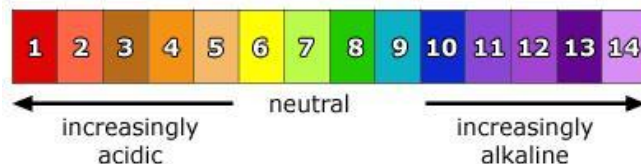


Red Cabbage Lab: Acids and Bases

Introduction:

Liquids all around us have either acidic or basic (alkaline) properties. For example, acids taste sour; while, bases taste bitter and feel slippery. However, both strong acids and strong bases can be very dangerous and burn your skin, so it is important to be very careful when using such chemicals. In order to measure how acidic or basic a liquid is, one must use the pH scale as illustrated below:



The strength of the pH scale is determined by the concentration of hydrogen ions (H^+) where a high concentration of H^+ ions indicate a low pH and a low concentration of H^+ ions indicate a high pH. The pH scale ranges from 1 to 14 where 1 to 6 is classified as acidic, 7 neutral (neither a base or an acid) and 8 to 14 is classified as basic.

In this lab, you will use the juice from red cabbage as a pH indicator to test common household liquids and determine their pH levels. You will mix cabbage juice with different household liquids and see a color change produced by a pigment called flavin (an anthocyanin) in red cabbage. Through this color change, you will be able to successfully identify the approximate pH of common household liquids using the table below:

Color:	Pink	Dark Red	Violet	Blue	Blue-Green	Green-Yellow
Approx. pH	1-2	3-4	5-7	8	9-10	11-12
Acid/ Base	Acid	Acid	Acid/Neutral	Base	Base	Base

Materials:

Pre-Cut Cabbage
Blender
Strainer
Large Container
~1L Beaker
5 plastic cups
1 plastic spoon

Liquids to Test:

- Lemon juice
- White Vinegar
- Apple Juice
- Baking Soda
- Soap

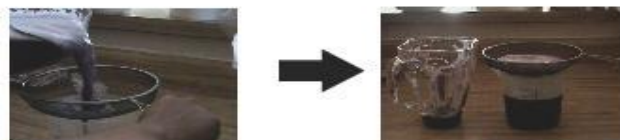
Instructions:

Preparing the Cabbage Juice :

1. Put the red cabbage leaves into the blender with 800mL of water.
2. Close the top and let it blend at high power for 30 seconds.



3. Once it is blended, filter out the leaves inside the mixture with the strainer and pour the mixture into a large container.



*This should provide you with 600-800 ml of cabbage juice.

Mixing the Cabbage Juice:

Label each cup with each of the liquids. (Example: vinegar, apple juice, etc.)

Pour 100 ml of each individual liquid into its respective cup (except for baking soda

For baking soda, add 3 tablespoons of baking soda into 100 ml water.

Example:



4. Pour 50 ml of cabbage juice into each of the cups. Do this one at a time and record the color change below:

Liquid:	Color Change/ pH
Lemon Soda	
Apple Juice	
White Vinegar	
Baking Soda	
Soap	

5. Prepare and test a buffer

Prepare two cups. Label one acid and one buffer. Place 10mL of vinegar into each cup. Add 5ml of sodium acetate to the buffer cup. Add 20 mL of cabbage juice to each cup and note the color change. Add equal amounts of a base solution slowly to both cups and note which cup changes color more quickly.