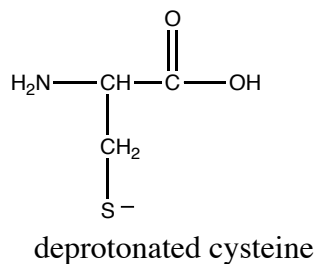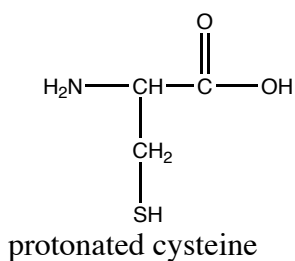# LECTURE 27

1. Zinc can act as a Lewis acid and coordinate amino acids like cysteine by their sulfhydryl (SH) groups. Normally, the sulfhydryl group of cysteine has a pK_a of ~8. However, the interaction with zinc can lower the pK_a of the sulfhydryl group by as much as 4 pH units. Recalling your knowledge of acid/base chemistry, **estimate** the approximate ratio of protonated to deprotonated cysteine at neutral pH for **(a)** free cysteine (pK_a of ~8) and **(b)** cysteine coordinated to zinc (pK_a of ~4). (Since this is an estimate, don't worry about sig figs).

protonated cysteine   deprotonated cysteine

2. For $[CoCl_6]^{3-}$,
   (a) Determine the coordination number of the cobalt.
   (b) Determine the oxidation number of the cobalt.

3. Cisplatinum $[Pt(NH_3)_2Cl_2]$ is a potent anticancer drug.
   (a) Draw the structure of this square planar molecule and the structure of its isomer transplatinum
   (b) State the expected angles for a square planar molecule
   (c) Determine the CN

5.111 Principles of Chemical Science
Fall 2014