

About STUTI:

The Scheme 'Synergistic Training program Utilizing the Scientific and Technological Infrastructure' (STUTI) is intended to build human resource and its knowledge capacity through open access S&T Infrastructure across the country. As a complement to the various schemes of DST funding for expansion of R&D Infrastructure at academic institutions, STUTI scheme envisions a hands-on training program and sensitization of the state-of-the-art equipment as well as towards sharing while ensuring transparent access of S&T facilities.

Instruments covered for training:

ICP-OES

LC-HRMS

SEM

XRD

NMR

FTIR

X Band ESR

UV-Vis NIR

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

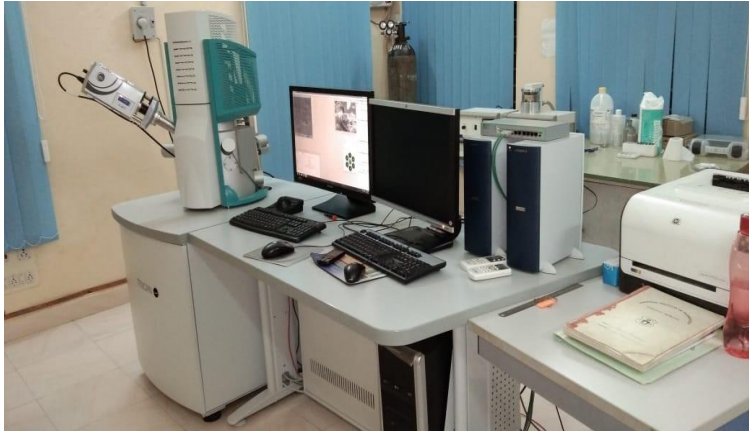


Liquid Chromatography- High Resolution Mass Spectrometry (LC-HRMS)

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.



Scanning Electron Microscope (SEM) Make:

TESCAN

Model: VEGA3 LMU

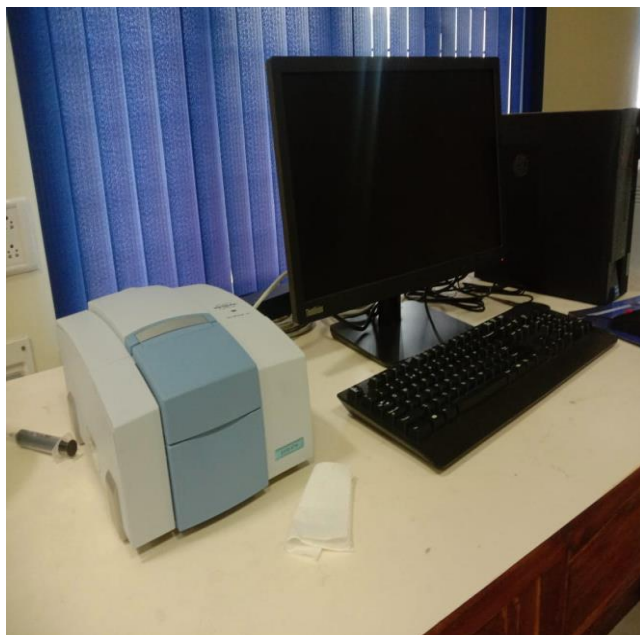
Applications: Surface Studies, Nano Particle imaging, Phase transitions, Corrosion products and all kinds of solid material studies.

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.



Fourier Transform Infrared Spectroscopy (FTIR)

Make: Bruker

Model: Alpha-II

Applications: Quality verification of incoming/outgoing materials
Deformulation of polymers, rubbers, and other materials through thermogravimetric infra-red (TGA-IR) or gas chromatography infra-red (GC-IR) analysis
Microanalysis of small sections of materials to identify contaminants
Analysis of thin films and coatings
Monitoring of automotive or smokestack emissions

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 360degree rotatable analyzer 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

2D-NMR: ***HOMO:** NOESY, COSY, TOCS
***HETERO:** HSQC, HMBC.



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.

UV-Vis-NIR Spectrometer

Make: Agilent Technologies

Model: Carry 5000

Applications: The electronic transitions and band gaps of semiconductors, thin films, etc. can be determined. Electronic structures of polymers, complexes, biomolecules, materials, pharmaceuticals and other products can be evaluated.

