Bio I

Chemistry with Cabbage

Materials

10 household substances	hot plate	10 ml graduated cylinder	marker
red cabbage	goggles	5 test tubes	dropper
10 plastic cups	hot mitt	test tube rack	scissors
beaker			

Procedure

1. Using the scissors, chop up the portion of red cabbage into small pieces.

2. Place the chopped cabbage into a beaker and add enough water to fill the beaker half-way.

3. Place the cabbage and water mixture on the hotplate. Leave the beaker on the hot plate until the water has become a bright purple color.

4. Number the small plastic cups #1-10.

5. Obtain a small sample of the ten substances located on the middle lab table. (Fill cups less than ½ full) Be sure to fill the appropriately numbered cup with the appropriate sample. For example, cup #1 is filled with sample #1.

6. Using your senses, sight and smell (remember to waft), guess the contents of the cup. Hypothesize if the substances are acidic or basic. TASTE TESTING IS NOT AN OPTION. Record the predictions in the chart provided.

7. When the cabbage water is ready, carefully remove the beaker from the hot plate. Allow the mixture to cool. Once the mixture has cooled, separate the purple water from the cabbage by pouring the purple water into a clean beaker.

8. Pour 3ml of cabbage water into a test tube.

9. Using the dropper, add about 5-10 drops of the samples to the test tube containing the cabbage water. Observe the color change of the substance. Use the pH scale provided below to determine the pH of the substance. Record the data in the table provided.

10. Repeat #8 and #9 for the other nine unknown substances. Record information on the table provided.

Data/Analysis

Sample	Hypothesis: Substance	Hypothesis: Acidic/Basic	Actual pH (Acidic/Basic)	Actual Substance
1				
2				
3				
4				

5				
6				
7				
8				
9				
10				

Conclusion

1. Graph and label the pH of each substance on the line below.

←----------→

2. In hypothesizing, what were some of the methods that you used to help in your decision of whether each substance was an acid or base? How correct were you?

3. What do the color changes of the cabbage water indicate? (Which color represents an acid and which represents a base?

4. The label on a shampoo bottle claims that it is pH balanced. What do you think “pH” balance means?

5. Can a solution ever have a pH = 0? What is the physical meaning of this?