WORKSHEET 2

CHAPTER 3 – METALS, NON-METALS AND METALLURGY

A. Tick (✓) the correct option.

1. Metals can be beaten into thin sheets. This property of metals is known as
   a. ductility. b. malleability. c. sonority. d. conductivity.
2. Which of the following elements is the only metal to exist as liquid at room temperature?
   a. Mercury b. Bromine c. Gallium d. Fluorine
3. Which of the following displacement reactions does not occur?
   a. $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$ b. $Cu + 2AgNO_3 \rightarrow Cu(NO_3)_2 + 2Ag$
   c. $2Al + 3FeSO_4 \rightarrow Al_2(SO_4)_3 + 3Fe$ d. $Pb + ZnSO_4 \rightarrow PbSO_4 + Zn$
4. Chemical formula of galena is
   a. SnO_2. b. ZnS. c. HgS. d. PbS.
5. Silver articles, when exposed to air, become black after some time due to the formation of
   a. silver chloride. b. silver sulphide. c. silver nitrate. d. silver oxide.

B. Fill in the blanks.

1. _____ is a non-metal but is lustrous.
2. Diamond and graphite are allotropes of _____
3. The process of heating an ore strongly in the presence of excess of air is known as _____
4. _____ is a homogeneous mixture of two or more metals, or a metal and a non-metal.
5. The compounds of non-metals with hydrogen are known as _____

C. State whether the following statements are true or false.

1. Lead is the best conductor of heat.
2. Sodium metal is so soft that it can be easily cut with a knife.
3. The oxides formed when metals react with water turn blue litmus red.
4. Silver reacts violently with cold water.
5. Brass is an alloy of copper and tin.

D. Match the following.

1. Non-metal oxide	Soluble in water but insoluble in kerosene
2. Sodium	Neither malleable nor ductile
3. Potassium chloride	Ore of aluminium
4. Bauxite	Reacts with violently with cold water
5. Sulphur	Turns blue litmus red

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

Class: X Date: .....

E. Answer the following questions.

Very Short Answer Questions

1. What are amphoteric oxides? Give two examples.
2. Define metallurgy.

Short Answer Questions

1. Element A is highly reactive and stored under kerosene. It reacts with water to form a basic oxide. On losing an electron, it acquires an electronic configuration similar to neon.

   Based on the given information, answer the following questions:

   a. Is element A a metal or a non-metal?
   b. Name the element. Also write its electronic configuration.
   c. What type of compound will the element form with chlorine?

2. How is roasting different from calcination?

Long Answer Questions

1. Write the differences between physical properties of metals and non-metals.
2. What is corrosion? Give any two examples of corrosion. Also give any three ways to prevent corrosion.

ANSWERS

WORKSHEET 2

A. Tick (✓) the correct option.

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

B. Fill in the blanks.

1. Iodine
2. carbon
3. roasting
4. Alloy
5. hydrides

C. State whether the following statements are true or false.

1. F
2. T
3. F
4. F
5. F

D. Match the following.

1. Non-metal oxide	Turns blue litmus red
2. Sodium	Reacts with violently with cold water
3. Potassium chloride	Soluble in water but insoluble in kerosene
4. Bauxite	Ore of aluminium
5. Sulphur	Neither malleable nor ductile

E. Answer the following questions.

Very Short Answer Questions

1. Oxides which show both basic as well as acidic character, i.e. which react with both acids and bases to form salt and water are known as amphoteric oxides. For example, ZnO, Al_2O_3, etc.
2. The science and technology of metals and alloys employed for the extraction of metals economically on a large-scale from their ores and refining them is called metallurgy.

Short Answer Questions

1. a. We are given that the metal reacts with water to form a basic oxide. Therefore, the element is a metal.
   b. It is given that the element is highly reactive and stored under kerosene. Also, it is a metal. Hence, the given metal is an alkali metal. Also, since it achieves an electronic configuration similar to neon on losing an electron, hence, the atomic number of the metal is 11. Thus, metal A is sodium. Its electronic configuration is 2, 8, 1.
   c. The element will react with chlorine to form an ionic compound called sodium chloride.
2. The process in which the concentrated ore is heated strongly below its melting point in the presence of excess of air is known as roasting. It is used for sulphide ores such as ZnS, HgS, etc.

   The process in which the concentrated ore is heated strongly below its melting point in the absence or limited supply of air is known as calcination. It is used for carbonate, hydroxide or hydrated oxide ores such as $ZnCO_3$, $Al_2O_3 \cdot 2H_2O$, etc.

Long Answer Questions

1. The differences between the physical properties of metals and non-metals are given in the following table:

S.No.	Metals	Non-metals
1.	Metals are lustrous.	Non-metals are non-lustrous (except iodine)
2.	Metals are malleable and ductile.	Non-metals are non-malleable and non-ductile. They are brittle.
3.	Metals are good conductors of heat and electricity.	Non-metals are poor conductors of heat and electricity (except graphite).
4.	Metals generally have high densities (except alkali metals).	Non-metals have low densities.
5.	Metals are solid at room temperature (except mercury which is a liquid at room temperature).	Non-metals are gases, liquid or solids at room temperature.
6.	Metals are generally strong and tough (except alkali metals). They possess high tensile strength.	Non-metals are not strong and they have low tensile strength.
7.	Metals are sonorous.	Non-metals are not sonorous.
8.	Metals generally have high melting and boiling points (except alkali metals, mercury and gallium).	Non-metals generally have low melting and boiling points (except boron and carbon).

2. The phenomenon of slow deterioration or destruction of a metal when exposed to air, water or any other substance around it in the atmosphere is called corrosion. The examples of corrosion are:
   a. When a piece of iron or any iron article is exposed to moist air for a long time, a layer of reddish-brown flaky and porous substance is formed on the surface of iron. This substance is called rust. Rust is hydrated iron(III) oxide.
   b. When a piece of copper or any copper utensil is exposed to moist air containing carbon dioxide, it loses its red shine after some time due to the formation of a green coating of basic copper(II) carbonate [$CuCO_3 \cdot Cu(OH)_2$].

   The methods of preventing corrosion are:
   a. ***Protection by coating with oil or grease:*** Corrosion can be prevented by coating the material with oil or grease.
   b. ***Protection by covering with paint, plastic, rubber or ceramic:*** Corrosion is prevented by covering the material with a coat of paint, plastic, rubber or ceramic.
   c. ***Prevention by electroplating:*** Corrosion is prevented by electroplating iron with a more resistant metal such as chromium or nickel.

   [**Note:** The student can use other methods as well as mentioned in the textbook.]