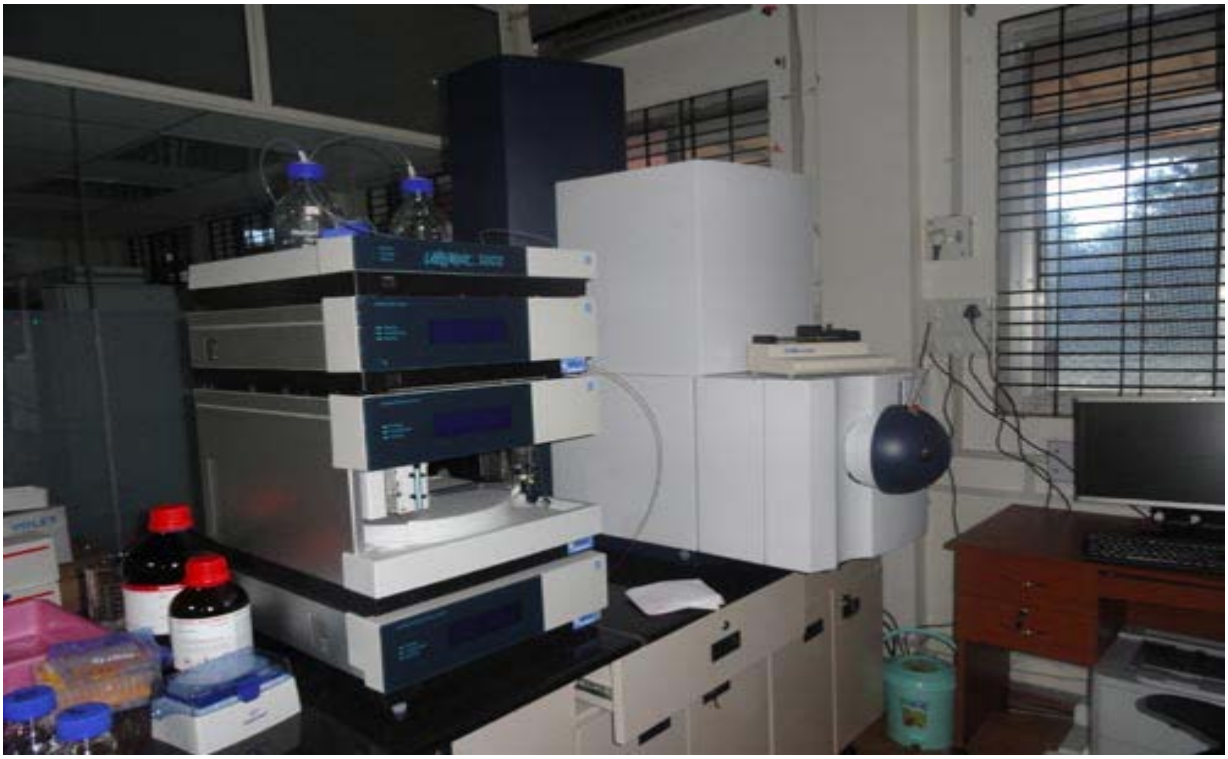

Liquid Chromatography Mass Spectrometry (LC-MS): Presently, SIC is equipped with Bruker Daltonik, Benchtop easy-to-use, High Performance Electrospray Ionization Quadrupole time-of-flight LC MS spectrometer designed for exact mass and true isotopic measurements. We analyse samples for other Schools within the Institute and from external commercial companies.

High Performance Liquid Chromatography (HPLC) (Reversed Phase): UltiMate 3000 Standard LC systems provide the right solution for demanding microbore, analytical, and semipreparative LC applications. System components are perfectly matched to meet requirements such as low extracolumn and gradient delay volume for high separation efficiency and low gradient response times, as well as superior mixing performance. Analytical systems are UHPLC compatible with pressures up to 62 MPa (9000 psi). For more product information on UltiMate 3000 UHPLC systems and solutions,

SmartFlow technology for pulsation free flows even at high flow rates and pressures

- UltiFlow technology for nano/cap/micro flow rates (down to 50 nL/min)
- UHPLC compatibility of analytical systems with operation pressures up to 62 MPa (9000 psi)
- Superior binary high-pressure or quaternary low-pressure gradient proportioning
- Active rear seal wash for increased piston seal lifetime
- Patented piston seal tightness monitoring
- Variable mixing volumes for optimal mixing performance
- High-precision sampling from multiple formats (well plates, vials)
- System Wellness and predictive performance indicators
- Biocompatible option for reliable and robust bioanalytical LC applications

Chiral High Performance Liquid Chromatography (HPLC): YL's HPLC is built to provide an exceptional cost/performance ratio. Its high-end performance and features, whilst a state of the art manufacturing facility ensures that quality is not compromised.

Features:

⊙ Ultra speed data processing by Network HPLC
⊙ Enhanced superior performance
⊙ Versatile dedicated applications
⊙ Accurate and reliable data
⊙ Stylish and compact design

Cyclic Voltammetry (CV): Cyclic Voltammetry, CH Instruments (USA),CHI620D, is capable of a wide variety of electrochemical techniques, such as Cyclic voltammetry, Linear Sweep Voltametry, Differential Pulse voltammetry, Chronocoulometry, Build Electrolysis with Coulometry, its features provides powerful tools for both electrochemical mechanistic studies and trace analysis.

In-Situ Spectrophotometer

Spectroelectro Chemical Cell (SEC): In situ spectroscopy – Transmission mode To monitor the online spectral changes at the surface such as polymerisation Spectroelectrochemical cell 10mm path with Ag/AgCl reference, Pt counter and WE ITO and Au grid electrode.

