Electronic Supplementary Information

Synthesis of Oseltamivir and Tamiphosphor from *N*-Acetyl-D-glucosamine

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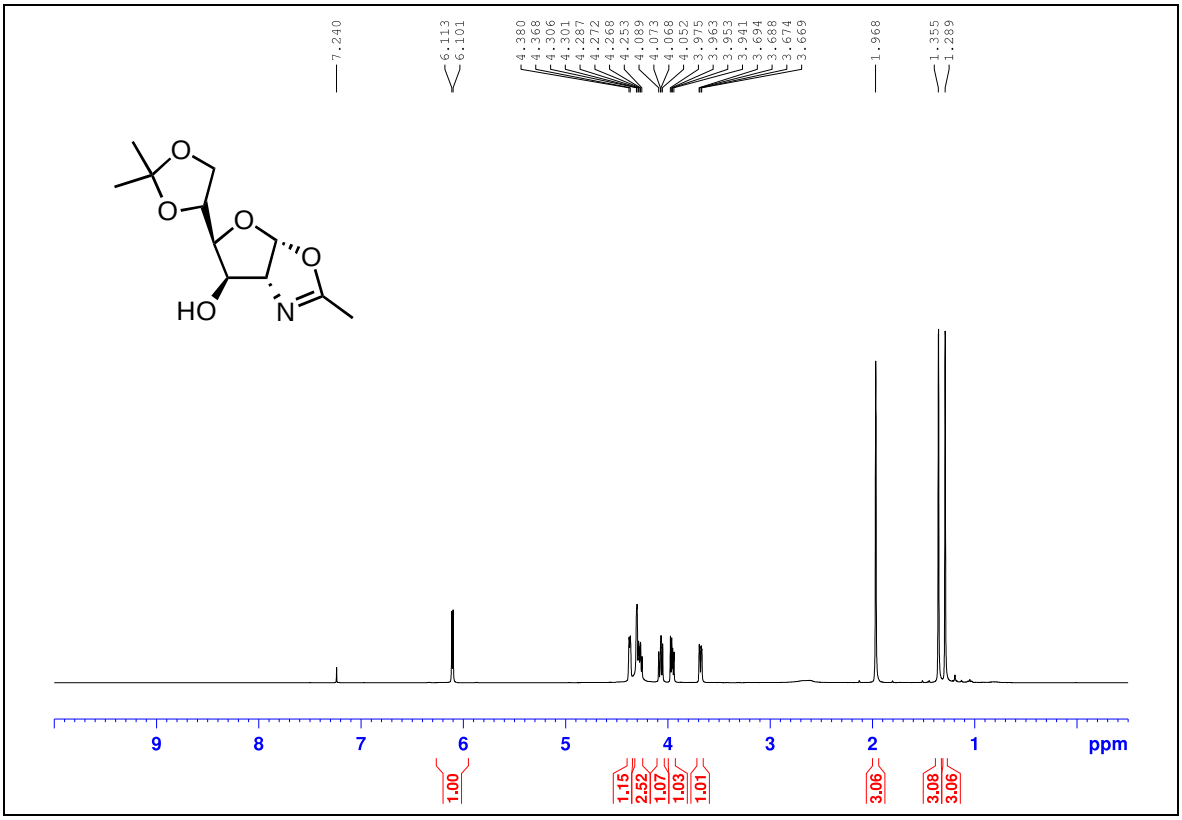
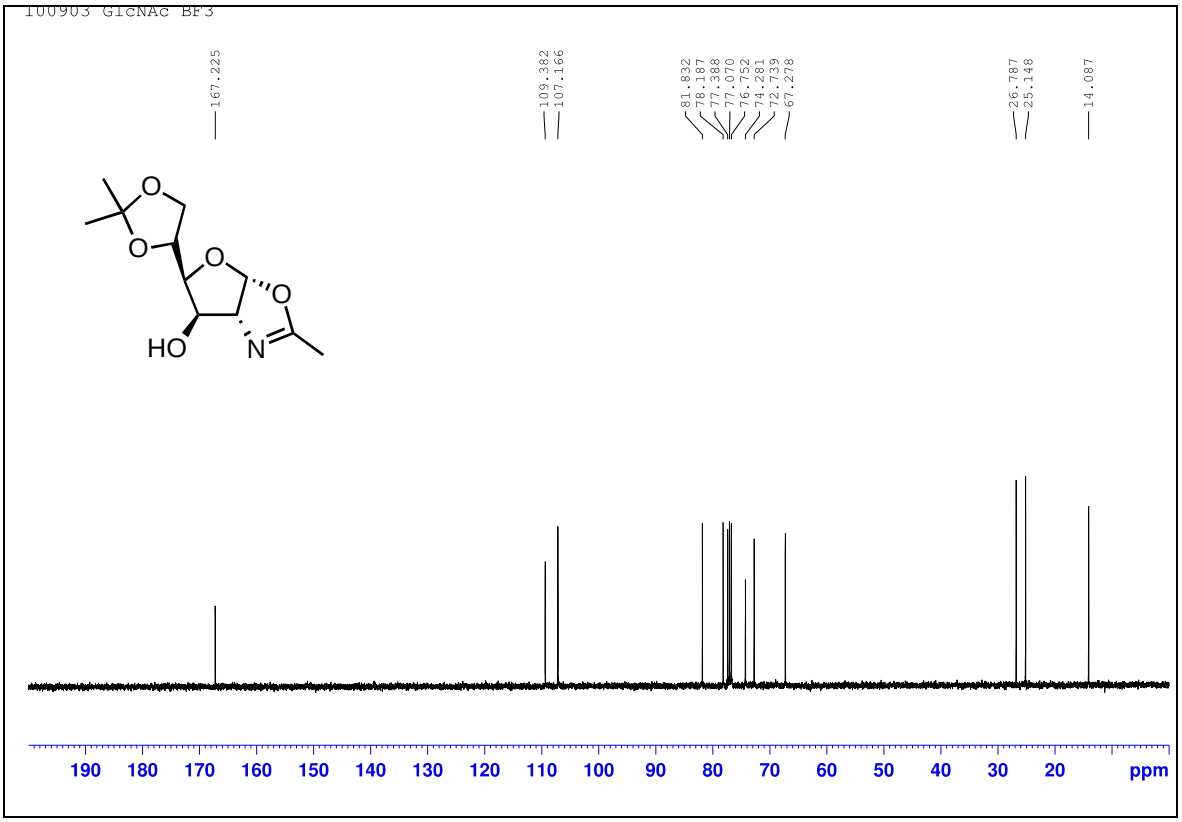
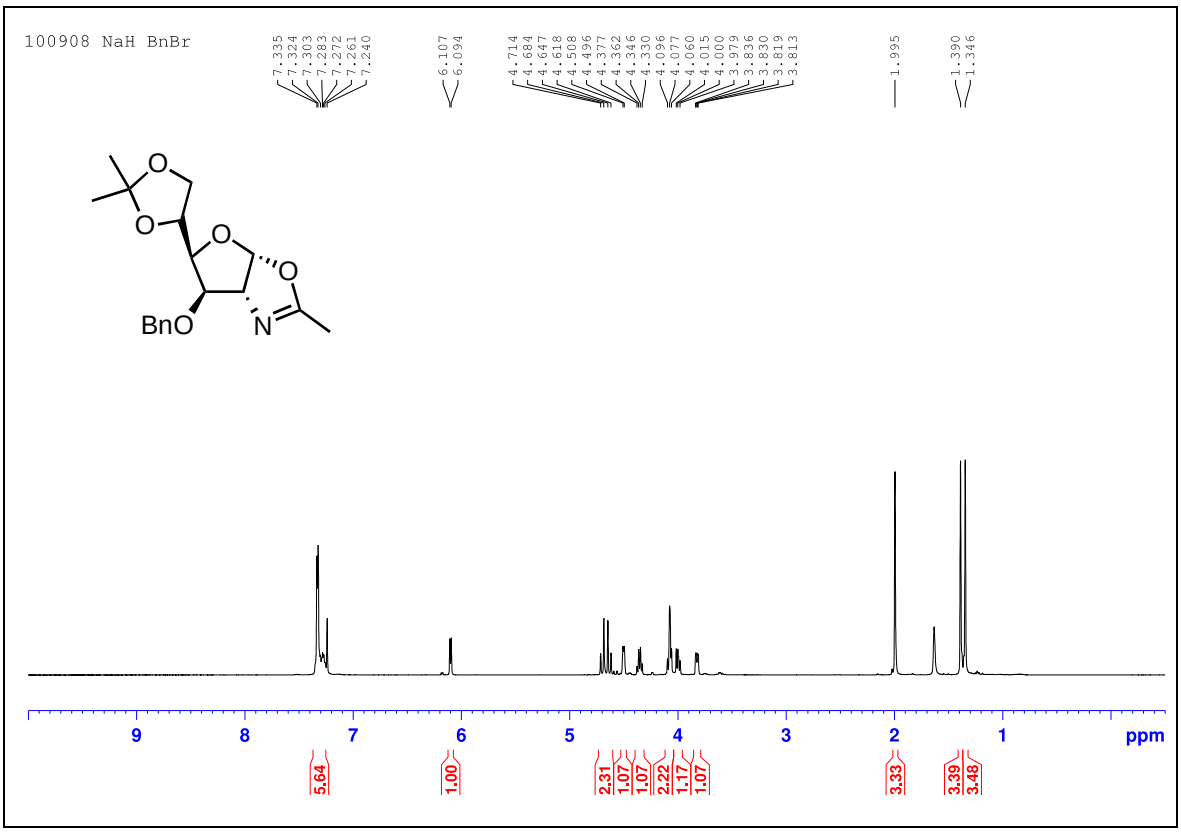
[b]*The Genomics Research Center, Academia Sinica, Taipei, 115, Taiwan.*



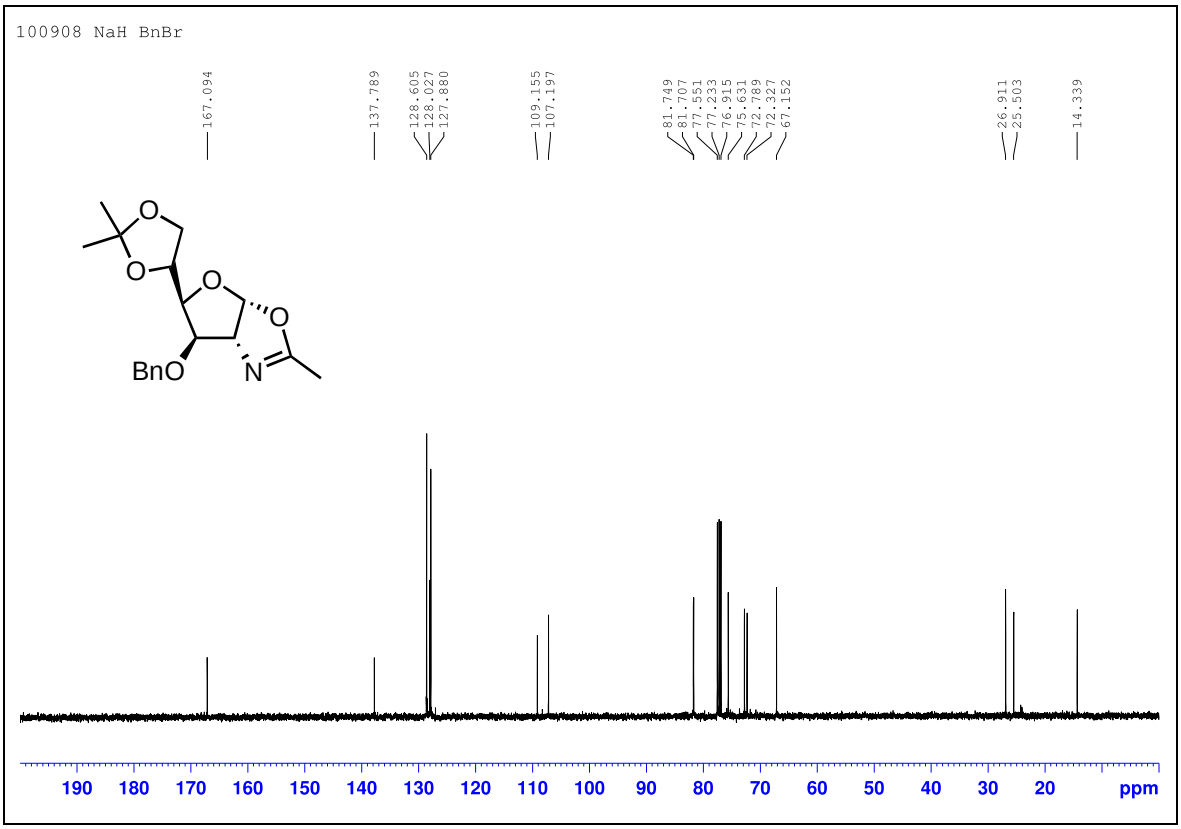
^{1}H NMR spectrum of compound **4** ($CDCl_3$, 400 MHz)



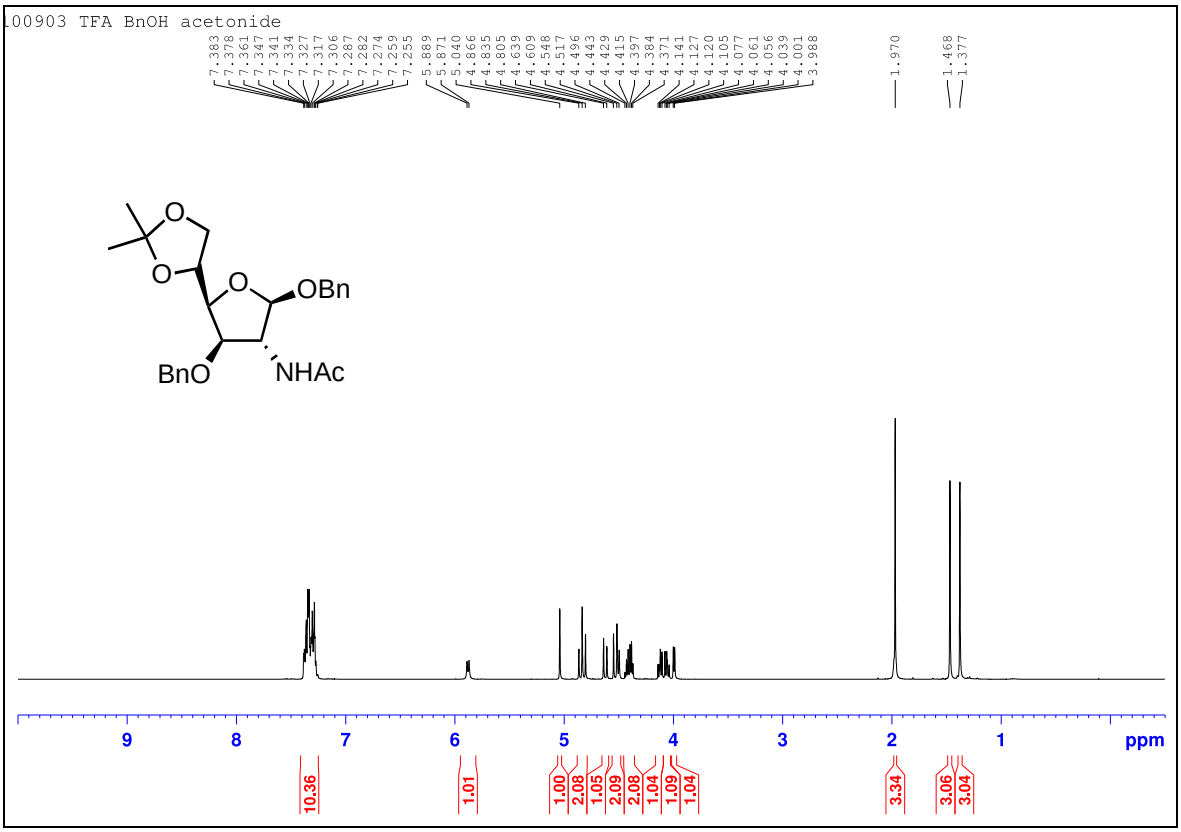
^{13}C NMR spectrum of compound **4** ($CDCl_3$, 100 MHz)



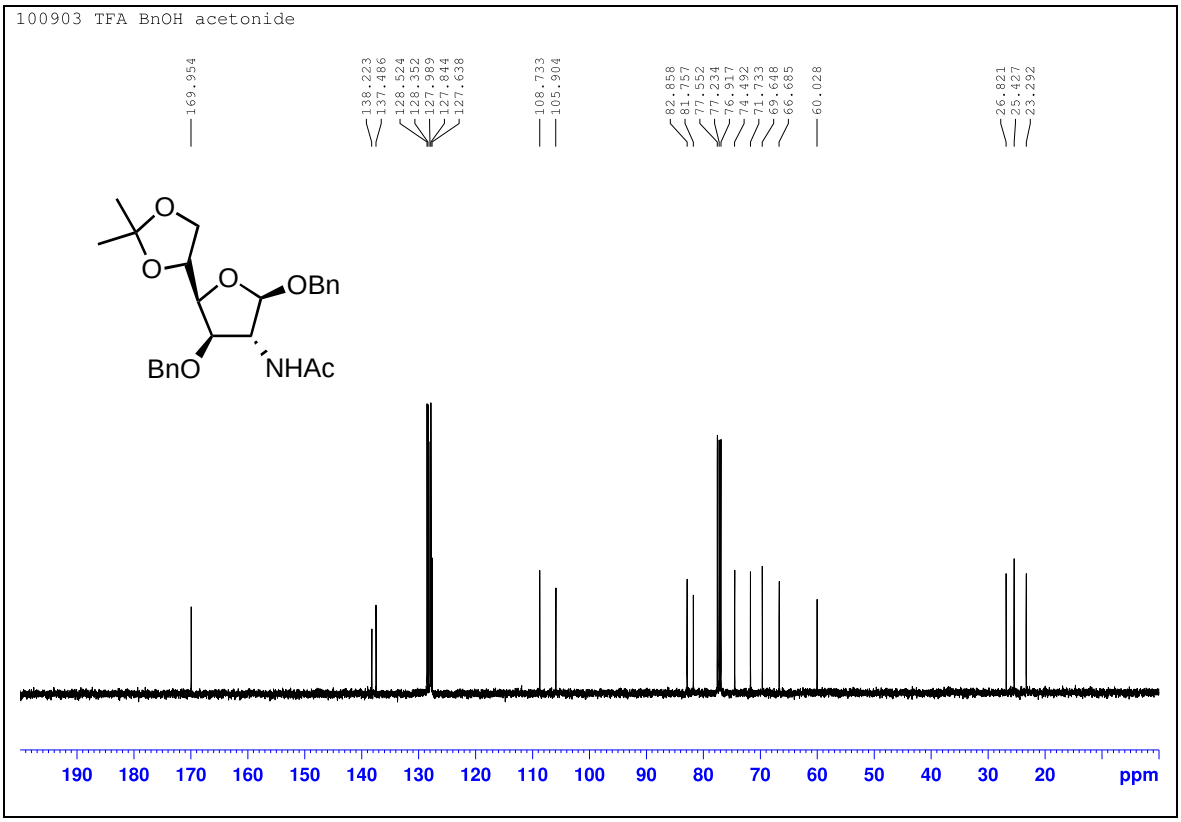
^{1}H NMR spectrum of compound **5** ($CDCl_3$, 400 MHz)



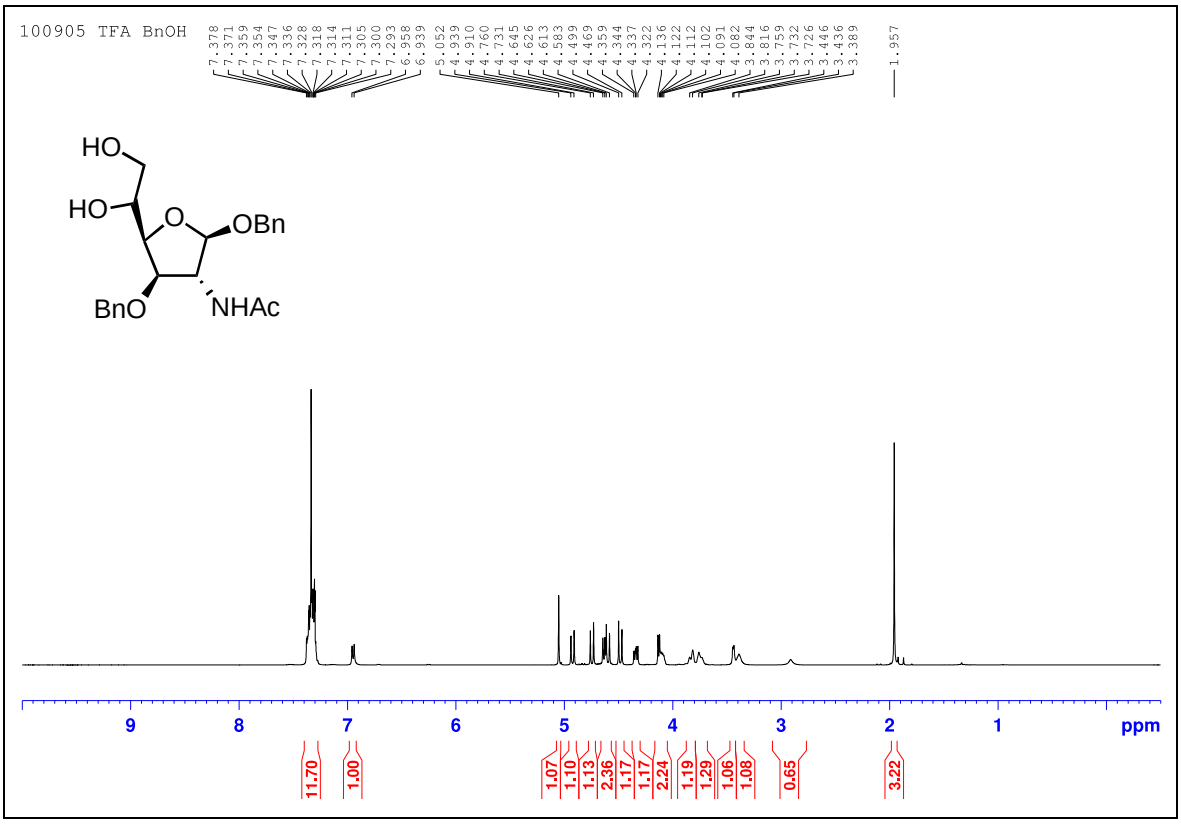
^{13}C NMR spectrum of compound **5** ($CDCl_3$, 100 MHz)



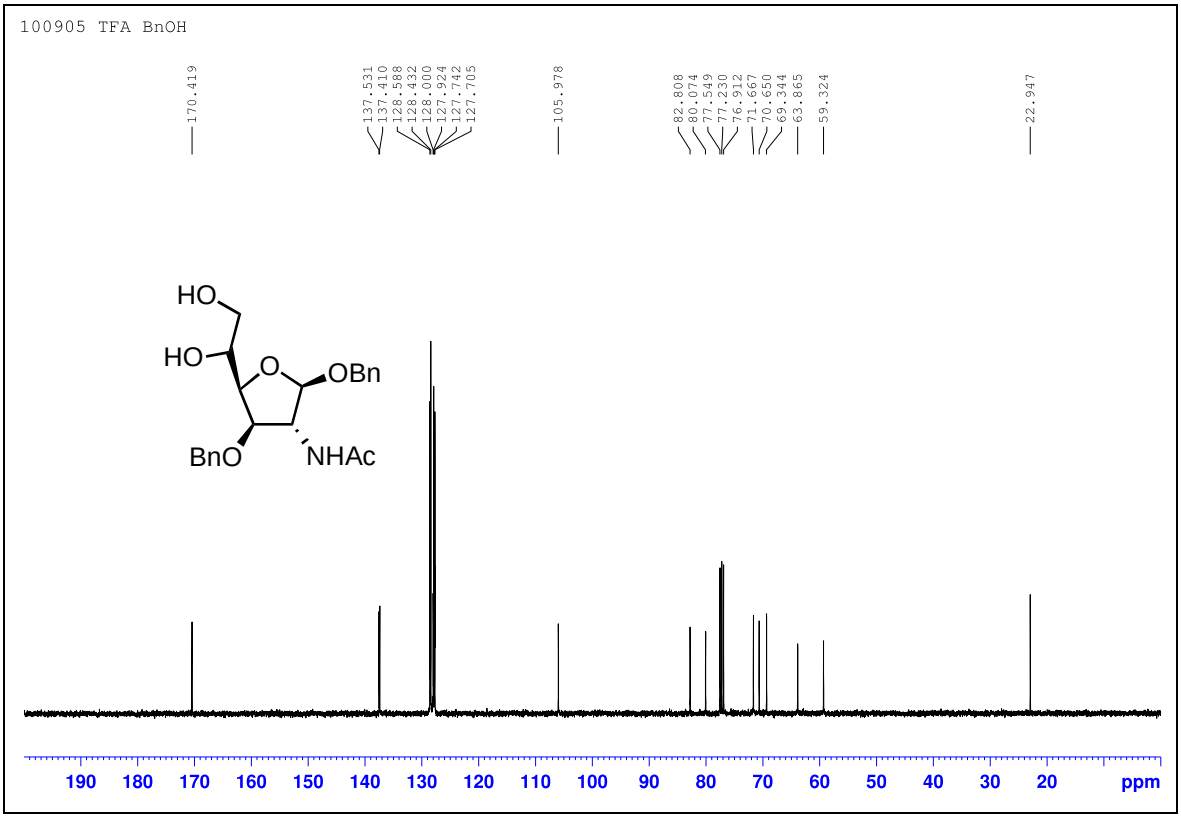
^{1}H NMR spectrum of compound **6** ($CDCl_3$, 400 MHz)



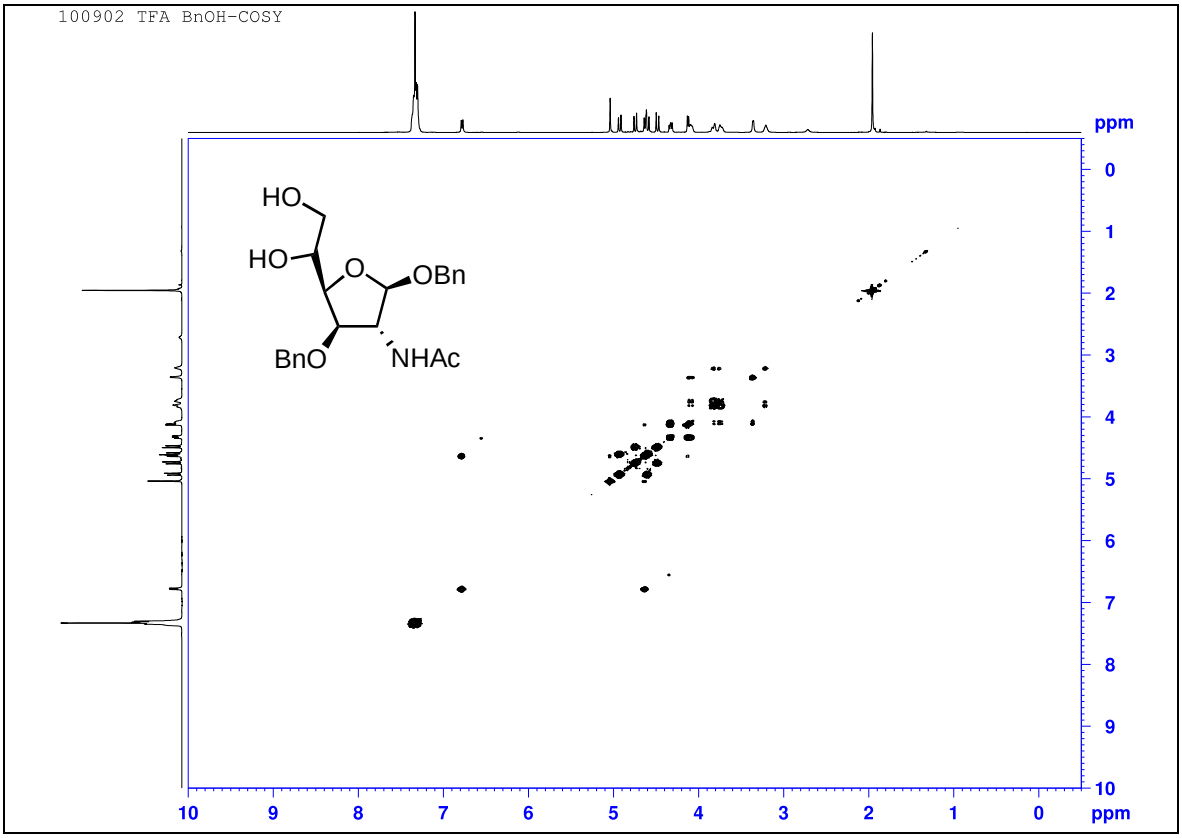
^{13}C NMR spectrum of compound **6** ($CDCl_3$, 100 MHz)



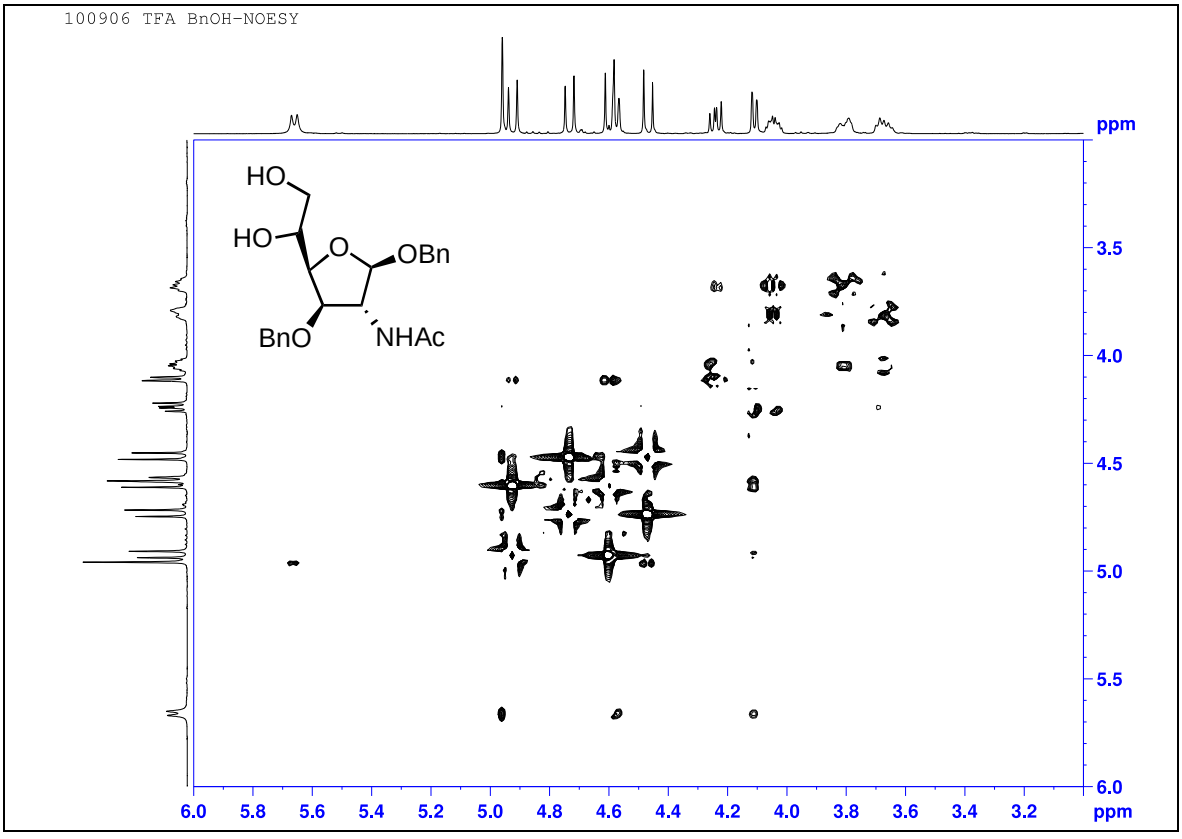
^{1}H NMR spectrum of compound **7** ($CDCl_3$, 400 MHz)



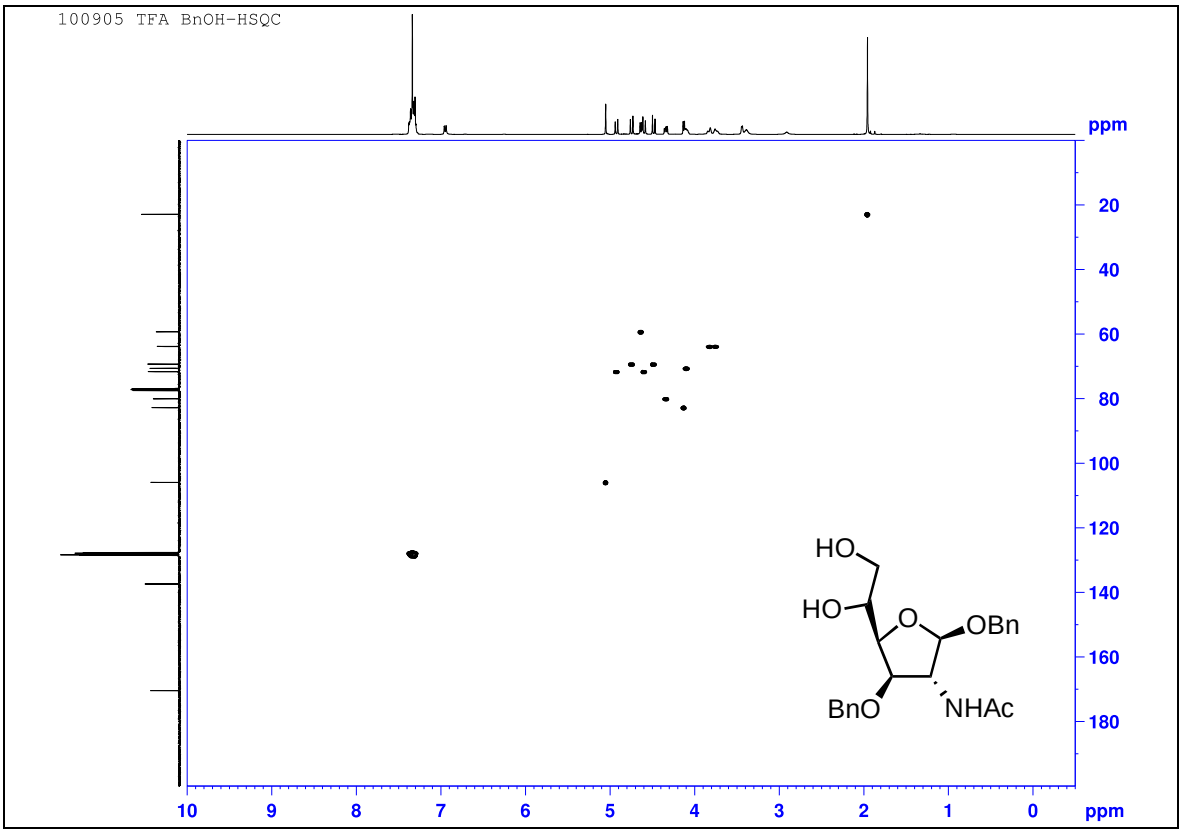
^{13}C NMR spectrum of compound **7** ($CDCl_3$, 100 MHz)



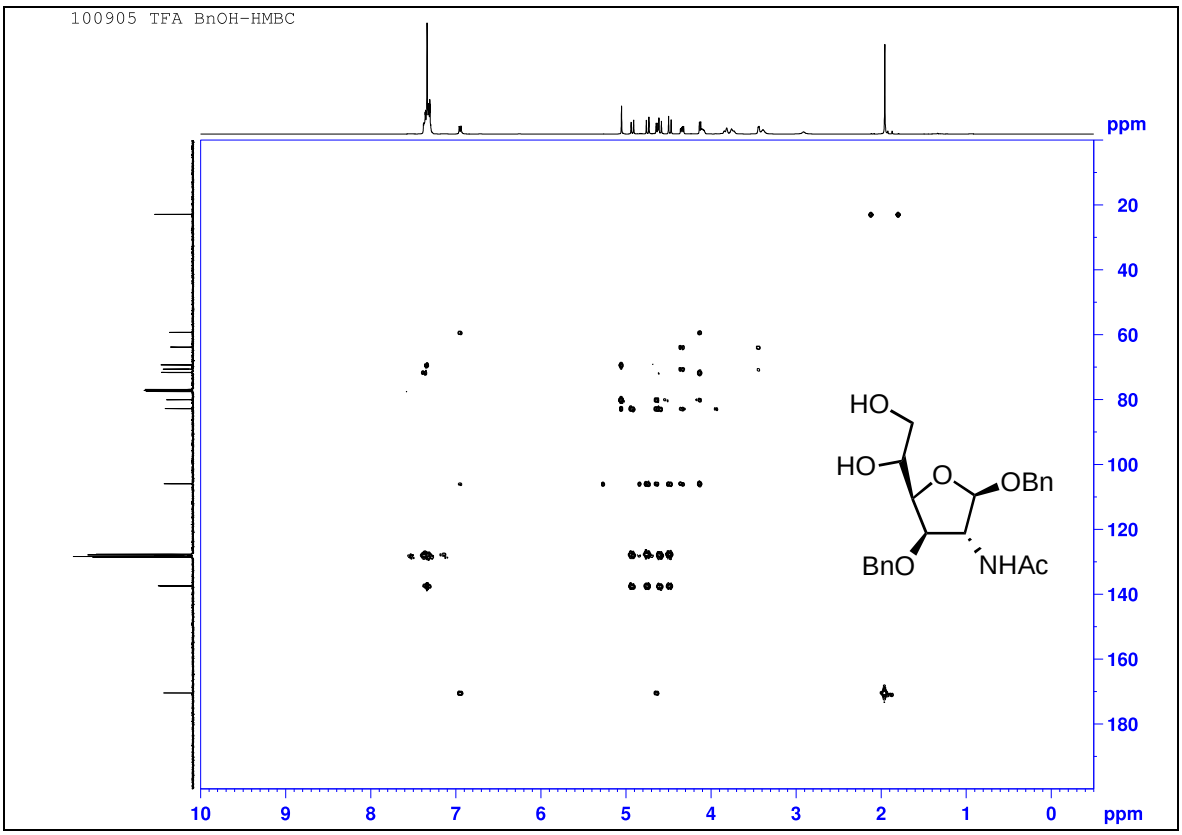
^{1}H–^{1}H COSY NMR spectrum of compound **7** ($CDCl_3$, 400 MHz)



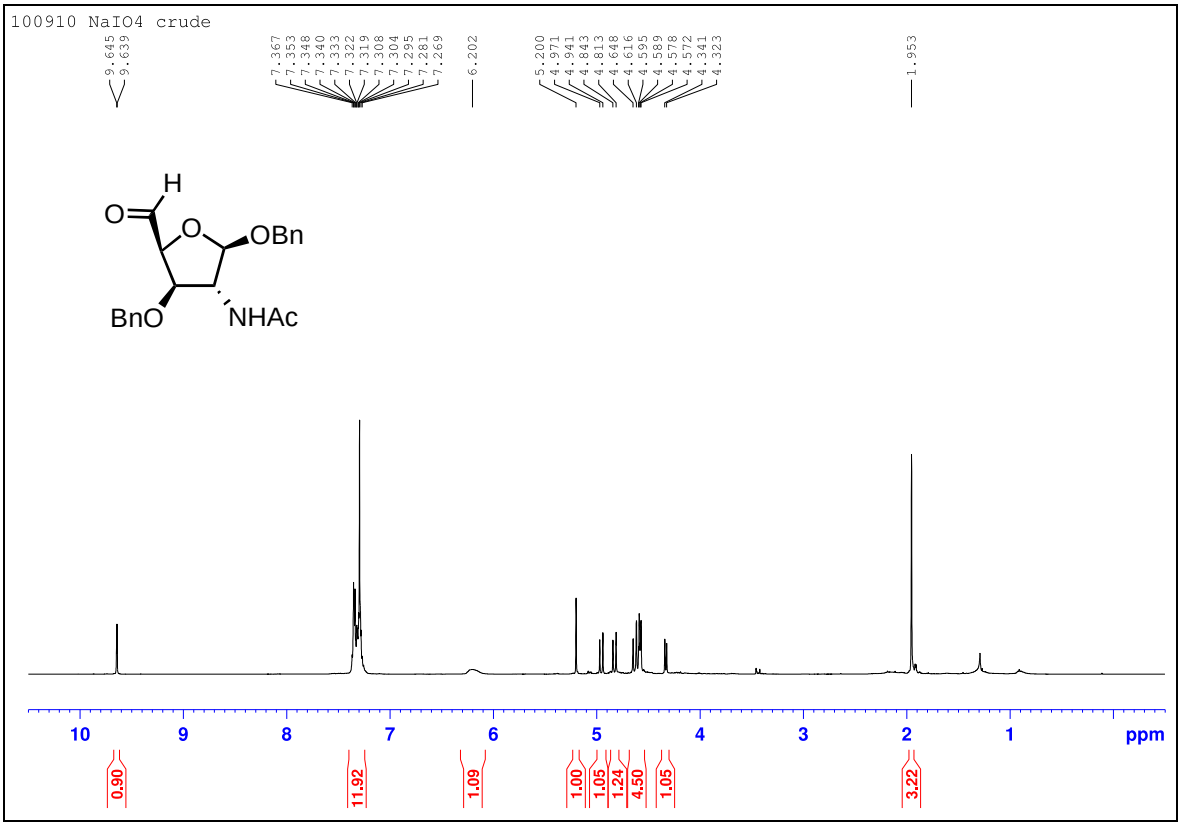
NOESY NMR spectrum of compound **7** ($CDCl_3$, 400 MHz)



