

George Mason University
Chem. 321: Quantitative Chemical Analysis
Acid-Base Computational Project

Due: Oct 27, 2004

Find your assigned acid or base from the list below. Record its chemical formula, structure, and pKa's from Appendix B of your text. Do the following:

1. Write all acid-base hydrolysis reactions for the polyprotic acid. Clearly write the structure of the species, and the charge.
2. Calculate fractions (α_i) of all the species as a function of pH in the range of 1-12. Use the equations given in the handout. Calculate α_i at every 0.1 – 0.2 pH unit to obtain a smooth plot. Plot the fractional distribution vs. pH for all species.
3. Identify species at all intersection points and peaks.
4. Draw a complete titration curve assuming 30.0 mL 0.1 M acid is titrated with 0.10 M NaOH. Calculate the pH at 1.0 mL intervals of base added until you have titrated all acidic groups and added 10.0 mL of excess base. Plot the titration curve. Use the equations explained in the handout.
5. Plot the buffer capacity as explained in the handout. Explain which pH regions have the highest buffer capacity and why?

Student	Acid/Base
Abera	Malonic acid
Nazila	Glutamine
John	Phosphoric
Kirubel	Phenylalanine
Duc_Hieu	8-hydroxyquinoline
Auteen	Histidine
Robyn	Boric acid
Sara	Arsenic acid
Lionel	Citric acid
Courtney	Valine
Farimah	1,2,3-trihydroxybenzene
Kathryn	Tyrosine
Yacoub	Tryptophan
Mohammad	Aspartic acid
Josh	Ethane 1,2-dithiol
Rachel	d-Tartaric acid
Chiamaka	Glutamic acid
Hermela	Nitritriacetic acid
Brad	Lysine
Tung	Pyridoxal-5-phosphate
Adam	Pyrophosphoric acid
Edward	Iminodiacetic acid