

NMR Data

Chapter 2

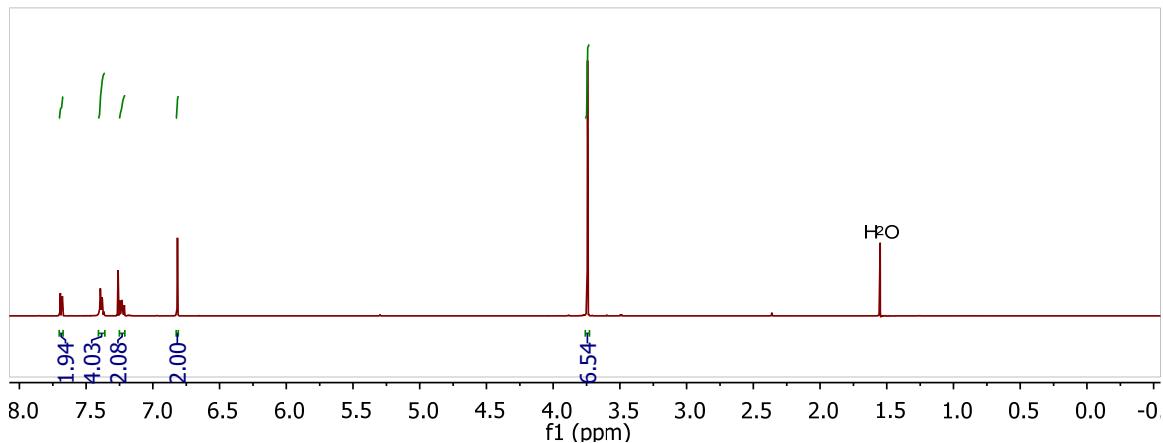


Figure 1. ¹H-NMR (500 MHz, CDCl_3) spectrum of **B**.

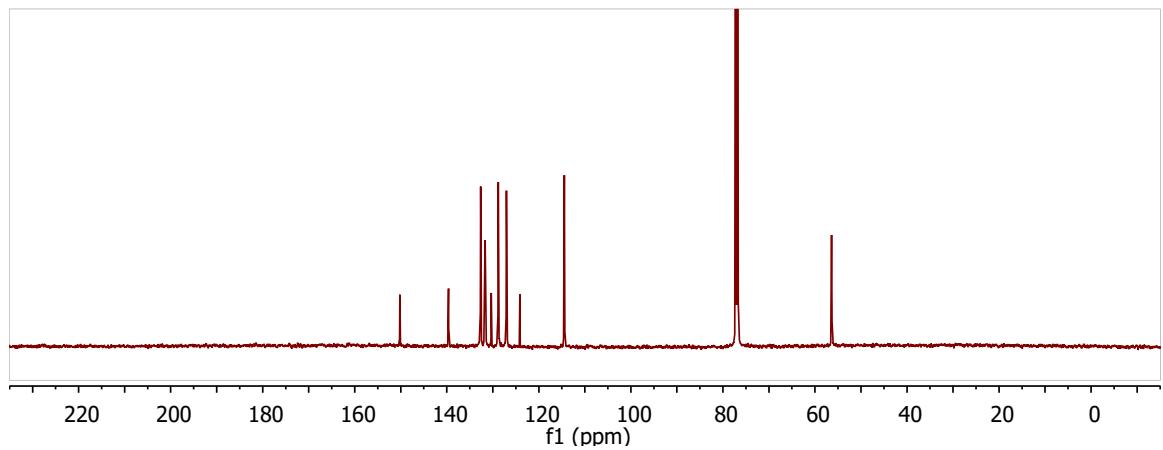


Figure 2. ¹³C{¹H}-NMR (126 MHz, CDCl_3) spectrum of **B**.

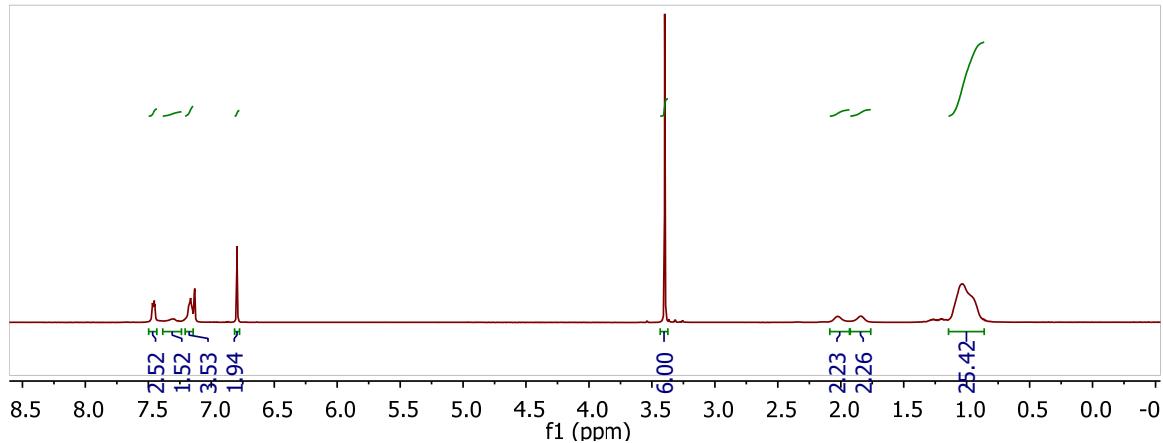


Figure 3. ¹H-NMR (500 MHz, C_6D_6) spectrum of **1-(OMe)₂**.

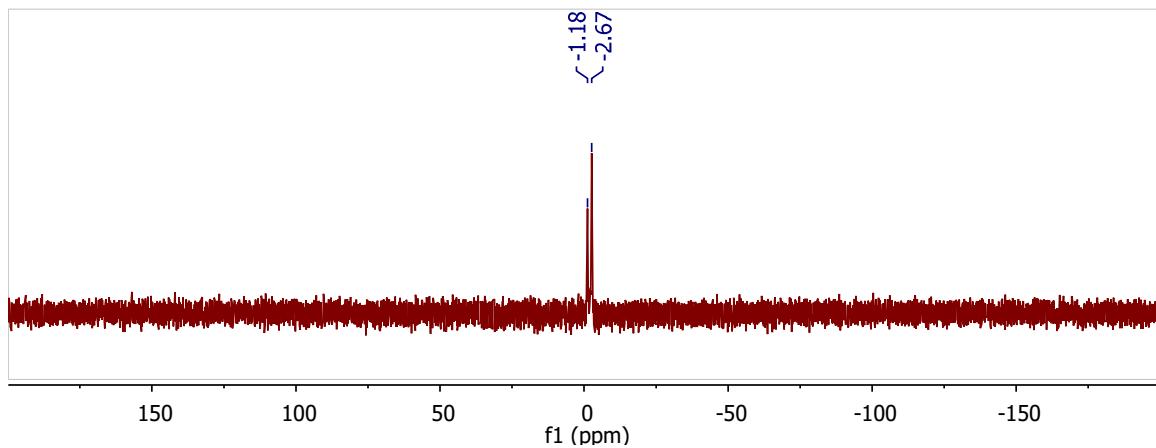


Figure 4. $^{31}\text{P}\{\text{H}\}$ -NMR (121 MHz, C_6D_6) spectrum of **1-(OMe)₂**.

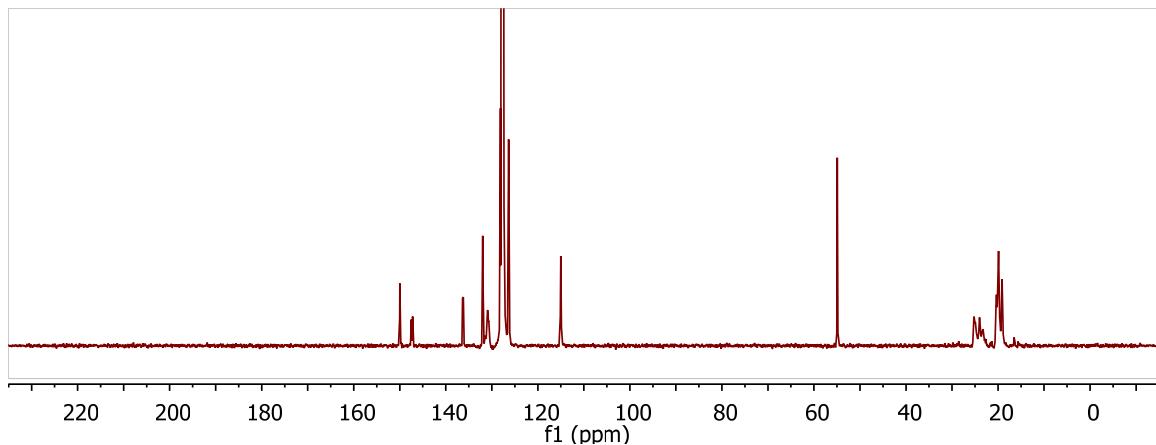


Figure 5. $^{13}\text{C}\{\text{H}\}$ -NMR (126 MHz, C_6D_6) spectrum of **1-(OMe)₂**.

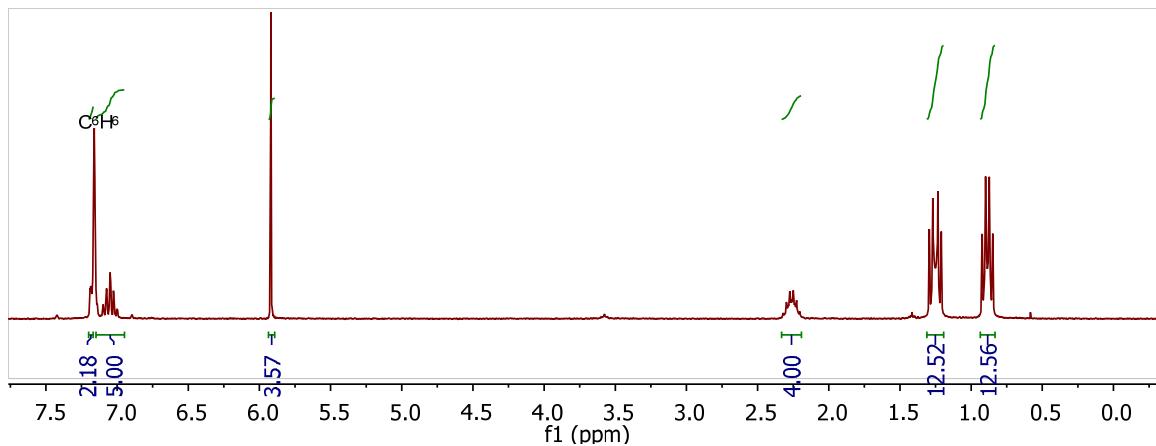


Figure 6. ^1H -NMR (300 MHz, C_6D_6) spectrum of complex **3**.

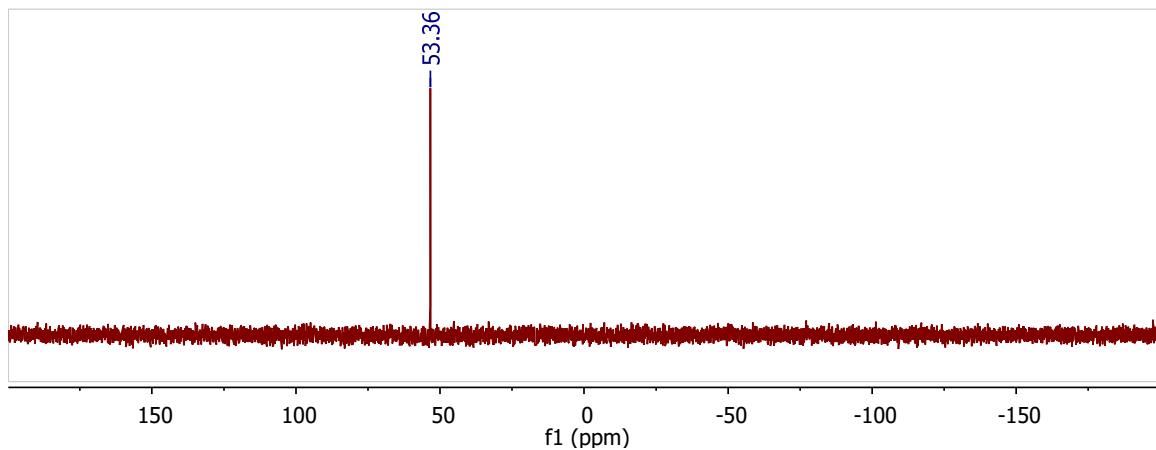


Figure 7. $^{31}\text{P}\{^1\text{H}\}$ -NMR (121 MHz, C_6D_6) spectrum of complex 3.

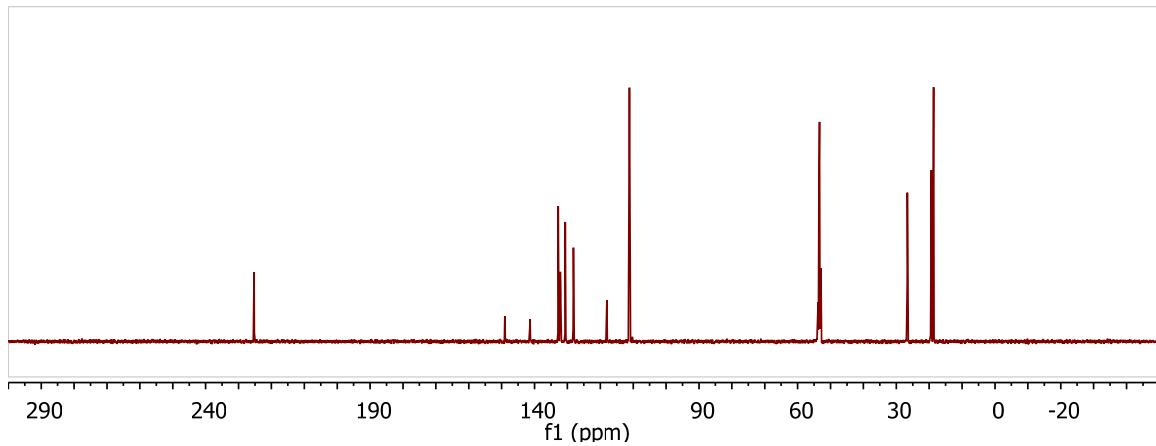


Figure 8. $^{13}\text{C}\{^1\text{H}\}$ -NMR (126 MHz, CD_2Cl_2) spectrum of complex 3.

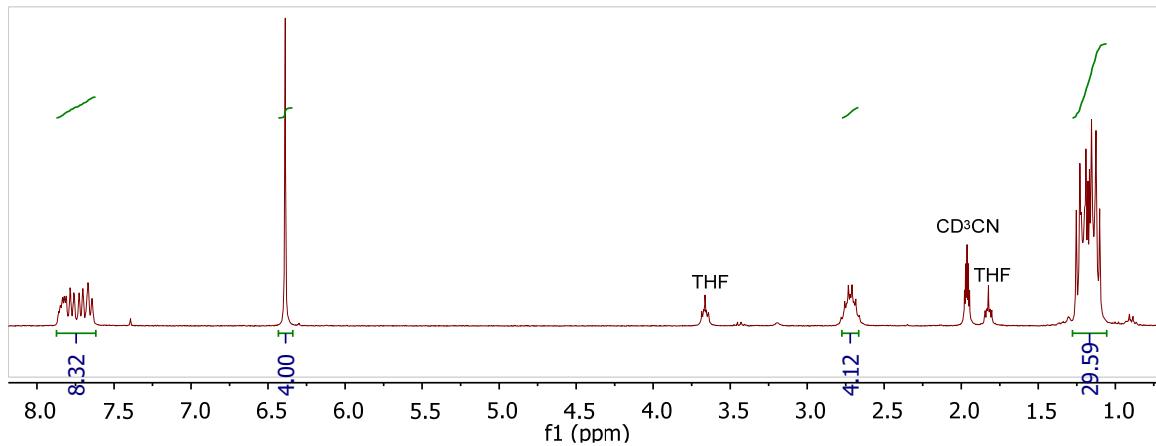


Figure 9. ^1H -NMR (300 MHz, CD_3CN) spectrum of complex 4.

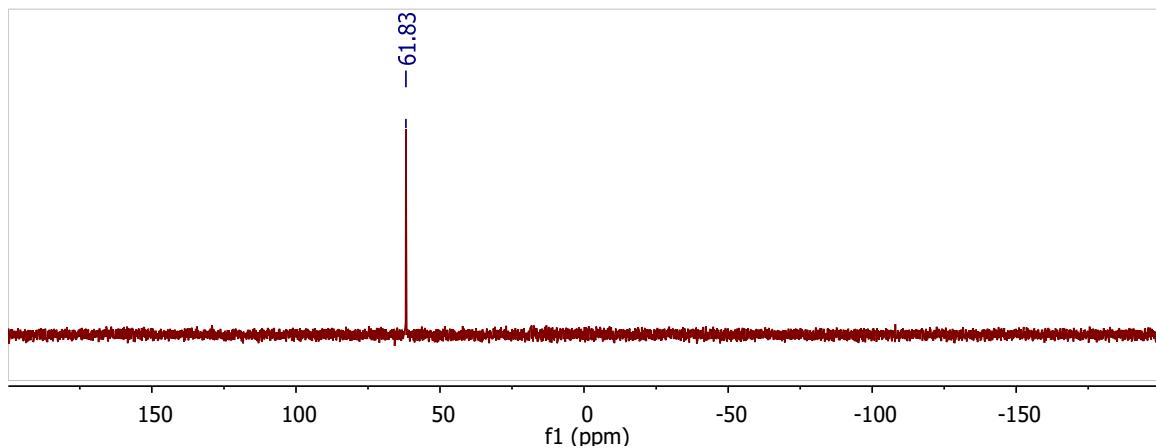


Figure 10. $^{31}\text{P}\{\text{H}\}$ -NMR (121 MHz, CD_3CN) spectrum of complex 4.

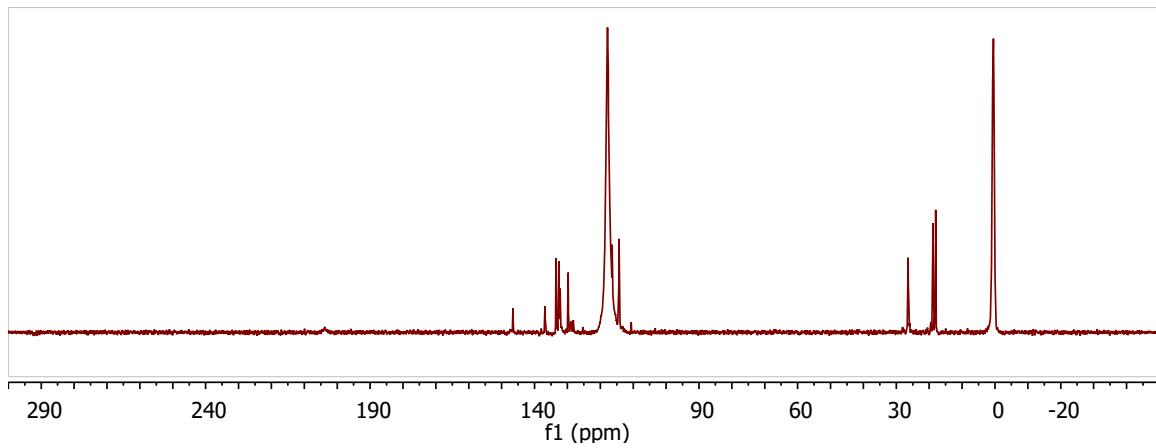


Figure 11. $^{13}\text{C}\{\text{H}\}$ -NMR (126 MHz, CD_3CN) spectrum of complex 4.

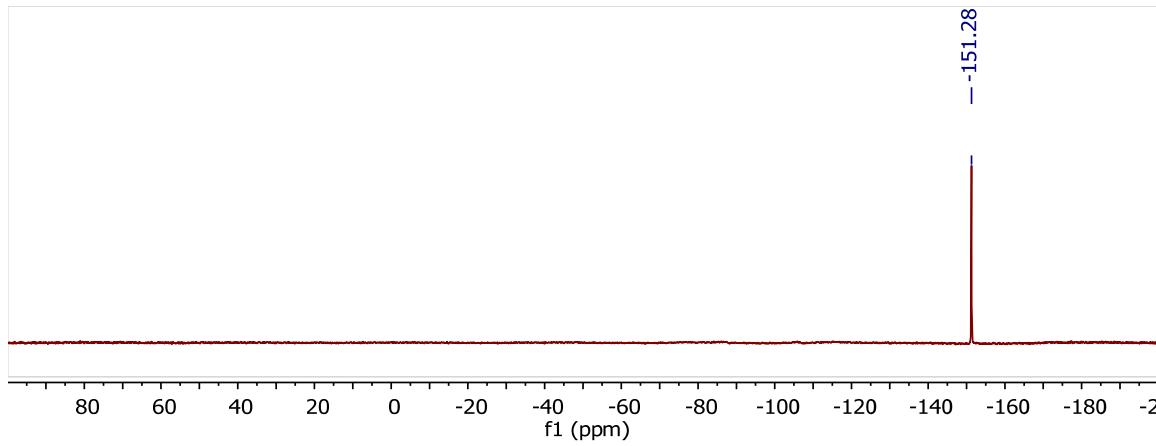


Figure 12. ^{19}F -NMR (282 MHz, CD_3CN) spectrum of complex 4.

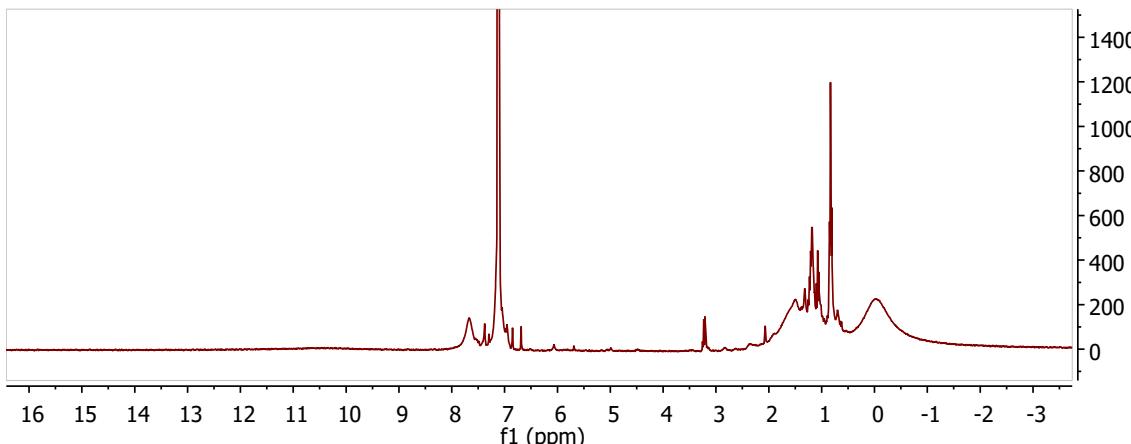


Figure 13. ^1H -NMR (300 MHz, C_6D_6) spectrum of complex **5**.

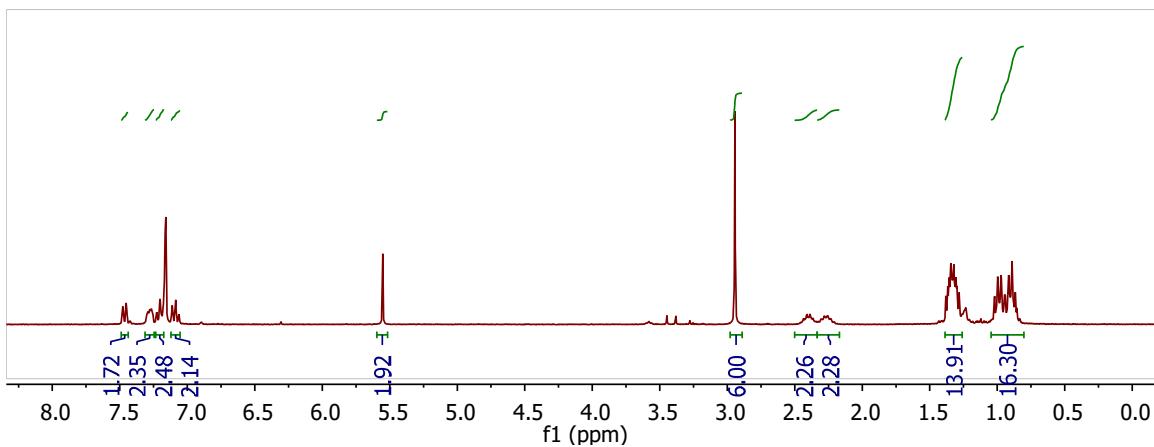


Figure 14. ^1H -NMR (300 MHz, C_6D_6) spectrum of complex **3-(OMe)₂**.

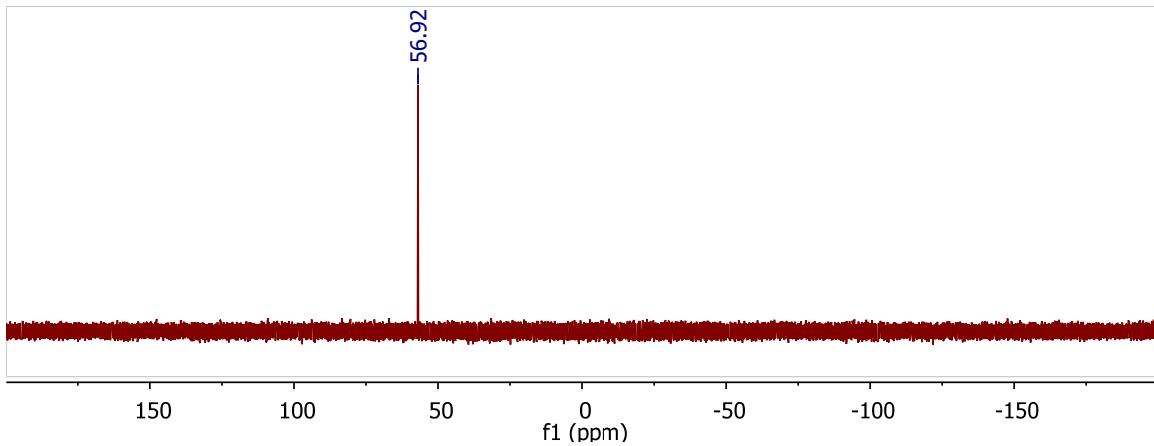


Figure 15. $^{31}\text{P}\{\text{H}\}$ -NMR (121 MHz, C_6D_6) spectrum of complex **3-(OMe)₂**.

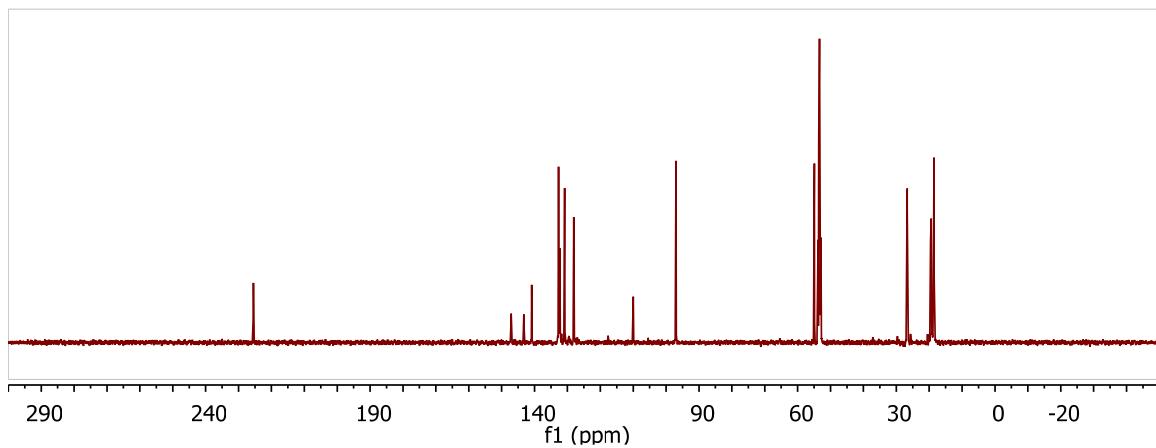


Figure 16. $^{13}\text{C}\{\text{H}\}$ -NMR (126 MHz, CD_2Cl_2) spectrum of complex **3-(OMe)₂**.

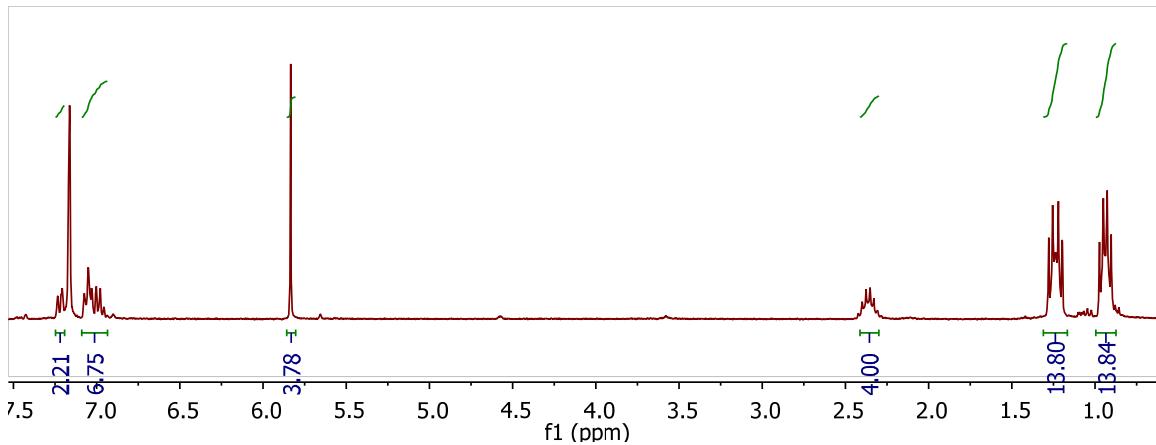


Figure 17. ^1H -NMR (300 MHz, C_6D_6) spectrum of complex **8**.

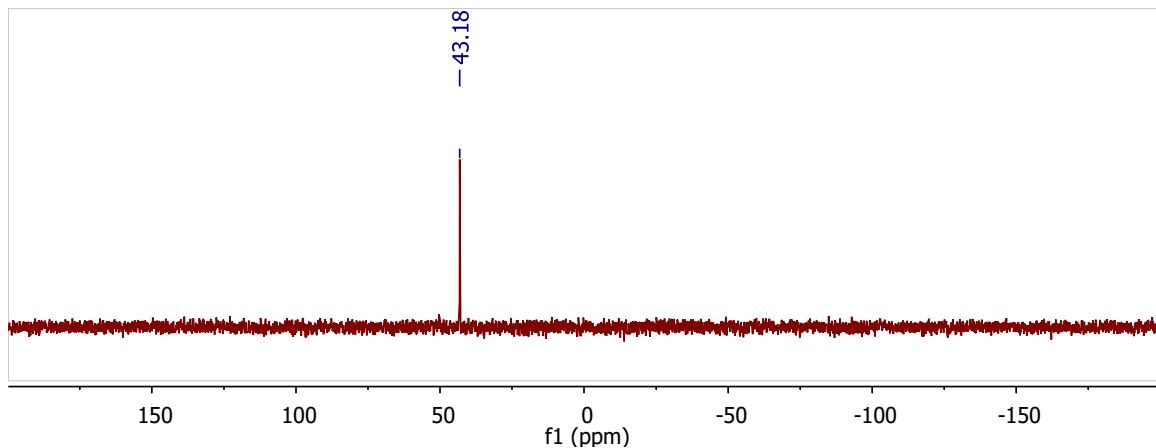


Figure 18. $^{31}\text{P}\{\text{H}\}$ -NMR (121 MHz, C_6D_6) spectrum of complex **8**.

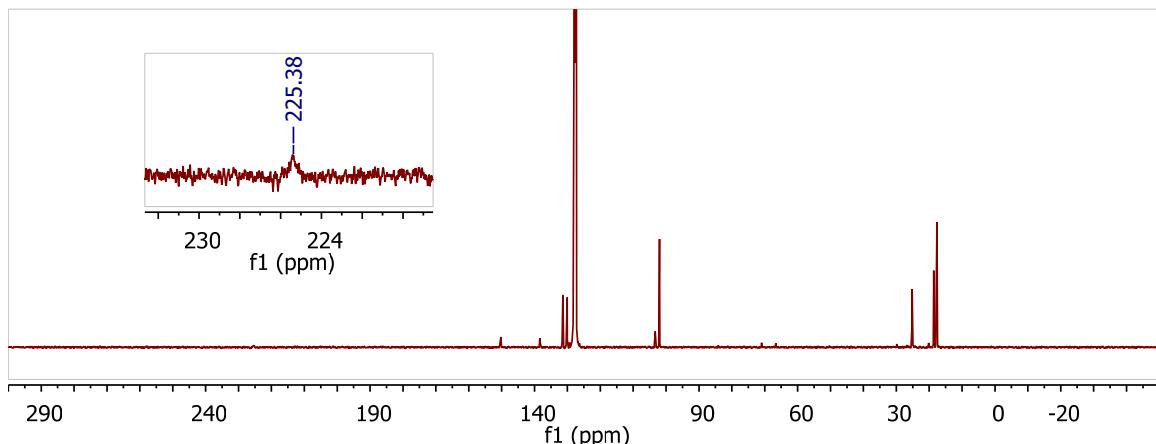


Figure 19. $^{13}\text{C}\{^1\text{H}\}$ -NMR (126 MHz, C_6D_6) spectrum of complex 8.

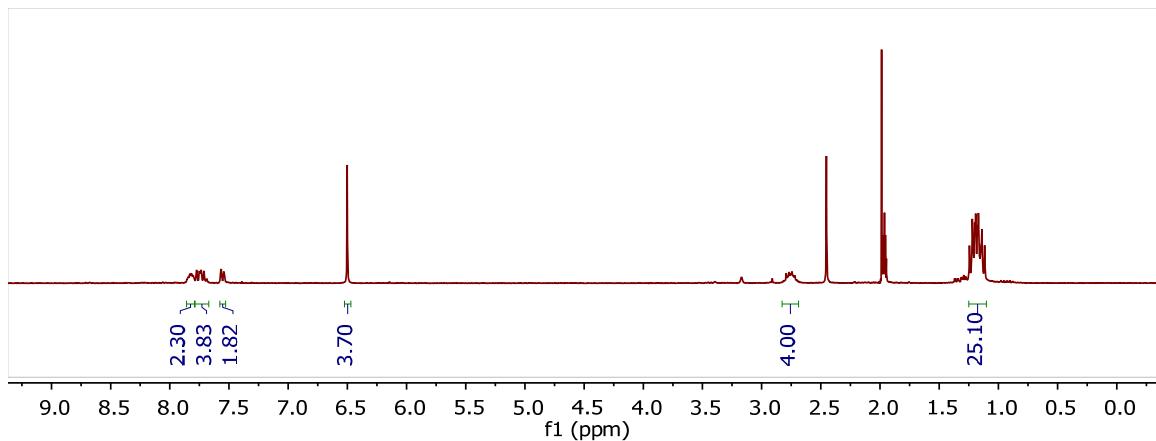


Figure 20. ^1H NMR (300 MHz, C_6D_6) spectrum of 6.

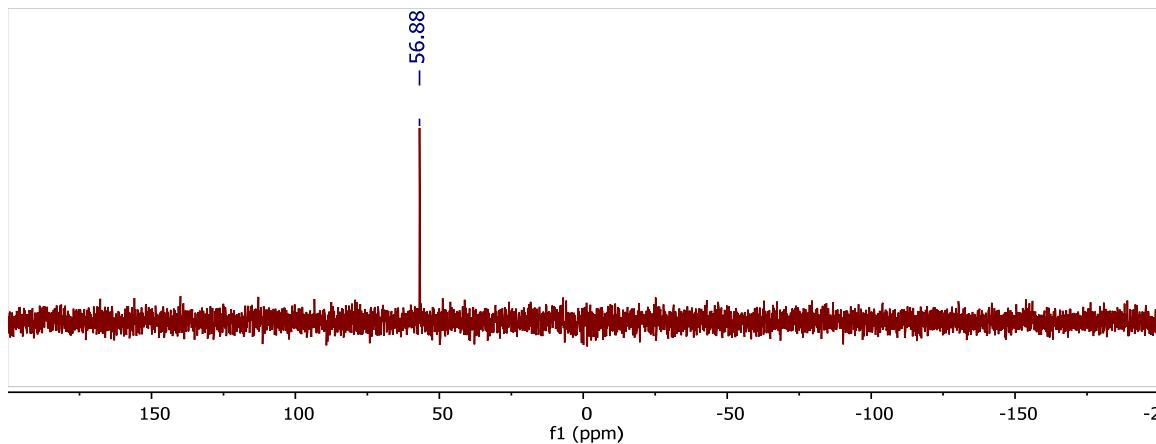


Figure 21. ^{31}P NMR (121 MHz, C_6D_6) spectrum of 6.

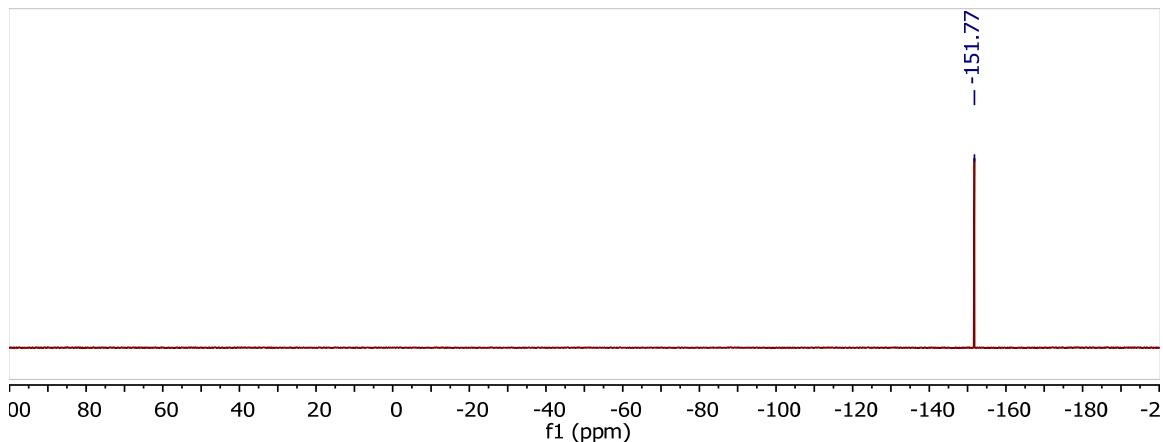


Figure 22. ^{13}C NMR (126 MHz, C_6D_6) spectrum of **6**.

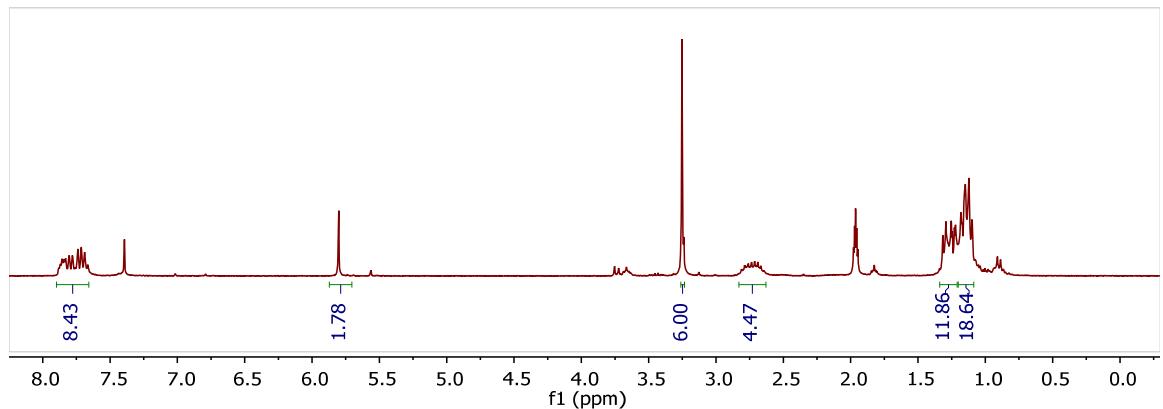


Figure 23. ^1H NMR (300 MHz, C_6D_6) spectrum of **4-(OMe)₂**.

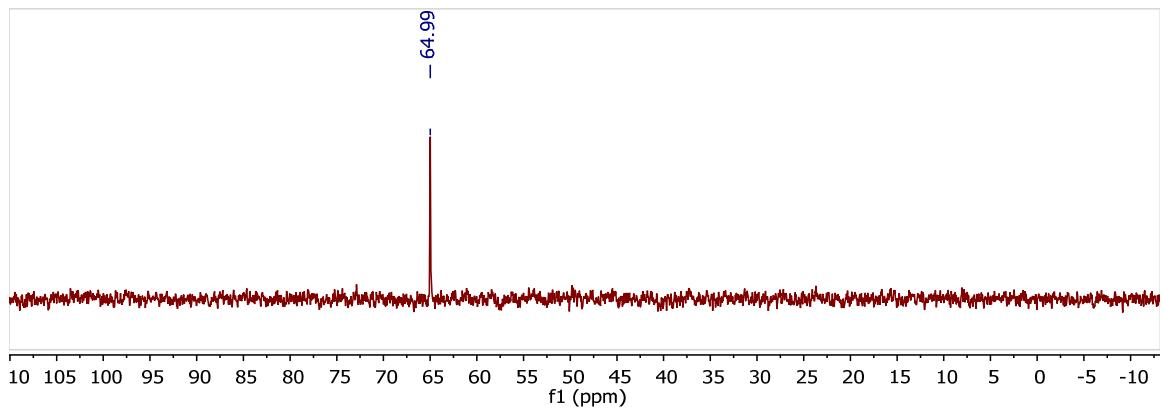


Figure 24. ^{31}P NMR (121 MHz, C_6D_6) spectrum of **4-(OMe)₂**.

