

Acids & Bases: Common Household Products

Purpose: Learn about indicators. Learn how to use litmus paper and pH paper test strips. Learn to match colors of pH paper to the color chart provided and identify the pH of each substance. Compare pH range with acid and base.

Safety

Safety glasses should be worn at all times.
Never taste chemicals – even if you know their identity
Ammonia liquid and vapor are extremely irritating, especially to eyes.
Wash your hands immediately if you come in contact with any of the chemicals.

Materials & Equipment

Hydrion pH paper	HCl	Baking Soda
Red litmus paper	Lemon juice	Soft Drink
Blue litmus paper	Ammonia	Detergent
Stir sticks	Vinegar	Bleach

Procedures

1. Rotate through the lab stations in any order as long as you do all of them.
2. At each station you will find a beaker of a liquid and a stir stick. One station is distilled water, the other stations have a solution made from diluting one of the products listed above with distilled water.
3. Each station should have one tube of blue litmus paper, one tube of red litmus paper, and one tube of Hydrion pH paper. **Cut the paper in half please!**
4. Touch the stick to the red litmus, blue litmus, and pH paper strips. Record the color in the first 3 columns of the data table. In the 5th column identify the substance as an acid, base or neutral. In the last column match the color of the pH paper to the chart on the tube and record that number in the data table. Distilled water has been done as an example.
5. Clean up the station before moving on.

Name: _____

Date: _____

Data Table

Solution	Red Litmus	Blue Litmus	Hydrion paper	Acid/Base/Neutral	pH
Distilled Water	Red	Blue	Yellow(ish)	Neutral	7
Ammonia					
Vinegar					
Detergent					
Baking soda					
Soft Drink					
Lemon juice					
NaClO (bleach)					
HCl					

Indicators are substances that react to a change in H^+ concentration by changing color. Some are naturally occurring such as red cabbage, red rose petals, and tea. Commercial indicators include litmus paper, pH paper, universal indicator solution, bromothymol blue, phenolphthalein, and others. Litmus is red in the presence of an acid, and blue in the presence of a base. Universal indicator solution and pH paper have a range of colors that correspond to pH values from 1 to 12. Bromothymol blue is yellow in an acid, green in pH 7 and blue in a base. Phenolphthalein is colorless in an acid and pink in a base.

Questions:

1. What was the pH of distilled water?
2. Why do you think distilled water was used to dilute the substances?

3. List the products in this lab that were acidic.

What was the range of pH for the acids?

4. List the products in this lab that were basic.

What was the range of pH for the bases?

Read the paragraph regarding indicators to help you answer the following questions.

5. What causes an indicator to change color?

6. What color would you expect bromthymol blue to be if you put some into the beaker of:

Ammonia	Vinegar	Distilled water

7. What color would you expect phenolphthalein to be if you put it in the beaker of bleach?

8. Can you use litmus paper to determine the pH number of a solution? Explain your answer.

9. What color would you expect phenolphthalein to be in the presence of H_2SO_4 ?

10. Of the indicators described in the paragraph, what would you use to find the pH of the water in a swimming pool?