

Supplementary Materials

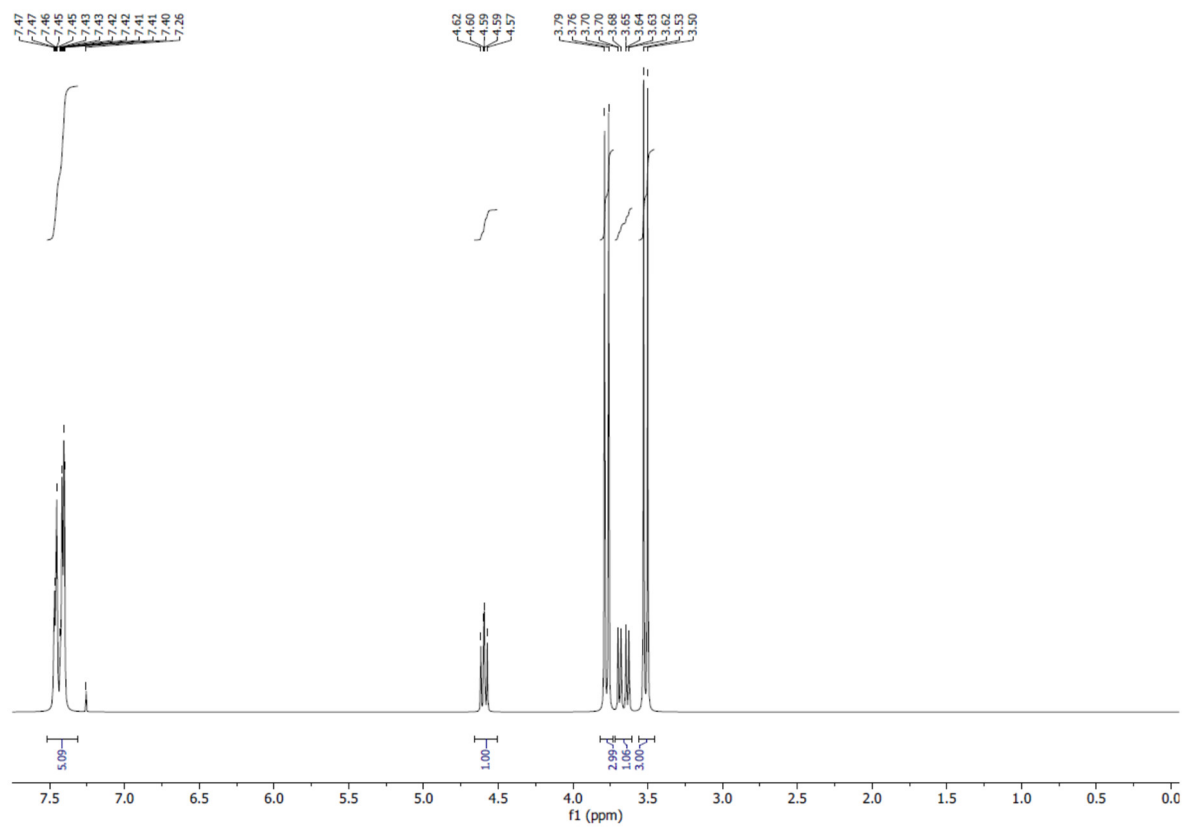


Figure S1. ^1H NMR (400 MHz, CDCl_3) spectra of dimethyl (2,2-dicyano-1-phenylethyl)phosphonate (1).

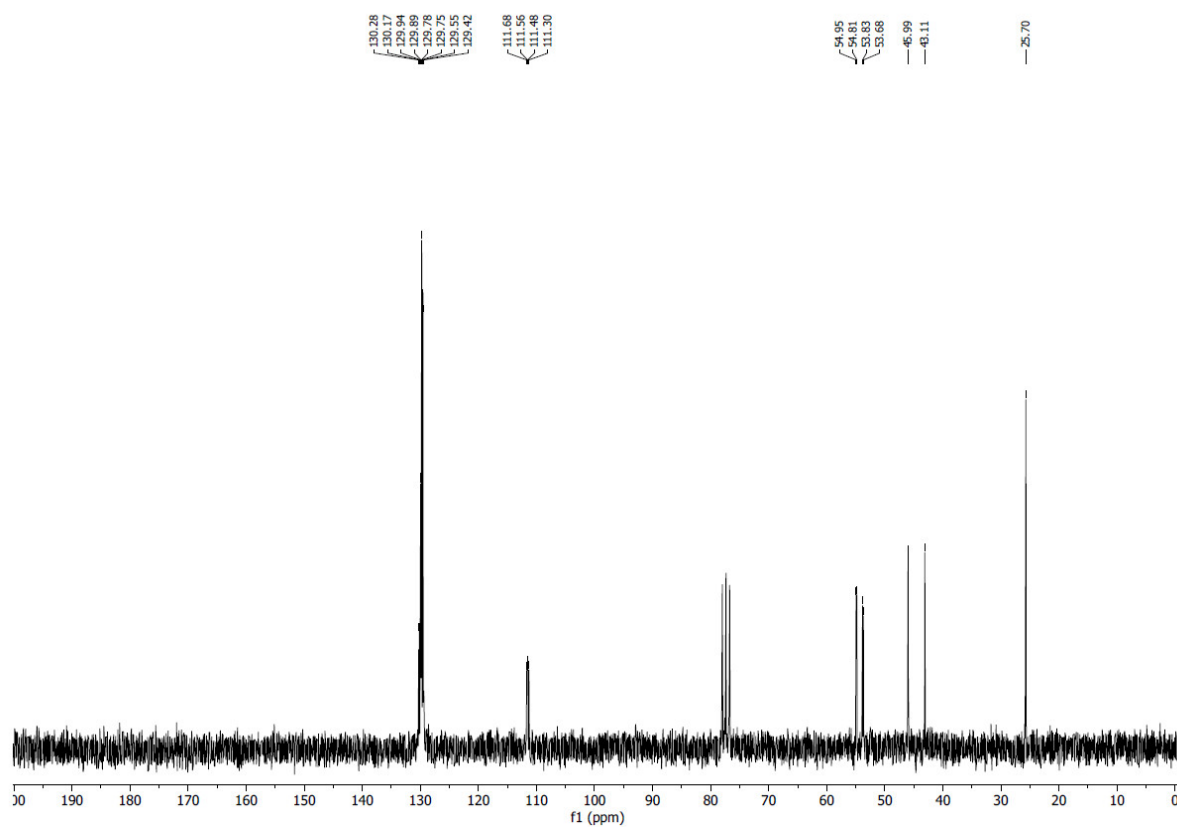


Figure S2. ^{13}C NMR (100 MHz, CDCl_3) spectra of dimethyl (2,2-dicyano-1-phenylethyl)phosphonate (1).

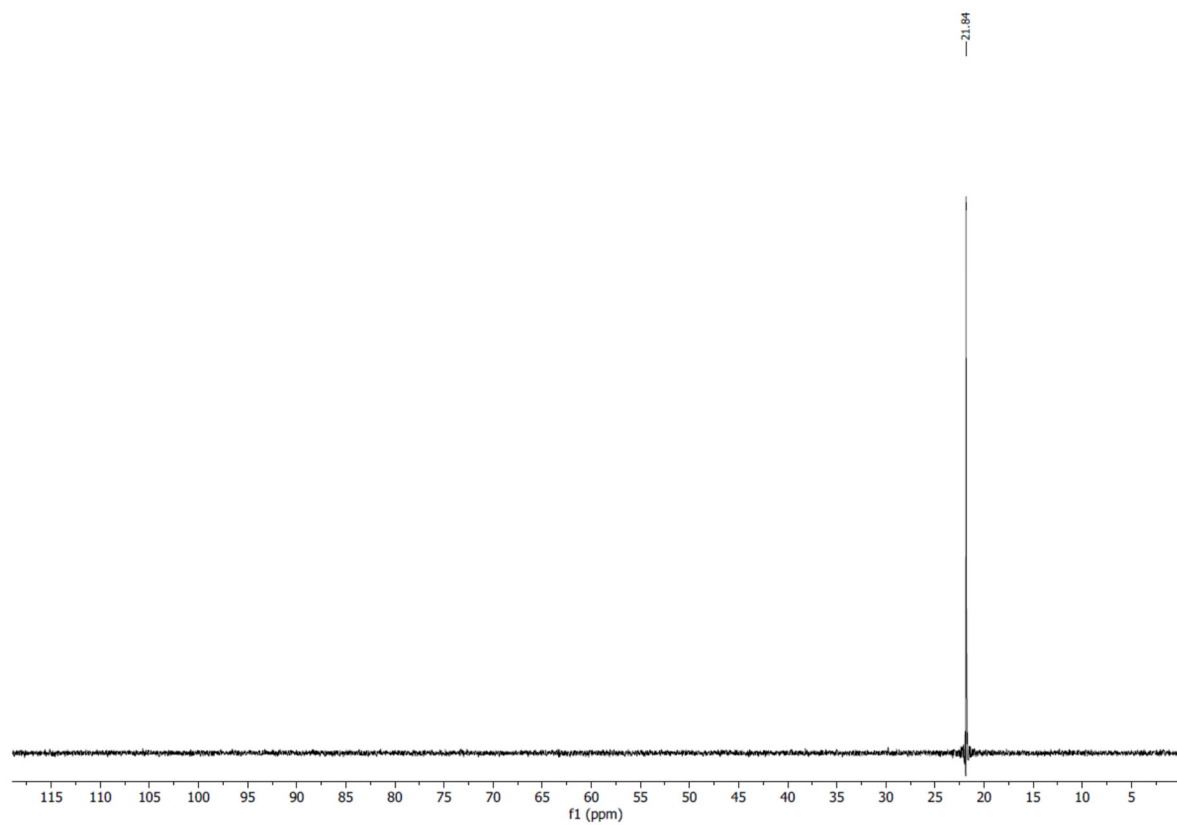


Figure S3. ^{31}P NMR (162 MHz, CDCl_3) spectra of dimethyl (2,2-dicyano-1-phenylethyl)phosphonate (1).

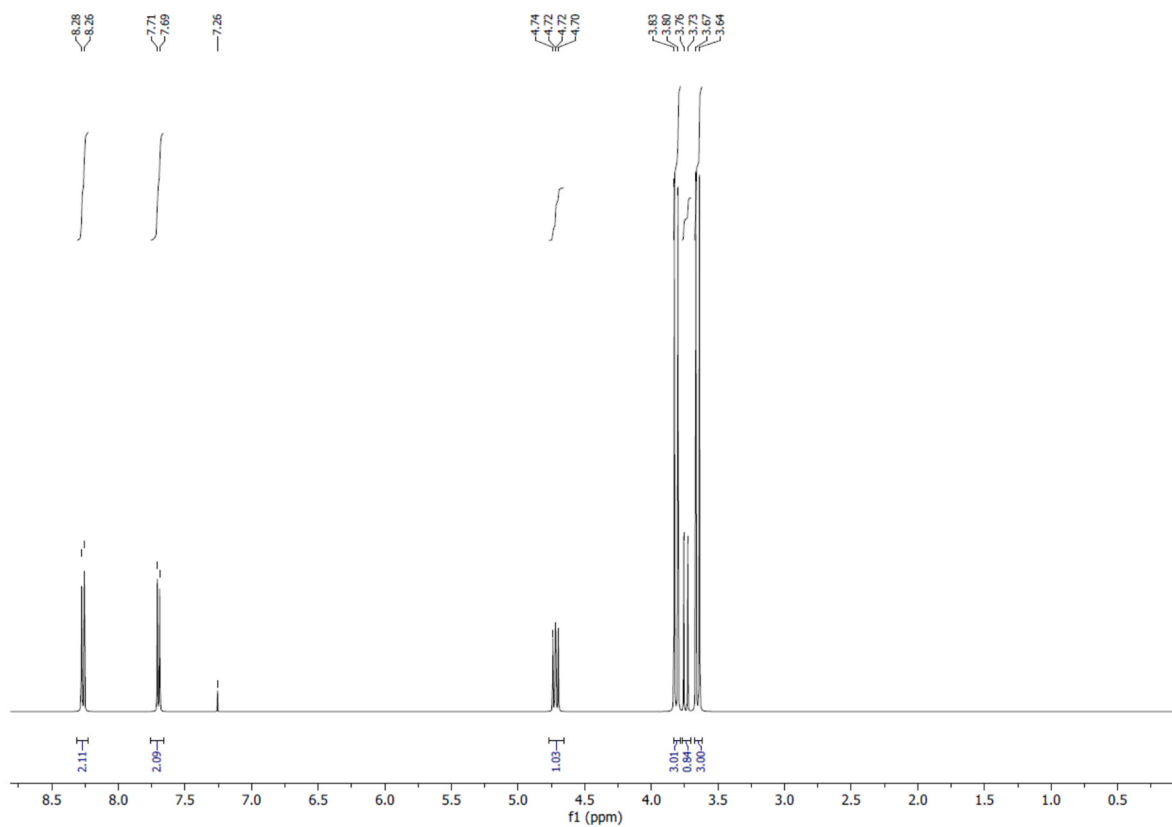


Figure S4. ¹H NMR (400 MHz, CDCl₃) spectra of dimethyl (2,2-dicyano-1-(4-methoxyphenyl)ethyl)phosphonate (2).

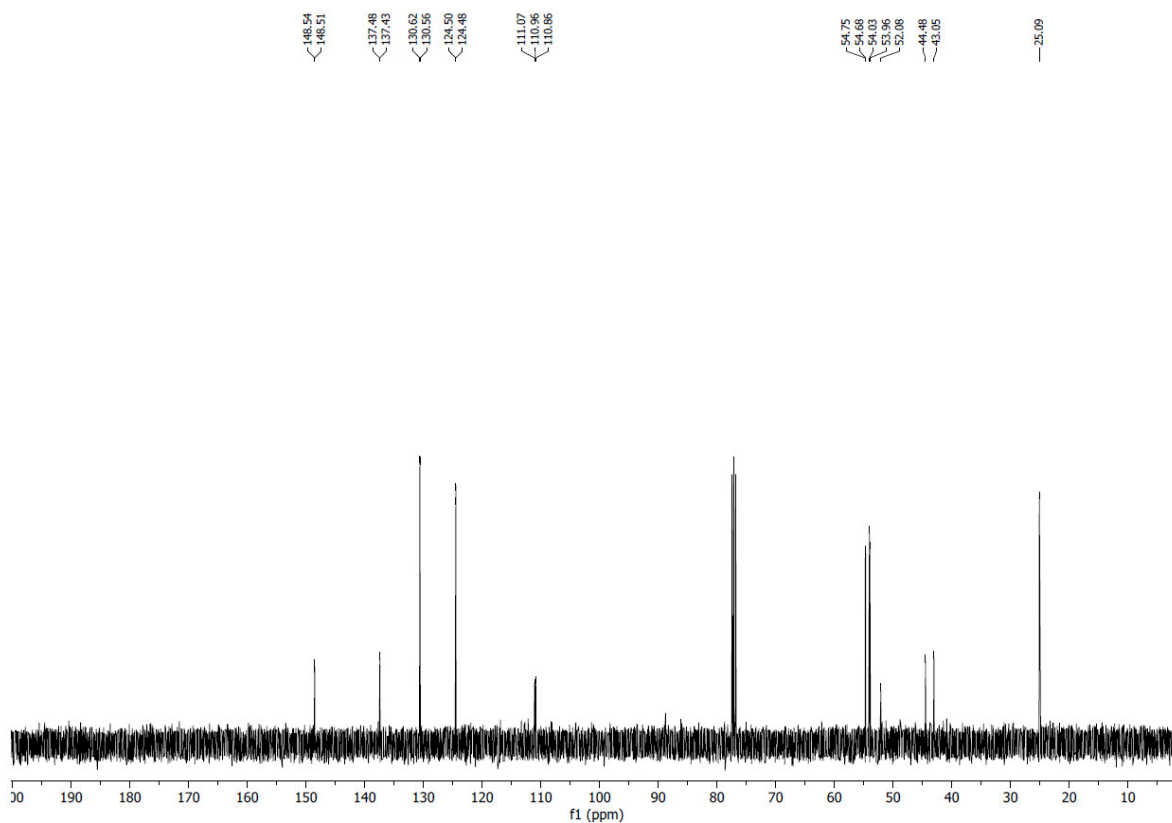


Figure S5. ¹³C NMR (100 MHz, CDCl₃) spectra of dimethyl (2,2-dicyano-1-(4-methoxyphenyl)ethyl)phosphonate (2).

