

05

2020 SEPTEMBER

DAY 249 - 117 WEEK 36

SATURDAY

September 2020							
Wk	M	T	W	T	F	S	S
36		1	2	3	4	5	6
37	7	8	9	10	11	12	13
38	14	15	16	17	18	19	20
39	21	22	23	24	25	26	27
40	28	29	30				

APPOINTMENT / MEETING

Class - VI

Subject Chemistry
Chapter - 4 Elements and Compounds, Symbols and Formulae part - 2
Date - 16.6.20

- ① What is Symbol?
- ② Give the symbol of the following
Argon, Hydrogen, Nitrogen, Potassium,
Calcium, Neon.
- ③ Name the common elements in the following
 - (a) In the universe
 - (b) In the earth's crust
 - (c) In the atmosphere
 - (d) In the human body
- ④ What is Compound? Give eg.
- ⑤ Give the important characteristics of compound.
- ⑥ What is molecule?

NOTES

Sunday 06

October 2020							
Wk	M	T	W	T	F	S	S
40				1	2	3	4
41	5	6	7	8	9	10	11
42	12	13	14	15	16	17	18
43	19	20	21	22	23	24	25
44	26	27	28	29	30	31	

SEPTEMBER 2020

DAY 251 - 115 WEEK 37

MONDAY

07

APPOINTMENT / MEETING

7 Name the elements present in the following compounds
 Water, Sand, Alcohol, Ammonia

8 What is electrolysis?

9 How can you say that the compound is completely different from its constituents element?

10 Name the constituent elements and proportion of elements from the following compounds

H_2O , CO_2 , NO_2 , CaO , $NaCl$, $ZnCl_2$

P.S.L
 16.6.20

which is a systematic arrangement of elements in a tabular form for their convenient study.

Table 4.2 : Names and symbols of first 20 elements

Name	Symbol	Name	Symbol
Hydrogen	H	Sodium	Na
Helium	He	Magnesium	Mg
Lithium	Li	Aluminium	Al
Beryllium	Be	Silicon	Si
Boron	B	Phosphorus	P
Carbon	C	Sulphur	S
Nitrogen	N	Chlorine	Cl
Oxygen	O	Argon	Ar
Fluorine	F	Potassium	K
Neon	Ne	Calcium	Ca

Group :	↓	IA	IIA	IIIA	IVA	VA	VIA	VIIA	Zero
Period →	1	H							He
	2	Li	Be	B	C	N	O	F	Ne
	3	Na	Mg	Al	Si	P	S	Cl	Ar
	4	K	Ca						

A part of Periodic Table.

The horizontal rows are called **periods** represented by 1, 2, 3, 4 while vertical columns are called **groups** represented by IA, IIA zero.

The subject teacher should use the Periodic Table Chart to show the first 20 elements.

BIRTH OF THE ELEMENTS

The simplest element is hydrogen, which was the first to be formed shortly after the Big-Bang. It was followed by Helium. All the elements now known to us were created in the heart of stars which were scattered through space when the stars exploded.

COMMON ELEMENTS

- In the universe** – Hydrogen and helium are the two most common elements.
- In the Earth's crust** – Oxygen is in greatest amount followed by silicon, aluminium and iron.
- In the atmosphere** – Nitrogen is the most abundant element.
- In the Human body** – Carbon, hydrogen and oxygen are the most common elements because they make up the different compounds in all the body cells.

COMPOUNDS

To understand the meaning of a compound, the following facts are to be considered.

- The 26 English alphabets make huge number of words with different combinations you read in a dictionary.
- The ten digits from 0-9 make infinite sets of numbers.
- Only a few basic units (building blocks) make a large number of objects and materials with various combinations.

That means most of the things known to us consist of combinations of different elements.



Exploding Star

Compounds are pure substances formed by the chemical combination of two or more elements in a definite proportion by mass.

Example : Water, marble, glucose, sugar, salt, alcohol, carbon dioxide, calcium oxide, nitrogen dioxide, zinc chloride, etc.

