

# Chemistry Worksheet #1

## Classification of Matter Physical and Chemical Changes

Questions from Chemistry 2e, OpenStax  
Access for free at <https://openstax.org/details/books/chemistry-2e>

- How does a heterogeneous mixture differ from a homogeneous mixture? How are they similar?
- How does a homogeneous mixture differ from a pure substance? How are they similar?
- How does an element differ from a compound? How are they similar?
- How do molecules of elements and molecules of compounds differ? In what ways are they similar?
- How does an atom differ from a molecule? In what ways are they similar?
- Many of the items you purchase are mixtures of pure compounds. Select three of these commercial products and prepare a list of the ingredients that are pure compounds.
- Classify each of the following as an element, a compound, or a mixture:
  - copper
  - water
  - nitrogen
  - sulfur
  - air
  - sucrose
  - a substance composed of molecules each of which contains two iodine atoms
  - gasoline
- Classify each of the following as an element, a compound, or a mixture:
  - iron
  - oxygen
  - mercury oxide
  - pancake syrup
  - carbon dioxide
  - a substance composed of molecules each of which contains one hydrogen atom and one chlorine atom
  - baking soda
  - baking powder
- Classify the six underlined properties in the following paragraph as chemical or physical:

Fluorine is a pale yellow gas that reacts with most substances. The free element melts at  $-220\text{ }^{\circ}\text{C}$  and boils at  $-188\text{ }^{\circ}\text{C}$ . Finely divided metals burn in fluorine with a bright flame. Nineteen grams of fluorine will react with 1.0 gram of hydrogen.
- Classify each of the following changes as physical or chemical:
  - condensation of steam
  - burning of gasoline
  - souring of milk
  - dissolving of sugar in water
  - melting of gold

**28.** Classify each of the following changes as physical or chemical:

(a) coal burning

(b) ice melting

(c) mixing chocolate syrup with milk

(d) explosion of a firecracker

(e) magnetizing of a screwdriver

**29.** The volume of a sample of oxygen gas changed from 10 mL to 11 mL as the temperature changed. Is this a chemical or physical change?

**30.** A 2.0-liter volume of hydrogen gas combined with 1.0 liter of oxygen gas to produce 2.0 liters of water vapor. Does oxygen undergo a chemical or physical change?