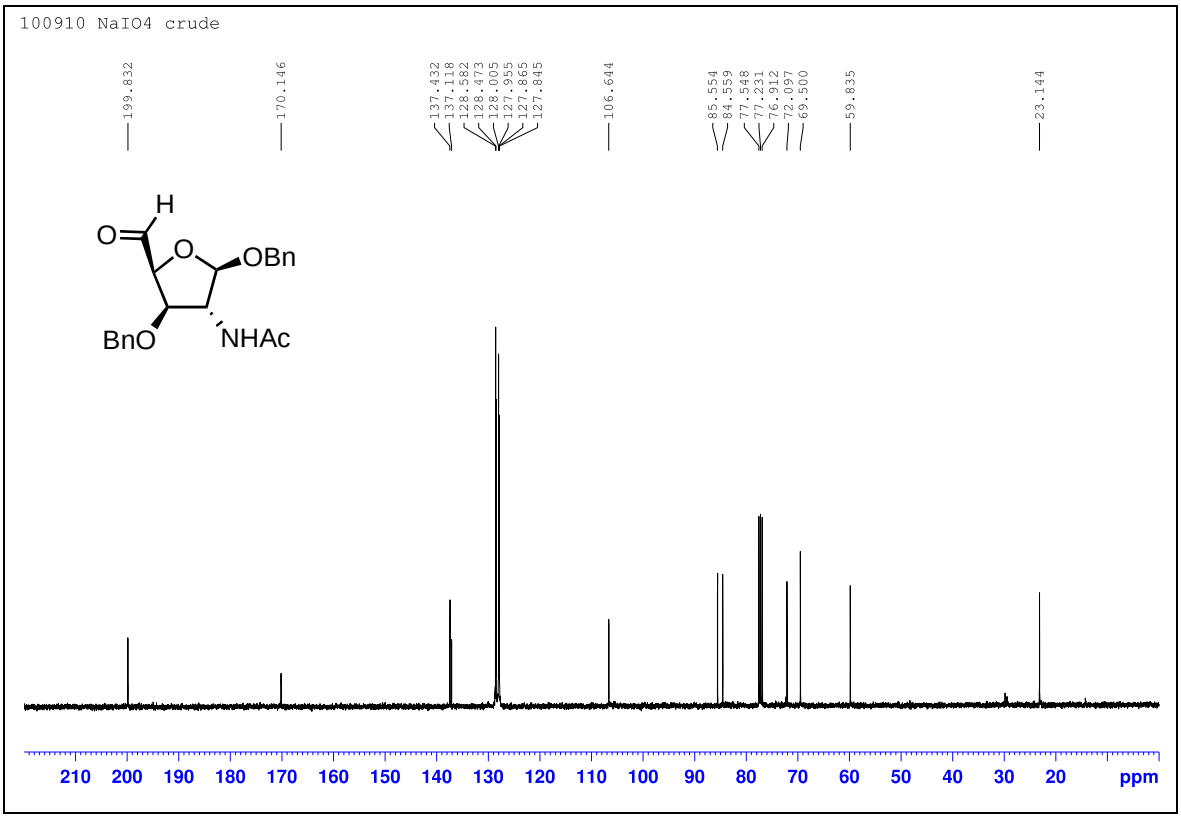
^{1}H–^{13}C HSQC NMR spectrum of compound **7** ($CDCl_3$, 400 MHz)



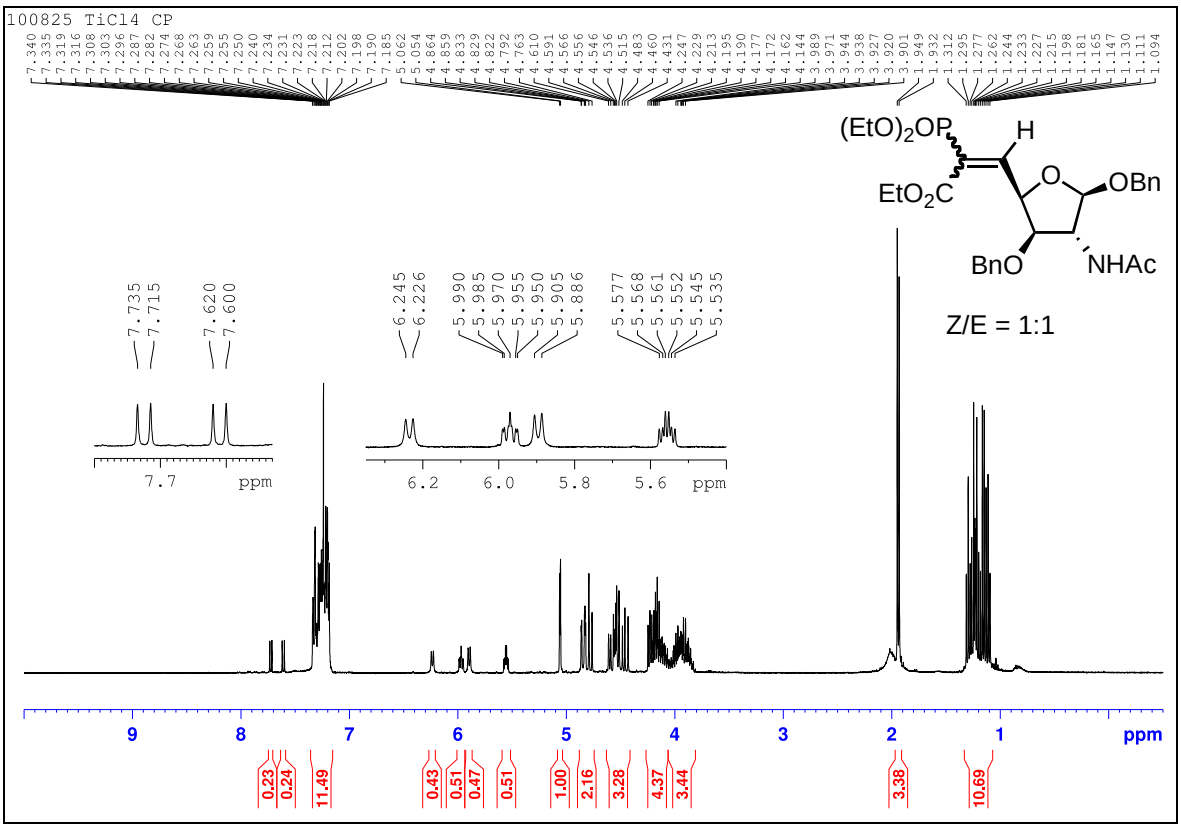
^{1}H–^{13}C HMBC NMR spectrum of compound **7** ($CDCl_3$, 400 MHz)



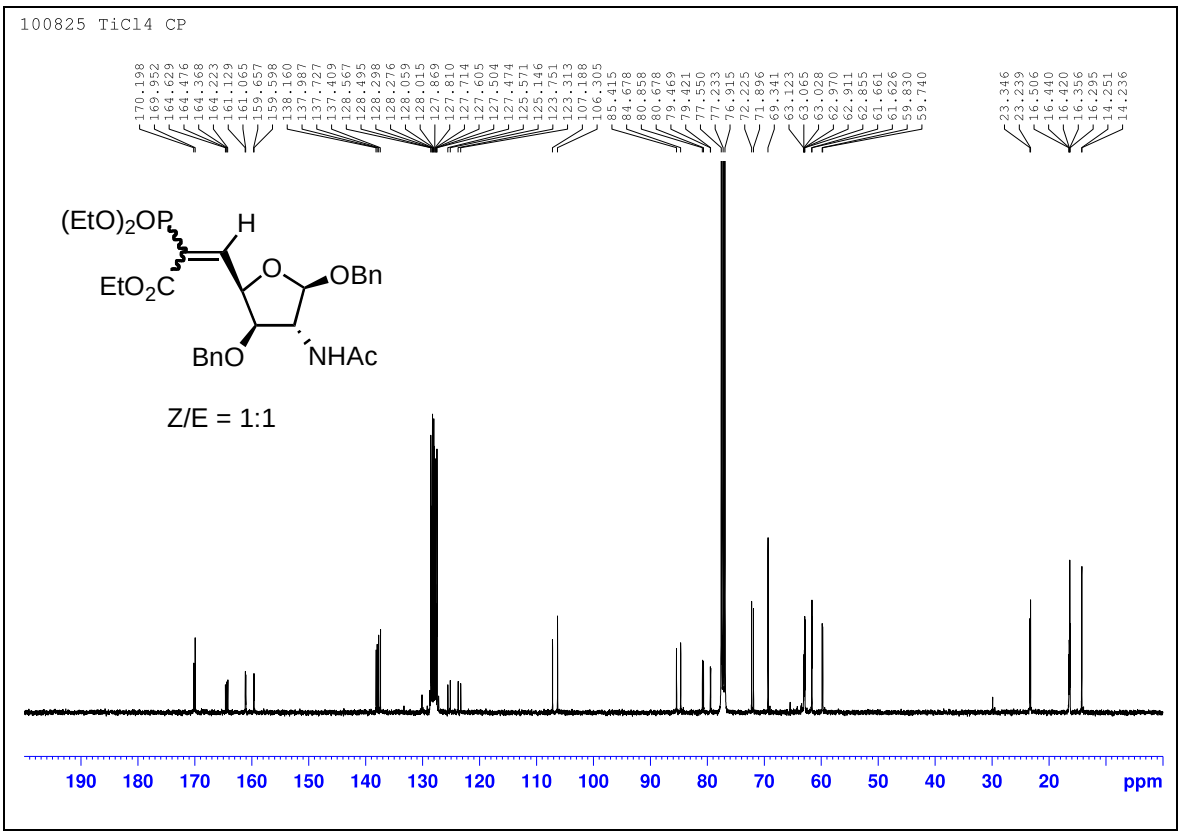
^{1}H NMR spectrum of compound **8** ($CDCl_3$, 400 MHz)



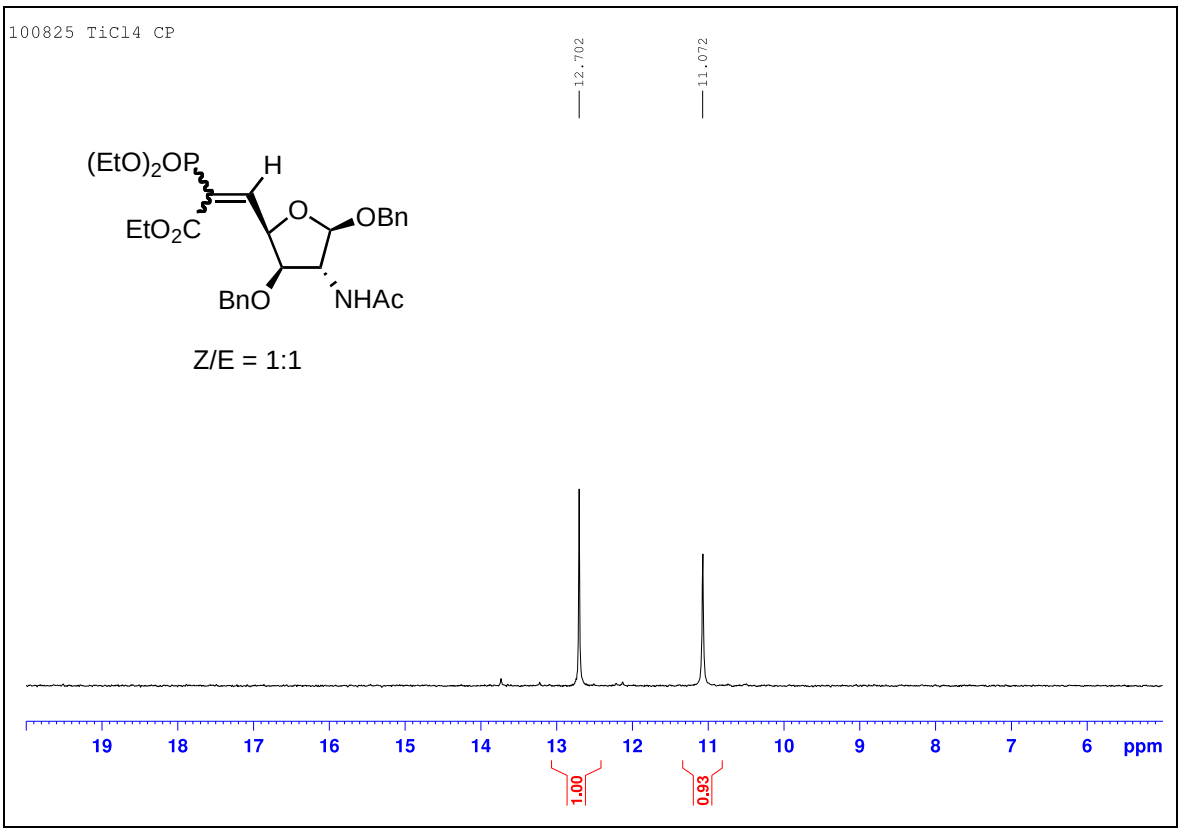
^{13}C NMR spectrum of compound **8** ($CDCl_3$, 100 MHz)



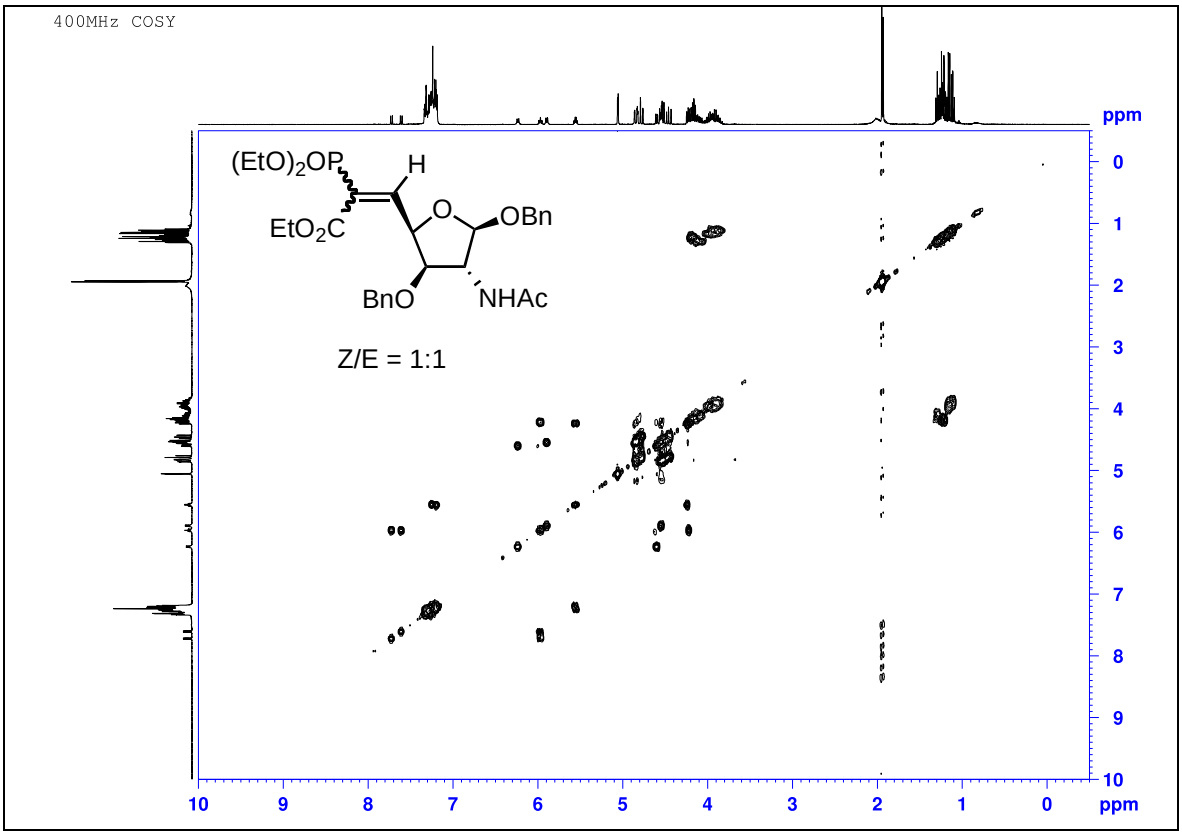
^{1}H NMR spectrum of compound **9** ($CDCl_3$, 400 MHz)



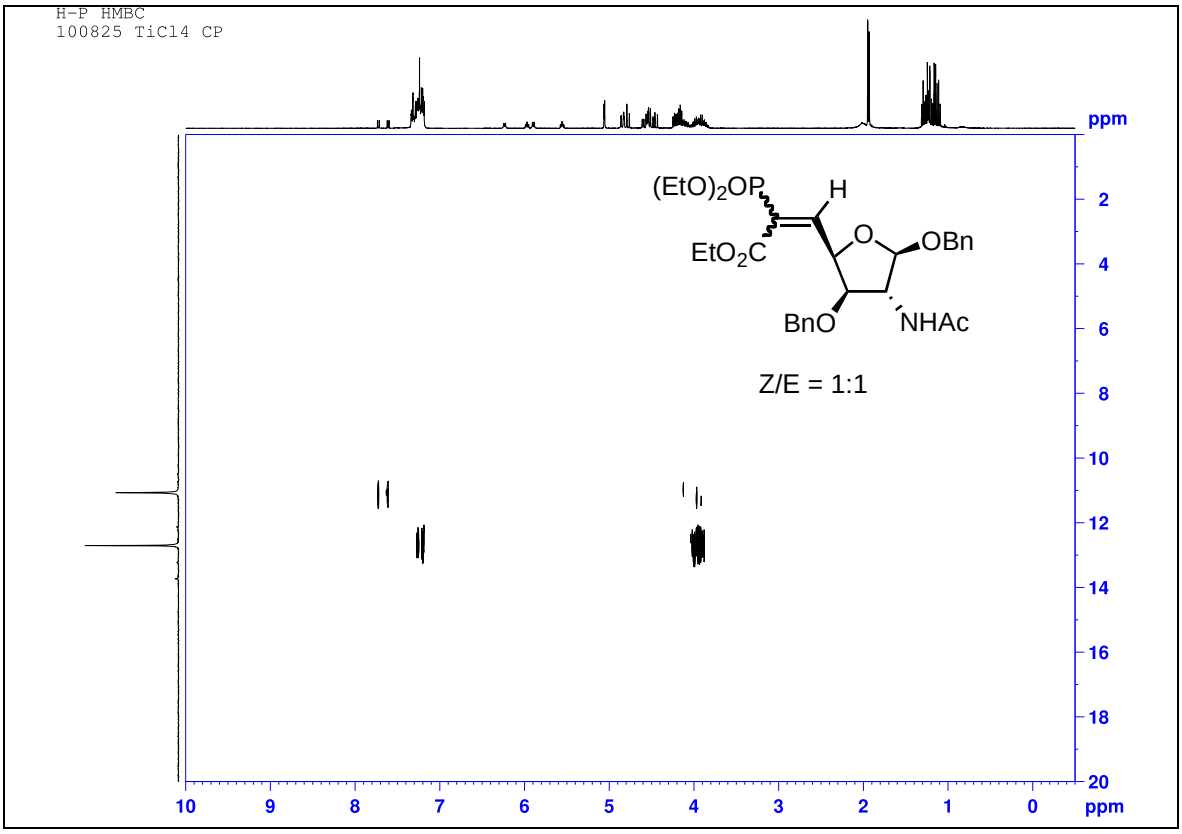
^{13}C NMR spectrum of compound **9** ($CDCl_3$, 100 MHz)



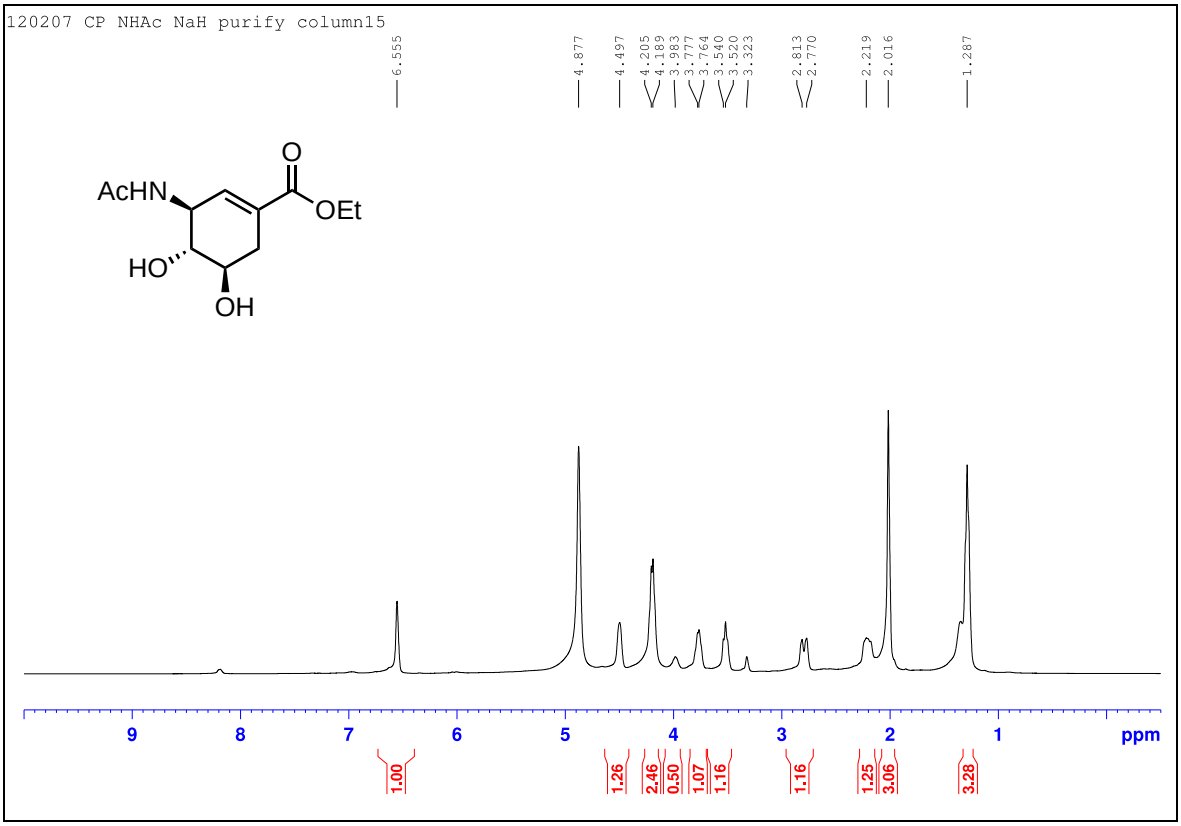
^{31}P NMR spectrum of compound **9** ($CDCl_3$, 162 MHz)



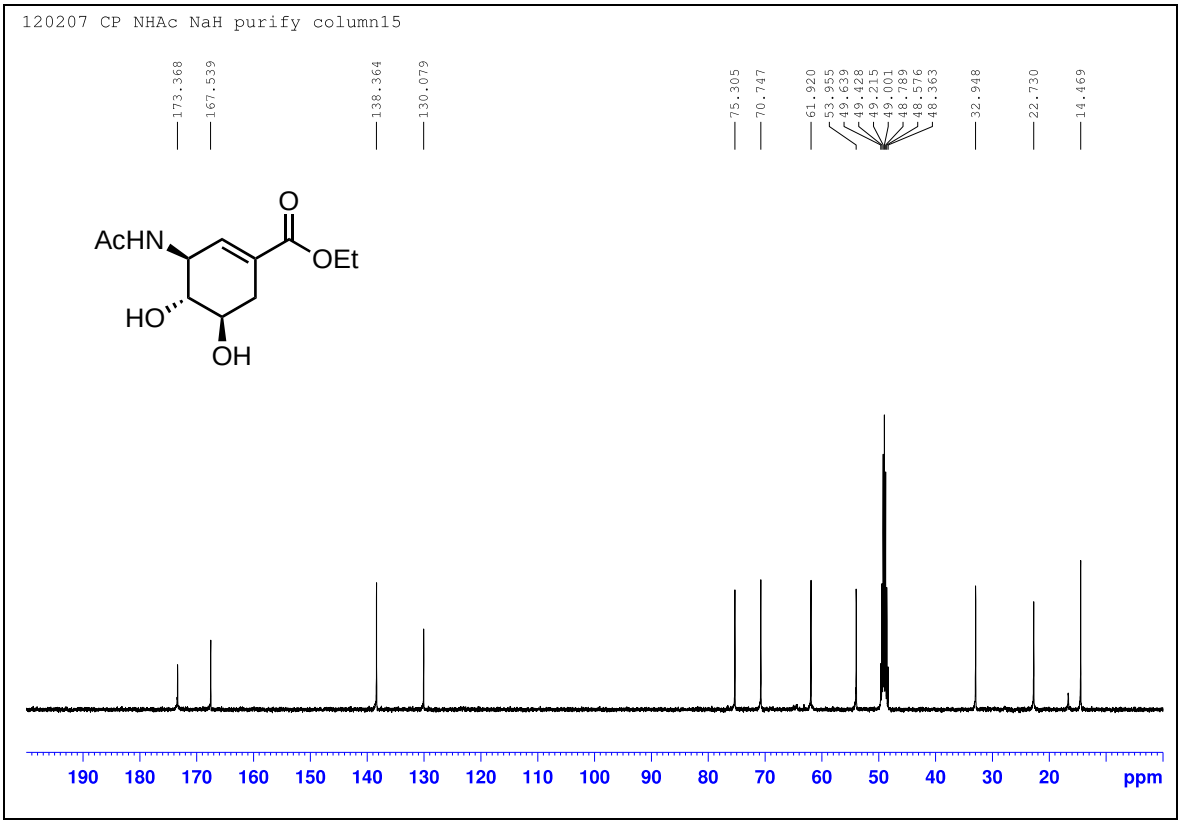
^{1}H–^{1}H COSY NMR spectrum of compound **9** ($CDCl_3$, 400 MHz)



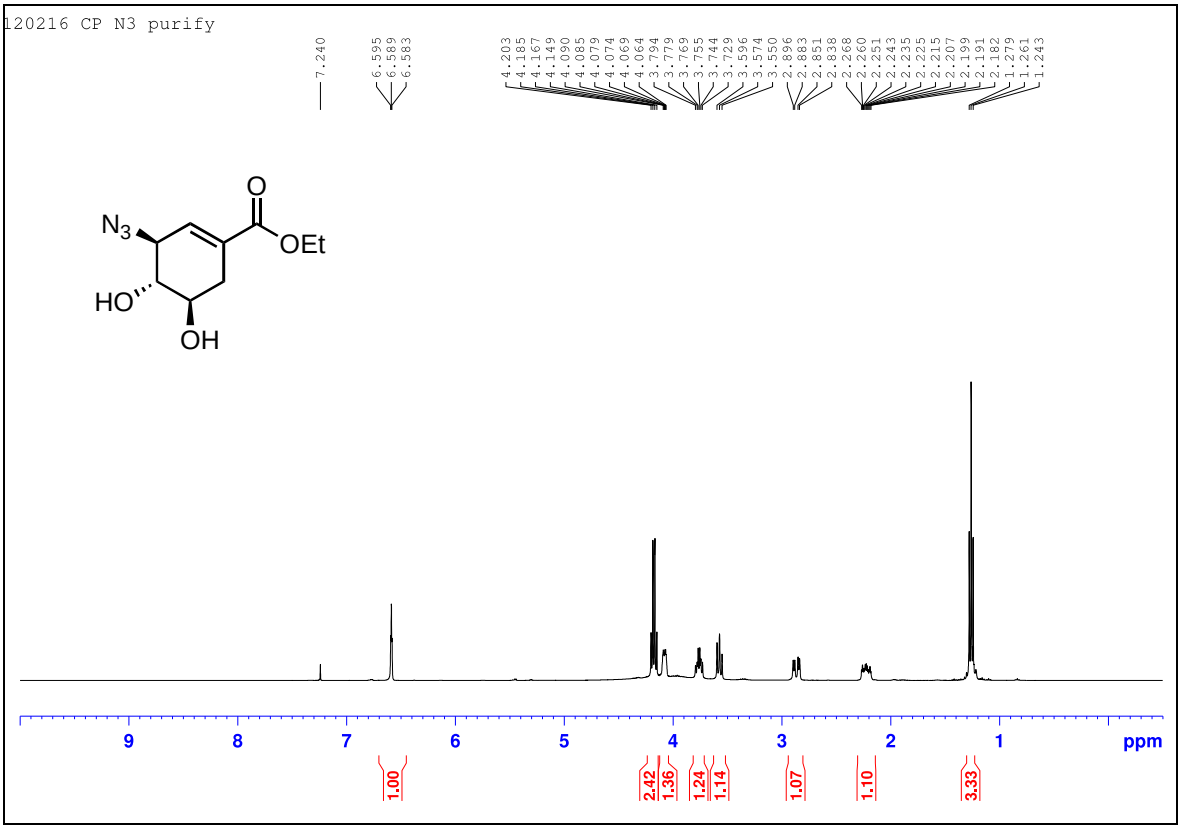
^{1}H–^{31}P HMBC NMR spectrum of compound **9** ($CDCl_3$, 400 MHz)



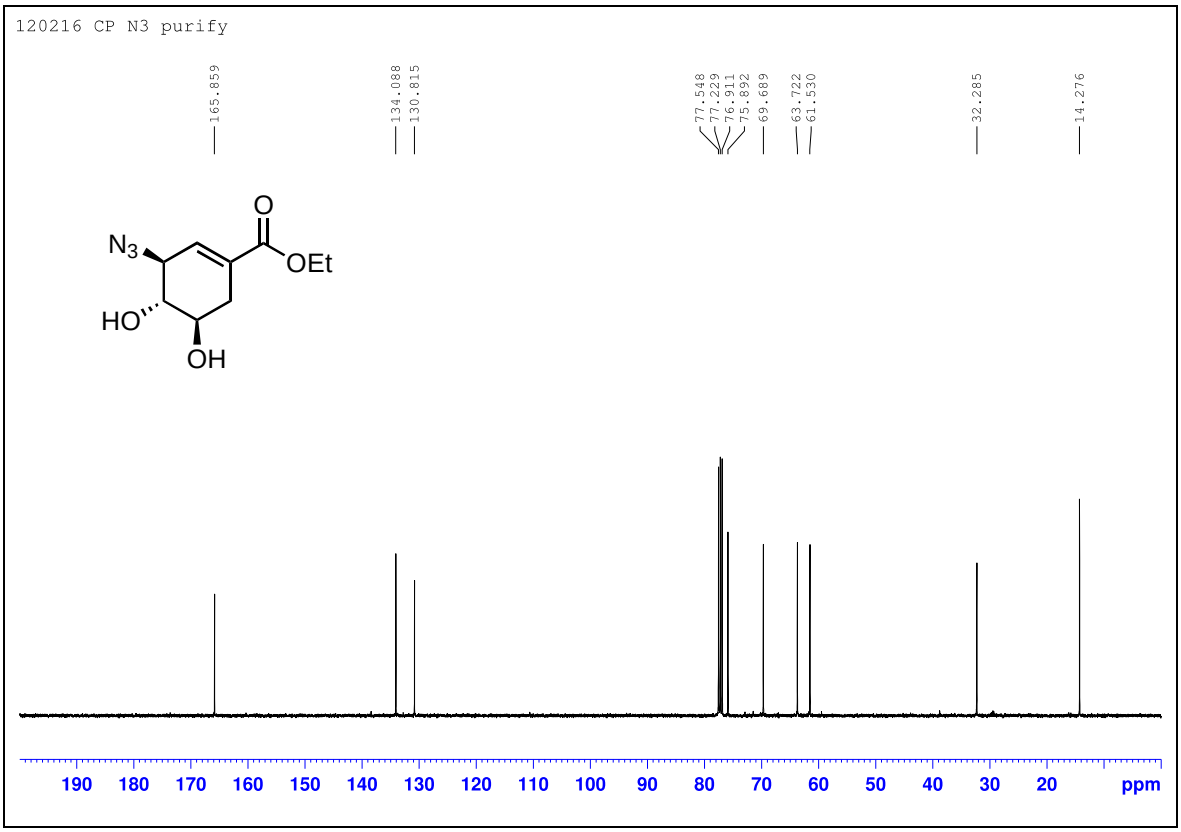
^{1}H NMR spectrum of compound **10** (CD_3OD, 400 MHz)



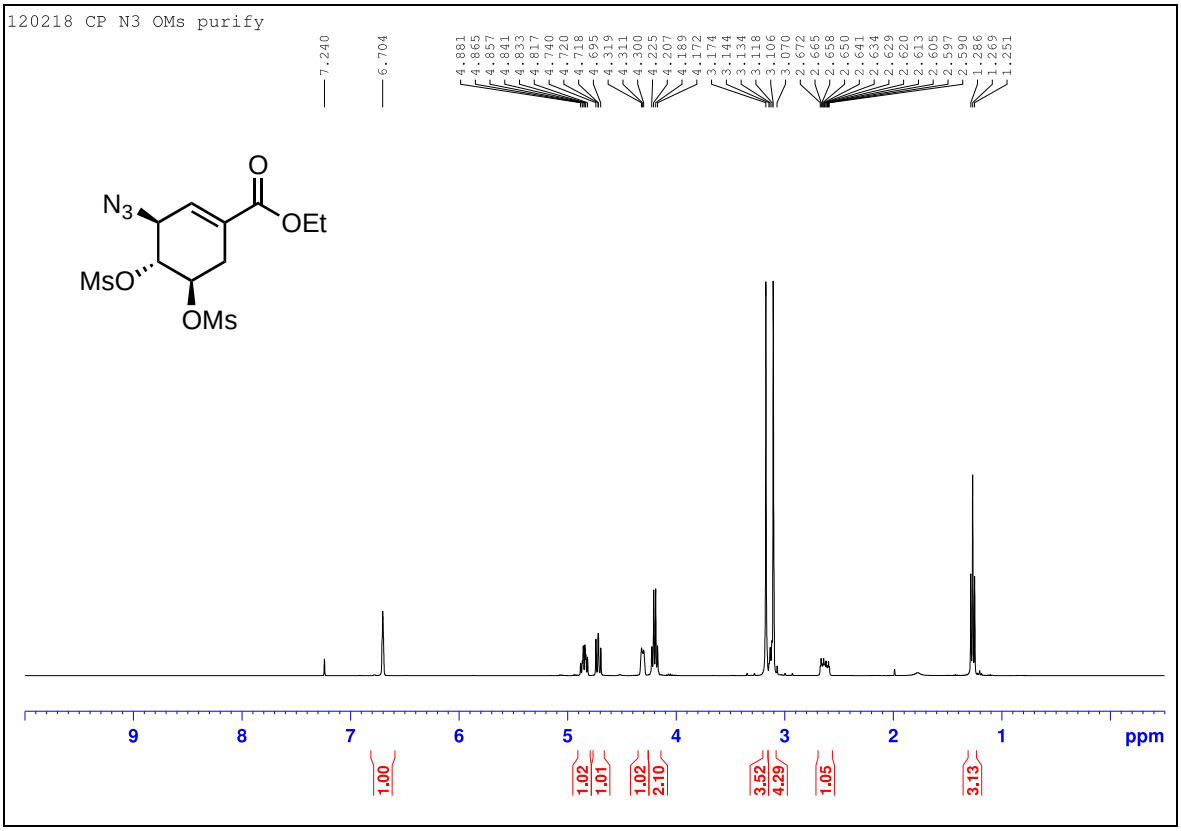
^{13}C NMR spectrum of compound **10** (CD_3OD, 100 MHz)



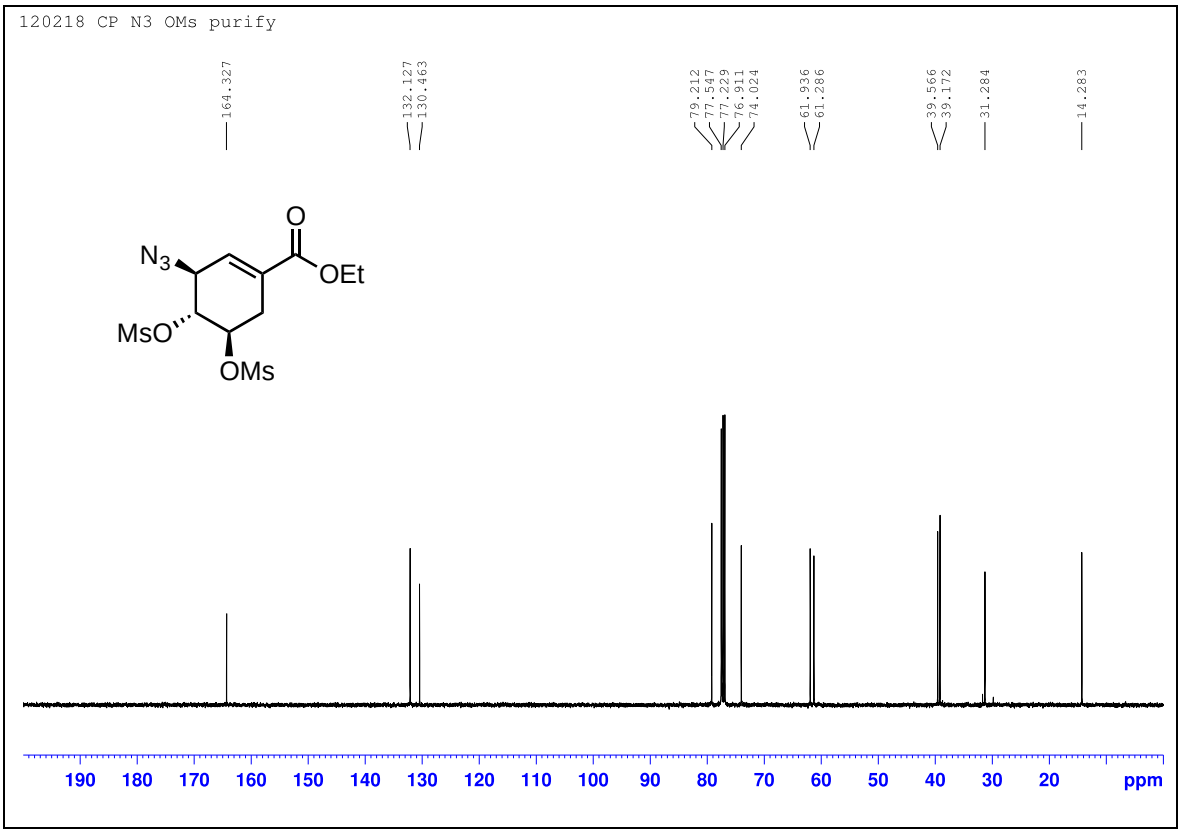
^{1}H NMR spectrum of compound **11** ($CDCl_3$, 400 MHz)



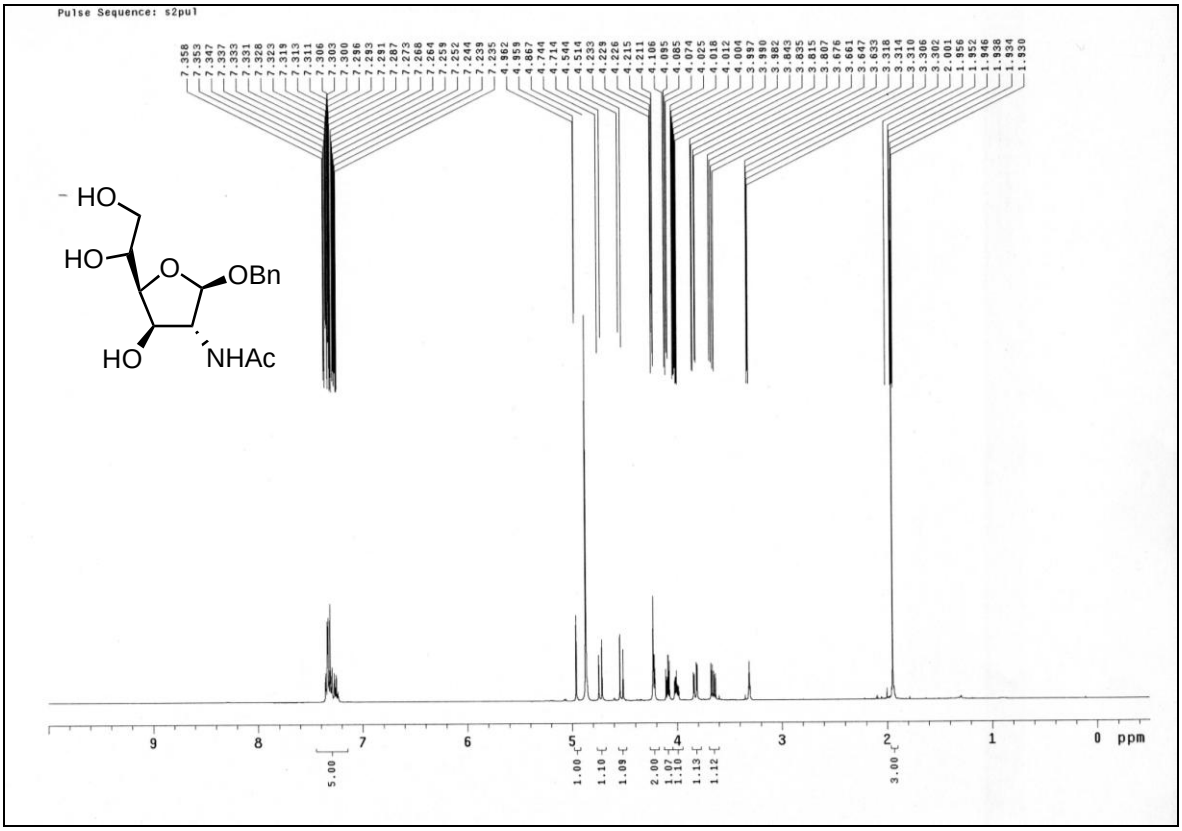
^{13}C NMR spectrum of compound **11** ($CDCl_3$, 100 MHz)



