

Physical and Chemical Changes

Purpose: To identify chemical and physical changes in matter.

Materials:

Test tube rack	1 M hydrochloric acid (HCl)	Safety goggles	Scoop
Three test tubes	0.1 M silver nitrate (AgNO ₃)	Table salt	Safety apron
Candle	Magnesium ribbon	Matches	Thermometer
Antacid tablet	Aluminum Foil	Water	

Lab Safety:

- Avoid skin contact with hydrochloric acid or silver nitrate.
- Don't pour any chemicals down the sink.
- Wear your safety goggles and aprons at all times.

Pre-Lab: Before beginning Part 1, complete the pre-lab portion on the DATA SHEET.

Procedure: Follow direction and complete the question on the DATA SHEET.

Part 1

1. Melt the bottom of a candle and place the candle on the foil. Allow the wax to cool so that the candle is secure and able to stand in an upright position.
2. Light the candle and allow it to burn while you continue with the investigation.
3. Record your observations of the burning candle on the DATA SHEET.

Part 2

1. Add water to a test tube until half full.
2. Add a small scoop of table salt to the test tube.
3. Place your thumb over the test tube and shake until the salt has dissolved.
4. Record your observations on the DATA SHEET.
5. Add 5 drops of silver nitrate to the salt solution. DO NOT stir or shake.
6. Record your observations on the DATA SHEET.
7. Discard the substances in the waste beaker.
8. Clean with soap, rinse and dry the test tube.

Part 3

1. Add water to a test tube until half full.
2. Place thermometer in water. Record the temperature in Celsius on the DATA SHEET.
3. Add a small piece of an antacid tablet to the water.
4. Record your observations on the DATA SHEET.
5. Record the temperature in Celsius after adding the antacid to the water on the DATA SHEET.
6. Discard the substances in the waste beaker.
7. Clean with soap, rinse and dry the test tube and thermometer.

Part 4

1. Place 5 drops of hydrochloric acid into a test tube.
2. Place a thermometer in the hydrochloric acid. Record the temperature of the HCl in Celsius.
3. Add a small piece of magnesium ribbon to the HCl.
4. Record your observations on the DATA SHEET.
5. Record the temperature in Celsius after adding the magnesium ribbon to the HCl on the DATA SHEET.
6. Discard the substances in the waste beaker.
7. Clean with soap, rinse and dry the test tube and thermometer.

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PRE-Lab Questions

Name _____ Period _____

1. What are the 3 rules that apply to every lab we do in PS Chemistry?

5. What is a waste beaker?

2. What are the 3 safety cautions?

6. How much hydrochloric acid will you add to the test tube in Part 4?

3. What are three signs that you might see to indicate that a chemical reaction is taking place?

7. Do you add water to Part 4?

4. How do you clean and dry a test tube?

8. What is a precipitate?

9. What unit will you use for temperature?

Pre-lab

Temperature change can indicate a physical change. Temperature change can also indicate a chemical change. Discuss this with your lab members and write a paragraph describing how this is possible. Include examples in your paragraph. Show me your paragraph before beginning the lab.

Part 1

1. What observations did you make while the candle was burning? (Think about all your senses!)

2. What was left after the candle burned?

Part 2

1. What observations did you make when the salt was added to the water? (Think about all your senses!)

2. What observations did you make when the silver nitrate was added?

Part 3

1. What was the initial temperature of the water? _____ ° C

2. What observations did you make when the antacid was added to the water? (Think about all your senses!)

3. What was the temperature of the water after the antacid was added? _____ ° C

Part 4

1. What was the initial temperature of the hydrochloric acid? _____ ° C

2. What observations did you make when the magnesium ribbon to the hydrochloric acid? (Think about all your senses!)

3. What was the temperature of the hydrochloric acid after adding the magnesium ribbon? _____ ° C

Analysis & Application

1. Identify each of the following as either chemical or physical change and EXPLAIN.

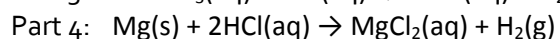
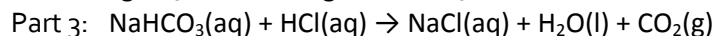
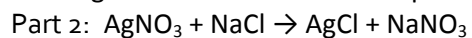
- a. Melting candle wax _____
- b. Burning a candle _____
- c. Breaking an antacid tablet _____
- d. Adding antacid to water _____
- e. Dissolving table salt _____
- f. Mixing salt water and silver nitrate _____
- g. Cutting pieces of magnesium ribbon _____
- h. Mixing magnesium ribbon and HCl _____

2. Describe two observations you might make when a physical change occurs.

3. Describe two observations you might make when a chemical change occurs.

4. Describe three examples of chemical changes you observe in your everyday life.

5. The following chemical reactions are representative of those that took place during today's lab.



- a. In part 2, the silver nitrate was added to sodium chloride, what do you think the precipitate was? *Hint: It's a compound to the right of the arrow.*
- b. In part 3, the antacid was added to water, what do you think caused the fizzing? *Hint: It's a gas to the right of the arrow.*
- c. In part 4, the magnesium ribbon was added to water, what do you think caused the fizzing? *Hint: It's a gas to the right of the arrow.*