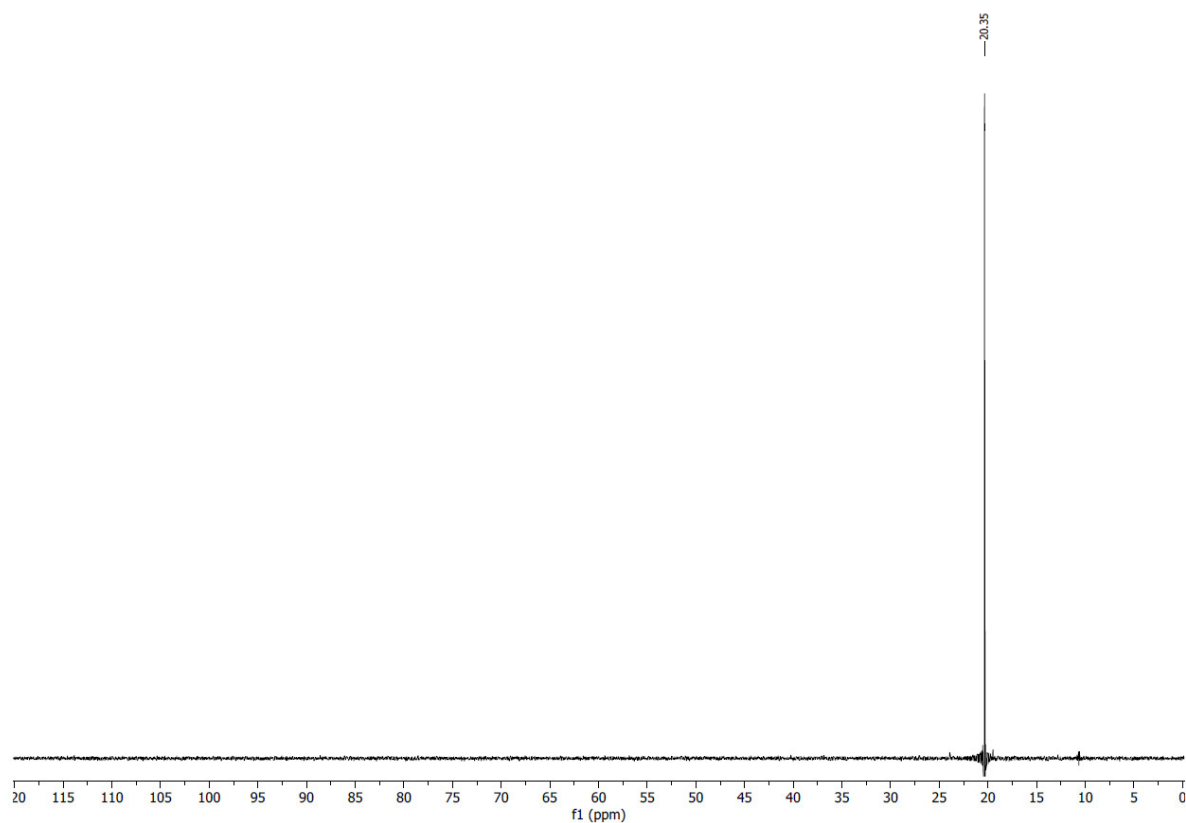


Figure S6. ³¹P NMR (162 MHz, CDCl₃) spectra of dimethyl (2,2-dicyano-1-(4-methoxyphenyl)ethyl)phosphonate (2).

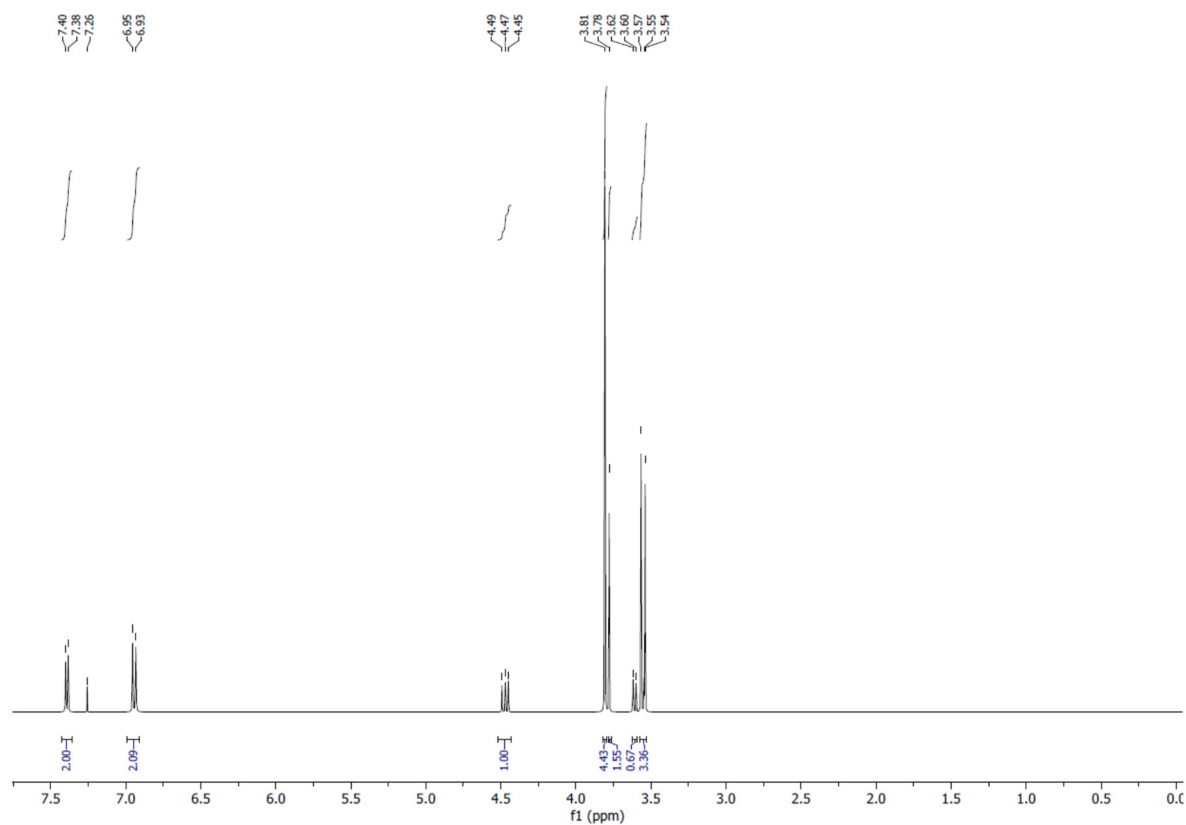


Figure S7. ¹H NMR (400 MHz, CDCl₃) spectra of dimethyl (2,2-dicyano-1-(4-methoxyphenyl)ethyl)phosphonate (3)

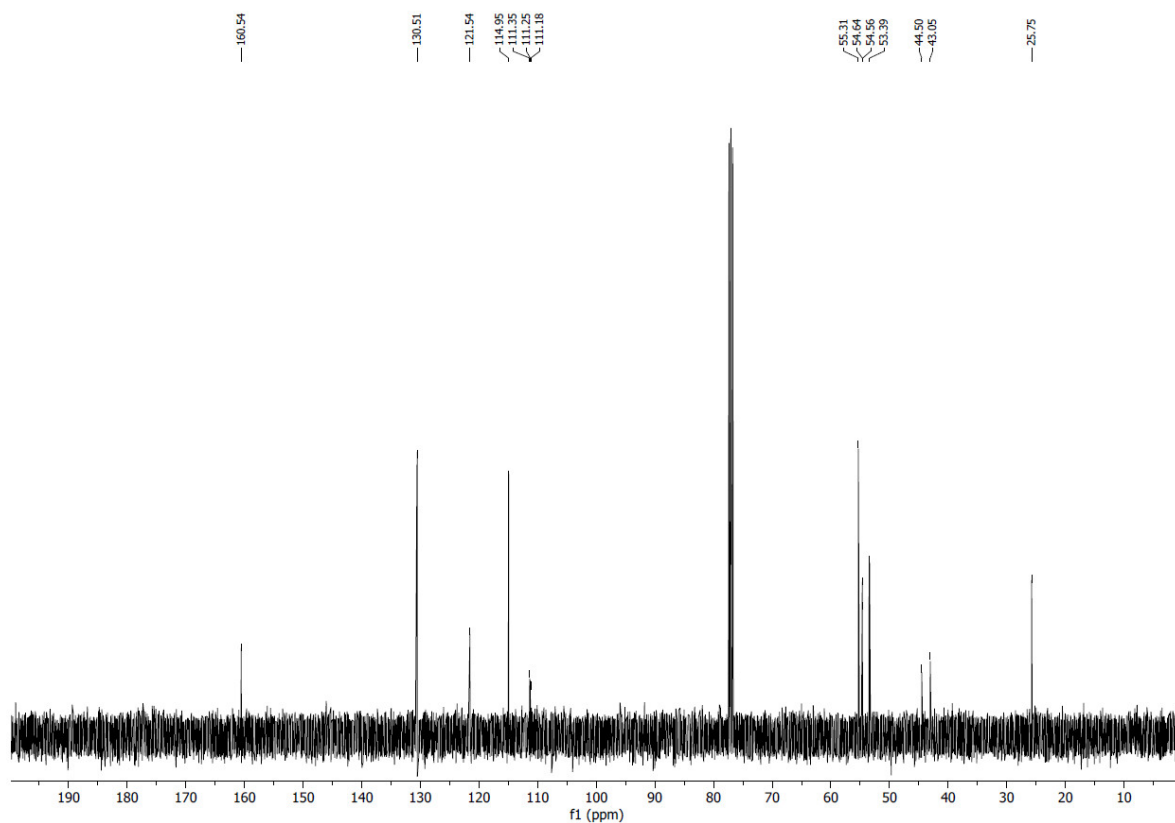


Figure S8. ^{13}C NMR (100 MHz, CDCl_3) spectra of dimethyl (2,2-dicyano-1-(4-methoxyphenyl)ethyl)phosphonate (3)

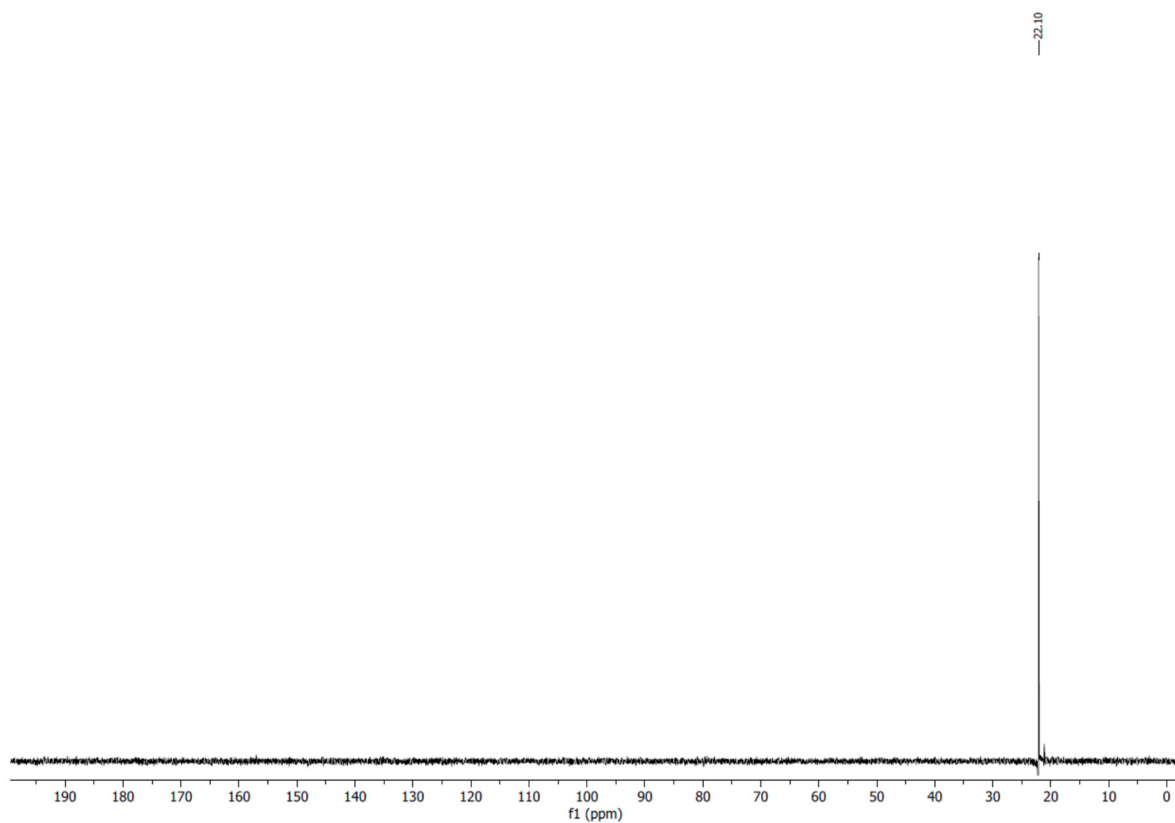


Figure S9. ^{31}P NMR (162 MHz, CDCl_3) spectra of dimethyl (2,2-dicyano-1-(4-methoxyphenyl)ethyl)phosphonate (3)

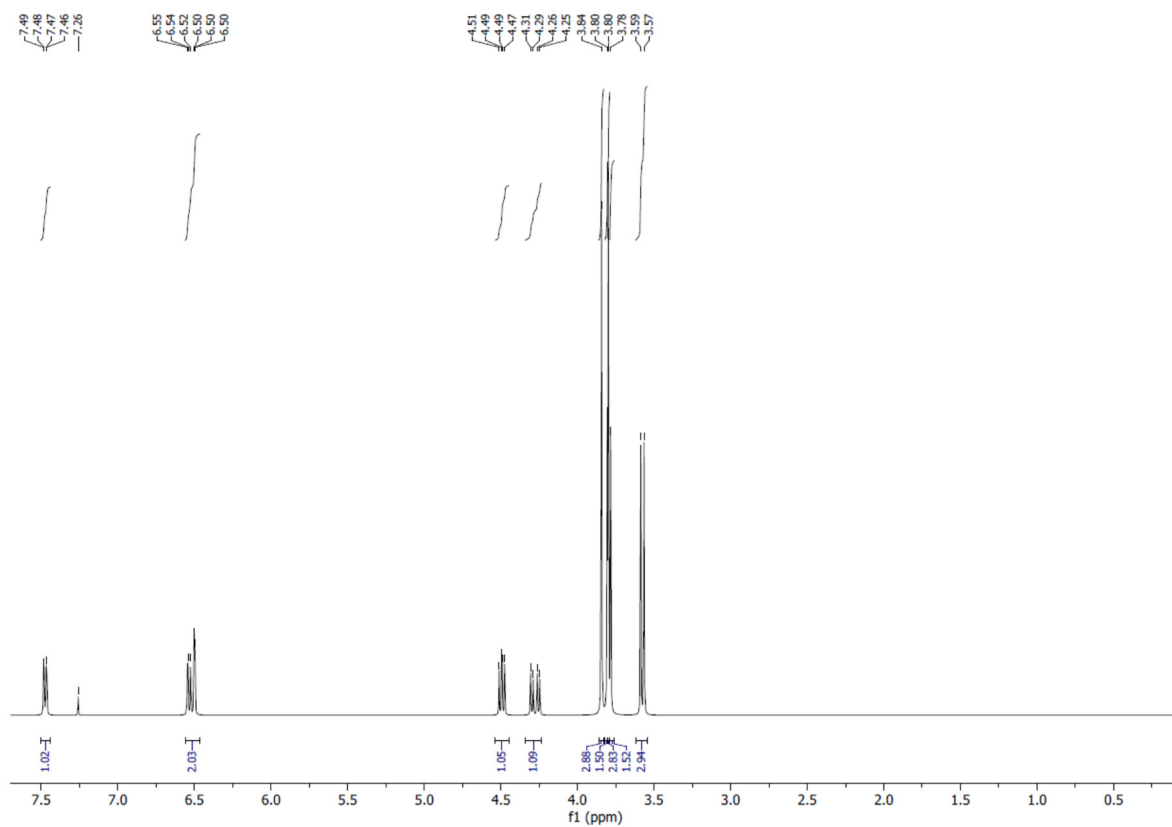


Figure S10. ¹H NMR (500 MHz, CDCl₃) spectra of dimethyl (2,2-dicyano-1-(2,4-dimethoxyphenyl)ethyl)phosphonate (4)

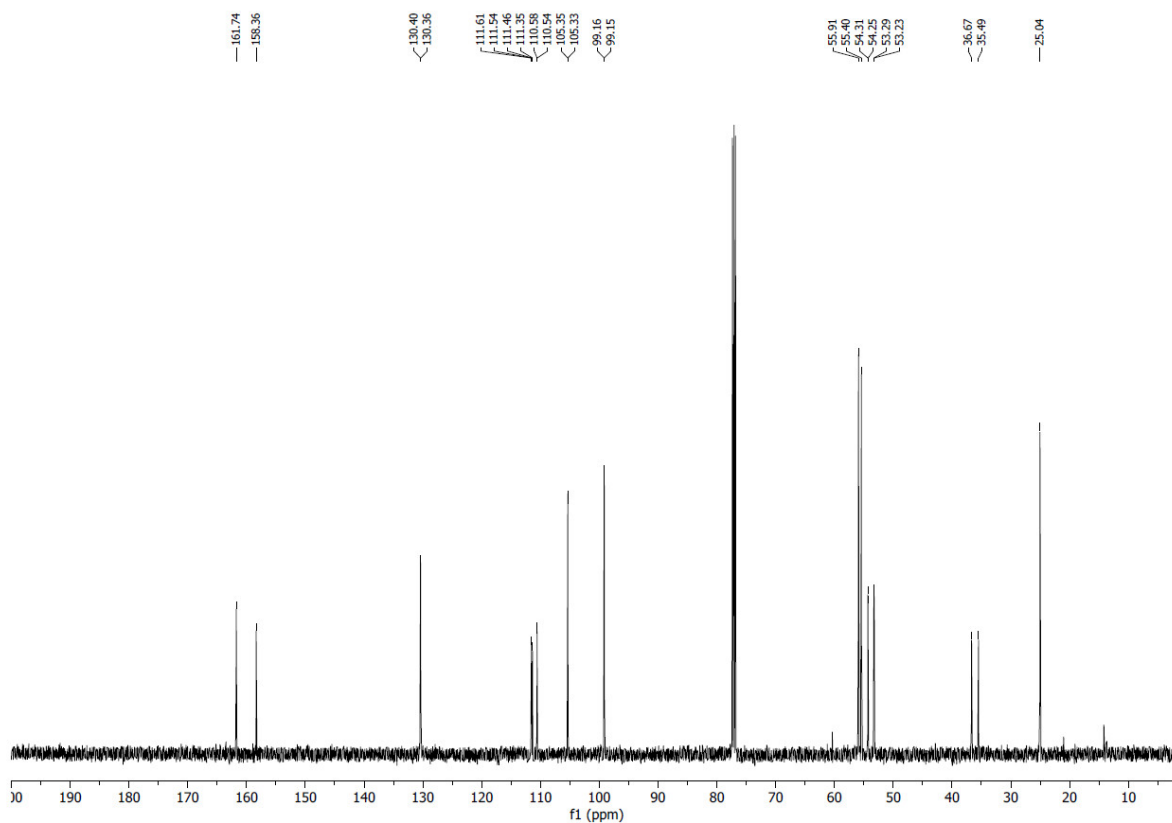


Figure S11. ¹³C NMR (125 MHz, CDCl₃) spectra of dimethyl (2,2-dicyano-1-(2,4-dimethoxyphenyl)ethyl)phosphonate (4)

