Your Sorption Science Expert

Surface Measurement Systems

World Leader in Sorption Science

TAPPI NANO DIVISION

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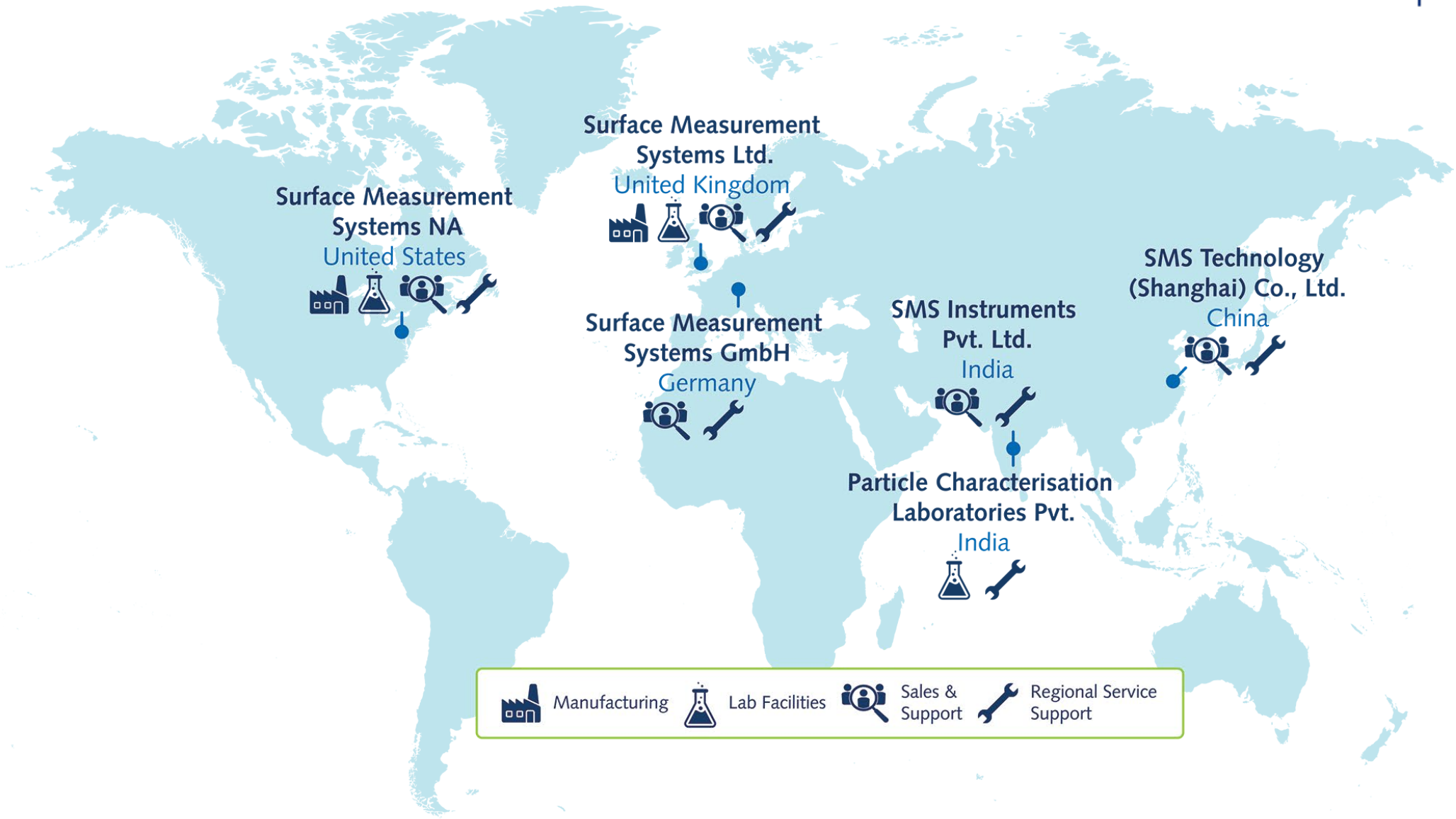

Instruments – Product lines

DVS

iGC SEA

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New Products

BTA

iGC-SEA

Inverse Gas Chromatography-
Surface Energy Analyzer

DVS

Carbon

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BTA Frontier

Specifications

- **Three different gas or vapor inlets**/sources: CO_2, H_2O and VOCs
- Generation of water vapor from 0-90%RH
- Small **amounts of sample** needed **(~10 to 1000 mg)**
- Vapor/gas sensors are located before & after sample column
  - CO_2, Water vapor, PID sensor- organic species: 1ppb to 100ppm and Thermal conductivity detector (TCD)
- **In-situ** sample **conditioning/regeneration** up to 300 °C

