ODM EDUCATIONAL GROUP
Changing your Tomorrow

ELEMENTS, COMPOUNDS, SYMBOLS AND FORMULAE

SUBJECT-CHEMISTRY

CHAPTER NO- 4

Exercise ques n ans

PERIOD-7

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Exercise 1

Classify the following substances into elements and compounds.

Answer:

Mercury, sulphur, sugar, water, sand, gold, coal, oxygen, alcohol.

Ans. **Element:** Mercury, sulphur, gold, coal, oxygen.

Compound : Sugar, water, sand, alcohol.

Give the symbols of: Carbon, calcium, copper, chlorine, cobalt, argon.

Answer:

Carbon is C Chlorine is Cl

Calcium is Ca Cobalt is Co

Copper is Cu Argon is Ar

Question 3.

Define a pure substance. How many types of pure substances do you know ?

Answer:

Pure substances : "A substance of a definite composition which has consistent properties throughout, is called a pure substance"

Types of pure substances: Pure substances are of two types **(i) Elements**, **(ii) Compounds**.

Question 4.

Define : (a) Elements (b) Compounds.

Name the particles from which elements and compounds are made of.

Answer:

(a) Elements : An element is defined as a pure substance made up of only one kind of atoms that cannot be converted into anything simpler than itself by any physical or chemical process.

(b) Compounds : Compounds are pure substances composed of two or more elements in definite proportion by mass and has a definite set of properties. Compound is made up of only one kind of molecules.

Question 5.

Give two examples for each of the following :

(a) Metals

(b) Non-metals

(c) Metalloids

(d) Noble gases

Answer:

(a) Metals : Iron, silver, gold.

(b) Non-metals : Carbon, sulphur, oxygen.

(c) Metalloids : Antimony, silicon, boron.

(d) Noble gases : Helium, argon, neon.

Name the elements which form water. How will you justify that water is a compound ?

Answer:

The elements which form water are (i) Hydrogen and oxygen.

Justification : Water has entirely different properties (i.e. is a liquid, extinguishes fire) from the elements it is made up of i.e. Hydrogen a gas catches fire oxygen a gas supporter of combustion.

1. Energy is needed to form water on combining O_2 with H_2.

2. We can not seperate the constituents of water by simple physical means.

Question 7.

Give three differences between metals and non-metals.

Answer:

Metals

1. Metals are ductile i.e. can be drawn into wires.
2. They are malleable i.e. can be beaten to form sheets.
3. They are sonorous.

Non-metals

1. Non-metals are mostly soft solids cannot be drawn into wires.
2. They are mostly gases and are not malleable.
3. They donot produce sound when struck.

Question 8.

How is sodium chloride different from its constituent elements, sodium and chlorine ?

Answer:

Sodium is a metal that is stored in kerosene oil as it reacts very fast with air and water. Chlorine is a reactive greenish yellow gas which is poisonous. When these two elements combine chemically they form common salt sodium chloride which is non poisonous colourless solid substance that we use in our food to add taste and to obtain some nutrition.

Question 9.

State four important characteristics of compounds.

Answer:

1. When compound is formed energy like heat, light or electricity is either needed or produced.
2. A compound has properties entirely different from the properties of its constituents.
3. Change in weight takes place.
4. It cannot be separated into its constituents by simple physical means.

Question 10.

Give two examples for each of the following :

(a) Non-metals which are solids
(b) Metals which are soft
(c) Non-metals which are lustrous
(d) Elements which are liquids.
(e) Inert gases
(f) Metalloids

Answer:

(a) Phosphorus, Sulphur
(b) Lead and Sodium
(c) Radium, Graphite
(d) Mercury, Bromine
(e) Helium, Neon
(f) Antimony, Arsenic

Question 11.

Name the elements present

(a) Sugar
(b) Ammonia
(c) Marble
(d) Washing soda

Answer:

Compounds
(a) Sugar
(b) Ammonia
(c) Marble
(d) Washing soda
Elements present
(a) Carbon, hydrogen & oxygen
(b) Nitrogen and hydrogen
(c) Calcium, carbon & oxygen
(d) Sodium, carbon & oxygen

Question 12.

