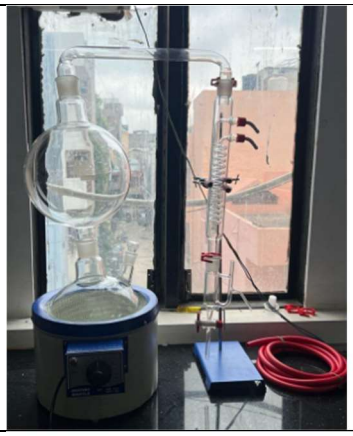
| Sl. No. | Instrument/Facility | Description | Photo |
|---|---|---|---|
| 1. | **Atomic absorption spectroscopy** | Atomic absorption spectroscopy and atomic emission spectroscopy is a spectro analytical procedure for the quantitative determination of chemical elements by free atoms in the gaseous state |  |
| 2. | **Gel documentation system** | Gel documentation systems, also known as 'gel docs' or 'gel imagers,' are used to record and analyze the results of gel electrophoresis and membrane blotting experiments. |  |
| 3 | **Phase contrast microscope** | Phase-contrast microscopy is an optical microscopy technique that converts phase shifts in light passing through a transparent specimen to brightness changes in the image. |  |

| | | | |
|---|---|---|---|
| **4** | **Fume hood** | A fume hood is a type of local exhaust ventilation device that is designed to limit exposure to hazardous or toxic fumes, vapors or dusts |  |
| **5** | **NIKON Binoculars** | More than 50 pieces are available for students use |  |
| **6** | **Kjeldahl Apparatus** | Kjeldahl Apparatus is used to determine organic nitrogen (n2) and protein contents in chemical substance. |  |
| **7** | **Cuddeback Camera Trap** | About 19 pieces are available for field instalment |  |
| **8** | **Nikon laser range finder** | Five pieces are available for field purpose |  |

| | | | |
|---|---|---|---|
| **9** | **Distillation Unit** | Water distillation unit with 10 liters capacity to prepare distilled water |  |
| **10** | **Trinocular Microscope** | Three Trinocular microscopes are available for specimen observation |  |
| **11** | **Canon Camera** | Canon SLR camera for picturing animals and plants. |  |
| **12** | **Tree Caliper** | Tree calipers are used to measure the diameter of trees. |  |

Terms of Use: Under the cooperation agreements, all equipment and facilities for study and research are provided at no charge. Payment for consumables is subject to an additional agreement on a case-by-case basis.

Contact Information: Prof. S. Jayakumar, s.jkumar1@pondiuni.ac.in

**The Sophisticated equipment housed at Pondicherry University Central Instrumentation Facility which is available for joint-use with Partner Institutions**

## X-ray Photoelectron Spectrometer (XPS)

**Make: Thermo Scientific**
**Model: K-Alpha-KAN9954133**

XPS is a powerful technique to determine the quantitative elemental composition of sample surfaces. XPS measures the kinetic energy of photoelectrons ejected from the valence shell, from which the binding energy that is specific to each element is obtained, and the elemental composition of the sample can be revealed. The incident X-ray penetrates the top around 10 nm of the surface layer, XPS can probe the surface ligand structure regardless of the size of the particles. Since it has monochromatic X-ray with small-spot system it is capable of depth profiling and elemental mapping. XPS is routinely used to analyze inorganic compounds, metal alloys, semiconductors, polymers, elements, catalysts, glasses, ceramics, paints, papers, inks, woods, plant parts, make-up, teeth, bones, medical implants, bio-materials, coatings, viscous oils, glues, ion-modified materials and many others.

**Essential Specifications:**

**Analyzer**: 180° double focusing hemispherical analyzer with 128-channel detector
**X-ray source**: Al- Kα micro-focused monochromator with variable spot size
**Ion Gun**: Energy range 100-4000 eV
**Charge Compensation**: Dual beam source
**Sample Size**: 4-axis sample stage, 60 x 60 mm sample area, and 20 mm maximum sample thickness

## Ultraviolet, Visible and Near Infra-Red (UV-VIS-NIR) SPECTROMETER
**Make: shimadzu**
**Model: 3600**

Electromagnetic radiation interacts with matter in different ways in different parts of the spectrum. Ultraviolet region can interact and cause excitation of molecular and atomic valence electrons, including ejection of the electrons (photoelectric effect). Visible region can cause molecular electron excitation (including pigment molecules found in the human retina) and plasma oscillations (in metals only). The NIR region of the spectrum can be absorbed to cause molecular vibration, and plasma oscillation (in metals only).

