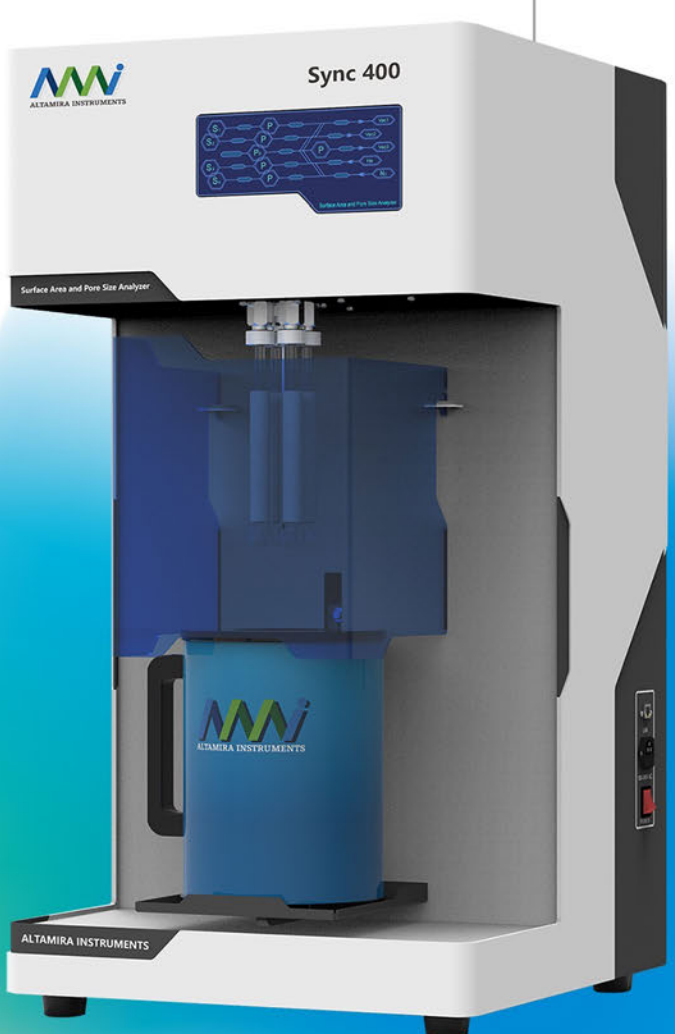
ALTAMIRA INSTRUMENTS

Specific Surface Area And Pore Size Analyzer

Sync series

Pore size range
0.35-500nm

Specific surface area
>0.0005㎡/g



Altamira Instruments, LLC

Sync Series

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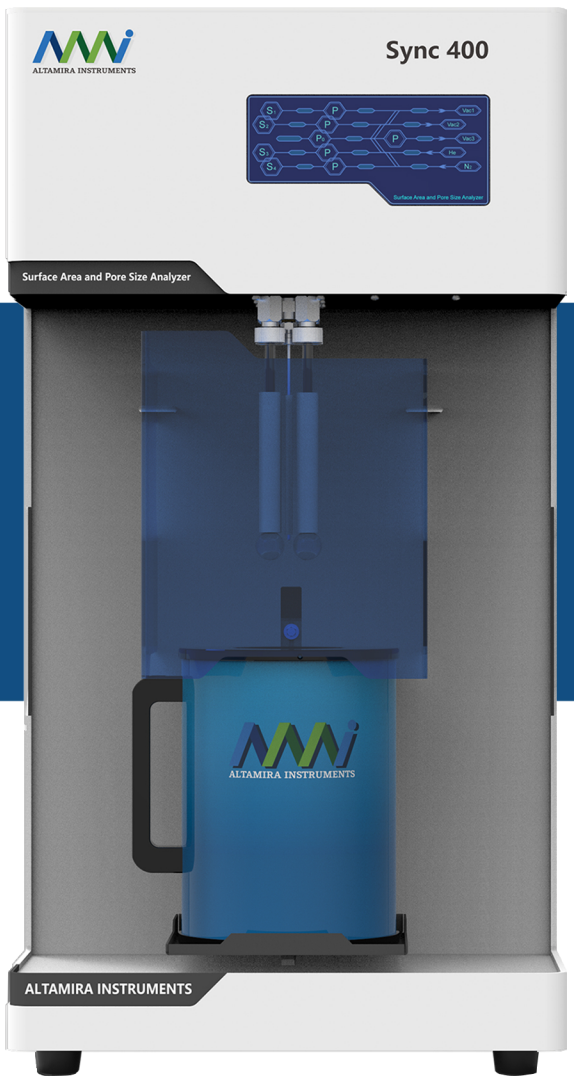
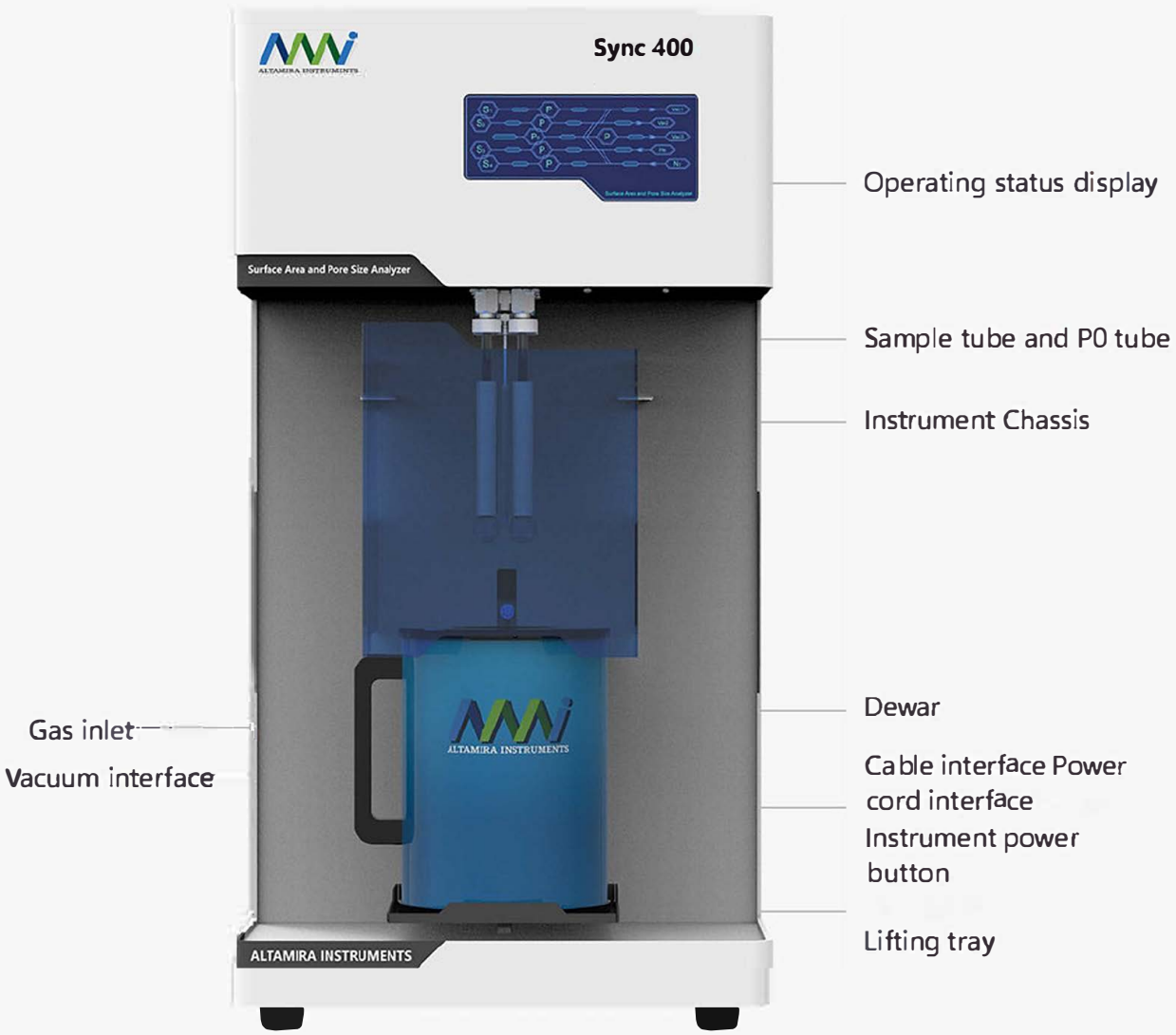


ALTAMIRA INSTRUMENTS

Overview

The Sync series of specific surface area and pore size analyzers, are the latest instruments introduced by Altamira to characterize the surface properties and pore structure of micro to nano materials. The static-volumetric gas adsorption method is used in Sync series to analyze the adsorption behavior of materials. During the test, samples share the same Dewar and the same gas source, ensuring the accuracy and repeatability of the analysis test, and truly achieve no differential analysis between multiple stations.

