

### Instruments covered for training:

XRD	Ultrasonification	NMR	X Band ESR
LC-HRMS	SEM	CHNS Analyser	
ICP-OES	Fluorescence Work station	Microwave Synthesizer	

#### Inductively Coupled Plasma Optical-Emission spectroscopy

**Make:** Agilent Technologies

**Model:** 700 series

**Applications:** This technique is used for quantitative and qualitative determination of the metals and metalloids in the following sample



#### Liquid Chromatography-High Resolution Mass Spectrometry (LC-HRMS)

**Make:** Agilent Technologies

**Model:** QTOF 6530

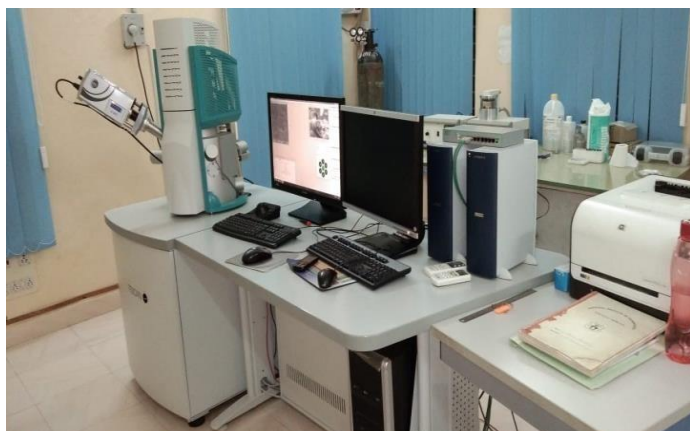
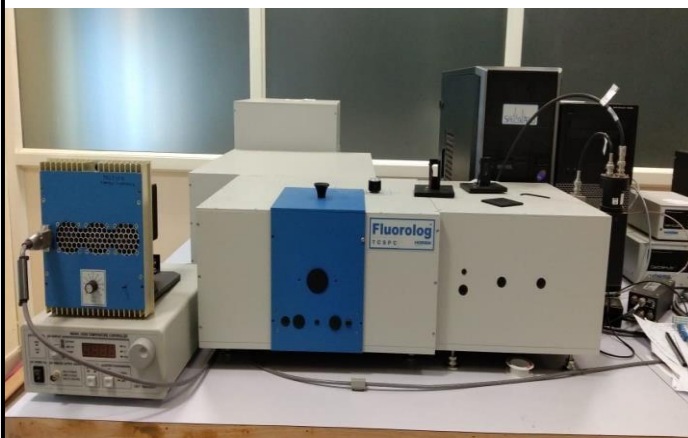
**Applications:** The molecular structure of petroleum components, industrial products, pharmaceuticals and biomolecules can be judged. The purity of the finished chemical industrial products is established.

### Flouresence Workstation

**Make:** Horiba Instruments  
Incorporated, USA

**Model:** FL-1000

**Applications:** Molecular and solid-state fluorescence emission can be monitored and quantum lifetime measurements can be evaluated. Materials in all states and biological samples can be investigated



### Scanning Electron Microscope (SEM)

**Make:** TESCAN

**Model:** VEGA3 LMU

**Applications:** Surface Studies, Nano Particle imaging, Phase transitions, Corrosion products and all kinds of solid material studies.

### X-Ray Diffraction (XRD)

**Make:** Panalytical

**Model:** X-pert powder

**Applications:** Powder XRD equipment can be used for the characterization of powder samples for the phase analysis, Identifying crystalline phases and orientation and crystallographic information. This equipment can also capture data from the bulk polycrystalline samples after the required sample preparation. Structural properties such as Lattice parameters, Strain, Grain size, texture and epitaxy can be determined from the data. The XRD diffraction data will be provided to the user and the user can investigate the above materials' properties by analyzing the data





### CHNS Analyser

**Make:** Elementar, Germany

**Model:** UNICUBE+

**Applications:** The CHNS(O) Analyzer find utility in determining the percentages of Carbon, Hydrogen, Nitrogen, Sulphur and Oxygen of organic compounds, based on the principle of "Dumas method" which involves the complete and instantaneous oxidation of the sample by "flash combustion".

### NMR

#### Spectroscopy

**Make:** Bruker

**Model:** Ascend 400 MHz

**Applications:** Molecular Structure

Determination of Condenser: Achromatic strain-free condenser N.A0.90 with iris diaphragm.

Compensator: Quartz wedge lambda tint plate and bedeck.

Reflected illuminated: Attached with halogen illumination lamp 100w halogen illuminated with external power supply incident light polarizer 360degrotatable analyser with filler Organic compounds, Pharmaceuticals and Drugs. Structure and atomic arrangements in molecules and crystals can be investigated. Kinetic and temperature studies of reaction mixtures.

**1D-NMR:** 1H, 13C, 31P, 19F, DEPT-135, DEPT-90, DEPT-45, 1D\_NOESY, Water Suppression, VT Temperature







### X Band ESR Spectroscopy

**Make:** JEOL Resonance Inc., Japan

**Model:** JES-FA100

**Applications:** ESR Spectrometer is used for the measurement of species that contain unpaired electrons (Free radicals, transition metal complexes, molecular structure, valence electron wave functions, electron transport, crystal & ligand field splitting, relaxation mechanisms and reaction kinetics, odd-electron molecules, rare earth ions etc. ESR is a powerful non-destructive and non-intrusive analytical method. ESR yields meaningful structural information even from ongoing chemical or physical processes, without influencing the process itself.

### Ultrasonification

**Make:** Athena

**Model:** ATS-6.5



### Microwave Synthesizer

**Make:** RAGA'S