

## Titration Lab

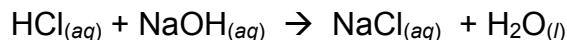
### SAFETY:

In this lab we will be using acids and bases. It is important to be on task, and aware of your group. THIS IS YOUR WARING! Any student off-task or away from their group will receive a no credit, without the opportunity to make up the work.

If any of the solutions comes into contact with your skin, immediately rinse with water.

### Purpose:

Titration is a neutralization reaction of an acid with a base to produce a salt and water. For example, the reaction of the strong acid HCl with the strong base NaOH produces the salt sodium chloride and water:



In this lab we will be using 0.01M NaOH to determine the concentrations of 2 acids.

Indicators change color based on pH. The indicator we will be using today is colorless in an acid, but changes to pink when neutral, and purple when a base.

### Materials:

0.01M NaOH solution, acid solution, indicator solution, 4 plastic cups (3 small cups and 1 large cup), 3 eye droppers.

### Procedure.

#### PROPER LAB PROCEDURES!

Be careful not to contaminate the solutions. Fill cups with correct solutions, use only 1 eye dropper per cup to avoid contamination.

1. Gather about 6 or 7 dropper fulls of KOH in a small cup
2. 3-4 dropper fulls of acid 1 in a small cup
3. Count approximately 20 drops of acid into the titration cup.
4. Add 3 drops of indicator to the titration cup
5. Slowly add KOH to the titration cup. Carefully stir as the KOH is added.
6. As soon as the solution turns a faint pink and stays pink for at least 10 seconds, stop.
7. Rinse the titration cup completely and repeat steps 3-6 for a total of 3 trials.
8. Repeat steps for acid 2.

Data: (Be sure to label each chart with the name of the acid.)

Acid 1:

	Drops of acid	Drops of KOH	[H <sup>+</sup> ]
Trial 1			
Trial 2			
Trial 3			
Average			

**Acid 2:**

	Drops of acid	Drops of KOH	[H <sup>+</sup> ]
Trial 1			
Trial 2			
Trial 3			
Average			

To receive FULL CREDIT, show ALL work here (don't forget your units)

**Discussion:**

1. Why do you think we did 3 trials for each acid?
2. Calculate the pH for each acid using the average.
3. Which acid had a higher concentration of H<sup>+</sup>? How do you know?
4. When the solution turned pink, what is the ratio of H<sup>+</sup> to OH<sup>-</sup>?

5. Complete a neutralization reaction for the 2 titrations:  
Acid 1 = HCl  
Acid 2 = HNO<sub>3</sub>

**Conclusion:**

Include 3 paragraphs in your conclusion.

A: Describe what you did in this lab

B: Explain your results

C: Explain any possible sources of error