

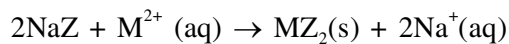
## HYDROGEN AND ITS COMPOUND

- In comparison to the zeolite process for the removal of permanent hardness, the synthetic resins method is :
  - less efficient as it exchanges only anions
  - more efficient as it can exchange only cations
  - less efficient as the resins cannot be regenerated
  - more efficient as it can exchange both cations as well as anions
- Hydrogen has three isotopes (A), (B) and (C). If the number of neutron(s) in (A), (B) and (C) respectively, are (x), (y) and (z), the sum of (x), (y) and (z) is :
  - 4
  - 3
  - 2
  - 1

SOLUTION

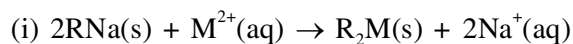
## 1. NTA Ans. (4)

**Sol.** (a) Zeolite method removes only cations ( $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$  ion) present in hard water

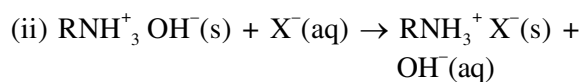


(M → Mg, Ca)

(b) Synthetic resin method removes cations ( $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$  ion) and anions (like  $\text{Cl}^-$ ,  $\text{HCO}_3^-$ ,  $\text{SO}_4^{2-}$  etc.)



(Cation exchange resin) (M → Mg, Ca)



(Anion exchange resin) ( $\text{X}^- = \text{Cl}^-, \text{HCO}_3^-, \text{SO}_4^{2-}$  etc)

## 2. NTA Ans. (2)

**Sol.** Hydrogen has three isotopes

Isotopes	Number of neutrons
Protium ( ${}^1_1\text{H}$ )	0
Deuterium ( ${}^2_1\text{H}$ )	1
Tritium ( ${}^3_1\text{H}$ )	2

Hence the sum of neutrons are 3