Issue 2010/01 April 2010

Enquiries: Dr Catherine Kealley, catherine.kealley@uts.edu.au

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1. Message from the National President

Welcome to our first newsletter for 2010. A lot has happened since the last newsletter, including the re-registration of the organization as "AXAA-Inc". Whilst the official name change was small, this was an important step instigated by our treasurer, Rob Hart, and I extend our thanks to him for executing this (and all of his other AXAA duties).

The National Council had a face-to-face meeting in early March (held at the Star City, AXAA-2011 venue) to make big decisions regarding AXAA-2011. It is with great pleasure that I announce our decision to award student bursaries for AXAA-2011, in addition to cash prizes, as part of our upcoming student seminar days. We are planning extended student seminar days in most states this year, which promise to be very exciting, so stay tuned for more information.

Finally, I would like to bring your attention to the call for nominations for the Norrish and Cheary awards, for XRF and XRD, respectively, for "significant long term contributions" to x-ray analysis. These calls are made intermittently, at least a year apart, and I encourage you all to nominate those you feel deserving.

Warm wishes to all.

Vanessa Peterson
AXAA President
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2. Editorial

Welcome to our first newsletter for 2010! Given the high number of contributors, it certainly is a great start to the year. It should be noted that the article that received the most feedback in 2009 was the "Employment Opportunity in Orange", which combined XRF and goats (well done Ken Turner). Hence, the standard has been set for 2010 … your article will need to be of the same calibre or better to receive this prestigious standing (maybe AXAA should consider awarding a prize for this???). With this challenge in mind, the **closing date for Issue 2010/02 is June 11th 2010.** I am happy to send an email reminder a fortnight before this deadline to anyone who wishes to be on the reminder list (let me know if you have not already done so: catherine.kealley@uts.edu.au). As editor, I would greatly appreciate short reports on general topics and techniques, short articles or technical notes (1-2 pages of text, or less), news items from vendors, Technical Program Committee reports on activities held, upcoming events information, meeting and conference dates, and so on. Any photographs/graphs/diagrams are especially welcomed (a picture is worth 1000 words!). Feel free to contact me with any submissions, questions or suggestions you have: catherine.kealley@uts.edu.au.

Catherine Kealley
AXAA Vice-President/Newsletter Editor
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3. AXAA 2011 – Conference Announcements

PLATINUM SPONSORS

BRUKER PANalytical

For all your conference needs, please go to: **www.axaaconference.info**

We are delighted to announce that the first of our Plenary Speakers have confirmed their attendance, including:

- Professor David Bish, Indiana University
- Dr Phil Potts, The Open University
- Dr Dan Neumann, National Institute of Standards and Technology
- Professor Daniel Chateigner, Université de Caen Basse-Normandie
- Dr Mark Rivers, University of Chicago

Vanessa Peterson

AXAA President

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4. AXAA Awards for Excellence in X-Ray Analysis: Call For Nominations

Closing Date for Submission of Nominations: 22 October 2010

The Awards

Two awards have been established, one for XRF and one for XRD. These will be for "significant long term contributions" to x-ray analysis rather than say a single paper, and will perpetuate the contribution of the person after whom the award is named.

XRF – Keith Norrish AXAA Award for Excellence in X-ray Fluorescence Analysis

XRD – Bob Cheary AXAA Award for Excellence in X-ray Diffraction Analysis

Form of Awards: Each award will comprise an engraved medal.

Selection Criteria

1. The principal criterion will be the excellence of the applicant's development of high-impact, innovative x-ray analysis methods and their take-up by the x-ray analysis community. Work in which XRF or XRD has been a peripheral tool will not be considered.
2. The period over which the contribution is to be considered will be at least 5 years.
3. All or most of the cited work will have been conducted in Australia.
4. The recipient will have been a member of AXAA for at least 5 years prior to the application being submitted.
5. It is desirable, but not essential, that the applicant has contributed to AXAA in a substantial way, for example through quality presentations at AXAA national conferences and/or administrative service for AXAA.
6. Past recipients of an AXAA XRD or XRD award will not be considered for a second award in the same category.