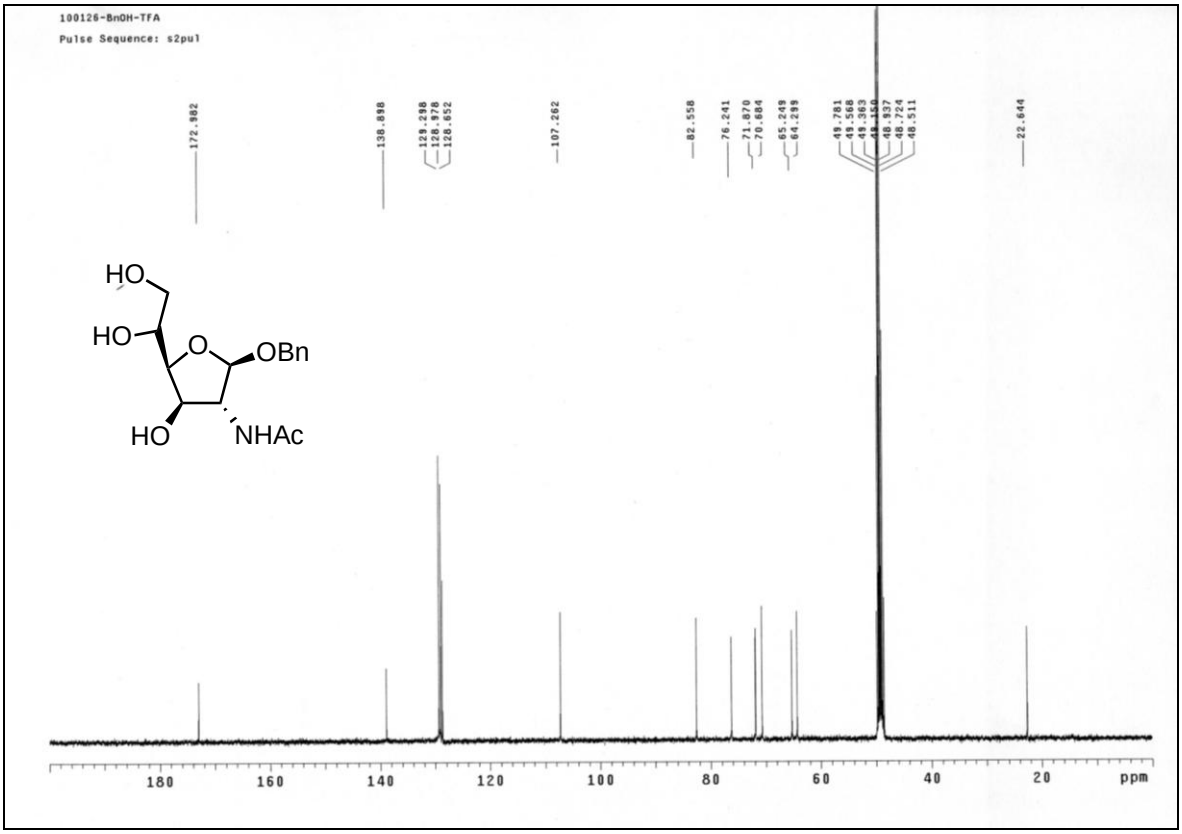
^{1}H NMR spectrum of compound **12** ($CDCl_3$, 400 MHz)



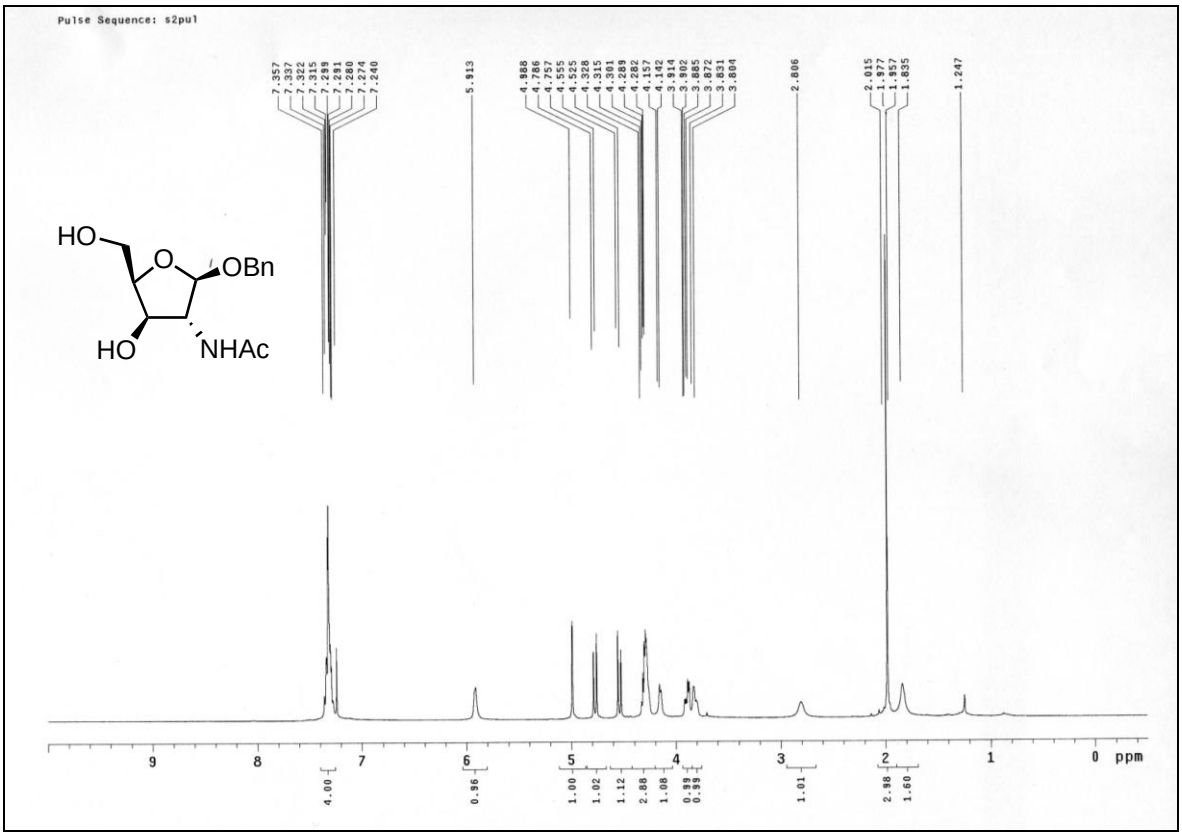
^{13}C NMR spectrum of compound **12** ($CDCl_3$, 100 MHz)



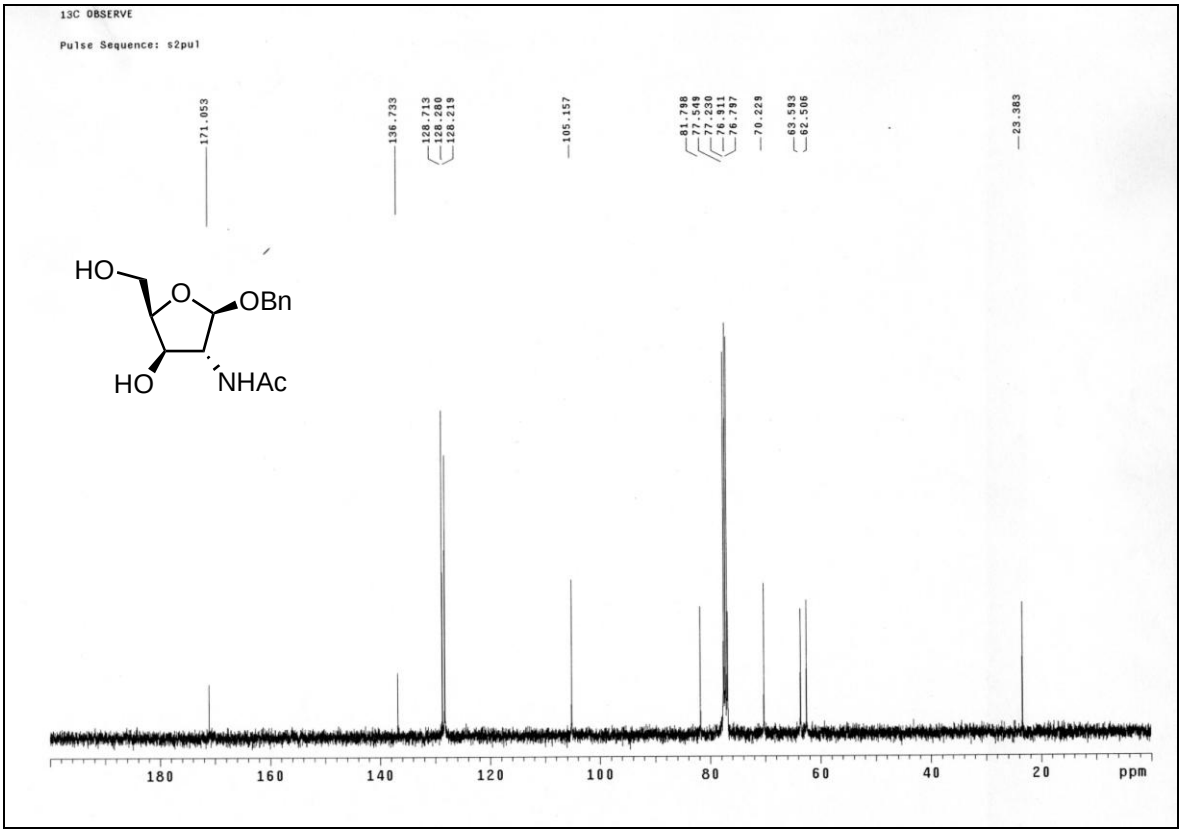
^{1}H NMR spectrum of compound **13** (CD_3OD, 400 MHz)



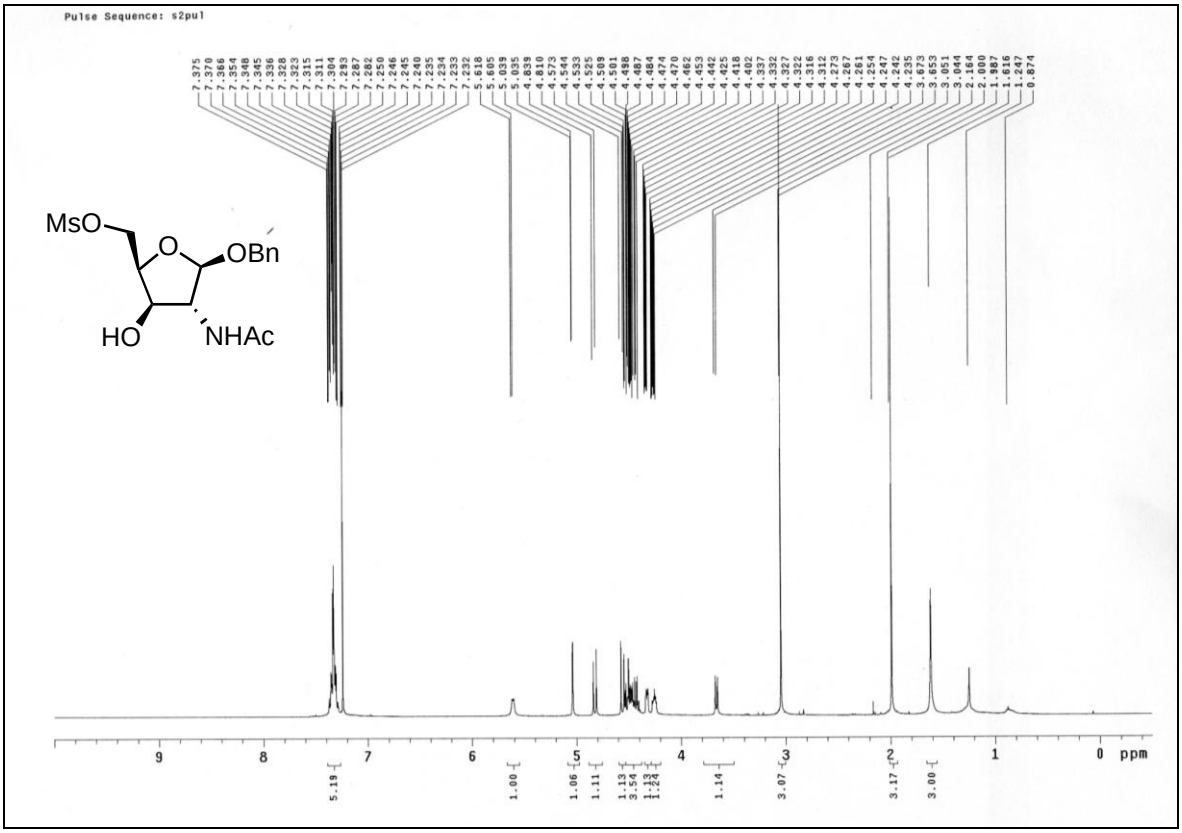
^{13}C NMR spectrum of compound **13** (CD_3OD, 100 MHz)



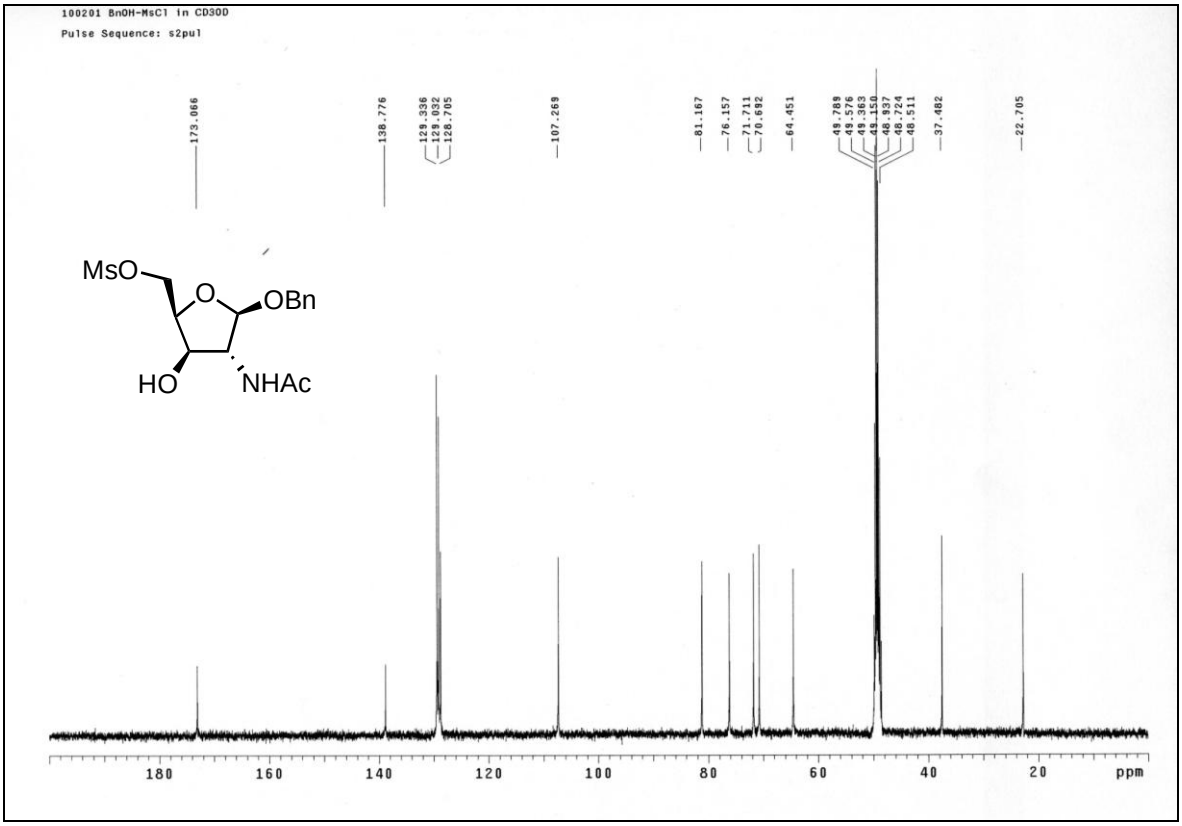
^{1}H NMR spectrum of compound **14** ($CDCl_3$, 400 MHz)



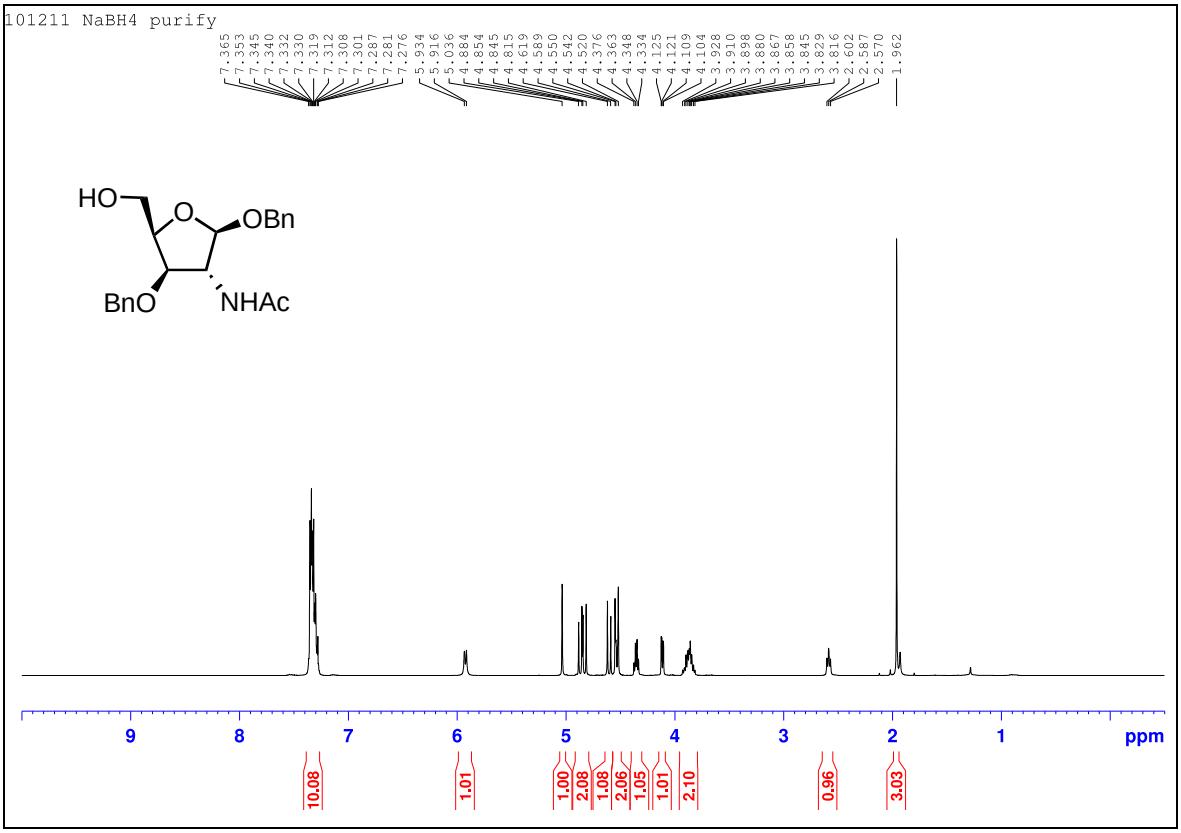
^{13}C NMR spectrum of compound **14** ($CDCl_3$, 100 MHz)



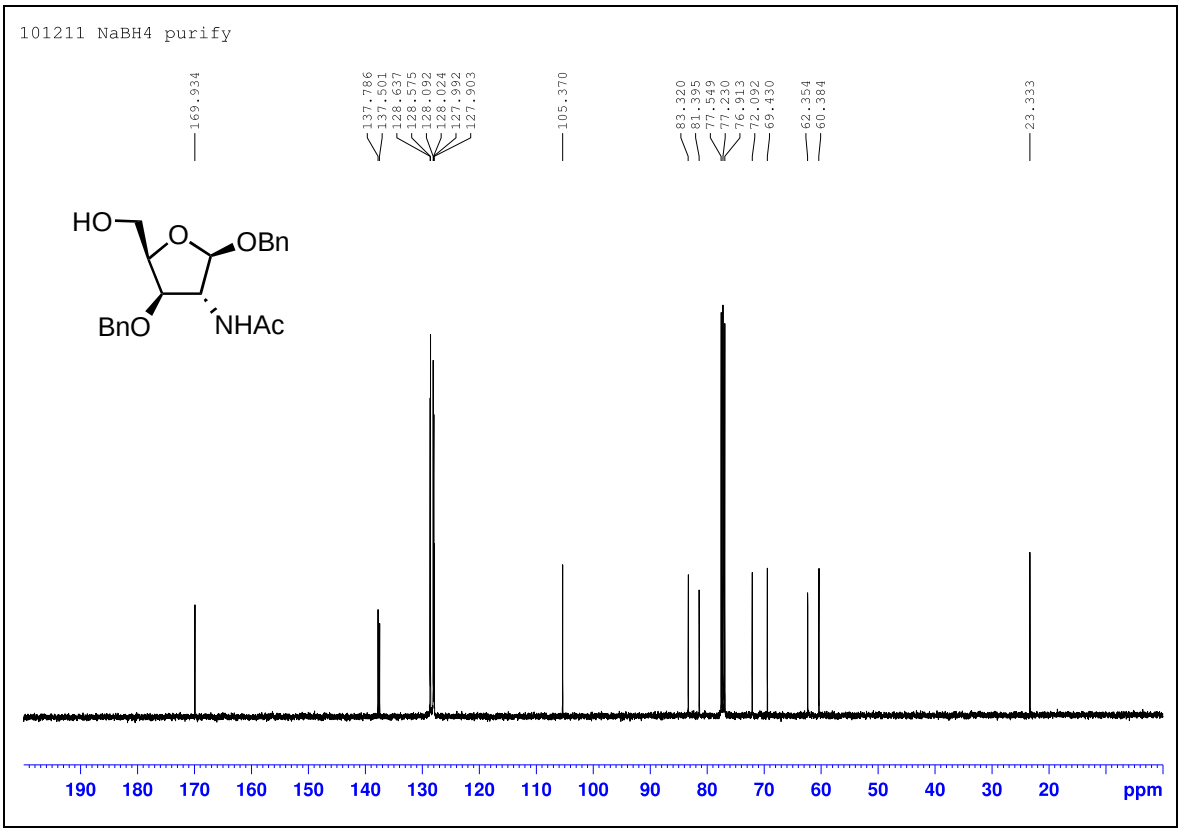
^{1}H NMR spectrum of compound **15** ($CDCl_3$, 400 MHz)



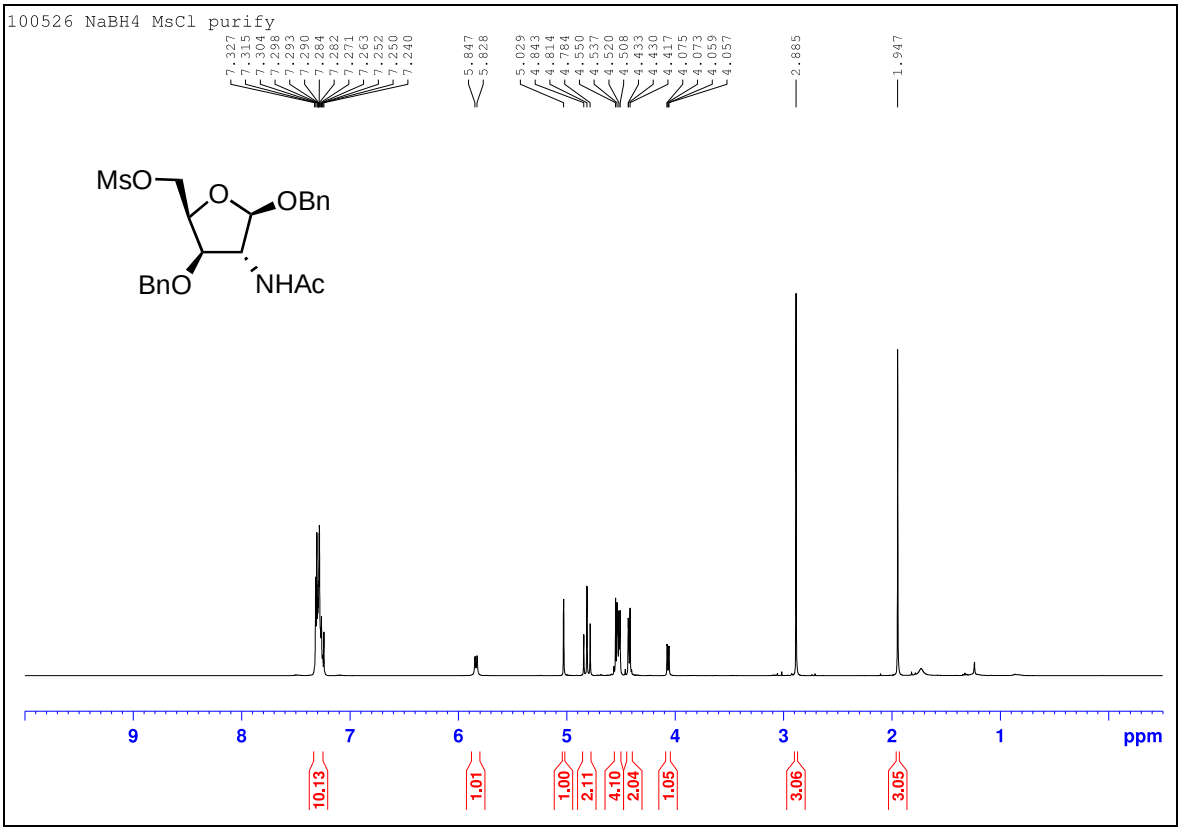
^{13}C NMR spectrum of compound **15** (CD_3OD, 100 MHz)



^{1}H NMR spectrum of compound **16** ($CDCl_3$, 400 MHz)



^{13}C NMR spectrum of compound **16** ($CDCl_3$, 100 MHz)



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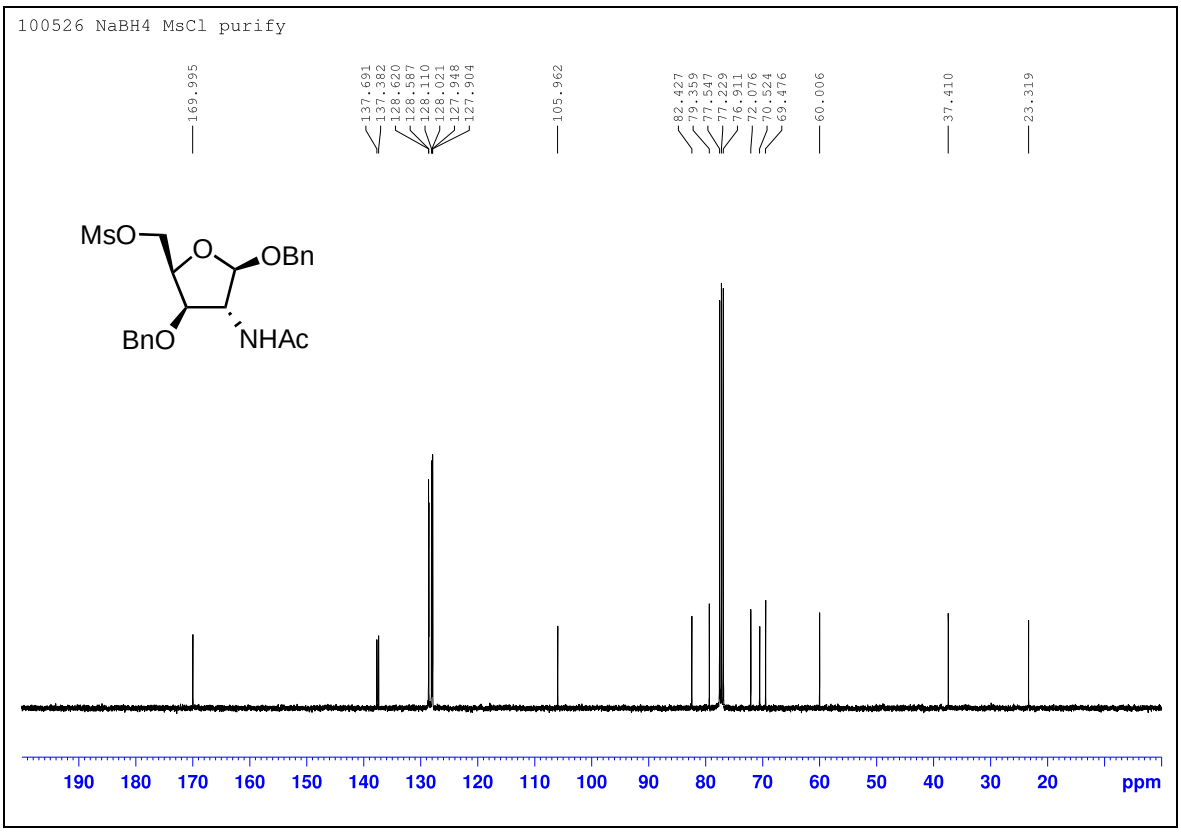
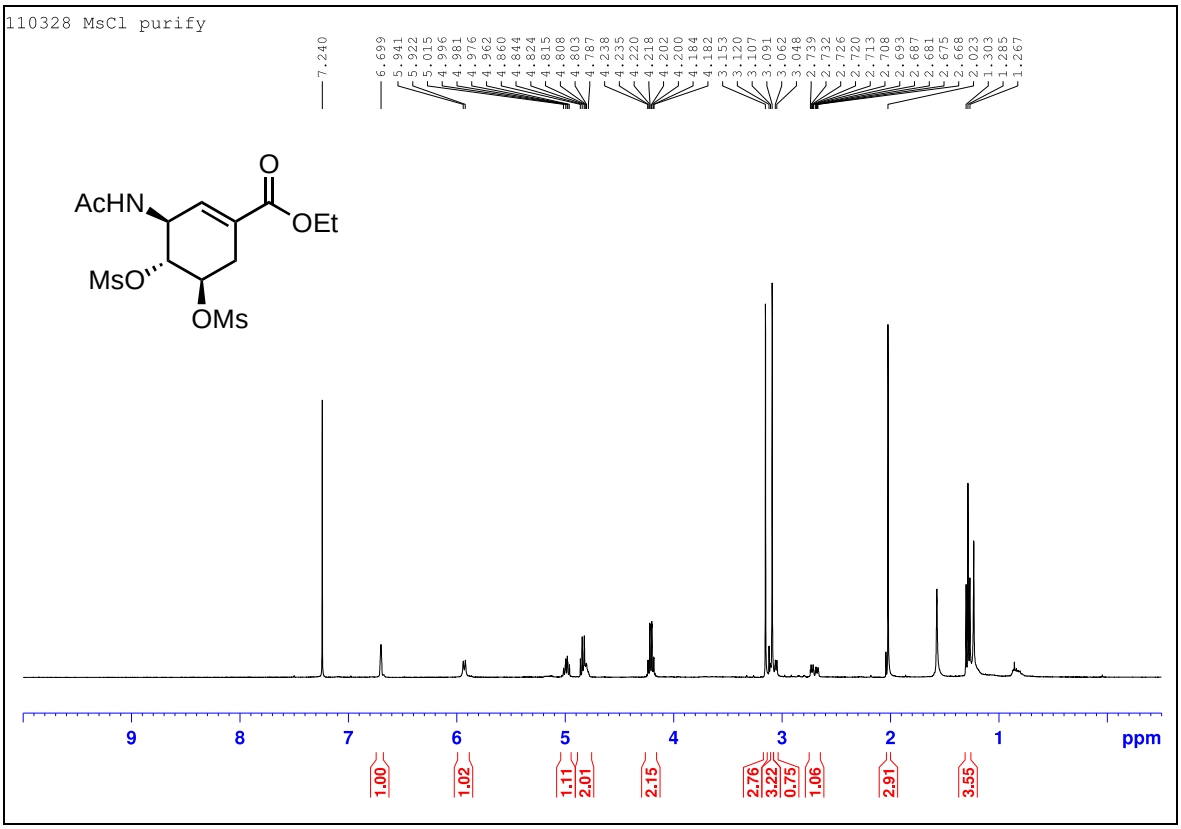
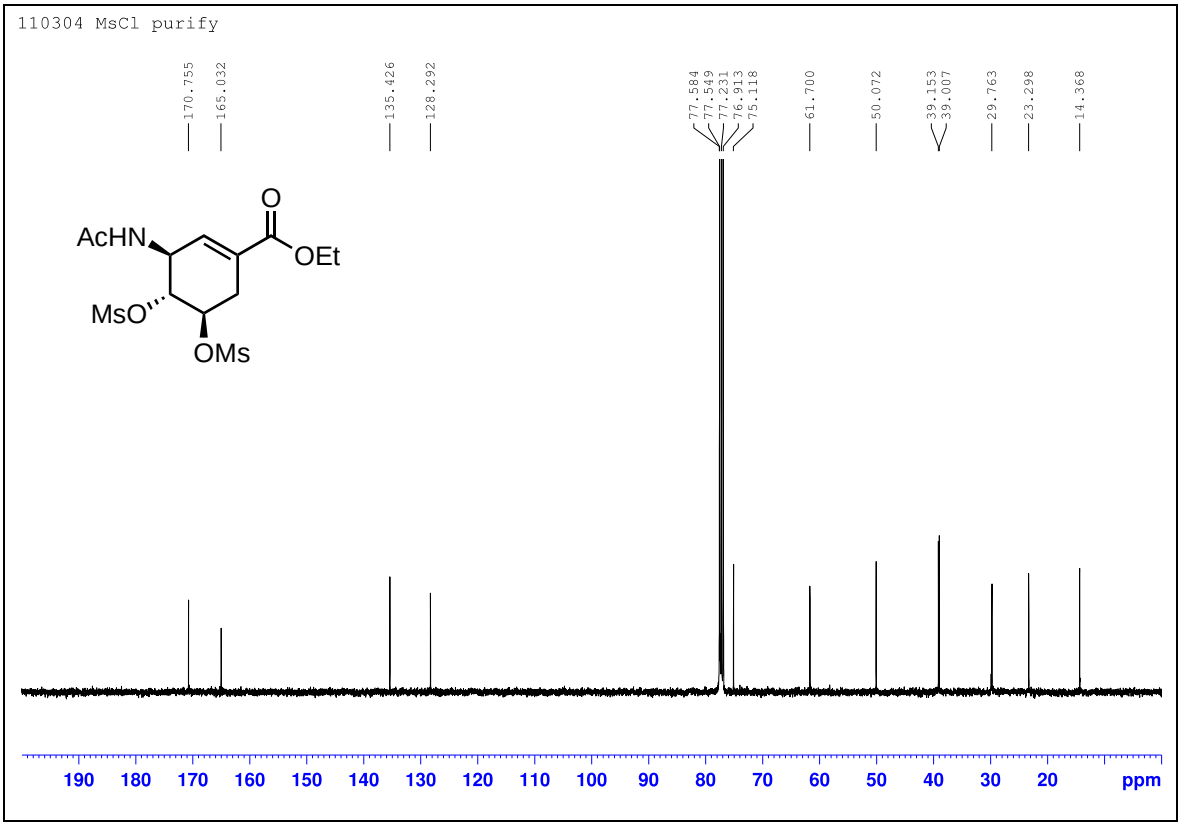


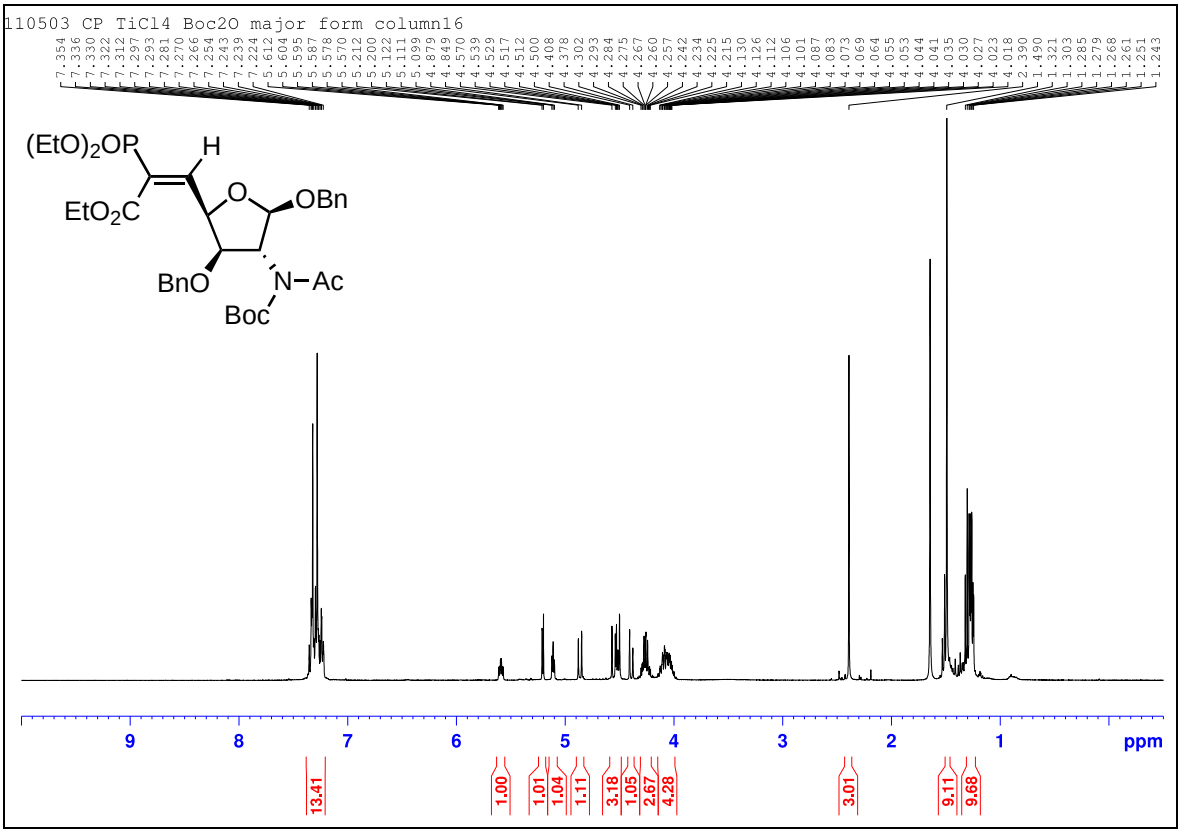
^{13}C NMR spectrum of compound **17** ($CDCl_3$, 100 MHz)



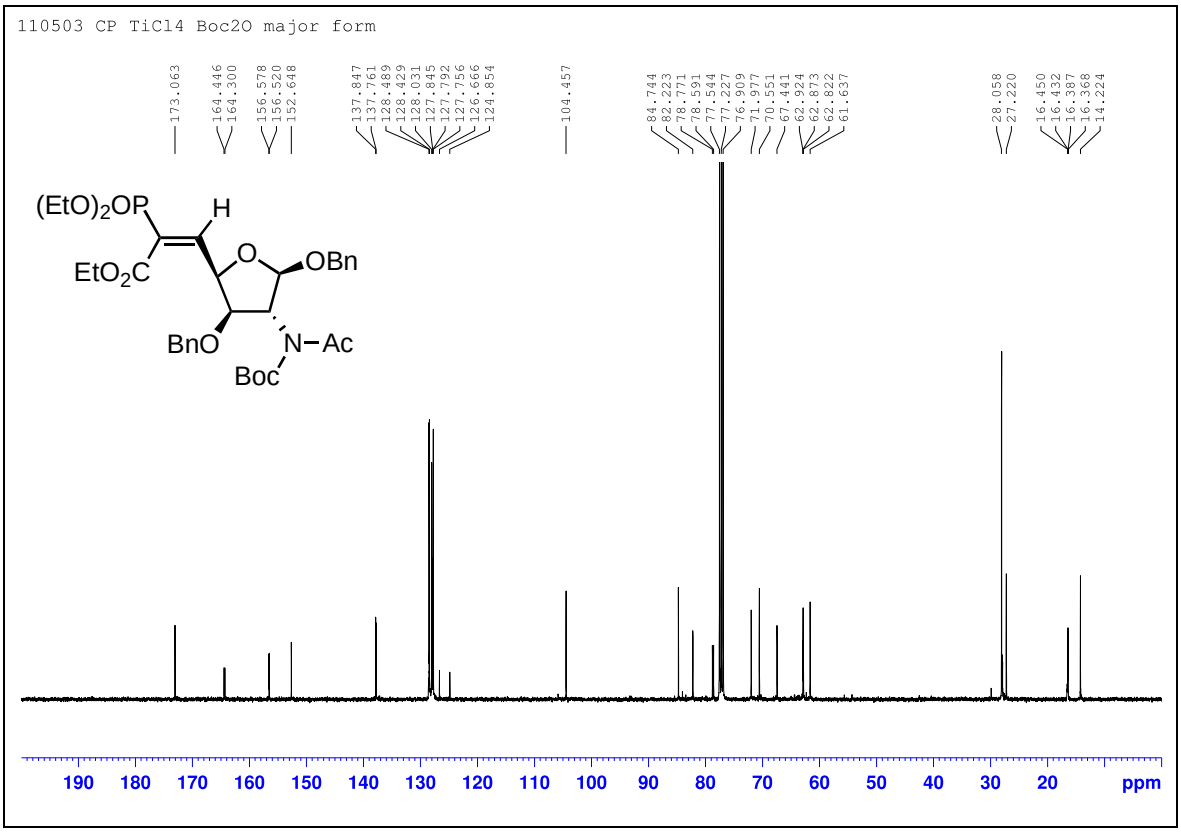
^{1}H NMR spectrum of compound **18** ($CDCl_3$, 400 MHz)