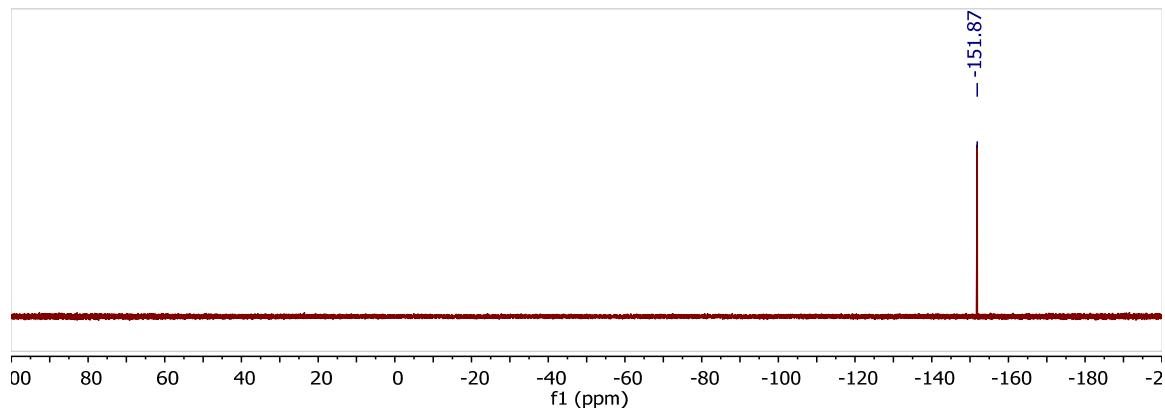


Figure 25. ^{19}F -NMR (282 MHz, CD_3CN) spectrum of complex **4-(OMe)₂**.

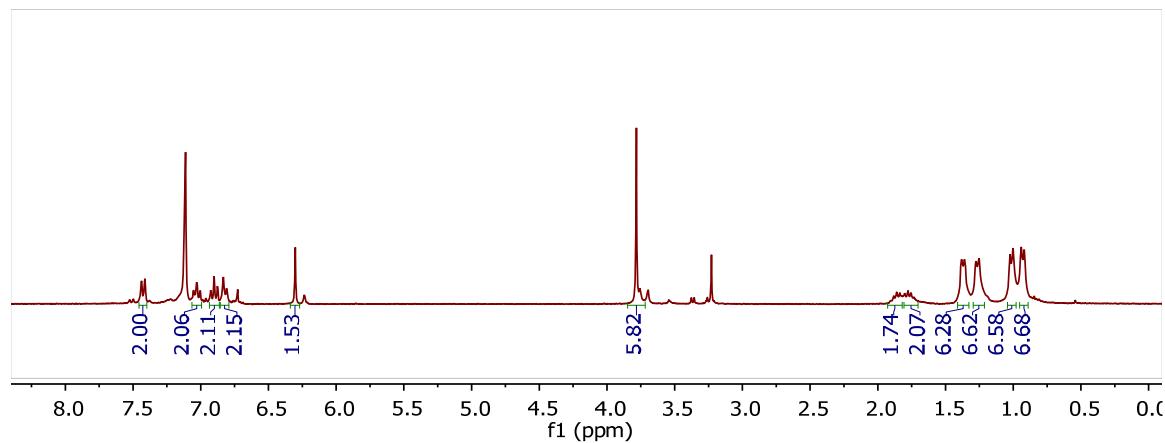


Figure 26. ^1H NMR (300 MHz, C_6D_6) spectrum of **7-(OMe)₂**.

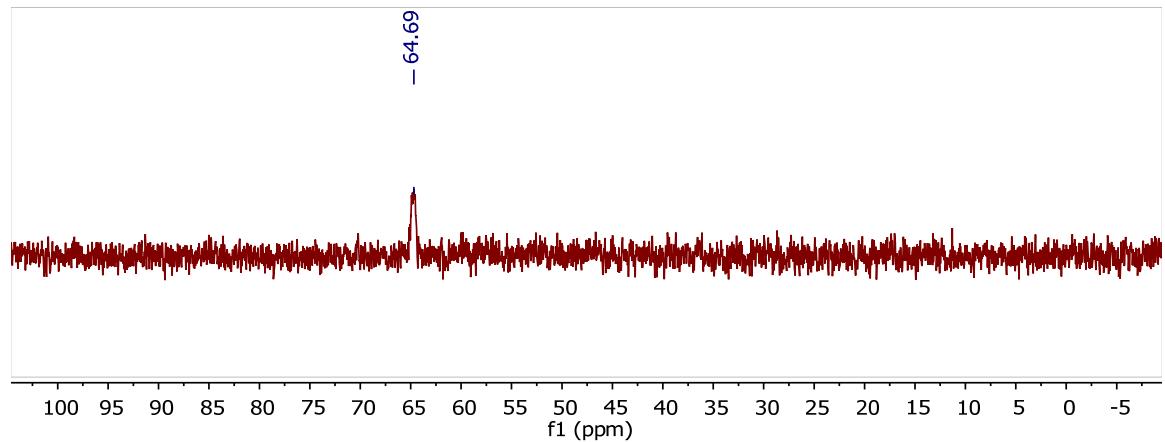


Figure 27. ^{31}P NMR (121 MHz, C_6D_6) spectrum of **7-(OMe)₂**.

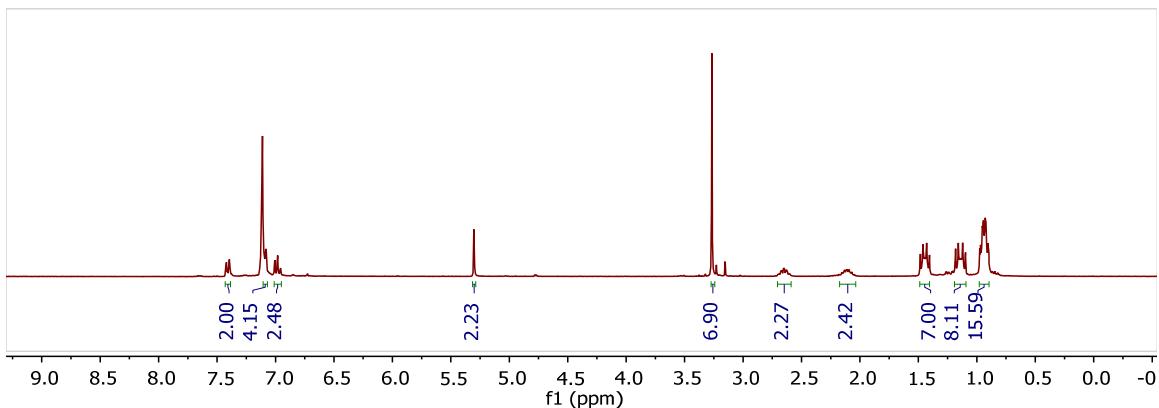


Figure 28. ^1H NMR (300 MHz, C_6D_6) spectrum of **8-(OMe)₂**.

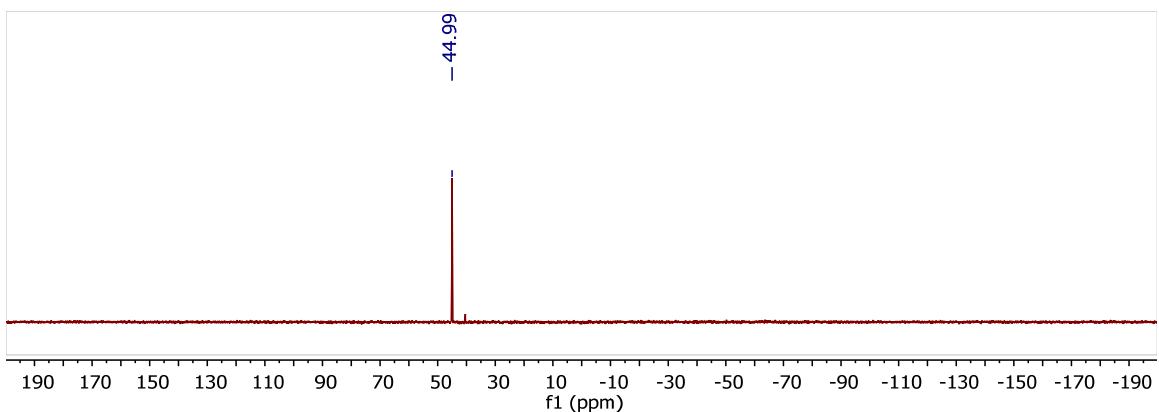


Figure 29. ^{31}P NMR (121 MHz, C_6D_6) spectrum of **8-(OMe)₂**.

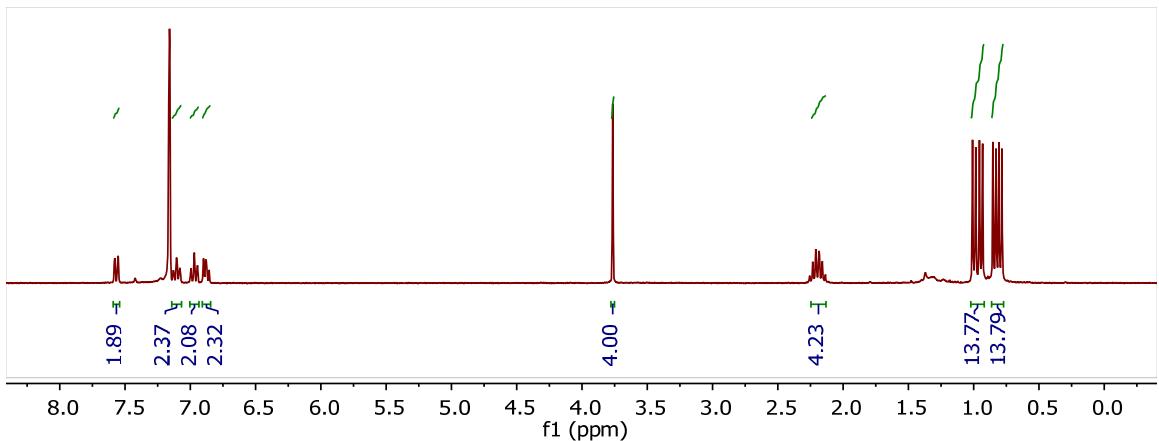


Figure 30. ^1H NMR (300 MHz, C_6D_6) spectrum of **9**.

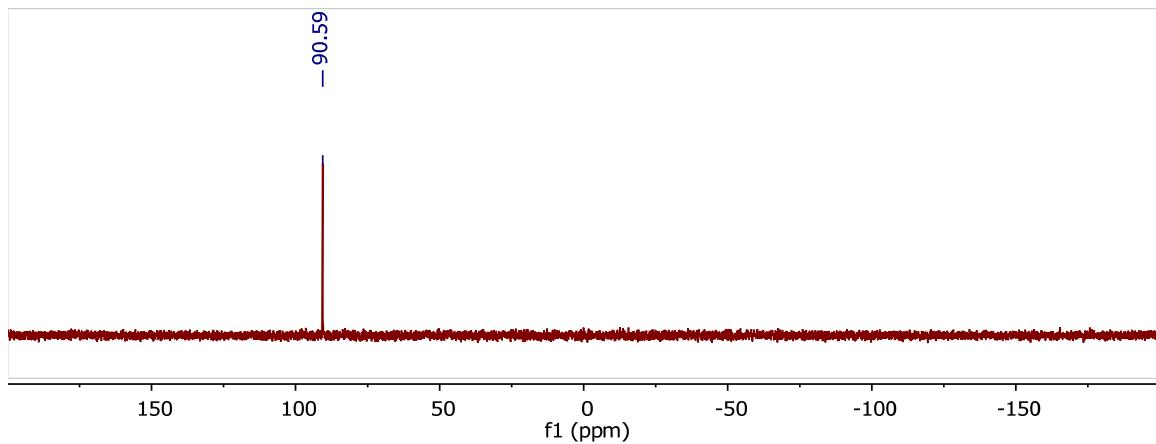


Figure 31. ^{31}P NMR (121 MHz, C_6D_6) spectrum of **9**.

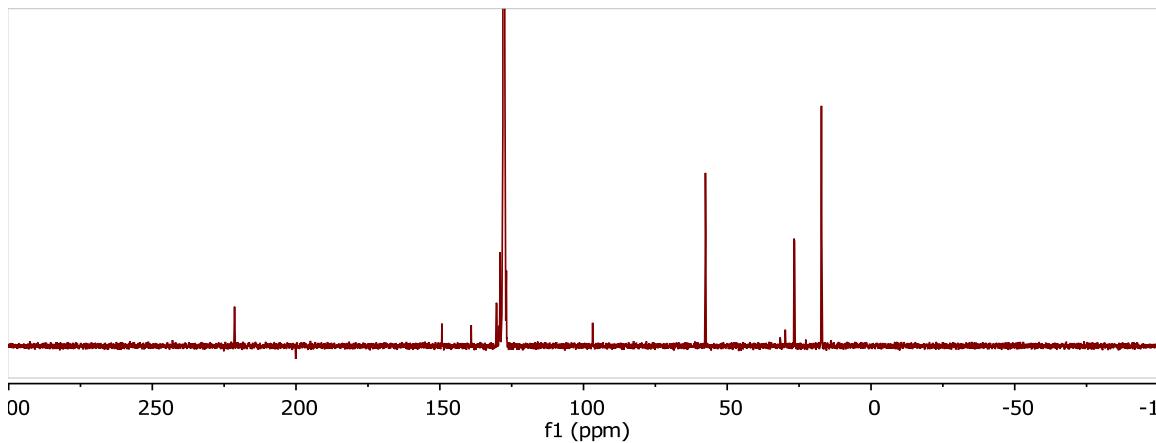


Figure 32. ^{13}C NMR (126 MHz, C_6D_6) spectrum of **9**.

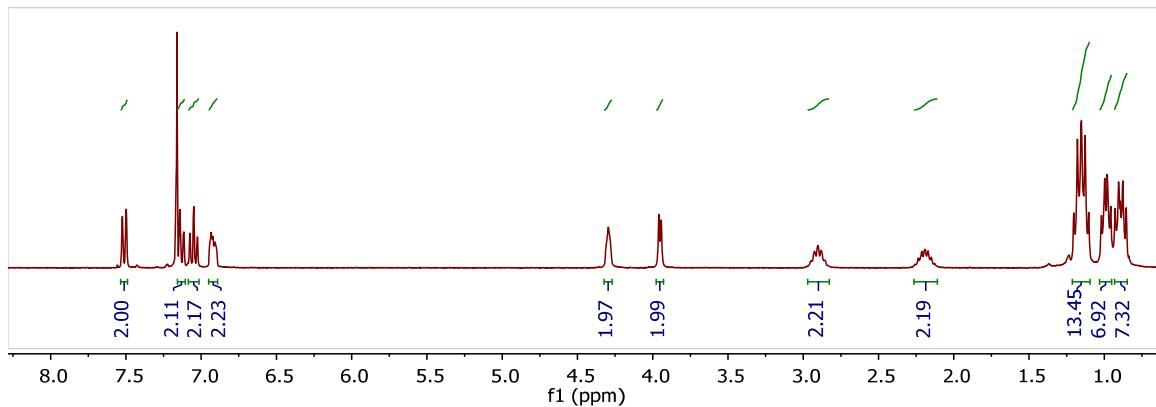


Figure 33. ^1H NMR (300 MHz, C_6D_6) spectrum of **11**.

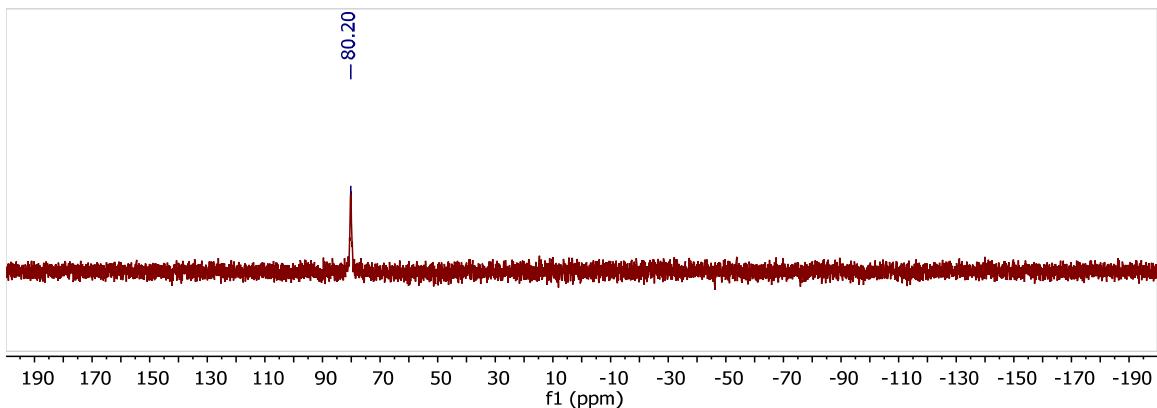


Figure 34. ^{31}P NMR (121 MHz, C_6D_6) spectrum of **11**.

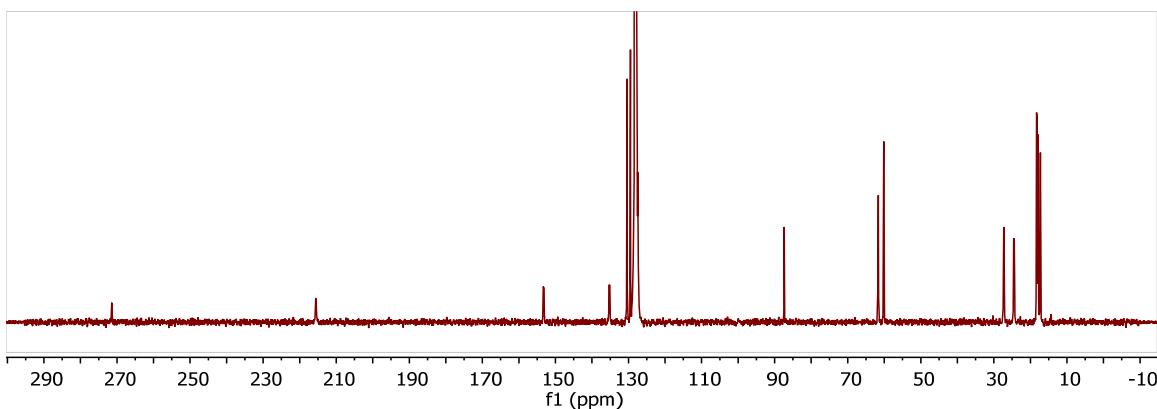


Figure 35. ^{13}C NMR (126 MHz, C_6D_6) spectrum of **11**.

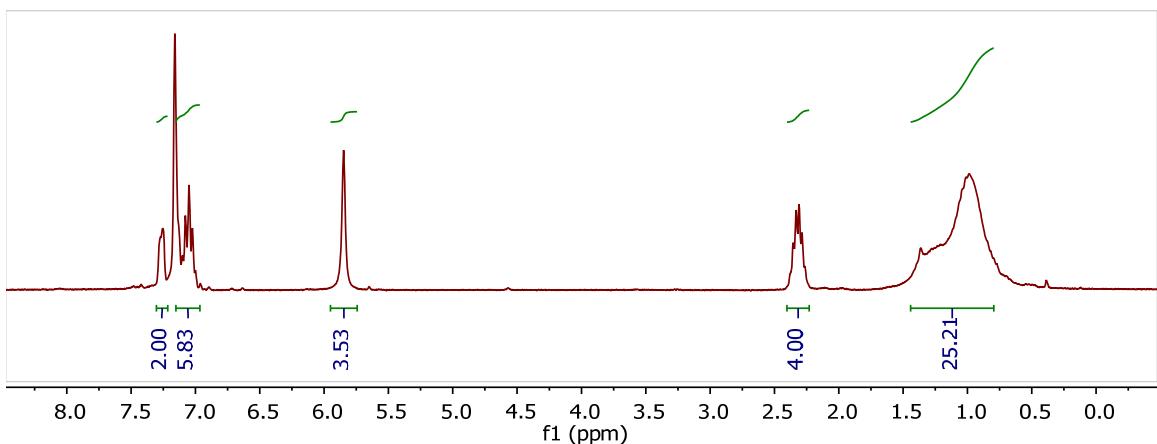


Figure 36. ^1H NMR (300 MHz, C_6D_6) spectrum of **12**.

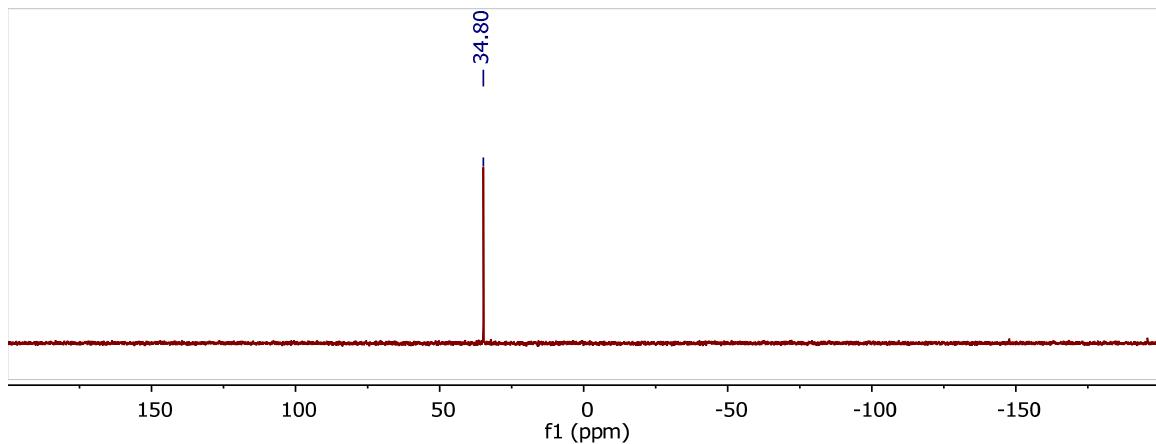


Figure 37. ^{31}P NMR (121 MHz, C_6D_6) spectrum of **12**.

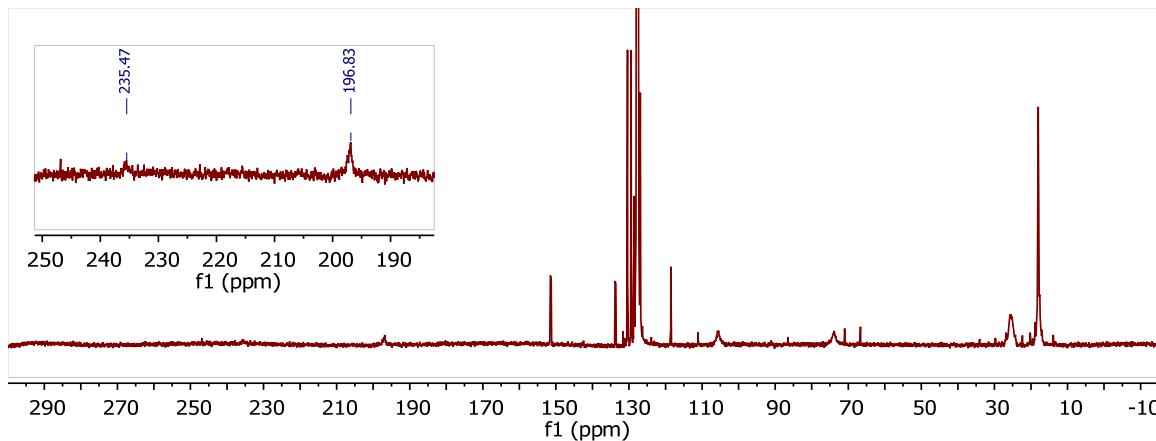


Figure 38. ^{13}C NMR (126 MHz, C_6D_6) spectrum of **12**.

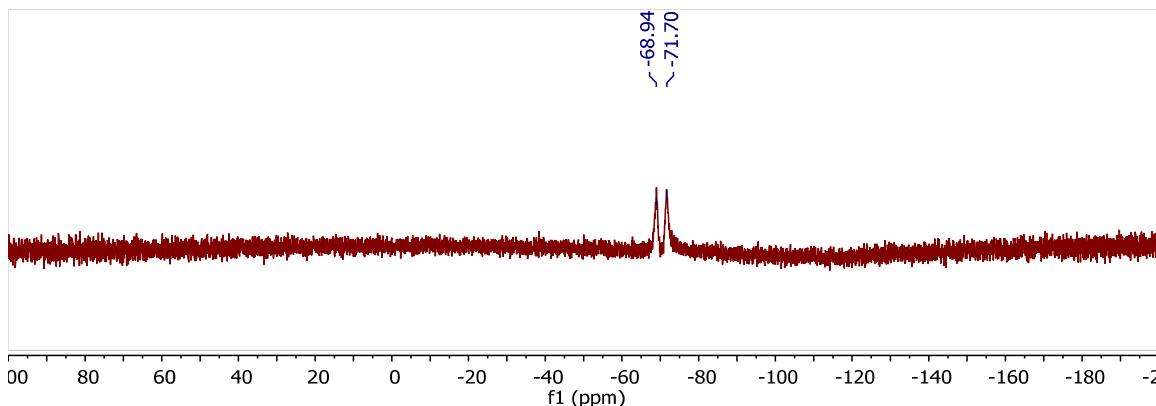


Figure 39. ^{19}F NMR (282 MHz, $d_8\text{-THF}$) spectrum of **10**.

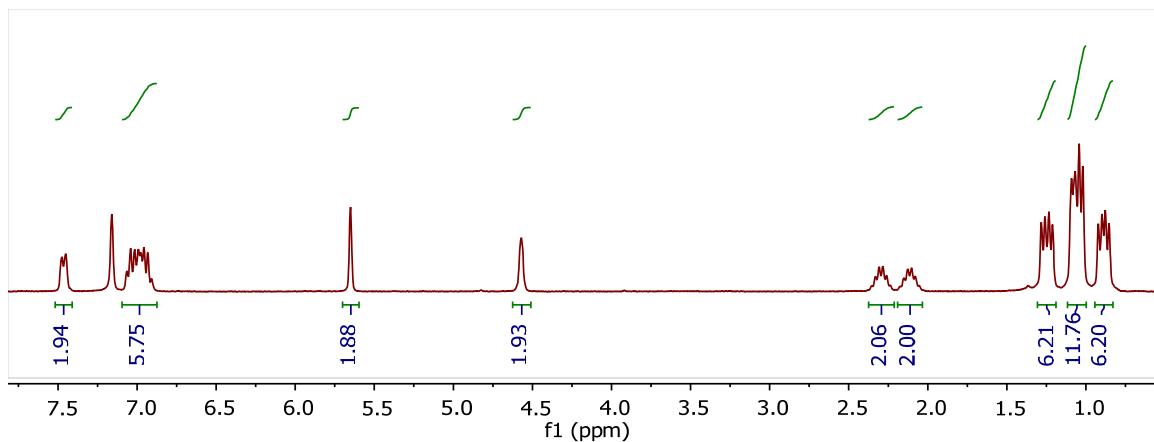


Figure 40. ^1H NMR (300 MHz, C_6D_6) spectrum of **13-CO**.

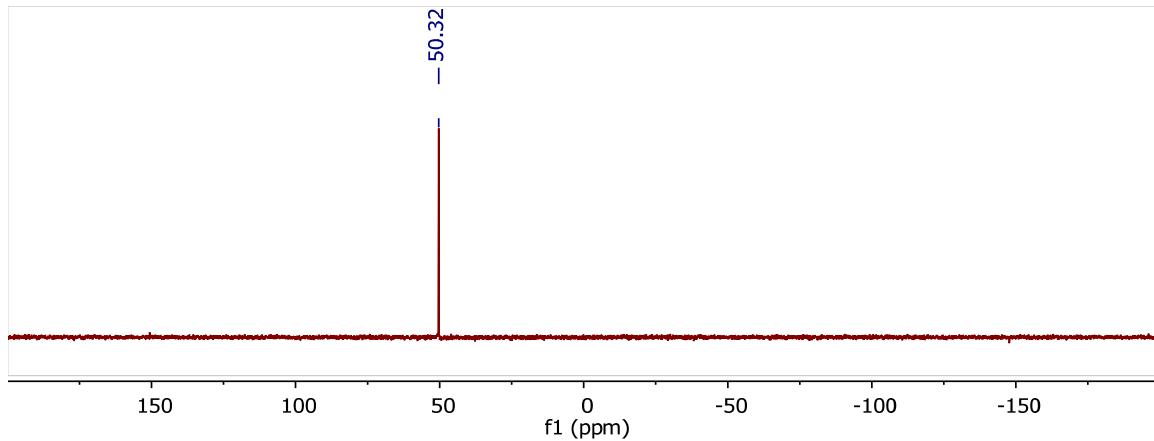


Figure 41. ^{31}P NMR (121 MHz, C_6D_6) spectrum of **13-CO**.

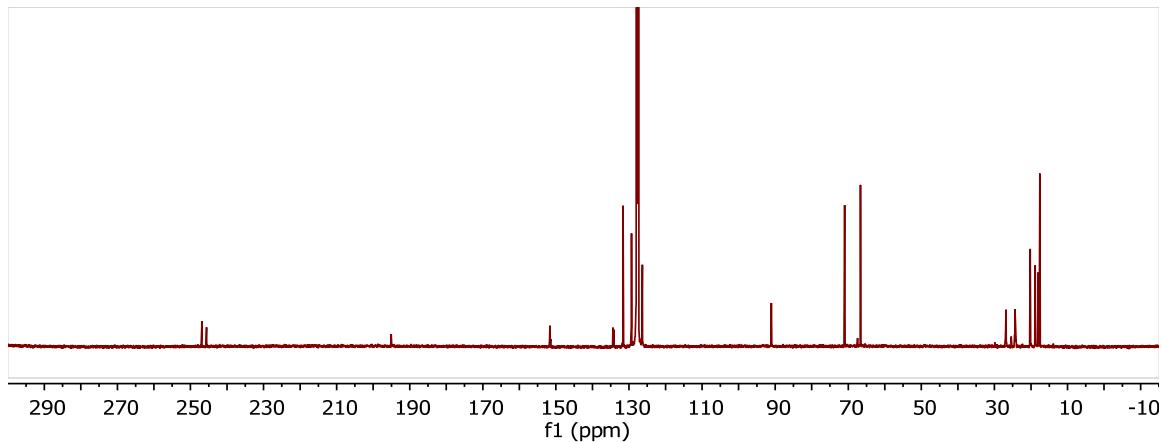


Figure 42. ^{13}C NMR (126 MHz, C_6D_6) spectrum of **13-CO**.

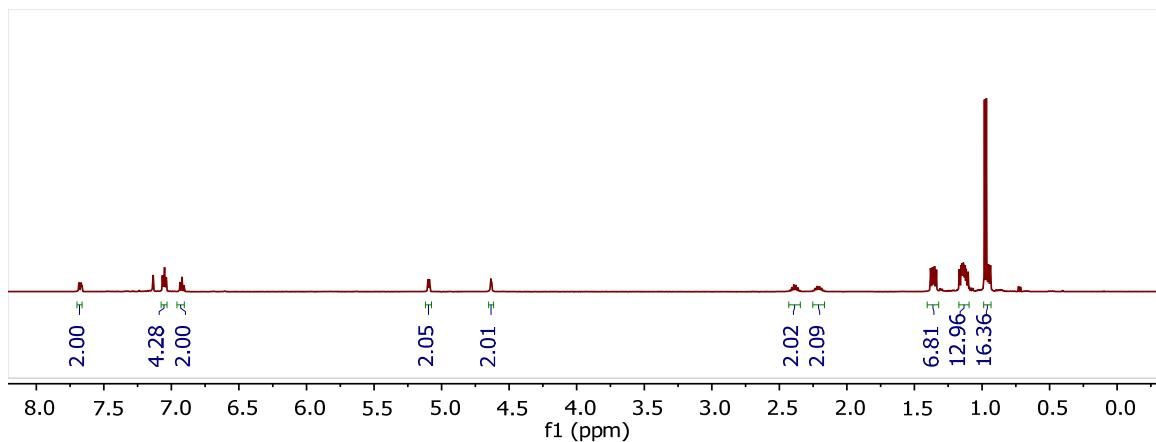


Figure 43. ^1H NMR (300 MHz, C_6D_6) spectrum of **13-PMe₃**.

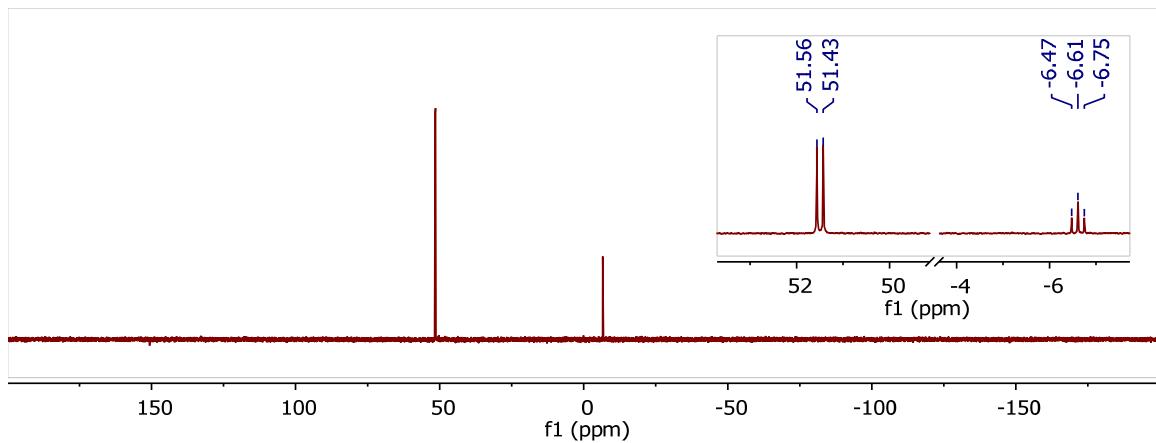


Figure 44. ^{31}P NMR (121 MHz, C_6D_6) spectrum of **13-PMe₃**.

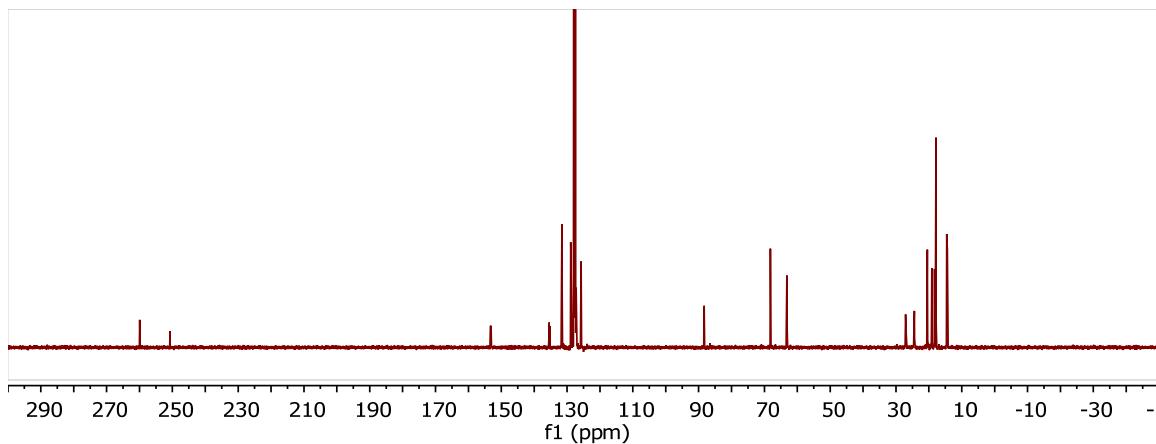


Figure 45. ^{13}C NMR (126 MHz, C_6D_6) spectrum of **13-PMe₃**.

Chapter 3

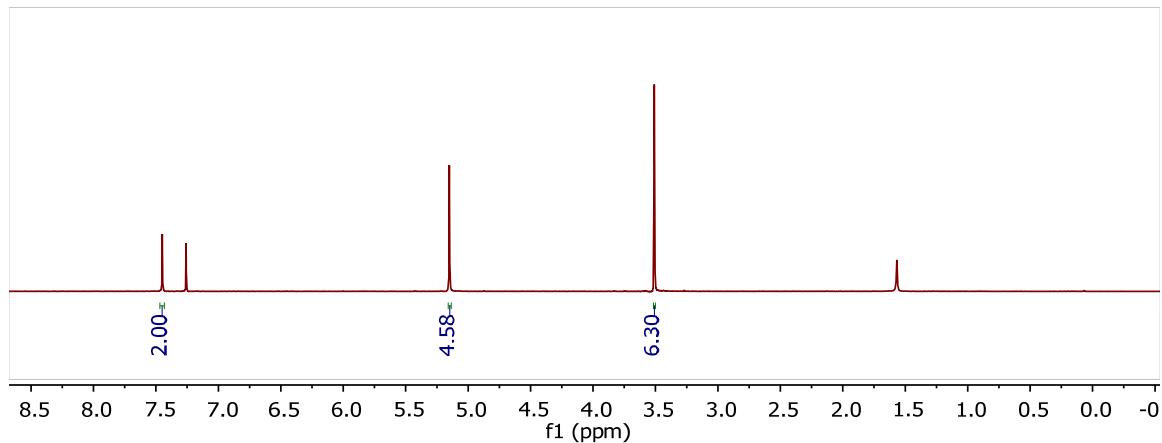


Figure 46. ¹H-NMR (500 MHz, CDCl_3) spectrum of **A**.

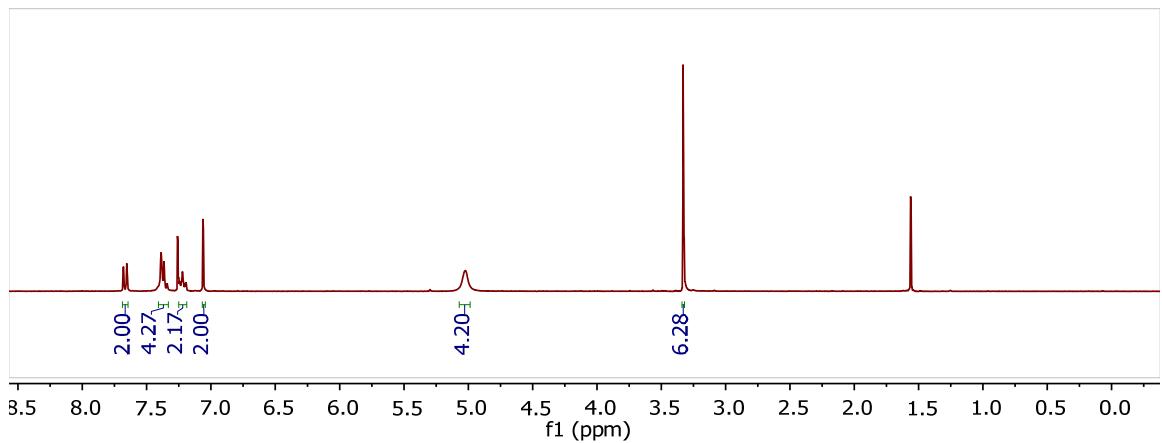


Figure 47. ¹H-NMR (500 MHz, CDCl_3) spectrum of **B**.

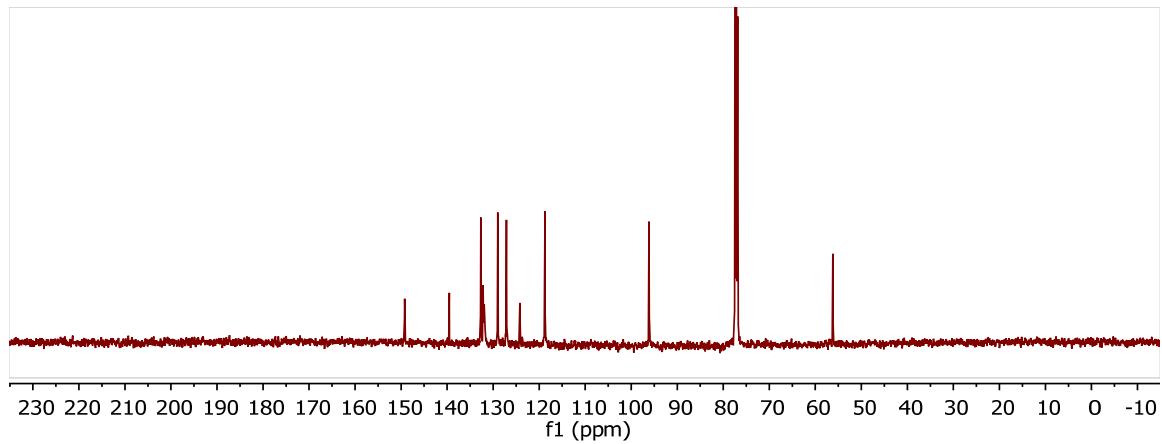


Figure 48. ¹³C-NMR (126 MHz, CDCl_3) spectrum of **B**.

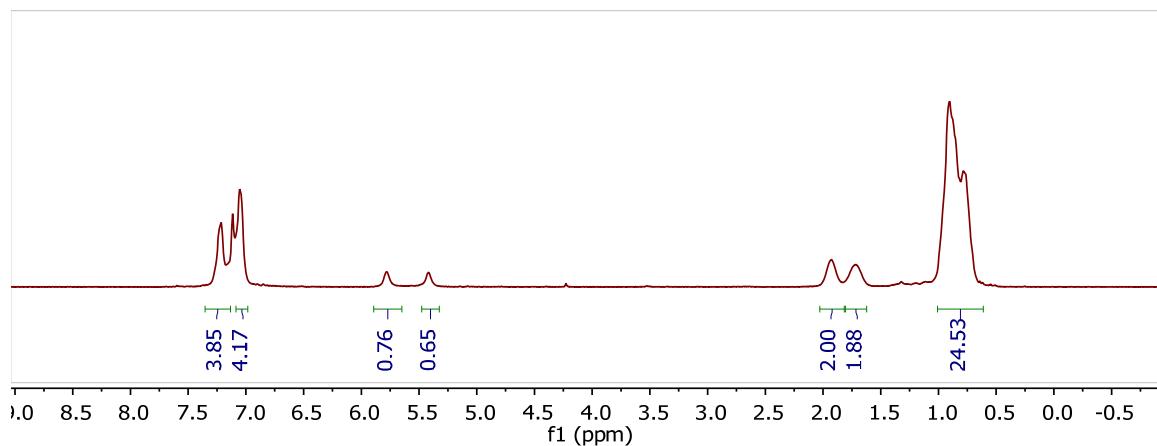


Figure 49. ¹H-NMR (300 MHz, C₆D₆) spectrum of **1-H**.

