BTsorb 100 Series

Breakthrough Curve and Mass Transfer Analyzer

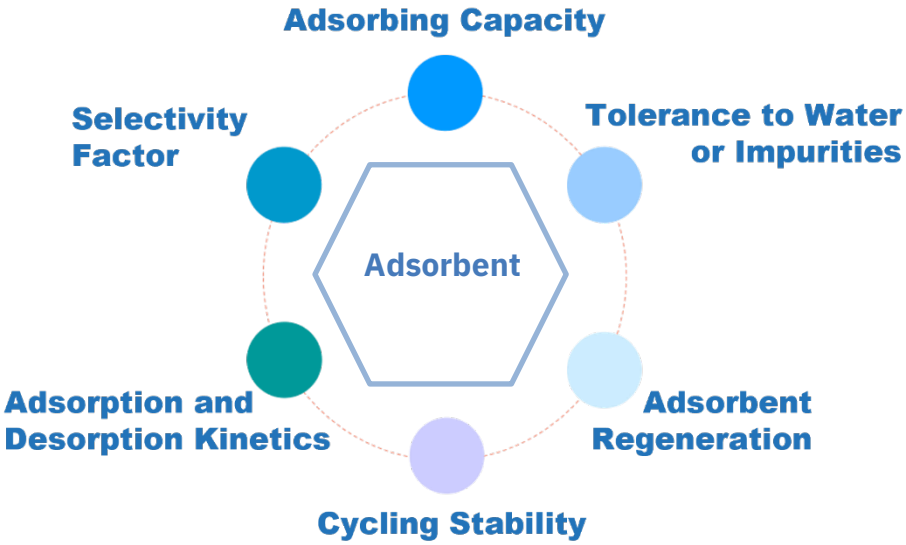
INTRODUCTION

"Accurate, Accessible, Advanced Sorption"

The **BTsorb 100** series is a new line of cost-effective material characterization instruments designed for breakthrough curve testing, competitive adsorption, and mass transfer kinetics analysis. It is a comprehensive, versatile, and precise dynamic sorption analyzer.

- **Accurate:** Trusted results you can rely on.
- **Accessible:** Cost-effective without compromise.
- **Advanced:** Engineered for high-performance.

The **BTsorb 100** series is primarily used to evaluate the adsorption and separation properties of porous materials. Common samples include MOFs, zeolites, silica gels, activated carbons, and other functional adsorbents. These materials are widely applied in processes such as gas separation, purification, and CO_2 capture. The **BTsorb 100** meets the broad range of dynamic sorption analysis needs for these applications.



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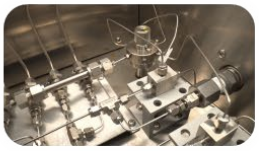
KEY FEATURES

Safety

BTsorb 100 can monitor temperature, pressure, gas flow and gas leakage information and automatically suspend the experiment in case of unsafe conditions.

Heated valve box



Prevent steam condensation, and there is no "cold point" in the pipeline.

MS interface

The MS sample introduction tube is directly connected to the oven, without any "cold point".

Gas inlets

Up to 4 gas inlets with MFCs.

Vapor option

BTsorb 100 is equipped with 2 evaporators with level display function. Its temperature range is -10 - 90°C and can work under 100 bar pressure.

Pressure range

Up to 100 bar.

Columns in different materials and capacities

Water bath interface

The water bath piping adopts quick-connect fittings, making the operation simple and convenient.

