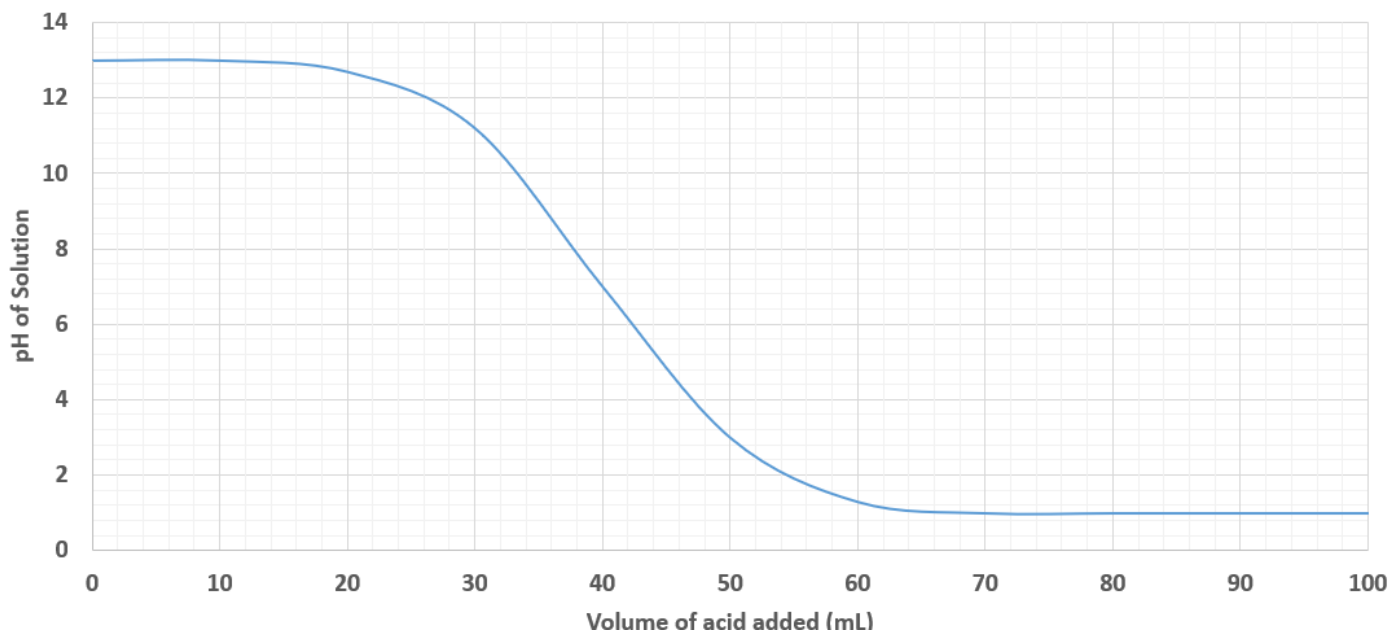


# Neutralization Assignment – Student Edition

## I. Interpreting Data

The graph below shows the pH of a solution as increasing amounts of acid are added to it. Use it to answer the questions which follow

The change in pH of solution as acid is added to it.



### Questions

1. Is the solution at the start of the experiment an acid or an alkali? \_\_\_\_\_
2. What evidence did you use to arrive at your answer to question 1?  
\_\_\_\_\_  
\_\_\_\_\_
3. How much acid was added to the solution before it became neutral? \_\_\_\_\_
4. What was the pH of the acid which was added to the solution? \_\_\_\_\_
5. What evidence did you use to arrive at your answer to question 4?  
\_\_\_\_\_  
\_\_\_\_\_

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### II. Identifying Neutralization

Identify which of the following equations are examples of neutralization. Mark them with an 'N'.

