

Product Overview

- Advanced Analytical Solutions

We Exceed Your Expectations

Professional Competence

Bruker AXS is a worldwide market leader in providing advanced X-ray and optical emission systems and complete solutions for structure and elemental analysis using X-ray diffraction (XRD), X-ray fluorescence (XRF/OES) and crystallographic diffraction techniques. We also offer the world's largest selection of AFMs, stylus profilers, and 3D optical microscopes to enable nano- to macro-scale surface measurements for the widest range of scientific and industrial applications. Our products fit the analytical requirements of customers in materials research, life science, quality control, and process analysis. They provide essential information about the molecular structure, material and structural parameters of thin film and bulk material as well as elemental composition of solids and liquids.

High Performance

Bruker AXS X-ray systems emphasize modularity and flexibility, enabling an entry-level system to be reconfigured or upgraded to meet changing requirements. We offer the widest available variety of X-ray sources, optics, sample environments and detectors, along with expert advice on configuring the optimal system. All of our systems and solutions are easy to operate, robust and compact, with degrees of automation ranging from none to one-button operation. Professional training and worldwide service is in place to support the customer.

A History of Innovation Leadership

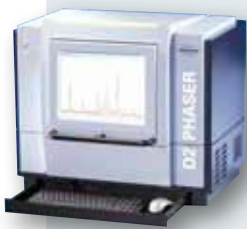
Bruker AXS is constantly redefining the performance and quality standards in X-ray analysis. Breakthrough innovations and continual improvements upon established techniques provide our customers with analytical possibilities that were considered beyond reach only a short while ago. Examples include our revolutionary detection technologies, multilayer X-ray optics, and ability to perform XRF analysis of light or trace elements. Further accomplishments are highlighted at the bottom of this and the following pages.

SUPER SPEED SOLUTIONS

Bruker AXS breaks all records. The SUPER SPEED components ensure breathtaking speed at high-sensitivity resolution – without sacrificing reliability and flexibility. The X-ray diffraction SUPER SPEED SOLUTIONS enable an unprecedented throughput in research and development.

- TURBO X-RAY SOURCE
- VANTEC-1 detector – instant diffraction snapshots
- LYNXEYE™ – rapid powder diffraction
- VANTEC-500 detector – the extra dimension of XRD²
- VANTEC-2000 detector – ultra size XRD²

X-ray Powder Diffraction (XRPD)



D2 PHASER



D4 ENDEAVOR



D8 ADVANCE

XRD
Powder

X-ray diffraction expands analytical capabilities down to the nanometer range. Our highly accurate, reliable and fast diffraction solutions are accompanied by an intuitive and clearly laid-out user interface, easy handling, and individual data presentation, as well as perfect integration and communication capabilities.

Applications

- Crystalline phase identification
- Crystalline phase quantification
- % crystallinity
- Crystallite size determination
- Crystal structure analysis
- Crystal orientation
- Texture and preferred orientation
- Microstrain
- Residual stress
- Depth profiling
- Polymorph screening
- High temperature
- Low temperature
- Humidity
- Phase transition
- Nanoparticles

DAVINCI design

The D8 ADVANCE with DAVINCI design facilitates a pioneering diffractometer concept, which eliminates the problems of awkward configuration and adjustments once and for all. It is extremely easy to exchange all components and geometries, thanks to the multi-level design:

- DAVINCI.SNAP-LOCK: alignment- and tool-free optics change
- DAVINCI.MODE: real-time component recognition, configuration and conflict detection
- DIFFRAC.DAVINCI: graphical representation of the actual goniometer showing all beam path components including their status, enabling immediate measurements as well as the creation of measurement methods

X-ray Diffraction (XRD)

Quick-Change Artists without Limits

The capabilities provided by the D8 DISCOVER, laboratory X-ray diffraction enters new frontiers in the nano-world and materials research so that synchrotron measurement campaigns become obsolete in many cases.

