

### Introduction:

Most food items are acidic while most cleaning products are basic. Recall that in a neutralization reaction between an acid and a base, the products will be water and a salt.

### Purpose:

You will neutralize a colorless soft drink using dilute household ammonia. The indicator used to determine when neutralization occurs will be phenolphthalein, sometimes referred to as "phth." Phenolphthalein is colorless in an acid and pink in a base.

### Materials:

dilute household ammonia in dropper bottle	phenolphthalein (phth)
colorless soft drink in beaker	test tube
litmus paper	safety goggles

The rule is to wear goggles ANY time you're using chemicals of any type!

**WEAR YOUR GOGGLES!**

### Procedure:

1. Use litmus paper to determine if the dilute ammonia is an acid or base. Record your results in the data table below.
2. Use litmus paper to determine if the soft drink is an acid or base. Record your results in the data table below.
3. Approximately half-fill a test tube with the colorless soft drink and add 2-3 drops of phenolphthalein.
4. Add dilute household ammonia one drop at a time until ONE drop turns the soft drink barely pink. The pink color should remain for about 30 seconds. This is easier to see if you place the test tube in front of a white piece of paper.
5. Test the product with litmus paper to see if it is an acid, base, or neutral and record your results in the data table below.
6. Dispose of all materials used in the lab. No lab materials should be consumed!

Substance	Litmus Test	Acid/Base/Neutral
dilute ammonia		
soft drink		
neutralization product		

questions continued on next page

Unit 7H Neutralization of a Soft Drink Lab

**Conclusions: Fill in the blanks or circle the best answer.**

1. Was the soft drink an acid or a base? \_\_\_\_\_  
Was the household ammonia an acid or a base? \_\_\_\_\_  
Does this agree with the findings in the earlier lab that most food products are acidic and most cleaning products are basic? \_\_\_\_\_
2. The reaction of an acid with a base is known as \_\_\_\_\_.  
The soft drink was \_\_\_\_\_ by the dilute ammonia. In neutralization reactions, the  $H^+$  from the \_\_\_\_\_ reacts with the  $OH^-$  from the base to form \_\_\_\_\_.
3. Write the word equation for the neutralization of an acid and a base:
4. Hair is normally (acidic, basic) with a pH of 3-5. Hair is at its maximum strength at a pH of 4-5. Shampoos are basic, and tend to leave the hair basic. At a pH of 8.5, which is (acidic, basic), some of the disulfide bonds holding the hair together are broken and split ends will form. At a pH of 12, hair dissolves. Some shampoos are said to be "pH balanced", so they must contain a(n) \_\_\_\_\_ to neutralize the basic detergent. Products that are used for hair removal are basic enough to break the bonds holding hair together!
5. Lemon juice, (an acid, a base), is often squeezed on fish to neutralize the amines in the fish which are bases.
6. Heartburn is the result of excess stomach acid. Antacid tablets, which must be (acidic, basic), act to neutralize the excess acid.
7. Write the neutralization reaction when:  
 $H_3PO_4$  reacts with  $Al(OH)_3$   
  
 $HCl$  reacts with  $Ba(OH)_2$   
  
 $HC_2H_3O_2$  reacts with  $KOH$