

Atomic Structure:- Atoms Colliding By

lets start from the beginning :-

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Q) What is an Atom?

@dackify
insta

→ Smallest particle of an element which can take part in a :-

Chemical Reaction

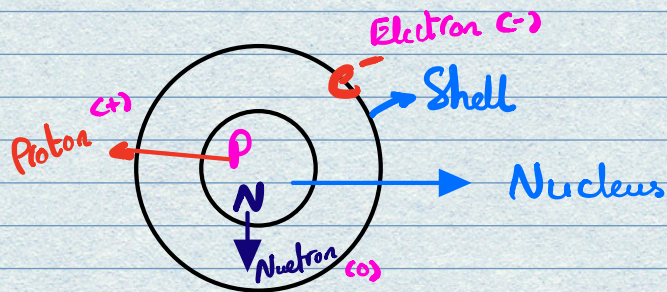
Q) Whats a Chemical ?

Any substance which contains matter

Q) Whats a Chemical Reaction?

→ It involves sharing or loss or gain of electrons

Q) Whats inside an Atom?



Atomic Number (Z) :-

Number of protons in the nucleus of an atom

★) Proton number is the identity of an element.

↓
If it changes → Element changes

Mass Number (A)

Sum of Protons and Neutrons in the nucleus of an atom.

$$\text{Proton} \therefore +1 = 1$$

$$\text{Neutron} \therefore 0 = 1$$

$$\text{Electron} \therefore -1 = 1/1840$$

$$\star \text{No of Neutrons} =$$

$$A - Z$$

IONS

Ion \therefore Charged Particle

\rightarrow In an ATOM \therefore no of P & e^- = Same

\rightarrow +ve sign = More Protons than electrons

\rightarrow -ve sign = More electrons than protons!

Examples:-

$$7p / 7e = 0 = \text{Atom}$$

$$+7 / -8 = 1^- = \text{Anion}$$

$$+7 / -9 = 2^- = \text{Anion}$$

$$+7 / -6 = 1^+ = \text{Cation}$$

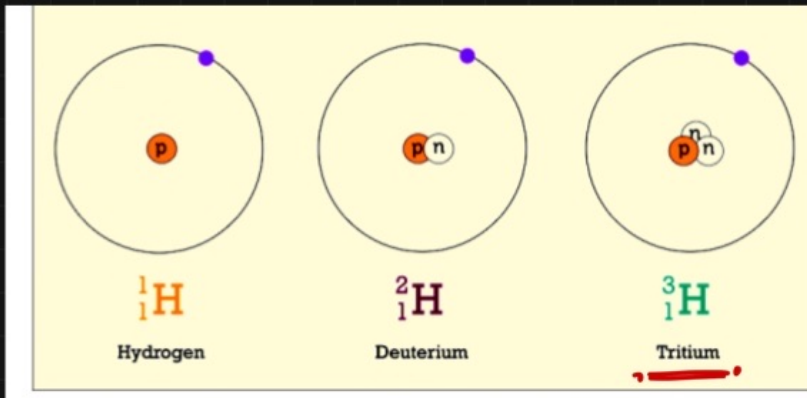
$$+7 / -5 = 2^+ = \text{Cation}$$

ISOTOPES

Atoms of same element with dif no of Neutrons !

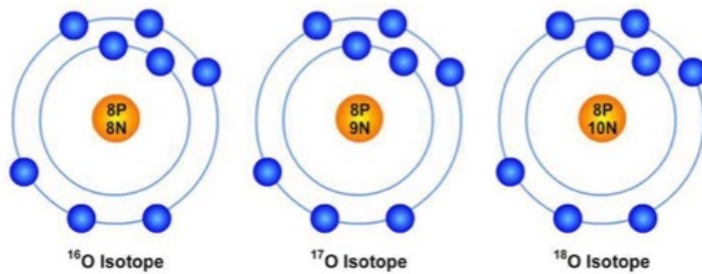
Chemical properties depends upon no of electrons.

In the outer shell. Hence Isotopes are Identical Chemically

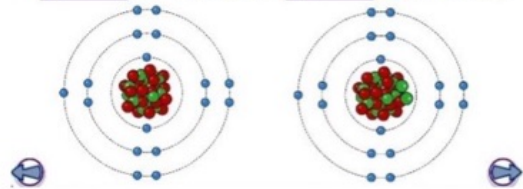
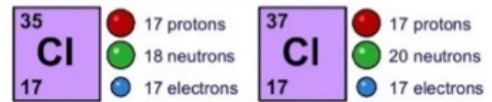


plants.

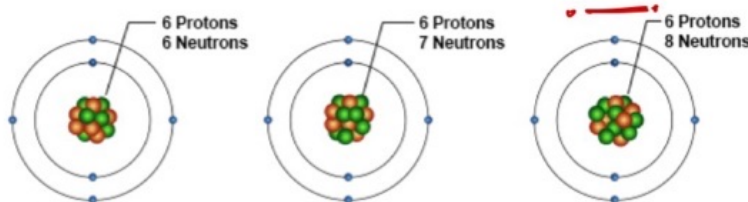
Oxygen Isotopes



About 75% of naturally-occurring chlorine is chlorine-35 (${}^{35}\text{Cl}$) and 25% is chlorine-37 (${}^{37}\text{Cl}$).



NATURAL ISOTOPES OF CARBON



Carbon-12 (6P + 6N)	Carbon-13 (6P + 7N)	Carbon-14 (6P + 8N)
Atomic Weight = 12	Atomic Weight = 13	Atomic Weight = 14
Isotope Mass: 12 u	Atomic Mass = 13.00335 u	Isotope Mass: 14.003241 u
Abundance: 98.89%	Abundance: 1.109%	Abundance: 1 Part Per Trillion
		Half-life: 5,730 ± 40 Years

${}^{234}\text{U}$	${}^{235}\text{U}$	${}^{238}\text{U}$
234.04094	235.04392	238.05078
$t_{1/2}$ =246,000 yrs	$t_{1/2}$ =704 million yrs	$t_{1/2}$ =447 billion yrs
0.0055%	0.720%	99.2745%
Radioactive	Radioactive	Radioactive