





آزمایشگاه مرکزی دانشگاه شیراز



Nuclear Magnetic Resonance Spectroscopy (NMR)

Device Model: NMR-400 Advance-III
Made by Bruker Company in Germany

The application of the device is in **determining the structure of molecules**. It provides services to various research areas and the industrial sector.

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Scanning Electron Microscopy (SEM)

Device Model: TESCAN-Vega 3
Made by TESCAN Company in Czech
Republic

The application of the device is in **surface imaging** of micrometer-sized samples. It provides services to various research areas and the industrial sector.



Sputtering Coating

Device Model: Q150R-ES

Made by Quorum Technologies in England

The application of the device is in the preparation of non-conductive samples for observation with scanning electron microscopy. It provides services to various research areas such as electronics, optics, and material science and the industrial sector.

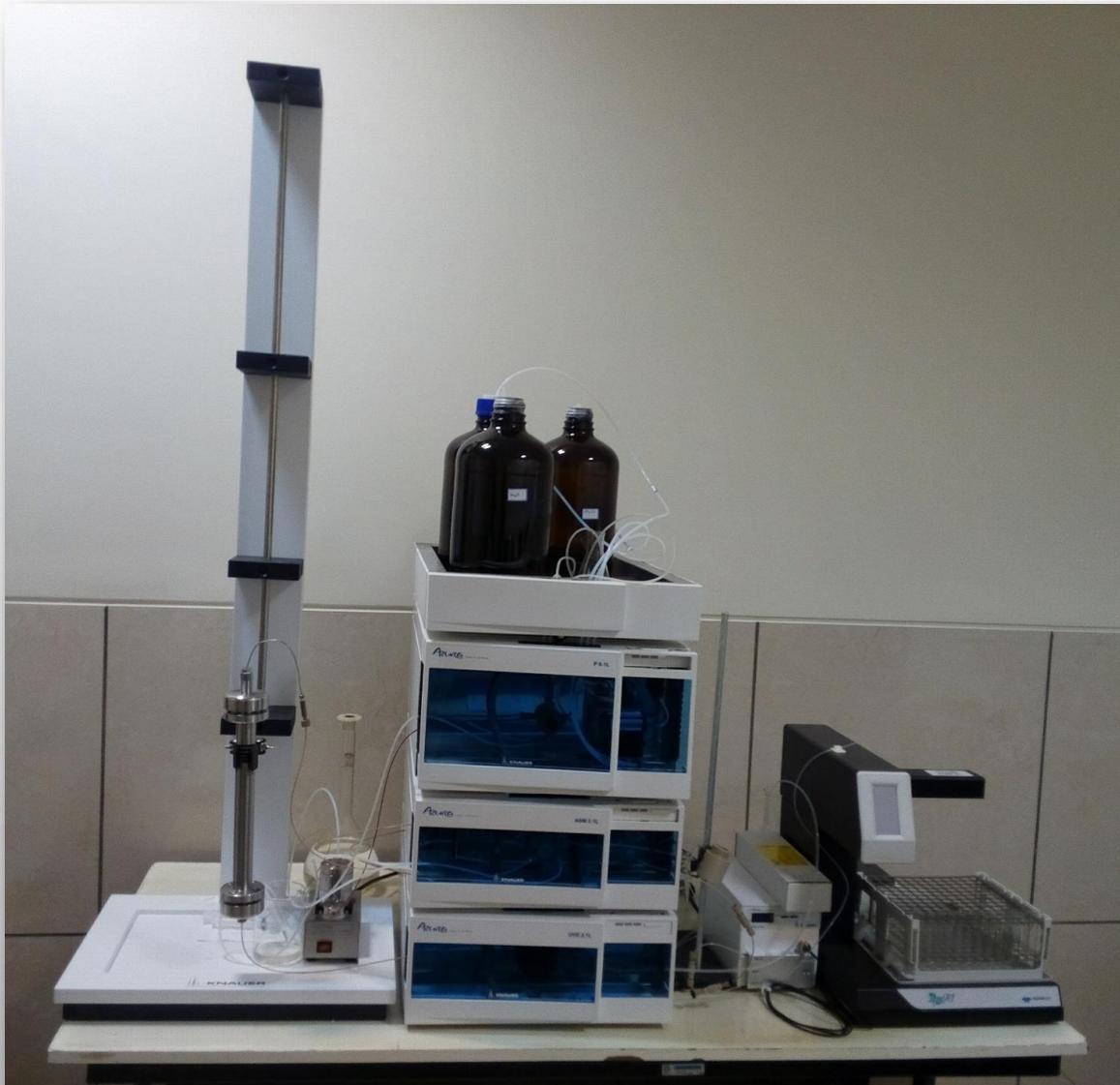


آزاد دانشگاه مرکزی دانشگاه شیراز

Fast Protein Liquid Chromatography (FPLC)

