

## List of Major Equipment Available in Chemical Engineering Department

### 1. High Performance Liquid Chromatography (HPLC)

Make: Waters Corporation

Model: Waters 2707

Funding agency: TEQIP-III, NIT



High-performance liquid chromatography (HPLC; formerly referred to as high-pressure liquid chromatography) is a technique in analytical chemistry used to separate, identify, and quantify each component in a mixture. It relies on pumps to pass a pressurized liquid solvent containing the sample mixture through a column filled with a solid adsorbent material. Each component in the sample interacts slightly differently with the adsorbent material, causing different flow rates for the different components and leading to the separation of the components as they flow out of the column.

## 2. BET Surface Area Analyzer

Model: TC303



Surface area analyzer is a very sensitive technique to find out the surface area, size, shape and volume of the pores. It is also useful to calculate the catalytic activity of the solid catalyst. Surface area analyzers help researchers obtain the area or pore size of surfaces on samples as diverse as pharmaceuticals and activated carbon by measuring their gas sorption capabilities. The greater an object's surface area, the more capable it is of gas sorption.

### 3. CHNS Analyzer

Model: Euro EA elemental analyzer (CRFC)

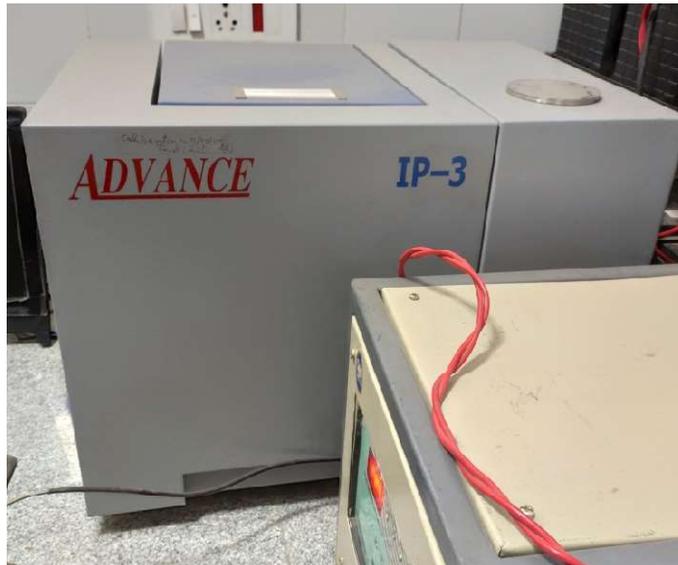
The CHNS Analyzer find utility in determining the percentages of elemental Carbon, Hydrogen, Nitrogen, Sulphur and Oxygen of organic compounds.



#### 4. Bomb Calorimeter

Make: Advance Research Instruments

Model: IP-3



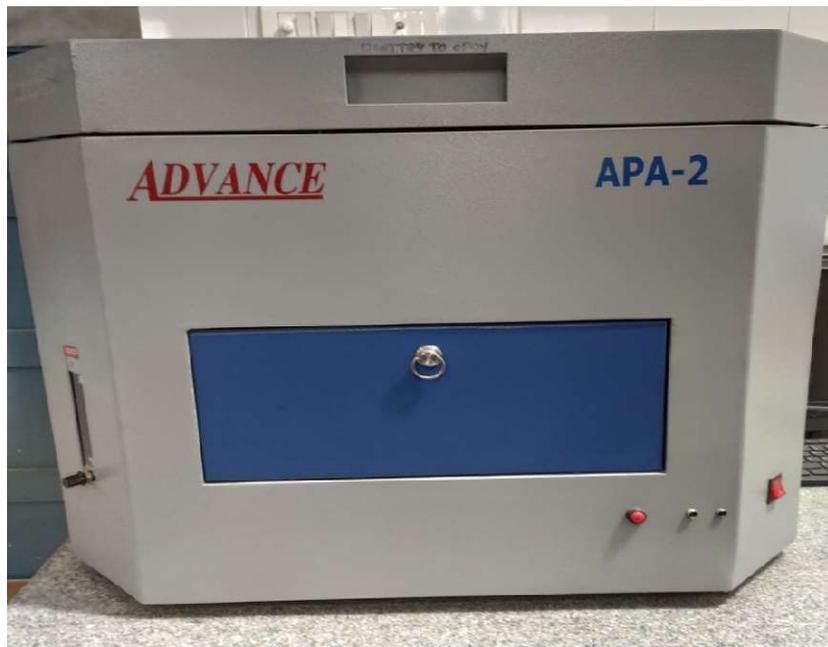
A bomb calorimeter is a type of constant-volume calorimeter used in measuring the heat of combustion of a particular reaction.

## 5. Proximate Analyzer

Make: Advance Research Instruments

Model: APA-2

Funding agency: Plan Fund



Proximate Analyzer is used to determine the moisture, ash, volatile matter and fixed carbon in coal and coke.