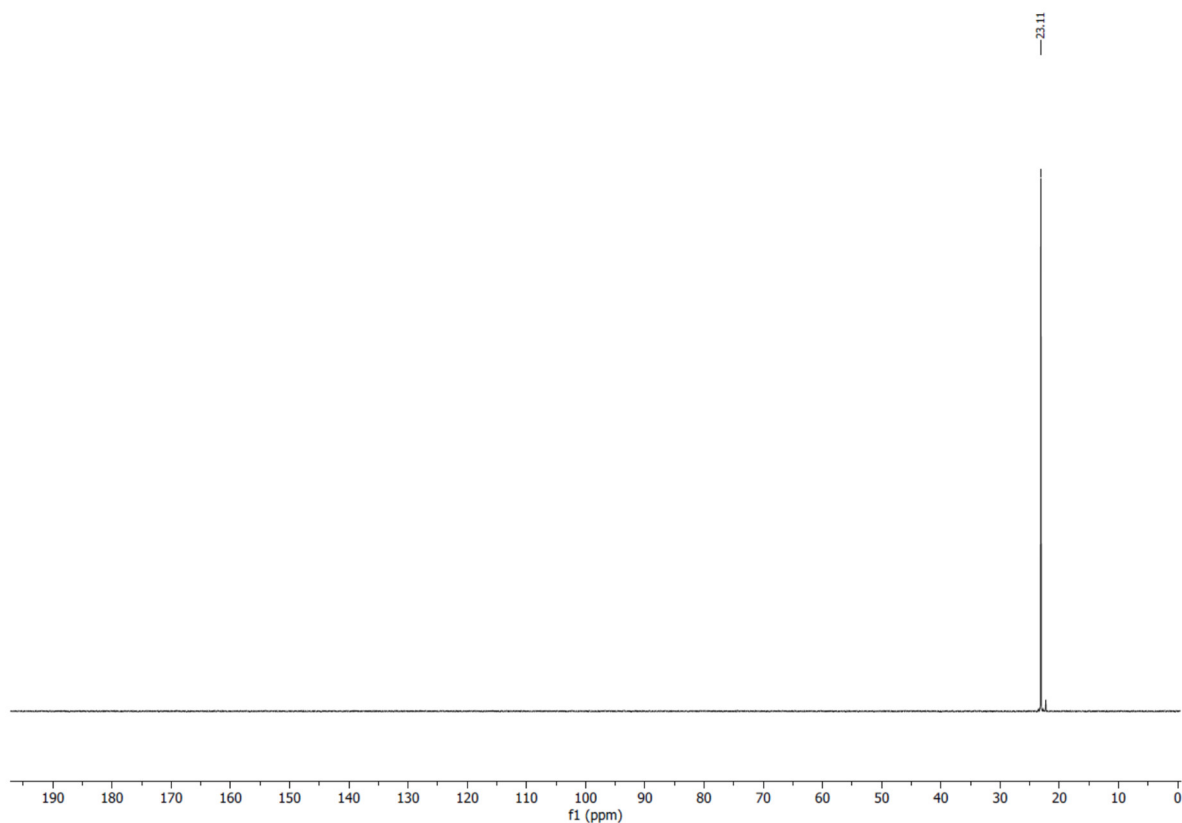


Figure S12. ^{31}P NMR (203 MHz, CDCl_3) spectra of dimethyl (2,2-dicyano-1-(2,4-dimethoxyphenyl)ethyl)phosphonate (4)

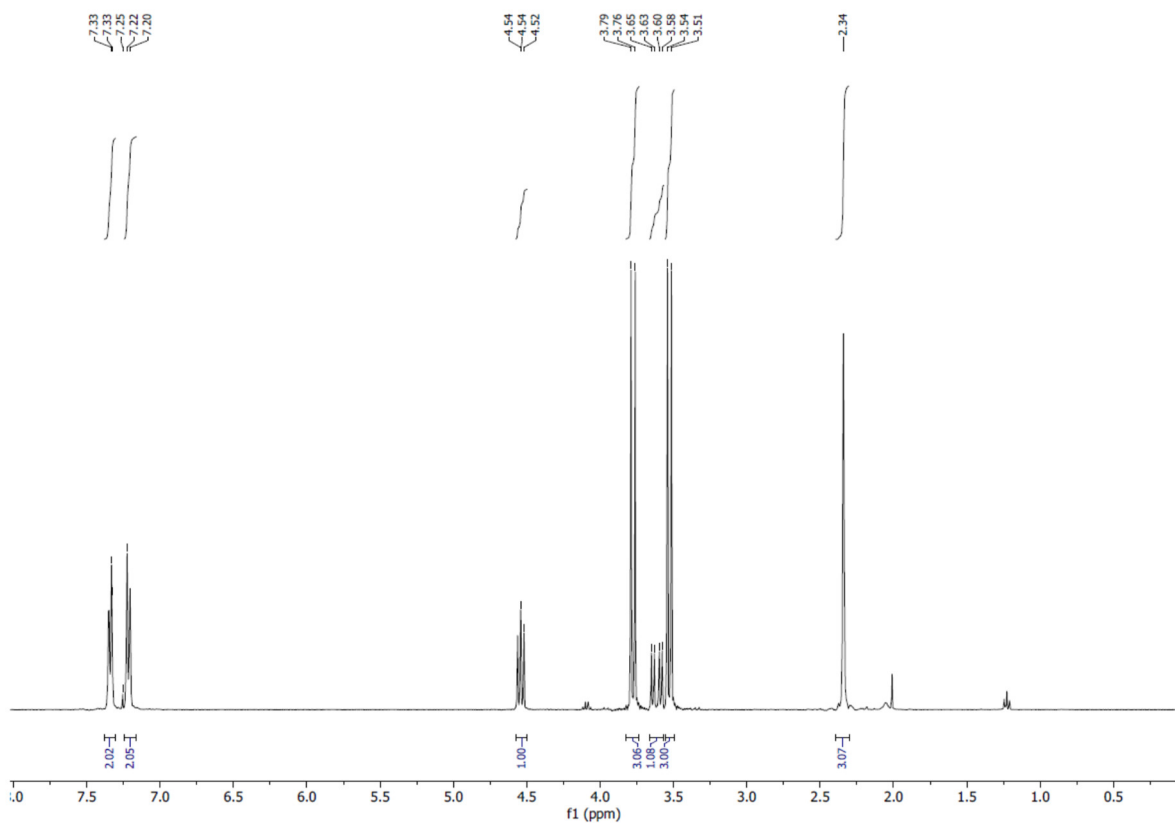


Figure S13. ^1H NMR (400 MHz, CDCl_3) spectra of dimethyl (2,2-dicyano-1-(4-methylphenyl)ethyl)phosphonate (5).

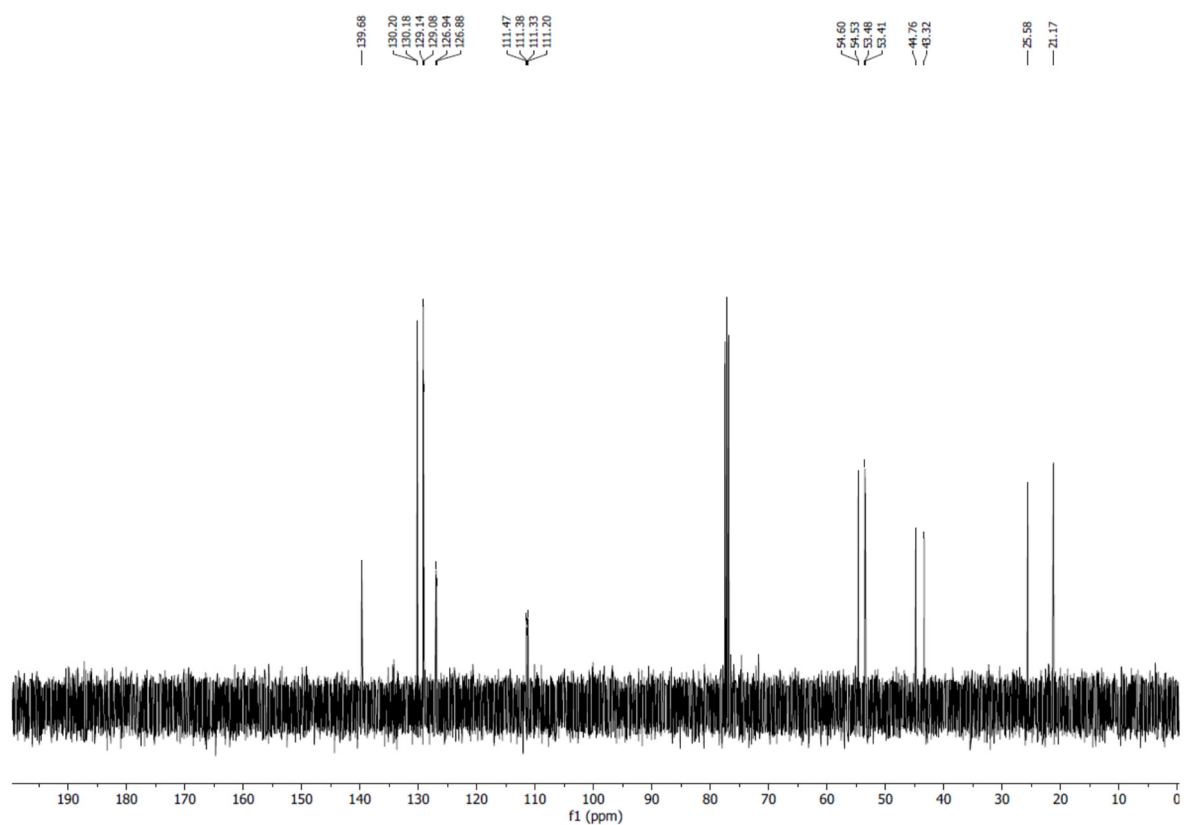


Figure S14. ^{13}C NMR (100 MHz, CDCl_3) spectra of dimethyl (2,2-dicyano-1-(4-methylphenyl)ethyl)phosphonate (**5**).

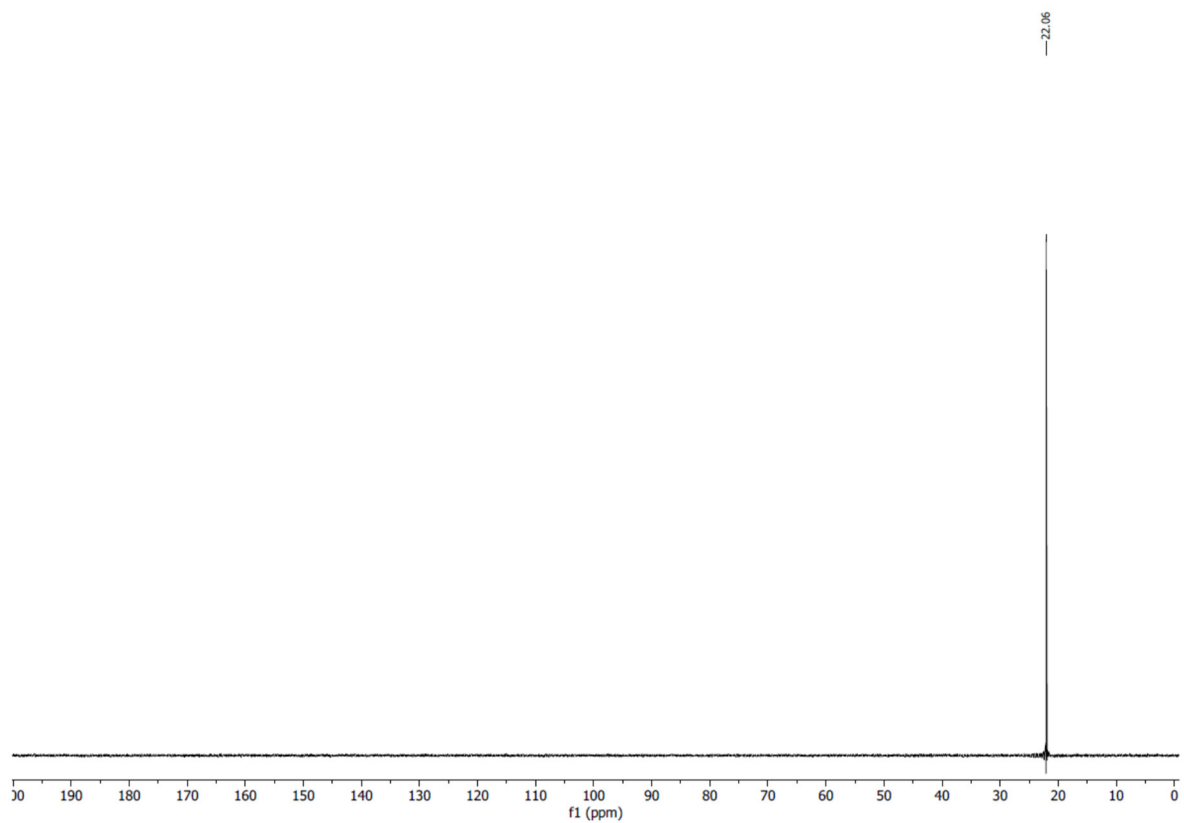


Figure S15. ^{31}P NMR (162 MHz, CDCl_3) spectra of dimethyl (2,2-dicyano-1-(4-methylphenyl)ethyl)phosphonate (**5**).

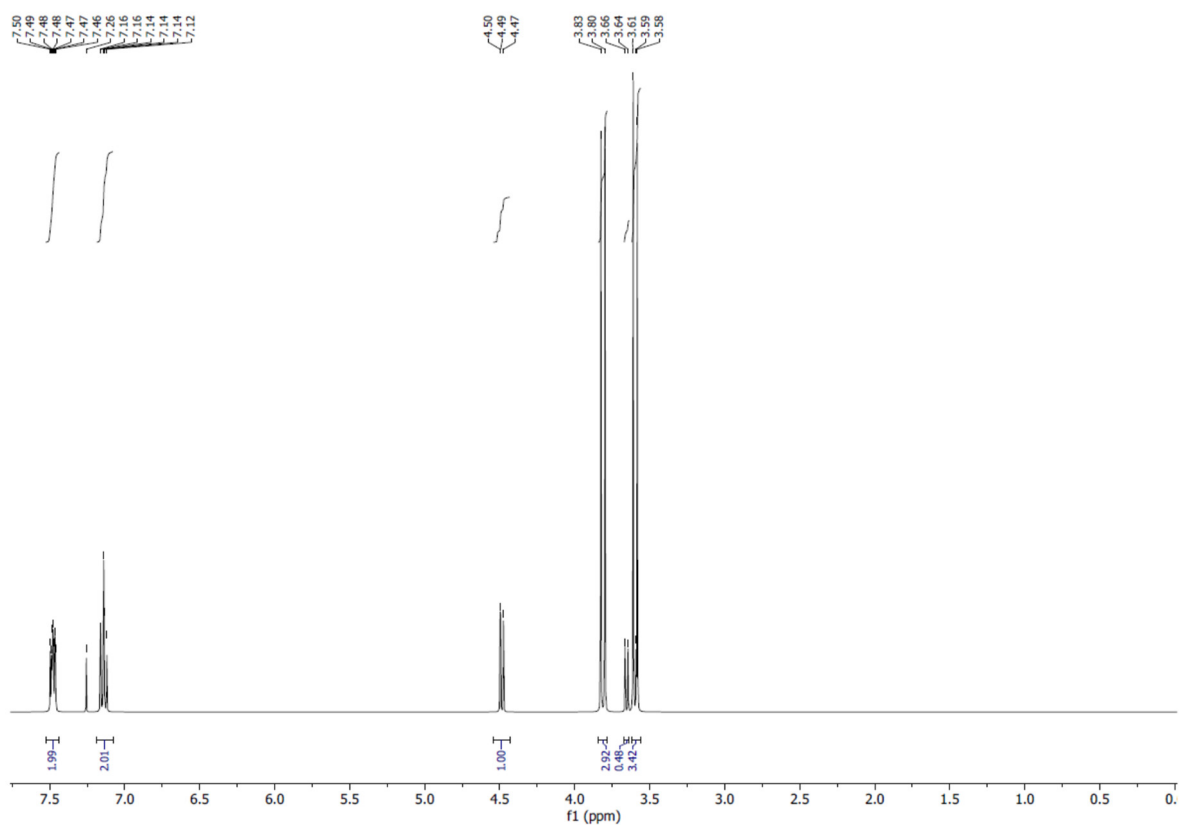


Figure S16. ¹H NMR (400 MHz, CDCl₃) spectra of dimethyl (2,2-dicyano-1-(4-fluorophenyl)ethyl)phosphonate (6).

