WORKSHEET 1

CHAPTER 1 – THE LANGUAGE OF CHEMISTRY

A. Tick (✓) the correct option.

1. The symbol for the element tungsten is
   a. Tn. b. Sn. c. W. d. Sb.
2. The valency of phosphate ion in calcium phosphate is
   a. +2. b. +3. c. –2. d. –3.
3. The formula for copper (II) nitrate is
   a. Cu_2NO_3. b. $Cu(NO_3)_2$. c. $CuNO_3$. d. $Cu_3(NO_3)_2$.
4. The number of oxygen atoms in iron (III) sulphate is
   a. 2. b. 4. c. 8. d. 12.
5. The mass equal to $\frac{1}{12}$ th of the mass of a ^{12}C atom is called
   a. relative atomic mass. b. atomic mass unit. c. atomic mas scale. d. relative molecular mass.

B. Fill in the blanks from the choices given within the brackets.

1. The shorthand representation of an _____ (element/compound) is called symbol.
2. A chemical equation does not tell about the _____(rate/kind) of the reaction.
3. Valency of iron in $FeCl_2$ is _____(2/3)
4. A symbol represents _____(1 g-atom/1 g-molecule) of an element.
5. Chemical _____ (symbol/formula) of a substance is the symbolic representation of actual number of atoms present in one molecule of a substance.

C. State whether the given statements are correct or incorrect. If incorrect, rewrite those statements.

1. Valency is the number of hydrogen atoms that combine with one atom of an element to form a compound.
2. The symbol for the element, mercury is Ag.
3. A chemical equation does not tell about the physical state of reactants or products.
4. Radical is an atom of an element which carries charge and behaves as a single unit.
5. The chemical formula of ammonium dichromate is $(NH_4)_2CrO_4$.

D. Match the following.

1. The substances formed during a chemical reaction	Fe^{2+}, Fe^{3+}
2. Variable valency	Zn^{2+}, Cu^{2+}
3. Bases containing OH^- radical	Products

Name: ..... Teacher's signature: .....

Class: ..... IX ..... Date: .....

4. First letter of the name of an element — Hydroxides
5. Divalent radical — Symbol

E. Answer the following.

1. Give at least two examples to explain how the ions of the elements having variable valency are named.
2. Write the symbols and Latin names of the following elements
   a. Gold b. Lead c. Potassium d. Silver
3. Calculate the percentage of water of crystallisation in blue vitriol whose formula is $CuSO_4 \cdot 5H_2O$. [Cu = 63 u, S = 32 u, O = 16 u and H = 1 u]
4. What do you understand by a chemical equation? Why is this term used? What are the limitations of a chemical equation?
5. Write down the chemical formulae and balance the following equations:
   a. Zinc + Sulphuric acid → Zinc sulphate + Hydrogen
   b. Calcium + Water → Calcium hydroxide + Hydrogen
   c. Silver nitrate → Silver + Nitrogen dioxide + Oxygen
   d. Copper + Nitric acid → Copper (II) nitrate + Nitrogen dioxide + Water
   e. Zinc sulphide + Oxygen → Zinc oxide + Sulphur dioxide

ANSWERS

WORKSHEET 1

A. Tick (✓) the correct option.

1. c 2. d 3. b 4. d 5. b

B. Fill in the blanks from the choices given within the brackets.

1. element 2. rate 3. 2 4. 1 g-atom 5. formula

C. State whether the given statements are correct or incorrect. If incorrect, rewrite those statements.

1. Correct
2. Incorrect

   The symbol for the element, mercury is Hg.
3. Correct
4. Correct
5. Incorrect

   The chemical formula of ammonium dichromate is $(NH_4)_2Cr_2O_7$.

D. Match the following.

1.	The substances formed during a chemical reaction	Products
2.	Variable valency	Fe^{2+}, Fe^{3+}
3.	Bases containing OH^- radical	Hydroxides
4.	First letter of the name of an element	Symbol
5.	Divalent radical	Zn^{2+}, Cu^{2+}

E. Answer the following.

1. The lower valency is named by adding the suffix ous and higher valency by adding the suffix ic.

   For example:

Element	Lower valency	Higher valency
Iron [Ferrum]	Ferrous (Fe^{2+})	Ferric (Fe^{3+})
Copper [Cuprum]	Cuprous (Cu^{+})	Cupric (Cu^{2+})

2.

	Symbol	Latin name
a.	Au	Aurum
b.	Pb	Plumbum
c.	K	Kalium
d.	Ag	Argentum

3. Molecular mass of $CuSO_4 \cdot 5H_2O = 63 + 32 + 4 \times 16 + 5\ (2 \times 1 + 16) = 249$ u

   249 g of blue vitriol contains 90 g of water of crystallisation

   $\therefore$ 100 g of blue vitriol contain = $\frac{90}{249} \times 100$ = 36.14% water of crystallisation

4. A chemical equation is a symbolic representation of a chemical reaction using symbols and chemical formulae of the substances involved in the reaction. The term chemical equation is used because in ordinary chemical change no new atoms are created and no atoms disappear.

Limitations of a Chemical Equation

i. It does not tell about the physical state of the reactants or products.

ii. It does not tell about the rate of the reaction.

iii. It does not tell whether the reaction will complete or not.

iv. It does not tell about the chemical changes taking place in the reaction like change in colour, precipitation, etc.

5. a. $Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$

b. $Ca + 2H_2O \rightarrow Ca(OH)_2 + H_2$

c. $2AgNO_3 \rightarrow 2Ag + 2NO_2 + O_2$

d. $Cu + 4HNO_3 \rightarrow Cu(NO_3)_2 + 2NO_2 + 2H_2O$

e. $2ZnS + 3O_2 \rightarrow 2ZnO + 2SO_2$