

Facilities

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.

Specifications:

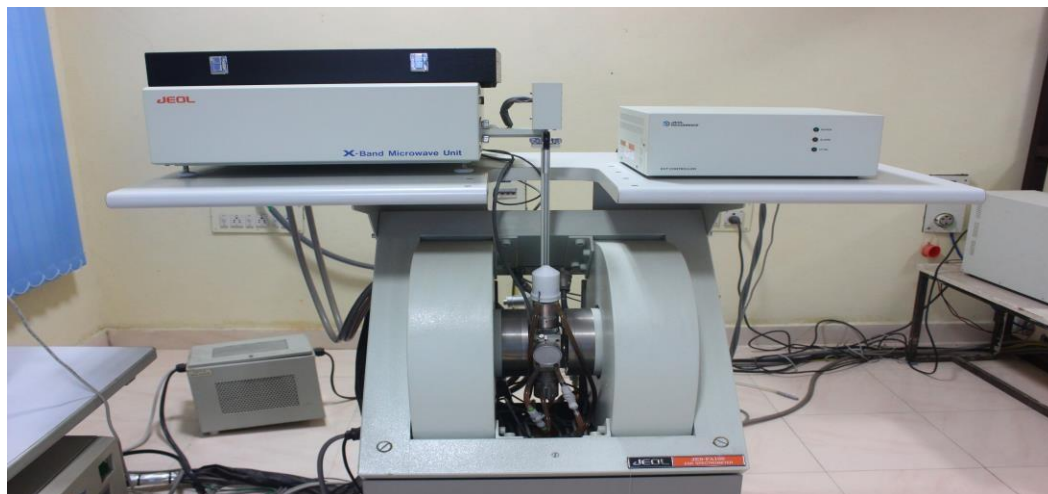
MASS Spectrometer

- Mass Range m/z 100-20000 High mass range
M/z 50-3200 High-resolution mode
- Sensitivity (1 pg. Reserpine signal noise ratio >180:1)
- Mass Accuracy <2ppm
- Resolution (FWHM) 20000
- Ionization Method: ESI & APCI
 - 1) ESI positive & negative
 - 2) APCI positive & negative

LC SYSTEM

- Pump:1290 infinity quaternary pump with 1200 bar maximum pressure
- Detector:1260 infinity Diode array detector(DAD)190-950nm
- Flow rate:0.001-5ml/min

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.

Specifications:

- Standard Frequency (X band) - 8.75-9.65 GHz
- Sensitivity - 7×10^9 spins/0.6mT
- Resolution – 3 μ T or better-Temperature study - Variable Temperature facility (-153 to +25 °C)

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.

1. Biological
2. Environmental
3. Pharmaceutical
4. Industrial
5. Aqueous and Organic

Specifications:

Plasma Generator

- RF Generator: Solid-state generator with quick (<1 hour) warm-up
- Frequency: 27.12 MHz or higher
- Power: Up to 1500 watts (computer-adjustable)
- Controls: Fully computer-controlled and software-driven
- Argon: Argon flow rates monitored
- Plasma Detection: Plasma should be radially viewed / or axially viewed/ or dually viewed (through protective screens)
- Chiller: Internal (by Peltier) or External along with equipment for RF coil cooling

Optical System

- Wavelength range: 170 to 770 nm wider
- Focal length: more than 0.5 meters for holographic grating/More than 0.32 meter for Echelle grating
- Optical Resolution:
 - Better than 10 pm in the UV range (below 300 nm)
 - Better than 17 pm in the visible range (above 350nm)

UV purge: Nitrogen/argon pure/gas sealed for 165 to 190nm please specify the gas consumption during the analytical flow (considering UV elements), standby and shutdown mode.