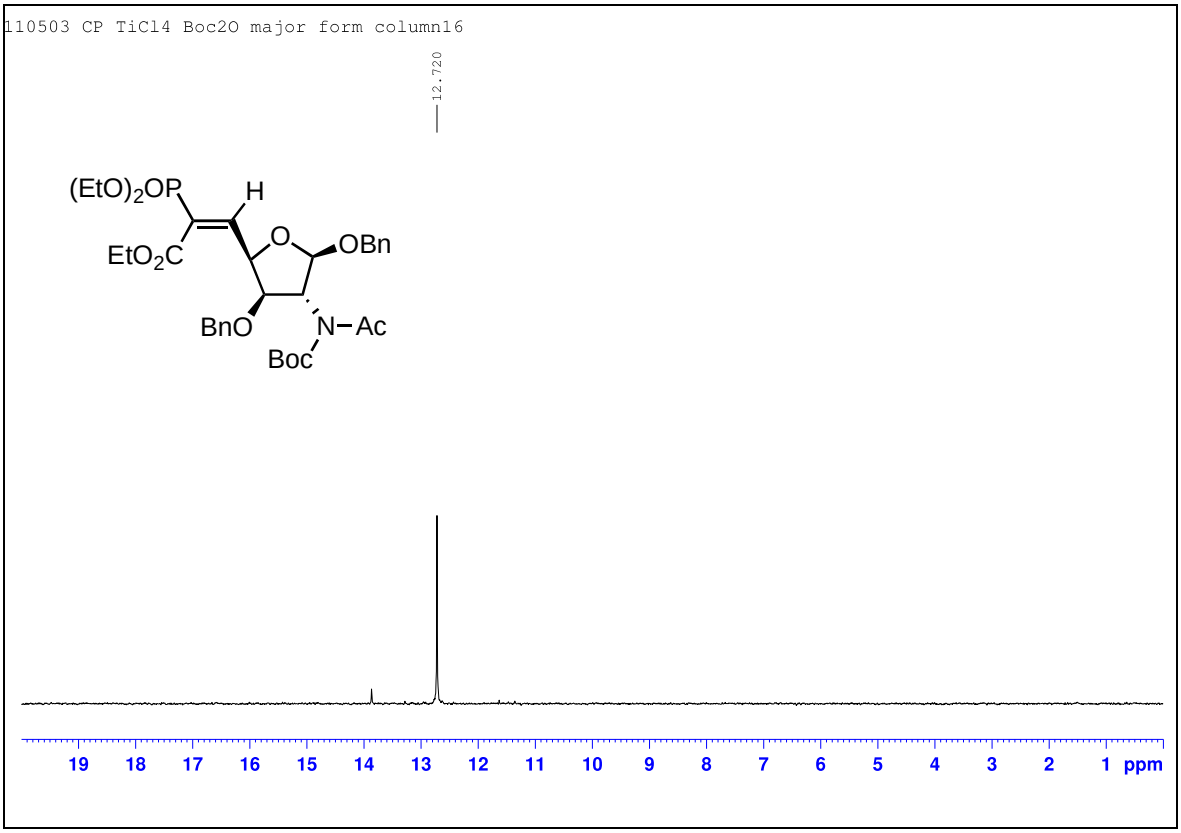
^{13}C NMR spectrum of compound **18** ($CDCl_3$, 100 MHz)



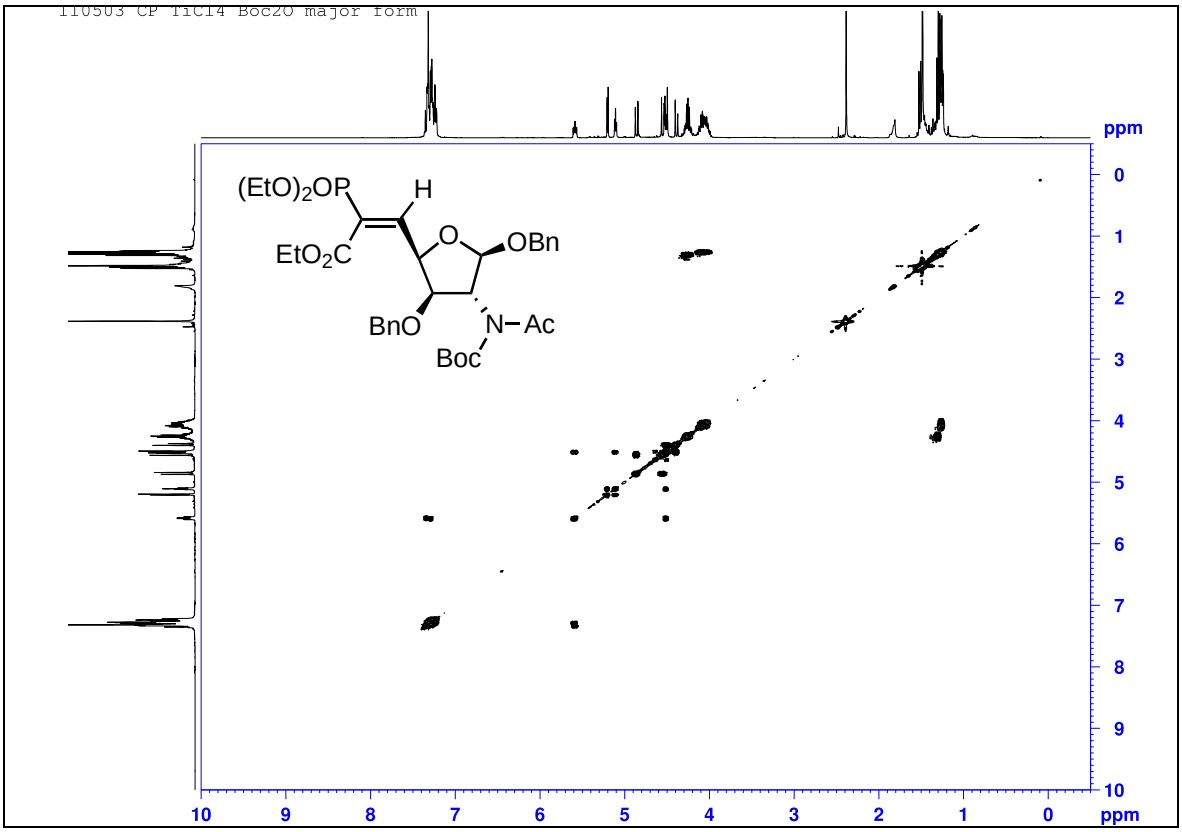
^{1}H NMR spectrum of compound (*E*)-**20** ($CDCl_3$, 400 MHz)



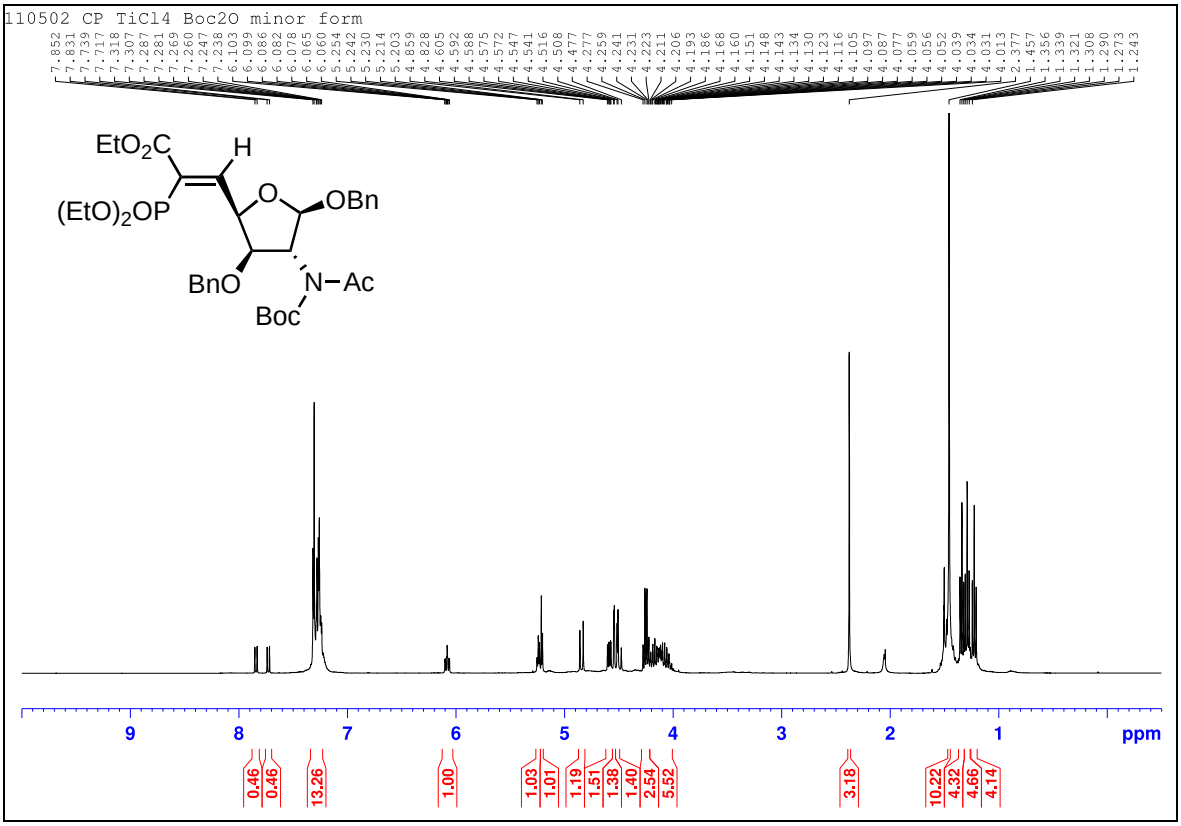
^{13}C NMR spectrum of compound (*E*)-**20** ($CDCl_3$, 100 MHz)



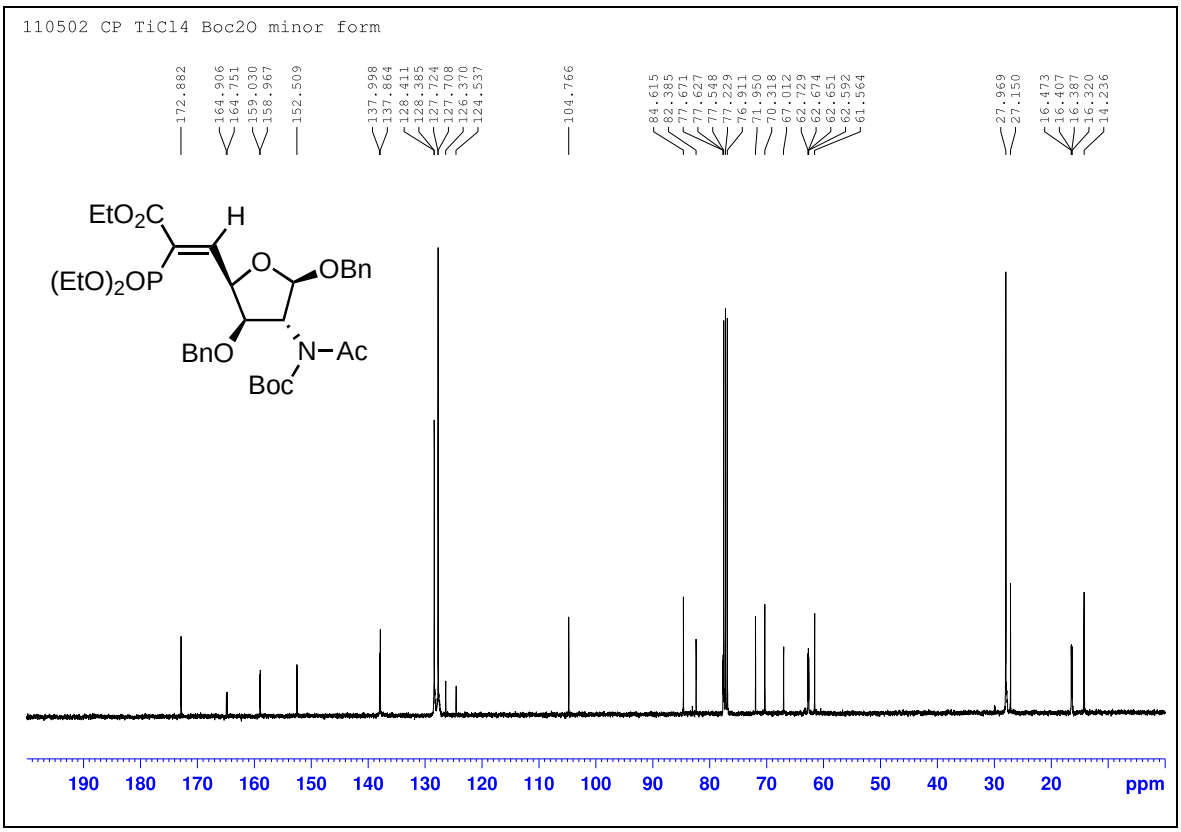
^{31}P NMR spectrum of compound (*E*)-**20** ($CDCl_3$, 162 MHz)



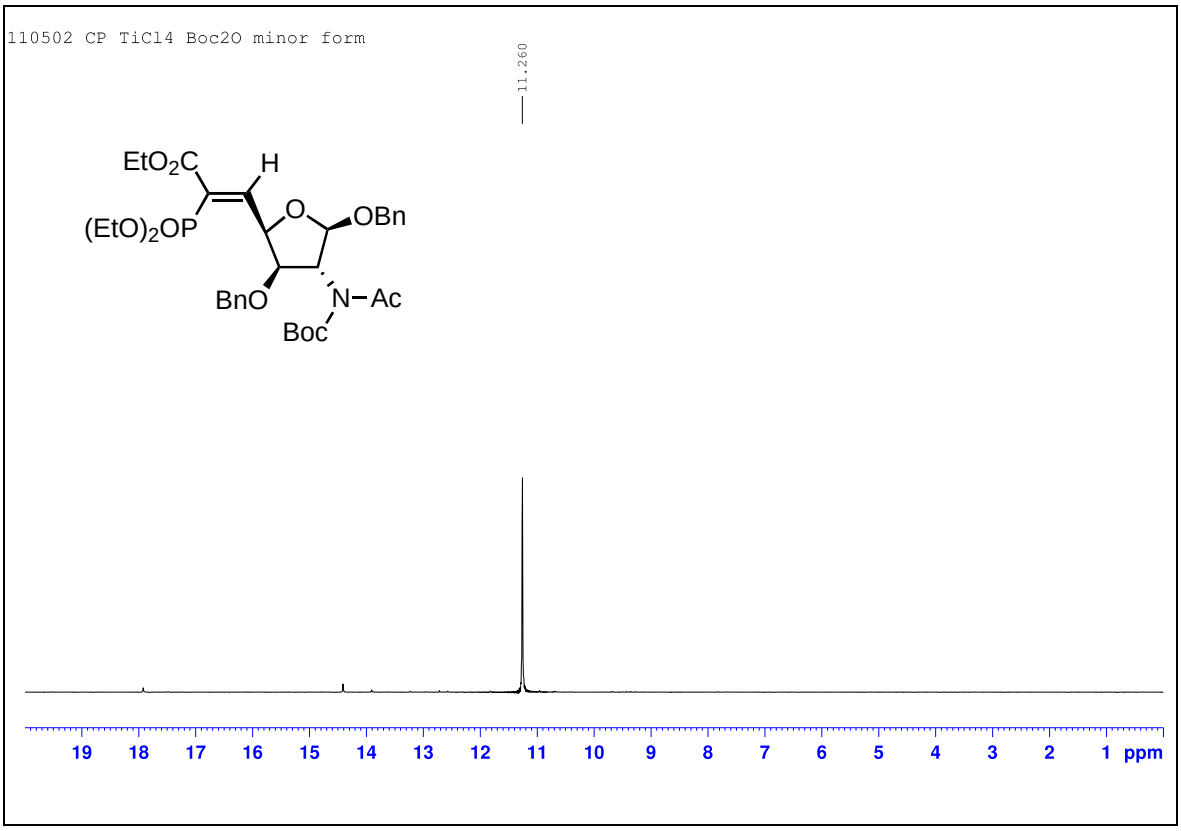
^{1}H–^{1}H COSY NMR spectrum of compound (*E*)-**20** ($CDCl_3$, 400 MHz)



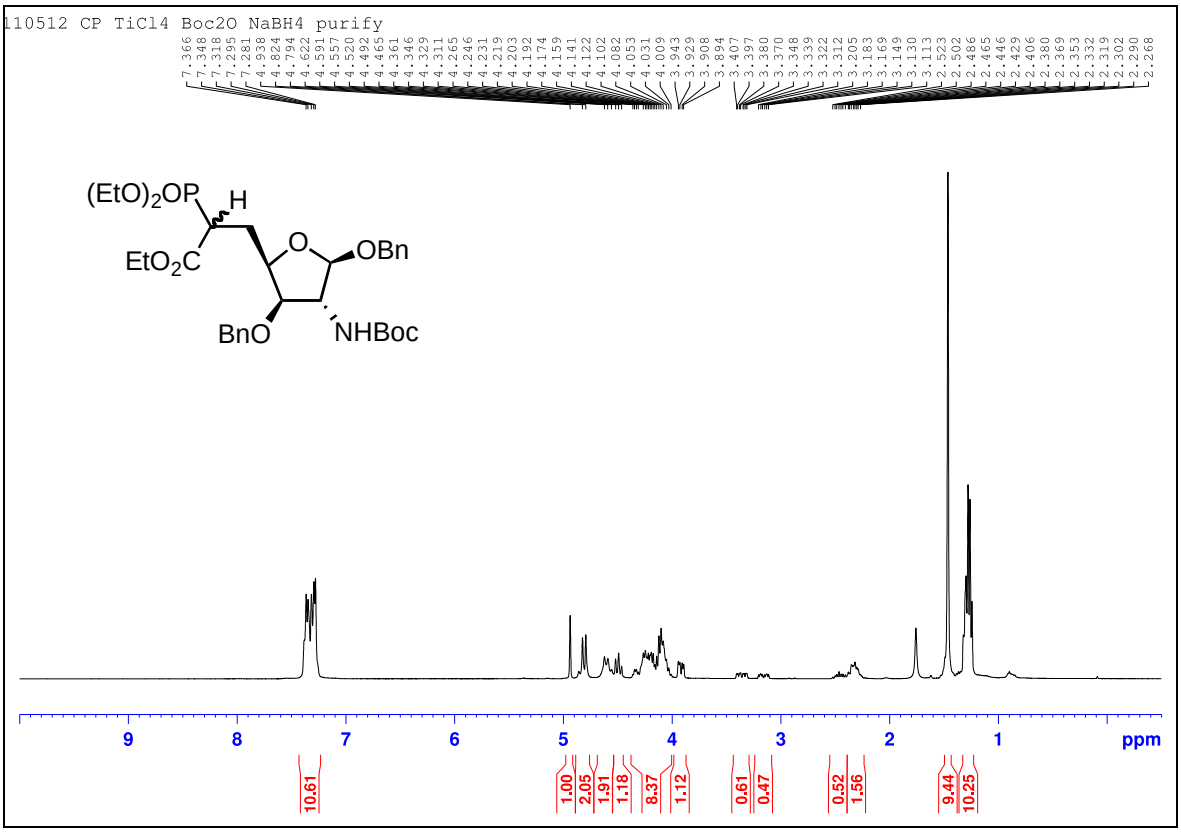
^{1}H NMR spectrum of compound (*Z*)-**20** ($CDCl_3$, 400 MHz)



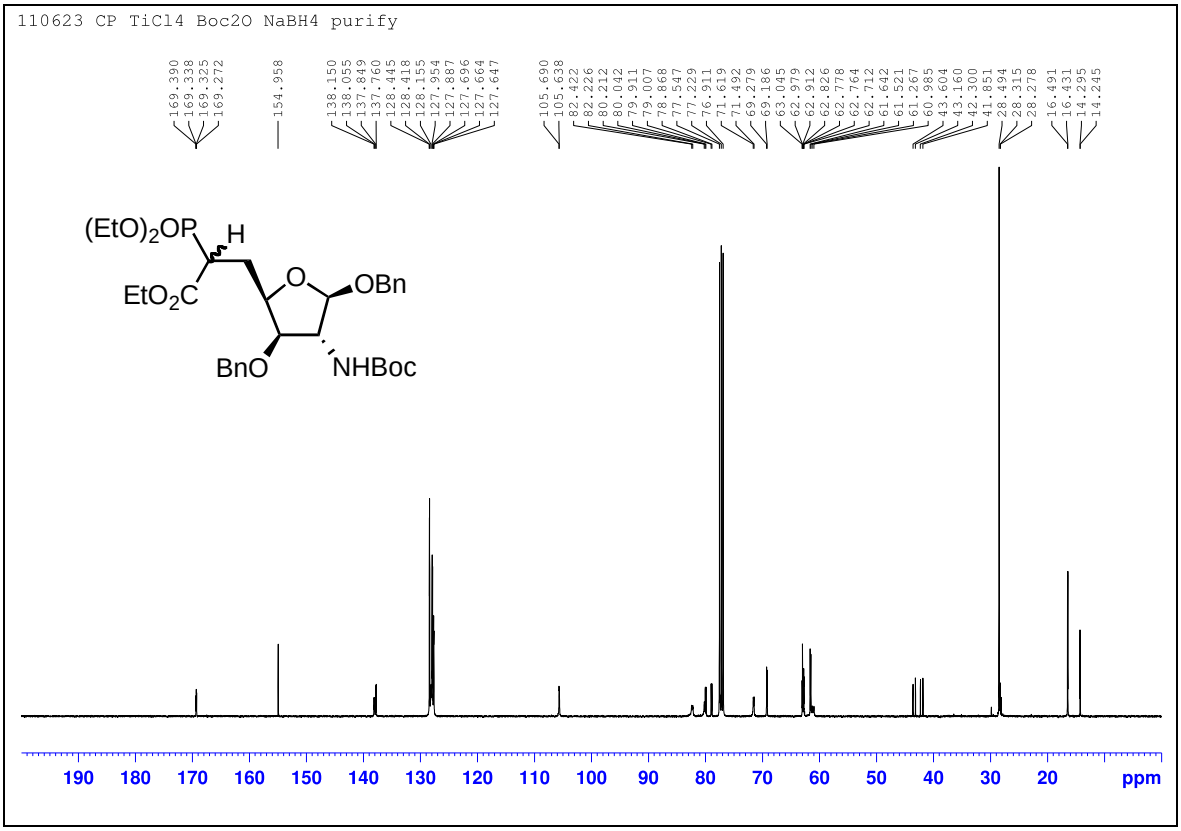
^{13}C NMR spectrum of compound (*Z*)-**20** ($CDCl_3$, 100 MHz)



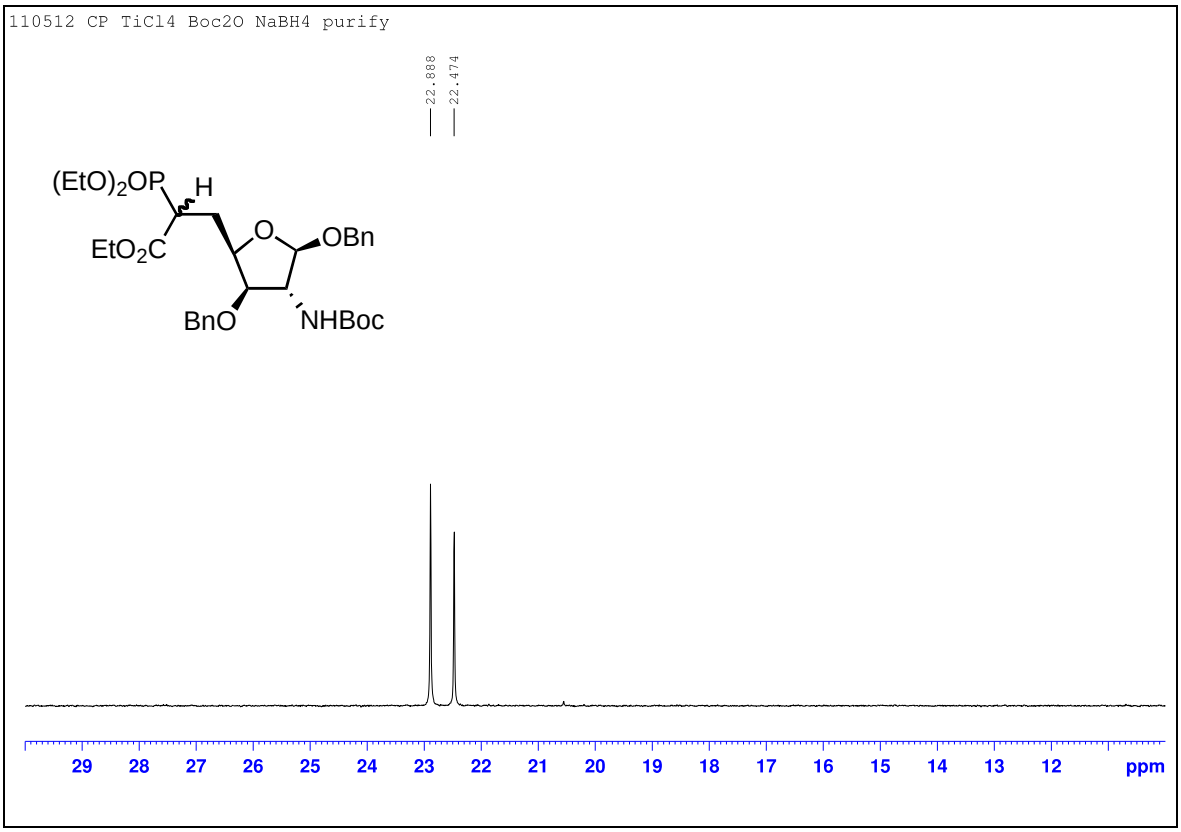
^{31}P NMR spectrum of compound (*Z*)-**20** ($CDCl_3$, 162 MHz)



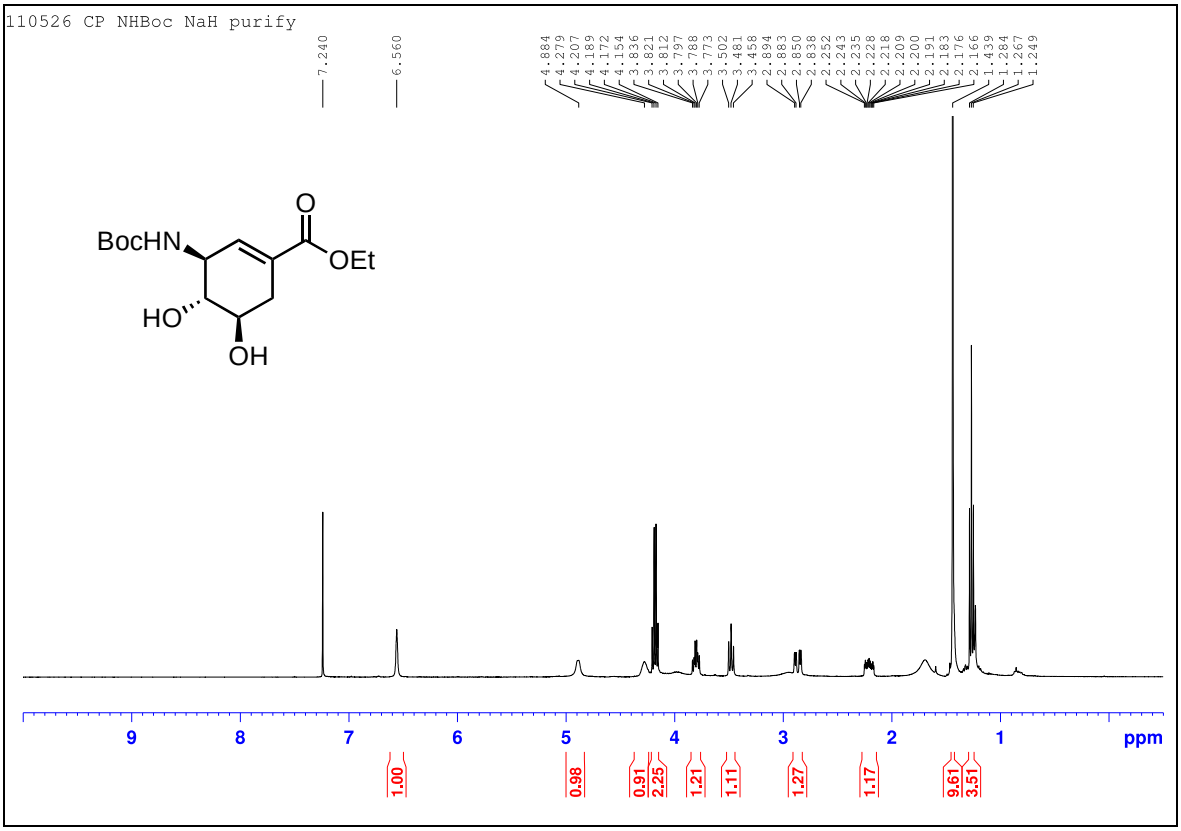
^{1}H NMR spectrum of compound **21** ($CDCl_3$, 400 MHz)



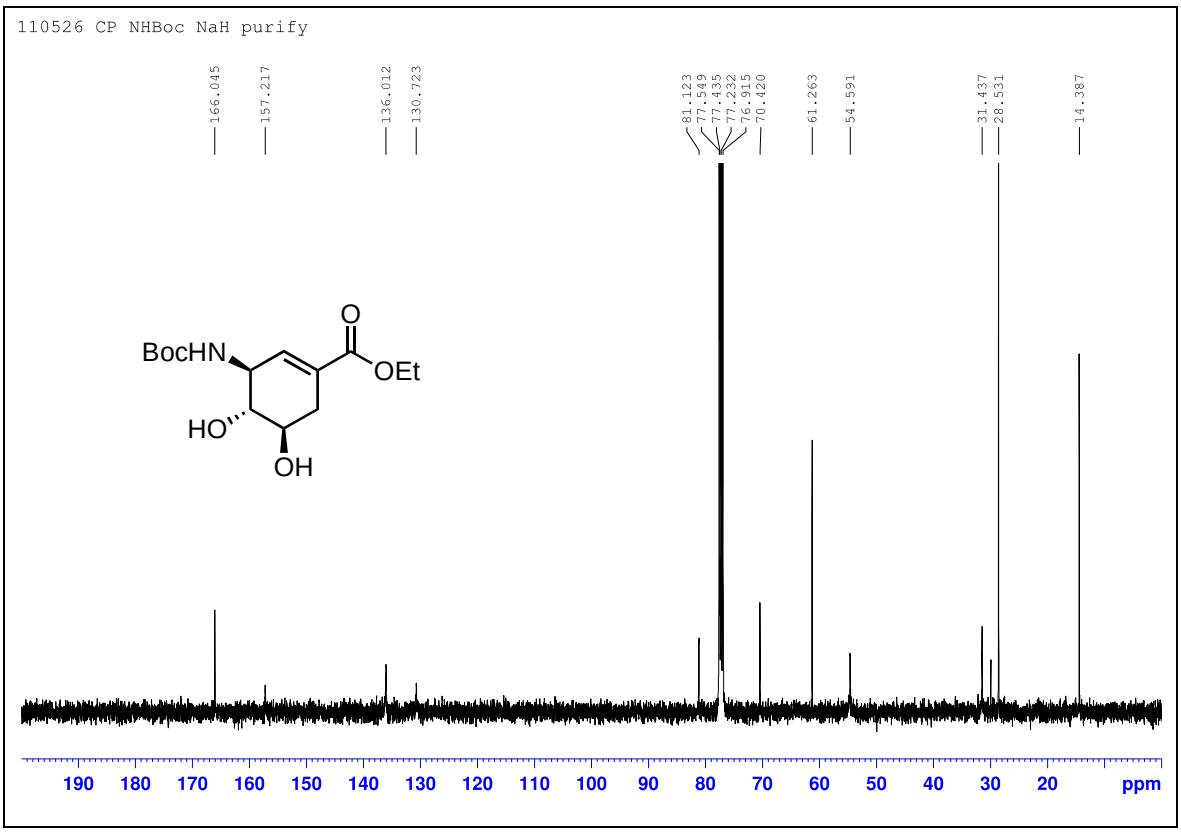
^{13}C NMR spectrum of compound **21** ($CDCl_3$, 100 MHz)



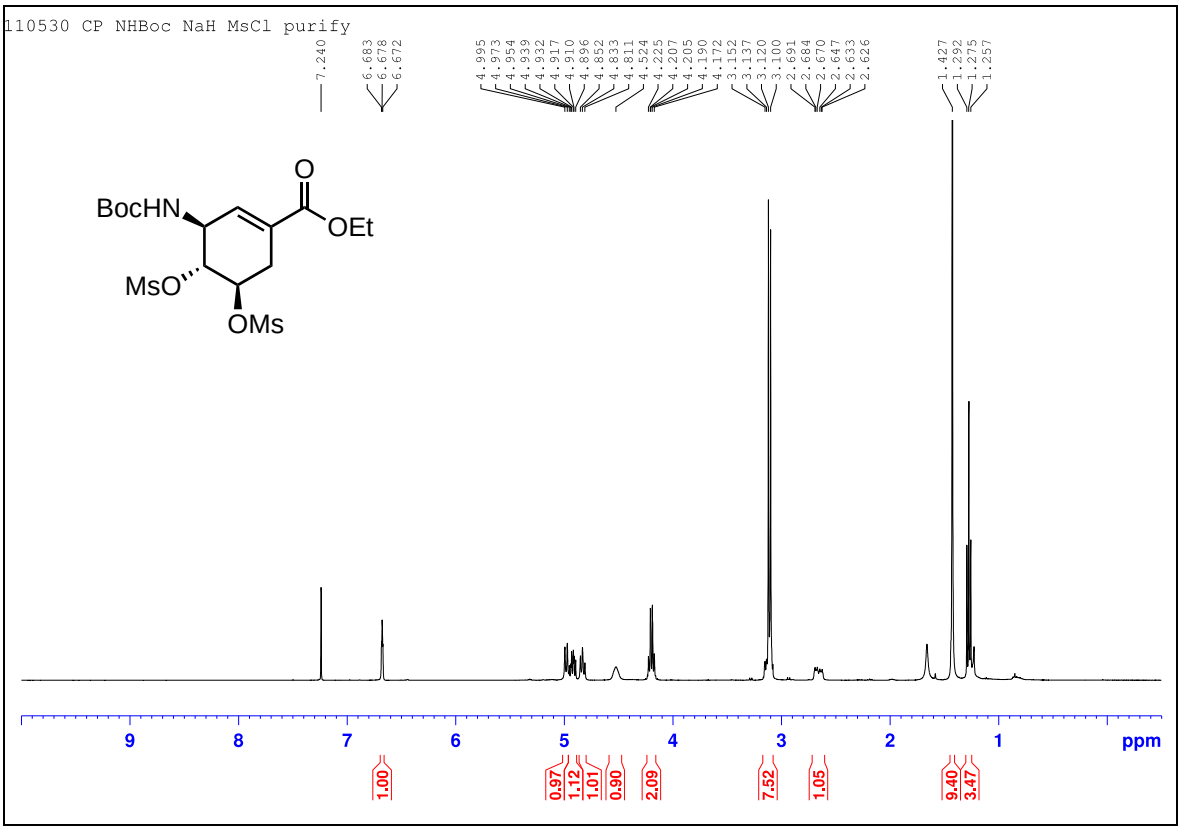
^{31}P NMR spectrum of compound **21** ($CDCl_3$, 162 MHz)



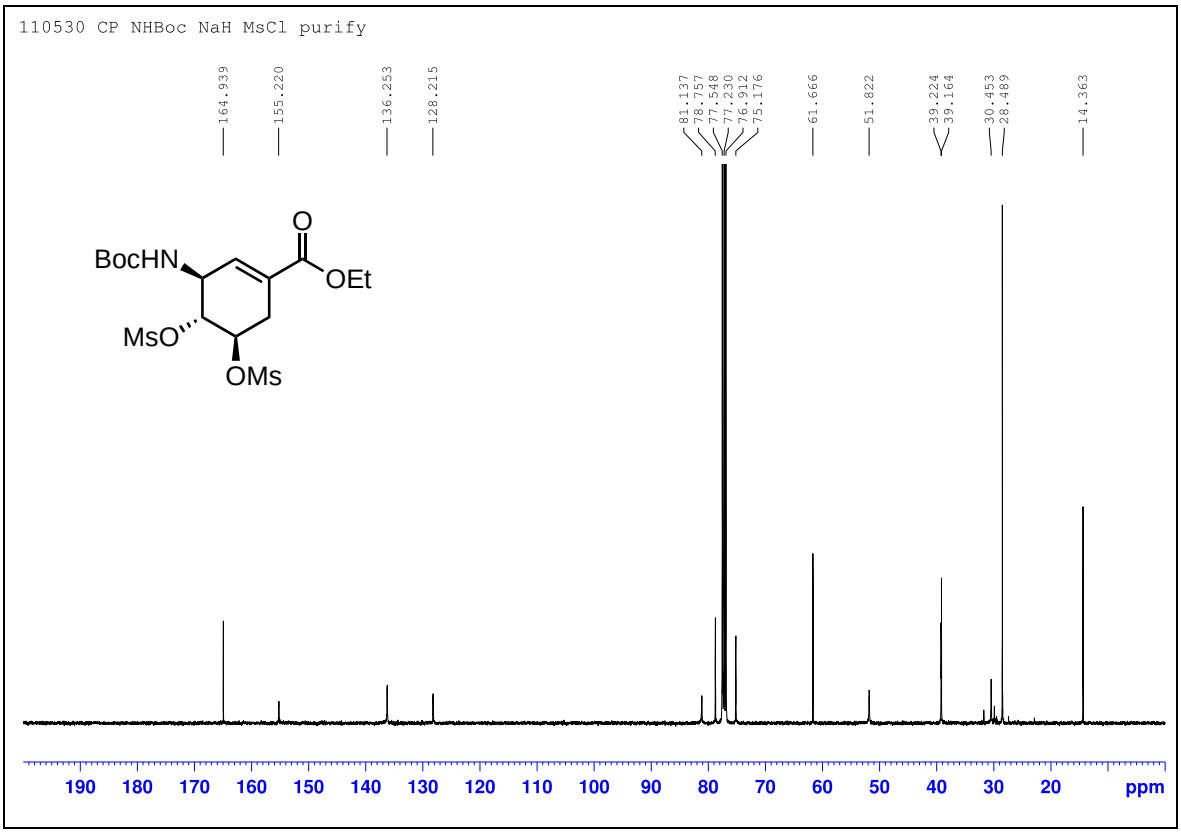
^{1}H NMR spectrum of compound **22** ($CDCl_3$, 400 MHz)



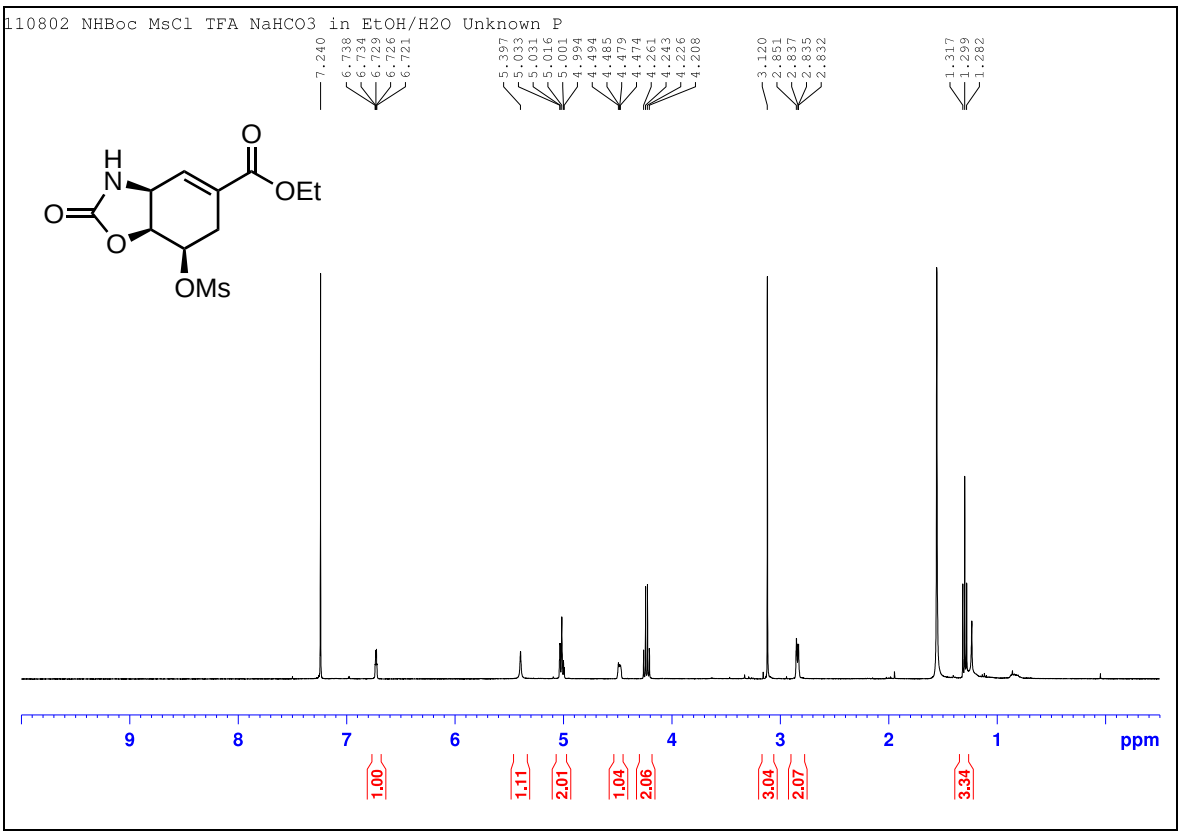
^{13}C NMR spectrum of compound **22** ($CDCl_3$, 100 MHz)



