ASAP 2020 Plus

micromeritics®

SOPHISTICATED DESIGN, INTUITIVE OPERATION, RESEARCH-GRADE RESULTS

ASAP® 2020 Plus: Accelerated Surface Area and Porosimetry System

The Micromeritics ASAP 2020 Plus integrates a variety of automated gas sorption techniques into a single, but powerful, table top instrument. The system is designed to provide high-quality surface area, porosity, and chemisorption isotherm data to materials analysis laboratories with ever-expanding analytical requirements.

The ASAP 2020 Plus provides maximum versatility over a remarkable range of applications to meet your specific needs.

With more installed instruments in more countries for more users, the ASAP family of products have proven to be the instruments of choice worldwide when researchers require precise, high-quality gas adsorption data.

*Shown with optional cold trap for use with oil-based pumps.

Design Versatility

- Two independent vacuum systems permit simultaneous preparation of two samples while analyzing another. This maximizes your personnel productivity and your return on time invested
- Continuous saturation pressure (P_0) monitoring and unique Isothermal Jacket Cold Zone Control provide a stable thermal environment for both saturation pressure and adsorption. Spend time on results instead of controlling temperature variations
- The ASAP 2020 Plus is configurable with many optional accessories to meet your specific analytical requirements

Advanced Capabilities through Optional Configurations

The ASAP 2020 Plus can be configured to your specific needs with the option of upgrading at a later date as your analytical requirements change, maximizing the utility of this instrument and your investment.

Choose from low surface area, to heated vapor, to micropore capability. Add a cryostat, an external detector, or configure the unit for enhanced chemical resistance when working with aggressive vapors. The ASAP 2020 Plus permits one instrument to accommodate almost any surface characterization need in your lab.

Unique and Innovative Isothermal Jacket Cold Zone Control

Isothermal jackets are guaranteed for the life of the instrument and ensure a constant thermal profile along the full length of both the sample and saturation pressure (P_0) tubes.

Partnership and Support Network

- Expertise in application assistance is only a phone call away. Every Micromeritics instrument is backed by a dedicated, knowledgeable staff of experts
- Responsive worldwide service and technical support provides the needed security and peace of mind for you, our customers, ensuring that your sample and product development pathways continue to progress
- Referenced in an extensive number of peer-reviewed articles in prestigious journals, your ASAP 2020 will link you to a large and growing community of users

MicroActive for ASAP 2020 Plus

Interactive Data Reduction Software

Micromeritics' innovative MicroActive software allows you to interactively evaluate isotherm data. You can easily include or exclude data, fitting the desired range of experimentally acquired data points using interactive, movable calculation bars. The isotherm can be viewed real-time on either a linear or logarithmic scale, available to you under each calculation model.

Physisorption Reports

- Isotherm
- BET Surface Area
- Langmuir Surface Area
- t-Plot
- Alpha-S Method
- BJH Adsorption and Desorption
- Dollimore-Heal Adsorption and Desorption
- Temkin and Freundlich
- Horvath-Kawazoe
- MP-Method
- DFT Pore Size and Surface Energy
- Dubinin-Radushkevich
- Dubinin-Astakhov
- User Defined Reports

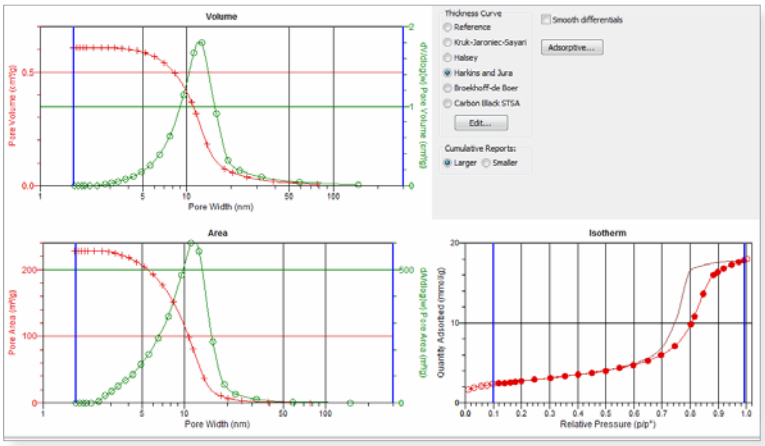
MicroActive for ASAP 2020 Plus: Chemisorption

