

Examine Gas Hydrate Formation

with the

Rocking Cell RC5



Characteristics

- Screening tests of hydrate inhibitors
- Turbulent mixing and high shear forces
- 5 adjustable test chambers that can be extended up to 10 chambers
- Pressure can be adjusted separately up to 200 bar (2.900 psi)
- Easy to handle, computer controlled
- Sour gas testing

Strict method for research on inhibitors

With the Rocking Cell RC5 by PSL Systemtechnik hydrate formation can be examined in a lab instrument to test the effectiveness and efficiency of kinetic hydrate inhibitors and the influence of corrosion inhibitors. The Rocking Cell applies one of the strictest accepted methods.

Measuring principle

The measuring principle of the Rocking Cell is based on the tilting of cooled, pressurized test cells (rocking cells). While tilting, a ball inside the chamber is steadily rolling over the length of the test chamber, thereby blending the fluid-gas mixture. The movement of the ball creates strong shear forces and turbulences in the test chamber. Thus, the conditions in pipelines are reproduced.

Test procedure

For testing, the test chambers are filled with a sample fluid (water or other) and a certain amount of inhibitor. The test chambers are cooled down to the test temperature. Subsequently, the central gas supply is used, to fill each chamber to the individually required pressure of up to 200 bar (2.900 psi).

Well-engineered and user-friendly

The 5 test chambers are mounted on a movable axis in a closed cooling bath with cooling liquid. Only this axis is tilted during the test. The Rocking Cell can be extended

up to 10 test chambers. The test chambers are magnetically attached and can thus be easily removed for filling or cleaning.

The compact Rocking Cell requires only a small amount of space and is equipped with an integrated PC.

Typical experiment schedule

A typical experiment is executed in three steps:

1. Flowing conditions: The test chambers are see-sawed with an adjustable rocking rate and rocking angle. Meanwhile, they are brought to a given temperature, either directly or via temperature ramp.



2. Shut-in: The test chambers are kept in a given position (adjustable up to 45° angle). The sample is cooled or heated to scheduled temperature.

3. Restart flowing conditions: The test chambers are tilted again with an adjustable rocking rate and rocking angle and cooled or heated, respectively, to a given temperature. During a test run, temperature and pressure values are recorded.

Thus you can monitor hydrate formation by the pressure changes that result from forming and dissociation of gas hydrates.

Variable test conditions with software

The pre-installed PSL software WinRC enables comfortable data recording and evaluation, as well as scheduling and execution of automated test runs.

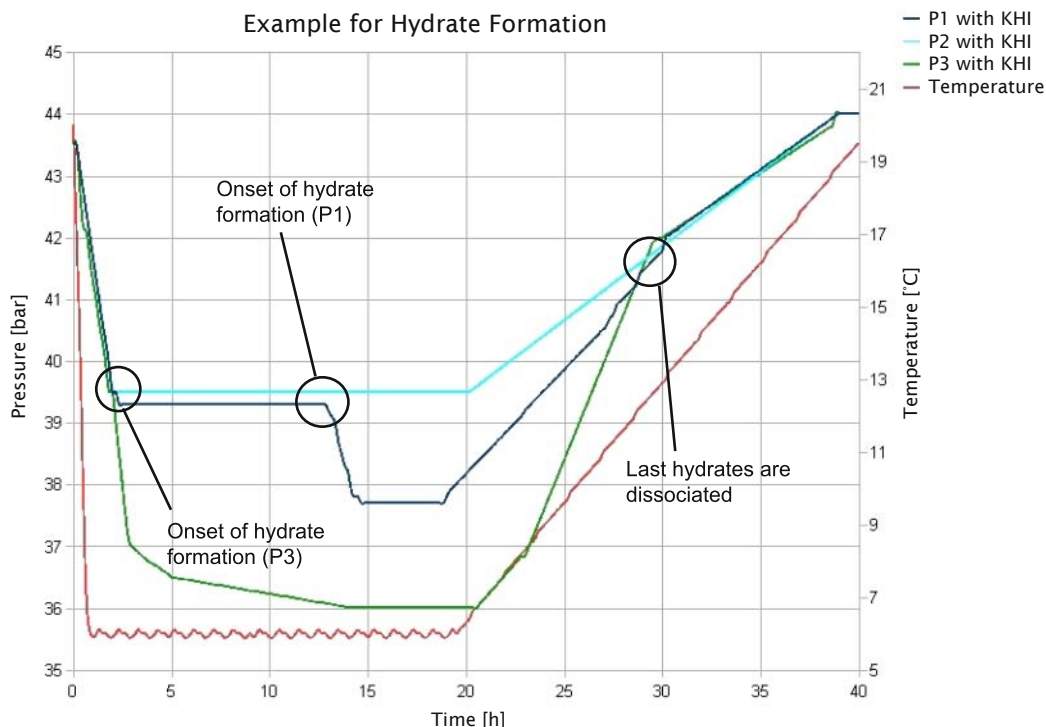
Versatile test runs are possible with variable

scheduling of test conditions. With the PSL software you can define test parameters like temperature, rocking rate and angle, duration of the test run and of shut-in also position of the test chamber during shut-in. Long-time runs up to 30 days and longer are possible.

Material of chambers and balls

Test chambers are made of stainless steel to achieve realistic pipeline conditions. For sweet testing V2A mixing balls can be used. For sour gas testing glass balls are available. Additionally, cells and manifold system can be made out of Hastelloy. Feed lines and connections are made of PEEK, to prevent condensation.

Furthermore, we can adapt the Rocking Cell to your requirements.



Specifications:

Test chambers:	5, volume: 40 cm ³ , made of stainless steel (AISI 316 Ti) or Hastelloy
Rocking rate:	adjustable 1 ... 20 min ⁻¹
Rocking angle:	adjustable 1 ... 45°
Pressure range:	up to 200 bar (2.900 psi)
Temperature range:	-10 ... +60 °C (+14 ... +140 °F)
Data recording:	variable between 1 and 30 sec
Bath volume, Cooling liquid:	9,5 litre, water-glycol-mix
Voltage input:	230 V~, 50/60 Hz (115 V~ on request)
Power consumption:	90 W (RC5), 2.900 W (cryostat)
Weight:	21 kg (without cryostat)
Dimensions (WxDxH):	51 x 60 x 29 cm (without cryostat)



PSL Systemtechnik GmbH
Albrecht-von-Groddeck-Str. 5
D-38678 Clausthal-Zellerfeld
Germany