



H-SORB X600 SERIES HIGH PRESSURE ADSORPTION ANALYZERS

Gold APP Instruments China

Lead You to Particle World Better



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Gold APP Instruments Corporation Limited is a dedicated manufacturer for gas adsorption analyzers, is a high technology company that combines state-of-the-art hardwares and professional theories for nano-materials determination. We originates and serves the China Weapons System, relies on advantages of local talented human resource and weapons system technology and devotes into scientific instruments development, production and sale. To research and develop fully automatic and intelligent laboratory determination analyzers, provide international standards, high cost performance and state-of-the-art instruments for R&D institutes, universities and manufacturing enterprises are our unchanged mission.

Our analyzers cover:

- * BET surface area analyzers (flowing gas principle & volumetric adsorption principle)
- * Pore size, pore volume, pore size distribution analyzers
- * High pressure and temperature adsorption analyzers
- * Helium pycnometer density analyzers/ open & closed pore cell analyzers
- * Thermal analysis analyzers (TG/TGA/DTA/DSC etc)

The H-Sorb X600 series high pressure adsorption analyzers adopt the volumetric technique principle which consists of dosing a known amount of gas adsorptive into measurement tubes where lying samples (like zeolites, carbon nanotubes, rocks, catalysts, activated carbons, sieve, hydrides etc.) to be analyzed.

When samples reach equilibrium with the adsorbate gas (such as hydrogen, methane, carbon dioxide, nitrogen, argon, krypton etc.), detailed and comprehensive final equilibrium pressures will be recorded automated by software. These data are used to calculate the quantity of gas adsorbed by samples.

This measurement procedure automatically repeated by software under given temperature and pressure intervals until finalized the maximum preselected pressure.

Finally, each of the equilibrium points' volume adsorbed, equilibrium pressure, absolute pressure etc. data are plotted to produce the isotherm. By using the isotherm data, operators can calculate furthermore isotherm reports like PCT/ PCI/ TPD/ kinetic/ adsorption concentration wt% etc..



- ① 2 pretreatment/ degassing ports (for H-Sorb 2600 series)
2 testing ports (for H-Sorb 4600 series).
- ② 2 testing ports.
- ③ software controlled heating mantle can realize temp. up to 400 Celsius degree.
- ④ provide heating furnace (room temp. to 550 °C)
& 4L stainless steel LN₂ Dewar (-196 °C testing)
- ⑤ tray can realize up/ down smoothly.
- ⑥ hand knob to control the heating mantle up/ down.
- ⑦ temperature probe sensor (in the middle).
- ⑧ transparent protective doors be printed with operation notices for both degassing & testing.
- ⑨ 2 USB ports



FEATURES

Manifold Pipeline System

- * Imported VCR interface high pressure pneumatic valves can realize auto on-off within 200Bar, sealing performance is top to 1×10^{-10} Pa.m³/s, can be used more than 5 million times;
- * Programmable logic controller (PLC) system with a high integration and sound anti-interference, this can improve analyzer performance stability and prolong its life;
- * 316L type stainless steel thick wall pipeline by using high pressure micro welding technology, it benefits to a compacted pipeline connection, sound sealing performance and small dead volume space.



316L micro-welding manifolds



branded mechanical pump



H-Sorb 4600 series model
(2 testing ports in both sides)

Auto Measurement

Parameters be set by software, fully automated, can realize unattended operation at night; H-Sorb mode is available for accurate control gas charging pressure points, gain ideal data points.

Safty Operation Guard

H-Sorb asymptotic technology can automatically realize gas charging & discharging, prevents high pressure potential danger caused by mis-operation, and also minimizes large differential pressure's impact to pressure transducers.

Data Reports

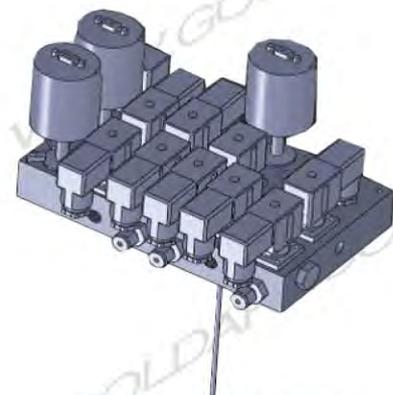
software can auto get adsorption & desorption isotherms, further to produce Langmuir model regression isotherm, TPD curve, PCT(Pressure-Composition-Temperature) isotherm, Langmuir maximum adsorption constant L and adsorption pressure constant B measurement; Langmuir correction model loading-ratio correlation regression (LCR) isotherm; adsorption capacity vs pressure, adsorption capacity vs time, adsorption concentration (wt%) vs time etc. reports



well packed SS sample tubes



branded pneumatic valves



monolithic manifolds system

Sample Tube

The standard 10 ml volume micro-welded stainless steel sample tube can be loaded into rocks/coals/ powder etc. samples, and large capacity sample tubes can be customized.