When a full range of wavelengths of UV-VIS and NIR radiation is passed through a sample, an absorption spectrum is obtained indicating the various possible interactions that have taken place by the interaction of the Electromagnetic spectrum with the sample. The specific absorption peaks (spectra) recorded using the spectrometer can be used to qualitatively and quantitatively estimate the constituents of the sample.

**Essential Features:**

Wave length Range : 175 nm to 3300 nm

Resolution : 0.1 nm

Maximum Absorption: 8(abs)

Attachments : Diffuse Reflectance Accessory; Absolute Reflectance Accessory; Sample Transport Accessory; Temperature Controller

**Sample requirement**:

1. The samples can be analyzed in the form of powder, solid, liquid and thin films also.
2. For powder samples about 500 mg to 1 g fine powder may be needed for the analysis.
3. Transparent solid samples of 10-20 mm diameter and about 0.5 to 1 mm thickness may also be used.
4. For liquid samples about 3 to 5 ml may be needed and solvent is also required for background correction and to adjust sample for proper concentration.

## SCANNING ELECTRON MICROSCOPY (SEM)
**Make: Hitachi**
**Model: S-3400N**

Scanning electron microscopy (SEM) uses a focused electron probe to extract structural and chemical information point-by-point from a region of interest in the sample. The high spatial resolution of an SEM makes it a powerful tool to characterize a wide range of specimens at the nanometer to micrometer length scales.

A focused beam of electrons is rastered across an area of a specimen's surface from which an image can be viewed. Two types of electrons are emitted from the sample surface after interaction with the electron beam; these are collected by different detectors. Secondary electrons give detail regarding the topographical features, while backscattered electrons exhibit compositional contrast.

**Essential Features:**

| | |
|---|---|
| Resolution | : 3nm@30kV HV mode; 10nm @3 kV HV mode |
| Detectors | : Secondary Electron; Semiconductor BSE (Quad type) |
| | Cathodeluminescence, Energy dispersive X-ray detector |
| Magnification | : x5 to x300, 000; |
| Vacuum System | : TMP & Rotary to 1.5 x $10^{-3}$ Pa |
| Specimen Stage | : Motorized 5-axis, Eucentric |
| Specimen height | : Max. 80mm at 10mm W.D. |

**Samples required:**

1. The samples can be analyzed in the form of powder, liquid, crystal, and thin films also.
2. If sample is powder, we need at least 1mg.
3. If solid/film/pellet/metal the size (length ×breadth) of the sample should not exceed 40mm×40 mm. And the height of the sample should not be greater than 50mm.For best result make sample's size, thickness and height as much as small.

**Fourier Transform Infra-Red (FTIR) Spectrometer**
**Make: Thermo Nicolet**
**Model: 6700**

Infrared spectroscopy is a technique based on the vibrations of the atoms of a molecule. An infrared spectrum is commonly obtained by passing infrared radiation through a sample and determining what fraction of the incident radiation is absorbed at a particular energy. The energy at which any peak in an absorption spectrum appears corresponds to the frequency of a vibration of a part of a sample molecule.

FTIR spectroscopy is a technique used to determine qualitative and quantitative features of IR-active molecules in organic or inorganic solid, liquid or gas samples. It is a rapid and relatively inexpensive method for the analysis of solids that are crystalline, microcrystalline, amorphous, or films.
Another advantage of the IR technique is that it also can provide information about the "light elements" (*e.g.*, H and C) in inorganic substances.

**Essential Specification:**

Wave number range : 5000 to 700 $cm^{-1}$ and 700 to 50 $cm^{-1}$ (Covering IR & FAR IR)

Resolution : 0.1 $cm^{-1}$

**Sample required:**

1. The samples can be analyzed in the form of powder, solid, liquid and thin films also.
2. For powder samples about 500mg to 1 g fine powder may be needed for the analysis.
3. Transparent solid samples of 10-20 mm diameter and about 0.5 to 1 mm thickness may also be used.
4. For liquid samples about 3 to 5 ml may be needed and solvent is also required for background correction and to adjust sample for proper concentration.

## Vibrating Sample Magnetometer (VSM)
## Make: Lake Shore
## Model: 7404

The magnetic properties of solids are very important, and attempts to understand them have led to a deep insight into the fundamental structure of many solids, both metallic and non-metallic.