The Sync

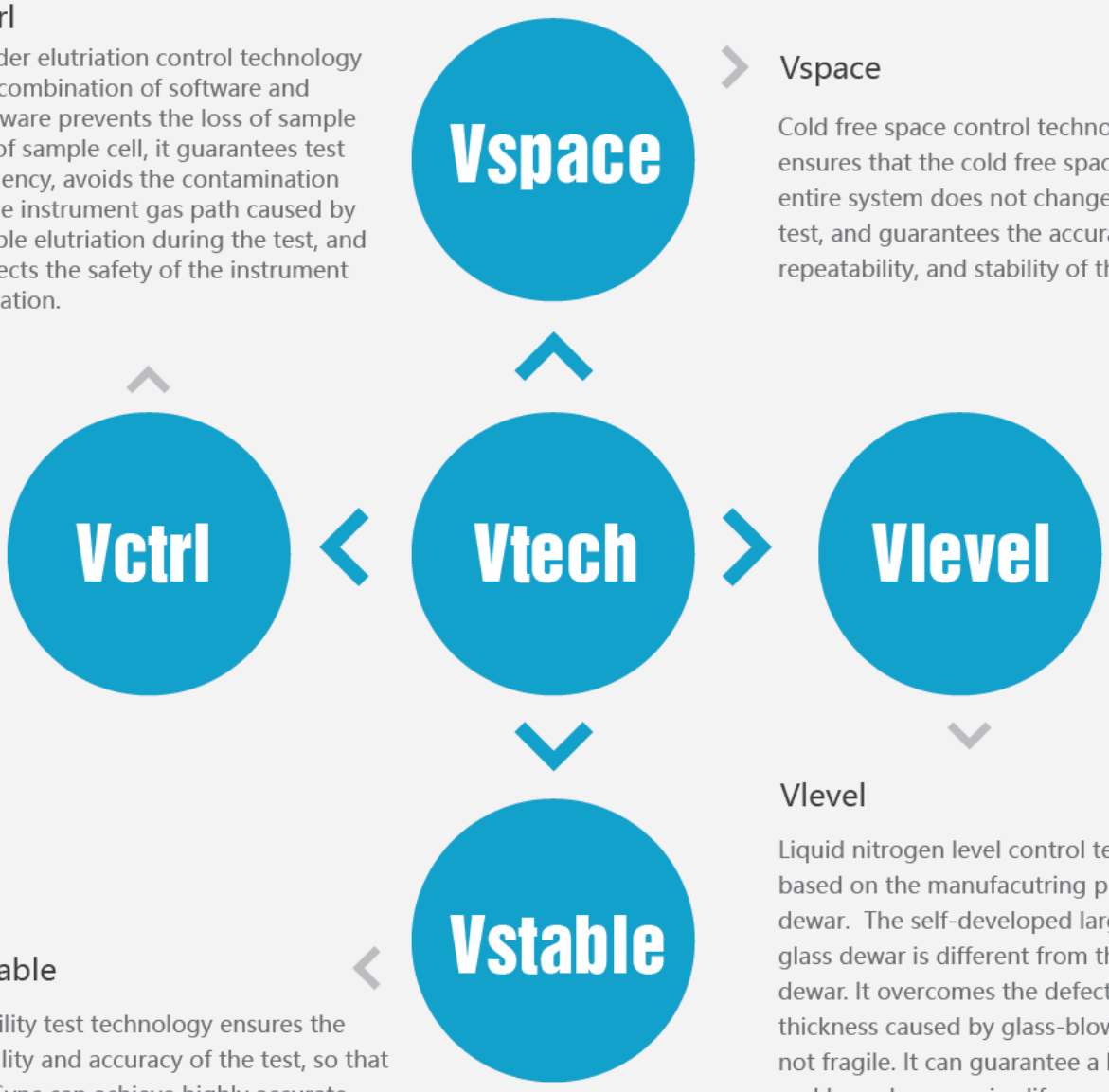


Technical Superiority

Unique technology, including: Vspace-free space control technology, Vlevel-liquid nitrogen level control technology, Vstable-stability test technology, and Vctrl-powder elutriation control technology further enhances the test efficiency of the Sync. This technology guarantees more repeatable and stable test results. In addition it can better meet the test requirements of macroporous materials.

