

Electronic Supporting Information

Ms. title: Pentamethylcyclopentadienyl Half-Sandwich Hydrazine Complexes of Ruthenium: Preparation and Reactivity

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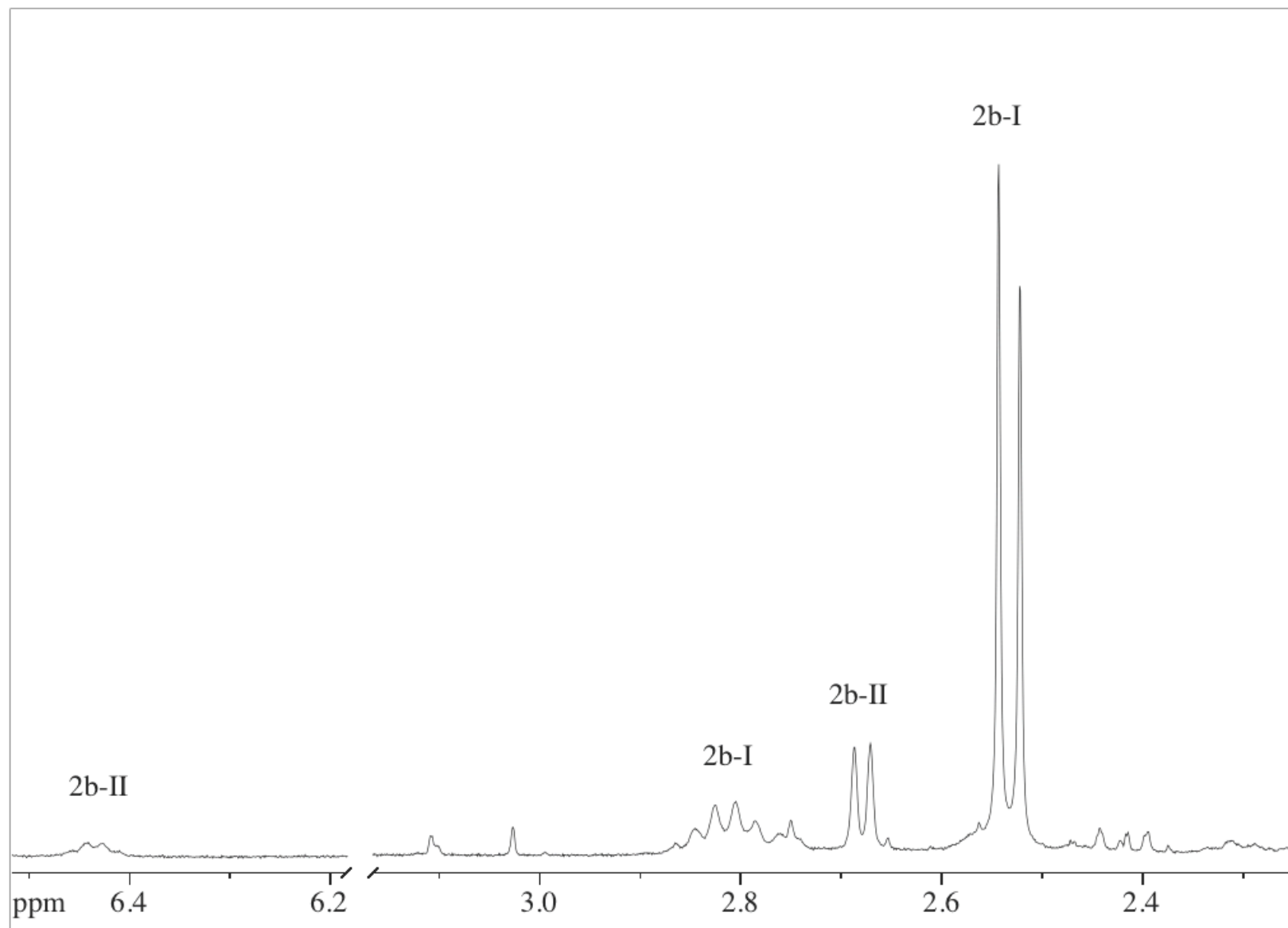


Fig. S1. ^1H NMR spectrum in CD_2Cl_2 of $[\text{Ru}(\eta^5\text{-C}_5\text{Me}_5)(\text{NH}_2\text{NHCH}_3)\{\text{P}(\text{OEt})_3\}]\text{BPh}_4$ (**2b**).

