



Powder XRD

Diffraction

PROPERTY OF I.C.D.D.

An international journal of materials characterization

DO NOT REMOVE

Volume 14 Number 3 September 1999

33-1161
SiO₂
 Silicon Oxide

Quartz, syn

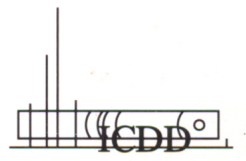
Rad. CuK α_1 λ 1.540598 Filter Mono. d-sp Diff.
 Cut off Int. Diffractometer I/I_{001} 3.6
 Ref. Natl. Bur. Stand. (U.S.) Monogr. 25, 18 61 (1981)

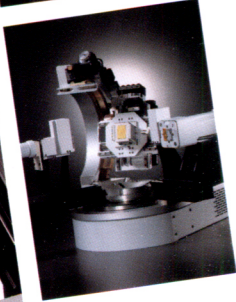
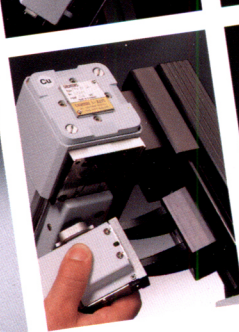
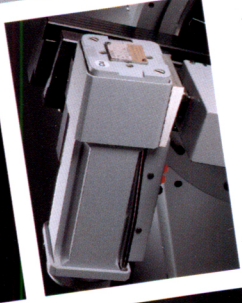
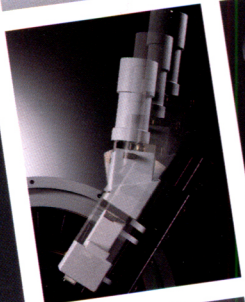
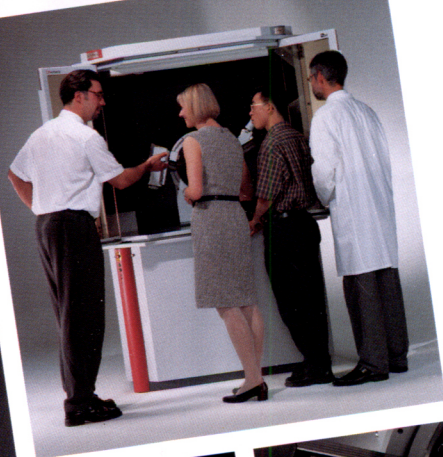
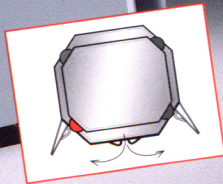
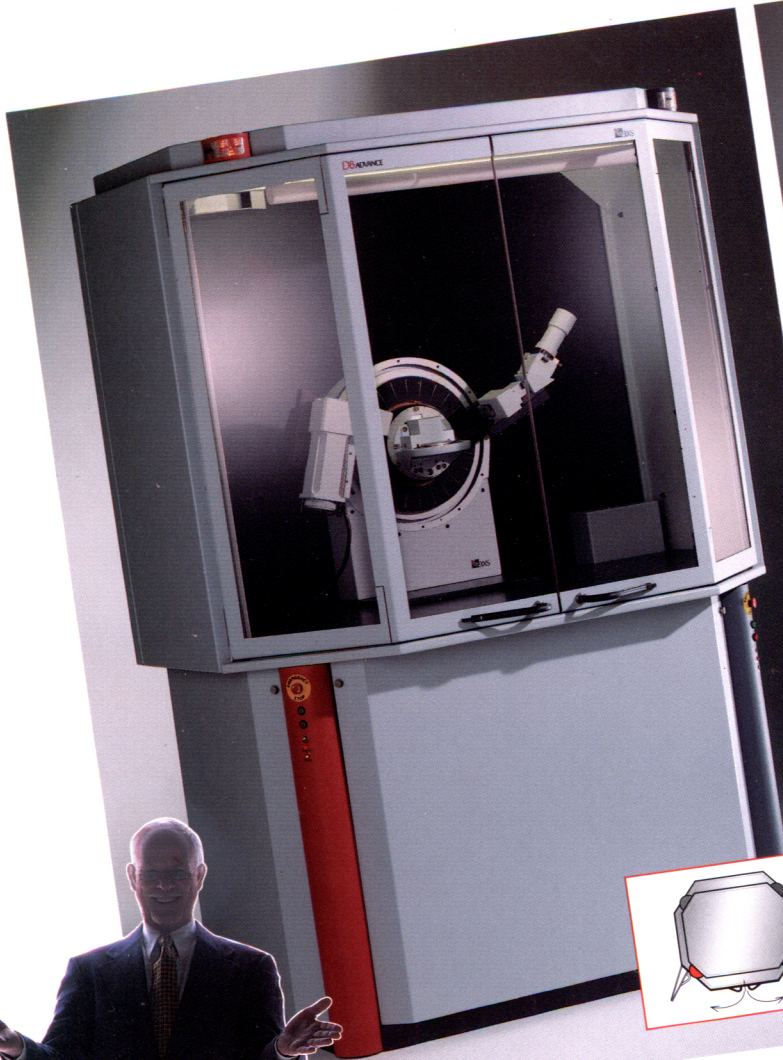
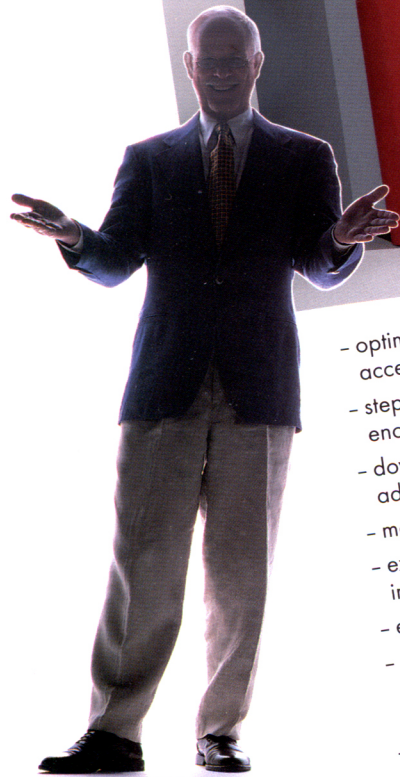
Sys. Hexagonal
 a 4.9133(2) b
 c 5.4053(4) α β
 Ref. Ibid.

