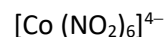
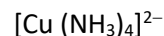
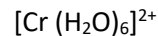
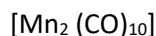
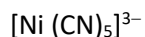
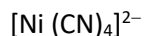
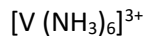
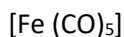
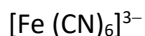
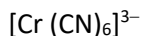




Tutorial/Assignment -2

1. Predict hybridization in these complexes. Use orbital diagram/mixing. Depict σ/π bonding also.



2. Compare the crystal field splitting between octahedral and square planar fields.
3. Why is crystal field splitting of f-orbitals smaller than d-orbitals?
4. Between Cis- and trans- $[\text{Cu}(\text{en})_2(\text{H}_2\text{O})_2]^{2+}$ complexes which one is more stable and why?
5. Predict the distortion of KCuF_3
6. What is dynamic J-T distortion. Predict J-T distortion in $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$ and $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$
7. Discuss the trend in crystal field splitting energies (Δ) for $[\text{Ru}(\text{OH}_2)_6]^{2+}$, $[\text{Ru}(\text{ox})_3]^{3-}$, $[\text{Ru}(\text{OH}_2)_6]^{3+}$ ions.
8. Discuss the trend in crystal field splitting energy (Δ) of cobalt-complexes: CoF_6^{2-} , $\text{Co}(\text{en})_3^{3+}$, and $\text{Co}(\text{NH}_3)_6^{2+}$.
9. Draw the crystal field splitting (CFT) of distorted octahedral complexes (Z-compression and Z-elongation) and compare it with Octahedral complexes.
10. Discuss the trend (lower to higher) in crystal field splitting energy(Δ) of complexes: $[\text{Rh}(\text{NH}_3)_6]^{3+}$, $\text{Co}(\text{NH}_3)_4^{3+}$, CoF_6^{3-} , $[\text{Co}(\text{NH}_3)_6]^{3+}$
11. Predict absorption spectra of $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$
12. Between $[\text{Ni}(\text{H}_2\text{O})_6]^{2+}$ and $[\text{Ni}(\text{CN})_6]^{4-}$ complexes which one is more distorted and why?
13. Do you think CFT can classify CO molecule as a strong ligand? Justify your answer.

Home Assignments: Problems in Chapter 14 (Page no. 459-460) and Chapter 15 (Page no. 492-494) of book (Inorganic Chemistry by Huheey, Keiter, Keiter & Medhi, 4th edition).