# Tuning of ruthenium(II) terpyridine complexes redox potential by coordination to heteroaryl-2-imidazole ligands

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Four new ruthenium(II) terpyridine complexes $[RuCl(Himpy)(tpy)]^+$ **(1)**, $[RuCl(Himpa)(tpy)]^+$ **(2)**, $[RuCl(Himpm)(tpy)]^+$ **(3)** and $[RuCl(Himpz)(tpy)]^+$ **(4)** have been synthesized and well characterized by UV-vis, $^1$H-NMR, ESI-MS, and elemental analysis. Structures of **(1)** and **(4)** have been solved by X-ray crystallography. Electrochemical measurements were performed in order to know the influence of σ-donor/π-acceptor properties of heteroaryl-2-imidazole ligands on redox potentials of all the complexes. Conductivity measurements performed in several solvents indicated 1:1 complex:counter-ion ratio. Electronic absorption spectra showed the MLCT energies to be bathochromically shifted compared to $[Ru(tpy)_2]^{2+}$ ($\lambda = 475$ nm). Chemical shifts of all heteroaryl and imidazole protons were upfield and downfield shifted, respectively. Cyclic voltammetry displayed all the oxidation potentials around 0.3 V vs. $Fc/Fc^+$ couple, with complex **(1)** exhibiting the less positive oxidation potential.

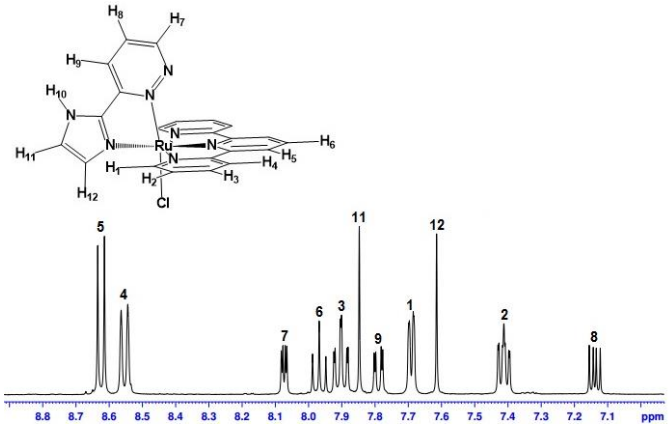


**Figure 1.** $^1$H-NMR spectrum of **(2)** in DMSO-$d_6$.

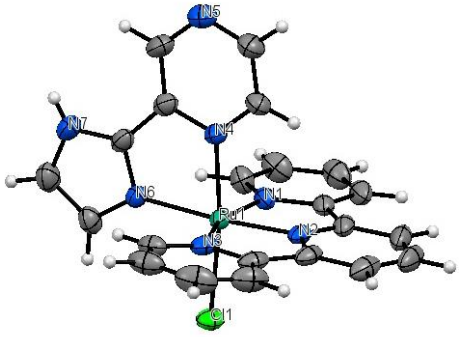


**Figure 2.** X-ray structure of **(4)**.

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