BELSORP-HP

High pressure gas adsorption measurement

High pressure gas adsorption measurement (20MPa Max.)

Compact design

H_2 storage (PCT-curve)

BEL JAPAN, INC.

Specialists in Adsorption

OVERVIEW

The importance of high pressure adsorption measurement is growing in various industries, hydrogen or methane storage, pressure swing adsorption(PSA), CO_2 adsorption into high-polymer, as well as many of applications.
Normally the instruments for measuring high pressure gas sorption are large-size, expensive and hard to use.
BELSORP-HP is low price, easy to operate and has a small foot print suitable for bench-top operation.
Over years of our experience and research in adsorption science, BELSORP-HP has been designed as the best instrument for high pressure adsorption application.
BELSORP-HP would provide the useful information with the researchers in both research and industrial fields.

FEATURES

High pressure adsorption measurement up to 20MPa

- High accurate pressure transducers enable gas sorption measurement with high accuracy.
- Precise correction for non-ideality is made.

Easy operation

Just with simple operation and parameter setting, pretreatment/measurement,
data analyze and also re-calculation are performed automatically by user-friendly software.

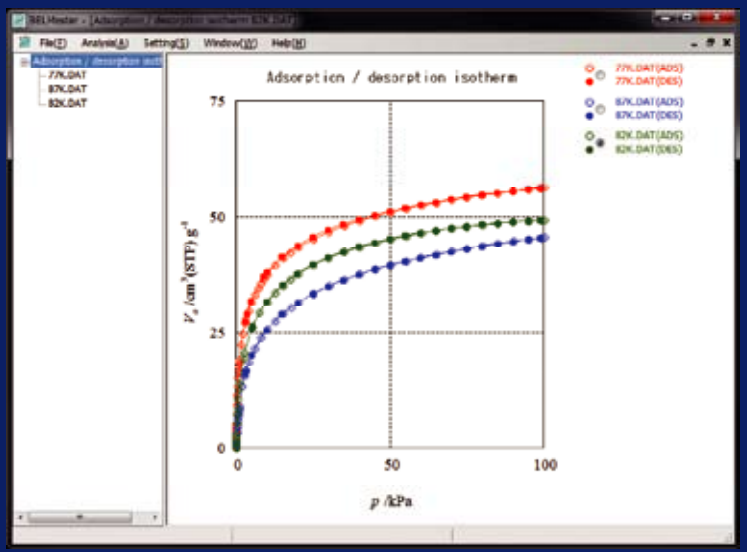
Compact bench-top type

JIS H7201 compliant

A variety of measurement/pretreatment temperature control systems from 4.2K to 400˚C

Heater	For temperature range 50 ～ 400℃.
LN_2 controller	For temperature 77K(LN_2) and 87K(LAr). Liquid coolant level can be controlled.
Water bath	For temperature range -10 ～ 70℃*.
BELThermo™	Peltier temperature controller (10 ～ 50℃). Compact and affordable system.
BELCryo™	4.2 ～ 300K (Type 1H), 50 ～ 300K (Type 2H), 4.2K ～ 200˚C

*Temperature range depends on the refrigerated/heating circulator provided at the customer's site.