Applications

- Crystalline phase identification
- Crystalline phase quantification
- % crystallinity
- Crystallite size determination
- Crystal structure analysis
- Texture and preferred orientation
- Microstrain and relaxation
- Residual stress
- Layer thickness
- Layer roughness
- Lattice parameter
- Chemical composition
- Lateral structures
- Defects
- Depth profiling
- Real space mapping
- Microdiffraction
- Polymorph screening
- High temperature
- Low temperature
- Humidity
- Phase transition
- Nanoparticles



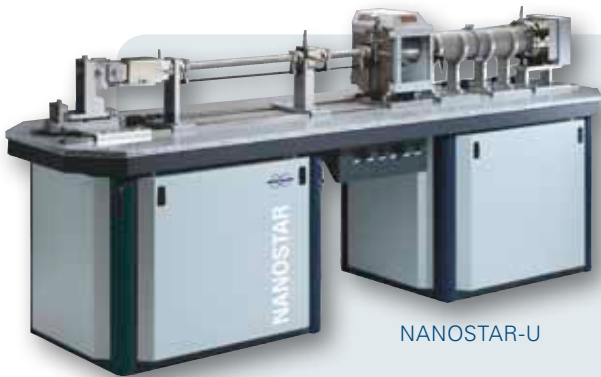
D8 DISCOVER

High-Throughput Applications

Screening a large number of samples quickly and completely requires dedicated instrumentation and extensive knowledge of the analytical process. Extremely large amounts of data need to be handled, especially in catalyst development and pharmaceutical research. Unique applications from Bruker AXS extract authoritative results from the most varied of sample characteristics, parameters and correlations, e.g.:

- Laser/Video system for precisely focused, automated alignment
- Eulerian cradles, 2D detectors, robotic wafer handling
- Powerful X-ray sources, innovative detectors
- Integrated Analytical Intelligence with POLYSNAP software

Nanostructure Analysis



NANOSTAR-U

Enter the universe of nanostructure Analysis

The innovative Small Angle X-ray Scattering System NANOSTAR is the ideal tool for investigating precipitants in bulk materials and macromolecules like protein solutions with a size on the order of 10 to 1000 Ångstrom.

Applications

- Small Angle X-ray Scattering (SAXS)
- Wide Angle X-ray Scattering (WAXS)
- Nanography
- Particle size
- Particle size distribution
- Particle shape
- Orientation distribution
- Particle distances
- Low temperature
- High temperature
- Grazing Incidence Small Angle X-ray Scattering (GISAXS)
- BioSAXS



D2 CRYSO

Applications

- Crystal surface orientation
- Flat orientation
- Semi- and compound semiconductors
- Optical crystals



D8 FABLINE

The D8 FABLINE is the only X-ray metrology instrument with four combined applications:

- High-Resolution X-Ray Diffraction (HRXRD)
- X-ray Reflectivity (XRR)
- Micro-X-ray Fluorescence (μ XRF)
- Grazing incidence Diffraction (GID)

XRD
Material Res.
SAXS
EDXRD

Göbel and MONTEL Mirror

The highest performance can only be achieved with the most modern instruments. With the invention of the Göbel Mirror, Bruker AXS raised the standards for diffraction and SAXS. Göbel Mirrors are X-ray optics with incomparable precision. In particular in combination with high-brilliance micro focus X-ray sources ($1\mu\text{S}$) or rotating anode sources (TXS) a beam with high-flux on a small spot is generated.

- Maximum flux
- Perfect beam homogeneity
- Highest spectral purity
- Bragg-Brentano, parallel beam, or focusing geometries
- High-flux densities for μ XRD applications

Atomic Force Microscopy (AFM)

Analyze Nanometer Size Surface Structures

Bruker's atomic force microscopes (AFMs) drive the world's leading-edge research in life science, materials science, semiconductor, electrochemistry, and many other applications. The Dimension FastScan™ is the world's fastest and most productive AFM, offering unrivalled speed and resolution providing the highest levels of nanoscale performance for a wide variety of samples. The MultiMode® 8 with ScanAsyst -HR is the latest generation of the world's most widely used AFM, offering the highest resolution and the versatility to excel in applications ranging from materials research to life science. The BioScope Catalyst™ has been specifically engineered to image biological samples and features the most comprehensive integration available between AFMs and inverted optical microscopes.