Applications

Applications will be submitted by a nominator on behalf of the applicant. The documentation will comprise:

- CV
- Publication list. This may include items protected by confidentiality if the applicant can pre-arrange an appropriate confidentiality agreement.
- Advocacy statement highlighting the application's alignment with the selection criteria.
- Names and contacts for three technical referees, one being the nominator.
- Applications are to be submitted in electronic form to the AXAA President – Vanessa Peterson. Please send to Vanessa as an attachment: vanessa.peterson@ansto.gov.au

Closing Date for Submission of Nominations: 22 October 2010

Selection Process

1. The National Council has appointed a selection panel of three persons for each award. The selection panels will be allowed approximately two months to review the applications and make recommendations.

2. The recommended recipients will be considered by the AXAA Council which will then make a formal decision on the recommendations. Decisions by the Council will be final, and there will be no appeal process.

3. The Council reserves the right not to make an award if the standard of applications is deemed to fall below the expected standard.

Vanessa Peterson

AXAA President

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5. Upcoming Events

National XRD Course X-ray Powder Diffraction Analytical Methods, Curtin University, Perth

****Dates for next course to be advised****

Venue: Department of Imaging and Applied Physics, Curtin University of Technology, Bentley (Perth), Western Australia. Note: Client-specific version of the course can be presented at the customer's site

Duration: 4 days

Dates: 2010 and 2011 courses to be advised

Course Presenters: Professor Brian O'Connor and Dr Robert Hart

Enquiries and further information: B.O'Connor@curtin.edu.au

Cost: $2,320 including GST

Availability of places strictly limited.

Overview: The course has been designed to give participants a theoretical and practical grounding in the principal characterisation methods which make use of x-ray powder diffractometry data. Approximately 60% of the course involves hands-on instruction. Students personally collect diffractometry data sets and then process these, both manually and with PC computers, in exercises on various analytical methods, including Rietveld analysis. Public domain software will be used, including WINPLOTR and Rietica. The course also includes overviews and demonstrations of the commercial software packages X'Pert HighScore Plus and Diffracplus Topas. While the course is relevant to the analysis of all classes of crystalline materials, attention will be devoted mainly to materials relevant to the mining and mineral processing sector.

Brian O'Connor
Curtin University of Technology
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Internet XRF Course: Series 3, 2010

The course provides XRF analysts, particularly those new to the field, with on-site instruction in the practical principles of wavelength dispersive XRF. Features of course include -

- Start at any time, subject to the availability of places in the course
- Self-paced instruction to accommodate the needs of busy people
- Study materials transmitted as e-mail attachments in the form of 11 modules; with an assignment being set for each module.
- Feedback on the assignments provides excellent mentoring.

Course availability: Starting date by arrangement. Limited number of places available for Series 3 (2010) of the internet course.
Course director: Professor Brian O'Connor
Course fee: $2,420 including GST
Further information and enrolment: brian_oconnor@iprimus.com.au (Tel 08 9291 7067)

Brian O'Connor
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6. Calendar of Events

Date	Event	Location	Further Information
Start at any time	XRF I-Course	Internet delivery	brian_oconnor@iprimus.com.au
2010 and 2011 dates to be advised	National XRD Course	Curtin University of Technology, Perth	B.O'Connor@curtin.edu.au
11-14 July 2010	SRMS / MEDSI 2010	Oxford, UK	http://www.srmsmedsi2010.org/srmsmedsi.html
11-16 July 2010	VUVX2010	University of British Columbia Vancouver, Canada	http://www.vuvx2010.ca/
12-15 July 2010	Australian Synchrotron-ANZAAS Winter School	Melbourne	http://www.synchrotron.org.au/index.php/news/events/australian-events/event/56-australian-synchrotron-winter-school
14-17 July 2010	11th SXNS Conference	Northwestern University, Evanston (nr Chicago), Illinois, US	http://www.sxns11.northwestern.edu
2-6 August 2010	59th Annual Denver X-ray Conference	Denver Marriott Tech Center Hotel, Denver, Colorado, U.S.A.	http://www.dxcicdd.com/
15-20 August 2010	XRM-2010	Chicago, USA	http://xrm2010.aps.anl.gov/
6-11 February 2011	AXAA Conference	Star City, Darling Harbour, Sydney, Australia	vanessa.peterson@ansto.gov.au

