

# LECTURE 29

1. Cisplatinum  $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$  is a potent anticancer drug. For lecture 27 practice problems, you drew the structure of cisplatinum and its isomer transplatinum, determined the expected bond angles, and determined the CN.
  - (a) Draw the crystal field energy-level diagram for cisplatinum, labeling the  $d$ -orbitals
  - (b) Predict whether cisplatinum is diamagnetic or paramagnetic. Explain your answer.
2.
  - (i) Draw a crystal field splitting diagram to show the expected distribution of electrons in the 3d-orbitals of the central metal in each of the following complex ions.
  - (ii) Label as low-spin or high-spin state.
  - (iii) Indicate the number of unpaired electrons in each case.
  - (iv) Give the names of the d-orbitals, and label the appropriate orbital sets  $e_g$  and  $t_{2g}$  or  $e$  and  $t_2$ .
  - (v) Write the  $d^n$  electron configurations.
    - (a) octahedral  $[\text{Mn}(\text{CN})_6]^{3-}$
    - (b) tetrahedral  $[\text{NiCl}_4]^{2-}$

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