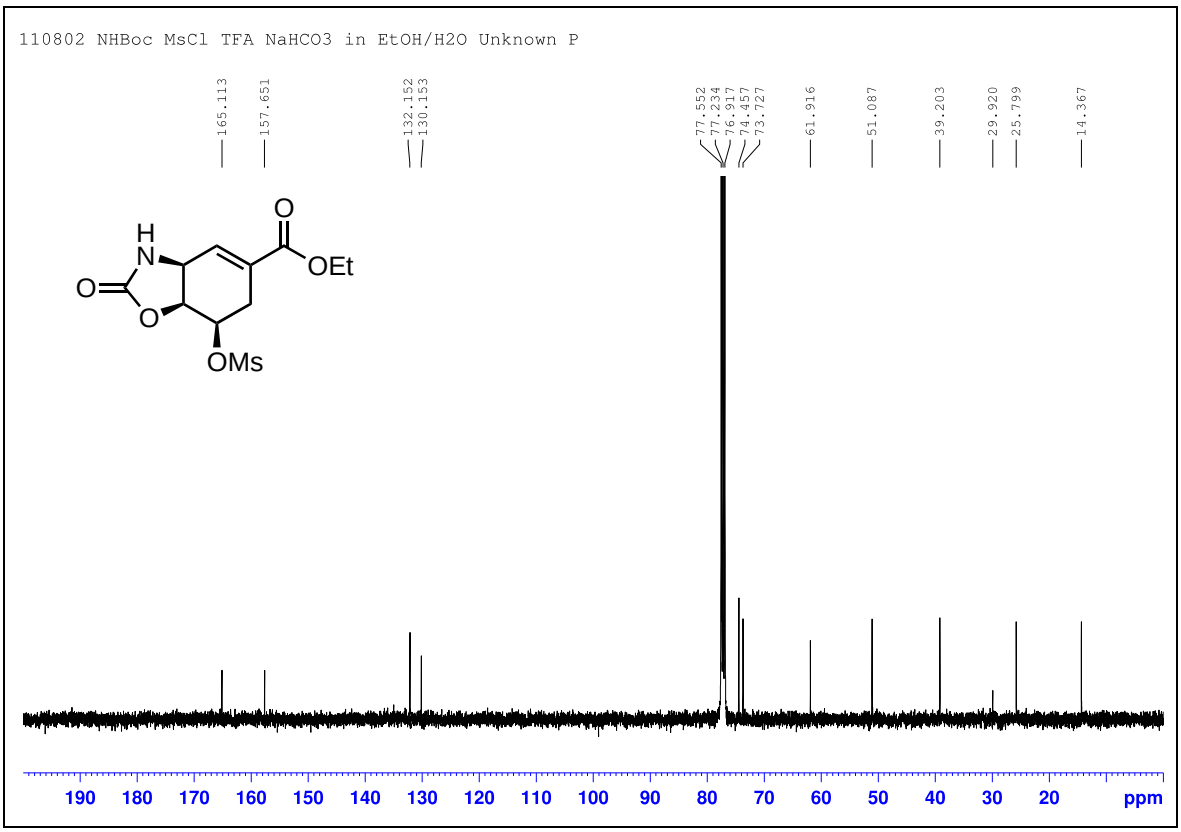
^{1}H NMR spectrum of compound **23** ($CDCl_3$, 400 MHz)



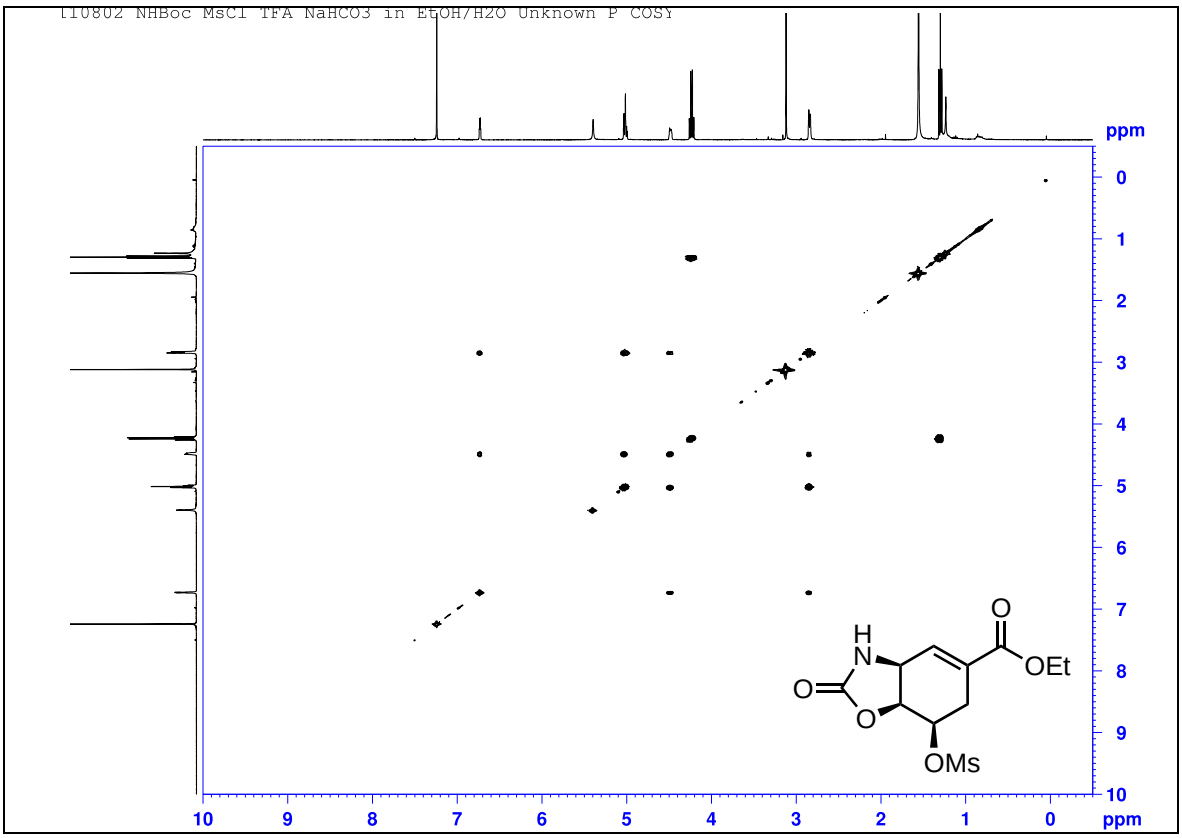
^{13}C NMR spectrum of compound **23** ($CDCl_3$, 100 MHz)



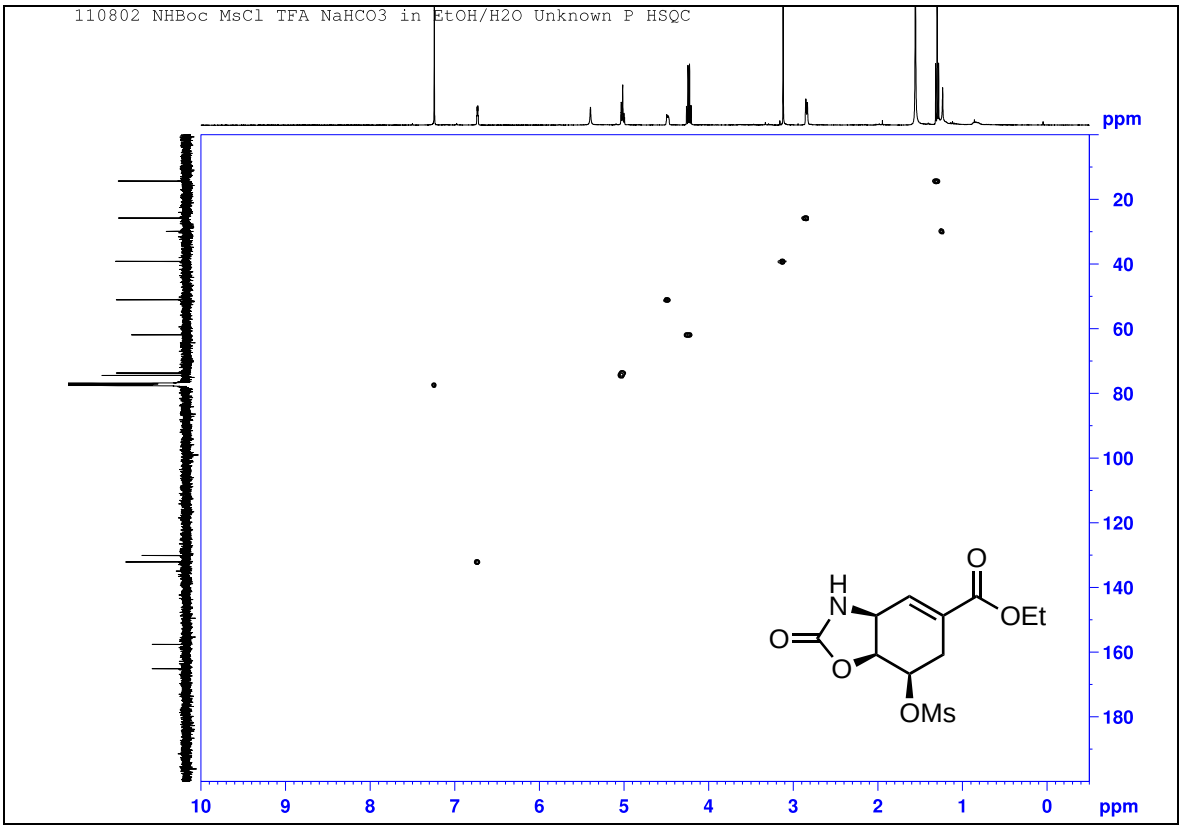
^{1}H NMR spectrum of compound **24** ($CDCl_3$, 400 MHz)



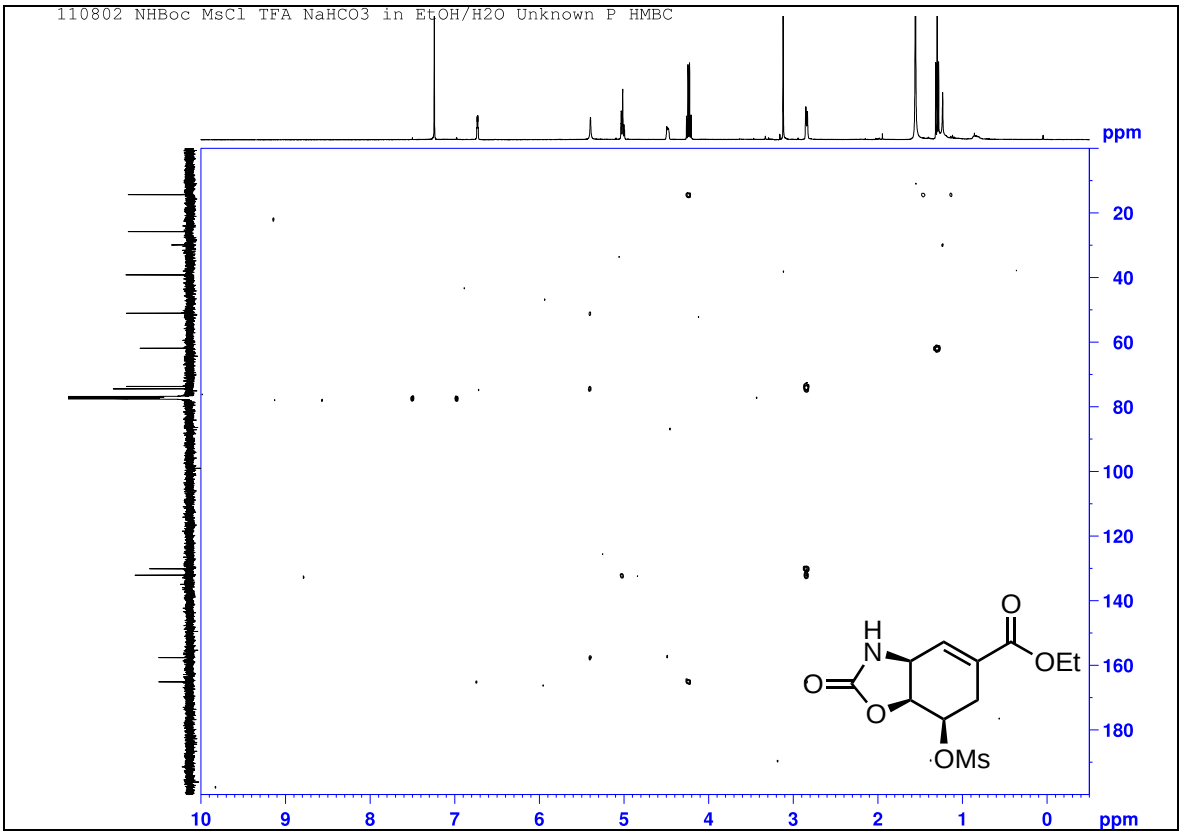
^{13}C NMR spectrum of compound **24** ($CDCl_3$, 100 MHz)



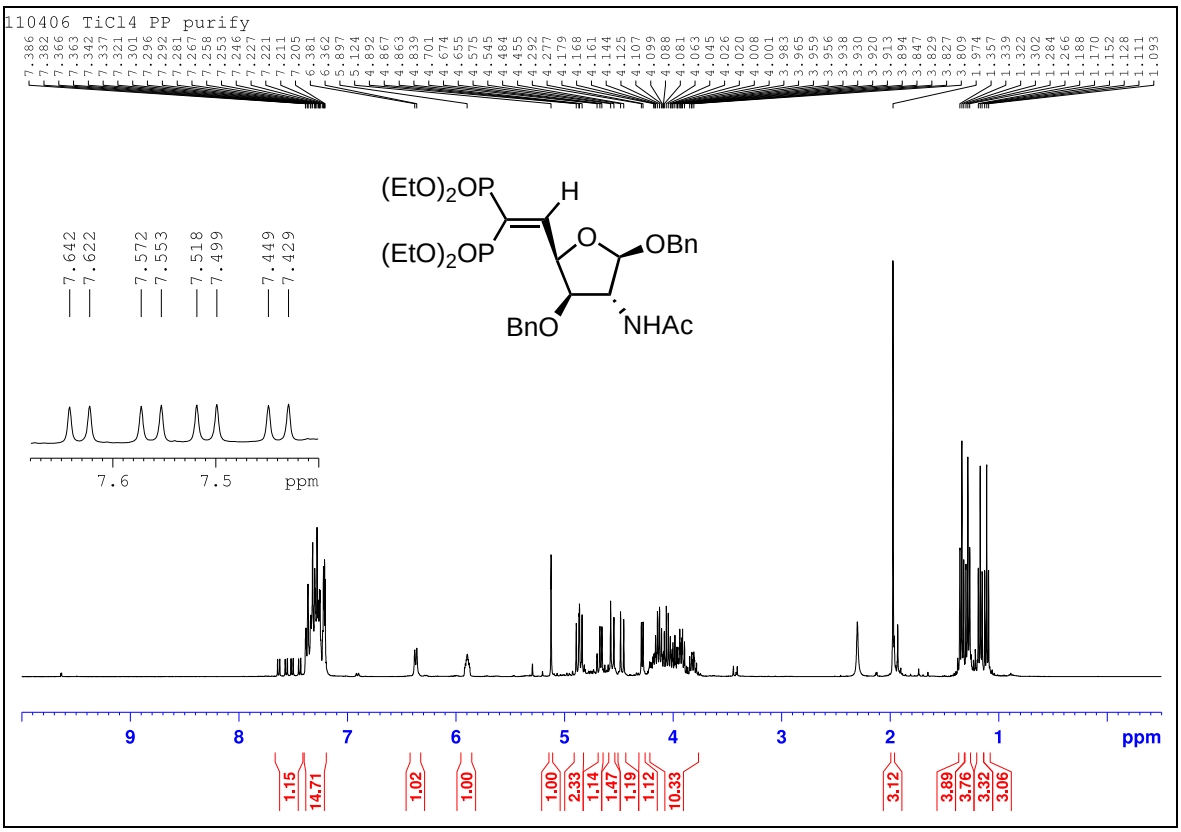
^{1}H–^{1}H COSY NMR spectrum of compound **24** ($CDCl_3$, 400 MHz)



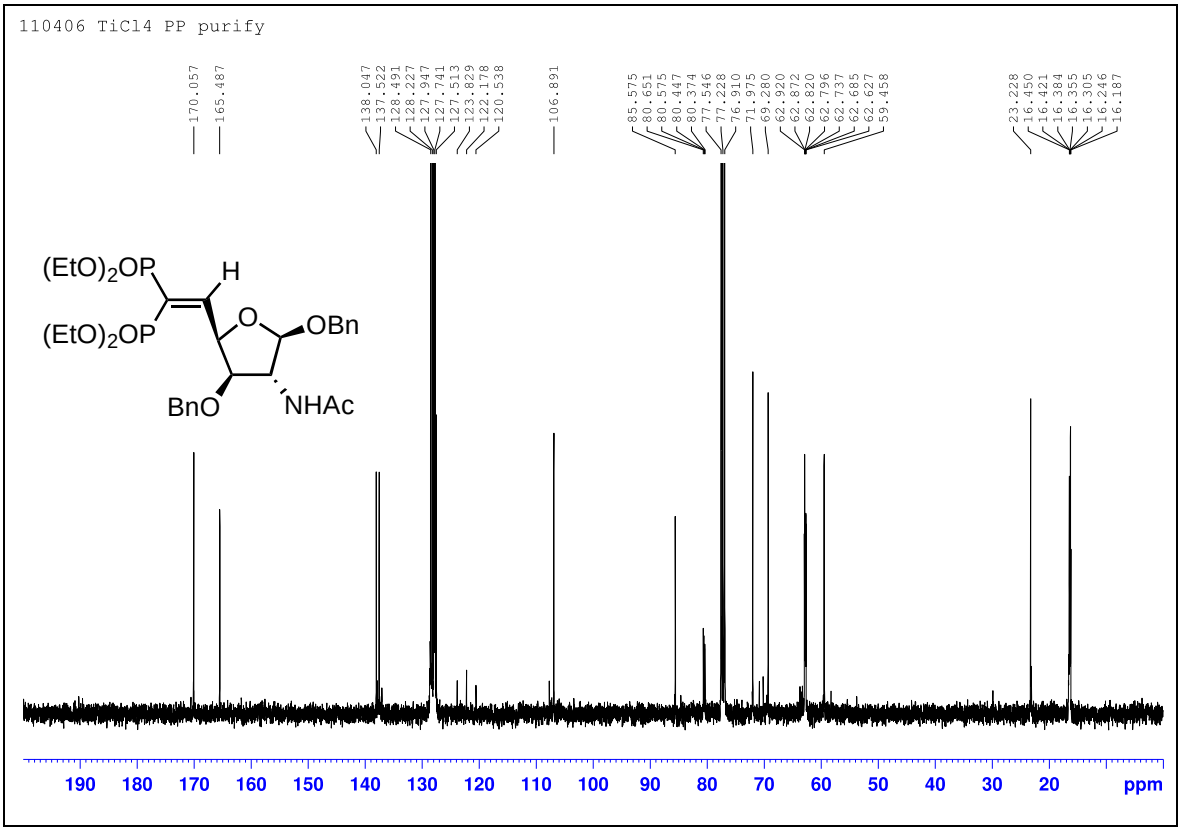
^{1}H–^{13}C HSQC NMR spectrum of compound **24** ($CDCl_3$, 400 MHz)



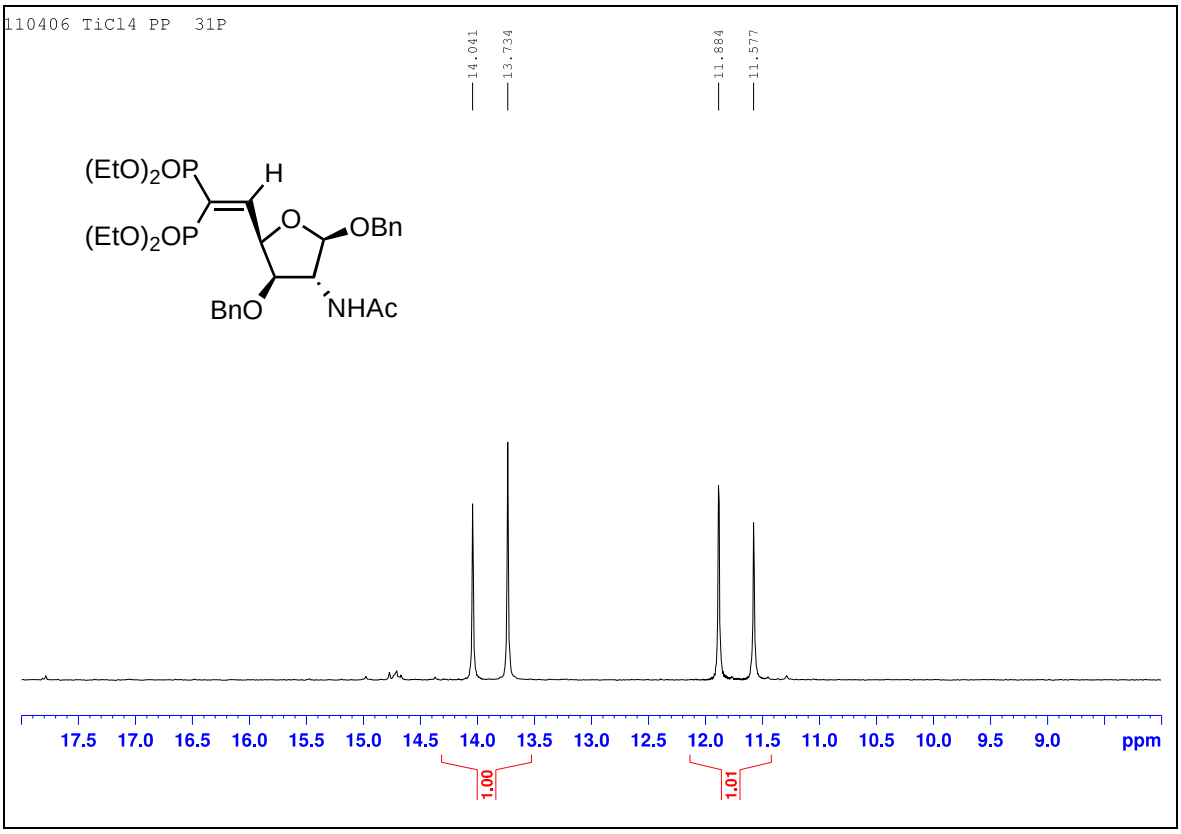
^{1}H–^{13}C HMBC NMR spectrum of compound **24** ($CDCl_3$, 400 MHz)



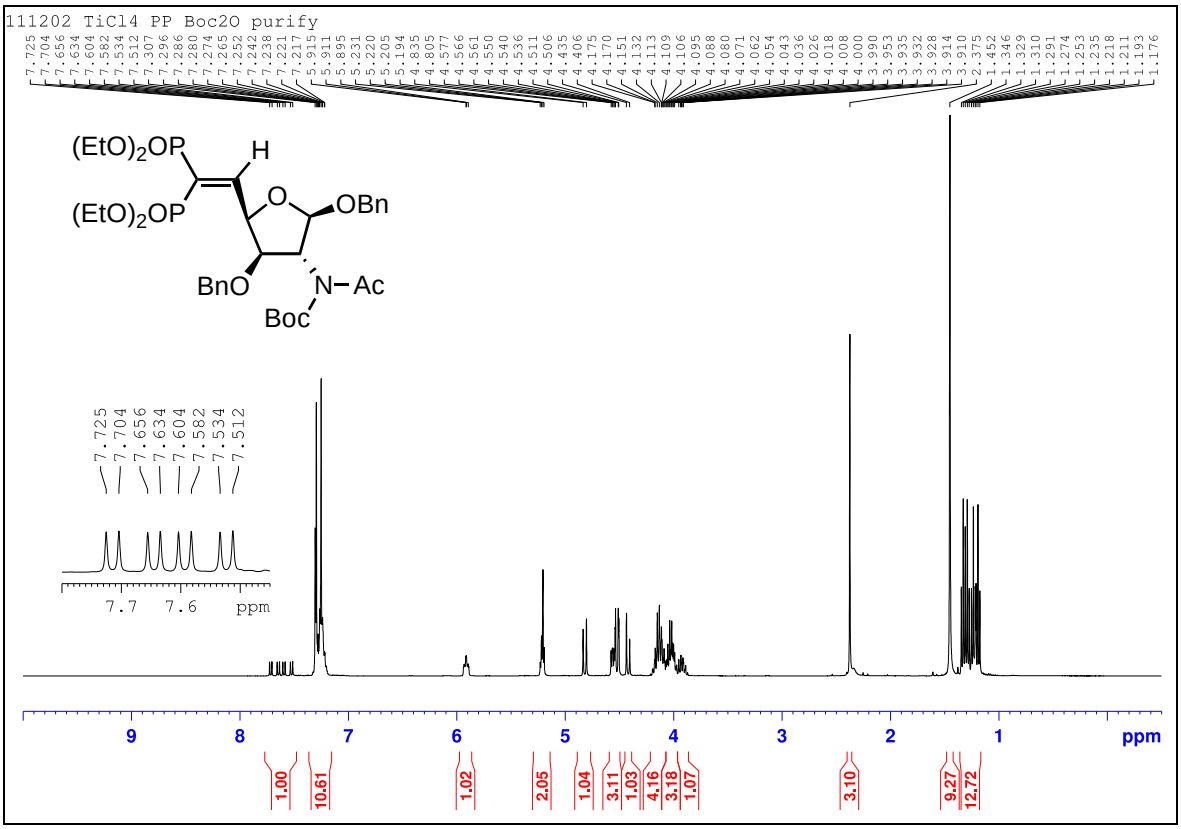
^{1}H NMR spectrum of compound **25** ($CDCl_3$, 400 MHz)



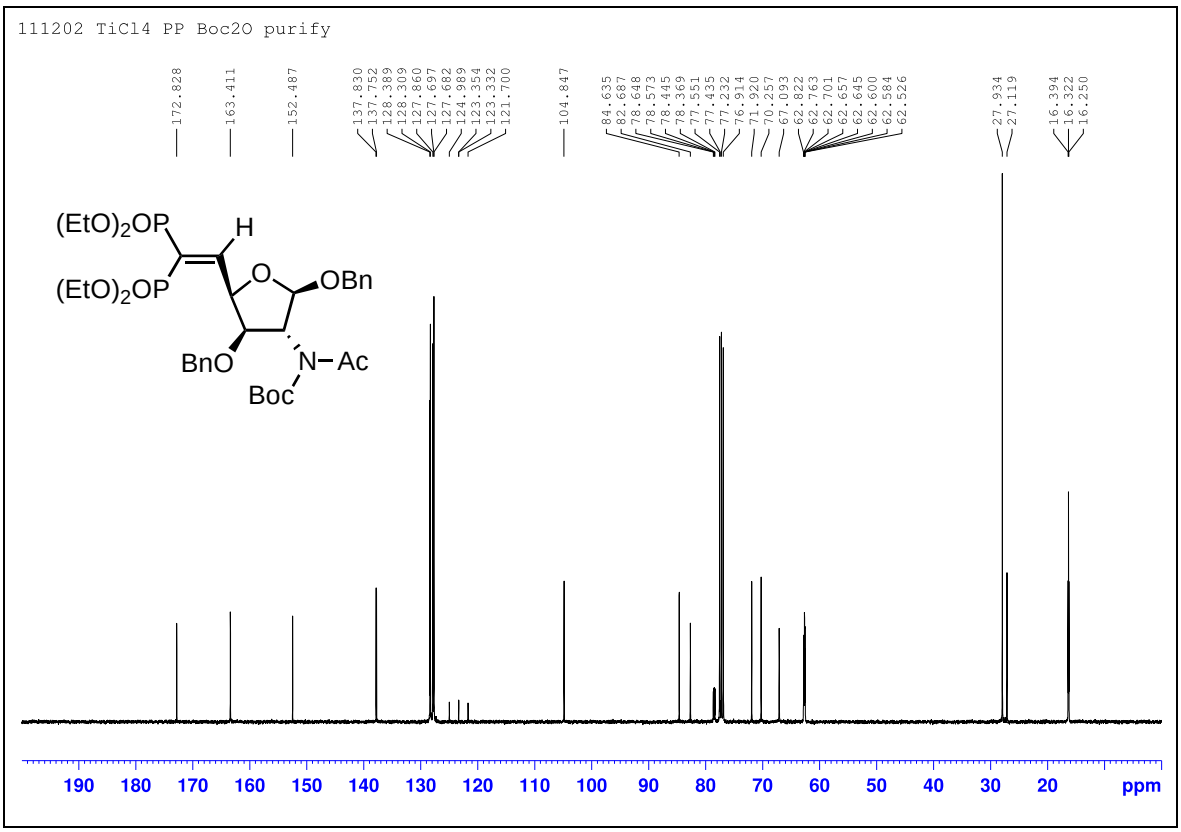
^{13}C NMR spectrum of compound **25** ($CDCl_3$, 100 MHz)



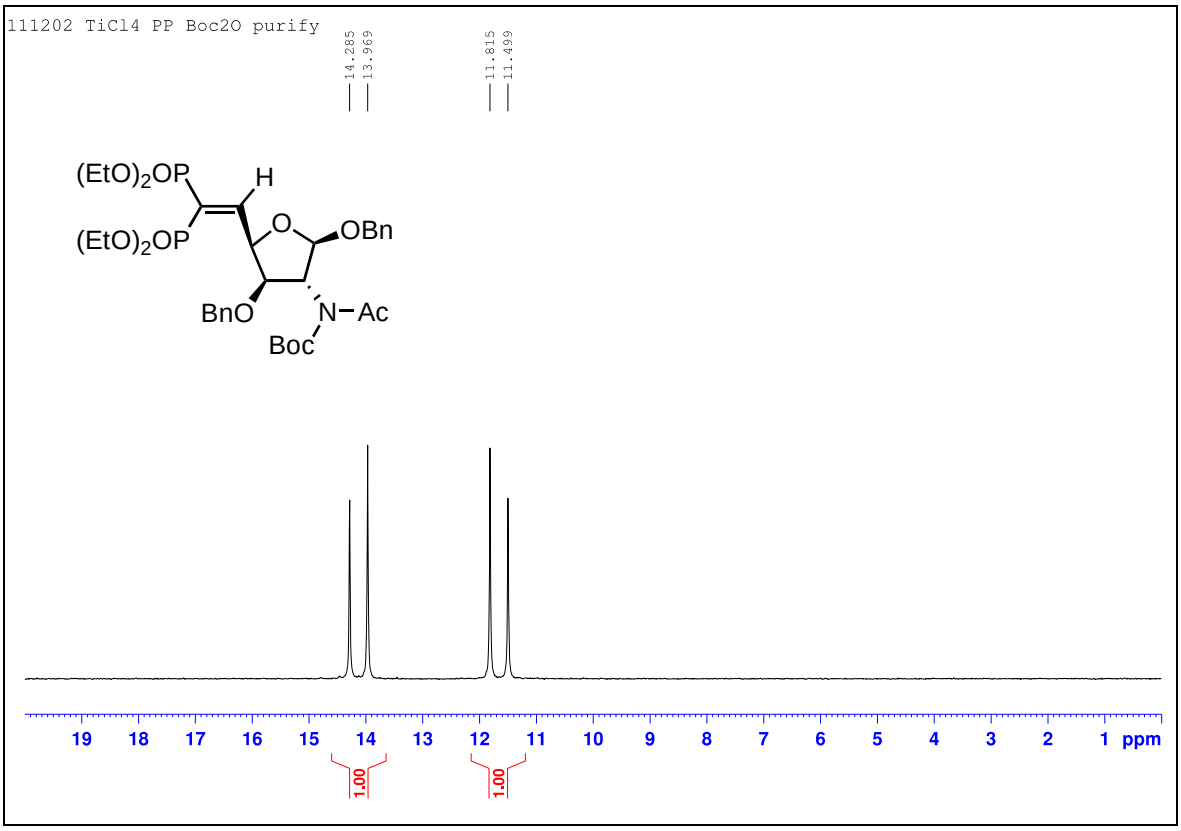
^{31}P NMR spectrum of compound **25** ($CDCl_3$, 162 MHz)



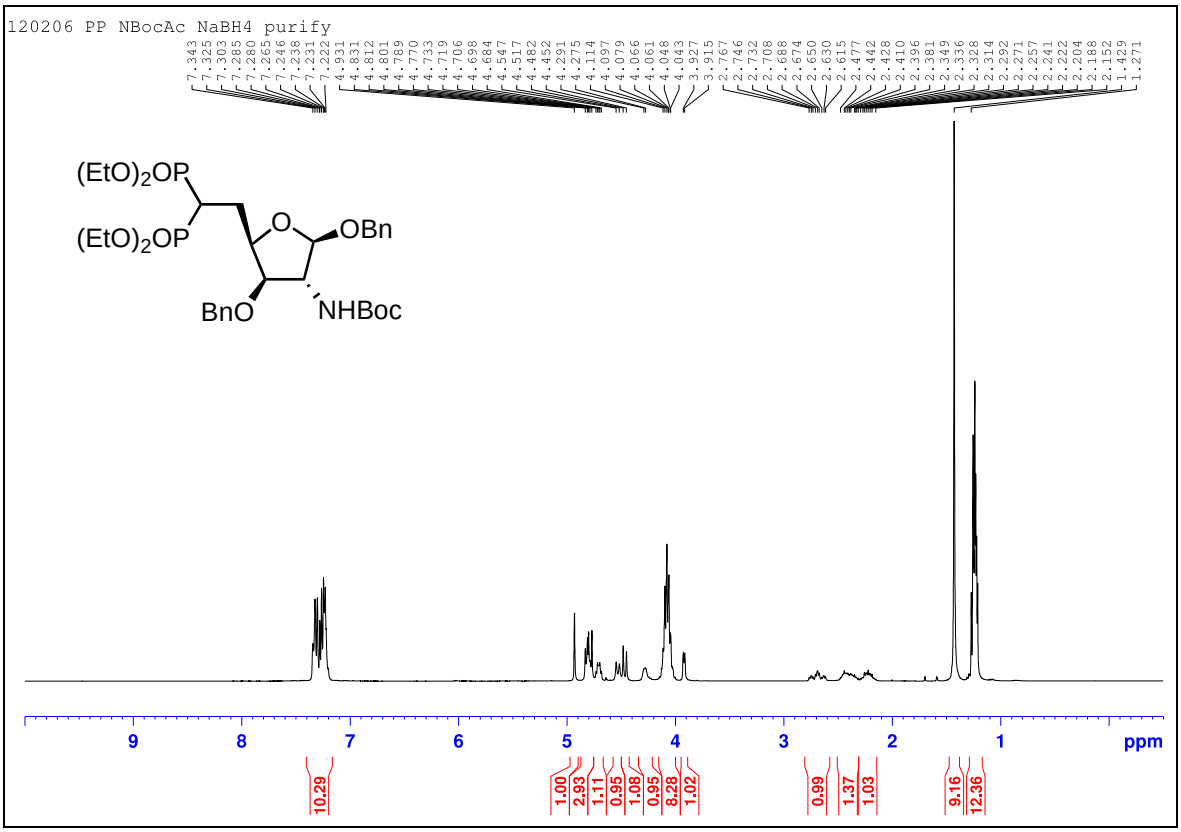
^{1}H NMR spectrum of compound **26** ($CDCl_3$, 400 MHz)



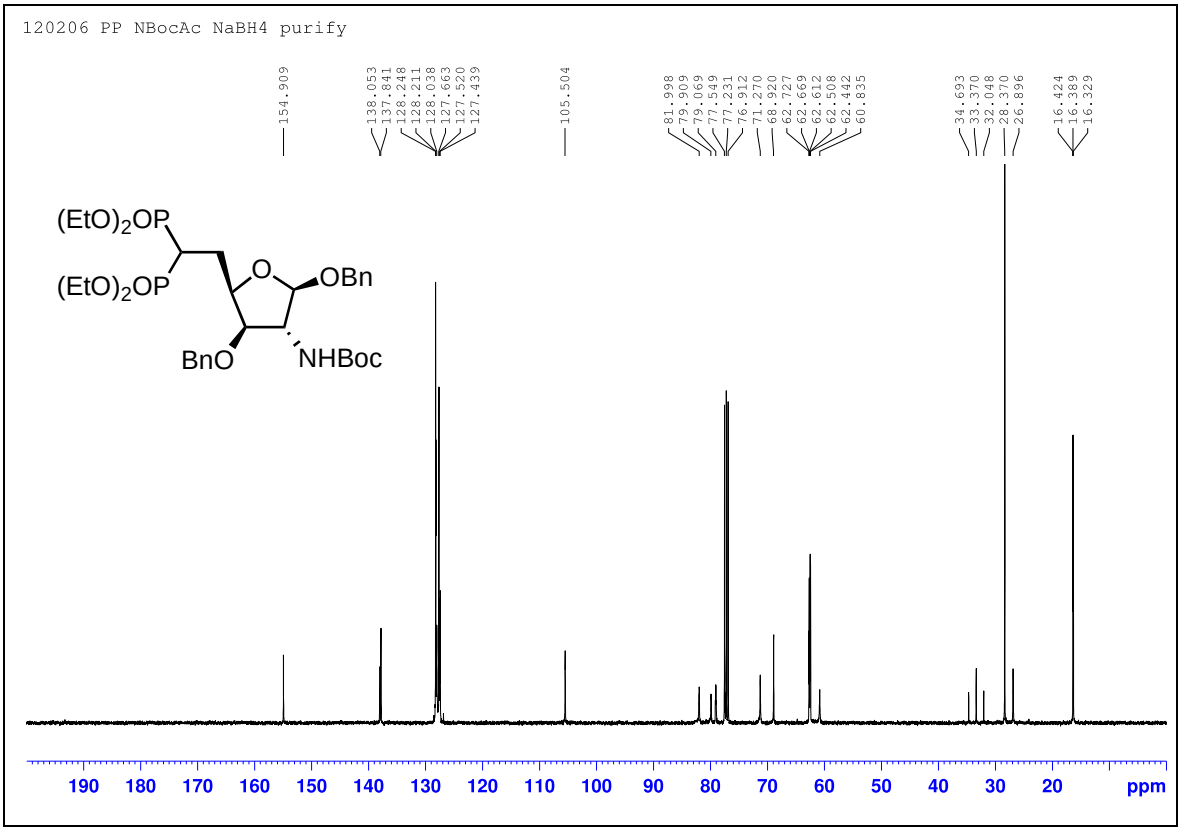
^{13}C NMR spectrum of compound **26** ($CDCl_3$, 100 MHz)



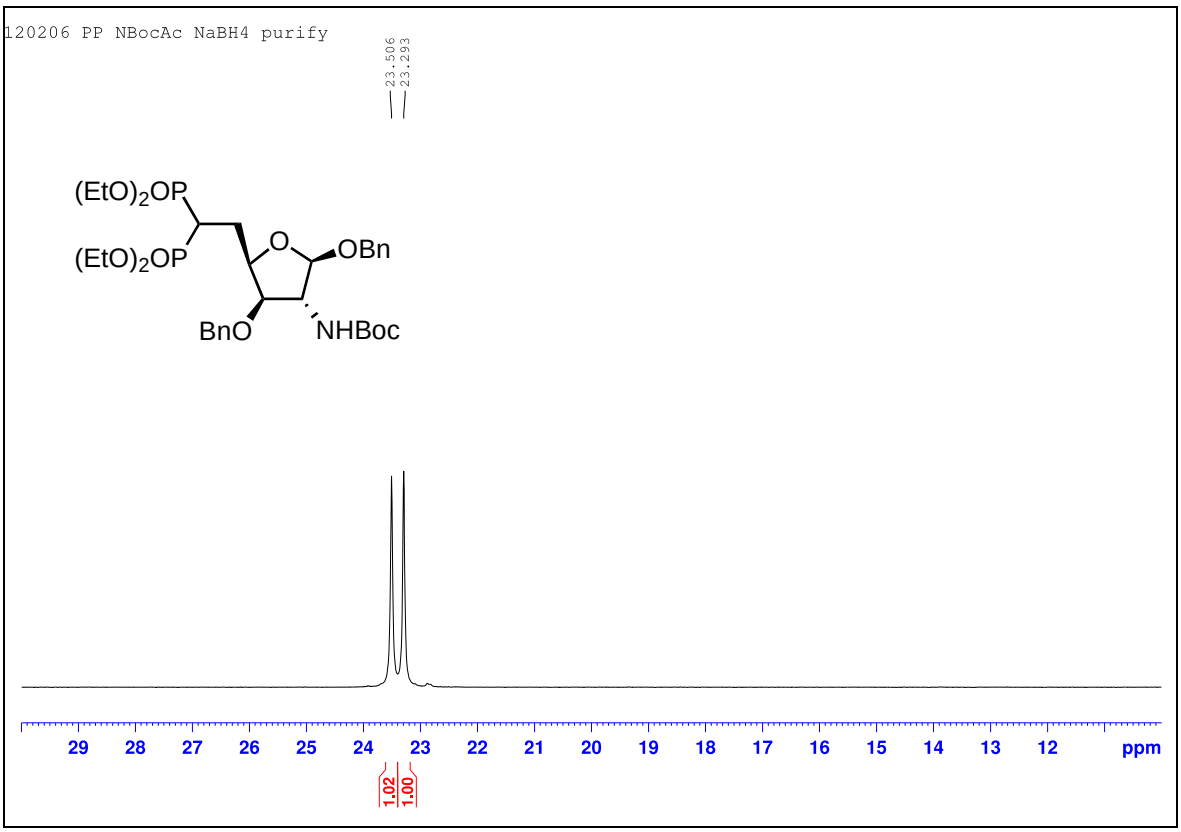
^{31}P NMR spectrum of compound **26** ($CDCl_3$, 162 MHz)



