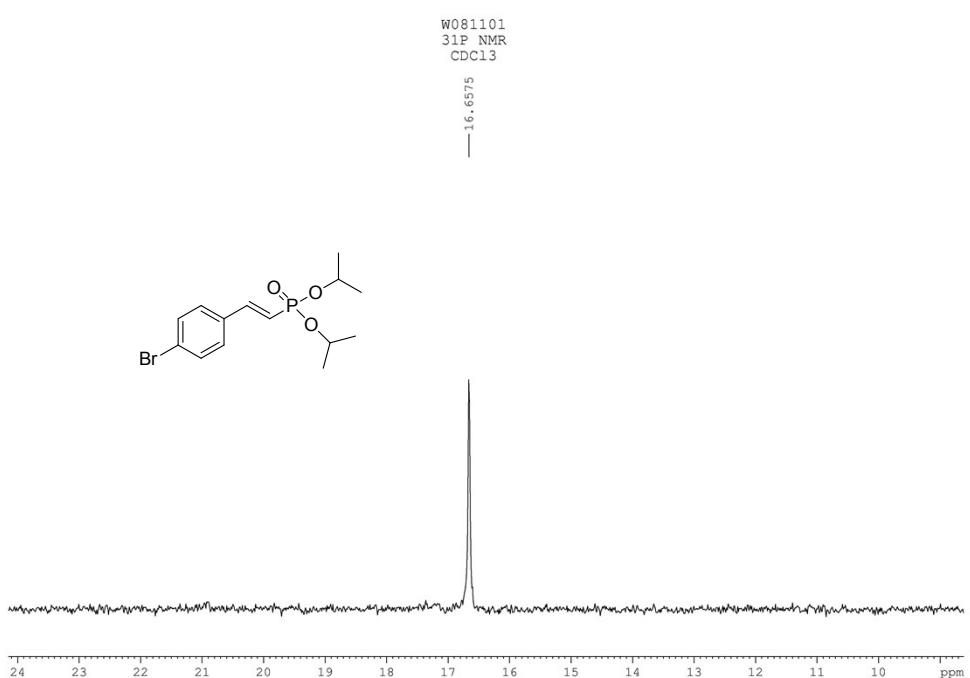


Fig. 27 ³¹P NMR spectrum of compound **3i**

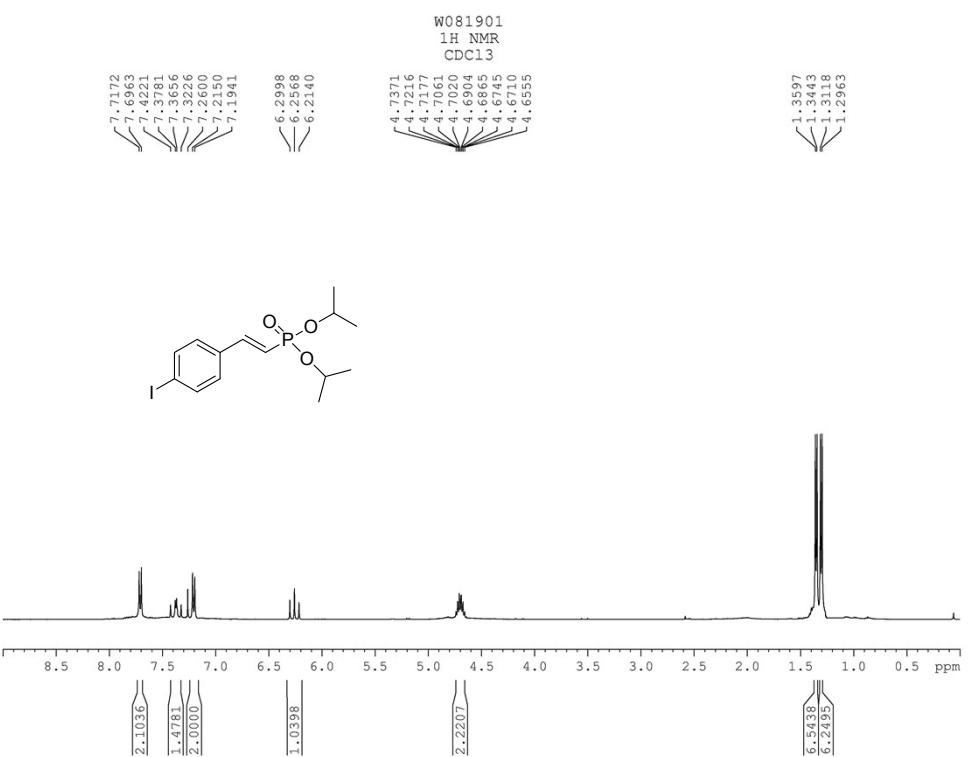


Fig. 28 ¹H NMR spectrum of compound **3j**

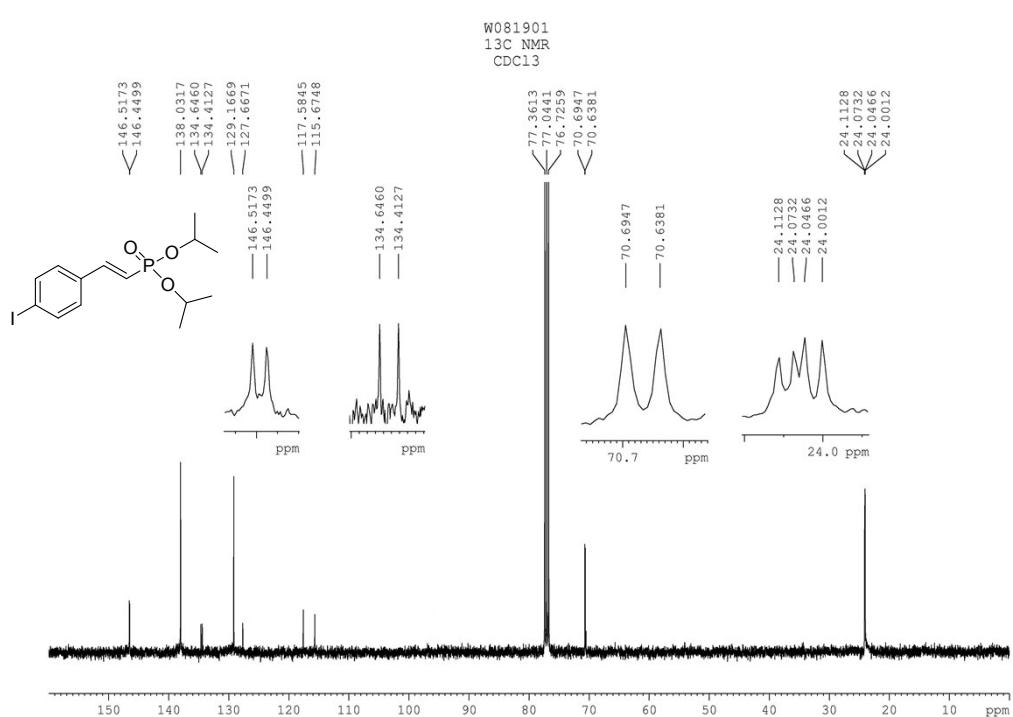


Fig. 29 ¹³C NMR spectrum of compound **3j**

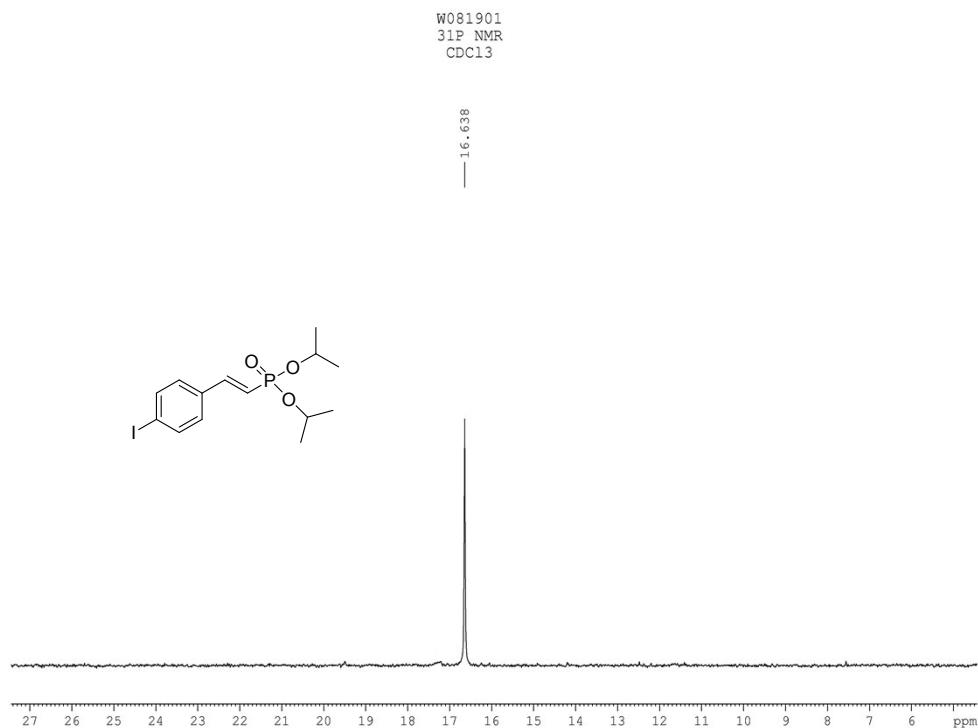


Fig. 30 ³¹P NMR spectrum of compound **3j**

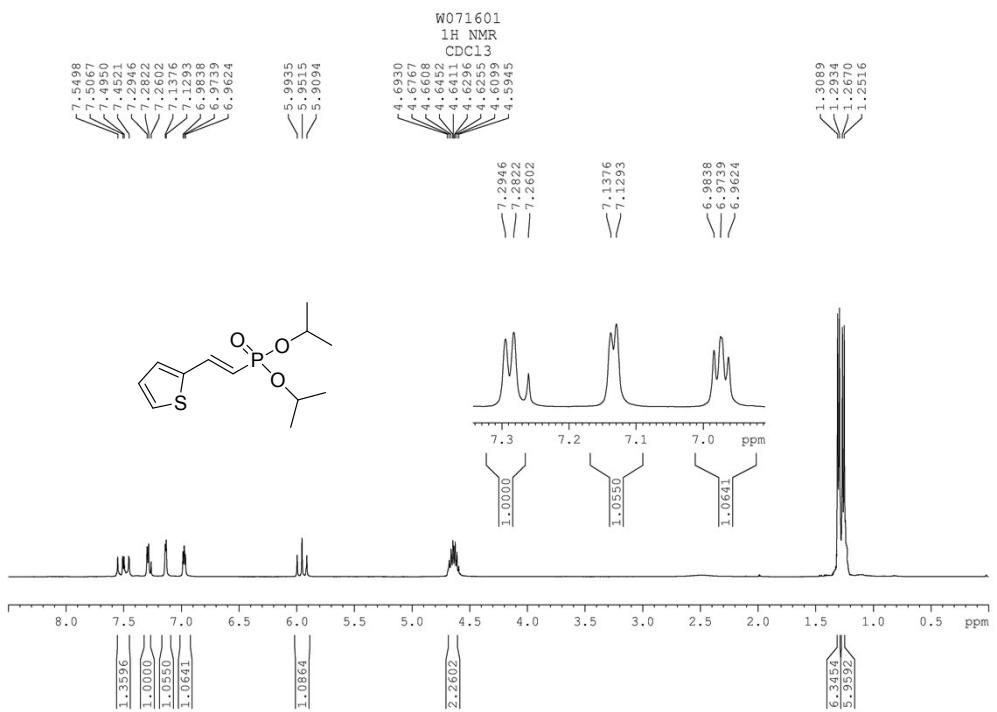


Fig. 31 ^1H NMR spectrum of compound **3k**

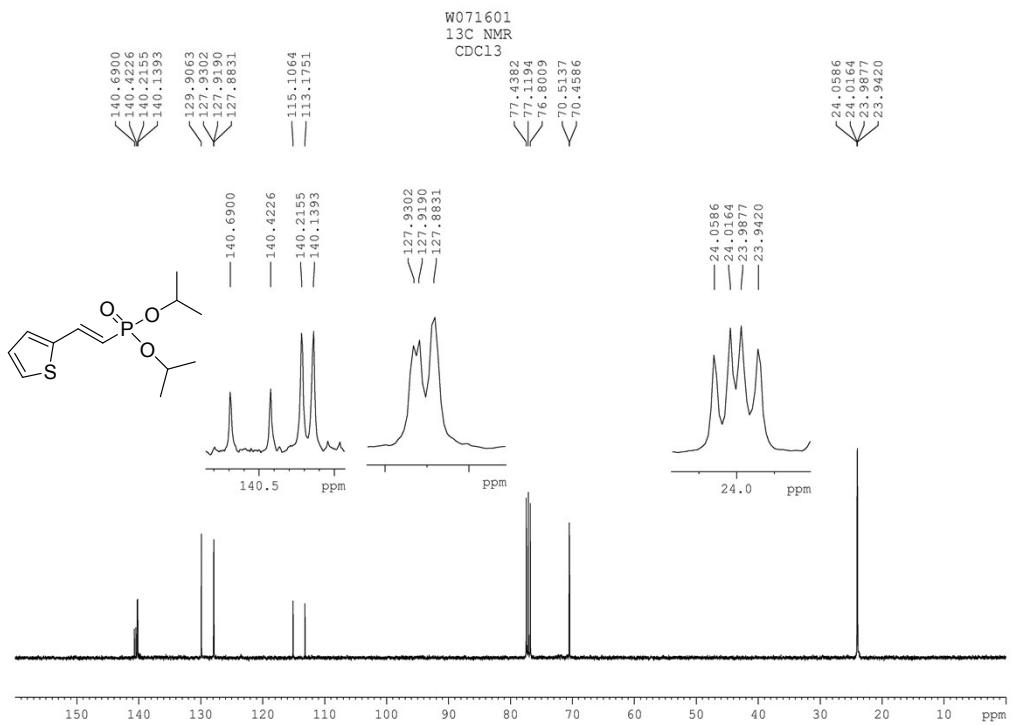


Fig. 32 ^{13}C NMR spectrum of compound **3k**

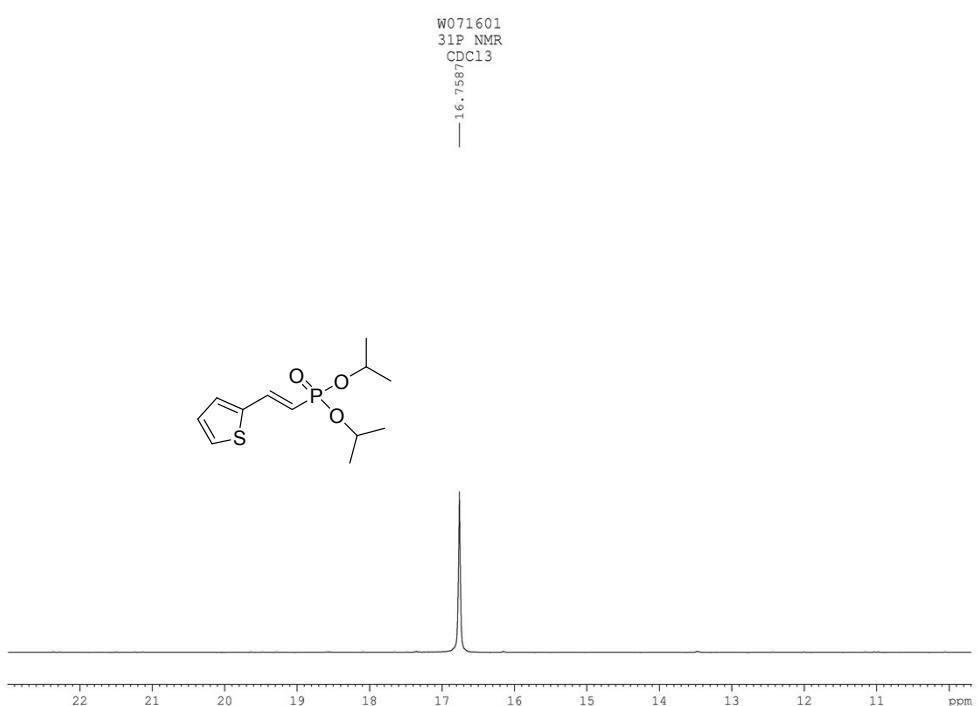


Fig. 33 ³¹P NMR spectrum of compound **3k**

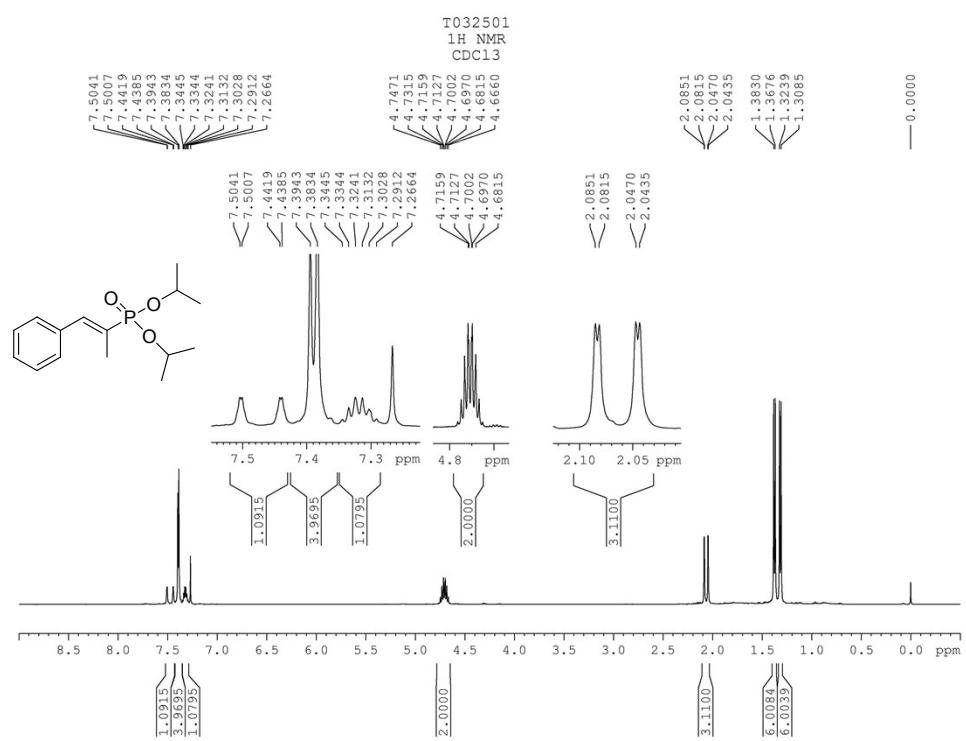


