**pH Determination of Household Products**

Lab # 3

**What is pH value?**

A measure of the acidity or alkalinity of a solution, numerically equal to 7 for neutral solutions, increasing with increasing alkalinity and decreasing with increasing acidity. The pH scale commonly in use ranges from 0 to 14.

**How it is useful?**

We can know the acidity of different substances.
### Objectives:
1. Use red cabbage juice as an indicator to identify acidic, basic, and neutral substances found at home
2. Estimate the pH value of substances
3. Describe a neutralization reaction
4. Collect and analyze data
**Hypothesis/prediction:** All items used to clean will be more like (acids/bases) because ___________________________ and items used as foods will be more like (acids/bases) because ___________________________.  

The **indicator** is ___________________________.  
The **independent variable** is ___________ and the **dependent variable** is _____________.

**DATA**
1. Data table  
2. Drawings: cups with indicator, products being tested, indicator plus substances being tested  
3. Graph of the results: from the most acidic to the most basic

**PROCEDURE**

Preparation of red cabbage indicator (done by the teacher the night before)
1. Cut ½ of a cabbage into small pieces.  
2. Cook cabbage in 2 liters of water for about 30 minutes  
3. Separate the bluish-purple liquid from the cabbage and let it cool

**Estimating pH values with red cabbage indicator – complete data table!**
4. line up all substances to be tested on top of white paper  
5. predict each substance as basic, neutral or acidic  
6. describe the color of each substance to be tested - best to use color pencils!  
7. place a labeled beaker in front of each substance to be tested  
8. describe the color of the indicator  
9. add about 10mL of red cabbage indicator to all labeled beakers  
10. add drop by drop (up to 15 drops) of substance being tested to each corresponding beaker with indicator until you see a color change  
11. organize all beakers from most acidic to most basic using the pH scale for red cabbage juice as a guide  
12. describe the color change in each beaker  
13. estimate the pH value of each substance by using the pH scale for red cabbage juice  
14. classify each product as acid, base, or neutral

15. slowly pour 2 mL of vinegar into 2 mL of baking powder and write your observations  
16. add 2 mL of milk into each cup (A & B). Add six drops of water, one drop at a time, to cup A. After each drop, mix well and record any change. Using vinegar, repeat the procedure with cup B and record any changes.

**CLEAN UP!** Pour all substances in the waste beaker & rinse each used beaker. Dry each cup & leave everything the way you found it. Remember no traces of water on your working area or -25pts for each member of the group.

**ANALYSIS (pH post-lab questions)** Answer the following questions completely.

1. The purpose of this lab was ...

2. It is important to learn about acids and bases because ...
3. Red cabbage juice change color because ...

4. From the most acidic to the most basic, the substances tested were ...

5. The data supports/rejects the hypothesis proposed because ...

6. In living things, pH is maintained within a narrow range because it is vital for homeostasis.” This means ...
This lab has been created by A. Fuentes and I have added definition of pH value and its uses.