

Regents Chemistry

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1. Which substance can *not* be decomposed by a chemical change?
- A) ammonia **B) copper**
C) propanol D) water
2. Which property could be used to identify a compound in the laboratory?
- A) mass **B) melting point**
C) temperature D) volume
3. Which substance can not be broken down by a chemical reaction?
- A) ammonia **B) argon**
C) methane D) water
4. Two solid samples each contain sulfur, oxygen, and sodium, only. These samples have the same color, melting point, density, and reaction with an aqueous barium chloride solution. It can be concluded that the two samples are the same
- A) compound** B) element
C) mixture D) solution
5. Which substance can be broken down by a chemical change?
- A) antimony B) carbon
C) hexane D) sulfur
6. Which substance can be decomposed by chemical means?
- A) ammonia** B) oxygen
C) phosphorus D) silicon
7. Two substances, *A* and *Z*, are to be identified. Substance *A* can *not* be broken down by a chemical change. Substance *Z* can be broken down by a chemical change. What can be concluded about these substances?
- A) Both substances are elements.
B) Both substances are compounds.
C) Substance *A* is an element and substance *Z* is a compound.
D) Substance *A* is a compound and substance *Z* is an element.
8. A sample of $\text{CO}_2(\text{s})$ and a sample of $\text{CO}_2(\text{g})$ differ in their
- A) chemical compositions
B) empirical formulas
C) molecular structures
D) physical properties
9. Which statement describes a chemical property of bromine?
- A) Bromine is soluble in water.
B) Bromine has a reddish-brown color.
C) Bromine combines with aluminum to produce AlBr_3 .
D) Bromine changes from a liquid to a gas at 332 K and 1 atm.
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Physical/Chemical practice questions

10. Which equation represents a physical change?

- A) $\text{H}_2\text{O}(\text{s}) + 6.01 \text{ kJ} \rightarrow \text{H}_2\text{O}(\ell)$
- B) $2\text{H}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{H}_2\text{O}(\text{g}) + 483.6 \text{ kJ}$
- C) $\text{H}_2(\text{g}) + \text{I}_2(\text{g}) + 53.0 \text{ kJ} \rightarrow 2\text{HI}(\text{g})$
- D) $\text{N}_2(\text{g}) + 2\text{O}_2(\text{g}) + 66.4 \text{ kJ} \rightarrow 2\text{NO}_2(\text{g})$

11. Which statement describes a chemical property of hydrogen gas?

- A) **Hydrogen gas burns in air.**
- B) Hydrogen gas is colorless.
- C) Hydrogen gas has a density of $0.000\ 09\text{g}/\text{cm}^3$ at STP.
- D) Hydrogen gas has a boiling point of $20. \text{ K}$ at standard pressure.

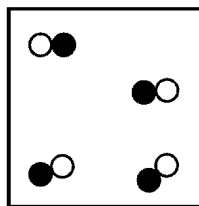
12. Which statement describes a chemical property of the element magnesium?

- A) Magnesium is malleable.
- B) Magnesium conducts electricity.
- C) **Magnesium reacts with an acid.**
- D) Magnesium has a high boiling point.

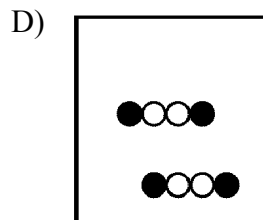
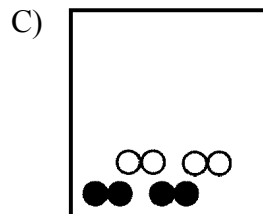
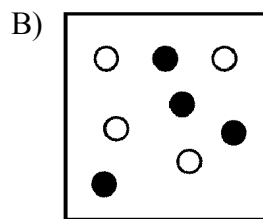
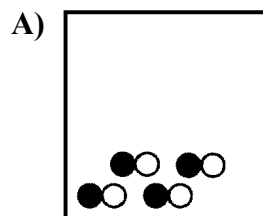
13. Which process is a chemical change?

- A) melting of ice
- B) boiling of water
- C) subliming of ice
- D) **decomposing of water**

14. Given the particle diagram representing four molecules of a substance:



Which particle diagram best represents this same substance after a physical change has taken place?



