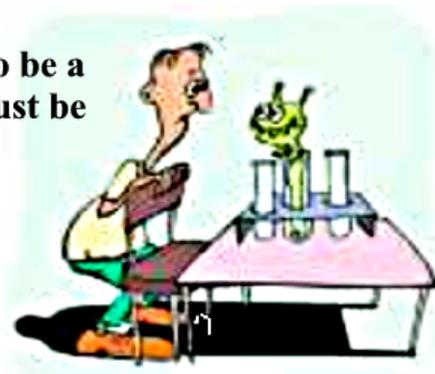


The Mystery Powders Lab: Physical and Chemical Changes

2 pts ec printing

Oh no! This seems to be a new substance. It must be a chemical change.



Background Information: You have learned how to describe matter based on its physical and chemical properties. You have also learned some clues that tell you whether a physical change or a chemical change is occurring. Remember a **physical change involves a change in a physical property but the substance does not change its identity. When a chemical change occurs a new substance is produced.** There are hints like a color change or fizzing (a gas) that indicate a chemical change has taken place because a new substance is produced.

Objective: To determine the identity of four mystery powders which are similar in appearance by observing a physical property (solubility) and a chemical property (reactivity). You will also determine whether mixing these “mystery powders” with water, vinegar or iodine causes a physical or chemical change.

Materials: Powders A, B, C, D, 4: straws:A, B, C, D Micropipettes: Vinegar, Water, Iodine
Chemical Wells, Paper Towel, toothpicks

Procedures:

1. Find the **GREEN** straw. Using the cut end of the straw scoop up a **very small** amount of **Powder “A”** and place it in **well #1**. The powder should just cover the bottom.
2. Place the same amount of **Powder “A”** in **well #5** and **well #9**.
3. Find the **YELLOW** straw. Place the same amount of **Powder “B”** in **well # 2, 6, and 10**.
4. Find the **BLUE** straw. Place the same amount of **Powder “C”** in **wells # 3,7,and 11**.
5. Find the **RED** straw. Place **Powder “D”** in wells # 4,8,and 12.
6. Use an eyedropper to place **water** into the well #1 so that it fills most of the well. Use a spatula to stir the mixture. **RECORD YOUR OBSERVATIONS IN THE DATA TABLE.**
7. Use $\frac{1}{2}$ of a tooth pick to stir individual wells.
8. Use the **vinegar** micropipette to add **7 drops** of vinegar to the powder in well # 5. Stir with $\frac{1}{2}$ of a tooth pick and record observations.
9. Use the **iodine** micropipette to add **7 drops** of iodine to well #9. **BE CAREFUL BECAUSE IODINE WILL STAIN.** Stir with $\frac{1}{2}$ of a toothpick. Record observations.
10. Repeat the same process with the **Powder “B” (#2,6,10)**, **Powder “C” (#3,7,11)** and **Powder “D”(#4,8,12)**
11. Always use a clean $\frac{1}{2}$ tooth pick for every stirring.
12. **RECORD ALL OBSERVATIONS.**

SET UP DATA

	Powder A	Powder B	Powder C	Powder D
Water	#1 Powder A and water	#2 Powder B Water	#3 Powder C and water	#4 Powder D and water
Vinegar	#5 Powder A and vinegar	#6 Powder B and vinegar	#7 Powder C and vinegar	#8 Powder D and vinegar
Iodine	#9 Powder A and iodine	#10 Powder B and iodine	#11 Powder C and iodine	#12 Powder D and iodine

TABLE 1: OBSERVATIONS

SUBSTANCE	POWDER "A"	POWDER "B"	POWDER "C"	POWDER "D"
UNMIXED	White Powder	White Powder	White Powder	White Powder
MIXED WITH WATER				
MIXED WITH VINEGAR				
MIXED WITH IODINE				
NAME OF SUBSTANCE				

TABLE 2: RESULTS
PROPERTY: SOLUBLE OR REACTIVE CHANGE: PHYSICAL OR CHEMICAL

SUBSTANCE		POWDER "A"	POWDER "B"	POWDER "C"	POWDER "D"
MIXED WITH WATER	PROPERTY				
	CHANGE				
MIXED WITH VINEGAR	PROPERTY				
	CHANGE				
MIXED WITH IODINE	PROPERTY				
	CHANGE				

LAB QUESTIONS

- How were all of the **unmixed** substances (baking powder, baking soda, cornstarch, and sugar) similar to each other in terms of their physical properties?

- What was the only **physical property** that you tested? What is the definition of this physical property?

- What was the only **chemical property** you tested? What is the definition of this chemical property?

- Describe the difference between a physical change and a chemical change.

5. What clues did you see that indicated a chemical change?

6. What does fizzing indicate is happening?

7. What does a color change indicate is happening?

8. Explain how you were able to identify the mystery powders.

9. Explain why it was important to clean the spatula after you stirred each powder in a liquid.

Mystery Powder Clue Information

Substance	Unmixed	Mixed with water	Mixed with vinegar	Mixed with iodine
Baking Powder	Fine white powder	Fizzing (reactive)	Fizzing (reactive with the water in vinegar)	Color change to greenish-black and fizzing (reactive)
Baking Soda	Fine white powder	Dissolves in water (soluble)	A lot of fizzing (reactive)	Dissolves in iodine (soluble)
Cornstarch	Fine white powder	Does not dissolve in water-forms a white mixture (non-soluble)	Does not dissolve in vinegar- forms a white mixture (non-soluble)	Color change to purplish-black (reactive)
Powdered Sugar	Fine white powder	Dissolves in water (soluble)	Dissolves in vinegar (soluble)	Color change to greenish-brown or yellow (reactive)