

INTERNAL CONDITIONING

(OR)

INTERNAL TREATMENT

(OR)

BOILER COMPOUNDS

This process is carried out in the boiler itself

It includes

- 1. Carbonate conditioning**
- 2. Phosphate conditioning**
- 3. Calgon Conditioning**
- 4. Colloidal Conditioning.**

1. Carbonate conditioning

Scale formation can be avoided by adding Na_2CO_3 to boiler water.

It is used in high pressure boilers. The scale forming salt like CaSO_4 is converted into CaCO_3 .



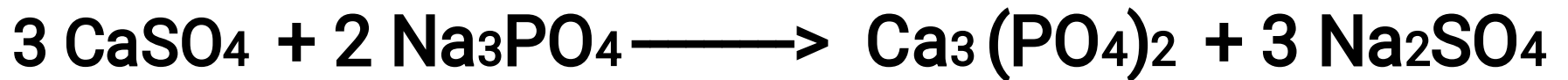
The forward reaction is favored by increasing the concentration of CO_3 . CaCO_3 formed can be removed easily.

2. Phosphate Conditioning

Scale of can be avoided by adding sodium phosphate.

It is used in high pressure boilers.

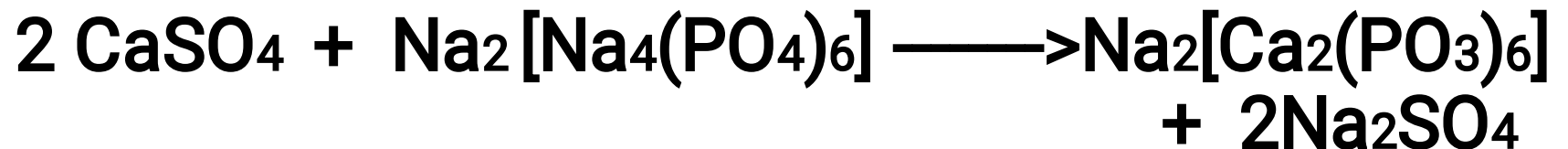
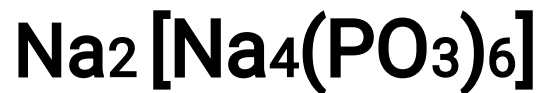
Phosphate reacts with Ca^{2+} and Mg^{2+} salts to give sludge of calcium and Magnesium phosphate



- 1. Trisodium Phosphate - Na_3PO_4 - acidic water.**
- 2. Disodium hydrogen Phosphate - Na_2HPO_4 -
weakly acidic water**
- 3. Sodium dihydrogen Phosphate - NaH_2PO_4 -
Alkaline water**

3. Calgon Conditioning

Calgon - sodium hexa meta Phosphate .



This substance interacts with calcium ions to form highly soluble complex and thus prevents the precipitation of scale forming salts.

The complex $\text{Na}_2 [\text{Ca}_2(\text{PO}_3)_6]$ is soluble in water and there is no problem of sludge disposal.

4. Colloidal Conditioning (sodium Aluminate conditioning)

Scale formation can be avoided by adding colloidal agents like kerosene, agar - agar , gellatin etc.,

It is used in low pressure boilers.

These colloidal get coated over the scale forming particles and convert them into non - adherent , loose precipitate called sludge , which can be removed by blown down operation.