D₅ 2.65 D₆ 2.66
 ex no β 1.544
 Ref. Swanson, Fuyat, Natl. Bur. Stand. (U.S.) Monogr. 25, 18 61 (1981)

Color Colorless
 Pattern taken at 25 C. Sample from the Glass Section at NBS, Gaithersburg, Maryland, USA. Ground single-crystals of optical quality. Pattern reviewed by Holzer, University, Fargo, North Dakota, USA. ICDD Grant-in-Aid (1990). Agrees well with experimental and calculated patterns. O₂Si type. Quartz group. Also called: silica. Also called: low quartz. Silicon used as internal standard. PSC: hP9. To replace 5-490 and validated by calculated pattern. Plus 6 additional reflections to 0.9089.

dÅ	Int	hkl	dÅ	Int	hkl
4.257	22	100	1.1532	1	311
3.342	100	101	1.1405	<1	204
2.457	8	110	1.1143	<1	303
2.282	8	102	1.0813	2	312
2.237	4	111	1.0635	<1	400
2.127	6	200	1.0476	1	105
1.9792	4	201	1.0438	<1	401
1.8179	4	202	1.0347	<1	214
1.8021	14	112	1.0150	<1	223
1.6719	<1	003	0.9898	1	402
1.6591	4	202	0.9873	1	313
1.6082	2	103	0.9783	<1	304
1.5418	<1	210	0.9762	1	320
1.4536	9	211	0.9636	<1	205
1.4189	1	113			
1.3820	<1	300			
1.3752	6	212			
1.3718	7	203			
1.2880	8	301			
1.2558	2	104			
1.2285	2	302			
1.1999	1	220			
1.1978	2	213			
1.1843	1	221			
1.1804	3	114			
	3	311			



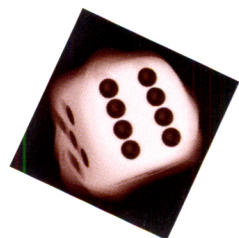


- optimum goniometer and sample accessibility and visibility
- stepper motors with optical encoders for highest precision
- dovetail-tracks for continuously adjustable measurement circle
- maximum modularity
- exchange of optical components in seconds
- exchange of detectors in seconds
- ceramic X-ray tube with reproducible focus position - 100% compatible with glass tubes
- Dynamic Scintillation Detector with large dynamic range, low background, and long lifetime
- DIFFRAC^{plus} - complete suite of WINDOWS NT based software

Germany:
Tel. (+49) 721/595-28 88
Fax (+49) 721/595-45 87

USA:
Tel. (+1) 608/276-3000
Fax (+1) 608/276-3006

D8 ADVANCE – DON'T GAMBLE WITH YOUR ANALYTICAL RESULTS!



**find out
what's inside**

BRUKER ANALYTICAL X-RAY SYSTEMS



crystallographica searchmatch

The makers of *Crystallographica* are proud to announce the launch of *Crystallographica Search-Match*, an all-new search-match program for Windows 95/98/NT.

- ◆ Works with all versions of the Powder Diffraction File including the new cPDF
- ◆ Search using full powder diffraction pattern and/or peak list
- ◆ Automatic residual search for multi-phase identification
- ◆ Unique integrated Boolean card retrieval and display
- ◆ Single / multi-phase full pattern powder simulations
- ◆ Reads common file formats
- ◆ Built-in tools include peak finding and background / $k\text{-}\alpha_2$ stripping
- ◆ Report writing directly to Microsoft Word
- ◆ Full 32-bit technology delivering unrivalled speed and power

Visit our new web site for details
or contact us for a free demo CD!



OxfordCryosystems

3 Blenheim Office Park, Lower Road, Long Hanborough
Oxford · OX8 8LN · UK

Tel: +44 (0)1993 883488 · Fax: +44 (0)1993 883988

E.mail: info@OxfordCryosystems.co.uk

Search-Match?

Upgrade to the state-of-the-art

www.crystallographica.co.uk

X-ray diffraction for today and tomorrow



The inevitability of change has long been recognized - and the pace of change is accelerating at an ever increasing rate. This is true in the laboratory domain as in every other aspect of modern life. What you require from your X-ray diffractometer could be a world apart from your expectations today.

The Philips X'Pert PRO diffractometer system is an X-ray diffraction system with a virtually limitless capacity to adapt to changing circumstances. The PreFIX (Pre-aligned, Fast-Interchangeable X-Ray optics) system enables instruments to be reconfigured in a few minutes to handle different types of analysis.

A totally open design architecture guarantees full freedom to accommodate further advances in years to come.

