



TRAINING PROGRAM



GC Operation, Open Lab, and maintenance

Introduction:

Scientists have a need to know the composition, identity and quantity of the samples with which they are deal. Consequently, the Chromatography which is the separation of an analyte from a complicated mixture of similar constituents for qualitative or quantitative identification is a very important development technique of chemical and physical analysis. This course discusses one of most important methods of instrumental analysis in the different applications. There is no chemical industrial field has no need to gas chromatographic analysis.

Who Should Attend?

The course is of interest for any person working in any analytical laboratory. Laboratory staff, Chemists, supervisors and technicians.

Methodology:

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:

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

Course Objectives:

The quality of analysis depends more on the quality of the operator than that of the instrument, so this course will help laboratory staff to understand meaning and principals of gas chromatographic and their applications.

Course Outline:

Day 1:

- Introduction
- History of Chromatography
- Type of Chemical Analysis
- Separation Analysis
 - Separations in everyday life
 - Simple separation procedures
 - Classification of separation process
 - Chromatographic Separation
 - Types of Separation Chromatography
- Symbols and terms of Chromatography
- Physical forces and interactions chromatography
- Fundamentals of chromatography

- Definitions
- Basic System Design
- Concept of Polarity
- Properties of Separation
- Physiochemical Processes of Separation
- Adsorption
- Partition
- Ion Exchange
- Size Exclusion

Day 2:

- Type of Chromatographic Analysis
- Gas Chromatography
- Objectives & Definitions
- Principles of GC
- Mobile and Stationary Phase
- Instrumentation of Gas Chromatography
 - Mobile Phase
 - Gas Supplies
 - Sample Introduction, Injection Ports and Valves
 - Packed Column Injectors
 - Open Tubular Column Injectors
 - Injection Methods and Techniques
 - The role of sample introduction and injection ports in GC operations
 - Injection ports maintenance and its impact on GC performance

Day 3:

- Columns
 - Open Tubular Capillary GC Column
 - Packed GC Column
 - Configurations of the stationary phase
 - Column selection & maintenance
 - Selecting Stationary Phases
 - How columns can impact GC performance
- Detectors
 - Flame ionization Detector
 - Thermal Conductivity Detector
 - Other Detectors
 - Detector Selection
 - The role of Detectors in GC operations
 - Detector maintenance
 - How detectors can impact GC performance
- GC operation
 - Setup and GC Operation, Basic steps
 - Sampling Techniques
 - Programmed Temperature GC
 - Peak Dispersion in a Chromatographic Column
 - Your First Chromatogram
 - From Chromatograms to Report

Day 4:

- Maintenance and troubleshooting
 - Errors in Qualitative and Quantitative Analysis
 - Correction of errors and improving accuracy
 - Preventive maintenance
 - Routine Maintenance
 - Practical application for schedule maintenance
 - How to replace spare parts
 - Troubleshooting fixation
- Evaluation of GC
- Data Acquisition and Calibration
 - Recorders & Data Acquisition
 - Data analysis
 - Data Acquisition and Processing
 - Data Processing
 - Calibration
 - Data Acquisition and Processing System
 - Calibration linked to GC performance

Day 5:

- Data Results
 - Recorders & Data Acquisition
 - Data analysis
 - Data Acquisition and Processing
 - Data Processing

- Application in analysis by Gas Chromatography
 - Analysis of Non-volatiles
 - Water sample & Inorganic GC
 - Organic and petroleum samples
 - Qualitative & Quantitation Analysis Strategies
 - Performing Trace Analysis
 - Errors in Qualitative and Quantitative Analysis
 - Chemical laboratory measurement evolution