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Chapter 2 Standardized Test Practice

1. Which of the following materials is a mixture?

A. Carbon **B.** Methane **C.** Air **D.** Ice

2. Physical properties of a substance include:

F. color and odor.
G. density and hardness.
H. melting point and boiling point.
J. all of the above.

Passage I

Use the following passage to answer questions 3–5.

The substance looked pale yellow and had a density of 3.6 g/mL. It burned readily in air and produced bubbles when reacted with acid. When heated, it changed from solid to liquid at 79°C and from liquid to gas at 143°C.

3. The change in state from a solid to a liquid is:

A. a chemical change.
B. a physical change.
C. a chemical property.
D. known as solution formation.

4. What is the physical state of the substance at a temperature of 125°C?

F. Solid **G.** Liquid **H.** Gas **J.** Heterogeneous mixture

5. Which of the following describes a chemical change?

A. The substance burning readily in air
B. The substance changing from a solid to a liquid at 79°C
C. The substance changing from a liquid to a gas at 143°C
D. The substance having a density of 3.6 g/mL

6. Which of the following statements is true?

F. The composition of the same compound varies depending on where it occurs.
G. A compound is a heterogeneous mixture of two or more elements.
H. In general, the properties of a compound are different from those of its component elements.
J. Filtration can be used to separate a mixture of two liquids.

7. Which of the following substances can be decomposed by a chemical change?

A. Ammonia (NH_3) **B.** Argon (Ar) **C.** Iron (Fe) **D.** Helium (He)

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Passage II

Use the following passage to answer questions 8–11.

A substance is a form of matter with a uniform and unchanging composition. A student performed experiments and conducted research on the properties of several common substances. Her findings are summarized in the table below.

Table 1

Substance	Chemical formula	Color	Density at room temperature (g/cm^3)	Melting point (°C)	Boiling point (°C)	Physical state at room temperature
Oxygen	O_2	colorless	0.0014	−218	−183	gas
Hydrogen	H_2	colorless	0.00009	−259	−253	gas
Water	H_2O	colorless	1.00	0	100	liquid
Mercury	Hg	silver	13.5	−39	357	liquid
Sodium chloride	NaCl	white	2.17	801	1413	solid

8. Which of the properties in Table 1 is a chemical property?

F. Color **G.** Density **H.** Melting point **J.** none of the above

9. Water is a substance composed of hydrogen and oxygen. Based on the data in Table 1, which of the following statements is true?

A. The properties of water are similar to the properties of its component elements (hydrogen and oxygen).

B. Water is more than 100 times as dense as its component elements (hydrogen and oxygen).

C. All liquid-state substances are compounds.

D. Water is the liquid with the greatest density.

10. On the basis of the data presented in Table 1, which of the following sequences represents the melting points of the substances from lowest to highest?

F. Sodium chloride, water, mercury, oxygen, hydrogen

G. Hydrogen, oxygen, water, mercury, sodium chloride

H. Hydrogen, oxygen, mercury, water, sodium chloride

J. Sodium chloride, mercury, water, oxygen, hydrogen

11. Which of the following substances could exist as a liquid at 50°C?

A. Sodium chloride only

B. Water or mercury

C. Water, mercury, or sodium chloride

D. Water only

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12. Ice, liquid water, and water vapor (steam) have:

F. similar physical properties and chemical properties.

G. similar physical properties but different chemical properties.

H. different physical properties but similar chemical properties.

J. identical physical properties and chemical properties.

13. At 1 atmosphere and 20°C, all samples of $H_2O(l)$ must have the same:

A. mass. **B.** density. **C.** volume. **D.** weight.

14. Which of the following is characteristic of a compound?

F. Pure substance **H.** Contains different kinds of atoms

G. Homogeneous **J.** all of the above

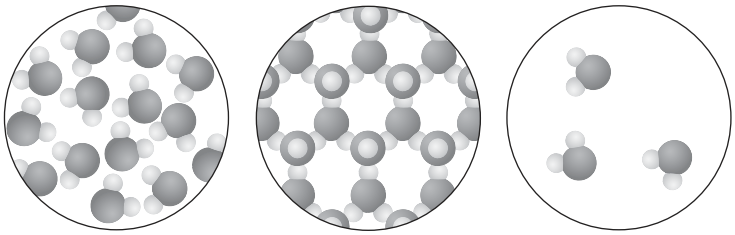
15. Anything that has mass and occupies space is:

A. a mixture. **B.** a solid. **C.** a compound. **D.** matter.

Passage III

Use the following passage to answer questions 16–17.

A substance can exist as a solid, liquid, or gas depending on the temperature and pressure conditions it is subjected to. A student made the following sketches to illustrate the structure of ice, liquid water, and water vapor—all of which are forms of H_2O. The larger dark grey particles represent oxygen atoms and the smaller light gray particles represent hydrogen atoms.



A **B** **C**

16. Water molecules in the solid state (known as ice) are locked into fixed positions. Which diagram illustrates ice?

F. A only **G.** A and B **H.** B only **J.** C only

17. Ice is less dense than water, which is why an ice cube floats in a glass of water. On the basis of this information and the diagrams above, which sequence represents the densities of the three states of water from least dense to most dense?

A. C, B, A **B.** C, A, B **C.** B, A, C **D.** A, B, C