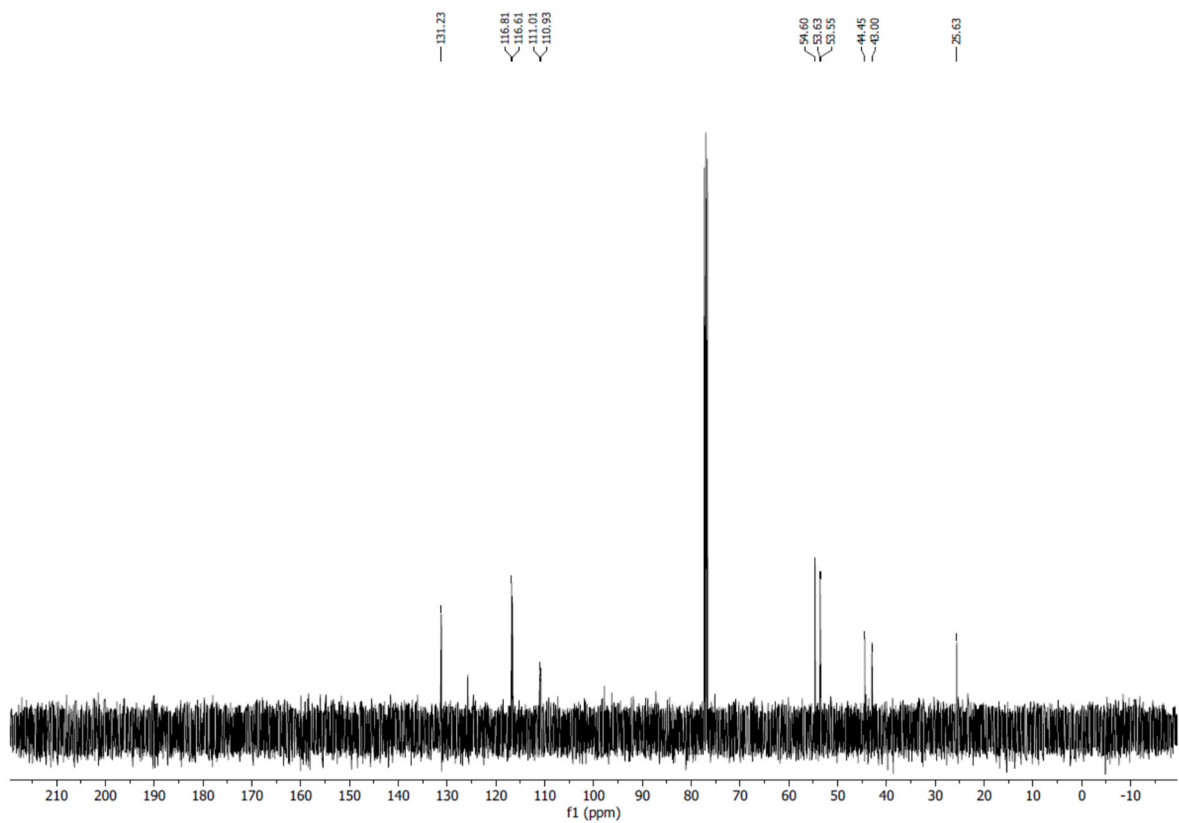


Figure S17. ¹³C NMR (100 MHz, CDCl₃) spectra of dimethyl (2,2-dicyano-1-(4-fluorophenyl)ethyl)phosphonate (6).

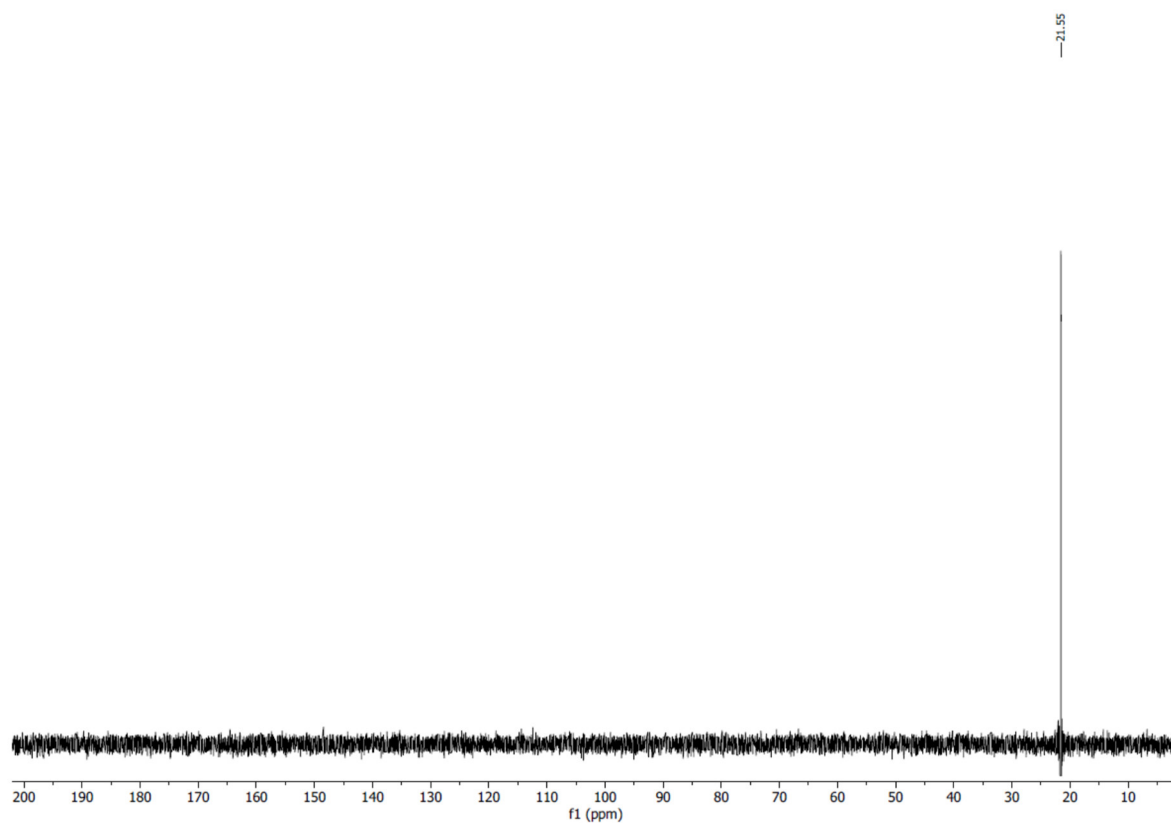


Figure S18. ^{31}P NMR (162 MHz, CDCl_3) spectra of dimethyl (2,2-dicyano-1-(4-fluorophenyl)ethyl)phosphonate (**6**).

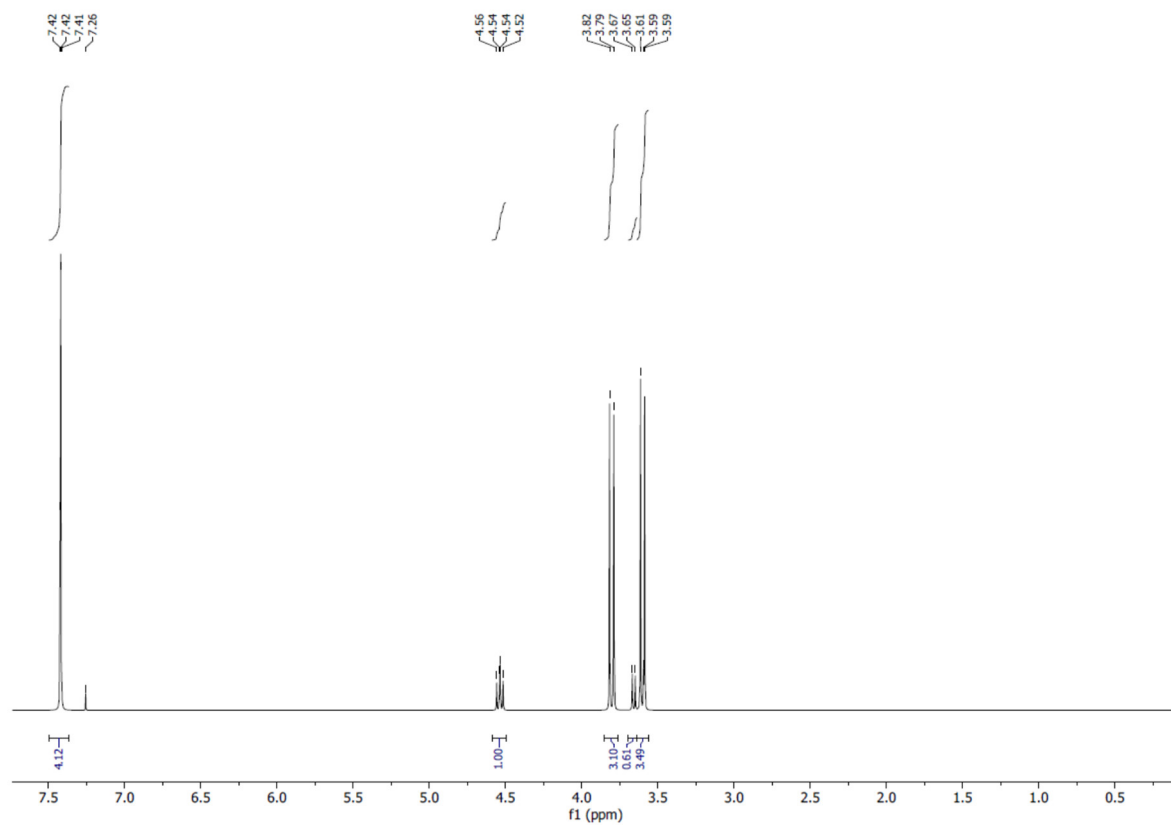


Figure S19. ^1H NMR (400 MHz, CDCl_3) spectra of dimethyl (2,2-dicyano-1-(4-chlorophenyl)ethyl)phosphonate (**7**).

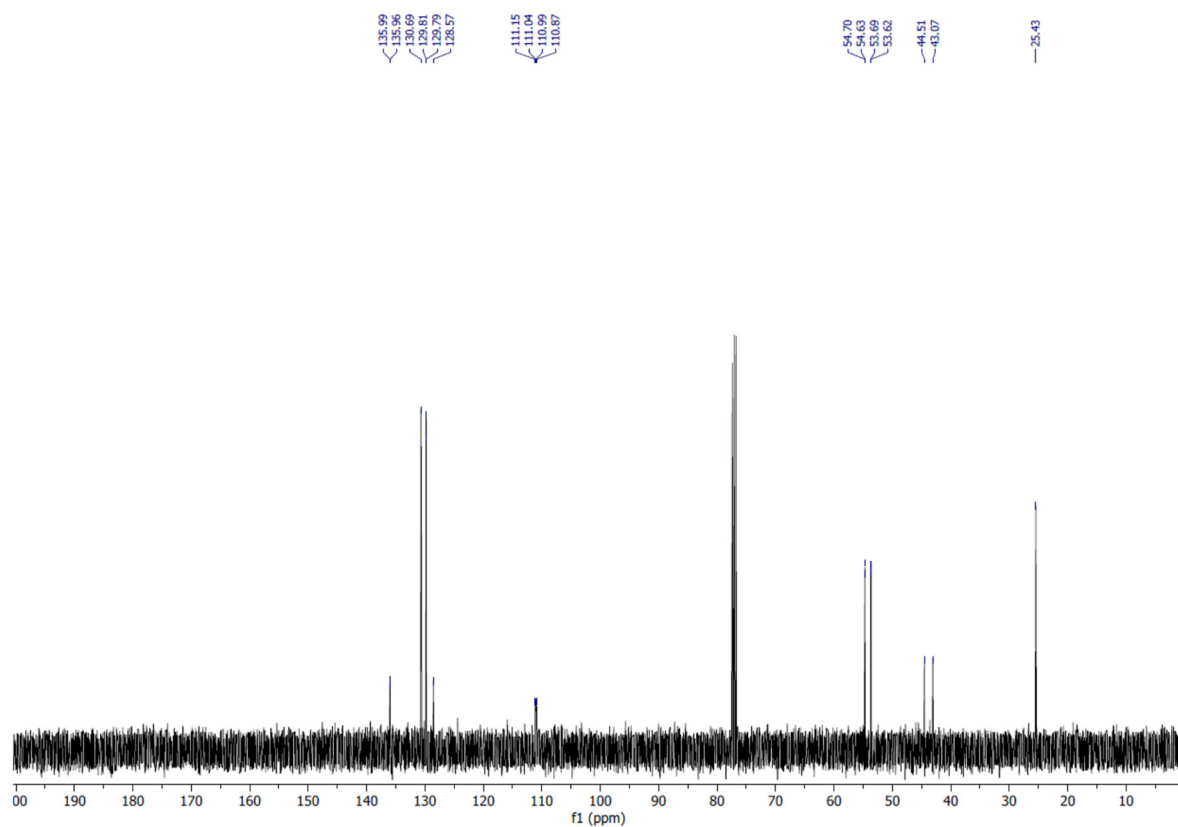


Figure S20. ¹³C NMR (100 MHz, CDCl₃) spectra of dimethyl (2,2-dicyano-1-(4-chlorophenyl)ethyl)phosphonate (7).

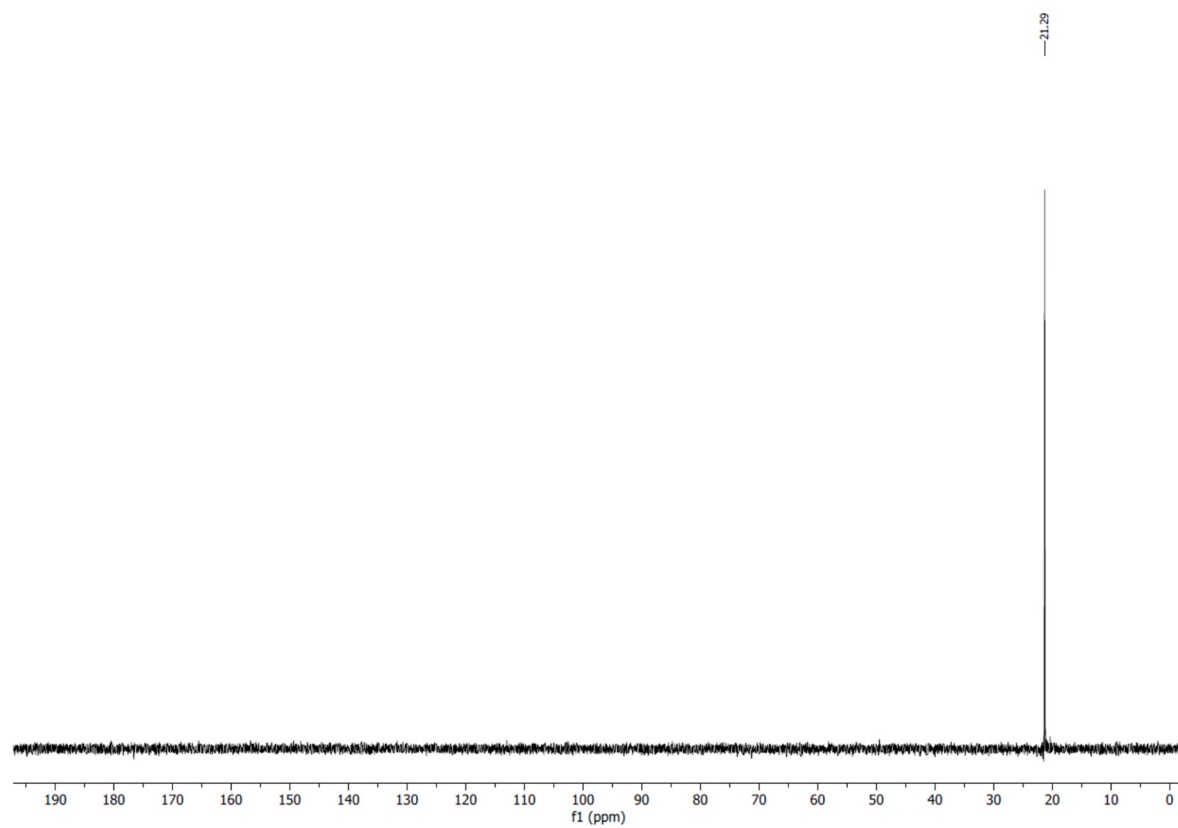


Figure S21. ³¹P NMR (162 MHz, CDCl₃) spectra of dimethyl (2,2-dicyano-1-(4-chlorophenyl)ethyl)phosphonate (7).

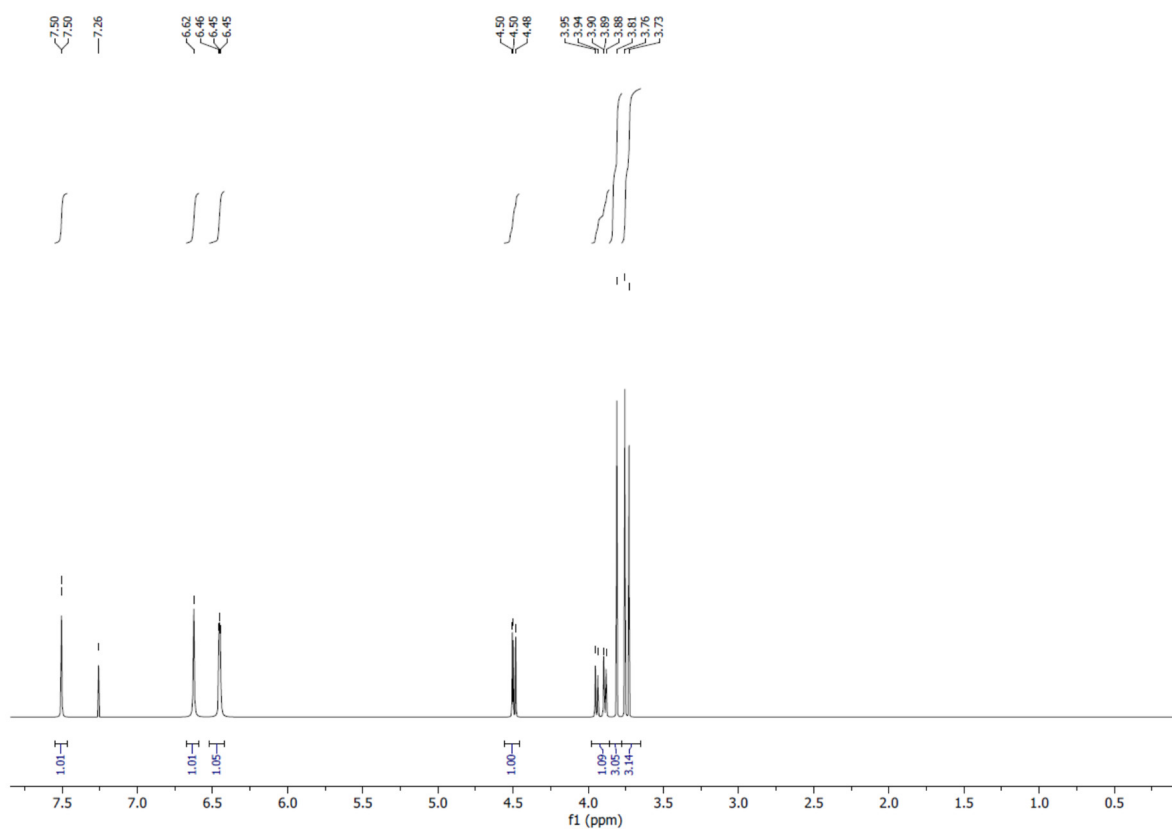


Figure S22. ¹H NMR (400 MHz, CDCl₃) spectra of dimethyl (2,2-dicyano-1-(furan-2-yl)ethyl)phosphonate (8).

