

Crystalline

SEE IT ALL



Get more answers earlier on

Advance your crystallization research with the Crystalline series, the multiple reactor system which gives you easy access to information previously only available for much larger samples. Designed by experts in crystallization research the Crystalline family provides real time answers to all your material science or solid state research questions.

Crystalline
SEE IT ALL

A race against time

With increasing economic demands, it is becoming progressively more important to gain additional information on drug candidates early on in the development cycle. Better informed decisions can be made during the selection of candidates if further solid state information is available – saving time and money later on in the development process. But early stage drug candidates are difficult and expensive to produce and often only a single gram of material is available. To fulfill the increasing need to learn more on these small amounts of compound, Crystallization systems developed the Crystalline family: providing more information on less material.

The Crystalline is a unique modular product line, based on a small volume parallel crystallizer. This multiple reactor station was developed specifically for crystallization research, by Crystallization systems to answer the most pressing questions in solid state research and process development: What is happening? When is it happening? The system and software have been designed by scientists who perform crystallization experiments on a daily basis.

Walk up and use

The Crystalline follows in the same philosophy of the Crystal16™ system – it is a user-friendly tool with uncomplicated software that will enable you to improve your crystallization research.

The Crystalline with through the vial analytical capabilities is easy to set up and operate. The ergonomic design and effortless operation removes all the barriers to using technology which was previously only accessible to experts. The intuitive control and analysis software gives every user access to valuable information from small amounts of samples.



Crystalline^{SE}

SEE IT ALL

Small giant

The Crystalline SE has all the capabilities you would expect from a sophisticated parallel crystallizer; yet it has a footprint, not much larger than a shoe box. This ergonomically designed core module features reaction vessels with overhead stirring on sample volumes as small as 1 ml. Utilizing the specially designed stirring paddles it is possible to mix even the most viscous materials in a controlled fashion, facilitating the study of slurry conversions and other processes at a small scale.

Eight in one

With 8 independently controlled reactors, it is possible to study the effect of different solvents or counter ions in a simple and easy fashion. The Crystalline SE utilizes disposable 8 ml glass vials, allowing you to screen many conditions, with a very limited amount of sample. The proprietary smart caps facilitate refluxing on a milliliter scale, as well as seeding and anti-solvent addition experiments.

The real time turbidity measurements are carried out without any physical contact between the sample and the probe – making this an extremely easy system to use. Just pop your sample into the reactor...

- Smallest reactors with overhead stirring
- Refluxing at a milliliter scale
- Real time, through the vial turbidity measurements

More from one

This unit is ideal for scale-up studies from polymorph and salt screening experiments, making it possible to drive polymorph conversions in a controlled fashion, with temperature feedback based on in-process turbidity information. The Crystalline SE can easily import solubility and MSZW information from e.g. Crystal16™, to be used as a starting point for controlled single crystal growth.



Making use of non-linear temperature profiles in combination with direct response to the crystallization behavior of the sample, diffraction quality single crystals can be grown in a reproducible and controlled fashion. Different crystallization techniques can be used, including thermocycling, slow evaporation and vapor diffusion.



- Specially designed for parallel crystallization studies
- Grow single crystals overnight
- Controlled scale-up from microliter screens
- Speed up your crystallization research
- Easy to use – no extensive training required



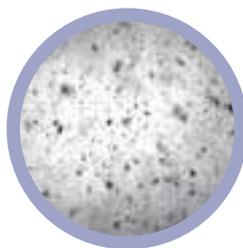
Crystalline^{PV}

SEE IT ALL

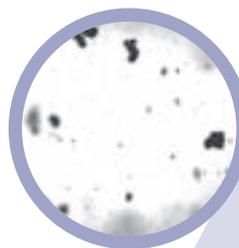
Seeing is believing

The Crystalline PV combines turbidity measurements with four independent real time particle viewers. With four high quality digital visualization probes, seeing what is happening in the vial has never been easier: no moving parts, no cumbersome insertion probes. The visualization probes are controlled separately from each other, and can be synchronized with the turbidity measurements and temperature profile of each independent reactor. With a robust design, the probes are contained in a sealed, pre-aligned and sturdy environment, giving the user walk-up access to four parallel particle viewers.

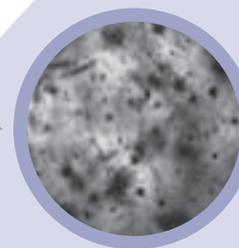
- Visualization of the complete crystallization process
- Particle size and shape information at the smallest scale
- Feedback control based on visual information



Small particles of ground anhydrous Carbamazepine is added to H₂O at 35°C.



The anhydrous Carbamazepine gradually forms aggregates in H₂O, resulting in larger particles.



Needles of the Carbamazepine dihydrate form after ca. 10 min.

Find out what is happening

Have you ever wondered what is happening during crystallization? How do you know if the sample is aggregating or oiling out? Stop guessing: now you can see what is happening. You can easily correlate the turbidity signals with visual information – finally getting the complete picture of the crystallization process.

