Acid Base Take Home Lab: Red Cabbage Indicator; SC7b

Subject/Concept: Chemistry/Acids-Bases, Indicators

Purpose: The purpose of this laboratory is to investigate the indicator properties of red cabbage and to classify household acids and bases.

Materials:

- 2 or 3 leaves of a red (purple) cabbage torn into small pieces.
- water
- blender
- 6 clear glasses or plastic cups
- 5 or more kitchen or food products (suggestions: baking soda, vinegar, soaps, lemon juice, cleansers with ammonia, drain clog remover, milk, clear sodas, other food or drink liquids or powders, antacid tablets, ...)

Procedure:

SAFETY PRECAUTIONS:

1. Treat all kitchen products used in this lab with extreme care as they may be very acidic or very basic and can therefore be toxic or corrosive.
2. Do NOT mix any of the household chemicals together as these chemicals may react with each other (especially the cleansers and soaps!).
3. The purple solution produced from the red cabbage leaves may stain clothing, counters, or floors. If spilled, wash surface promptly.

1. Read and then reread the above **SAFETY PRECAUTIONS**.

2. In the blender, blend the cabbage and about 2 cups of water for about 30 seconds to make a purple solution. Fill one glass at least one inch with the cabbage juice in a glass. This purple is the color of the cabbage juice in a neutral water solution, the control solution.
3. Place 1/3 of a cup of any of the five kitchen or food products which are clear liquids in the other five cups. If the product is a powder, use only a teaspoon of the powdered product dissolved in a 1/3 cup tap water. If the product to be used is a colored liquid (like milk), first dilute the liquid with water so that it is fairly transparent and use 1/3 cup of this solution.
4. Add approximately two tablespoons of the cabbage solution to each glass and observe the color of the resulting solution.

Questions:

1. Knowing that baking soda and ammonia are basic and that vinegar and lemon juice are acidic, try to classify all of the products you used as basic, acidic, or neutral. Give the reasoning each classification.
2. As an extension, you may wish to repeat the above experiment using strong tea as an indicator. The tea will change from a deep brown to a light yellow across the pH scale. (Which way does the color change as pH increases?)

For Credit:

To receive credit, your parent or guardian must write a short note confirming that you performed the experiment for them and explained the results to their satisfaction using the concept of **acid/base indicators**. Attach your note to the back of this sheet.