Vctrl

Powder elutriation control technology The combination of software and hardware prevents the loss of sample out of sample cell, it guarantees test efficiency, avoids the contamination of the instrument gas path caused by sample elutriation during the test, and protects the safety of the instrument operation.



Vspace

Cold free space control technology ensures that the cold free space of the entire system does not change during the test, and guarantees the accuracy, repeatability, and stability of the analysis.

Vlevel

Liquid nitrogen level control technology based on the manufacutring process of the dewar. The self-developed large capacity glass dewar is different from the standard dewar. It overcomes the defect of uneven thickness caused by glass-blowing and is not fragile. It can guarantee a high vacuum and has a long service life.

Vstable

Stability test technology ensures the stability and accuracy of the test, so that the Sync can achieve highly accurate results for macro-porous materials, such as white carbon black and alumina, achieve greater repeatability and stability, and permit the analysis of materials above with pore sizes above 50nm.

Features

High test efficiency

Up to four samples can be analyzed simultaneously, so that the BET specific surface area test efficiency is up to 20min /sample, meeting the requirements of customers with large sample bottlenecks in the fields of production and scientific research.

Safety

To ensure the safety of users,
(1) Independently-operated safety protection software can remotely monitor the operating status of the instrument. When the instrument indicates an abnormal pressure or other possible dangers, the software can automatically control the instrument, thus removing the unsafe condition and protecting the safety of the instrument and the operator.
(2) The protecting casing of the dewar prevents the danger of splashing of the low temperature liquid during the operation of the instrument.

Real time monitoring of P0

An independent P0 sensor allows for real-time monitoring of p0 during the test and eliminates the influence of ambient temperature and atmospheric pressure on the results.

Multi-channel inlet

The user can choose the multi-channel gas intake option, which permits the user to switch between various adsorbed gases.

Visual display of operating status

A status display system on the front panel of the instrument shows the working diagram of the instrument. The LED light on the display system is used to indicate the status (on-off) of the valves. Th operating process of the instrument can be easily observed during the test process.

Linkable and remote access

The communication interface of the instrument is an Ethernet port, which can be controlled via a lab computer.

Independent vacuum degasser

The standard configuration is with a completely independent vacuum degasser which can heat the sample by programmable temperature ramps. Having a stand-alone degasser is more flexible and convenient for sample pretreatment, and at the same time reduces the time caused by in-situ degassing on the analysis port, significantly improving test efficiency.

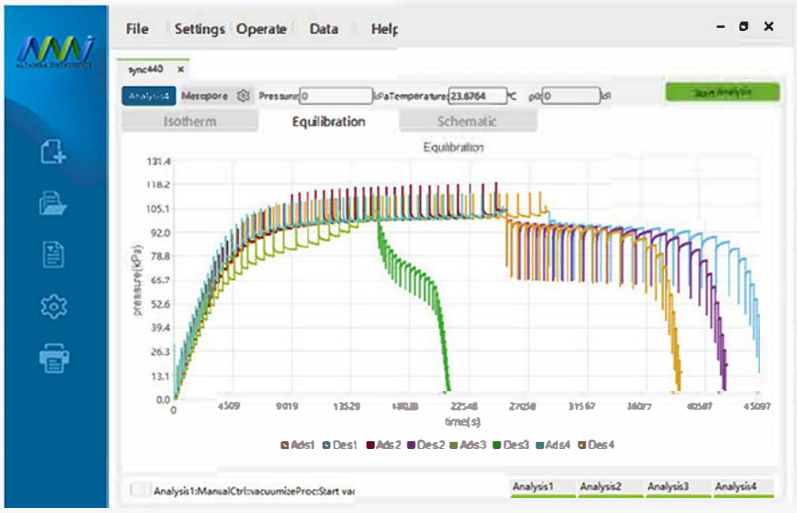
Control / Analysis Software

The newly developed Sync control software implements control, data collection, calculation analysis, and report preview on the Windows platform, and has unique experimental monitoring functions.

