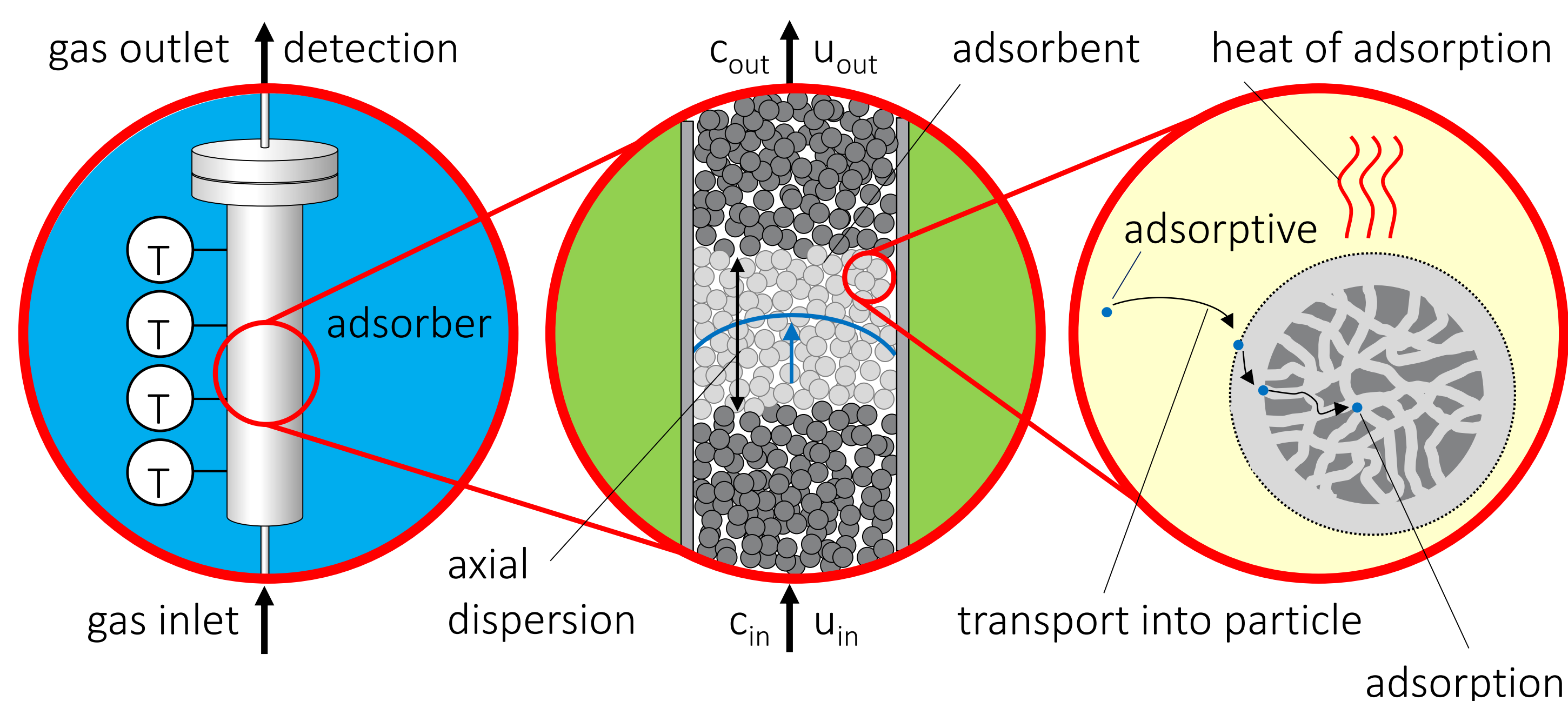


Applications

- Technical Adsorbents
- Material Research
- Chemical Engineering
- Energy Storage
- Selectivity Studies
- Separation Technologies
- Environmental
- Gas Storage

Method

Industrial adsorbents such as active carbons, zeolites and silica gels are widely used in adsorptive separation processes on a multi-ton scale.



- 1) Adsorbent is in a fixed bed
- 2) Adjusting stationary pressure and temperature
- 3) Switching well-defined gas composition to adsorber
- 4) Recording of gas composition on adsorber outlet
- 5) Recording of temperatures along the adsorber

Determination of

- Equilibria (isotherms) of mixtures
- Selectivities
- Regenerability of adsorbents
- Sorption kinetics /dynamics (mass transfer, axial dispersion)
- Displacement effects on preloaded samples
- Technically usable sorption capacity