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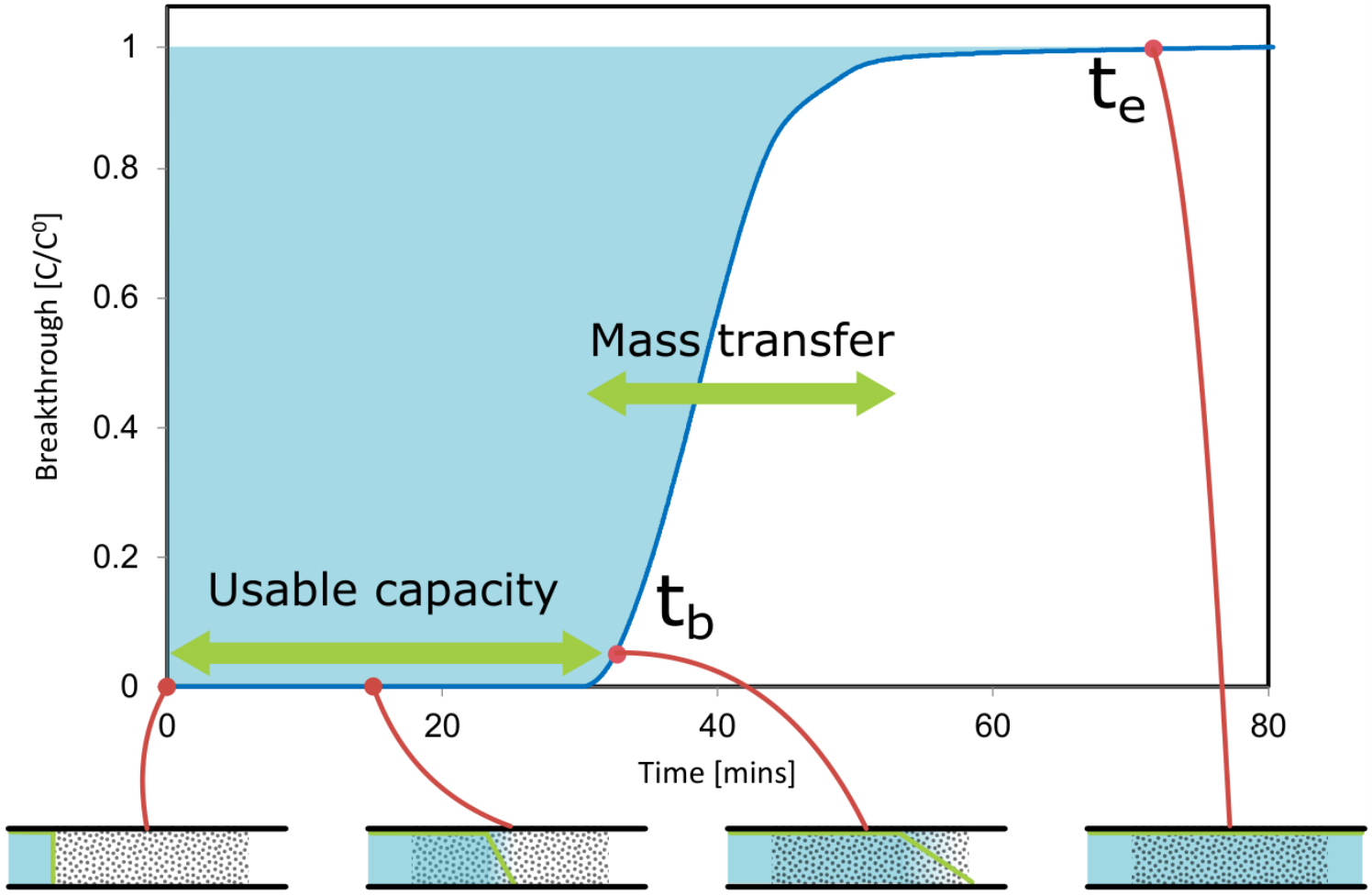
Breakthrough curve: crucial parameters



Measure true single/multicomponent sorption by determining uptakes of each.

Obtain crucial process parameters like breakthrough and equilibration time.

Investigate kinetics, diffusion, flow rate effects, etc.