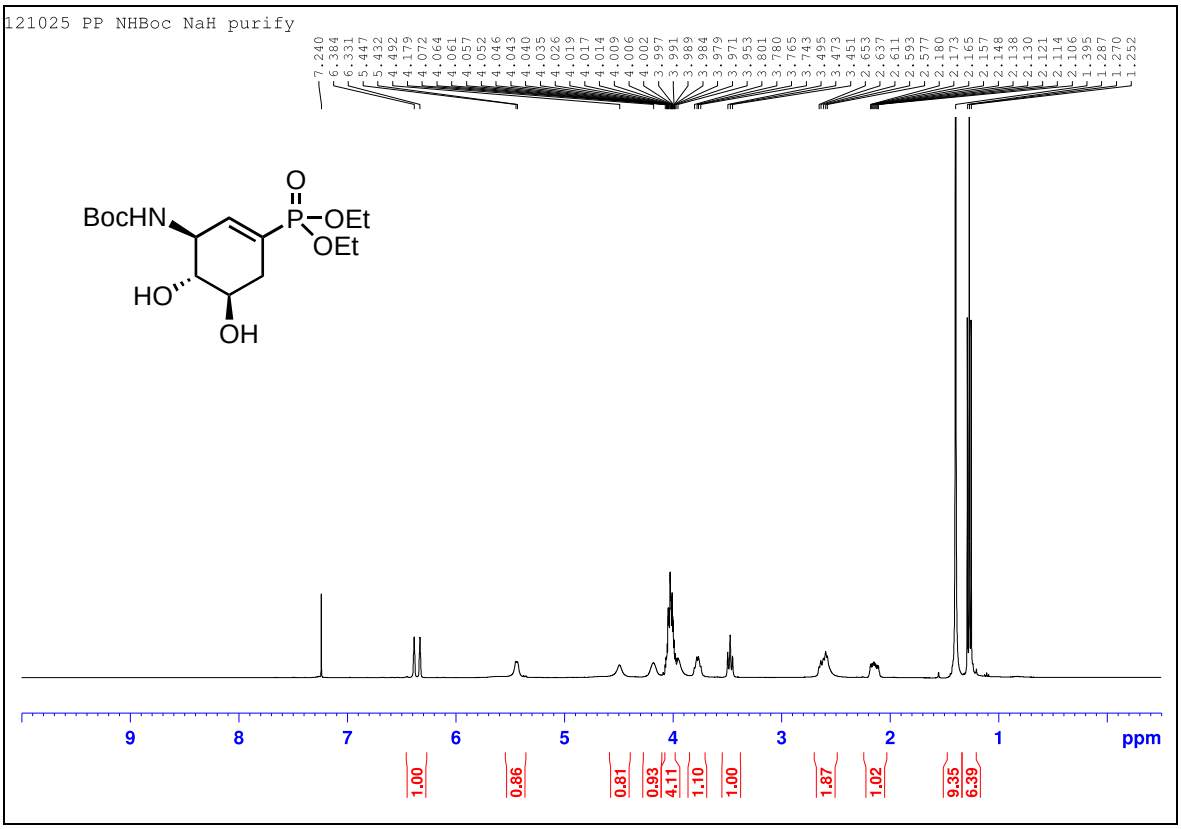
^{1}H NMR spectrum of compound **27** ($CDCl_3$, 400 MHz)



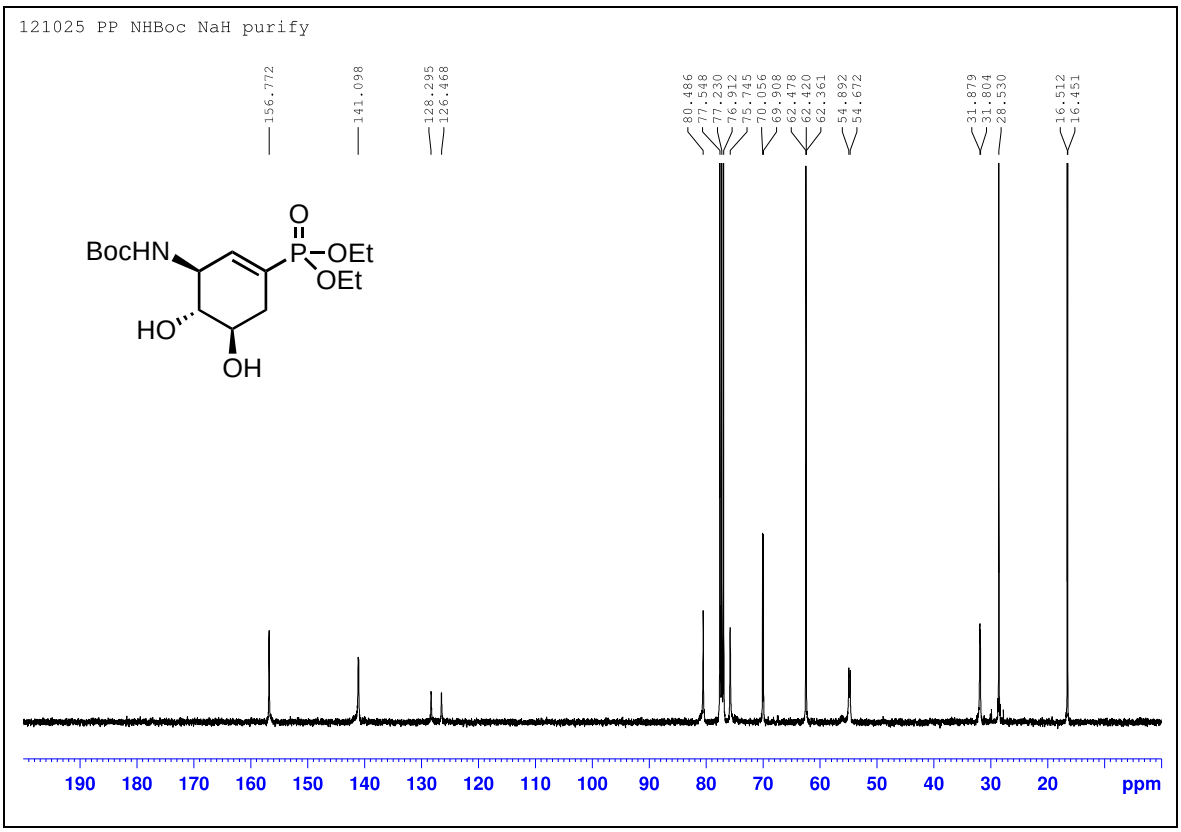
^{13}C NMR spectrum of compound **27** ($CDCl_3$, 100 MHz)



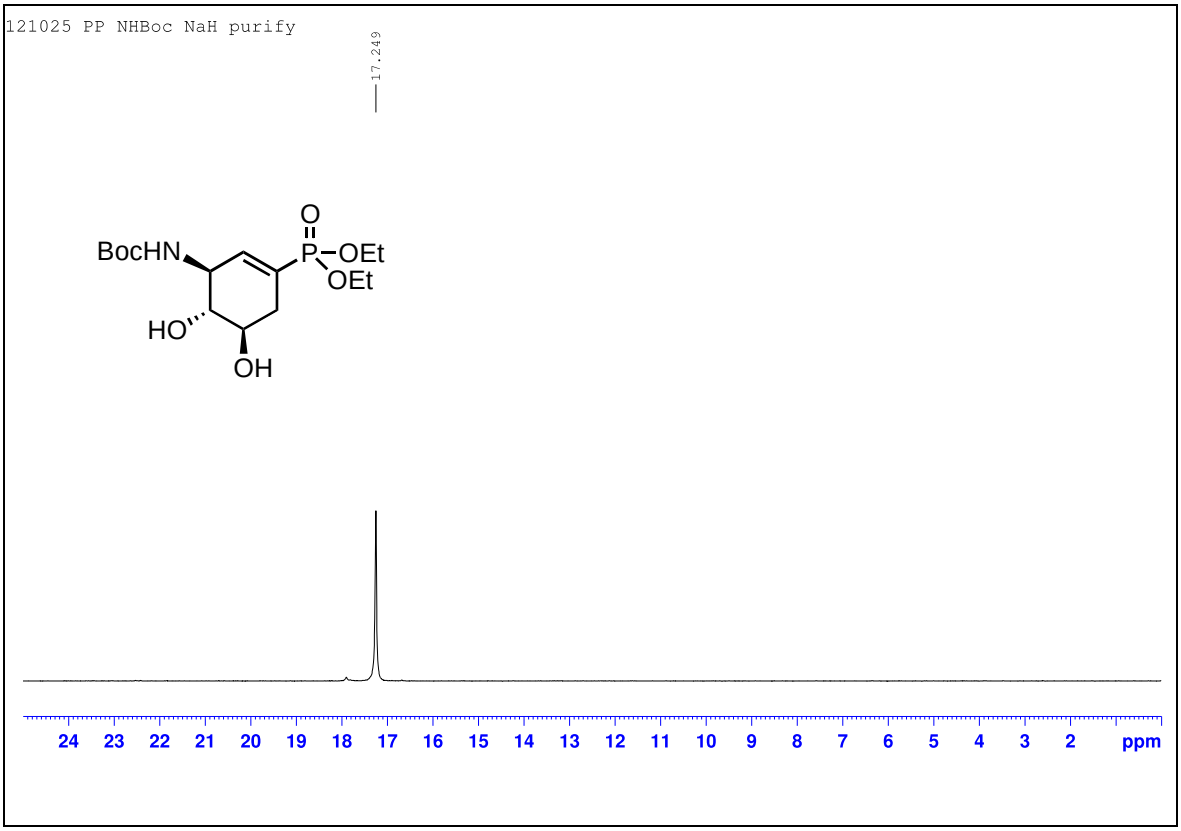
^{31}P NMR spectrum of compound **27** ($CDCl_3$, 162 MHz)



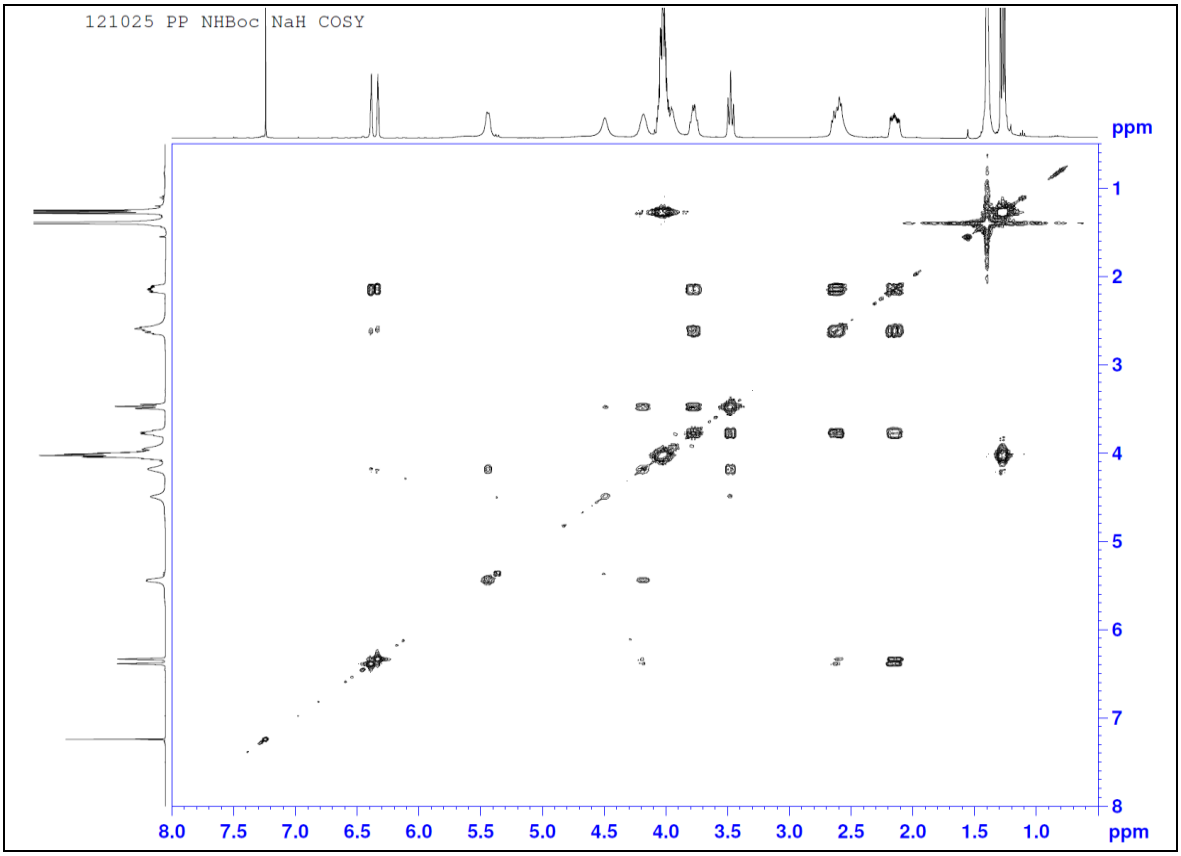
^{1}H NMR spectrum of compound **28b** ($CDCl_3$, 400 MHz)



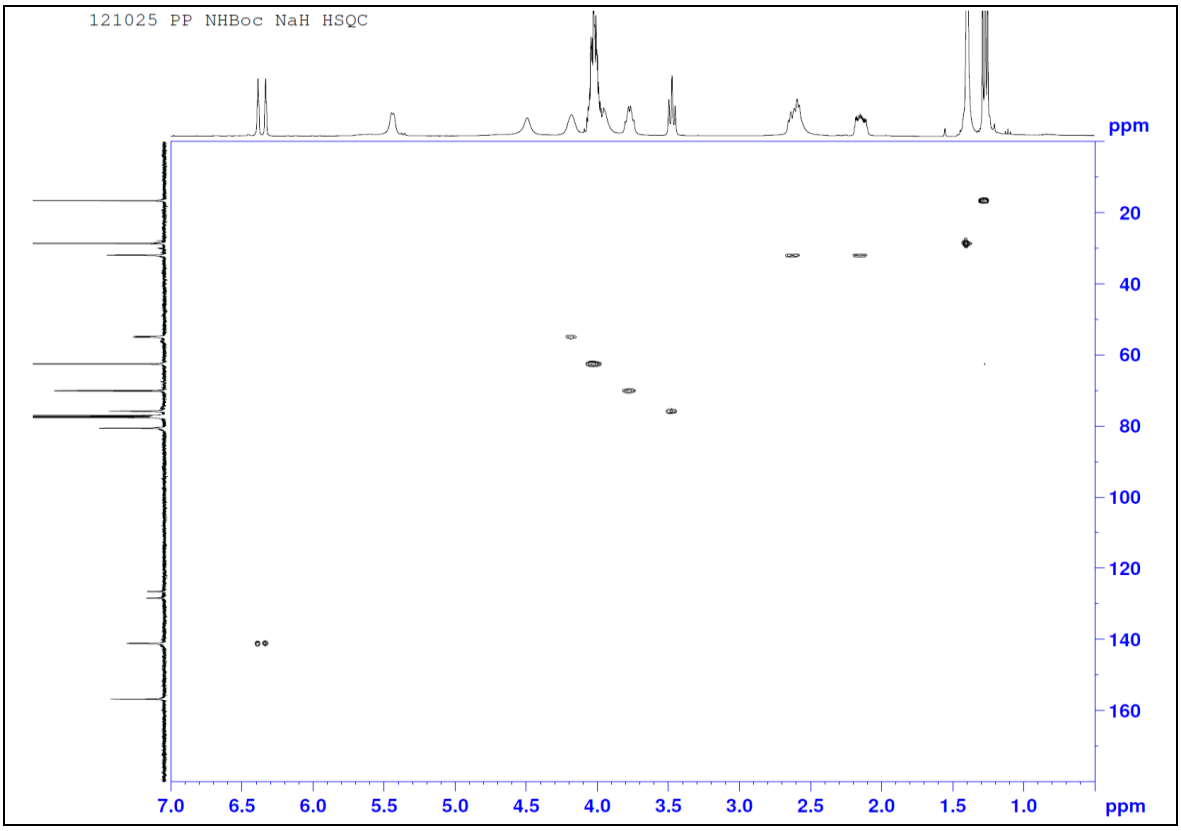
^{13}C NMR spectrum of compound **28b** ($CDCl_3$, 100 MHz)



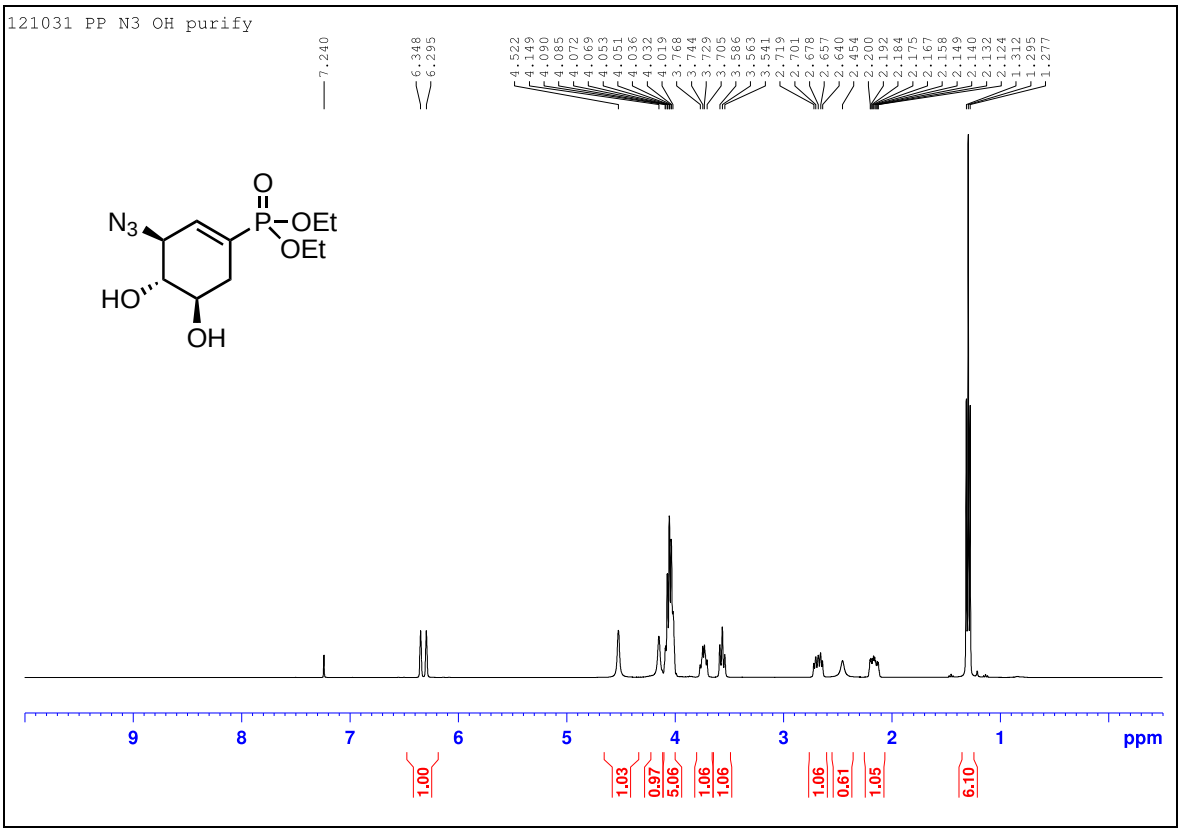
^{31}P NMR spectrum of compound **28b** ($CDCl_3$, 162 MHz)



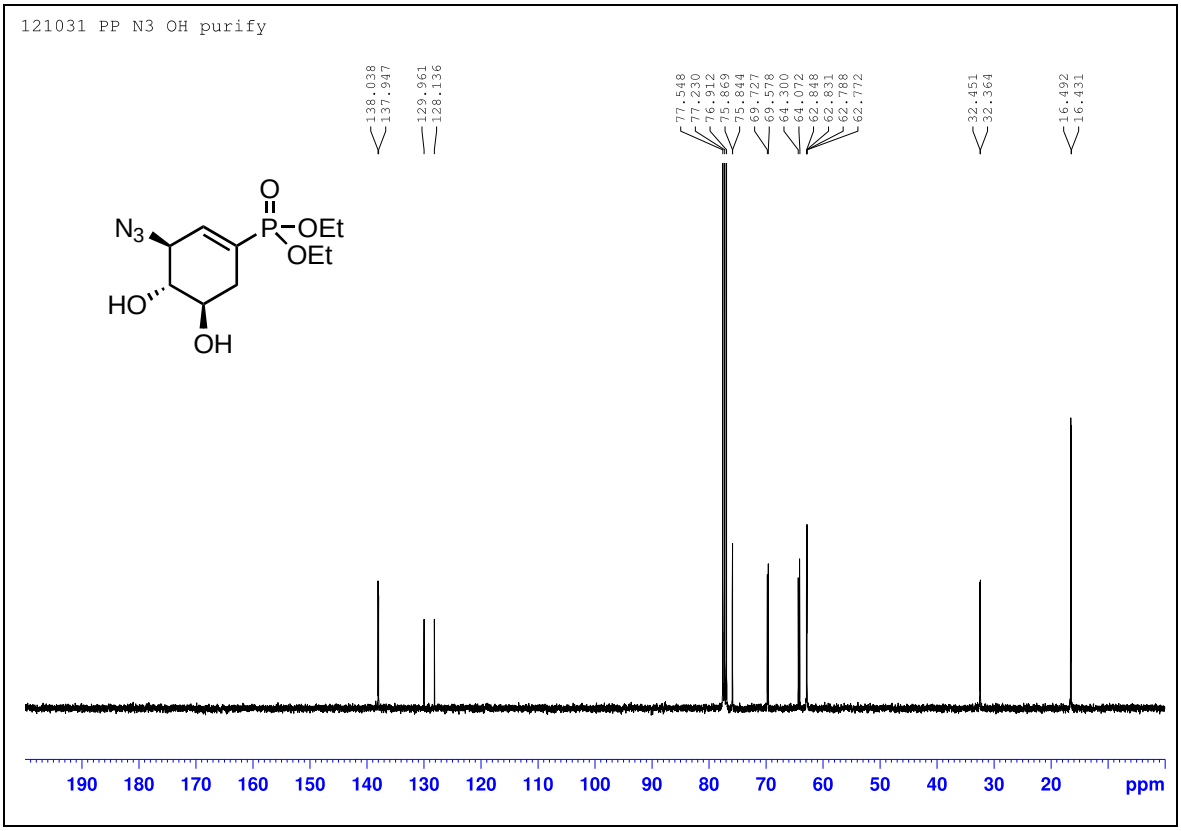
^{1}H–^{1}H COSY NMR spectrum of compound **28b** ($CDCl_3$, 400 MHz)



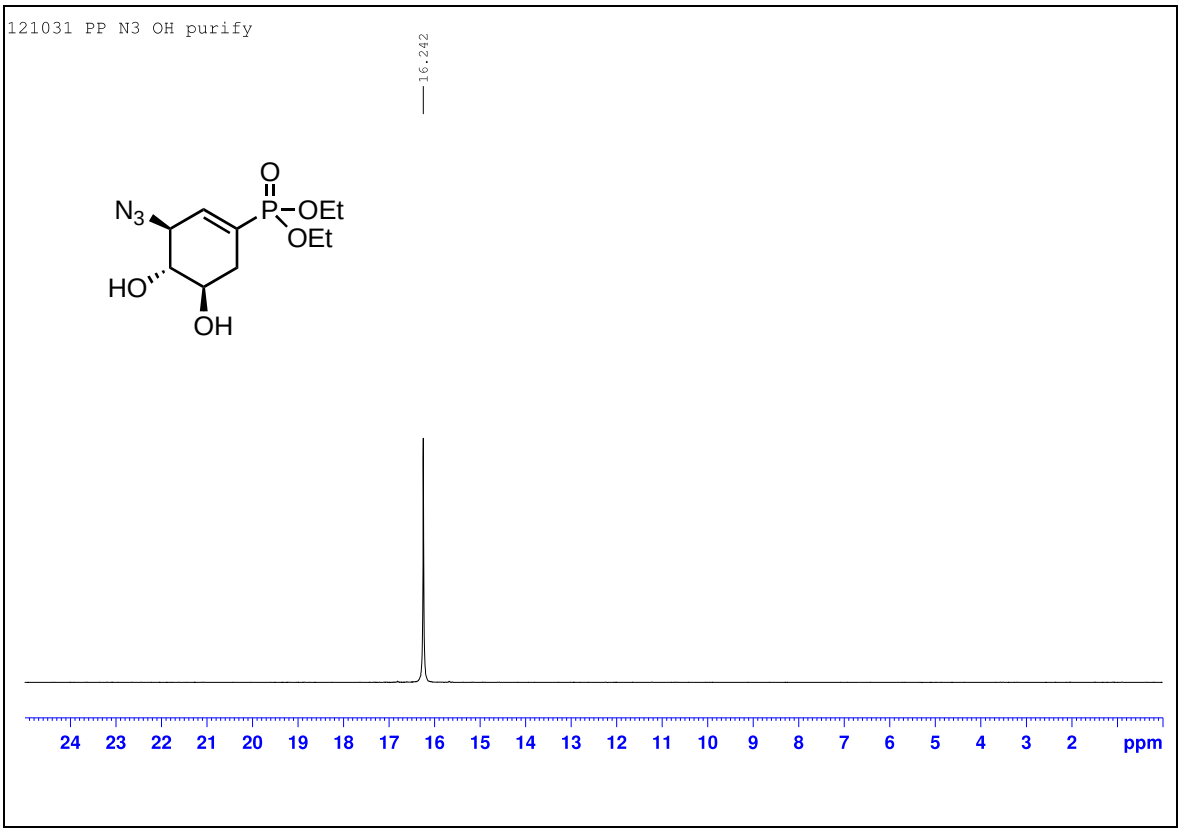
^{1}H–^{13}C HSQC NMR spectrum of compound **28b** ($CDCl_3$, 400 MHz)



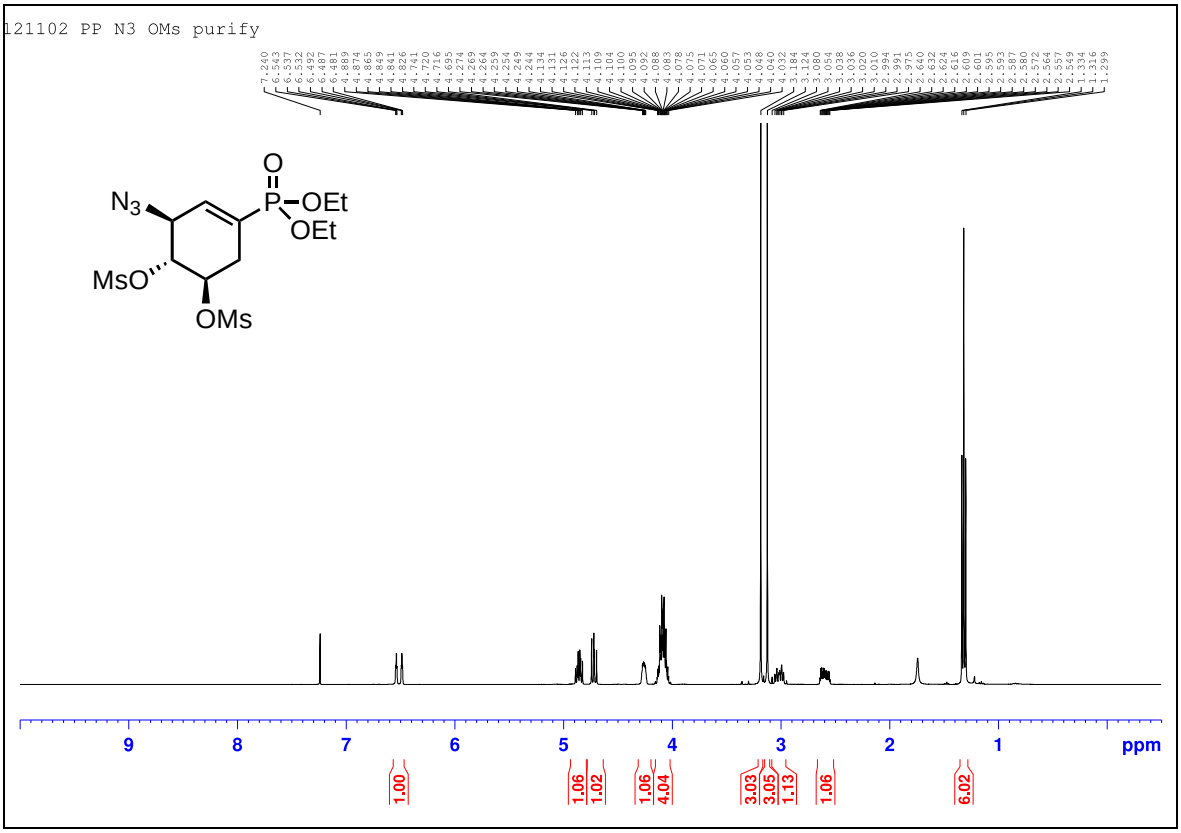
^{1}H NMR spectrum of compound **29** ($CDCl_3$, 400 MHz)



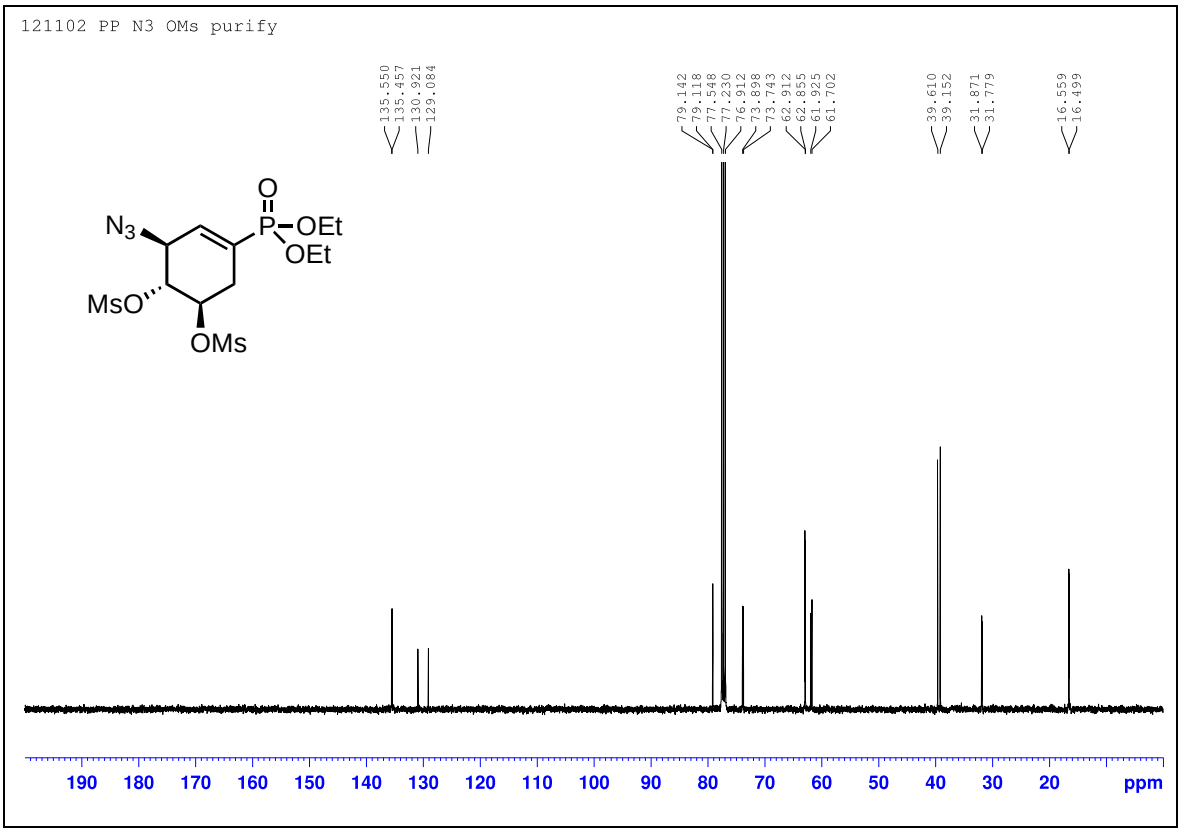
^{13}C NMR spectrum of compound **29** ($CDCl_3$, 100 MHz)



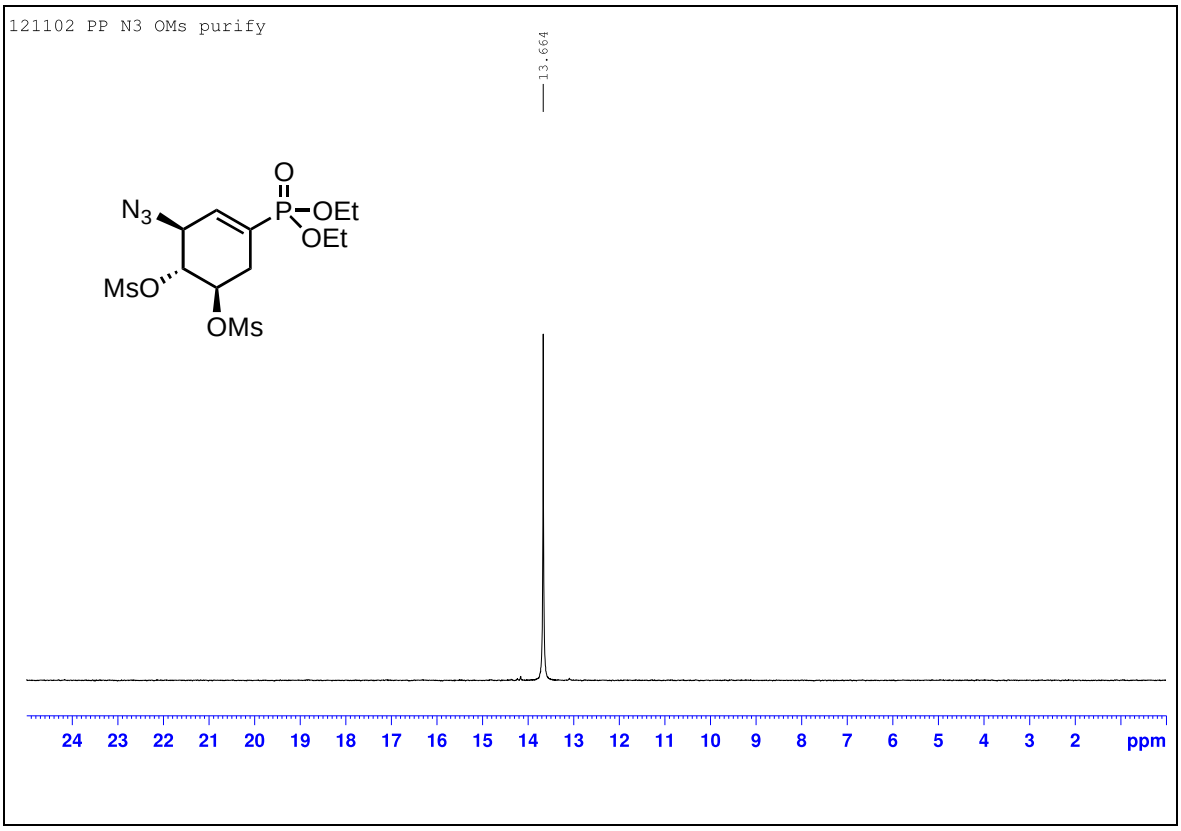
^{31}P NMR spectrum of compound **29** ($CDCl_3$, 162 MHz)



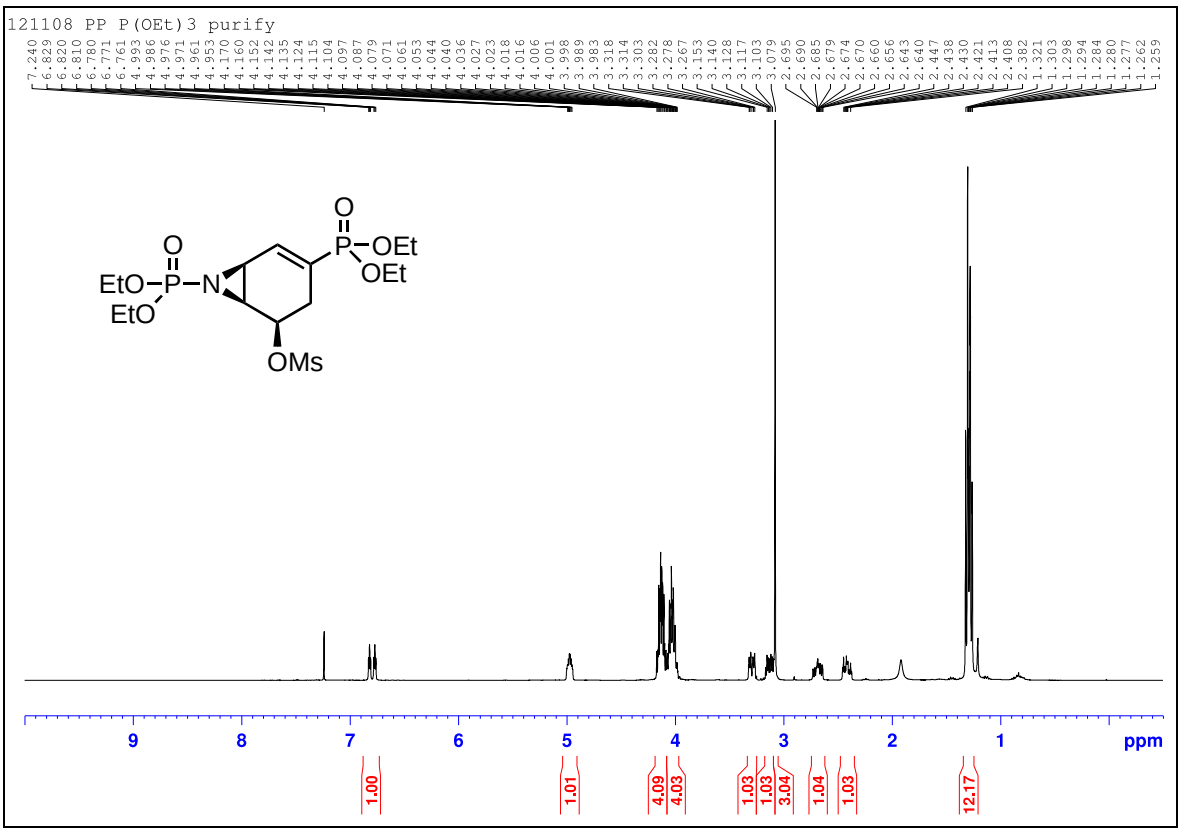
^{1}H NMR spectrum of compound **30** ($CDCl_3$, 400 MHz)



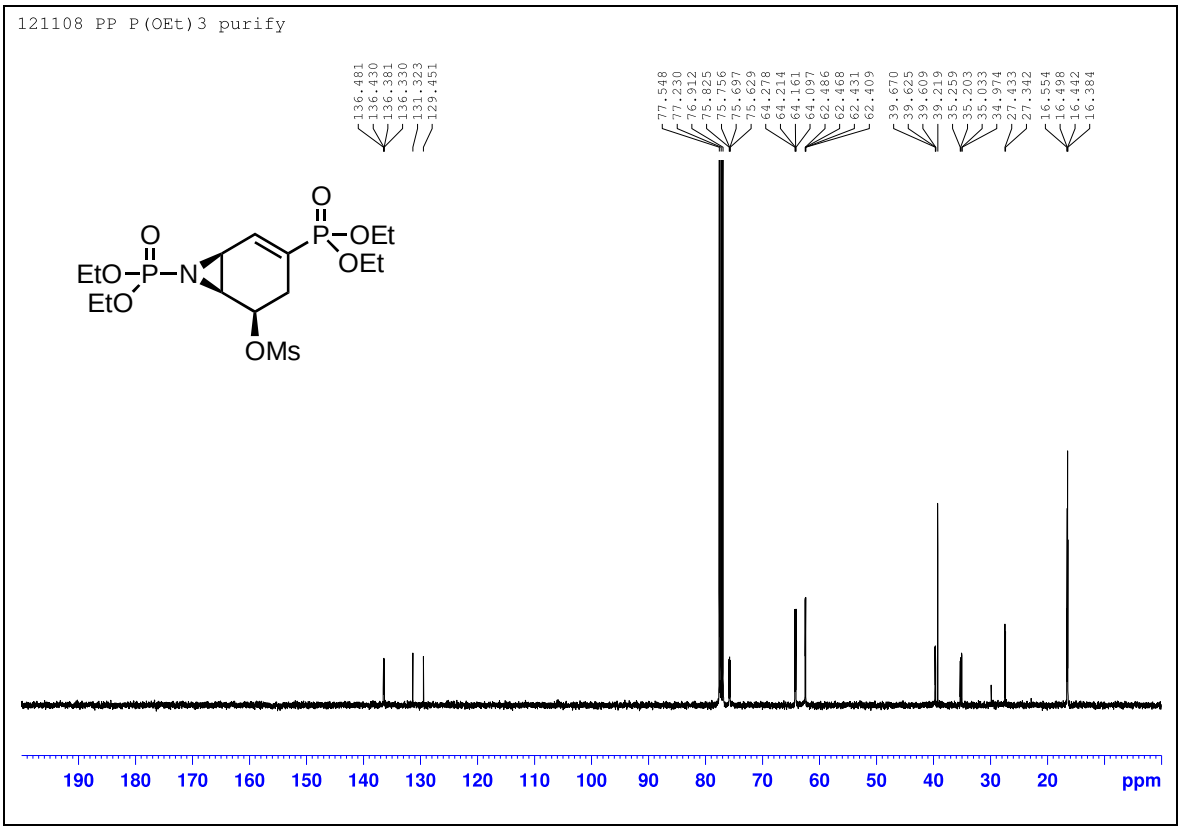
^{13}C NMR spectrum of compound **30** ($CDCl_3$, 100 MHz)



