AMI-Surface DX Series

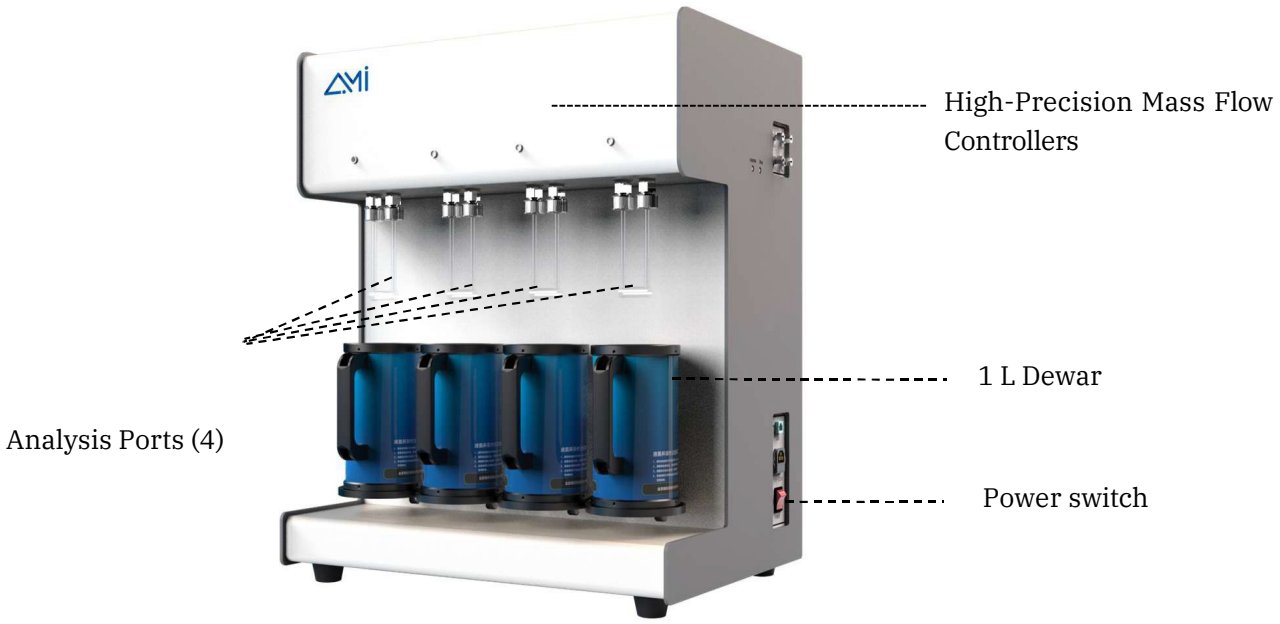
Dynamic Nitrogen Adsorption Specific Surface Area Analyzer

INTRODUCTION

"Accurate, Accessible, Advanced Gas Sorption"

The **AMI-Surface DX** Series offers a fully automated solution for BET surface area analysis using dynamic flow adsorption. Designed for high-throughput laboratories, it features four analysis stations that can be configured for simultaneous testing—either with a shared TCD for cost efficiency or with four independent TCDs for maximum throughput and parallel analysis.

Operating without a vacuum system, the **AMI-Surface DX** uses a dynamic flow (non-static) method that supports both single-point and multi-point BET analysis. This makes it ideal for quality control, R&D, and production environments, especially for low surface area materials. With reference comparison methods, adsorption peaks are detected rapidly and accurately—delivering precise results with exceptional speed.



*Structural distribution diagram of **AMI-Surface DX** Series*

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KEY FEATURES

Patent of Invention
Accurate adsorption measurements based on sharp peak detection eliminate errors caused by incomplete desorption. Ideal for low surface area samples such as ternary materials and battery electrode materials.
(Patent No. 20140320453.2)

Automatic Nitrogen Partial Pressure Control
The **Surface DX** is equipped with high-precision mass flow controllers to automatically regulate nitrogen partial pressure during BET surface area measurements. This ensures stable and accurate gas flow across the sample surface, delivering consistent and reliable adsorption results with minimal manual intervention.

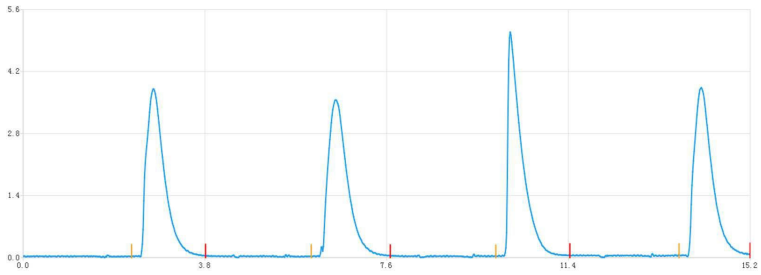
Four Parallel Operating Analysis Stations
The **Surface DX 400** can run up to four samples at once with independently controlled stations. Achieve unmatched throughput with consistent test conditions and result repeatability better than **±1.0%**.