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7. AXAA Website and Contacts

WEBSITE http://www.axaa.org

NATIONAL COUNCIL PRESIDENT
Vanessa Peterson, Bragg Institute, ANSTO, PMB 1, Menai, NSW 2234
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NATIONAL COUNCIL VICE-PRESIDENT
Catherine Kealley, Mintech Chemical Industries
Telephone (08) 9419 5300, e-mail: catherine.kealley@uts.edu.au

NATIONAL COUNCIL SECRETARY
Ned Blagojevic, ANSTO, PMB 1, Menai NSW 2234
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NATIONAL COUNCIL TREASURER
Rob Hart, Department of Imaging and Applied Physics, Curtin University of Technology, GPO Box U1987, Perth, WA 6845.
Telephone: (08) 9266 2643, e-mail: r.d.hart@exchange.curtin.edu.au

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8. Company News

Bruker Biosciences Pty Ltd News

Bruker AXS Introduces the New D8 DISCOVER™, an Advanced X-ray Diffraction System for Materials Research Applications Including 2-Dimensional Diffraction XRD2

At Analytica 2010 in Munich, Germany, Bruker AXS, the market leader in X-Ray Diffraction (XRD), introduces its next-generation ***D8 DISCOVER™*** diffraction system for advanced materials research.

The new ***D8 DISCOVER*** is the successor to the most popular X-ray diffractometer on the market. While maintaining the strengths of its predecessor, the new ***D8 DISCOVER*** further increases ease-of-use with real-time component detection, plug-and-play functionality and fully integrated 2-dimensional XRD^2 capabilities. These unique features allow the user to easily switch between all materials research X-ray diffraction applications, including reflectometry, high-resolution diffraction, grazing incidence diffraction (IP-GID) and small angle X-ray scattering (SAXS), as well as residual stress and texture investigations. In particular, for micro-diffraction and ultra-fast reciprocal space mapping, the new two-dimensional ***VANTEC-500*** detector with 2048 x 2048 channels at 14.4 cm^2 active area provides highest sensitivity for detecting even the weakest diffraction signals in short measurement times. The new ***D8 DISCOVER*** is designed to meet all the latest X-ray safety regulatory requirements, providing scientists peace-of-mind.

An integral part of the new ***D8 DISCOVER*** is the new ***DIFFRAC.SUITE™*** software with consistently implemented automation functionality. An X-ray optics module, a detector, or any

accessory mounted onto the instrument registers itself in real-time with its relevant parameters and analytical capabilities, including powerful detection of possible component conflicts. The factory-aligned, snap-lock X-ray optics provide true 'plug-and-play' functionality, including automatic and tool-free switching of the diffraction geometry with minimal user intervention. The ***DIFFRAC.SUITE*** offers intuitive operation based on a graphical user interface that can be customized to match the operator's requirements.

"The new ***D8 DISCOVER*** incorporates XRD^2 capabilities, featuring the brand new two-dimensional ***VANTEC-500*** detector based on Bruker's proprietary MikroGap™ technology. Its outstanding capabilities, including the large active area of 14,400 mm^2, enable materials research with outstanding spatial resolution and short measurement times. This will allow our users a new view into the nano-materials world," stated Dr. Geert Vanhoyland, XRD Product Manager at Bruker AXS in Karlsruhe.

The New D8 DISCOVER™ is an Advanced X-ray Diffraction System for Materials Research Applications Including 2-Dimensional Diffraction XRD^2

"Applying a 'Leonardo DaVinci' design philosophy to a modern system enables expert analytical XRD capabilities while minimizing user interventions. Incorporating numerous proprietary innovations, the new ***D8 DISCOVER*** offers unrivalled ergonomics, turning a complex research instrument into an easy to use routine tool for everyone," commented Dr. Lutz Brügemann, Director of R&D and Marketing at Bruker AXS.

