Unit 2 Properties of Matter Assessment

1. Which example indicates that a chemical change has occurred? [Answer: A/Standard: CHEM.4A]
   1. When two aqueous solutions are mixed, a precipitate is formed.
   2. As ammonium nitrate dissolves in water, it causes the temperature of the water to decrease.
   3. Alcohol evaporates when left in an open container.
   4. Water is added to blue copper(II) chloride solution. The resulting mixture is lighter blue in color.
2. An aqueous solution of sodium chloride is best classified as a [Answer: B/Standard: CHEM.4D]
   1. homogeneous compound
   2. homogeneous mixture
   3. heterogeneous compound
   4. heterogeneous mixture
3. Which diagram best represents a gas in a closed container? [Answer: 1/Standard: CHEM.4C]



1. Which set of procedures and observations indicates a chemical change? [Answer: D/Standard: CHEM.4A]
   1. Ethanol is added to an empty beaker and the ethanol eventually disappears.
   2. A solid is gently heated in a crucible and the solid slowly turns to liquid.
   3. Large crystals are crushed with a mortar and pestle and become powder.
   4. A cool, shiny metal is added to water in a beaker and rapid bubbling occurs.
2. Which statement describes a chemical property of bromine? [Answer: C/Standard: CHEM.4A]
   1. Bromine is soluble in water.
   2. Bromine has a reddish-brown color.
   3. Bromine combines with aluminum to produce AlBr3.
   4. Bromine changes from a liquid to a gas at 332 K and 1 atm.
3. A molecular compound is formed when a chemical reaction occurs between atoms of [Answer: c/Standard: CHEM 4D]
4. chlorine and sodium
5. chlorine and yttrium
6. oxygen and hydrogen
7. oxygen and magnesium
8. Which substance cannot be broken down by chemical means? [Answer: B/Standard: CHEM 4D]
9. ammonia
10. antimony
11. methane
12. water
13. Matter is classified as a [Answer: B/Standard: CHEM.4D]
    1. substance, only
    2. substance or as a mixture of substances
    3. homogenous mixture, only
    4. homogenous mixture or as a heterogeneous mixture
14. A beaker contains both alcohol and water. These liquids can be separated by distillation because the liquids have different [Answer: C/Standard: CHEM.4B]
    1. boiling points
    2. particle sizes
    3. densities
    4. solubilities
15. An example of an extensive property of matter is \_\_\_\_\_\_\_.[Answer: C/Standard: CHEM.4B]
    1. Temperature
    2. Luster
    3. Mass
    4. Hardness
16. Which of the following are considered physical properties of a substance? [Answer: D/Standard: CHEM.4A]
    1. Color and odor
    2. Melting and boiling points
    3. Malleability and hardness
    4. All of the above
17. Which state of matter has a definite volume and takes the shape of its container?

[Answer: B/Standard: CHEM.4C]

* 1. Solid
  2. Liquid
  3. Gas
  4. Both b and c

1. Which state of matter takes both the shape and volume of its container?

[Answer: C/Standard: CHEM.4C]

* 1. Solid
  2. Liquid
  3. Gas
  4. Both b and c

1. Which state of matter expands when heated and is easy to compress? [Answer: A/Standard: CHEM.4C]
   1. Gas
   2. Liquid
   3. Solid
   4. All of the above
2. All of the following are physical properties of a substance in the liquid state EXCEPT \_\_\_\_\_. [Answer: A/Standard: CHEM.4C]
   1. Indefinite volume
   2. Definite mass
   3. Not easily compressed
   4. Indefinite shape
3. Which of the following is NOT a physical property of water? [Answer: C/Standard: CHEM.4A]
   1. It has a boiling point of 100°C.
   2. It is a colorless liquid.
   3. It is composed of hydrogen and oxygen
   4. Sugar dissolves in it.
4. Which of the following CANNOT be classified as a pure substance? [Answer: A/Standard: CHEM.4D]
   1. table salt
   2. nitrogen
   3. air
   4. gold
5. Separating a solid from a liquid by evaporating the liquid is called \_\_\_\_.[Answer: D/Standard: CHEM.4D]
   1. Filtration
   2. Solution
   3. Condensation
   4. Distillation
6. Which of the following is true about compounds? [Answer: C/Standard: CHEM.4D]
   1. They can be physically separated into their component elements.
   2. They have compositions that vary.
   3. They are pure substances.
   4. They have properties similar to those of their component elements.
7. A substance that can be separated into two or more substances only by a chemical change is a(n) \_\_\_\_. [Answer: D/Standard: CHEM.4D]
   1. Solution
   2. Mixture
   3. Element
   4. Compound
8. What is one difference between a mixture and a compound? [Answer: B/Standard: CHEM.4D]
   1. A compound consists of more than one phase.
   2. A compound can only be separated into its components by chemical means.
   3. A mixture can only be separated into its components by chemical means.
   4. A mixture must be uniform in composition.
9. At standard pressure, how do the boiling point and the freezing point of NaCl(aq) compare to the boiling point and the freezing point of H2O(l)? [Answer: D/Standard: CHEM 4A]
10. Both the boiling point and the freezing point of NaCl(aq) are lower.
11. Both the boiling point and the freezing point of NaCl(aq) are higher.
12. The boiling point of NaCl(aq) is lower, and the freezing point of NaCl(aq) is higher.
13. The boiling point of NaCl(aq) is higher, and the freezing point of NaCl(aq) is lower.
14. Which of these describes a pollution-producing process that involves only a physical change? [Answer: C/Standard: CHEM.4A]
    1. Coal with a high sulfur content is burned, producing gases that cause acid rain.
    2. Chlorofluorocarbons are released, changing ozone in the upper atmosphere into oxygen.
    3. Hot wastewater is discharged into a lake, lowering oxygen levels in the water.
    4. Nitrogen oxide emissions combine with water vapor, producing nitric acid.
15. In photography, which of these is an example of a chemical change? [Answer: C/Standard: CHEM.4A]
    1. Light being refracted by a camera lens
    2. Adjusting a lens to focus light
    3. Halide granules being activated by light
    4. Allowing a certain wavelength of light into the camera
16. A sugar cube in a test tube is heated over a Bunsen burner. The sugar cube turns black and has less mass than before it was heated. These changes occur because the sugar has — [Answer: C/Standard: CHEM.4A]
    1. Melted
    2. Boiled
    3. reacted chemically
    4. become hydrated