

**EXPERIMENT 24: BASES AND BASIC ANHYDRIDES**

**Equipment:** 3 test tubes, 1 deflagrating spoon, stopper.

**Materials:** pH papers, litmus papers, methyl orange, charcoal 5-6 mL of the following: 3M NaOH, 3M KOH, sat'd Ca(OH)<sub>2</sub>, NH<sub>3(aq)</sub>, NaOH(dilute), con. HCl, con. NaOH

In this experiment you will learn some important properties of bases. Some common household substances which contain bases are lye (NaOH), milk of magnesia (Mg(OH)<sub>2</sub>), and ammonia water.

- A. Test 3M NaOH, 3M KOH, saturated Ca(OH)<sub>2</sub>, and NH<sub>3(aq)</sub> with pH paper. Do this by pouring a few drops of the base into a test tube, dip a glass rod into the solution, then touch the pH paper with the tip of the glass rod. Test the bases with phenolphthalein, methyl orange, and litmus. Record the results in the Table below.
- B. Put a drop of very dilute sodium hydroxide on the tip of your finger and rub it with your thumb. **WASH IT OFF IMMEDIATELY!!!** Repeat using dilute solution of the other bases. Record the results in the Table below.

**TABLE OF RESULTS** - Indicators of Bases

**C. TEACHER**

**DEMONSTRATION:**

Cautiously add a few drops of concentrated HCl to a few drops of concentrated NaOH in a test tube.

- D. To 10mL of water in a test tube add a small piece of CaO and shake.

Filter and test the filtrate with red litmus. What change in pH was observed?

	NaOH	KOH	Ca(OH) <sub>2</sub>	NH <sub>3(aq)</sub>
pH				
Litmus - Red				
Litmus - Blue				
Phenolphthalein				
Methyl Orange				
Feel				
Action on acids				

1. What ion must be present in excess? \_\_\_\_\_
2. Starting with CaO and water, write equations to show how this ion was formed. \_\_\_\_\_  
\_\_\_\_\_
3. State four characteristics of bases. \_\_\_\_\_  
\_\_\_\_\_

**CONCLUSIONS**

According to the Arrhenius Theory, bases are ..... compounds which ..... in water to release ..... ions. This ion in solution causes certain indicators to change ....., fairly concentrated basic solutions to feel ....., and can ..... acid solutions. A basic anhydride is a(n) ..... of a metal that reacts with water to form a ..... solution.

