

Chapter 2—The Chemical View of Matter

MULTIPLE CHOICE

1. Which of the following is not one of the common states of matter?
- solid
 - plasma
 - liquid
 - gas

ANS: B PTS: 1

2. A pure substance which can be decomposed into two or more pure substances is a(n)
- element
 - mixture
 - compound
 - atom

ANS: C PTS: 1

3. Which of the following is one of the classes of pure substances?
- compound
 - homogeneous mixture
 - solution
 - heterogeneous mixture

ANS: A PTS: 1

4. Which is not a mixture?
- pure water
 - mayonnaise
 - strawberry Kool-Aid drink
 - rock

ANS: A PTS: 1

5. Most samples of matter occur in nature as
- elements
 - compounds
 - homogeneous samples
 - mixtures

ANS: D PTS: 1

6. Separating a mixture of iron and sulfur can be done
- by filtration
 - dissolving in water
 - with a magnet
 - by burning

ANS: C PTS: 1

7. Which statement describes a physical property of oxygen?
- oxygen supports burning of gasoline

- b. oxygen has a density of 1.4 g/mL
- c. oxygen is required for human metabolism of food
- d. oxygen combines with iron causing the formation of rust

ANS: B PTS: 1

8. Which is a chemical property?

- a. boiling point
- b. state
- c. odor
- d. flammability

ANS: D PTS: 1

9. A process is probably a chemical reaction if

- a. it produces light
- b. a solid appears when two solutions are mixed
- c. bubbles start to form when two substances are mixed
- d. all of these

ANS: D PTS: 1

10. Which of the following is not a chemical change?

- a. burning charcoal
- b. rusting iron
- c. melting ice
- d. baking bread

ANS: C PTS: 1

11. Which term describes energy?

- a. motion
- b. heat
- c. light
- d. all of these

ANS: D PTS: 1

12. Alfred Nobel _____?

- a. discovered dynamite
- b. proposed the metric system
- c. developed the STM, scanning tunneling microscope
- d. discovered kinetic energy

ANS: A PTS: 1

13. Which mixture is heterogeneous?

- a. salt and water
- b. water and oil
- c. sweetened hot tea
- d. Ivory soap bar

ANS: B PTS: 1

14. The element whose name is derived from the Latin *aurum*, meaning shining dawn

- a. gold

- b. aluminum
- c. silver
- d. chromium

ANS: A PTS: 1

15. The symbol for magnesium is

- a. Ma
- b. Mg
- c. Mm
- d. Mn

ANS: B PTS: 1

16. Which of the following elements is a metal?

- a. Ca, calcium
- b. Na, sodium
- c. Hg, mercury
- d. all of these

ANS: D PTS: 1

17. Sublimation is a characteristic physical property of

- a. chlorine (Cl₂, liquid)
- b. oxygen (O₂, gas)
- c. bromine (Br₂, liquid)
- d. iodine (I₂, solid)

ANS: D PTS: 1

18. What information is not provided by the formula, C₄H₁₀, for butane?

- a. butane is an organic compound
- b. the molecular formula
- c. the relative number of atoms of each kind
- d. the shape of the molecule

ANS: D PTS: 1

19. Which of the following sets, is a list of the symbols for an element and a compound (in that order)?

- a. Mg, CO
- b. CO, CO₂
- c. CO, Co
- d. H₂O₂, P

ANS: A PTS: 1

20. Which of the following sets, is a list of the symbols for:
lead, a compound of equal parts hydrogen and oxygen, and elemental oxygen?

- a. Pb, H₂O₂, O
- b. Pb, HO, O
- c. Pb, H₂O₂, O₂
- d. PB, HO, O₂

ANS: C PTS: 1

21. In the balanced equation, $2 \text{Al} + 6 \text{HCl} \rightarrow 2 \text{AlCl}_3 + 3 \text{H}_2$, the sum of the coefficients of the reactants is

- a. 5
- b. 8
- c. 13
- d. none of these

ANS: B PTS: 1

22. The equation, $2 \text{C(s)} + \text{O}_2\text{(g)} \rightarrow 2 \text{CO(g)}$, tells us
- a. the number of atoms of each kind in reactants and products is the same
 - b. carbon monoxide (CO) is a product
 - c. two atoms of carbon undergo reaction
 - d. all of these

ANS: D PTS: 1

23. How does the known number of nonmetals compare to that of metals?
- a. there are fewer metals
 - b. there are an equal number of each
 - c. there are fewer nonmetals
 - d. unknown because not all metals and nonmetals have been discovered

