



V-Sorb 4800STM

Specific Surface Area (SSA) Analyzer

Gold APP Instruments China

Lead You to Particle World Better



V-Sorb 4800S

Analysis Data Reports

V-Sorb 4800S is developed by Gold APP Instruments for surface area determination which utilizes static volumetric method. Compared with other companies' analyzers, multi pioneered technologies lead it to a leading level in world market.

V-Sorb 4800S analyzer designed from the user perspective and equipped with fully automated operation system, user-friendly interface makes it easy to learn, imported accessories assure stability and prolong life.

High cost performance of V-Sorb 4800S easily ensure your investment profits and flexible equipped peripheral can satisfy different users' requests.

Adsorption and desorption isotherms data,

Single point BET surface area data,

Multi-point BET surface area data,

Langmuir surface area data,

t-plot external surface area data,

True density data,

carbon black STSA data etc.

V-Sorb 4800S Overview



4 samples can be tested simultaneously, benefits much for busy labs and manufacturers.

All sample cells are made of quartz.

2 temperature probe systems at each side.

2 transparent covers equipped for 2 sides ports; protecting operators and isolating foreign disturbance.

4L stainless steel, thick wall and narrow mouth Dewars for each side, service life lasts more than 5 years.

2 fully PC controlled automatic Dewar elevators at each side; no noise produced for ups and downs; guarantee a stable working at whole process.

Specifications

Analysis Method: static volumetric nitrogen adsorption principle

Measuring Ranges: $0.005\text{m}^2/\text{g}$ to no known upper limit

Accuracy: repeatability errors $\leq 1\%$

Vacuum System: V-Sorb unique **monolithic manifolds** and pneumatic valve control system, greatly reduce the dead volume; improve the adsorbate micro-change sensitivity; enhance pore size distribution analysis resolution; decrease connecting points; strengthen sealing performance and prolonged instrument life

Coolant Level Controller: V-Sorb **original coolant level control system** with temperature probe, ensure the coolant level unchanged when compares with sample cells in the whole analysis process, completely eliminate the analysis errors caused by dead volume change

Control System: **programmable pneumatic valve** system with high integration and strong anti-interference ability, enhance instrument's stability

Sample Ports: four samples' analyzing and four degassing concurrently

Pressure Measurement: imported **sectional measuring dual pressure transducer**, notably improve the measuring accuracy at low P/P_0 point, two transducers' 0-1000Torr (0-133Kpa)

Transducer Accuracy: imported silicon thin film pressure transducer, accuracy can reach 0.1% of real reading, better than 0.1% of F.S.(full-scale), far accurate than Pirani resistance vacuum gauge(general error is 10%-15%)

Partial Pressure: P/P_0 controllable accuracy range is 5×10^{-6} -0.998

Ultimate Vacuum: $4 \times 10^{-2}\text{Pa}$ ($3 \times 10^{-4}\text{Torr}$)

Vacuum Pump: built-in bipolar vacuum pump controlled by patented software which can auto control pump's start/stop

Sample Types: powders, particle, fiber, flakes and other materials

Adsorbate Gas: high purity nitrogen ($\geq 99.999\%$), Ar, Kr, CO_2 etc. non-corrosive gases are optional

Data Acquisition: high-precision and high integration data acquisition modules, minimal error, strong anti-interference ability

Data Reduction: Windows[®]-based independent developed Gold APP Instruments software[™], perfect versatility, produced full featured and **multi-model reports** (txt, word, excel, pdf)

Specifications: Height 22.05 inches (56cm)* Width 20.87 inches (53cm)*Depth 23.62 inches (60cm); 132 pound (60kg)

Advantages

A: Vacuum System

1. Unique integral manifolds system, decrease connecting points apparently, reduce leak rate, improve ultimate vacuum.
2. **Modularity design** can configure as customer requests, benefits future functions extension and instrument maintenance.
3. **Sweden imported bipolar vacuum pump**, low noise, stable working, oil-return prevention; ultimate vacuum can reach $4 \times 10^{-2}\text{Pa}$ ($3 \times 10^{-4}\text{Torr}$).