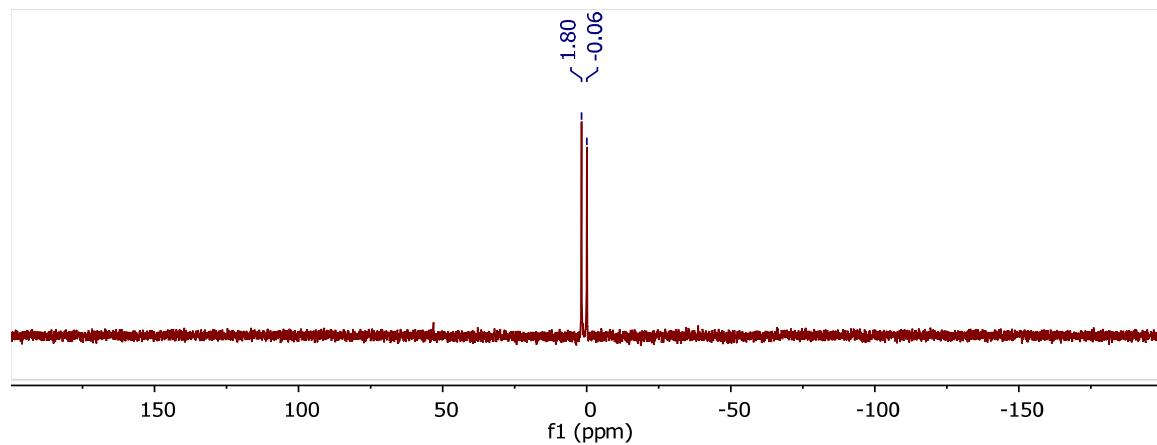


Figure 50. ³¹P-NMR (121 MHz, C₆D₆) spectrum of **1-H**.

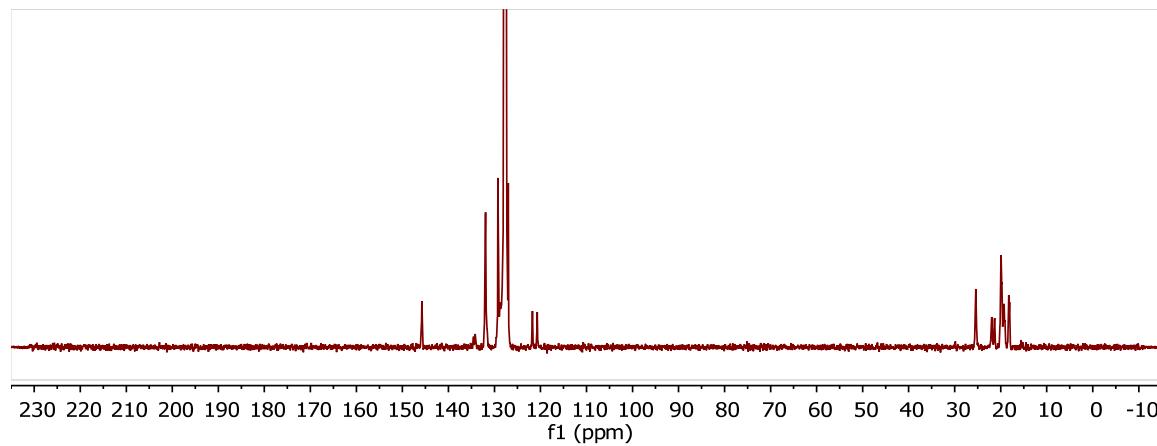


Figure 51. ¹³C-NMR (126 MHz, C₆D₆) spectrum of **1-H**.

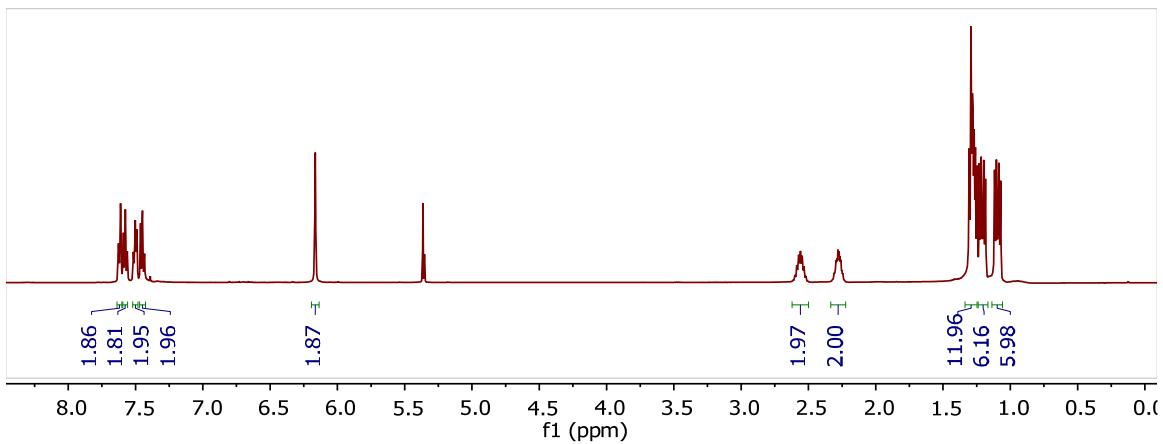


Figure 52. ^1H -NMR (500 MHz, CD_2Cl_2) spectrum of **2**.

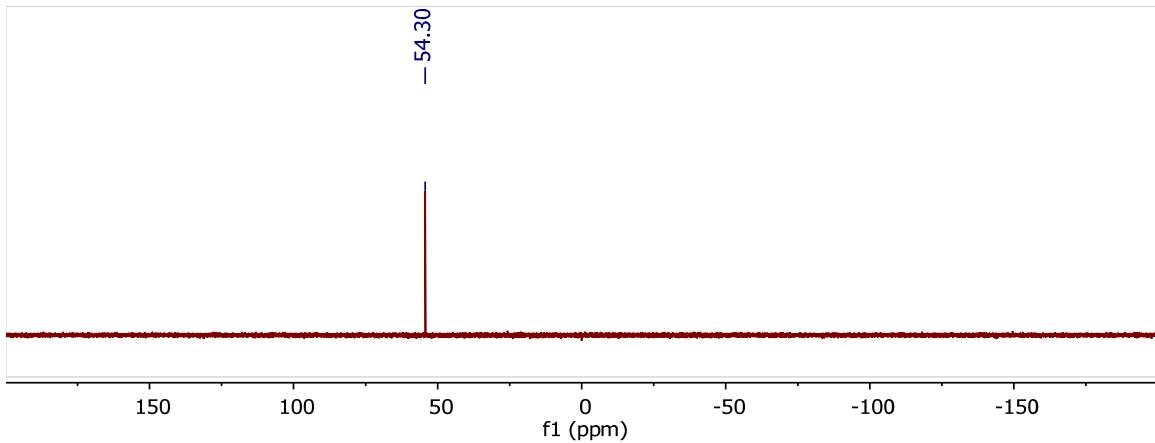


Figure 53. ^{31}P -NMR (121 MHz, CD_2Cl_2) spectrum of **2**.

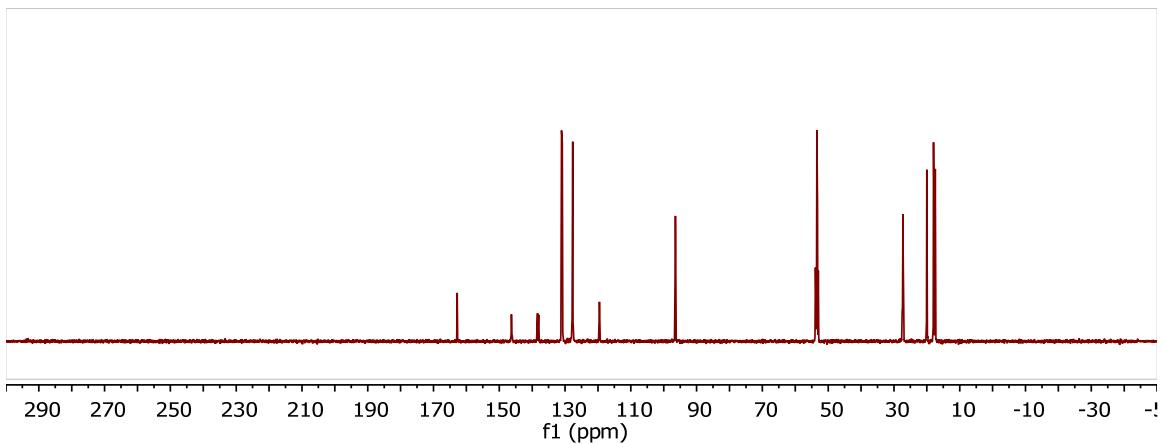


Figure 54. ^{13}C -NMR (126 MHz, CD_2Cl_2) spectrum of **2**.

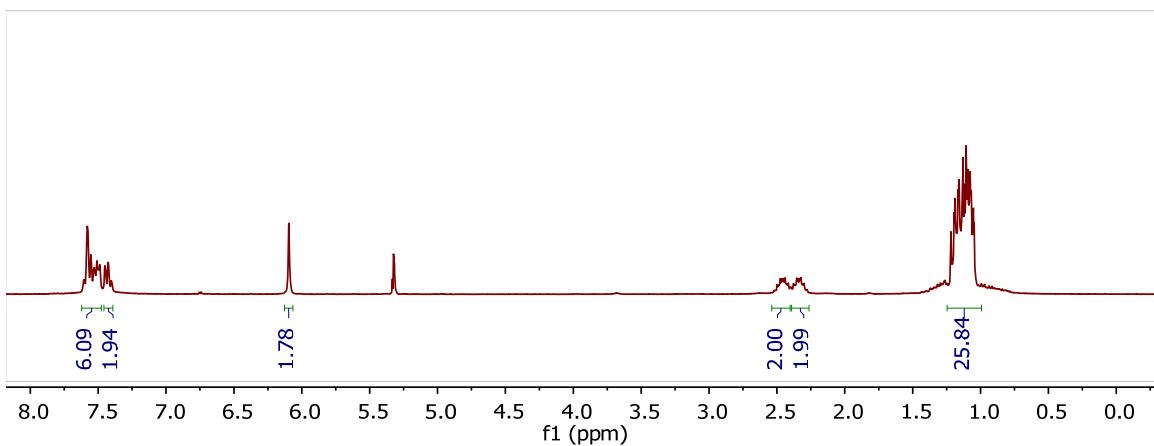


Figure 55. ¹H-NMR (500 MHz, CD₂Cl₂) spectrum of **3**.

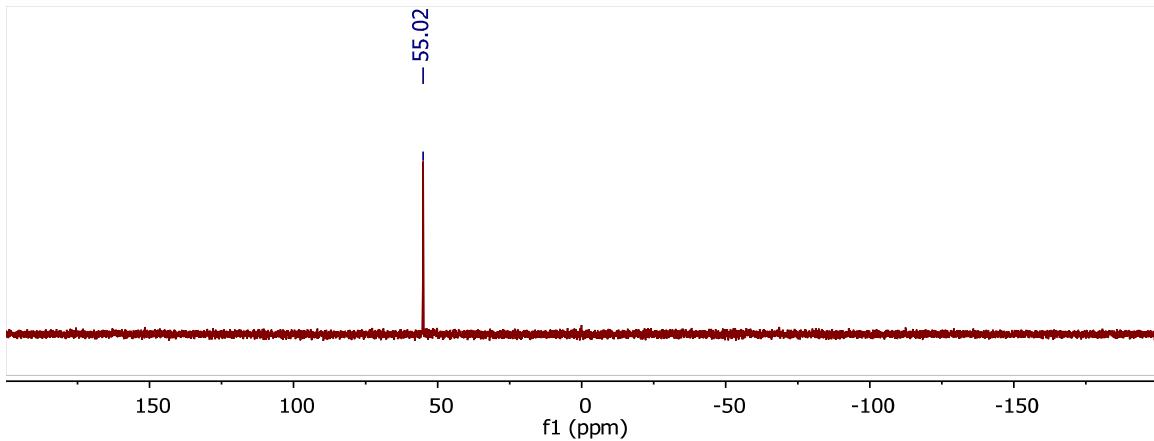


Figure 56. ³¹P-NMR (121 MHz, CD₂Cl₂) spectrum of **3**.

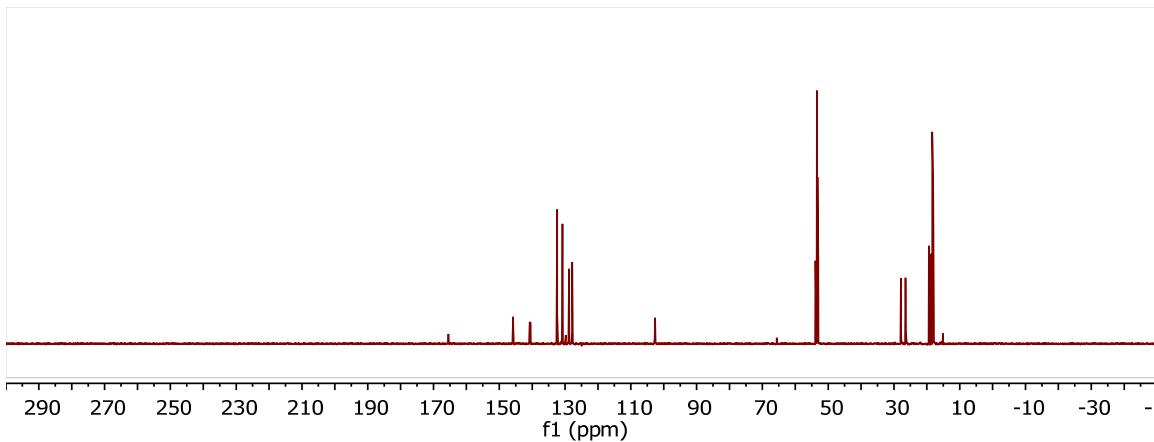


Figure 57. ¹³C-NMR (126 MHz, CD₂Cl₂) spectrum of **3**.

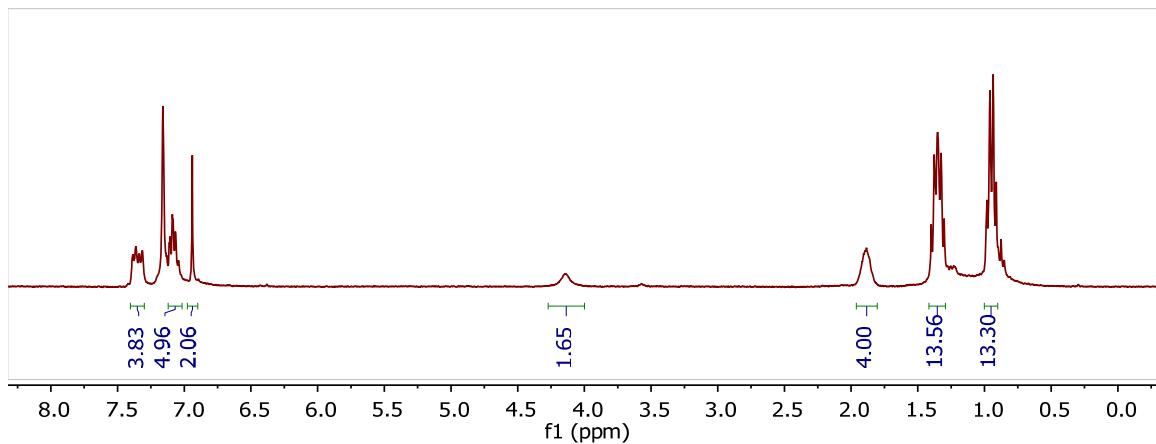


Figure 58. ^1H -NMR (500 MHz, C_6D_6) spectrum of **4-H**.

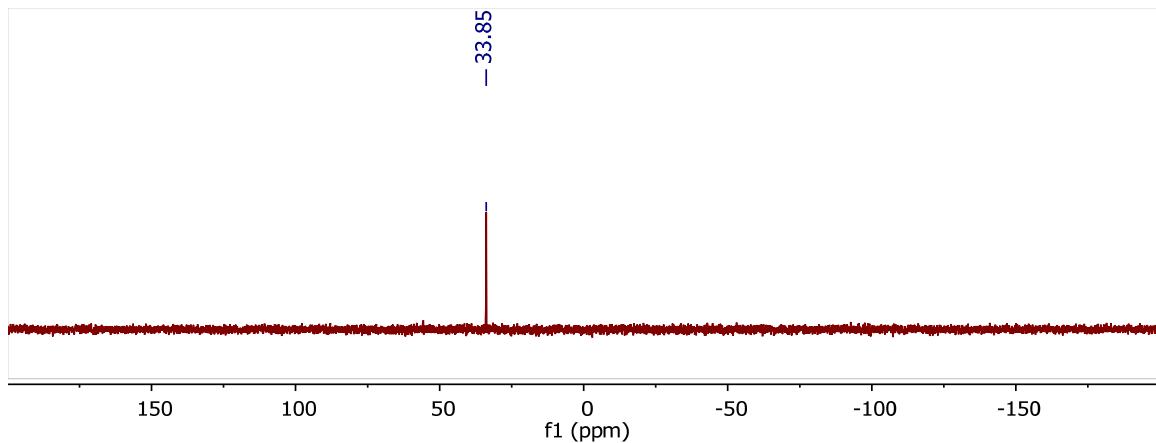


Figure 59. ^{31}P -NMR (121 MHz, C_6D_6) spectrum of **4-H**.

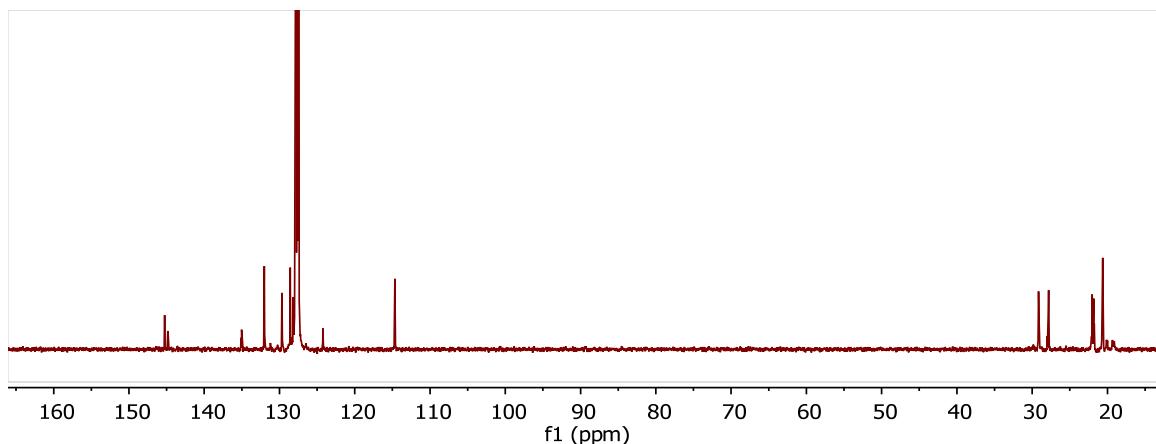


Figure 60. ^{13}C -NMR (126 MHz, C_6D_6) spectrum of **4-H**.

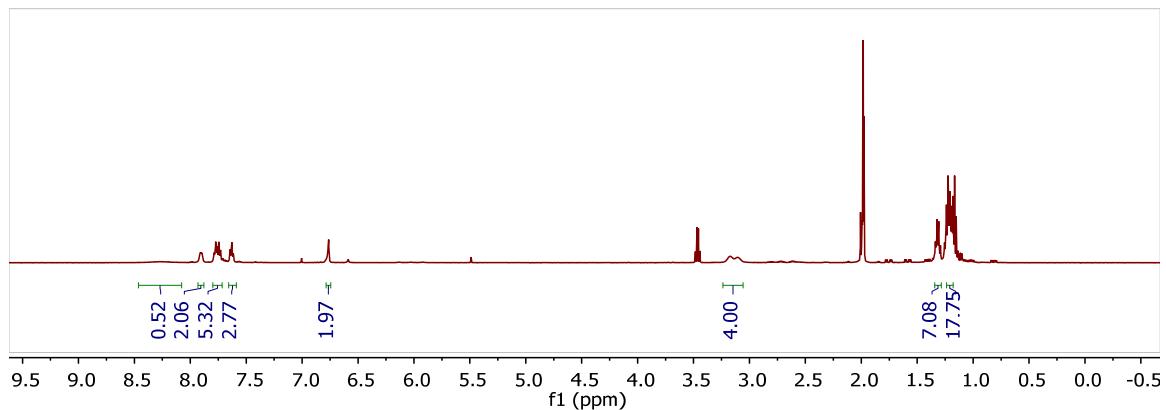


Figure 61. ¹H-NMR (500 MHz, CD₃CN) spectrum of **5-H**.

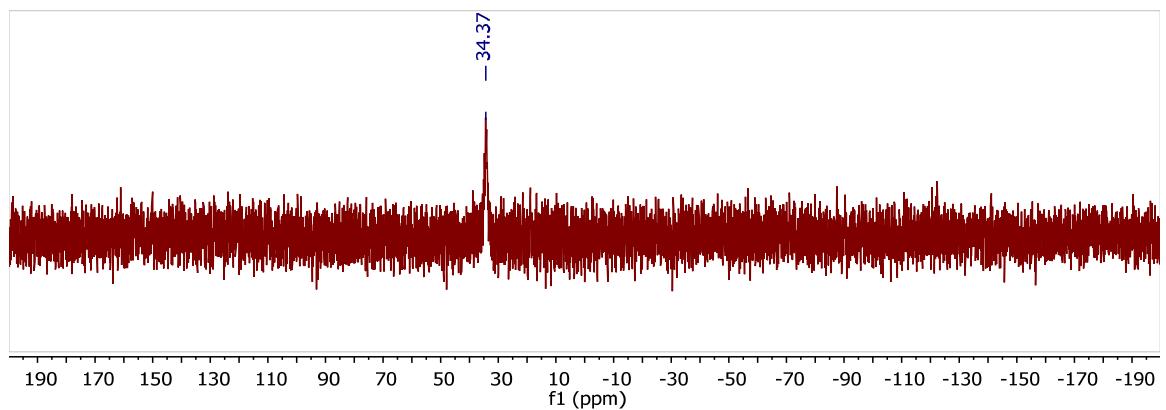


Figure 62. ³¹P-NMR (121 MHz, CD₃CN) spectrum of **5-H**.

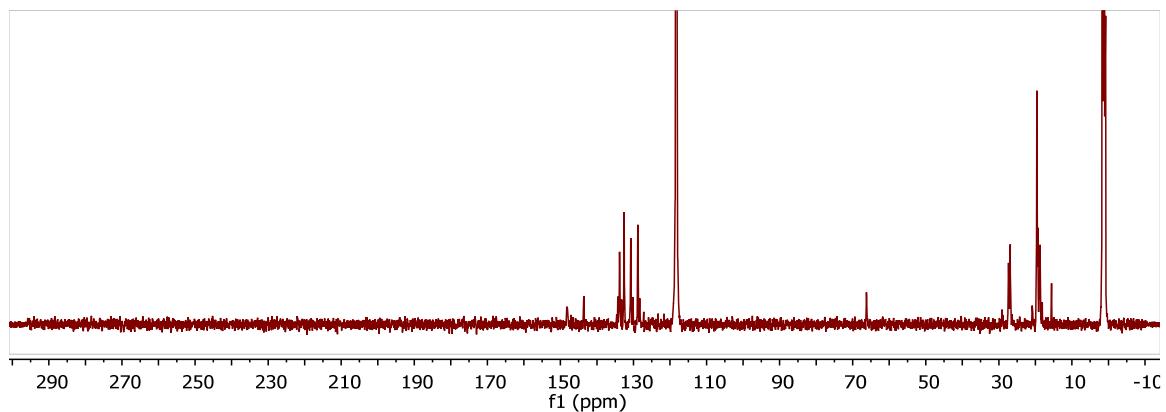


Figure 63. ¹³C-NMR (126 MHz, CD₃CN) spectrum of **5-H**.

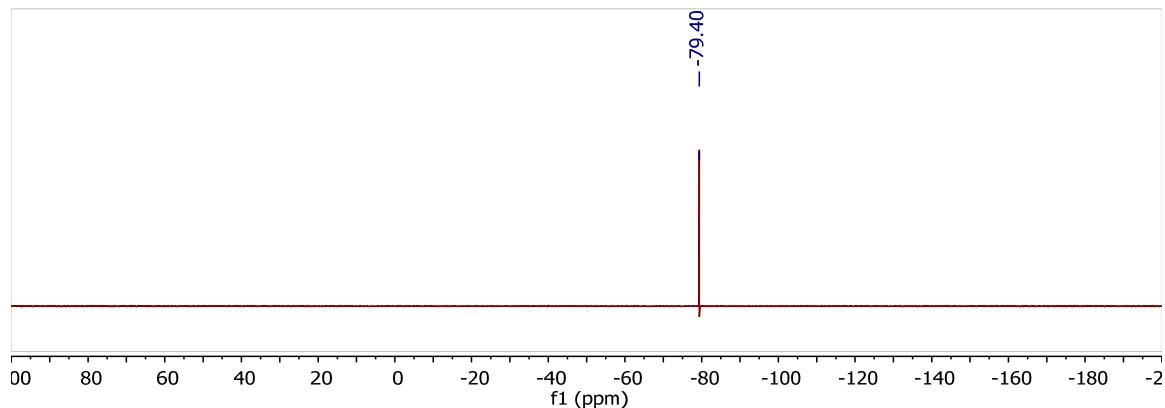


Figure 64. ${}^{19}\text{F}$ -NMR (282 MHz, CD_3CN) spectrum of **5-H**.

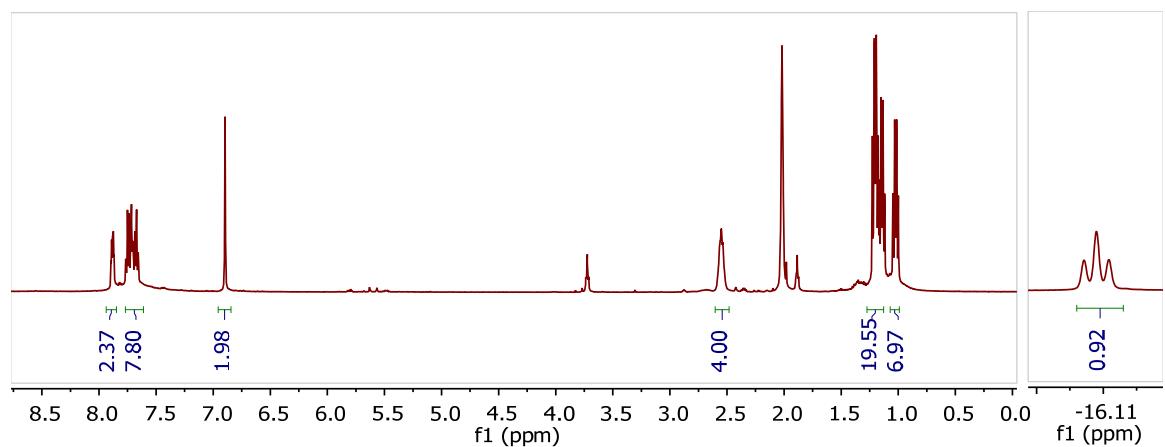


Figure 65. ${}^1\text{H}$ -NMR (500 MHz, CD_3CN) spectrum of **6-H**.

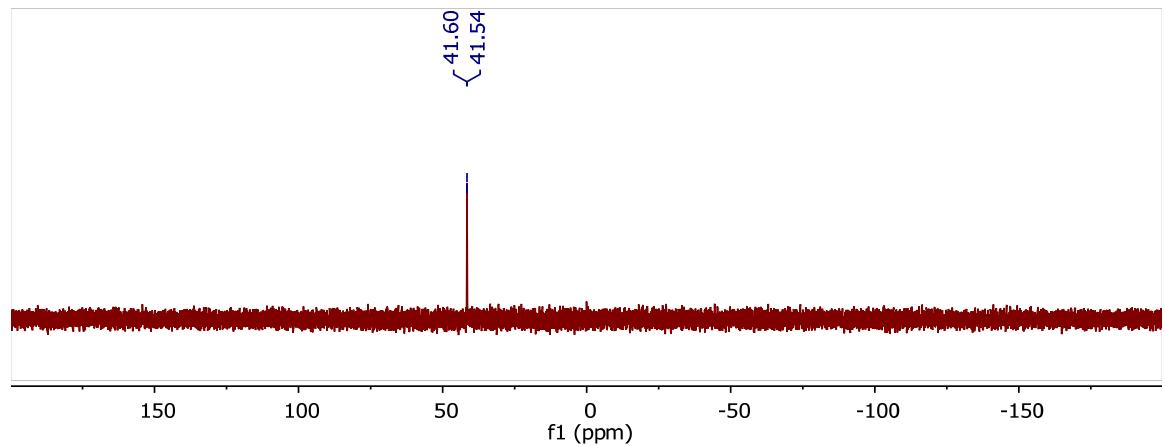


Figure 66. ${}^{31}\text{P}$ -NMR (121 MHz, CD_3CN) spectrum of **6-H**.

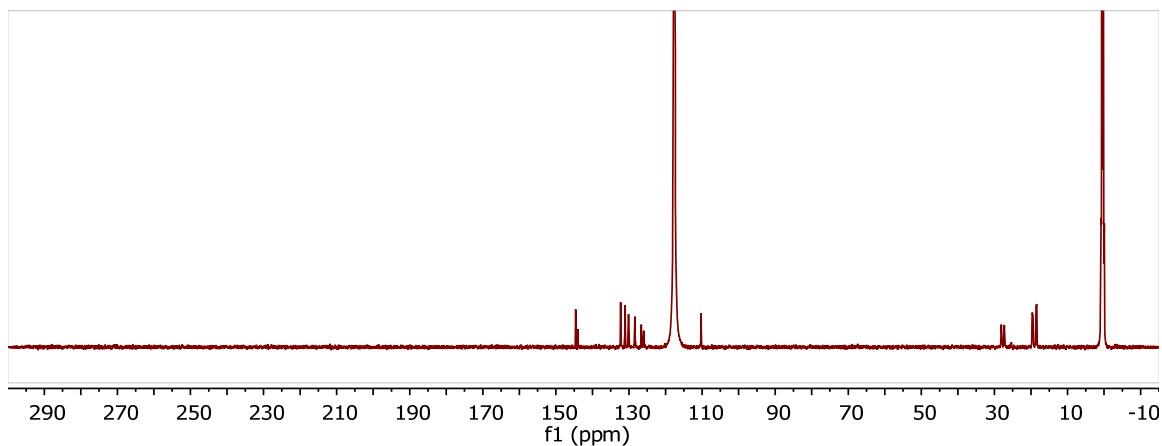


Figure 67. ^{13}C -NMR (126 MHz, CD_3CN) spectrum of **6-H**.

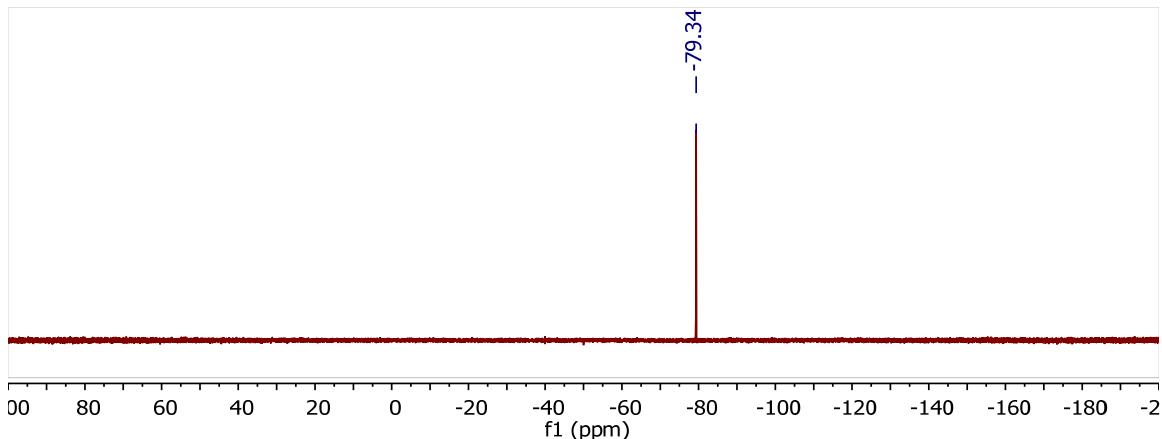


Figure 68. ^{19}F -NMR (282 MHz, CD_3CN) spectrum of **6-H**.

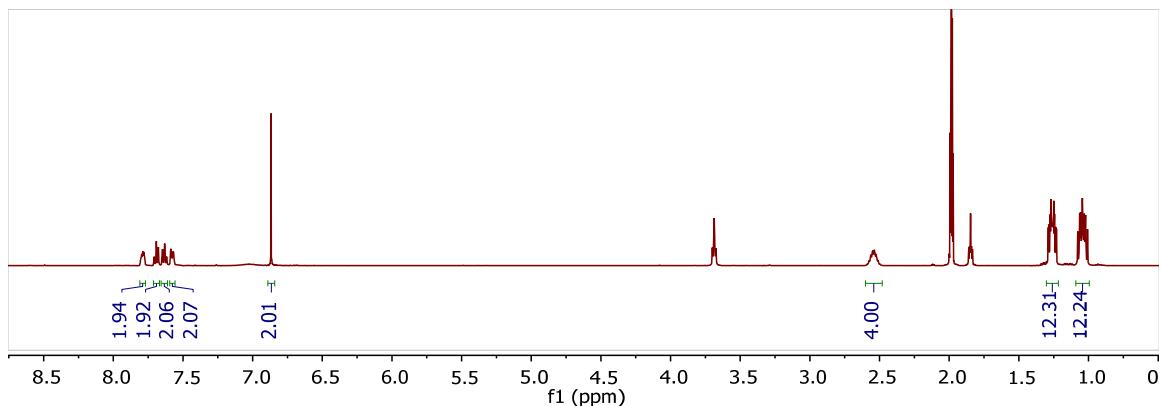


Figure 69. ^1H -NMR (500 MHz, CD_3CN) spectrum of **7-H**.

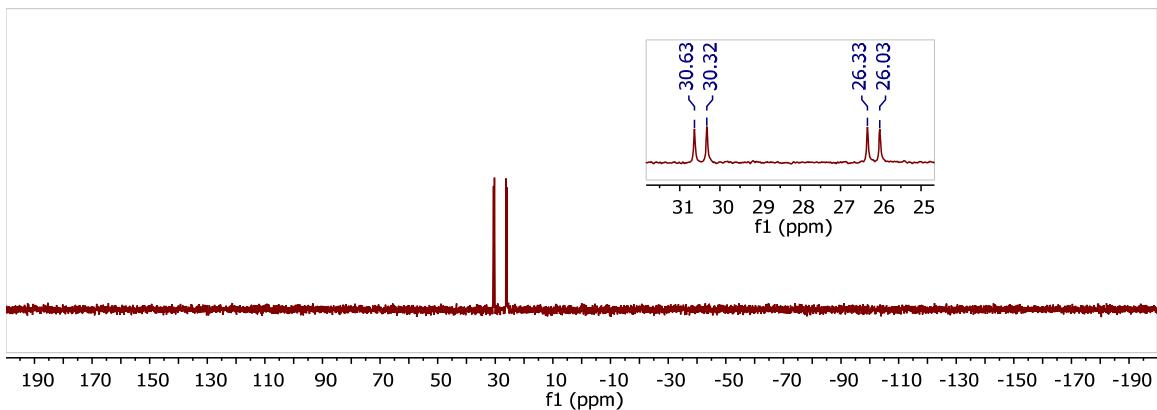


Figure 70. ^{31}P -NMR (121 MHz, CD_3CN) spectrum of **7-H**.

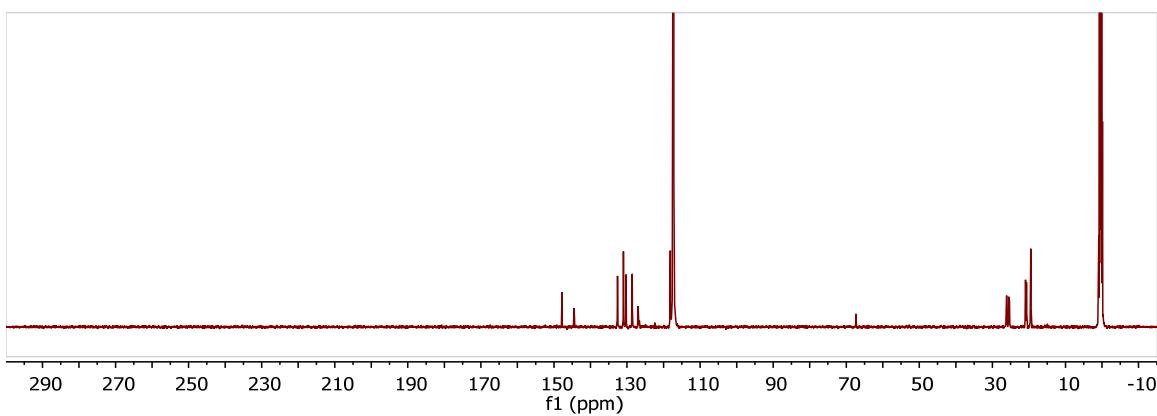


Figure 71. ^{13}C -NMR (126 MHz, CD_3CN) spectrum of **7-H**.

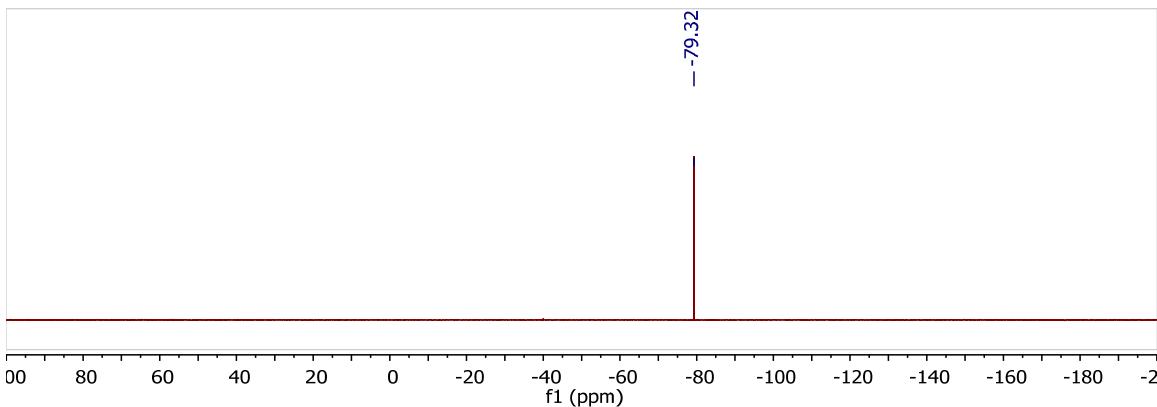


Figure 72. ^{19}F -NMR (282 MHz, CD_3CN) spectrum of **7-H**.

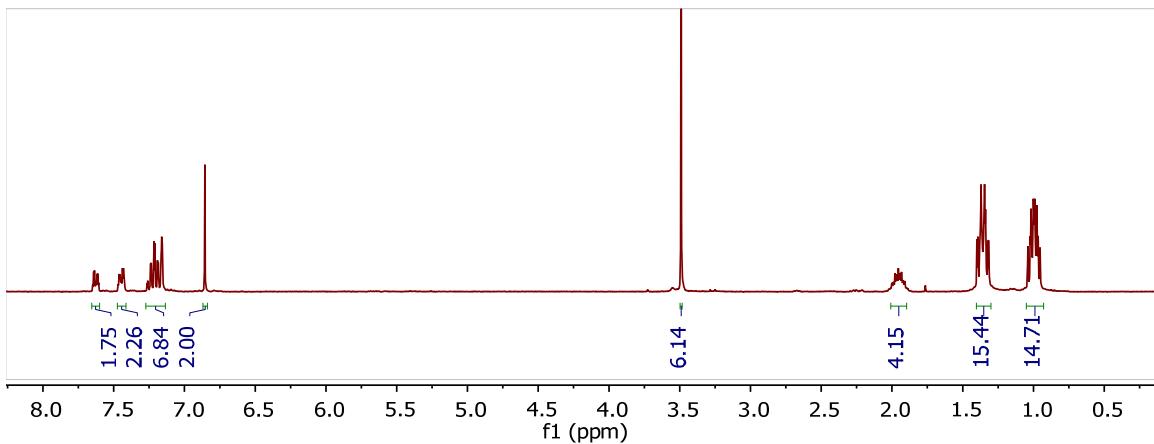


Figure 73. ^1H -NMR (500 MHz, C_6D_6) spectrum of **4-Me**.

