



**Chemistry 216  
Spring 1999  
Final Exam**



Name.....

[1] How does a toploading balance work?

Define buoyancy factor. Estimate the error in ignoring buoyancy factor when weighing an unknown object of density  $5 \text{ g/cm}^3$  using steel weights of density  $7.7 \text{ g/cm}^3$ . The density of air is  $0.0012 \text{ g/cm}^3$ .



[2] Consider the titration of 50 mL 0.1 M diprotic ( $pK_{a1} = 5.00$ ,  $pK_{a2} = 10.00$ ) acid with 0.1M NaOH. Calculate the pH after 0 mL, 20 mL, 50 mL, 70 mL base.

[3] Sketch and describe the way a sodium ion selective electrode works. What is meant by a "selectivity coefficient" in ion selective electrodes.

[4] Explain the procedure you would use to obtain a UV-vis absorption spectrum using a single-beam spectrometer. How does a double-beam spectrometer work?

[5] Describe how you would determine the stoichiometry and formation constant of a metal-ligand complex using the mole ratio method and the method of continuous variation.