

Chemistry Study Materials for Class 9 (NCERT Based notes of Chapter -03)

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Atoms and Molecules

SYMBOLS OF ATOMS OF ELEMENTS

Dalton was the first scientist to use the symbols for elements in a very specific sense. When he used a symbol for an element he also meant a definite quantity of that element, that is, one atom of that element. Berzelius suggested that the symbols of elements be made from one or two letters of the name of the element.

Many of the symbols are the first one or two letters of the element's name in English. The first letter of a symbol is always written as a capital letter (uppercase) and the second letter as a small letter (lowercase).

For convenience elements are represented by unique symbols.
For example:

Hydrogen is represented by 'H'. Oxygen is represented 'O'.

Nitrogen is represented by 'N'. Iron is represented by 'Fe'.

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	Hydrogen		Carbon		Oxygen
	Phosphorus		Sulphur		Iron
	Copper		Lead		Silver
	Gold		Platina		Mercury

His work proved as a boon to science. For his marvelous work Berzelius, together with John Dalton, Antoine Lavoisier, and Robert Boyle is considered as the Father of Modern Chemistry.

Symbol of many elements are taken from their English name, while

Symbol and Name of some elements					
Element	Symbol	Element	Symbol	Element	Symbol
Hydrogen	H	Sodium	Na	Chromium	Cr
Helium	He	Magnesium	Mg	Manganese	Mn
Lithium	Li	Aluminium	Al	Iron	Fe
Beryllium	Be	Silicon	Si	Cobalt	Co
Boron	B	Phosphorus	P	Nickel	Ni
Carbon	C	Sulphur	S	Copper	Cu
Nitrogen	N	Chlorine	Cl	Zinc	Zn
Oxygen	O	Argon	Ar	Silver	Ag
Fluorine	F	Potassium	K	Gold	Au
Neon	Ne	Calcium	Ca	Mercury	Hg

symbol of many elements are taken from their Greek or Latin names.

Symbol of some element which are derived from their Latin name

Several elements are named after the place where they discovered, such as 'Copper' which was taken from Cyprus. Some elements are named after their colour, such as 'Gold' which means yellow.

Symbols of some elements taken from their Latin Name		
English Name of Elements	Symbol	Latin Name of Elements
Sodium	Na	Natrium
Potassium	K	Kalium
Iron	Fe	Ferrum
Copper	Cu	Cuprum
Silver	Ag	Argentum
Gold	Au	Aurum
Mercury	Hg	Hydragyrum
Lead	Pb	Plumbum
Tin	Sn	Stannum

ATOMIC MASS

Mass of atom is called atomic mass. Since, atoms are very small consequently actual mass of an atom is very small. For example the actual mass of one atom of hydrogen is equal to 1.673×10^{-24} g. This is equal to 0.0000000000000000000000001673 gram. To deal with such small number is very difficult. Thus for convenience relative atomic mass is used.

Carbon-12 is considered as unit to calculate atomic mass.

Carbon-12 is an isotope of carbon. The relative mass of all atoms are found with respect to C-12.

One atomic mass = $\frac{1}{12}$ of the mass of one atom of C-12.

This means atomic mass unit = $\frac{1}{12}$ th of Carbon – 12

Atomic Mass of some elements					
Element	Symbol	Atomic Mass	Element	Symbol	Atomic Mass
Hydrogen	H	1u	Sodium	Na	23u
Helium	He	4u	Magnesium	Mg	24u
Lithium	Li	7u	Aluminium	Al	27u
Beryllium	Be	9u	Silicon	Si	28u
Boron	B	11u	Phosphorous	P	31u
Carbon	C	12u	Sulphur	S	32u
Nitrogen	N	14u	Chlorine	Cl	35u
Oxygen	O	16u	Potassium	K	39u
Fluorine	F	19u	Calcium	Ca	40u
Neon	Ne	20u	Iron	Fe	56

Thus atomic mass is the relative atomic mass of an atom with respect to $\frac{1}{12}$ th of the mass of carbon-12 atom. ‘amu’ is the abbreviation of Atomic mass unit, but now it is denoted just by ‘u’.

The atomic mass of hydrogen atom = 1u.

This means one hydrogen atom is 1 times heavier than $\frac{1}{12}$ th of the carbon atom.

The atomic mass of oxygen is 16u, this means one atom of oxygen is 16 times heavier than $\frac{1}{12}$ th of carbon atom.