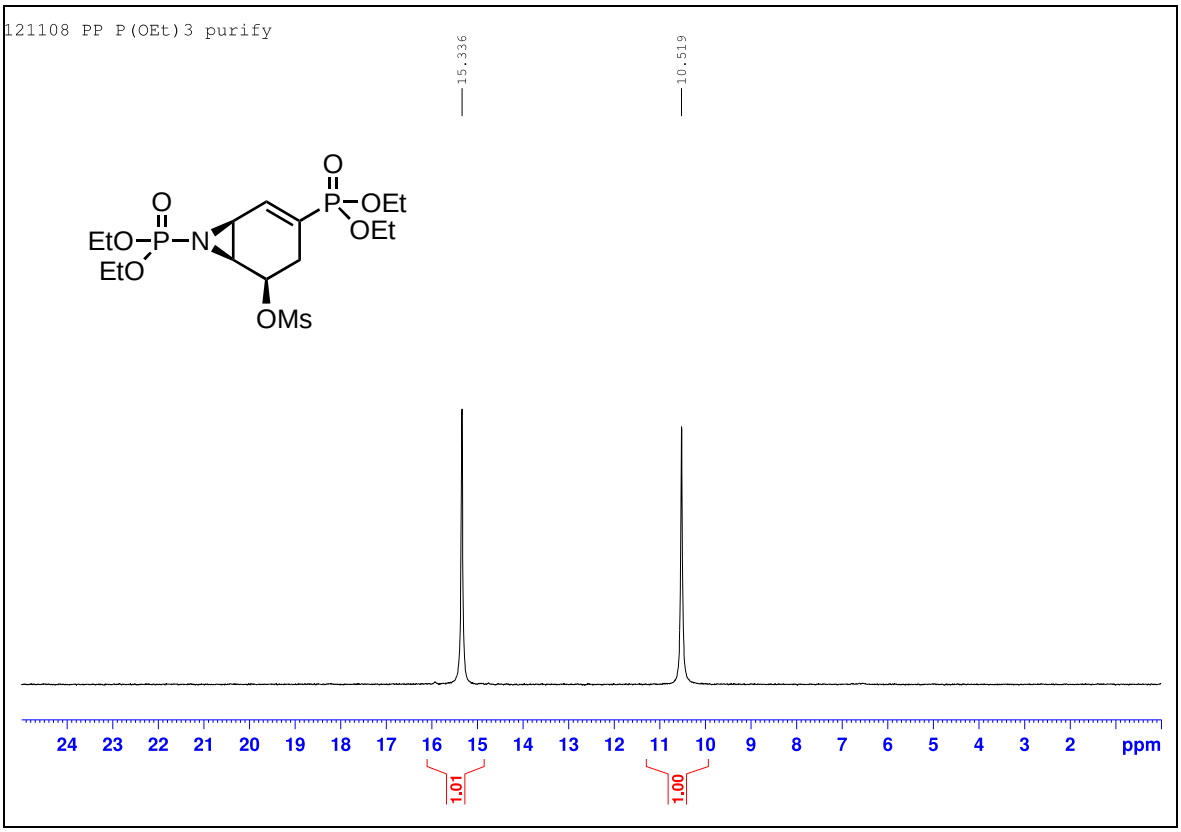
^{31}P NMR spectrum of compound **30** ($CDCl_3$, 162 MHz)



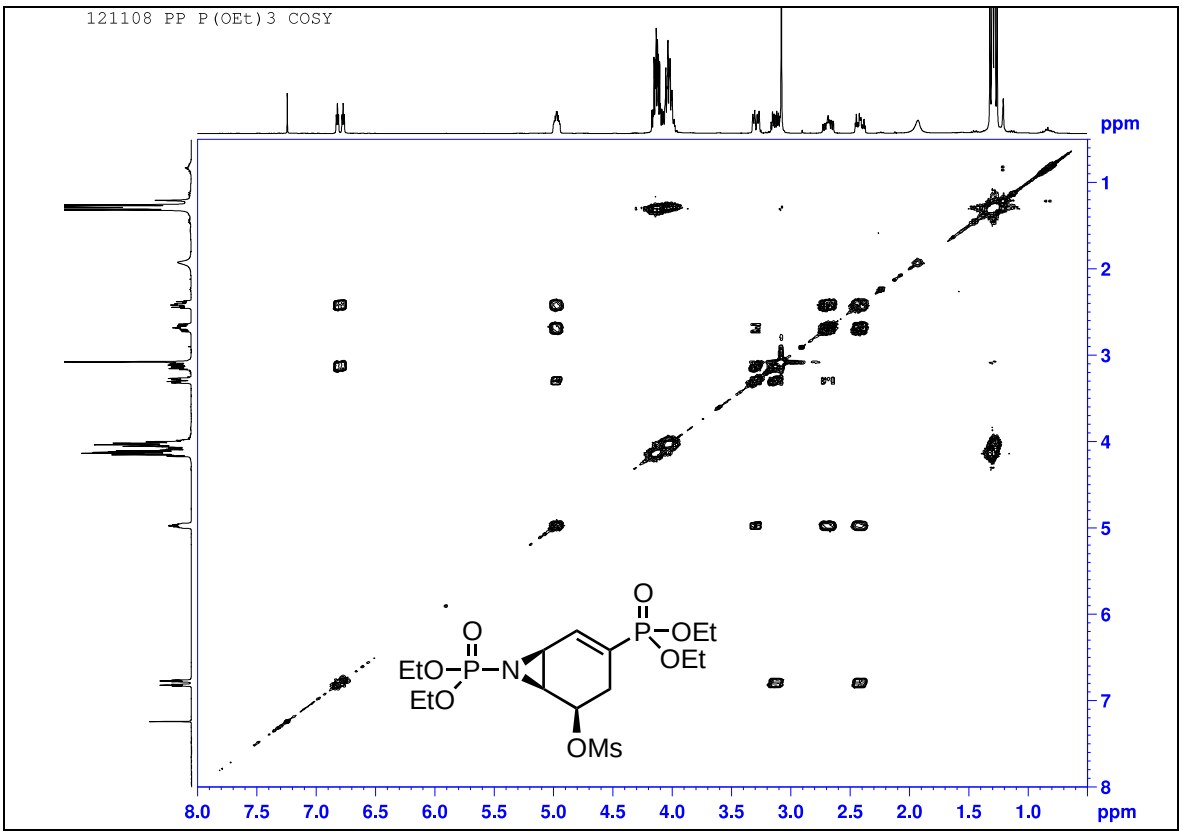
^{1}H NMR spectrum of compound **31** ($CDCl_3$, 400 MHz)



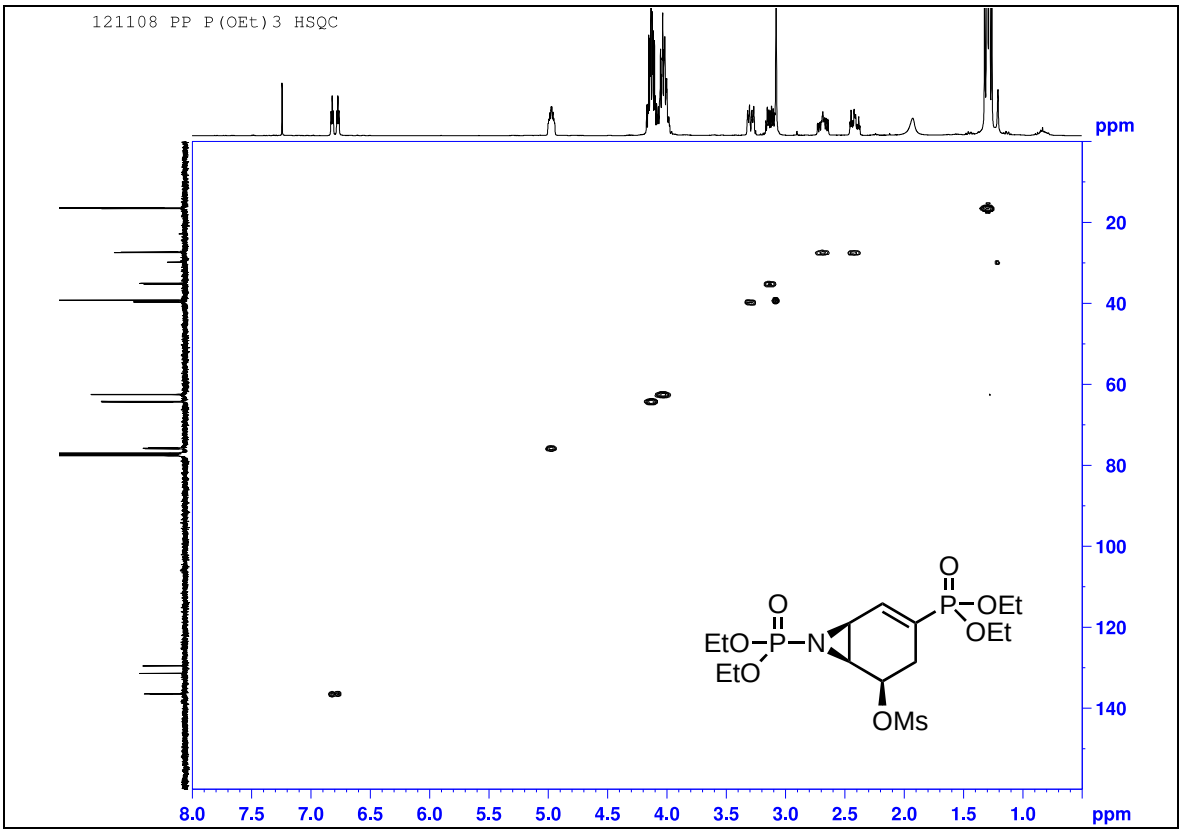
^{13}C NMR spectrum of compound **31** ($CDCl_3$, 100 MHz)



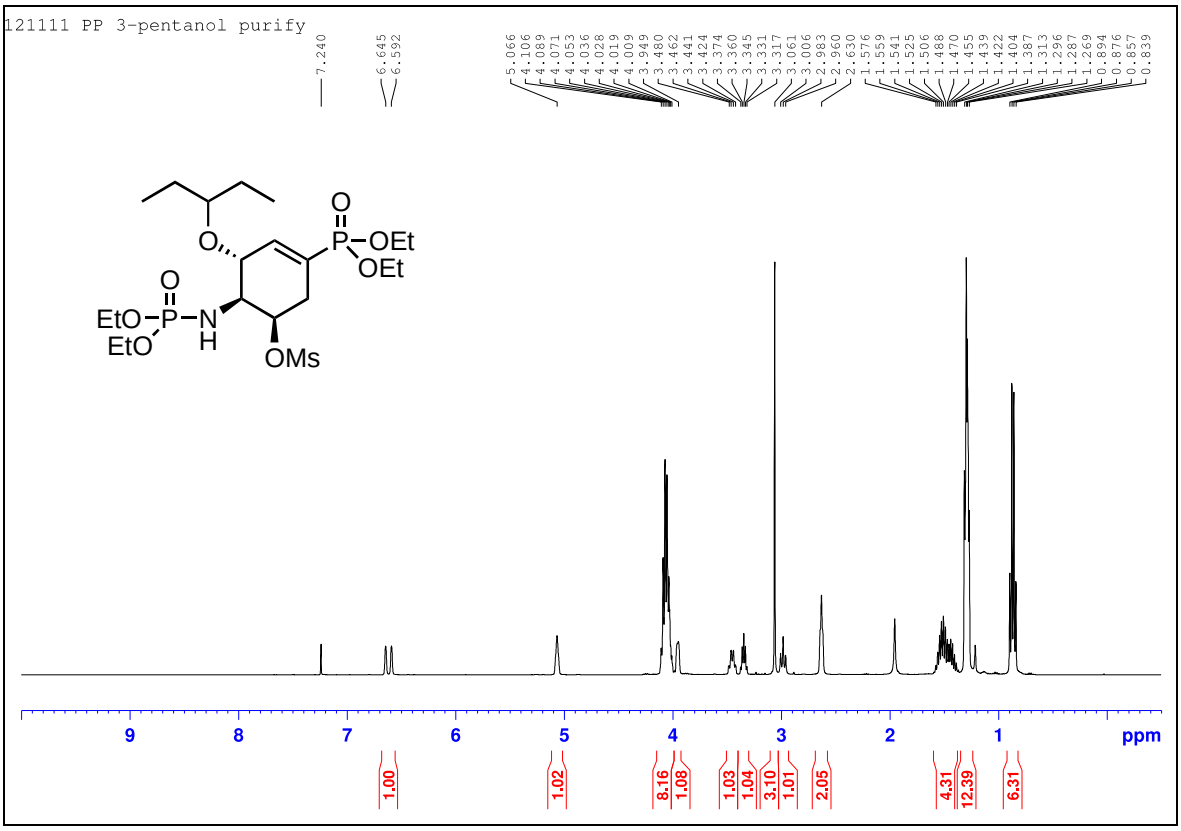
^{31}P NMR spectrum of compound **31** ($CDCl_3$, 162 MHz)



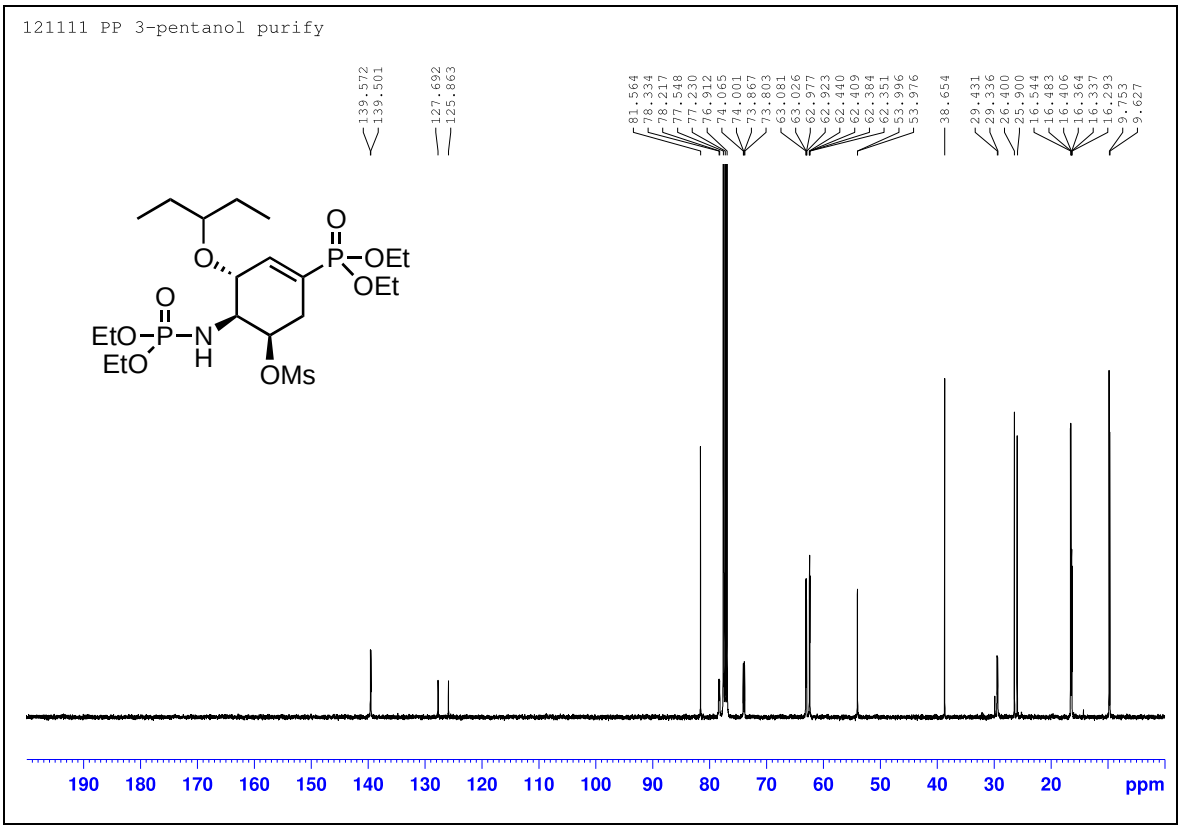
^{1}H–^{1}H COSY NMR spectrum of compound **31** ($CDCl_3$, 400 MHz)



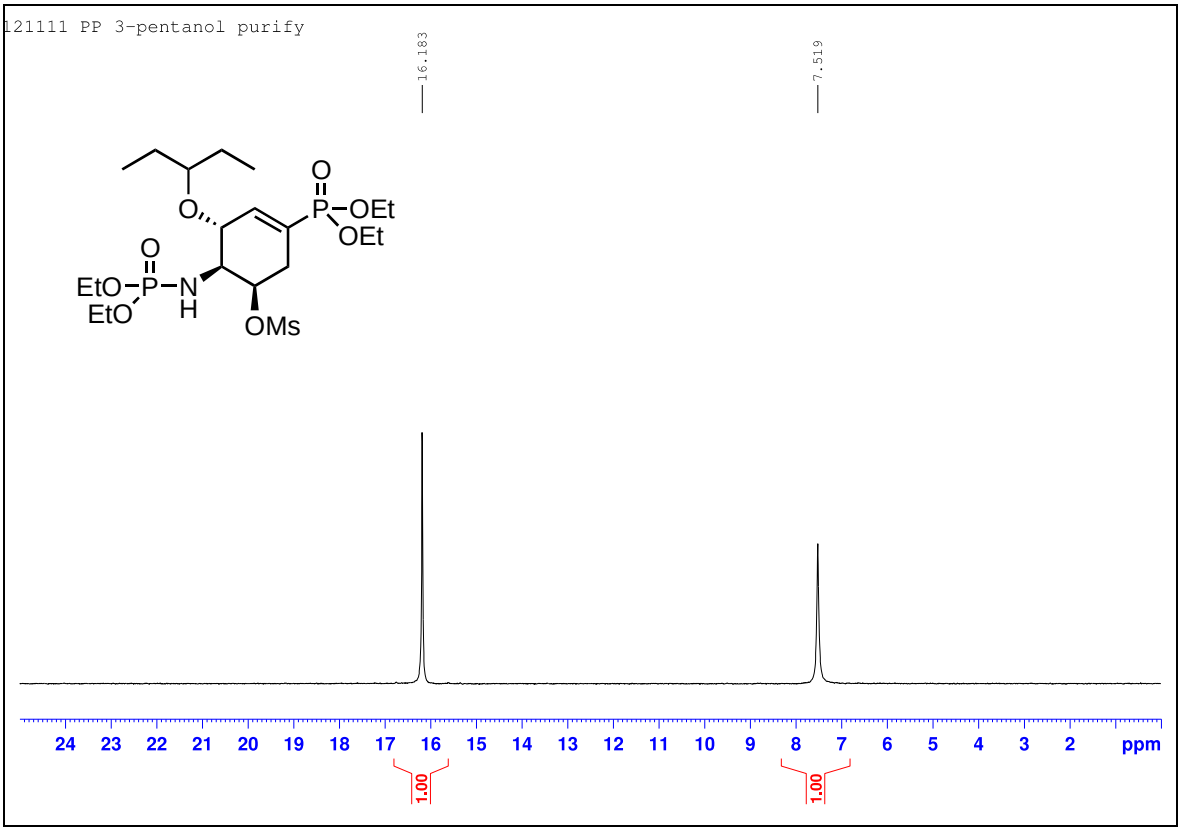
^{1}H–^{13}C HSQC NMR spectrum of compound **31** ($CDCl_3$, 400 MHz)



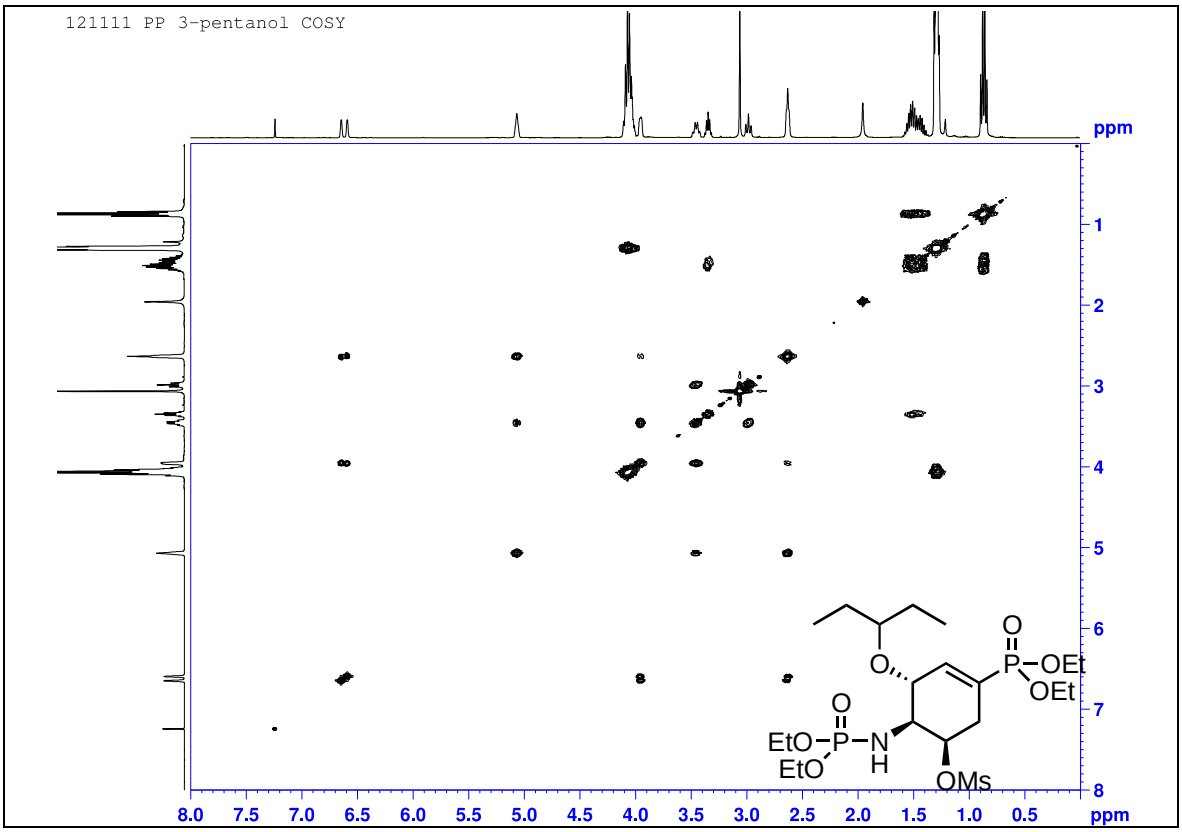
^{1}H NMR spectrum of compound **32** ($CDCl_3$, 400 MHz)



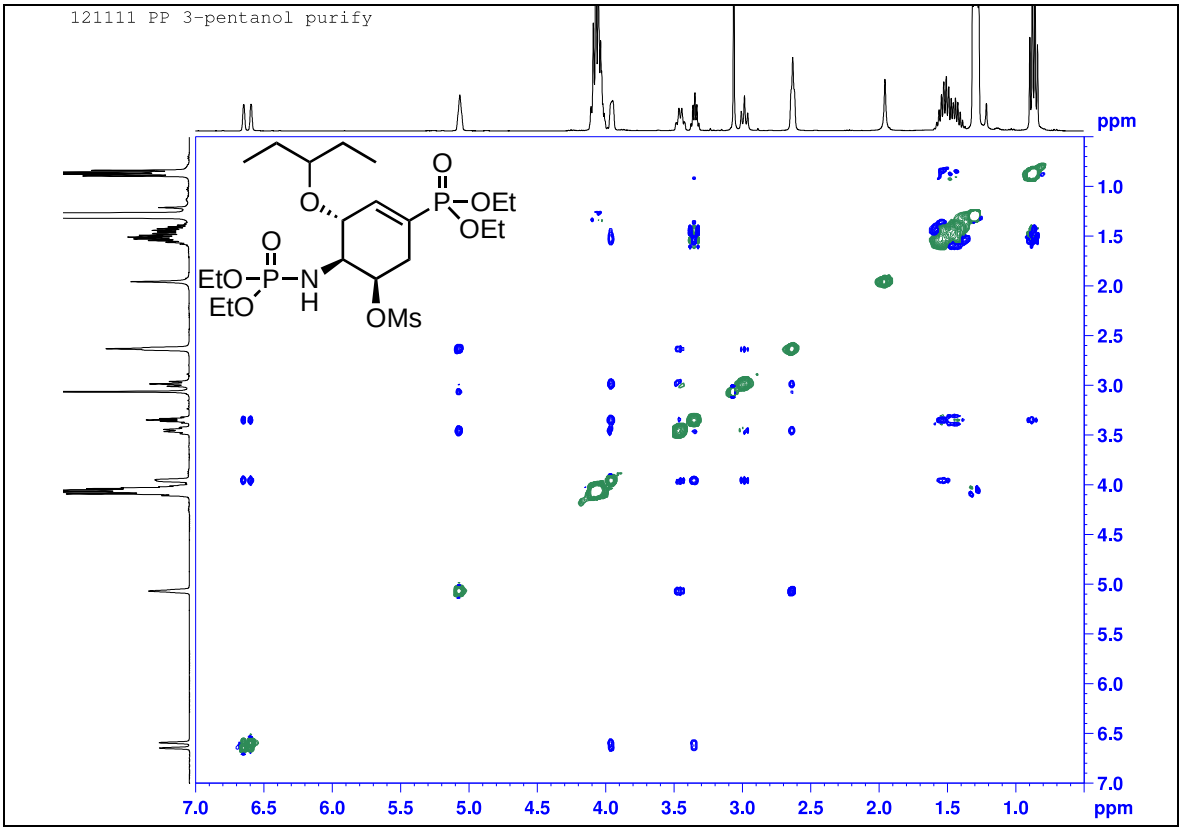
^{13}C NMR spectrum of compound **32** ($CDCl_3$, 100 MHz)



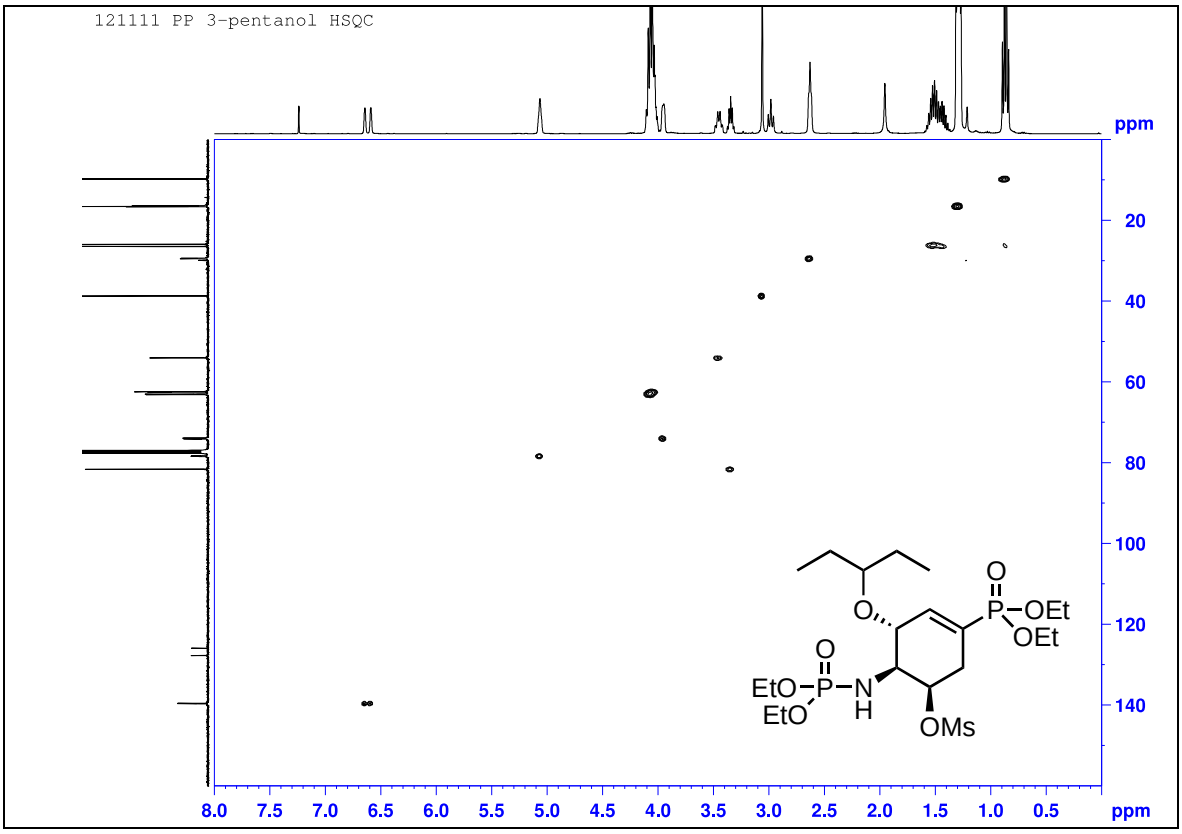
^{31}P NMR spectrum of compound **32** ($CDCl_3$, 162 MHz)



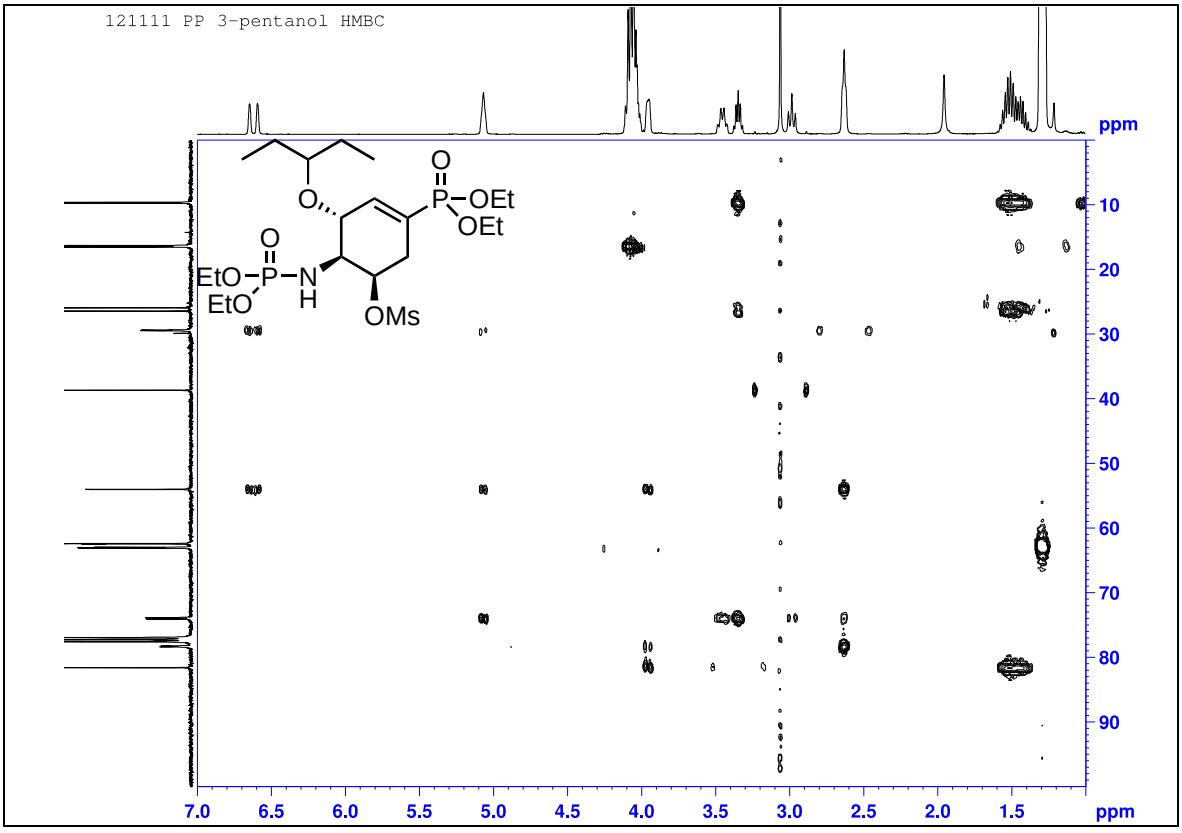
^{1}H–^{1}H COSY NMR spectrum of compound **32** ($CDCl_3$, 400 MHz)



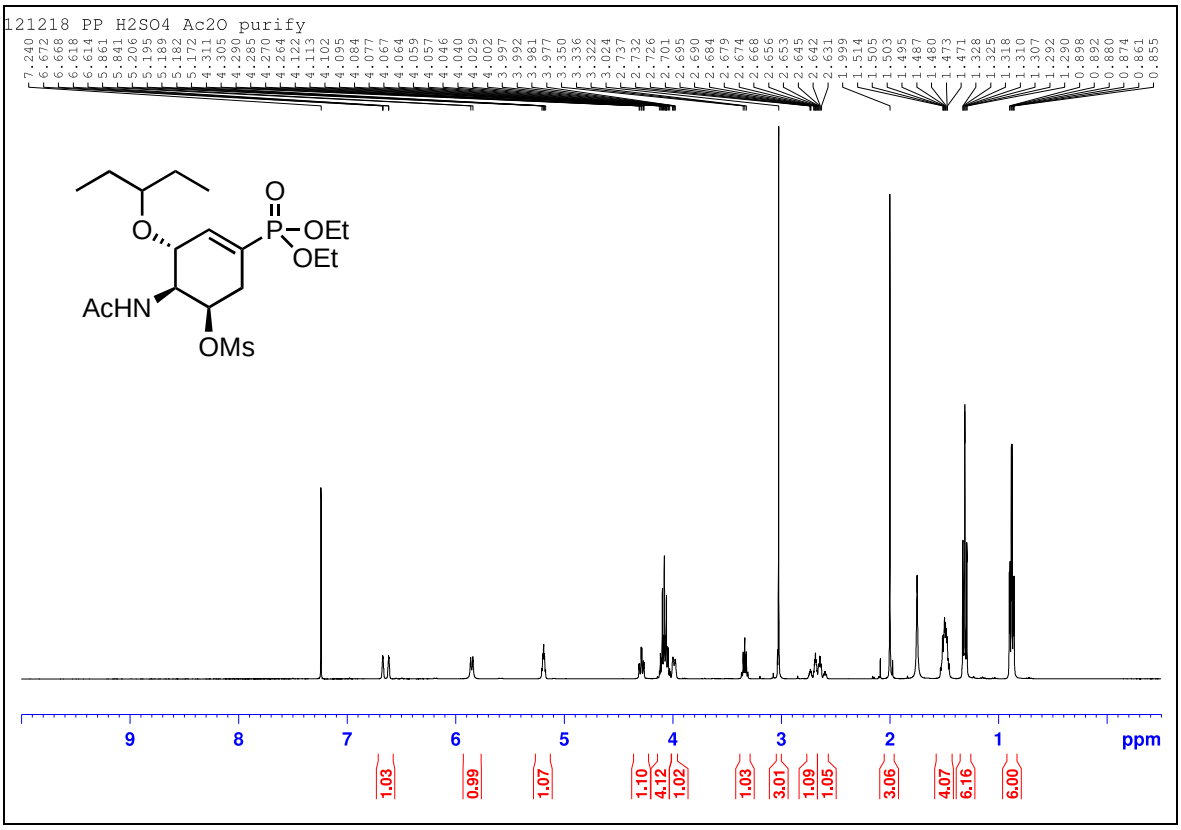
NOESY NMR spectrum of compound **32** ($CDCl_3$, 400 MHz)



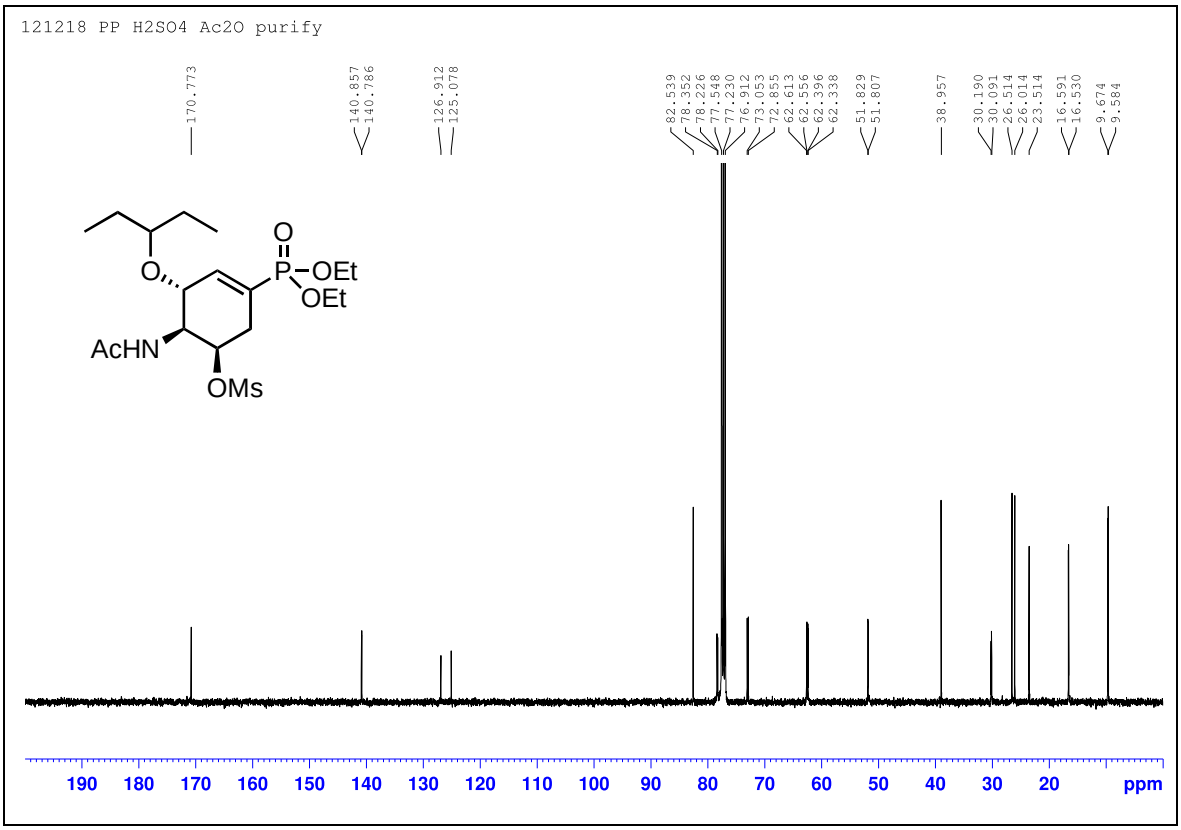
^{1}H–^{13}C HSQC NMR spectrum of compound **32** ($CDCl_3$, 400 MHz)



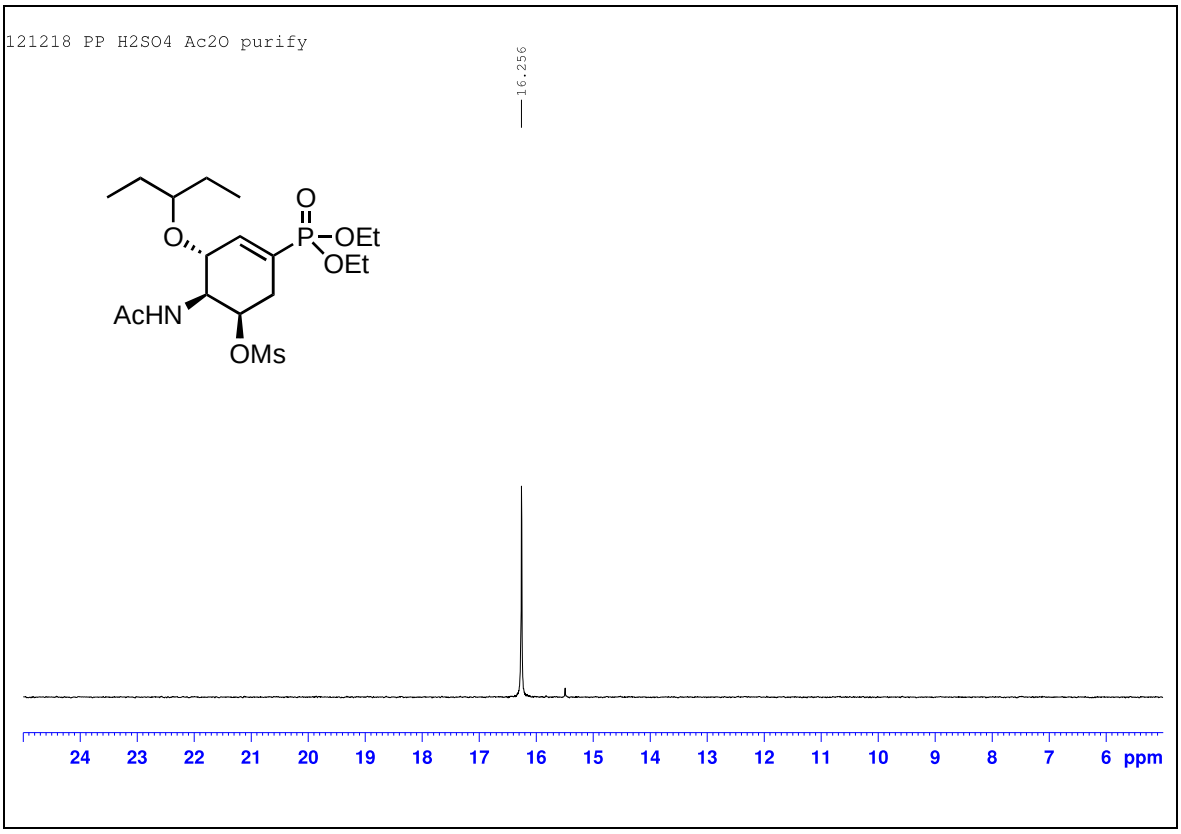
^{1}H–^{13}C HMBC NMR spectrum of compound **32** ($CDCl_3$, 400 MHz)