The VSM is the instrument used to measure the magnetic moment, the most fundamental quantity in magnetism, of solid samples.

When a sample material is placed in uniform magnetic field, a dipole moment proportional to the product of sample susceptibility and applied field is induced in the sample. If the sample is made to undergo sinusoidal motion as well, an electrical signal will be induced in suitably located stationary pick-coils. This signal, which is at the vibration frequency, is proportional to the magnetic moment, vibration amplitude and vibration frequency. The instrument displays the magnetic moment in e.m.u. units.

**Essential Specification:**

| | |
|---|---|
| Vibration Frequency | : 82.5 Hz |
| Magnet | : 4" (2" at Pole face) |
| Max. Field | : 15 kGauss |
| Moment range | : 1μemu – 56 emu |
| Temperature | : 80-1400 K |

**Sample required:**

1. For powder samples about 30-50 mg.
2. For single crystal measurements, the dimensions of the crystal should be less than 2.5 mm.

**Spectrofluorometer**
**Make : Jobin Yvon**
**Model : FLUOROLOG - FL3-11**

The **spectrofluorometer** is an instrument which takes advantage of fluorescent properties of some compounds in order to provide information regarding their concentration and chemical environment in a sample.

Fluorescence spectroscopy has found use in the following applications: protein conformation and transport; trace levels of biologically active compounds and carcinogens; quality-assurance of medications; monitoring of drug-delivery and interactions; properties of macromolecules and nanoparticles; photo-reactivity of organic compounds; detection of chemical reactions; structure-property relations; monitoring pollutants in air, water, and soil.

Monitoring the activities of molecules with fluorophores is crucial to many kinds of experiments in cell biology, molecular biology and genetics, pharmaceuticals, and forensics, among many others. Fluorophores are molecules that, when exposed to light, absorb photons at a characteristic wavelength and subsequently emit photons at a different and slightly longer characteristic wavelength.

The life time of the excited states can also be found out with the instrument, which helps to understand the possible energy exchanges with in the sample system.

**Essential Specifications:**

| | |
|---|---|
| Source | : Xenon Lamp 450W; Pulsed xenon lamp 75W for Phosphorescence studies and Nano-LED sources available to excite sample at 295/460/560 nm for life time studies. |
| Range | : 180-1550 nm |
| Detector | : PMT for UV & Visible (180 to 850 nm) region and Cooled detector for IR Region 800-1550 nm; |
| Resolution | : 0.2 nm (maximum at specific wave lengths) |
| Software | : DATA MAX / GRAMS/31 |

## NUCLEAR MAGNETIC RESONANCE (NMR)
**Make: Bruker**
**Model: Avance-II**

Nuclear Magnetic Resonance (NMR) is a powerful non-selective analytical tool that enables you to ascertain molecular structure including relative configuration, relative and absolute concentrations, and even intermolecular interactions without the destruction of the analyte.

The principle behind NMR is that many nuclei have spin and all nuclei are electrically charged. If an external magnetic field is applied, an energy transfer is possible between the base energy to a higher energy level (generally a single energy gap). The energy transfer takes place at a wavelength that corresponds to radio frequencies and when the spin returns to its base level, energy is emitted at the same frequency. The signal that matches this transfer is measured in many ways and processed in order to yield an NMR spectrum for the nucleus concerned.

**Essential Features:**

| | |
|---|---|
| Magnet | : 9.4 T superconducting ultra-shield |
| Probes | : 5mm QNP, capable of 1H/19F/13C/31P<br>5mm Broadband Observe with gradients<br>5 mm Broadband Inverse with gradients<br>Flow Probe/3mm Broadband Inverse |
| Frequency range | : 100-400 MHz |
| Temperature range | : -150 to +180° C |
| Detectable nuclei | : $^{1}H$, $^{13}C$ (most commonly detected)$^{31}P$, $^{15}N$ etc. |
| Accessory | : Temperature variation |
| Detection | : As a liquid solution in deuterated solvents |
| Software | : Bruker Topspin |

**Experiments:**

| | |
|---|---|
| 1. 1D 1H and 13C NMR Spectrum | 2. Homo nuclear Decoupling (Proton) |
| 3. Solvent suppression experiment. | 4. Hetero nuclear Gated Decoupling |
| 5. Hetero nuclear Inverse Gated Decoupling | 6. 2D COESY and NOESY |
| 7. DEPT-135, DEPT-90 and DEPT-45 | 8. HMQC and 9. HMBC |

**Sample Requirements:**

1. Samples are accepted in solid or liquid form. Compounds should be highly pure and Soluble in commonly available solvents (chloroform, DMSO).
2. For 1H NMR sample quantity should be 5 to 10 mg and for $^{13}C$ and other nuclei 40 to 50 mg.

