Instrumentation & Equipment

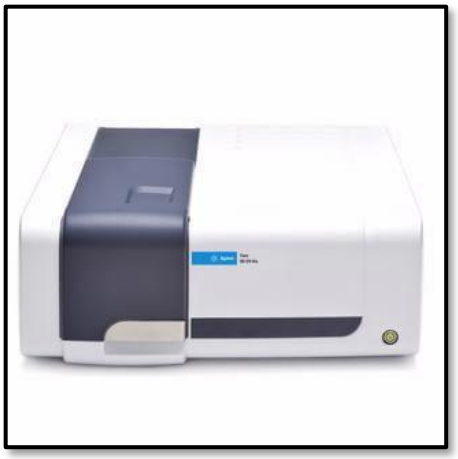
(Physics & Chemistry)

Aiken
UNIVERSITY OF SOUTH CAROLINA

Index

16	Varian CP-3380 Gas Chromatograph 1	19
17	Mbraun Labstar Glovebox	20
18	Dionex UltiMate 3000 UHPLC System	21
19	Pine Bipotentiostat (Model AFCBP1)	22
20	Table Top Atomic Force Microscope	23
21	HC-E1 Sumitomo Cryostat	24
22	Muffle furnace KSL-1200X	25
23	Heidolph Rotary Evaporator (x3)	26
24	Nima Technology Langmuir-Blodgett Trough	27
25	Horiba DeltaPro Lifetime Fluorimeter	28

Agilent Cary 60 UV-Vis Spectrophotometer



Description

The Agilent Cary 60 UV-Vis Spectrophotometer is a state-of-the-art instrument designed for precise measurement of the absorbance and transmittance of liquid samples. It is known for its exceptional speed and sensitivity, making it suitable for a variety of applications ranging from routine analysis to advanced research. The instrument uses a Xenon flash lamp, which provides several advantages, including a long lifespan and rapid data acquisition.

Details and Capabilities

- **Wavelength Range:** 190–1100 nm
- **Light Source**: Xenon flash lamp with a 3 nm bandwidth
- Fast data collection (up to 80 data points per second)
- Minimal photobleaching due to pulsed light source.
- Optional accessories for micro-volume measurements
- **Applications:** Ideal for kinetics, DNA/RNA quantitation, protein analysis, and other applications requiring high sensitivity.
- **Advantages:** Known for its speed and versatility, it can perform single and multi-component analysis with precision.

Operational Use

- **Sample Analysis**: Used to determine the concentration of solutes by measuring the absorbance at specific wavelengths.
- **Kinetics Studies:** Capable of rapid kinetic measurements, making it suitable for monitoring fast chemical reactions.

Agilent Cary 8454 UV-Vis Spectrophotometer

Description

The Agilent Cary 8454 UV-Vis Spectrophotometer is an advanced diode array spectrophotometer that offers high-speed scanning and enhanced reproducibility. It features a unique optical design that allows for simultaneous measurement of all wavelengths, which significantly reduces measurement time and increases throughput.

Details and Capabilities

- **Wavelength Range:** 190–1100 nm
- **Light Source:** Tungsten-halogen and deuterium lamps
- Diode array technology for fast, simultaneous spectral acquisition
- Automatic calibration and baseline correction
- Easy-to-use software for data analysis and reporting
- **Applications:** Used for routine and complex analytical tasks in pharmaceuticals, environmental monitoring, and chemical analysis.
- **Advantages:** Provides rapid and accurate results, making it suitable for high throughput environments.

Operational Use

- **High-Throughput Analysis:** Enables rapid measurement of multiple samples, ideal for quality control and research settings.
- **Quantitative Analysis:** Provides accurate and reproducible measurements of concentration and purity in liquid samples.

Anasazi Eft-60 Nuclear Magnetic Resonance

(NMR) Spectrometer

Description

The Anasazi Eft-60 NMR Spectrometer is a compact, user-friendly instrument designed for routine NMR analysis in educational and research laboratories. It offers robust performance and ease of use, making it suitable for both teaching and research applications.

Details and Capabilities

- **Magnetic Field Strength:** 60 MHz
- Fully automated operation with intuitive software interface
- High-resolution capabilities for detailed spectral analysis
- Compatible with a wide range of nuclei, including ^1H, ^13C, and others.
- **Applications:** Used to determine molecular structures, study reaction mechanisms, and investigate molecular dynamics.
- **Advantages:** Cost-effective and reliable, offering high-quality NMR data without the need for cryogens.

