Acid – Base Titration

**Purpose:**

To determine the concentration of hydrochloric acid

**Materials:**

buret

stand and buret clamp

10 mL pipet

pipet pump

400 mL beaker for waste

small beaker containing NaOH

small beaker containing HCl

paper towel

two Erlenmeyer flasks per person

**Procedures:**

1. Rinse the buret with 5 mL of NaOH solution, draining the liquid into the waste beaker. Refill the buret with NaOH. Record the initial volume of the NaOH.

2. Using a pipet measure 10 mL of HCl into a clean flask. Add a few drops of phenopthalene. Repeat for a second trial.

3. Place the flask under the tip of the buret. Place a piece of white paper under the flask to see the colour change. While continuously swirling. run the NaOH solution into the flask until a pink colour appears. Add the NaOH drop by drop as you approach the endpoint. One drop will turn the entire solution pink, which should remain for a least 30 seconds while the solution is being swirled.

4 Record the final volume of the NaOH

5 Repeat the titration with the second flask (Each student will do two titrations)

6 When all of the titrations have been completed, drain the buret into the 400 mL waste beaker. Empty the waste beaker into the appropriate container at the front desk.

7 Dispose of excess HCl in the appropriate waste beaker

8. The waste solution in the flask after the titration can be washed down the sink with plenty of water.

**Data Chart:** [NaOH] = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Trial 1 | Trial 2 | Trial 3 | Trial 4 |
| Initial Volume  of NaOH |  |  |  |  |
| Final Volume  of NaOH |  |  |  |  |
| Volume  of NaOH used |  |  |  |  |

# Calculations

1. Write the balanced chemical equation for the neutralization reaction.

2. Calculate the average volume of NaOH used. Only include values that are consistent with each other

3. Determine the concentration of the HCl using the average volume of NaOH.

**Conclusion:**

State the concentration of the HCl determined through titration.