Fig. 34 ¹H NMR spectrum of compound **3l**

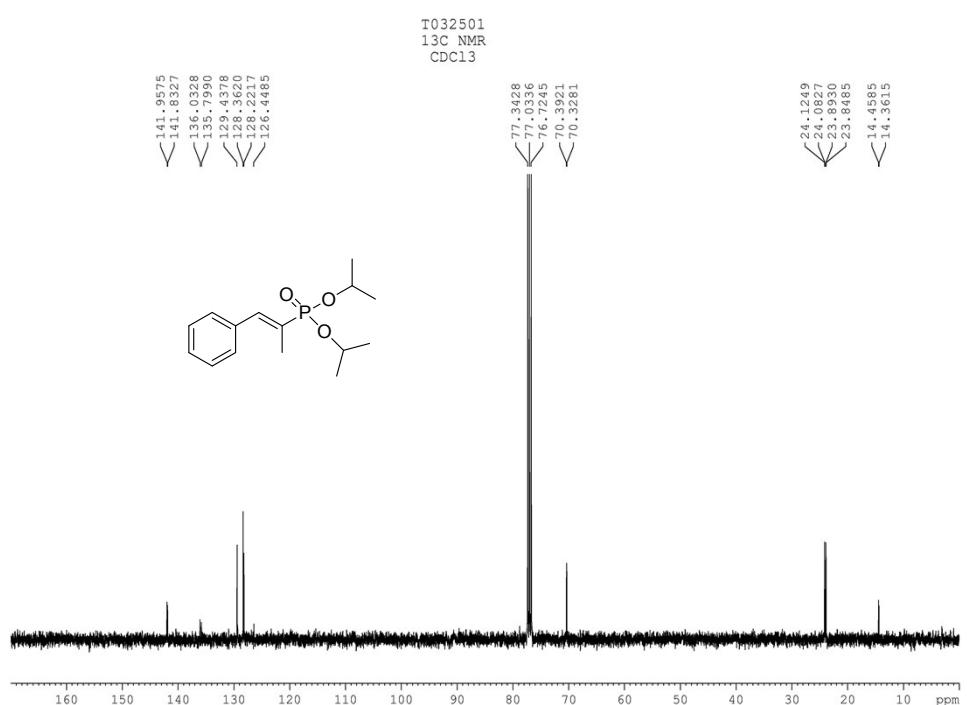


Fig. 35 ¹³C NMR spectrum of compound 3l

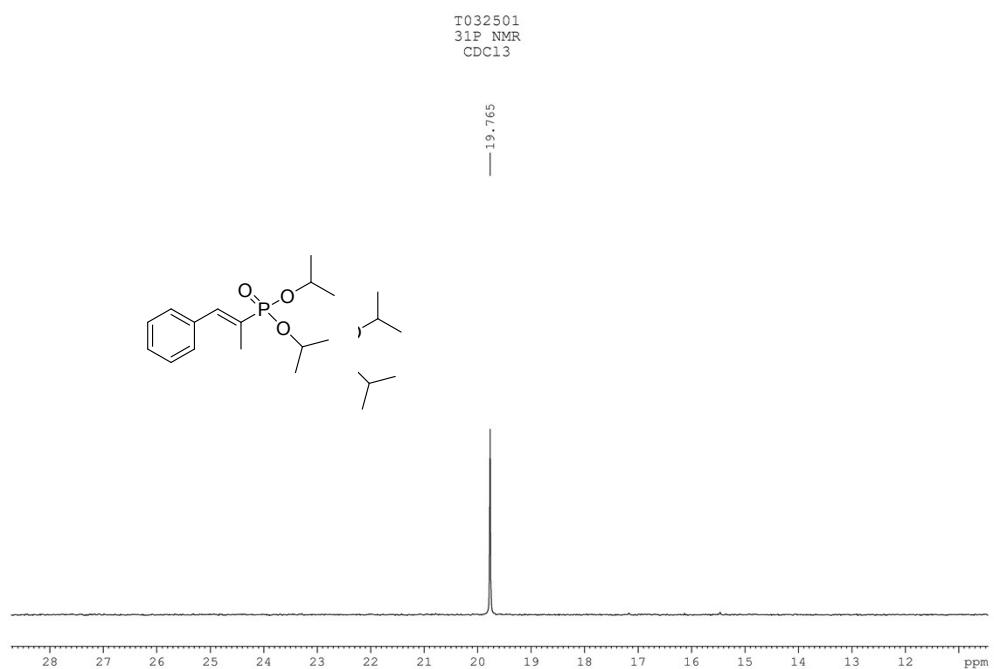


Fig. 36 ³¹P NMR spectrum of compound 3l

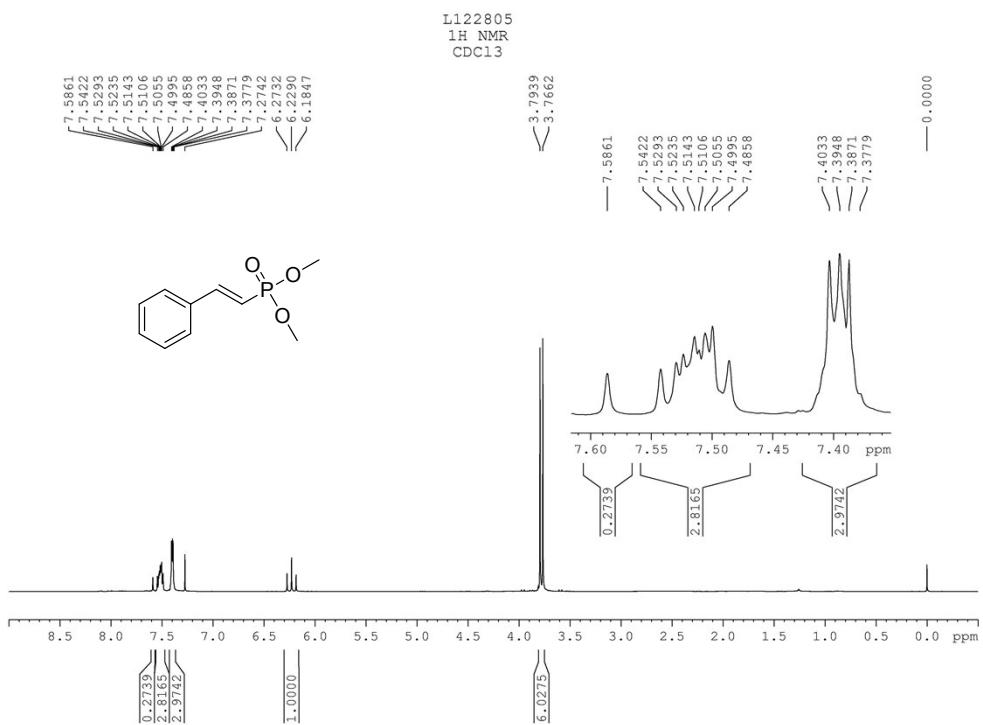


Fig. 37 ^1H NMR spectrum of compound **3m**

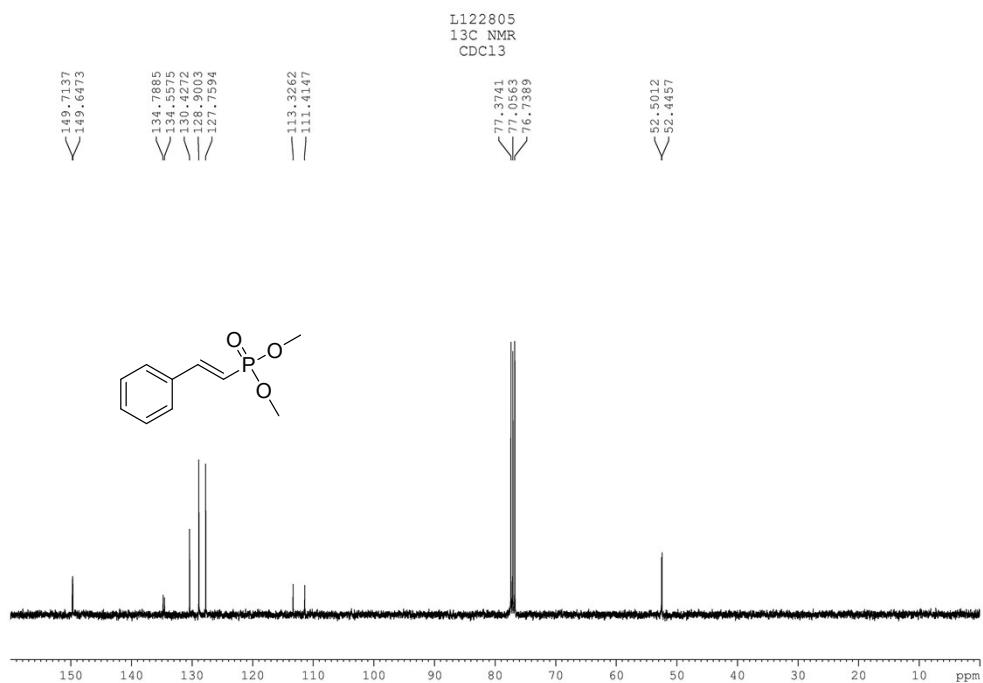


Fig. 38 ^{13}C NMR spectrum of compound **3m**

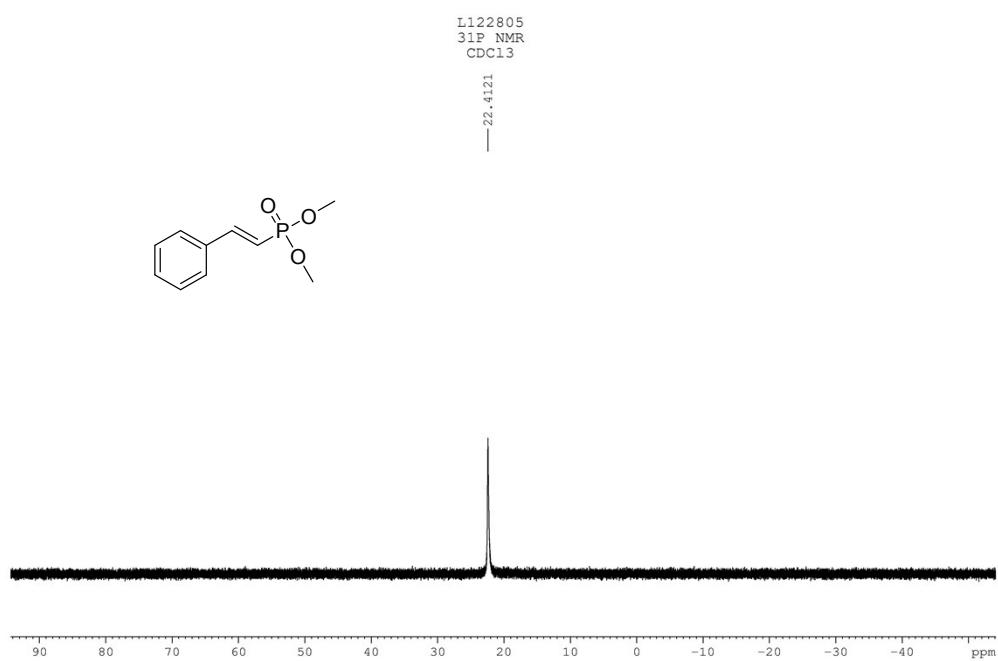


Fig. 39 ³¹P NMR spectrum of compound 3m

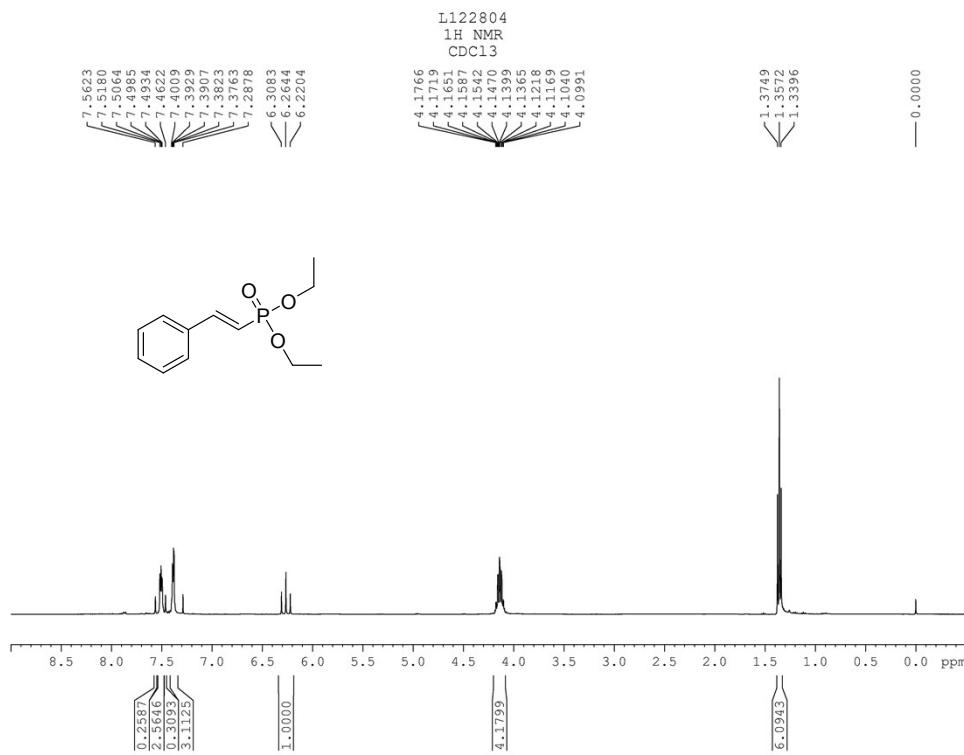


Fig. 40 ¹H NMR spectrum of compound 3n

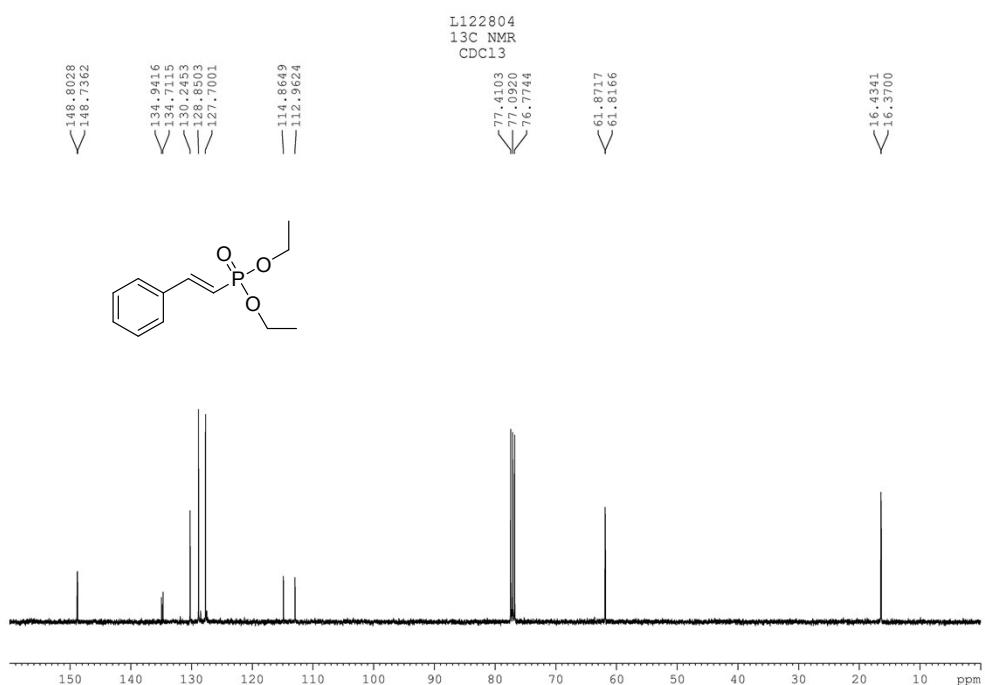


Fig. 41 ^{13}C NMR spectrum of compound **3n**

