

STOE STADI P POWDER DIFFRACTOMETER SYSTEM

The world leading system in structure solution from X-ray powder data



In the world of X-ray powder diffraction, the STOE STADI P is one of the most acknowledged instruments for phase analysis, structure refinement and structure solution, even under non-ambient conditions.

Well-defined monochromatic $K\alpha_1$ radiation in the range from Fe- to Mo-anodes, high resolution and symmetric peak shape have gained this unique system reputation among powder diffraction scientists all over the world.

Different sample stages, running from capillary to transmission, from reflection to controlled semi-circle sample holders minimize preferred orientation effects.

The versatile diffractometer system offers a selection of different detector systems - linear Position Sensitive Detector, scintillation counter or Imaging Plate Detector - which guarantees optimized data collection time for all possible applications.

An optional automatic alignment system for the curved Ge (111) monochromator ensures perfect and reliable monochromator adjustment and provides a log book function of the primary beam intensity.

With the STADI P system, different set-ups, either horizontal or vertical, can be combined, e.g. two transmission diffractometers, one transmission diffractometer and a fixed stage or a combination of one transmission and one Bragg-Brentano diffractometer.

Optional high- and low-temperature devices for various geometries and applications offer an accessible temperature range between 20 and 2000 K.

All these features make the STADI P a professional tool for a wide range of analytical applications in the unsurpassed quality and reliability which have become STOE's trademark throughout more than 110 years.

- Features**
- All sample holders and detectors fast and easily to exchange
 - Pure $K\alpha_1$ radiation
 - Automatic or manual monochromator alignment using one single degree of freedom
 - All high and low temperature devices easily adaptable
 - Optimum resolution at all data collection modes
 - Analysis of air- and moisture-sensitive samples as well as micro samples

- Detectors**
- Scintillation counter
 - Position Sensitive Detector
 - Imaging Plate Detector

- Software**
- STOE Win X^{POW}
 - Search/Match module supporting ICDD PDF 2
 - CSD Rietveld refinement and structure solution
 - LAYER for reflectometry evaluation



Combination of a transmission diffractometer and a Bragg-Brentano diffractometer, both working with $K\alpha_1$ radiation in vertical mode.



High temperature attachment for capillaries fixed on a transmission diffractometer (horizontal set-up).



Fixed stage in Debye-Scherrer geometry with monochromator, sample holder for capillaries and Imaging Plate Detector.

- Options**
- Transmission sample holder for zero scatter foils (adjustable for thickness)
 - Capillary holder for open or sealed capillaries
 - Adjustable reflection sample holder for powders and bulk samples

- High- and low-temperature stages for a temperature range between 20 and 2000 K
- Automatic sample changers for up to 30 transmission /12 reflection samples

Crystal structure solution and Rietveld refinement

Peak separation, indexing and lattice parameter refinement

Full pattern fitting

Structure solution with modern ab initio methods and Rietveld refinement

Rapid phase identification

Multi phase analysis due to clear X-ray diagrams

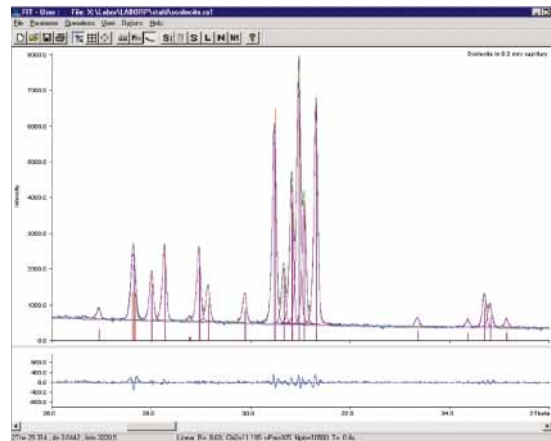
Qualitative and quantitative phase analysis with I/I_{cor} values from ICDD data base or Rietveld refinement

