

Neutralization of Stomach Acid

Introductory Material and Background:

Acid of the stomach (gastric acid, HCl) is neutralized naturally by sodium bicarbonate (NaHCO_3) secreted by the pancreas when the chyme enters the small intestines (duodenum). This reaction can be accomplished by ways other than entrance into the small intestine in cases of heartburn and upset stomach by means of pharmaceuticals such as Rolaids.

Materials and Methods:

Materials:

Rolaids
Universal Indicator
Distilled Water
Hydrochloric Acid (1M)
Dropper Pipet
Stir Bar and Stir Plate
600 mL Beaker
Mortar and Pestle

Procedure:

Preparation:

1. Place 300 mL of distilled water into a 600 mL beaker with a stir bar
2. Add 1mL (about a dropper full) of Universal Indicator
3. Add about 6 drops of 1M HCl to the beaker
4. Place the beaker on the stir plate and turn it on
5. Aside from the setup grind up 2 Rolaids with the mortar and pestle

Demonstration:

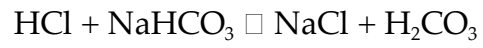
1. Setup: "What we have here is my stomach and it's upset, you can tell by the red color."
2. Ask students what you do when you have an upset stomach.
3. Add the crushed Rolaids
4. With the stir @ ~900 rpm the neutralization should take about 2 minutes to change the red to a green color.

Hints:

1. Conduct this demo while discussing heartburn and ulcers.
2. Conduct this demo while first presenting notes about the digestive system.

Explanation of Demo Function:





Explain why this causes a color change.

Additional Approaches:

This demo could be used in a review to ensure that students understand the action of the pancreas in the digestive system.