For More Information:
For more information on ***D8 DISCOVER***, please contact Bruker Biosciences Pty Ltd at baxs@bruker-axs.com.au

Chris Kelaart
Bruker Biosciences Pty Ltd
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With the debut of PANalytical's Empyrean diffractometer, the world of X-ray diffraction is no longer flat

World leading X-ray analytical instrument manufacturer, PANalytical, has set a new benchmark in multi-purpose X-ray diffraction (XRD) again with the launch of Empyrean - a truly innovative, high-performance diffractometer that does it all. Every major element of Empyrean is new: the X-ray source, the state-of-the-art goniometer, the sample stages and the radiation enclosure. Importantly, the instrument also introduces the world's first 3D detection system, PIXcel^{3D}.

Empyrean, the only XRD system that does it all

Versatile, powerful, easy to use
As a result, Empyrean is unique in its ability to measure all sample types - from powders to thin films, from nanomaterials to 3D objects - on a single instrument. Users can switch effortlessly between application setups in a fast and cost-effective way using PANalytical's proven PreFIX modules, with no compromise on the quality of diffraction data. Ease of use is another major benefit of the Empyrean. Dedicated hardware, software and regulatory expertise incorporated in pre-defined programs, and a customizable desktop and batch sample capabilities help make advanced functions accessible to all.

Dr. Martijn Fransen, Product Marketing Manager XRD commented: *"Empyrean is PANalytical's answer to the challenges of modern materials research. While today's research themes are nanomaterials, life sciences and renewable energy tomorrow science may move in a totally different direction. The lifetime of a PANalytical diffractometer stretches further than the typical horizon of a single research program and, for many scientists, an ability to accommodate change is a 'must-have' feature in their decision to invest in an XRD system."*

Whatever the sample type, Empyrean delivers the best analysis
For many users, **powder samples** are their primary interest and this is where Empyrean delivers the best accuracy and highest quality data in the most flexible and advanced system on the market. Switching to **thin films**, Empyrean provides for high-resolution epitaxy analysis and handles all common applications. Investigations into **nanomaterials** can also be performed with Empyrean:

size and shape of crystalline domains within the material, and structural analysis of near amorphous materials are all possible. PDF (pair distribution function), SAXS (small angle X-ray scattering), and even the ability to monitor the evolution of crystalline phases in situ with the unique slurry flow cell stage are all possible on the advanced Empyrean platform. Perhaps the most compelling benefit of the Empyrean is its amazing ability to study the internal structure of **solid objects** without having to cut: them up (non-destructive cross-sectioning). Thanks to the unique PIXcel^{3D} detector, the world's first, which can be used as a CT scanner allowing non-destructive analysis of pharmaceutical formulations (tablets, capsules), electronic components (batteries, ICs, capacitors) and geo- and archaeological samples, just to name a few.

Global support
Empyrean is supported by PANalytical's unrivalled worldwide network of support and service specialists.

For more information on the ground-breaking Empyrean system, please visit www.panalytical.com/ or contact your local PANalytical specialist.

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PANalytical

PANalytical adds a new dimension to XRD with PIXcel^{3D} – the world's first 3D detector