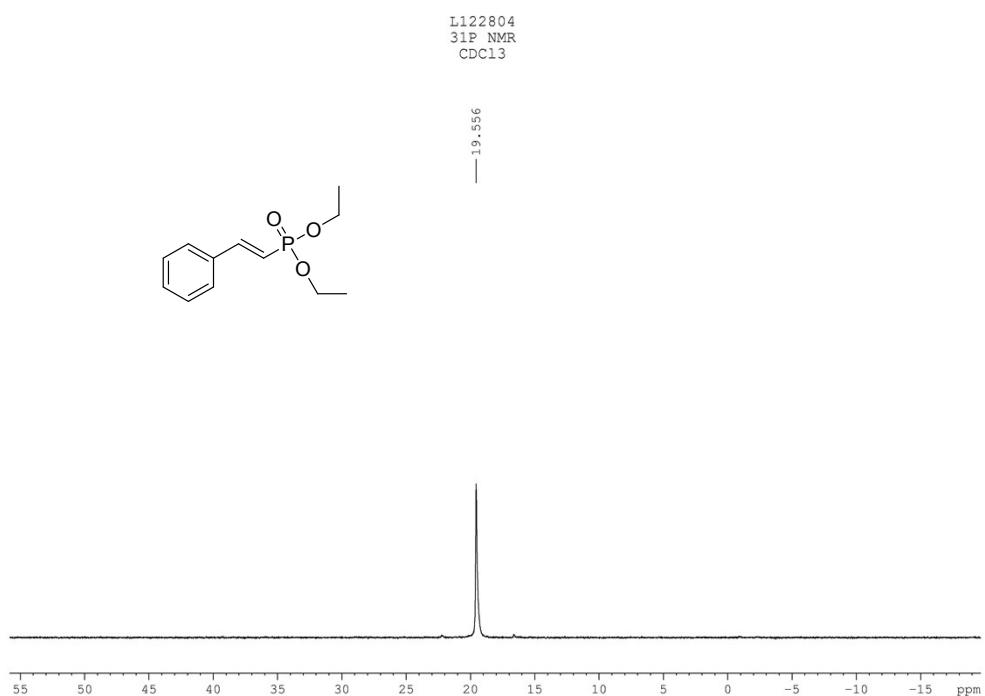


Fig. 42 ^{31}P NMR spectrum of compound **3n**

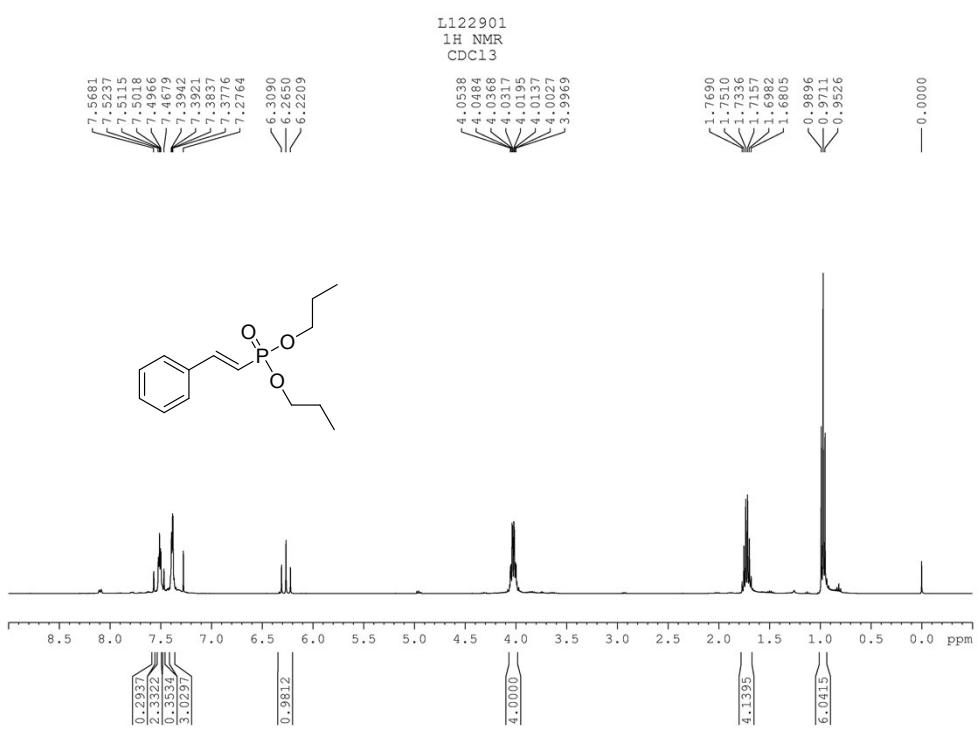


Fig. 43 ¹H NMR spectrum of compound 3o

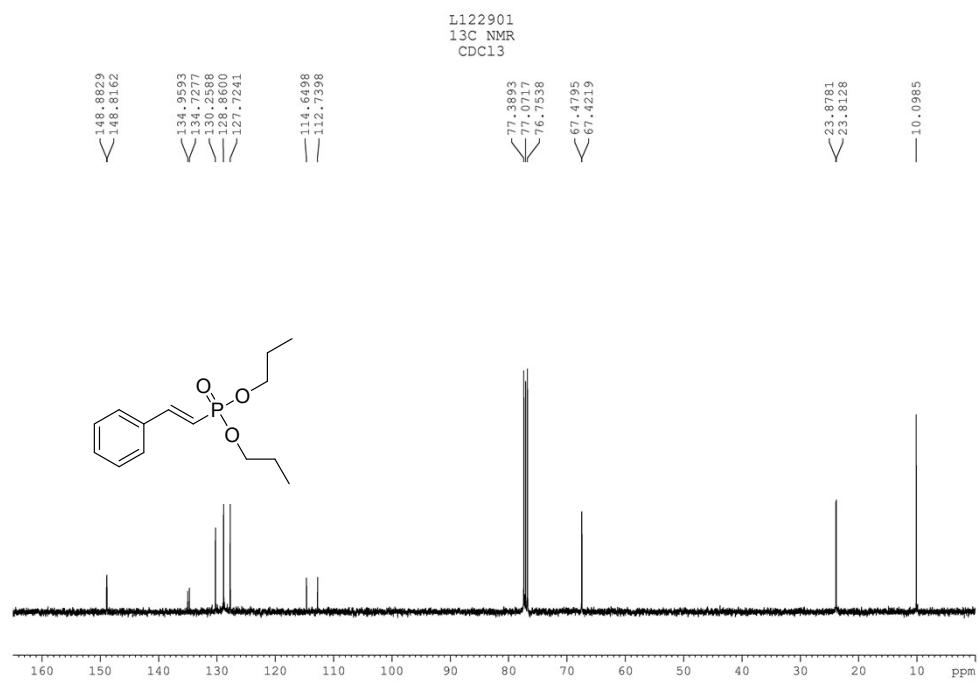


Fig. 44 ¹³C NMR spectrum of compound 3o

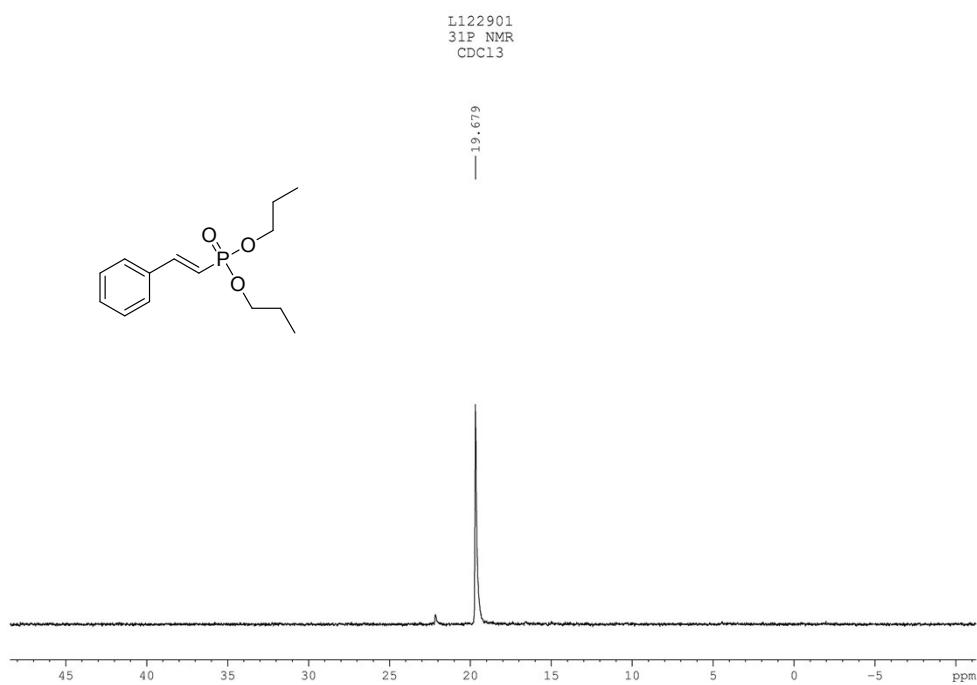


Fig. 45 ^{31}P NMR spectrum of compound **3o**

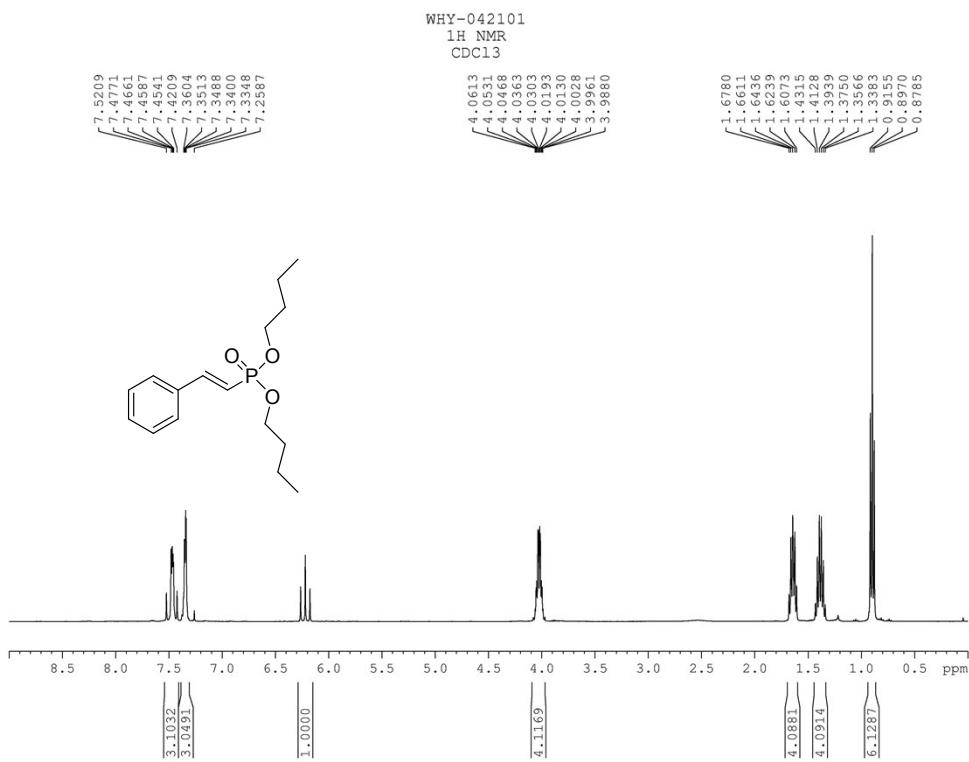


Fig. 46 ^1H NMR spectrum of compound **3p**

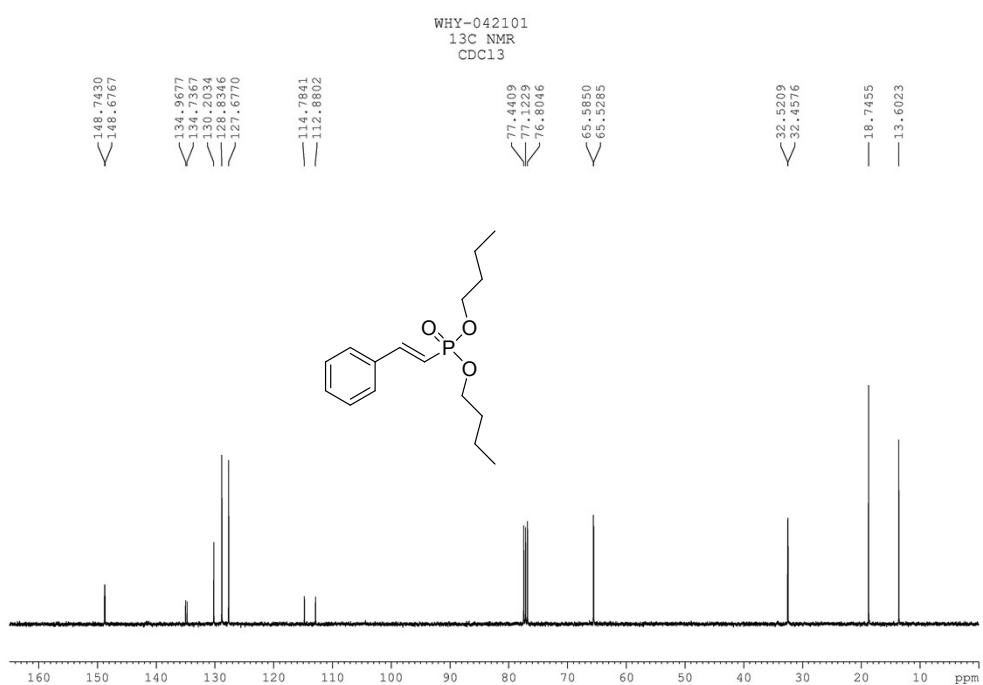


Fig. 47 ^{13}C NMR spectrum of compound 3p

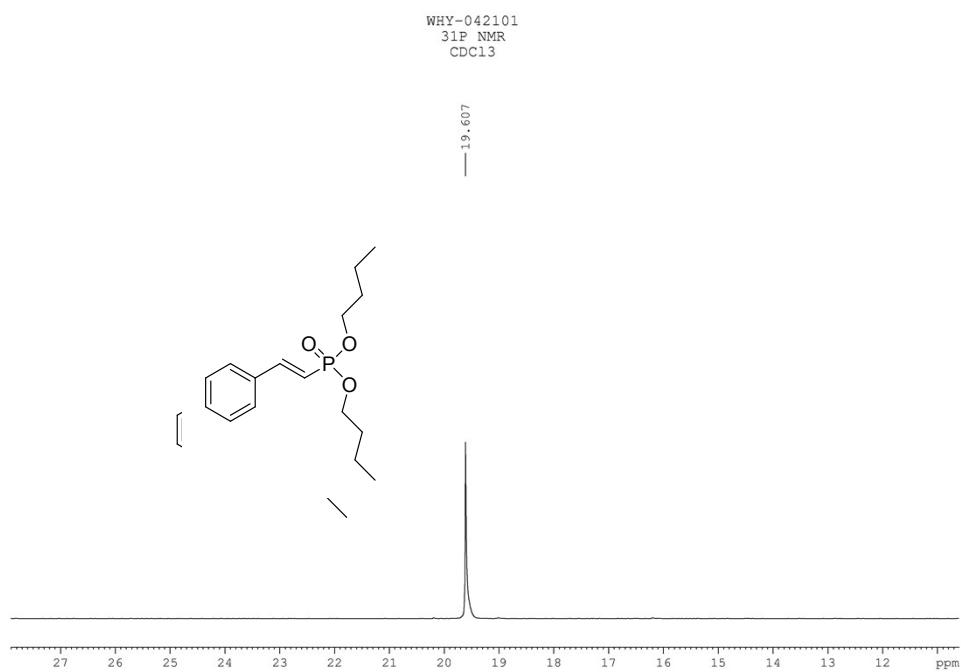


Fig. 48 ^{31}P NMR spectrum of compound 3p

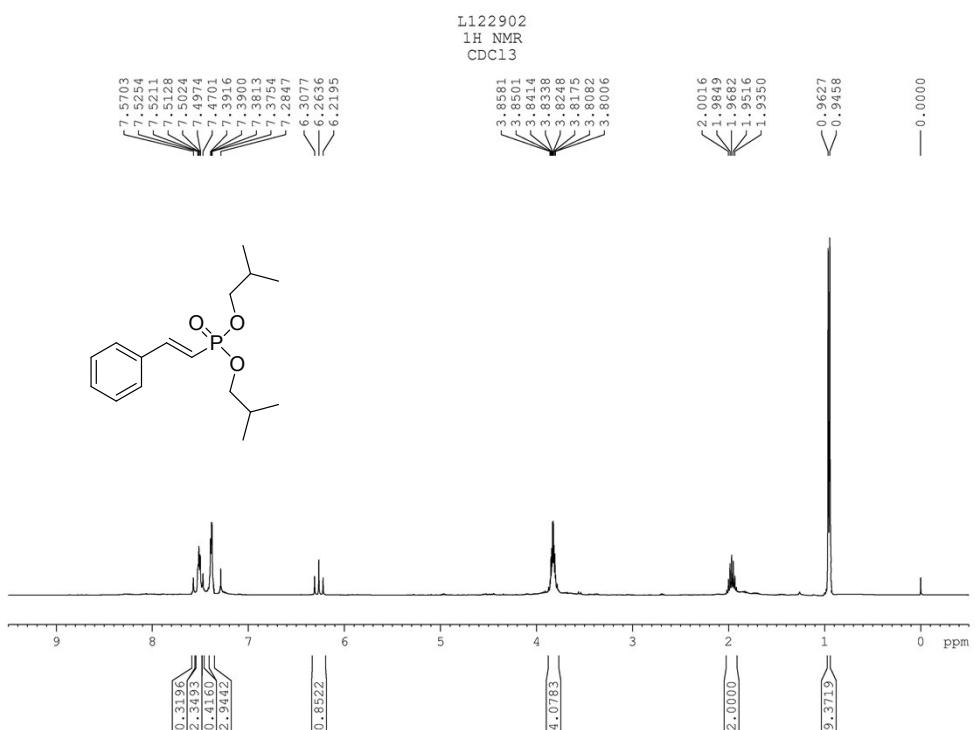


