

Sophisticated Analytical Instrument Facility, STIC, Kochi

Sl. No.	Instrument	Make/ Model	Major Specifications/ Accessories available	Type of measurement/analysis available
1.	Scanning Electron Microscope (with EDS)	Jeol 6390LV	Accelerating voltage: 0.5 kV to 30 kV Resolution: 4 nm (30 kV) Magnification: 300,000 EDS Attachment	Surface topography and morphology of materials as well as biological samples EDS for elemental detection and analysis
2.	X-Ray Diffractometer (Single crystal)	Bruker AXS Kappa APEX II CCD	KAPPA 4 Axis Goniometer KRYO-FLEX Low Temp Device Structure Elucidation Software SHELXTL	Single crystal structure analysis
3.	X-Ray Diffractometer (Powder)	Bruker AXS D8 Advance	Max. usable angular range: 3° to 135° Diffrac plus software Wavelength: 1.5406 Å ⁰ PDF 2 and Topaz P available Lynx Eye Detector Low/ High Temp. Attachment (-150 to +450°C) SAXS Attachment	X-ray powder diffractograms Phase analysis Limited structure analysis Diffractograms from -150°C to +450°C Small angle X-ray scattering measurements in solids and liquids
4.	ICP Atomic Emission Spectrometer	Thermo Electron IRIS Intrepid II	Spectral range: 165 - 1000 nm Resolution: 0.005 nm at 200 nm Microwave Digester (Milestone) for sample digestion	Elemental detection and analysis of elements in biological/clinical samples, environmental samples, rocks, soils, clays, composites, minerals and all other materials
5.	FT-NMR Spectrometer	Bruker 400 Avance III	400 MHz Frequency UltraShield Superconducting Magnet 9.4 T BBFO Probehead Variable Temp range -80 to +130°C	1D and 2D NMR Spectra of all active nuclei, Decoupling, Gated decoupling, Inverse gated decoupling, DEPT, HMQC, HMBC, COSY, COSY with and without gradient, TOCSY, NOESY, Relaxation measurements etc.
6.	UV-VIS-NIR Spectrophotometer	Varian Carry 5000	Range: 190-3200 nm; Resolution: 0.05 nm in UV, 0.2 nm in NIR Wavelength Accuracy: ± 0.1 nm (UV-Vis) ± 0.4 nm (NIR) Wavelength reproducibility: 0.025 nm Internal DRA available	Usual analysis in the region. Absorption, transmittance and quantitative analysis

7.	FT-IR Spectrometer	Thermo Nicolet Avatar 370	Range: 4000- 400 cm^{-1} FT-IR database for identification of unknown compounds HATR Assembly	FT-IR spectra of solid and liquid samples
8.	Thermal Analysis System (TG/DTA)	Perkin Elmer Diamond TG/DTA	TG Sensitivity : 200 mg DTA Sensitivity: $\pm 1000 \mu\text{V}$ Temperature range: Ambient to 1200 $^{\circ}\text{C}$	All types of thermal analysis studies/testing
9.	Thermal Analysis System (DSC)	Mettler Toledo DSC 822 $^{\circ}$	Temperature range: -150 $^{\circ}\text{C}$ to 700 $^{\circ}\text{C}$ Temp. Accuracy: ± 0.2 $^{\circ}\text{C}$	DSC thermograms of solid samples
10.	GC-Mass Spectrometer	Varian 1200L	Single quadrupole, EI Mass range: 10-800 amu Resolution: 1 amu NIST library	Separation/identification of organic compounds
11.	CHNSO Elemental Analyzer	Elementar Vario EL III	Precision $>0.1\%$ abs, Auto sampler, Ultra microbalance	Estimation of C, H, N, S, O in solid and liquid samples