# CH 223 Spring 2024: <br> "Titration of Weak Acids <br> (online)" Lab-Instructions 

Note: This is the lab for section W1 of CH 223 only.

- If you are taking section 01 or section H1 of CH 223, please use this link: http://mhchem.org/q/6a.htm

Step One:
Watch the lab video for the "Weak Acids" lab, found here:
http://mhchem.org/v/h.htm
Record the data found at the end of the lab video on page Ib-6-3.

Step Two:
Complete pages Ib-6-3 through Ib-6-4 using the "Weak Acids" video. Include your name on page Ib-6-3!

Step Three:
Submit your lab (pages Ib-6-3 through Ib-6-4 only to avoid a point penalty) as a single PDF file to the instructor via email (mike.russell@mhcc.edu) on Wednesday, May 8 by 11:59 PM. I recommend a free program (ex: CamScanner, https://camscanner.com) or a website (ex: CombinePDF, https://combinepdf.com) to convert your work to a PDF file.

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

1. Obtain from the video

Collect the following data from the "Titration of a Weak Acid" video (http://mhchem.org/v/h.htm)

## [ NaOH ] (M): <br> $\qquad$

## Sample \#1

[ NaOH ] (M): $\qquad$

Unknown sample (g): $\qquad$ Unknown sample (g): $\qquad$

Equivalence volume (mL): $\qquad$ Equivalence volume (mL): $\qquad$

## Sample \#2

$$
2
$$

Half-equivalence volume (mL): $\qquad$ Half-equivalence volume (mL): $\qquad$

Equivalence pH: $\qquad$ Equivalence pH : $\qquad$

Half-equivalence pH : $\qquad$ Half-equivalence pH : $\qquad$
2. Lab Calculations: show all calculations on separate paper; include with your lab report
mol unknown acid at equivalence: $\qquad$ mol unknown acid at equivalence: $\qquad$
molar mass unknown (g/mol): $\qquad$ molar mass unknown (g/mol): $\qquad$
$\mathrm{K}_{\mathrm{a}}$ unknown acid: $\qquad$ $\mathrm{K}_{\mathrm{a}}$ unknown acid: $\qquad$

Average $\mathrm{K}_{\mathrm{a}}$ : $\qquad$ Parts per thousand $\left(\mathrm{K}_{\mathrm{a}}\right)$ : $\qquad$

Average molar mass (g/mol): $\qquad$ Parts per thousand (molar mass): $\qquad$
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
$\qquad$ Molar mass of unknown ( $\mathbf{g} / \mathrm{mol}$ ): $\qquad$

Volume NaOH to reach Half-equivalence (mL): $\qquad$

Concentration of Unknown acid in original solution (M): $\qquad$