Fig. 49 ¹H NMR spectrum of compound 3q

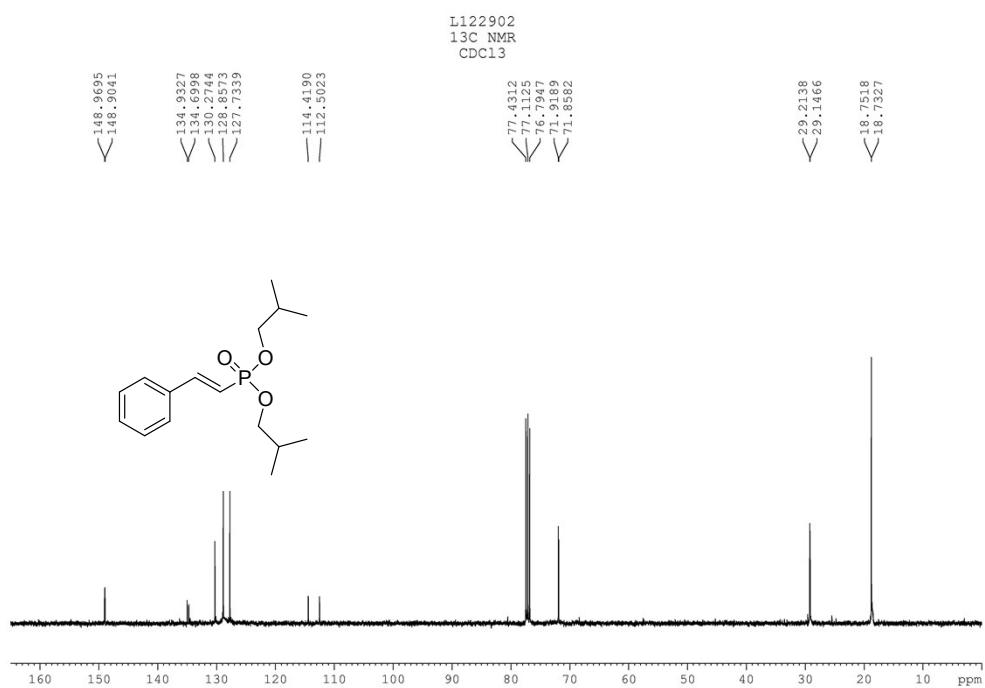


Fig. 50 ¹³C NMR spectrum of compound 3q

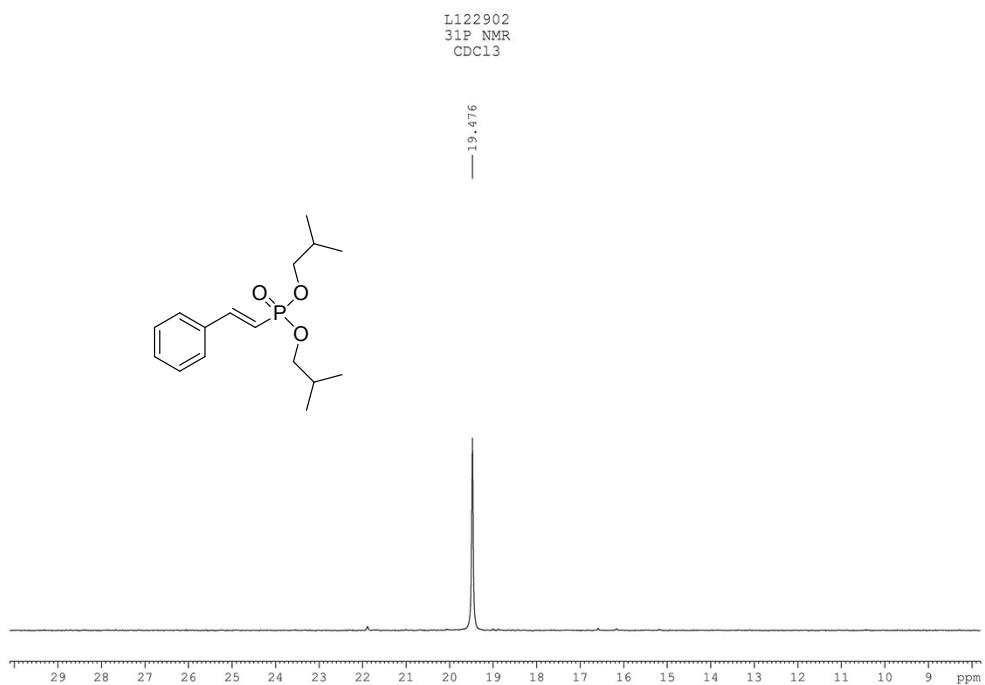


Fig. 51 ^{31}P NMR spectrum of compound **3q**

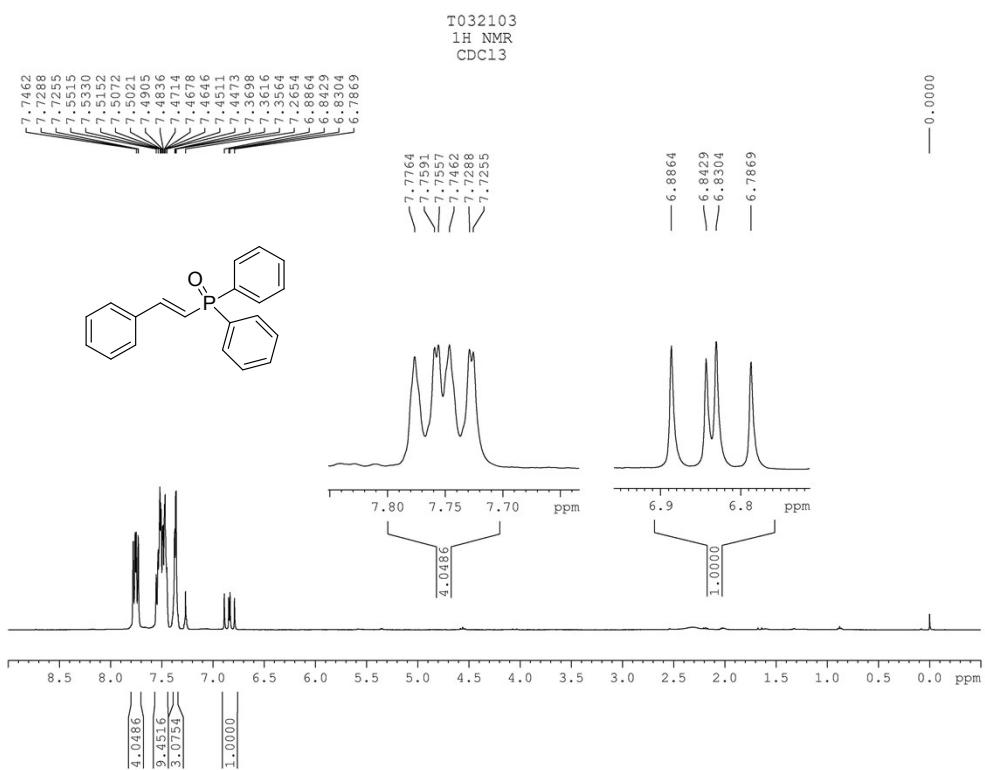


Fig. 52 ^1H NMR spectrum of compound **3r**

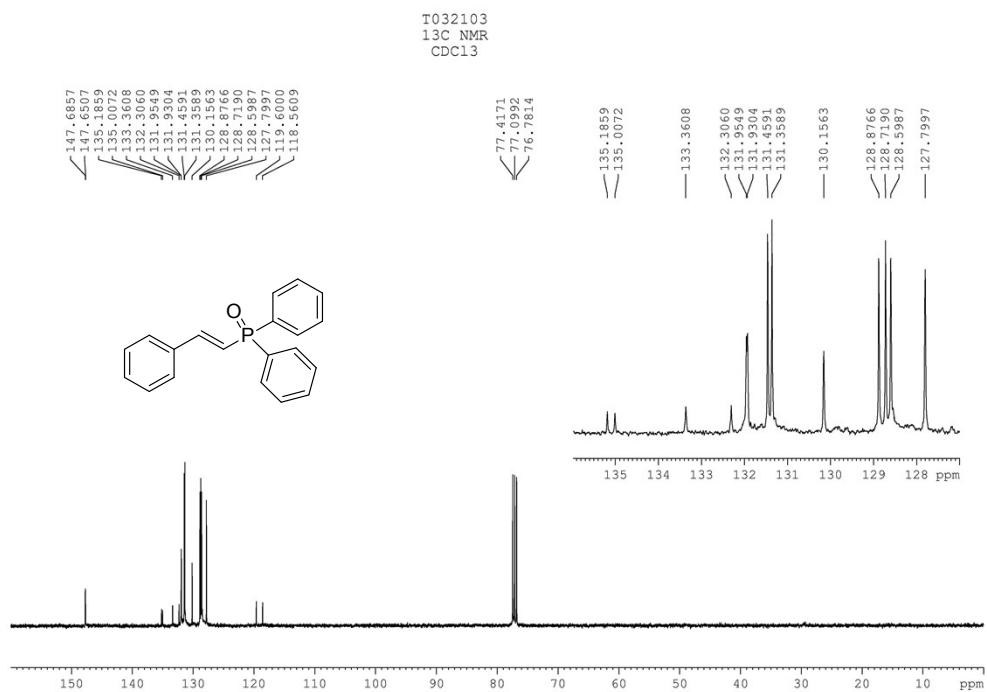


Fig. 53 ¹³C NMR spectrum of compound **3r**

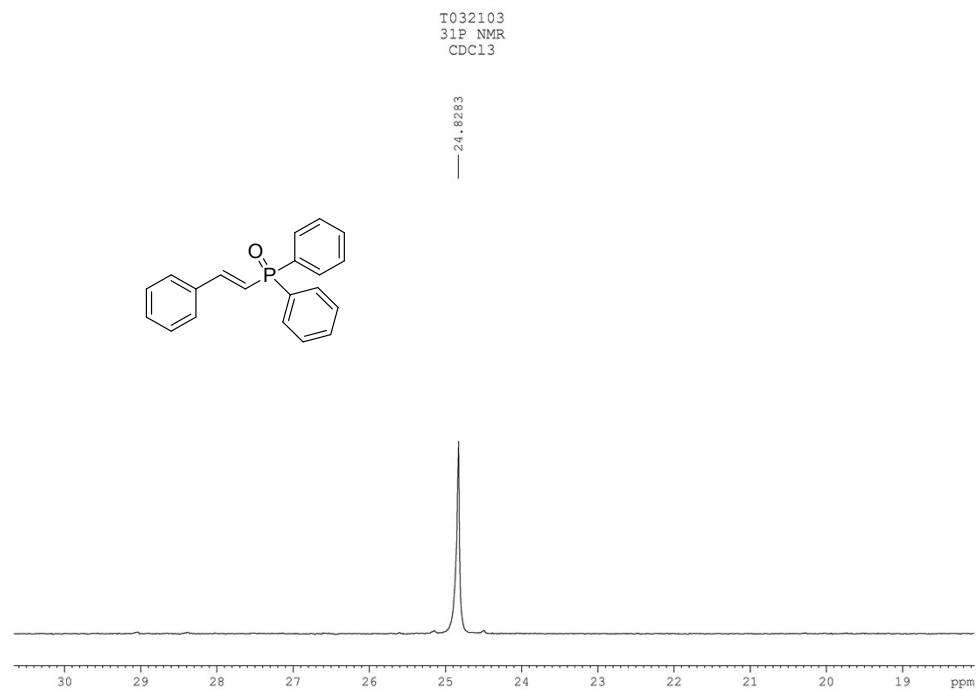


Fig. 54 ³¹P NMR spectrum of compound **3r**

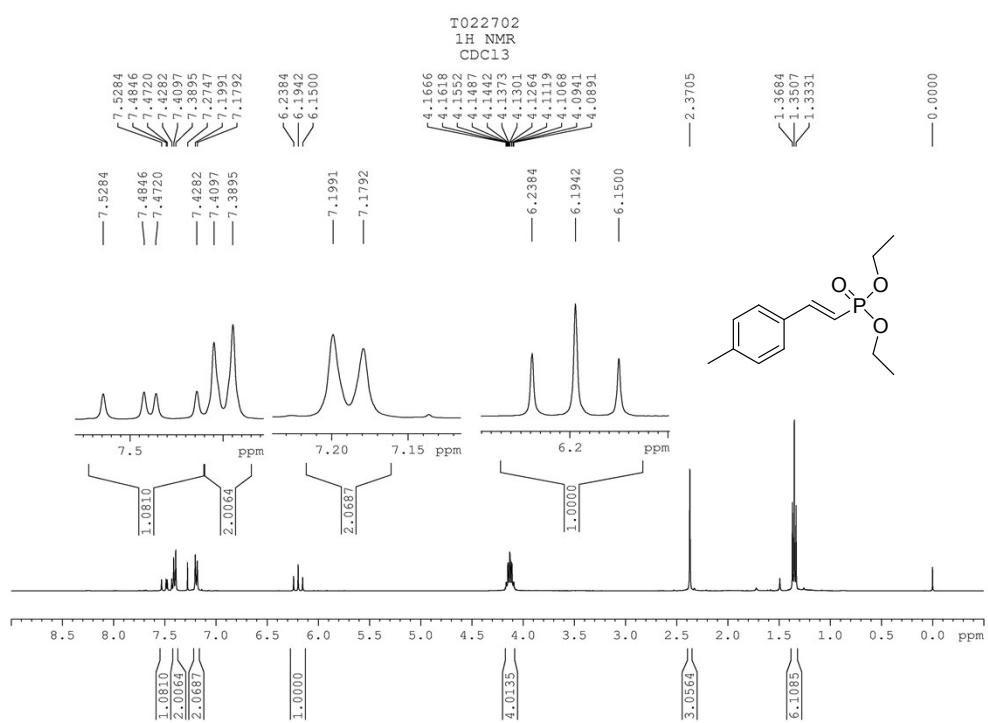


Fig. 55 ¹H NMR spectrum of compound 3s

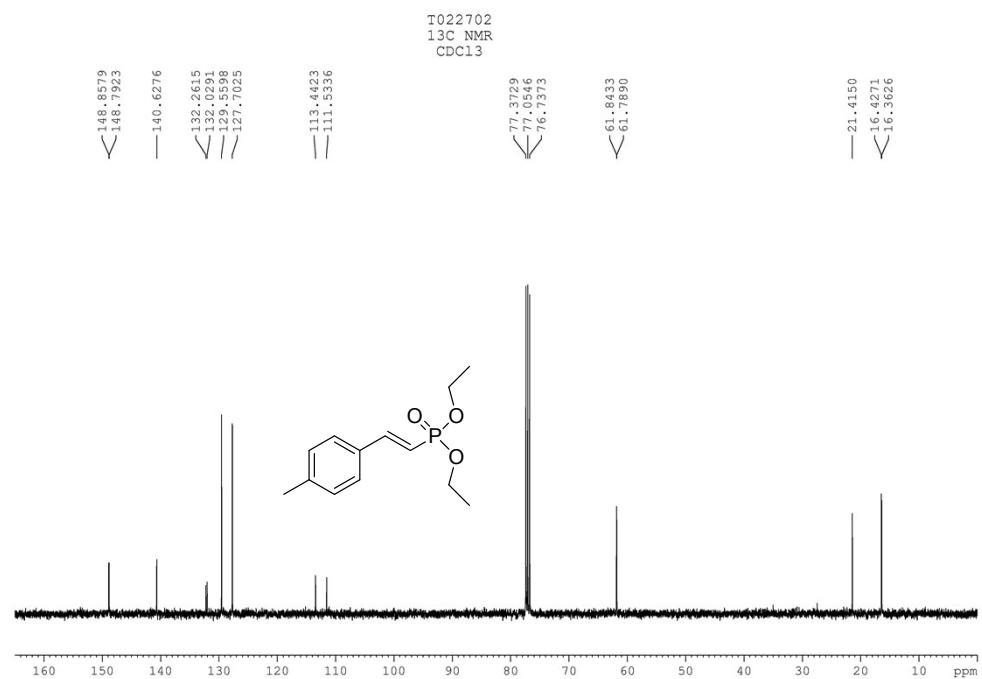


Fig. 56 ¹³C NMR spectrum of compound 3s