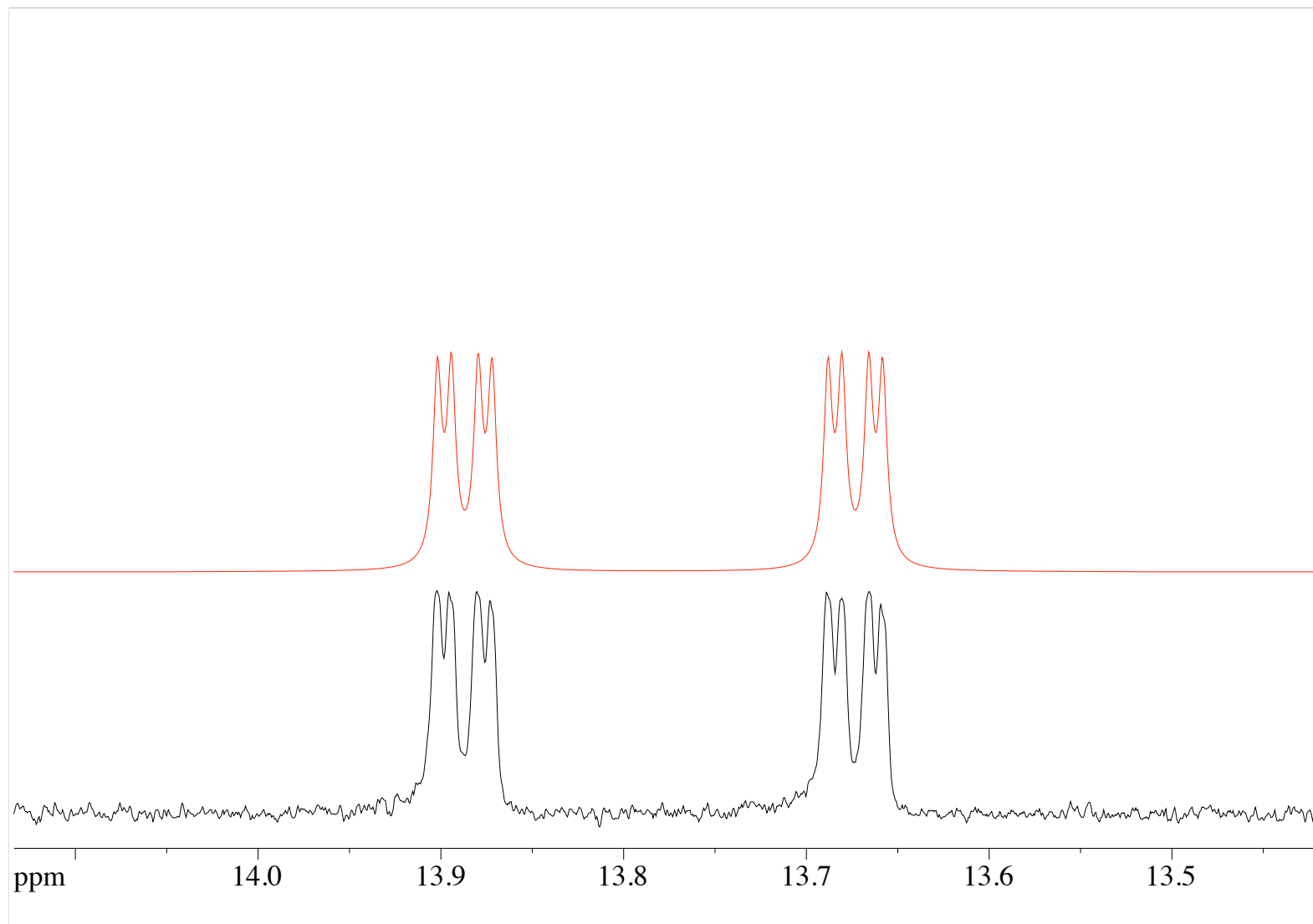


Fig. S2: ¹H NMR spectrum of complex $[\text{Ru}(\eta^5\text{-C}_5\text{Me}_5)(^{15}\text{NH}=\text{NC}_6\text{H}_5)(\text{PPh}_3)\{\text{P}(\text{OEt})_3\}]\text{BPh}_4$ (**9c₁**) in CD_2Cl_2 at 298 K, in the diazene proton region. Lower, experimental spectrum; upper, simulated with the parameters reported in the Experimental section.