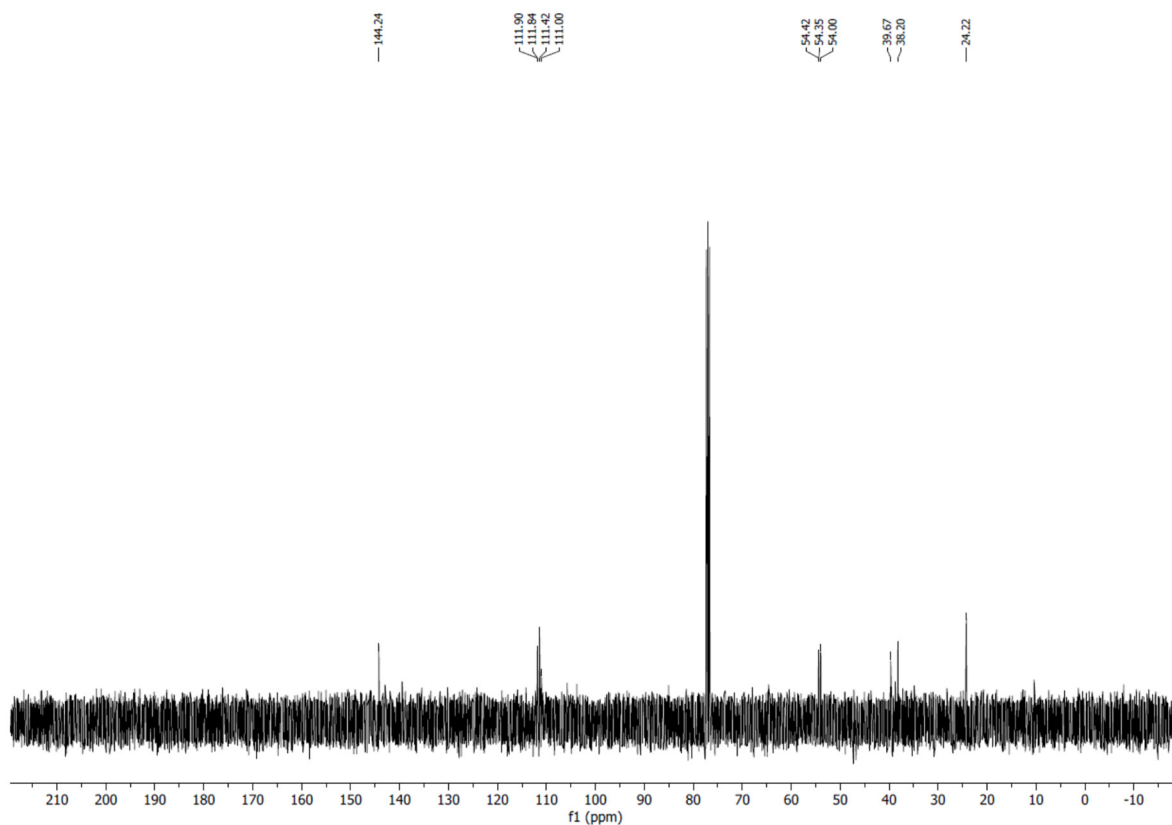


Figure S23. ¹³C NMR (100 MHz, CDCl₃) spectra of dimethyl (2,2-dicyano-1-(furan-2-yl)ethyl)phosphonate (8).

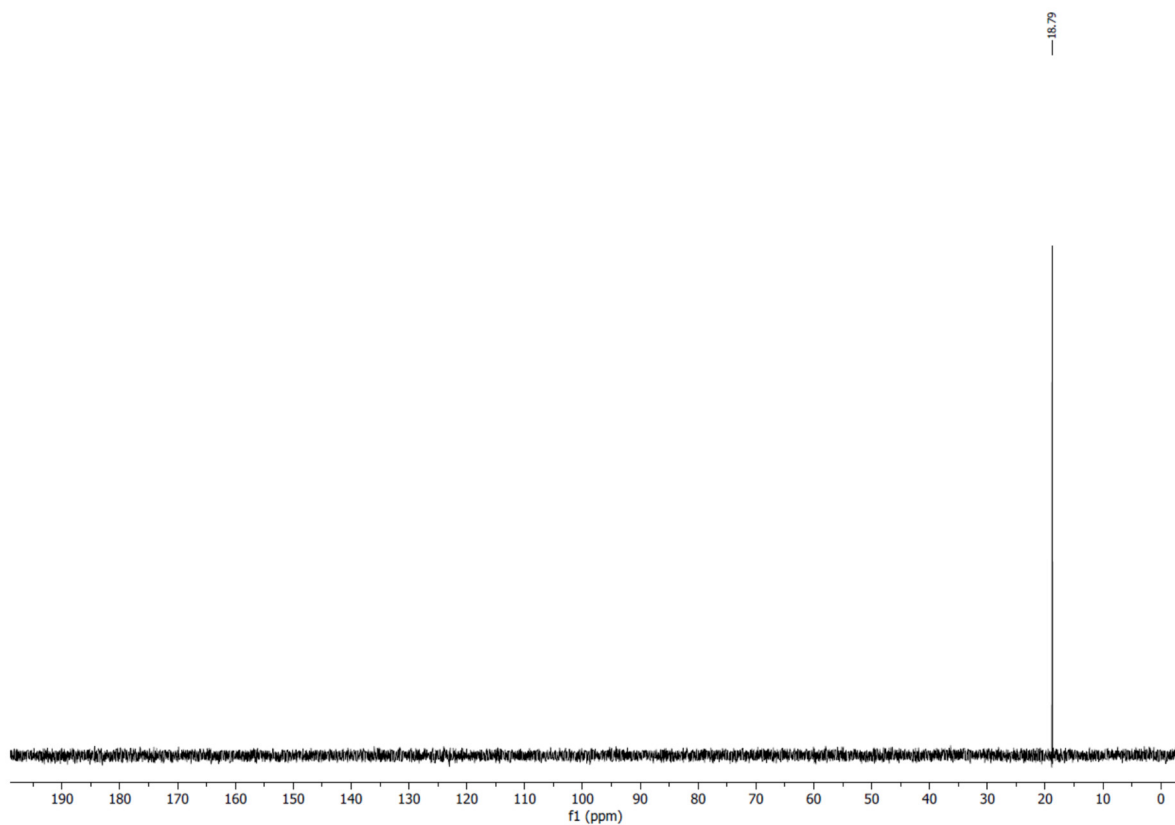


Figure S24. ^{31}P NMR (162 MHz, CDCl_3) spectra of dimethyl (2,2-dicyano-1-(furan-2-yl)ethyl)phosphonate (8).

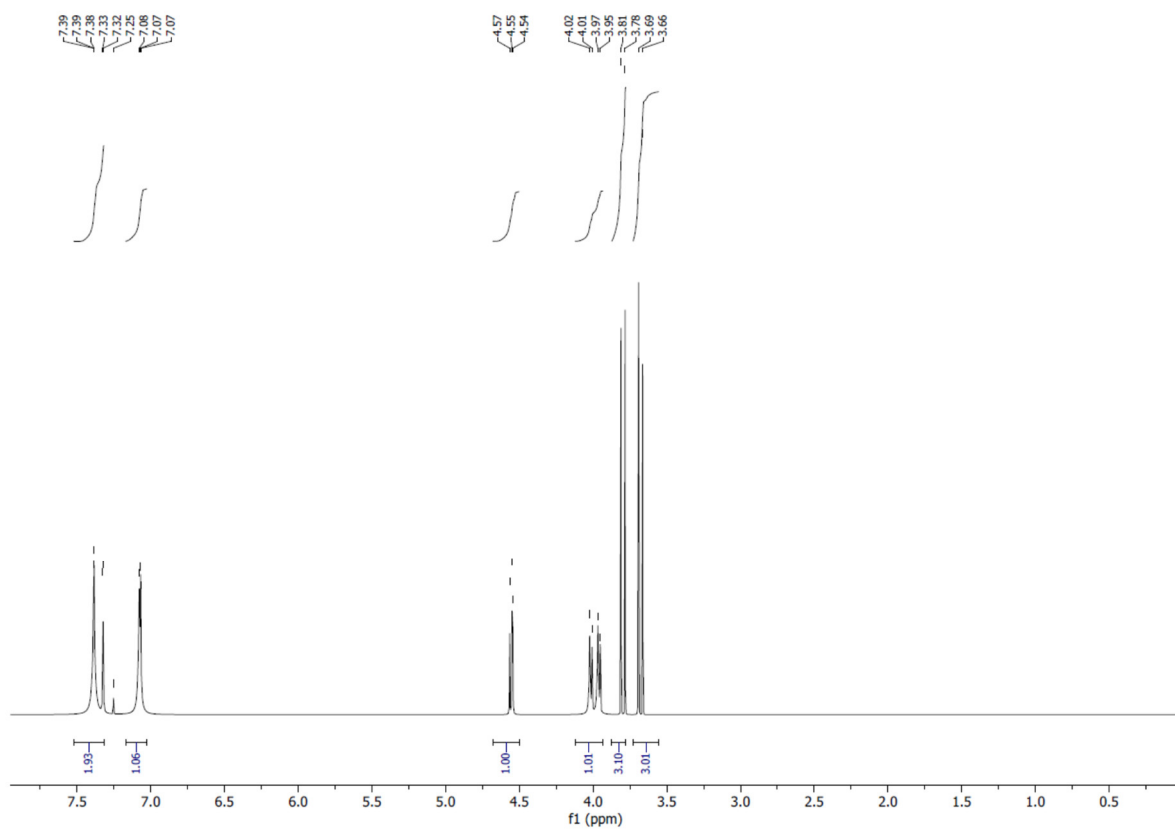


Figure S25. ^1H NMR (400 MHz, CDCl_3) spectra of dimethyl (2,2-dicyano-1-(thiophen-2-yl)ethyl)phosphonate (9).

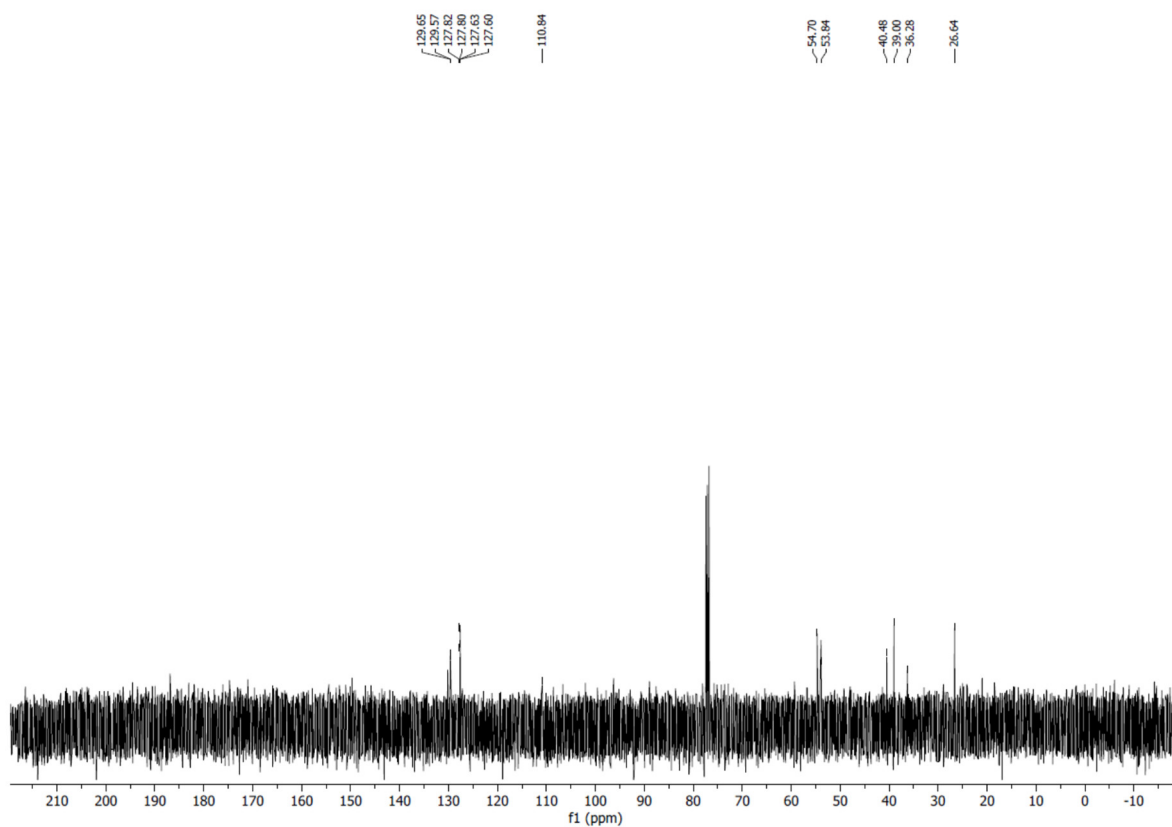


Figure S26. ^{13}C NMR (100 MHz, CDCl_3) spectra of dimethyl (2,2-dicyano-1-(thiophen-2-yl)ethyl)phosphonate (**9**).

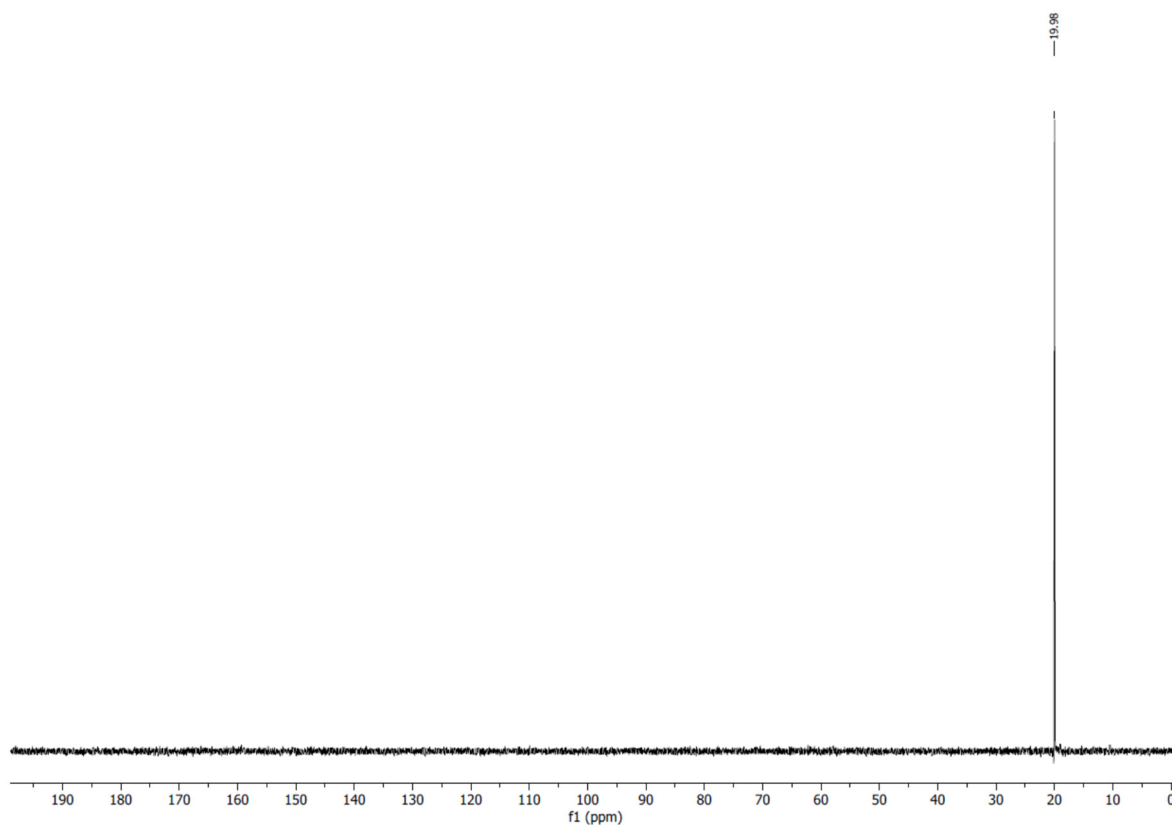


Figure S27. ^{31}P NMR (162 MHz, CDCl_3) spectra of dimethyl (2,2-dicyano-1-(thiophen-2-yl)ethyl)phosphonate (**9**).