Operational Use

- **Structural Elucidation:** Helps determine the structure of organic compounds by providing information about molecular connectivity and conformation.
- **Reaction Monitoring:** Allows researchers to track changes in molecular structure during chemical reactions.

Buehler MetaServ250

Description

The Buehler MetaServ250 is a high-performance metallographic polisher and grinder designed for preparing samples for microscopic examination. It provides precise control over polishing parameters, ensuring a high-quality finish for a wide range of materials.

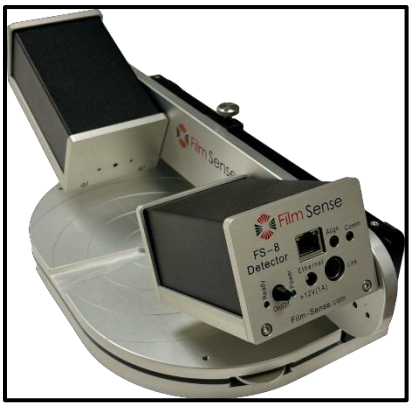
Details and Capabilities

- **Speed Control:** Variable speed from 50 to 500 RPM.
- Durable construction with a user-friendly interface
- Adjustable pressure and platen speed for optimal sample preparation
- Compatible with a variety of polishing pads and abrasives
- **Applications:** Used in metallography, materials science, and engineering for preparing samples of metals, ceramics, and composites.
- **Advantages:** Offers consistent and repeatable results, essential for accurate microstructural analysis.

Operational Use

- **Sample Preparation:** Prepares samples to a mirror-like finish for subsequent analysis using optical microscopy or scanning electron microscopy (SEM).
- **Microstructural Analysis:** Essential for examining the grain structure, phase distribution, and surface defects of materials.

Film Sense Multi-Wavelength Ellipsometer



Description

The Film Sense Multi-Wavelength Ellipsometer is an advanced instrument for characterizing thin films and coatings. It uses ellipsometry, an optical technique that measures the change in polarization of light reflected from a sample, to determine film thickness and optical constants.

Details and Capabilities

- **Wavelength Range:** Multiple wavelengths for increased accuracy and sensitivity
- Non-destructive analysis with high precision
- Capable of measuring films from sub-nanometer to micrometer thickness
- User-friendly software for data acquisition and modeling
- **Applications:** Suitable for analyzing dielectric, semiconductor, and metallic films in research and industrial settings.
- **Advantages:** Provides fast, accurate measurements with minimal sample preparation, making it ideal for both research and quality control.

Operational Use

- **Thin Film Analysis**: Determines the thickness and refractive index of thin films, essential for developing optical coatings and semiconductor devices.
- **Material Characterization:** Used in research and development to study the properties of novel materials and coatings.

Glancing Angle Deposition System

Description

The Glancing Angle Deposition (GLAD) System is a specialized physical vapor deposition (PVD) tool used to fabricate nanostructured thin films with tailored properties. By controlling the deposition angle, the system allows for the growth of highly oriented structures with unique optical, mechanical, and electrical characteristics.

Details and Capabilities

- Precise control over deposition parameters, including angle, rate, and temperature.
- Capable of fabricating films with complex nanostructures, such as helices and columns
- Advanced software for deposition process control and monitoring
- **Applications:** Used in creating coatings with specific optical, electrical, and mechanical properties for applications in sensors, optics, and electronics.
- **Advantages:** Enables the fabrication of films with controlled porosity and orientation, essential for developing advanced materials and devices.

Operational Use

- **Nanostructured Films:** Fabricates films with unique properties for applications in photonic devices, sensors, and energy storage.
- **Custom Coatings:** Develops coatings with tailored properties for specific industrial or research applications.

Harrick PDC Plasma Cleaner

Description

The Harrick PDC Plasma Cleaner is a versatile instrument used for cleaning and modifying surfaces using plasma technology. It effectively removes organic contaminants and alters surface properties, making it an essential tool for sample preparation in various fields.