Device Model: AZURA

Made by **KNAUER** Company in Germany



Fast Protein Liquid Chromatography (FPLC) is a powerful chromatographic technique used for the **separation, purification, and analysis** of **proteins**.

It finds applications in various fields such as biochemistry, biotechnology, pharmaceuticals, and molecular biology, enabling researchers to isolate and study proteins with high resolution and efficiency, facilitating protein characterization, purification, and downstream analysis.

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High Performance Liquid Chromatography (HPLC)

Device Model: AZURA

Made by **KNAUER** Company in Germany

High-Performance Liquid Chromatography (HPLC) is an analytical technique used for the **separation, identification, and quantification** of **chemical compounds** in a mixture. It finds applications in fields such as pharmaceuticals, environmental analysis, food and beverage industry, and forensic science, enabling precise analysis of complex samples with high sensitivity and resolution, facilitating tasks like drug analysis, pollutant detection, quality control, and compound profiling.





Gas Chromatography – Mass Spectroscopy (GC-MS)

Device Model: GC-MSD

Made by **AGILENT** Company in America

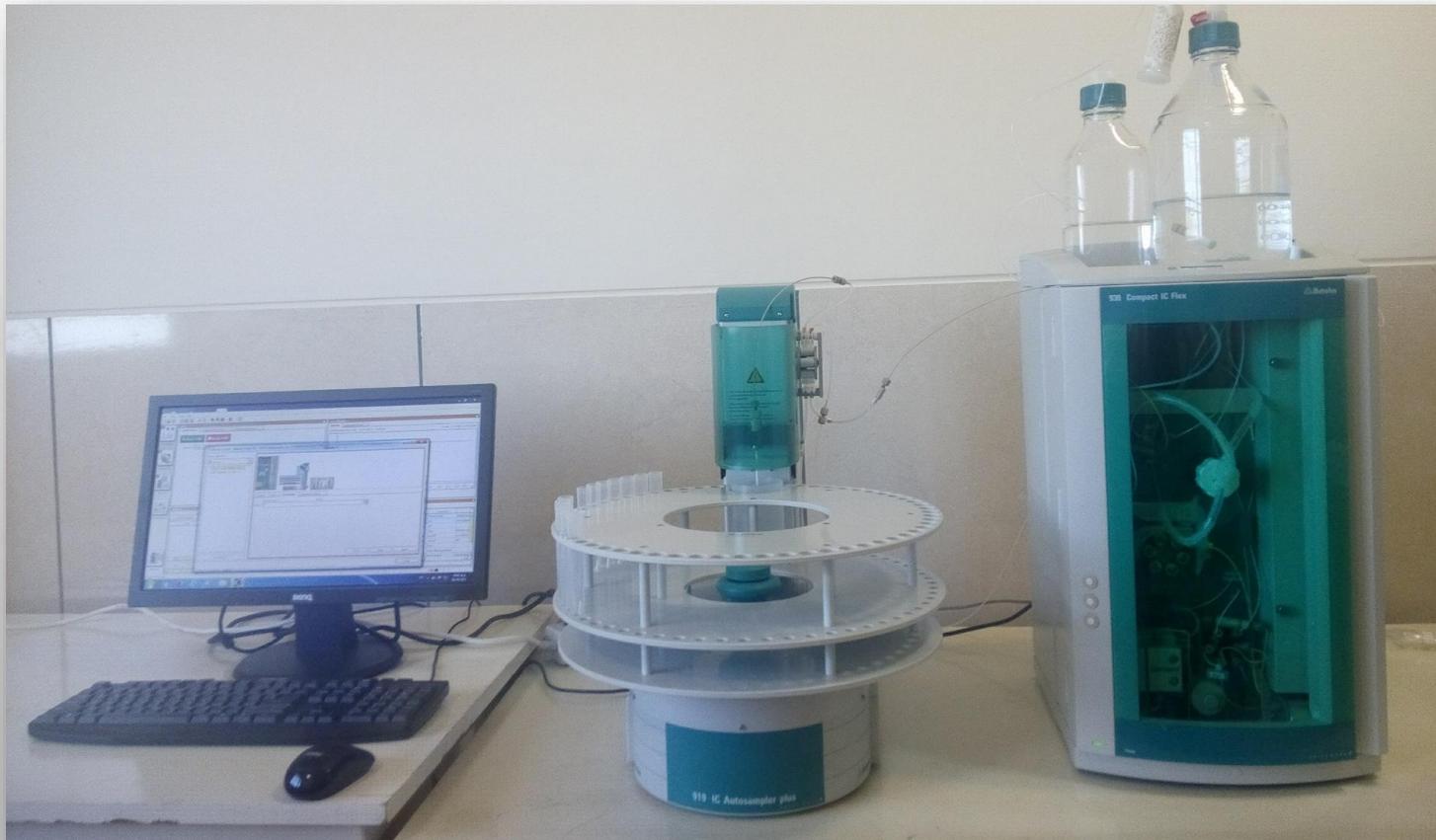
Gas Chromatography-Mass Spectrometry (GC-MS) is a powerful analytical technique that combines the separation capabilities of gas chromatography with the **identification** and **quantification** abilities of mass spectrometry. It finds applications in fields such as forensic science, environmental analysis, pharmaceuticals, and food safety, enabling the identification and analysis of complex mixtures, detection of trace compounds, and characterization of volatile substances with high precision and sensitivity.



