# ADSORPTION 5

**Delivery period:**
Semester 2 (Jan to Mar) --- Tues & Wed am
Two 50-minute lectures --- 10 weeks

**Course organiser:**
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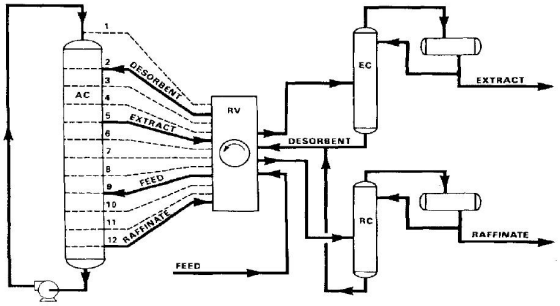
## COURSE DESCRIPTION

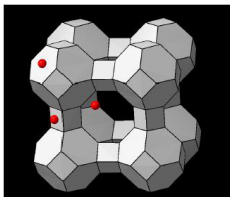
The course covers the basic principles of adsorption and adsorption separation processes, including both equilibrium and dynamic modelling and a brief overview of representative industrial processes.

Zero-length Column



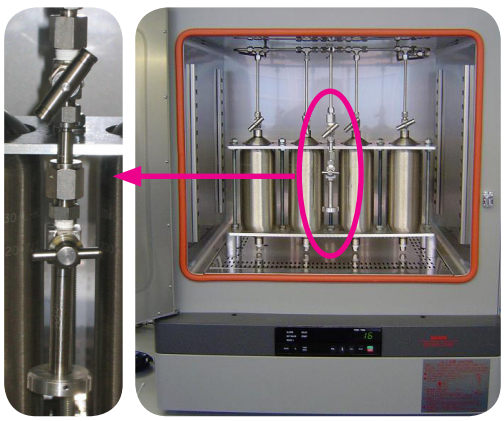

UOP Sorbex Process

## MAIN TOPICS



Cation positions in A-type Zeolites

1. Forces and energetics of adsorption
2. Adsorbent materials
3. Adsorption equilibrium (single/multicomponent systems)
4. Characterisation of adsorbents
5. Diffusion and surface resistance in porous solids
6. Measurement of diffusion in porous solids
7. Sorption kinetics
8. Adsorption column dynamics (linear, non-linear, and multicomponent/non-isothermal systems)
9. Adsorbent contactors
10. Adsorption separation processes (regeneration, pressure swing, thermal swing, and displacement processes)

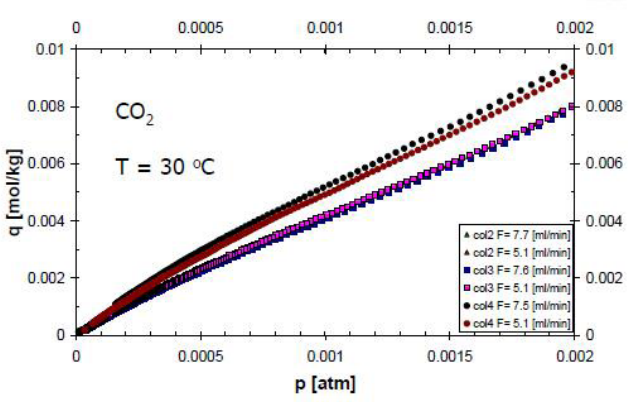


Mixture gas dosing system used also for volumetric/gravimetric adsorption measurements

## LEARNING OUTCOMES

The relationship between the properties of the adsorbent and the process applications will be emphasized.

1. Learn the basics of the design of adsorption systems.
2. Gain the capability to model transient adsorption processes.
3. Gain an understanding of the fundamentals of adsorption:
   - Equilibrium properties
   - Transport properties in adsorption
   - Kinetics of mass transfer

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