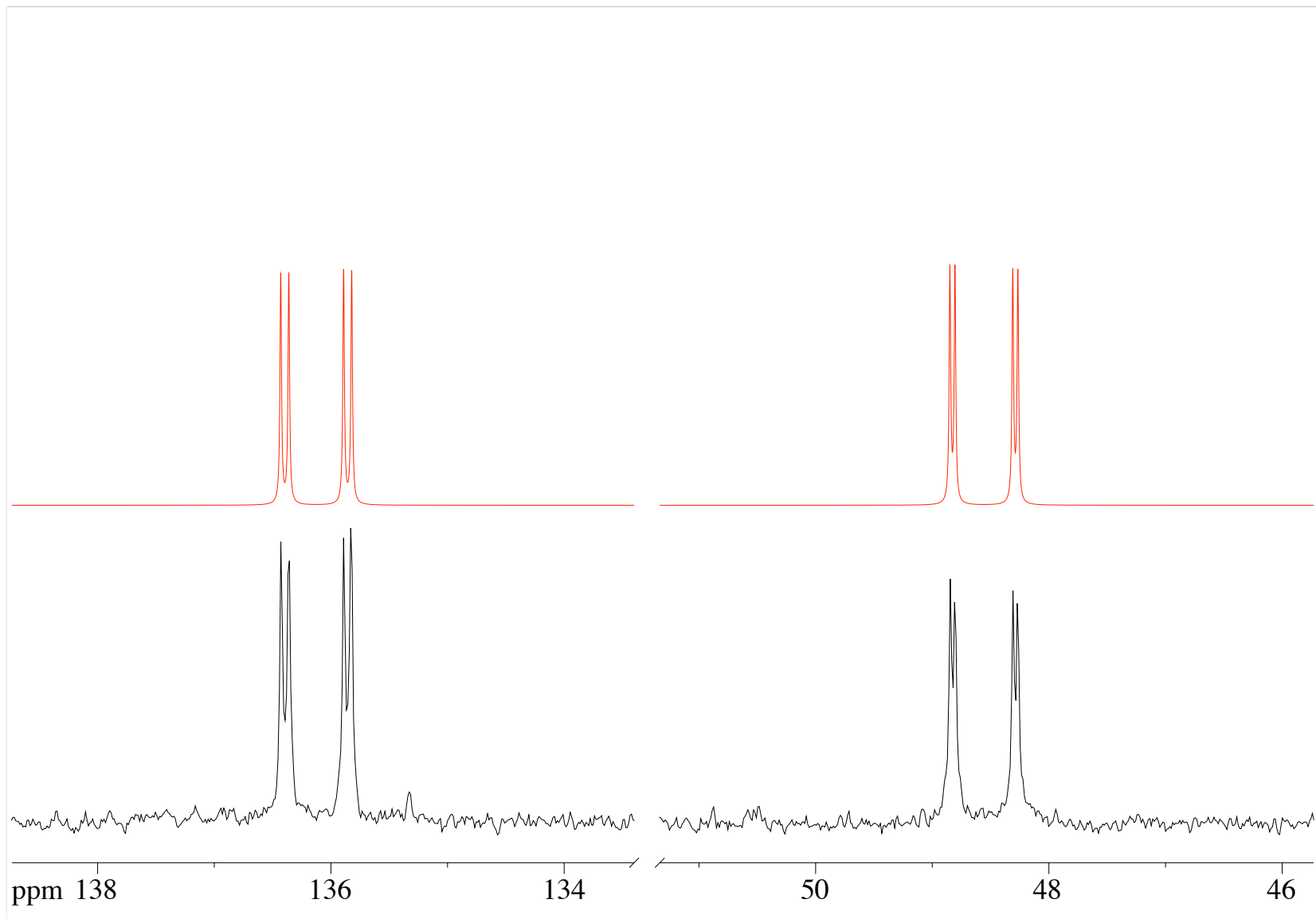


Fig. S3: $^{31}\text{P}\{^1\text{H}\}$ NMR spectrum of complex $[\text{Ru}(\eta^5\text{-C}_5\text{Me}_5)(^{15}\text{NH}=\text{NC}_6\text{H}_5)(\text{PPh}_3)\{\text{P}(\text{OEt})_3\}]\text{BPh}_4$ (**9c1**) in CD_2Cl_2 at 298 K. Lower, experimental spectrum; upper, simulated with the parameters reported in the Experimental section.