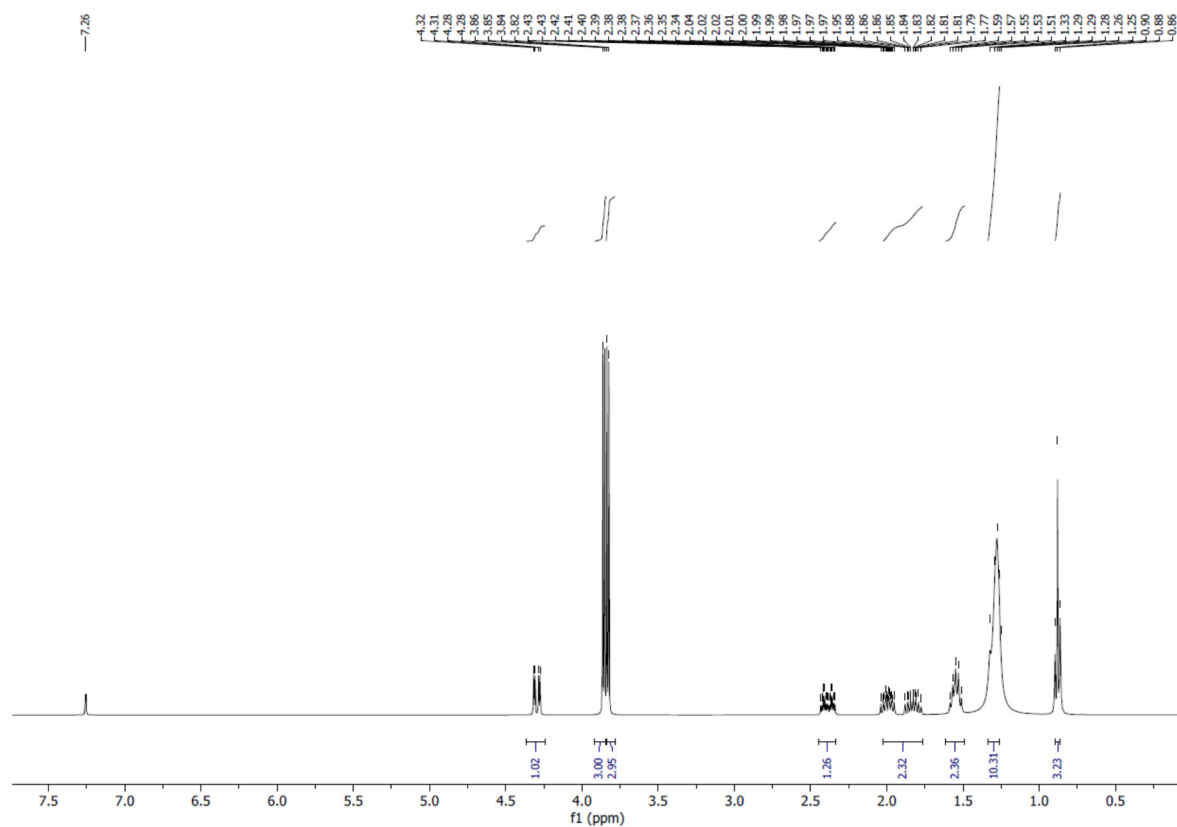


Figure S28. ¹H NMR (400 MHz, CDCl₃) spectra of dimethyl (2,2-dicyano-1-monooctyl)phosphonate (10).

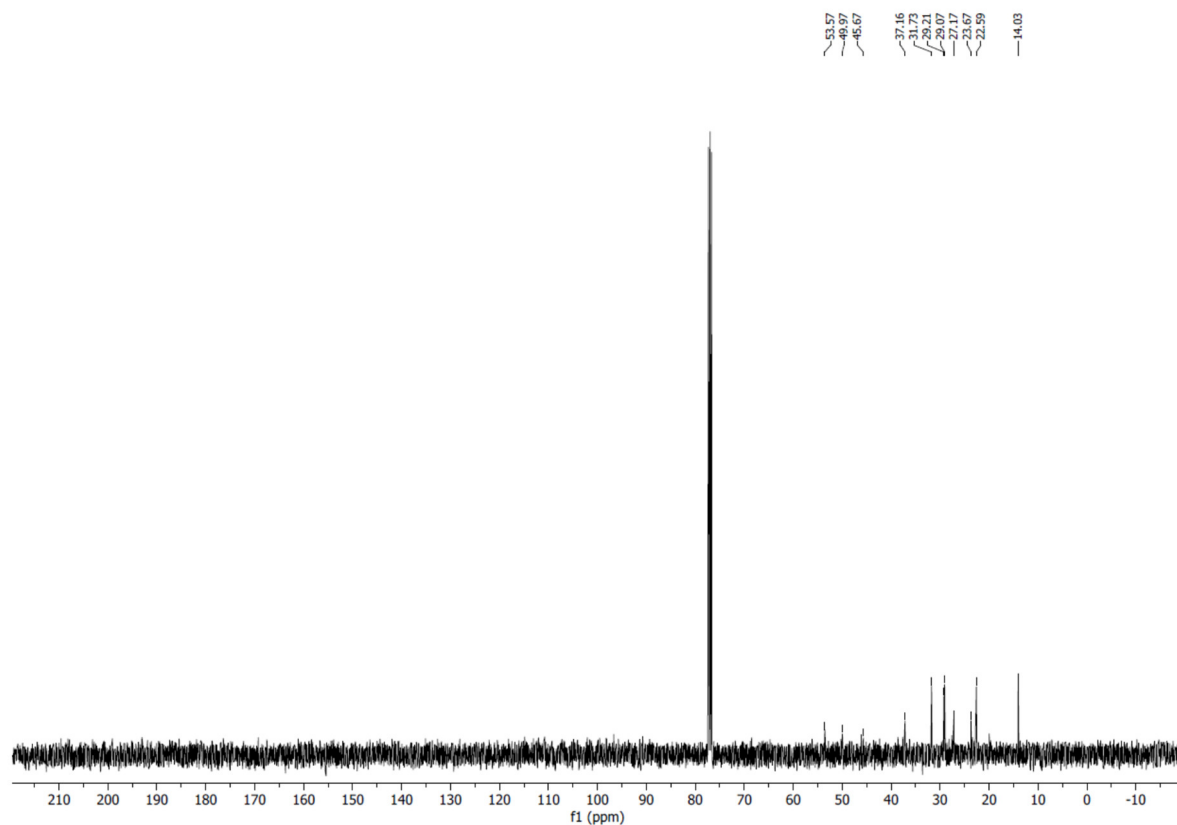


Figure S29. ¹³C NMR (100 MHz, CDCl₃) spectra of dimethyl (2,2-dicyano-1-monooctyl)phosphonate (10).

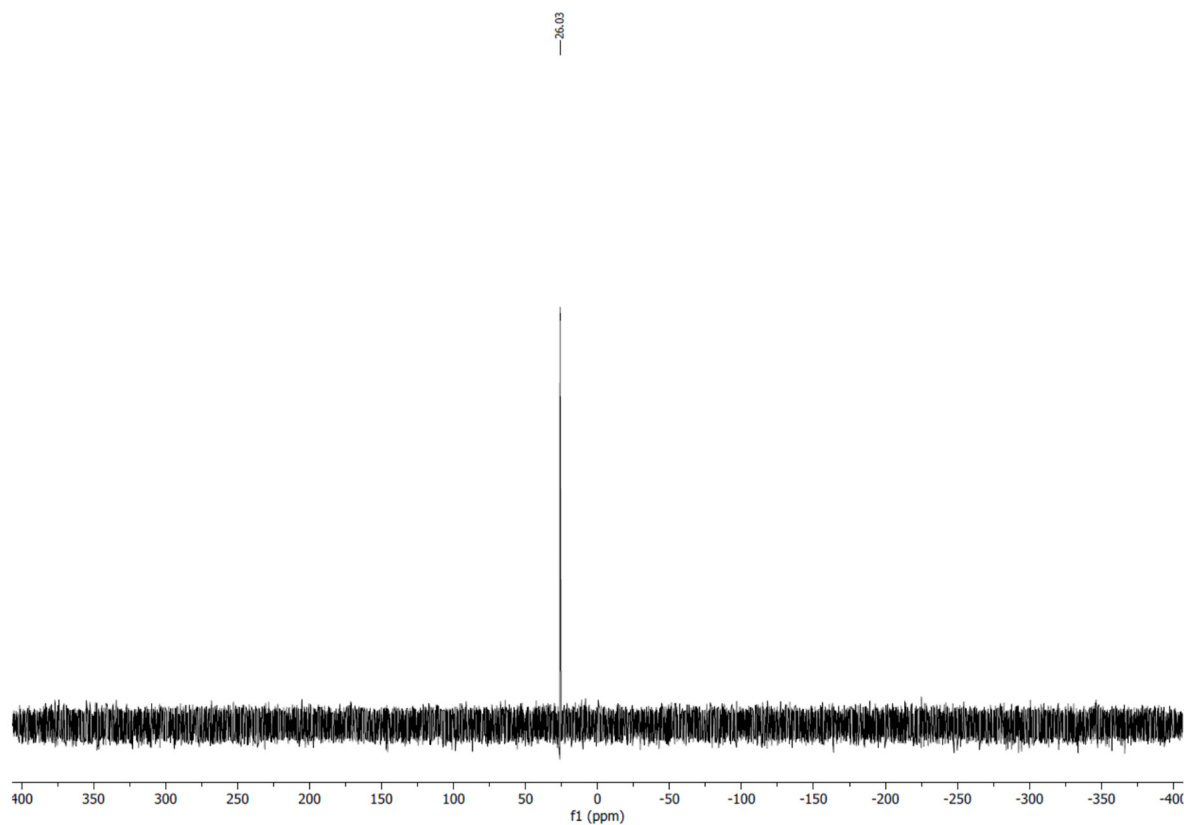


Figure S30. ^{31}P NMR (162 MHz, CDCl_3) spectra of dimethyl (2,2-dicyano-1-monooctyl)phosphonate (10).

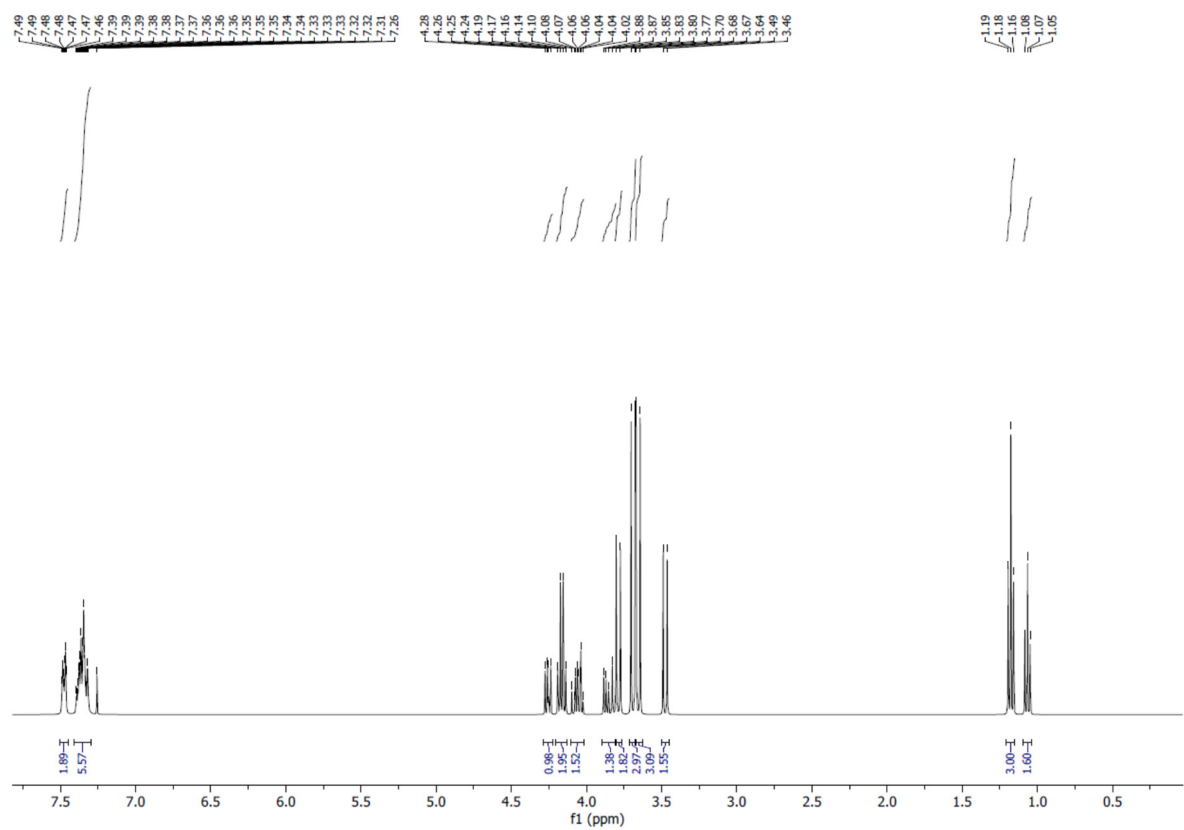


Figure S31. ^1H NMR (400 MHz, CDCl_3) spectra of 2-cyano-3-(dimethoxy-phosphoryl)-3-phenyl-propionic acid ethyl ester (11).

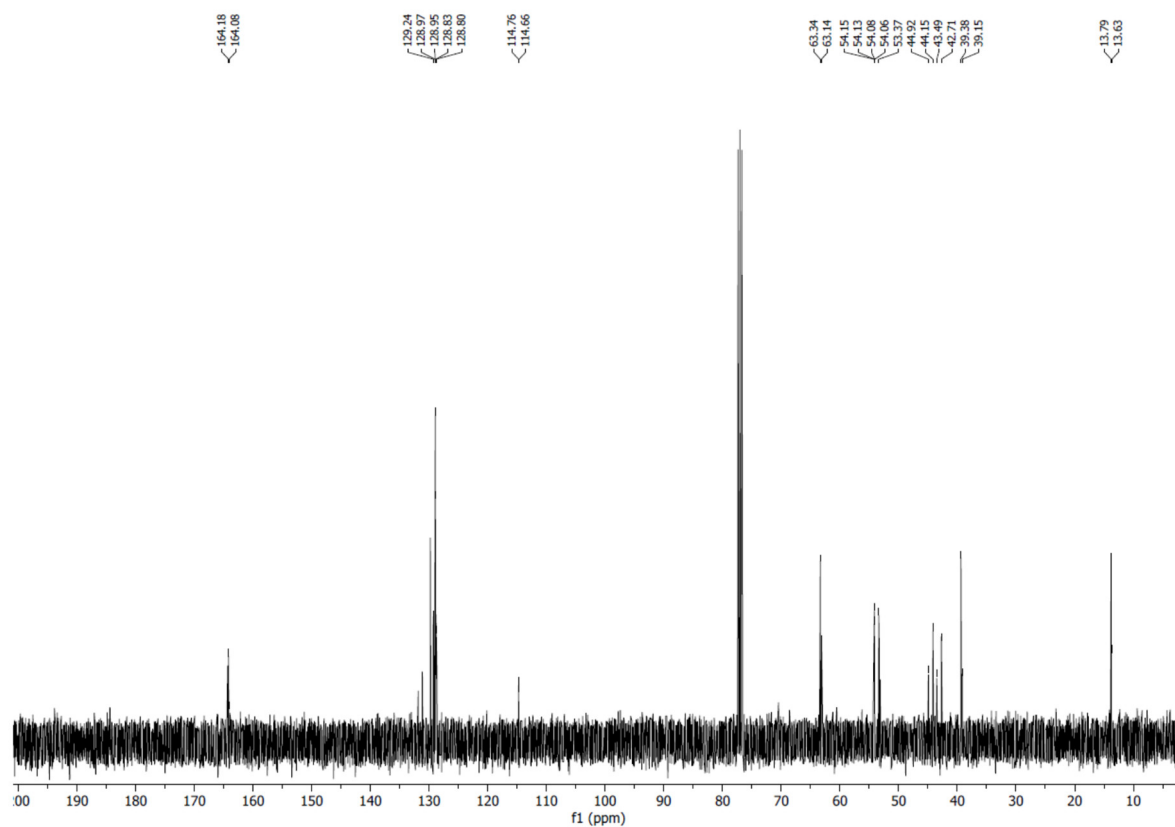


Figure S32. ^{13}C NMR (100 MHz, CDCl_3) spectra of 2-cyano-3-(dimethoxy-phosphoryl)-3-phenylpropionic acid ethyl ester (**11**).

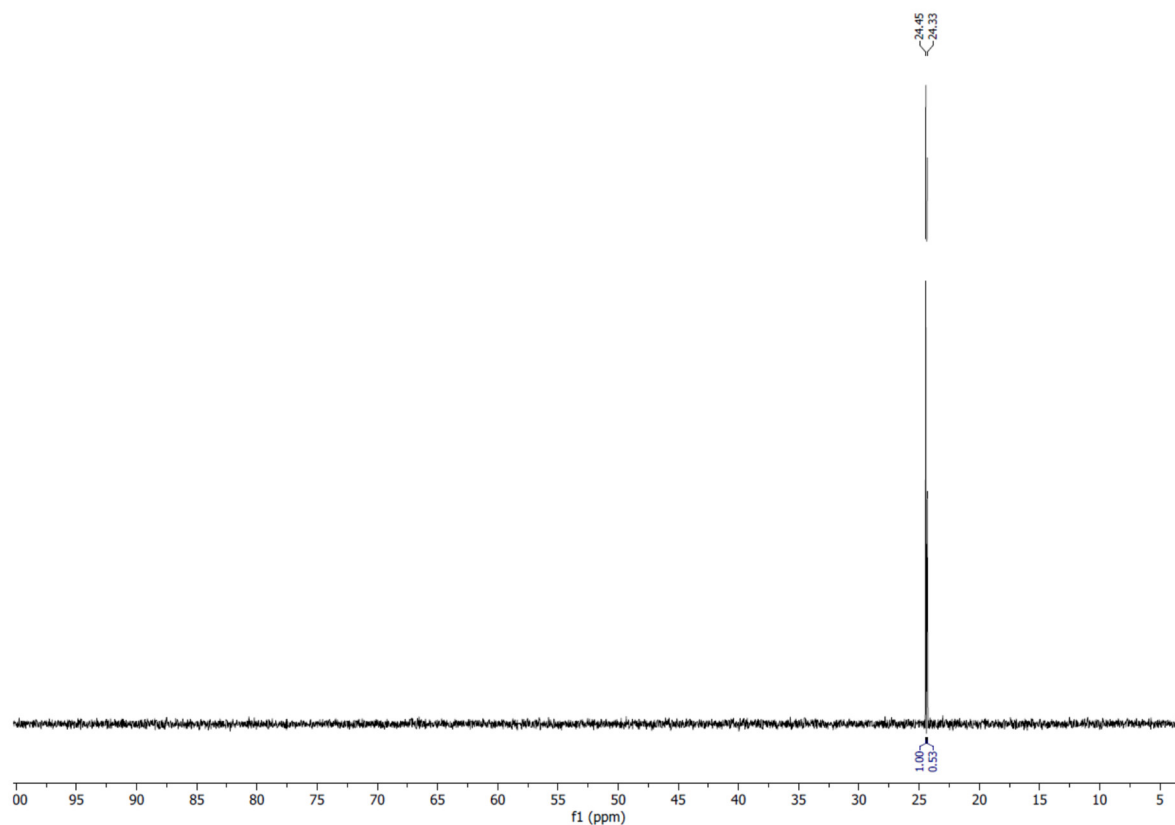


Figure S33. ^{31}P NMR (162 MHz, CDCl_3) spectra of 2-cyano-3-(dimethoxy-phosphoryl)-3-phenylpropionic acid ethyl ester (**11**).