A compound can be broken down into simpler substances. A substance like table salt is a compound, not an element, because it can be broken down into two elements, *i.e.*, sodium and chlorine by chemical process. [Its chemical name is sodium chloride].

Table 4.3 : Examples of compounds

Compound	Elements present
Water	Hydrogen, oxygen
Sugar	Carbon, hydrogen, oxygen
Common salt (or sodium chloride)	Sodium, chlorine
Alcohol	Carbon, hydrogen, oxygen
Ammonia	Nitrogen, hydrogen
Marble/chalk	Calcium, carbon, oxygen
Sand/Silica	Silicon, oxygen
Sodium carbonate	Sodium, carbon, oxygen
Glucose	Carbon, hydrogen, oxygen
Carbon dioxide	Carbon, oxygen
Nitrogen dioxide	Nitrogen, oxygen
Calcium oxide	Calcium, oxygen
Zinc chloride	Zinc, chlorine

Molecule is the smallest unit of a compound. A molecule of a compound consists of atoms of two or more elements in a definite proportion *i.e.* fixed ratio.

Note : All the molecules of a compound are same in all respects, but they differ from the molecules of other compounds. Therefore, each compound has its own specific physical and chemical properties. A molecule of water is completely different from the molecule of glucose.

The properties of compounds are also found to be completely different from those of the elements of which they are made up of.

Remember :

The important characteristics of a compound are :

1. It consists of two or more elements.
2. The constituting elements of a compound are combined in a definite proportion in every sample of the compound.
3. It is pure and homogeneous.
4. The physical and chemical properties of a compound differ from those of its constituent elements.
5. The components of a compound cannot be separated by simple physical means, *e.g.* filtration, evaporation, decantation, boiling, melting, freezing, *etc.*
6. Energy is either absorbed or evolved when a compound is formed.

To explain the above characteristics let us take an example of a very simple compound, water, which was earlier thought to be an element but later on it was found that, it is a compound.

- Water is formed when the two elements hydrogen and oxygen combine chemically in a fixed ratio of 1:8 by mass. From whatever source the water is taken and tested, the ratio of hydrogen and oxygen is found to be same. It will always have a fixed formula H_2O *i.e.* two atoms of hydrogen and one atom of oxygen.

- The properties of water are entirely different from those of its constituent elements. Hydrogen and oxygen are gases but water is a liquid under normal conditions. Hydrogen burns itself, oxygen supports burning but water helps in putting off fire.
- Water molecule cannot be broken into its constituent elements hydrogen and oxygen by simple physical methods. It's components can be separated by a chemical process known as **electrolysis***.
- Heat and light are produced when hydrogen and oxygen burn together and chemically combine to form water.

Another example is common salt which is a compound "sodium chloride" made up of sodium and chlorine. 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, a non poisonous colourless solid substance that we use in our food to add taste and to obtain nutrition.

The two elements present in salt can be separated only by electrolysis, a chemical process.

* *Electrolysis is a chemical process in which electric current is passed through a compound in liquid state to separate its constituent elements.*

Table 4.4 : Proportion of elements by mass in some compounds

Compounds	Elements	Proportion of elements
H ₂ O	H : O	1 : 8
CO ₂	C : O	3 : 8
NO ₂	N : O	7 : 16
CaO	Ca : O	5 : 2
NaCl	Na : Cl	23 : 35.5
ZnCl ₂	Zn : Cl	65 : 71

Note : Two or more elements, when mixed in any proportion and not combining chemically, form a mixture. *E.g.* : A mixture of iron and sulphur. These elements can be separated by physical methods.

In a compound, elements always combine in a fixed proportion. Any change in the proportion of elements will make a different compound *e.g.* if two hydrogen atoms and one oxygen atom combine, they form a molecule of water (H₂O). However, if two hydrogen atoms and two oxygen atoms combine they form a different compound hydrogen peroxide (H₂O₂), which is completely different, instead of water.

In the same way NO₂, N₂O and NO are different compounds though all the three are made up of nitrogen and oxygen but in different proportions.