Ion Chromatography (IC)

Device Model: Compact IC Flex 930
Made by METROHM Company in Switzerland

Ion Chromatography (IC) is an analytical technique used for the **separation** and **quantification** of **ions** in a sample. It finds applications in fields such as environmental analysis, pharmaceuticals, food and beverage industry, and water quality testing, enabling the detection and analysis of various inorganic and organic ions, including anions and cations in clinical, environmental, petrochemical, refineries, water and wastewater, with high sensitivity and selectivity for tasks like ion identification, speciation, and pollutant monitoring.





Electrospinning

Device Model: Spinner 3X-Adva
Made in Iran



Electrospinning is a fiber production technique that uses an electric field to **create ultrafine polymer fibers**. It finds applications in fields such as tissue engineering, filtration systems, energy storage, and nanotechnology, enabling the production of nanofibers with high surface area, controlled porosity, and diverse functionalities for applications like scaffolds for tissue regeneration, air filtration, battery electrodes, and drug delivery systems.

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Fluorescence Spectroscopy

Device Model: Varian Cary Eclipse
Made by AGILENT Company in America



Fluorescence Spectroscopy is a powerful analytical technique that **measures the emission of fluorescent light** from a sample upon excitation with specific wavelengths. It finds applications in fields such as biochemistry, pharmaceuticals, environmental monitoring, and material science, enabling the study of molecular interactions, protein folding, cellular imaging, and **detection of pollutants** or **biomarkers** with high sensitivity and specificity.

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Freeze Dryer

Device Model: Alpha 2-4 LD Plus
Made by CHRIST Company in Germany

A Freeze Dryer is a device used to **remove moisture** from a material through the process of sublimation, preserving its structure and properties. It finds applications in fields such as pharmaceuticals, food preservation, biotechnology, and research laboratories, veterinary medicines, agriculture and medical sciences, enabling the long-term storage of heat-sensitive substances, production of stable powders, and preservation of biological samples or delicate materials by removing water without causing damage.

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Professional Mapping Drone

Device Model: SQ-EBEE

Made by **SENSEFLY** Company in Switzerland



A Mapping Drone is an unmanned aerial vehicle equipped with advanced imaging technology to **capture high-resolution aerial imagery** and generate **accurate maps** or 3D models of the terrain or objects below. It finds applications in fields such as surveying, agriculture, environmental monitoring, and infrastructure inspection, providing efficient and cost-effective solutions for **topographic mapping**, crop analysis, disaster assessment, and infrastructure planning with enhanced spatial data acquisition and analysis.