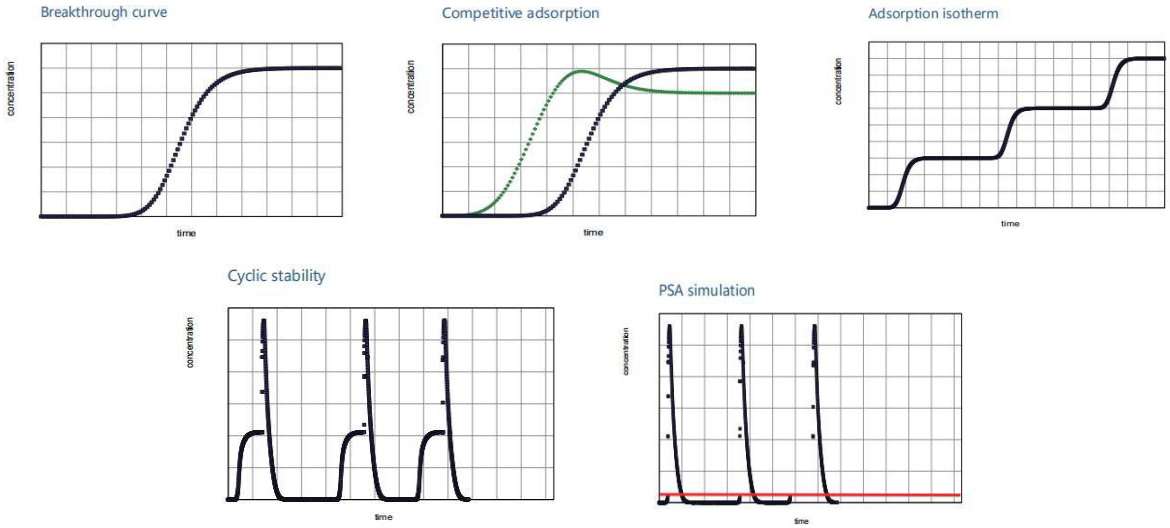
TSA temperature control module

Through the unique design, the system is designed to achieve -10 - 400°C. This design not only allows temperature swing adsorption (TSA), but also enables customers to switch between pretreatment and experimental steps with ease.

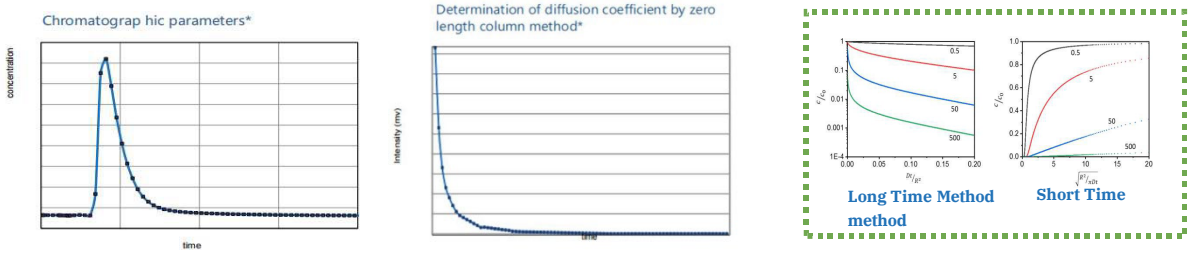
CAPABILITIES

The **BTsorb 100** offers 5 modes for breakthrough curve and competitive adsorption analysis, enabling dynamic evaluation of gas or gas/vapor mixture separation. It also includes 2 dedicated modes for diffusion studies using chromatography and the zero-length column method.

5 Modes for Breakthrough Curve & Competitive Adsorption:

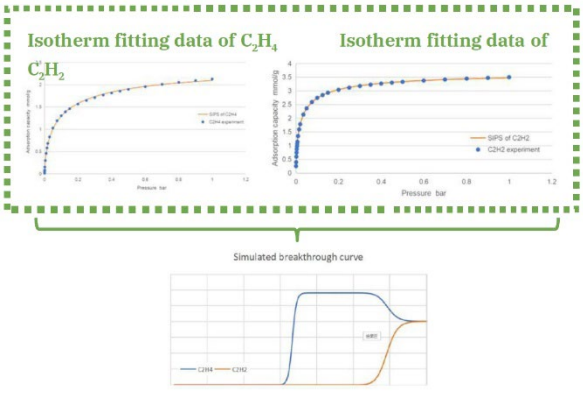


2 Modes for Diffusion Coefficients:



SOFTWARE

BTSimulation is a user-friendly control software offering tools for breakthrough curve prediction, adsorption column heat distribution, single and multi-component adsorption calculations, cycle stability simulation, and analysis of selectivity, affinity, and kinetics. This allows users to obtain insights from both experimental data and simulation models.



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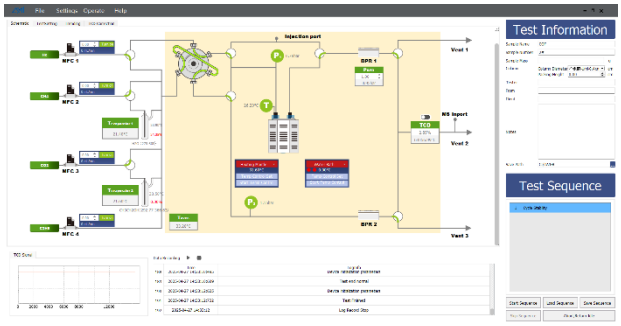
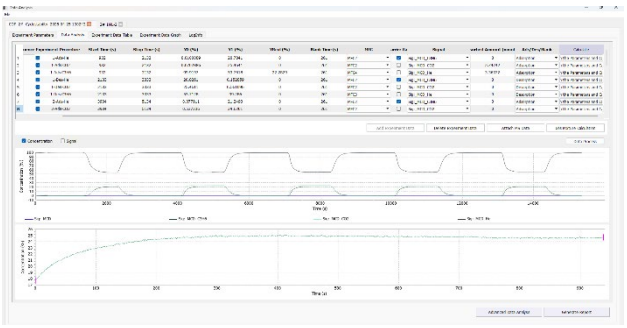
SOFTWARE (cont.)

BTManager is a user-friendly software platform that enables precise control of all experimental processes, while automatically recording data and calculating test results. It offers a range of features designed to simplify and support user operation.

