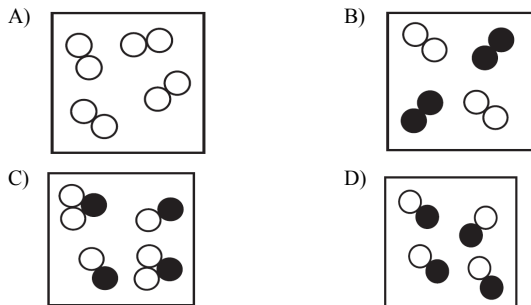
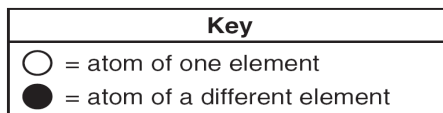
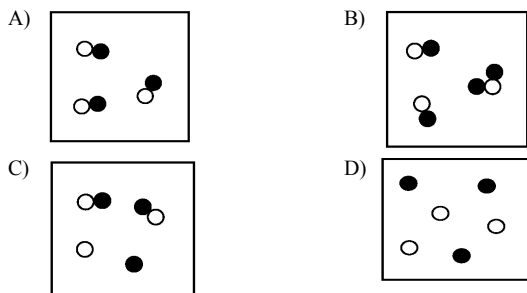
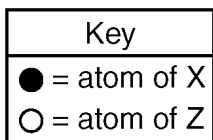


1. Which particle diagram represents a sample of one compound, only?



2. Which particle diagram represents a mixture of element X and element Z only?



3. Matter is classified as a

- A) substance, only  
 B) substance or as a mixture of substances  
 C) homogenous mixture, only  
 D) homogenous mixture or as a heterogeneous mixture

4. Which substance can *not* be decomposed by a chemical change?

- A) AlCl<sub>3</sub>    B) H<sub>2</sub>O    C) HI    D) Cu

5. Which property could be used to identify a compound in the laboratory?

- A) mass    B) melting point  
 C) temperature    D) volume

6. Which list of formulas represents compounds, only?

- A) CO<sub>2</sub>, H<sub>2</sub>O, NH<sub>3</sub>    B) H<sub>2</sub>, N<sub>2</sub>, O<sub>2</sub>  
 C) H<sub>2</sub>, Ne, NaCl    D) MgO, NaCl, O<sub>2</sub>

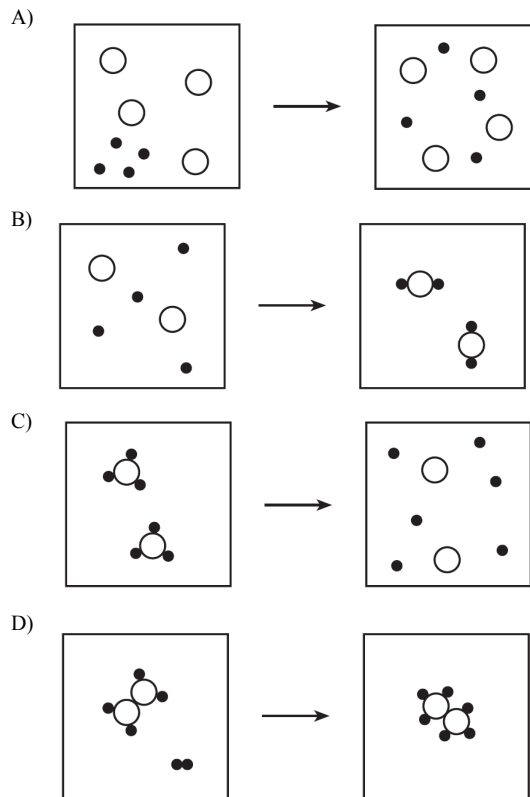
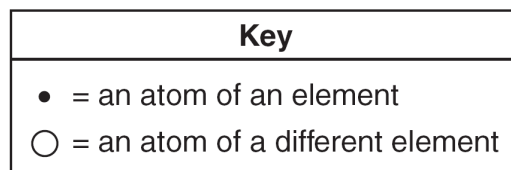
7. Matter that is composed of two or more different elements chemically combined in a fixed proportion is classified as

- A) a compound    B) an isotope  
 C) a mixture    D) a solution

8. A compound differs from a mixture in that a compound always has a

- A) homogeneous composition  
 B) maximum of two components  
 C) minimum of three components  
 D) heterogeneous composition

9. Which diagram represents a physical change, only?



10. The list below shows four samples: A, B, C, and D.

- (A) HCl(aq)  
 (B) NaCl(aq)  
 (C) HCl(g)  
 (D) NaCl(s)

Which samples are mixtures?