In situ spectroscopy – Transmission mode includes 2 QP 200-2 UV VIS optical fiber, 1cm cuvette sample holder, 1cm …. Cell with teflon cap 50nos of ITO Plattes 7mm x 1.5mm … x 50mm height

Elemental Analyzer (CHNS-O): Elemental analyser, dedicated to the determination of the amounts (%) of carbon, hydrogen, nitrogen and sulphur in organic and inorganic samples produced within the School and externally.

The FLASH 2000 is based on a dynamic flash combustion and the ability to switch from CHN or CHNS to Oxygen without powering down to reconfigure, excellent accuracy and reproducibility. We analyse samples for other Schools within the Institute and from external commercial companies.

Some examples of the samples we analyse include:

- Organic compounds
- Pharmaceuticals
- Organometallics
- Petrochemicals
- Carbides & nitrides
- Polymers

Thermal Analyzer (TGA): It is a technique that measures the change in weight of a sample as it is heated, cooled or held at constant temperature. Its main use is to characterize materials with regard to their composition. Application areas include plastics, elastomers and thermosets, mineral compounds and ceramics as well as a wide range of analyses in the chemical and pharmaceutical industries.

Dual Ion Beam Sputtering Deposition (DIBSD): The diverse novel researches performed by this unique facility will be a platform to attract top-seeded researchers and experimentalists in key semiconductor opto-electronic and nanotechnology industries, research laboratories, and academic institutions across the entire globe to establish a strong collaborative research programme with IIT Indore. Research activities, boosted by the DIBSD facility, are mainly focused on growth of novel nanostructures and high-quality thin films having enormous applications in semiconductor opto-electronics, sensors, solar photovoltaics, detectors, biotechnology, microelectro-mechanical systems (MEMS), nanoelectromechanical systems (NEMS) etc.

Diverse novel research activities would have major impact on following industries:

- Automobile
- Nanotechnology
- Pharmaceutical (Nano-Bioelectronics)
- Electronics
- Chemical
- Renewable Energy

In a broad sense, the research work accomplished by this facility would be extremely beneficial to showcase our expertise in the emerging areas of current research and development. The high-tech research and developmental work performed by the DIBSD facility would usher the achievement of possible leadership of the institute in the niche area of innovative research fields in near future.With this advanced researchfacility and high level of expertise, we can offer our experimental services to other Schools within the Institute sector and external commercial organizations and academic institutions.

Polarimeter: Polarimeter AUTOPOL V is designed for today's FDA regulated analytical laboratories it has the standard measurement and compliance features you must have, including:

- TempTro – Electronic cooling and heating from 15°-30°C
- 21CFR Part 11 Compliance: Electronic signature and secure local data storage
- Six Standard Wavelengths: 365nm, 405nm, 436nm, 546nm, 589nm, 633nm
- Standard Accessories: TempTrol NIST Traceable Quartz Standard, TempTrol™ 100mm Polarimeter Cell, TempTrol Temperature Validation Cell and Built-In Sample Measurement Probe.

Lyophilizer: The Lyophilizer VirTis BenchTop have been designed to meet the needs of the most demanding research laboratories. Each system can be configured to meet your present and future needs. Condenser refrigeration packages of -55°C, -75°C, -85°C and -105°C can meet the demands of both aqueous or aqueous-solvent based formulations.

Rheometer: Rheometer from Anton Paar offers an open range of possibilities based on its modular setup, your MCR rheometer is efficiently and adaptibilty. Benefit from the rheometers' peak performance in oscillatory as well as rotational tests based on the powerful, dynamic EC motor, the patented normal force sensor integrated in the air bearing and time-saving features for maximum reliability and ease of use. Build on your rheometer to cover any application need: Simply integrated temperature devices provide unrivaled temperature control from –150°C up to 1000°C. You can also easily connect a wide selection of application-specific accessories for rheo-optical investigations, tests with additional parameters such as pressure or a magnetic field – and you can also use your rheometer for extended material characterization such as tribology, DMTA measurement and much more.

Langmuir-Blodgett film deposition system: Langmuir-Blodgett Film Deposition Systems or LB Systems by Apex are very useful instruments for Fabricating & Characterizing Single or Multi-layered Thin Films of Mono-molecular Thickness.

BET Surface Area Analyzer: Quanta chrome Autosorb iQ2 BET Surface Area & Pore Volume Analyzer is an instrument to determine the specific surface area of powders, solids and granules. Analyses: Single- and Multipoint BET (Brunauer, Emmett, and Teller) surface area, thickness,, pore area distributions (BJH method), pore volume, and pore surface area Langmuir surface area, Temkin and Freundlich isotherm analyses,

Measurement modes available;

- Physisoprtion
- Chemisorption

GAS CHROMATOGRAPH MASS SPECTROMETER (GC-MS): A gas-chromatograph coupled with mass spectrometer, Make; Shimadzu, Model: GCMS-QP2010SE is a combined analyzer that has a superior ability in analyzing organic compounds qualitatively and quantitatively. It inherits the features of high resolution and accurate mass measurement with simple operation and high sensitivity.

Types of analysis possible:

Sr. No.	Type of analysis	Spectra / Report provided
1	Ion detection MS	TIC, MS, Library search data
2	GC-MS	GC, MS all major peaks, Library search of all peaks
3	GC-FID	GC
4	GC-TCD	GC
5	NIST Library search	Library search data of GC peaks on request
6	Gaseous Sample Analysis	Detection of H_2,O_2, N_2, and CO_2