**Wave length dispersive- X-ray Fluorescence (WD-XRF)**
**Make: Bruker**
**Model: S4 PIONEER**

X-ray fluorescence (XRF) spectrometer is an x-ray instrument that emits X-rays from a material that has been excited by bombarding with high-energy X-rays or gamma rays. The phenomenon is widely used for elemental analysis and chemical analysis, particularly in the investigation of metals, glass, ceramics and building materials, and for research in geochemistry, forensic science and archaeology routine, relatively non-destructive chemical analyses of rocks, minerals, sediments and fluids. It works on wavelength-dispersive spectroscopic principles. However, an XRF cannot generally make analyses at the small spot sizes typical of 2-5 microns, so it is typically used for bulk analyses of larger fractions of geological materials. The relative ease and low cost of sample preparation, and the stability and ease of use of x-ray spectrometers make this one of the most widely used methods for analysis of major and trace elements in rocks, minerals, and sediment.

**Essential Features:**

| | |
|---|---|
| X-ray Tube | :Rh Anode-4kW(60kV &100mA max.) |
| No. of Analyzer Crystals | : 8 |
| Sample holder | : 34 mm diameter |
| Elements range | : Be to U |
| Detection limit | : In percentage and down to ppm |

**Sample requirement:**

Minimum 1 gram of sample in fine powder form is required.

**Thermal analysis**
**Make: TA instruments**
**Model: Q600 SDT and Q20 DSC**

Thermal analysis comprises a group of techniques in which a physical sample property is measured as a function of temperature, while the sample is subjected to a predefined heating or cooling programme.

When performing thermal analysis procedures, usually a controlled temperature program heats or cools a sample at a certain rate, and physical or chemical property changes are monitored as a function of temperature. Some of the measured properties include mass, temperature, heat flow, size, malleability, sound transmission, magnetic characteristics, optical characteristics, electrical conductivity, and tensile strength. Thermal analysis techniques give useful information about polymers, inorganic compounds, alloys, drugs, and other organic materials.

**TG or TGA**: thermal gravimetric analysis or thermogravimetry. Measures the mass change of the sample with a thermosbalance. A variation on this is **DTG**, or derivative thermogravimetry, which measures the slope or derivative of the mass change with temperature, *dm/dt*.

**DSC and DTA**: differential scanning calorimetry, and a related technique, differential thermal analysis. DSC measures the amount of heat flowing into the sample (endothermic, $+dH/dt$) or out of the sample (exothermic, $-dH/dt$), and DTA (the older technique) measures small differences in temperature between a sample and reference as the same amount of heat energy is applied to both.

**Essential Features:**

| | |
|---|---|
| Temperature range | : RT to 1000° C (SiC furnace) -SDT<br>RT to 500° C -DSC |
| Experiment | : Ramp, Isothermal, step |

**Sample Requirements:**

Sample required is about 10-80 mg for TG/DTA & 10-30 mg for DSC. Samples should be non-explosive and non-corrosive.

## PARTICLE SIZE ANALYSIS (ZETA SIZER)

**Make: Malvern**

**Model: Zeta Sizer Nano S**

Particle size analysis, particle size measurement, or simply particle sizing is the collective name of the technical procedures, or laboratory techniques which determines the size range, and/or the average, or mean size of the particles in a powder sample.

Particle size analysers measure the sizes of grains or particles in a sample. They use methods such as light scattering, sedimentation, laser diffraction etc. to calculate particle sizes. Particle size analysers can measure the sizes of many particles in a sample very quickly and can provided data on particle size distributions, which is of value to a great many industries.

**Essential Specifications:**

Technique : Laser diffraction – Dynamic Scattering

Measurement types : Particle / molecular size, absolute molecular weight

**Sample's requirement:**

Powder dispersed in liquid (Wet Method)

## SURFACE AREA ANALYSIS
**Make: Micromeritics**
**Model: Gemini VII 2390t**

Surface Area is an intrinsic property of powdered porous materials that can reveal important information regarding the usefulness of a material for an application, Surface area plays critical role in the bio-availability of Pharmaceuticals, dispersion of dyes, adsorption capacity of carbon and many more. Surface area analyser is used for surface area measurement by means of Physical adsorption.