The new Innova-IRIS AFM-Raman systems provide the industry's leading performance for TERS and co-localized Raman-AFM measurements, enabling comprehensive correlated property mapping and extending the boundaries of nanoscale spectroscopy.

Finally, the InSight 3DAFM™ and Dimension AFP™ Automated Atomic Force Profiler provide fully automated dimensional metrology for semiconductor, data storage and LED applications. The systems provide the industry's best measurement uncertainty for critical dimension, profilometry, yield impacting trench depth measurements, roughness and defect review.



InSight 3DAFM



Dimension FastScan



BioScope Catalyst

Only Bruker Provides the Complete AFM Solution

Bruker's innovative Peak Force Tapping® technology enables unique new AFM imaging modes that deliver quantitative information and a leap forward for AFM use of use. ScanAsyst® uses self-optimizing algorithms to acquire high resolution images in both air and liquids. PeakForce QNM® enables nanoscale quantitative characterization of materials properties while PeakForce TUNA™ enables quantitative nanoscale conductivity mapping.

Stylus and Optical Metrology (SOM)

3D Optical Microscopes

Bruker's ContourGT™ 3D Microscopes combine advanced 64-bit, multi-core operation and analysis software, patented white light interferometric hardware, and unprecedented operator ease of use to deliver the most advanced 3D optical surface metrology ever developed. These 10th generation systems provide fast, angstrom-to-millimeter vertical range metrology over large fields of view, with flexible sample setup and industry-leading repeatability for production, research and quality control applications.



ContourGT 3D Optical Microscopes



DektakXT Stylus Profiler

Ultimate Stylus Profiling Performance

The DektakXT™ features a revolutionary design that enables unmatched, better than 5-angstrom repeatability. Through its combination of industry firsts, DektakXT delivers the ultimate in performance, ease of use and value to enable better process monitoring from R&D to QC. The technological breakthroughs incorporated in this 10th generation Dektak enable critical nanometer-level surface measurements for the microelectronics, semiconductor, solar, high-brightness LED, medical, scientific, and materials science industries.



NPFLEX-LA 3D Optical Microscope for Lead Angle

AFM
SOM

Innovations Customized for Your Application

Bruker provides patented metrology solutions that tailor decades of surface measurement experience specifically to your applications. For example, the NPFLEX-LA™ 3D Optical Microscope is the first comprehensive, non-contact metrology solution that repeatably quantifies true lead angle and surface texture of dynamic sealing surfaces. Likewise, our R&D 100 Award winning AcuityXR™ Enhanced-Resolution Microscopy Technology enables select ContourGT systems to break the optical diffraction limit and deliver lateral resolutions previously considered unattainable with conventional optical microscopy techniques.

X-ray Fluorescence Analysis (XRF)

Defining the World of Elements in Seconds

X-ray fluorescence spectrometry is the most effective way to perform multi-elemental analysis determining concentrations in all forms of samples: solids, powders and liquids. Based on the renowned XFlash[®] silicon drift detector technology Bruker AXS energy dispersive X-ray fluorescence (EDXRF) systems offer highest

analytical precision and stability. The S2 PICOFOX allows the analysis of thin films as well as the analysis of traces down to 0.1 ppb using total reflection X-ray fluorescence (TXRF). The S2 RANGER with TouchControl[™] provides you with instant answers for element concentrations from Na to U in unknown samples.



