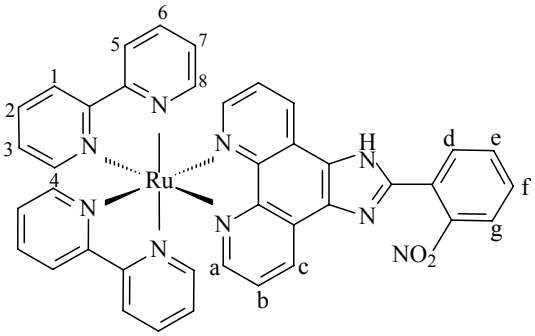
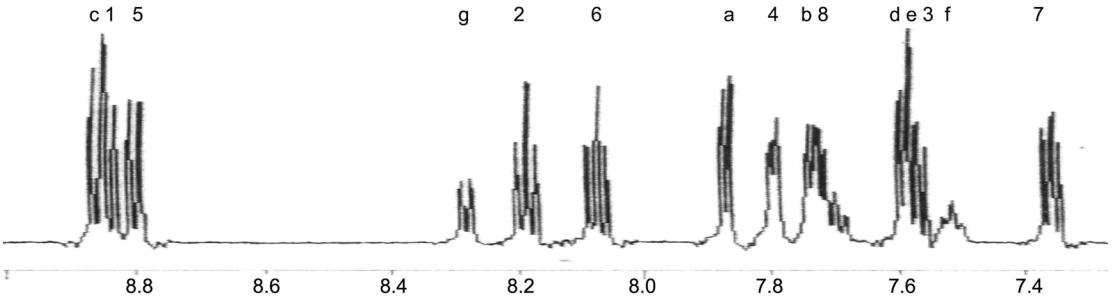
The spectra of NMR as well as their definitions are given below.

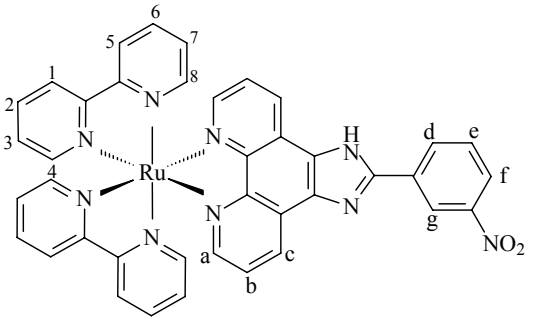
1. $[Ru(bpy)_2(o\text{-npip})]^{2+}$

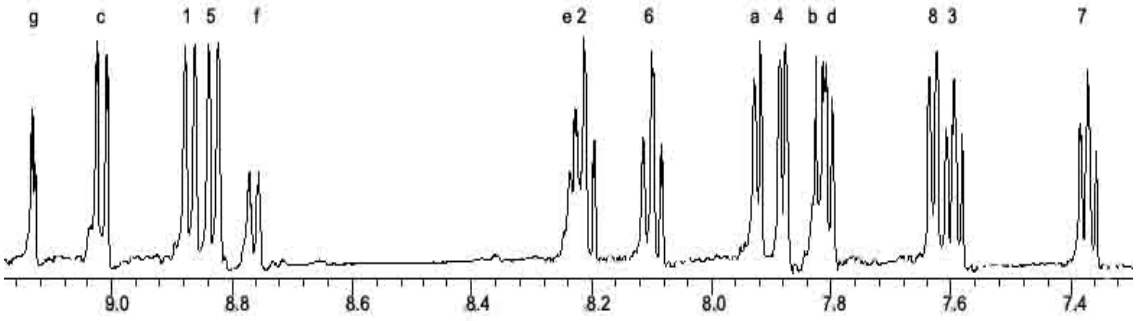




^{1}H NMR [$(CD_3)_2SO$]: δ 8.87–8.79 (m, 6 H), 8.29 (d, 1 H), 8.20 (t, 2 H), 8.09 (t, 2 H), 7.88 (d, 2 H), 7.80 (d, 2 H), 7.74–7.68 (m, 4 H), 7.60–7.55 (m, 4 H), 7.53 (t, 1 H) and 7.37 (t, 2 H).

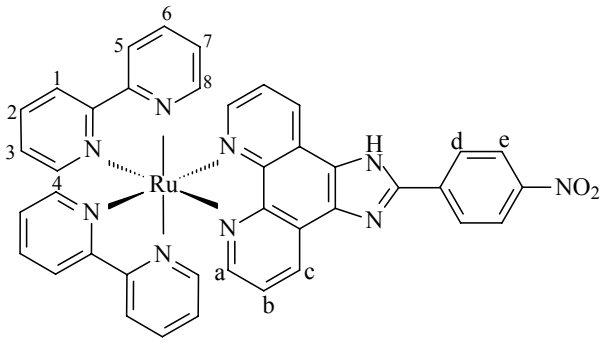
2. $[Ru(bpy)_2(m\text{-npip})]^{2+}$

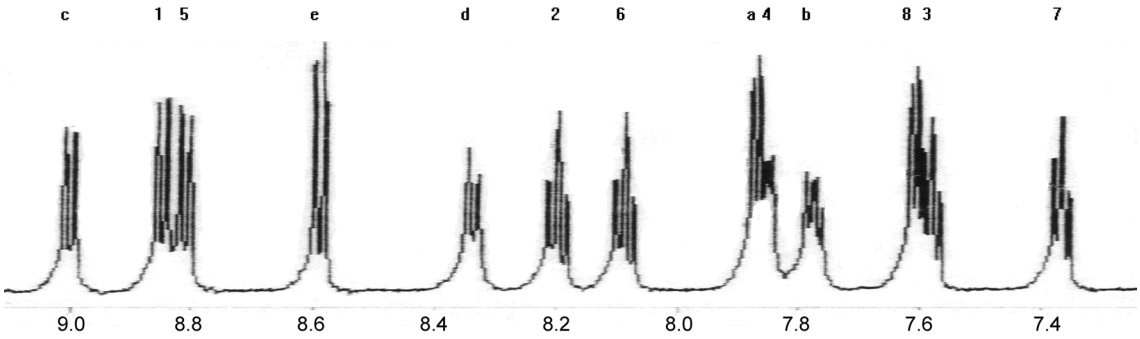




^{1}H NMR [$(CD_3)_2SO$]: δ 9.14 (s, 1 H), 9.06 (d, 2 H), 8.87 (d, 2 H), 8.84 (d, 2H), 8.75 (d, 1 H), 8.25-8.20 (m, 3 H), 8.12 (t, 2 H), 7.91 (d, 2H), 7.88 (d, 2H), 7.83-7.80 (m, 3 H), 7.63 (d, 2 H), 7.60 (t, 2 H), 7.38 (t, 2H).

3. $[Ru(bpy)_2(p\text{-npip})]^{2+}$





^{1}H NMR [$(CD_3)_2SO$]: δ 9.00 (d, 2 H), 8.86 (d, 2 H), 8.82 (d, 2 H), 8.60 (d, 2H), 8.34 (d, 2H), 8.21 (t, 2 H), 8.10 (t, 2 H), 7.87 (d, 2 H), 7.85 (d, 2H), 7.79 (t, 2H), 7.61 (d, 2 H), 7.59 (t, 2 H), 7.38 (t, 2 H).