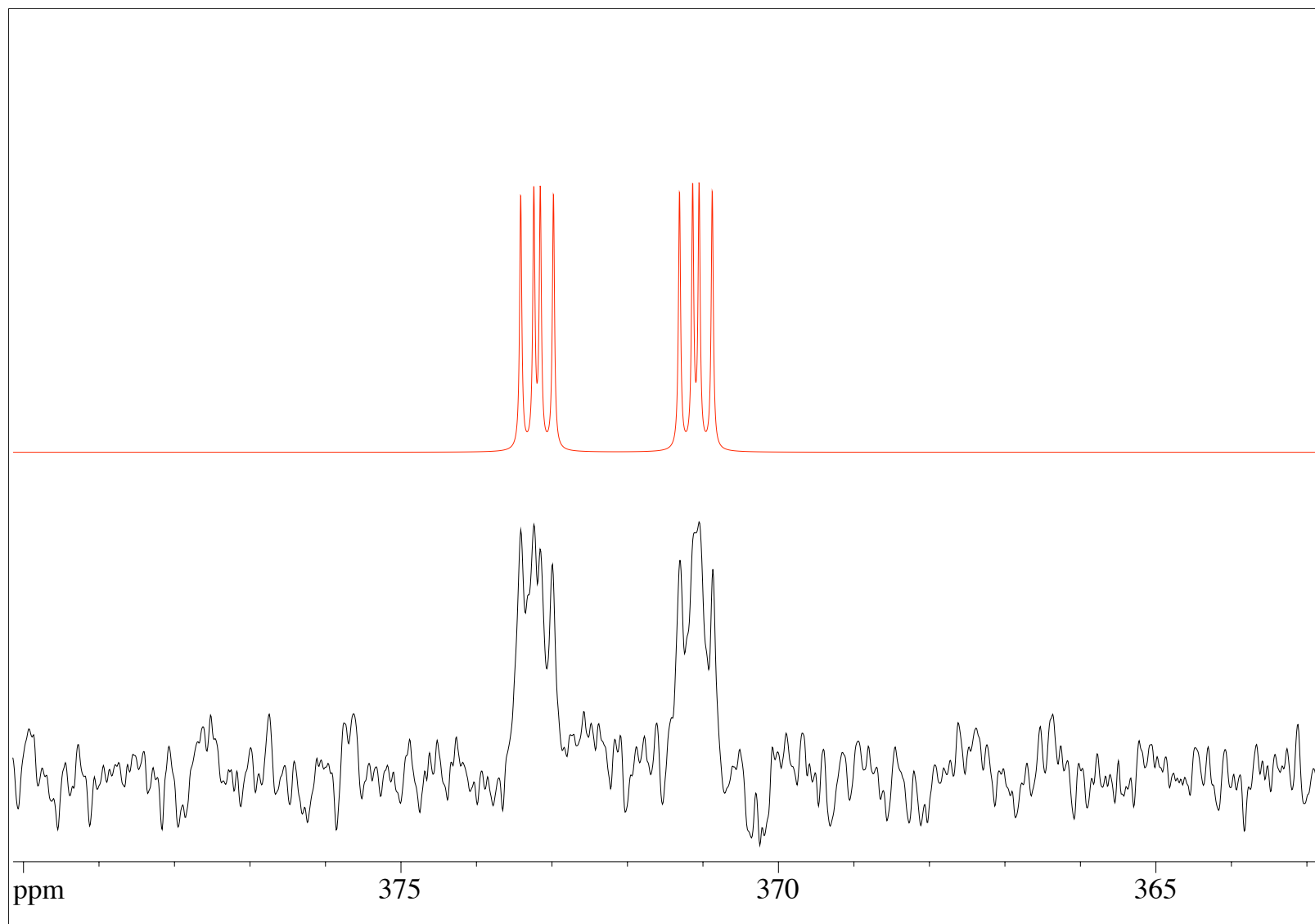


Fig. S4: ^{15}N NMR spectrum of complex $[\text{Ru}(\eta^5\text{-C}_5\text{Me}_5)(^{15}\text{NH}=\text{NC}_6\text{H}_5)(\text{PPh}_3)\{\text{P}(\text{OEt})_3\}]\text{BPh}_4$ (**9c₁**) in CD_2Cl_2 at 298 K. Lower, experimental spectrum; upper, simulated with the parameters reported in the Experimental section.

