CHEMICAL ANALYSIS LAB

Principal Investigator: Dr. M. Tajmeel Feroze

Lab Scope and Nature of Work: Chemical analysis lab at Department of Chemical engineering is used to conduct experiments related to different analytical techniques to determine the chemical composition of samples. The lab is also involved in several trainings/ workshops for students and professionals to disseminate knowledge and to keep the professionals from various defense and strategic organizations, academia and industry abreast of the state-of-the-art developments in contemporary fields of analytical techniques.

LABORATORY FACILITIES

EURO EA Elemental Analyzer

High-Performance Liquid Chromatography (HPLC)

Potentiostat

Pressure Analyzer

Ultrasonic Bath

Fourier Transform Infrared (FTIR) Spectrometer

Double Beam UV-Vis Spectrophotometer

Gas Chromatography–Mass Spectrometry

EURO EA Elemental Analyzer

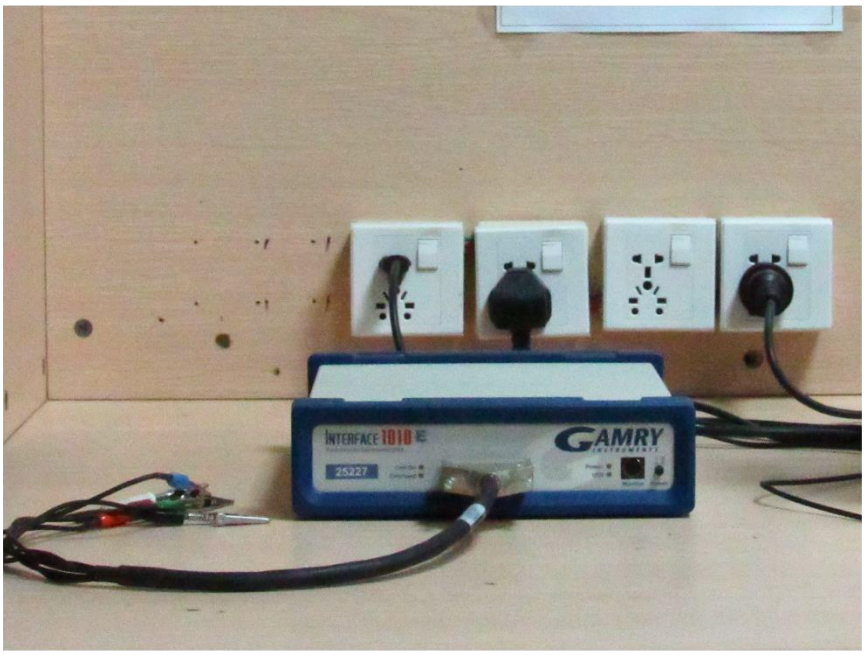
This is a **EURO EA Elemental Analyzer,** an advanced instrument used for determining the elemental composition of materials—typically carbon, hydrogen, nitrogen, and sulfur. It provides precise quantitative analysis for research in materials science, environmental studies, and chemical engineering.

HPLC

The **High-Performance Liquid Chromatography (HPLC)** system is used for the separation, identification, and quantification of chemical compounds in a mixture. It offers high accuracy and sensitivity, making it essential for pharmaceutical, environmental, and materials research analyses.

Potentiostat

Potentiostat is an electrochemical workstation used to study the electrical properties of materials and reactions. It precisely controls and measures voltage and current, enabling advanced analyses such as corrosion studies, battery testing, and electrochemical sensor characterization.



Pressure Analyzer

The **Pressure Analyzer** is used to measure and monitor gas or fluid pressures with high precision. It plays a key role in evaluating material permeability, adsorption properties, and process control in chemical, environmental, and engineering research applications.

Ultrasonic Bath

The **Ultrasonic Bath** is used for efficient cleaning and dispersion through high-frequency sound waves that generate microscopic cavitation bubbles. It is widely utilized for cleaning laboratory glassware, degassing solutions, and ensuring uniform dispersion of nanoparticles and other materials.

Fourier Transform Infrared (FTIR) Spectrometer

The **Fourier Transform Infrared (FTIR) Spectrometer** is used to identify and analyze chemical bonds in materials by measuring their infrared absorption spectra. It provides detailed information on molecular structure, functional groups, and material composition, making it essential for chemical, polymer, and materials characterization.

Double Beam UV-Vis Spectrophotometer

The **Double Beam UV-Vis Spectrophotometer** is used to measure the absorbance and transmittance of light across ultraviolet and visible wavelengths. Its dual-beam design allows simultaneous comparison between sample and reference, ensuring high accuracy in quantitative and qualitative analysis of chemical and biological samples.

Gas Chromatography–Mass Spectrometry

The **Gas Chromatography–Mass Spectrometry (GC-MS)** system combines the separation capabilities of gas chromatography with the molecular identification power of mass spectrometry. It is used for precise detection, identification, and quantification of volatile and semi-volatile compounds in complex mixtures, making it indispensable in environmental, pharmaceutical, and forensic analysis.