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Electronic Supporting Information

Ms. title: Pentamethylcyclopentadienyl Half-Sandwich Hydrazine Complexes of Ruthenium: Preparation and Reactivity Author: G. Albertin* *et al.*



Fig. S1. ¹H NMR spectrum in CD₂Cl₂ of $[Ru(\eta^5-C_5Me_5)(NH_2NHCH_3){P(OEt)_3}]BPh_4$ (**2b**).



Fig. S2: ¹H NMR spectrum of complex $[Ru(\eta^5-C_5Me_5)(^{15}NH=NC_6H_5)(PPh_3){P(OEt)_3}]BPh_4$ (9c₁) in CD₂Cl₂ at 298 K, in the diazene proton region. Lower, experimental spectrum; upper, simulated with the parameters reported in the Experimental section.



Fig. S3: ³¹P{¹H} NMR spectrum of complex [Ru(η^5 -C₅Me₅)(¹⁵NH=NC₆H₅)(PPh₃){P(OEt)₃}]BPh₄ (**9c**₁) in CD₂Cl₂ at 298 K. Lower, experimental spectrum; upper, simulated with the parameters reported in the Experimental section.



Fig. S4: ¹⁵N NMR spectrum of complex [Ru(η^5 -C₅Me₅)(¹⁵NH=NC₆H₅)(PPh₃){P(OEt)₃}]BPh₄ (**9c**₁) in CD₂Cl₂ at 298 K. Lower, experimental spectrum; upper, simulated with the parameters reported in the Experimental section.



Fig. S5: ¹⁵N{¹H} NMR spectrum of complex [Ru(η^5 -C₅Me₅)(¹⁵NH=NC₆H₅)(PPh₃){P(OEt)₃}]BPh₄ (**9c**₁) in CD₂Cl₂ at 298 K. Lower, experimental spectrum; upper, simulated with the parameters reported in the Experimental section.



 $\label{eq:Fig.S6:Full scan} Fig. S6: Full scan ESI(+)-MS \ spectrum \ of \ complex \ [Ru(\eta^5-C_5Me_5)(NH_2NH_2)\{P(OEt)_3\}_2]BPh_4 \ \textbf{(2a)}.$



Fig. S8: Full scan ESI(-)-MS spectrum of complex $[Ru(\eta^5-C_5Me_5)(NH_2NH_2){P(OEt)_3}_2]BPh_4$ (2a).