CH 223 Spring 2024:
"Titration of Weak Acids
*(in class)" **Lab** - Instructions*

Note: **This is the lab for section 01 and H1 of CH 223 only.**

- *If you are taking section W1 of CH 223*, please use this link:
  http://mhchem.org/q/6b.htm

Step One:

Get a printed copy of this lab! You will need a printed (hard copy) version of pages Ia-6-3 through Ia-6-4 to complete this lab. If you do not turn in a printed copy of the lab, there will be a 2-point deduction.
* ***Special Note:*** Also bring a printed copy of the "Acid and Base Titrations" instructions for the Vernier pH titration equipment (we will use these again this week.)

Step Two:

Bring the printed copy of the lab (and the Vernier instructions) with you on Monday, April 29 (section 01) *or* **Wednesday, May 1 (section H1.)** During lab in room AC 2507, you will use these sheets (with the valuable instructions!) to gather data, all of which will be recorded in the printed pages below.

Step Three:

Complete the lab work and calculations on your own, then **turn it in** (pages Ia-6-3 through Ia-6-4 *only* to avoid a point penalty) **at the beginning of recitation to the instructor on Monday, May 6 (section 01)** *or* **Wednesday, May 8 (section H1.)** The graded lab will be returned to you the following week during recitation.

If you have any questions regarding this assignment, please email (mike.russell@mhcc.edu) the instructor! Good luck on this assignment!

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Titration of Weak Acids

Name:

Complete the following questions. All work must be shown to receive full credit.

Lab Partner(s):

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1. *Perform in the lab*

Select an unknown acid and titrate ***two samples*** of the acid per the guidelines in the "**Acid and Base Titration**" lab.

Measure approximately 0.5 g of the unknown acid sample using an analytical balance (record to 0.0001 g) and dissolve each sample in about 75 mL of water. Record the following information for each sample; show all work and include calculations. *Optionally* include titration graphs for Sample #1 and Sample #2, but it is not required.

[NaOH] (M): _____

Sample #1 **Letter = _____**

Unknown sample (g): _____

Equivalence volume (mL): _____

Half-equivalence volume (mL): _____

Equivalence pH: _____

Half-equivalence pH: _____

[NaOH] (M): _____

Sample #2 **Letter = _____**

Unknown sample (g): _____

Equivalence volume (mL): _____

Half-equivalence volume (mL): _____

Equivalence pH: _____

Half-equivalence pH: _____

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2. *Lab Calculations: show all calculations on separate paper; include with your lab report*

mol unknown acid at equivalence: _____

molar mass unknown (g/mol): _____

K_a unknown acid: _____

mol unknown acid at equivalence: _____

molar mass unknown (g/mol): _____

K_a unknown acid: _____

Average K_a: _____

Average molar mass (g/mol): _____

Parts per thousand (K_a): _____

Parts per thousand (molar mass): _____

3. Postlab question: *(Show all work after the problem.)*

   0.4998 g an unknown acid was placed in 75.00 mL of water.
   The unknown acid required 16.44 mL of 0.2001 M NaOH to reach equivalence.
   The pH at half equivalence was 3.86

K_a: _____ **Molar mass of unknown (g/mol)**: _____

Volume NaOH to reach Half-equivalence (mL): _____

Concentration of Unknown acid in original solution (M): _____