Vidya Bhawan Balika Vidyapith

Shakti Utthan Ashram, Lakhisarai – 811311 (Bihar)

Chapter:- 3. ATOMS AND MOLECULES.

CLASS:- IXth **SUBTEACHER:-VIKASH KR. RAJAK**

SUBJECT:-CHEMISTRY **DATE :-30/05/2020**

🕮 Topic:- Atoms

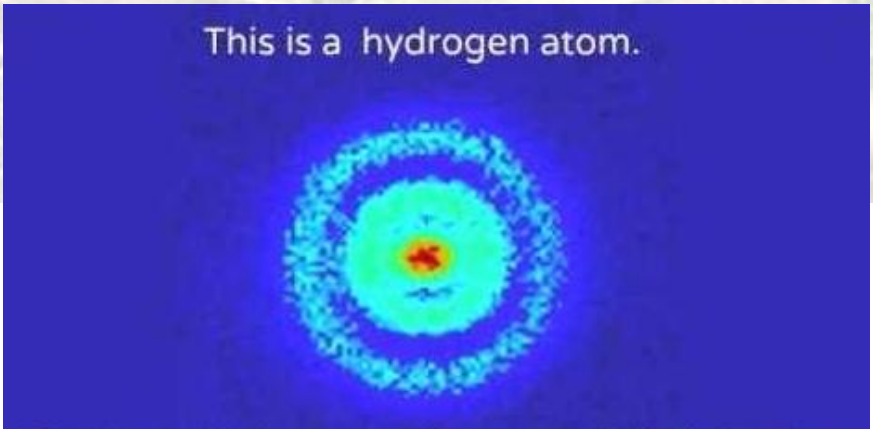
➢ Atoms:-

Just as all the houses are made up of bricks, in the same way, all the matter is made up of atoms. Thus, atoms are the building blocks of all the matter around us. In chemistry, atom is defined as follows: An atom is the smallest particle of an element that can take part in a chemical reaction. Atoms of most of the elements are very reactive and do not exist in the Free State (as single atoms). They exist in combination with the atoms of the same element or another element. There are as many kinds of atoms as are elements. Atoms are very, very small in size. An idea of the extremely small size of atoms can be had from the fact that 35,000,000 copper atoms arranged end to end in a line would cover a distance of about 1 centimetre. The size of an atom is indicated by its radius which is called 'atomic radius' (radius of atom). Atomic radius is measured in 'nanometres' (which is a very, very small unit of measuring length). The symbol of a nanometre is nm.

$$1 \text{ nanometre} = \frac{1}{10^9} \text{ metre}$$

$$\text{or } 1 \text{ nm} = \frac{1}{10^9} \text{ m}$$

$$\text{or } 1 \text{ nm} = 10^{-9} \text{ m}$$

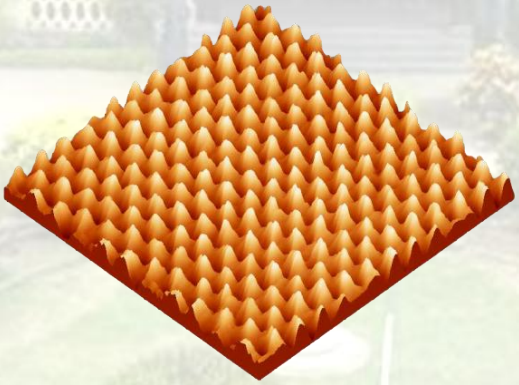


☞ **Hydrogen atom is the smallest atom of all. The atomic radius of a hydrogen atom is 0.037 nanometre (or 0.037 nm). If we express the radius of a hydrogen atom in metres, it will be 0.037×10^{-9} metre which means 0.000000000037 metre. It is really very, very small. The atomic radii of some of the common elements are given below (Please note that 'radii' is the plural of radius).**

Atomic Radii and Crystal Structures for 16 Metals

Metal	*Atomic Radius (nm)*	*Metal*	*Atomic Radius (nm)*
Aluminum	0.1431	Molybdenum	0.1363
Cadmium	0.1490	Nickel	0.1246
Chromium	0.1249	Platinum	0.1387
Cobalt	0.1253	Silver	0.1445
Copper	0.1278	Tantalum	0.1430
Gold	0.1442	Titanium (α)	0.1445
Iron (α)	0.1241	Tungsten	0.1371
Lead	0.1750	Zinc	0.1332

☞ **Atoms are so small that we cannot see them even under the most powerful optical microscope. Electron microscope (which uses electrons for its working) can produce extremely magnified images of tiny objects. The most advanced type of electron microscope is the Scanning Tunnelling Microscope (STM). Scanning tunnelling microscope can produce computer-generated images (pictures) of the surface of elements which show the individual atoms.**



STM Image of Graphite

✍ ***Home Work***

Answer the following questions:-

1. **Give the explanation of Conservation of Mass?**
2. **Give an experiment to show mass is conserve.**
3. **Write the Drawback of Dalton's Atomic Theory.**
4. **What is Dalton Atomic Theory**