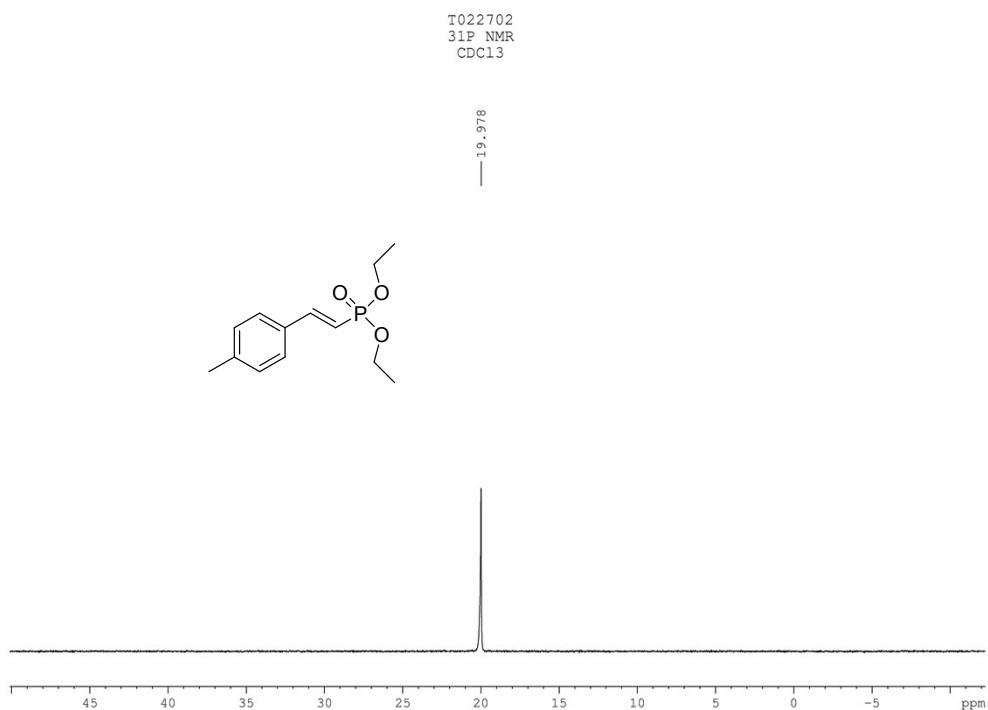


Fig. 57 ^{31}P NMR spectrum of compound **3s**

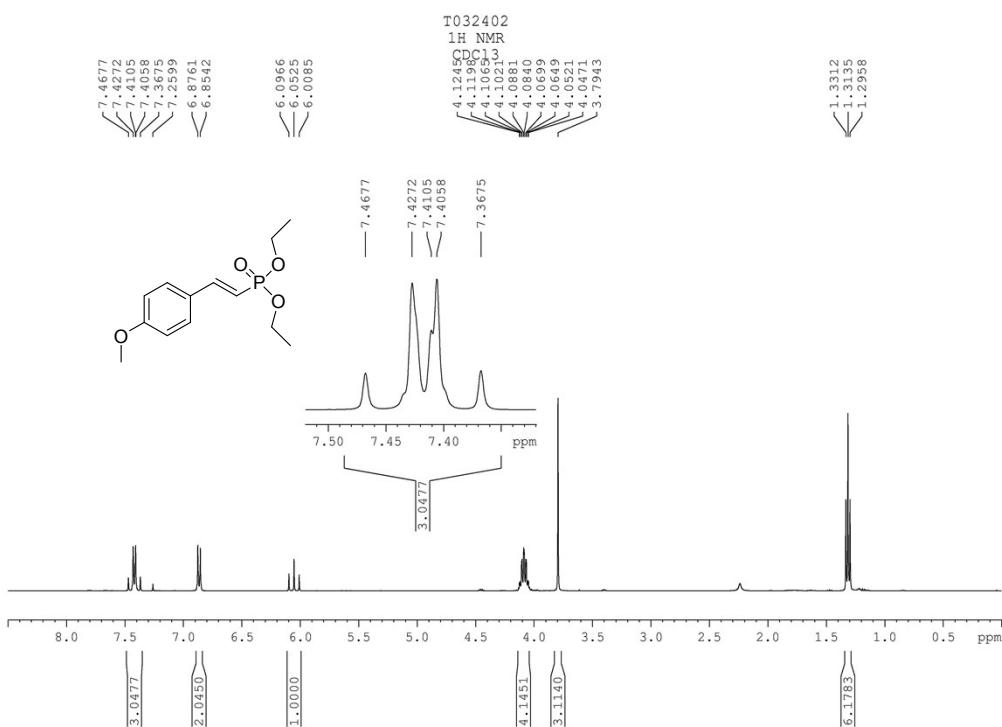


Fig. 58 ^1H NMR spectrum of compound **3t**

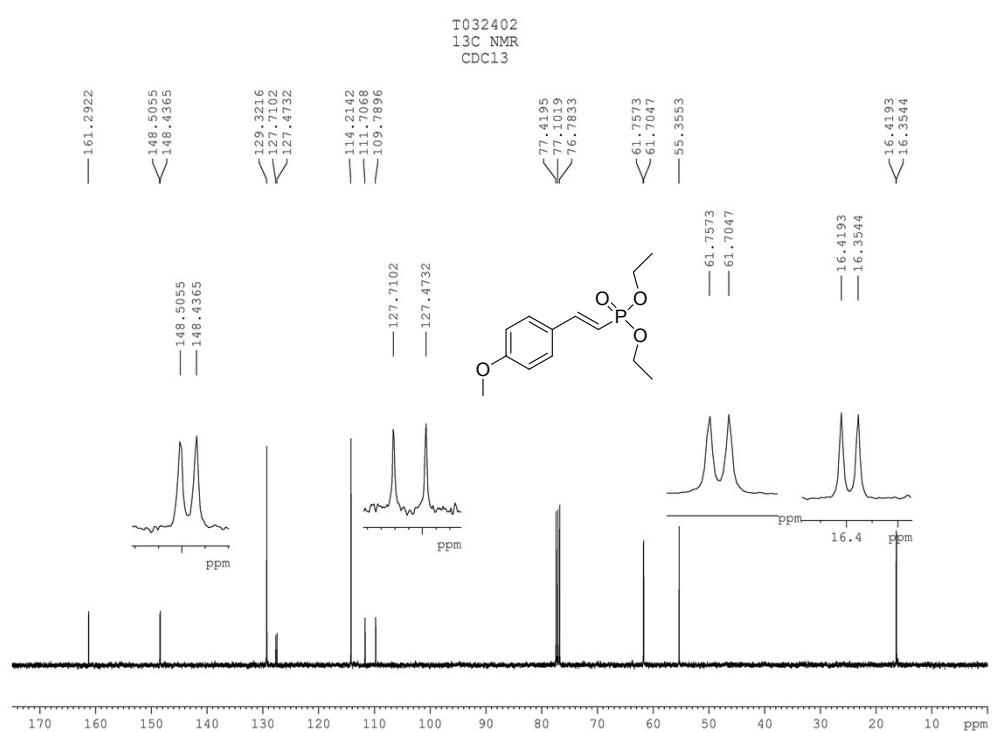


Fig. 59 ^{13}C NMR spectrum of compound **3t**

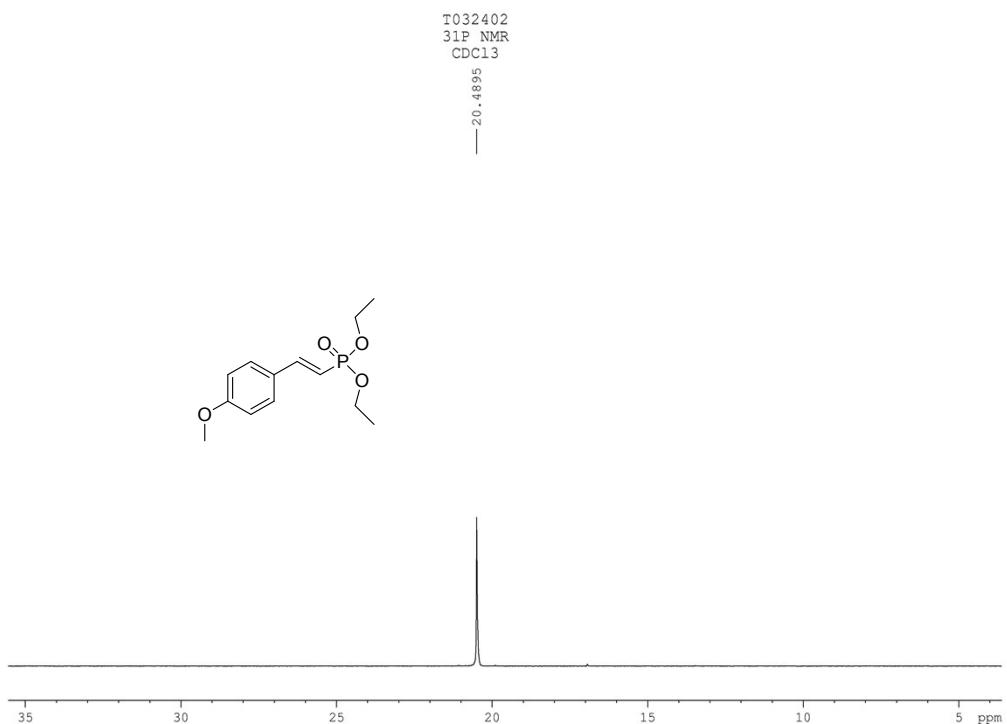


Fig. 60 ^{31}P NMR spectrum of compound **3t**

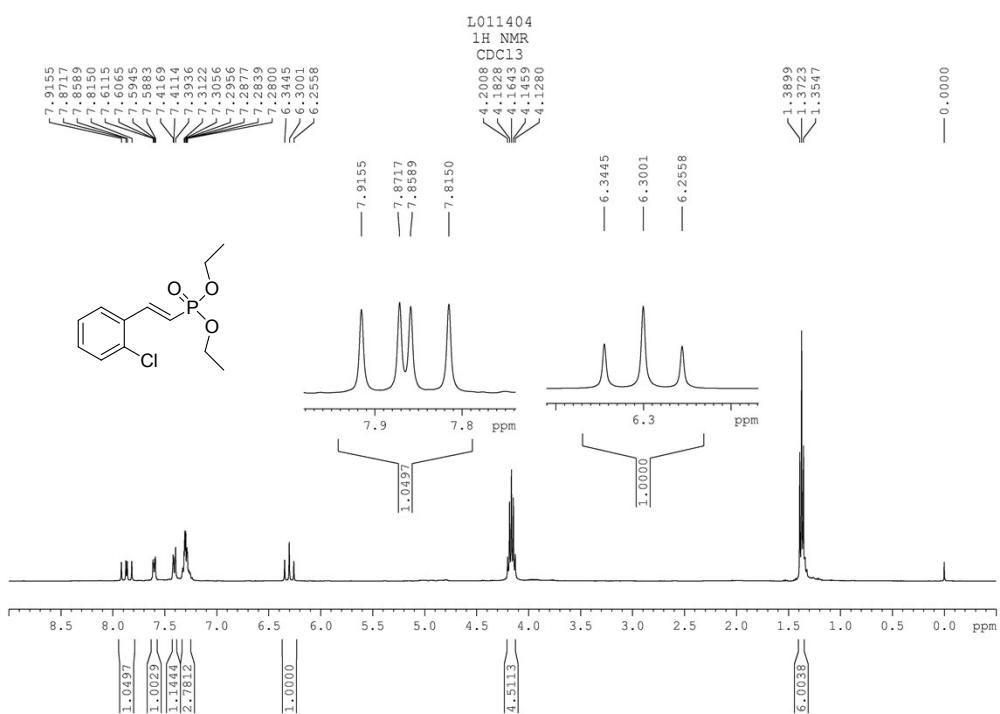


Fig. 61 ¹H NMR spectrum of compound 3u

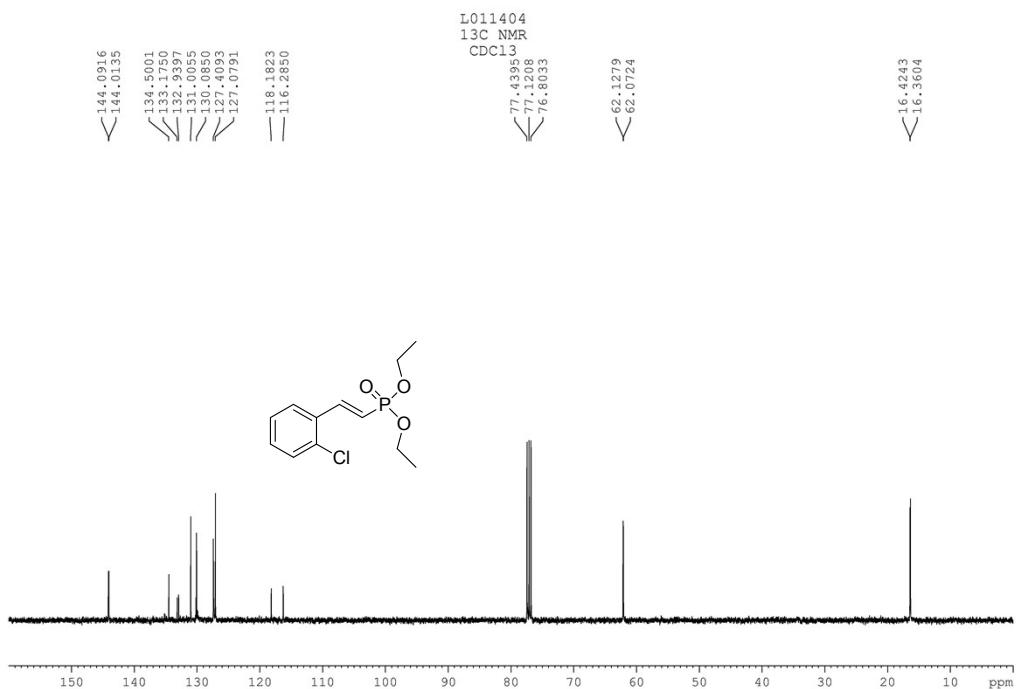


Fig. 62 ¹³C NMR spectrum of compound 3u

L011404
31P NMR
CDCl₃

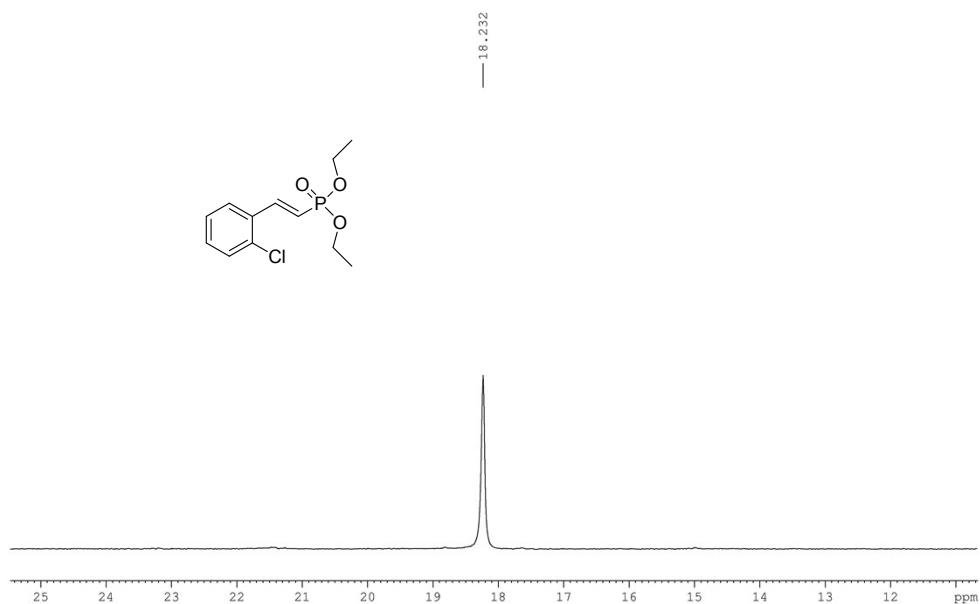


Fig. 63 ³¹P NMR spectrum of compound 3u

