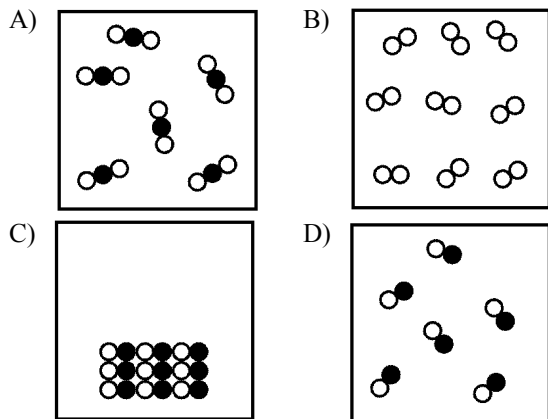


- 1) Which substance can *not* be broken down by a chemical change?
- A) ammonia B) methanol
C) propane D) phosphorus
- 2) Which substance can be broken down by chemical means?
- A) magnesium B) manganese
C) mercury D) methanol
- 3) Matter is classified as a
- A) substance, only
B) substance or as a mixture of substances
C) homogenous mixture, only
D) homogenous mixture or as a heterogeneous mixture
- 4) Which type of matter is composed of two or more elements that are chemically combined in a fixed proportion?
- A) solution
B) compound
C) homogeneous mixture
D) heterogeneous mixture
- 5) Which list of formulas represents compounds, only?
- A) CO₂, H₂O, NH₃ B) H₂, N₂, O₂
C) H₂, Ne, NaCl D) MgO, NaCl, O₂
- 6) Given the key:

Key	
○	= Atom of oxygen
●	= Atom of carbon

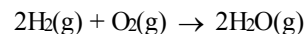
Which particle diagram represents a sample containing the compound CO(g)?



- 7) Which type of change must occur to form a compound?
- A) chemical B) physical
C) nuclear D) phase
- 8) In an equation, which symbol would indicate a mixture?
- A) NH₃(s) B) NH₃(ℓ)
C) NH₃(aq) D) NH₃(g)
- 9) Which Kelvin temperature is equal to -73°C?
- A) 100 K B) 173 K C) 200 K D) 346 K

- 10) 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

- 11) Consider the following reaction:

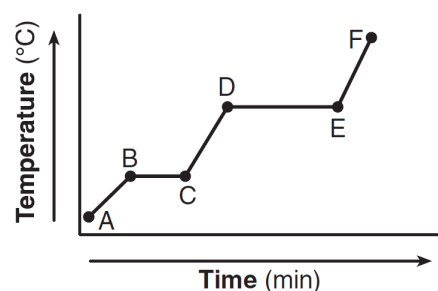


What kind of change do the reactants undergo in the reaction?

- A) atomic change B) phase change
C) chemical change D) nuclear change
- 12) Two grams of potassium chloride are completely dissolved in a sample of water in a beaker. This solution is classified as
- A) an element
B) a compound
C) a homogeneous mixture
D) a heterogeneous mixture
- 13) A mixture of crystals of salt and sugar is added to water and stirred until all solids have dissolved. Which statement best describes the resulting mixture?
- A) The mixture is homogeneous and can be separated by filtration.
B) The mixture is homogeneous and cannot be separated by filtration.
C) The mixture is heterogeneous and can be separated by filtration.
D) The mixture is heterogeneous and cannot be separated by filtration.
- 14) Which of these contains only one substance?
- A) distilled water B) sugar water
C) saltwater D) rainwater
- 15) Which of these terms refers to matter that could be heterogeneous?
- A) element B) mixture
C) compound D) solution
- 16) A mixture of sand and table salt can be separated by filtration because the substances in the mixture differ in
- A) boiling point B) density at STP
C) freezing point D) solubility in water
- 17) A beaker contains both alcohol and water. These liquids can be separated by distillation because the liquids have different
- A) boiling points B) densities
C) particle sizes D) solubilities

- 18) An example of a physical property of an element is the element's ability to
- react with an acid
 - react with oxygen
 - form a compound with chlorine
 - to be dissolved in water
- 19) Which statement describes a chemical property of silicon?
- Silicon has a blue-gray color.
 - Silicon is a brittle solid at 20.°C.
 - Silicon melts at 1414°C.
 - Silicon reacts with fluorine.
- 20) Which sample of CO₂ has a definite shape and a definite volume?
- CO₂(aq)
 - CO₂(g)
 - CO₂(ℓ)
 - CO₂(s)
- 21) Which statement describes a chemical property of aluminum?
- Aluminum is malleable.
 - Aluminum reacts with sulfuric acid.
 - Aluminum conducts an electric current.
 - Aluminum has a density of 2.698 g/cm³ at STP.
- 22) At STP, which 2.0-gram sample of matter uniformly fills a 340-milliliter closed container?
- Br₂(ℓ)
 - Fe(NO₃)₂(s)
 - KCl(aq)
 - Xe(g)
- 23) The temperature of a sample of matter is a measure of the
- total kinetic energy of the particles in the sample
 - total potential energy of the particles in the sample
 - average potential energy of the particles in the sample
 - average kinetic energy of the particles in the sample
- 24) Which sample of water contains particles having the highest average kinetic energy?
- 25 mL of water at 95°C
 - 45 mL of water at 75°C
 - 75 mL of water at 75°C
 - 95 mL of water at 25°C
- 25) Two samples of gold that have different temperatures are placed in contact with one another. Heat will flow spontaneously from a sample of gold at 60°C to a sample of gold that has a temperature of
- 50°C
 - 60°C
 - 70°C
 - 80°C
- 26) Which temperature is equal to 120. K?
- 153°C
 - 120.°C
 - +293°C
 - +393°C
- 27) Which phase change results in the release of energy?
- H₂O(s) → H₂O(ℓ)
 - H₂O(s) → H₂O(g)
 - H₂O(ℓ) → H₂O(g)
 - H₂O(g) → H₂O(ℓ)

- 28) Which unit is used to express the energy absorbed or released during a chemical reaction?
- kelvin
 - joule
 - volt
 - torr
- 29) Which phase change is exothermic?
- solid to liquid
 - solid to gas
 - liquid to solid
 - liquid to gas
- 30) A 36-gram sample of water has an initial temperature of 22°C. After the sample absorbs 1200 joules of heat energy, the final temperature of the sample is
- 8.0°C
 - 14°C
 - 30.°C
 - 55°C
- 31) How many Joules of heat energy are released when 50. grams of water are cooled from 70.°C to 60.°C?
- 42 J
 - 210 J
 - 2100 J
 - 4200 J
- 32) What is the total number of joules released when a 5.00-gram sample of water changes from liquid to solid at 0°C?
- 334 J
 - 1670 J
 - 2260 J
 - 11 300 J
- 33) Which phase change is endothermic?
- H₂O(ℓ) → H₂O(g)
 - I₂(g) → I₂(s)
 - Hg(ℓ) → Hg(s)
 - H₂S(g) → H₂S(ℓ)
- 34) How much energy is required to vaporize 10.00 grams of water at its boiling point?
- 2.26 kJ
 - 3.34 kJ
 - 4.2 kJ
 - 22.6 kJ
- 35) The graph below represents the uniform heating of a sample of a substance starting as a solid below its melting point.



Which statement describes what happens to the energy of the particles of the sample during time interval DE?

- Average kinetic energy increases, and potential energy remains the same.
- Average kinetic energy decreases, and potential energy remains the same.
- Average kinetic energy remains the same, and potential energy increases.
- Average kinetic energy remains the same, and potential energy decreases.