For more information:
Philips Analytical
Lelyweg 1,7602 EA,
Almelo, The Netherlands
Tel. : +31 (546) 534444
Fax : +31 (546) 534592

www.analytical.philips.com

Let's make things better

Published online by Cambridge University Press



PHILIPS

Editor-in-Chief

Ting C. Huang
 6584 Radko Drive
 San Jose, CA 95119-1924 U.S.A.
 ting_huang@ibm.net

Managing Editor

Shannon Mattaboni
 JCPDS-International Centre for Diffraction Data
 12 Campus Blvd.
 Newtown Square, PA 19073-3273 U.S.A.
 mattaboni@icdd.com

Editor for Reviews and Reprints

Deane K. Smith
 1652 Princeton Drive
 State College, PA 16803-3273 U.S.A.
 smith@vax1.mrl.psu.edu

Editor for New Diffraction Data

William E. Mayo
 Rutgers University
 Ceramics Department
 Piscataway, NJ 08855-0909 U.S.A.
 edisonjam@aol.com

Western European Editor

Norberto Masciocchi
 Università di Milano
 Dipartimento di Chimica
 Strutturale e Stereochimica Inorganica
 Via Venezian, 21
 20133 Milano, Italy
 norbert@csmtbo.mi.cnr.it

Eastern European Editor

Jaroslav Fiala
 SKODA Research Ltd.
 31600 Plzeň, Czech Republic
 jaroslav.fiala@vsb.cz

Editor for Southeast Asia

Brian H. O'Connor
 Curtin University
 GPO Box U 1987, Perth 6001
 Western Australia, Australia
 toconnorb@cc.curtin.edu.au

Editor for Japan

Hideo Toraya
 Ceramics Research Lab
 Nagoya Institute of Technology
 Asahigaoka, Tajimi 507 Japan
 toraya@crl.nitech.ac.jp

International Reports Editor

Winnie Wong-Ng
 National Institute of Standards and Technology
 100 Bureau Drive Stop 8520
 Gaithersburg, MD 20899-8520 U.S.A.
 winnie.wong-ng@nist.gov

Editorial Advisory Board

P. Bayliss, Sydney, Australia
 C. Z. Bojarski, Katowice, Poland
 A. Brown, Dorset, England
 D. Cox, Upton, New York
 W. Eysel, Heidelberg, Germany
 L. Frevel, Midland, Michigan
 P. Gado, Budapest, Hungary
 H. Goebel, Munchen, Germany
 R. Jenkins, Newtown Square, Pennsylvania
 G. G. Johnson Jr., State College, Pennsylvania
 Q. Johnson, Livermore, California
 J. I. Langford, Birmingham, U.K.
 D. Louër, Rennes, France
 G. J. McCarthy, Fargo, North Dakota
 H. F. McMurdie, Gaithersburg, Maryland
 M. E. Mrose, Gaithersburg, Maryland
 M. Nichols, Livermore, California
 R. L. Snyder, Columbus, Ohio
 T. Yamanaka, Tokyo, Japan
 R. A. Young, Atlanta, Georgia

AIP Production: Lin Miller, *Editorial Supervisor*
 Andrea Witt, *Journal Coordinator*
 Kelly Quigley, *Chief Production Editor*

Powder Diffraction is a quarterly journal published by the JCPDS-International Centre for Diffraction Data through the American Institute of Physics (AIP). *Powder Diffraction* is a journal of practical technique, publishing articles relating to the widest range of application—from mineral analysis to epitaxial growth of thin films and to the latest advances in software. Although practice will be emphasized, theory will not be neglected, especially as its discussion will relate to better understanding of technique.

Submit manuscripts (3 copies) to the most appropriate *Powder Diffraction* Editor listed on this page. The Editors will consider all manuscripts received, but assume no responsibility regarding them. Materials will be returned only when accompanied by appropriate postage. There is no publication charge. See *Powder Diffraction Notes for Authors* for additional information.

Proofs and all correspondence concerning papers in the process of publication should be addressed to: Editorial Supervisor, *Powder Diffraction*, AIP, Suite 1NO1, 2 Huntington Quadrangle, Melville, NY 11747-4502.

For advertising rates and schedules contact AIP Advertising Department. Orders, advertising copy, and offset negatives should be sent to: Advertising Department, American Institute of Physics, Suite 1NO1, 2 Huntington Quadrangle, Melville, NY 11747-4502; phone: (516) 576-2440; fax: (516) 576-2481.

Subscription Prices (1999)

	U.S.A & Canada	Mexico, Central & South America	Europe, Mid-East & Africa*	Asia & Oceania*
Individual	\$60	\$85	\$85	\$85
Institutional or Library	\$105	\$105	\$105	\$105

*Subscription rates to Eastern Hemisphere include air freight service.

Back-Number Prices. 1999 single copies: \$30. Prior to 1999 single copies: \$30.

Subscription, renewals, and address changes should be addressed to *AIP Circulation and Fulfillment Division (CFD)*, Suite 1NO1, 2 Huntington Quadrangle, Melville, NY 11747-4502. Allow at least six weeks advance notice. For address changes please send both old and new addresses and, if possible, include a mailing label from the wrapper of a recent issue.

Claims, Single Copy Replacement and Back Volumes: Missing issue requests will be honored only if received within six months of publication date (nine months for Australia and Asia). Single copies of a journal may be ordered and back volumes are available in print or microform. Individual subscribers please contact AIP Circulation and Fulfillment Division (CFD) at (516) 576-2288; (800) 344-6901. Institutional or library subscribers please contact AIP Subscriber Services at (516) 576-2270; (800) 344-6902.

Reprint Billing: Contact: AIP Circulation and Fulfillment Division, Melville, NY 11747-4502; (516) 576-2230; (800) 344-6909.

Copying: Single copies of individual articles may be made for private use or research. Authorization is given (as indicated by the Item Fee Code for this publication) to copy articles beyond the use permitted by Sections 107 and 108 of the U.S. Copyright Law, provided the copying fee of \$6 per copy per article is paid to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, USA. Persons desiring to photocopy materials for classroom use should contact the CCC Academic Permissions Service. The Item Fee Code for this publication is 0885-7156/96 \$6.00.

Authorization does not extend to systematic or multiple reproduction, to copying for promotional purposes, to electronic storage or distribution, or to republication in any form. In all such cases, specific written permission from AIP must be obtained.