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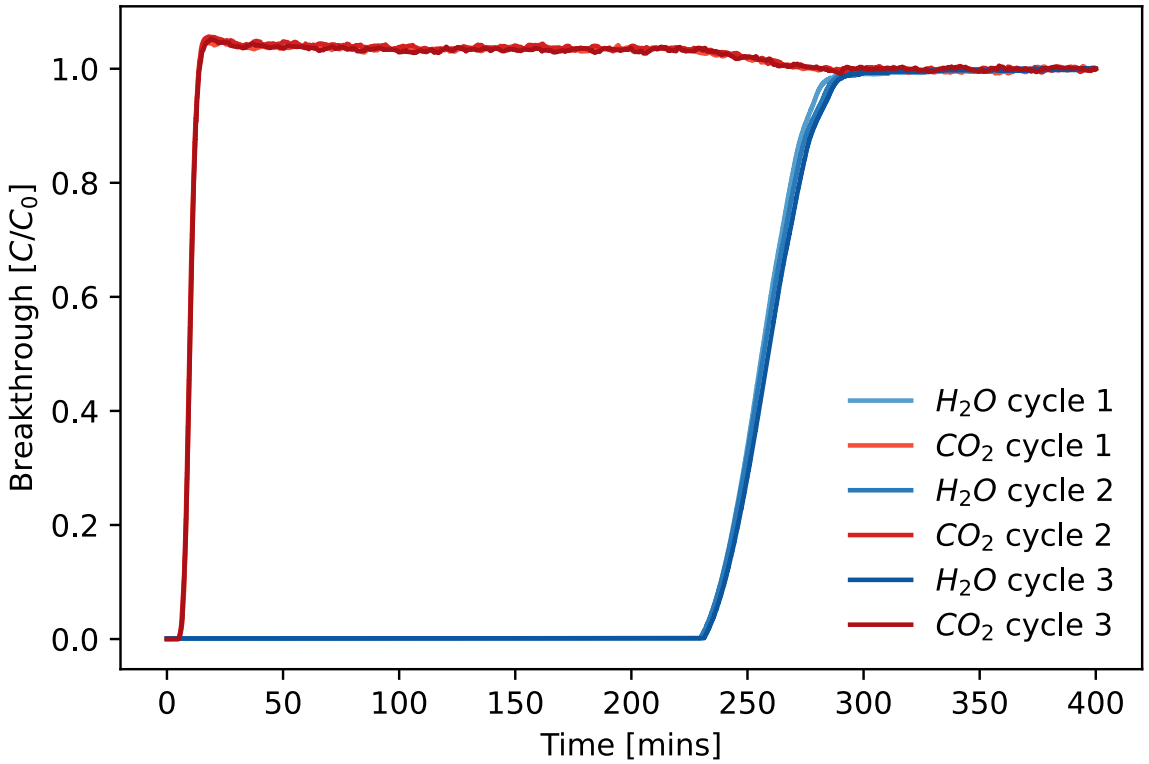
Case study: Impact of H_2O on CO_2 adsorption



Influence of water on the CO_2 uptake: 20% RH and 3.5% vol CO_2 on **Zeolite 13X.** Three sequential breakthrough experiments (activation not shown).

- Explore the **competitive effect of water on the CO2 adsorption** of porous materials
- Characteristic "roll-up" effect is observed, as the water front is replacing adsorbed CO2
- **Near-perfect repeatability** over three cycles