B: Control System

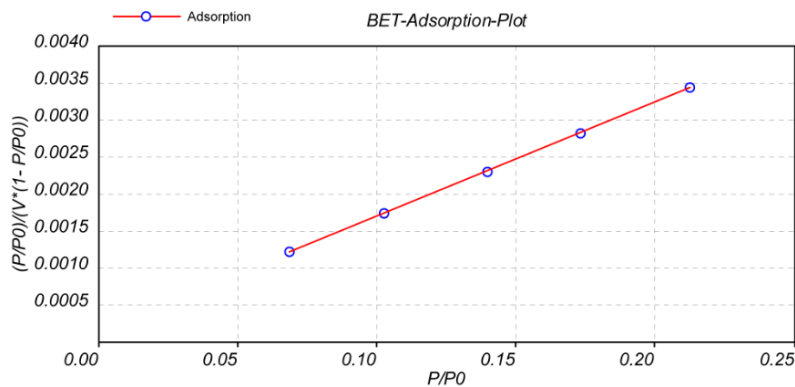
1. Industry used programmable pneumatic valve system, strong anti-interference ability, convenient for installation and uninstallation.
2. **Separated analysis and pretreatment manifolds** can prevent foreign matter to contaminate manifolds in sample treatment.

C. Measures for Improving Accuracy

1. Imported silicon thin film capacitive pressure transducer, accuracy can reach 0.1% of real reading, better than 0.1% of F.S. (full-scale).
2. 0-10Torr (optional) and 0-1000Torr dual pressure transducers, sectional measurement in pressure range can reduce errors in low vacuum, 0-10Torr silicon thin film transducer is highly accurate than Pirani resistance vacuum gauge (general error is 10%-15%).
3. **Original stepping coolant level control system**, ensure the coolant level unchanged when compares with sample cells in the whole analysis process, completely eliminate the analysis errors caused by dead volume change.
4. Pioneered **gas outlet and inlet control system** can efficiently prevent sample splash in evacuation and gas inlet process, guarantee clean manifolds and sample weight unchanged, avoid zero and liner drifting caused by transducer's macro-change.

D. Data Acquisition and Reduction

1. High precision and integration data acquisition module is easy to connect, minimal errors and strong anti-interference ability; standard RJ45 communication mode is good for analyzer's applications extension and interconnection, can also conveniently switched to RS232 and USB modes.
2. **Multi calculating methods for data reduction** provides all-round sample analysis options; powerful data archiving and searching system helps a lot for data management.



BET Adsorption

BET Comprehensive Data

BET Tabular Report

P/P0	Quantity Adsorbed(ml/g)	(P/P0)/(V*(1- P/P0))	Single point BET
0.212640	78.748516	0.003429	269.838919
0.173075	74.458462	0.002811	267.959350
0.139828	70.747012	0.002298	264.839130
0.102791	66.303545	0.001728	258.892483
0.068951	61.572219	0.001203	249.485947
Slope	Intercept	Vm(ml)	C Value
0.015480	0.000135	64.039758	115.728390
R	Multi-BET Area	Langmuir Area	
0.999996	278.731520	382.076160	

Battery: with the development of industrial technology, energy becomes the focus of social problems. Non-renewable energy sources' exhaustion and environment pollution force human to explore new and alternative energy. Battery, especially the energy storage battery, is favored by people for its low-pollution and renewable and hopefully to be the alternative energy in future, obtains a bright and broad development prospect. Storage materials, the critical parts in battery, must have a qualified surface area performance, too big or too small surface area will greatly affects battery performance and hence surface area proves to be the most crucial physical index.

Catalysts have been employed in chemical industries for many years and their performance became more and more powerful. The active surface area and porous structures of catalysts have a strong influence on production rates. Big surface area and porous are two obvious features for catalysts, what is more important is these two also can increase the contact area for catalysts and reactive materials to improve catalytic efficiency. Thus, specific surface area and pore volume are determined indexes to judge whether catalysts are qualified or not.

Carbon black reinforcement is widely used in rubber industry as one very mature technology. Many alternatives, such as carbon-white, have been explored to replace carbon black in recent years. Study approved that reinforcing filler's external surface area, exclusive of micropore, has great influence on reinforcement performance in carbon black reinforcement techniques, therefore, it needs to analysis the external surface area of reinforcement in carbon black industry.

silica gel, active alumina oxide, molecular sieve, sepiolite, zeolite, alumina oxide, silicates, quartz, silicon carbide, lithium cobalt oxide, lithium manganese oxide, black lead, lithium nickel and cobalt, corrosion resister, nano-calcium carbonate, zinc oxide, magnesium oxide, barium oxide, iron oxide, copper oxide, ferrite, silver/iron/copper/tungsten/nickel/aluminate powder, filler, inorganic filler, calcium carbonate, silica, deposited matter, suspended matter, titanium dioxide, rare earth, coal, energy storage materials, cleansing agent, filter aid, superfine fiber, porous fabric, composite material etc.