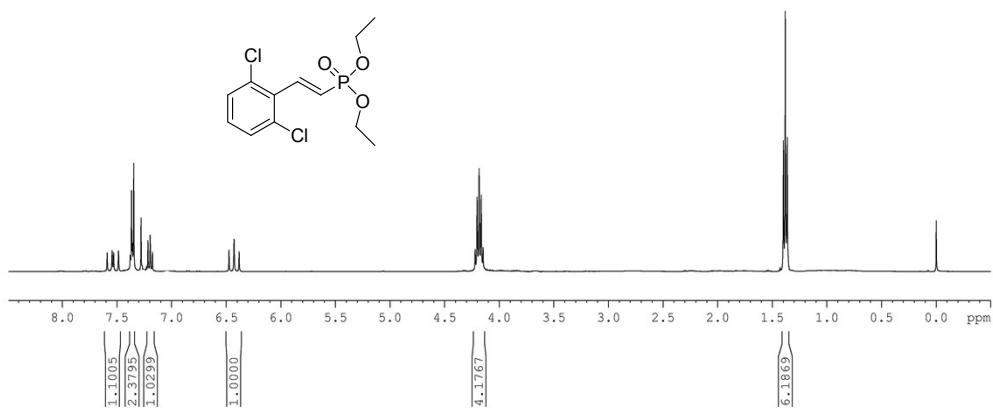
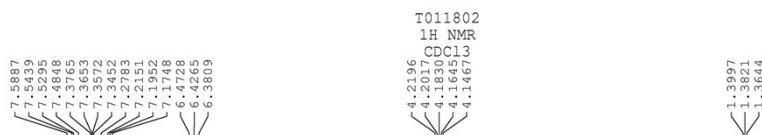


Fig. 64 ¹H NMR spectrum of compound 3v

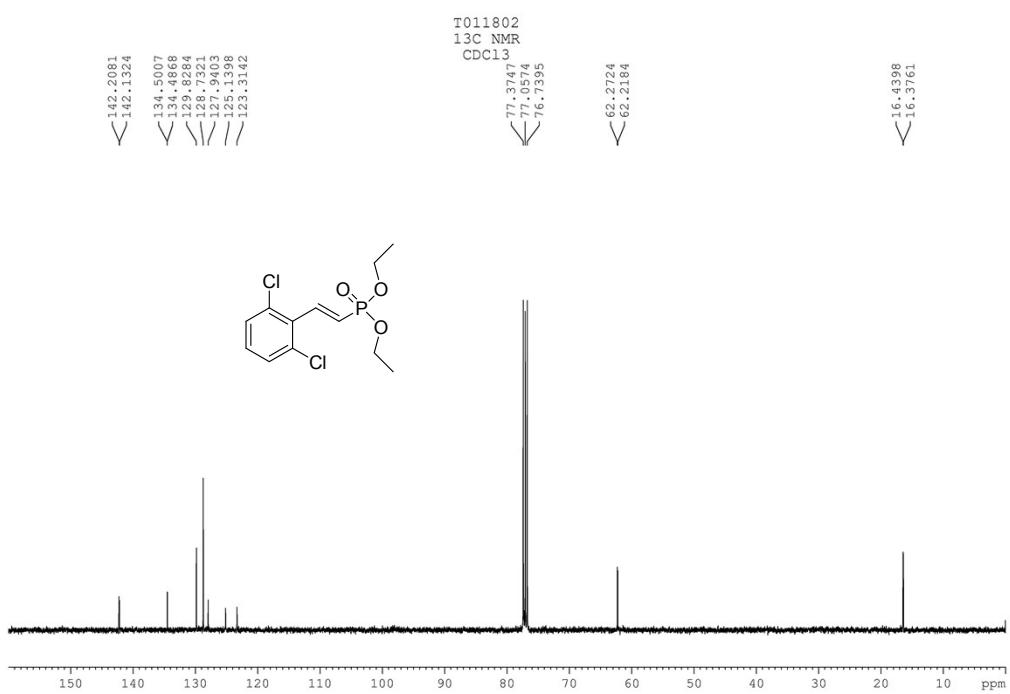


Fig. 65 ^{13}C NMR spectrum of compound **3v**

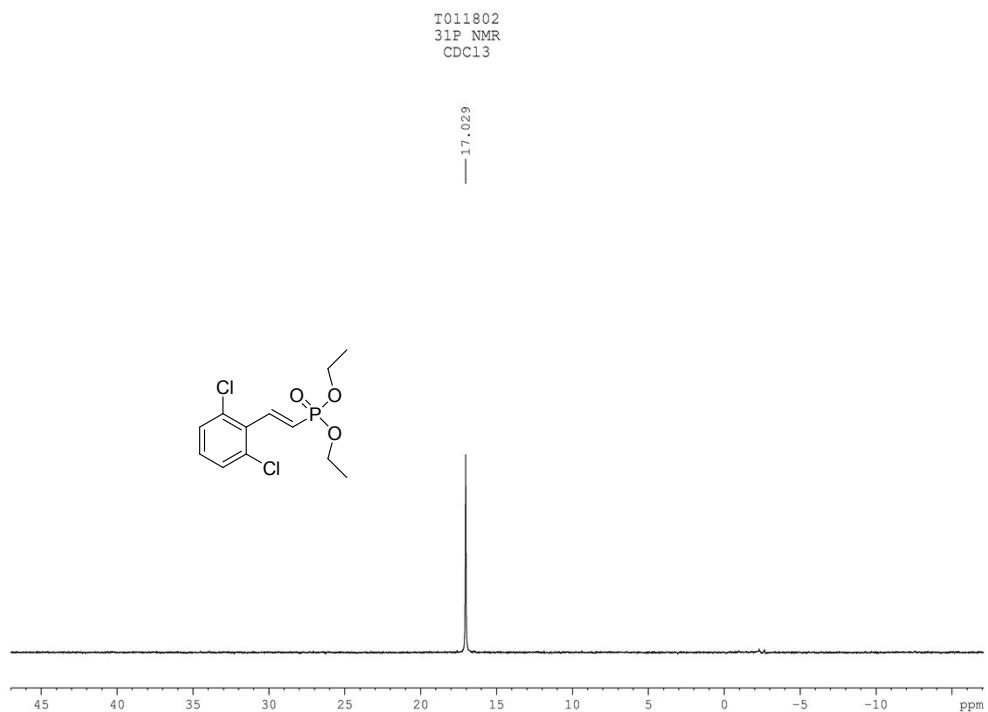


Fig. 66 ^{31}P NMR spectrum of compound **3v**

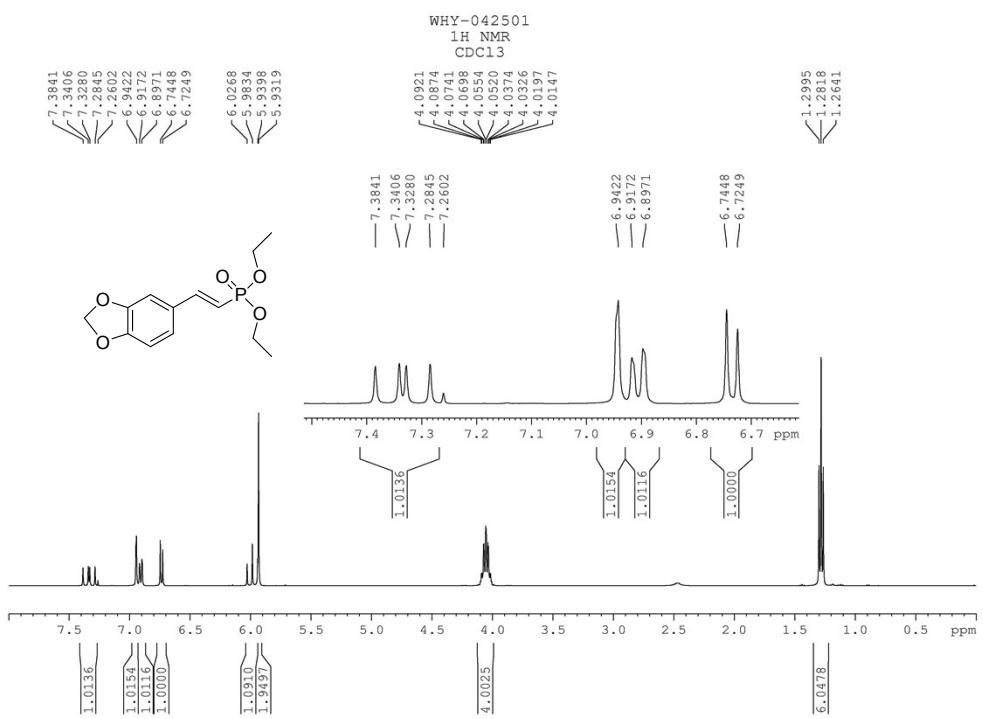


Fig. 67 ¹H NMR spectrum of compound 3w

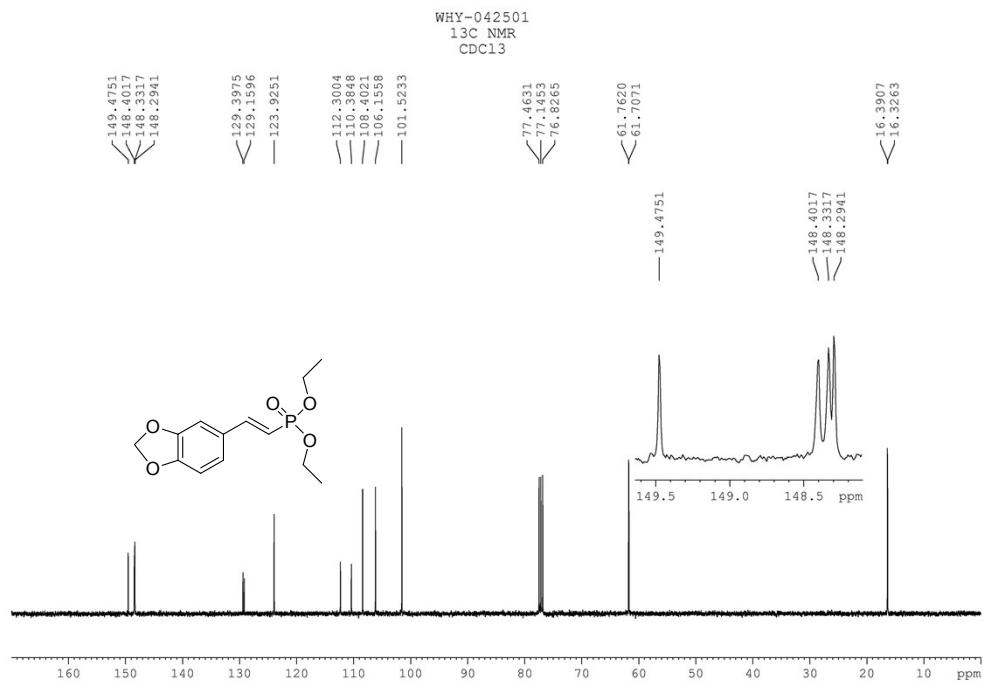


Fig. 68 ¹³C NMR spectrum of compound 3w

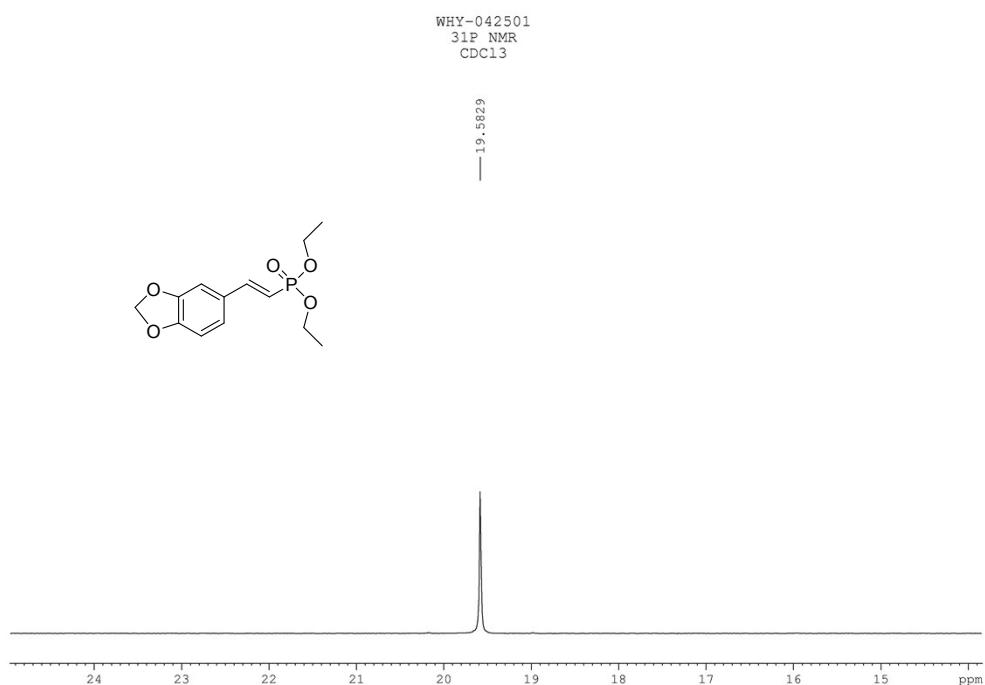


Fig. 69 ³¹P NMR spectrum of compound 3w

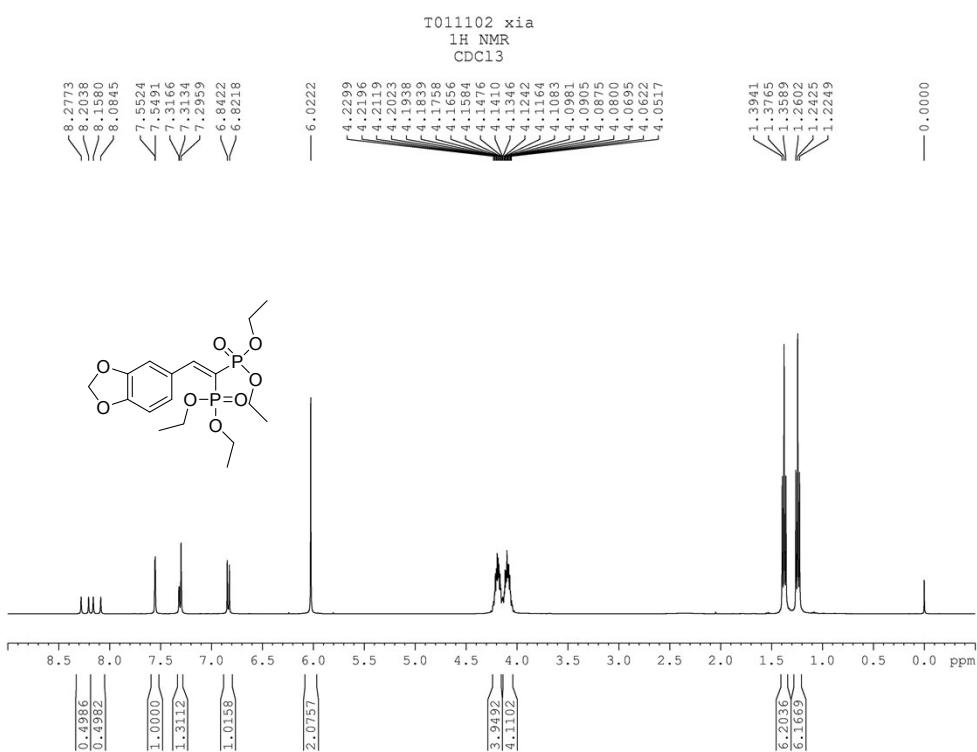


Fig. 70 ¹H NMR spectrum of compound 3w'

