

INSTRUCTIONS

1. Be sure to follow all lab safety rules.
2. Safety goggles must be worn at all times during lab work.
3. Read procedure through carefully before starting lab.
4. All lab equipment must be washed, dried, and put away at the end of the lab

MATERIALS:

- | | |
|-------------------|---------------------------------|
| -2 beakers | - medicine dropper |
| -Evaporating Dish | -Hot Plate |
| -Tongs | -Universal indicator (pH paper) |
| -Safety Goggles | -HCl |
| -NaOH | -Phenolphthalein |

PART A:

1. Use a graduated cylinder to obtain 10ml of hydrochloric acid and pour it into your beaker.
2. Describe 3 physical properties of the acid.

1	2	3
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3. Use the pH paper to test the pH level of the acid. Record the pH value below.

pH value:

4. Add 2 drops of phenolphthalein solution to the beaker of acid. Gently swirl the beaker. Place the beaker aside for now.
5. OBTAIN ANOTHER SEPARATE BEAKER.
6. Pour 10ml of sodium hydroxide solution into this beaker.
7. Describe 3 physical properties of the sodium hydroxide solution.

1	2	3
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8. Use the pH paper to test the pH level of the sodium hydroxide solution. Record the pH value below.

pH value:

9. A) Using a graduated cylinder, carefully measure 1 mL of sodium hydroxide solution from your beaker and add it to the beaker containing the acid.

B) After adding the 1 mL of sodium hydroxide, swirl the beaker and test the pH level of the acid. Record the information on the chart on the next page.

C) Repeat step A and B two more times.

NOTE: by the time you perform step 10 you should have added 3mL of sodium hydroxide to the beaker of hydrochloric acid and tested the pH value 3 times!

10. A) Using the medicine dropper, add 10 drops of sodium hydroxide solution to the beaker containing the acid.

B) After adding the 10 drops swirl the beaker and test the pH level of the acid.

C) Repeat this process until the beaker of acid turns FAINT PINK for 15 seconds (PERSISTENT FAINT PINK). Record the information in the chart on the next page.

HINT: REMEMBER THAT THIS IS A NEUTRALIZATION REACTION SO YOU ARE LOOKING FOR A pH READING OF ABOUT 7!

Note: Be sure to work slowly and to keep track of all of your results. You may need more sodium hydroxide solution in order to complete the task.

Step	Amount of sodium hydroxide	pH level of acid solution
1	1 mL	
2	1mL	
3	1mL	
4	10 drops	
5	10 drops	
6	10 drops	
7	10 drops	
8	10 drops	
9	10 drops	
10	10 drops	

Part B:

1. Set up the heating apparatus (hot plate) as instructed by your teacher.
2. Pour the contents of the beaker (acid solution that turned persistent faint pink) into an evaporating dish. Note: the pH reading of this solution should be around 7 or neutral.
3. Place the evaporating dish on the hot plate.
4. Evaporate the solution close to dryness and then remove from heat with the tongs. Do not let the contents of the evaporating dish completely dry out.
5. Record your observations about the material left in the evaporating dish by describing 4 of its

properties.

1	2	3	4.
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Part C

1. Place any left over chemicals in the proper waste container.
2. Wash the beakers. Allow them to air dry on the counter.
3. Put away all materials.
4. **DO NOT PUT AWAY THE HOT PLATE UNTIL IT HAS COOLED.** It may be best to put it away tomorrow.

Analysis:

Complete the following questions:

1. This lab activity was an example of a neutralization reaction. Define the following terms: acid, base, pH scale and neutralization reaction.

Term	Definition
Acid	
Base	
pH scale	
Neutralization reaction	

2. Name the products formed when solutions of hydrochloric acid and sodium hydroxide are mixed.

3. Write a balanced chemical equation for the reaction of hydrochloric acid and sodium hydroxide.

4. When the neutralized solution was evaporated, what product was formed?

5. Use the periodic table of elements to complete the following table:

Chemical symbol	Name of Element	Atomic Number	Atomic Mass	Metal or Non-metal
H				
Cl				
Na				
O				

6. Compare and contrast the properties of acids and bases.

Acid	Base

7. In your own words, describe a neutralization reaction.

Conclusions:

Was this lab successful? Why or why not?