

QSCAN solvent test street

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Bakemastraat 97K, Delft, Netherlands

Operated by

Description

The Mini AutoClave (MAC) for quick scan purposes is a set up for medium throughput vapour-liquid-equilibrium (VLE) equipment where six experiments can be performed simultaneously. An advantage is the relatively small volume of solvent needed to run a proper test. All six reactors can run independently of each other and can be started and stopped at any time. A typical measurement takes about 24 to 48 hours. The test set-up is divided into two temperature sections. Three reactors are heated to 40°C by a water bath and three reactors are connected to an oil bath and can be heated to any temperature between ambient and 120°C and these three reactors run at the same temperature. Vaporliquid equilibrium measurements are performed in 0.1 litre reactors equipped with a magnetic stirrer and a pressure gauge. Typically, 0.05 litre of solvent is used. The solvent in the reactor can be heated up and equilibria can be determined at a constant temperature of the solvent. From these data so-called pressure-loading (P- α) curves can be constructed. The pressure (P) is obtained as a function of the loading (α). The loading is expressed in mol CO₂/mol solvent. For the glass reactors, measurements have an upper limit of about 7 bars. For safety reasons, a high pressure limit of about 5 bar was chosen. This implies that the P- α curves, measured at the MAC set-up, range from about 2 to 5000 mbar.

Scientific Environment

The facility is successfully used for business to business projects and other research programmes such as greenhouse applications, production of gases, materials testing.

State of the Art

A variety of analytical equipment is available to determine gas and liquid composition. Modelling tools are available to perform simulations of the underlying separation principles (thermodynamics, kinetics). Software tools are available to perform process design and development (flow sheeting and scale-up) as well as to perform technical and economic evaluations

Areas of Research

Quality Control / Quality Assurance (QA)

www.mysite.com

Quality Commitment

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CCUS Technologies Capture

- Solvents

Research Fields

- Fluid dynamics
- Thermodynamics

Scale of Facility

- Lab Scale

Research Facility Contact

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Website

<https://www.tno.nl/en/>

Facility Availability

Unit of Access (UA)

Week

Availability Per Year (in UA)

Min 4 weeks

Forms of Access

In Person, Contract Research, Cooperative Research

Present Facility State of Access

Fully Accessible

Average Duration of a Typical Access

Typical 24-48 hours, but even up to 1 week

Operational or Other Constraints

Specific Risks

High pressure limit c.5 bar

Legal Issues

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CCUS Projects

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Figures



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