Permission for Other Use: Permission is granted to quote from the journal with the customary acknowledgment of the source. To reprint a figure, table, or other excerpt requires the consent of one of the authors and notification to AIP.

Requests for Permission: Address requests to AIP Office of Rights and Permissions, Suite 1NO1, 2 Huntington Quadrangle, Melville, NY 11747-4502; Fax: 516-576-2327; Telephone: 516-576-2268; E-mail: rights@aip.org.

Document Delivery: Copies of journal articles can be ordered for online delivery from the new Articles in Physics online document delivery service (URL: <http://www.aip.org/articles/>).

Reprints: Reprints can be ordered with or without covers only in multiples of 50 (with a minimum of 100 in each category) from AIP, Circulation & Fulfillment/Reprints, Suite 1NO1, 2 Huntington Quadrangle, Melville, NY 11747-4502; Fax: 516-349-9704; Telephone: 800-344-6909 (in U.S. and Canada), or 516-576-2234.

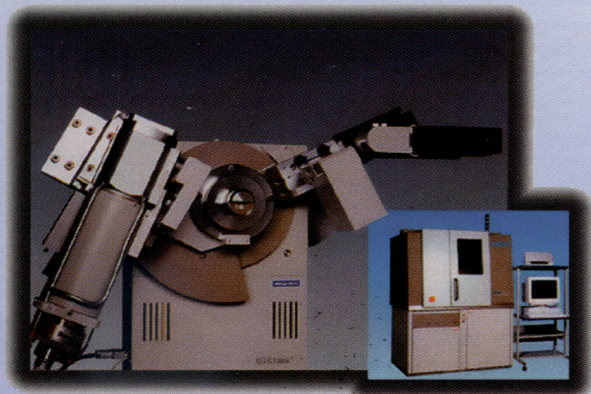
Powder Diffraction (ISSN: 0885-7156) is published quarterly (4X annually) by the JCPDS-International Centre for Diffraction Data through the American Institute of Physics. 1999 Subscription rates: US\$105. POSTMASTER: Send address changes to *Powder Diffraction*, AIP Circulation & Fulfillment Division, Suite 1NO1, 2 Huntington Quadrangle, Melville, NY 11747-4502. Periodicals postage paid at Huntington Station, NY 11746, and additional mailing offices.

Online Availability: Abstracts of journal articles published by the AIP and Member Societies (and several other physics publishers) are available in the SPIN database via the AIP online service PINET. Also available on PINET are *Advance Abstracts*, a current awareness service, other physics information resources, as well as internet services (Internet: elecprod@aip.org).

Copyright © 1999 JCPDS-International Centre for Diffraction Data, 12 Campus Blvd., Newtown Square, PA 19073-3273. All rights reserved.
www.icdd.com/products/journals.htm

D/MAX-

2000/PC



- **Standard features provide the most flexibility for your investment**
- **Flexible optical system**
- **User-friendly software and hardware**
- **Attachments for every application**

Rigaku's D/MAX family of x-ray diffractometers continues to evolve with the 2000/PC.

The D/MAX-2000/PC includes focusing and parallel-beam optics, which can be exchanged by the user in half a minute without realignment.

Variable slits are standard, providing exceptional low-angle performance down to 1.5° , a real benefit for many pharmaceutical and geological applications.

Rigaku's graphite diffracted-beam monochromator is specially designed for both focusing and parallel-beam configurations — no need for additional hardware and time-consuming reconfiguration.

In addition, the D/MAX-2000/PC offers the highest degree of automation found in any diffraction system.

Whether you require sealed-tube sources, high-reliability rotating anodes, or mirror optics, Rigaku has it all.



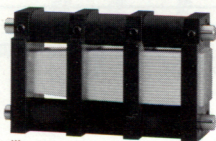
North America:
9009 New Trails Drive
The Woodlands,
Texas 77381 USA
Tel: 281-367-2685
Fax: 281-364-3628
e-mail: info@rigaku.com
<http://www.rigaku.com/>

Japan:
3-9-12 Matsubara-cho, Akishima-shi,
Tokyo 196-8666, Japan
Tel: 81-42-545-8189
Fax: 81-42-545-7985
e-mail: rinttyo@rigaku.co.jp
Telex: J26418 RINT

Ting C. Huang	Editorial: New International Reports Editor and Managing Editor	165
J. A. Kaduk	Combining CDIF and PDF information in problem solving: Crystal structure of a corrosion deposit, hexaaquairon(II) trifluoromethanesulfonate	166
Lj. Karanović, I. Petrović-Prelević, and D. Poleti	A practical approach to Rietveld analysis. Comparison of some programs running on personal computers	171
W. Wong-Ng, J. A. Kaduk, R. A. Young, F. Jiang, L. J. Swartzendruber, and H. J. Brown	Investigation of $(\text{Sr}_{4-\delta}\text{Ca}_\delta)\text{PtO}_6$ using X-ray Rietveld refinement	181
Gilberto Artioli, Maurizio Marchi	On the space group of garronite	190
J. M. S. Skakle, R. Herd	Crystal chemistry of $(\text{RE},\text{A})_2\text{M}_3\text{O}_7$ compounds (RE=Y, lanthanide; A=Ba, Sr, Ca; M=Al, Ga)	195
Tonči Balić Žunić, Jesper Dohrup	Use of an ellipsoid model for the determination of average crystallite shape and size in polycrystalline samples	203
Giorgio Spinolo, Filippo Maglia	Cohen's method revisited	208
W. Pitschke, K. Koumoto	Powder diffraction data and Rietveld refinement for Y-doped $(\text{ZnO})_3\text{In}_2\text{O}_3$	213
V. Venegas, A. Gómez, and E. Reguera	Powder X-ray diffraction study of disilver(1 ⁺) pentacyano nitro ferrate(2 ⁻)	219
F. Lucas, A. Elfakir, and M. Quarton	X-ray powder diffraction data of $\text{A}^{\text{II}}(\text{ZnX}^{\text{V}}\text{O}_4)_2$ compounds (A=Sr, Ba; X=P, As)	222
Raj P. Singh, Michael J. Miller, and Jeffrey N. Dann	X-ray diffraction analysis of $(\text{Na}_{0.6}\text{H}_{0.4})(\text{Ta}_{0.7}\text{Nb}_{0.3})\text{O}_3$	231
M. Touboul, N. Pénin, and L. Seguin	X-ray powder diffraction data for two tetraborates $\text{CsB}_3\text{O}_5(\text{CBO})$ and $\text{TEC}(\text{TEC})$	234
M. Touboul, N. Penin, and L. Seguin	New X-ray powder diffraction data for thallium pentaborates $\text{Tl}[\text{B}_5\text{O}_6(\text{OH})_4] \cdot 2\text{H}_2\text{O}$ and TlB_5O_8	237
	International Reports	240
	Regional Report	240
	A Farewell and Introduction	241
	Calendar of Meetings	241
	Short Courses & Workshops	245
	Cumulative Author Index	247

