



# **SNS COLLEGE OF TECHNOLOGY**

Vazhiampalayam, Coimbatore-35

**(An Autonomous institution)**

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## **DEPARTMENT OF CHEMISTRY**

**COURSE NAME : 23CHT102- CHEMISTRY OF ENGINEERING  
MATERIALS**

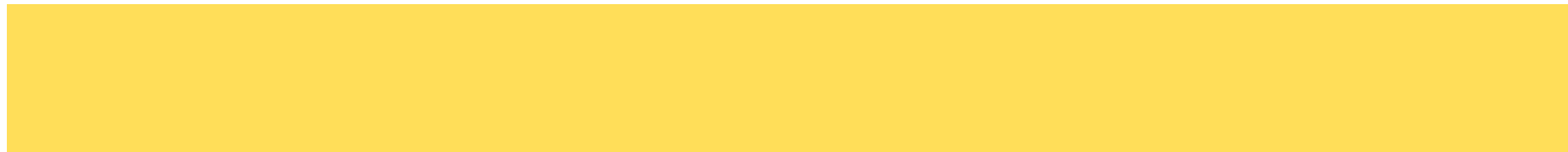
**I YEAR / II SEMESTER**

**UNIT IV: WATER TECHNOLOGY**

**TOPIC : 5. INTERNAL CONDITIONING**



# BRAINSTORMING WITH RECAP





## INTERNAL TREATMENT BY BOILER COMPOUNDS

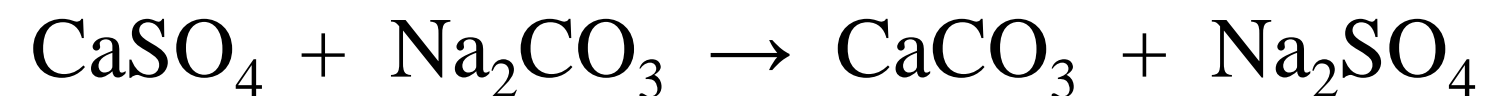


The residual salts that are not removed by external methods can be removed by adding some chemicals directly into the boiler water. These chemicals are known as 'Boiler compounds'. This method is known as 'Internal treatment'.

Eg) Carbonate conditioning, Phosphate conditioning and Calgon conditioning

### **a) Carbonate conditioning:**

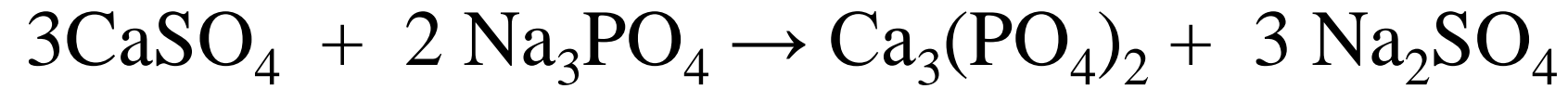
Used for low pressure boilers. Here the salts like  $\text{CaSO}_4$  are converted to easily removable  $\text{CaCO}_3$ . But sometimes it produces  $\text{NaOH}$ ,  $\text{CO}_2$  and hence Carbonic acid. So it is less preferred.





### **b) Phosphate conditioning:**

Used for high pressure boiler. No risk of CO<sub>2</sub> liberation.



Three types of Phosphate salts are used:

Na<sub>3</sub>PO<sub>4</sub> – Tri sodium Phosphate – Used for highly acidic water

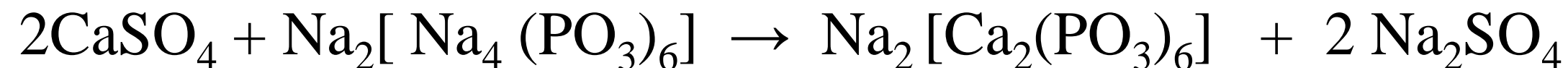
Na<sub>2</sub>HPO<sub>4</sub> – Disodium hydrogen Phosphate – Used for slightly acidic water

NaH<sub>2</sub>PO<sub>4</sub> – Sodium di hydrogen phosphate – Used for alkaline water

### **c) Calgon conditioning:**

Calgon is the trade name of sodium hexa meta phosphate- Na<sub>2</sub> [ Na<sub>4</sub> (PO<sub>3</sub>)<sub>6</sub>].

With calcium ions it forms a soluble complex and prevents scale and sludge formation. It is used for high and low pressure boilers.





# SUMMARY





# REFERENCES



1. O.G. Palanna, “Engineering Chemistry ”Tata McGraw-Hill Pub. Co. Ltd, New Delhi.2017.
2. Wiley, “Engineering Chemistry”, John Wiley & Sons. InC, USA.
3. P.C.Jain & Monicka Jain, “Engineering Chemistry” , Dhanapat Rai Publising Company Pvt. Ltd. 2017.
4. R. Sivakumar and N Sivakumar, “Engineering Chemistry” Tata McGraw-Hill.Pub.Co.Ltd. New Delhi.2009.

**THANK YOU**