

Physical Change vs Chemical Change Lab

Name: _____ Period: _____

Introduction

Matter has characteristics called properties that help us identify and describe it. Properties can be considered either physical or chemical.

Physical properties include: color, odor, density, hardness, structure, solubility, melting point and boiling point. These are called physical properties because they can be detected without changing the nature of the material. Some common examples of physical changes are: melting, freezing, condensing, breaking, crushing, cutting, dissolving, and bending.

Chemical properties are determined by a reaction of a substance with another substance. A new substance with new properties is formed during the chemical reaction. Examples of chemical reactions include: combination with acid or base, burning (combustion), oxidation (corrosion or rusting) or formation of a product after reacting with another substance. Common examples of chemical changes that you may be somewhat familiar with are: digestion, respiration, photosynthesis, burning, and decomposition.

Is it a chemical or physical change?

A few changes are difficult to know at first if they are chemical or physical changes. The basic test is that if the shape, size, or physical state is altered, but the chemical composition remains the same, then it is a **physical change**. If a new substance with new chemical make up is formed, then a **chemical change** or chemical reaction has occurred. In a chemical reaction the atoms are the same but the atoms of the substance(s) are rearranged.

Question:

Could you determine if a change is chemical or physical based only on the qualitative observations between the interaction of two substances?

Hypothesis:

Sweet Sugar! – Physical Change Observed

Chemical Change Observed

Boil, Boil, Toil and Trouble – What is in the bubbles? Is boiling a physical or chemical change?

Sugar Water: What is dissolving, exactly?

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Investigation 1 – Styro –o-my

Materials: 1 Piece of Styrofoam cup small beaker acetone

Directions:

1. Tear off a piece of Styrofoam cup.
2. List the physical properties of Styrofoam below.
3. Place the Styrofoam on the desk top.
4. Drop 6-8 drops of acetone onto Styrofoam.
5. Record qualitative observations – it's ok to pick it up.

Physical Properties of Styrofoam	Physical Properties after adding acetone	Was this a chemical or physical change? Why? (hint go to internet)

Investigation 2 – Is it Chemical or Physical?

Materials: 2 clean, dry test tubes calcium chloride baking soda phenol red

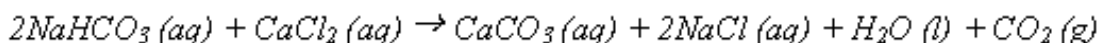
1. Scoop a small amount of solid calcium chloride and add to a clean, dry test tube. List 2 physical properties of calcium chloride.
2. Add 3 ml of water to the calcium chloride and gently swirl to mix. Is there evidence of a chemical change? Is dissolving a physical change or a chemical change?
3. Add 2 drops of phenol red to the test tube. Phenol red is a pH indicator that will turn yellow in the presence of an acid and pink in the presence of a base. Record your observations.
4. Scoop a small amount of solid sodium hydrogen bicarbonate (baking soda) and add to a clean, dry test tube. List 2 physical properties of baking soda.

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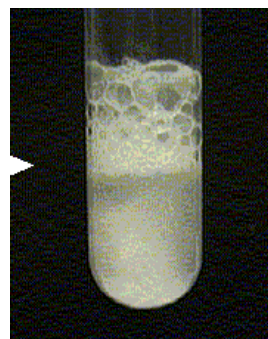
5. Add 3 ml of water to the baking soda and gently swirl to mix. Is there evidence of a chemical change?
6. Add 2 drops of phenol red to the test tube. Record your observations.
7. Place the test tube with the baking soda mixture in the test tube holder. Carefully pour the dissolved calcium chloride mixture **INTO** the tube with baking soda mixture. Observe and record the results.

8. The following reaction occurs:



9. At this point, call your teacher over to help you perform the burning splint test.

- *If the burning splint goes out when inserted into the top portion of the test tube, then the gas is probably carbon dioxide (CO₂).*
- *If the burning splint burns vigorously when inserted into the top portion of the test tube, then the gas is probably oxygen (O₂).*
- *If the burning splint creates a "whooping" sound when inserted into the top portion of the test tube, then the gas is probably hydrogen (H₂).*



Claim _____

Evidence _____

Reasoning _____