Dynamic Light Scattering (DLS)

Device Model: SZ- 100

Made by HORIBA Company in Japan



Dynamic Light Scattering (DLS) is a technique that measures the Brownian motion of particles in a solution to determine their **size** and **size distribution**, **surface charge** and **molecular weight**. It finds applications in fields such as colloid science, biophysics, and polymer research, enabling the characterization of nanoparticles, protein aggregation studies, and the analysis of colloidal systems for various applications including drug delivery, material science, and biomolecular interactions.



Rotary Evaporator

Device Model: Hei-VAP Advantage
Made by HEIDOLPH Company in Germany

A Rotary Evaporator is a laboratory device used for gentle and efficient evaporation of solvents from samples by rotating them under reduced pressure. It finds applications in fields such as chemistry, pharmaceuticals, and research laboratories, enabling **solvent removal**, **concentration**, and **purification**, and facilitating tasks like sample preparation, extraction, and solvent recycling with enhanced efficiency and control.



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Ultra Pure Water Generator

Device Model: Direct-Q5

Made by Millipore Company in France



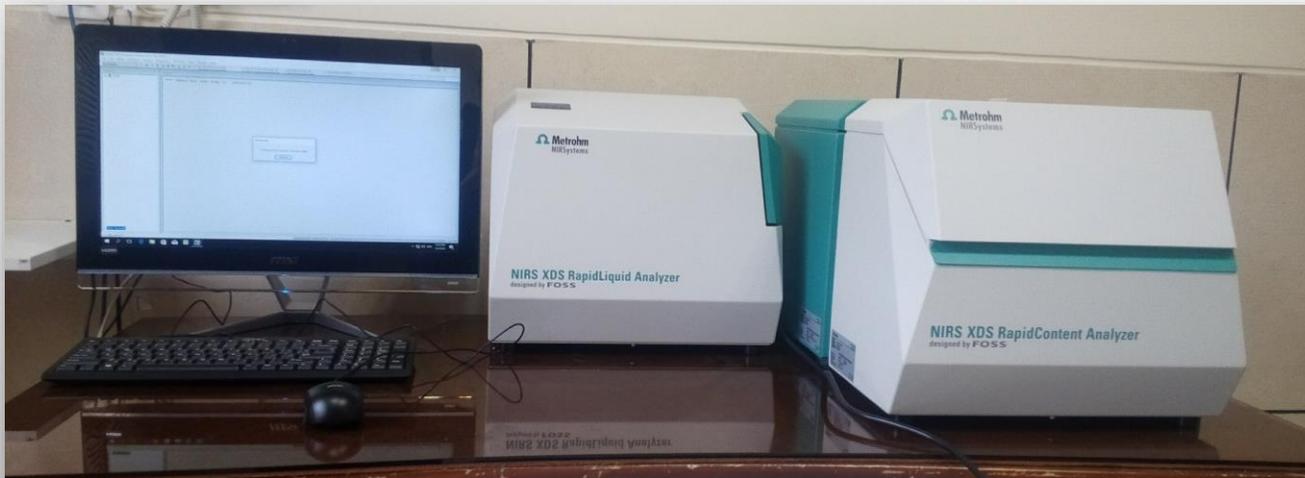
An Ultra Pure Water Generator is a device that produces **high-quality water** with **extremely low levels of impurities** and **contaminants**. It finds applications in fields such as pharmaceutical manufacturing, semiconductor fabrication, laboratory research, and healthcare facilities, providing a reliable source of ultrapure water for critical processes like analytical testing, equipment cleaning, and sensitive experiments requiring water of exceptional purity.