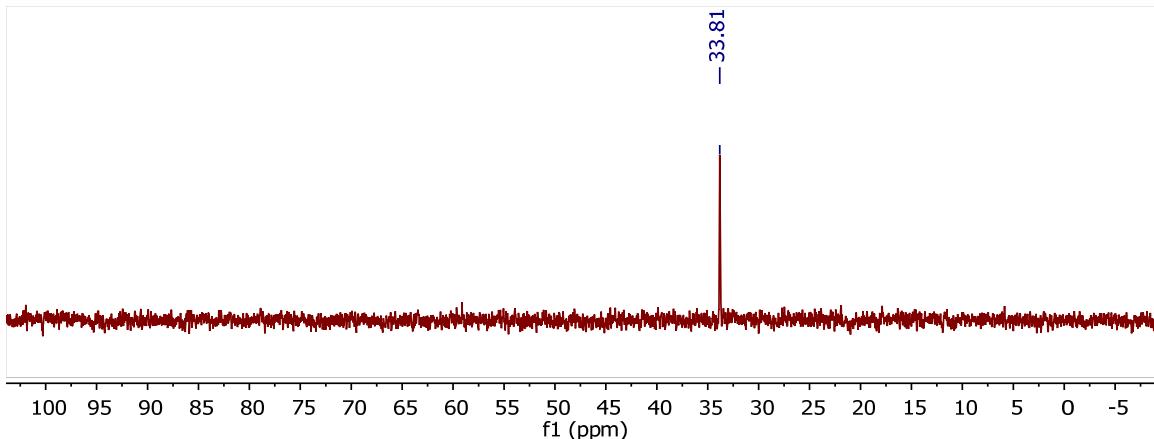


Figure 74. ^{31}P -NMR (121 MHz, C_6D_6) spectrum of **4-Me**.

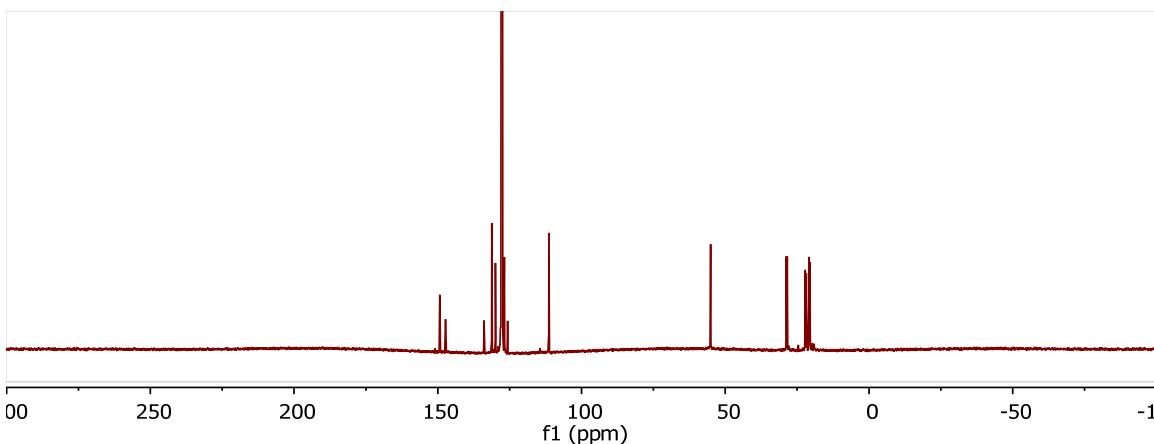


Figure 75. ^{13}C -NMR (126 MHz, C_6D_6) spectrum of **4-Me**.

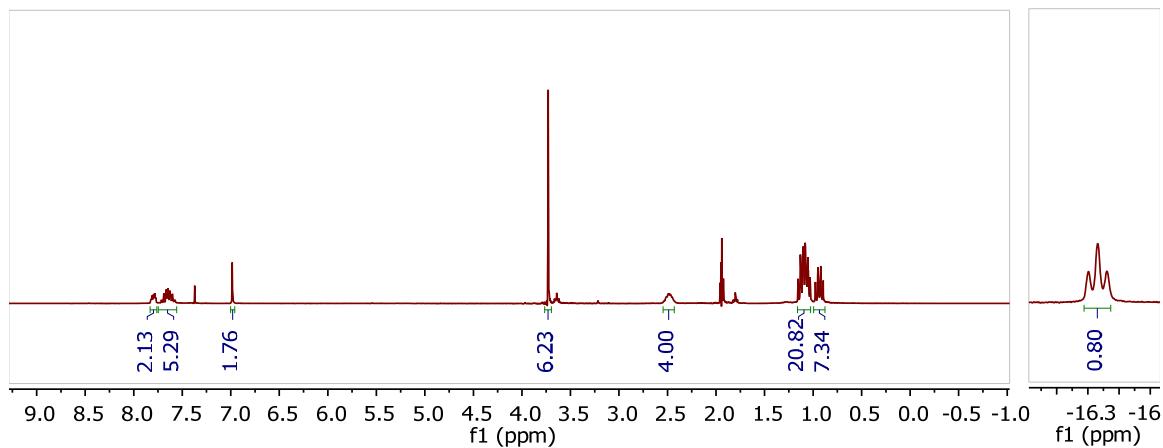


Figure 76. ¹H-NMR (500 MHz, CD₃CN) spectrum of **6-Me**.

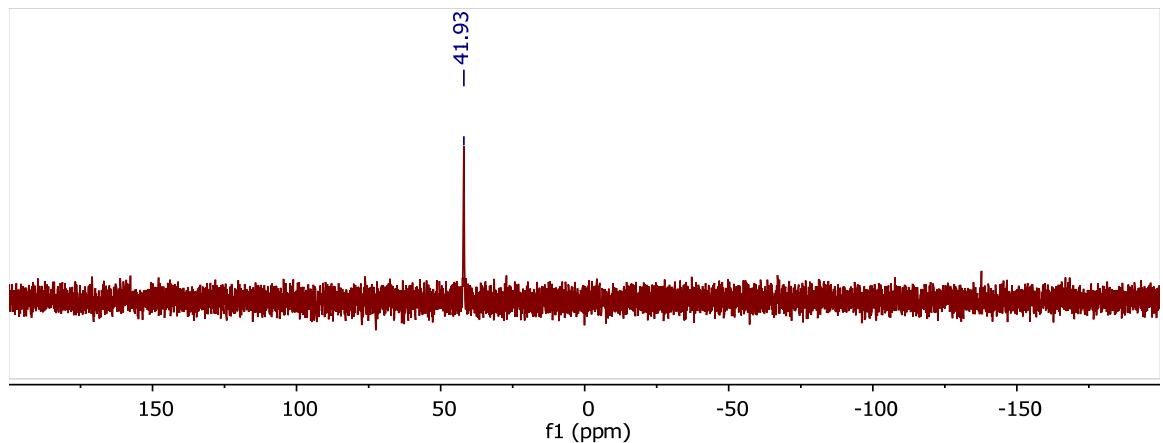


Figure 77. ³¹P-NMR (121 MHz, CD₃CN) spectrum of **6-Me**.

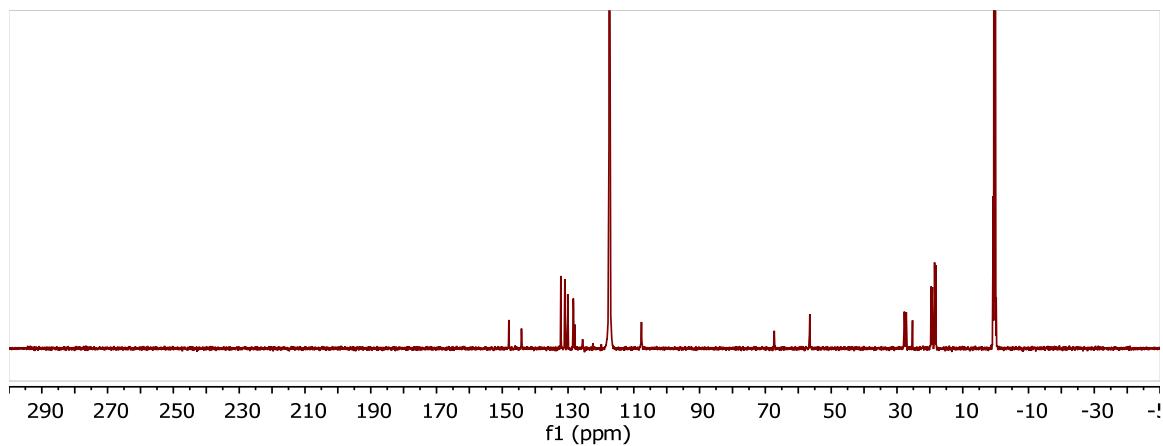


Figure 78. ¹³C-NMR (126 MHz, CD₃CN) spectrum of **6-Me**.

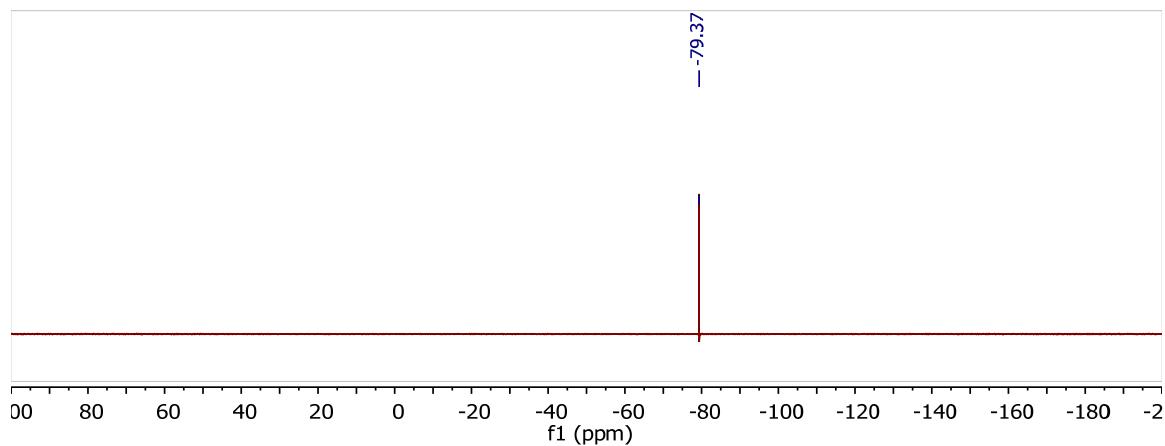


Figure 79. ^{19}F -NMR (282 MHz, CD_3CN) spectrum of **6-Me**.

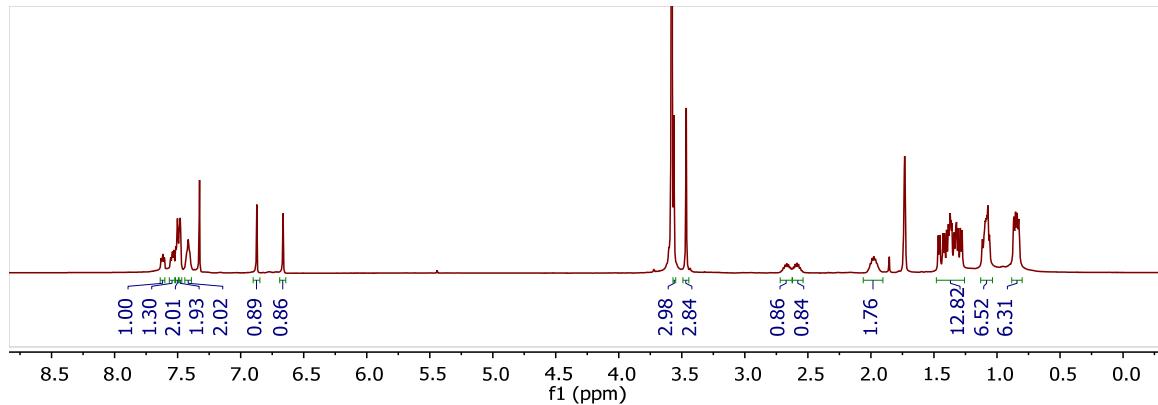


Figure 80. ^1H -NMR (500 MHz, $d_8\text{-THF}$) spectrum of **8-Me**.

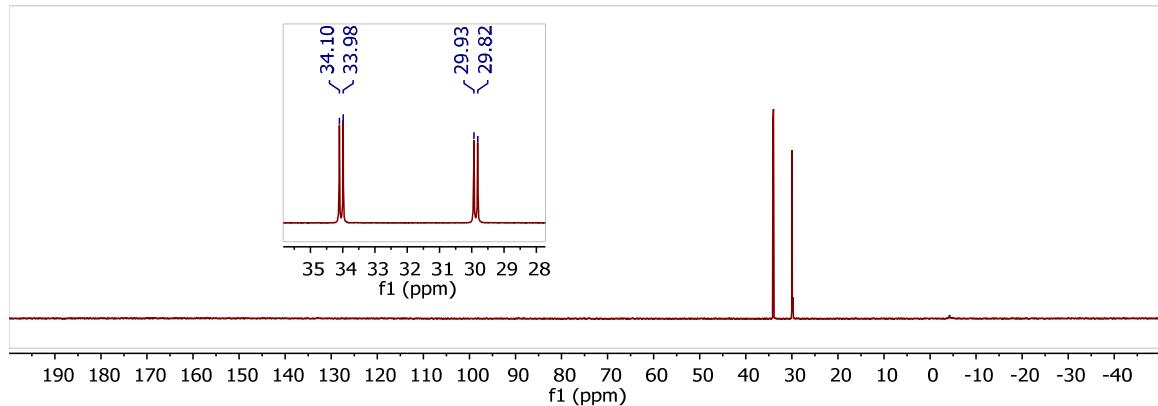


Figure 81. ^{31}P -NMR (202 MHz, $d_8\text{-THF}$) spectrum of **8-Me**.

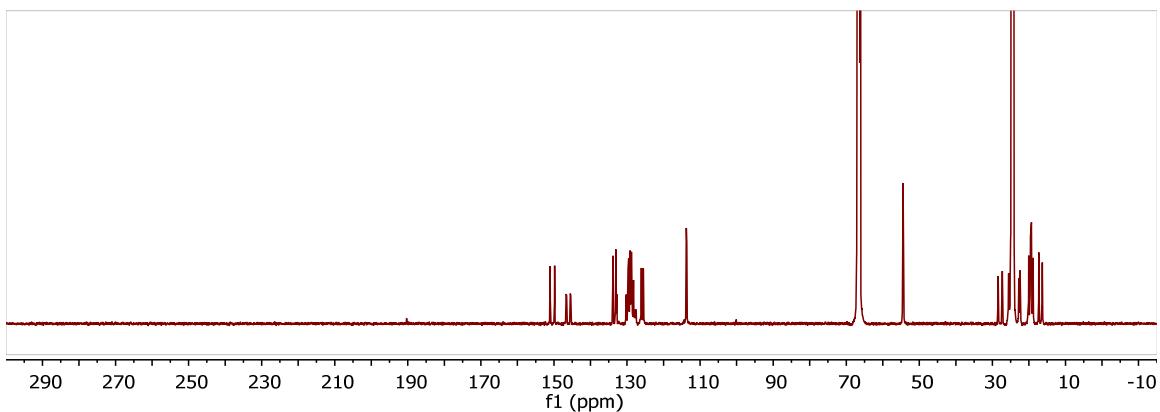


Figure 82. ¹³C-NMR (126 MHz, d₈-THF) spectrum of **8-Me**.

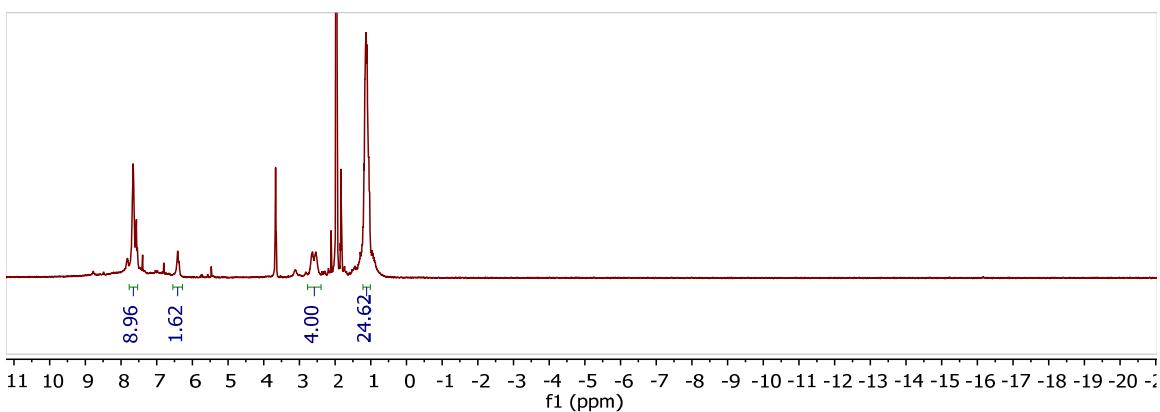


Figure 83. ¹H-NMR (300 MHz, d₈-THF) spectrum of **(3)H⁺**.

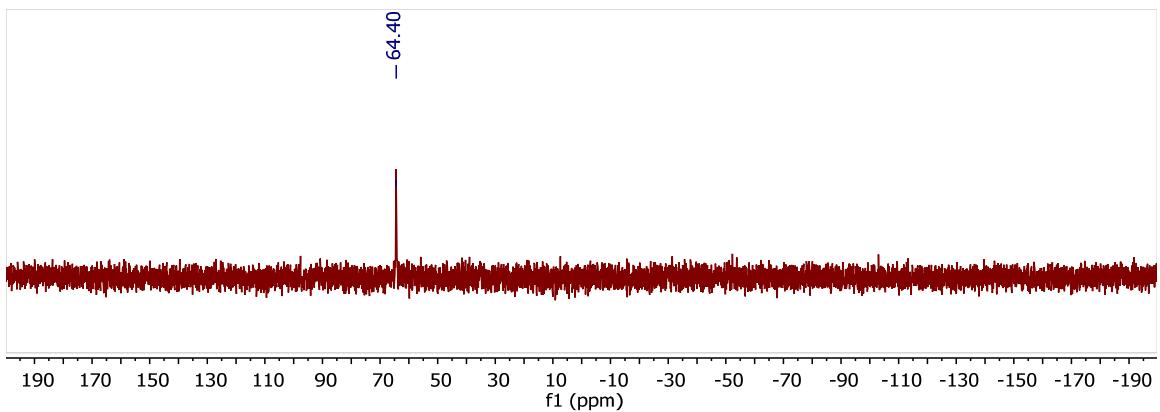


Figure 84. ³¹P-NMR (202 MHz, d₈-THF) spectrum of **(3)H⁺**.

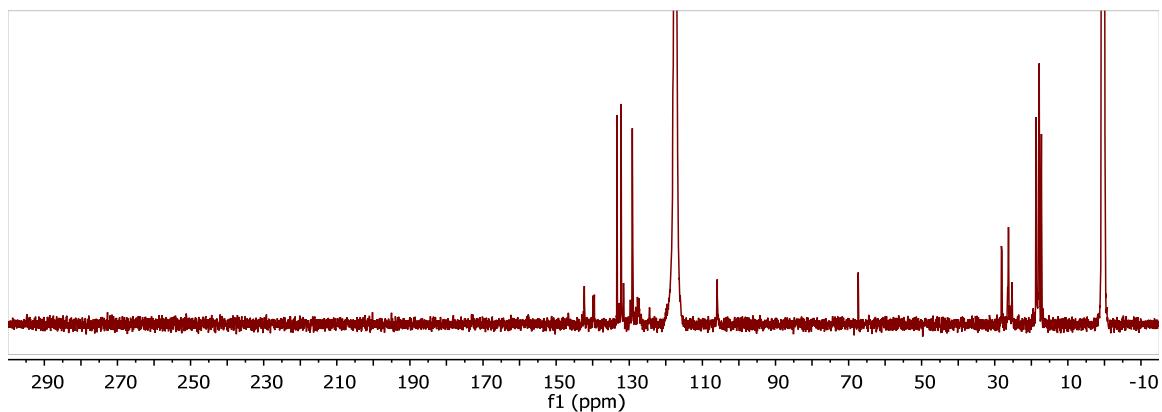


Figure 85. ¹³C-NMR (126 MHz, d₈-THF) spectrum of (3)H⁺.

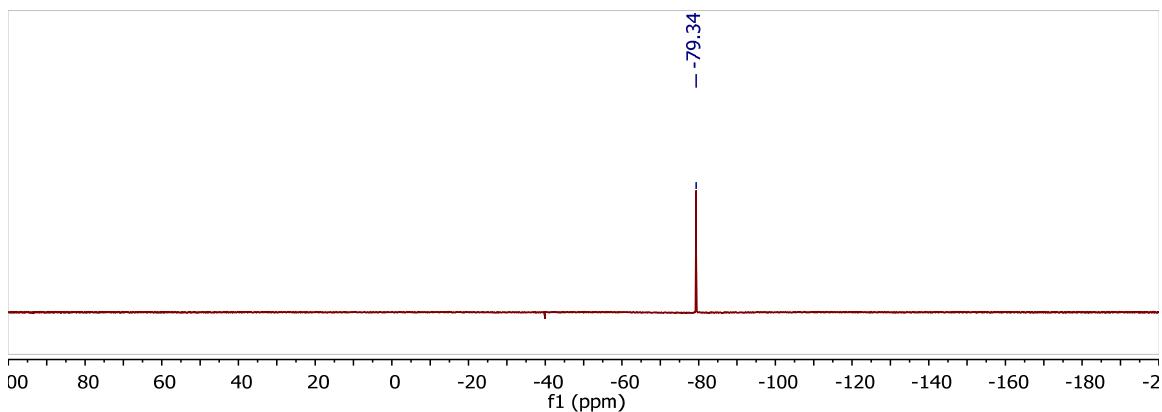


Figure 86. ¹⁹F-NMR (282 MHz, CD₃CN) spectrum of (3)H⁺.

Chapter 4

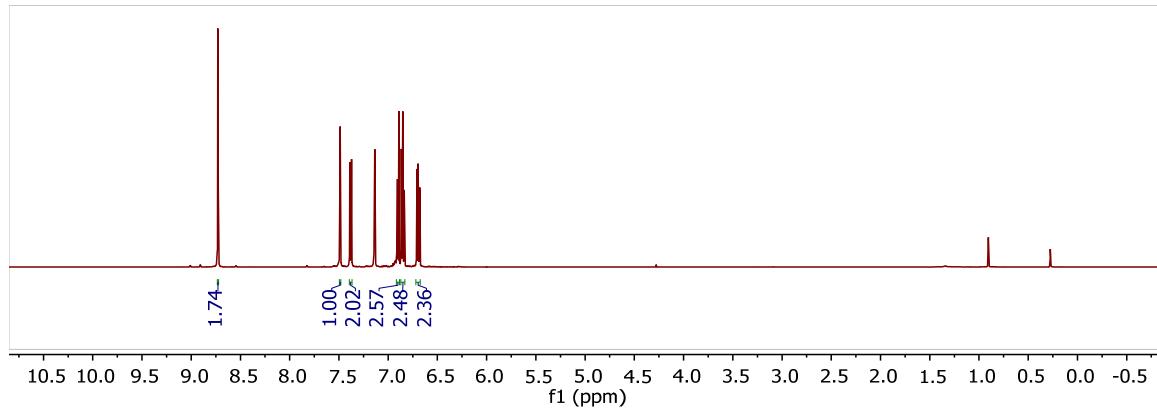


Figure 87. ^1H NMR (500 MHz, C_6D_6) spectrum of mBr_2N .

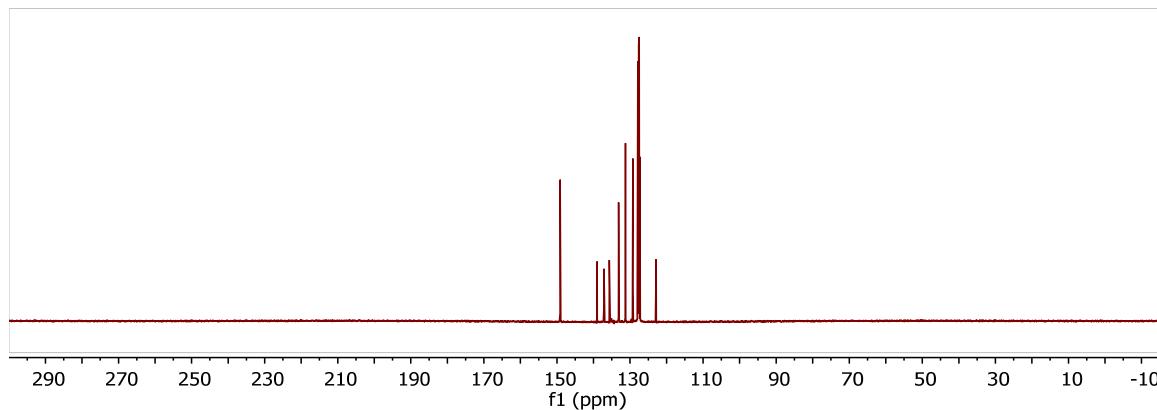


Figure 88. $^{13}\text{C}\{\text{H}\}$ NMR (126 MHz, C_6D_6) spectrum of mBr_2N .

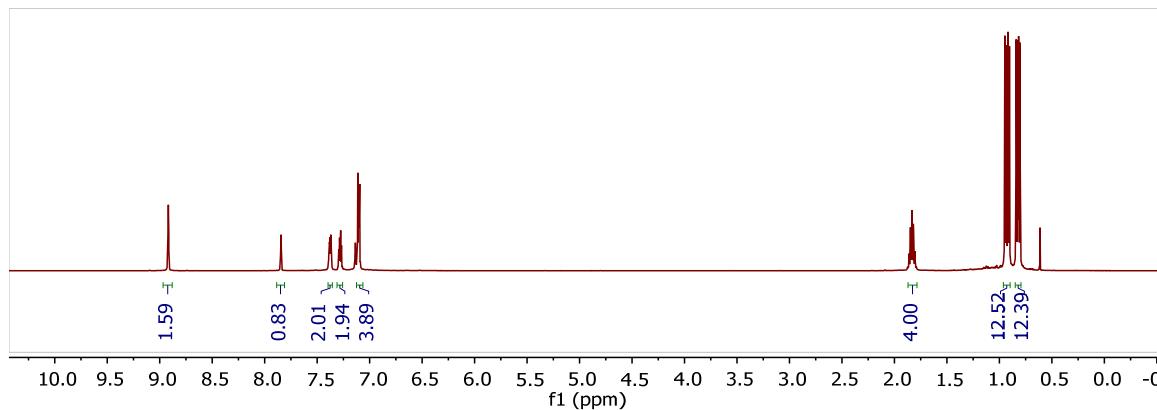


Figure 89. ^1H NMR (500 MHz, C_6D_6) spectrum of **1**.

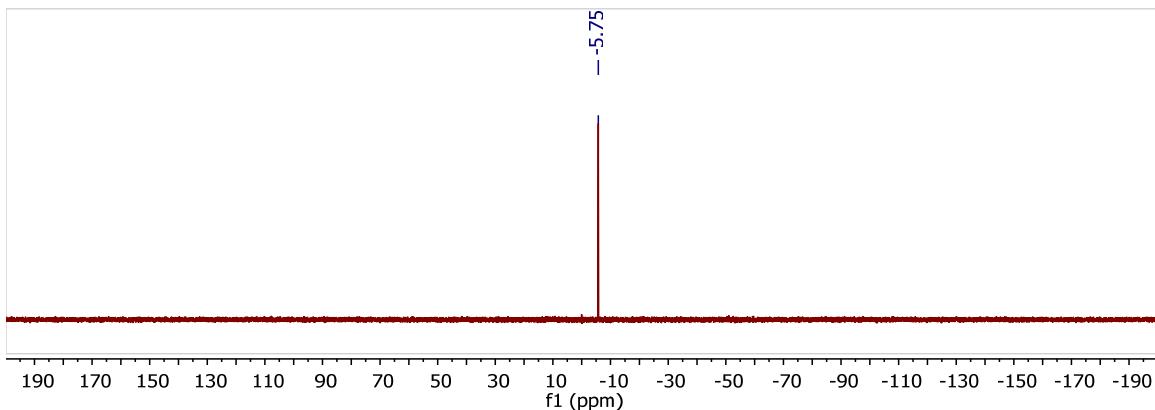


Figure 90. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of **1**.

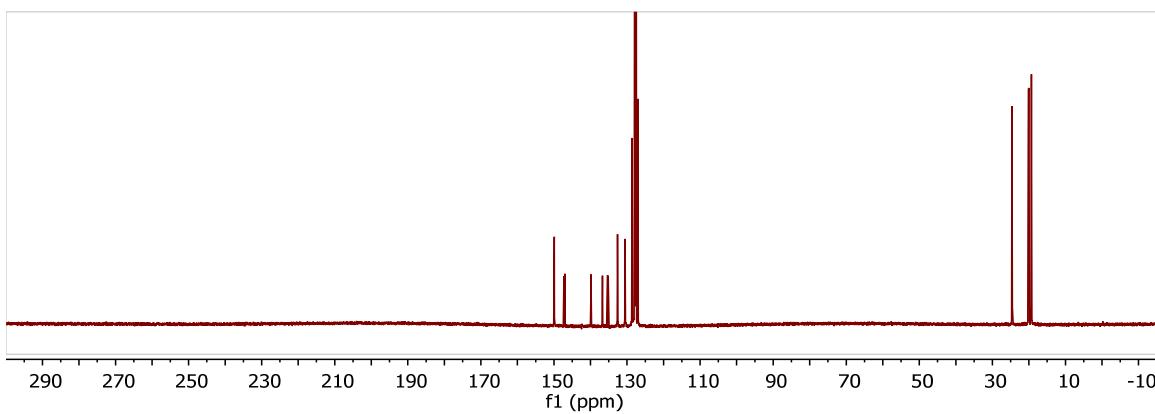


Figure 91. $^{13}\text{C}\{\text{H}\}$ NMR (126 MHz, C_6D_6) spectrum of **1**.

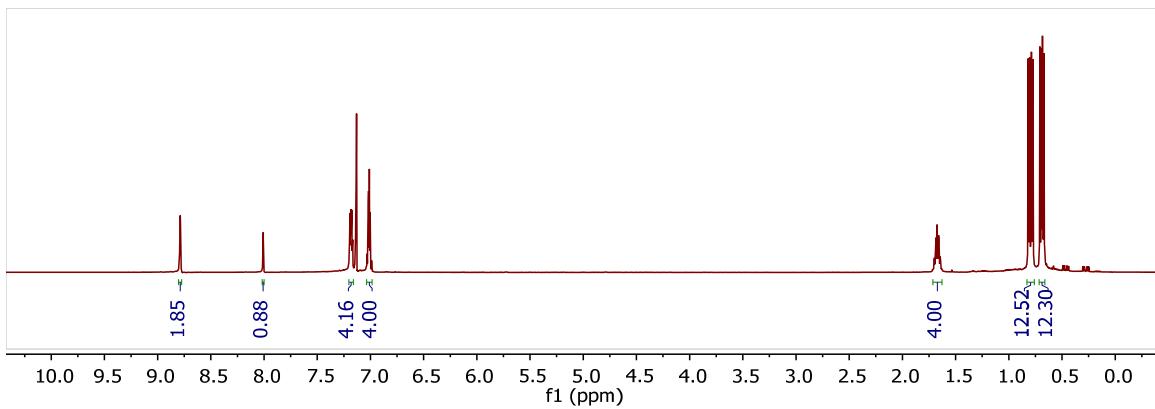


Figure 92. ^1H NMR (500 MHz, C_6D_6) spectrum of **1-B(C₆F₅)₃**.

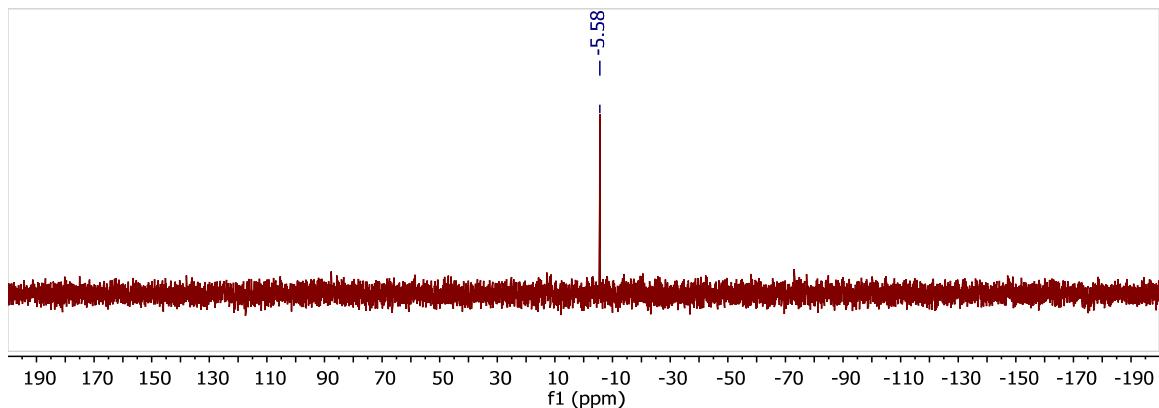


Figure 93. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of **1-B(C₆F₅)₃**.

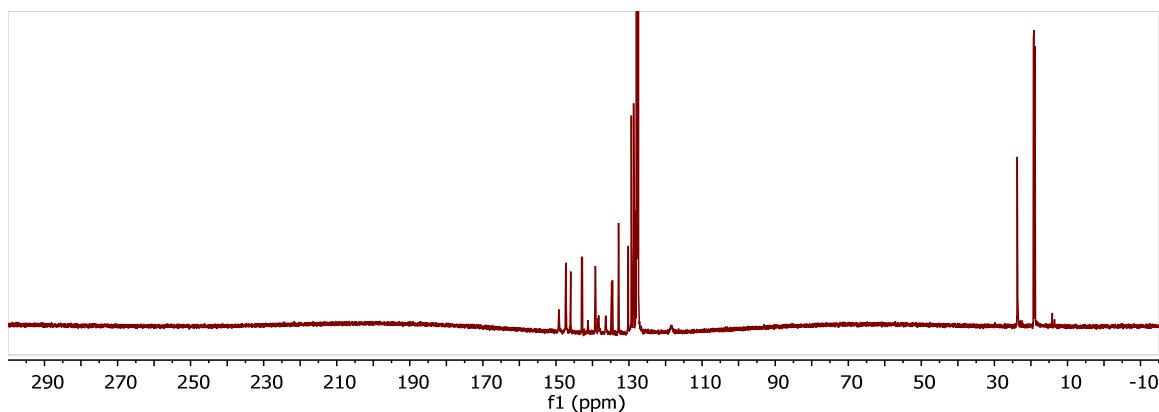


Figure 94. $^{13}\text{C}\{\text{H}\}$ NMR (126 MHz, C_6D_6) spectrum of **1-B(C₆F₅)₃**.

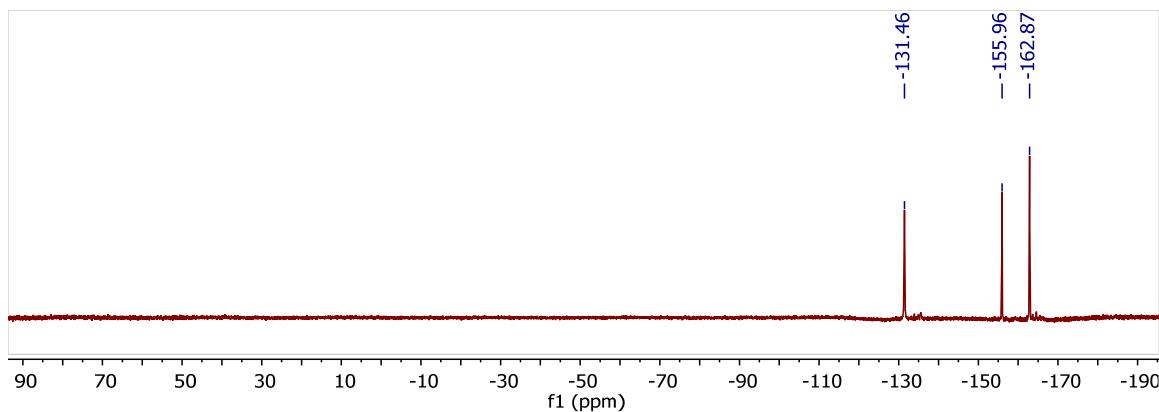


Figure 95. ^{19}F NMR (282 MHz, C_6D_6) spectrum of **1-B(C₆F₅)₃**.

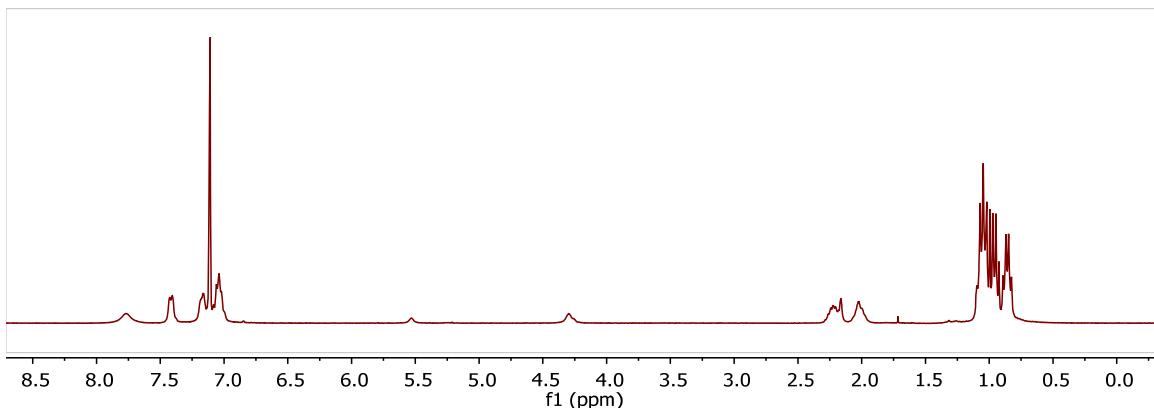


Figure 96. ^1H NMR (300 MHz, C_6D_6) spectrum of **2Ni**.

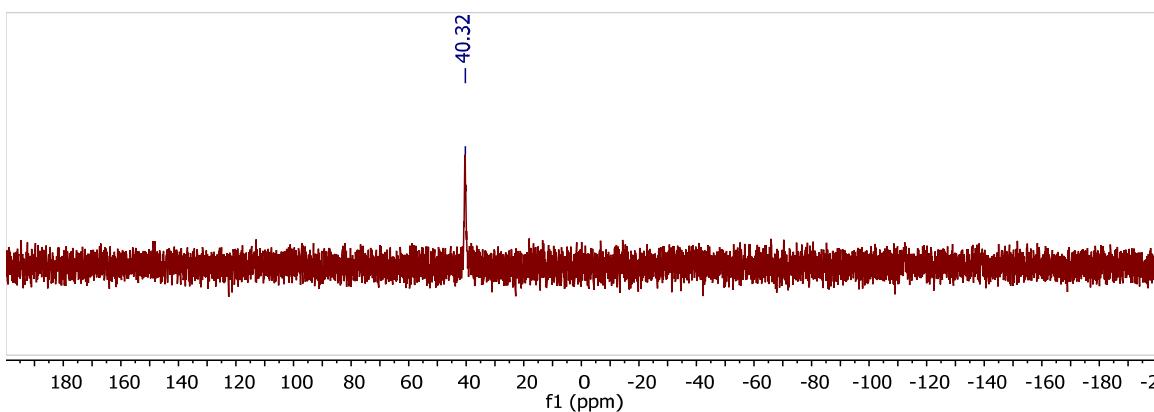


Figure S97. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of **2Ni**.

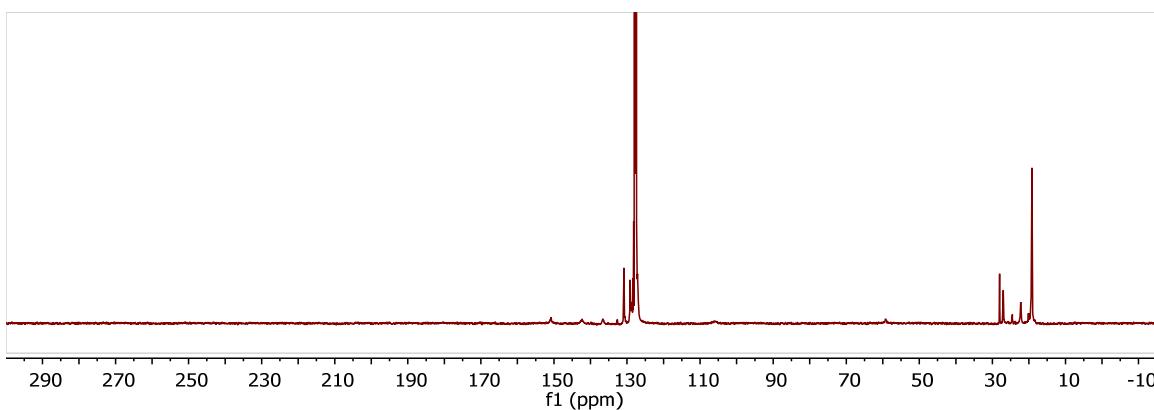


Figure 98. $^{13}\text{C}\{\text{H}\}$ NMR (126 MHz, C_6D_6) spectrum of **2Ni**.