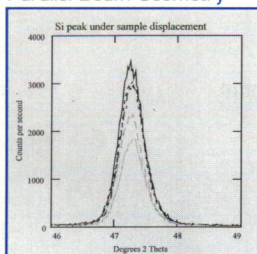
**PROPERTY
OF
I.C.D.D.
DO NOT REMOVE**

Enhance instrument **PERFORMANCE** with X-ray collimating lenses for parallel beam powder diffraction from **X-RAY OPTICAL SYSTEMS**.

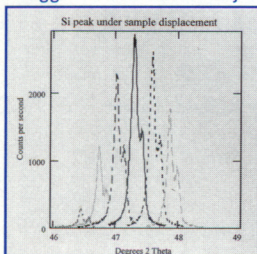


x-ray collimator
(10x10 mm² output beam)
©XOS 1996

Parallel Beam Geometry



Bragg-Brentano Geometry



Outstanding Performance in **Stress and Texture Applications**

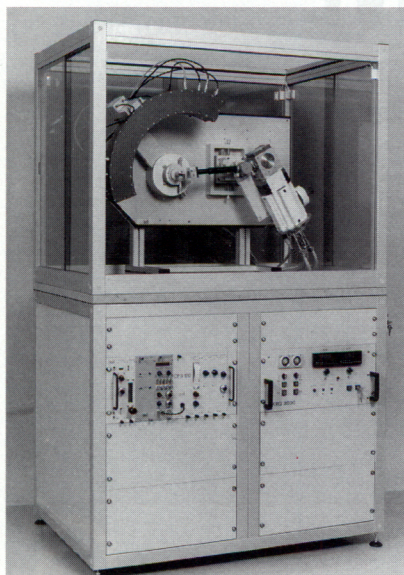
Elimination of all defocusing errors	No sample preparation needed
Large beam size	Improved particle statistics
Intensity gain up to 40 X	Improved counting statistics
2-D collimated quasi parallel beam	Increased orientation statistics
Constant peak profile and width over whole 2θ range	Ideally suited for industrial applications and full pattern analysis

Also available, X-ray focusing lenses for Micro X-Ray Fluorescence.
Call J.Phillip Bly, Sales and Application Engineer today.



30 Corporate Circle • Albany, NY 12203
Phone: 518.464.3334 • Fax: 518.464.3335
www.xos.com • email: info@xos.com

inel REAL TIME XRD



MPD Multi-Purpose X-ray Diffractometer

Versatile diffractometers designed to take advantage of the rapid, real time data collection our patented CPS X-ray detectors offer.

- *No scanning feature - acquire up to 120° 2θ simultaneously
- Unique capillary devices for analysis of air sensitive materials
- Identify materials even if only micro amounts are available
- Parallel beam with germanium or multilayer mirror optics

for information on our complete product line please contact us

inel - Z.A - CD 405 - 45410 ARTENAY (FRANCE)
Tel. (33) 0 2 38 80 45 45 Fax. (33) 0 2 38 80 08 14
E.MAIL: inel@valcofim.fr-INTERNET:http://www.valcofim.fr/inel

inel Inc. P.O. Box 147, STRATHAM, NH 03885 (USA)
TEL. (603) 778-9161 FAX. (603) 778-9171
E-MAIL: inelinc@aol.com

Performs Great Under Pressure

SPEX CertiPrep introduces a unique manual press which *performs with the greatest of ease!* Try one out today and start reducing your sample pelletizing costs to mere **peanuts** a day!

The Air-actuated Bench-Press™ eliminates the tedious task of hand pumping, necessary with other manual presses. Just push the button and the Bench-Press will generate up to **25 Tons** of pressure for sample pelletizing.

SPEX CertiPrep also offers the X-Press Series of 35 ton, automated laboratory presses, the 3630 and the 3624B.

A variety of pellet dies, reinforcing caps (SPEC-Caps), and Prep-Aid™ (sample binder) are also available to meet all of your sample pelletizing needs.

SPEX
INC.
CertiPrep

203 Norcross Avenue,
Metuchen, NJ 08840

Website: www.spexcsp.com
Phone: 732-549-7144
Fax: 732-603-9647

1-800-LAB-SPEX • sampleprep@spexcsp.com (e-mail)

Add **FLUX**ability to

Your Sample Preparation Techniques!

SPEX CertiPrep-Claisse automated fusion fluxers, "First and Finest in Fusion", quickly prepare hard-to-dissolve samples for XRF or ICP/AA analysis. Cement, slag, glass, ceramics, rocks and ores are fused with lithium borate fluxes to make glass discs or solutions. Accuracy, reliability and low cost per fusion are obtainable with the 3-burner and 6-burner models.



