

Instruments covered for training:

1. High Resolution Transmission Electron Microscopy (HR-TEM).
2. High-Resolution Mass Spectrometry (HRMS)
3. Vibrating Sample Magnetometer (VSM)
4. Gas Chromatography–Mass Spectrometry (GC-MS)
5. Ion Chromatography
6. Hyphenated Thermogravimetric Analyzer (TGA) with FT-IR
7. Bomb Calorimeter
8. Laser Flash Apparatus (LFA)
9. Contact Angle Meter



Equipment Name: High Resolution Transmission Electron Microscopy (HR-TEM)

Make: FEI

Model: Tecnai 300 kV, G2-30 STwin

Applications: TEM could be used to obtain the morphology, particle size distribution, crystal structure of materials and their correlation to the physical properties. It helps in the development of new materials with improved properties in the areas of biomedicine, energy, nanotechnology etc.

Equipment Name: High Resolution Mass Spectrometry (HRMS)

Make: AGILENT

Model: 6545XT

Applications: This equipment is used to measure the exact mass of the sample with very high resolution and accuracy.



Equipment Name: Vibrating Sample Magnetometer (VSM)

Make: Lakeshore, USA

Model: 7404

Applications: To measure the hysteresis loops of magnetic materials and to find the saturation magnetization, coercivity and remanence. The soft and hard magnetic nature of the materials could be identified. Studies such as coercivity mechanisms and exchange coupling could be used to develop high-performance magnetic materials.



Equipment Name: Ion Chromatography

Make: Metrohm

Model: Eco IC

Applications: Used for the analysis of drinking water and its pollutants, determination of anions and cations (in terms of ppb) and in the analysis of various food, beverages and pharma products. The samples used in the instrument is of liquid in nature with the solutes less than $0.45\mu\text{m}$.

Equipment Name: Gas Chromatography Mass Spectrometer (GC-MS)

Make: Agilent Technologies

Model: 7890B (GC); 5977B (GC/MSD) - ALS

Applications: Used in the profiling of metabolites, detection of lipophilic and aromatic amines, identification of volatiles, quantitative determination of various plant, animal, microbes and environmental samples. It can be analyzed either in the liquid (or) gas form (without moisture).





Equipment Name: Hyphenated TG-IR

Make: Perkin Elmer

Model: TGA 8000 coupled to a Frontier FT-IR spectrometer with a TL 8000

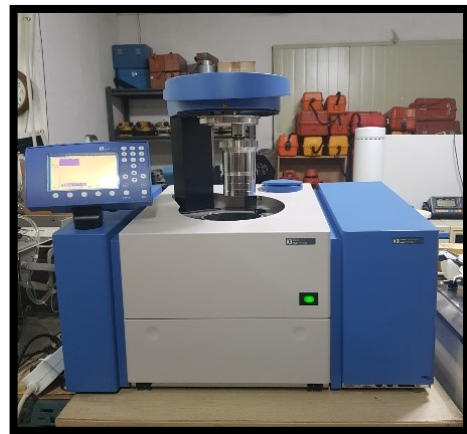
Applications: Identify the temperature onset of chemical changes (functional group changes & disappearance) on solid materials (e.g., biomass, coal) can be precisely studied, with 0.1°C accuracy. Hyphenated TG-IR solution facilitates in identification of elements in the sample.

Equipment Name: Bomb Calorimeter

Make: IKA

Model: C5003

Applications: It is used to determine the calorific values of liquid and solid sample.



Equipment Name: Laser Flash Apparatus (LFA)

Make: NETZSCH

Model: LFA467

Applications: This instrument is used to measure thermal diffusivity and calculation of Thermal conductivity of different materials.



Equipment Name: Contact Angle Meter

Make: Apex Instruments

Model: ACAM-D3

Applications: Contact angle measurements for thin film or solid with smooth surface. can be estimated to identify the degree of hydrophobicity or hydrophilicity. Surface Tension Measurements using Pendent drop method can also be performed.