S2 PICOFOX



XFlash[®] LE SDD Detector



S2 RANGER

Applications

- Fresh water, sea water
- Sewage, sludge
- Pharmaceuticals
- Blood, urine
- Proteins, macromolecules
- Food, dietary supplements
- Wine, beverages
- Nanoparticles
- Washcoats
- Contaminations
- Aerosols
- Thin films



Applications

- Petrochemicals
- Minerals and mining
- Slags
- Cement
- Geology
- Pharmaceuticals
- Metals and alloys
- Soil, sediments and waste

XFlash[®] LE SDD Detector

The XFlash[®] LE detector further expands the application range of Benchtop-EDXRF systems such as the S2 RANGER. Due to the ultrathin high transmission entrance window the XFlash[®] LE SDD with 50 W excitation power eliminates conventional limitations of EDXRF systems and significantly enhances the sensitivity for light elements, such as eight times more sensitivity for sodium and four times more sensitivity for magnesium. In addition the XFlash[®] LE achieves an excellent energy resolution of less than 129 eV for Mn K α_1 at very high count rates due to the advanced MCA electronic enabling users to achieve excellent analytical precision.

Unrivalled Analytical Performance

Our wavelength dispersive X-ray fluorescence (WDXRF) systems provide you with excellent analytical results for elements from Be to U in your samples. They feature high accuracy and the best achievable precision for effective process and quality control. They are reliable and robust for all industrial applications, yet flexible and powerful for all non-routine applications in research and development.



S8 TIGER



S8 LION/S8 DRAGON

XRF
TXRF
EDXRF
WDXRF

Applications

- Petrochemicals
- Plastics and polymers
- Cement
- Geology
- Metals and alloys
- Precious metals
- Minerals and mining
- Glass and ceramics
- Chemicals and catalysts
- Pharmaceuticals
- Soil, sediments and waste
- Foods

TouchControl™

Reliable results and error-free instrument operation is the key to success. This is why Bruker AXS developed the intuitive instrument operation with touch screen. With minimum training, even inexperienced operators can obtain optimum results. And your analytical data are safe due to the unique TouchControl™ concept.

- Easy-to-use – intuitive operation
- No mouse or keyboard needed
- Minimal training required
- Immediate results on the touch screen
- Compact all-in-one design

Micro-X-ray Fluorescence Analysis



M4 TORNADO



M1 MISTRAL/M1 ORA



ARTAX

μ -XRF is the method of choice for the elemental analysis of inhomogeneous or irregularly shaped samples as well as small samples or even inclusions. The M1 and M4 tabletop spectrometers offer maximum versatility for all applications, whether for routine analysis in quality control or for individual setups analyzing special samples.

Applications

M4 TORNADO

- Minerals
- Metals and alloys
- Electronic components (RoHS)
- Particles
- Forensics
- Layers
- Art conservation, archeology

M1 MISTRAL/M1 ORA

- Jewelry
- Metals and alloys
- Layers (M1 MISTRAL)

ARTAX

Non-destructive element analysis in

- Art conservation, archeology and archeometry
- Metals, alloys, sheet metal
- Thin layers

The ARTAX is a unique, portable micro-XRF spectrometer designed to meet the requirements for a spectroscopic analysis of immobile and valuable objects on site, i.e. in archeometry and restoration. It can be used for both spot measurements and high-resolution 1D and 2D mapping.

Speed and Spatial Resolution

Using polycapillary optics Bruker AXS' micro-XRF spectrometers can illuminate areas down to 25 μ m in diameter with maximum X-ray intensity. The integrated Peltier-cooled XFlash[®] Silicon Drift Detectors process highest count rates at optimal energy resolution. Short measurement times and fast sample stages lead to extremely quick results regarding the elemental composition of a sample.

- Spatially resolved analysis of arbitrarily shaped samples, including fine structures
- No cooling media or consumables required
- Non-destructive measurement without sample preparation
- Outstanding analytical flexibility

Handheld XRF Spectrometry



S1 TURBO^{SD}



TRACER III-V

Applications

- Analysis of metal alloys for Positive Material Identification (PMI)
- Non-destructive testing with grade ID and chemistry
- Light element capability: Mg, Al, Si, P
- Scrap metal recycling
- QA/QC in the manufacturing environment

Applications

- Art conservation, archaeology and archeometry
- Research and teaching tool for universities
- Research and development
- Selected by leading Museums like the Getty and MOMA