1. Magnesium oxide + hydrochloric acid  $\rightarrow$  Magnesium chloride + Water \_\_\_\_\_
2. Calcium + sulfuric acid  $\rightarrow$  Calcium sulfate + hydrogen \_\_\_\_\_
3. Magnesium + oxygen  $\rightarrow$  magnesium oxide \_\_\_\_\_
4. Calcium carbonate + nitric acid  $\rightarrow$  calcium nitrate + carbon dioxide + water \_\_\_\_\_
5. Sodium hydroxide + hydrochloric acid  $\rightarrow$  Sodium chloride + water \_\_\_\_\_

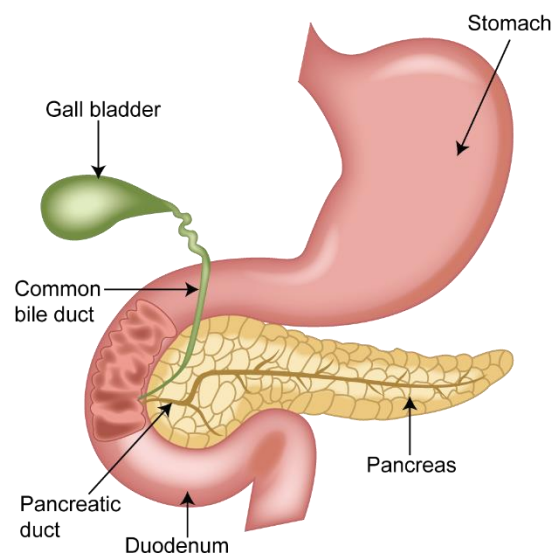
### III. Stomach Acid and Neutralization

Read the following article and then use it to answer the questions.

Food is digested by the enzymes found in your mouth, stomach, and small intestines. Enzymes are particularly sensitive to the pH of their environment. For example: the enzyme salivary amylase only works in the mouth where the pH is around neutral, the protein-digesting enzyme pepsin found in the stomach needs pH 2 to function, while the enzymes trypsin, intestinal amylase and lipase only operate in the mildly basic pH of the small intestine.

The stomach wall produces hydrochloric acid which maintains the acidic environment allowing pepsin to attack proteins effectively. This acid is corrosive and strong enough to burn through many materials, however the stomach wall is protected by a lining of mucus which prevents any holes being burnt through the stomach.

When food is eaten too quickly or if too much is eaten at once, an uncomfortable condition called indigestion can occur. This is where the acidic stomach juices rise into the esophagus. Since the esophagus is not protected from the stomach juices irritation occurs. If this causes chest pain, it is sometimes referred to as 'heartburn'. The symptoms of indigestion and heartburn can be relieved using an antacid medication such as Tums, Gaviscon, or Mylanta. These medicines contain a metal oxide, hydroxide or carbonate which removes the acid particles from the digestive juice and raising the pH until it is closer to 7.



Name: \_\_\_\_\_ Period: \_\_\_\_\_ Date: \_\_\_\_\_

## Neutralization Assignment – Student Edition

### Questions:

1. Name the chemicals in your body which are responsible for digesting food.

\_\_\_\_\_

2. Describe the conditions needed in the stomach for pepsin to operate.

\_\_\_\_\_

3. What do the following terms mean?

a) Corrosive \_\_\_\_\_

\_\_\_\_\_

b) Indigestion \_\_\_\_\_

\_\_\_\_\_

c) Symptom \_\_\_\_\_

\_\_\_\_\_

d) Antacid \_\_\_\_\_

\_\_\_\_\_

4. State the pH of stomach juice. \_\_\_\_\_

5. How is the stomach tissue protected from stomach acid?

\_\_\_\_\_

6. What type of chemical are antacids? \_\_\_\_\_

7. Give the word equation for the reaction between stomach acid and Mylanta (magnesium hydroxide).

\_\_\_\_\_

8. The pancreas releases a chemical at the junction of the stomach and the small intestine. This fluid prevents the acid from destroying the small intestine. What pH would you expect this fluid to be?

\_\_\_\_\_

Name: \_\_\_\_\_ Period: \_\_\_\_\_ Date: \_\_\_\_\_

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