Visible Near Infra Red (Vis-NIR) Spectroscopy

Device Model: NIRS XDS

Made by Metrohm Company in Switzerland



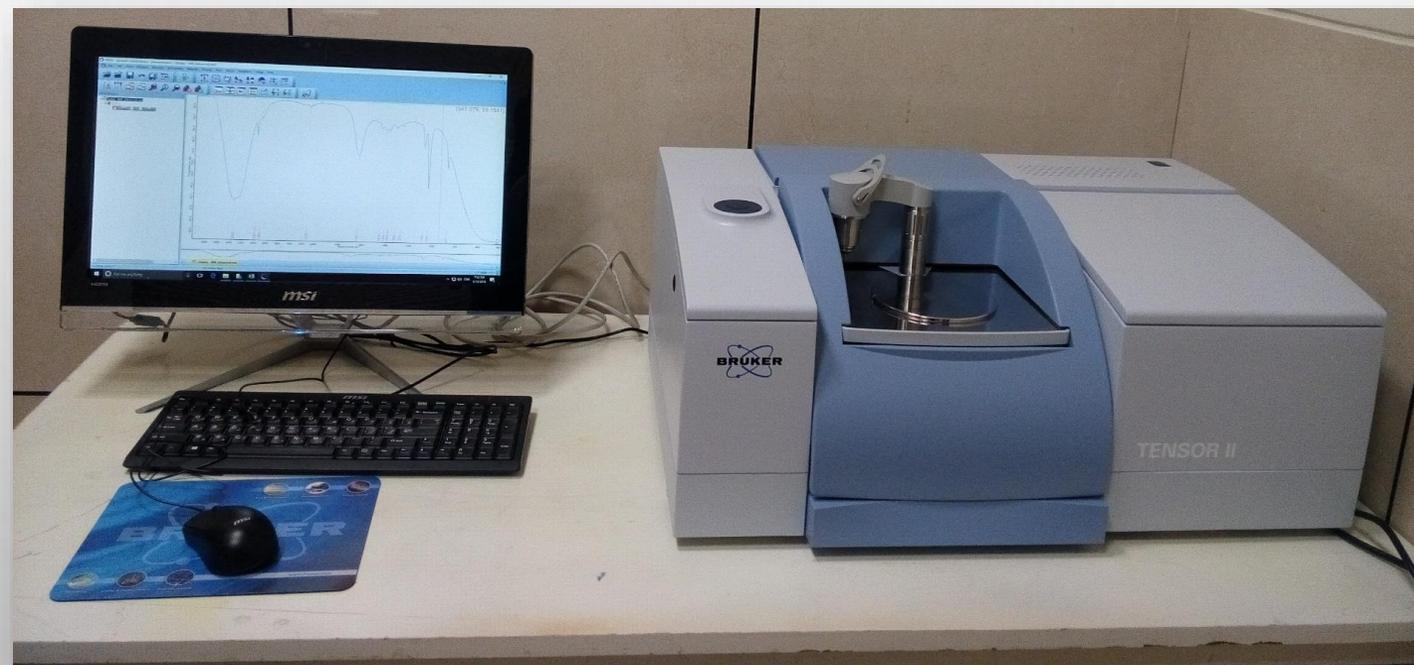
Visible Near Infrared (Vis-NIR) Spectroscopy is a technique that analyzes the interaction of light with materials in the visible and near-infrared range to gather information about their **composition and properties**. It finds applications in fields such as agriculture, food and beverage, pharmaceuticals, and environmental monitoring, enabling rapid and non-destructive analysis of samples like petrochemical yields, polymers, dye pigments, wood, food and medicines for tasks **quality control, moisture content determination, chemical analysis, and product authentication**.



Fourier-Transform Infrared Spectroscopy (FTIR)

Device Model: Tensor II

Made by Bruker Company in Germany



Fourier-Transform Infrared Spectroscopy (FTIR) is a versatile analytical technique that measures the absorption, transmission, and reflection of infrared light by a sample to **identify** and **analyze** its **chemical composition**. It finds applications in fields such as pharmaceuticals, polymer researches, environmental analysis, food industries, dye researches, medical and forensic science, enabling identification of functional groups, quantification of components, and characterization of molecular structures, aiding in tasks such as material analysis, quality control, and identification of unknown substances.



Confocal Raman Spectroscopy and Microscopy

Device Model: Lab Ram HR

Made by HORIBA Company in Japan



Raman Confocal Microscopy combines spectroscopic analysis with high-resolution imaging, enabling **non-destructive characterization** of materials **at the molecular level**. It finds applications in fields such as materials science, pharmaceuticals, forensics, and life sciences, geology, biology, chemistry, polymer, semiconductor-optics and electronics, food industries, authentication of artworks and antiquities, facilitating investigations of **chemical composition**, **structural analysis**, and **biological imaging** with exceptional sensitivity and spatial resolution.