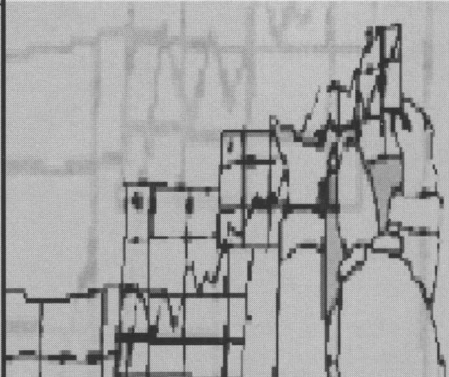
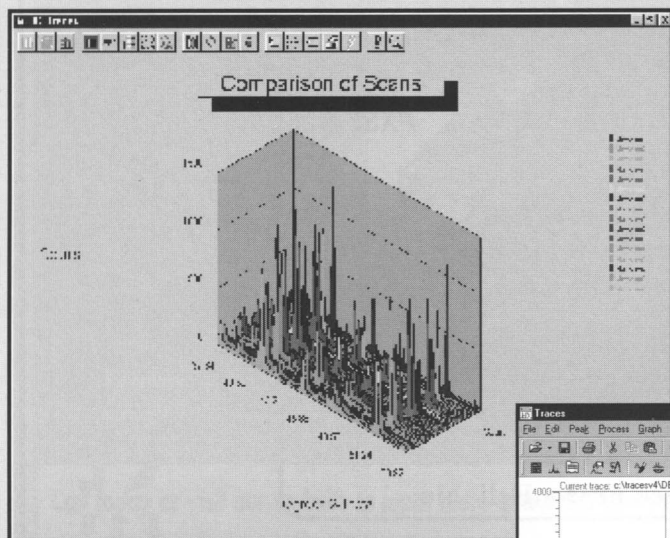
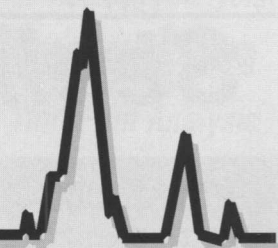
800-LAB-SPEX
www.spexcsp.com

SPEX
INC.
CertiPrep

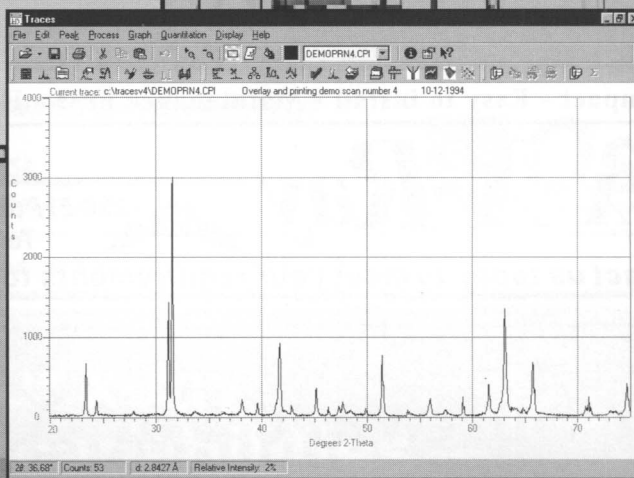
203 Norcross Avenue
Metuchen, NJ 08840
732-549-7144 Fax 732-603-9647
sampleprep@spexcsp.com



Diffraction Technology



Tracesv5



CATCH THE NEXT WAVE OF ADVANCED XRD SCAN PROCESSING
 CATCH THE NEXT WAVE OF ADVANCED XRD SCAN PROCESSING
 CATCH THE NEXT WAVE OF ADVANCED XRD SCAN PROCESSING
FOR ALL XRD USERS

- Import Data files from all major manufacturers
- Export data in many popular formats
- Peak Fitting & Deconvolution, Least squares and genetic algorithm
- Search/Match, Hanawalt, 1-9 strongest lines
- Powder Pattern generator, user data or ICDD data
- 3D graphics – perspective, surface, tape area, rotation
- Log scale toggle on/off
- Multiple peak area quantitation
- Auto or Manual background fit & strip
- Print ICDD PDF cards
- Display PDF lines by PDF No., Mineral Name, Chemical Name
- Create Mini database with ICDD data or your own d&I data
- Manipulate scans, subtract, add, zero shift, trim
- Many advanced options –Pattern Synthesis Quantitative, Reflectivity Simulation, Indexing, Unit Cell Refinement.

Diffraction Technology



38 Essington Street, (PO Box 444),
Mitchell, A.C.T., 2911, Australia.

Telephone: (02)6242 8233
Int: 61 2 6242 8233
Fax: (02)6242 8266
Int: 61 2 6242 8266
ACN: 056 506 248
Email: difftech@difftech.com.au
Internet: www.difftech.com.au

United States: Jerry Krause
Analytical X-ray Instrument Sales
Phone/Fax: 303 277 1569
Internet: jkxray@aol.com

United Kingdom: Arthur Bagley
Hiltonbrooks Ltd.
Phone: 0 1477 534140
Fax: 0 1477 535041
Internet: arthur@xrays.u-net.com

Tracesv5 represents the next generation of visual XRD scan processing, providing 32 bit operational benefits over its famous predecessors. Visual XRD Data collection software completes the 32 bit package making it ideal for WINDOWS NT™ systems.

All trade names are the property of their respective owners.