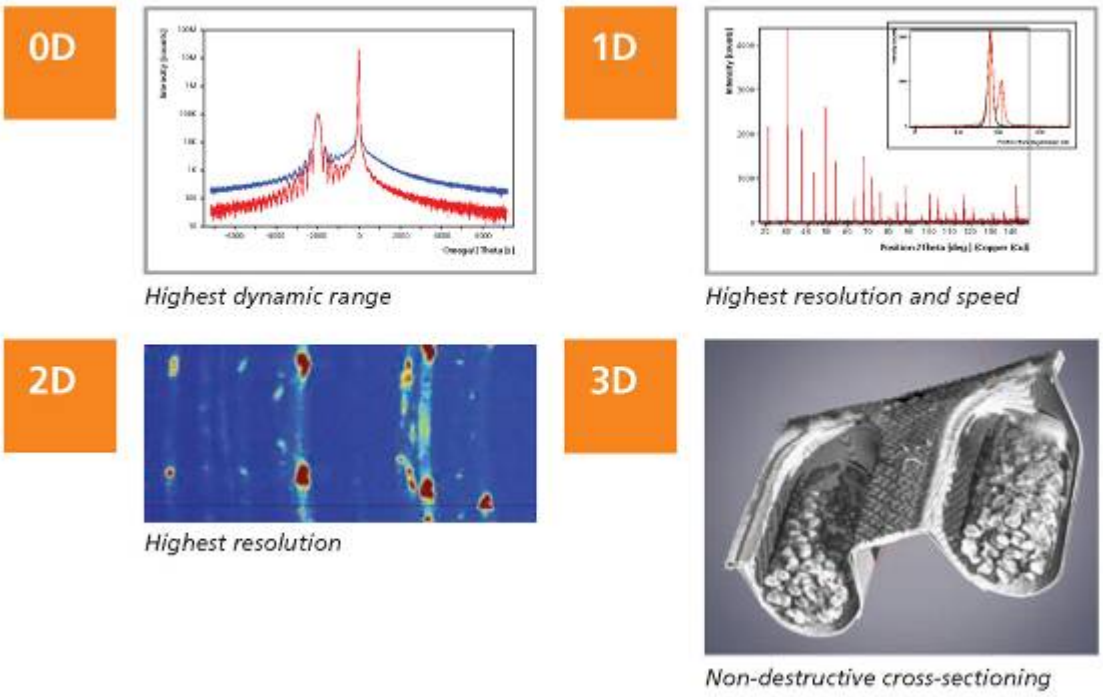
The introduction of PANalytical's revolutionary PIXcel^{3D} detector adds a new dimension to X-ray diffraction. A world first, the PIXcel^{3D} is at the heart of the new high-performance Empyrean diffractometer, a multi-purpose system that handles diffraction measurements on powders, high-resolution thin film, nanomaterials and solid objects in one instrument, with no compromise in data quality.

The PIXcel^{3D} detector is the result of PANalytical's exclusive involvement in the Medipix2 collaboration – a consortium of more than 16 leading particle physics research institutes across Europe, headed by CERN.

Dr. Martijn Fransen, Product Marketing Manager XRD said: *"We are very proud to be a commercial partner in Medipix2. PANalytical has a track record of innovation and this association will keep us at the forefront of detector technology for many years to come. We are determined to continue developing the best, and most innovative, detectors for all our future XRD customers."*

PIXcel^{3D} delivers maximum flexibility for the widest range of applications. It is the only detector that offers four modes:

- In 0D mode it is the point detector with the highest dynamic range
- in 1D mode it is the line detector with the highest dynamic range and the smallest strip size
- in 2D mode it is the area detector with the smallest pixels, the highest dynamic range per pixel, truly independent event registration (no point spread function) and thus highest resolution of all 2D XRD detectors
- in 3D mode it is the only computed tomography (CT) detector on a diffraction platform, with the smallest pixel size and the highest dynamic range, allowing diffractionists to view the internal structure of their solid objects non-destructively, and quantitatively measure properties such as porosity with high accuracy



For the full story on the development of PIXcel^{3D} visit: www.panalytical.com or contact your local PANalytical specialist.

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AXT Grows Service & Support

Service Division Broadens Support

In 2009 AXT was lucky enough to add to our team some of the country's most experienced service engineers. We are proud to welcome to our team Davy Lee and Ross Appleby who offer a depth of experience to our alternative service solutions for PANalytical XRD and XRF. **Stanislav Ulitzka** of Two Theta is also collaborating with AXT. Stani compliments our existing applications specialist Dr Ulrich Senff.

New Service Staff

Davy Lee has had a 40+ year career as a Service Supervisor, Engineer and Trainer at PANalytical. Davy has unequalled knowledge and experience on all their X-ray Analysers.

Ross Appleby recently joined AXT after a 25+ year career with PANalytical as a service engineer. In addition to being a very talented engineer Ross brings skills in software and programming to support integration and automation projects.

New AXT Regional Offices

AXT Melbourne:

Simon McCall has joined AXT in the position as Sales Manager and is heading up the new Melbourne office. Prior to joining AXT Simon worked for PANalytical for nearly 17yrs as a Sales Engineer and Product Specialist involved in XRF and XRD.