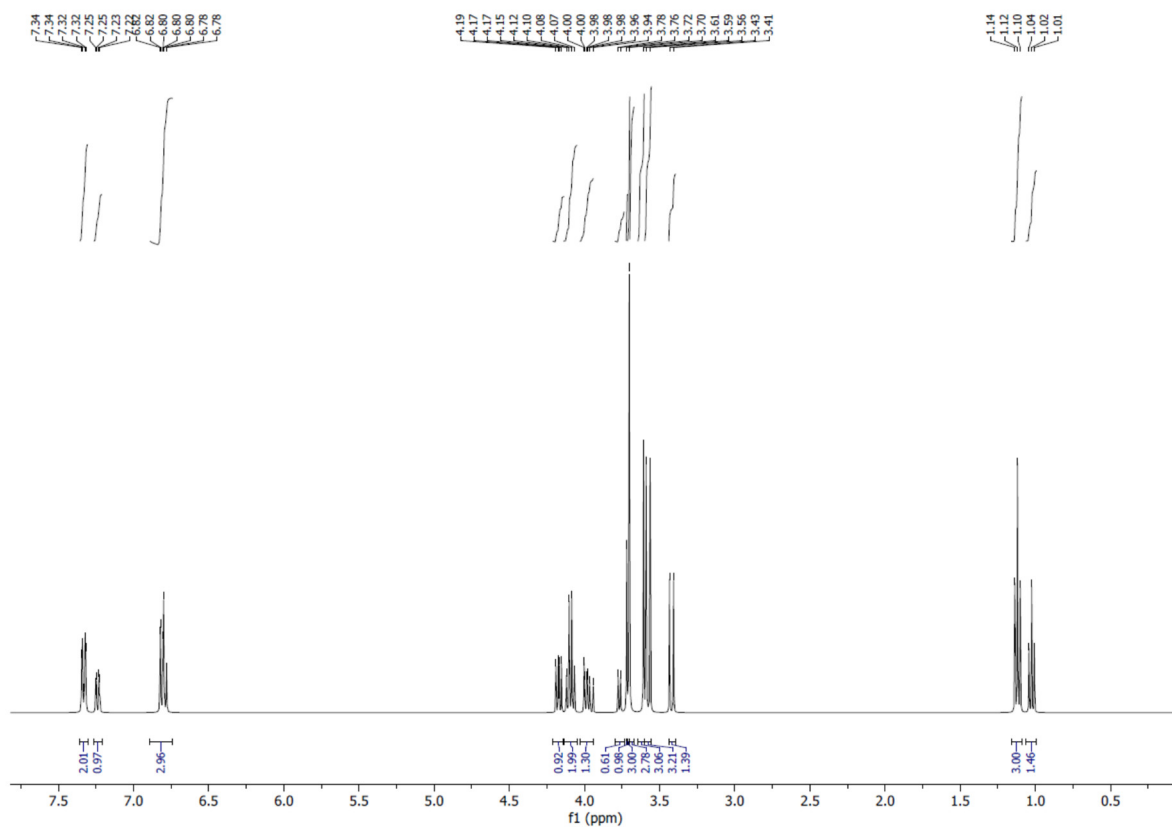


Figure S34. ¹H NMR (400 MHz, CDCl₃) spectra of 2-cyano-3-(dimethoxy-phosphoryl)-3-(4-methoxyphenyl)-propionic acid ethyl ester (12).

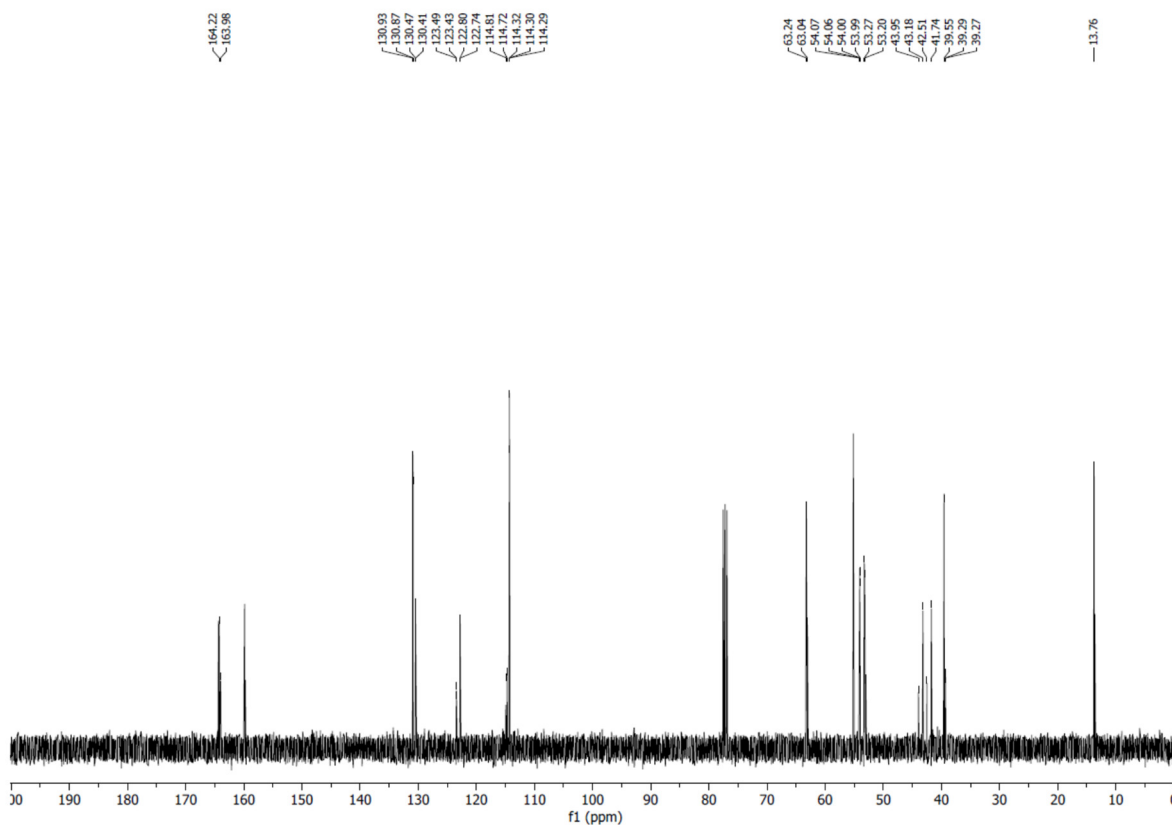


Figure S35. ¹³C NMR (100 MHz, CDCl₃) spectra of 2-cyano-3-(dimethoxy-phosphoryl)-3-(4-methoxyphenyl)-propionic acid ethyl ester (12).

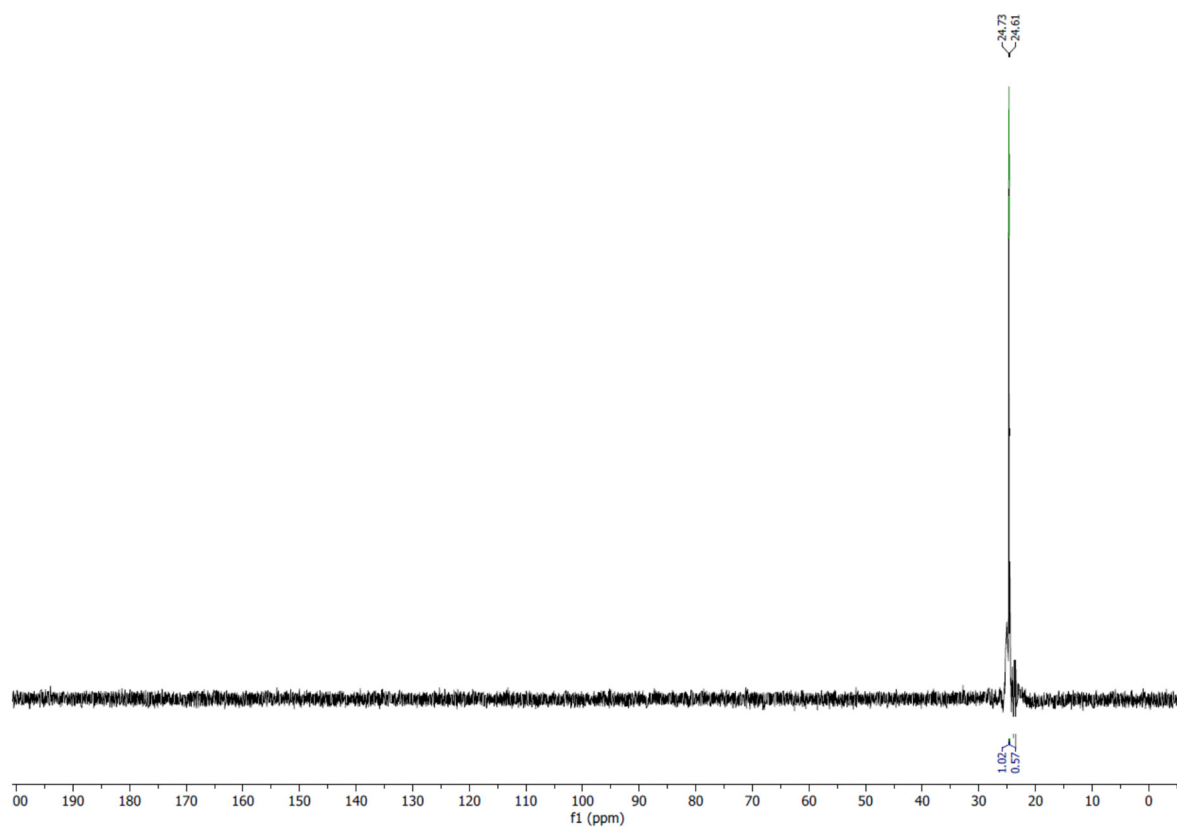


Figure S36. ³¹P NMR (162 MHz, CDCl₃) spectra of 2-cyano-3-(dimethoxy-phosphoryl)-3-(4-methoxyphenyl)-propionic acid ethyl ester (12)

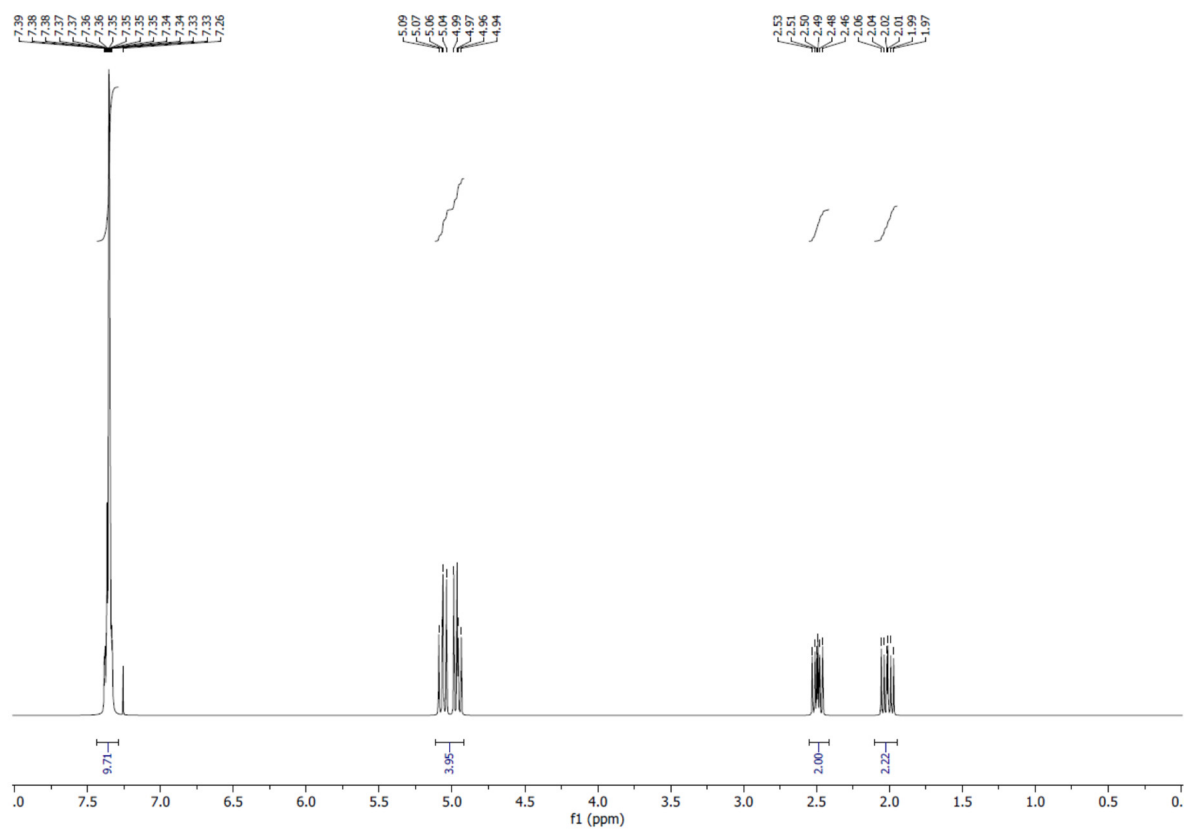


Figure S37. ¹H NMR (400 MHz, CDCl₃) spectra of dibenzyl (2-cyanoethyl)phosphonate (13).

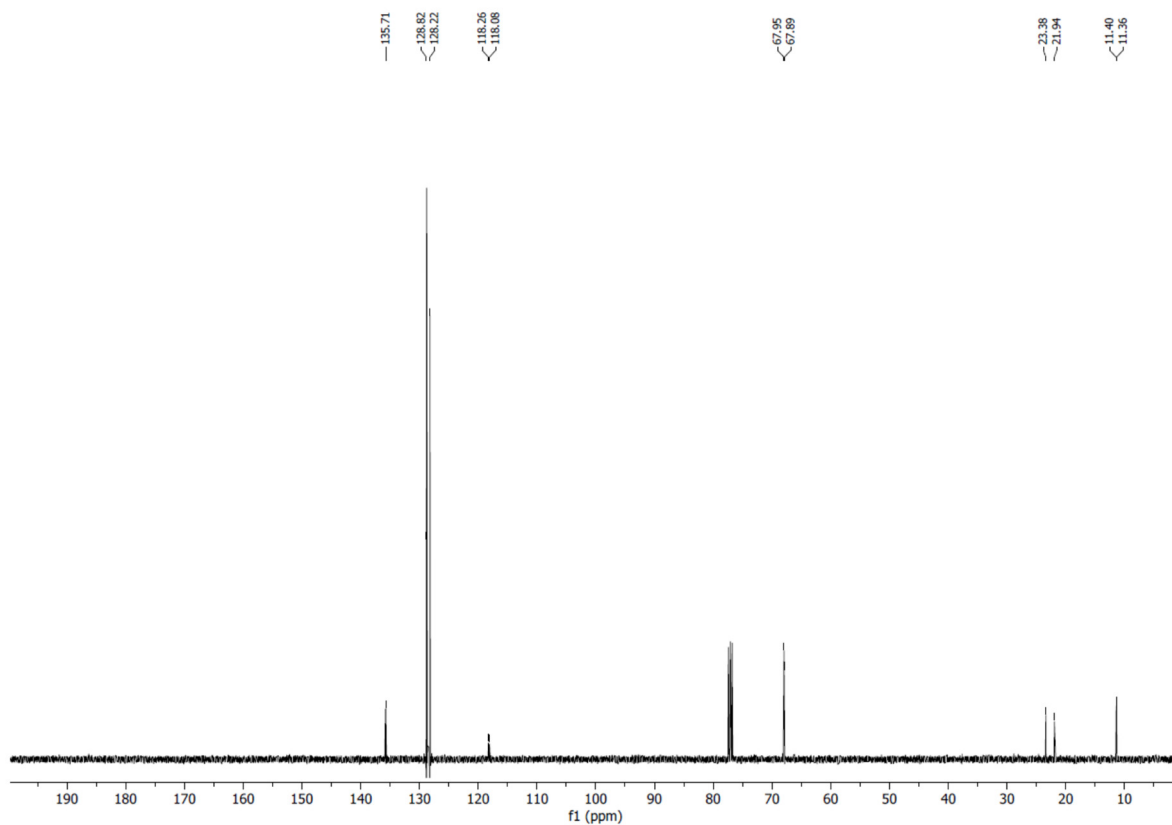


Figure S38. ^{13}C NMR (100 MHz, CDCl_3) spectra of dibenzyl (2-cyanoethyl)phosphonate (**13**).