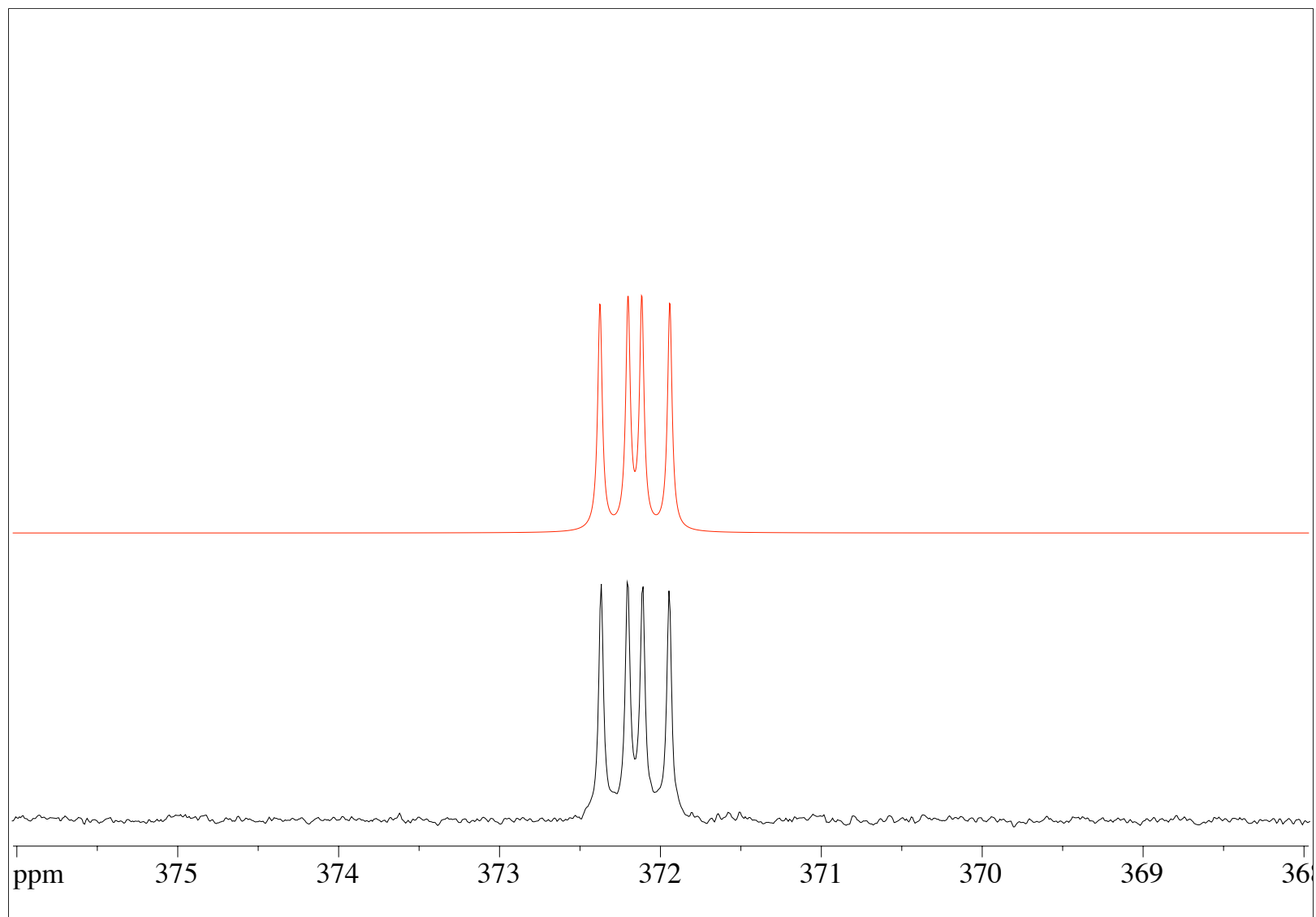


Fig. S5: $^{15}\text{N}\{^1\text{H}\}$ NMR spectrum of complex $[\text{Ru}(\eta^5\text{-C}_5\text{Me}_5)(^{15}\text{NH}=\text{NC}_6\text{H}_5)(\text{PPh}_3)\{\text{P}(\text{OEt})_3\}]\text{BPh}_4$ (**9c₁**) in CD_2Cl_2 at 298 K. Lower, experimental spectrum; upper, simulated with the parameters reported in the Experimental section.

