



# Principal Of Analytical Chemistry

## Introduction:

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Determining the chemical composition of water can give operators an indication of the tendency of the water to generate scale or cause corrosion. Proper treatment of the water based on the chemical analysis prevent scale or corrosion and minimizes down time increasing production. Production water needs to be monitored for major cations and anions that are used as indicators of corrosion or scaling tendency. This course designed to give participants a basic understanding of the causes of deposition and corrosion in water and steam systems. Analysis methods for the major cations and anions that are used as indicators of corrosion and scaling tendency are described.

## Who Should Attend?

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The content is ideal for personnel who are involved in water analysis, boiler operations, inspection, and environmental aspects.

## Methodology:

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This interactive Training will be highly interactive, with opportunities to advance your opinions and ideas and will include;

- Lectures

- Workshop & Work Presentation
- Case Studies and Practical Exercise
- Videos and General Discussions

## Certificate:

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**BTS** attendance certificate will be issued to all attendees completing minimum of 80% of the total course duration

## Course Objectives:

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This course aims to train the participants in the following: Basics of water chemistry. Understanding of the causes of deposition and corrosion in water and steam systems. Fundamentals of the analysis methods, for the major cations and anions that are used as indicators of corrosion and scaling tendency. Fundamentals of the analysis of other water properties that affect its quality. The ability to interpret the water analysis test results.

## Course Outline:

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Basics of water chemistry

Types of Boilers

Boiler Problems Caused by Water

- Scaling
- Corrosion
- Carryover

Necessity of Water Treatment for Boilers

Boiler water treatments

- External Boiler Water Treatment
- Screening
- Clarification
- Coagulation
- Filtration
- Aeration, Deaeration
- Chlorination, Dechlorination
- Softening
- Lime-Soda Softening
- Sodium Zeolite Softening
- Demineralization
- Dealkalization
- Internal Boiler Water Treatment
- Phosphate based boiler compounds:
- Non-phosphate based boiler compounds

## **Preservation of Boilers during Stoppage**

## **Water Quality Control for Boiler**

### **Analysis of Water for boiler**

- Why do we need to analyze water?
- Water Lab
- Personnel
- Laboratory Facilities
- Sampling
- Analytical Methods
  - ❖ Separation Techniques
  - ❖ Measurement Techniques
  - ❖ What do we test for, why, and how?
  - ❖ Global Standard method of water analysis
- pH acidity and alkalinity
- Temperature
- Specific Gravity
- Turbidity
- Total Hardness
- P, M & OH Alkalinity

- Specific conductance
- Solids
- Dissolved Oxygen (DO), Oxygen Demand
- Sulphite
- Phosphate
- Inorganic Chemicals
- Records and Data Reporting
- Water regulations