BET analysis provides precise specific surface area evaluation of materials by nitrogen multilayer adsorption measured as a function of relative pressure using a fully automated analyser. The technique encompasses external area and pore area evaluations to determine the total specific surface area in $m^2/g$ yielding important information in studying the effects of surface porosity and particle size in many applications.

**Essential Specifications:**

Surface area : from 0.1 $m^{2,\ total}$
From 0.01 $m^2$ / g, Specific

Pore volume : from $4x10^{-6}$ $cm^3$ /g

Pressure measurement region: 0 to 950 mm Hg

$P/P_0$ resolution :< $10^{-4}$

Adsorbate Gas: Nitrogen

## HIGH-PERFORMANCE THIN-LAYER CHROMATOGRAPHY (HPTLC)
**Make: CAMAG**
**Model: Automatic TLC sampler IV (ATS4)**

High-performance thin-layer chromatography (HPTLC) is a form of thin-layer chromatography (TLC) that provides superior separation power using optimized coating material, novel procedures for mobile-phase feeding, layer conditioning, and improved sample application. It promotes for higher separation efficiencies, shorter analysis time, lower amounts of mobile phase, and efficient data acquisition and processing.

**Essential Specifications:**
Object size: up to 20x20 cm
Sample dosage: 25 µL gas-tight syringe with side port.
Dosage volume: 100 nL to 1 mL in increments of 100nL.

**Attachments:**

**TLC Scanner 4**
- Measurement of reflection, either in absorbance or fluorescence mode
- Object formats up to 20 x 20 cm
- Spectral range from 190 to 900 nm
- Automatic start of all lamps: deuterium, halogen-tungsten, and high pressure mercury lamp
- Data step resolution 25–200 µm
- Scanning speed 1–100 mm/s
- Spectrum recording up to 100 nm/s

**Light sources**
- Deuterium lamp, usable continuum 190 – 450 nm
- Halogen-tungsten lamp, usable continuum 350 – 900 nm
- High-pressure mercury lamp, line spectrum 254 – 578 nm

**Chromatogram development**
Automated Multiple Development (AMD 2), Twin Trough Chambers for 20 x 20 cm plates, with stainless steel lid, for 20 x 10 cm plates, with stainless steel lid and for 10 x 10 cm plates, with stainless steel lid

**HIGH RESOLUTION TRANSMISSION ELECTRON MICROSCOPE (HR-TEM)**
**Make: FEI Company of USA**
**Model: Tecnai G2 F30 S-Twin (FEG based TEM)**

An Electron Microscope uses an electron beam as a source of illumination and the electromagnetic lenses to manipulate the beam to penetrate the sample. The resulting diffraction pattern reveals the structure of the observed sample.

Analysing the image and the corresponding diffraction we can obtain useful information on the grain sizes, the precipitates, the orientation of precipitates to the matrix and on the appearance of the super structure with the aid of the energy dispersive X-ray micro analysis (EDX) attachment, it is also possible to measure qualitatively the concentration and composition of elements, using the characteristic X-ray spectra.

**Essential Specifications:**
Max. Accelerating Voltage: 300 kV
TEM Point resolution (nm):0.205
TEM Line resolution (nm): 0.102
Information limit (nm) ≤ 0.14
Extended resolution (HR-STEM (nm): 0.16
EDAX resolution: 136eV
Electron Gun type: Schottky Field emitter with high maximum beam current (> 100 nA)
Magnification range (EF) TEM: 60 x – 1 M x
Camera length (mm): 80 – 4500
Max. Diffraction angle (degrees): ± 12
STEM HAADF resolution (nm): 0.19
STEM magnification range: 150 x - 230 Mx
Max. Tilt angle with double-tilt holder: ±40°
Max. Tilt angle with tomography holder: ±80°
EDS solid angle (srad): 0.13

**GAMMA CHAMBER**
**Make : BRIT India**
**Model: GC5000**

Gamma chamber 5000 is a compact, portable, self-shielded type of a Co-60 Gamma Irradiator. Its design conforms to American National Standards ANSI-N433.1, 1977 for safe design and use of self-contained Dry Source Storage Gamma Irradiator (category-1) Atomic Energy Regulatory (AERB), India.

