

Discovering the Use of Indicators

Name: _____

Indicators are used in laboratories to help determine the pH of a substance. They give a general reading for the pH, while other methods like pH paper give a specific value. This lab will help you understand how indicators work.

Methods:

1. WEAR YOUR SAFETY GLASSES. You will use a spot plate to mix your acids and bases with your various indicators.
2. Measure of 5mL of hydrochloric acid and place it in a LABELED beaker. Do this for all of the other liquids to be tested as well (vinegar, water, sodium bicarbonate and sodium hydroxide).
3. Take ONE of the indicators being used. Mix a few drops of each liquid that you placed in the beakers with one drop of the indicator. Record the colour the data chart.

Table 1: Colour Change with Indicators

Indicator	Hydrochloric Acid	Vinegar	Water	Sodium Bicarbonate	Sodium Hydroxide
phenolphthalein	clear	clear	clear	pink	fuchsia
metaphenyl orange	red	orange	yellow	yellow	yellow
dimethyl blue	yellow	yellow	blue	blue	blue
Cabbage juice	red	purple	blue	green	green

4. Clean and dry the spot plate, then repeat step 3 with each of the other indicators provided.
5. Put a couple of drops of each liquid from the beakers onto your spot plate and test each one with the pH paper. Use the scale to determine the actual pH of the substance. Record in the table.

Table 2: pH of the Solutions

Hydrochloric Acid	Vinegar	Water	Sodium Bicarbonate	Sodium Hydroxide
1	2	6	8	12-13

6. Rinse off the spot plate. Dump the contents of the beakers down the sink and wash the beakers out. Return all of the materials to where you found them. Wash your hands.

Conclusions:

1. Look at the colour changes and pH values. Determine the approximate pH when each colour change occurs. (For example, litmus changes from red to violet between a pH of 4 to 7, then it changes from violet to blue between pH 7 and 9).
2. Make a pH diagram similar to the one found on page 272 of your textbook. Yours should have hydrochloric acid, vinegar, water, sodium bicarbonate and sodium hydroxide on it.
3. Why would a scientist use an indicator instead of pH paper or a pH meter?