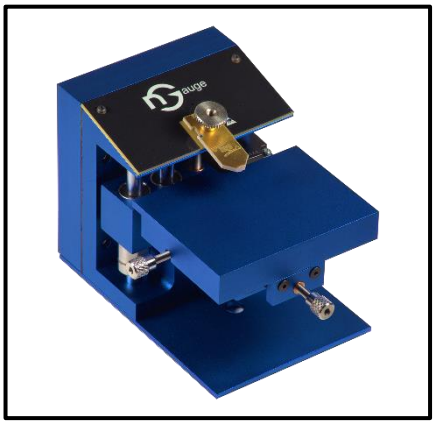
Details and Capabilities

- **Plasma Source:** Generates a low-pressure plasma for surface treatment.
- Efficiently removes organic contaminants and modifies surface chemistry.
- Simple operation with adjustable power and gas flow settings
- Compatible with a wide range of materials, including metals, polymers, and glass.
- **Applications:** Used in surface preparation for bonding, coating, and microscopy, as well as in microfabrication and nanotechnology.
- **Advantages:** Provides a clean and reactive surface without chemical residues, enhancing the quality and reliability of subsequent processes.

Operational Use

- **Surface Cleaning:** Removes contaminants from the surfaces of materials, ensuring optimal conditions for analysis or bonding.
- **Surface Activation:** Modifies surface properties to enhance adhesion or wettability, improving the performance of coatings and adhesives.

ISCPS Corp nGauge Atomic Force Microscope (AFM)



Description

The ISCPS Corp nGauge Atomic Force Microscope (AFM) is a high-resolution imaging tool used to measure surface topography and properties at the nanoscale. It provides quantitative data on surface roughness, morphology, and mechanical properties, making it invaluable for research and development in materials science and nanotechnology.

Details and Capabilities

- **Resolution:** Atomic-level resolution for detailed surface analysis
- Advanced imaging modes for measuring mechanical and electrical properties.
- Capable of operating in ambient, liquid, and vacuum environments
- Intuitive software for data acquisition and analysis
- **Applications:** Used in materials science, biology, and nanotechnology research to study surfaces and interfaces at the nanoscale.
- **Advantages:** Provides comprehensive data on surface properties, enabling researchers to develop new materials and improve existing ones.

Operational Use

- **Surface Topography**: Analyzes the surface structure of materials at the nanoscale, providing insights into surface roughness and morphology.

Perkin Elmer Analyst Spectrophotometer

Description

The Perkin Elmer Analyst 100 is a reliable atomic absorption spectrophotometer designed for elemental analysis. It is widely used in environmental, pharmaceutical, and food safety testing due to its ability to accurately detect trace elements in a variety of samples.

Details and Capabilities

- **Element Detection:** Capable of detecting metals and metalloids with high sensitivity and accuracy
- Simple operation with automatic optimization of parameters
- Robust design with advanced optics for enhanced performance
- Built-in safety features to protect users and samples.
- **Applications:** Used for analyzing trace elements in water, soil, food, and biological samples.
- **Advantages:** Offers high sensitivity and accuracy, making it suitable for a wide range of applications in research and industry.

Operational Use

- **Elemental Analysis:** Determines the concentration of metals and metalloids in samples, ensuring compliance with safety standards and regulations.
- **Quality Control:** Provides reliable data for quality assurance in various industries, including pharmaceuticals, food, and environmental monitoring.

Renishaw inVia

Raman Microscope

Description

The Renishaw inVia Raman Microscope is a powerful tool for molecular and material characterization using Raman spectroscopy. It offers high spatial resolution and sensitivity, making it ideal for detailed spectral mapping and analysis of complex samples.

Details and Capabilities

- **Spectral Range:** Covers a wide range of Raman shifts for comprehensive analysis.
- High spatial resolution for detailed imaging and mapping
- Advanced optical design for enhanced sensitivity and accuracy
- User-friendly software for data acquisition and interpretation
- **Applications:** Used in materials science, pharmaceuticals, and forensic analysis to identify chemical compounds and study material properties.
- **Advantages:** Provides non-destructive analysis with minimal sample preparation, preserving the integrity of valuable samples.

Operational Use

- **Molecular Identification:** Identifies chemical compounds and structures, providing insights into molecular composition and interactions.
- **Material Characterization:** Analyzes the composition and properties of materials, aiding in the development of new products and processes.

StellarNet Fluor-System

Fluorescence Spectrometer

Description

The StellarNet Fluor-System is a compact, portable fluorescence spectrometer designed for measuring the fluorescence emission of samples. It offers high sensitivity and fast data acquisition, making it suitable for a wide range of applications in research and industry.