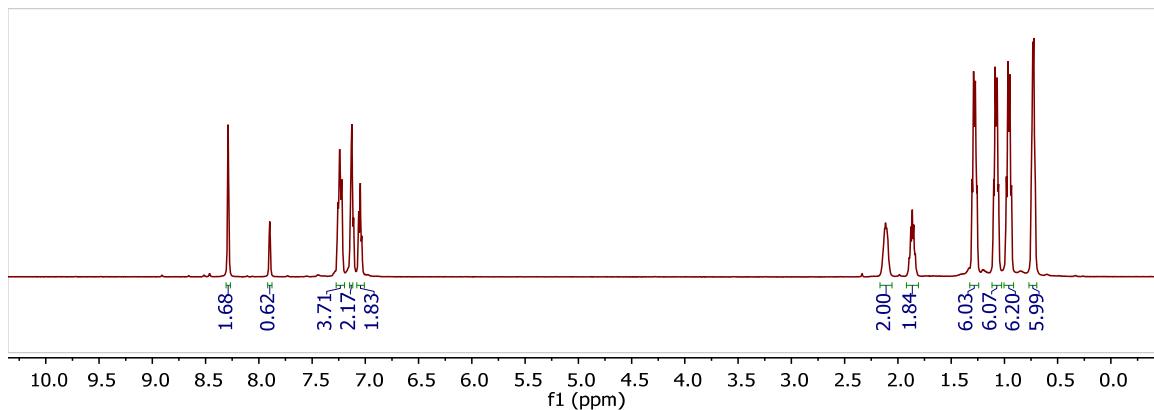


Figure 99. ^1H NMR (500 MHz, C_6D_6) spectrum of **2Pd**.

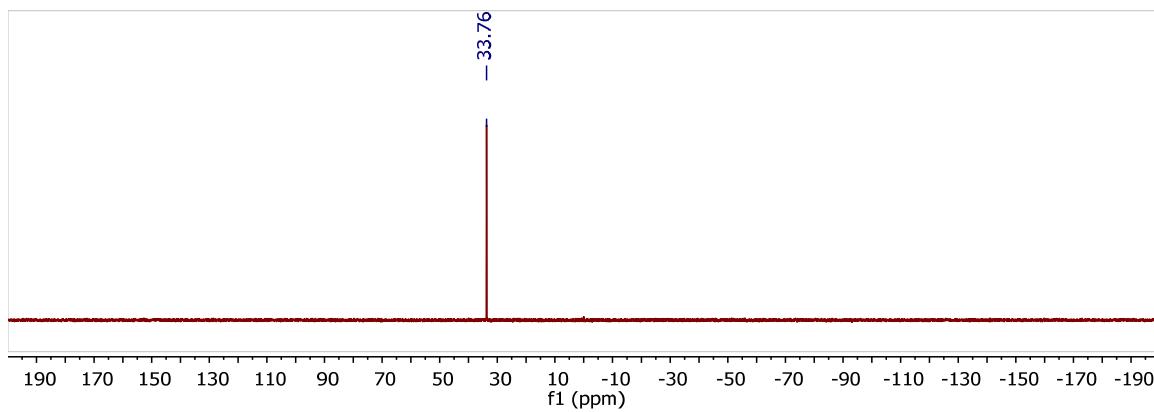


Figure 100. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of **2Pd**.

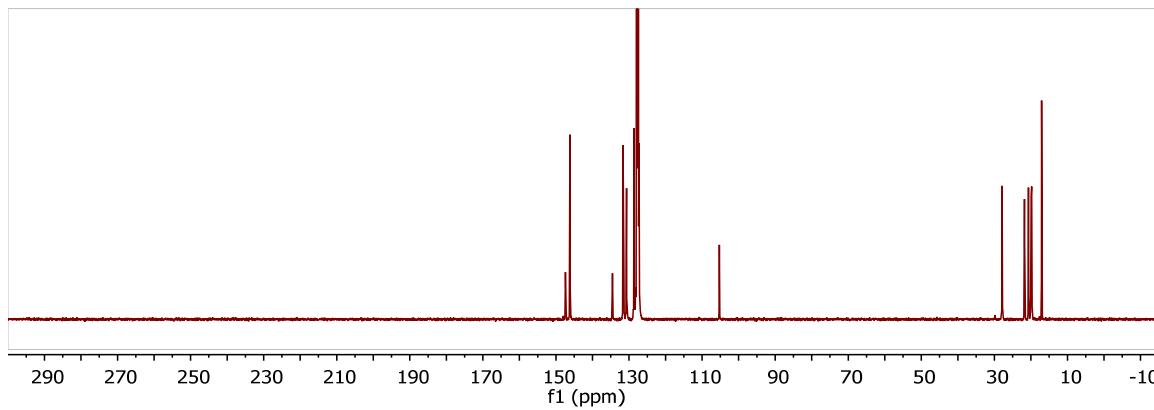


Figure 101. $^{13}\text{C}\{\text{H}\}$ NMR (126 MHz, C_6D_6) spectrum of **2Pd**.

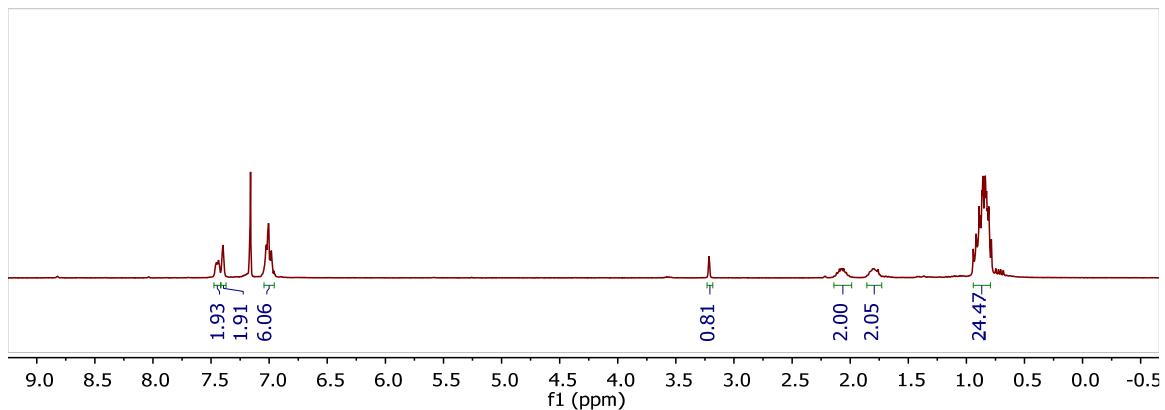


Figure 102. ^1H NMR (300 MHz, C_6D_6) spectrum of $2\text{Ni}\text{-B}(\text{C}_6\text{F}_5)_3$.

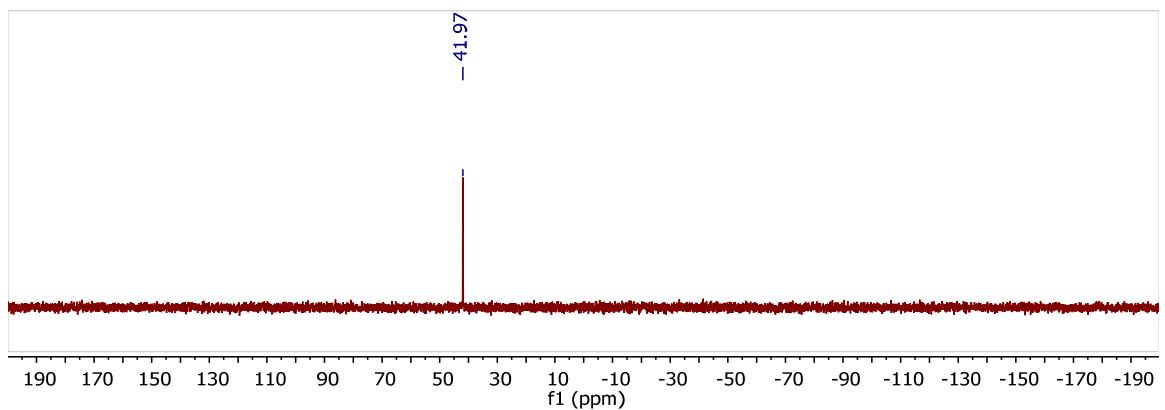


Figure 103. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of $2\text{Ni}\text{-B}(\text{C}_6\text{F}_5)_3$.

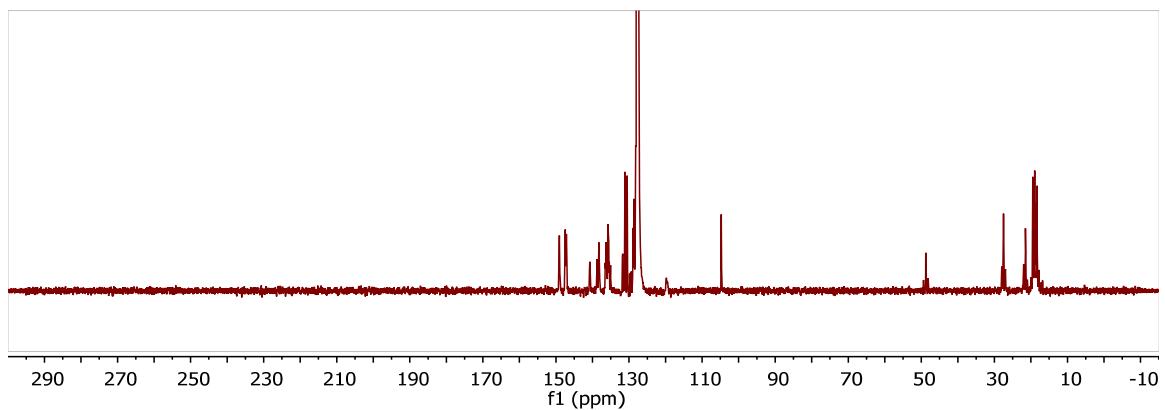


Figure 104. $^{13}\text{C}\{\text{H}\}$ NMR (126 MHz, C_6D_6) spectrum of $2\text{Ni}\text{-B}(\text{C}_6\text{F}_5)_3$.

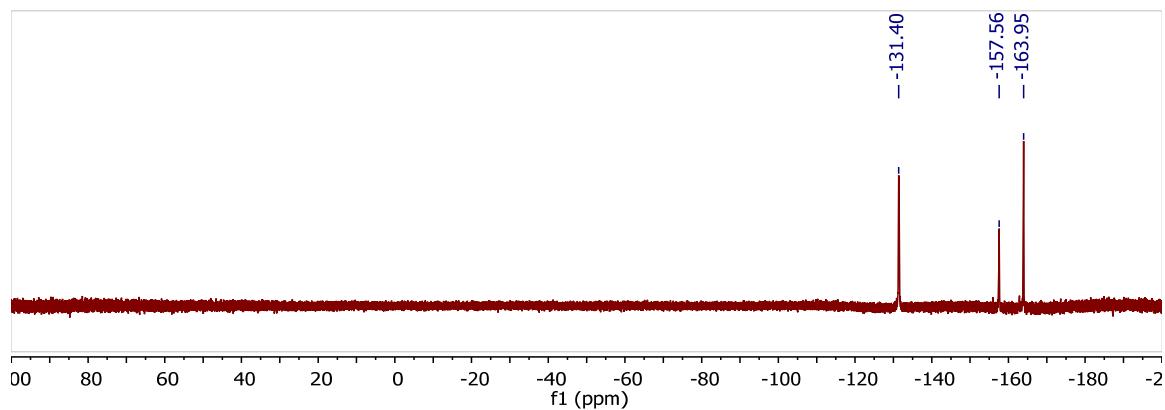


Figure 105. $^{19}\text{F}\{\text{H}\}$ NMR (282 MHz, C_6D_6) spectrum of **2Ni-B(C₆F₅)₃**.

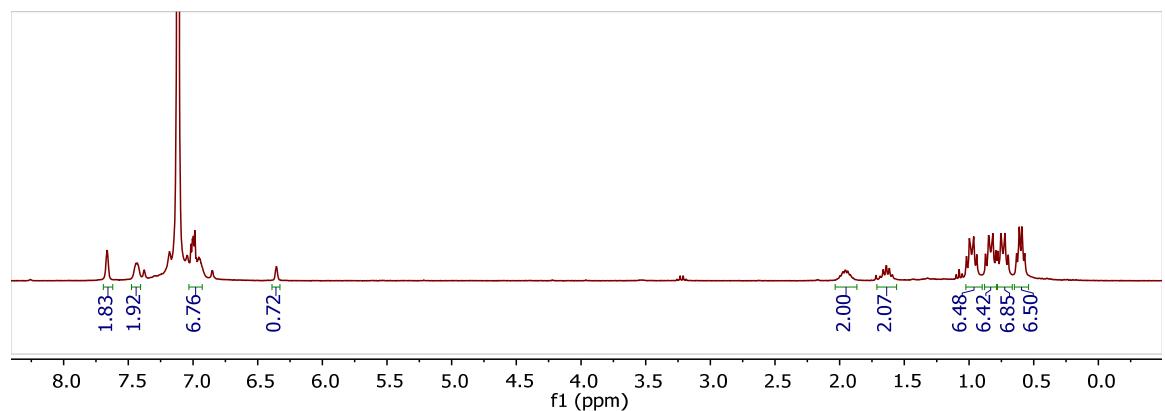


Figure 106. ^1H NMR (500 MHz, C_6D_6) spectrum of **2Pd-B(C₆F₅)₃**.

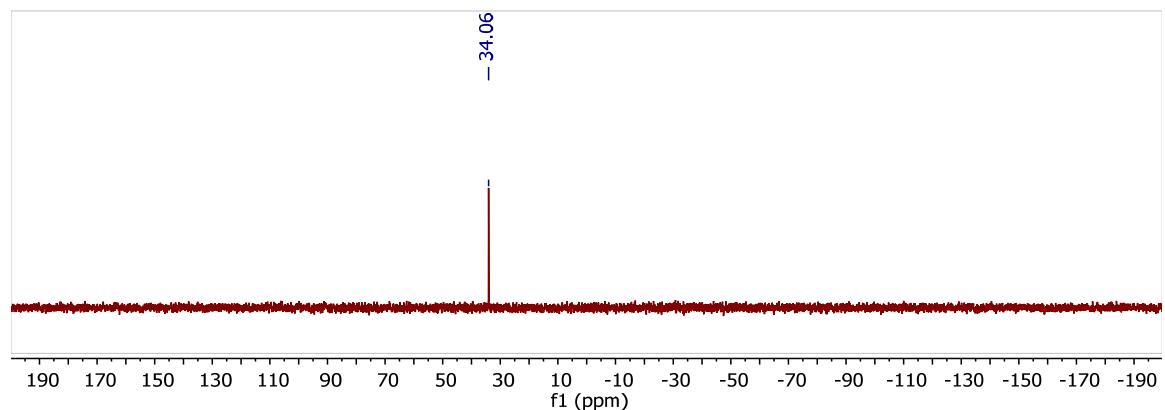


Figure 107. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of **2Pd-B(C₆F₅)₃**.

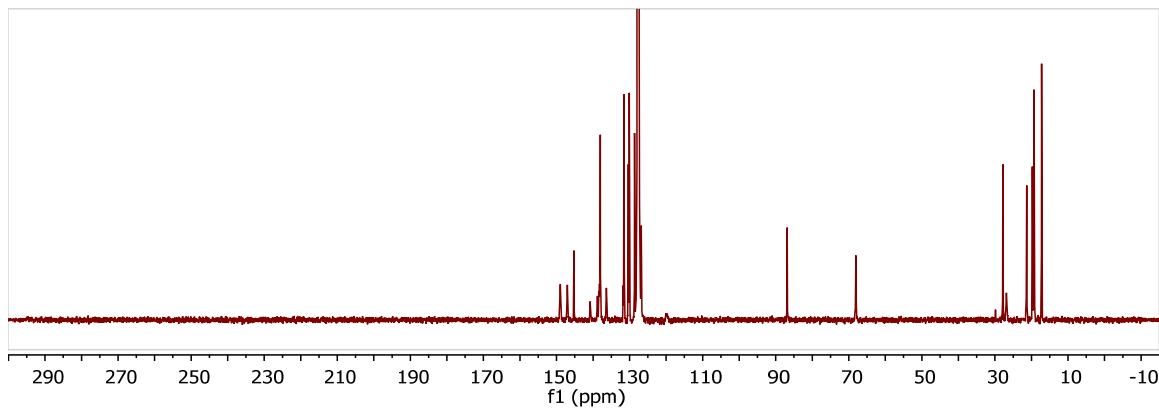


Figure 108. $^{13}\text{C}\{\text{H}\}$ NMR (126 MHz, C_6D_6) spectrum of $\text{2Pd-B}(\text{C}_6\text{F}_5)_3$.

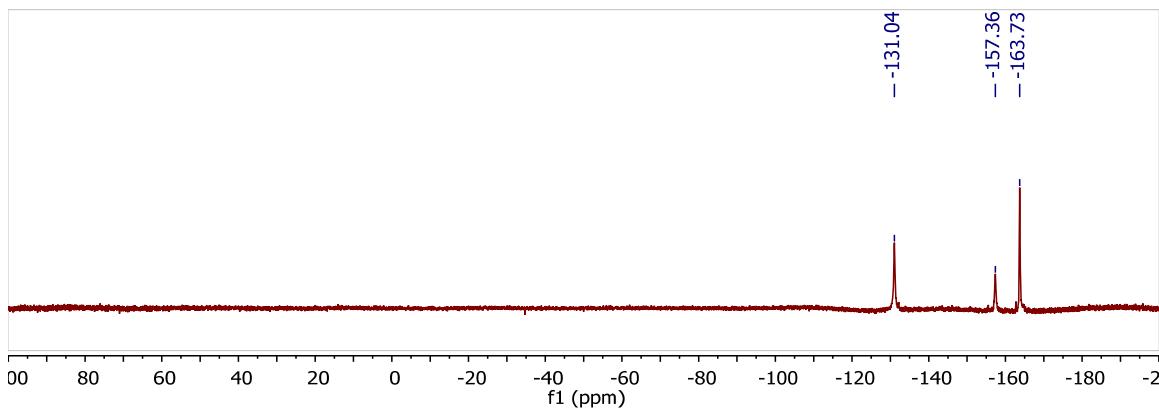


Figure 109. ^{19}F NMR (282 MHz, C_6D_6) spectrum of $\text{2Pd-B}(\text{C}_6\text{F}_5)_3$.

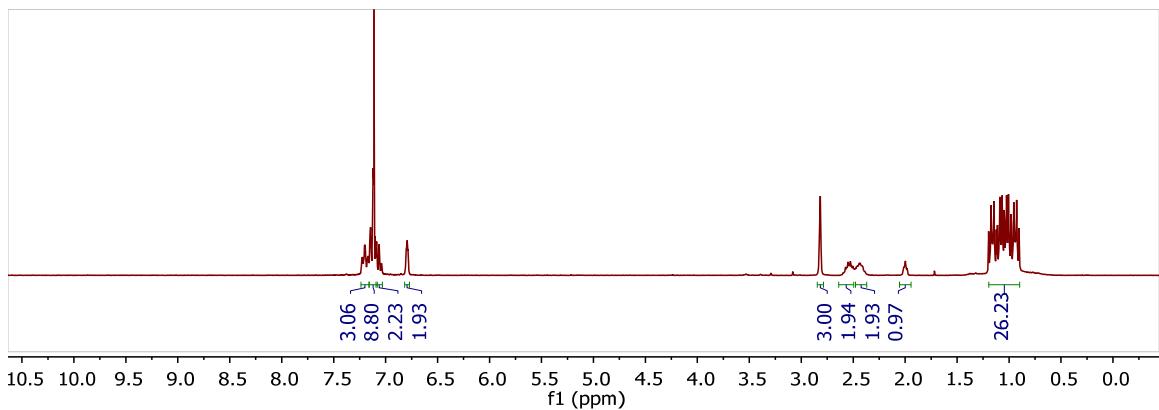


Figure 110. ^1H NMR (300 MHz, C_6D_6) spectrum of 2Ni-Me .

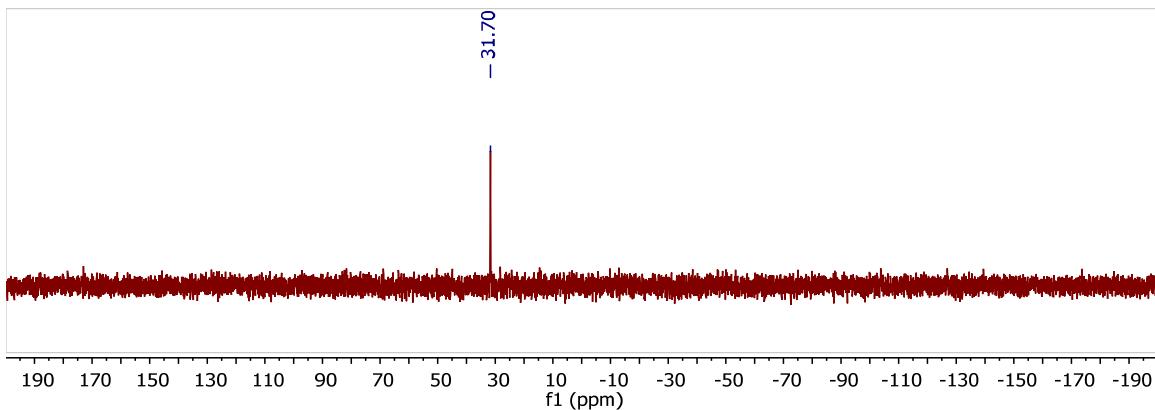


Figure 111. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of **2Ni-Me**.

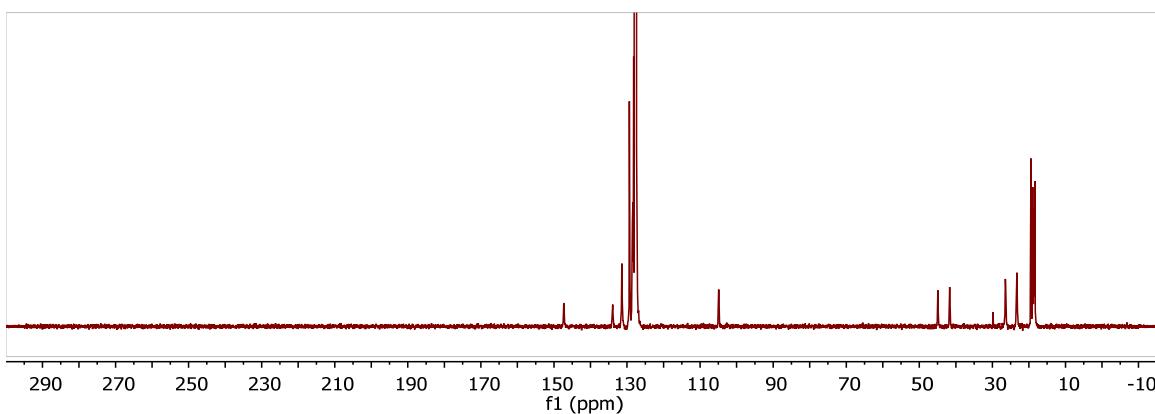


Figure 112. $^{13}\text{C}\{\text{H}\}$ NMR (126 MHz, C_6D_6) spectrum of **2Ni-Me**.

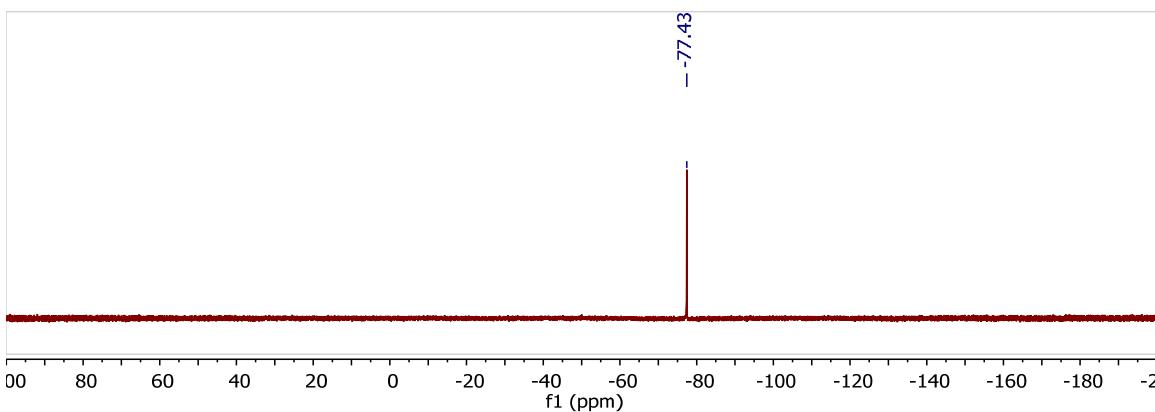


Figure 113. ^{19}F NMR (282 MHz, C_6D_6) spectrum of **2Ni-Me**.

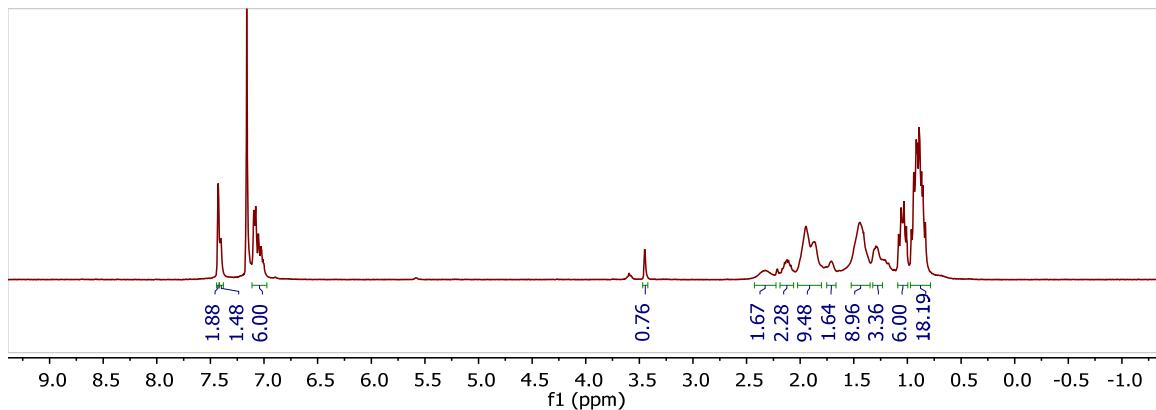


Figure 114 ^1H NMR (300 MHz, C_6D_6) spectrum of **2Ni-BCy₂OTf**.

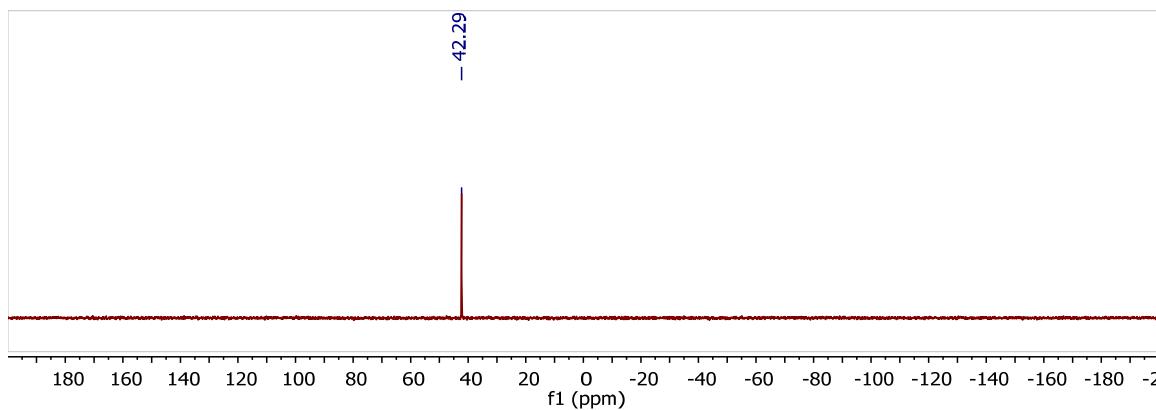


Figure 115. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of **2Ni-BCy₂OTf**.

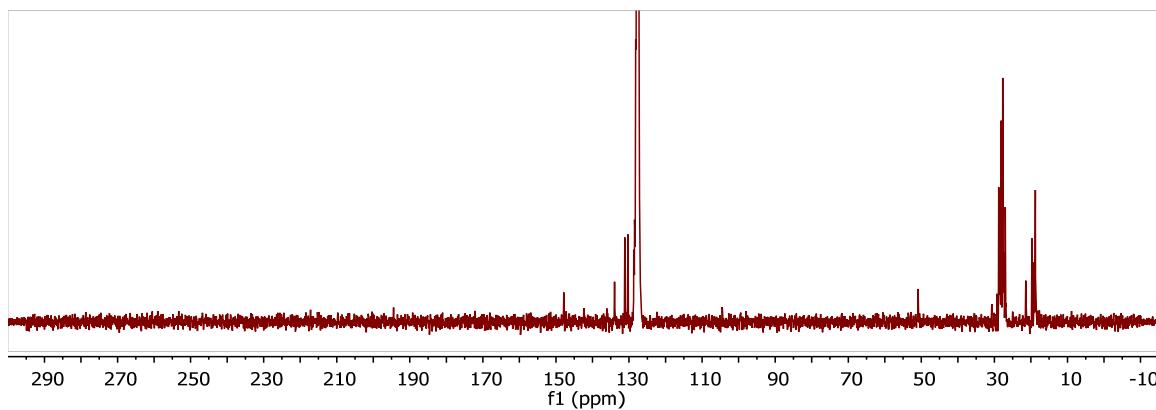


Figure 116. $^{13}\text{C}\{\text{H}\}$ NMR (126 MHz, C_6D_6) spectrum of **2Ni-BCy₂OTf**.

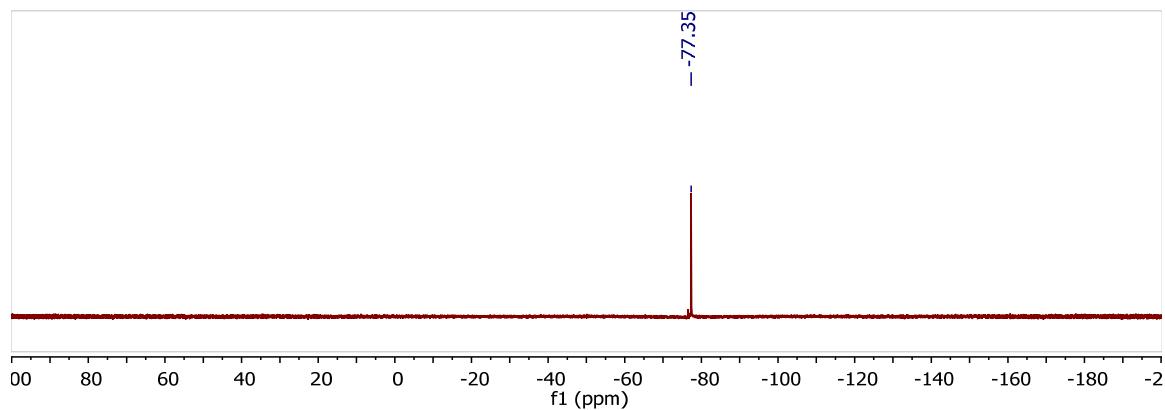


Figure 117. ^{19}F NMR (282 MHz, C_6D_6) spectrum of **2Ni-BCy₂OTf**.

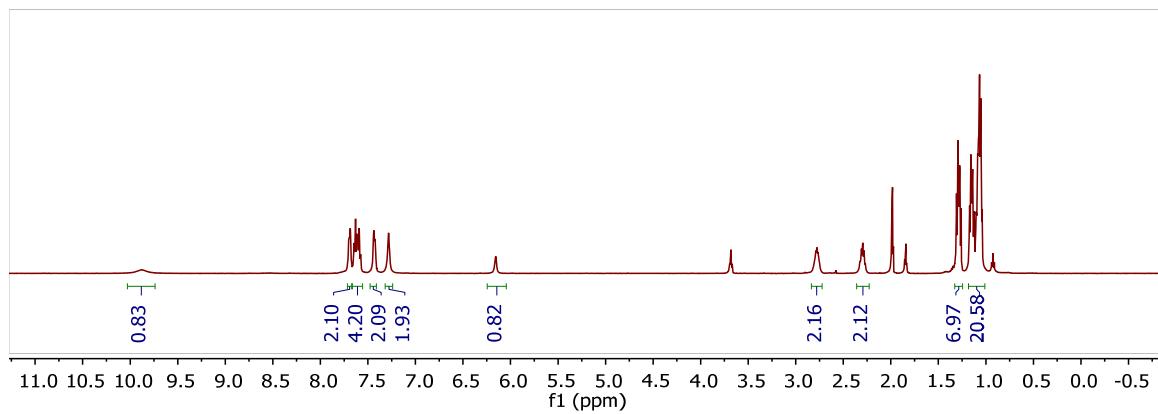


Figure 118. ^1H NMR (500 MHz, CD_3CN) spectrum of **2Pd-H**.

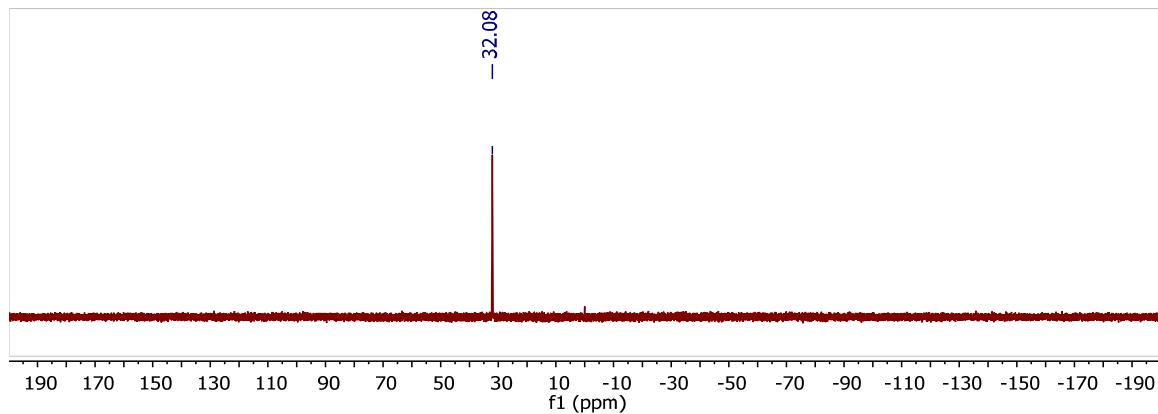


Figure 119. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, CD_3CN) spectrum of **2Pd-H**.

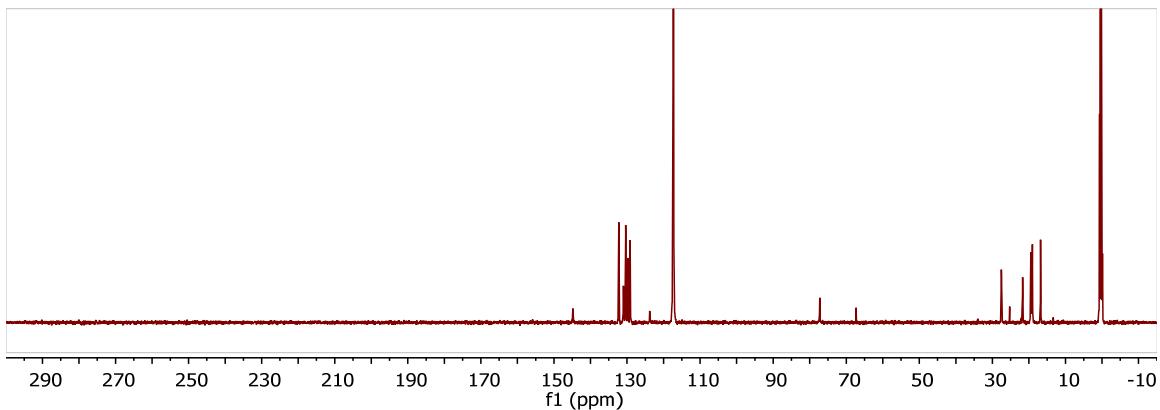


Figure 120. $^{13}\text{C}\{\text{H}\}$ NMR (126 MHz, CD_3CN) spectrum of **2Pd-H**.

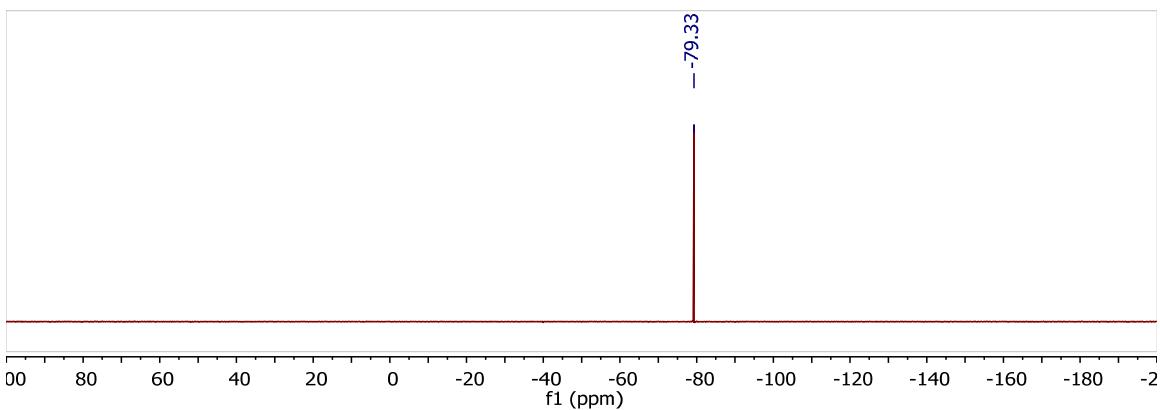


Figure 121. ^{19}F NMR (282 MHz, CD_3CN) spectrum of **2Pd-H**.

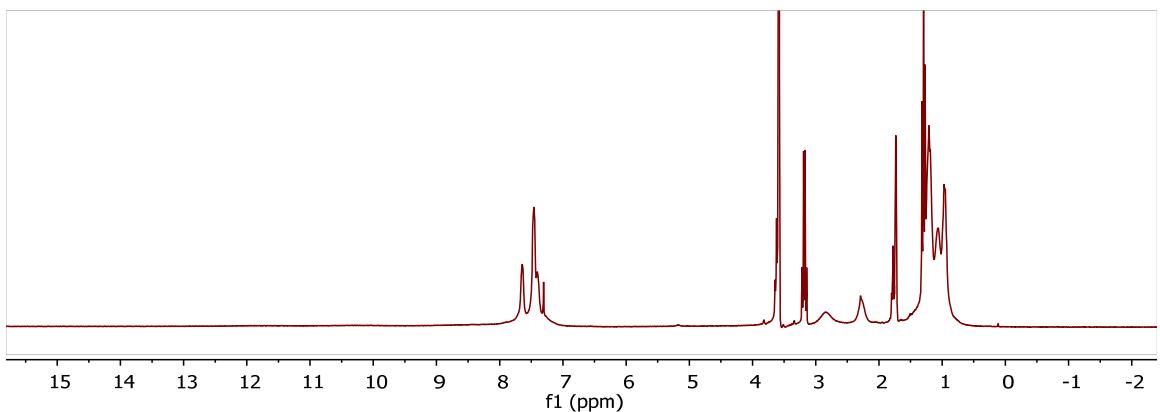


Figure 122. ^1H NMR (300 MHz, $d_8\text{-THF}$) spectrum of **3Ni**.

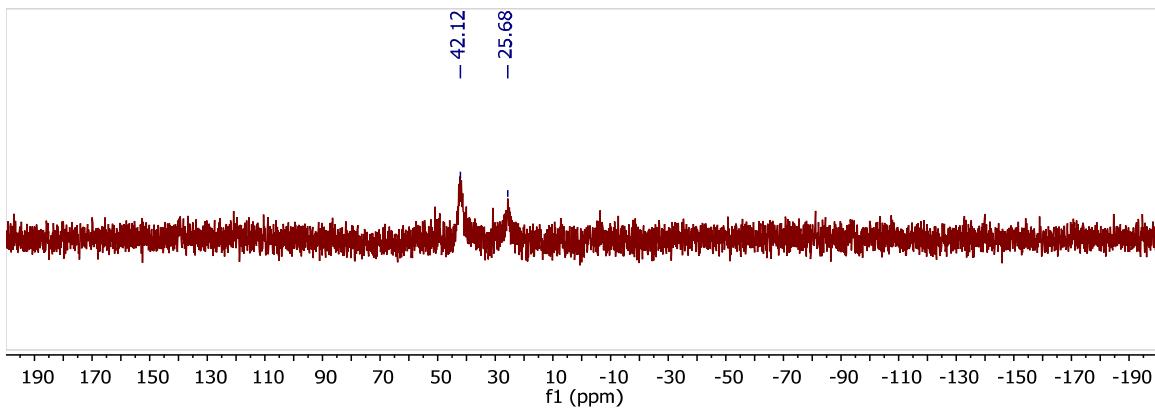


Figure 123. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, $d_8\text{-THF}$) spectrum of **3Ni**.

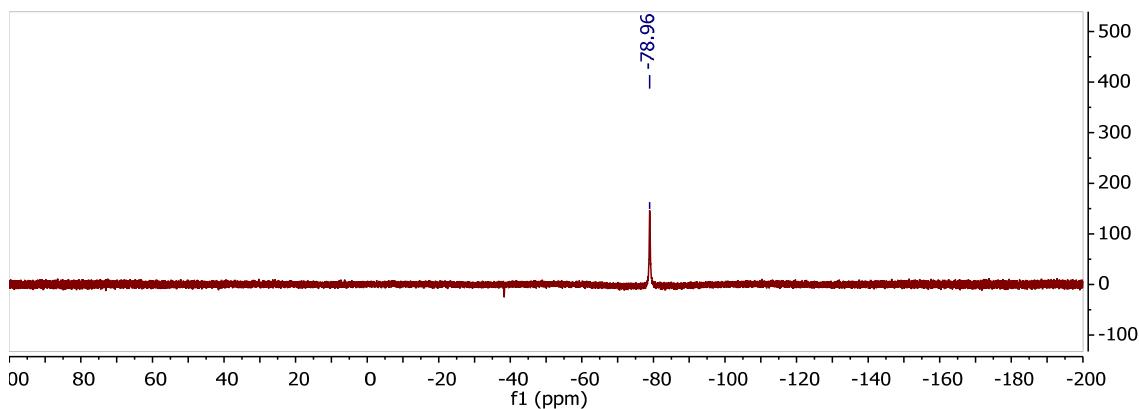


Figure 124. ^{19}F NMR (282 MHz, $d_8\text{-THF}$) spectrum of **3Ni**.