μXRF

HHXRF

XRF Elemental Analyzer

- Light element analysis – Mg, Al, Si, P, S and Cl without vacuum or He
- SDD provides rapid analysis and ID of alloys
- TÜV SÜD certification – trusted the world over!
- Joint Bruker/NASA patent, earned NASA's Space Seal for vacuum technology
- Tube-based XRF for handheld elemental analysis – no radioactive materials
- PDA based analyzer

The Bruker handheld XRF analyzers provide quick and easy non-destructive analysis. The S1 TURBO^{SD} and S1 SORTER enable fast analysis and ID of most alloys. The TRACER III-V and III-SD tube based systems include the Bruker/NASA joint patented vacuum system and high-resolution detector allows for laboratory grade results of elements from Mg to U.

Optical Emission Spectrometry (OES)

High-End Elemental Analysis of Metals

Spark optical emission spectrometers (S-OES) are the ideal instruments for all types of metals. From pure metal trace analysis to high alloyed grades, spark OES covers the complete range from sub-ppm to percentage levels. All relevant elements can directly be analysed simultaneously.

Spark spectrometer instruments cover all types of metal applications. Our range of high-end instruments allows our customers to elevate their business into new levels of quality and process control.



Q2 ION (CCD)

Applications Q2 ION

- Iron and steel and alloys
- Aluminum and alloys
- Copper and alloys
- Nickel and alloys
- Cobalt and alloys
- Magnesium and alloys
- Zinc and alloys



Q4 TASMAN (CCD)



Q6 COLUMBUS (CPM)

Applications Q4 TASMAN/ Q6 COLUMBUS

- Iron and steel and alloys
- Aluminum and alloys
- Copper and alloys
- Nickel and alloys
- Cobalt and alloys
- Magnesium and alloys
- Lead and alloys
- Tin and alloys
- Titanium and alloys
- Zinc and alloys

Pioneering Channeltron Technology

Q8 MAGELLAN and Q6 COLUMBUS feature the latest technology in photomultiplier detectors:

- Lowest dark current
- Large dynamic range
- Highest sensitivity
- Improved limits of detection
- Impressive stability and repeatability

Spark Stand With Co-axial Argon Flow

The innovative co-axial Argon flow represents the culmination of our efforts to further improve performance:

- Extended cleaning intervals
- Low Argon consumption
- Better analytical quality
- Reduced operation costs



Q8 MAGELLAN

Applications

Elemental analysis of:

- Iron and steel alloys and traces
- Nitrogen in steel
- Aluminum alloys and traces
- Copper alloys and traces
- Oxygen in copper
- Nickel alloys and traces
- Cobalt alloys and traces
- Magnesium alloys and traces
- Tin alloys and traces
- Lead alloys and traces
- Titanium alloys and traces



Q8 CORONADO

Applications

- Process analysis of steels
- Process analysis of cast iron
- Process analysis of aluminum
- Process analysis of copper

OES

Complete Software Package

Spectrometer software QMATRIX is an easy to use front-end interface:

- QMATRIX for the routine analysis
- Regression software for calibration
- SQL for data treatment

Automation Control Software QMATION

The Q8 CORONADO is controlled by the powerful QMATION software:

- .Net framework technology
- Graphical user interface for providing system status

C, S, O, N, H – Analysis

Gas- and combustion analyzers – fast and accurate

Our innovative analysis instruments allow automatic and fast determination of Carbon, Sulfur, Oxygen, Nitrogen and Hydrogen in solids. Our instruments provide highly accurate measurement within a short analysis time and are highly reliable and userfriendly.

The state-of-the-art technology allows not only the use for quality control but also in the various fields of material development. The “One-4-All” analysis software is clear and simply structured and universal for all instruments.



