

INSTRUMENT FACILITIES AVAILABLE AT THE INDIVIDUAL SAIFs

Sophisticated Analytical Instrument Facility, IIT-Bombay, Mumbai

Sl. No.	Instrument	Make/Model	Major Specifications/ Accessories available	Type of measurement/analysis available
1.	FT- IR Spectrometer	Nicolet Magna 550	Range: 400-4000 Cm^{-1} & 50 to 600 Cm^{-1} ; Resolution: 0.5 Cm^{-1} ; Grazing/variable angle specular reflectance; Variable angle ATR attachments.	Analysis of organic and inorganic compounds, Polymer coatings, Semi-conductors, Surface analysis and Surface orientation of molecular species.
		Nicolet 170 SX	Range: 400-4000 Cm^{-1} Resolution: 0.06 Cm^{-1}	
2.	ICP-Atomic Emission Spectrometer	Plasma Lab Labtam 8440	Range: 160 to 800 nm, covering all important elements; Detection limit: 0.01 to 0.1 ppm; Hydride generator for elements like As, Sb, Sn, Hg, Se & Bi.	Analysis of elements in soil, rock, plants, effluents, water, chemicals, environmental, metallurgical, biological/clinical and pharmaceutical samples.
3.	ICP-Atomic Emission Spectrometer	Jobin Yuon Ultima 2	Range: 120 to 800 nm; Detection limit: 10ppb	
4.	Fluorescence Spectrometer	Applied Photophysics SP-70	Excitation with nanosecond flashlamp system; Lifetime measurements down to 0.5 nanosecond; Low temperature accessory.	Fluorescence studies/measurements of species in biological systems, polymers, membranes, liquid crystals, low dimensional structures, semiconductors etc. in areas of Photobiology, Photochemistry and Photophysics.
5.	Laser Raman Spectrometer	Jobin Yvon Ramanor HG 2S	Range: 50 to 4000 Cm^{-1} ; 488 & 514 nm excitations; High temperature and sample spinning accessories.	Analysis of powder, single crystals, liquids, thin films, polymers etc.
6.	FT-NMR Spectrometer	Varian Mercury Plus 300	300 MHz machine with 5 mm probe; capable of liquid and solid sample analysis for nuclei from nitrogen to phosphorus including proton and fluorine; solid state NMR 7 mm rotor for ^{15}N to ^{31}P analysis.	Organic, Organometallic, pharmaceutical and polymer sample analysis for structure elucidation & quality control.
7.	ESR Spectrometer	Varian E-112	X-band operation 9-10 GHz; Variable temperature & aqueous solution accessories; Goniometer/sample rotator.	ESR studies/analysis of metals, alloys, liquid crystals, catalysts, drugs, enzymes, proteins, gases, organic & inorganic radicals.

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8.	X-Ray Fluorescence Spectrometer	Philips PW2404	4 KW high power X-Ray spectrometer; Sample preparation accessories: Minipress, Fusion bead machine & Powdering machine.	Analysis of liquid, solid, and powder samples including ash, soil, rock etc. for elements from Boron to U ²³⁵ .
9.	GC-LC- Mass Spectrometer	Hewlett Packard 5989B	Range: upto 2000 amu; GC, HPLC, EI, CI, ES-API.	Analysis of organic compounds, bio-samples like proteins-21; GC-MS (EI, CI), DIP-MS (EI, CI), ES-MS (Softionisation).
10.	CHNSO Elemental Analyzer	Thermo Finnigan FLASH EA 1112 Series	Volatile liquid and solid preparation accessory	Estimation of C,H,N,S,O in percentage.
11.	Scanning Electron Microscope	Cameca SU-SEM probe	Resolution: upto 40 ⁰ A Magnification: upto 40,000 x; Accelerating Voltage: upto 30 kV; Fully integrated EDS/WDS system.	To study surface topography, crystallography, magnetic/electric character, composition etc. of samples in physical, mineralogical and biological sciences.
12.	Transmission Electron Microscope	Philips CM-200	Accelerating Voltage: upto 200 kV; Spot resolution: 2.3 ⁰ A EDX, STEM, Local orientation measurement package (TSL-ACT), External CCD.	Study of ultrastructures of materials; Local orientation measurements in nanograms.
13.	Image Analysing System	Leitz TAS PLUS	Soft imaging system; High resolution CCD Camera, compatible high resolution frame grabber card; Image analysis software.	Classification of grain structure and inclusion analysis in metals and alloys; Size distribution analysis of powder, counting dark blemishes & holes; Evaluating porosity of paper filters etc.
14.	Thermal Analysis System (DSC/DTA/TGA)	Dupont, USA 990	TGA/DTA: Range-Room temp. to 1000 ⁰ C; DSC: Range-Room temp. to 600 ⁰ C.	Thermal analysis studies including transition temperatures, Exothermic/Evelothermic heat flow measurements, peak temperature etc.
15.	Thermal Analysis System (DTA/TGA)	Perkin Elmer Diamond TG/DTA	Temp. range: RT to 1500 ⁰ C; Heating rate: 0.01 to 100 ⁰ C	Simultaneous DTA/TGA thermal analysis studies including transition temperatures, Exothermic/Evelothermic heat flow measurements, peak temperature etc.
16.	Molecular Graphics Workstation	Silicon Graphics Power Indigo 2XZ	Molecular Modeling Program; BIOSYM-Insight II and Discover Softwares; TRIPOS – Alchemy III, Chemprint, Power Search Softwares.	Insight II program helps to build and manipulate virtually any class of molecule or molecular system in conjunction with molecular mechanics/dynamics program DISCOVER.