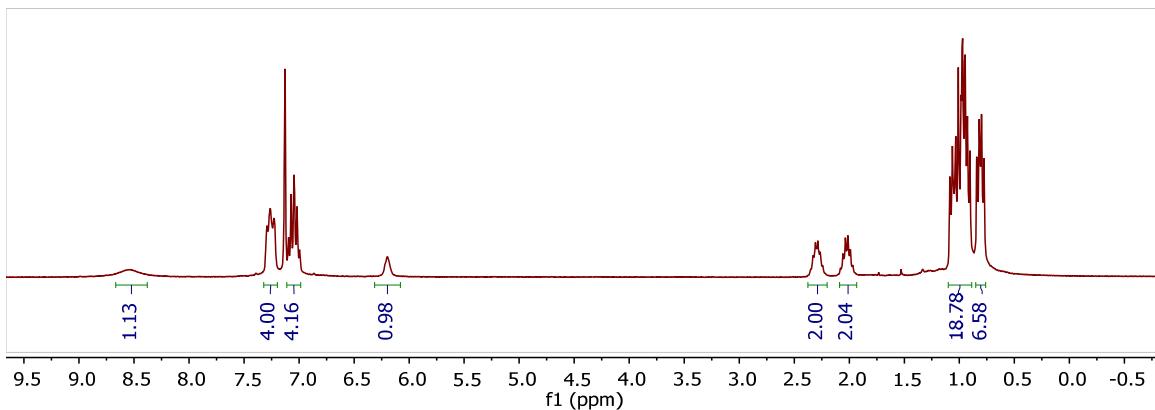


Figure 125. ^1H NMR (500 MHz, C_6D_6) spectrum of **4Ni**.

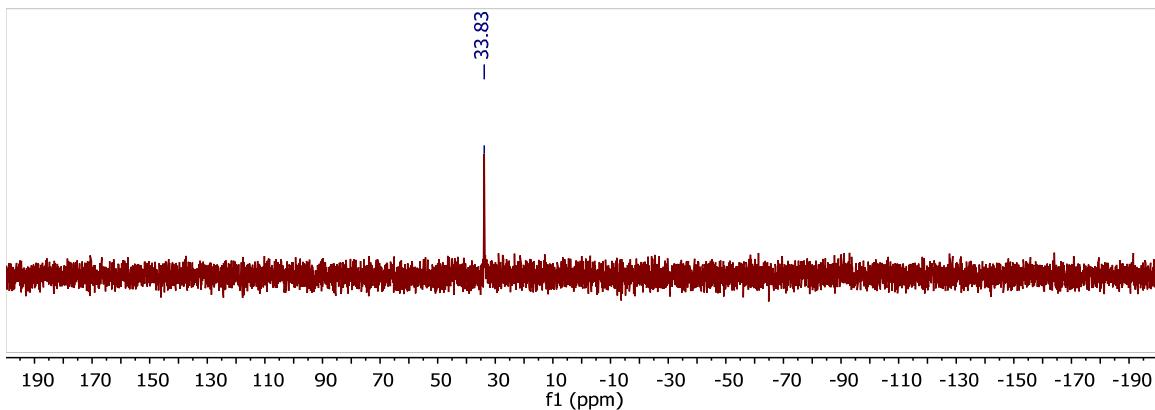


Figure 126. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of **4Ni**.

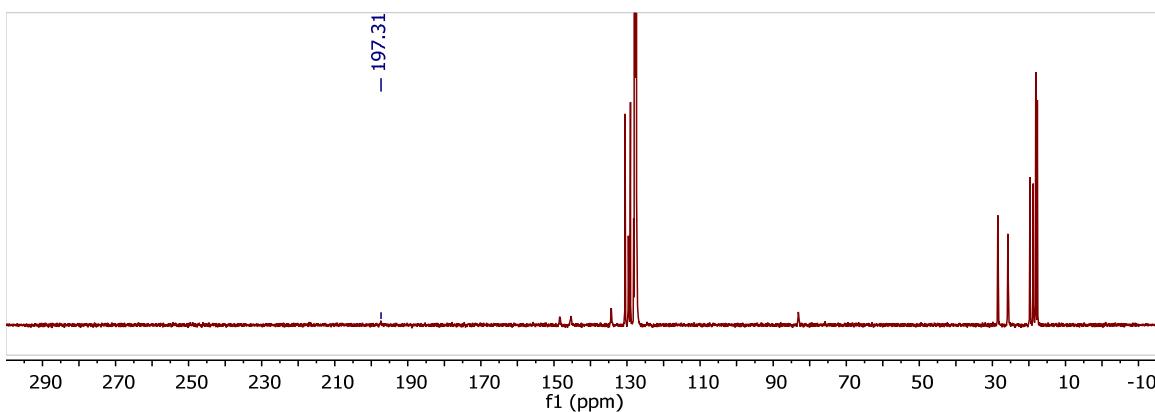


Figure 127. $^{13}\text{C}\{\text{H}\}$ NMR (126 MHz, C_6D_6) spectrum of **4Ni**.

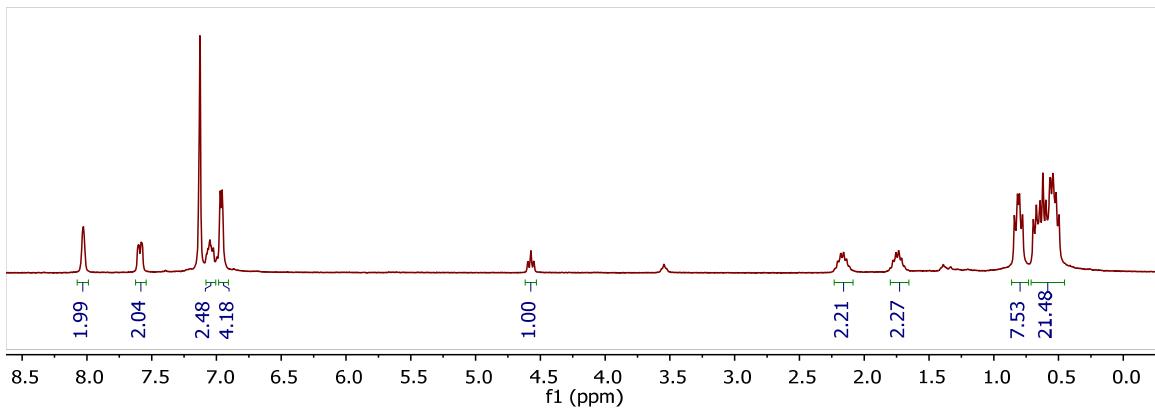


Figure 128. ^1H NMR (300 MHz, C_6D_6) spectrum of **4Ni-B(C₆F₅)₃**.

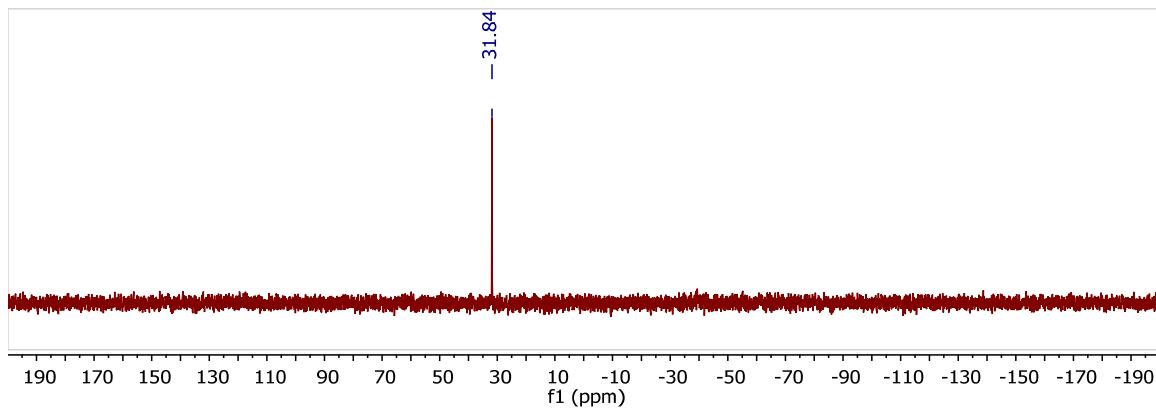


Figure 129. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of $4\text{Ni-B}(\text{C}_6\text{F}_5)_3$.

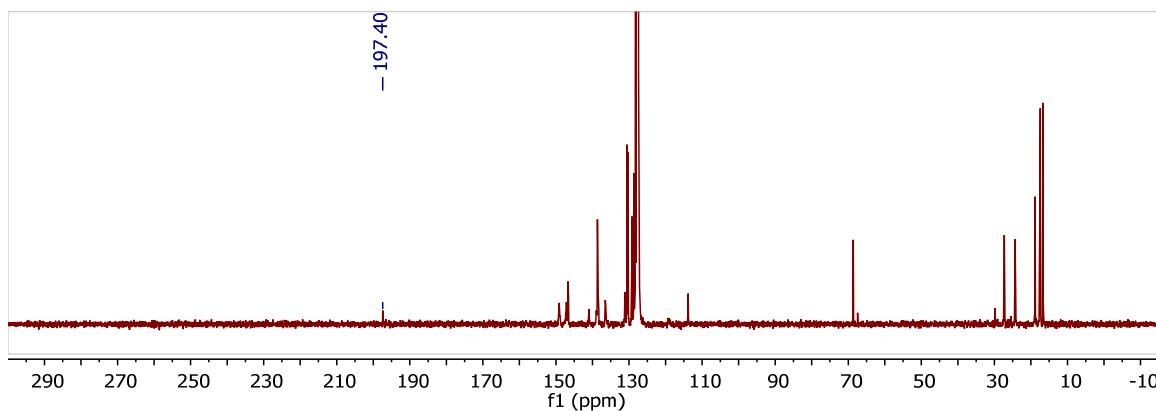


Figure 130. $^{13}\text{C}\{\text{H}\}$ NMR (126 MHz, C_6D_6) spectrum of $4\text{Ni-B}(\text{C}_6\text{F}_5)_3$.

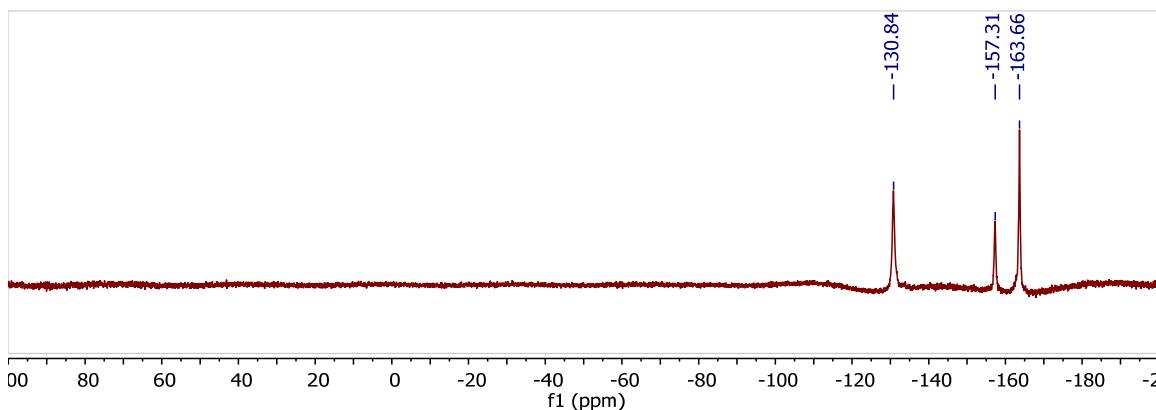


Figure 131. ^{19}F NMR (282 MHz, C_6D_6) spectrum of $4\text{Ni-B}(\text{C}_6\text{F}_5)_3$.

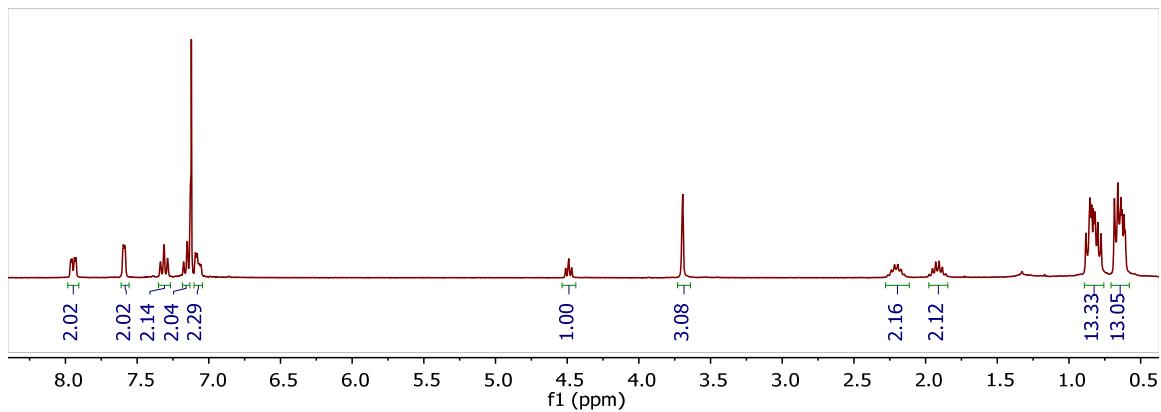


Figure 132. ^1H NMR (500 MHz, C_6D_6) spectrum of 4Ni-Me.

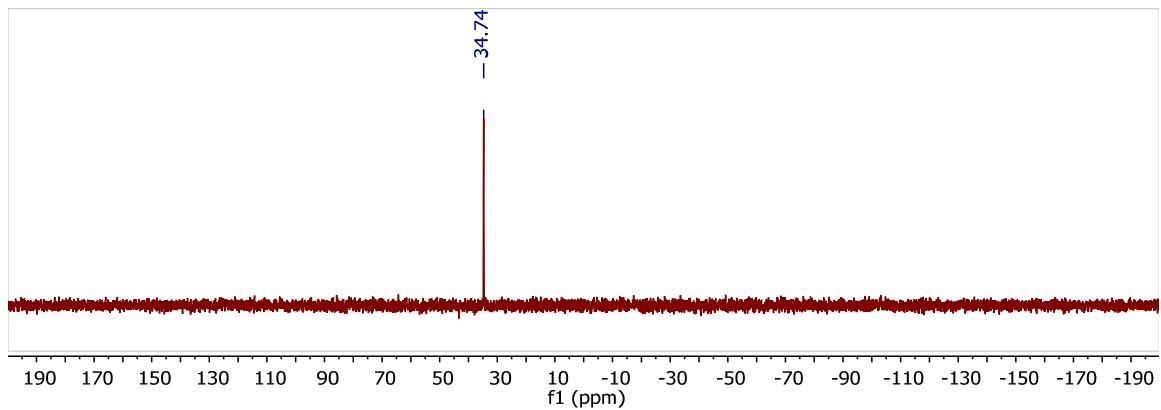


Figure 133. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of 4Ni-Me.

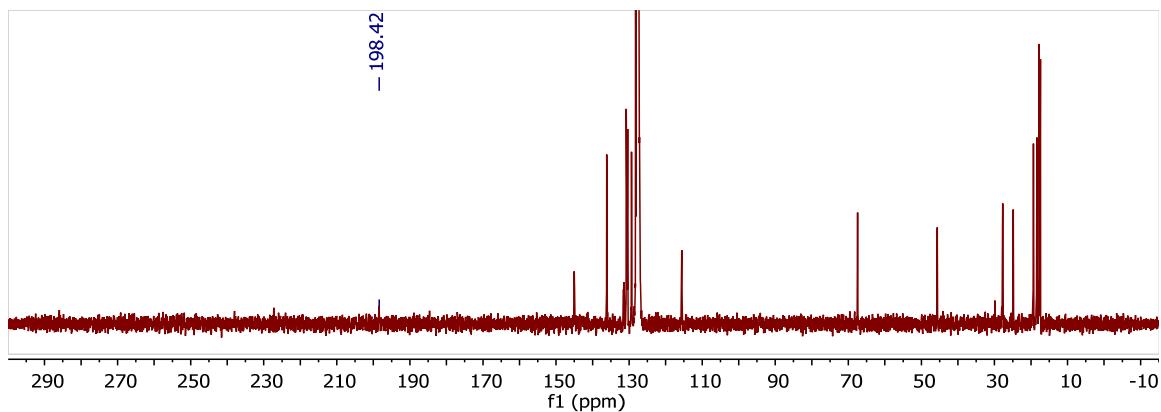


Figure 134. $^{13}\text{C}\{\text{H}\}$ NMR (126 MHz, C_6D_6) spectrum of 4Ni-Me.

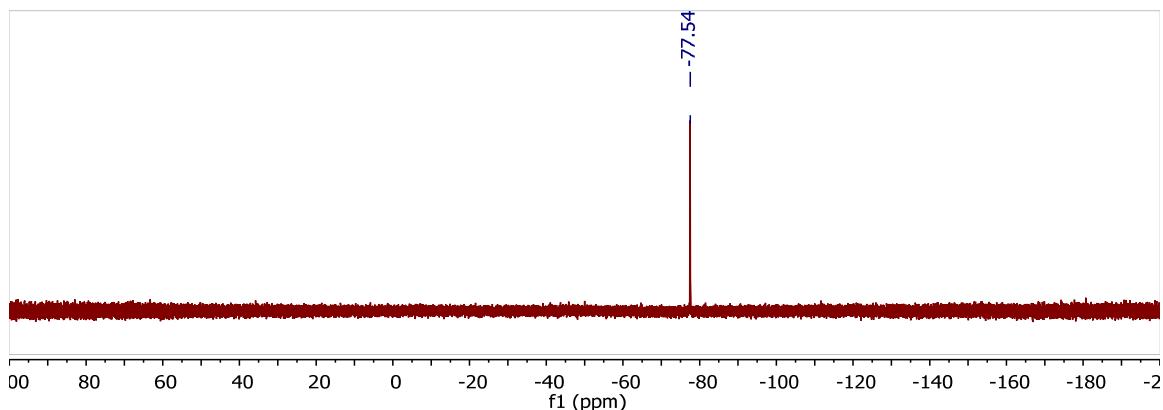


Figure 135. ^{19}F NMR (282 MHz, C_6D_6) spectrum of **4Ni-Me**.

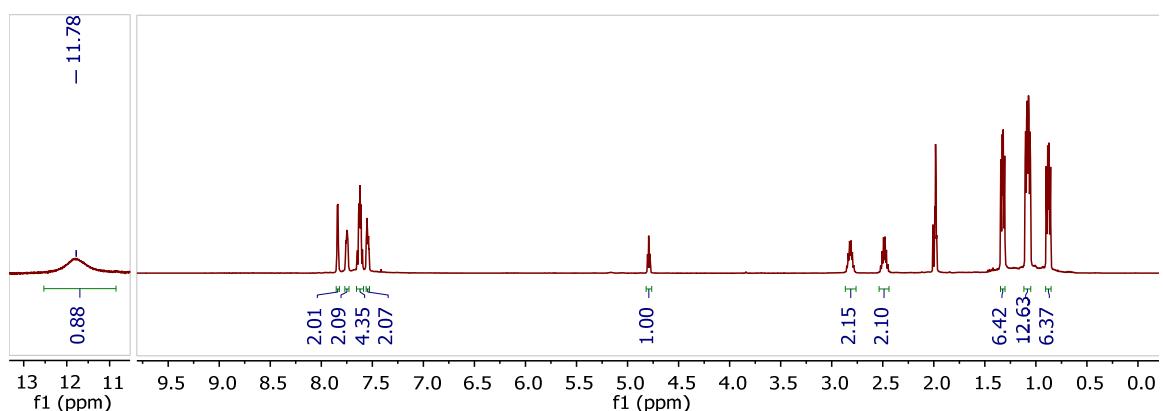


Figure 136. ^1H NMR (500 MHz, CD_3CN) spectrum of **4Ni-H**.

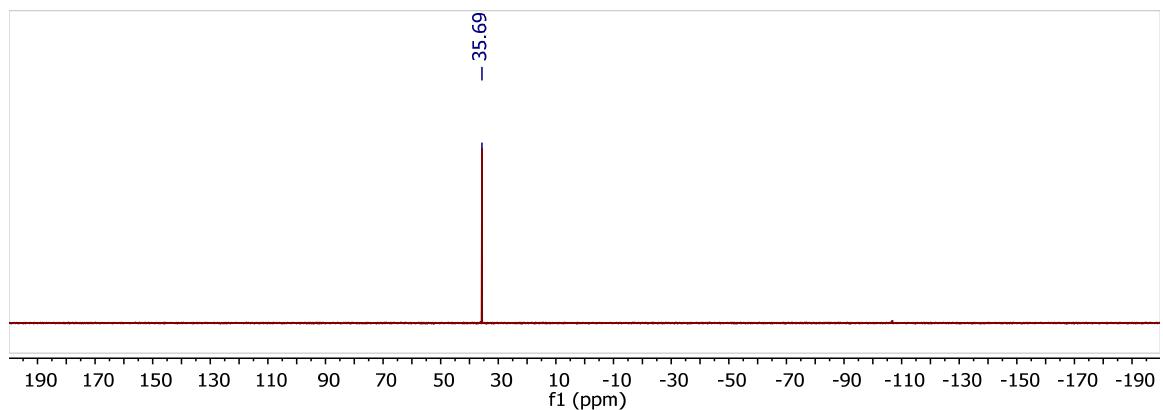


Figure 137. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, CD_3CN) spectrum of **4Ni-H**.

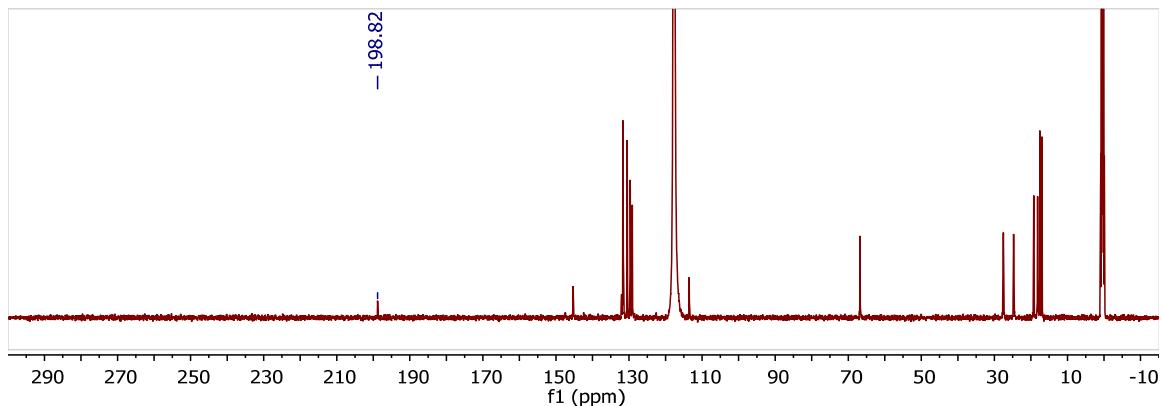


Figure 138. $^{13}\text{C}\{\text{H}\}$ NMR (126 MHz, CD_3CN) spectrum of **4Ni-H**.

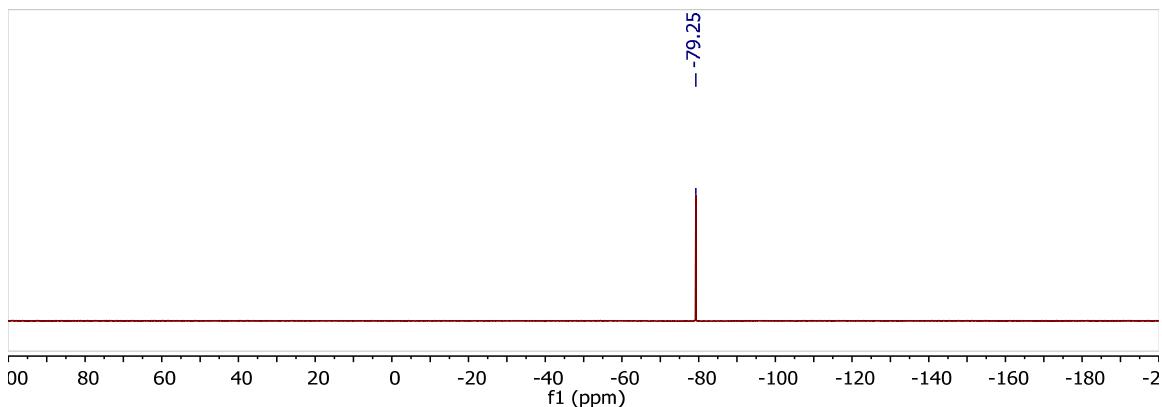


Figure 139. ^{19}F NMR (282 MHz, CD_3CN) spectrum of **4Ni-H**.

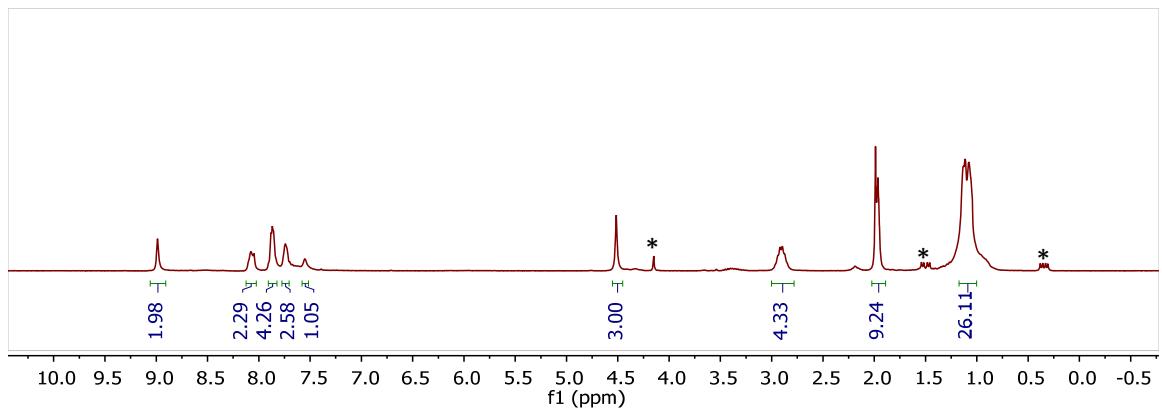


Figure 140. ^1H NMR (500 MHz, C_6D_6) spectrum of **5Ni**. Peaks marked with an asterisk are from the gradual decomposition of **5Ni** in solution.

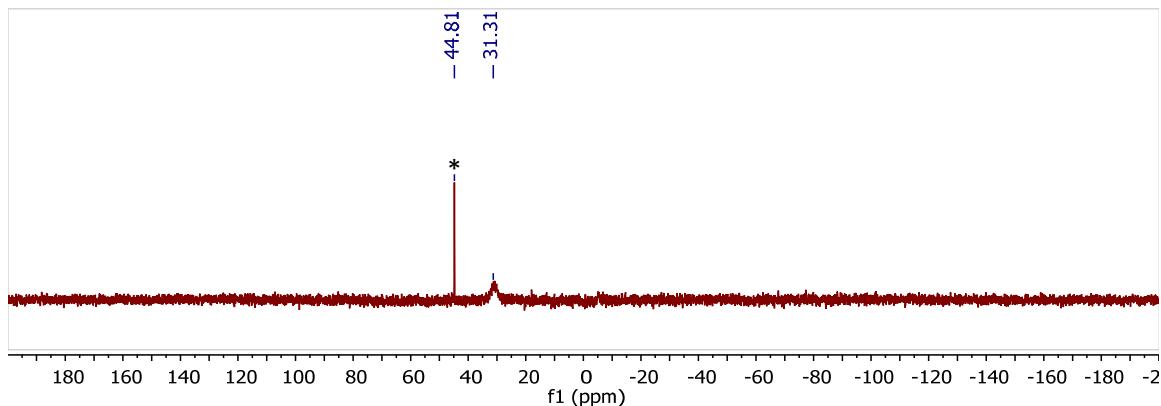


Figure 141. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of **5Ni**. Peaks marked with an asterisk are from the gradual decomposition of **5Ni** in solution.

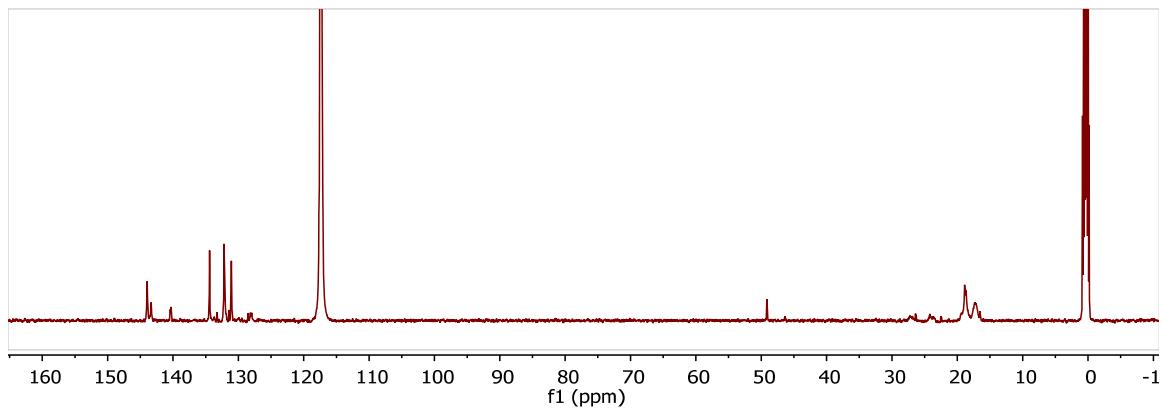


Figure 142. $^{13}\text{C}\{\text{H}\}$ NMR (126 MHz, C_6D_6) spectrum of **5Ni**.

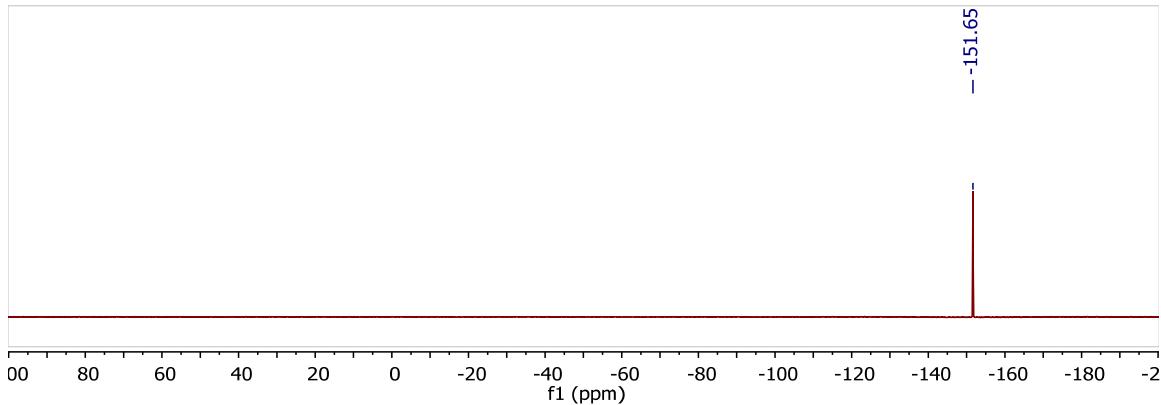


Figure 143. ^{19}F NMR (282 MHz, C_6D_6) spectrum of **5Ni**.

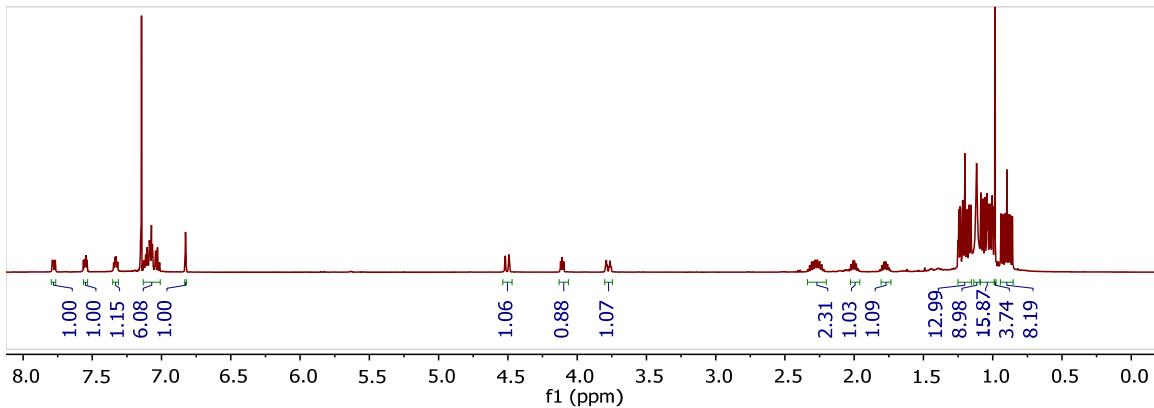


Figure 144. ^1H NMR (500 MHz, C_6D_6) spectrum of **6Ni**.

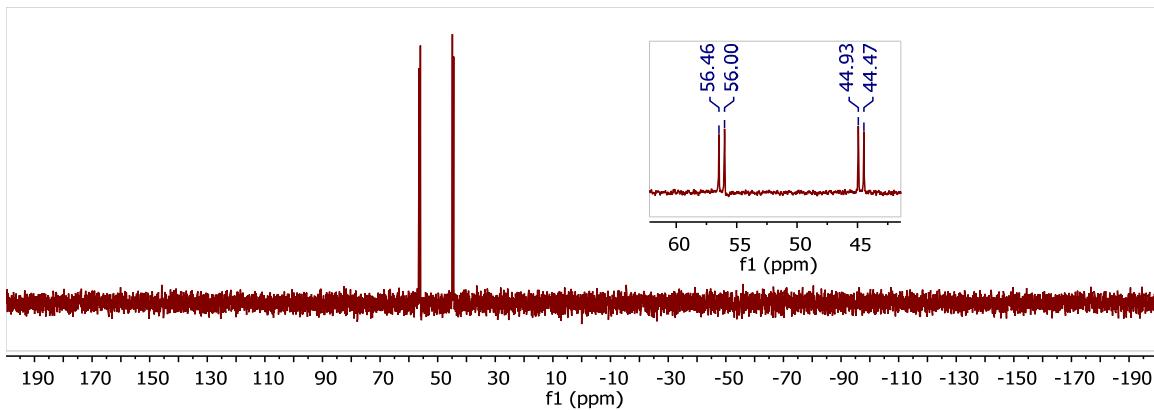


Figure 145. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of **6Ni**.

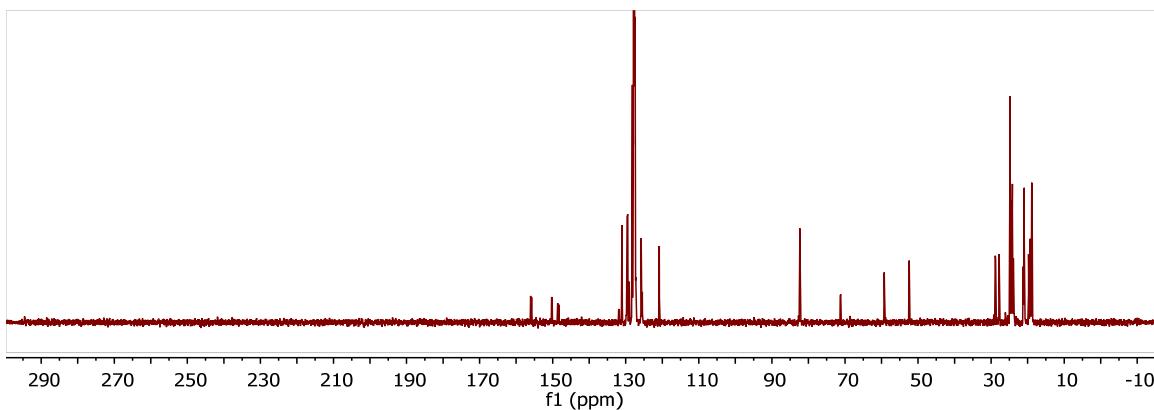


Figure 146. $^{13}\text{C}\{\text{H}\}$ NMR (126 MHz, C_6D_6) spectrum of **6Ni**.

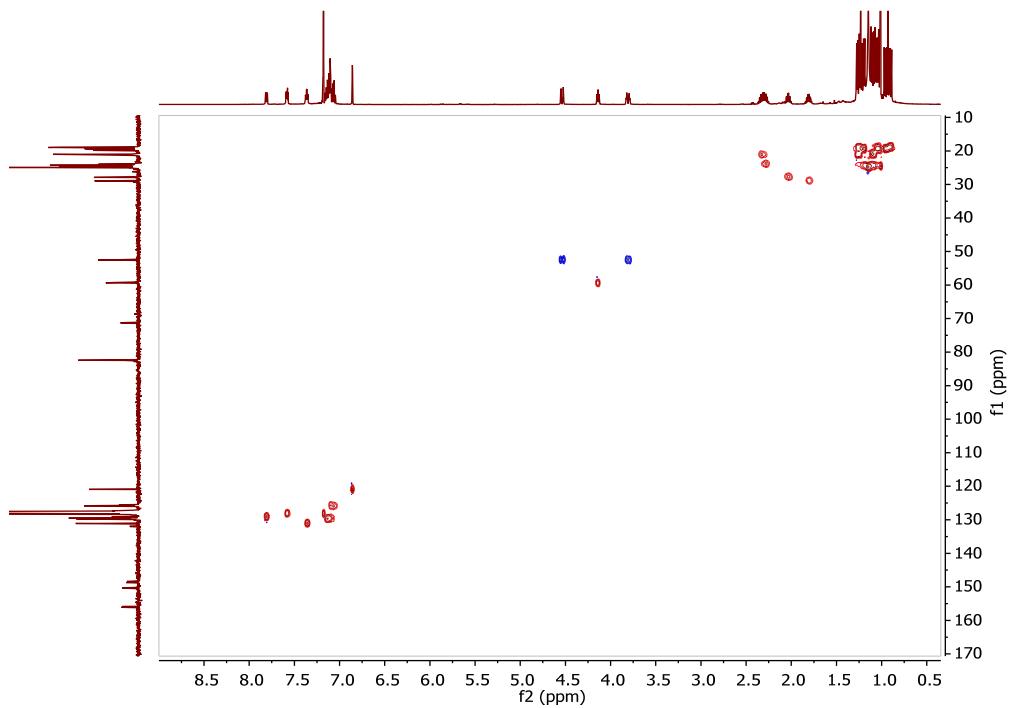


Figure 147. gHSQCAD NMR (500 MHz ^1H , C_6D_6) spectrum of **6Ni**.

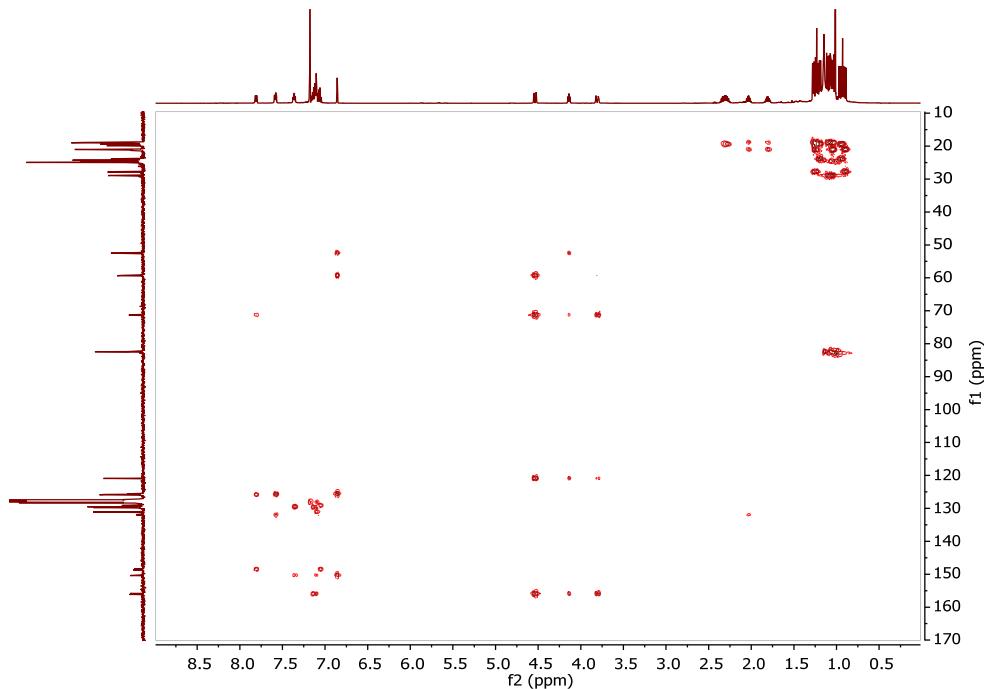


Figure 148. gHMBCAD NMR (500 MHz ^1H , C_6D_6) spectrum of **6Ni**.

