

Removal of Hardness of Water -I

The hardness of water can be removed by the following methods:

A. Clark's method

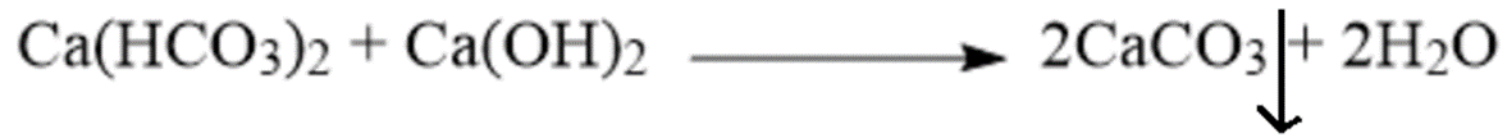
B. Ion Exchange Process

i. Permutit Process

ii. Ion-exchange resin process

Clark's method

- In Clark's method a calculated amount of calcium hydroxide Ca(OH)_2 is added to hard water.
- Due to reaction, insoluble carbonates are obtained as precipitate which are separated by filtration.



Ion Exchange Process :

- One or more undesirable contaminants are removed from water by exchange with another non-objectionable, or less objectionable substance.
- Both the contaminant and the exchanged substance must be dissolved in water and have the same type of electrical charges.
- Two types:
 - i. Permutit Process
 - ii. Ion- exchange resin process

Permutit Process

- Permutit or zeolite is a complex compound, which is insoluble in water.
- It can exchange the ions present in it with the ions present in the solution.
- zeolites are packed in a suitable container and a slow stream of hard water is passed through this material.
- As a result, calcium and magnesium ions present in hard water are exchanged with sodium ions in the permutit, $\text{Na}^+(\text{Al-Silicate})^-$



THANK YOU