

Introduction to Chemistry, SI, Matter Classification, Names and Formulas **62**

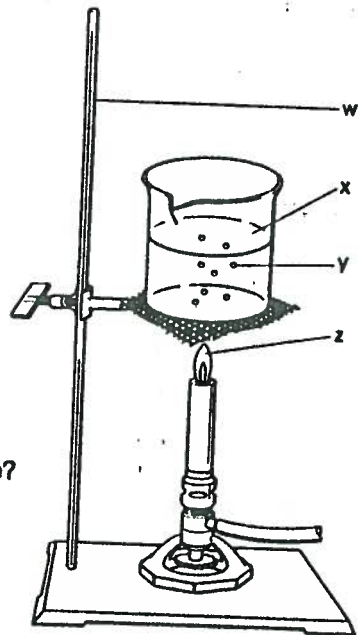
62 pts total

For the following questions, choose the letter of the BEST answer and darken this letter **IN PENCIL** on the answer sheet. If the BEST ANSWER is letter E, make a penciled circle in the space after letter D on the answer sheet.

1 pt per question unless noted otherwise.

- 1 The metric base unit used to measure linear dimensions is a _____.
 a. kelvin **b. meter** c. candela d. kilogram
- 2 ^{deka deci} 10^1 , 10^{-1} , and 10^{-2} represent, respectively, the prefixes _____.
 a. mega-, hecto-, milli- c. hecto-, deka-, deci-
 b. deci-, centi-, milli- **d. deka-, deci-, centi-**
- 3 An interpretation of an observation is called a(n) _____.
 a. measurement b. standard **c. inference** d. quantity
- 4 When a candle is burned, which of the following is clearly an observation?
 a. Carbon dioxide and water are produced. c. Matter changes form.
 b. The wax rapidly combines with oxygen. **d. There is an odor when the flame is blown out.**
- 5 Which of the following is *not* an example of a theory?
 a. At a constant temperature, the volume of any gas is inversely proportional to the pressure exerted upon it.
 b. Many diseases are caused by germs.
 c. When matter changes state, molecules or atoms get closer together or farther apart.
d. Water boils at 100°C.

Refer to the figure at the right in answering questions _____, and _____



- 6 Which of the labeled areas represent matter in the liquid state?
 a. both W and X **c. X only**
 b. both W and Y d. Z only
- 7 Which of the labeled areas represent energy rather than matter?
 a. both W and Z c. both Y and Z
 b. both X and Y **d. Z only**
- 8 Which of the following cannot be inferred from this figure?
a. conservation of energy c. change in state
 b. chemical change d. energy conversion
- 9 Which of the following is characteristic of pure substances?
 a. They are solutions. c. They are composed of one element.
 b. They are mixtures. **d. They have a constant boiling point.**
- 10 All mixtures _____.
 a. are easy to separate c. are composed of parts with different identities
 b. have a constant boiling point d. can be separated by distillation
- 11 An example of a pure substance is _____.
 a. salt water c. household ammonia
b. copper d. tap water

- 12) Distillation is a process that
 A. separates mixtures B. causes chemical changes
 C. is the opposite of electrolysis D. produces warming curves
- 13) Water could be distinguished best from alcohol by taking a sample of each (water and alcohol) and comparing their :
 A. masses B. volumes C. boiling points D. Tyndall effects
- 14) ----- > If 5 g of A reacts with 15 g of B to make 20 g of a new compound, what law has been proved ?
 A. Law of definite proportions
 B. Law of conservation of mass
 C. Law of constant composition
 D. Law of conservation of energy
- 15) If a substance has particles that are all identical but which have 3 atoms of one kind joined to 2 atoms of another kind in each particle (molecule) then the substance is a(n)
 A. solution B. mechanical mixture C. element D. compound
 E. suspension
- 16) If a substance has two different kinds of particles (molecules) mixed evenly through each so that the substance looks clear to the eye and homogeneous, then the substance is a(n)
 A. solution B. mechanical mixture C. element D. compound
 E. suspension
- 17) A cloudy substance that looks uniform at first but that settles into a solid and liquid when it is allowed to stand still for some time would be a(n)
 A. solution B. mechanical mixture C. element D. compound
 E. suspension
- 18) Which of the following statements about oxygen describe physical properties of oxygen? *properties by itself*
 I) Oxygen has a density of 1.43 g/L at STP. ✓
 II) Oxygen supports the burning of magnesium.
 III) The melting point of oxygen is -218°C . ✓
 IV) Carbon combines with oxygen to form carbon dioxide gas.
 V) Oxygen reacts with iron to form rust.
- A) I only
 B) I and III
 C) I, II and III
 D) II, IV and V
- 19) Scientific laws are generalizations
 A) designed to fit scientific theories
 B) derived from the results of experiments
 C) derived from models to explain nature
 D) designed to verify models
- 20) An example of a mixture is
 A) water
 B) sulphur
 C) carbon dioxide
 D) air
- 21) A mixture consists of substances associated in
 A) definite proportions
 B) equal proportions
 C) any proportions
 D) chemical combination

