

N. Phy

$A = \text{mass No} = \text{Total No. of Nucleons}$

$$A = N(\text{Neutrons}) + Z(\text{mass No})$$

Saturday 31
 $N = A - Z = \text{Neutron No}$

Isotopes: Z (Atomic No) \rightarrow Same
 A (mass No) \rightarrow Different

eg (1) ${}^6\text{Li}$ and ${}^7\text{Li} \Rightarrow$ The no. of protons in the nucleus of each is 3 but their neutron numbers are $6 - 3 = 3$ and $7 - 3 = 4$ respectively

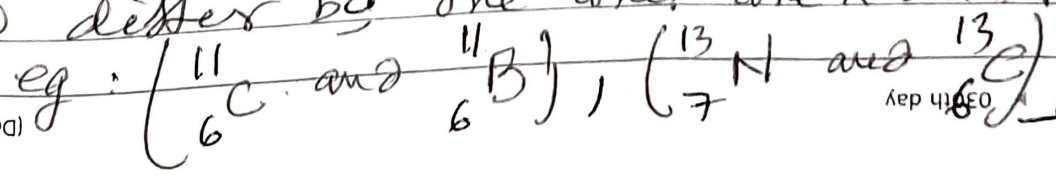
(2) ${}^1\text{H}$, ${}^2\text{H}$, ${}^3\text{H}$

Isobars: $Z \rightarrow$ Diff., $A \rightarrow$ Same

Isotones: No. of neutrons (N) \rightarrow Same
No matter what the Z value.

Mirror nuclei \rightarrow The pairs of isobaric nuclei where the Z and N are interchanged

and differ by one unit are known as Mirror Nuclei.



Nuclear Mass :-

$$M_{nuc} = M(A, Z) - Zm_e$$

Binding Energy :- $(E_B) \Rightarrow$

$$E_B = \Delta m c^2$$

$$\Delta M = ZM_H + NM_n = M(A, Z)$$

\rightarrow mass of Hydrogen

mass of the neutron

mass of the Atom

of mass no. A and
at. No. Z

$$E_B = [ZM_H + NM_n - M(A, Z)]c^2$$

$$= [ZM_p + NM_n + Zm_e - M_{nuc} - Zm_e]c^2$$

$$\therefore E_B = [ZM_p + NM_n - M_{nuc}]c^2$$

ΔM (mass loss)

$$\Delta M = ZM_p + NM_n - M_{nuc}$$