- A) A and B    B) A and C    C) C and B    D) C and D

11. Which pair are classified as chemical substances?

- A) mixtures and solutions    B) compounds and solutions  
 C) elements and mixtures    D) compounds and elements

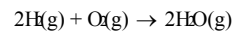
12. At 1 atmosphere and 20°C, all samples of H<sub>2</sub>O(l) must have the same

- A) mass    B) density    C) volume    D) weight

13. A chemical formula is an expression used to represent

- A) mixtures, only    B) elements, only  
 C) compounds, only    D) compounds and elements

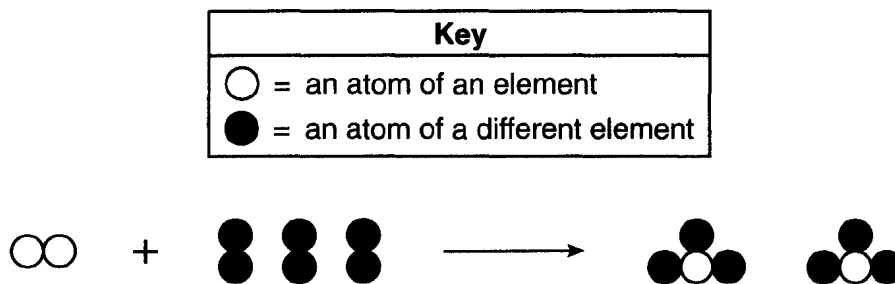
14. Consider the following reaction:



What kind of change do the reactants undergo in the reaction?

- A) atomic change    B) phase change  
 C) chemical change    D) nuclear change

15. Given the balanced particle-diagram equation:



Which statement describes the type of change and the chemical properties of the product and reactants?

- A) The equation represents a physical change, with the product and reactants having different chemical properties.
- B) The equation represents a physical change, with the product and reactants having identical chemical properties.
- C) The equation represents a chemical change, with the product and reactants having different chemical properties.
- D) The equation represents a chemical change, with the product and reactants having identical chemical properties.

16. Which statement describes a chemical property of aluminum?

- A) Aluminum is malleable.
- B) Aluminum reacts with sulfuric acid.
- C) Aluminum conducts an electric current.
- D) Aluminum has a density of 2.698 g/cm<sup>3</sup> at STP.

17. 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<sub>3</sub>.
- D) Bromine changes from a liquid to a gas at 332 K and 1 atm.

18. A large sample of solid calcium sulfate is crushed into smaller pieces for testing. Which two physical properties are the same for both the large sample and one of the smaller pieces?

- A) mass and density
- B) mass and volume
- C) solubility and density
- D) solubility and volume

19. 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 09g/cm<sup>3</sup> at STP.
- D) Hydrogen gas has a boiling point of 20. K at standard pressure.

20. Which statement best describes the shape and volume of an aluminum cylinder at STP?

- A) It has a definite shape and a definite volume.
- B) It has a definite shape and no definite volume.
- C) It has no definite shape and a definite volume.
- D) It has no definite shape and no definite volume.

21. 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.

22. 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

23. Which grouping of the three phases of bromine is listed in order from left to right for increasing distance between bromine molecules?

- A) gas, liquid, solid
- B) liquid, solid, gas
- C) solid, gas, liquid
- D) solid, liquid, gas

24. Which statement best describes the molecules of H<sub>2</sub>O in the solid phase?

- A) They move slowly in straight lines.
- B) They move rapidly in straight lines.
- C) They are arranged in a regular geometric pattern.
- D) They are arranged in a random pattern.

25. Which statement correctly describes a sample of gas confined in a sealed container?

- A) It always has a definite volume, and it takes the shape of the container.
- B) It takes the shape and the volume of any container in which it is confined.
- C) It has a crystalline structure.
- D) It consists of particles arranged in a regular geometric pattern.