

## 1.E: Chemistry, Matter, and Measurement (Exercises)

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- Does each statement refer to a chemical property or a physical property?
  - Balsa is a very light wood.
  - If held in a flame, magnesium metal burns in air.
  - Mercury has a density of 13.6 g/mL.
  - Human blood is red.
- Does each statement refer to a chemical property or a physical property?
  - The elements sodium and chlorine can combine to make table salt.
  - The metal tungsten does not melt until its temperature exceeds 3,000°C.
  - The ingestion of ethyl alcohol can lead to disorientation and confusion.
  - The boiling point of isopropyl alcohol, which is used to sterilize cuts and scrapes, is lower than the boiling point of water.
- Define *element*. How does it differ from a compound?
- Define *compound*. How does it differ from an element?
- Give two examples of a heterogeneous mixture.
- Give two examples of a homogeneous mixture.
- Identify each substance as an element, a compound, a heterogeneous mixture, or a solution.
  - xenon, a substance that cannot be broken down into chemically simpler components
  - blood, a substance composed of several types of cells suspended in a salty solution called plasma
  - water, a substance composed of hydrogen and oxygen
- Identify each substance as an element, a compound, a heterogeneous mixture, or a solution.
  - sugar, a substance composed of carbon, hydrogen, and oxygen
  - hydrogen, the simplest chemical substance
  - dirt, a combination of rocks and decaying plant matter
- Identify each substance as an element, a compound, a heterogeneous mixture, or a solution.
  - air, primarily a mixture of nitrogen and oxygen
  - ringer's lactate, a standard fluid used in medicine that contains salt, potassium, and lactate compounds all dissolved in sterile water
  - tartaric acid, a substance composed of carbon, hydrogen, and oxygen
- Identify each material as an element, a compound, a heterogeneous mixture, or a solution.
  - equal portions of salt and sand placed in a beaker and shaken up
  - a combination of beeswax dissolved in liquid hexane
  - hydrogen peroxide, a substance composed of hydrogen and oxygen
- What word describes each phase change?
  - solid to liquid
  - liquid to gas
  - solid to gas
- What word describes each phase change?
  - liquid to solid
  - gas to liquid
  - gas to solid

### Answers

- physical property

- b. chemical property
- c. physical property
- d. physical property

2.

- a. chemical property
- b. physical property
- c. chemical property
- d. physical property

3. An element is a substance that cannot be broken down into chemically simpler components. Compounds can be broken down into simpler substances.

4. A compound is composed of two or more elements combined in a fixed ratio. An element is the simplest chemical substance.

5. a salt and pepper mix and a bowl of cereal (answers will vary)

6. vinegar and rubbing alcohol (answers will vary)

7.

- a. element
- b. heterogeneous mixture
- c. compound

8.

- a. compound
- b. element
- c. heterogeneous mixture

9.

- a. solution
- b. solution
- c. compound

10.

- a. heterogeneous mixture
- b. solution
- c. compound

11.

- a. melting or fusion
- b. boiling or evaporation
- c. sublimation

12.

- a. freezing
- b. condensation
- c. deposition

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