**Names \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Titration activity**

**Goal** – to create and verify the concentrations of a known base solutions.

**Safety**- Wear safety goggles and aprons at all times.

Clean up small spills immediately using lots of water. For large spills, contact the teacher.

NaOH is highly caustic in its pure powder form. Take great care when using!

Never add water to concentrated acid!

**Procedure-**

1. Create100mL of a 0.10M NaOH solution as accurately as possible.

Solution making procedure for NaOH

1) Calculate amount of grams of NaOH necessary to make solution.

2) Add solid NaOH to volumetric flask

3) Fill flask to ½ full with distilled water and swirl until solid has dissolved

4) Finish filling flask to 100mL line. Bottom of the meniscus should be touching the line.

1. Test the molarity of your NaOH solution by titrating it with the known HCl solution provided by the teacher.

Titration procedure

* 1. Place 20-25mL of your solution in a beaker.
  2. Add a few drops phenolphthalein to the beaker (it will turn pink in NaOH)
  3. Fill the buret with the **acid** solution that you will titrate with and record the initial volume (make sure it is the base solution than what is in your beaker.)
  4. Add the solution from the buret in 2mL increments. Stir or swirl the beaker after each additional 2mL is added.
  5. After 16mL is added, begin to add in 1mL increments.
  6. The color will change just after the solution is added, but will change back when stirred. As this happens, begin to add the solution drop by drop.
  7. Stop when the color does not change back. (The perfect titration would be when one drop is added and the solution changes color (faint pink) and does not change back)
  8. Record the final volume.
  9. Do the titration 3 times to ensure accuracy.

**Data for solution making:**

Mass of NaOH used \_\_\_\_\_\_\_\_\_\_\_\_\_ Volume of NaOH solution made \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Data for titration of your base solution**

**Calculations**

1. Based on your quantities used to make the solution, what was your expected concentration?
2. What was the determined concentration based on your titrations?
   * 1. Show work for individual concentration calculations
     2. Take average the titrations
3. What was your percent error for the making of the solution?

**Questions**

1. Why does the solution change color during the titrations?
2. List 3 sources of error for the lab. Don’t use equipment uncertainty! Make sure they match whether your values were higher or lower.