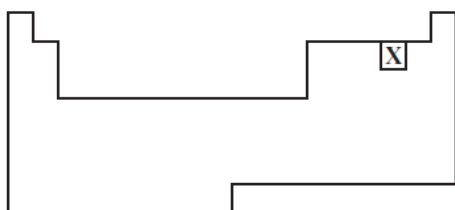


MULTIPLE CHOICE TEST WITH ONE CORRECT ANSWER
(Answer by circling only one of the answers marked with A, B, C or D)

1. Which of the following ideas was proposed by Niels Bohr?

- A. Electrons occupy specific energy levels within the atom.
- B. The nucleus of an atom contains neutrons and protons.
- C. An atom is a solid sphere that cannot be separated into smaller parts.
- D. An atom consists of negative charges embedded into a positively charged sphere.

2. The figure below shows a Periodic Table with the position of one element indicated with an X. Thus, the element X is:



- A. Halogen element.
 - B. Semimetal (metalloid).
 - C. Noble gas.
 - D. Nonmetal.
3. How many electron layers are the electrons in the barium atom distributed in? ($Z = 56$)?
- A. 1
 - B. 2
 - C. 5
 - D. 6
4. How many shared electron pairs are there altogether in three molecules of chlorine?
- A. 1
 - B. 3
 - C. 6
 - D. 7

5. Palmitic acid, a component in most animal fats, has a molecular formula $\text{CH}_3(\text{CH}_2)_{14}\text{COOH}$. Which of the following is its empirical formula?

- A. CHO
 - B. $\text{C}_3\text{H}_6\text{O}_2$
 - C. $\text{C}_8\text{H}_{16}\text{O}$
 - D. $\text{C}_{16}\text{H}_{32}\text{O}_2$
6. Barium and iodine atoms combine to form an ionic compound. What is the chemical formula of this compound?
- A. BaI
 - B. BaI_2
 - C. Ba_2I
 - D. Ba_2I_2

7. An unknown metal, X, combines with nitrogen to form the compound XN. X also combines with oxygen giving the compound X_2O_3 . The metal X is, most likely?

- A. ${}^3\text{Li}$
 - B. ${}^{12}\text{Mg}$
 - C. ${}^{31}\text{Ga}$
 - D. ${}^{50}\text{Sn}$
8. When a cup of hot chocolate cools from $90\text{ }^\circ\text{C}$ to $80\text{ }^\circ\text{C}$, which of the following happens to the molecules of the liquid?
- A. Their rate of motion is decreasing.
 - B. Their valence electrons are being lost.
 - C. Their positions are becoming fixed in crystals.
 - D. Their average distance from adjacent molecules is increasing.



9. Which statement below describes **best** what happens when sodium chloride, NaCl, is dissolved in water?
- A. The NaCl reacts with water to form NaOH and HCl.
 - B. The NaCl reacts with water to form NaOH and Cl₂.
 - C. NaCl does not react with water, but does exist in solution in the form of sodium and chloride ions.
 - D. NaCl does not react with water, but does exist in solution in the form of sodium and chlorine atoms.
10. The white pigment in many paints is titanium(IV) oxide. It is made by burning titanium(IV) chloride. The other product in this reaction is chlorine gas. What is the balanced equation for this reaction?
- A. $\text{TiCl}_4 + \text{O}_2 = \text{TiO}_2 + 2\text{Cl}_2$
 - B. $2\text{TiCl}_4 + \text{O}_2 = \text{TiO}_2 + 4\text{Cl}$
 - C. $\text{TiCl}_4 + 2\text{O}_2 = 2\text{TiO}_2 + \text{Cl}_2$
 - D. $2\text{TiCl}_4 + 2\text{O}_2 = 2\text{TiO}_2 + \text{Cl}_4$
11. An engineer is building a sun reflector which must withstand storms, large winds, and yet reflect sunlight well. What would you suggest to be used?
- A. Alkali metal.
 - B. Alkaline earth metal.
 - C. Transition metal.
 - D. Semimetal (metalloid).
12. The name of the compound whose chemical formula is MnO₂ is:
- A. Manganese oxide
 - B. Manganese(I) oxide
 - C. Manganese(II) oxide
 - D. Manganese(IV) oxide
13. If you put a piece of cleaned magnesium ribbon into a solution of silver nitrate, the magnesium becomes coated with a grey substance. What is the explanation for this?
- A. The magnesium reacts with the silver nitrate and is coated with magnesium nitrate.
 - B. Silver in silver nitrate is actually more reactive than magnesium so the magnesium ribbon corrodes.
 - C. Magnesium is more reactive than silver and displaces the silver.
 - D. Magnesium is less reactive than silver and tarnishes.
14. What do their names tell you about the substances sodium sulfide and sodium sulfate?
- A. Sodium sulfide is soluble in water, sodium sulfate is not.
 - B. Sodium sulfate is highly flammable, sodium sulfide is not.
 - C. Sodium sulfide is a solid, sodium sulfate is a gas at room temperature.
 - D. Sodium sulfate has oxygen atoms joined to the sulfur atoms but sodium sulfide has not.
15. What is observed during the reaction of magnesium and hydrochloric acid?
- A. A precipitate.
 - B. Bubbles.
 - C. Light emission.
 - D. A color change.

PROBLEMS

(Answer in accordance with the requirements in the question.)

1. Write the formulae or names of the following compounds.

Magnesium hydrogencarbonate	<u>Mg(HCO₃)₂</u>
Ammonium bromide	<u>NH₄Br</u>
Sodium sulfite	<u>Na₂SO₃</u>
SnO ₂	<u>tin(IV) oxide</u>
Na ₂ CO ₃ ·10H ₂ O	<u>sodium carbonate decahydrate</u>
Pb(OH)Cl	<u>lead(II) hydroxide chloride</u>

6 points (6×1)

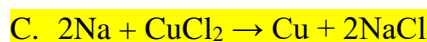
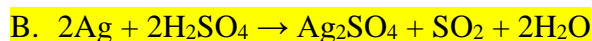
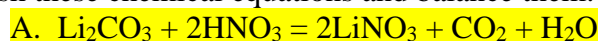
2. Encircle YES if the statement is true or NO if it is false.

- | | | |
|--|------------|-----------|
| A. Blue vitriol contains anions of divalent copper. | YES | NO |
| B. The salt solution obtained in the reaction between acid and base is always neutral. | YES | NO |
| C. Hydrogen is not always obtained in a reaction between metal and acid. | YES | NO |
| D. During titration, the erlenmeyer flask should be constantly stirred. | YES | NO |

4 points (4×1)

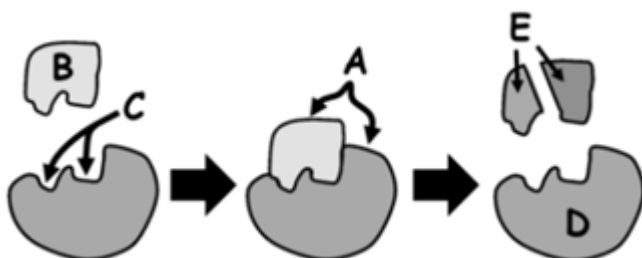
Crossing over is scored with 0 points.

3. Finish these chemical equations and balance them.



3 points (3 ×1 for balanced equation,
3×0,5 for products only)

4. On the line to the right of each term, write ONE letter according to the picture below.



Reactant	<u>B</u>
Products	<u>E</u>
Enzyme	<u>D</u>
Enzyme-substrate complex	<u>A</u>

2 points (4×0,5)