Anti-Elutriation Technology
A built-in anti-contamination unit prevents sample particles from entering the instrument's internal gas line, ensuring operational reliability and long-term cleanliness.

Optional Sample Preparation Unit
External sample preparation device with four-degas stations can remove adsorbed contaminants from surface and pores of samples with heating in flowing gas/vacuum. Temperature can be set and controlled from ambient to 400 °C.

Low Form Dewar flask
Long lasting, high volume (1 L) Dewar flasks assure a constant thermal profile along the length of sample tubes during experiment.

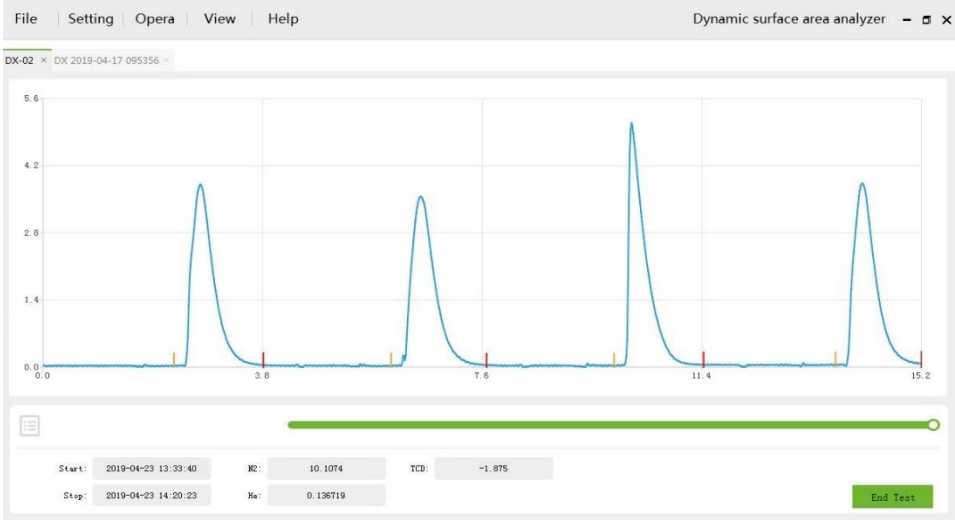
Fast, Sensitive Testing
Adsorption peak looks sharp, no trailing phenomenon, the change of nitrogen concentration caused by each sample adsorption is not diluted at all; the sensitivity of the sample test is greatly improved. The test efficiency is greatly improved under the condition of sufficient adsorption and the comparative test of four samples in one time only needs about 15 minutes.



SOFTWARE

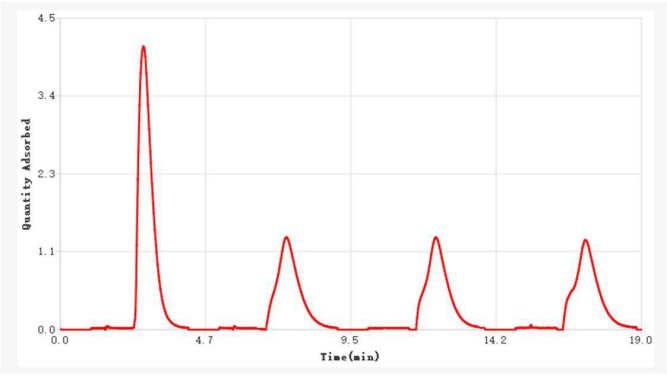
Convenient Operation and User-friendly Design

Operation of **AMI-Surface DX** Series:
The AMI-Surface DX software provides intuitive operation with real-time visualization of nitrogen and helium flow. During analysis, users can monitor adsorption activity dynamically, offering a clear understanding of test progress and conditions. Ideal for both novice and advanced users, the interface ensures reliable, traceable operation.

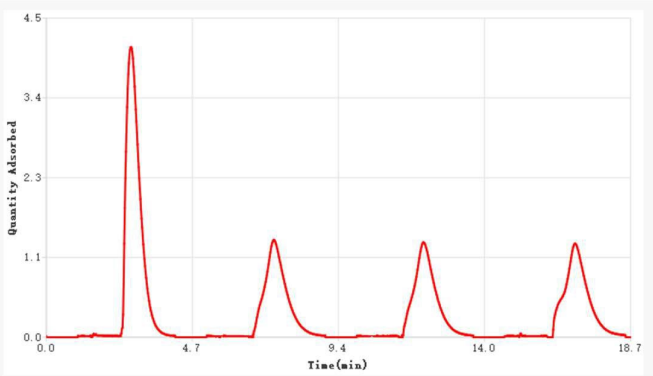


DATA ANALYSIS EXAMPLES

Analysis Results of a low surface area material:



Number	Sample	Mass(g)	Peak Area	Surface Area(m2/g)
1	Reference	1.0442	858692	9.100
2	NC-H3M#031	3.9968	440288	1.219
3	NC-H3M#046	3.8427	422557	1.217
4	NC-H3M#049	4.0343	450965	1.237