G4 ICARUS HF



G4 ICARUS TF

Applications

- Iron, steel and alloys
- Aluminum and alloys
- Titanium and alloys
- Zirconium and alloys
- Ores, minerals
- Coal, coke, ash
- Catalysts

CS-Analysis

G4 ICARUS analyzers are designed for simultaneous or individual, fast and accurate determination of carbon and sulfur in various metallic and non-metallic materials. G4 ICARUS features:

- Continuously adjustable HF furnace power for optimum sample combustion
- Alternative version with external high temperature tube furnace up to 1550° C
- Short analysis time, nearly maintenance-free operation
- Long term stable, selective solid-state NDIR detectors
- Automatic base line compensation/zero adjustment and Automatic Level Control



Applications

- Iron, steel and alloys
- Aluminum and alloys
- Copper and alloys
- Titanium and alloys
- Zirconium and alloys
- Ores
- Ceramics
- Minerals



G8 GALILEO



G4 PHOENIX

Applications

- Steel
- Aluminum
- Weld material
- Weld seams

ON/H-Analysis

G8 GALILEO delivers fast and automatic determination of total and diffusible hydrogen in solids by carrier gas method, melt and hot extraction. Different configurations for simultaneous or single element determination are available. G8 GALILEO features:

- Electrode furnace with programmable temperature up to 2500°C, contact-free optical sensor for temperature measurement
- Selective solid-state NDIR-detector for CO, long term stable thermal conductivity cell for N_2/H_2
- Optional automatic furnace cleaning system with dust removal and optional automatic crucible changer
- External furnace for diffusible Hydrogen with ramping functions optional

CS/ONH-Analysis

Microanalysis (EDS) and Electron Backscatter Diffraction (EBSD)

Rough surfaces, particles, thin layers, bulk samples ... The QUANTAX family of EDS instruments tackles even your toughest challenges with unprecedented speed, accuracy and ease of use. The unique, LN₂-free XFlash[®] Silicon Drift Detectors (SDD), together with our state-of-the-art Hybrid Pulse Processor technology, deliver both the highest available energy resolution and over ten times the speed of conventional Si(Li)-based systems.

The QUANTAX EDS microanalysis system works in conjunction with Scanning Electron Microscopes as well as Transmission Electron Microscopes (TEM). This includes the worldwide first SDDs designed for TEM (XFlash[®] 5030 T and 5060 T).

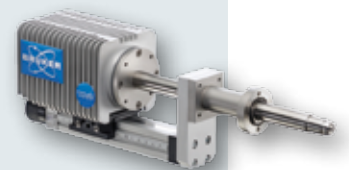
In addition QUANTAX also provides the option of EBSD analysis with the fully integrated QUANTAX CrystAlign.

Applications

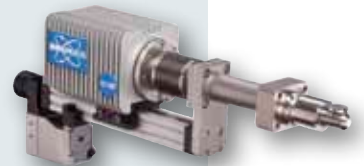
- Metals and alloys
- Semiconductors
- Layers and coatings
- Thin films
- Minerals
- Glasses
- Nano-materials
- Plastics and organic solids
- Biological samples
- Forensics



QUANTAX 800



XFlash[®] 5000 series for SEM



XFlash[®] 5030 T for TEM



*eFlash*¹⁰⁰⁰⁺ for EBSD

QUANTAX EDS for Nanoanalysis

- With worldwide leading XFlash[®] SDD technology
- For SEM and TEM
- High collecting efficiency
- Unmatched energy resolution
- Superb light element performance

QUANTAX CrystAlign for Fast and Easy to Use EBSD

- *eFlash* EBSD detectors with in-situ vertical screen positioning for best available EBSD signal
- Colored images for better grain differentiation using the ARGUS[™] FSE/BSE imaging system
- Seamless integration with ESPRIT EDS software

Crystallography at the Forefront of Science

Great Science deserves great tools

Single Crystal X-ray diffraction (SC-XRD) is the method of choice for determining the 3-dimensional structure of any kind of chemical compound. The method provides accurate and precise measurements of molecular dimensions in a way that no other investigative technique can begin to approach.

To get the maximum benefit out of this technique, scientists need the latest analytical tools. This was the driving vision of our development team for the D8 Crystallography Solutions: to provide your cutting-edge research with the superior tools it deserves!