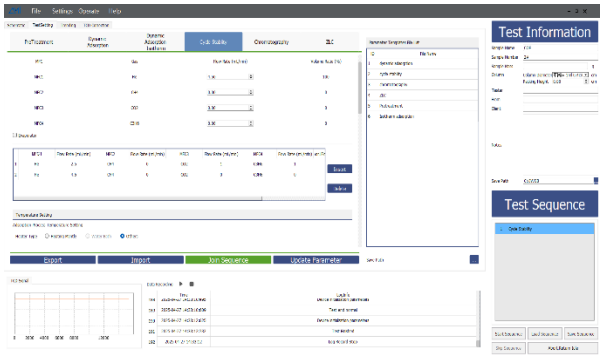
- In addition to standard procedures, the software allows full customization of experimental steps to meet specific testing requirements.
- All experimental steps and data are automatically recorded, making it easy for users to review and analyze results.
- As part of a fully automated system, BTManager enables conditional controls based on time, temperature, pressure, and detector signals—ensuring precise execution, repeatability, and accuracy.
- Includes advanced features such as blank adsorption correction, true flow calibration, abnormal data detection, and TCD signal calibration—minimizing environmental and system influences for highly reliable results.



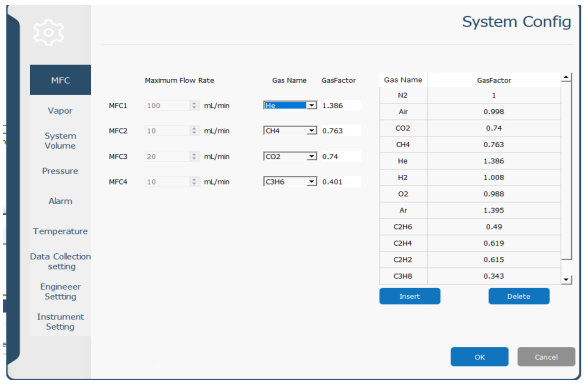
Control interface



Data analysis interface



Experimental parameter setting interface



System configuration interface

SPECIFICATIONS

BTSorb 100	Breakthrough Curve and Mass Transfer Analyzer			Breakthrough Curve Analyzer			
Model	100S Pro	100SLP Pro	100SMP Pro	100S	100SLP	100SMP	100SHP
Breakthrough Curve	✓	✓	✓	✓	✓	✓	✓
Competitive Adsorption	✓	✓	✓	✓	✓	✓	✓
Adsorption Isotherm	✓	✓	✓	✓	✓	✓	✓
Cyclic Stability	✓	✓	✓	✓	✓	✓	✓
Temperature Swing Adsorption	✓	✓	✓	✓	✓	✓	✓
Pressure Swing Adsorption	N/A	✓	✓	N/A	✓	✓	✓
Diffusion Coefficient	✓	✓	✓	N/A	N/A	N/A	N/A
Pressure Range	Atmospheric Pressure	Atmospheric Pressure to 10 bar	Atmospheric Pressure to 40 bar	Atmospheric Pressure	Atmospheric Pressure to 10 bar	Atmospheric Pressure to 40 bar	Atmospheric Pressure to 100 bar
MFCs	4 MFCs (1 carrier gas + 3 adsorbate gases) with a variety of flow ranges						
Gas Inlets	Standard 4 ports, expandable with multi-channel gas inlet controller (Optional)						
Vapor Dosing	Up to 2 vapor generators can be configured (Optional) (temperature control via circulating water baths, with a temperature range of -10°C to 90°C)						
Temperature Control	Standard: Heating module: Ambient - 400 °C; Circulating water bath: -10 - 90°C. Option: Heating furnace: Ambient - 1000°C; Continuous temperature control from -10°C to 400°C can be achieved through the combined use of heating module and circulating water bath.			Standard: Heating module: Ambient - 400 °C; Option: Circulating water bath: -10 - 90°C (included if configured for Vapor Dosing); Heating furnace: Ambient - 1000°C; Continuous temperature control from -10°C to 400°C can be achieved through the combined use of heating module and circulating water bath.			
Detector	Standard: High precision Thermal Conductivity Detector (TCD) Optional: Mass spectrometer (100 amu - 200/300 amu)						
Column	Standard: 1 ml and 4 ml 316SS Option: 1ml and 4ml quartz; Column for ZLC.						
Corrosion Resistance	Standard: Corrosion-resistant TCD Option: Sulfur-resistant corrosion protection gas path upgrade, passivation treatment of fittings and tubing is mainly used for sulfur - containing gases (such as H_2S) and scenarios with high - concentration of corrosive gases.						
Air Compressor	Used to drive pneumatic valves (option)						
Dimensions and Weight	L 32.3 in (820 mm) × W 32.3 in (820 mm) × H 34.6 in (880 mm), 440 lbs (200 kg)						

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.

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