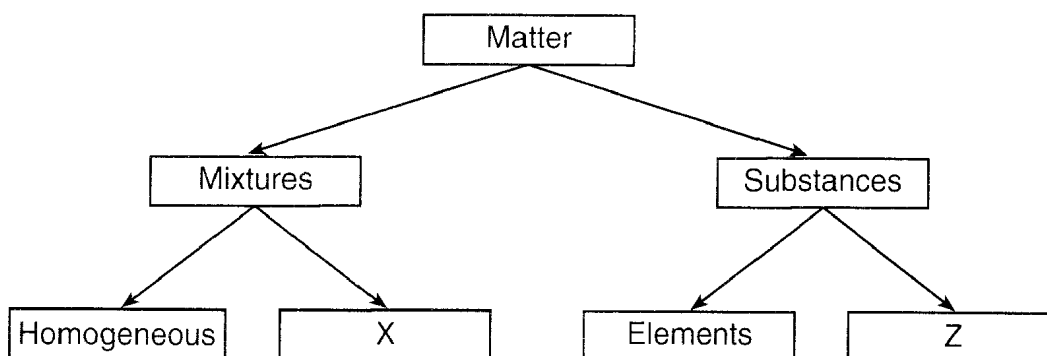
Physical/Chemical practice questions

15. Which statement describes a chemical property of oxygen?
- A) Oxygen has a melting point of 55 K.
 - B) Oxygen can combine with a metal to produce a compound.**
 - C) Oxygen gas is slightly soluble in water.
 - D) Oxygen gas can be compressed.
16. Which set of procedures and observations indicates a chemical change?
- A) Ethanol is added to an empty beaker and the ethanol eventually disappears.
 - B) A solid is gently heated in a crucible and the solid slowly turns to liquid.
 - C) Large crystals are crushed with a mortar and pestle and become powder.
 - D) A cool, shiny metal is added to water in a beaker and rapid bubbling occurs.**
17. An example of a physical property of an element is the element's ability to
- A) react with an acid
 - B) react with oxygen
 - C) form a compound with chlorine
 - D) form an aqueous solution**
18. Which statement describes a chemical property that can be used to distinguish between compound A and compound B?
- A) A is a blue solid, and B is a white solid.
 - B) A has a high melting point, and B has a low melting point.
 - C) A dissolves in water, and B does not dissolve in water.
 - D) A does not burn in air, and B does burn in air**
19. Which process represents a chemical change?
- A) melting of ice
 - B) corrosion of copper**
 - C) evaporation of water
 - D) crystallization of sugar

Physical/Chemical practice questions

Base your answers to questions 20 through 23 on the diagram below concerning the classification of matter.

Classification of Matter



20. Given a mixture of sand and water, state *one* process that can be used to separate water from the sand.

21. Explain, in terms of particle arrangement, why NaCl(aq) is a homogeneous mixture.

22. What type of substance is represented by *Z*?

23. What type of mixture is represented by *X*?

Physical/Chemical practice questions

Base your answers to questions **24** and **25** on the information below.

In an investigation, a dripless wax candle is massed and then lighted. As the candle burns, a small amount of liquid wax forms near the flame. After 10 minutes, the candle's flame is extinguished and the candle is allowed to cool. The cooled candle is massed.

24. State *one* observation that indicates a chemical change has occurred in this investigation.
25. Identify *one* physical change that takes place in this investigation.

Answer Key
Physical/Chemical practice questions

1. **B**
2. **B**
3. **B**
4. **A**
5. **C**
6. **A**
7. **C**
8. **D**
9. **C**
10. **A**
11. **A**
12. **C**
13. **D**
14. **A**
15. **B**
16. **D**
17. **D**
18. **D**
19. **B**
20. Examples: –
Evaporate the water. – Decant the water. -filtration
21. Examples: – The water molecules, sodium ions, and chloride ions are uniformly mixed together.
– All particles distribute evenly.
22. compound or compounds
23. Examples: –
heterogeneous –
nonuniform
24. *Examples:* -The burning candle releases heat and light. -A cobalt chloride test indicates water is produced. -A limewater test indicates carbon dioxide gas is produced.
25. *Examples:* -melting
-vaporization
-solidification