

Experiment: Physical and Chemical Properties and Changes

Objectives

- o Identify various physical and chemical properties of matter
- o To distinguish between chemical changes and physical changes.

Materials Needed

Name: _____

Equipment:

- Hot plate
- Glass stirring rod
- 12-Well plate
- Eyedroppers
- Microspatula
- Evaporating dishes

Chemicals:

- Various elements & compounds
- Iodine crystals

- Sucrose crystals
- Acetone
- Steel wool
- Cupric sulfate pentahydrate crystals
- 10% sodium carbonate solution
- 10% sodium sulfate solution
- 1 M HCl
- 10% calcium chloride solution
- 10% sodium chloride solution
- De-ionized water

Introduction

Chemistry is the study of matter. The most thorough description of a sample of matter will usually begin by observing relevant *physical properties*, both *intrinsic* and *extrinsic*. Many physical properties are qualitative such as color, crystal shape, and phase at room temperature. Other physical properties are quantitative (must be measured) such as density, specific heat capacity, and boiling point. Any change in a substance or sample is considered to be a *physical change* when its chemical composition is not altered, e.g. boiling, freezing, expanding, and dissolving.

Matter can also be characterized by its *chemical properties*. The chemical properties of a substance include possible ways it can interact with other matter and transform into new substances. When the chemical composition of a substance changes it is referred to as *chemical change*. During a chemical change, atoms are pulled apart from one another then rearranged to form new substances. Examples of chemical change are burning, rusting, fermenting, and decomposing.

In this experiment, you will first identify and record various physical properties of substances. In the second part, you will look at changes in matter and determine if they are physical or chemical.

Preliminary Questions

1. Classify the following properties of sodium metal as physical or chemical:

- a. Silver metallic color _____
- b. Turns gray in air _____
- c. melts at 98°C _____
- d. Reacts explosively with chlorine _____

2. Classify the following changes as physical or chemical:

- a. Magnesium burns forming a white powder _____
- b. Soda water is poured into a glass producing bubbles _____
- c. Concrete expands on a hot sunny day _____
- d. Bread dough "rises" when yeast is added _____