Cement plays a role as binder and the binding performance has closely relation with its specific surface area. Blaine method had been used for former cement specific surface area analyzing, but this method brought bigger measure errors which cannot meet nowadays high quality demands for modern buildings. The use of higher precision gas sorption method is an irresistible trend to determine cement specific surface area.



Sample pretreatment: V-Sorb™ degasser

Surface area and porosity measurement is closely connected with samples' external surface area. Besides, the key of gas sorption is the adsorbate can be efficiently attached onto samples' surface or be filled into pores, thus, no more important than particle surface purity. The purpose for sample pretreatment is to remove atmospheric contaminants on samples' surface and make room for adsorbate. Most samples need pretreatment and ways are changed with samples' characteristics. Normally, water molecule is the item need to be removed, thus, to dry samples in atmospheric pressure and temperature over 100°C (usually 105°C-120°C) is enough which can simplify operation procedures. It is easy to adsorb contaminants in atmospheric pressure and temperature for microporous and strong adsorptive samples, but sometimes need to be degassed under vacuum condition, even to inlet rare gases for better desorption. All in all, pretreatment is to clean and purify sample external surface to ensure more precision results.

Specifications:

- ✳ Up to 4 samples pretreatment currently, independent temp controller;
- ✳ Max temperature is up to 450°C, accuracy $\pm 1^\circ\text{C}$;
- ✳ Programmable heating process, step is 1-10°C;
- ✳ User-defined analysis gases (N_2 or He are more normally used);
- ✳ 48 hours uninterrupted/unattended operation, Surface area analysis less than 30 mins (based on sample property);
- ✳ capacitance diaphragm pressure gauge;
- ✳ PT100 with resolution 0.01°C, analysis software integrated PID theory.

Features:

- ✳ Adopts stainless steel vacuum system, perfect sealing performance, high vacuum, stable working and long service duration;
- ✳ Speedy heating process, saving time and improving pretreatment efficiency;
- ✳ Easy installation and uninstallation for sample cells;
- ✳ Unique sample splash proof system;
- ✳ Modularity inner structure design, convenient for installation, uninstallation and future upgrade;
- ✳ Each sample station has its own adjustable evacuation/backfill rate control.

Environmental:

- ✳ Ambient temperature: 10 to 50°C;
- ✳ Maximum relative humidity: 90%.

Electrical:

- ✳ Voltage 100 ~ 240 VAC;
- ✳ Frequency: 50 or 60 Hz.

Physical:

- ✳ Height 15.7 inches (40 cm)
- ✳ Width 11.8 inches (30 cm)
- ✳ Depth 19.7 inches (50 cm)
- ✳ Weight 33 lbs (20kg)



Accessories list

Sr.No.	Supplier	Parts	Qty.
1	Gold APP Instruments Supplied	V-Sorb 4800S Analyzer (with vacuum pump)	1 set
2		Analysis Software (English)	1 set
3		Rubber O-rings for Sample Cells Sealing	10 pcs
4		Spherical Sample Cells	10 pcs
5		V-shape Sample Funnel	10 pcs
6		Reference Material (large value)	10 g
7		Reference Material (medium value)	10 g
8		Reference Material (small value)	10 g
9		Copper Gas Pipe	2 m
10		Analysis Dewar	2 pcs
11		Fuse	2 pcs
12		RJ 45 Cable	2 pcs
13		Protective Gloves	1 pair
14		User Manual (English)	1 copy
15		PoCell	4 pcs
16		Filling Rod	8 pcs
17		Sample Cell Cleaning Brush	1 pc
18		Funnel Cleaning Brush	1 pc
19		Sample Weighting Cup	1 pc
20		Sample Pretreatment Degasser	1 set
21	Customer Prepared	0.0001 Precision Balance	1 set
22		Computer (Win 2000/07/08/XP/Vista etc)	1 set
23		Printer (not a must)	1 set
24		Power Cable	1 pc
25		Gas Regulator (should fit 1/8" NPT gas pipe, max reading is larger than 0.6 Mpa.)	2 sets
26		He Gas (purity upper 99.999%)	1 cylinder
27		N ₂ Gas (purity upper 99.999%)	1 cylinder
28		Liquid Nitrogen (purity upper 99.999%)	1 pot

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