EXPLORE THE NEW

KRATOS/SHIMADZU X-RAY LABORATORY

POWERFUL TECHNOLOGIES FOR ELEMENTAL ANALYSIS

SOLIDS, LIQUIDS, POWDERS & WAFERS

EDXRF

EDX-800

ENERGY DISPERSIVE X-RAY FLUORESCENCE SPECTROMETER



SIMPLE, POWERFUL PERFORMANCE..
Simultaneous Measurement of Carbon to Uranium
With A Touch of a Button

- 300MM Wafer Handling Facilities
- Analysis in Helium, Vacuum or Air
- Fully Automated Measurements
- Local Area Analysis with Scanning
- Standardless Fundamental Parameters
- Large Chamber with Automated Open/Close

WDXRF

XRF-1700

SEQUENTIAL X-RAY FLUORESCENCE SPECTROMETER



The Only Imaging Wavelength Dispersive Instrument in the World..
Ultra High Performance, Speed and Versatility
for Qualitative & Quantitative Analysis

- Rapid Qualitative Analysis of Elements Be to U
- 1mm Local Area Analysis with Mapping
- 30mm Wide Area Analysis
- Reliable Determination of C, H & O
- Quantitative Data from RhKa Scattering & FP Methods
- Ultra High Resolution, Sensitivity & Accuracy
- Simple, Powerful Multi-Tasking Operation

XRD

XRD-6000

PRECISION ENGINEERED X-RAY DIFFRACTION SYSTEM

Fast & Accurate Identification & Quantification Of
Crystalline Compounds and Structures



- Precision Engineered, Compact X-Ray System
- High Stability X-Ray Generator
- High Precision/High Speed Goniometer
- Multi-Tasking Support/Parallel Processing
- Consistent, Reliable Operation
- Low Cost of Ownership

Ask about our new applications booklet on solid state pharmaceutical products

Call or write today for more information:

PHONE: (914)426-6700 FAX: (914)426-6192

E-MAIL: info@kratos.com

INTERNET: <http://www.kratos.com>

KRATOS
ANALYTICAL
 A SHIMADZU GROUP COMPANY

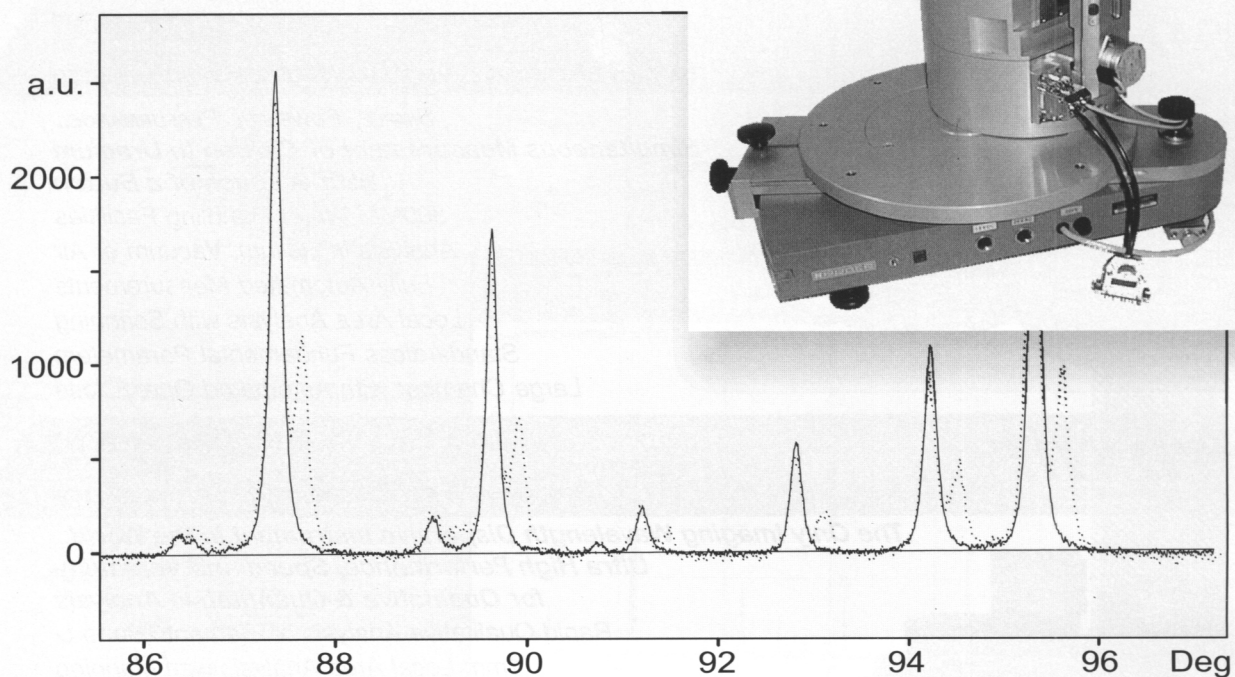
Denver X-ray Conference Booth #29, 31

A13

HUBER

Power in Powder Diffraction!

IMAGE FOIL GUINIER CAMERA 670



Get your diffractogram data within a couple of minutes! And get them without those bulky $K\alpha_2$ peaks.

Just have a look at the scan above. This is a zoomed view of sample 1g of the Commission on Powder Diffraction - Round Robin 1998. The dotted line was scanned on a conventional Bragg-Brentano instrument. It took some 4 hours for 100° 2-Theta with 3 sec per 0.02° step. The unbroken line results from our G670 and took 30 minutes for the same scan range but with 0.005° step size. Not to mention that $K\alpha_2$ is obsolete.

The samples are outside of the closed, and thus evacuable, camera housing. The Guinier Camera 670 fits onto the Basis 601 and uses any of the Guinier Monochromators of the HUBER Series 611/15. There are options for the Flat Specimen Sample Oscillation Device 670.1, or for the Capillary Rotation Device 670.2 together with the Furnace 670.3 and the High Temperature Controller 9634. The system includes the data collection software running on a PC. Data files of various popular ASCII types are available for further handling.