## 6. UV-Spectrophotometer

Model: T80 (Shimadzu)



Ultraviolet–visible spectroscopy or ultraviolet–visible spectrophotometry (UV–Vis or UV/Vis) refers to absorption spectroscopy or reflectance spectroscopy in part of the ultraviolet and the full, adjacent visible spectral regions.

## 7. Centrifuge

Model: NEYA-16R



A centrifuge is a piece of equipment that puts an object in rotation around a fixed axis (spins it in a circle), applying a force perpendicular to the axis of spin (outward) that can be very strong. The centrifuge works using the sedimentation principle.

## 8. High Pressure Autoclave

Make: Nano Mag



An autoclave is a pressure chamber used to carry out industrial and scientific processes requiring elevated temperature and pressure in relation to ambient.

## 9. UV-Spectrophotometer

Make: Shimadzu

Model: UV-1800



Ultraviolet-visible spectroscopy or ultraviolet-visible spectrophotometry (UV-Vis or UV/Vis) refers to absorption spectroscopy or reflectance spectroscopy in part of the ultraviolet and the full, adjacent visible spectral regions.

## 10. UV-Spectrophotometer

Make: Shimadzu

Model: T80

Funding agency:



Ultraviolet–visible spectroscopy or ultraviolet–visible spectrophotometry (UV–Vis or UV/Vis) refers to absorption spectroscopy or reflectance spectroscopy in part of the ultraviolet and the full, adjacent visible spectral regions.

## 11. Bioreactor

Model: Eppendorf, BioFlo/CelliGen115



Bioreactor is a device or system that supports a biologically active environment. In one case, a bioreactor is a vessel in which a chemical process is carried out which involves organisms or biochemically active substances derived from such organisms.

## **12. Fourier-transform infrared spectroscopy (FTIR)**

Make: Shimadzu

Funding agency: TEQIP-III NIT Srinagar

Infrared spectroscopy gives information on the vibrational and rotational modes of motion of a molecule and hence an important technique for identification and characterization of a functional; group.. The infrared spectrum of an organic compound provides a unique fingerprint, which is readily distinguished from the absorption patterns of all other compounds.

### **13. Porometer**

Porometer is used for measuring the area of the pore by the amount of a gas passing through a given area of it.

## 14. Incubator Shaker

Make: Kushner shake

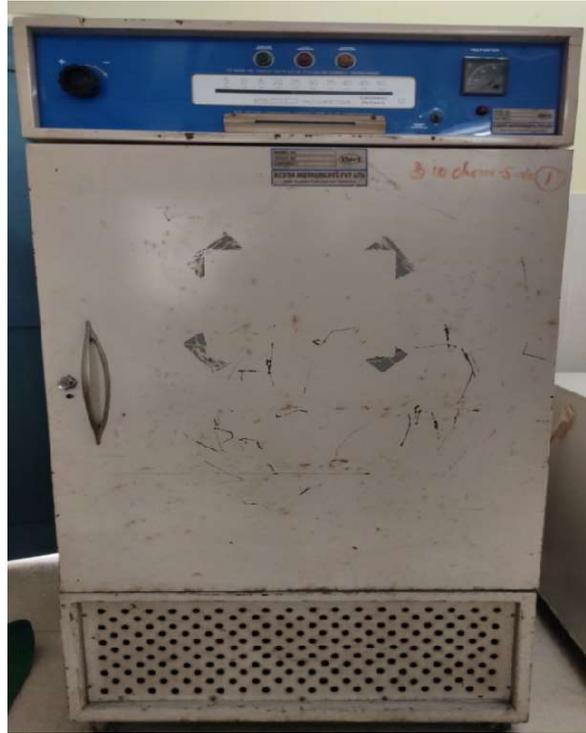
Model: ab-Therm LT-X



An incubator shaker (or thermal shaker) can be considered a mix of an incubator and a shaker. It has an ability to shake while maintaining optimal conditions for incubating microbes or DNA replications.

## 15. BOD Incubator

Make: Khera Instruments Pvt. Ltd.



BOD Incubator (Bio-Oxygen Demand) are used to maintain temperature for test tissue culture growth, storage of bacterial cultures and incubation where high degree of constant temperature accuracy is required

## 16. Cooling Centrifuge

Make: Remi



A centrifuge is a device for separating particles from a solution according to their size, shape, density viscosity of the medium and rotor speed. Refrigerated laboratory centrifuges temperature ranges as wide as  $-20^{\circ}\text{C}$  –  $40^{\circ}\text{C}$ , making them perfect for DNA, RNA, PCR or antibody analysis.

## 17. Autoclave



An autoclave is a pressure chamber used to carry out industrial and scientific processes requiring elevated temperature and pressure in relation to ambient.