

CHAPTER 2

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

ANS: b

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

ANS: c

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

ANS: a

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

ANS: a

5. Most samples of matter occur in nature as
 - a. elements
 - b. compounds
 - c. homogeneous samples
 - d. mixtures

ANS: d

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

ANS: c

7. Which statement describes a physical property of oxygen?
- oxygen supports burning of gasoline
 - oxygen has a density of 1.4 g/mL
 - oxygen is required for human metabolism of food
 - oxygen combines with iron causing the formation of rust

ANS: b

8. Which is a chemical property?
- boiling point
 - state
 - odor
 - flammability

ANS: d

9. A process is probably a chemical reaction if
- it produces light
 - a solid appears when two solutions are mixed
 - bubbles start to form when two substances are mixed
 - all of these

ANS: d

10. Which of the following is not a chemical change?
- burning charcoal
 - rusting iron
 - melting ice
 - baking bread

ANS: c

11. Which term describes energy?
- a. motion
 - b. heat
 - c. light
 - d. all of these

ANS: d

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

ANS: a

13. Which mixture is heterogeneous?
- a. salt and water
 - b. water and oil
 - c. sweetened hot tea
 - d. Ivory soap bar

ANS: b

14. The element whose name is derived from the Latin *aurum*, meaning shining dawn
- a. gold
 - b. aluminum
 - c. silver
 - d. chromium

ANS: a

15. The symbol for magnesium is
- a. Ma
 - b. Mg
 - c. Mm
 - d. Mn

ANS: b

16. Which of the following elements is a metal?
- Ca, calcium
 - Na, sodium
 - Hg, mercury
 - all of these

ANS: d

17. Sublimation is a characteristic physical property of
- chlorine (Cl_2 , liquid)
 - oxygen (O_2 , gas)
 - bromine (Br_2 , liquid)
 - iodine (I_2 , solid)

ANS: d

18. What information is not provided by the formula, C_4H_{10} , for butane?
- butane is an organic compound
 - the molecular formula
 - the relative number of atoms of each kind
 - the shape of the molecule

ANS: d

19. Which of the following sets, is a list of the symbols for an element and a compound (in that order)?
- Mg, CO
 - CO, CO_2
 - CO, Co
 - H_2O_2 , P

ANS: a

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?
- Pb, H_2O_2 , O
 - Pb, HO, O
 - Pb, H_2O_2 , O_2
 - Pb, HO, O_2

ANS: c

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
- 5
 - 8
 - 13
 - none of these

ANS: b

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

ANS: d

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

ANS: c

24. What prefix is the largest?
- mega
 - centi
 - micro
 - kilo

ANS: a

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

ANS: b

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

ANS: d

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

ANS: d

28. The quantity 10^{-9} (one billionth) is designated by the prefix
- a. pico
 - b. nano
 - c. centi
 - d. mega

ANS: b

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

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

31. Which of the following is not a pure substance?
- a. pure gold
 - b. clean air
 - c. refined sugar
 - d. distilled water

ANS: b

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

33. How many categories of pure substances exist?
- a. 2
 - b. 3
 - c. thousands
 - d. about 100

ANS: a

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

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

ANS: c

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

ANS: d

37. How many chemical formulas are in this chemical equation?
- $$\text{P}_4(\text{s}) + 6 \text{F}_2(\text{g}) \rightarrow 4 \text{PF}_3(\text{g})$$
- a. 2
 - b. 3
 - c. 4
 - d. 11

ANS: b

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

ANS: b

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

ANS: c

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

ANS: d

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

ANS: a

42. Which is a compound?
- a. mercury
 - b. blood
 - c. sugar
 - d. air

ANS: c

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

44. Which is a physical property?
- a. freezing point
 - b. color
 - c. odor
 - d. all of the above

ANS: d

45. Which of the following is an example of a chemical change?
- a. boiling water
 - b. iodine sublimating
 - c. barbequing a steak
 - d. breaking a piece of glass

ANS: c

46. What element has the symbol Cu?
- cobalt
 - carbon
 - copper
 - chromium

ANS: c

47. Identify the nonmetal?
- Fe
 - Na
 - S
 - Ag

ANS: c

48. What is the coefficient in front of iron when the following equation is balanced?
- $$\text{Fe} + \text{O}_2 \rightarrow \text{Fe}_2\text{O}_3$$
- 1
 - 2
 - 4
 - 6

ANS: c

49. How many millimeters are in 100 cm?
- 10
 - 1000
 - 100
 - 1

ANS: b

50. Which of the following has the highest kinetic energy?
- boulder on the top of hill
 - water behind a dam
 - a ball falling from a 3 story building
 - a piece of wood

ANS: c