- Polymorph and solvate screening
- Monitoring of habit changes
- Searching for less stable intermediates
- Controlling growth of certain polymorphs

Control the process

Have you ever puzzled over off-line analytics, trying to figure out what happened during the process? With the real time particle viewer you know exactly what is happening, when it is happening. By making use of the accurate thermocycling program of the Crystalline PV, you can investigate and control any crystallization process.

- Study nucleation and crystal growth
- Investigate reaction rates
- Monitor slurry conversions



The quality and crystal morphology of single crystals can be easily assessed in the high contrast images obtained with back lighting.



The pulsed front lighting gives sharp images of crystals grown from highly concentrated solutions (75% urea in water).

Crystalline^{RR}

SEE IT ALL



Real time Raman

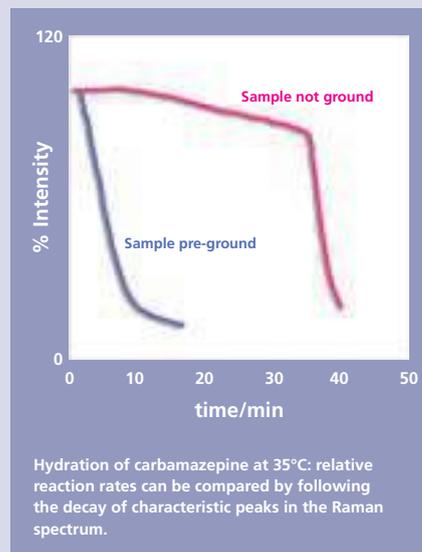
The Crystalline RR gives the user access to real time Raman spectroscopy, in combination with a sophisticated parallel crystallizer with turbidity measurement. The four independent Raman probes are integrated in an ergonomically designed, pre-aligned, robust and sealed module. The user does not have to insert any probes into the reaction vessel.

See when it happens

Traditionally analytical techniques are implemented in an off-line fashion, where samples have to be removed from the reaction or process, in order to obtain information about chemical composition or interactions. With off-line techniques one obtains information on a few data points in time, but the nagging question always remains: Have I missed something? With the Crystalline RR it is easy to follow crystallization processes and to study polymorph conversions, hydration or the formation of solvates in slurries.

Chemical interactions like co-crystal and salt formation can be studied effortlessly during the process. This hassle-free tool enables you to screen many solvents, counter ions or co-formers on a small amount of API – giving you valuable answers much earlier on in the process.

- Real time information on chemical interactions
- Drive reactions based on spectroscopic results
- Measure relative reaction rates



A closer look

The complete Crystalline series are desktop instruments taking up very little of your valuable laboratory space. With a footprint of only 310 x 420 mm, the Crystalline SE will fit onto any workbench.

A single Crystalline will hold up to 8 standard disposable glass vials (16,6 mm diameter, fl at bottomed, 8 ml volume).

The modular design of the Crystalline allows for customization according to your individual needs and budget. You can combine turbidity information with a parallel particle viewer or with real time Raman capabilities. All of these techniques are integrated into a small reactor with overhead stirring and refluxing capabilities.

Each reactor can be independently loaded, programmed and operated. Magnetic flux rotation with programmable stir speeds allows for both overhead stirring and mixing using magnetic stirrer bars.



Crystalline

SEE IT ALL

Operating parameters

- 8 independently programmable temperature zones
- Temperature range: -25 to 180°C
- Heating/Cooling: individually programmable per reactor
- Temperature profile: non-linear profiles supported
- Temperature control accuracy: 0.1°C
- Heating/Cooling ramps: programmable between 0°C and 20°C/min
- Stirring mechanism: overhead sample stirring or magnetic stirrer bars
- Stirrer speed: individually programmable from 0 – 1250 rpm
- Real time turbidity measurement: per individual reactor in transmission
- Working volume: (1 ml – 5 ml)
- Refluxing capability
- N₂ flow for slow evaporation

Operating software

The Crystalline operating software can be used to program each reactor individually. Making use of feedback control it is possible to respond to crystallization events, during the temperature cycle. Data from different analytics (e.g. turbidity and Raman spectra) can be correlated with temperature profiles and stirring speeds. Data for each reactor is easily transferred to, for instance, Excel spreadsheets. The operating software is compatible with Windows 64 bit.

Analytics

Each reactor is equipped with a LED and photo sensor for real time transmission turbidity measurement.

Crystalline PV

- 4 parallel visualization probes
- Sample illumination: front and back pulsed lighting
- Automatic light intensity control
- Each camera is individually controlled and programmable
- Image analysis software: particle size, distribution and shape

Crystalline RR

- 4 parallel real time Raman probes
- Correlation of Raman spectra with temperature profiles and turbidity signals
- Software interface for spectroscopic analysis

Electric specifications

The Crystalline requires 110V/220V power input.





Technobis

crystallization systems

Please contact us for more information
info@crystallizationsystems.com
www.crystallizationsystems.com

Crystalline is a product of Technobis Crystallization Systems
Pyrietstraat 2, 1812 SC Alkmaar
The Netherlands

T +31 72 3020040