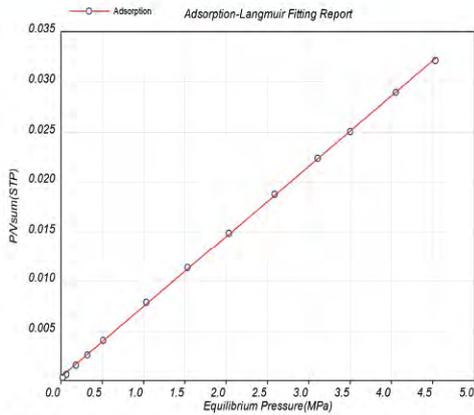
SPECIFICATIONS

Specs		Models					
		H-Sorb 2602	H-Sorb 2600	H-Sorb 2600PCT*	H-Sorb 4604	H-Sorb 4600	H-Sorb 4600PCT*
Sample Pretreatment	Ports	2			optional with 4 ports		
	Temp. Range	RT to 400 °C			RT to 400 °C		
	Working Mode	fully controlled by software			manual controlled		
Sample Testing	Principle	volumetric adsorption					
	Ports	2 ports work parallelly	2 ports work alternately	4 ports work parallelly	total 4 ports, left & right modules can test parallelly, and each module can test 2 samples alternately		
	Accuracy	repeatability deviation $\leq \pm 3\%$					
	Testing Temperature	room temperature to 550 °C as standard (option 1: over 550 °C can be customized as request) (option 2: -196 °C can be achieved by adding low temperature module)					
	Testing Pressure	atmospheric pressure to 200 Bar as standard (to 400 Bar as option by adding pump booster)					
	Gases	H ₂ , CH ₄ , CO ₂ , N ₂ , Kr, Ar etc., purity 99.999%					
	Working Mode	fully controlled by software					
	Analyzer Functions	Data Reports	adsorption and desorption capacity; adsorption and desorption rate; gas adsorption constant a, b values; adsorption and desorption isotherms; Gibbs supercritical adsorption determination; Langmuir model regression isotherm; TPD (temperature-programmed-desorption) curve; PCT (pressure-composition-temperature) isotherm for H ₂ adsorption; adsorption capacity vs pressure; adsorption capacity vs time; adsorption concentration (wt%) vs time etc. reports				
Hardwares	Pressure Sensors	0-300 Bar					
	Sensors Accuracy	0.01% F.S.(full scale), long term stability is 0.025% F.S.					
	Pipelines	stainless steel micro-welding pipelines					
	Valves	pneumatic valves + VCR rings					
	Vacuum Pump	dual stage mechanical pump (turbo molecular pump option)					
	Ultimate Vacuum	10 ⁻² Pa (dual stage mechanical pump), 10 ⁻⁶ Pa (turbo molecular pump)					
	Sample Tubes	stainless steel tubes in 10 ml (other volume be customized)					
	Dimension	net: 75x60x90 cm, 80 kgs gross: pkg 1: 92x73x110cm, 125kgs; pkg 2: 60x75x80cm, 80 kgs.					
Extra Accessories*	helium cylinder	pressure upper than 10Mpa, purity 99.999%, volume can be 10L, 20L or 40L etc.					
	nitrogen cylinder	no pressure request, purity 99.999%, volume can be 10L, 20L or 40L etc.					
	adsorbates cylinder	can be H ₂ , CO ₂ , CH ₄ , N ₂ etc. gases, pressure over 15Mpa, purity 99.999%, volume can be 10L, 20L or 40L etc.					
	balance (option)	precision should be 0.0001 g					

Remarks:

1. H-Sorb 2600PCT & 4600PCT be designed for hydrogen adsorption, with expansion cavity module.

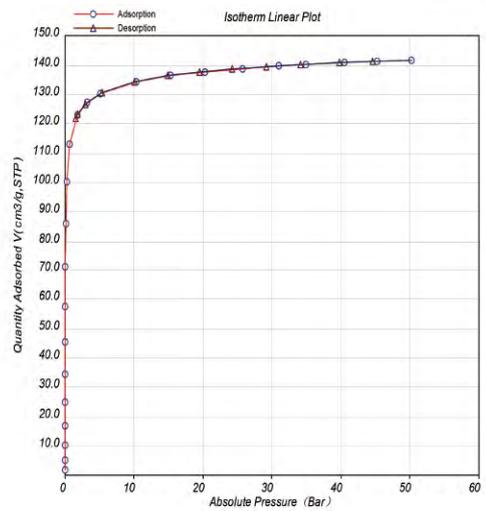




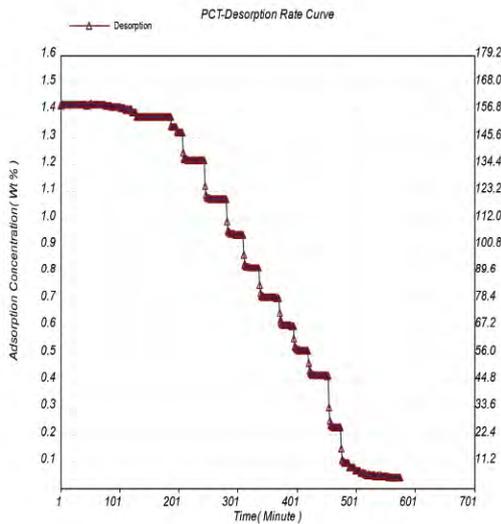
Detail Report

Slope	Intercept	VL(cm3/g)	Langmuir Pressure PL(MPa)
0.007072	0.000263	141.404071	0.037248
R			
0.999947			

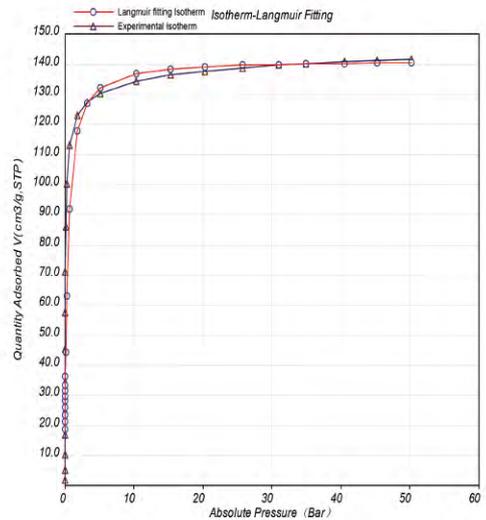
Langmuir adsorption



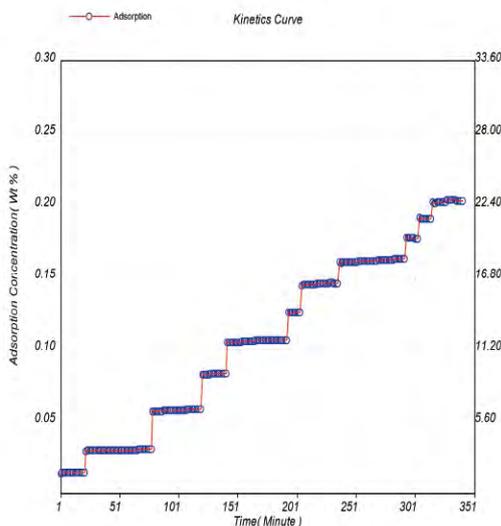
adsorption & desorption isotherm



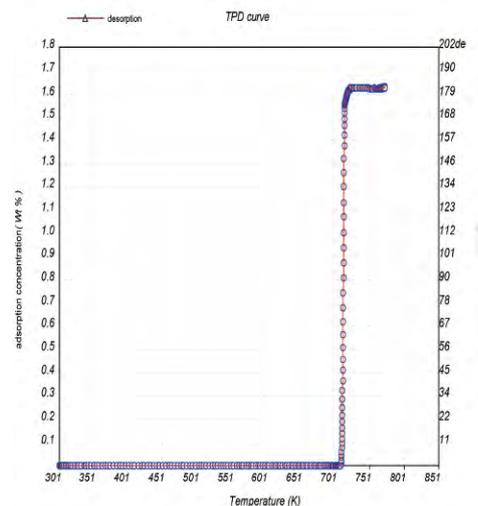
PCT desorption rate curve



Isotherm Langmuir fitting



kinetics curve



TPD curve



APPLICATIONS

For industries like hydrogen and NG storage, carbon dioxide sequestration, fuel cells/ battery materials study, stack gas scrubbers, hydrocarbon traps research, coalbed gas & shale gas adsorption capacity determination, methane storage, oil exploration industry and so on.

Mostly for materials like porous carbons, metal organic frameworks (MOFs), metal alloys (LaNi 5, AB5, AB2, La5Mg2Ni23, La3MgNi 14, La2MgNi9 etc.), catalysts, zeolites, hydrides, molecular sieves, hydrocarbon, shale rocks etc.



PROJECTS

We have over 1000+ projects worldwide, customers cover USA, Canada, Russia, Kazakhstan, England, Germany, Greece, Czech Republic, France, Nigeria, Iran, Israel, Bahrain, UAE, Saudi Arabia, India, Bangladesh, Pakistan, Malaysia, Thailand, Indonesia, Korea, Australia, New Zealand, Hong Kong, Brazil, Mexico and so on. Here are some projects onsite installation gallery.



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