1. Calculate the ratio of ammonia (NH₃) to the ammonium ion (NH₄⁺) in a solution with a pH of 10.0.

2. How many grams of NH₄Cl must be added to 100.0 mL of a 0.100 M solution of NH₃ to produce a buffer with pH=9.2 ? Assume that the volume will remain constant. pKa for NH₄⁺ = 9.2.

3. A solution containing 10.0 mL of 0.0100 M HCl, is titrated with 5.0 mL of 0.0100 M NaOH. What is the pH of the resulting solution?

4. Oxalic acid (H₂C₂O₄) has pKₐ₁ = 1.25 and pKₐ₂ = 4.26. At what pH is the H₂C₂O₄⁻ concentration equal to the H₂C₂O₄ concentration?

5. Calculate the conditional formation constant K_f for the formation of an EDTA complex with nickel(II) at a pH of 8.00, if log K_f = 18.6. From your result, is it possible to titrate Ni(II) with EDTA at this pH?

6.- Use your textbook to select the best indicator for the titration of tin(II) with cerium(IV),

7Balance the redox reaction using the half-reactions from the textbook
Cr₂O₇²⁻ + H⁺ + Fe²⁺ →

(use half-reactions in the book to write an appropriate balanced equation).

8. A sample (0.5000 g) containing some sodium carbonate was mixed with appropriate amount of water and titrated using phenolphthalein indicator with 0.0200 M HCl. The volume necessary to reach the ending point was 12.0 mL. Calculate the %% of Na₂CO₃ in the sample.

9. A 1.0000-g sample of iron ore was digested. The resulting solution was titrated with 0.0100 M EDTA solution using a well-established procedure. 25.0 mL of EDTA solution were used for titration. Calculate %% of Fe in the ore.

10. At pH 7.6, the predominant form of EDTA ion is ________________