Lab Freezer -86° C

Device Model: Platinum Next 500V
Made by ANGELANTONI Company in Italy



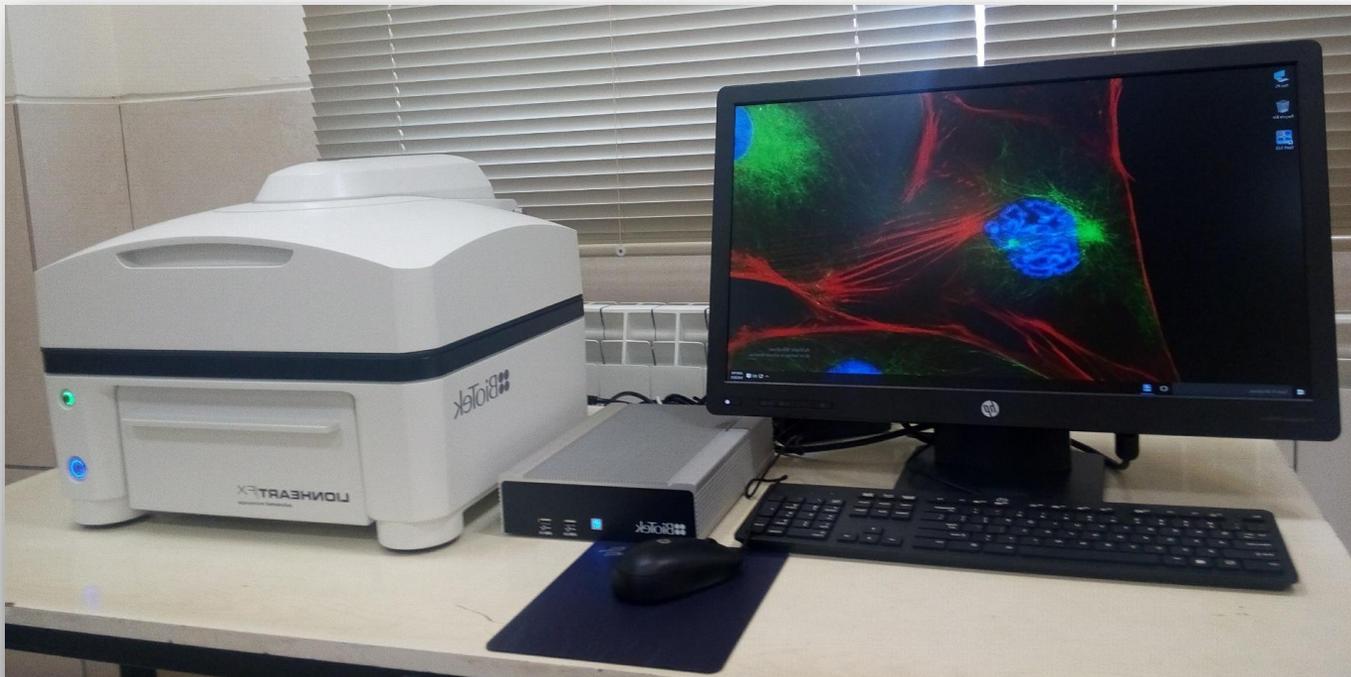
A Lab Freezer -86°C is a specialized freezer designed to **maintain extremely low temperatures** for the **long-term storage** of biological samples, vaccines, enzymes, and other temperature-sensitive materials. It finds applications in fields such as research laboratories, biotechnology, pharmaceuticals, and healthcare, providing a reliable storage solution for preserving valuable samples, maintaining their integrity, and facilitating experiments, testing, and analysis requiring ultra-low temperature conditions.



Fluorescence Microscope

Device Model: Lionheart FX

Made by BIOTEK Company in America



A Fluorescence Microscope is an optical microscope that uses fluorescence to **image** and **study** specimens. It finds applications in fields such as cell biology, molecular biology, immunology, and neuroscience, agriculture, Petrochemical and oil industry, veterinary medicine, enabling visualization of specific molecules, cellular structures, and processes within living or fixed samples, providing valuable insights into cellular dynamics, protein localization, and interactions for various research, diagnostic, and imaging purposes.