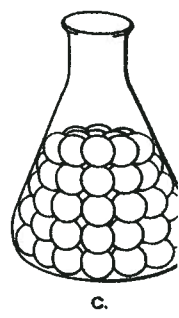
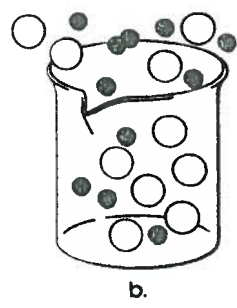
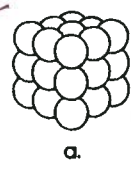
→ a-c. the
at side

22 Which of the figures represents a gaseous solution? **B**

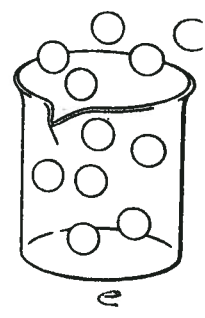
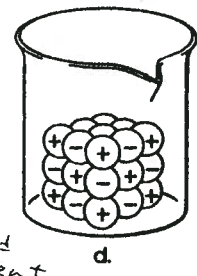
23 Which of the figures represents an ionic solid? **D**

24 Which of the figures represents a liquid pure substance? **C**

25 Which of the following is an element?
a. water
b. salt
c. air
d. potassium



26 Which of the following does not involve a chemical change?
a. cube of sugar dissolving in hot coffee
b. exploding dynamite
c. tarnishing silverware
d. burning hydrogen gas



27 In the formula, $\overset{+2}{\text{Cu}}_1(\text{NO}_3)_2^{-1}$, the circled (+2) indicates:
A. number of atoms combined
B. number of electrons given
C. number of electrons received
D. the number of different valences Cu has.

28 In the formula, $(\text{NH}_4)^{+1}\text{SO}_4^{-2}$, the circled (4) indicates the:
A. number of atoms combined
B. number of molecules combined
C. number of electrons given
D. number of electrons received

29 Which one of the following is an example of a physical change?
A) freezing water
B) burning dead leaves
C) digesting a piece of bread
D) rusting iron

30 Carbon is classed as an element rather than as a compound because it
A) cannot be chemically decomposed into two or more substances
B) has been known for many centuries
C) is formed when wood is heated out of contact with air
D) combines with oxygen to form a gas

31 You have examined a material and all BUT one of the following indicate that it is a pure substance. Which is the factor that shows it must be a mixture?
A) it is a uniform white powder
B) it is completely soluble in water
C) it looks like salt
D) it melts between 245 and 300°C

32 A pure substance that contains more than one type of atom is called
A) a solution
B) a compound
C) an element
D) an allotrope.

33 The formula of aluminum bromide is

- A) AlBr
- B) AlBr₂
- C) AlBr₃**
- D) AlBr₄



34 The correct name of the compound Cu(ClO₃)₂ is

- A) copper(II) perchlorate
- B) copper(I) chlorate
- C) copper(II) chlorate**
- D) copper(I) hypochlorite

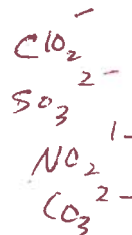
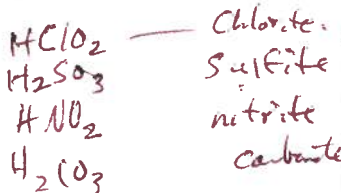
Copper II chlorate

35 The set of elements containing only non-metals is

- A) C, Cl, Li
- B) Cl, F, I**
- C) Al, Ba, K
- D) Br, Fe, Ne

36 Which one of the following acids is followed by the correct name of the salts it forms?

- A) chlorous acid - chlorite**
- B) sulfurous acid - sulfate
- C) nitrous acid - nitrate
- D) carbonic acid - carbide



37 An example of a binary compound is

- A) NaOH sodium hydroxide
- B) O₂ oxygen
- C) H₂S hydrogen sulphide**
- D) Co cobalt

38 Which one of the following compounds is correctly named?

- A) Fe(ClO₂)₃ iron(III) chlorite** X
- B) PbCO₃ lead(IV) carbonate X
- C) Mn₂S₄ manganese(II) sulfide
- D) Cu₂SO₄ copper(I) bisulfate

iron III chlorite
 lead II carbonate
 manganese III sulfide
 Copper I sulfate

39 A compound with the chemical formula HgCl₂ would best be named

- A) mercury(I) chloride
- B) mercurous chloride
- C) mercury(II) chloride**
- D) mercury chloride

mercury II chloride

40 A homogeneous material of variable composition is

- A) a pure substance
- B) an element
- C) a solution**
- D) a compound

41 The formula of aluminum nitrite is

- A) AlNO₃
- B) Al₃NO₂
- C) Al(NO₂)₃**
- D) Al(NO₃)₂