HUBER

X-RAY DIFFRACTION EQUIPMENT

HUBER Diffraktionstechnik GmbH
Sommerstrasse 4
D-83253 Rimsting, Germany

Tel.: +49 (0) 80 51 - 68 78 - 0
Fax: +49 (0) 80 51 - 68 78 - 10
e-Mail: Info@XHuber.com

Max-Flux™ 100 Optics for X-ray Diffraction

Osmic's expanded line of Max-Flux™ 100 optics for XRD now available for

Ti, Cr, Co, Cu, W-Lb, & Mo optics

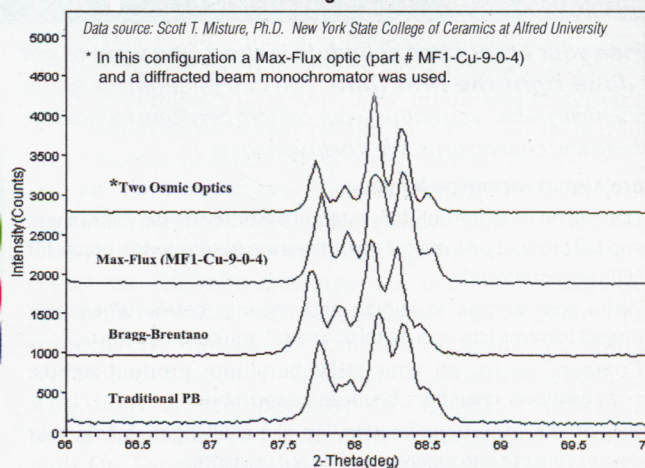
Applications

- Thin-Film Analysis
- Reflectometry
- High Resolution X-ray Diffraction
- Stress/Strain Measurement
- Phase Analysis
- Texture Analysis
- Point-defect analysis
- And more

Benefits

- Reduction of sample displacement errors
- Enables testing of irregularly shaped samples
- Increased Resolution
- Higher Flux
- Lower Background

Five Fingers of Quartz

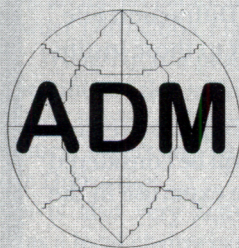


Osmic Inc.
An Advanced Materials and Technology Company

1788 Northwood Drive • Troy, MI 48084-5532, USA
Phone: 1.248.362.1290 • Fax: 1.248.362.4043
Internet: <http://www.osmic.com>

Your Software For X-Ray Analysis

Now optimized for the new, enhanced PDF database with more than 37,000 additional calculated patterns



Software package for data acquisition and analysis:

Diffractometer control, plot modules, peak search and calibration, qualitative and quantitative phase analysis, profile fitting and pattern simulation, lattice parameter refinement, crystallite size and micro stress.

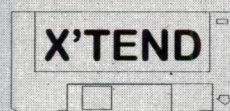
Ready to plug to your PHILIPS and SIEMENS diffractometer hardware.



New Edition

Stand alone package for qualitative and quantitative phase analysis.

Extremely fast search algorithms for ICDD-PDF database and user created databases. Very exact quantitative analysis using the WHOLE PATTERN method.



Extension package for most third party X-ray software. Graphic-analytical, profile-analytical and crystallographic options.

a. wassermann

röntgenanalytik.meßsysteme.software

P.O. BOX 2631, D-87416 Kempten, Germany, Tel. (49)0831-79515, FAX (49)0831-79930, E-mail: RMSKempten@aol.com

Get specialty beryllium prototypes with production processing in mind.

Driven to perform? Come to us. We'll put the metal to the metal.

When your production schedule is short, you want to get it done right the first time. You can eliminate a major uncertainty when you entrust your custom beryllium fabrication, joining and coating to us. We'll help you shine.

Here's what we can do for you:

- Depend on us as the only fully integrated source for beryllium sheet and foil products. All critical operations are performed in-house for seamless excellence.
- We're your partner in joining and coating metals. When your project involves joining a metal to a metal, you can count on us.
- Come to us for all your UHV beryllium product needs: x-ray windows, chambers, beam pipes and more.
- Rely on our expert engineering. We like challenges. Taking your design concept into reality would be our pleasure.

Count on us for your tough jobs. Keep in mind that we're the only fully integrated source for beryllium products for the analytical, medical, and scientific industries. Challenge us with your "cutting edge" requirements. We look forward to hearing from you.

TEL: 510-623-1500 • FAX: 510-623-7600

E-Mail: Electrofusion@BrushWellman.com

44036 South Grimmer Boulevard • Fremont, California 94538 • USA



BRUSHWELLMAN

ELECTROFUSION PRODUCTS

We're the beryllium window folks.

ICDD's Grant-in-Aid Program

The International Centre for Diffraction Data (ICDD) is interested in high quality experimental powder diffraction patterns to add to its internationally renowned database, the Powder Diffraction File™ (PDF®). The ICDD Grant-in-Aid Program is designed to give limited financial support to those institutions interested in supplying new patterns.

A grant can be used most effectively as supplement to existing funded projects involving the preparation and characterization of new materials, using powder XRD. Grant-in-Aid proposals will be considered on a worldwide competitive basis from any qualified investigator who can demonstrate expertise in the preparation of high quality powder diffraction patterns.

There are two grant cycles with proposal deadlines of:

Cycle I	31 January
Cycle II	31 July

The duration of a grant is 12 months. Recipients are required to submit biannual progress reports and must reapply every year if they wish to be considered for renewal.

For more information, please review the guidelines found at ICDD's web site, <http://www.icdd.com>, or contact the ICDD's Data Acquisition Manager:

Ms. Therese Mauchline
International Centre for Diffraction Data
12 Campus Boulevard
Newtown Square, PA 19073-3273 U.S.A.

Telephone: (610) 325-9814
Fax: (610) 325-9823
E-mail: MAUCHLINE@ICDD.COM