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High Temperature IGC-SEA

New high temperature oven: 30 °C - 500 °C

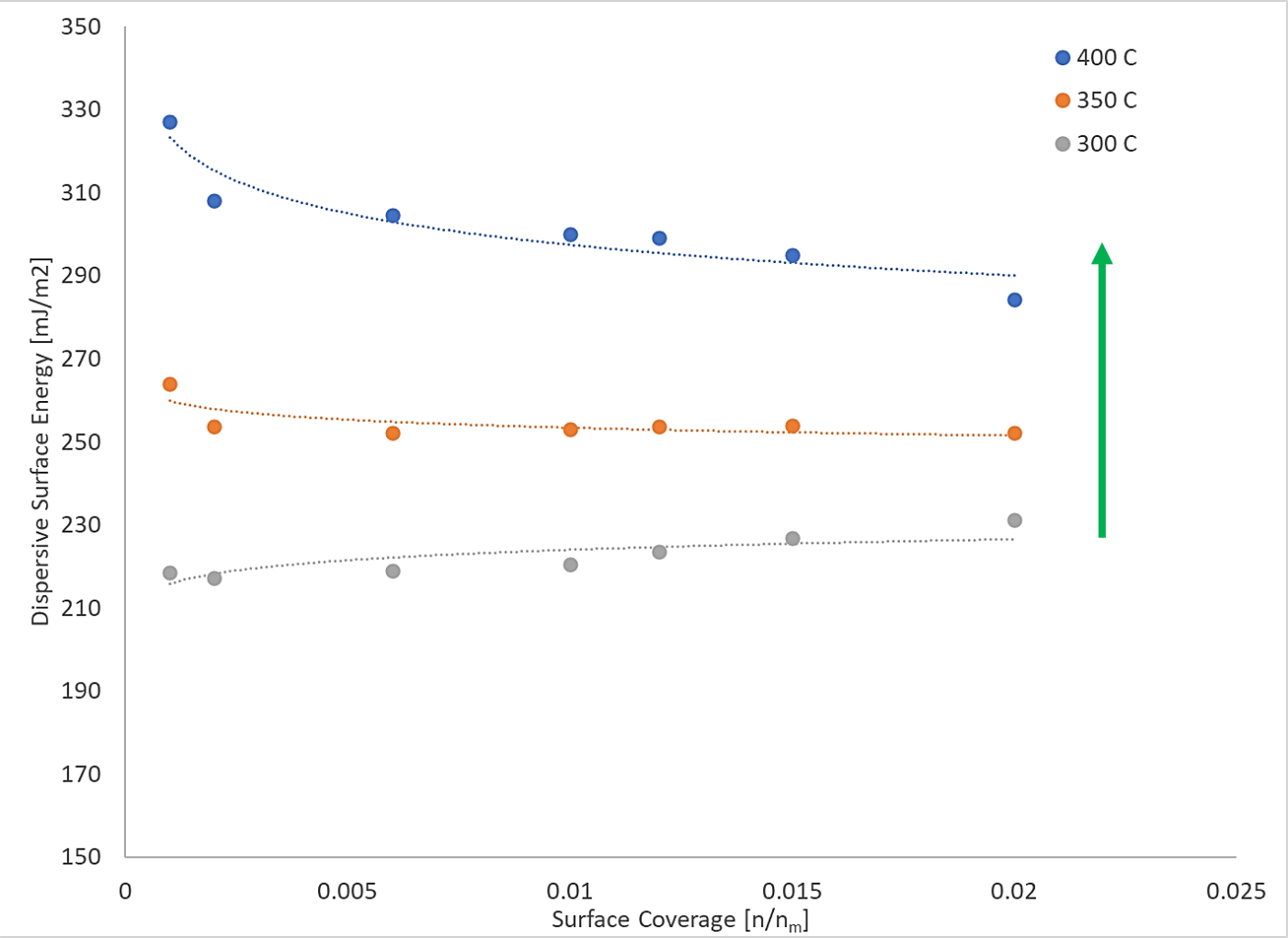
Conduct surface energy analysis under industrial conditions

Fully-automated iGC system

Patented headspace injection system with humidity generator

Purpose-built control & analysis software with CFR capabilities

Dispersive Surface Energy of Zeolite 13x



yd SE at 300° & 350 °C is homogeneous, the surface energetically uniform.

At 400 °C is shows some degree of heterogeneity.

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DVS Carbon

Main Features

- CO_2 gravimetric sorption analyzer
- Water vapor sorption analyzer
- Co-adsorption of CO_2 and water vapor
- Easy access to kinetics, sorption/desorption and hysteresis measurements
- Patented Speed of Sound for CO_2 measurement
- True0 drying at 0.0% RH
- Dual configuration for broad range of CO_2 concentrations*
  - High (0 -98%)
  - Low (e.g 400 ppm)
  - *Requires a cylinder of CO_2 to be connected to the DVS instrument

DVS

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Thank you for having us, the opportunity

and see you in 2024!

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DVS Instruments*

Water Vapour Only

DVS Intrinsic Plus

Water vapor
20-40 °C
Small footprint

DVS ADVENTURE

Water vapour
5-85 °C

Water and Organic Vapours

DVS RESOLUTION

Water and organic vapour
5 – 85 °C

DVS DISCOVERY

Water or organic vapour
10 – 70 °C (Dual balance)

DVS ENDEAVOUR

Water and organic vapor
10 – 70 °C (Five balances)

*Flow based - atmospheric pressure systems