

INSTRUMENT FACILITIES AVAILABLE AT THE INDIVIDUAL SAIFs

Sophisticated Instrumentation Centre for Applied Research & Testing, Vallabh Vidyanagar

Sl. No.	Instrument	Make/ Model	Major Specifications/ Accessories available	Type of measurement/analysis available
1.	UV-VIS-NIR Spectrometer	Perkin Elmer Lambda 19	Range: 180-3200 nm; Diffuse reflectance attachment; Colour matching software; Standards for wavelength and absorption calibration validation traceable to NIST	All types of measurements/studies in the region including Absorbance, Transmission and Reflectance spectra; Quantitative analysis.
2.	FT-IR Spectrometer	Perkin Elmer Spectrum GX	Range: 30-15600 cm ⁻¹ ; ATR accessory for reflectance measurement; IR Quant software; Spectrum search software	Analysis of organic/polymer compounds.
3.	ICP-Atomic Emission Spectrometer	Perkin Elmer Optima 3300 RL	Range: 187-725 nm; Detection limit: up to ppb level; SCD detector for simultaneous detection of 60 elements; Nebulizer for organic samples	Trace/ultratrace element analysis of almost all elements; Simultaneous detection of multiple elements.
4.	Laser Particle Size Analyzer	Symantec Helos BF	Range: 0.1 to 875 microns; 32 element array detector; Accessories for dry powders, pastes, liquids and small sample quantities	Particle size distributions curve; density distributions etc.
5.	Mercury Porosimeter	Thermoquest Italia SPA Pascal 440 & 140	Range: 400 Kpa to 400 Mpa	Analysis including pore size/volume distribution, bulk density and specific surface for porous solids.
6.	XRD Diffractometer (powder)	Philips Xpert MPD	Range (2θ): 27 ^o to 135 ^o ; X-ray tube: Cu; JCPDS database; Thin film attachment	2θ vs intensity plots/X-ray diffractograms; search match facility with JCPDS data for qualitative analysis.
7.	Scanning Electron Microscope	Philips XL30 ESEM TMP	Environmental SEM, HV and LV modes of operation; Magnification: upto 4,50,000x; GSED detector; EDAX detector; Carbon coating unit	Surface topographic/morphological studies of microstructures on bulk specimens; Study of hydrated samples, non-conducting samples, biological samples in uncoated form through ESEM mode; Detection of Boron onwards all elements.
8.	Transmission Electron Microscope	Philips Tecnai 20	Resolution : upto 2 ^o Å; Acc. voltage: 200 kV; Magnification: upto 7,50,000x Ultramicrotome	Study of ultrastructures of biological/non-biological samples.

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9.	GC-Mass Spectrometer	Perkin Elmer Turbomass	Mass range: upto 1200 amu; Programmable pneumatic control for carrier gas flow regulation; NIST Mass spectra library	Separation/identification of organic/organometallic compounds and molecules; EI, CI modes of operation.
10.	Gas Chromatograph	Perkin Elmer Autosystem XL	Temp. range: up to 450 ⁰ C; Thermal conductivity and Flame ionization detectors; BP1, BP5, BP225 capillary columns; Gas sampling valve accessory; Packed/capillary column injector	Separation of closely related chemical species; qualitative/quantitative analysis.
11.	HPLC	Perkin Elmer Series 200	Diode array detector; RI detector System; Size exclusion chromatography for molecular weight estimation; Column switching accessory	Separation and detection of different components of complex mixtures; Qualitative/quantitative analysis.
12.	Gel Permeation Chromatograph	Perkin Elmer 200	Range: 580-10 ⁷ mw; PLGEL calibration standard	Analysis of molecular weight distribution in polymers, resins, oils, oligomers and organic compounds.
13.	CHNSO Elemental Analyzer	Perkin Elmer PE 2400	Absolute CHN, CHNS, O modes of operations; Accuracy: ± 0.3%; 60 samples autosampler	Analysis/estimation of C, H, N, S, O in solid/liquid samples.
14.	Thermal Analyzer (DTA, TGA, DTA)	Perkin Elmer Pyris1 DSC, Pyris1 TGA, DTA 7	Temp. range: DTA/TGA: RT to 1500 °C DSC: -170 to 600 °C	All types of thermal analysis studies/testing; Thermodynamics.
15.	Laser Flash Thermal Conductivity Meter	Netzsch, MICRO Flash 300	Range: RT to 300 °C; Diffusivity range: 0.01-10 Cm ⁻¹ /s; In plane or through plane measurement	Thermal diffusivity, conductivity, specific heat measurement of materials.
16.	Universal Testing Machine	Simadzu AG 100 KNG	Range: 1 kgf to 10,000 kgf; 1 kgf, 2 kgf, 500 kgf, 10,000 kgf load cells	Bending, compression, shear testing of materials.
17.	Micro Hardness Tester	Shimadzu HMV 2T	Load range: 20 gms to 2 kg; Knoop and Vicker's indenter; 35 mm camera attachment	Measurement of surface hardness, hardness of coating as well as parent material.
18.	Liquid Nitrogen Plant	Sterling PLN 108S	Production capacity: 8 lts per hr.	Liquid nitrogen for R&D work.
19.	Deionized Water Plant	Millipore ELIX 3, 10 and Milli Q	HPLC grade water quality; Production capacity: 10 lts. per hr.	Deionised water for R&D work.