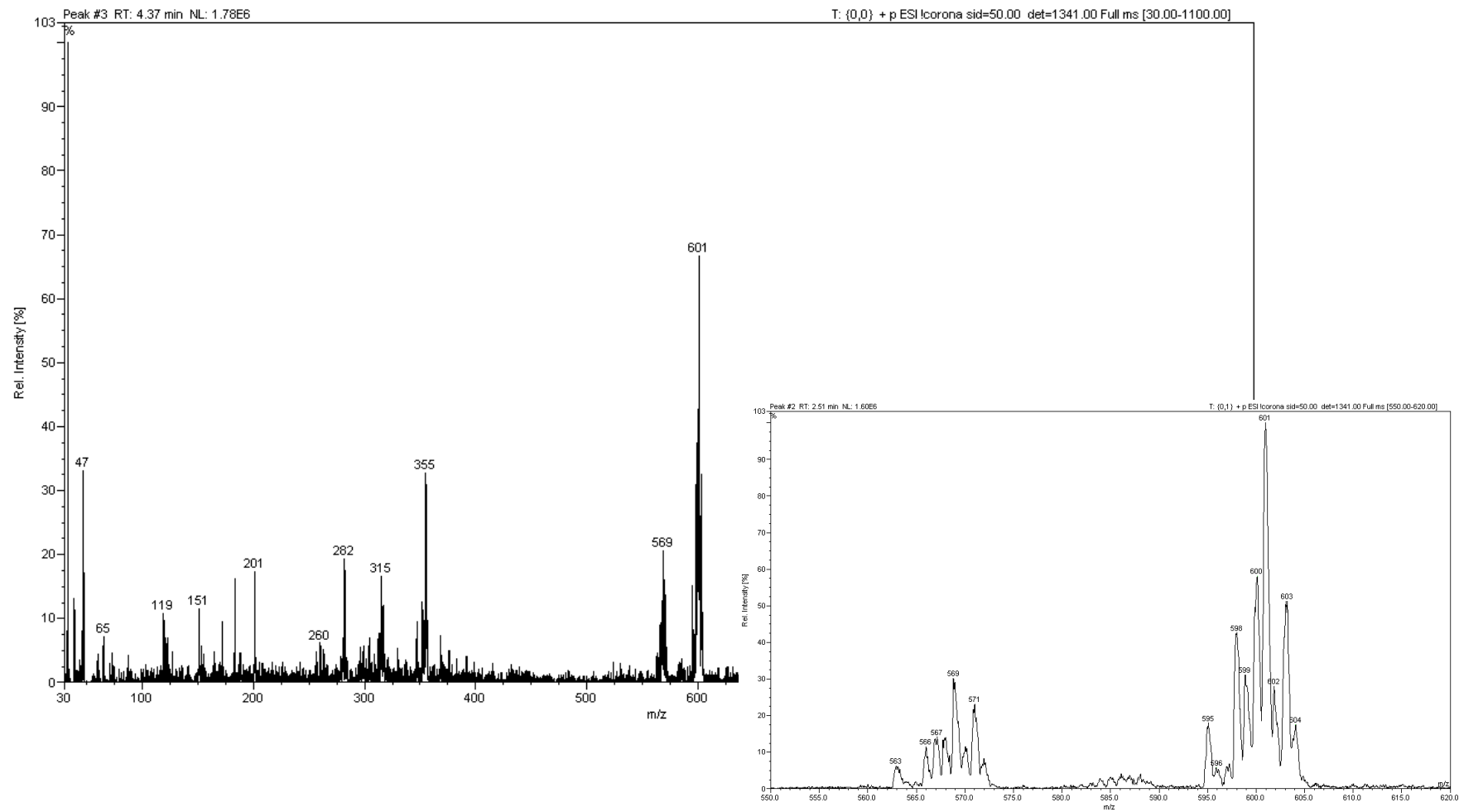


Fig. S6: Full scan ESI(+)-MS spectrum of complex $[\text{Ru}(\eta^5\text{-C}_5\text{Me}_5)(\text{NH}_2\text{NH}_2)\{\text{P}(\text{OEt})_3\}_2]\text{BPh}_4$ (**2a**).

