

RUBOLAB

Sorption Measurement & Analysis

High Quality Laboratory Technology



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■ RUBOLAB

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독일의 RUBOLAB GmbH 사는 다년간의 경험과 기술력을 바탕으로 흡착제의 여러가지 흡착 특성 (고압흡착, breakthrough curve, PSA: pressure swing adsorption, VSA: vacuum swing adsorption)을 평가하는 장비를 공급하고 있습니다.

■ Products

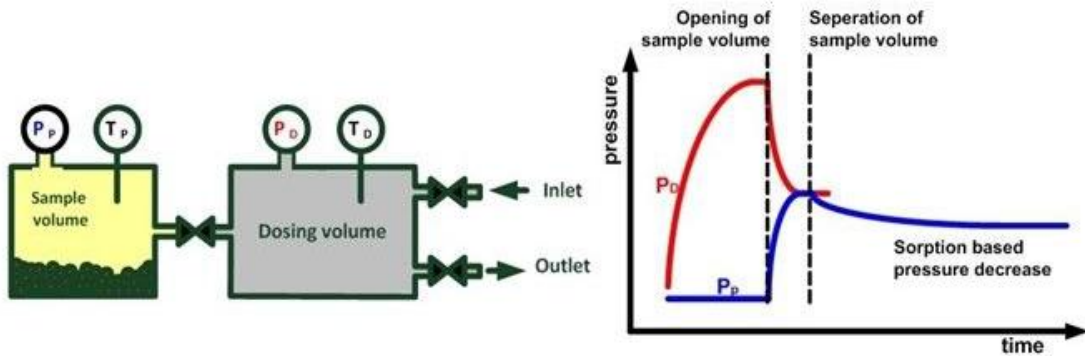


MPA

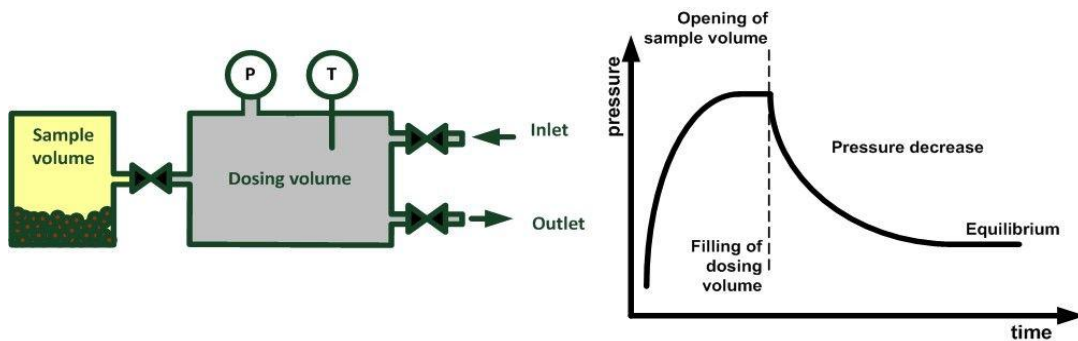
High Pressure Sorption Multiport Analyzer

- 100 bar / 20°C -300°C
- 고압에서 최대 5 개의 샘플 동시 측정
- 측정원리: dosing volume 에 채워진 흡착기체를 온도, 압력센서 (P_p , T_p)가 장착된 sample volume 으로 확산시킨 후 sample volume 내의 압력변화를 측정하여 흡착량 계산
- 요청에 따라 200 bar 업그레이드, cooling device 추가 가능

Advanced Method by RUBOLAB



Conventional Method

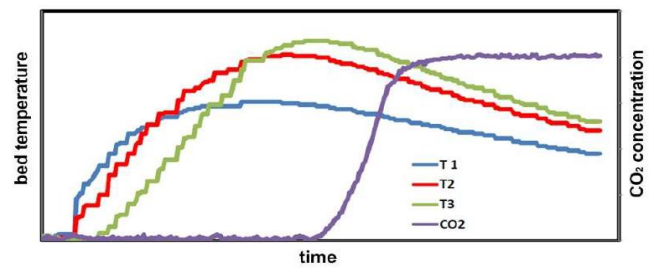
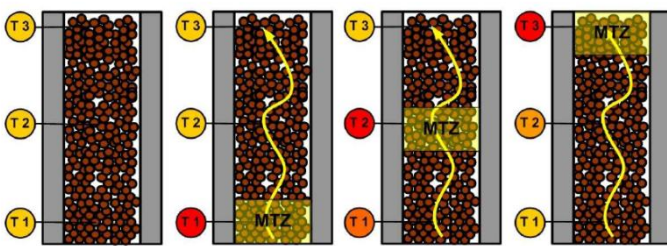