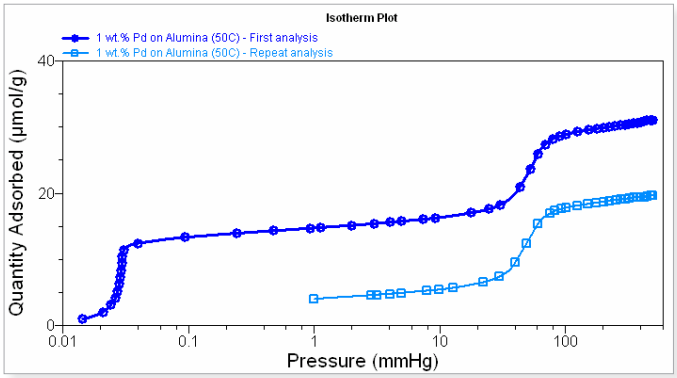
MicroActive provides you with direct access and manipulation of chemical adsorption isotherm data. Unified Analysis Conditions for physical and chemical analyses allows you to rapidly develop new methods with a common interface.

Reported Data Include:

- Active Metal Surface Area
- Average Crystallite Size
- Irreversible and Reversible Sorption
- Monolayer Capacity
- Active Metal Dispersion

Calculations can be easily generated and adjusted. The selection bars allow for a range of data points to be quickly and easily selected.



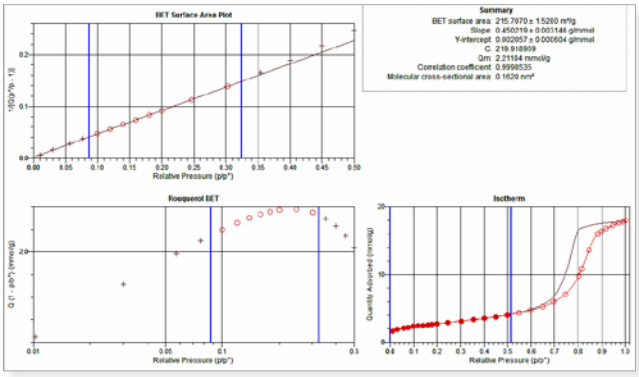


Data Reduction Features

- Interaction with adsorption data is direct. By simply moving the calculation bars, the user is immediately updated with new textual properties. One-click access to important parameters

- Interactive data manipulation minimizes the use of dialog boxes and tunneling of dialogs to specify calculation parameters

- Improved ability to overlay files (up to 25) including mercury intrusion data with a file add-and-subtract feature and data from competitive instruments



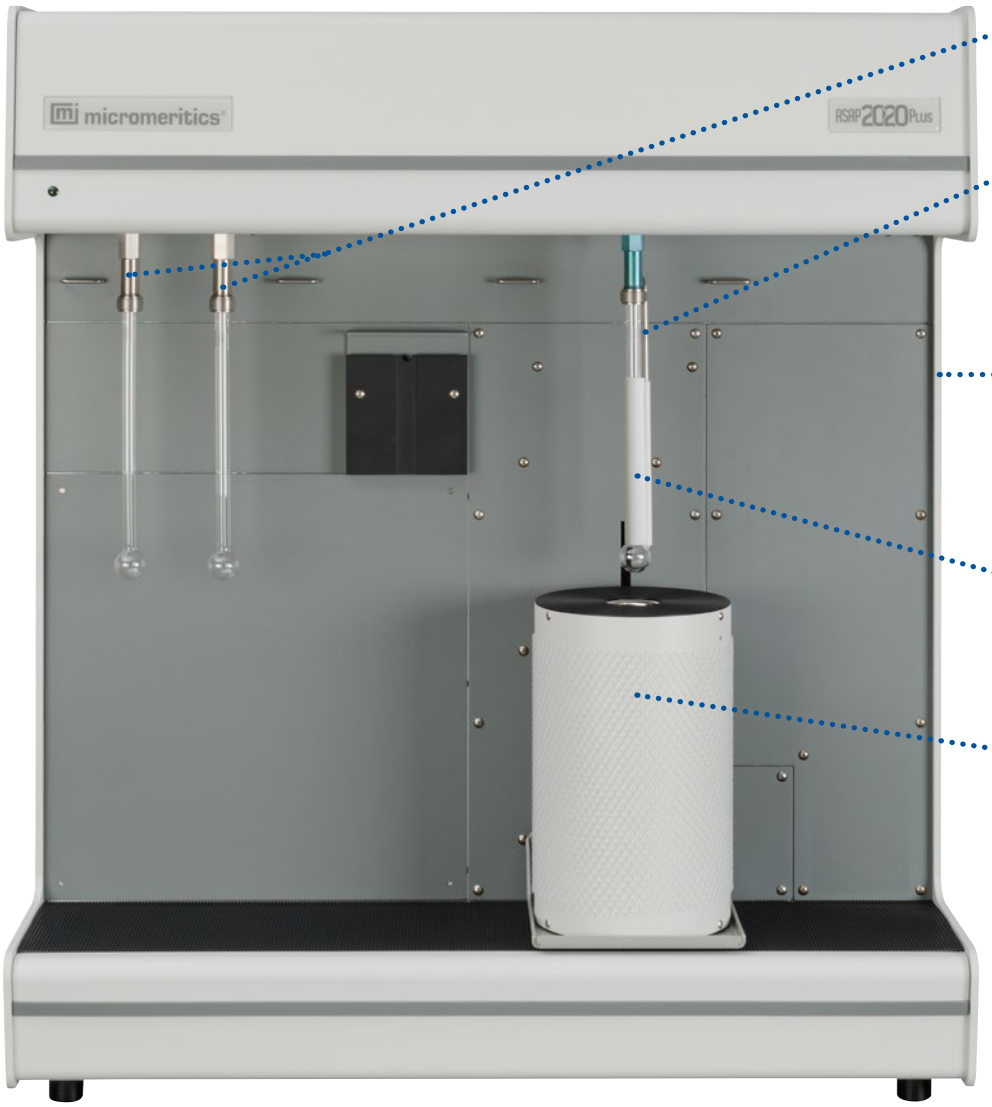
- User-selectable data ranges through the graphic interface allow direct modeling for BET, t-Plot, Langmuir, DFT interpretation, and much more. The MicroActive suite provides an extensive selection of NLDFT models for calculating pore size distributions