AXT Perth:

Fred Hoetmer and **Julia Dixon** have joined AXT in our new Perth office. Fred and Julia will continue to support Rocklabs in the west as well as bringing a full range of complimentary solutions to their customers.

AXT Representing ROCKLABS Australia Wide

AXT is now the exclusive distributor for Rocklabs Australia wide. We will bring Rocklabs expanding range of products and automation solutions to all our customers.

AXT – Canberra (ROCKLABS – QLD VIC NSW ACT TAS)

AXT – Perth (ROCKLABS – WA SA NT).

WDXRF Analysis of Coal: Rigaku SUPERmini

Obtaining fast and reliable Cl & P results on pressed coal samples

Complex samples such as pressed coal makes reliable analysis of elements such as P and Cl very difficult for EDXRF.

Supermini WDXRF

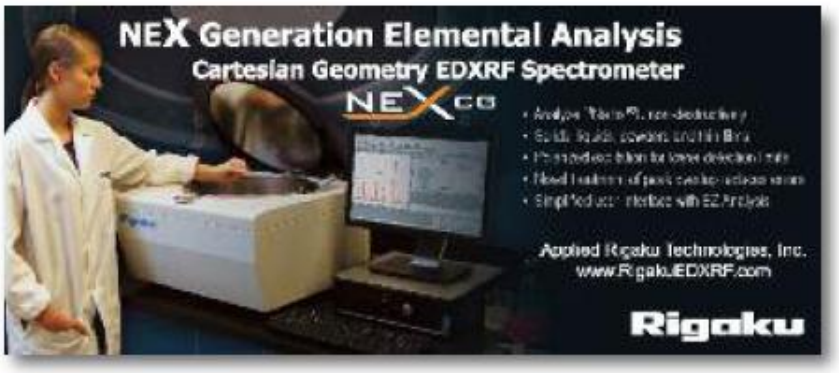
The Rigaku SUPERmini brings the resolving power of WDXRF to a table top system.

The worlds only Benchtop WDXRF Spectrometer.

- 200 Watts
- 12 position changer
- Spinner
- Vac and He
- Three crystals
- Auto filter

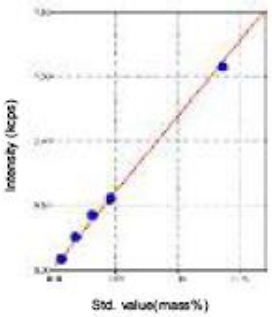
11	12	13	14	15	16	17
Na	Mg	Al	Si	P	S	Cl
sodium	magnesium	aluminum	silicon	phosphorus	sulfur	chlorine

Rigaku NEXCG



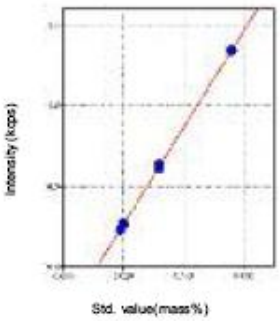
Pressed Coal Results

Component	**P**
Element line	P -KA
Accuracy	2.51696e-003
Corr. factor	9.98699e-001



Sample	Intensity	Std. value	Calculated	Deviation
1	0.16864	0.031	0.03409	0.00309
2	0.21889	0.045	0.04484	-0.00016
3	0.62755	0.136	0.13226	-0.00374
4	0.03430	0.006	0.00535	-0.00065
5	0.10061	0.017	0.01954	0.00254
6	0.22059	0.045	0.04520	0.00020
7	0.03215	0.006	0.00489	-0.00111

Component	**Cl**
Element line	Cl -KA
Accuracy	2.72972e-004
Corr. factor	9.99852e-001



