MICROTRAC
PARTICLE CHARACTERIZATION

ACCURATE ANALYSIS OF PORE STRUCTURES FOR ACTIVATED CARBON

PORE SIZE DISTRIBUTION WITH A NEW GCMC KERNEL BASED ON A SLIT-PORE MODEL WITH CARBON SURFACE HETEROGENEITY

SUITABLE APPLICATIONS

Catalyst | Adsorbents | Battery cell | Electronic component

APPLICABLE MATERIALS

Carbon

Roughness Model NEW

Smooth model

New carbon slit GCMC kernel with roughness surface

MEASUREMENT & ANALYSIS

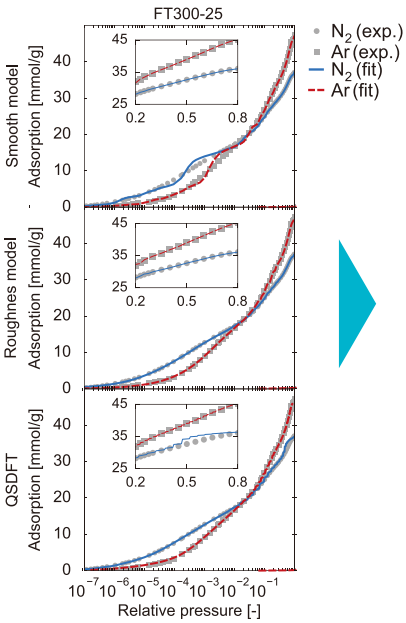
Materials: Activated carbon fiber (FT300-25; Kurarey Chemical) pretreated at 305°C for 3h in vacuum

Ads. isotherm: In N_2 at 77.4K, Ar at 87.3K by BELSORP MAX series (Microtrac)

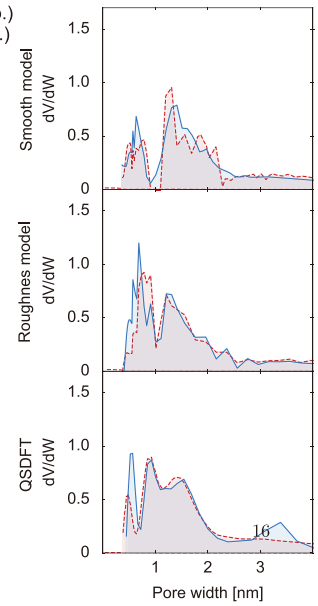
PSD Analysis: GCMC (smooth), GCMC (roughness), QSDFT

RESULTS

ADSORPTION ISOTHERM FITTING



PORE SIZE DISTRIBUTION



I GCMC with smooth model

An ideal adsorption isotherm with a smooth kernel exhibits partially different behavior from the experimental data, resulting in a valley in the pore size distribution at porediameters of approximately 0.9 nm.

I GCMC with roughness model NEW

The ideal adsorption isotherm with the updated kernel with surface roughness best fits the experimental isotherm and represents a more accurate pore size distribution.

I QSDFT

The PSDs derived from the QSDFT method also showed systematic valleys and peaks, indicating insufficient results.

EQUIPMENT

Gas & Vapor Adsorption Analyzers

BELSORP MAX X SERIES

Measurement items

- BET surface area
- Pore size distribution
- Gas & vapor adsorption

High-precision gas adsorption measurement system

BELSORP MAX G

Measurement items

- BET surface area
- Pore size distribution
- Gas adsorption

The new GCMC kernel with roughness surface and **QSDFT kernel** are implemented in the analysis software BELMASTER (Ver. 7.4.3.1~) and are suitable for the data from **BELSORP MAX X SERIES** and **BELSORP MAX G.**

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