I μ S for Cu-, Mo- and Ag-radiation

Riding the Perfect Wave

Matching the right wavelength to your sample can significantly improve the quality of the experiment. Molybdenum (Mo) radiation is most often the wavelength of choice for chemical crystallography. Copper (Cu) radiation's stronger interaction with the sample leads to stronger diffracted intensities and is typically applied for organic samples and proteins. Silver (Ag) radiation has minimal absorption and extinction effects and allows data collection to higher resolution.

- Sealed tube spot focus with flat graphite or TRIUMPH monochromator
- I μ S microfocus source
- TURBO X-RAY SOURCE (TXS) with HELIOS optics



D8 QUEST with PHOTON 100 CMOS detector

Applications

- Structure determination of new molecules and minerals
- Absolute structure determination on molybdenum and copper radiation
- Integrated treatment of up to eight-fold twinned samples
- Comprehensive treatment of absorption effects by intuitive correction methods
- Electron charge-density studies by high-angle diffraction
- Structural investigation of high pressure phases and modulated structures
- Diffuse scattering

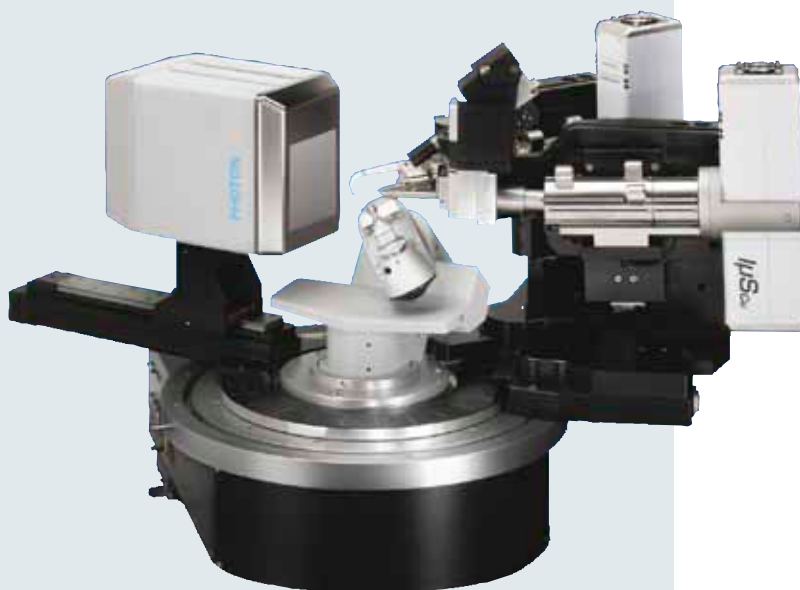
MA (EDS/EBSD)

Chemical Crystallography

D8 Solutions for Single Crystal Diffraction – as Individual as Your Research

We are proud to present the new D8 Crystallography Solutions, with an abundance of unparalleled innovations. With the D8 QUEST and the D8 VENTURE we are introducing a pioneering diffractometer concept with flexibility and modularity exploring the principles of DAVINCI design.

The D8 QUEST and the D8 VENTURE can be perfectly configured for the demands of any imaginable application in single-crystal X-ray diffraction.



D8 VENTURE dual source configuration
with Mo I μ S and Cu I μ S

Pioneering CMOS Technology

D8 QUEST and D8 VENTURE feature revolutionary CMOS technology:

- Large 100-cm² sensor for fast and efficient data collection
- Low-power-consumption sensor for high reliability backed by our unique three year detector warranty
- Air-cooled for low maintenance
- No glass fiber taper for superior spatial accuracy and high sensitivity
- Optimized pixel size and point-spread function for superior signal
- Large pixel volumes for best light conversion
- Fast readout for fast data collection
- No frame correlation needed
- No blooming or streaking
- Perfect match of the pixel size and the point spread of the high-resolution scintillator screens

When Details Matter – Biological Crystallography

Biological crystallography's rapid evolution has seen structural biologists tackling projects of ever-greater ambition. At the same time, modern structural genomics and drug discovery initiatives are striving for ever-greater productivity and efficiency. This is placing significantly greater demands on researchers and instrumentation. Latest technology achievements used in the D8 QUEST and D8 VENTURE help the researcher to address the even most challenging samples.



