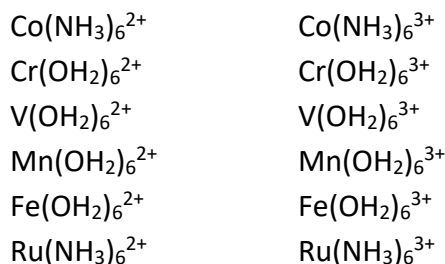


Problem Set 6

Ch 153a – Winter 2021

Due: 12 February, 2021

- 1) Determine the electronic configurations and ground-state term symbols for the following ions:



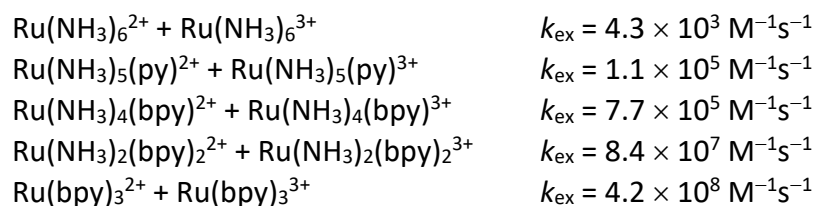
Considering just the central metal and six atoms bonded to it, which of these ions, if any, do you expect to be substantially distorted from octahedral geometry. Describe the expected distortion and explain your reasoning.

- 2) Read the Article by Rudy Marcus and Norman Sutin posted on the Ch153a website.
3) Consider the rates of electron exchange in the following metal complexes:



Suggest an explanation for the relative rates of electron exchange on the basis of the ground-state electronic structures of the 2+ and 3+ ions.

- 4) The rates of electron exchange between Ru^{3+} and Ru^{2+} complexes exhibit the following trend (py = pyridine; bpy = 2,2'-bipyridine):



Suggest an explanation for the relative rates of electron exchange in these Ru complexes?

5) Explain the following reaction products and relative rates of reduction by the $\text{Cr}(\text{OH}_2)_6^{2+}$ ion in aqueous solution:

