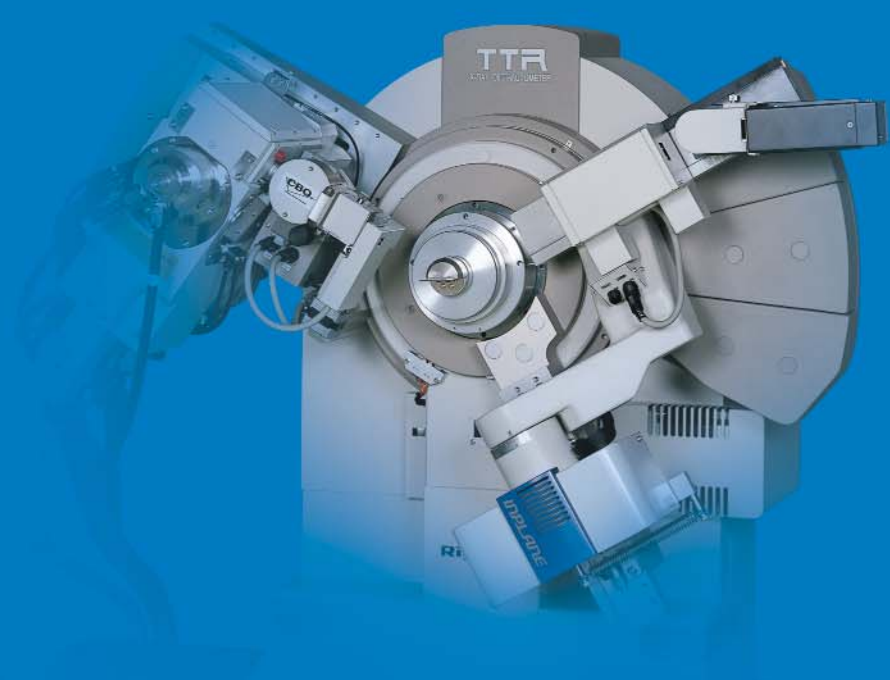
Rigaku

Leading With Innovation

TTRAX III

The world's most powerful θ:θ X-ray diffractometer



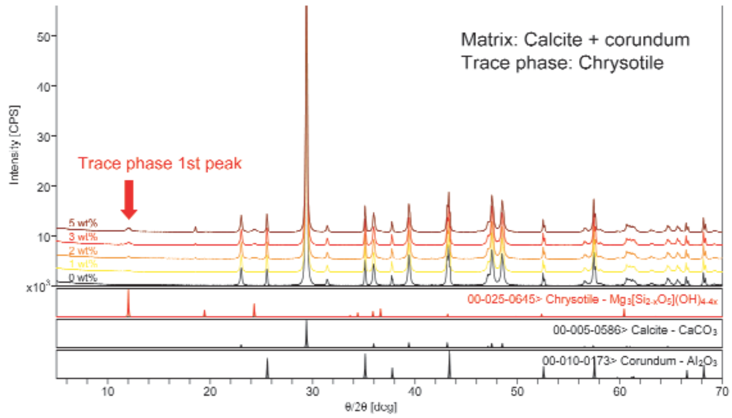
AXT

Rigaku is proudly represented in
Australia and New Zealand by
AXT Pty. Ltd.
1/3 Vuko Pl., Warriewood
NSW 2102 Australia
T. +61 (0)2 9450 1359 F. +61 (0)2 9450 1365
W. www.axt.com.au E. info@axt.com.au

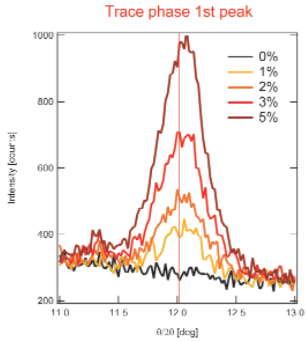
www.Rigaku.com

Determination of trace phases

The TTRAX III provides the lowest detection limit for trace phases and impurities of any commercially available X-ray diffraction system.

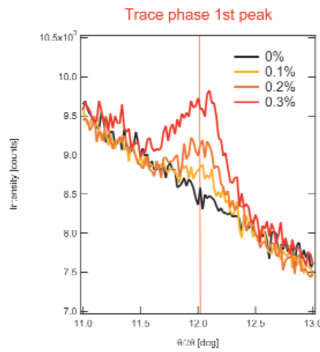


X-ray diffraction patterns from a three phase mixture of Chrysotile, Calcite, and Corundum. Patterns were collected on different mixtures down to 0.1 wt% of Chrysotile.



Duration: 30 min/scan

Zoomed area around the first small peak from the Chrysotile trace phase. Quick 3 minute scans easily detect trace concentrations down to 1.0 wt% of Chrysotile.



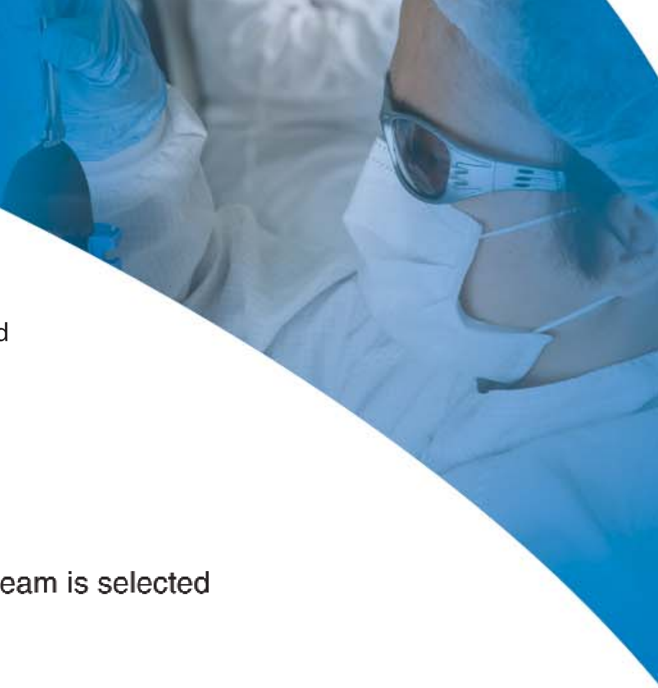
Duration: 30 min/scan

Zoomed area around the first small peak from the Chrysotile trace phase. In this case longer scans of 10 minutes show diffraction peaks visible above background down to 0.1 wt% Chrysotile.

High-powered powder diffraction

For trace phase analysis the power of a rotating anode X-ray source is critical. Trace phase analysis requires the optimization of both peak-to-background and signal-to-noise ratios in the collected data. The TTRAX III's 18 kW rotating anode X-ray source provides the performance necessary to optimize both requirements for trace phase analysis.

Rigaku
Leading With Innovation

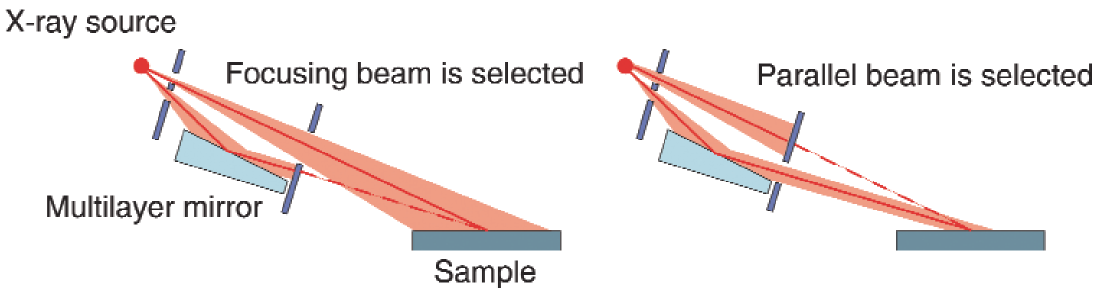


Cross Beam Optics

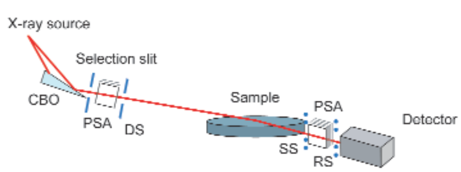
Flexible analysis of thin films and other advanced materials

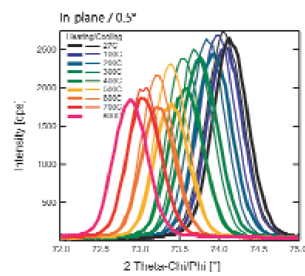
The TTRAX III, powered by Cross Beam Optics (CBO), provides an ideal platform for the analysis of thin film materials. A wide range of experimental geometries and the power of an 18 kW source allow users to measure advanced materials under extreme conditions.

CBO



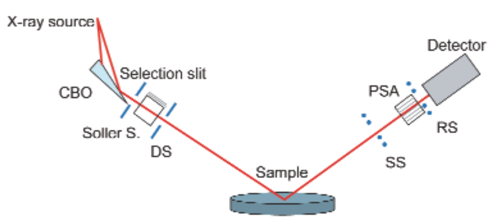
Thin film measurements

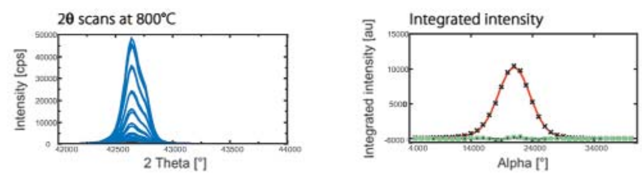




In-plane diffraction
In-plane diffraction provides crystal structure information, such as the lattice parameter and crystallite size parallel to the surface.

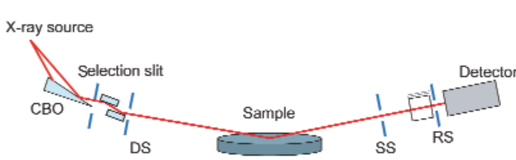
In-plane diffraction
Cu(220) diffraction peaks can be used to calculate lattice parameters parallel to the surface at variable temperatures.

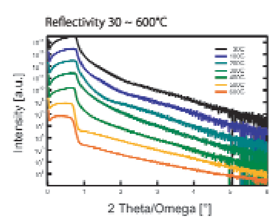




Rocking curve
Rocking curves provide information about film texture and perfection.

Rocking curve
Cu(111) diffraction at different alpha angles can be used to calculate film texture.





Reflectivity
Reflectivity provides thickness, density, and surface or interface roughness of multilayer samples.

Reflectivity
Reflectivity from Cu layers can be used to calculate film thicknesses at different temperatures.

System specifications

X-ray generator:	Maximum rated output	18 kW
	Rated tube voltage	20 - 60 kV
	Rated tube current	10 - 300 mA
	Control method	Inverter control (high frequency power supply)
	Stability	Within +/- 0.01% for 10% input power variation
	Rotating anode target	Cu (standard) (others: optional)
	Focus size	0.5 x 10 mm
	Tube shield	One electromagnetic shutter as standard
	Radiation enclosure	Full safety shielding with fail-safe open/close mechanism (less than 2.0 μSv/h leakage at outer surface of radiation enclosure)
Goniometer:	Scanning mode	θs/θd coupled or θs, θd independent
	Goniometer radius	285 mm (when goniometer is set for Bragg-Brentano focusing method)
	2θ measuring range (may differ depending on configuration)	θs/θd coupled: -3 - 154° (2θ) θs independent: -1.5 - 77° (2θ) θd independent: -92 - 120° (2θ)
	Minimum step angle	0.0001°
	Automatic variable slit	DS: -0.05 - 7.00 mm SS, RS: 0.05 - 20.00 mm (also interchangeable Soller slit and height limiting slit)
	Slewing speed	300°/min (2θ, θs/θd coupled), 150°/min (θs, θd independent)
	Scanning speed	0.02 - 100°/min (2θ, θs/θd coupled), 0.01 - 50°/min (θs, θd independent)
	Step width	0.0002 - 12° (2θ, θs/θd coupled), 0.0001 - 5° (θs, θd independent)
	Automatic alignment	Automated alignment for goniometer including slit height and detector HV/PHA (automatic tube height and alignment: optional)
	Monochromator	Dedicated to Cu (standard) (others: optional)
Detector/Counting electronics:	Counting linearity	700,000 cps or higher (with counting loss corrections) (automatic attenuator: optional)
	Scintillation counter	Scintillator: NaI, photomultiplier with preamplifier
	HV/PHA	0 - 1500 V (with external control functionality of voltage and baseline window)
	Scaler/Timer	32-bit scaler 2 channels/32-bit timer 1 channel as standard

Rigaku Americas Corporation
9009 New Trails Drive
The Woodlands, TX 77381 USA
Phone: 281-362-2300
FAX: 281-364-3628
E-mail: info@Rigaku.com

Rigaku Corporation
4-14-4, Sendagaya, Shibuya-ku
Tokyo 151-0051, Japan
Phone: 81-3-3479-0618
FAX: 81-3-3479-6112
E-mail: rinttyo@Rigaku.co.jp

SYS_BRO_TX3_01
Copyright © 2007. Rigaku Americas Corporation. All rights reserved.