Unit 1 Part 12: Multiple Choice Practice

Directions: Each of the questions or incomplete statements below is followed by four suggested answers or completions. Select the answer that is best in each case and then fill in the corresponding circle on the answer sheet.

Note: For all questions, assume that the temperature is 298K, the pressure is 1.00 atmosphere, and solutions are aqueous unless otherwise specified.

1. A student performs the following tests to determine the identity of a mineral sample from its physical and chemical properties.

physical tests ↓ physical properties ↓

Test 1	Microscopic examination of the mineral to see the shape of its crystals.
Test 2	Scratch test of the mineral to determine its hardness.
Test 3	Rubbing the mineral on a streak plate to determine the color of its powdered form.
Test 4	Dropping dilute hydrochloric acid on the mineral to see if bubbles will form.

reactivity gas formation

Which of the tests would involve a chemical change in the mineral?

A. Tests 2 and 4
B. Tests 3 and 4
C. Tests 1, 2, and 4
D. Test 4 only

2. A chemistry student makes careful observations and measurements of a small sample of matter, and determines the following:

Appearance	silver solid
Mass	11.85 g
Density	5.9 g/cm^3
Melting Point	30 °C

The student determines that the unknown substance is gallium (Ga). Which of the following is an extensive property of the gallium sample?

*extensive - amount of substance DOES matter

A. Silver solid
B. Mass of 11.85 g
C. Density of 5.9 g/cm^3
D. Melting point of 30 °C

3. A liquid has slightly different properties than a solid because in a solid, the particles –

A. are free to flow past one another. liquid only
B. are close together. liquid & solid
C. get bigger when the temperature increases. this isn't a thing...
D. vibrate in place. solid only

4. The following two equations represent changes to water.

1. $H_2O\,(l) \rightarrow H_2O\,(s) + \text{energy}$ phase change (physical)
2. $H_2O\,(l) + \text{energy} \rightarrow 2\,H_2\,(g) + O_2\,(g)$ ↖ bonds between H & O are broken (chemical)

A physical change is represented by –

A. Both 1 and 2
B. Neither 1 nor 2
C. 2 only
D. 1 only

5. A transparent liquid has uniform color. Under a microscope, no difference in uniformity is apparent. The liquid passes unchanged through a filter paper. Based on this information, it may be concluded that the liquid is –

A. an element. too specific (could be compound)
B. either a pure substance or a homogeneous mixture.
C. either an element or a ~~heterogeneous~~ mixture.
D. a ~~heterogeneous~~ mixture.

totally uniform → CAN'T be heterogenous

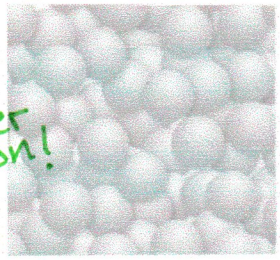
6. A sample of sulfur obtained from the crater of a volcano is carefully measured. Which of the following is an intensive property of the sample?

A. Density of 2.07 g/cm^3
B. Mass of 3.85 g
C. Volume of 1.86 cm^3
D. Temperature of 20 °C

* intensive - independent of the amount of substance

2 right answers, oops!

7. The diagram below shows the arrangement of atoms in liquid mercury. Which of the following properties of liquid mercury atoms explains why liquid mercury takes the shape of and fills only the bottom of a more voluminous container, but neither solid nor gaseous mercury does?



Liquid mercury atoms –

A. are practically incompressible. ← true, but don't answer the question!
B. are close together but free to move.
C. have a random arrangement. ←
D. slightly increase their average separation when heated. ↓

8. Which of these correctly identifies two processes with the types of changes that occur?

A. Combustion – physical change; Boiling – chemical change
B. Boiling – physical change; Combustion – chemical change
C. Melting – physical change; Sublimation – chemical change
D. Sublimation – physical change; Melting – chemical change

9. A student is asked to identify a substance on the basis of its chemical properties. The table below lists some of the properties of the element bromine (Br).

which of the properties of bromine is/are chemical properties?

1. **state**	liquid
2. **color**	reddish-brown
3. **elemental state**	diatomic
4. **reactivity**	moderately high
5. **melting point (°C)**	-7
6. **boiling point (°C)**	59

A. 1 and 3 only

B. 2 and 4 only

C. 4 only

D. 4, 5, and 6 only

10. During an investigation, a student determines that a copper sample has a density of 8.10 g/mL. What is the student's percent error if the accepted density for copper is 8.96 g/mL?

$$\frac{8.96 - 8.10}{8.96} \times 100$$

A. 0.7 %

B. 8.6 %

C. 9.6 %

D. 11.0 %