UV-Vis NIR Spectrophotometer



Make: Agilent Technologies

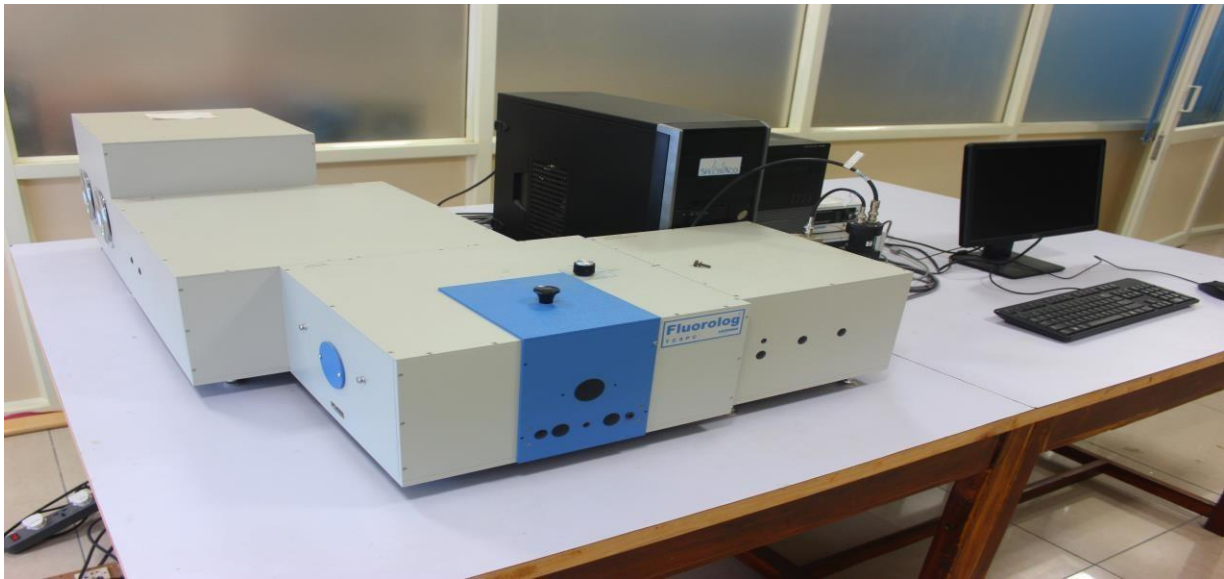
Model: Carry 5000

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.

Specifications:

- Photometric System: Double Beam, Double Monochromatic
- Wavelength Range: 3300 to 175 nm (+)
- Bandwidth: 0.01 and 0.04 nm (+)
- Resolution: 0.048 and 0.2 nm (+)

Fluorescence Workstation



Make: HORIBA INSTRUMENTS INCORPORATED, USA

Model: FL-1000

Applications: Molecular and solid-state fluorescence emission can be monitored and quantum lifetime measurements can be evaluated. Materials in all states and biological samples can be investigated.

Specifications:

- Excitation & Emission Wavelength Range: 200nm – 1000nm
- Wavelength Accuracy: 0.5

Universal Testing Machine (UTM)



Make: JINAN TESTING EQUIPMENT IE CORPORATION, China

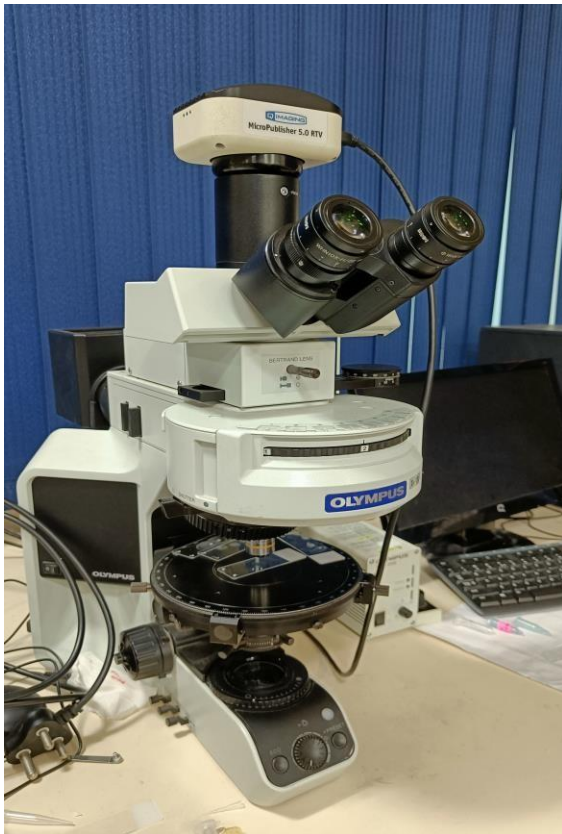
Model: WDW-100S

Applications: It can perform many standard tensile and compression tests on materials, components and structures. Physical and mechanical attributes of metals, alloys, finished solid products, etc., can be studied. Aforesaid tests can also be performed under sub-zero (-100°C) and high-temperature (up to 1000°C) conditions.

Specifications:

- Maximum Load : $\pm 100\text{kN}$
- Temperature : -100°C to 300°C (chamber)
300°C to 1000°C (3-Zone split furnace)
- Available extensometers: 25mm, Resolution=0.1 μm (15% maximum strain)
12.5mm. Resolution=0.1 μm
- Day Light: 1400 mm
- Speed range: 0.0005 mm/min to 500mm/min

Trinocular Polarizing Microscope



Make: Olympus

Model: BX53

Applications: Trinocular Polarizing Upright Research Microscope with Infinity corrected optical system. External power supply. Coaxial coarse and fine focussing 1 micron, with torque adjustable focus stopper with built-in filter cassettes (NCB filter, Blue and other conversion filters)

Specifications:

Transmitted Illumination: 12v 100w halogen external with power supply 12v 100w lamp halogen lamp 12v 100w (2Nos).

Polarizer: Intermediate tube with 360deg rotatable polarizer for transmitted light fitted below the condenser with a swing in the swing-out facility.

Eye Piece tube: Three-way trinocular eyepiece tube 100/0,0/100,20/80 or 50/50 light distribution.

Eyepiece Type: 10*eyepiece with 22 mm or better field of view and diopetre adjustment on both eyepiece and one-piece with a crosshair.

