Name: _____ Date: _____

Testing Antacid Tablets

Introduction

Antacids are a common medicine that are used to neutralize stomach acids. Most antacids contain carbonates, which have a neutralizing effect on acids. They also produce carbon dioxide gas, which builds up during the reacts and often results in a satisfying burp. Most antacids do not dissolve well in water, which prevents them from being absorbed into the blood.

In this lab, you will compare the effectiveness of several brands of antacids using titration. We will mix an acid-base indicator called bromothymol blue (or BTB) with powdered antacid to determine when it has been neutralized. BTB is blue in basic solution (pH > 7.6) and yellow in acidic solution (pH < 6.0), so when we have added enough acid to the antacid, it will remain yellow and we will know that we have neutralized the antacid completely.

Materials

antacid tablets, various brands
bromothymol blue indicator
distilled water
hydrochloric acid, 0.1M [HCl]

Equipment

beaker, 250-mL
buret
buret clamp
electronic balance
Erlenmeyer flask, 250-mL
graduated cylinder, 100-mL
mortar & pestle
ring stand
stirring rod

Safety Considerations

- Hydrochloric acid is toxic and irritating to the skin; you must wear goggles for the entire lab.
- Sometimes chemicals from previous labs still remain in glassware and on other lab equipment; wash all lab equipment before and after performing this lab.
- Wash your hands thoroughly after completing this lab.

Procedure

1. Set up a buret using a ring stand and buret clamp.
2. Fill the buret with 0.1M hydrochloric acid to the “0 mL” mark. If you overfill the buret, you may open the nozzle and pour the excess into your waste beaker.
3. Select a brand of antacid and crush enough tablets in a mortar and pestle to obtain a 1-g (1000 mg) sample. You may need to weigh out your powder to get exactly 1 g. Record the brand of antacid in the Data Table.
4. Pour the antacid powder into a 250-mL Erlenmeyer flask and add 15 mL of distilled water. The mixture will probably appear cloudy.
5. Add 4-5 drops of bromothymol blue (BTB) indicator to the flask and mix thoroughly. Note the color of the indicator in the mixture.
6. Using the buret, slowly add the hydrochloric acid to the Erlenmeyer flask and swirl gently until a complete color change occurs and remains for 10-15 seconds. This is the end-point; record the volume of acid used in the Data Table.
7. Repeat steps #2-6 for a total of three different brands of antacid.

Clean-up

1. Dispose of any leftover solutions in the sink; dry, extra antacid powder should be placed in the trash.
2. Clean all used lab equipment with soap, water and a test tube brush.
3. Return all equipment to its proper location.
4. Wipe down your lab area and wash your hands before leaving the lab.

Data Table

Antacid	Volume of acid used

Questions

1. Which brand of antacid required the **most** acid in order to be neutralized? What were the active ingredients of this brand?

   _____

   _____

2. Which brand of antacid required the **least** acid in order to be neutralized? What were the active ingredients of this brand?

   _____

   _____

3. Based on your results, are there any differences in performance between the "name brand" antacid and its "generic" knock-off? Why or why not?

   _____

   _____

4. Besides taking antacids, what is another method that you have used to calm an upset stomach? How well does it work?

   _____

   _____

5. List one way you could change this lab and describe how your results might be different.

   _____

   _____