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Excellence in Science

# Rigaku XRD for Pharmaceutical Applications

Rigaku
POWERING NEW PERSPECTIVES

- Polymorph & Solid-Form Characterization
- Crystallinity & Amorphous Content
- Component Analysis & Quantitation
- In-sity Thermal Coupling: XRD-DSC
- High-throughput Screening

FDA 21 CFR Part 11 Compliant

CMP Compliant

### Polymorph Identification
Check the raw materials
Quality Control
Check the Patent

### Crystalinity
Speed for dissolving

### Crystallite size
Speed for dissolving

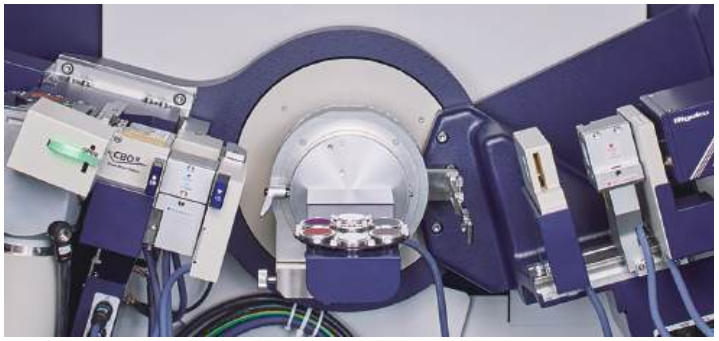
Rigaku offers advanced XRD systems such as SmartLab and MiniFlex, designed to support pharmaceutical research and quality control. These instruments enable high-precision analysis of APIs, excipients, and formulations via structural and phase characterization

By combining cutting-edge instrumentation (SmartLab, MiniFlex) with integrated software workflows and analytical versatility, Rigaku's XRD platforms deliver robust, reproducible, and compliant insights into API structures, formulation behaviour, and manufacturing quality control not only for the QA/QC applications but also for the R&D requirements as well.

## Miniflex

- Worlds 1st benchtop XRD launched in 1973 with more than 13000 journal citations and more than 5000 patents citations on Miniflex.
- A benchtop system ideal for routine phase ID, crystallinity quantification, crystallite size, and strain analysis. Best suited for routine QA/QC studies.
- Newer generations feature 2D hybrid pixel detectors (HPAD), automatic sample changers, and powerful PDXL software for Rietveld refinement and crystallographic calculations.
- D/teX Ultra - 1D advanced silicon strip detector standard.

## Powder diffraction measurement in reflection/ transmission mode



### Reflection mode optical configuration

- Bragg-Brentano focusing method
- Parallel beam method
- Divergent beam method

Users can easily switch geometry from the generally used reflection mode to transmission mode according to users' measurement purposes. The transmission method provides high-intensity and high-resolution data using a convergent beam.

### Transmission mode optical configuration

- Convergent beam method
- Parallel beam method

(The above picture shows the vertical transmission geometry.)


## SmartLab SE

- Supports both reflection and transmission geometries with automated Cross-Beam optics
- Includes SmartLab Studio II software with intelligent guidance for experiment setup and analysis.
- Ideal for research requiring simultaneous structural and phase insights, including thin films, powders, and in-situ testing (XRD-DSC measurements that correlates thermal events with structural changes).
- Combined XRD and DSC analyses enable real-time monitoring of structural changes (e.g. recrystallization, phase transitions) during temperature sweep or humidity variation - especially relevant for hydration studies of APIs.
- Standardless Quantitation, automation & batch analysis.

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