Real-time monitoring

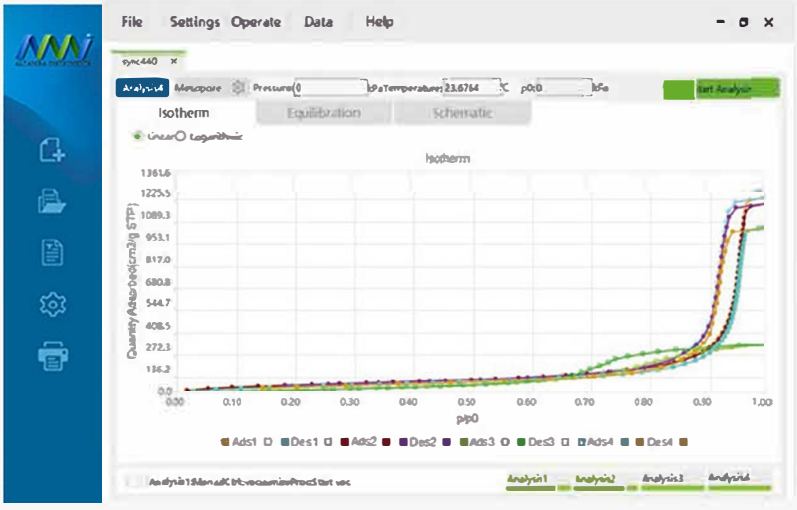
Pressure balance

The software has an independent interface to display the adsorption equilibrium process of each sample in real time. This can help to understand the adsorption characteristics of the sample in real time, analyze the abnormal phenomena such as gas leaks, insufficient pretreatment during the sample adsorption process, and monitor the operation of the instrument during the experiment.



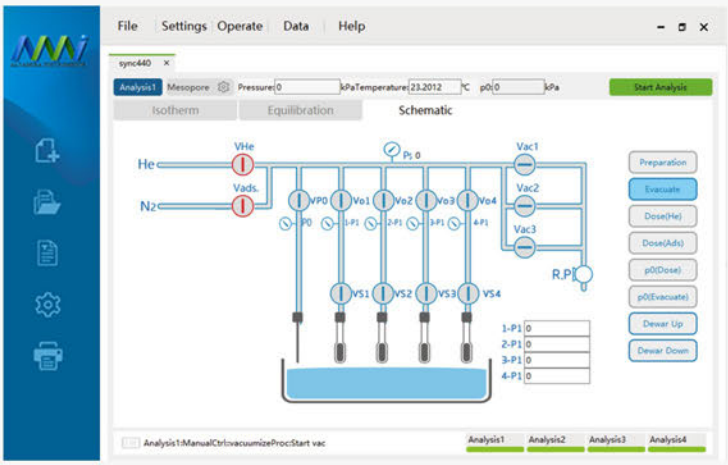
Adsorption isotherm

The software has an independent interface to display the adsorption isotherms of each sample in real time, show the experiment progress and adsorption results in real time, helping to determine the experimental abnormalities such as air leaks and cold free space changes.



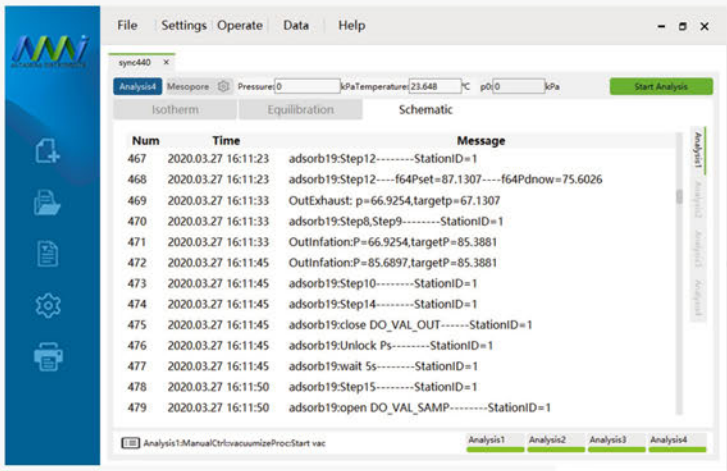
Manual control

Different from other manual on / off valve control, Sync software provides a series of combined automatic control processes, which facilitates users to perform manual operations for multiple purposes, greatly reducing the probability of manual operations failures. During the test, users can visually observe the pressure changes and valve status of various parts inside the instrument, which is convenient for users to understand the test process, and at the same time it is convenient for engineers to diagnose and maintain remotely.
The software provides an automatic process of adding liquid nitrogen. After a long time of experiment, the user can safely add liquid nitrogen according to the prompt of software. The test process is automatically suspended and resumed during the period without human judgment, and the degree of automation is high.



Real-time record storage of instrument control process

Message window can be switched to display, can record experimental control process and software manual operation information of the instrument in real time, which is benefit for engineers to analyze and remotely diagnose abnormal data.



Data analysis

The physical adsorption calculation model includes:

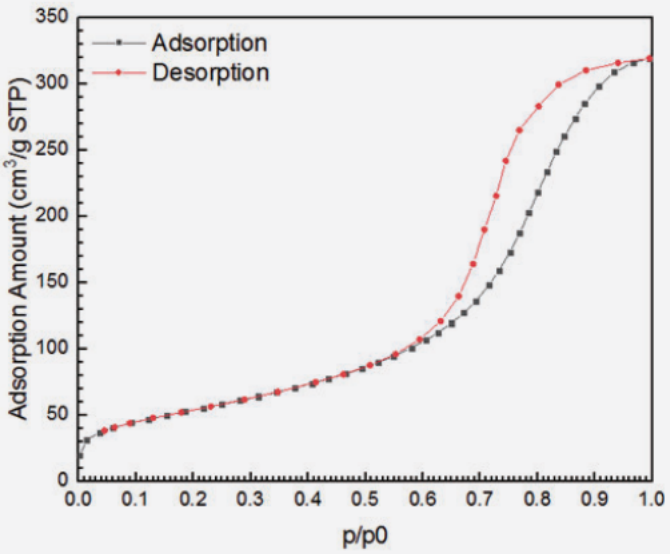
-Isothermal absorption and desorption curve;
-BET specific surface area (single point, multiple points);
-Langmuir surface area;
-Statistical thickness surface area. (STSA);
-BJH pore size analysis;
-t-plot analysis;
-HK pore size analysis;
-SF pore size analysis;
-NLDFT pore size distribution;
-Most acceptable pore size, Average pore size, Total pore volume;
-Adsorption curve etc.;

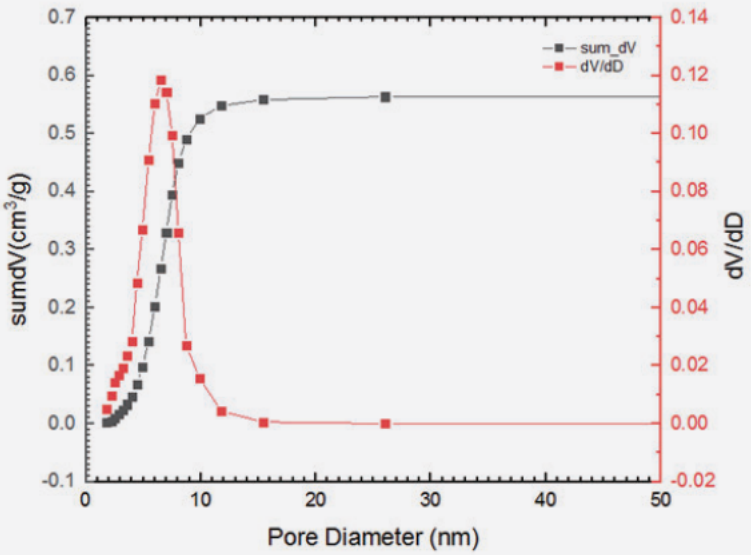
Typical analysis example

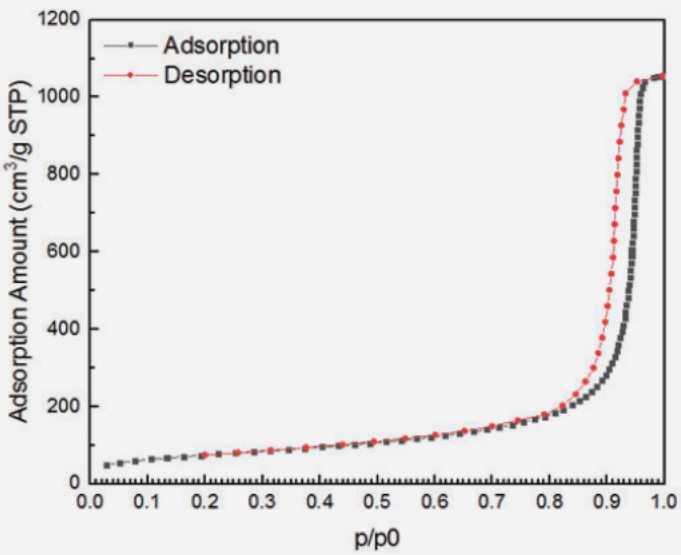
Repeatability of specific surface area BET

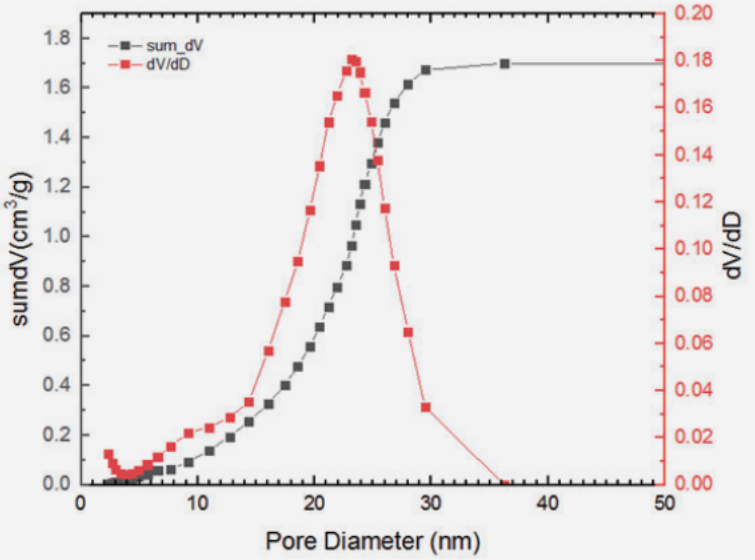
≤1%

Sample	Test number	measurement	Average	Repeatability
G8	1	9.094	9.17	0.66%
	2	9.222		
	3	9.243		
	4	9.098		
	5	9.162		
	6	9.228		
C8	1	127.367	126.6	0.31%
	2	126.362		
	3	126.482		
	4	126.578		
	5	126.167		
	6	126.863		









Specifications

Model	**Sync series**
Test principle	Static volumetric gas adsorption
Adsorbate gas	N_2、Ar、Kr、H_2、O_2、CO_2、CO、NH_3、CH_4 and other non-corrosive gases
Analysis port	1-4 samples tested at the same time
Pressure sensor	1000torr
P/P0 range	10^{-5}-0.998
Specific surface area range	>0.0005 m^2/g； Standard sample test repeatability (RSD)≤1.0%
Pore size range	0.35nm-500nm； Accurate analysis of mesopores and macropores, pore size repeatability (SD)≤0.2nm
Pore volume range	>0.0001 cm^3/g
Degassing station	none, external 4-station vacuum degasser
Degassing temperature	external: ambient—400℃，control precision 1℃
Vacuum pump	Two-stage rotary vane mechanical vacuum pump, ultimate vacuum $6.7*10^{-2}$Pa
Dimensions	L 21 in× W 21in × H 37in, weight about 90lbs
Environmental temperature requirements	15-35℃
Environmental humidity requirements	20%-80%，Non-condensing humidity
Power requirements	100-240VAC，50/60HZ，Maximum power300W
Recommended applications	Battery positive and negative electrode materials, starch and other pharmaceutical auxiliary materials, carbon black, white carbon black, titanium dioxide and other porous powders, alumina, molecular sieve, and other catalytic materials, activated carbon, zeolite and other adsorbent materials.

Static vacuum
Degasser

Altamira Instruments

AMI-TQJ4

Static vacuum degasser

Degassing Station **4** pcs

Degassing temperature

Ambient~400℃

Control accuracy: ±1℃, Each degassing position can control temperature independently.Intuitive and clear digital tube display.

Heating mantle.

Using high-grade thermal insulation cotton liner,External soft packing material,built-in thermocouple,easier to wrap the sample tube, make the heating temperature more uniform.

Powder elutriation control

Each degassing position is equipped with an independent powder elutriation control unit. The filter element is made of acetate fiber material. The filter length up to 15mm, which effectively prevents the contamination of the system by powder samples.

Compatibility

Fully compatible with competior's sample tube (1/2"3/8"1/4") and (12mm 9mm 6mm),

Vacuum pump

Two-stage rotary vane type mechanical vacuum pump , with ultimate vacuum to 10^{-2}Pa

Pressure display

Real-time display of the pressure in the sample tube, observe whether the vacuum meets the set-point

Physical: 16 in x 15in x 28in (l x d x h) weight: 45kg

Power: 110/220V±20V, 50/60Hz, maximum power: 300w

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