MiniBTC

Breakthrough Measurements on Adsorber Columns

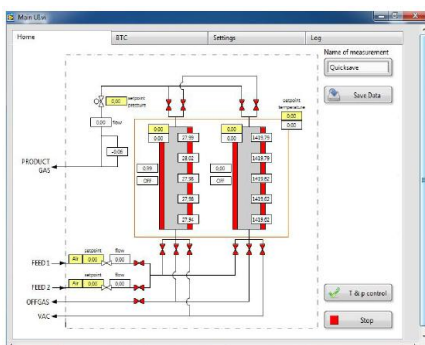
- 3 가지 모델: LP 7 bar, MP 20 bar, HP 40 bar / 0°C-200°C
- 흡착제의 파과곡선 (breakthrough curve) 측정
- 별도로 사용 가능한 gas dosing system 포함
- Column 의 높이, 지름 조절 가능
- 최대 10 개 column 연결 가능
- Volume reducer 사용시 소량의 샘플로도 측정 가능 (예. MOFs)



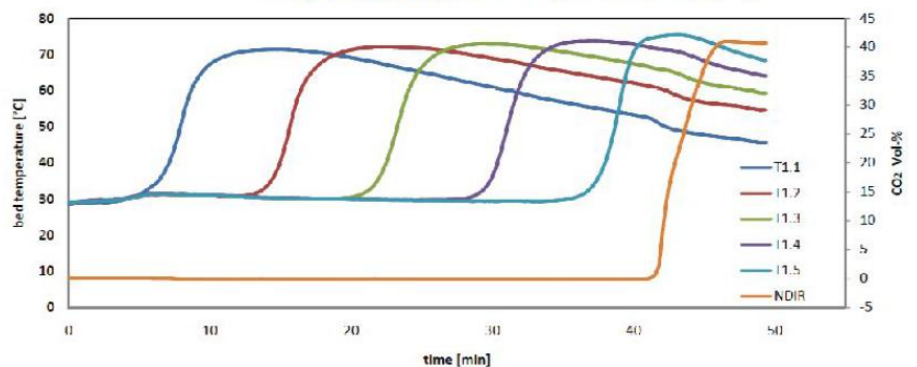
VariPSA

Study of Complex PSA / VSA Processes

- 69 bar / 0°C-350°C
- 흡착제의 pressure/vacuum swing adsorption 특성 측정
- 2 개의 기본 column 을 최대 10 개까지 확장 가능
- 사용이 편리한 터치스크린과 자동 시스템
- Gas detection sensor: NDIR, WLD (standard), mass spectrometer, gas chromatography (optional)



Breakthrough curve of CO₂/N₂ on zeolite 13X



■ Specifications

MPA

Amount of samples	5
Pressure range	Vacuum...100 bar
Number of pressure sensors	5 (sample volume) + 1 (dosing volume)
Accuracy of pressure measurement	0.1% FS
Temperature sensor	Pt 100 and Type K thermocouples
Temperature ranges	20°C...300°C
Gases	He, N ₂ , H ₂ , O ₂ , CO, CO ₂ , CH ₄ , other gases on request

MiniBTC

Number of adsorber columns	1 (customer specific solution with 2-10 available)
Pressure range	Vacuum...7 bar LP version Vacuum...20 bar MP version Vacuum...40 bar HP version
Number of pressure sensors	1
Accuracy of pressure measurement	0.1% FS
Temperature sensor	2 x 3 Type K thermocouples
Temperature ranges	Electrical heater: 25°C...300°C (standard) Liquid circulator: 0°C...200°C
Gases	He, N ₂ , H ₂ , O ₂ , CO, CO ₂ , CH ₄ , other gases on request

VariPSA

Number of adsorber columns	2 (max. 10)
Pressure range	Vacuum...69 bar
Number of pressure sensors	2
Accuracy of pressure measurement	0.1% FS (0.04% FS on request)
Temperature sensor	2 x 5 Type K thermocouples
Temperature ranges	Electrical heater: 60°C...350°C (standard) Liquid circulator: 20°C...150 °C (optional)
Gases	He, N ₂ , H ₂ , O ₂ , CO, CO ₂ , CH ₄ , other gases on request