Lab: Neutralization of a Soft Drink **Name_____**

Introduction: In the previous lab, "Household Products-Acid or Base?" it was determined that most food items are acidic while most cleaning products are _____ . Recall that in a neutralization reaction between an acid and a base, the products will be water and a _____. In this lab activity, you will neutralize a colorless soft drink using dilute household ammonia. The indicator used to determine when neutralization occurs will be phenolphthalein, often referred to as phth. Recall that phenolphthalein is _____ in an acid and _____ in a base.

Materials:

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

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

Conclusions:

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: