BUILDER

since 2023


## Specific surface area & pore size analyzer

# SSA-4000

• A highly stable gas physical adsorption analysis system with 3 analysis stations •

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# SSA-4000 Series

PFC high-precision injection and exhaust control system to achieve 1-100% pressurization or fixed injection automatic control, prevent excessive injection and inlet and exhaust, and minimize analysis time.

Three independently controlled and operating analysis stations. The BET specific surface area analysis time of three samples at 5 points was less than 30 minutes.

Software allows users to control and fine-tune analysis speed and precision.

Independent Po test station is standard for continuous measurement of saturated vapor pressure. Saturation vapor pressure can also be entered manually or collected during testing.

Large capacity stainless steel dewar bottle provides continuous temperature control for 40h.


Three preparation stations, independently controlled and operated. AI intelligent control system and sample dedicated degassing mode, to achieve a successful preparation, and intelligent monitoring and recording of degassing dehydration.

The metal composite heating furnace achieves a long-term constant temperature of up to 400℃.

The SSA-4000 series of specific surface area and aperture analyzers produce specific surface area and porosity results quickly and reliably, and the analysis station and degassing station are independent and integrated, saving laboratory space. SSA-4000 series is one of the indispensable tools in material research and quality control with low operating cost, fast analysis speed, simple use and good reliability.

## Intelligent Degassing System

Integrated intelligent degassing system, 3-station AI intelligent degassing station, equipped with independent vacuum system, degassing station and analysis station can run synchronously and asynchronously to improve work efficiency. Provide "standard", "ultra-light", "multi-water" and other modes of one-click selection, intelligent judgment of the treatment effect.

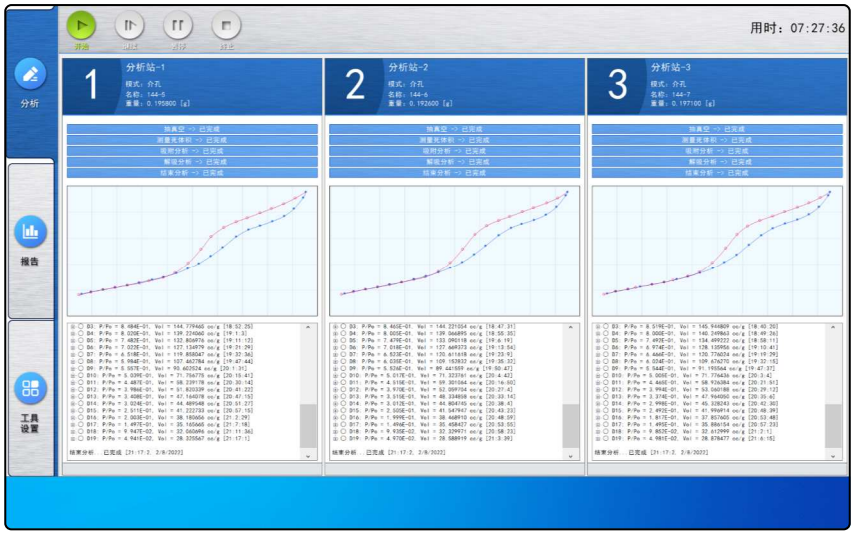
## "Fixed Point" and "Constant Pressure" Tests

Arbitrarily set the test pressure range and the number of data points in the test range to shorten the test time. Freely set any P/Po test point, greatly improve data stability.

## Exclusive Test Template Settings

In addition to the standard analysis mode of the software, users can customize the test template according to the sample type and call it with one click. It also supports automatic retrieval of analysis parameters from test reports.

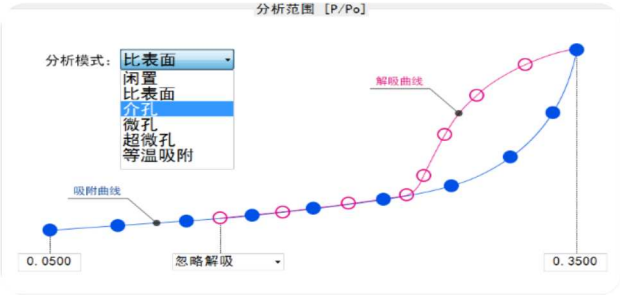
# Advanced Control Software, Powerful




- Visual display, setting window, in line with the needs of contemporary users, better use experience.
- Automatically saves data without worrying about data loss.
- Automatically determines the absorption/desorption equilibrium according to the sample adsorption characteristics.
- One-key automatic leak detection and automatic calibration.
- When a fault occurs, the pop-up prompts you to quickly rectify the fault.

# Fast Use of Software, Templates for Different Samples, One Click Call

▲Select the analysis type with one click according to the analysis requirements.




▲Test templates are invoked with one click depending on the material.

▲Provide dozens to hundreds of analysis templates to meet all users.

# AI intelligent degassing station to solve the problem of sample preparation


1、For the first analysis, it is not clear how long the water in the sample can be cleaned?

**▲ One click select "AI" intelligent mode, automatically determine the completion of processing, automatically stop, automatically record the total time, provide accurate conditions for the next preparation, to achieve dehydration "freedom".**

2、The sample has a large water content and is easy to "boil/elutriate" under vacuum?

**▲ One key selection of "multi-water" mode to solve the problem of elutriation preparation failure.**

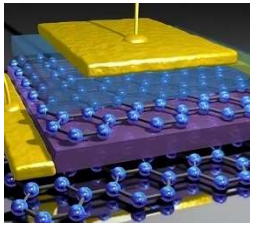
3、How to deal with ultra-fine powder such as Boehmite/alumina, ultra-light powder such as graphene/white carbon black, which is easy to "boil" under vacuum?

**▲ One click to select "ultra-light" mode to solve the problem of boiling preparation failure.**

Ultra light solid

Ultra light solid

Superfine solid



Porous Solids

# Applications

## Rubber Additive

The specific surface area affects the mechanical properties of rubber.

Such as white carbon black, carbon black...

## Restoratives

The expiry date, dissolution rate and potency of the drug also depend on the specific surface area of the material.

The physicochemical analysis content of the 2020 edition of Chinese Pharmacopoeia includes specific surface area determination, solid density determination, relative density determination, high performance liquid chromatography, and mercury and arsenic element form and valence determination. Such as magnesium stearate, montmorillonite powder.

## Catalyst

The specific surface area and pore volume affect the activity and efficiency of catalyst.

It involves many industries, such as petrochemical, chemical, pharmaceutical, food, agriculture, fine chemical and other fields.

## Ceramics

Structural ceramics, electronic ceramics, bioceramics.

Feldspar, kaolin, quartz powder, alkaline earth metals, metal oxides (silicon oxide, alumina, potassium oxide, sodium oxide, calcium oxide, magnesium oxide, iron oxide, titanium oxide), toner, various frits, auxiliary raw materials.

## Battery

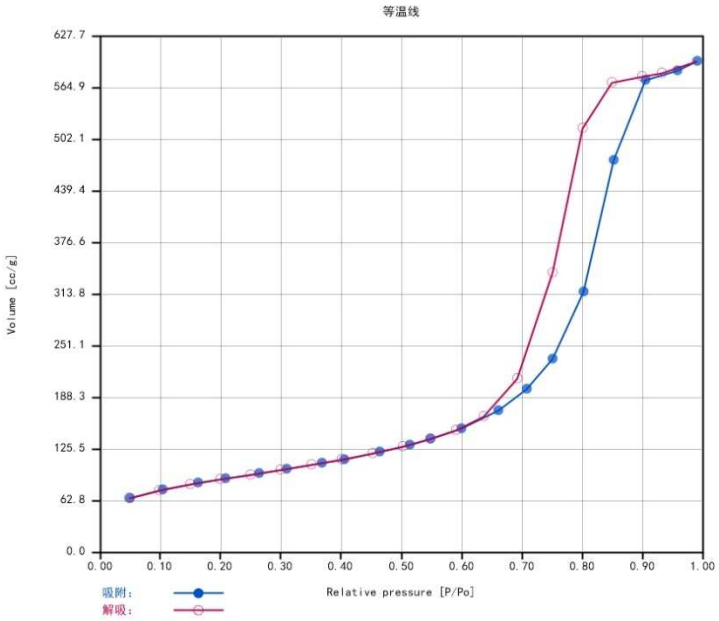
The specific surface area affects the first coulomb efficiency and cycle performance.

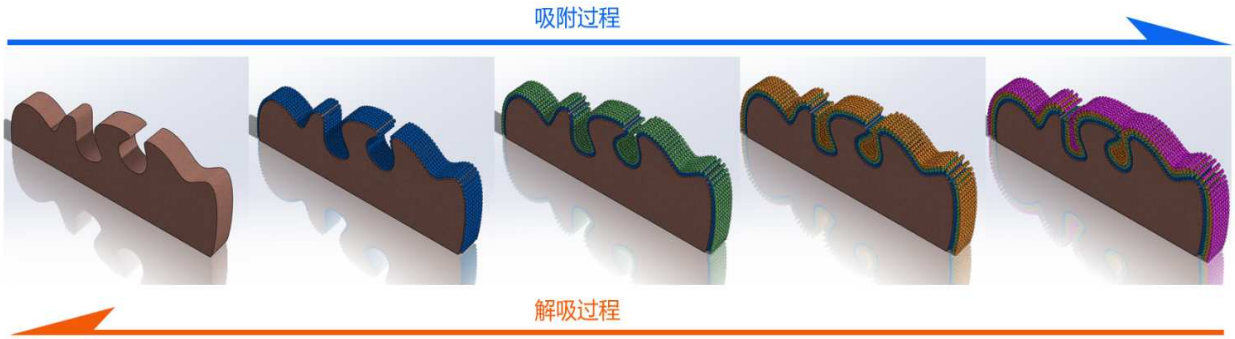
Lithium cobaltate, lithium manganate, graphite, lithium nickel-cobaltate, cobalt oxide, lithium iron phosphate, lithium titanate, ternary materials, polymer, polymer battery materials, alkali manganese materials, lithium ion materials, lithium manganese materials, alkaline materials, zinc manganese materials...

## Adsorbent

The adsorbent must be a porous material with a highly loose structure and a large exposed surface.

Such as silica gel, activated carbon, zeolite molecular sieve, organic resin, activated alumina and so on.

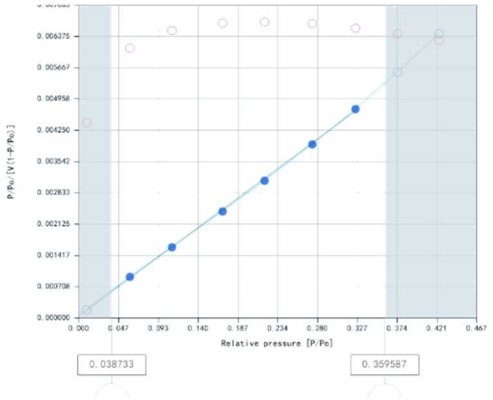


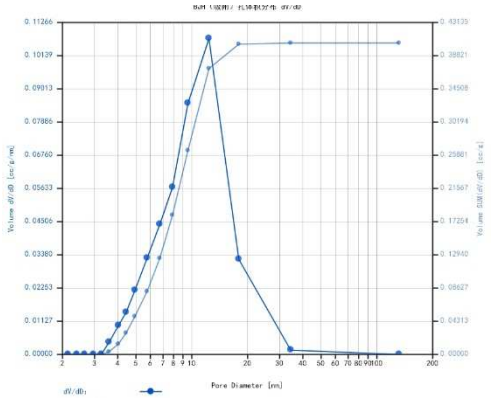

Test theory:

Adsorption and desorption isotherm Gas adsorption curve BET specific surface area measurement Langmuir specific surface area BJH method mesoporous pore volume distribution.

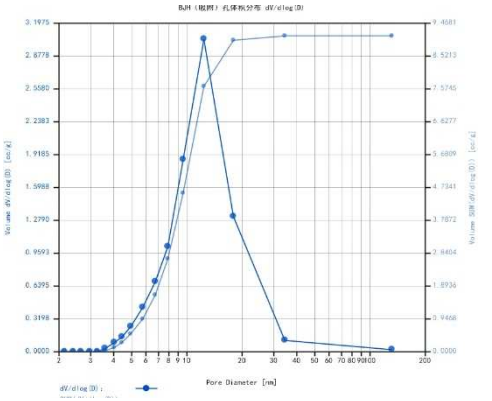
HK/MP/SF method Microhole analysis DR Method Microhole analysis of specific surface area inside and outside t-plot t-plot microhole analysis.



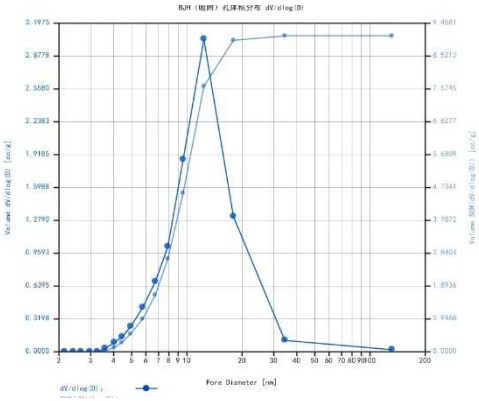

**BET Automatic Point Selection**




**BJH-DV/DD**




**BJH-DV/D(logD)**




**T-plot**

# Specifications

| SSA-4000 Parameters | | SSA-4000 Specifications | |
|---|---|---|---|
| Testing Principles | Static capacity method.（ISO 9277 /ASTM D6556 etc.） | Specifications | L680mm×W460mm×H820mm，N.W 42.55kg<br>Voltage: 220V Power: 700W Frequency: 50 Hz. |
| Precision | Specific surface area/pore size/pore volume/adsorption capacity repeatability ≤ 1%. | Humidity | Relative humidity range from 10% to 90%. |
| | | Temperature | - 20 ℃～ 50 ℃. |
| Adsorbate | 77K nitrogen, 87K argon, 273K carbon dioxide, 298K carbon dioxide, etc. | Dewar Flask | Configure 1 stainless steel Dewar bottle. |
| Test Range | Specific surface area ≥ 0.01 ㎡/g (nitrogen), pore size analysis 0.35nm-500nm. | Heating Furnace | Isothermal heating furnace, temperature 450 ℃. |
| Analysis Station | 3, parallel. | Pressure Sensor | 3 analysis stations, 1 Po station, 1000torr. |
| AI Preparation Station | Same analysis station integrated machine design, independent of each other; Equipped with a heating furnace, with an upper temperature limit of 450 ℃ and a temperature control accuracy of ± 0.01 ℃. Equipped with an independent mechanical pump and pressure sensor.<br><br>One click selection of multi water and ultra light sample degassing schemes; Multiple intelligent degassing solutions: temperature+fixed time; Temperature+AI judgment; Temperature+fixed time+AI judgment. | Test Function | Gas adsorption and desorption isotherms, BET/Langmuir specific surface area, t-plot inner and outer surface area of carbon black, t-plot micropore area/volume, BJH mesoporous pore size/pore area, as mesoporous volume, HK/SF/MP micropores, average pore size, total pore volume analysis, etc. |
| Vacuum System | The analysis station is equipped with a two-stage rotary vane vacuum pump; The preparation station is equipped with a two-stage rotary vane vacuum pump. | Intelligent Software | Intelligent software self inspection and warning, can set P/Po start and end points, and collect quantity; One click calling template, supporting custom exclusive templates. |
| Po Testing Station | Independent saturation steam pressure testing station for real-time testing, equipped with independent sensors. | Control System | Intelligent touch system, multi-mode one click selection. |