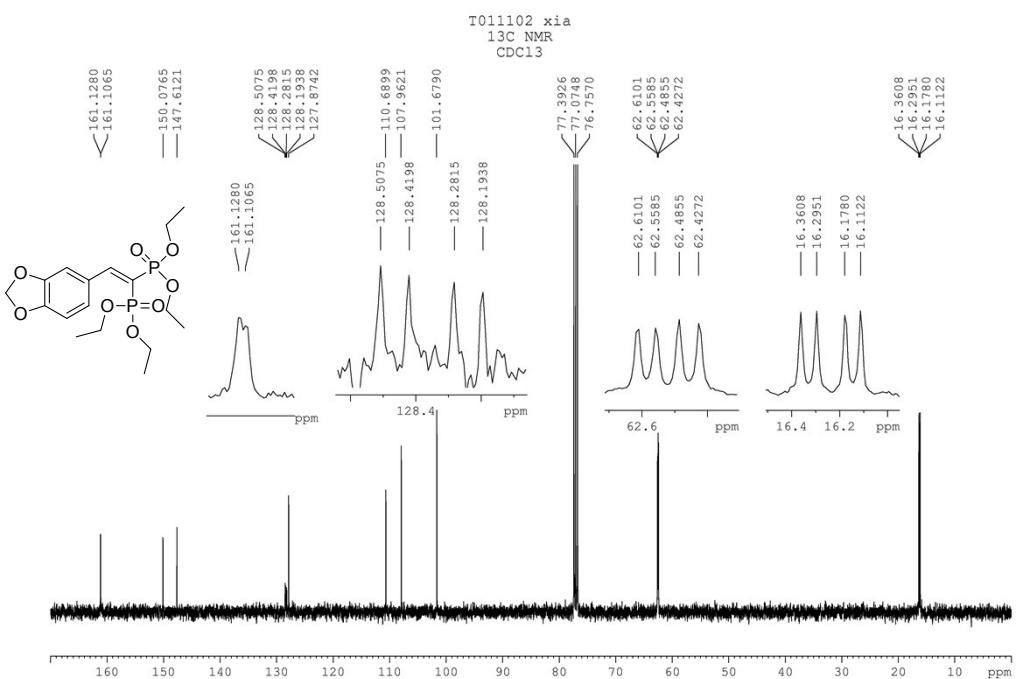


Fig. 71 ¹³C NMR spectrum of compound 3w'

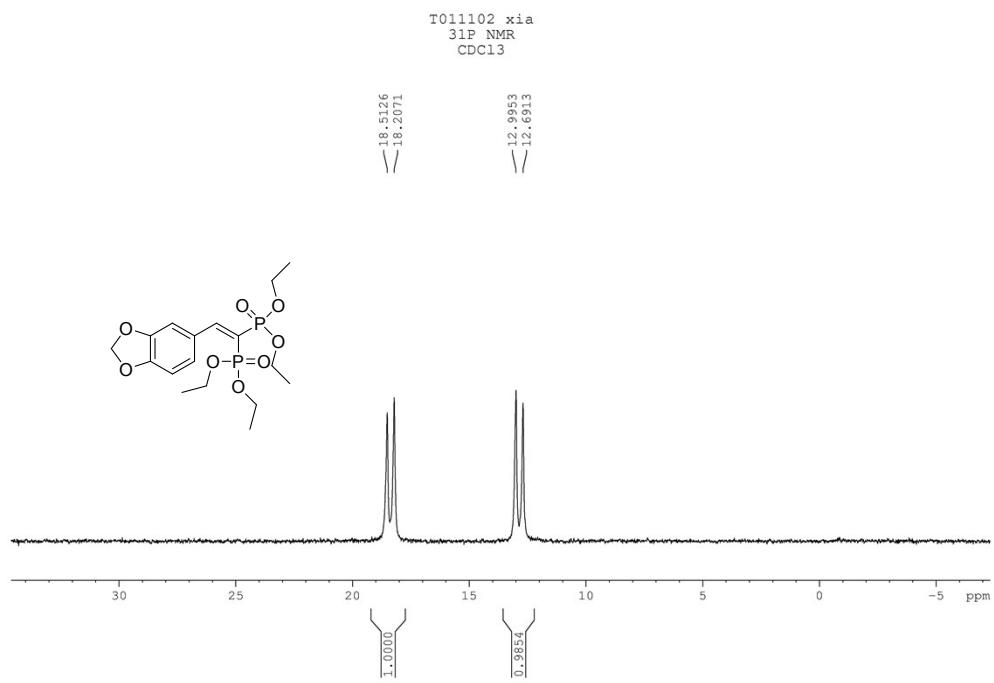


Fig. 72 ³¹P NMR spectrum of compound 3w'

