2019 CHEM2C: Assignment 6

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Due date: May 28 2019 (in class). Keep everything brief. Respect significant figures and units.

1. Given the following descriptions, write the formula, the name, and make a sketch of the associated coordination complex or complex ion:

   (a) Linear Ag^{+} complex ions having CN^{-} ligands.

   (b) Tetrahedral Cu^{+} complex ions having H_2O ligands.

   (c) Tetrahedral Mn^{2+} complex ions having oxalate (bidendate $C_2O_4^{2-}$) ligands.

   (d) Square planar Pt^{2+} with all NH_3 ligands.

   (e) Octahedral Fe^{3+} with ethylenediamine (en) ligands.

   (f) Octahedral Co^{2+} with Cl^{-} ligands.

2. Write out the formulas and sketch the structures of:

   (a) *cis*-dichloroethylenediamineplatinum(II).

   (b) *trans*-diamminedichloroplatinum(II).

   (c) *trans*-dichlorobis(ethylenediamine)cobalt(II).

   (d) *cis*-tetraamminechloronitrocobaltate(III).

   (e) *trans*-tetraamminechloronitrocobaltate(III).

   (f) *trans*-diaquobis(ethylenediamine)copper(II).

3. Draw and name all geometrical and linkage isomers of $Co(NH_3)_4(NO_2)_2$.

4. The $[Co(NH_3)_6]^{3+}$ ion is diamagnetic but the $[Fe(H_2O)_6]^{2+}$ ion is paramagnetic. Sketch the crystal-field splitting for both and discuss the spin state (high/low) in the context of weak and strong ligands.