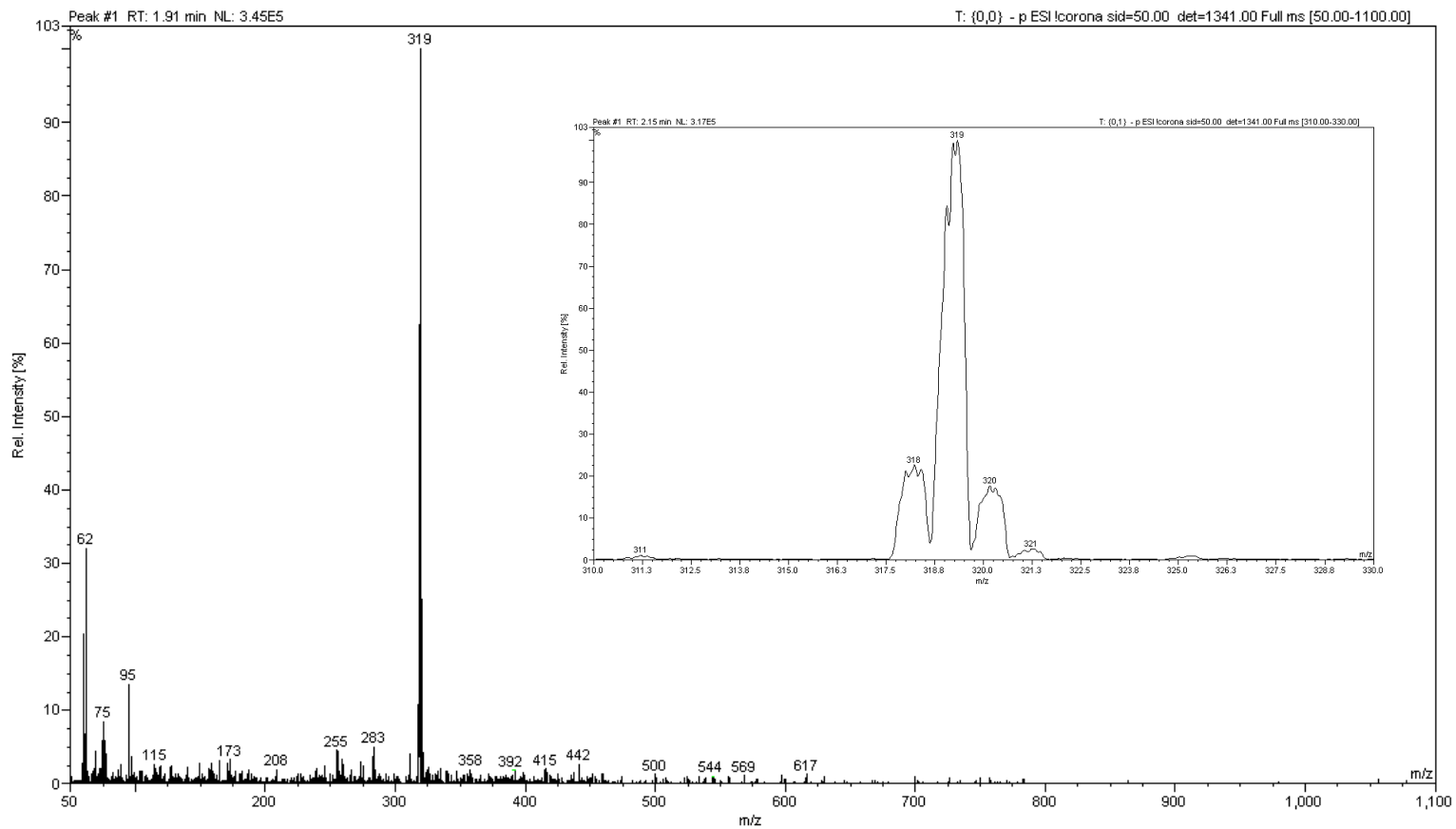


Fig. S8: Full scan ESI(-)-MS spectrum of complex $[\text{Ru}(\eta^5\text{-C}_5\text{Me}_5)(\text{NH}_2\text{NH}_2)\{\text{P}(\text{OEt})_3\}_2]\text{BPh}_4$ (**2a**).