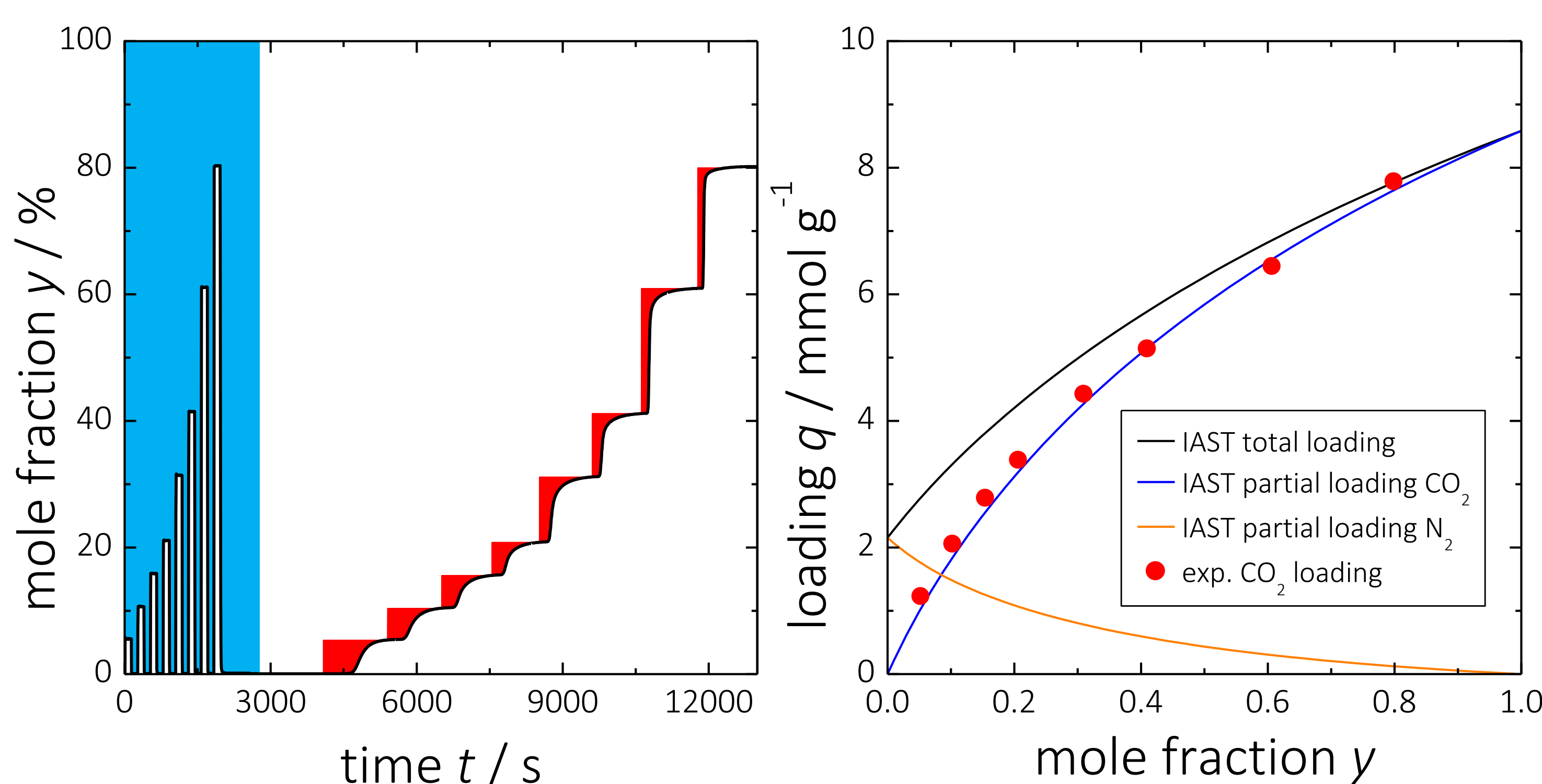
Emulation of:

- Technical sorption processes on the lab-scale
- The PSA-process
- Influence of heat of adsorption on separation processes

A complete understanding of the complex processes taking place in a fixed bed reactor is the key in order to achieve the best separation performance.

Example: Mixture Isotherm of CO₂ in N₂ on activated carbon

- Fully automated measurement routine
- **Bypass Measurement** of 5 %, 10 %, 15 %, 20 %, 30 %, 40 %, 60 % and 80 % CO₂ in N₂ for TCD calibration
- Pressurization to 10 bar with N₂ at 20 °C
- Running Sequence with 5 %, 10 %, 15 %, 20 %, 30 %, 40 %, 60 % and 80 % CO₂ in N₂ until pre-defined stationarity
- Applying mass balance between inlet and outlet (**Integration**) gives differential loadings of CO₂. Summation yields in the mixture isotherm.



→ **Good agreement** between measurement and calculations with the IAST model

→ The dynamic method is suited to determine mixture isotherms in a fully automated manner.

dynaSorb BT

dynaSorb BT Features:

- easy-to-use bench-top instrument
- adjustable gas flow rates
- gas mixing with bypass measurement
- built-in TCD
- safety gas sensor
- intelligent illumination
- *in-situ* sample pretreatment
- gas pre-conditioning
- superior control and simulation software package
- **Flow Range:** 0...40000 mL min⁻¹
- **Pressure Range:** 0...10 bar
- **Temperature Range:** -20...400 °C
- **Sample amount:**
 - Standard Adsorber 100 mL
 - Small Adsorber 5 mL
- **Massflow Controllers** 2, 3 or 4
- **Temperature sensors:**
 - Standard Adsorber 4
 - Small Adsorber 1