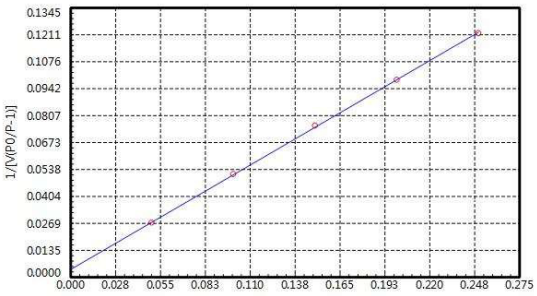


Number	Sample	Mass(g)	Peak Area	Surface Area(m2/g)
1	Reference	1.0213	836140	9.100
2	NC-H3M#031	3.9968	437848	1.218
3	NC-H3M#046	3.8427	419070	1.212
4	NC-H3M#049	4.0343	436612	1.203

Multi-Points BET Analysis:

BET Surface Area:	9.13864	m2/g
Slope:	0.47263	
Y-Intercept:	0.00446	cm3/g STP
Vm:	2.09602	cm3/g STP
C:	106.89248	
Correlation Coefficient (Cc):	0.99992	

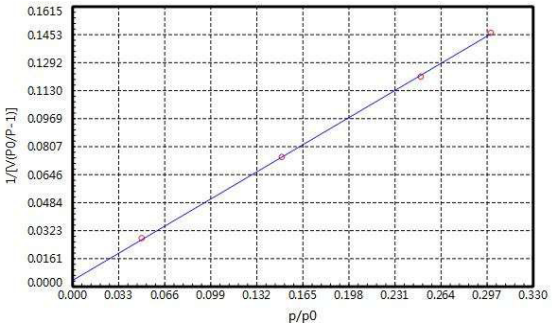
BET Surface Area Plot



ID	p/p0	V(cm3/g STP)	1/[V(Po/P-1)]
1	0.05000	1.90429	0.02764
2	0.10000	2.14198	0.05187
3	0.15000	2.31909	0.07609
4	0.20000	2.52773	0.09890
5	0.25000	2.72596	0.12228

BET Surface Area:	9.14797	m2/g
Slope:	0.47243	
Y-Intercept:	0.00418	cm3/g STP
Vm:	2.09816	cm3/g STP
C:	114.10706	
Correlation Coefficient (Cc):	0.99988	

BET Surface Area Plot



ID	p/p0	V(cm3/g STP)	1/[V(Po/P-1)]
1	0.05000	1.87720	0.02804
2	0.15000	2.35269	0.07501
3	0.25000	2.75046	0.12119
4	0.30000	2.91954	0.14679

SPECIFICATIONS

Model	Surface DX
Principle	Low temperature nitrogen adsorption, dynamic method
Method	Reference method Single point BET/ Multi-point BET
Efficiency	8 samples/hr
Adsorbate and Carrier Gas	High purity nitrogen (99.999%) High purity helium (99.999%)
Gas Mixing Control	Mass Flow Controllers
Thermal Conductivity Detector	1
Analysis Ports	4 (3 if performing the reference method)
Range of BET Surface Area	For reference method, the range is 0.5 to 100 m^2/g For single BET and multipoint BET, 0.5 m^2/g to infinity
Repeatability	Typically, better than ±1.0% (carbon black)
Volume and Weight	L 24.0 in (610 mm) × W 18.0 in (460 mm) × H 27.0 in (680 mm), 66 lbs (30 kg)
Power Requirements	110V 200-240 VAC, 50/60 Hz, maximum power 300 W

Model	Surface DX 400
Principle	Low temperature nitrogen adsorption, dynamic method
Method	Single point BET
Efficiency	28 samples/hr.
Adsorbate and Carrier Gas	3:7 Nitrogen-Helium mixture gas (99.999%)
Thermal Conductivity Detectors	4
Analysis Ports	4
Range of BET Surface Area	0.1 - 100 m2/g
Repeatability	Typically, better than ±1.0% (carbon black)
Cold Trap	✓
Volume and Weight	L 27.5 in (700 mm) × W 16.0 in (410 mm) × H 31.0 in (785 mm), 77 lbs (35 kg)
Power Requirements	110V or 200-240 VAC, 50/60 Hz, maximum power 300 W

ABOUT US

Advanced Measurement Instruments (AMI), consisting of Altamira Instruments, Rubolab, ISI, and JWGB, offers a comprehensive portfolio of solutions for all your material characterization needs. As a global and diversified company, we have many years of professional experience, and our mission is to empower scientists and researchers around the world in the field of materials science by providing cutting-edge analytical instruments. We are committed to providing high-quality, user-friendly, cost-effective products and services to ensure that customers get the best solutions in research and industrial applications.

MISSION

At AMI, our mission is to advance the world of materials characterization by providing cutting-edge analytical instruments that empower customers in commercial and research fields.

Innovation Within Reach

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