

PROBLEM SOLVING IN CHEMICAL ANALYSIS



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TRAINING TITLE

PROBLEM SOLVING IN CHEMICAL ANALYSIS

VENUE

Dubai, UAE

DURATION

5 Days

DATES

25 – 29 July 2021

PRICE

US\$4,000 per attendee including training material/handouts, morning/afternoon coffee breaks and Lunch buffet.

TRAINING INTRODUCTION

The efficient use of chemical analysis and instrument technique are very imperative tools to solve any laboratory problem. The course provides laboratory analysis methods and troubleshooting techniques of most used instruments in any laboratory. In addition, it provides elegant tools for obtaining qualitative and quantitative data techniques with practice work on analysis Software. The aim of this course is to enrich and update the knowledge and skills of the participants for understanding the problem of chemical analysis and implementing analysis troubleshooting.

TRAINING OBJECTIVES

- To impart the participants technique of solving problem in the laboratory.
- To understand and apply practically the instruments troubleshooting.
- To know the difficult task of judging the accuracy and precision of experimental data and how these judgments can be sharpened by the application of statistical methods.
- To understand the tools and techniques for achieving process analysis, qualitative methods, cause and effect diagrams and calibration graph.

TRAINING AUDIENCE

The course is planned for chemist, lab technicians, chemical engineers, instrumental engineers and lab supervisors/managers.

TRAINING OUTLINE

- Chemistry Fundamental
- Introduction to Chemical Analysis Technique
- Basic Laboratory Technique: Sample Preparation, Analytical Measurement, Fundamental Concepts, Chemical Equation, Acidity of Solution, Buffers, Gravimetric Methods of Analysis
- Preparation of Chemicals and Problem Solving
- Titration Methods and Metoods Problem
- Potential Selectivity of Electrolytic Methods
- Sample Contamination
- Analyte Extraction by Manipulation Methods
- Introduction to Analysis Instruments
- Gas Chromatography Technique: Inject System, Column, Detector types
- High Performance Liquid Chromatography: Mobile Phase, Pumping System, Sample Inject system, Column, Detector Types
- Spectroscopy Technique: Infrared Spectroscopy, Nuclear Magnetic Resonance Spectroscopy, Mass Spectrometry, Atomic Spectroscopy
- Organic Molecules Identifying and Spectrum Problem
- Instrument Problems and Troubleshooting: Band Broadening, Broaden in Initial Peak Bandwidths, Retention Gap Sampling, Sampling By Solute Focusing, Retention Gaps Tube, Baseline Deviation, Noisy Baseline, Spikes in Baseline, Peak Shape Problems, Flat Top Peaks, Split Peaks, Negative Peaks, Retention Changes, Ghost Peak, Causes and Prevention of Column Damage, Column Contamination, Needle Discrimination, Change in Detectors Sensitivity, Difficulty in Lighting Fid Flame, Loss of Detectors Linear Range, Leaks in MS, Excessive Noise or High Background in MS Chromatography Variables Effect, Band Broadening Effect, Techniques For Minimize Peak Broadening, Efficiency of Packed Columns with Gaseous Mobile Phases, Efficiency of Packed Columns with Liquid Mobile Phases, Efficiency of Open Tubular Columns with Gaseous Mobile Phases, /Column Selection, Column Condition and Regeneration Technique, GC Sample Introduction, Split Inlet System in GC, Splitless Inlet in GC, Cool On-Column Inlets, Effect of Mobile-Phase Flow Rate, Effect of Solvent Strength on Capacity Factors, Effect of Mobile Phase on Selectivity, Selectivity in Detector.
- Maintenance and Installation Methods: Clean and Condition Septa, Cleaning Injector Liners, Silylating Liners, Column Conditioning, Installation Fused Silica Capillary Columns, Column Placement in the oven, Column Installation, Leak

Detection, Bleed Test, Fid Jet Cleaning Procedure, TCD Clean Detector Cell , Cleaning Of ECD, FPD Maintenance, Cleaning MS and Change The Filament

- Error in Quantitative Analysis
- Calibration Methods
- External and Internal Standards
- Outliers Test
- Determination of Analyte Concentration
- Standard Addition Method
- Confidence Limits
- Detection limit
- Repeatability and Reproducibility.
- Quality Control and Validation Method: Specificity, Linearity, Selectivity, Accuracy, Precision, Bias, Linearity, Range, Limit of Detection, Limit Of Quantification, Robustness, Ruggedness, Stability

TRAINING CERTIFICATE

MAESTRO CONSULTANTS Certificate of Completion for delegates who attend and complete the training course

METHODOLOGY

Our courses are highly interactive, typically taking a case study approach that we have found to be an effective method of fostering discussions and transferring knowledge. Participants will learn by active participation during the program through the use of individual exercises, questionnaires, team exercises, training videos and discussions of “real life” issues in their organizations. The material has been designed to enable delegates to apply all of the material with immediate effect back in the workplace.