Details and Capabilities

- **Wavelength Range:** Broad range for excitation and emission measurements
- Portable design with high sensitivity and fast response time
- Modular system with customizable components for specific applications
- Easy-to-use software for data collection and analysis
- **Applications:** Used in biochemistry, environmental monitoring, and materials science for fluorescence analysis and quantitative measurements.
- **Advantages:** Provides reliable results with minimal setup and maintenance, making it ideal for both field and laboratory use.

Operational Use

- **Fluorescence Analysis:** Measures the emission spectra of fluorescent compounds, providing information on molecular structure and interactions.
- **Quantitative Analysis:** Determines the concentration of fluorescent molecules in samples, aiding in research and quality control.

Thermo Scientific Barnstead Smart2Pure Water Purifier

Description

The Thermo Scientific Barnstead Smart2Pure Water Purifier is an advanced water purification system designed to provide ultrapure water for laboratory use. It combines multiple purification technologies to produce high-quality water suitable for a variety of applications.

Details and Capabilities

- **Purity Level:** Produces Type 1 and Type 2 pure water.
- Integrated UV lamp and ion exchange technologies for high purity
- Compact design with easy installation and maintenance
- User-friendly interface with real-time monitoring of water quality
- **Applications**: Used in analytical chemistry, molecular biology, and other laboratory applications requiring high-purity water.
- **Advantages:** Provides reliable and efficient water purification, ensuring consistent quality for critical laboratory processes.

Operational Use

- **Laboratory Water Supply:** Provides ultrapure water for experiments, instrument use, and sample preparation, ensuring the accuracy and reliability of analytical results.
- **Sample Preparation:** Ensures high-quality water for sensitive analyses, minimizing the risk of contamination and interference.

Thermo Scientific LTQ XL Mass Spectrometer

Description

The Thermo Scientific LTQ XL Mass Spectrometer is a versatile instrument known for its high sensitivity and fast scan speed. It is widely used in proteomics, metabolomics, and drug development for identifying and quantifying molecules in complex mixtures.

Details and Capabilities

- **Ionization Methods:** Supports multiple ionization techniques, including electrospray ionization (ESI) and atmospheric pressure chemical ionization (APCI)
- Advanced ion trap technology for detailed mass analysis
- High-resolution capabilities for accurate identification and quantification
- Comprehensive software suite for data analysis and interpretation
- **Applications:** Used in a variety of fields, including pharmaceuticals, biotechnology, and environmental analysis, for studying complex biological and chemical systems.
- **Advantages:** Provides high-resolution, accurate mass analysis with excellent sensitivity, making it suitable for both qualitative and quantitative applications.

Operational Use

- **Mass Analysis:** Identifies and quantifies molecules in complex mixtures, providing insights into the composition and structure of biological and chemical samples.

Thermo Scientific

Nicolet 380 ATR-FT-IR

Description

The Thermo Scientific Nicolet 380 is an FT-IR spectrometer equipped with ATR (Attenuated Total Reflectance) technology, allowing for easy and non- destructive sample analysis. It is widely used in material identification, quality control, and chemical analysis.

Details and Capabilities

- **Spectral Range:** Mid-infrared range for comprehensive molecular analysis
- ATR accessory for quick, non-destructive measurements
- High sensitivity and resolution for detailed spectral analysis
- Intuitive software for data acquisition and interpretation
- **Applications:** Used in a variety of fields, including pharmaceuticals, polymers, and environmental analysis, for identifying and quantifying chemical compounds.
- **Advantages:** Provides fast and convenient analysis with minimal sample preparation, making it suitable for routine and complex analytical tasks.

Operational Use

- **Chemical Analysis:** Identifies functional groups and chemical bonds in samples, providing insights into molecular structure and composition.
- **Quality Control:** Verifies the composition and purity of materials, ensuring compliance with industry standards and regulations.

Thermo Scientific Nicolet FT-IR Spectrophotometer

Description

The Thermo Scientific Nicolet 4700 FT-IR Spectrophotometer is a high- performance instrument for infrared spectral analysis. It offers exceptional sensitivity and resolution, making it suitable for a wide range of applications in research and industry.