What is the proportion of elements present in the following compounds?

(a) H_2O
(b) CO_2
(c) CaO
(d) NO_2

Answer:

Compounds	Elements	Proportion of elements
(a) H_2O	H : O	1 : 8
(b) CO_2	C : O	3 : 8
(c) CaO	Ca : O	5 : 2
(d) NO_2	N : O	7 : 16

Question 13.

Name two compounds which dissolve in water.

Answer:

Two compounds which dissolve in water are sugar, table salt.

EXERCISE- II

Question 1.

Define:

(a) Atom
(b) Molecule
(c) Atomicity
(d) Formula

Answer:

(a) Atom : An atom is the smallest indivisible unit of an element which exhibits all the properties of that element and may or may not have independent existence.

(b) Molecule : A molecule can be defined as the smallest unit of an element or a compound which exhibits all the properties of that element or compound and has independent existence. They are divisible into atoms.

(c) Atomicity : The number of atoms in a molecule of an element is called its atomicity.

(d) Formula : Formula is a short way of representing the molecule of an element or a compound.

Question 2.

Why are symbols and formulae of substances important?

Answer:

Importance of symbols and Formulae :

Symbols and formulae of substance gives a lot of information like.

1. Types of elements present in the compound. E.g. (H_20 is made of two elements hydrogen and oxygen).
2. Number of each kind of atoms in one molecule. E.g. (water has 2 atoms of hydrogen combined with 1 atom of oxygen.)
3. Mass of one molecule of the compound. E.g. [H_2O has mass $(1 \times 2) + 16 = 18$ g].

Question 3.

Mention three gaseous elements and write their molecular formula.

Answer

Three gaseous elements	molecular formula	Atoms in one molecule
Hydrogen	H_2	2
Oxygen	O_2	2
Chlorine	Cl_2	2

Question 4.

State the informations obtained from the formula of a compound.

Answer:

A formula gives us the following information about a compound.

1. Types of elements present in the compound.
2. Number of each kind of atoms in one molecule of the compound.
3. Mass of one molecule of the compound.

Example:

A molecule of carbon dioxide gas is represented by CO_2 It indicates that a carbon dioxide molecule is formed by the combination of two elements i.e. carbon and oxygen. The number of carbon atom is one and that of oxygen atom is two. The mass of one molecule of carbon dioxide can be calculated by adding the mass of one atom of carbon and two atoms of oxygen.

5. (a) 2H is two atoms of hydrogen. H_2 is one molecule of hydrogen gas.
(b) H_20 represents one molecule of water. $3H_20$ represents 3 molecules of water.

Question 6.

State the number of atoms of each kind, present in

(a) $C_6H_{12}O_6$

(b) H_2SO_4

(c) HNO_3

(d) $CaCO_3$

Also name these compounds.

Answer:

(a) $C_6H_{12}O_6$ has atoms of

Carbon	6 atoms in number
Hydrogen	12 atoms in number
Oxygen	6 atoms in number

The name of the compound is Glucose.

(b) H_2SO_4

Hydrogen	2 atoms in number
Sulphur	1 atom in number
Oxygen	4 atoms in number

The name of the compound is Sulphuric acid.

(c) HNO_3

Hydrogen	1 atom in number
Nitrogen	1 atom in number
Oxygen	3 atoms in number

The name of the compound is Nitric acid.

(d) $CaCO_3$

Calcium	1 atom in number
Carbon	1 atom in number
Oxygen	3 atoms in number

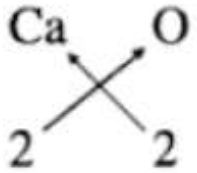
The name of the compound is Calcium Carbonate.

Question 7.

Write the molecular formulae of compounds calcium oxide, hydrogen sulphide, carbon monoxide and lead sulphide.