**Essential Specifications:**

| | |
|---|---|
| Maximum Co-60 source capacity | : 518 TBq (14,000 Ci) |
| Dose rate at maximum capacity | : 9.5 kGy/hy (0.95 megarad /hr) |
| Dose rate uniformity | : Radial +25% or better and axial -25% or better |
| Irradiation volume | : 5000 cc approx. |
| Size of sample chamber | : 17.2 cm (dia) 20.5 cm (h) |
| Shielding material | : Lead & Stainless |
| Minimum irradiation time | : 6 seconds |

**Ultra-Fast (Femto Second) Laser System**
**Make: Newport Corporation, USA**
**Model : Oscillator- NSI-Mai-Tai-HP-1050, Femtosecond single-box Ti-Sapphire oscillator with MaiTai Seed Kit, 'Spitfire Ace-100F - High power (> 4 W), < 120 fs Ti:sapphire regenerative amplifier including stretcher and compressor, Empower 30 - High power CW diode pumped Q switched, intra-cavity doubled Nd:YLF laser and optical parametric amplifier - TPR-TOPAS-F, TOPAS-Prime, 60-200fs, 1160-2600nm tuning range.**

The Ultra-Fast (Femto Second) Laser Systems used for the analysis of ultra-fast processes such as life time measurements, non-linear processes such as four-wave-mixing, second harmonic generation etc., . The application areas include Physics – material Science and Optics, Chemistry, Nano science and green energy materials research.

**Essential Specifications:**

1. **Oscillator :**

| | |
|---|---|
| Wavelength tuning | : from 690 to 1040 nm |
| Pulse Width | : < 100 fs |
| Tuning Range | : 690–1050 nm |
| Average Power | : >2.5 W |
| Repetition rate | : 80 MHz ±1 MHz |

2. **Ti:sapphire regenerative amplifier**

| | |
|---|---|
| Pulse Width | :< 120 fs |
| Average Power | : >5.0 W |
| Repetition rate | : 1 kHz |

3. **Empower 30, High power CW diode pumped Q switched, intra-cavity doubled Nd:YLF laser**

| | |
|---|---|
| Wavelength | : 527nm |
| Repetition rate | : 1-10 kHz |
| Power | : 20 Watt at 1 kHz |

**Semi Macro Elemental (CHNS-OX) Analyser**
**Make: Elementar GmbH, Germany**
**Model: EL Vario Cube**

**Elemental analysis** is a process where a sample of a material is analyzed for its elements. Elemental analysis can be qualitative (determining what elements are present), and it can be quantitative (determining how much of each are present).

The samples are weighed in tin boats and loaded in the integrated carousel for 80 samples. In a fully automatic process, the transfer of the sample through the ball valve into the combustion tube is performed. Each sample is individually flushed with carrier gas to remove atmospheric nitrogen, resulting in a zero blank sampling process. The catalytic combustion is carried out at a permanent temperature of up to 1200 °C. Subsequently, the reduction of the combustion gases on hot copper is carried out in a second (reduction) furnace. The formed analysis gases N, $CO_2$, $H_2O$ and $SO_2$ remain in the He carrier gas stream. The gas mixture is separated in its components via three columns by the well proven purge & trap chromatography and is subsequently fed into a thermal conductivity detector (TCD) through an electronic gas flow controller that ensures absolutely stable pressure and flow conditions. A connected PC computes the element concentration from the detector signal, and the sample weight on the basis of stored calibration curve.

**Specifications:**

Calibration: Multi point calibration, regression linear to the 4th order, stable over months.
Sample weight: 0.02 - 50 mg organic substance or up to 1 g soil sample.
Analysis time: self-optimizing depending on element content and sample weight
Typically for CHNS 10 min; CHN 8 min; CN 6 min and N 3 min
Auto sampler: 80 positions in a magazine as standard - reloadable any time during operation
Gases used for Analysis: He: 99.995% purity 3 l/analysis; $O_2$: 99.995% purity 0.05 l/analysis
Combustion temperature: up to 1200 °C; Reduction temperature: up to 950 °C
Maximum C/N ratio: 12000: 1
Sample weight range: < 1mg to up to 20mg of organic matter depending upon requirements
Detection range: C: 0-40 mg, N: 0-15 mg, H: 0-3 mg, S: 0-6 mg
Detection limit: < 40 ppm with TCD, Accuracy: < 0.1% abs.
**Applications:** Geological samples, Organic chemistry, Agriculture and environment and Sulphur trace analysis

Contact person for URGENT: Prof. Jayakumar S., s.jkumar1@pondiuni.ac.in
Procedure for availing facility: https://www.pondiuni.edu.in/department/central-instrumentation-facility/