Details and Capabilities

- **Spectral Range:** Mid-infrared to far-infrared range for comprehensive analysis
- High-performance optics for enhanced sensitivity and accuracy
- Versatile sampling accessories for diverse applications
- User-friendly software for data acquisition and analysis
- **Applications:** Used in pharmaceuticals, polymers, petrochemicals, and environmental analysis for identifying and quantifying chemical compounds.
- **Advantages:** Provides reliable and accurate results, making it an essential tool for research and quality control.

Operational Use

- **Molecular Characterization:** Analyzes the composition and properties of materials, providing insights into molecular structure and interactions.
- **Quality Assurance:** Ensures compliance with industry standards and regulations by verifying the composition and purity of products.

Varian CP-3380 Gas Chromatograph 1

Description

The Varian CP-3380 Gas Chromatograph is a versatile instrument used for separating and analyzing volatile compounds in complex mixtures. It is widely used in environmental, pharmaceutical, and petrochemical analysis.

Details and Capabilities

- **Detection Methods:** Compatible with various detectors, including FID, TCD, and ECD
- Flexible configuration with multiple column and detector options
- Advanced software for data acquisition and analysis
- Robust design for reliable operation and minimal maintenance
- **Applications:** Used for analyzing gases, liquids, and solids in a variety of industries, including environmental monitoring, pharmaceuticals, and petrochemicals.
- **Advantages:** Provides high-resolution separation and accurate quantification of volatile compounds, making it suitable for both research and quality control.

Operational Use

- **Compound Separation:** Separates and analyzes volatile compounds in complex mixtures, providing insights into their composition and concentration.
- **Environmental Monitoring:** Detects and quantifies pollutants in air, water, and soil samples, aiding in environmental protection and compliance.

Mbraun Labstar Glovebox

Description

The Mbraun Labstar Glovebox is a controlled atmosphere enclosure designed for handling sensitive materials in a moisture- and oxygen-free environment. It provides a safe and reliable workspace for research and development in materials science, chemistry, and electronics.

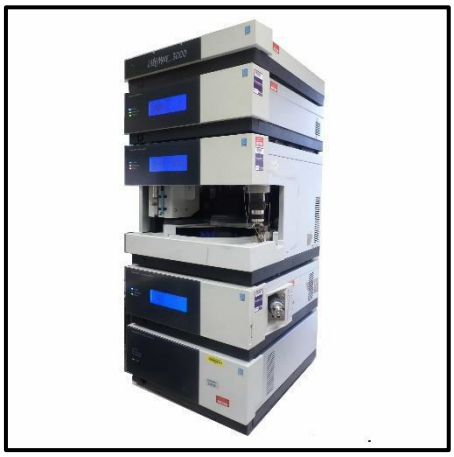
Details and Capabilities

- **Atmosphere Control:** Maintains low levels of moisture and oxygen with integrated gas purification systems.
- Ergonomic design with large viewing windows and glove ports
- Integrated gas purification system for maintaining a clean atmosphere.
- Advanced control system for monitoring and maintaining environmental conditions.
- **Applications:** Used for handling air-sensitive materials, such as organometallic compounds, catalysts, and semiconductors, in research and development.
- **Advantages:** Provides a safe and controlled environment for handling sensitive materials, ensuring the integrity and quality of experimental results.

Operational Use

- **Air-Sensitive Handling:** Enables safe handling of air-sensitive materials, preventing contamination and degradation.
- **Material Synthesis:** Supports the synthesis and processing of sensitive compounds and materials, facilitating research and development in advanced materials.

Dionex UltiMate 3000 UHPLC System



Description

The Dionex UltiMate 3000 UHPLC System is a high-performance liquid chromatography system designed for fast and accurate analysis of complex samples. It offers high resolution and sensitivity, making it suitable for a wide range of applications in pharmaceuticals, biotechnology, and environmental analysis.

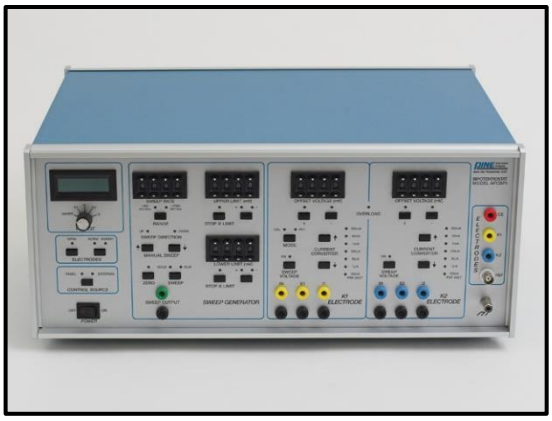
Details and Capabilities

- **Pressure Range:** Up to 1000 bars for high-resolution separations.
- Advanced pump technology for precise flow control
- High-resolution detectors for accurate quantification and identification
- User-friendly software for method development and data analysis
- **Applications:** Used for analyzing complex mixtures in pharmaceuticals, biotechnology, and environmental monitoring.
- **Advantages:** Provides fast and reliable separations with high resolution and sensitivity, making it ideal for both research and quality control.

