

## Nomenclature and Isomerism Lab (Brown & LeMay)

- 23.35 Write the formula for each of the following compounds, being sure to use brackets to indicate the coordination sphere:
- hexaamminechromium(III) nitrate
  - tetraamminecarbonatocobalt(III)sulfate
  - dichlorobis(ethylenediamine)platinum(IV) bromide
  - potassium diaquatetrabromovanadate(III)
  - bis(ethylenediamine)zinc(II) tetraiodomercurate(II)
- 23.36 Write the formula for each of the following compounds, being sure to use brackets to indicate the coordination sphere:
- tetraaquadibromomanganese(III) perchlorate
  - bis(bipyridyl)cadmium(II) chloride
  - potassium tetrabromo(ortho-phenanthroline)-cobaltate(III)
  - cesium diamminetetracyanochromate(III)
  - tris(ethylenediamine)rhodium(III) tris(oxalato)-cobaltate(III)
- 23.37 Write the names of the following compounds, using the standard nomenclature rules for coordination complexes:
- $[\text{Rh}(\text{NH}_3)_4\text{Cl}_2]\text{Cl}$
  - $\text{K}_2[\text{TiCl}_6]$
  - $\text{MoOCl}_4$
  - $[\text{Pt}(\text{H}_2\text{O})_4(\text{C}_2\text{O}_4)]\text{Br}_2$
- 23.38 Write names for the following coordination compounds:
- $[\text{Cd}(\text{en})\text{Cl}_2]$
  - $\text{K}_4[\text{Mn}(\text{CN})_6]$
  - $[\text{Cr}(\text{NH}_3)_4(\text{CO}_3)]\text{Cl}$
  - $[\text{Ir}(\text{NH}_3)_4(\text{H}_2\text{O})_2](\text{NO}_3)_3$
- 23.39 Consider the following three complexes:
- (Complex 1)  $[\text{Co}(\text{NH}_3)_4\text{Br}_2]\text{Cl}$   
 (Complex 2)  $[\text{Pd}(\text{NH}_3)_2(\text{ONO})_2]$   
 (Complex 3)  $[\text{V}(\text{en})_2\text{Cl}_2]^+$
- Which of the three complexes can have (a) geometric isomers, (b) linkage isomers, (c) optical isomers, (d) coordination- sphere isomers?
- 23.40 Consider the following three complexes:
- (Complex 1)  $[\text{Co}(\text{NH}_3)_5\text{SCN}]^{2+}$   
 (Complex 2)  $[\text{Co}(\text{NH}_3)_3\text{Cl}_3]^{2+}$   
 (Complex 3)  $\text{CoClBr} \cdot 5\text{NH}_3$
- Which of the three complexes can have (a) geometric isomers, (b) linkage isomers, (c) optical isomers, (d) coordination- sphere isomers?
- 23.41 A four-coordinate complex  $\text{MA}_2\text{B}_2$  is prepared and found to have two different isomers. Is it possible to determine from this information whether the complex is square planar or tetrahedral? If so, which is it?
- 23.42 Consider an octahedral complex  $\text{MA}_3\text{B}_3$ . How many geometric isomers are expected for this compound? Will any of the isomers be optically active? If so, which ones?
- 23.43 Sketch all the possible stereoisomers of (a) tetrahedral  $[\text{Cd}(\text{H}_2\text{O})_2\text{Cl}_2]$ , (b) square-planar  $[\text{IrCl}_2(\text{PH}_3)_2]^-$ , (c) octahedral  $[\text{Fe}(\text{o-phen})_2\text{Cl}_2]^+$ .
- 23.44 Sketch all the possible stereoisomers of (a)  $[\text{Rh}(\text{bipy})(\text{o-phen})_2]^{3+}$ , (b)  $[\text{Co}(\text{NH}_3)_3(\text{bipy})\text{Br}]^{2+}$ , (c) square-planar  $[\text{Pd}(\text{en})(\text{CN})_2]$