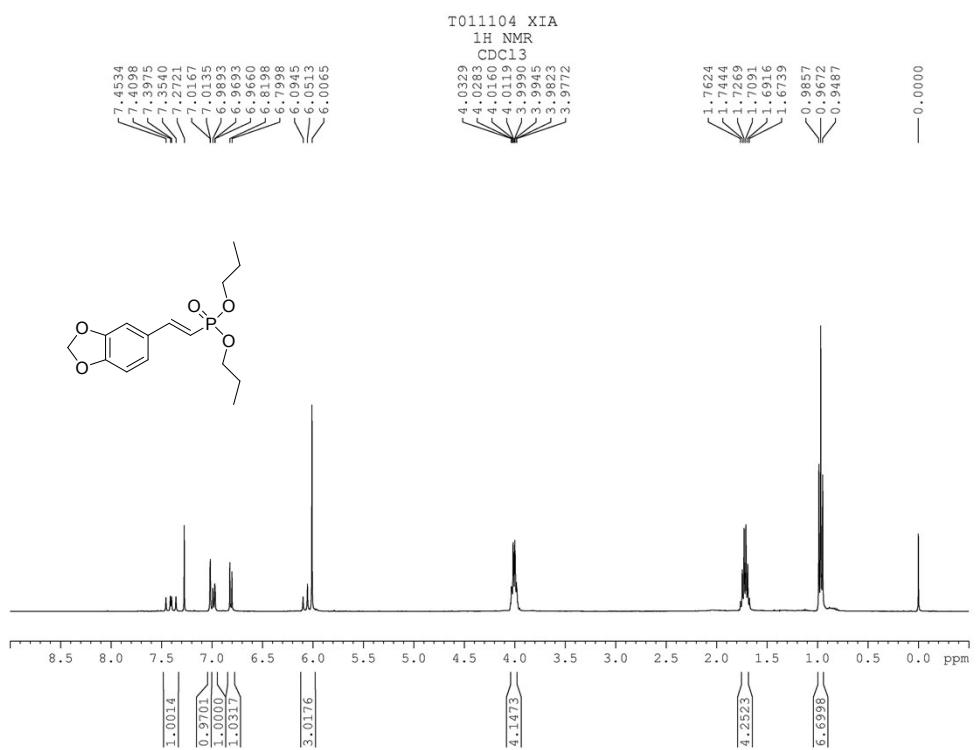


Fig. 73 ¹H NMR spectrum of compound **3x**

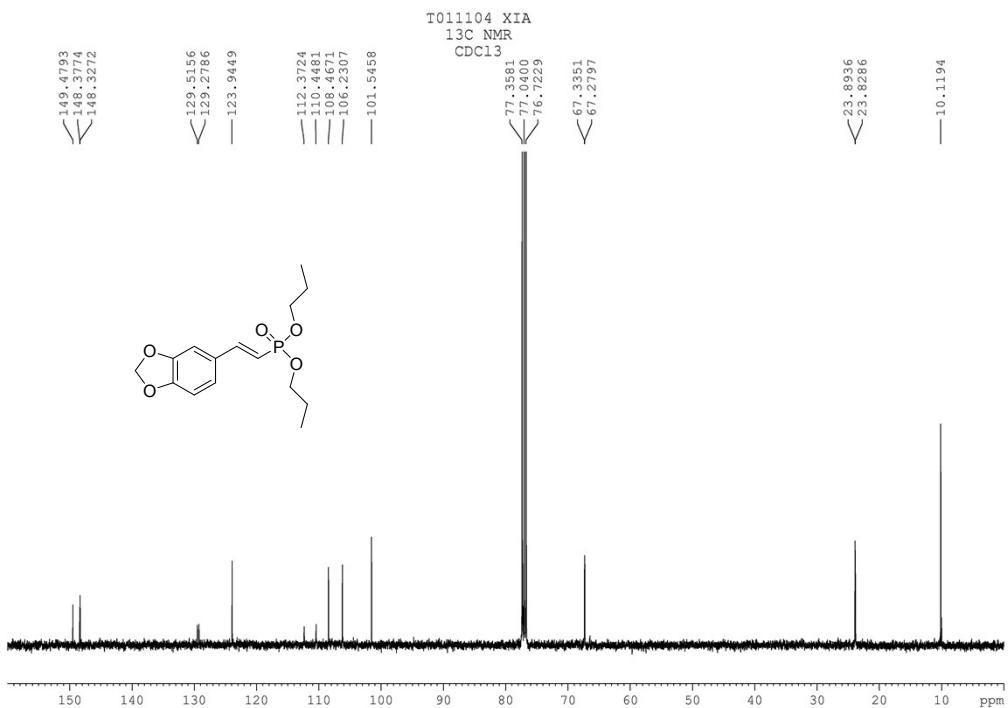


Fig. 74 ¹³C NMR spectrum of compound **3x**

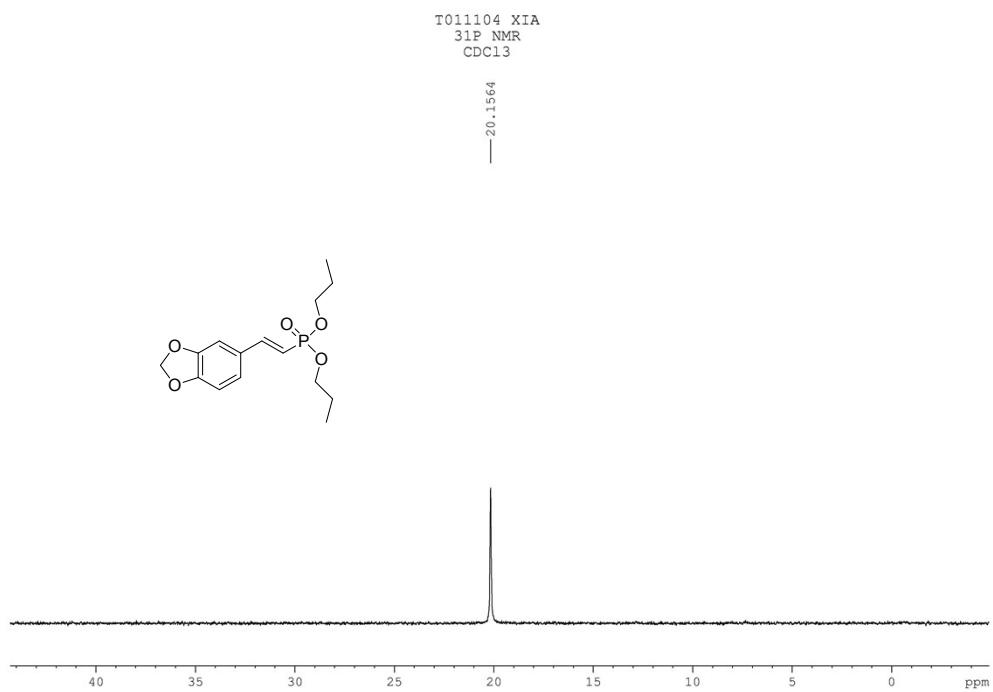


Fig. 75 ³¹P NMR spectrum of compound **3x**

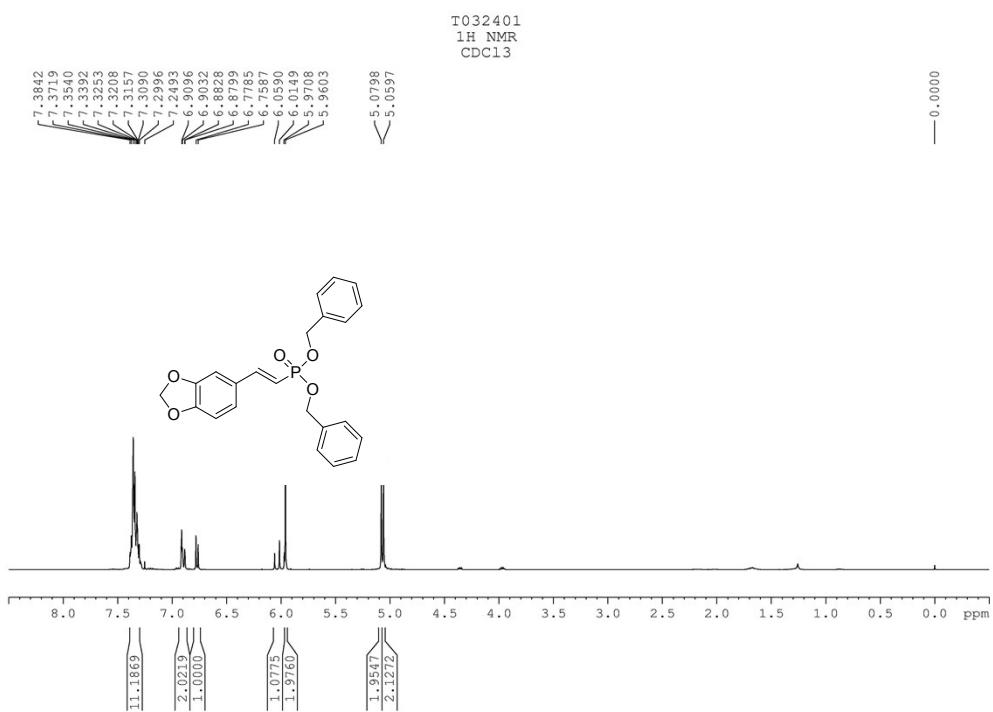


Fig. 76 ¹H NMR spectrum of compound **3y**

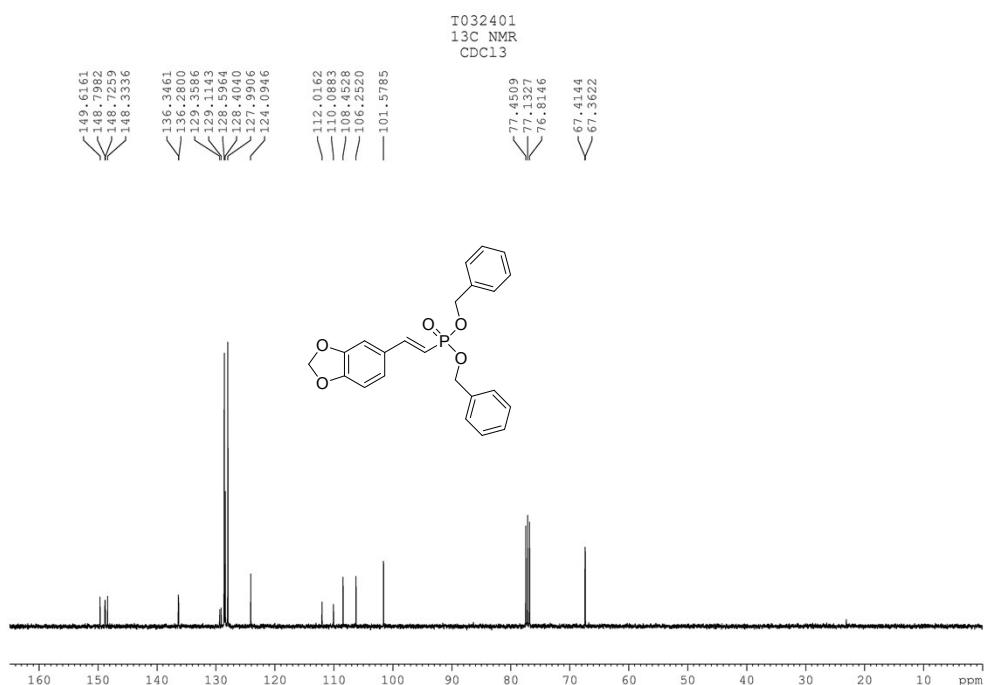


Fig. 77 ¹³C NMR spectrum of compound **3y**

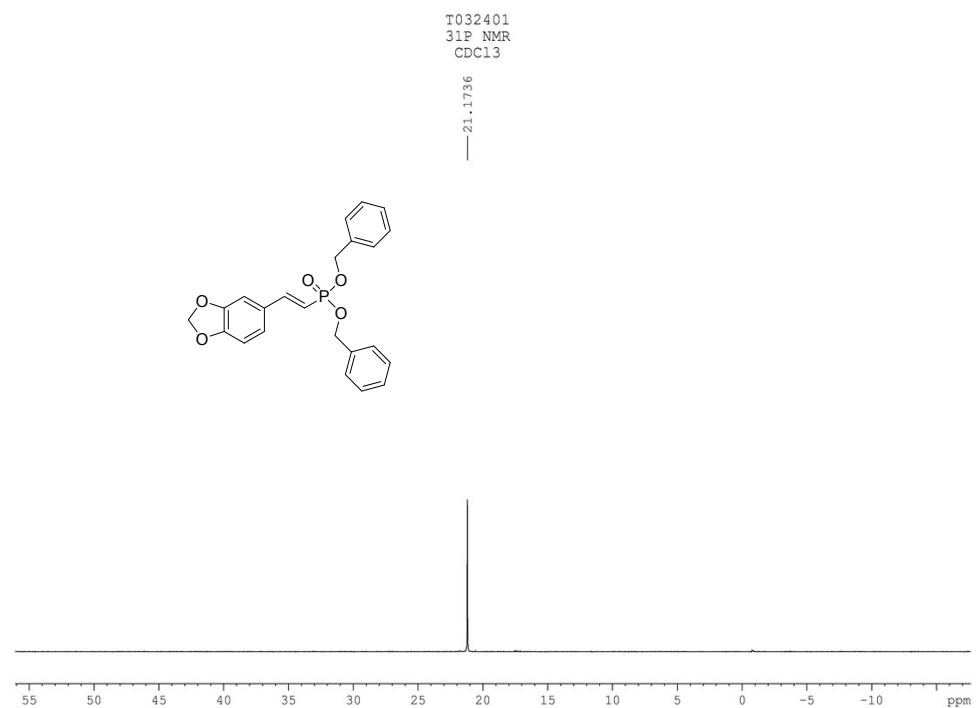


Fig. 78 ³¹P NMR spectrum of compound **3y**

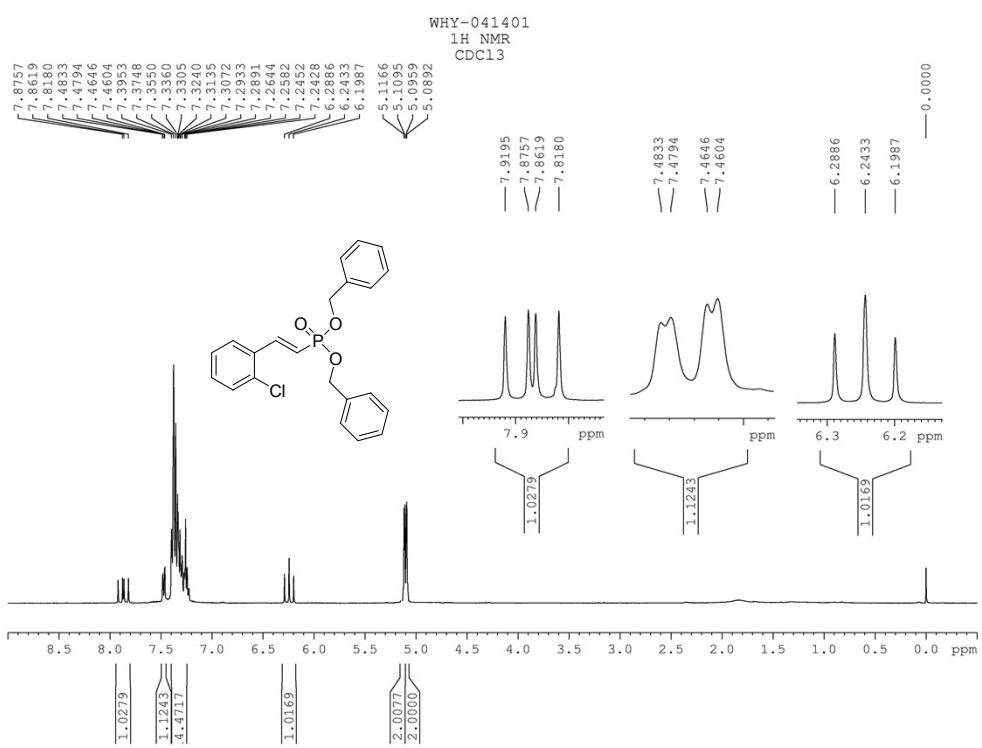


Fig. 79 ¹H NMR spectrum of compound 3z

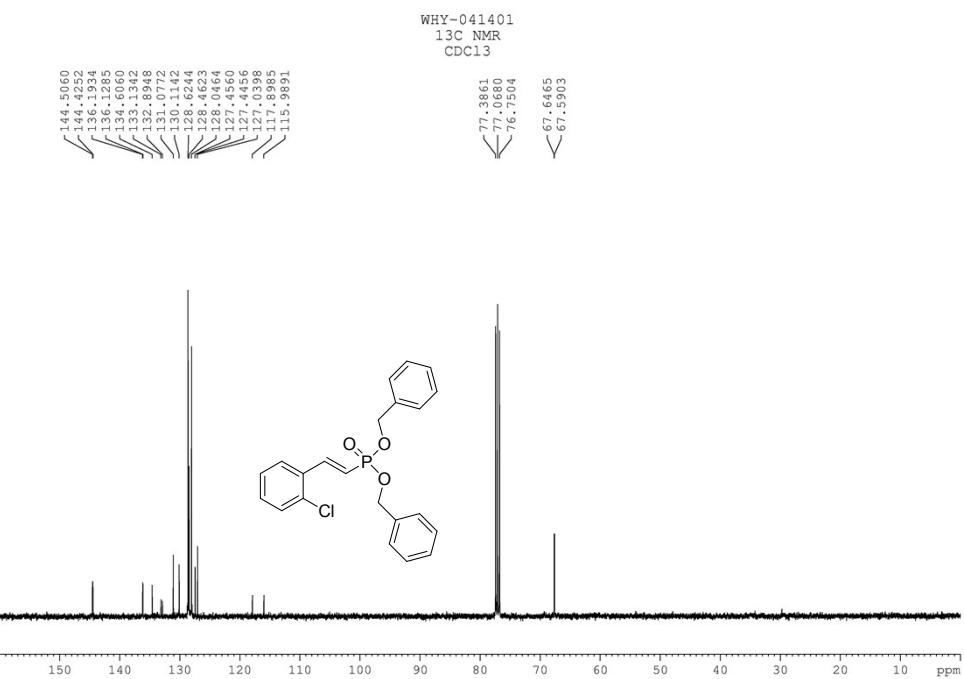


Fig. 80 ¹³C NMR spectrum of compound 3z

WHY-041401
31P NMR
CDCl3

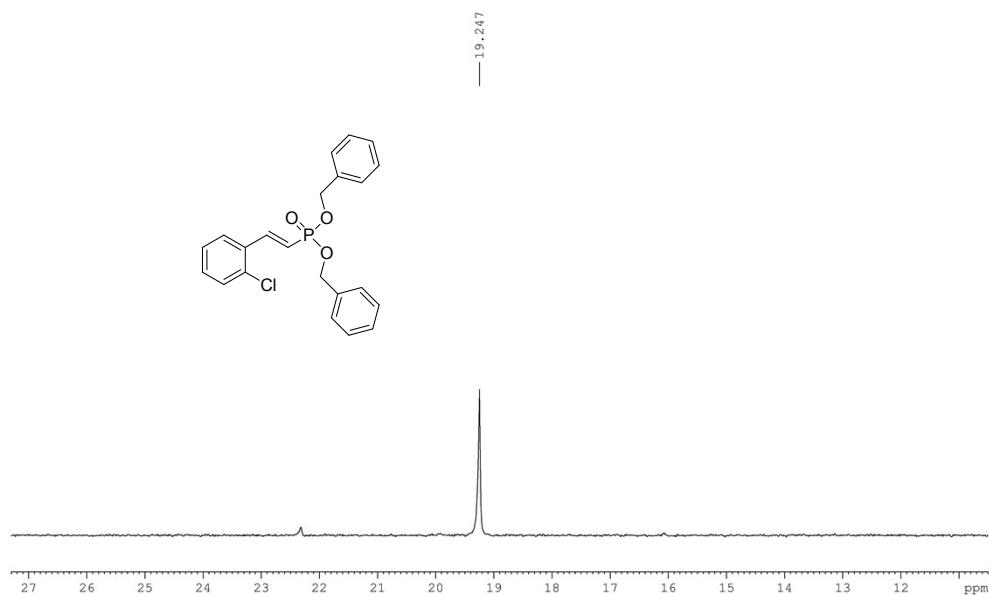


Fig. 81 ³¹P NMR spectrum of compound 3z

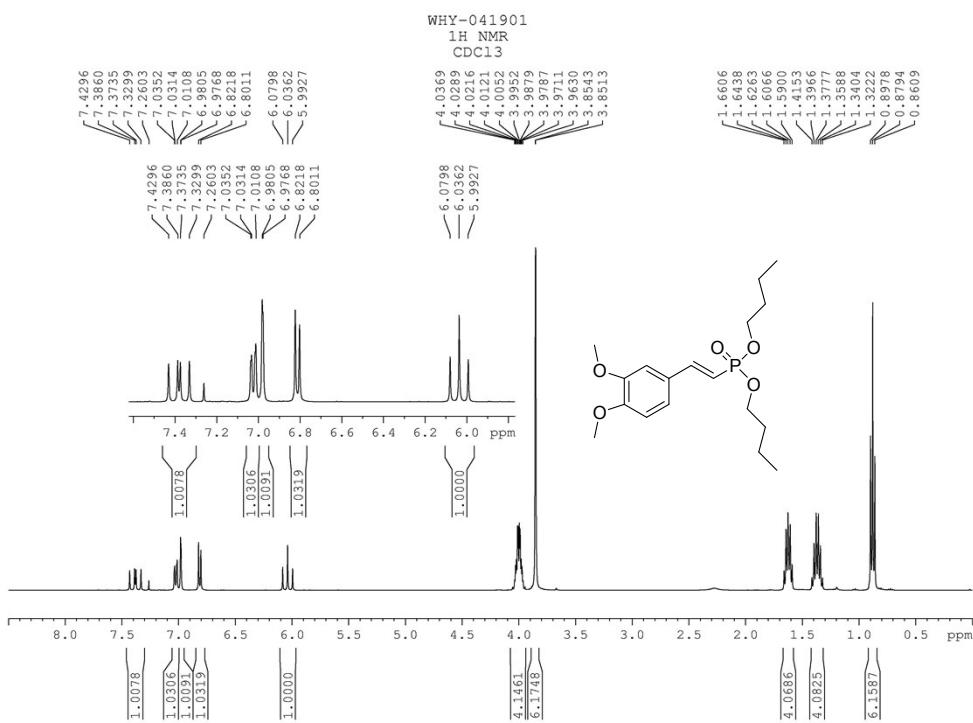


Fig. 82 ¹H NMR spectrum of compound 3zz

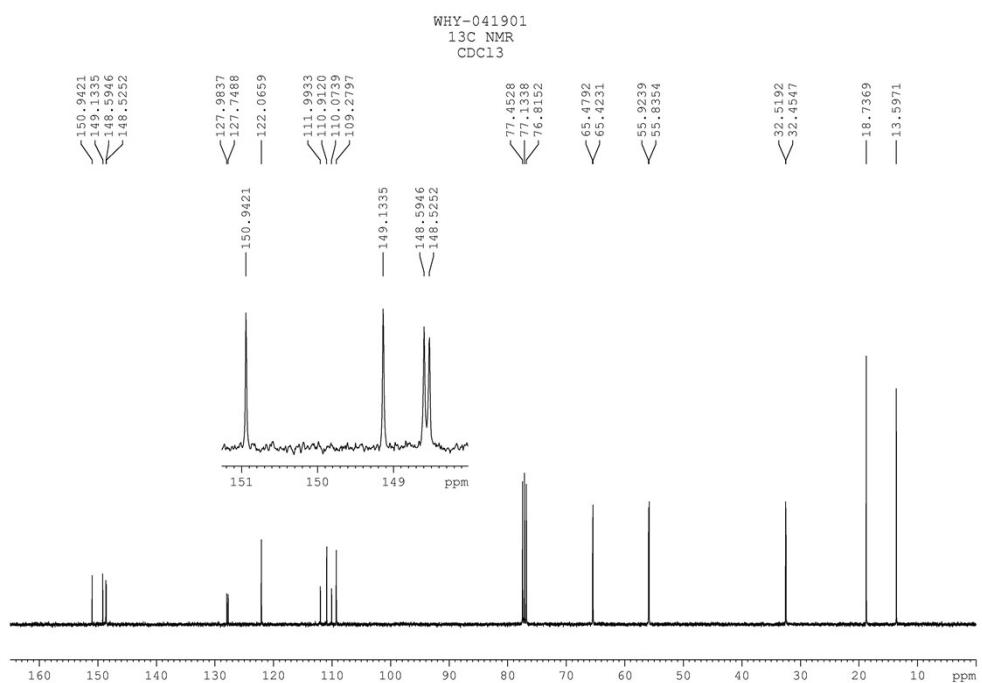


Fig. 83 ^{13}C NMR spectrum of compound 3zz

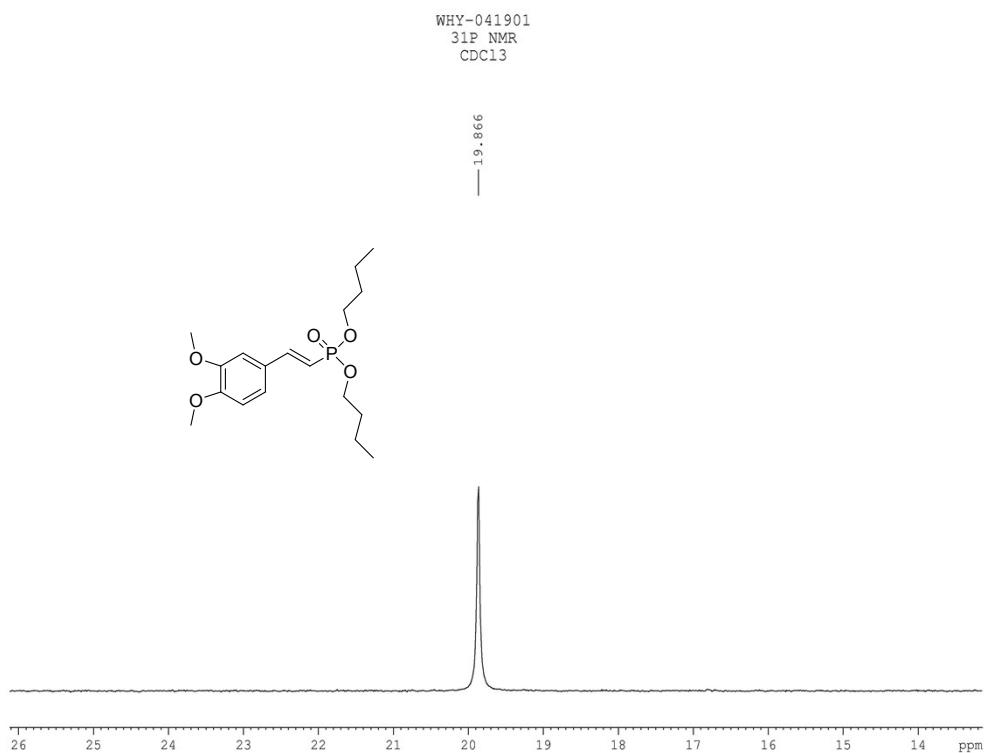


Fig. 84 ^{31}P NMR spectrum of compound 3zz