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 360degrotatable analyser 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 , ^{13}C , ^{31}P , ^{19}F , DEPT-135, DEPT-90, DEPT-45, 1D_NOESY, Water Suppression, VT Temperature

2D-NMR: ***HOMO:** NOESY, COSY, TOCSY

***HETERO:** HSQC, HMBC

Specifications:

- UltraShield™ Plus 9.4T magnet
- 5 mm BBFOPLUS probe, optimized for X-nuclei direct observation. Broadband in a frequency range between ^{31}P and ^{15}N . This probe has ^2H "lock" channel and z gradient that allows us to carry out 2D spectroscopy and hetero correlation $^{19}\text{F}/^1\text{H}$ and $^1\text{H}/^{19}\text{F}$.
- Control temperature unit (from $-50\text{ }^\circ\text{C}$ to $50\text{ }^\circ\text{C}$).

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.

Specifications:

- Electron Gun: Tungsten heated cathode / optionally LaB6

Resolution: 1 μm in the secondary electron mode at a working distance of 5 mm

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 analysing the data.

Specifications:

- Source: Cu target X-Ray tube
- X-Ray Power: 2KW
- Operation Modes: Vertical & Horizontal
- Accuracy: ± 0.0025
- $2^\circ \theta$ Measurement range: 6° to 130°
- Diffractometer radius: 130 to 230 mm
- Radiation: Cu $K\alpha$;
- Software: X'perthighscore plus

TGDTA



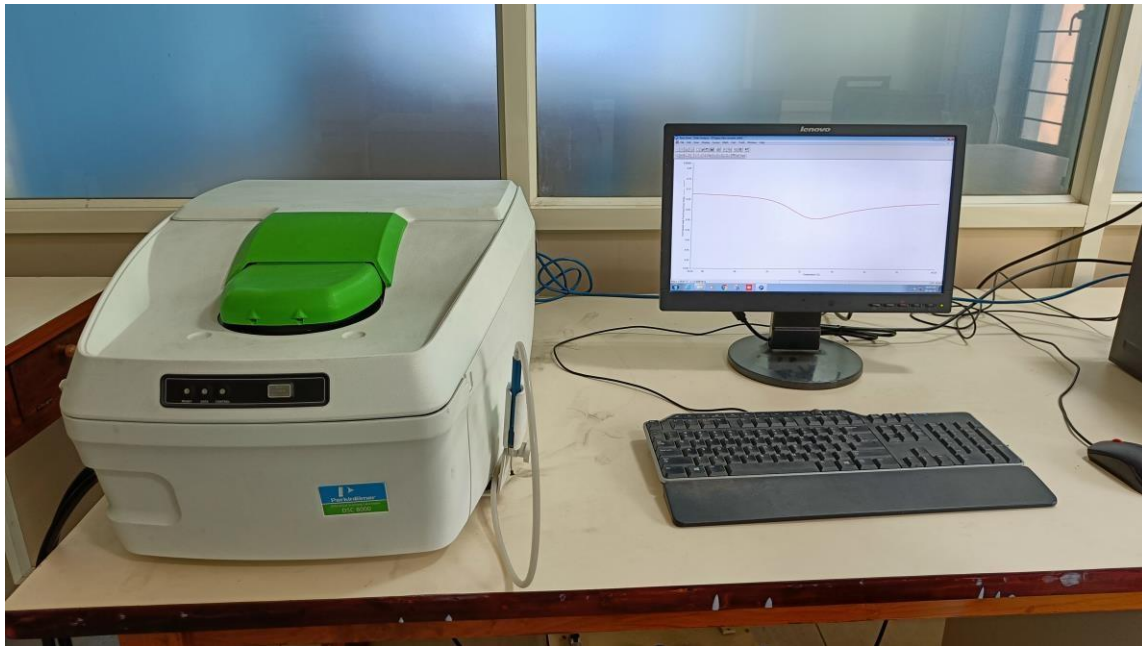
Make: Netzsch

Model: Regulars STA 2500

Applications: High-performance analytical instruments by NETZSCH Analysing & Testing allow for comprehensive analysis of the thermal properties of a great variety of materials. Select the appropriate testing methods for your polymers and other organic materials, metals and alloys, ceramics, glass, building materials or other inorganic materials from among our various series of instruments.

Specifications:

- Temp. range: RT to 1700°C
- Heating Rate: 0.1°-100°C/min.
- Weight: 10mg to 40mg
- Atmosphere: Argon, Nitrogen
- Purge gas flow: 50,
- Protective gas flow: 20
- Sample capacity(Max): 200mg
- Pans: 30micro litre



Make:PerkinElmer

Model:DSC8000

Specifications:

Range -180 C to 750 C

Accuracy ± 0.05 C Using on-set temperatures of Indium melting peak

Precision ± 0.008 C

Data points/sec 33

Controlled heating rates 0.01 to 300 C/min

Controlled cooling rates 0.01 to 150 C/min

Controlled Cooling Ambient coolant – nitrogen purge

10 C/min to 22 C

20 C/min to 35 C

50 C/min to 70 C

100 C/min to 125