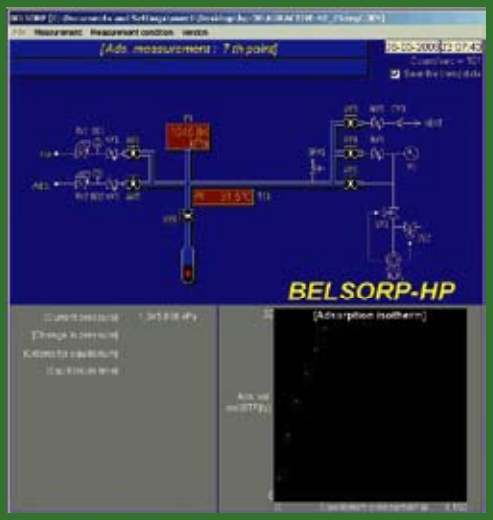


H_2 adsorption isothem on MOF at 77K, 82K and 87K

BELCryo

SOFTWARE

Measurement software

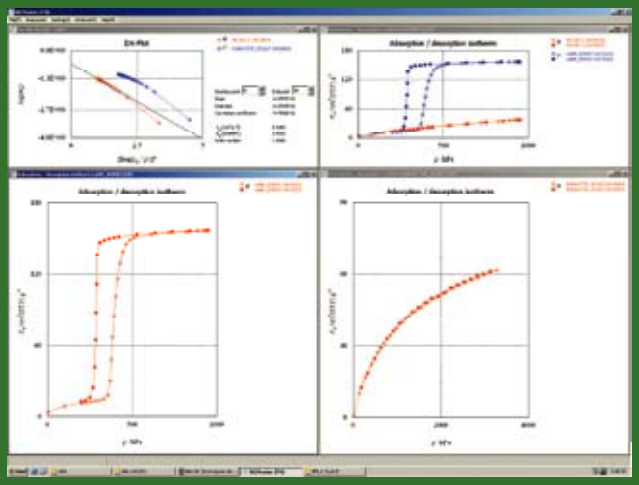


- High throughput measurement sequence control.
- Display of instrument status, trend chart and real-time isotherm.
- Measurement parameters can be altered during sample measurement.
- Guidance message makes the operation easy.
- Interactive instrument schematic for control of valves. Simply click the appropriate symbol on the schematic.

Analysis software-BELMaster™

- Multilanguage
- Simple drag and drop data manipulation.
- Support of data overlays for comparing different samples.
- Analyzed result can be transferred to Excel* spreadsheet and plotting programs using CSV data file format.
- Set preferred analysis option using the Routine Analysis Function.
- User can create custom reference isotherms for t-curve and αs analysis.
- BELSim™ the latest powerful pore size evaluation method (NLDFT/GCMC) is included as standard configurations.

*Microsoft Excel is the trademark of Microsoft Corporaton.



- Analysis theories
  - Adsorption / Desorption isotherm
  - PCT curve
  - BET method
  - Langmuir method
  - BJH / CI / DH / INNES method*
  - αs plot*
  - t plot*
  - MP method*
  - Horvath-Kawazoe method
  - Saito-Foly method
  - Dubinin-Astakhov method
  - Difference of adsorption isotherms
  - Isosteric heat of adsorption (Clausius-Clapeyron equation)
  - Molecular probe method*
  - BELSim™(GCMC and NLDFT analysis)*

*optional

Adsorption rate analysis software-BELDyna™

Adsorption rate is an important factor which indicates the dynamic behavior of adsorption. BELDyna™ can create the graph of concentration changes against time. In addition to that, the pore diffusion coefficient and mass transfer coefficient (LDF) can be obtained. These values are useful for kinetic study of adsorption.

Recalculation software-BELSORP-HP RECALC

- Paramater change can be applied to mesurement data.
- Even after the mesurement, parameters, such as virial coefficient, sample weight and so on can be modified.

SPECIFICATIONS

Measurement principle	Volumetric adsorption method	
Adsorptive	N_2, Ar, O_2, CO, H_2, CO_2, CH_4 and other non-corrosive gas	
Analysis / pretreatment port	1	
Pressure transducer	Range : Select one among F.S. 1, 1.5, 2, 3.5, 13.5, 20MPa (133kPa for low pressure measurement can be added) Accuracy : 0.08%F.S.	
Measurement pressure range	85% of pressure transducer F.S.	
Temperature range	4.2K ～ 400℃ (Temperature range depends on the selected options for temperature control device.)	
Measurement software	Adsorption / desorption isotherm measurement and adsorption kinetics.	
Analysis software (BELMaster™)	Adsorption / Desorption isotherm PCT curve BET method Langmuir method BJH / CI / DH / INNES method* αs plot* t plot* MP method* Horvath-Kawazoe method Saito-Foly method Dubinin-Astakhov method Difference of adsorption isotherms Isosteric heat of adsorption (Clausius-Clapeyron equation) Molecular probe method* BELSim™(GCMC and NLDFT analysis)* *optional	
Physical	W600xD300xH600 mm, 60 kg	
Utility	Gas	He: pres. 0.2 bar (Gauge) (joint: 1/8" Swagelok) Air for pneumatic valve: pres. 4～5 bar (Gauge)(joint: 1/8" Swagelok)
	Power	AC100 ～ 120, 200 ～ 240V/ 500W

· A personal computer, an oil vacuum pump and a refrigerated/heating circulator (when water bath is selected) would be provided at the customer's side.
· Due to our policy of continuous product improvement, the specifications and the information are subject to change without notice.

A MEMBER OF NIKKISO

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BEL-12.06.5000T