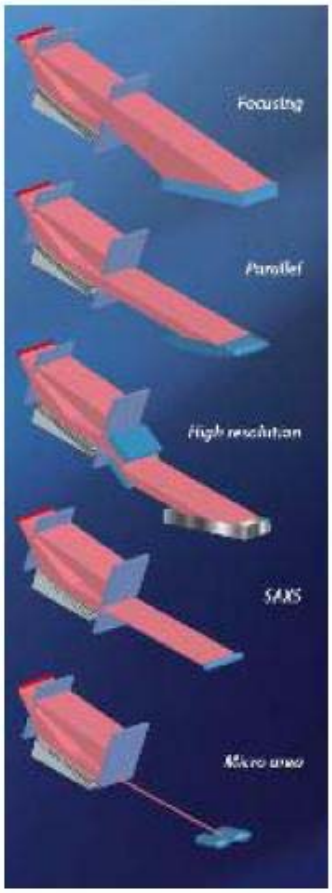
Sample	Intensity	Std. value	Calculated	Deviation
1	1.33878	0.056	0.05590	-0.00010
2	0.63214	0.032	0.03237	0.00037
3	0.26774	0.020	0.02023	0.00023
4	0.22711	0.019	0.01888	-0.00012
5	0.61301	0.032	0.03173	-0.00027
6	0.25749	0.020	0.01989	-0.00011

Rigaku

Cross Beam Optics

Cross Beam Optical™ (CBO) technology. CBO technology uses simultaneously mounted, simultaneously aligned optical components for both focusing (Bragg-Brentano) and parallel beam diffractometer geometries.

Users can switch between the two geometries without the need to remove, replace, or realign optical components.



AXT Represents Rigaku XRD

AXT and Rigaku Corporation are pleased to announce that from January 2010 AXT sells and supports their extensive range of X-ray Diffraction (excluding protein systems) in Australia, New Zealand, PNG and Oceania.

AXT is fully set-up with Rigaku trained Engineers to offer full sales and customer support on all products offered. The following is an overview of the Rigaku products:

Miniflex II XRD : Compact Performer
- Exceptional Price/Performance Ratio
- World's 1st truly benchtop XRD
- Legendary maintenance free operation
- Optional D/TEX solid state linear detector for rapid acquisition
- Optional 6 position sample changer with spinner
- Latest PDXL Search/Match & Quantitative Software

Ultima 4 XRD : Fast Flexible Functional System
- State of the Art Multifunction/Purpose XRD
- Patented Crossed Beam Optics (CBO)
- High performing D/Tex solid state rapid detector optional
- Extensive Suite of PDXL software available
- Huge range of attachments and accessories (e.g. Sample Changers, Capillary spinners, Thin Film, Non Ambient, Differential Scanning Calorimetry, Eurelian Cradles)

SmartLab® : Advanced High Resolution System
- Advanced – Modular High Resolution System
- Fully automatic system alignment
- Patented Crossed Beam Optics (CBO)
- In-plane measurement without reconfiguration
- Guidance Software based Automated measurements
- Myriad of Attachments means any application possible
- Optional 9.0kW Rotating Anode Generator

TTRAX III : World's Most Powerful XRD
- θ/θ design for horizontal sample mounting
- High intensity X-ray source from 18 kW rotating anode
- Patented Crossed Beam Optics (CBO)
- In-plane measurement without reconfiguration
- High-resolution optics
- SAXS capabilities

VARIAN
medical systems

AXT

Authorized distributor for Varian Medical Systems

Varian Ultra Light XRF Tube

Fits PW2400, PW2404, Magix, Axios

• Spill Resistant

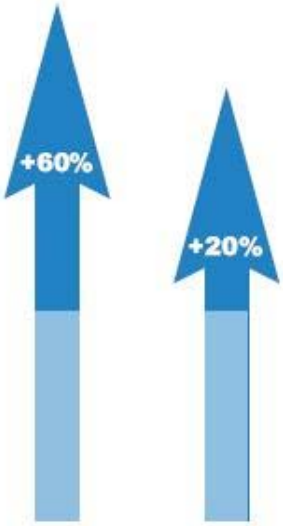
The window has a small lip and a flat profile that extends outside of the radiated area decreasing the risk of damage.

• Protective Coating

Improved strength and durability by preventing liquid and gaseous chemical attack.

Spill Resistant

Protective Coating



Improved Light Element Performance

• Vacuum Cap

Helps maintain the shelf life and protects your X-ray tube in transit.

• Improved Performance

For light elements the Varian OEG-99K-Rh is 60% better than a standard 4kW tube and 20% better than the best PANalytical tube.

New Vacuum Cap