Operational Use

- **Sample Analysis:** Separates and quantifies components in complex mixtures, providing insights into their composition and concentration.
- **Method Development:** Supports the development of analytical methods for new compounds and formulations, aiding in research and development.

Pine Bipotentiostat (Model AFCBP1)



Description

The Pine Bipotentiostat (Model AFCBP1) is an advanced electrochemical instrument used for studying electrochemical reactions and characterizing materials. It offers precise control over potential and current, making it suitable for a wide range of electrochemical applications.

Details and Capabilities

- **Control Modes:** Potentiostatic and galvanostatic control for versatile electrochemical measurements.
- High accuracy and resolution for detailed electrochemical analysis
- Compatible with a wide range of electrodes and cells
- Intuitive software for data acquisition and analysis
- **Applications:** Used in research and development of batteries, fuel cells, and sensors, as well as in corrosion studies and electroplating.
- **Advantages:** Provides precise control and accurate data, enabling researchers to study and optimize electrochemical processes.

Operational Use

- **Electrochemical Analysis:** Studies electrochemical reactions and processes, providing insights into reaction mechanisms and kinetics.
- **Material Characterization:** Characterizes the electrochemical properties of materials, aiding in the development of modern technologies and devices.

Table Top Atomic Force Microscope

Description

The Table Top Atomic Force Microscope (AFM) is a compact, easy-to-use instrument designed for high-resolution imaging and measurement of surfaces at the nanoscale. It offers a wide range of imaging modes and capabilities, making it suitable for various applications in materials science, biology, and nanotechnology.

Details and Capabilities

- **Resolution:** Atomic-level resolution for detailed surface analysis
- Compact design with easy setup and operation
- Multiple imaging modes, including tapping and contact modes.
- User-friendly software for data acquisition and analysis
- **Applications:** Used in materials science, biology, and nanotechnology research to study surfaces and interfaces at the nanoscale.
- **Advantages:** Provides high-resolution imaging and measurement capabilities in a compact, easy-to-use package, making it ideal for educational and research settings.

Operational Use

- **Surface Topography:** Analyzes the surface structure of materials at the nanoscale, providing insights into surface roughness and morphology.
- **Material Properties**: Measures mechanical properties such as stiffness and elasticity, as well as electrical properties like conductivity.

HC-E1 Sumitomo Cyostat

Description

The HC-E1 Sumitomo Cryostat is a high-performance cryogenic system designed for cooling samples to extremely low temperatures. It provides a stable and controlled environment for experiments requiring low temperatures, making it essential for research in materials science, physics, and superconductivity.

Details and Capabilities

- **Temperature Range:** Capable of reaching temperatures as low as 1.5 K
- High cooling power and stability for reliable operation
- Compatible with a variety of sample holders and experimental setups
- Advanced control system for precise temperature regulation
- **Applications:** Used in research on superconductivity, low-temperature physics, and materials science, as well as in quantum computing and other advanced technologies.
- **Advantages:** Provides a stable and controlled low-temperature environment, enabling researchers to study phenomena that occur at cryogenic temperatures.

Operational Use

- **Low-Temperature Experiments:** Supports experiments requiring low temperatures, such as superconductivity research and quantum computing studies.

Muffle Furnace

KSL-1200X

Description

The Muffle Furnace KSL-1200X is a high-temperature furnace designed for heat treatment and thermal processing of materials. It provides precise temperature control and uniform heating, making it suitable for a wide range of applications in research and industry.

Details and Capabilities

- **Temperature Range:** Capable of reaching temperatures up to 1200°C
- High-temperature uniformity and stability for consistent results
- Programmable temperature control for precise thermal processing
- Durable construction for reliable operation and long service life
- **Applications:** Used in materials science, ceramics, metallurgy, and other fields for heat treatment, sintering, and thermal analysis.
- **Advantages:** Offers reliable and precise high-temperature processing, essential for developing and characterizing advanced materials.

