CHEM&110 Chemical Concepts

Activity 6: Chemical reactions Worksheet (10 pts)

Name:   
Date:

There are two parts to this week’s activity:

**Part 1. Acids and bases – a lab experiment**

Data table (4pt)

|  |  |  |  |
| --- | --- | --- | --- |
| Item/Substance placed into bowl with red cabbage | Color it turns with cabbage | Approximate pH | Acid, base or neutral? (Based on pH) |
| Water |  |  |  |
| A. Enter your choice of acid |  |  |  |
| B. Enter your choice of base |  |  |  |
| C. Enter your 1st household item |  |  |  |
| D. Enter your 2nd household item |  |  |  |
| E. Enter your 3rd household item |  |  |  |

For your reference:  
The red cabbage pigment colors and approximate pH values are:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| approximate pH: | 2 | 4 | 6 | 8 | 10 | 12 |
| color of extract: | red | purple | violet | blue | blue-green | green |

Follow up questions:

1. What was the purpose of adding water to your first bowl of cabbage? (Think back to Activity 1 on scientific cooking.) (0.5pt)

2. When you cleaned out the bowl containing baking soda or ammonia, did it feel different to your skin than the other bowls? If so, describe. (0.5pt)

3. When you mix baking soda and vinegar directly, what do you observe? Is this evidence for a chemical reaction? If so, what is the new substance being formed? (1pt)

**Part 2. Maillard or Carmelization or Enzymatic browning reactions?**

4. Sautéing onions changes their color, texture and flavor. What kind of browning reactions are involved? Explain your choice. (Hint: Onions are 90% carbohydrates and 8% proteins) (2pt)

<http://nutritiondata.self.com/facts/vegetables-and-vegetable-products/2501/2>

5. Take a “before vinegar is added” and “after vinegar is added” picture of your cabbage being cooked. What differences do you see and what is the chemical explanation for it? (2pt)

**BONUS:** Find information online about anthocyanins and cite your source. What health benefits do they provide? (1pt)