Exercise ⇒ 3:- ADVANCED

① $^{27}_{13}Al \xrightarrow{(ii)} {}^{30}_{15}P + y$

$^{27}_{13}Al \xrightarrow{(i)} {}^{30}_{14}Si + X.$

${}^{30}_{15}P \longrightarrow {}^{30}_{14}Si + Z$

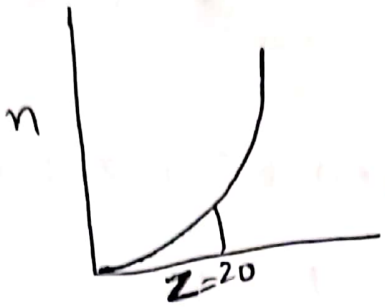
${}^{4}_{2}He + {}^{27}_{13}Al \longrightarrow {}^{30}_{14}Si + {}^{1}_{1}H$ → proton

${}^{27}_{13}Al + {}^{4}_{2}He \longrightarrow {}^{30}_{15}P + {}^{1}_{0}n$ → neutron

${}^{30}_{15}P \longrightarrow {}^{30}_{14}Si + {}^{0}_{+1}e$ → positron

Ans (A)

Q(5)



$\frac{n}{p} < 1$, $\boxed{n < p}$

So no of neutron should be increased.

(A) $n \rightarrow {}^{-}\beta + {}^{+}p$

(B) $p^+ + e^- \rightarrow n + \nu$.

(C) neutron emission, no of neutron will be decreased.

(D) $p^+ \rightarrow n + \beta^+$. (Ans) — (B, D)

Q(6)

$$^{238}_{92}U \xrightarrow{-X_1} {}^{234}_{90}Th \xrightarrow{-X_2} {}^{234}_{91}Pa \xrightarrow{-X_3} {}^{234}Z \xrightarrow{-X_4} {}^{234}_{90}Th$$

$^{238}_{92}U \longrightarrow {}^{234}_{90}Th + {}^{4}_{2}He$ $\boxed{X_1 \text{ is } \alpha \text{ particle.}}$ $\boxed{{}^{4}_{2}He^{+2}}$

$^{234}_{90}Th \rightarrow {}^{234}_{91}Pa + {}^{0}_{-1}\beta$

$^{234}_{91}Pa \rightarrow {}^{234}_{90}Z + {}^{0}_{+1}\beta$

~~X_2 is positron~~

X_2 is electron.

X_3 is positron.

(Ans) 1, 2 & 3.

Q.2 $_{29}^{63}Cu + {}_{1}^{1}H \longrightarrow 6\,{}_{0}^{1}n + {}_{2}^{4}He + 2\,{}_{1}^{1}H + {}_{Z}^{A}X$

$29 + 1 = 6 \times 0 + 2 + 2 \times 1 + Z$

$Z = 30 - 4 = 26$

$_{26}Fe \rightarrow 8^{th}$ group (Ans B)

Q.3 $_{4}^{9}Be + X \longrightarrow {}_{4}^{8}Be + Y$

(A) $_{4}^{9}Be + \gamma \longrightarrow {}_{4}^{8}Be + n$

(B) $_{4}^{9}Be + p \longrightarrow {}_{4}^{8}Be + {}_{1}^{2}D$

Ans = A & B

Q.4 $_{92}U^{238} \longrightarrow {}_{82}Pb^{206} + 8\,{}_{2}^{4}He + 6\,{}_{0}^{-1}\beta$

$t=0$, 1 mol

$t=t'$ 1 mol 8 mol.

$P_i \times V = 1 \times R \times 298$. ($n=1 \leftarrow$ mol of air)

$P_f \times V = 9 \times R \times 298$, ($n=1+8 \Rightarrow$ mol of air + alpha particles)

$$\frac{P_f}{P_i} = 9$$