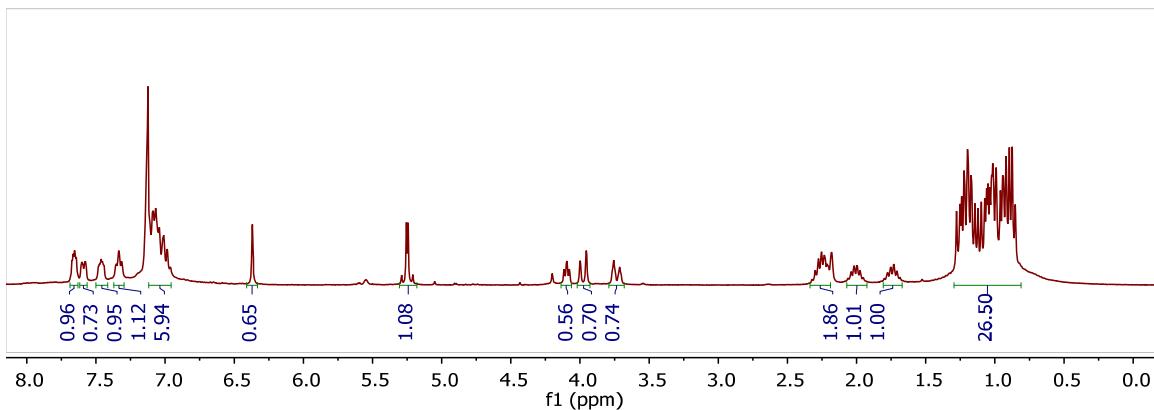


Figure 149. ^1H NMR (500 MHz, C_6D_6) spectrum of **7Ni**.

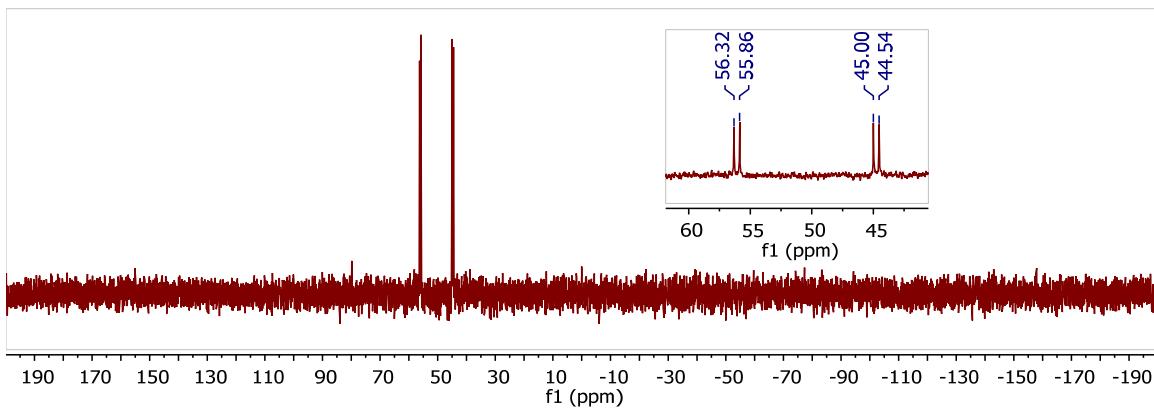


Figure 150. $^{31}\text{P}\{^1\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of **7Ni**.

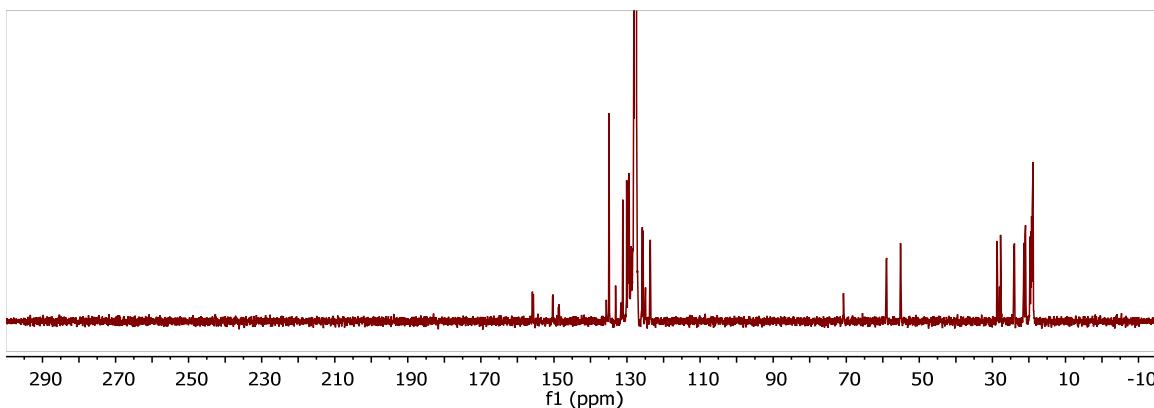


Figure 151. $^{13}\text{C}\{^1\text{H}\}$ NMR (126 MHz, C_6D_6) spectrum of **7Ni**.

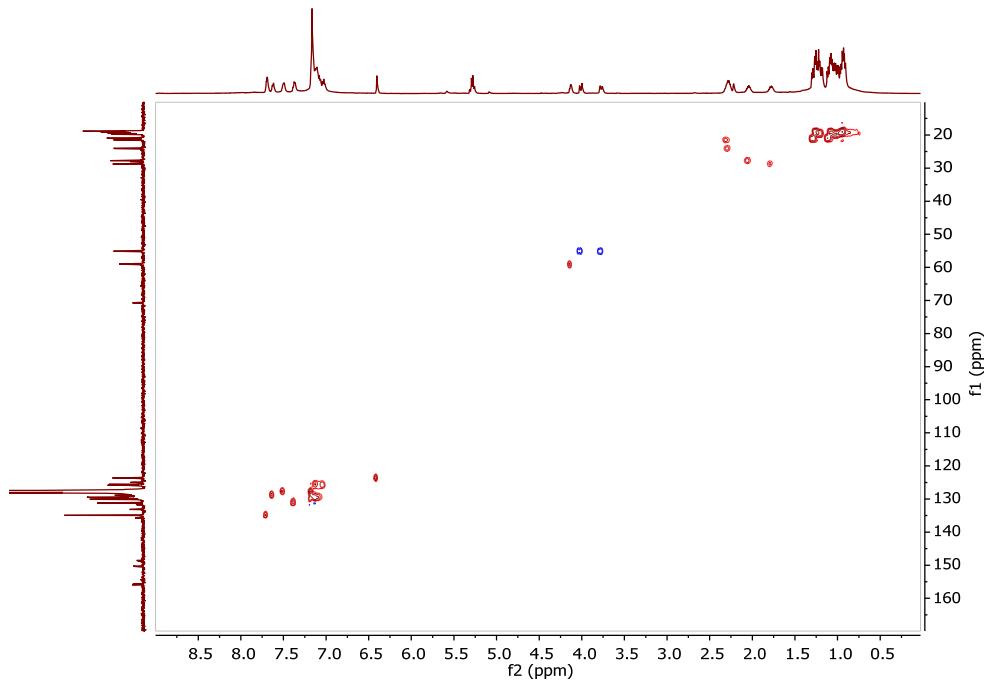


Figure 152. gHSQCAD NMR (500 MHz ¹H, C₆D₆) spectrum of 7Ni.

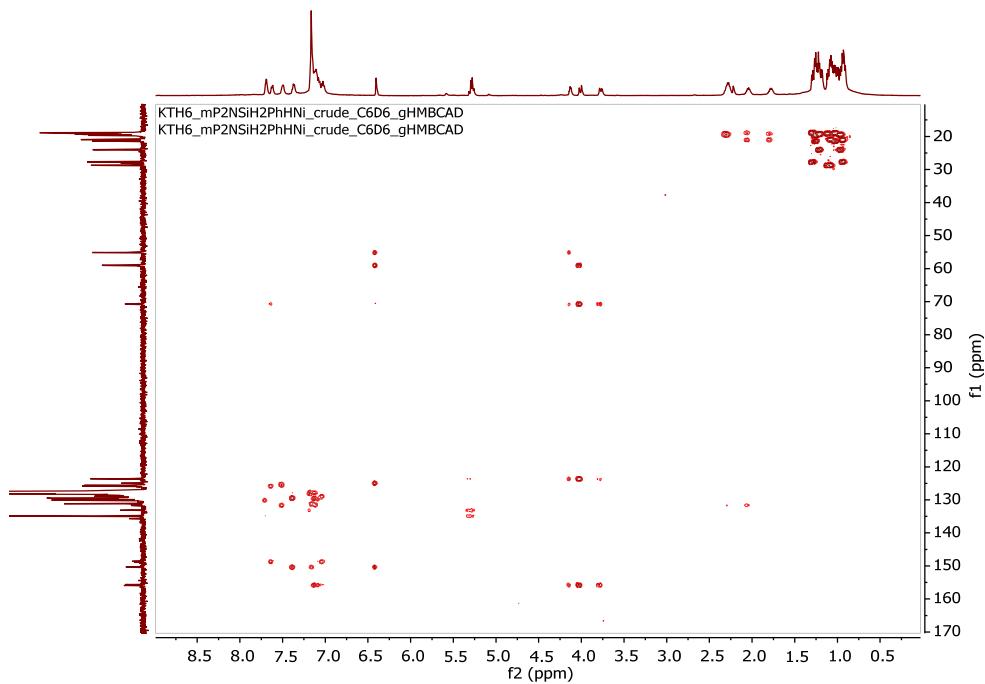


Figure 153. gHMCAD NMR (500 MHz ¹H, C₆D₆) spectrum of 7Ni.

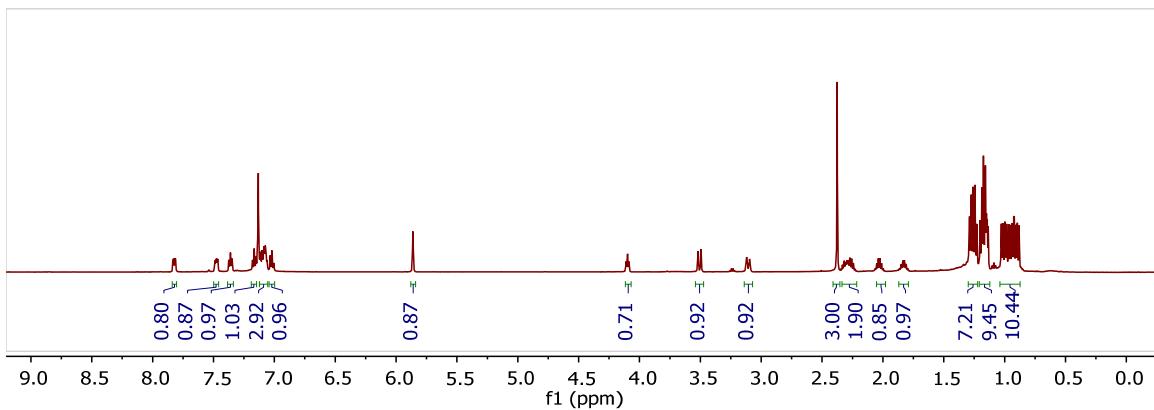


Figure 154. ^1H NMR (500 MHz, C_6D_6) spectrum of **8Ni**.

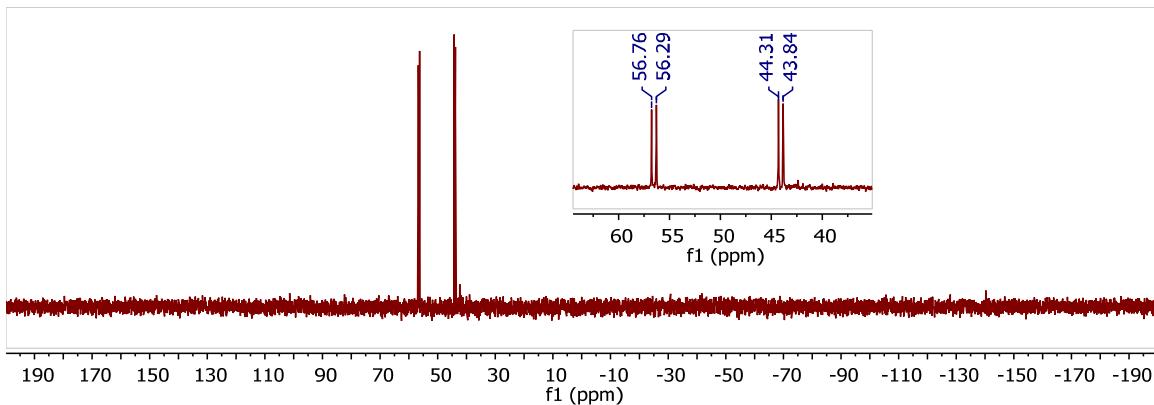


Figure 155. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of **8Ni**.

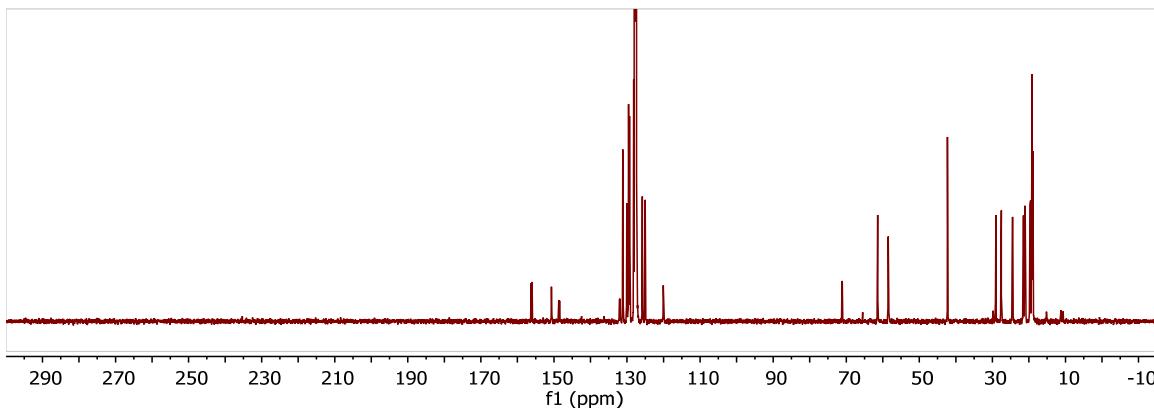


Figure 156. $^{13}\text{C}\{\text{H}\}$ NMR (126 MHz, C_6D_6) spectrum of **8Ni**.

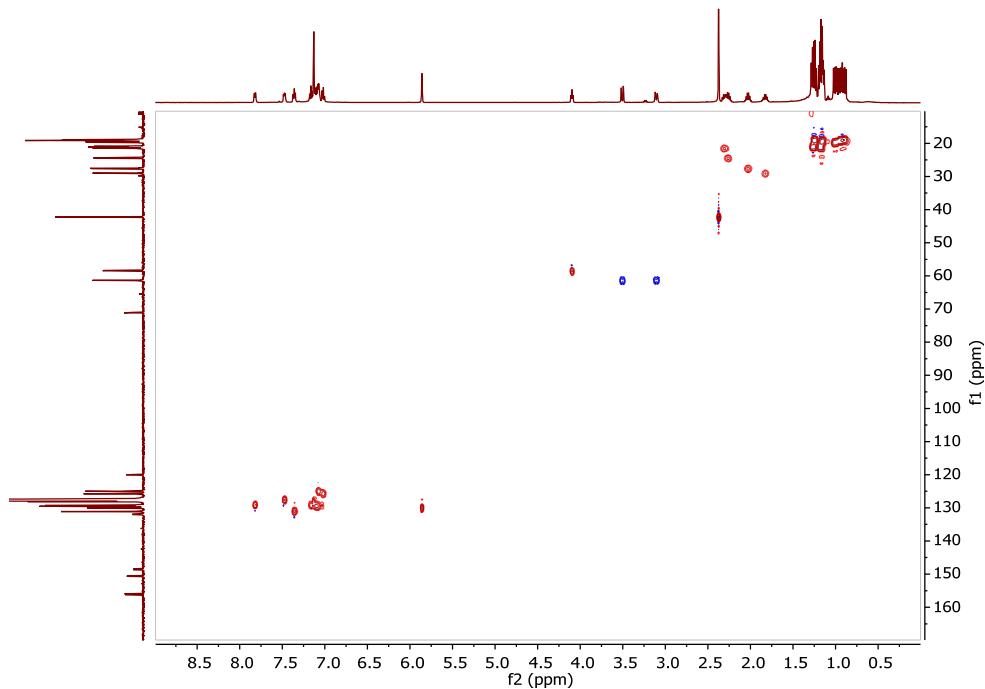


Figure 157. gHSQCAD NMR (500 MHz ^1H , C_6D_6) spectrum of **8Ni**.

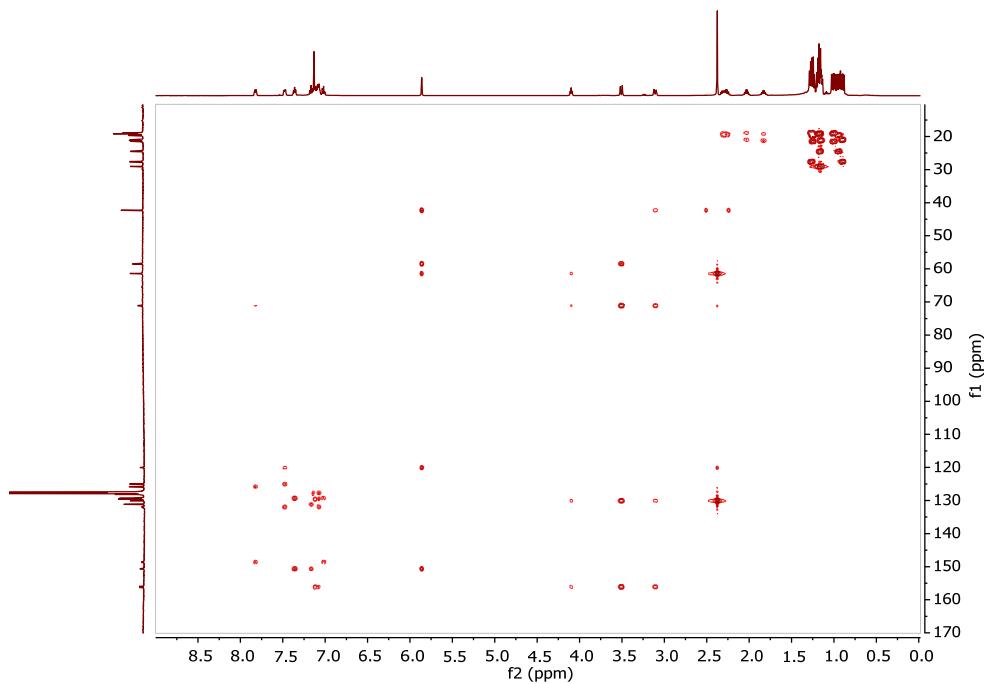


Figure 158. gHMCAD NMR (500 MHz ^1H , C_6D_6) spectrum of **8Ni**.

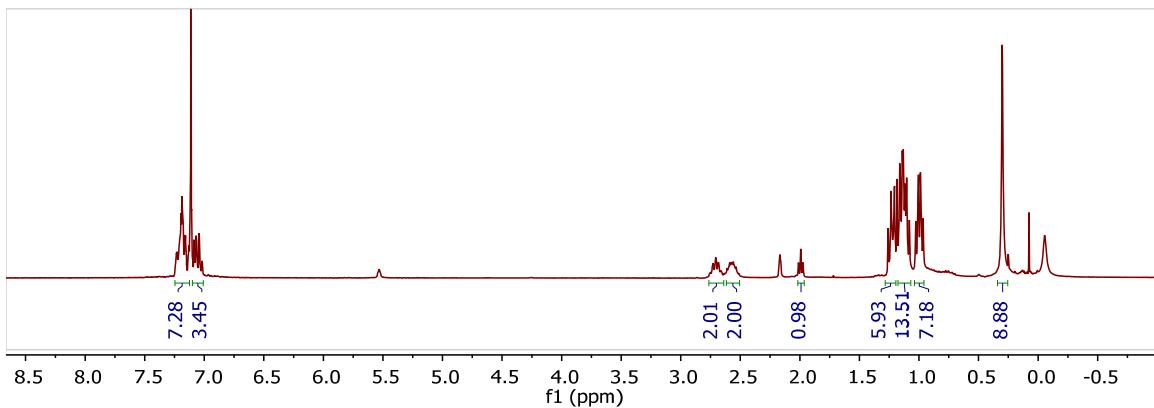


Figure 149. ^1H NMR (300 MHz, C_6D_6) spectrum of 2Ni-SiMe_3 .

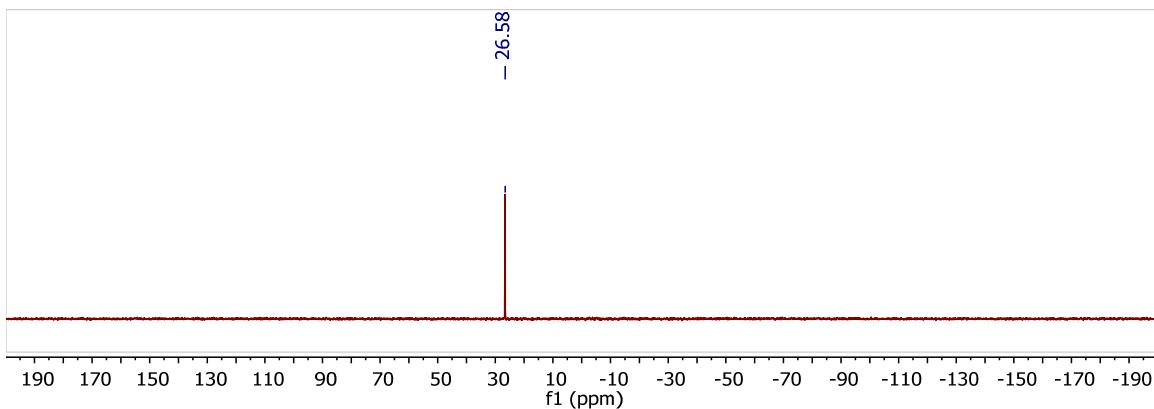


Figure 150. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of 2Ni-SiMe_3 .

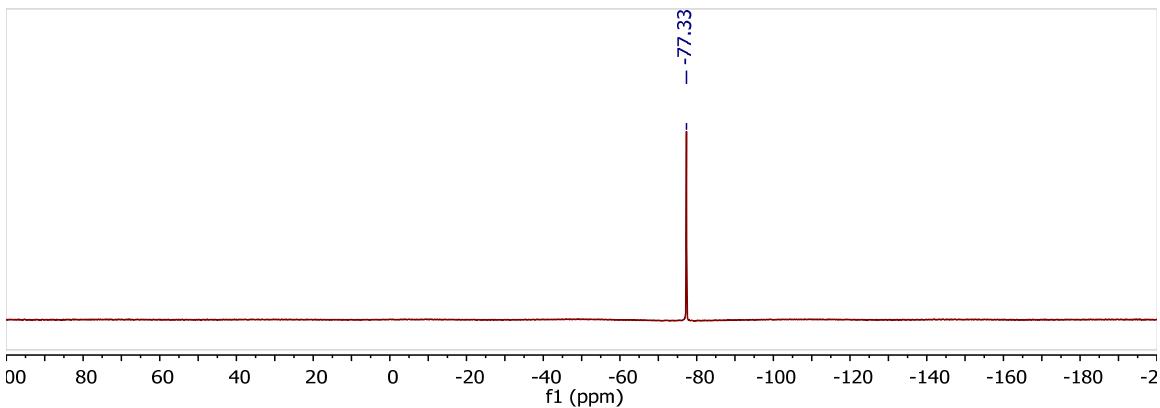


Figure 151. ^{19}F NMR (282 MHz, C_6D_6) spectrum of 2Ni-SiMe_3 .

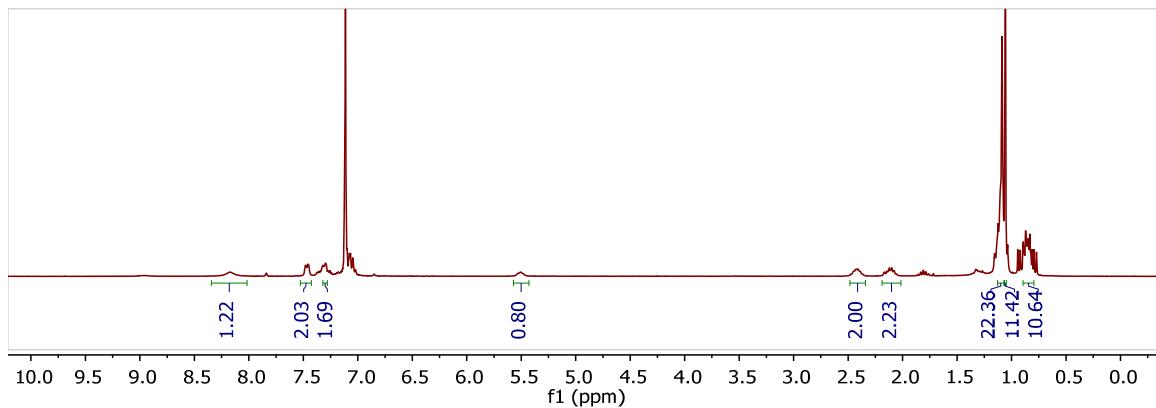


Figure 152. ^1H NMR (300 MHz, C_6D_6) spectrum of $4\text{Ni}(\text{CN}t\text{Bu})$.

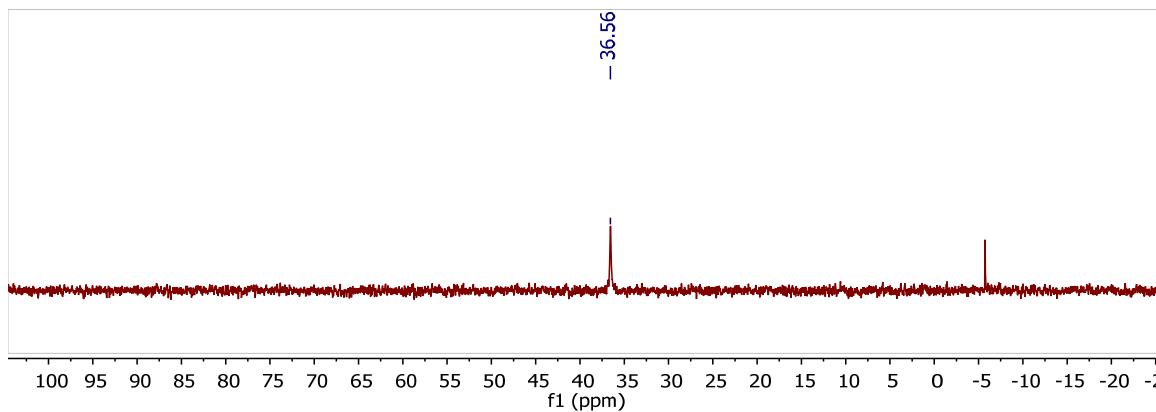


Figure 153. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of $4\text{Ni}(\text{CN}t\text{Bu})$.

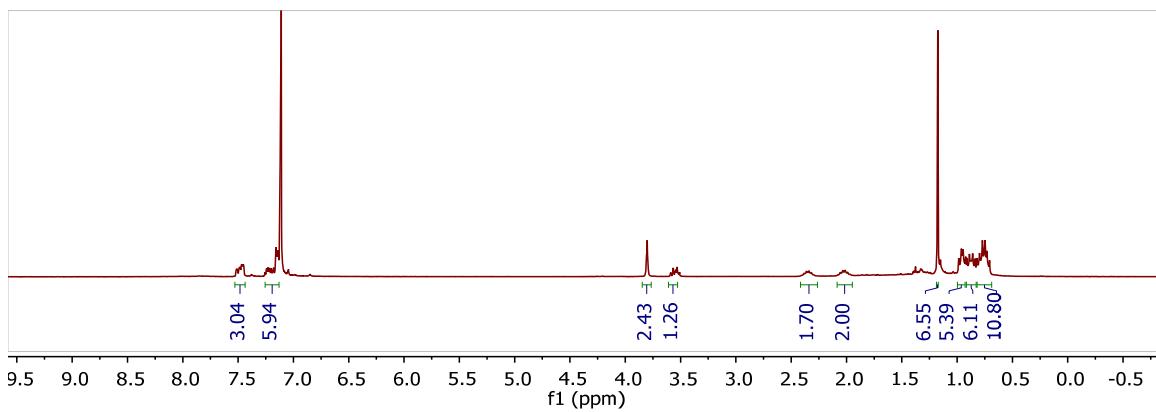


Figure 154. ^1H NMR (300 MHz, C_6D_6) spectrum of $4\text{Ni}(\text{CN}t\text{Bu})\text{-Me}$.

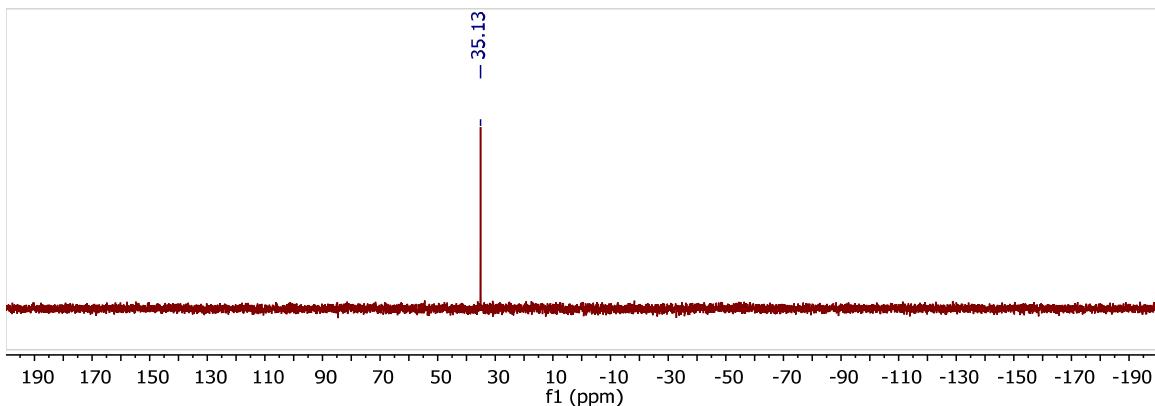


Figure 155. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of **4Ni(CNtBu)-Me**.

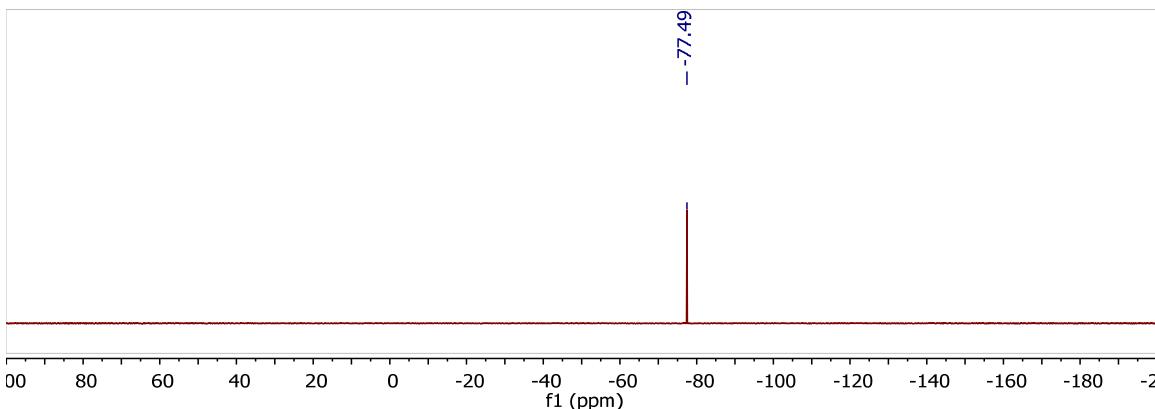


Figure 156. ^{19}F NMR (282 MHz, C_6D_6) spectrum of **4Ni(CNtBu)-Me**.

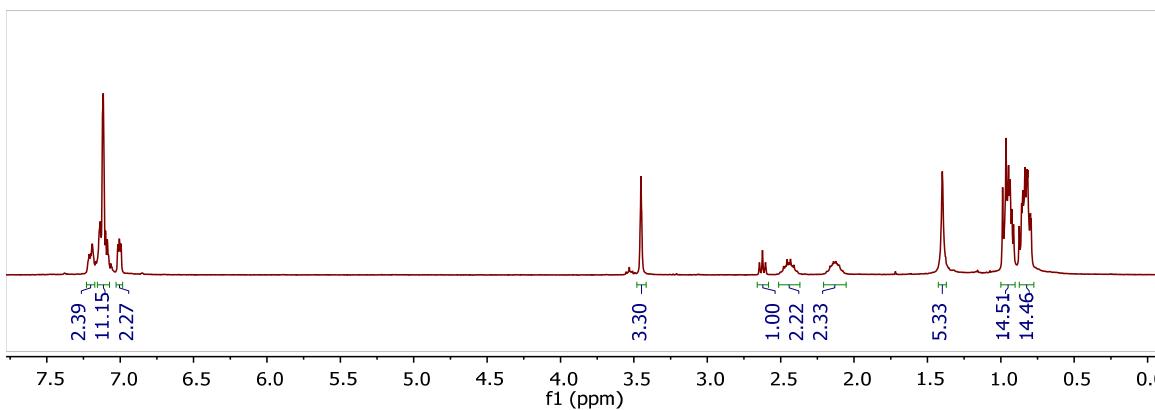


Figure 157. ^1H NMR (300 MHz, C_6D_6) spectrum of **4Ni(MeCN)-Me**.

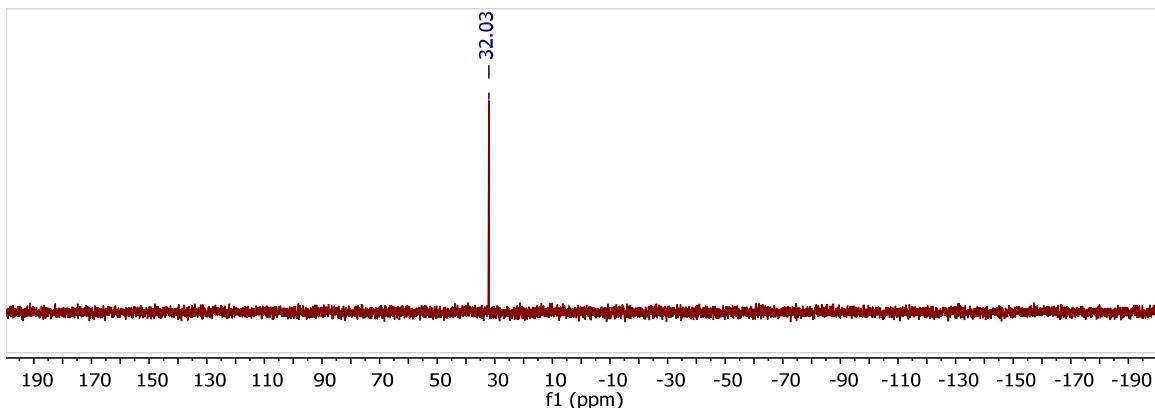


Figure 158. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of **4Ni(MeCN)-Me**.

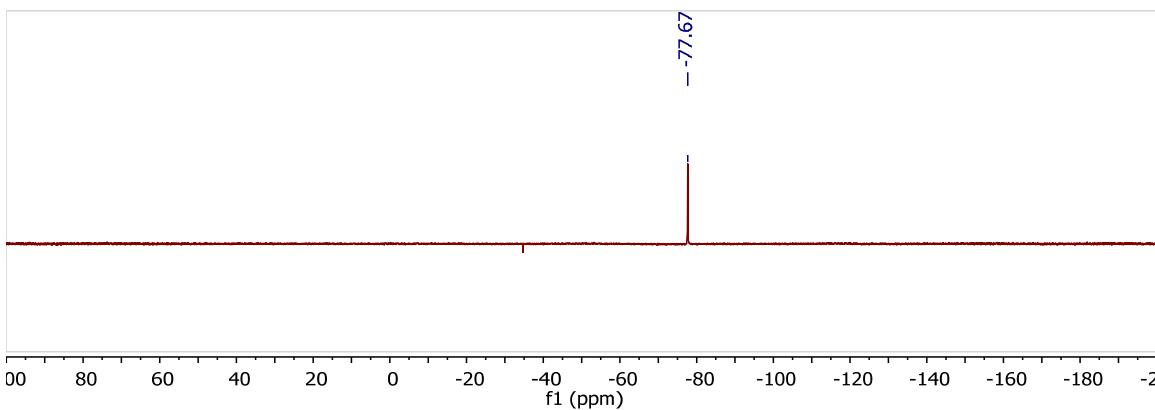


Figure 159. ^{19}F NMR (282 MHz, C_6D_6) spectrum of **4Ni(MeCN)-Me**.

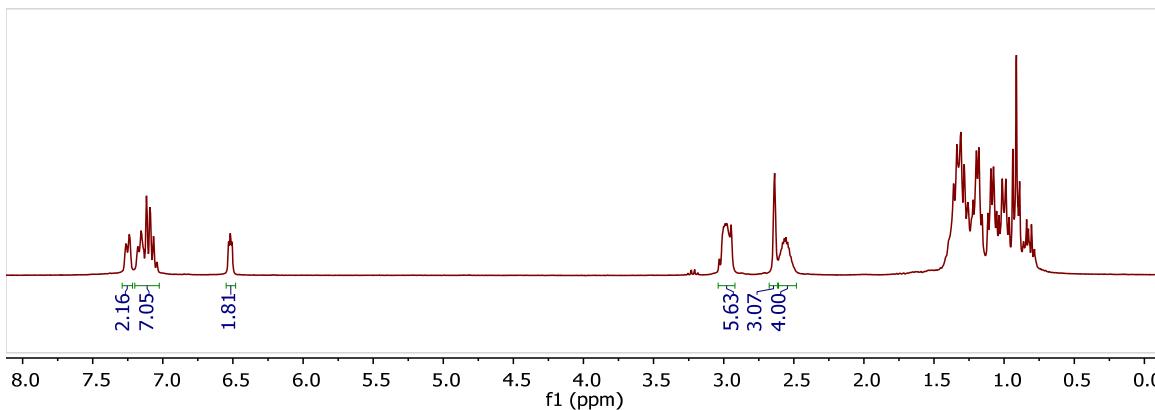


Figure 160. ^1H NMR (300 MHz, C_6D_6) spectrum of **4Ni(CN)-Me**.

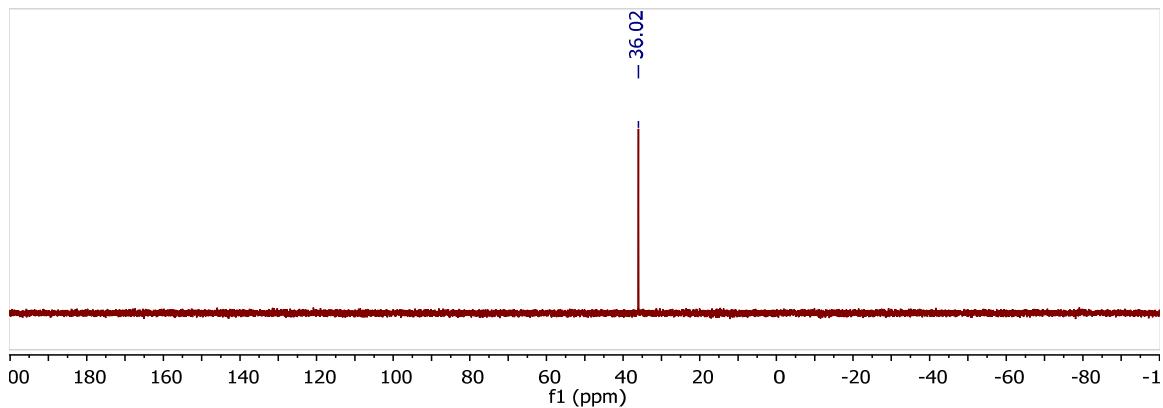


Figure 161. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of **4Ni(CN)-Me**.

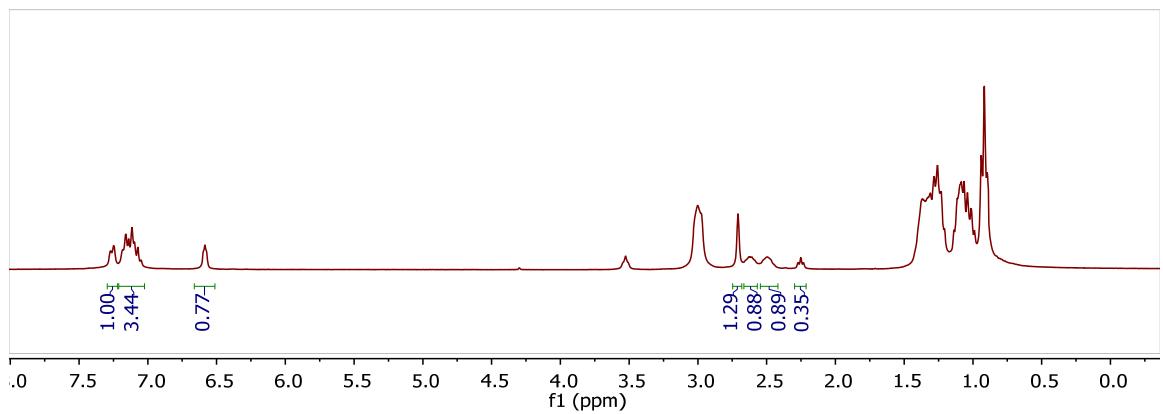


Figure 162. ^1H NMR (300 MHz, C_6D_6) spectrum of **4Ni(N₃)-Me**.

