

Virtual Titration Lab
Involving a monoprotic acid (HA) and Sodium Hydroxide
 $\text{HA (aq)} + \text{NaOH (aq)} \rightarrow \text{NaA (aq)} + \text{H}_2\text{O (l)}$

To learn more about the titration process (what it is, how and why we do it), watch this video: <https://www.youtube.com/watch?v=YqfvRBJ-iPg>

Make sure you are using Google Chrome as your browser and go to the following link: http://employees.oneonta.edu/viningwj/sims/titrations_t.html

(If you have problems with the adobe flash watch this video:

https://www.youtube.com/watch?v=nrzcIr_3yeQ

It explains how to fix adobe flash player blocked in Google Chrome)

Step 1: Choose "phenolphthalein" solution as an indicator from the dropdown menu. Think about what an indicator is? Why do we use it in titrations?

Step 2: Choose the concentration of NaOH to be 0.50 M.

Step 3: Perform titration by adding NaOH solution to the solution in the beaker by clicking different "Add Base" buttons.

Step 4: Find the volume of NaOH used where the equivalence point has reached (hint: the colour will change). What did the colour change from and to?

Step 5: Determine the concentration of unknown acid and click submit. Hint: the volume of unknown acid (HA) is 25 mL, concentration of NaOH = 0.50 M, and you found the volume of NaOH by performing the stoichiometric calculations, watch the units!

Messed up? No worries! Click "Retitrate" and start again. 😊

Step 6: Take a screen shot of your successful titration

Step 7: Write up an explanation of this activity. Be sure to include the screen shot, the generic balanced equation, why you used phenolphthalein, the knowns and the unknowns (volume and concentration of acid and base). Indicate the volume of NaOH at the point where the colour of the solution in the beaker changed. What did the colour change to? Show the calculation step-by-step that you used to determine the concentration of the unknown acid (HA).

Submit this completed assignment via the link on the Schoology site by Friday May 29th at 11:59 pm

Additional information:

- **Monoprotic acids** (HA) donate one hydrogen atom per molecule when reacting with a base. To get hints about the coefficients, think of the neutralization equation: Acid + base \rightarrow salt + water. Some examples of monoprotic acids include: hydrochloric acid, hydrobromic acid, hydroiodic acid etc. What are the coefficients when substituted in the equation?
- An **Indicator** is used in titrations because it undergoes a colour change in response to a chemical change. A drop of the indicator is added to the Erlenmeyer Flask at the beginning and when the necessary chemical change occurs, it's colour change allows you to know when to stop the titration.
- The name for the piece of equipment that holds NaOH in this simulation is called a **buret** (sometimes spelled **burette**) and is calibrated with 0.00 mL being at the top and 50.00 mL being at the bottom!