

Name:

***Recognizing the Evidence
of a Chemical Change Lab***

Date:

Block:

~~XXXXXX~~

Background Information

When two or more chemicals are mixed, a reaction often occurs in which new substances are formed. This is known as a chemical reaction. This reaction only occurs when the groups of atoms (molecules) are broken down, and the individual members (atoms) are rearranged to form different molecules.

Heating or cooling may cause atoms to rearrange with respect to one another, but each molecule remains intact. If the molecules are not broken down, no chemical reaction has occurred. Instead, this is known as a **physical change**. A true **chemical change** can be identified by any of several observable changes including a change in color, odor, or temperature and the formation of either a gas (bubbles in solution) or a precipitate (ppt), and/or light being emitted.

Procedure

You will conduct this lab by visiting *stations*. Using your data table, carry out the following reactions and record a “yes” or “no” if each reaction is or is not accompanied by each kind of change. Include any details you think are important (be observant!). Also record if you think the change is **chemical** or **physical**.

1. Using a 10 mL graduated cylinder and a scoopula, measure about 2 mL of acetic acid (vinegar), and then add a pinch of baking soda.
2. To about 5 mL of tap water, add 20-30 pellets of ammonium nitrate. Cover the end of the test tube with your thumb and shake well (do not spill the contents).
3. Add a few drops of silver nitrate to about 20-25 drops of potassium dichromate solution.
4. Add a few drops of sodium hydroxide to 20-25 drops of copper II sulfate solution.
- 5
 - a. Add six pellets of sodium hydroxide to about 5 mL of tap water. Stopper the test tube and shake well until the pellets dissolve. Save this portion of the experiment.
 - b. To the test tube from 5a, add three drops of phenolphthalein solution. Save this portion of the experiment.
 - c. **DEMO** To the test tube from 5b, add 5 mL of hydrochloric acid. Continue adding HCl until you see a change. Now, wash out the test tube well.
6. To a test tube containing 20-25 drops of cobalt II chloride solution, add several drops of sodium hydroxide solution.
7. Add a small strip of magnesium (Mg) to a test tube containing 30-40 drops of hydrochloric acid.

Note: Reactions 8 – 9 will be done as demonstrations in the fume hood and may be changed.

8. Place a small amount of 30% hydrogen peroxide into a flask. Add a pinch of manganese dioxide.
9. Place a penny (minted prior to 1983) in a glass petri dish and add nitric acid to the dish.

Data Table: Recognizing the Evidence of Chemical Changes

Hint: A precipitate is when a solid forms from the mixture of two liquids, in this case.

Station	Color change?	Precipitate formed? (ppt)	Gas formed? (bubbles)	Temperature Change?	Other change?	<u>Chemical or physical change?</u>
1	No	No	Yes	No	NaHCO ₃ dissolved	
2	No	No	No	Yes (got colder)	NH ₄ NO ₃ dissolved	
3	(dark brown ppt)	Yes (dark brown)	No	Yes (got warmer)	No	
4	(blue ppt)	Yes (blue gel)	No	Yes (got warmer)	No	
5a	No	No	No	Yes (got warmer)	NaOH dissolved	
5b	Yes (clear → pink)	No	No	No	No	
5c DEMO	Yes (pink → clear)	No	No	No	No	
6	(blueish/purple ppt)	Yes (blueish/purple)	No	No	No	
7	No	No	Yes	Yes (got warmer)	Mg disintegrates	
8 DEMO	Yes (clear → black)	No	Yes	Yes (got warmer)	Called "Genie in a Bottle"	
9 DEMO	Yes (clear → green → blue)	No	Yes	Yes (got warmer)	Penny shrivels	

To receive full credit, you must fill-out your ENTIRE data table – leave nothing blank