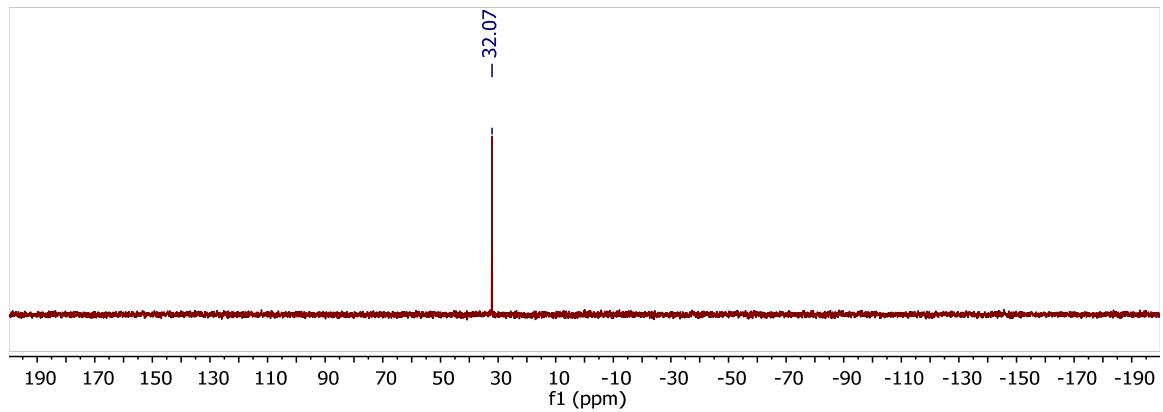


Figure 163. $^{31}\text{P}\{\text{H}\}$ NMR (121 MHz, C_6D_6) spectrum of **4Ni(N₃)-Me**.

Chapter 5

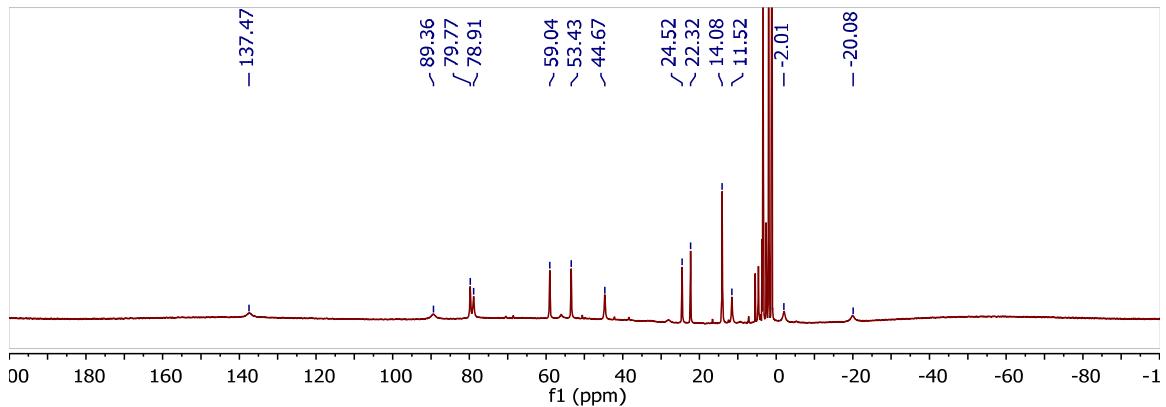


Figure 164. ¹H NMR (300 MHz, CD₃CN) spectrum of **3-Cl**.

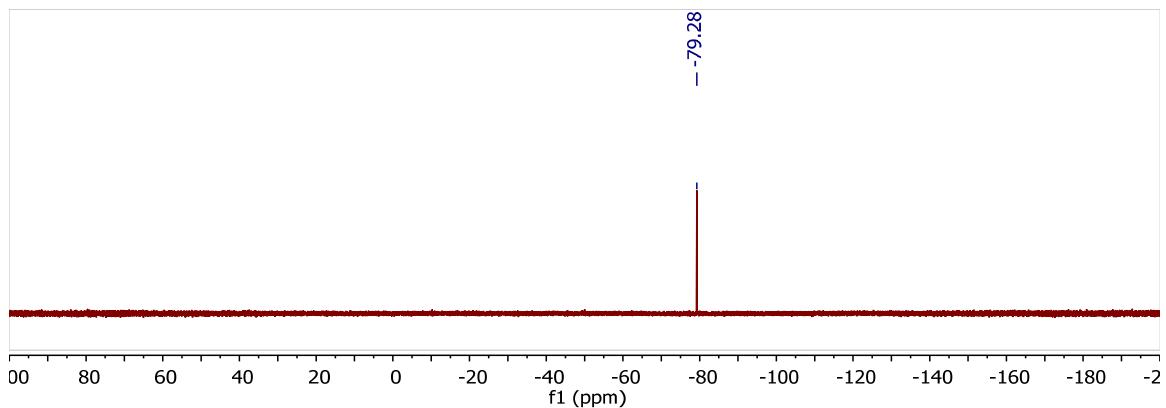


Figure 165. ¹⁹F NMR (282 MHz, CD₃CN) spectrum of **3-Cl**.

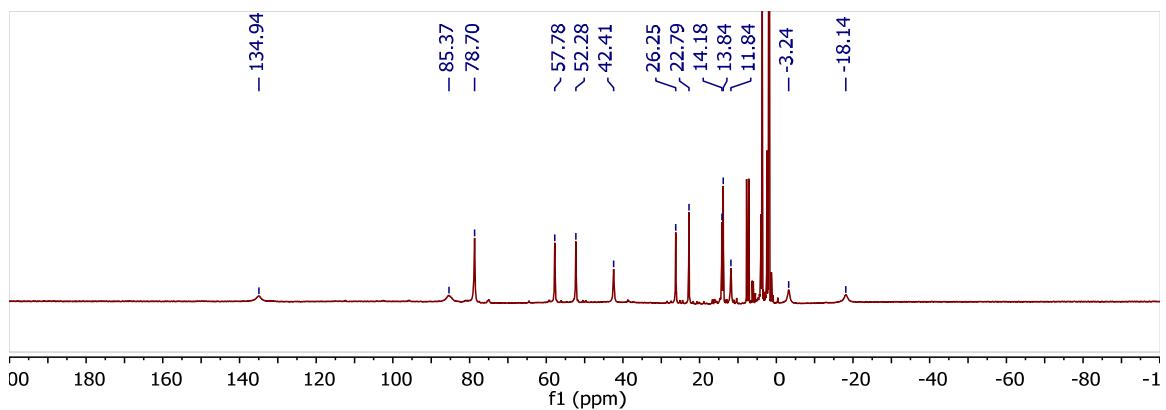


Figure 166. ¹H NMR (300 MHz, CD₃CN) spectrum of **3-N₃**.

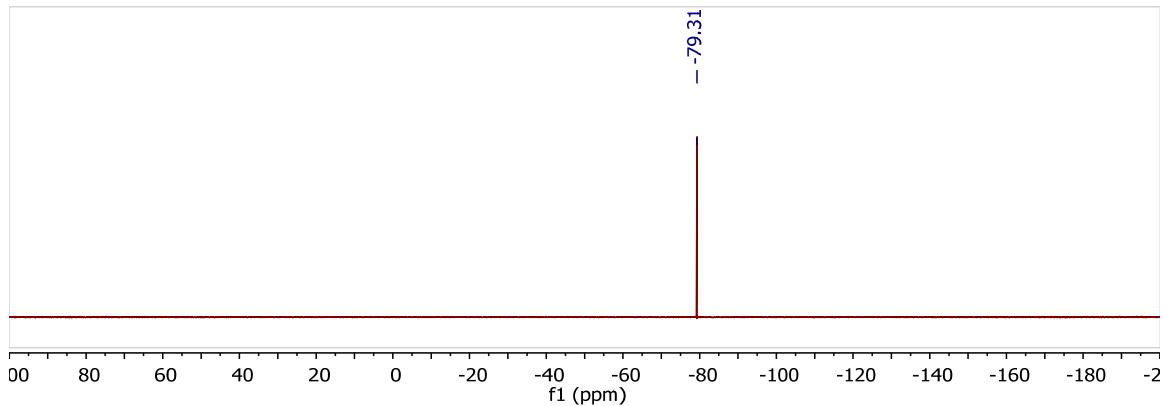


Figure 167. ^{19}F NMR (282 MHz, CD_3CN) spectrum of **3-N₃**.

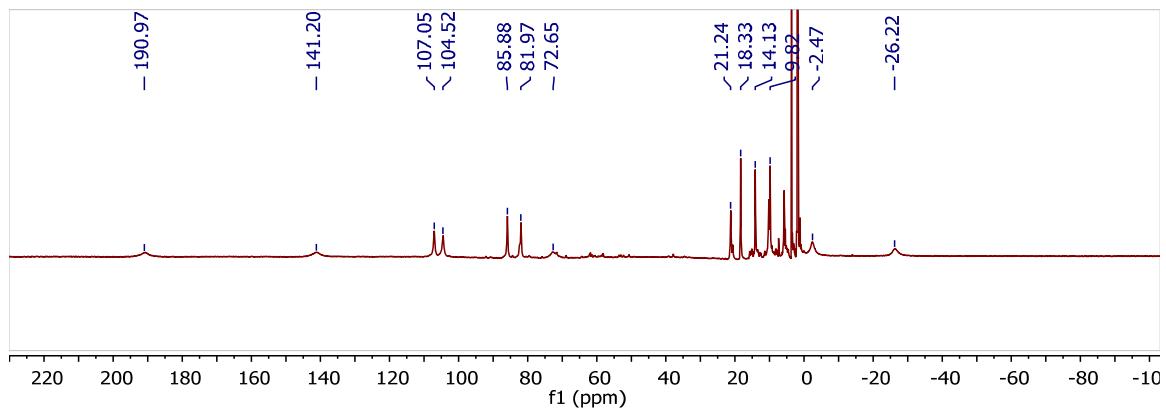


Figure 168. ^1H NMR (300 MHz, CD_3CN) spectrum of **3-Cl** after AgNO_2 addition.

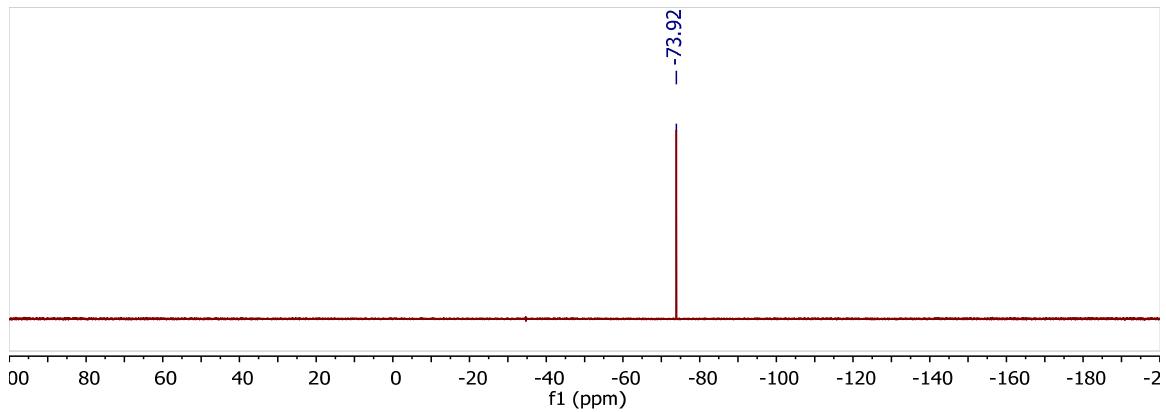


Figure 169. ^{19}F NMR (282 MHz, CD_3CN) spectrum of **3-Cl** after AgNO_2 addition.

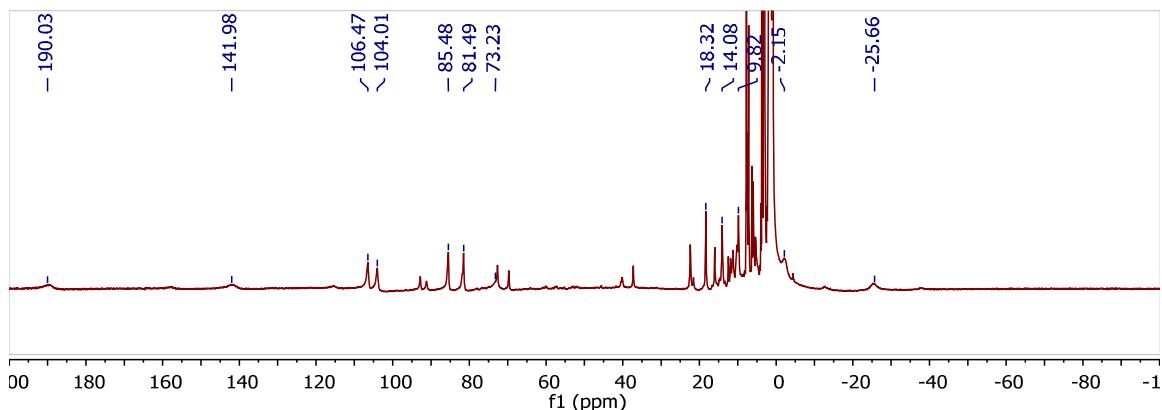


Figure 170. ^1H NMR (300 MHz, CD_3CN) spectrum of **3-Cl** after $[\text{TBA}][\text{IO}_4]$ addition.

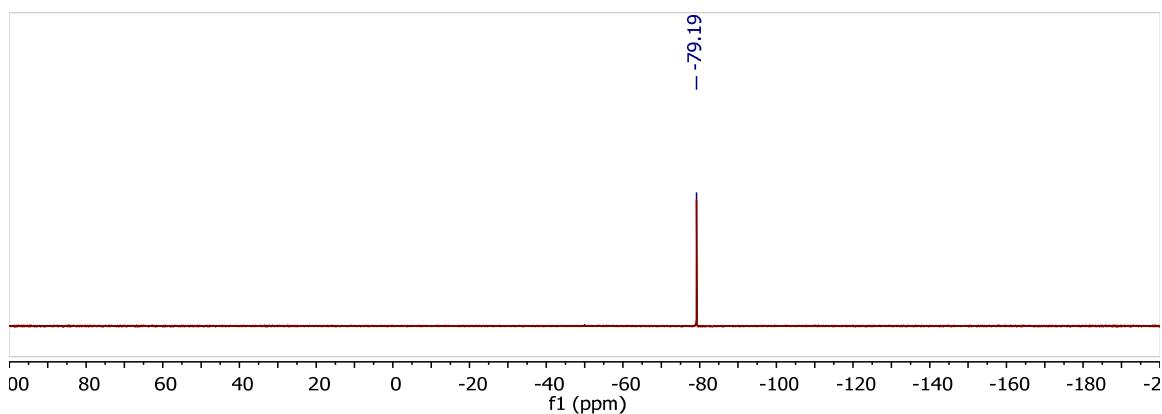


Figure 171. ^{19}F NMR (282 MHz, CD_3CN) spectrum of **3-Cl** after $[\text{TBA}][\text{IO}_4]$ addition.

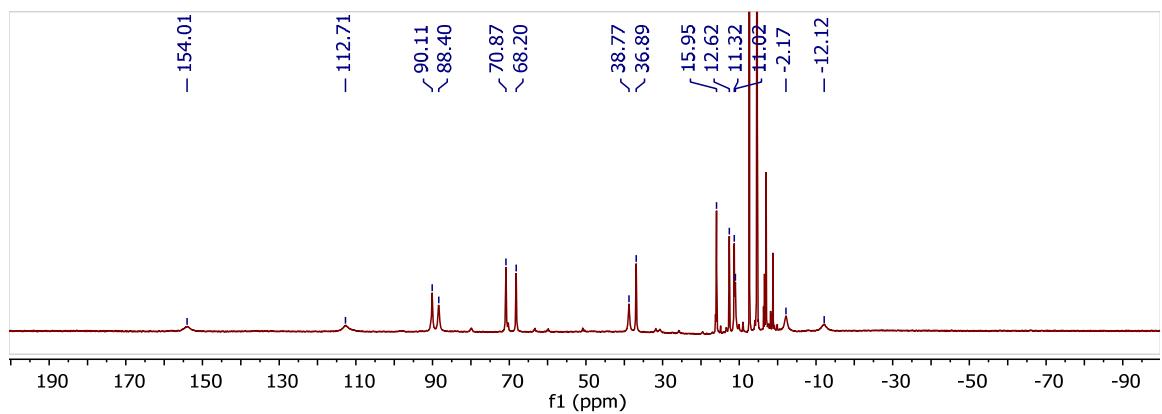


Figure 172. ^1H NMR (300 MHz, CD_2Cl_2) spectrum of **4-Cl**.

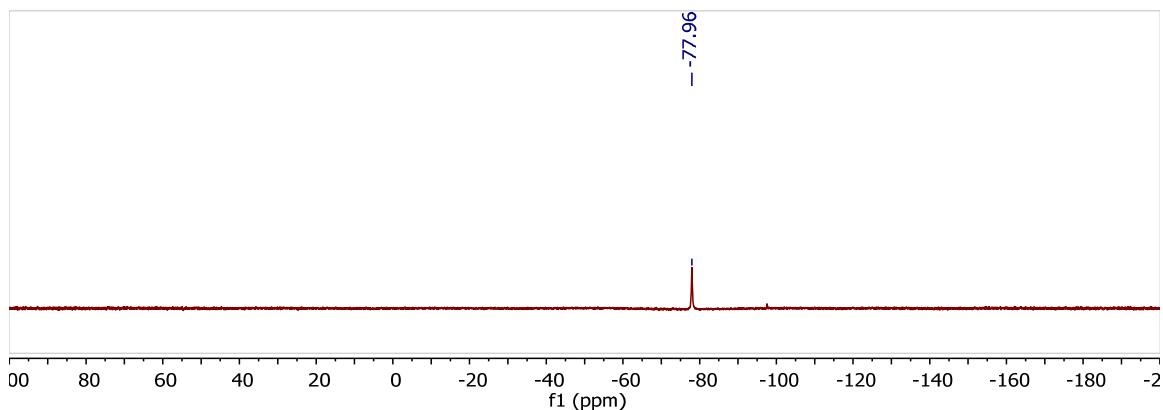


Figure 173. ^{19}F NMR (282 MHz, CD_2Cl_2) spectrum of **4-Cl**.

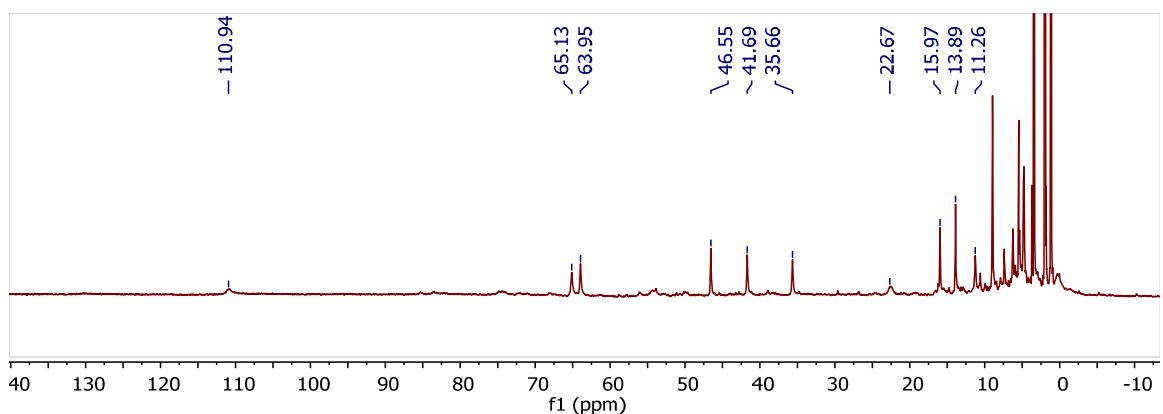


Figure 174. ^1H NMR (300 MHz, CD_3CN) spectrum of **6-Cl**.

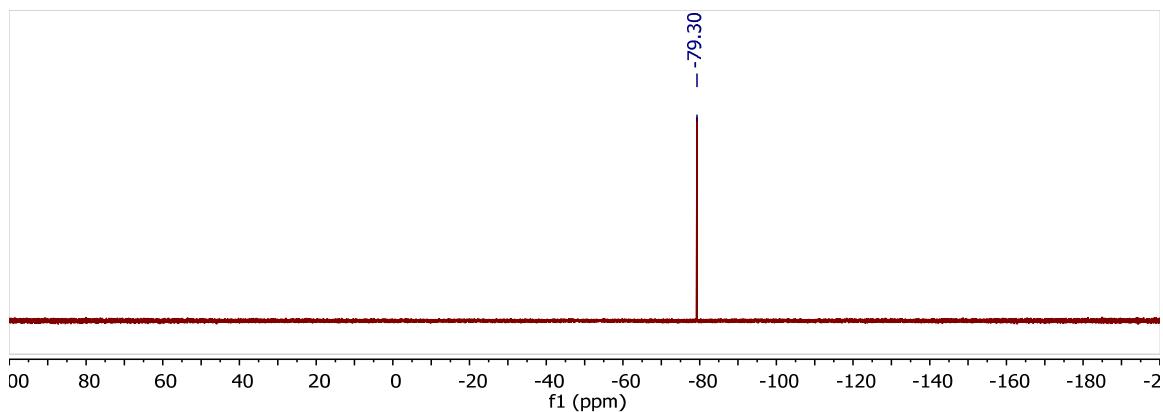


Figure 175. ^{19}F NMR (282 MHz, CD_2Cl_2) spectrum of **6-Cl**.

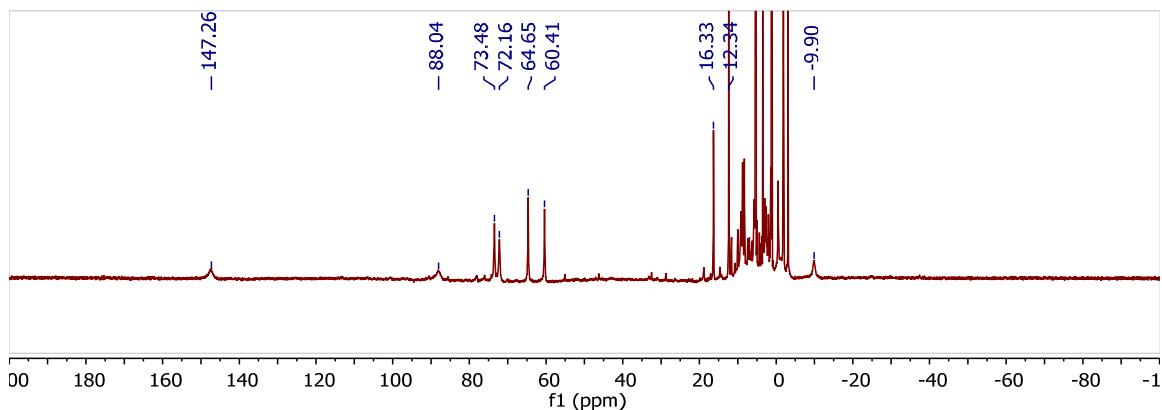


Figure 176. ^1H NMR (300 MHz, CD_2Cl_2) spectrum of **7-Cl**.

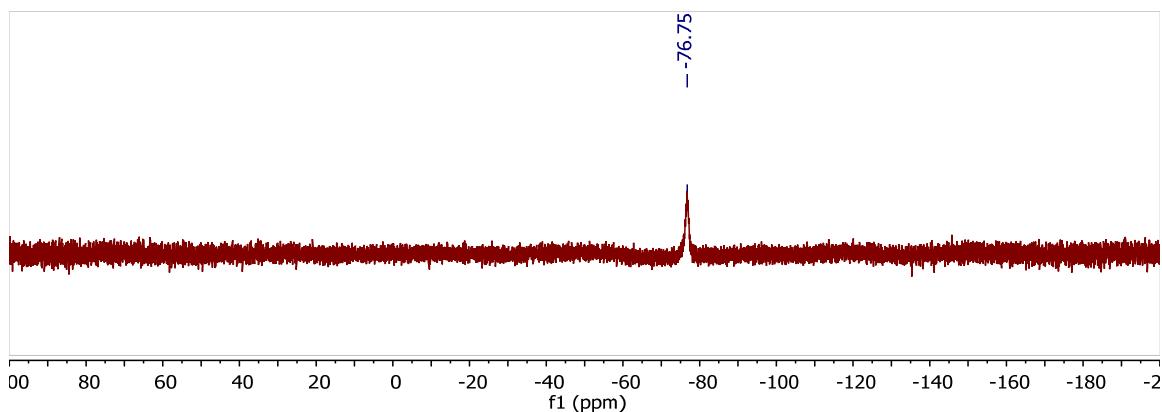


Figure 177. ^{19}F NMR (282 MHz, CD_3CN) spectrum of **7-Cl**.

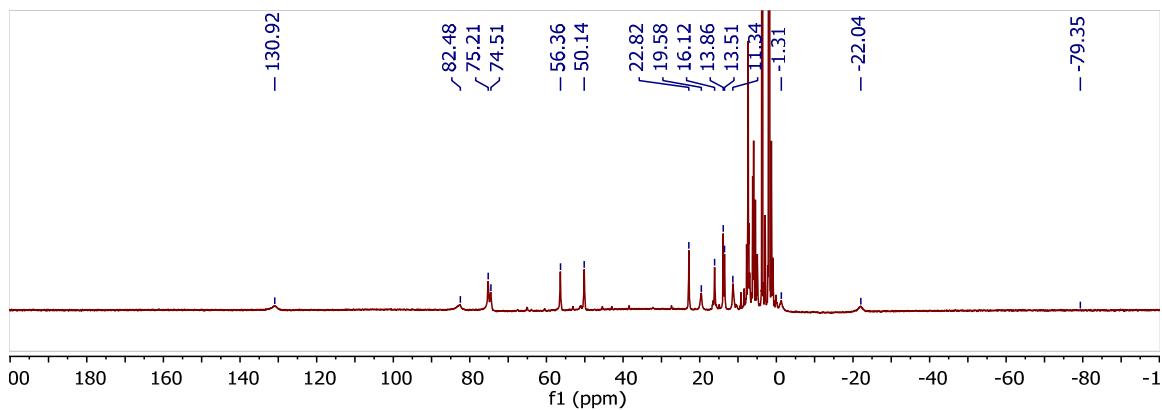


Figure 178. ^1H NMR (300 MHz, CD_3CN) spectrum of **6-OH**.

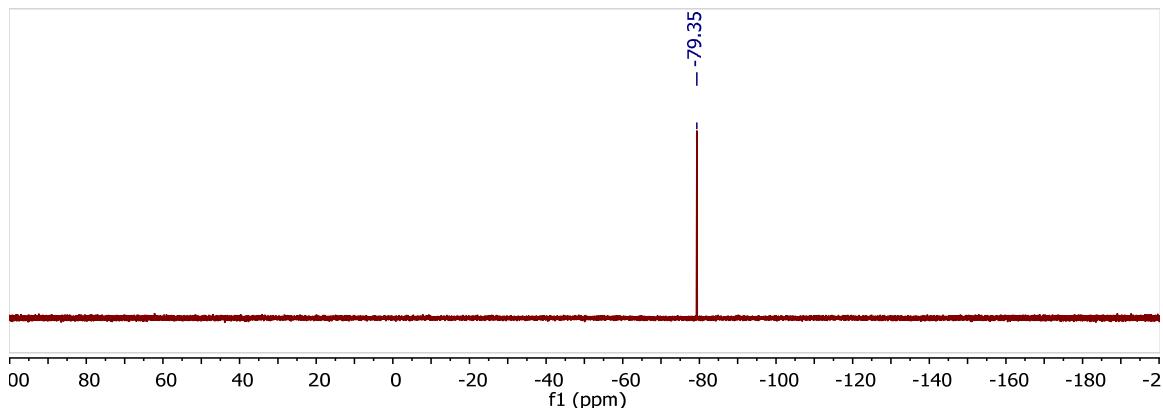


Figure 179. ^{19}F NMR (282 MHz, CD_3CN) spectrum of **6-OH**.

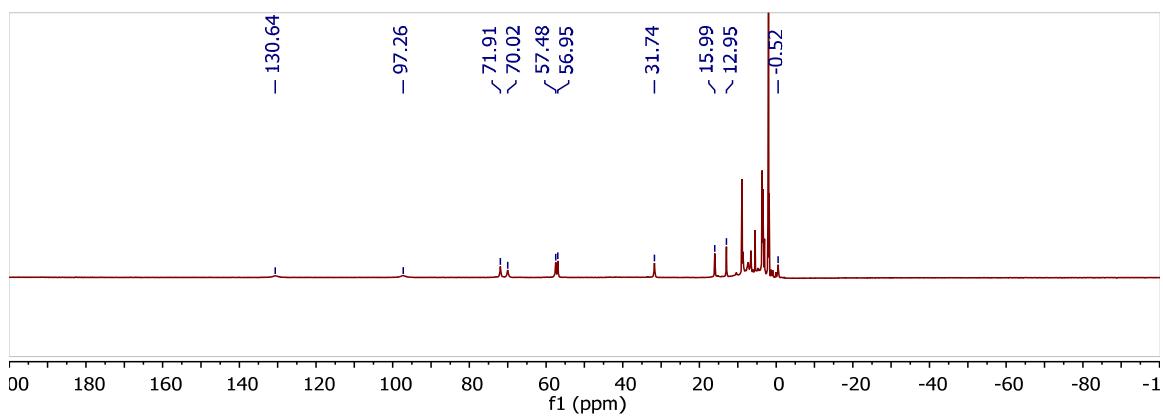


Figure 180. ^1H NMR (300 MHz, CD_3CN) spectrum of **9**.

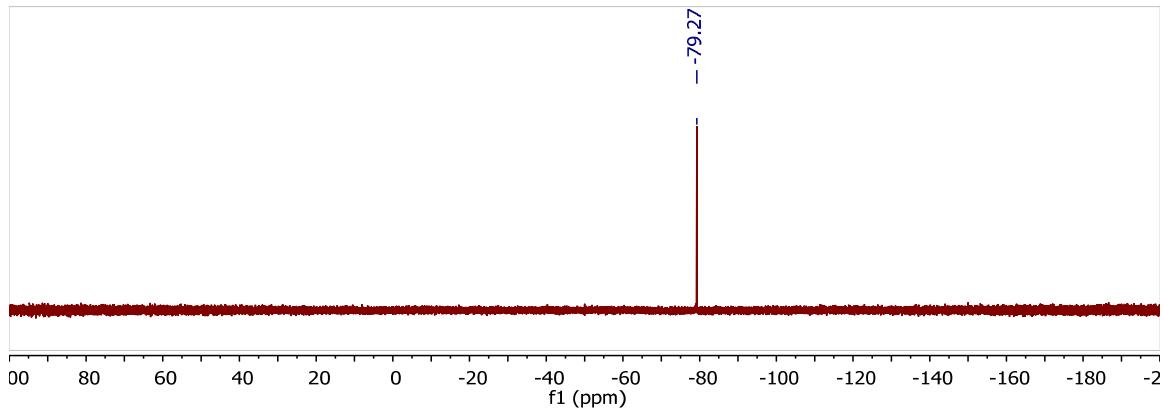


Figure 181. ^{19}F NMR (282 MHz, CD_3CN) spectrum of **9**.

Appendix A

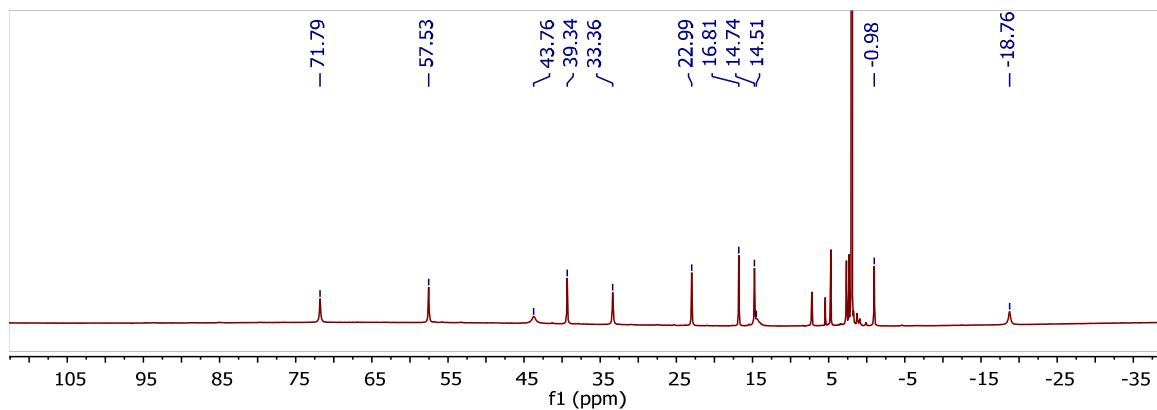


Figure 182. ¹H NMR (300 MHz, CD₃CN) spectrum of **3**.

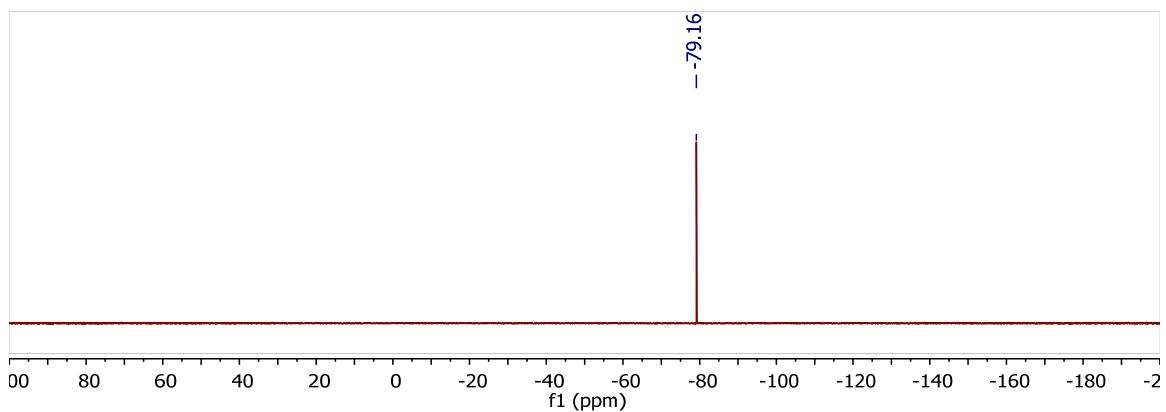


Figure 183. ¹⁹F NMR (282 MHz, CD₃CN) spectrum of **3**.

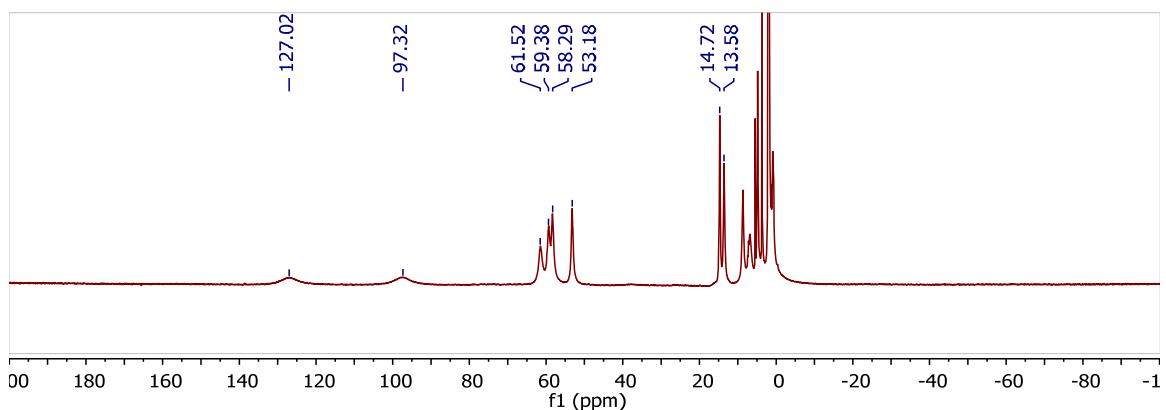


Figure 184. ¹H NMR (300 MHz, CD₃CN) spectrum of **5**.

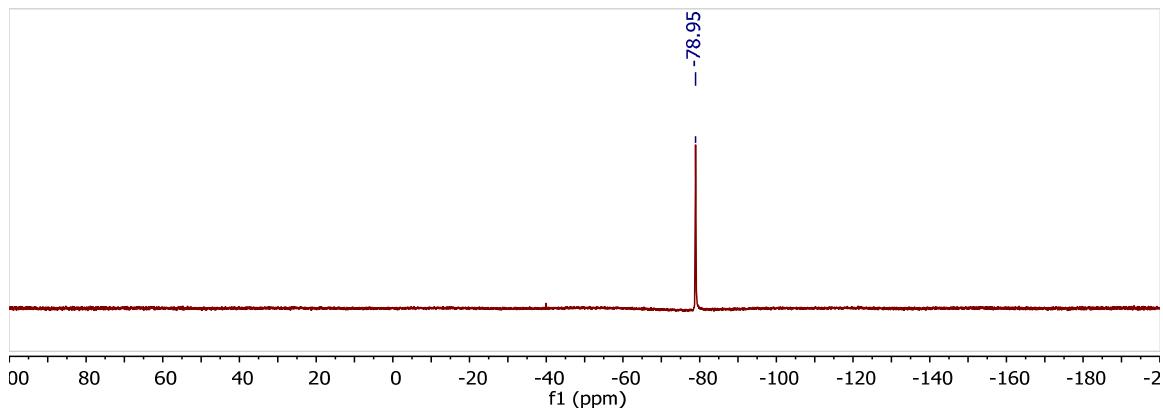


Figure 185. ¹⁹F NMR (282 MHz, CD₃CN) spectrum of **5**.

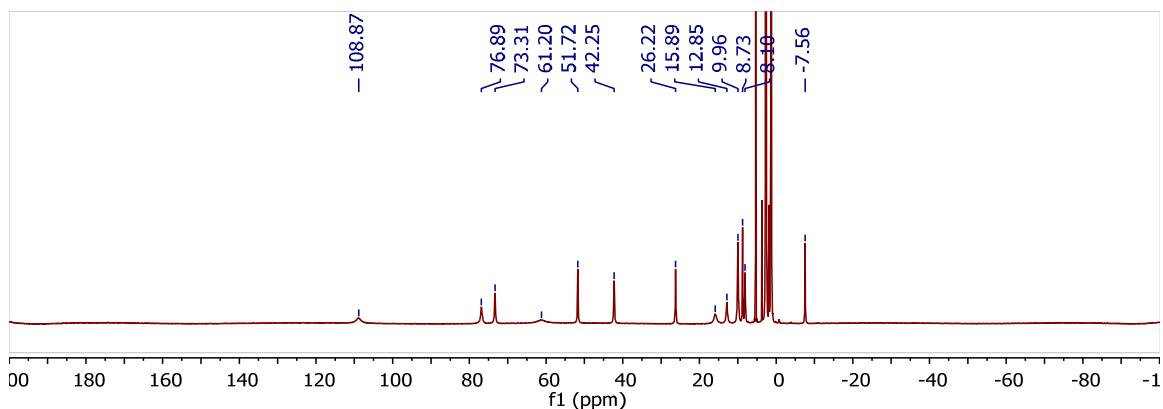


Figure 186. ¹H NMR (300 MHz, CD₂Cl₂) spectrum of **6**.

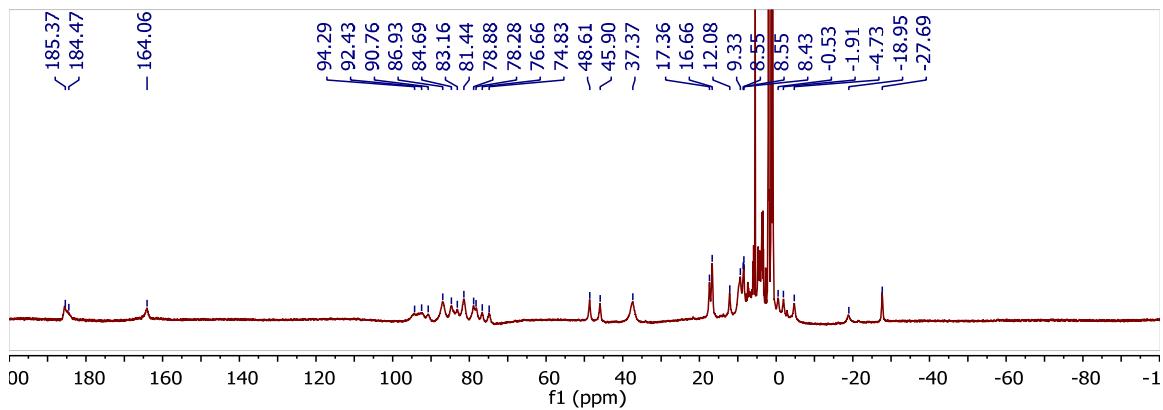


Figure 187. ¹H NMR (300 MHz, CD₃CN) spectrum of **8**.

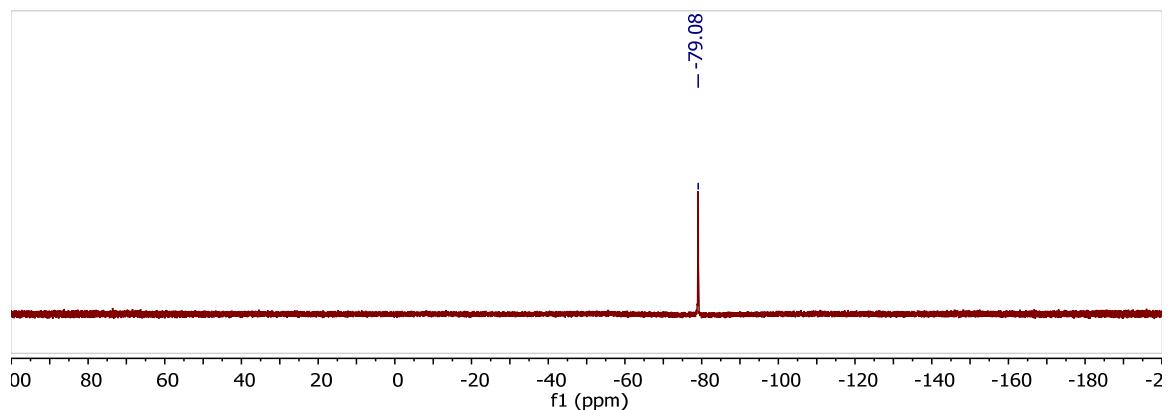


Figure 188. ${}^{19}\text{F}$ NMR (282 MHz, CD_5CN) spectrum of **8**.