Answer:

Compound Calcium oxide is formed of elements calcium (Ca) and oxygen (O)



O_2 CaO

Symbols combining power Here subscript number is same Ca_2 Formula of calcium oxide is CaO Compounds Hydrogen sulphide is formed of elements

hydrogen (H), sulphide (S)

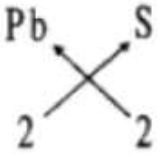
Symbols combining power

Formula is H_2S

Compound **Carbon monoxide** is compound of elements carbon (C) and oxygen (O)

Formula of carbon monoxide is CO

Formula of **lead sulphide** is PbS



Symbols combining power

Pb_2 S_2 PbS

Here the subscript numbers is same.

EXERCISE-III

Question 1.

Name:

(a) Three different forms of carbon.
(b) A form of carbon used as a gem.
(c) Two substances used to make electric wires.
(d) Two substances used to make jewellery.
(e) A substances used as an insulator.

Answer:

(a)

1. Diamond
2. Graphite
3. Coal

(b) Diamond is used as gem.
(c)

1. Copper.
2. Aluminium as these are good conductors of electricity.

(d)

1. Gold.
2. Silver as these are shining, lustrous, and ductile.

(e) Plastic is used as insulator as it is bad conductor of electricity.

Question 2.
Give one use of each of the following substances :

(a) Iron
(b) Brass
(c) Coal

Answer:
(a) Iron : To make machines tools and building material.
(b) Brass : To make water taps and utensils.
(c) Coal: Coal is used as fuel also used in thermal power plant to produce electricity.

Question 3.
Give reason:

(a) A frying pan is made up of steel but its handle is made up of wood.
(b) Graphite is used to make lead of the pencils.
(c) Argon is filled in electric bulbs.

Answer:

(a) Steel is good conductor of heat to cook food, pan is made of steel where as wood is insulator of heat and to hold, handle is made up of wood.
(b) Graphite leaves mark on the paper and makes it black.
(c) Argon is inert gas and protects the element of bulb from oxidation and burning. Hence increases bulb's life.

Answer:

(a) Copper and aluminium are good conductors of heat and electricity. They can be drawn into wires and beaten into sheets. Therefore, they are used to make electric wires.

(b) Metals are ductile, i.e., they can be drawn or stretched into thin wires. They are malleable, i.e., they can be beaten into thin sheets.

OBJECTIVE QUESTIONS

1. Fill in the blanks

(a) ..... refers to the number of atoms in the molecule of an element.

Atomicity refers to the number of atoms in the molecule of an element

(b) The most abundant element in the earth's crust is .....

The most abundant element in the earth's crust is **oxygen.**

(c) A metal which is a liquid at room temperature is.....

A metal which is a liquid at room temperature is **mercury.**

(d) The most abundant element in the atmosphere is .....

The most abundant element in the atmosphere is **nitrogen.**

(e) A metal which is a poor conductor of electricity is .....

A metal which is a poor conductor of electricity is **tungsten.**

(f) A diatomic gaseous element is .....

A diatomic gaseous element is **oxygen**.

(g) A liquid non-metal is .....

A liquid non-metal is **bromine.**

Ans.

	Column A		**Column B**
(a)	Metals	(*iii*)	Lustrous
(b)	Molecules	(*iv*)	Smallest unit of compound
(c)	Non-metals	(*ii*)	Brittle
(d)	Noble gases	(*i*)	Non-reactive

(a) A compound is made up ofjust one kind of atom.
Answer. True False
Correct : A compound is made up of two or more elements is a fixed proportion by mass.

(b) Metals reflect light and are good conductors of electricity.
Answer. True

(c) Metals can be polished.
Answer. True

(d) Elements are made up of compounds.
Answer. False
Correct : Elements are made up of atoms.

(e) All elements are artificially prepared.
Answer. False
Correct: All elements are made up of a limited number of basic substances.

(f) Molecules can exist independently.
Answer. True

(g) Molecules combine to form atoms.
Answer. False
Correct : Atoms combine to form molecule.

(h) Noble gases are higt reactive.
Answer. False
Correct: Noble gases are non-reactive.

(i) Ozone is a triatomic molecule.
Answer. True

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