High-/low-temperature phase analysis

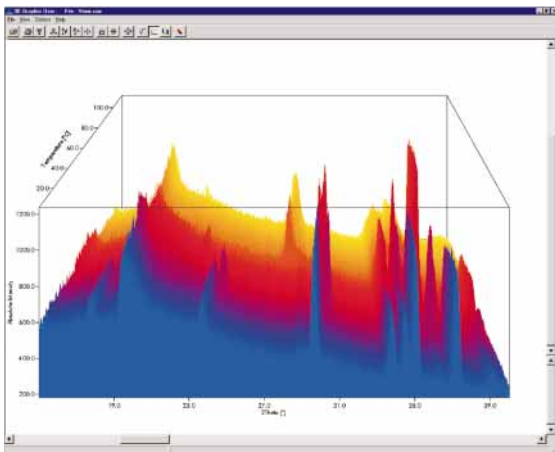
Qualitative and quantitative investigation of phase transitions

3D-graphics illustrating pattern versus temperature area

Applications



Pattern fitting of a scolecite sample measured in Debye-Scherrer mode in a capillary of 0.3 mm diameter.



3D-graphic of a temperature-resolved measurement of a clay mineral. Phase transitions can easily be observed and each single pattern quantitatively evaluated.

Only clear diagrams with well-defined and indexable reflections offer the possibility to solve and refine crystal structures from powder data. Therefore the system has to provide the user with peaks revealing narrow FWHM and reflections not affected by preferred orientation. All this is guaranteed by the STADI P due to the excellent design of the Ge(111) monochromator and the Position

Sensitive Detector systems (linear or Imaging Plate) in combination with versatile sample stages.

Resuming, the STADI P offers highest resolution and intensity in combination with reliability, flexibility and accuracy using wavelengths from Fe- to Mo-radiation.

Expertise in structure solution and Rietveld analysis

Combined applications

Two STADI P systems running the same or different geometries can be combined on only one tube housing.

As a reasonable alternative to a second diffractometer, a fixed stage for high-/ low-temperature measurements is available.

Sample changers for both geometries offer optimal utilization of measuring time.

Owing to this modular concept, the system keeps pace with your demands as your task of research progresses

Transmission/Debye-Scherrer

Pure $K\alpha_1$ radiation

High resolution measurements yield well-defined peak profiles.

Capillaries: structure determination from air-sensitive samples or samples affected by preferred orientation.

Thin foils: structure determination and refinement.

Micro-samples (0.01- 0.1 mg) measurable in transmission mode.

High- and low-temperature attachments offering a T-range from 20 to 2000 K.

Fast data acquisition using the Imaging Plate Detector.

Automatic sample changer (30 samples).

Variable Bragg-Brentano

Pure $K\alpha_1$ radiation or $K\alpha_{1/2}$

Various optical elements like automatic slit system or multilayer mirrors.

Scintillation counter

Linear Position Sensitive Detector provides short measuring times maintaining resolution.

Independent circle movement for $2\theta/\theta$, 2θ and ω .

Various high- or low-temperature reflection chambers.

Computer controlled sample holders (open Eulerian cradle etc.)

Automatic sample changer (12 samples)

Standard set-up	Diffractometer, monochromator, lin. PSD, sample holders, tube, tube housing, interface, generator, cabinet, radiation-hood, PC, software
Weight (complete system)	Approx. 350 kg
Weight of an additional diffractometer	Approx. 60 kg
Size (l, w, h)	1700 * 900 * 1900 mm
Radius of focusing circle	130 mm
2θ range	0 to approx. 140°
Scan modes	Freely programmable
Angular reproducibility	0.0005°
Minimum step size	0.0005°
Detectors	Linear PSD, solid state detector, scintillation counter, IP-Detector
Radiation protection	Fully interlocked system
Generator	3.6 kW, water-cooled
Computer system	PC running 32-bit Windows OS



Specifications without obligation and subject to change without notice

STOE & Cie GmbH • P.O.Box 101302 • D-64213 Darmstadt
Phone: (+49) 61 51 / 98 80 70 • Fax: (+049) 61 51 / 98 87 88
E-mail: stoe@stoe.com • <http://www.stoe.com>