Operational Use

- **Heat Treatment:** Supports the heat treatment and sintering of materials, enhancing their properties and performance.
- **Thermal Analysis:** Provides controlled heating for thermal analysis and characterization, aiding in research and development.

Heidolph Rotary Evaporator

Description

The Heidolph Rotary Evaporator is a versatile instrument used for distillation and solvent evaporation. It offers efficient and reliable performance, making it suitable for a wide range of applications in chemistry, biology, and pharmaceuticals.

Details and Capabilities

- **Evaporation Capacity**: Capable of handling large volumes of solvent with high efficiency
- Precise temperature and vacuum control for optimal evaporation
- Easy-to-use design with intuitive controls and safety features
- Compatible with a variety of glassware and accessories
- **Applications:** Used in chemical synthesis, purification, and concentration of samples, as well as in natural product extraction and solvent recycling.
- **Advantages:** Provides efficient and reliable evaporation with minimal operator intervention, making it ideal for both research and production settings.

Operational Use

- **Solvent Evaporation:** Efficiently removes solvents from samples, concentrating and purifying compounds for analysis or further processing.
- **Chemical Synthesis:** Supports chemical synthesis and purification by enabling efficient removal of solvents and volatile components.

Nima Technology Langmuir

Description

The Nima Technology Langmuir-Blodgett Trough is an advanced instrument used for creating and studying thin films and monolayers at the air-water interface. It provides precise control over film deposition, making it essential for research in materials science and nanotechnology.

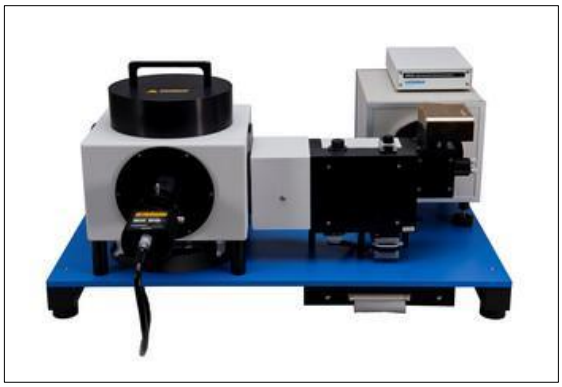
Details and Capabilities

- **Film Deposition:** Capable of creating high-quality monolayers and multilayers with precise control
- Advanced control system for accurate film deposition and manipulation
- Compatible with a wide range of materials, including lipids, polymers, and nanoparticles.
- User-friendly software for data acquisition and analysis
- **Applications:** Used in research on thin films, surfactants, and biomolecular interactions, as well as in the development of sensors and nanodevices.
- **Advantages:** Provides precise control over film deposition and manipulation, enabling researchers to study and develop advanced materials and devices.

Operational Use

- **Thin Film Studies:** Supports the creation and study of thin films and monolayers, providing insights into their structure and properties.
- **Material Development:** Aids in the development of advanced materials and devices by enabling precise control over film deposition and manipulation.

Horiba DeltaPro Lifetime Fluorimeter



Description

The Horiba DeltaPro Lifetime Fluorimeter is a high-performance instrument designed for precise fluorescence lifetime measurement using Time-Correlated Single Photon Counting (TCSPC) technology. It provides detailed insights into molecular interactions, energy transfer, and environmental effects on fluorescence, making it a valuable tool for researchers in chemistry, biology, and materials science. The DeltaPro's modular and compact design offers flexibility for various applications, with high sensitivity for detecting low-intensity fluorescence signals.

Details and Capabilities

- **Lifetime Measurement Range:** Picoseconds to nanoseconds
- **Light Source:** Pulsed laser diodes or LEDs
- **Detection:** TCSPC technology
- **Spectral Range:** UV, visible, and near-infrared
- High sensitivity for low-intensity signals
- **Applications:** Molecular interactions, energy transfer, and environmental sensing
- **Advantages:** Modular design, flexibility, and precision

Operational Use

- **Fluorescence Decay Analysis**: Measures molecular fluorescence decay to assess dynamic processes.
- **Material Science & Biophysics**: Ideal for studying nanomaterials, proteins, and molecular interactions.