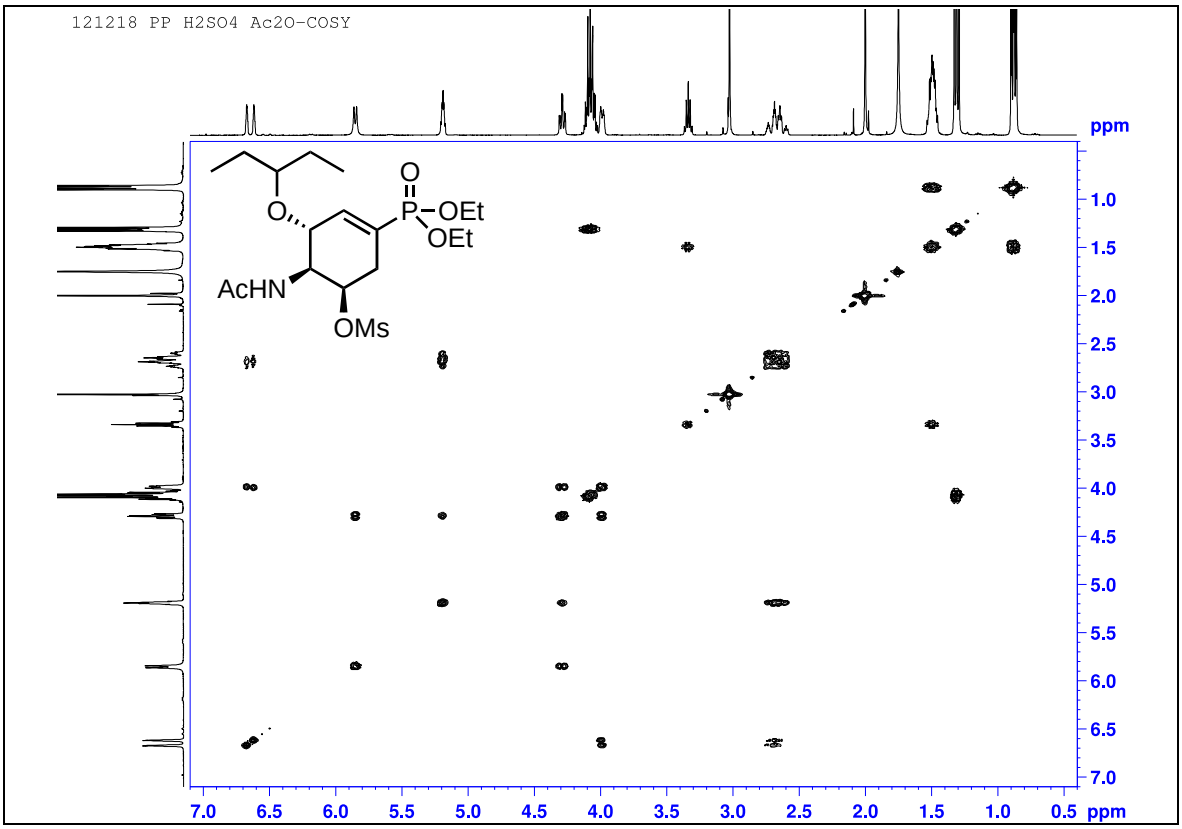
^{1}H NMR spectrum of compound **33** ($CDCl_3$, 400 MHz)



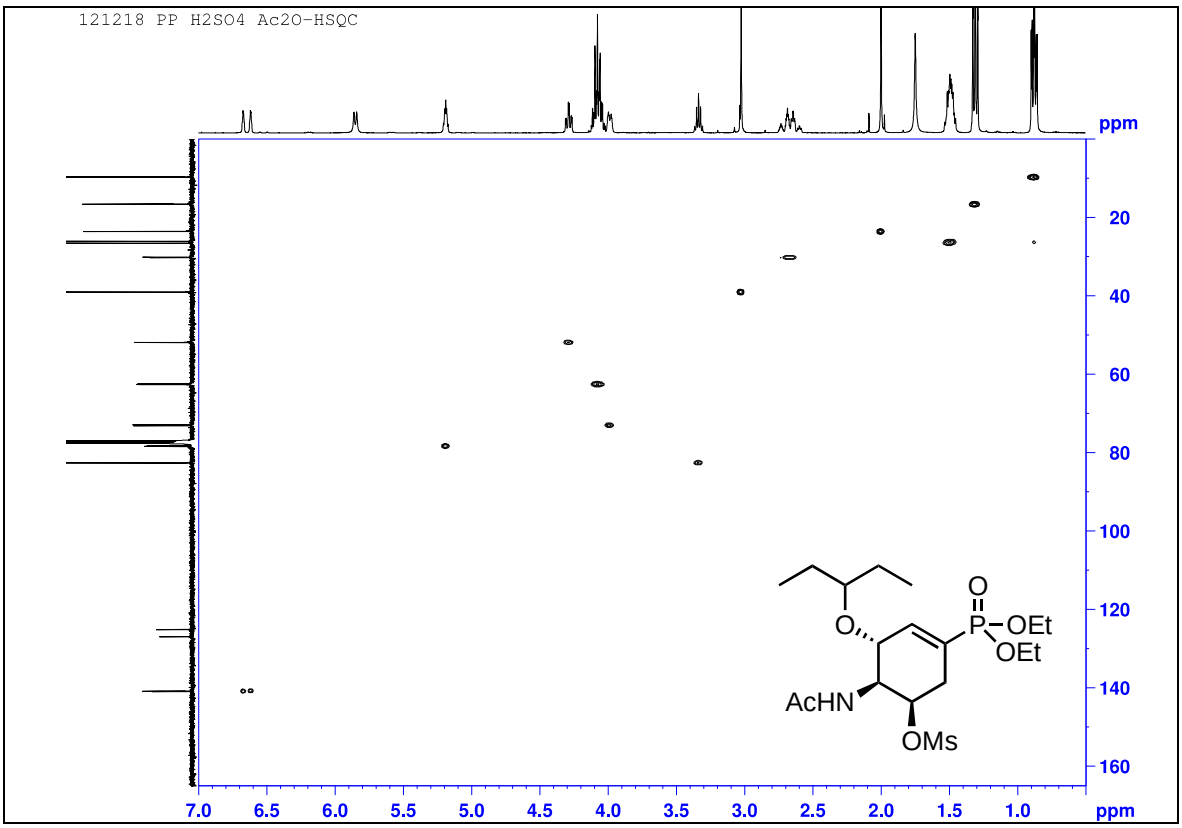
^{13}C NMR spectrum of compound **33** ($CDCl_3$, 100 MHz)



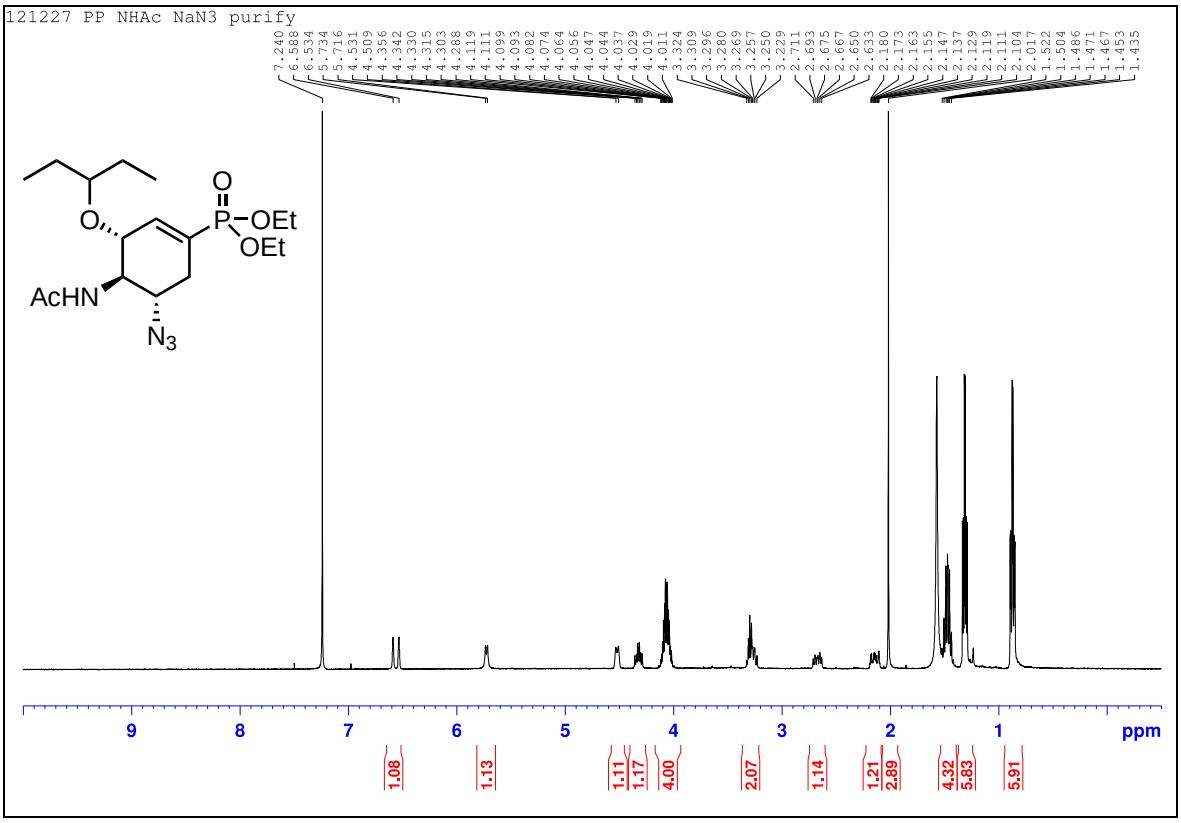
^{31}P NMR spectrum of compound **33** ($CDCl_3$, 162 MHz)



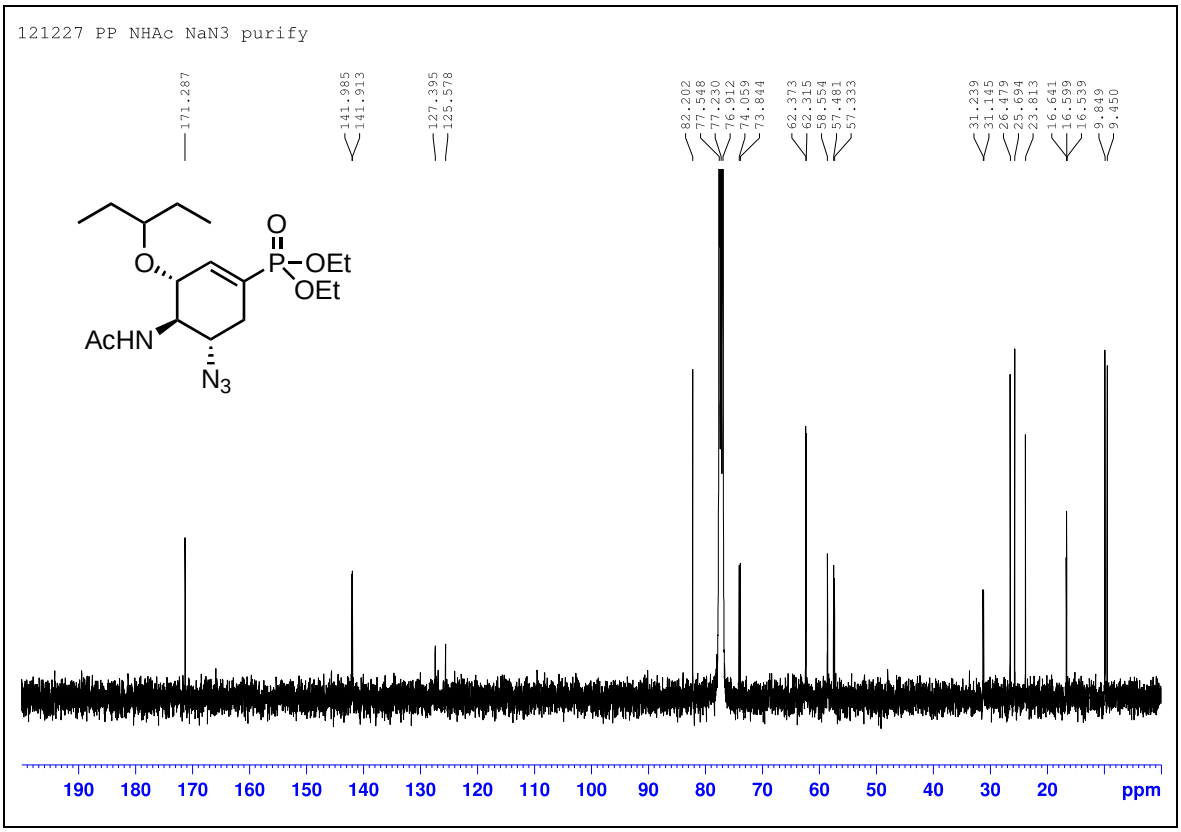
^{1}H–^{1}H COSY NMR spectrum of compound **33** ($CDCl_3$, 400 MHz)



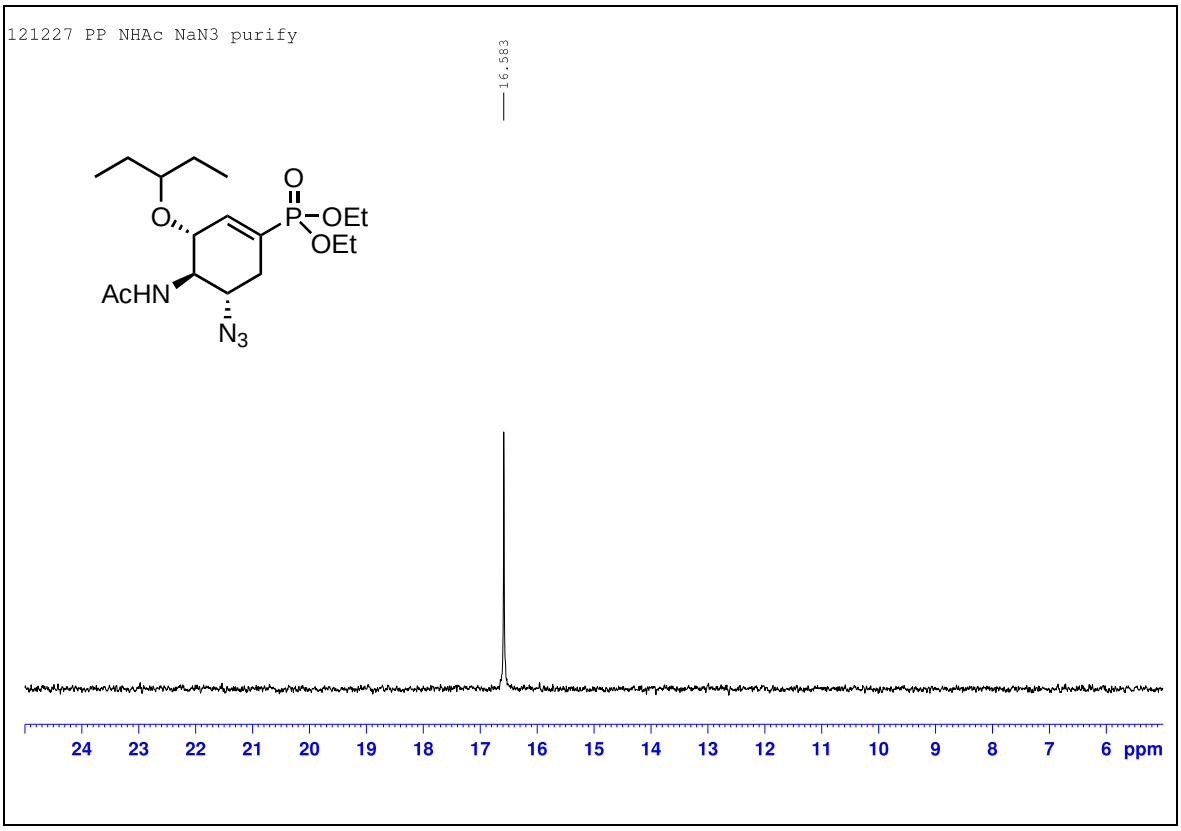
^{1}H–^{13}C HSQC NMR spectrum of compound **33** ($CDCl_3$, 400 MHz)



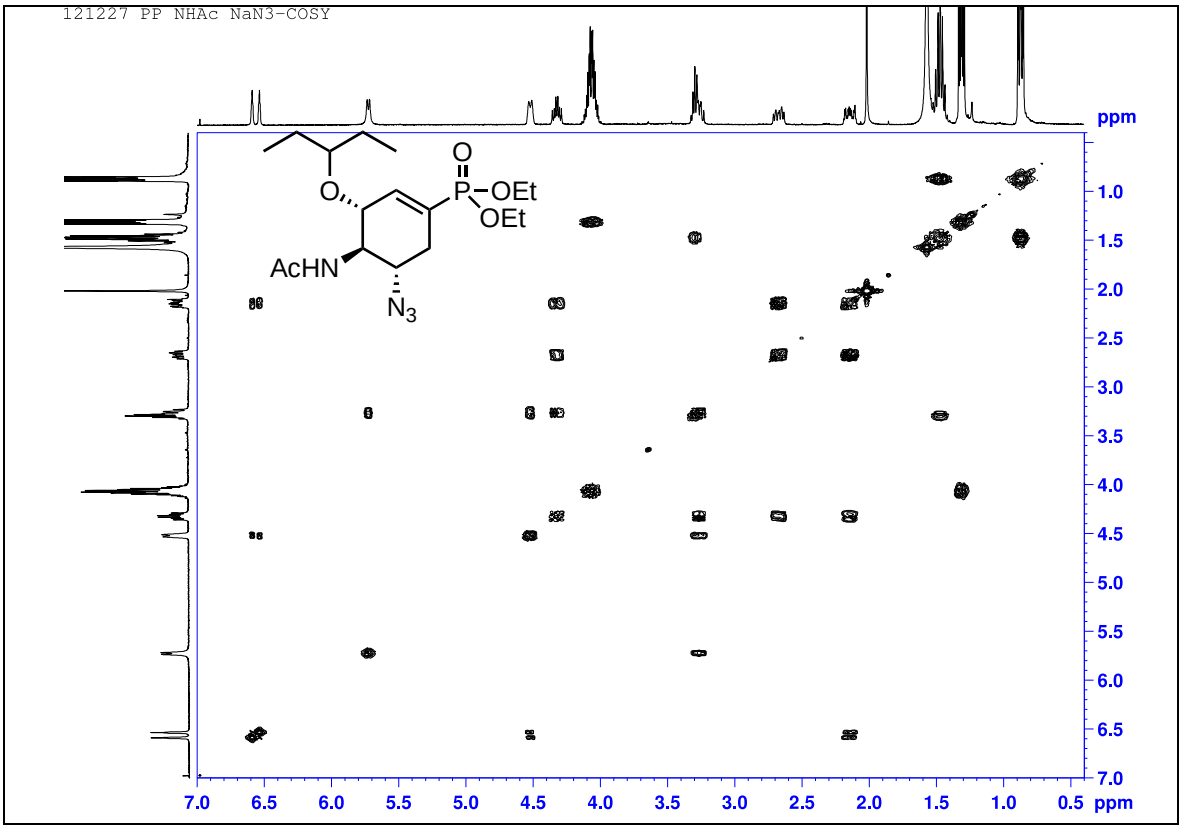
^{1}H NMR spectrum of compound **34** ($CDCl_3$, 400 MHz)



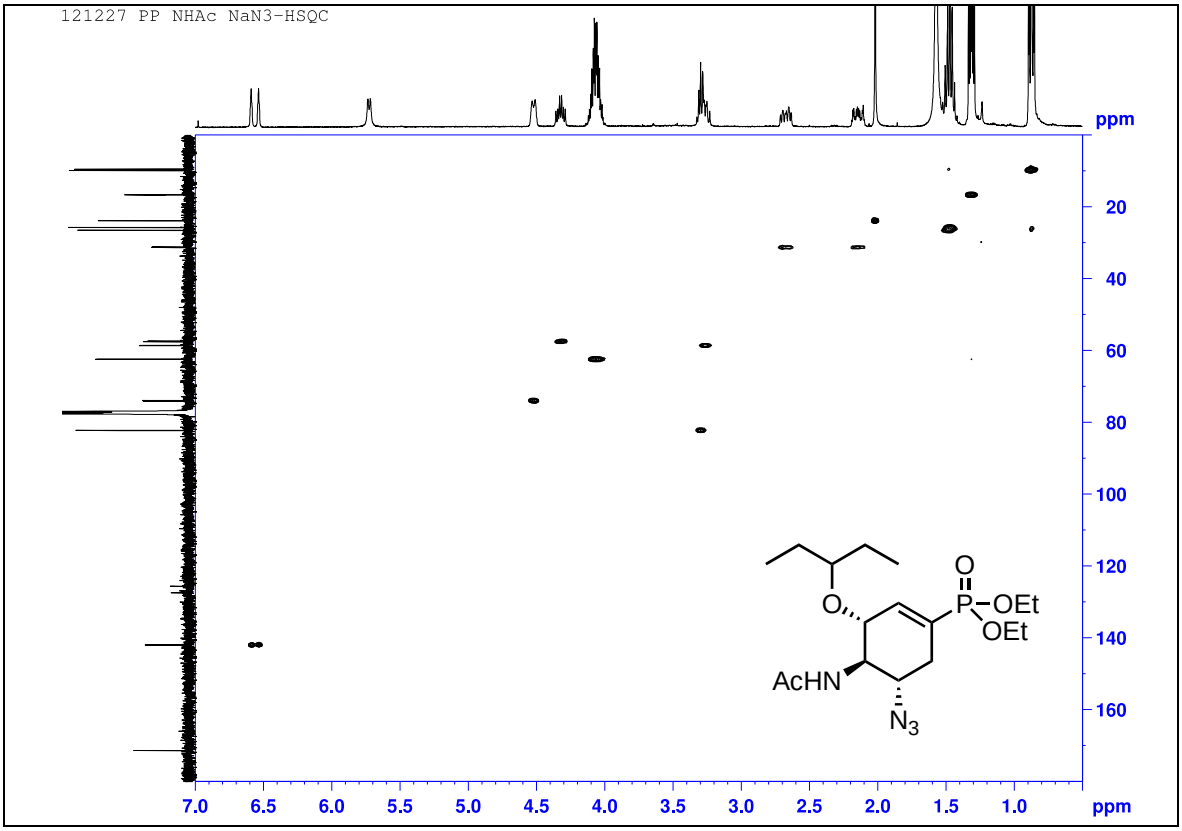
^{13}C NMR spectrum of compound **34** ($CDCl_3$, 100 MHz)



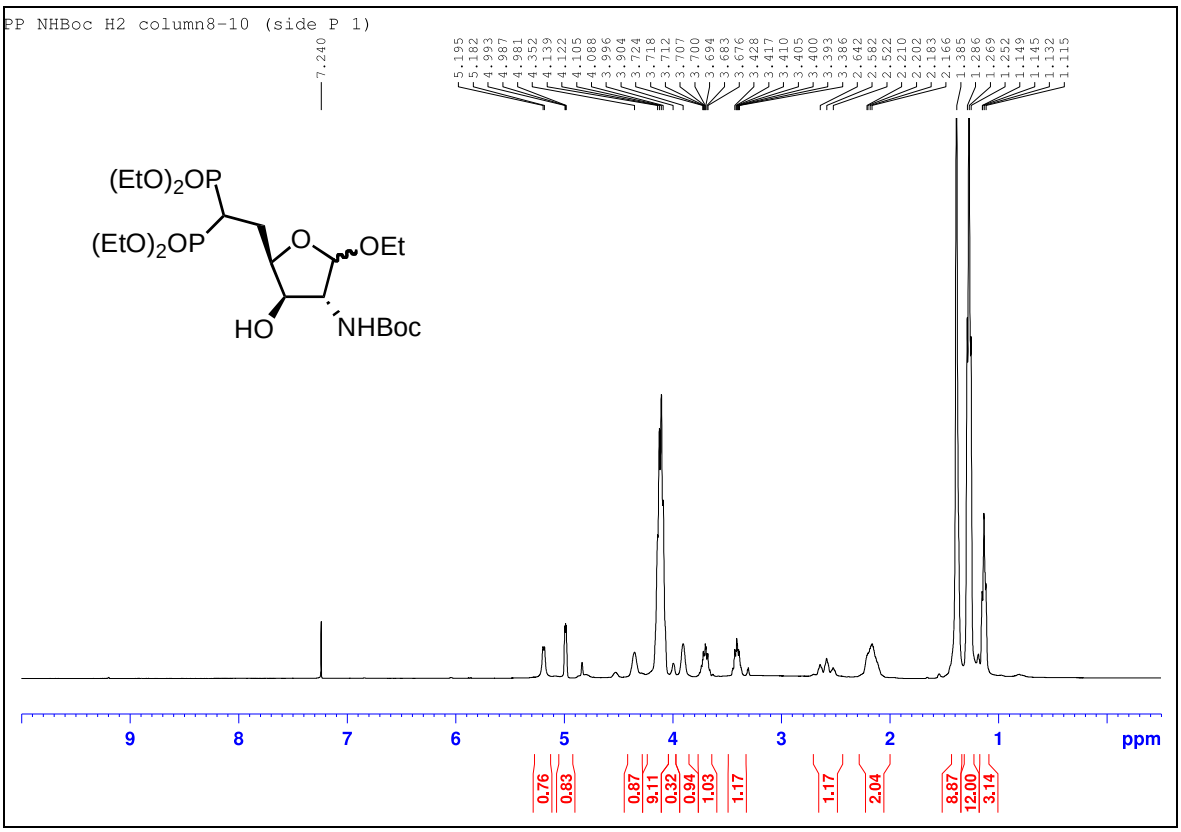
^{31}P NMR spectrum of compound **34** ($CDCl_3$, 162 MHz)



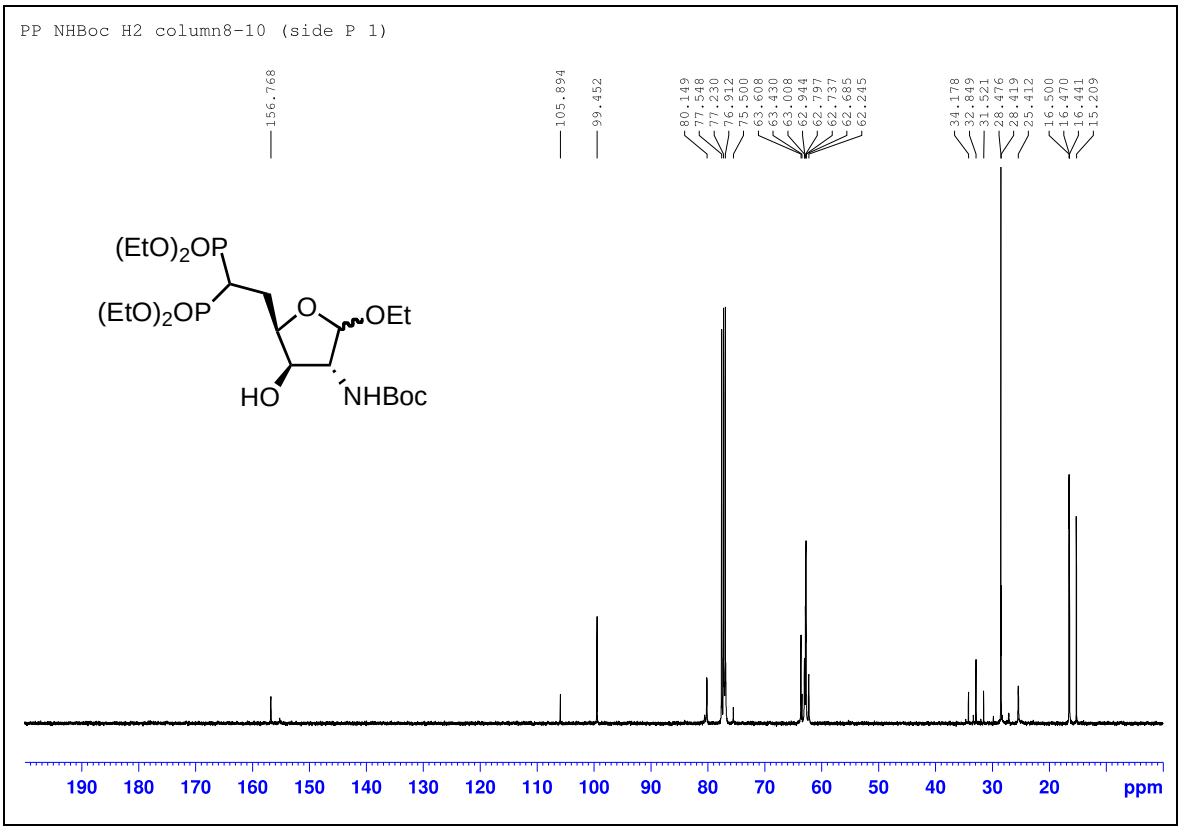
$^{1}H–^{1}H$ COSY NMR spectrum of compound **34** ($CDCl_3$, 400 MHz)



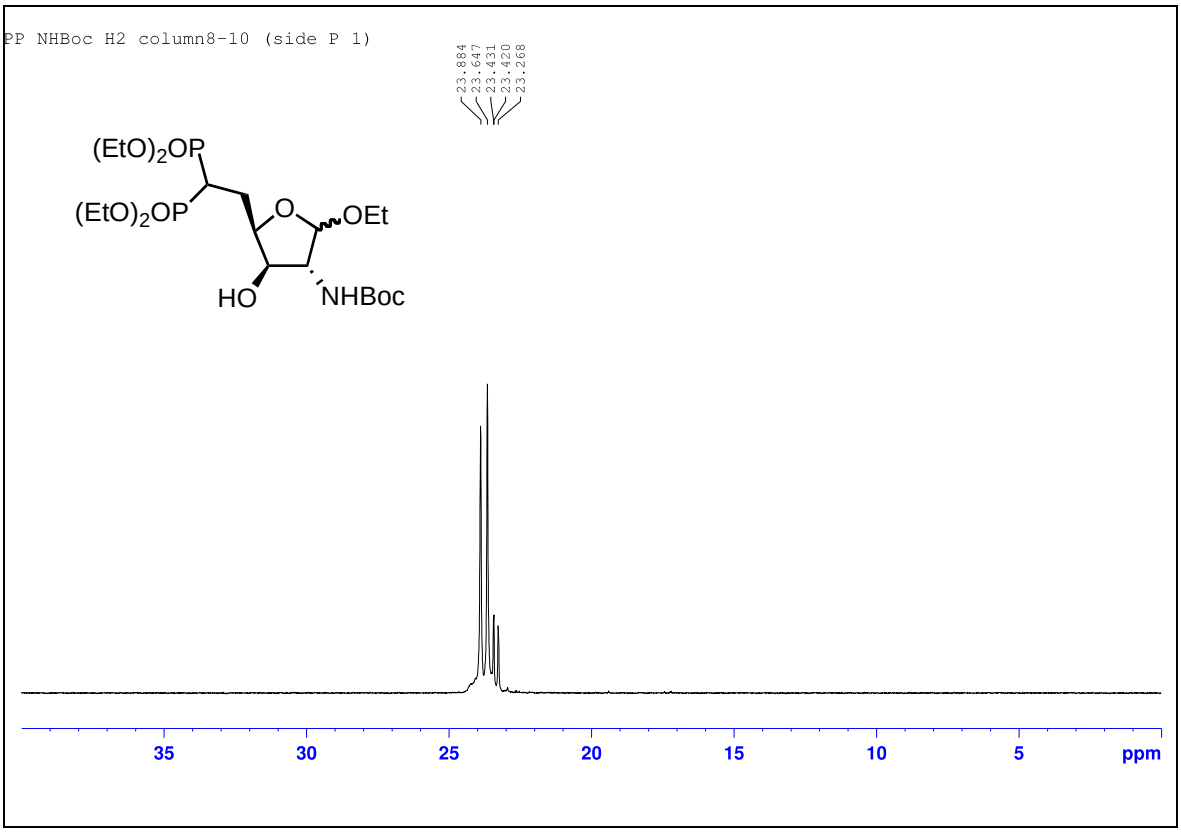
$^{1}H–^{13}C$ HSQC NMR spectrum of compound **34** ($CDCl_3$, 400 MHz)



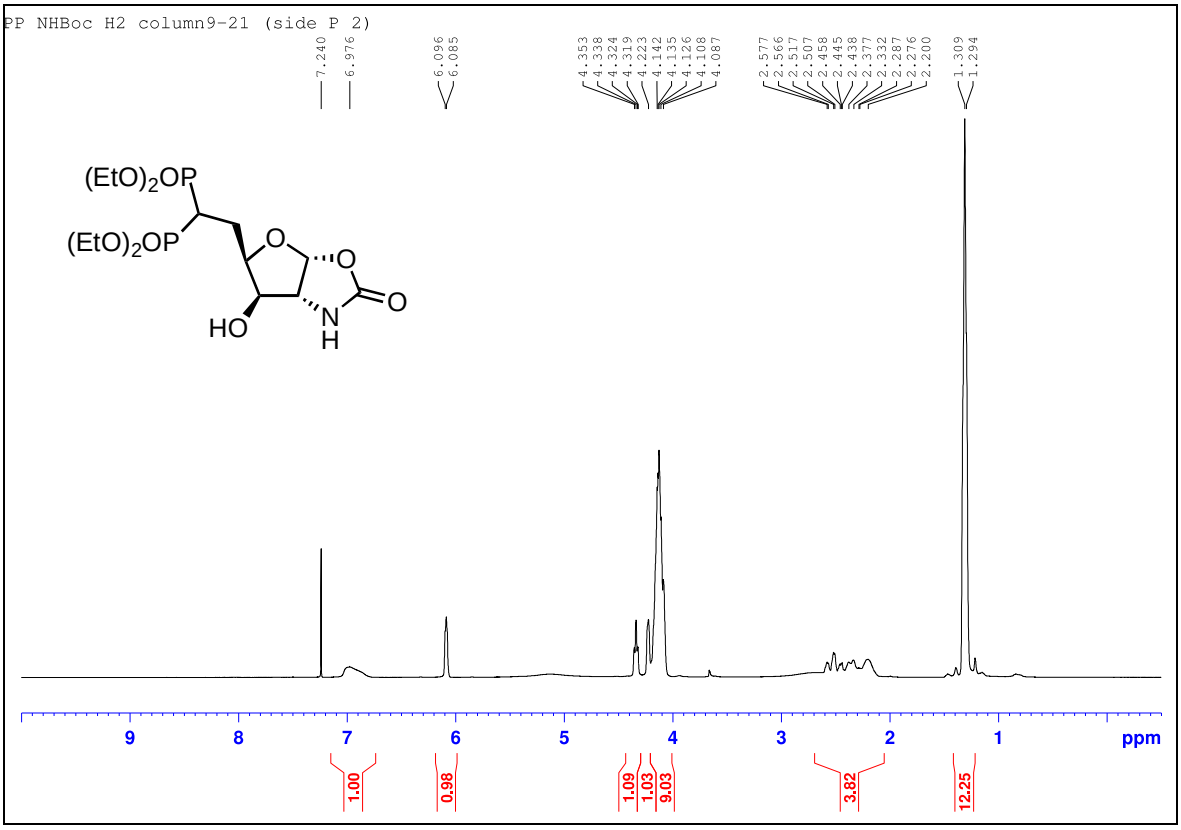
^{1}H NMR spectrum of compound **35** ($CDCl_3$, 400 MHz)



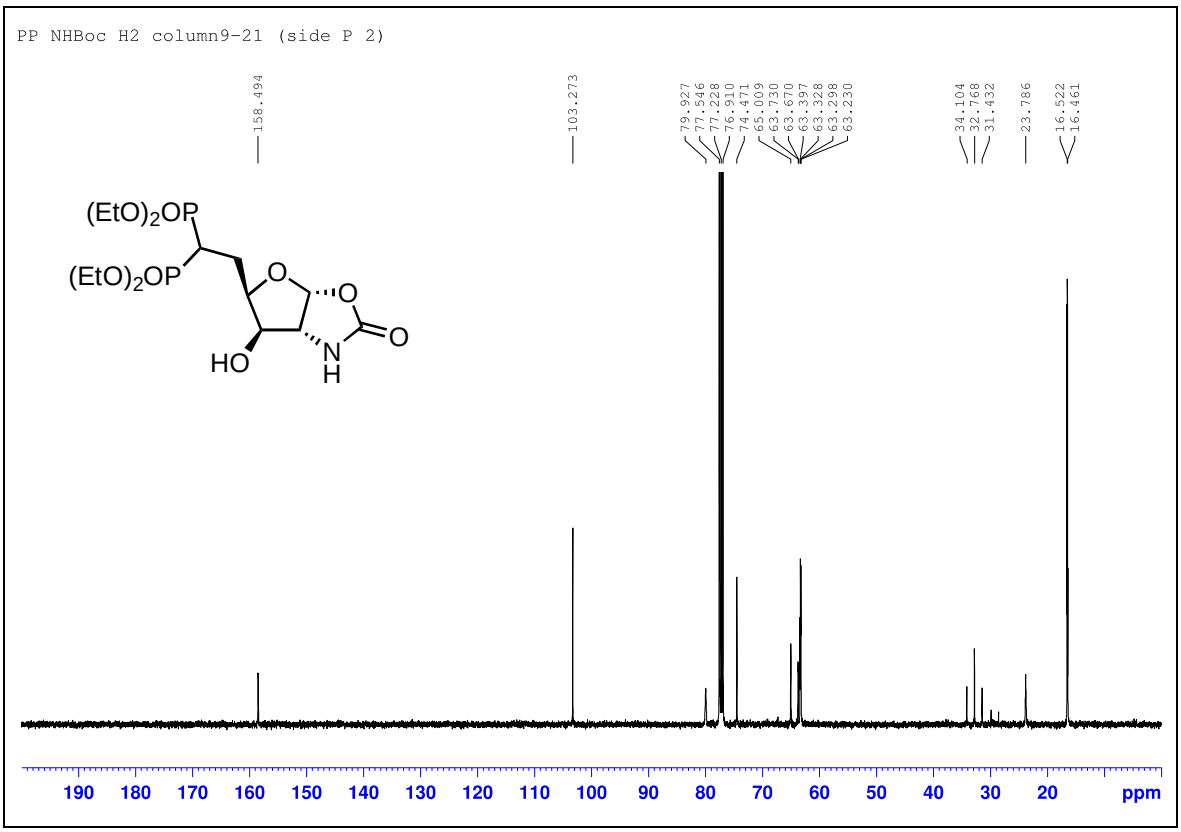
^{13}C NMR spectrum of compound **35** ($CDCl_3$, 100 MHz)



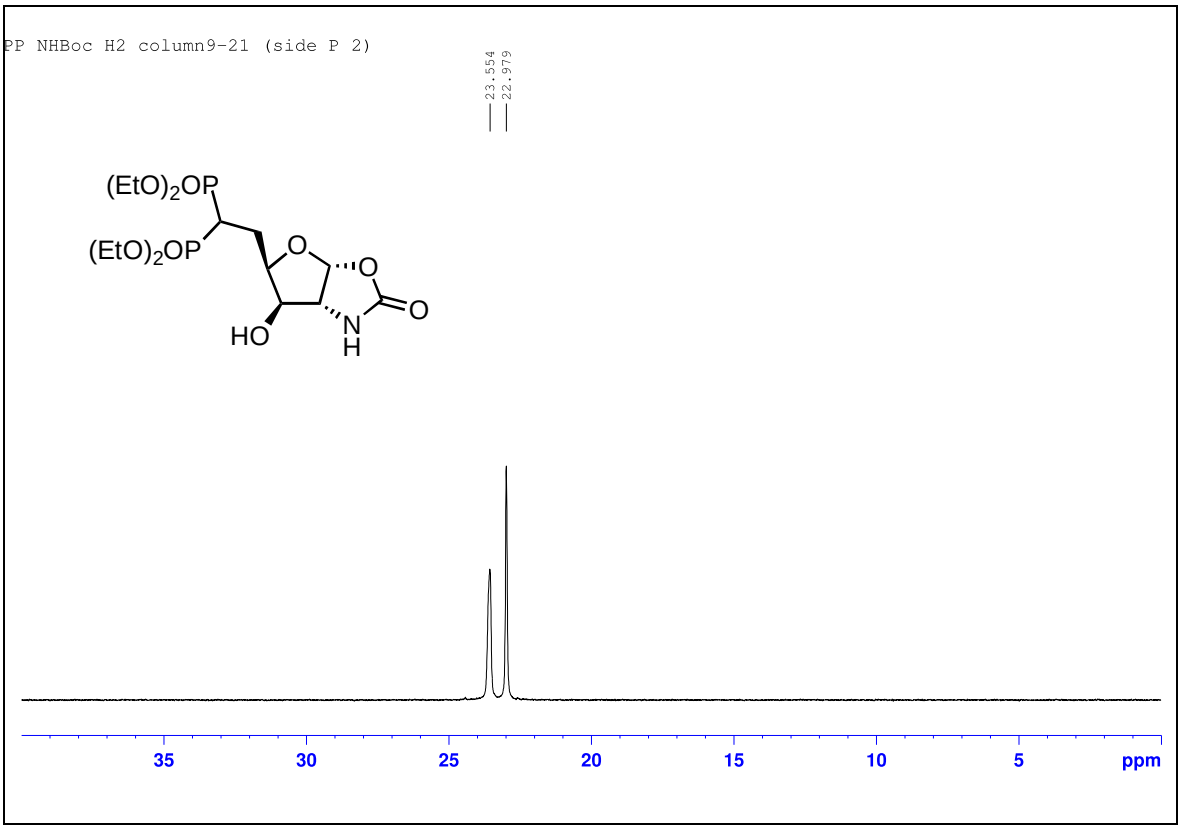
^{31}P NMR spectrum of compound **35** ($CDCl_3$, 162 MHz)



^{1}H NMR spectrum of compound **36** ($CDCl_3$, 400 MHz)



^{13}C NMR spectrum of compound **36** ($CDCl_3$, 100 MHz)



^{31}P NMR spectrum of compound **36** ($CDCl_3$, 162 MHz)