- Report Options editor allows the user to define reports with on-screen previews. Each report has the ability to possess one summary, tabular, and graphical information pane

- Powerful Python programming language allows you to develop extensions to the standard report available within the ASAP 2020 Plus MicroActive application

ASAP 2020 PLUS – PHYSISORPTION

Research grade results in a customer-configurable instrument to meet a wide variety of applications for mesopore, micropore, and low surface area applications.



Programmable two-station degas system for automated SOP sample preparation

A dedicated P_0 sensor allows for a faster analysis and provides P_0 values at the same conditions as the adsorption measurement

Six analysis gas inlets with dedicated vapor and helium free-space ports provide greater flexibility and automated selection of pretreatment, backfill, and analysis gases

Proven Isothermal Jacket Cold Zone Control provides accurate, reproducible temperature maintenance

Long duration and refillable dewar provides virtually unlimited time-of-analysis capability

Standard, independent dual vacuum systems (one for analysis, one for sample pretreatment). Standard dry pump design eliminates the need for cold trap

Proprietary transducer system provides unequalled stability, fast response, and low hysteresis for improved accuracy and signal to noise improvement

Coated monolithic, temperature-controlled, stainless-steel manifold provides non-contaminating, inert surface areas

Specifications

Pressure Measurement:
0 to 950 mmHg

Resolution: Up to 1×10^{-7} torr (0.1 mmHg transducer)

Accuracy: › 0.15% of reading

Degas System: Ambient to 450 °C, 1 °C increments

System Capacity:
1 analysis, 2 degas ports

Cryogen System: 3 L, › 72 hr. dewar, unlimited time with refilling during analysis

Stable Cold Zone Temperature Environment: Isothermal jacket for cold space control