UV-Vis Spectrophotometer

Device Model: LAMBDA 365

Made by PERKIN ELMER Company in America



A UV-Vis Spectrophotometer is a scientific instrument used to **measure** the **absorption** or **transmission** of ultraviolet (UV) and visible (Vis) light by a sample. It finds applications in various fields, including chemistry, biochemistry, pharmaceuticals, environmental science, materials science, medical sciences, food industries, oil and petrochemical industries, fluid sciences and quality control laboratories, enabling analysis of molecular structures, **quantification of compounds**, and **characterization of chemical reactions** and interactions with high sensitivity and precision.



Liquid chromatography-Mass spectroscopy (LC-MS)

Device Model: ACQUITY UPLC H PLUS / ACQUITY QDa
Mass Detector
Made by WATERS Company in America



LC-MS is a powerful analytical technique that combines the separation capabilities of liquid chromatography with the detection and identification abilities of mass spectrometry. It finds applications in fields such as biochemistry, pharmaceuticals, metabolomics, environmental analysis, medical sciences, food industries, oil and petrochemical industries and forensic science, enabling the **analysis of complex mixtures, identification of compounds, quantification of analytes, and characterization of biomolecules** with high sensitivity and selectivity.



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Atomic Absorption Spectrometer (AAS)

Device Model: ICE3500

**Made by THERMO FISHER SCIENTIFIC
Company in America**



AAS is a scientific instrument used to **measure** the **concentration of elements** in a sample by analyzing the absorption of specific wavelengths of light. It finds applications in fields such as environmental analysis, food and beverage industry, mining, and clinical research, pharmaceuticals, biochemistry, oil and petrochemical industries, enabling the quantitative analysis of trace metals and elements, identification of contaminants, and quality control in various industries requiring accurate elemental analysis.



Flow cytometry

Device Model: MACSQuant 10

Made by MILTENYI BIOTEC Company in Germany

Flow cytometry is a powerful technique used to **analyze** and **sort cells** or particles based on their physical and chemical properties as they pass through a laser-based flow cell. It finds applications in fields such as immunology, cancer research, stem cell biology, microbiology, nano-bio-technology, agriculture researches and veterinary medicine, enabling the **characterization of cell populations**, **identification of specific markers**, and **investigation of cellular functions** at a single-cell level, providing valuable insights into disease mechanisms and therapeutic development.

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Ultrasonic Homogenizer

Device Model: SONOPULS HD-4200

Made by BANDELIN Company in Germany

An Ultrasonic Homogenizer is a device that utilizes high-frequency sound waves to **disrupt** and **disperse** samples, enabling **efficient mixing, emulsification**, and cell disruption. It finds applications in fields such as biotechnology, pharmaceuticals, nanotechnology, and food science, facilitating tasks like sample preparation, particle size reduction, extraction, and dispersion, enhancing processes such as formulation development, sample analysis, and nanoparticle synthesis with precise and controlled sonic energy.





Atomic Force Microscopy (AFM)

Device Model: Full Plus

Made by ARA RESEARCH Company in Iran



Atomic Force Microscopy (AFM) is a powerful **imaging technique** that uses a tiny probe to scan surfaces, create **high-resolution topographic images at the atomic scale** and investigate of **structural and physical properties** of materials, such as **roughness, topography, and particle size**, at the **nanoscale**. It finds applications in various fields, including nanotechnology, materials science, biology, and semiconductor research, enabling studies of surface morphology, mechanical properties, and molecular interactions with exceptional precision and versatility



Osmometer

Device Model: OSMOMAT 3000

Made by GONOTEC Company in Germany



An Osmometer is a scientific instrument used to **measure the osmolality of a liquid sample**, which indicates the concentration of solutes present. It finds applications in fields such as clinical diagnostics, pharmaceuticals, and research laboratories, enabling the assessment of fluid balance, determination of osmotic pressure, and quality control of solutions in various industries including healthcare, biotechnology, and food and beverage.



X-Ray Diffraction (XRD)

Device Model: D8 ADVANCE

Made by BRUKER Company in Germany



XRD is a technique that analyzes the scattering pattern of X-rays to determine the **atomic** and **molecular structure** of **crystalline materials**. It is extensively used in fields like materials science, physics, geology, chemistry, and pharmaceuticals to investigate crystal structures, phase identification, and **lattice parameter** measurements, providing valuable insights into material composition and properties..

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