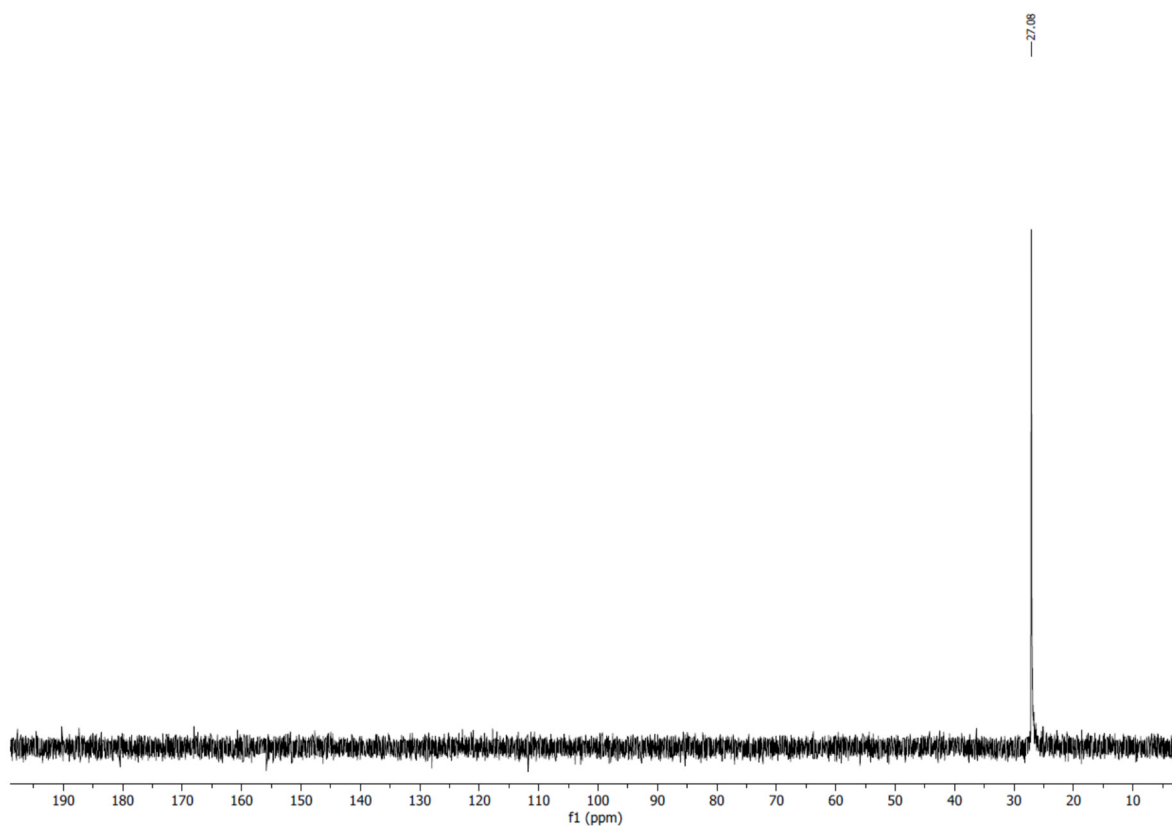


Figure S39. ^{31}P NMR (162 MHz, CDCl_3) spectra of dibenzyl (2-cyanoethyl)phosphonate (**13**).

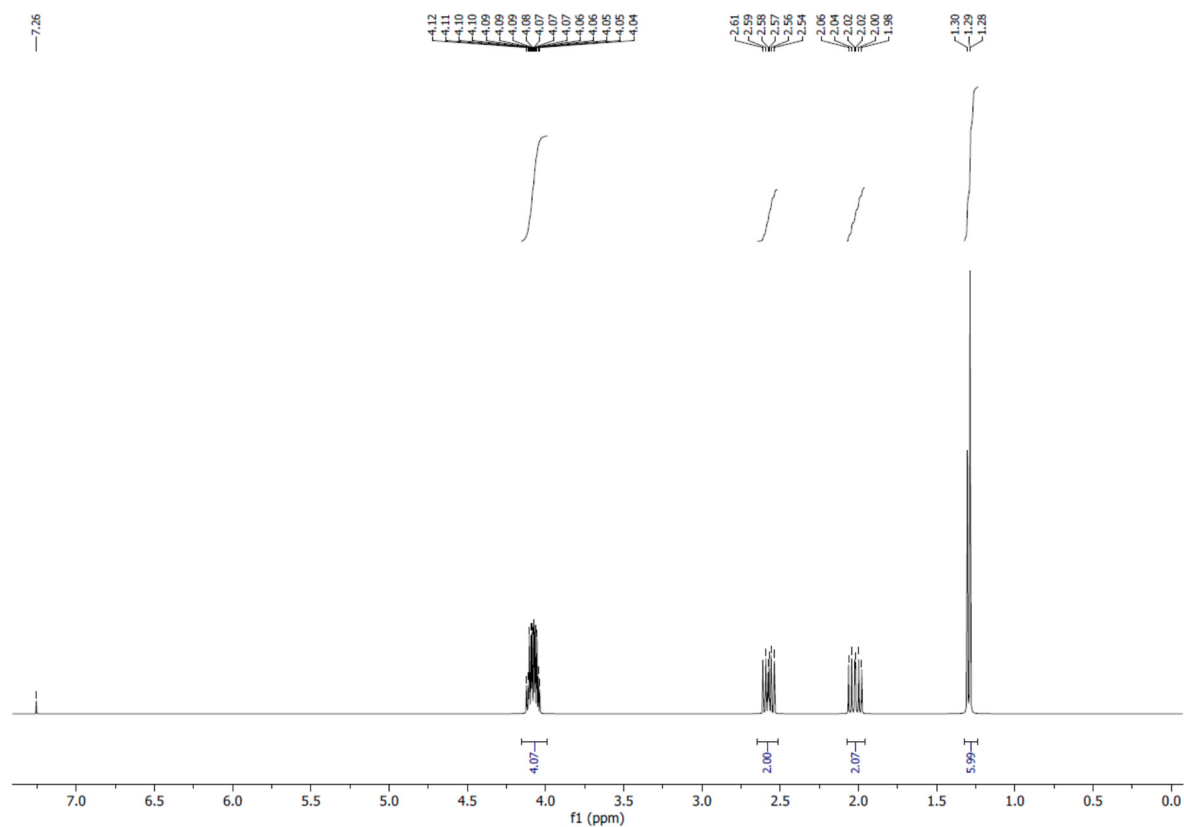


Figure S40. ¹H NMR (400 MHz, CDCl₃) spectra of diethyl (2-cyanoethyl)phosphonate (**14**).

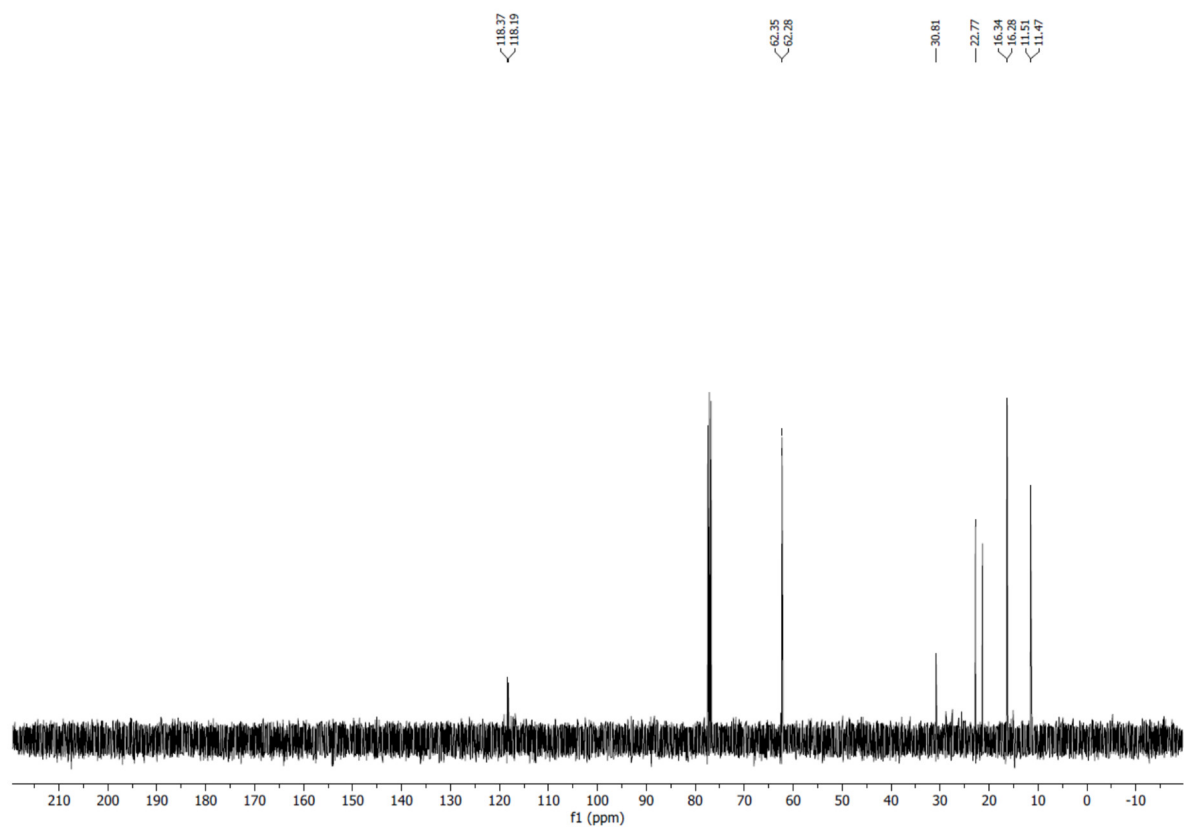


Figure S41. ¹³C NMR (400 MHz, CDCl₃) spectra of diethyl (2-cyanoethyl)phosphonate (**14**).

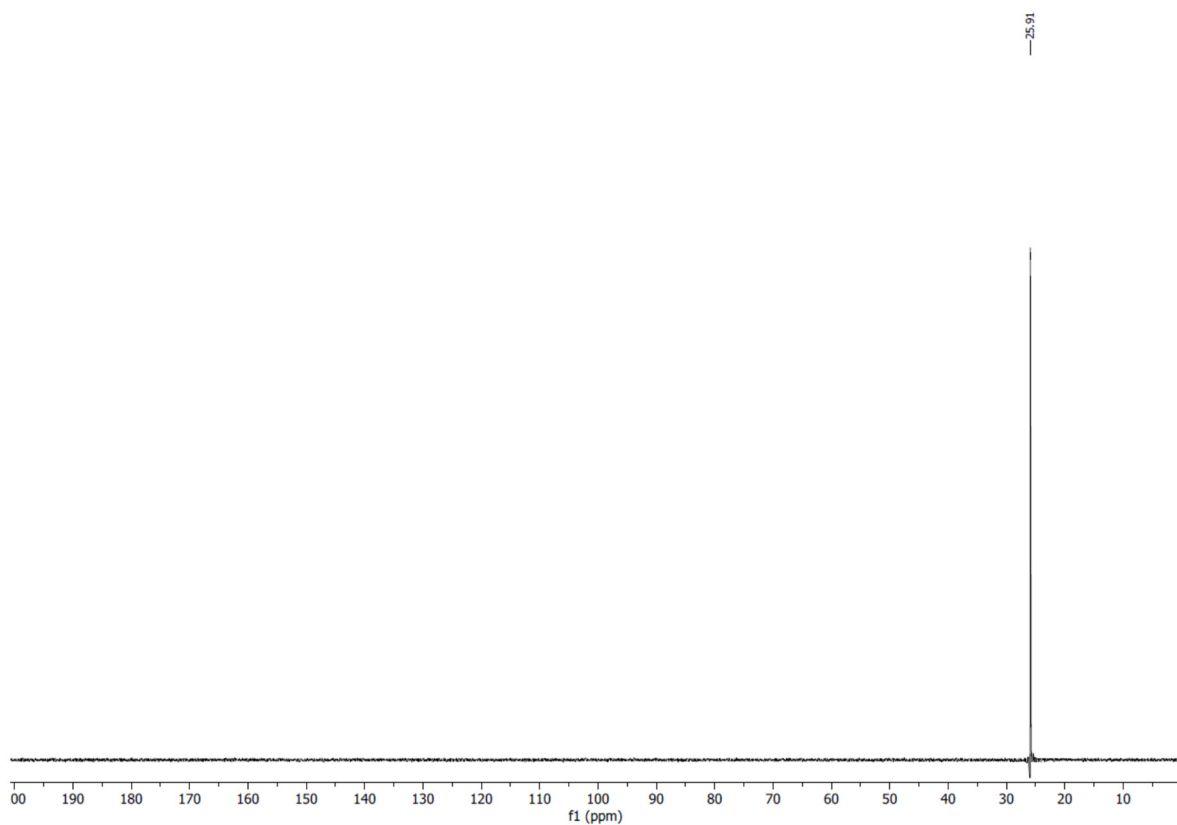


Figure S42. ^{31}P NMR (162 MHz, CDCl_3) spectra of diethyl (2-cyanoethyl)phosphonate (**14**).

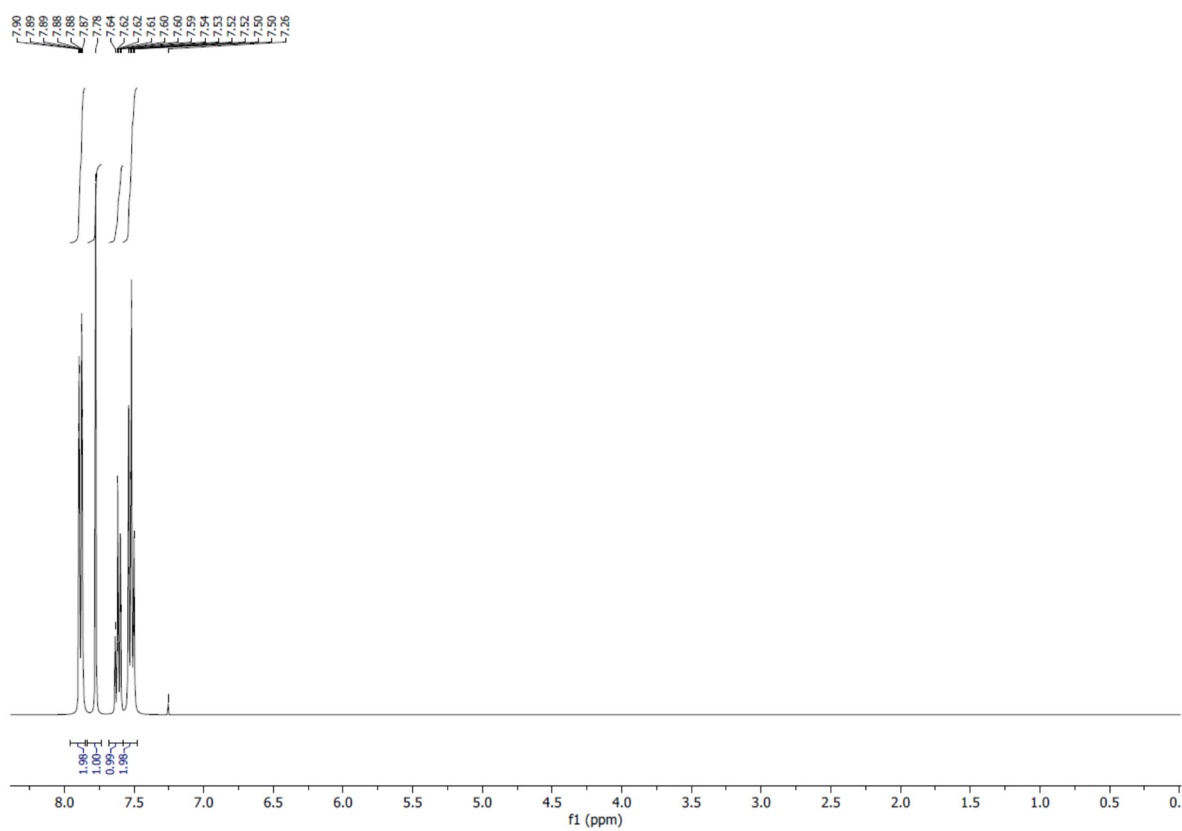


Figure S43. ^1H NMR (400 MHz, CDCl_3) spectra of benzylidenemalononitrile.

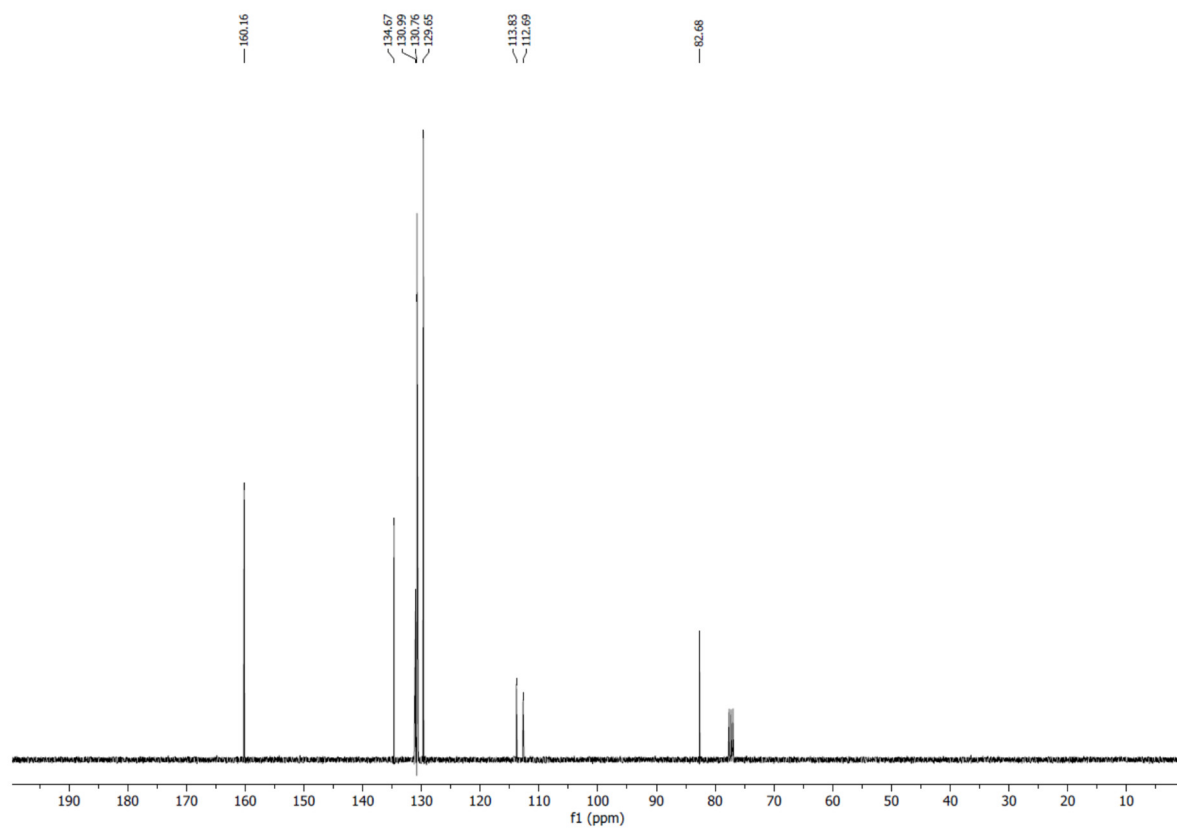


Figure S44. ^{13}C NMR (100 MHz, CDCl_3) spectra of benzylidenemalononitrile.