ANS: C PTS: 1

24. What prefix is the largest?
- a. mega
 - b. centi
 - c. micro
 - d. kilo

ANS: A PTS: 1

25. A person weighs 165 lbs. What is the weight in kilograms if $2.2 \text{ lbs} = 1 \text{ kg}$?
- a. 165×2.2
 - b. $165 \div 2.2$
 - c. $2.2 \div 165$
 - d. $165 + 2.2$

ANS: B PTS: 1

26. Which prefix has the meaning 10^{-3} ?
- a. mega
 - b. nano
 - c. centi
 - d. milli

ANS: D PTS: 1

27. How many milligrams are there in 10 grams?
- a. 10^3
 - b. 10^{-6}
 - c. 10^{-3}
 - d. 10^4

ANS: D PTS: 1

28. The quantity 10^{-9} (one billionth) is designated by the prefix

- a. pico
- b. nano
- c. centi
- d. mega

ANS: B PTS: 1

29. Convert 15 L of gasoline to gallons. $1.06 \text{ qt} = 1 \text{ L}$; $4 \text{ qts} = 1 \text{ gal}$

- a. $(15) (1.06/1) (1/4)$
- b. $(15) (1/1.06) (4/1)$
- c. $(15) (1.06/1) (4/1)$
- d. $(15) (1/1.06) (1/4)$

ANS: A PTS: 1

30. An example of a homogeneous mixture is

- a. oil in water
- b. a salt water solution
- c. a suspension
- d. a pure substance

ANS: B PTS: 1

31. Which of the following is not a pure substance?

- a. pure gold
- b. clean air
- c. refined sugar
- d. distilled water

ANS: B PTS: 1

32. Which state of matter is composed of charged particles which are dramatically affected by electric and magnetic fields?

- a. solids
- b. liquids
- c. gases
- d. plasmas

ANS: D PTS: 1

33. How many categories of pure substances exist?

- a. 2
- b. 3
- c. thousands
- d. about 100

ANS: A PTS: 1

34. A pure substance which can be decomposed into two or more pure substances is a(n)

- a. element
- b. compound
- c. mixture
- d. colloid

ANS: B PTS: 1

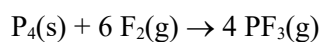
35. For which of the following is it necessary that there be a definite composition which cannot vary?
- mixture
 - solution
 - compound
 - colloid

ANS: C PTS: 1

36. How many phosphorus atoms are in the formula H_3PO_4 ?
- 4
 - 3
 - 7
 - 1

ANS: D PTS: 1

37. How many chemical formulas are in this chemical equation?



- 2
- 3
- 4
- 11

ANS: B PTS: 1

38. Which of the following is an SI unit?
- pound
 - kilogram
 - millimeter
 - calorie

ANS: B PTS: 1

39. Potential energy is defined as
- heat energy
 - energy associated with motion
 - stored energy
 - the ability to do work

ANS: C PTS: 1

40. Which of the following is a physical change?
- souring of milk
 - ripening of fruit
 - frying an egg
 - melting

ANS: D PTS: 1

41. The simplest form of matter is a(n)
- element
 - mixture
 - compound
 - solution

ANS: A PTS: 1

42. Which is a compound?

- a. mercury
- b. blood
- c. sugar
- d. air

ANS: C PTS: 1

43. How would you separate a mixture of salt, sand, and water?

- a. by filtration, followed by evaporation
- b. freezing, followed by melting
- c. separating with tweezers, followed by evaporation
- d. by filtration, followed by burning

ANS: A PTS: 1

44. Which is a physical property?

- a. freezing point
- b. color
- c. odor
- d. all of the above

ANS: D PTS: 1

45. Which of the following is an example of a chemical change?

- a. boiling water
- b. iodine sublimating
- c. barbecuing a steak
- d. breaking a piece of glass

ANS: C PTS: 1

46. What element has the symbol Cu?

- a. cobalt
- b. carbon
- c. copper
- d. chromium

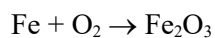
ANS: C PTS: 1

47. Identify the nonmetal?

- a. Fe
- b. Na
- c. S
- d. Ag

ANS: C PTS: 1

48. What is the coefficient in front of iron when the following equation is balanced?



- a. 1
- b. 2
- c. 4
- d. 6

ANS: C

PTS: 1

49. How many millimeters are in 100 cm?

- a. 10
- b. 1000
- c. 100
- d. 1

ANS: B

PTS: 1

50. Which of the following has the highest kinetic energy?

- a. boulder on the top of hill
- b. water behind a dam
- c. a ball falling from a 3 story building
- d. a piece of wood

ANS: C

PTS: 1