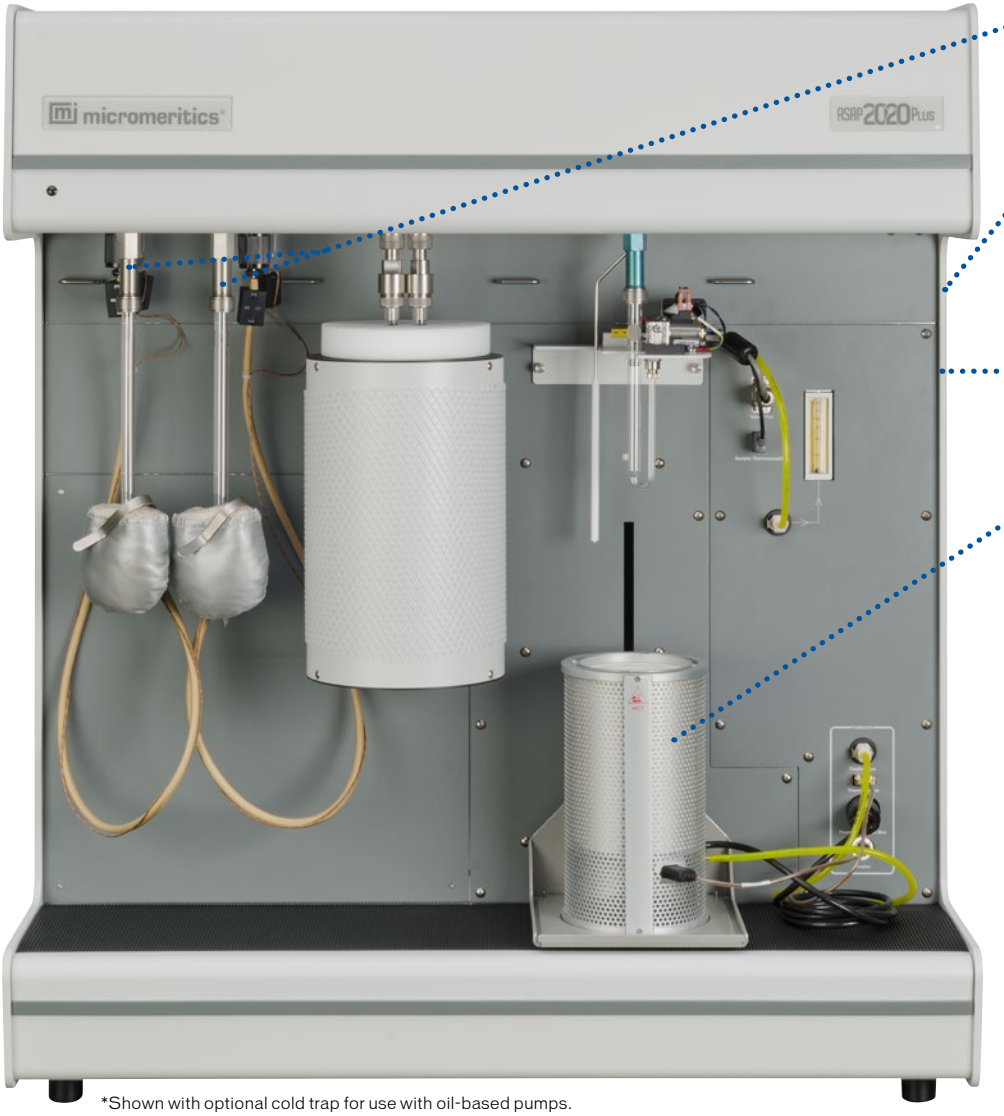
Continuous P_0 monitoring

Optional Cryostat
A single-stage cryogenic refrigerator that operates on the Gifford-McMahon refrigeration cycle. It uses helium gas from a helium compressor(s) to offer a wide range of analytical temperatures with milli Kelvin levels of stability.

*Due to continuous improvements, specifications are subject to change without notice.

ASAP 2020 PLUS - CHEMISORPTION

The ASAP 2020 Plus Chemisorption option permits you to obtain valuable information about the physical and chemical properties of your catalyst, catalyst support, adsorbents, and other materials. Its unique design provides a high level of system cleanliness to permit low-pressure chemisorption isotherms.



*Shown with optional cold trap for use with oil-based pumps.

Programmable, two-station degas system allows physisorption sample preparation while running a chemisorption analysis

Twelve gas inlets allow multiple probe gases to be investigated maximizing efficiency and range of applications

Dedicated exhaust port for external detector connections

High-temperature 1100 °C furnace rapidly ramps to temperature and provides excellent, stable temperature and control with quick cool downs

In situ chemisorption sample preparation and activation provide a fully automated method that does not require user intervention

Design permits quick and easy transition from chemisorption to physisorption analysis

Designed for Expanding Needs

HighVac Option
Equipped with a 10-mmHg transducer and a high vacuum pump. This system provides the low-pressure capability and pressure-measurement resolution required for low surface area analyses using krypton as the adsorptive.

Micropore Option
Includes a 0.1-mmHg transducer and a high vacuum pump. This system delivers accurate porosity data on pores between 0.35 and 3 nanometers and provides a comprehensive selection of micropore reports.

Enhanced Chemical Resistance Option
The stainless-steel manifold is available with chemically resistant Kalrez® seals to support analyses using aggressive gases or vapors as the adsorptive.

Vapor Adsorption Option
Includes optional vapor accessories.

Cold Trap Option
Cold trap option available for your specific application.

Specifications

Pressure Measurement:
0 to 950 mmHg

Resolution: Up to 1×10^{-7} torr (0.1-mmHg transducer)

Accuracy: › 0.15% of reading

Degas System: Ambient to 450 °C, 1 °C increments

System Capacity:
1 analysis, 2 degas ports

Sample Temperature: Ambient + 10 °C to 1100 °C, >1 °C increments

Control: Ramp up to
20 °C/min to 800 °C
10 °C/min to 1000 °C
5 °C/min to 1100 °C

*Due to continuous improvements, specifications are subject to change without notice.

*Shown with optional cold trap for use with oil-based pumps.

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