D8 VENTURE with microfocus TXS



PHOTON 100 CMOS detector

Brighten-up your Home Lab – TURBO X-RAY SOURCE (TXS), μ S and HELIOS MX

A successful diffraction experiment starts with an excellent X-ray source. Whether you choose the high-flux TURBO X-RAY SOURCE (TXS) microfocus rotating anode generator or the outstanding μ S microfocus source, you always get the best-in-class for all of your applications. The new TXS and μ S now deliver beam intensities comparable to those of typical bending-magnet beamlines. For example, a 10-second exposure from the TXS or 70 seconds from the μ S can produce the same diffracted intensity as a 1-second exposure at these beamlines. Our high intensity, superior beam profiles, unmatched beam stability, and instant access makes home-lab crystallography with Bruker solutions more productive than ever before.

Applications

- Substrate binding
- Membrane proteins
- Molecular replacement
- Protein microcrystals
- Multi-protein complexes
- High-resolution protein structures
- SAD-phasing
- Molecular motors
- Twinned protein samples
- Protein-DNA complexes
- Long unit cell axes
- Structural enzymology

Automated Crystal-Structure Analysis

3D Structures at the Touch of a Button

Bruker AXS' SMART X2S is the first benchtop X-ray crystallography system for fully automated 3D chemical structure determination. It is designed for use by chemists and does not require special training in crystallography. The SMART X2S takes small molecule structure determination to the next level of convenience by automating the previously difficult aspects of X-ray structure determination, from sample loading through data collection all the way to report generation and data archiving. Its compact design, low maintenance, low cost of ownership and easy and intuitive operation through a touch screen graphical interface are truly groundbreaking.



SMART X2S

Features

- Provides you with the 3D structure of a molecule at a bench of your synthesis laboratory
- Crystal-in, structure-out automation
- Answers your structural chemical questions unambiguously

AUTOSTRUCTURE™

AUTOSTRUCTURE is the comprehensive program for fully automatic determination of 3D crystal structures of organic and inorganic molecules from X-ray data. It allows solving and refining structural parameters routinely, providing the crucial tool to make accurate chemical X-ray structure determination quick and easy.

- Fast, reliable, intuitive-to-use, fully-automated
- Results verified using IUCr standard structure checkers
- Cascades through Patterson, direct- and dual-space methods to increase structure solution success

Lab and Process Automation

Bruker AXS X-ray instruments are designed with high flexibility for future requirements. They can be upgraded to automatic operation. All Bruker AXS X-ray solutions allow seamless and flexible integration into laboratory and total automation solutions.



D8 FABLINE

- Dedicated solution for the semiconductor industry
- High-throughput
- Analytical flexibility
- Safe sample handling
- 300 mm wafer
- Wafer storage in cassettes
- Automatic wafer recognition
- Market leading wafer handler for automated alignment and transport
- Full analytical capabilities
- SECS/GEM interface
- SEMI S2 and S8 compliance
- Pattern recognition
- Analysis of patterned wafers



Automation Solution using D4 and S8

- Sample transportation
- Sample preparation
- Sample handling robotics
- Automation software
- Seamless integration into laboratories
- Total automation solutions e.g. for the cement, aluminum and semiconductor industry
- Container laboratories
- Flexible integration packages
- Upgrade packages
- Powerful Automation Control Software AXSLAB
- Interfacing to plant control system or LIMS (Laboratory Information Management System)

Automation Control Software AXSLAB


The laboratory automation is controlled by the powerful AXSLAB software. From any PC in the network, single jobs or batches can be started and the status can be easily checked. Intelligent sample management allows the highest sample throughput and immediate access to priority samples.

The Whole Spectrum with SPECTRA^{plus}

The fully IAI Integrated Analytical Intelligence in SPECTRA^{plus} is based on more than 50 years of experience in XRF analysis – for standardless XRF analysis for all types of materials. Corrections can be made automatically.

Contact Us for More Information

For more detailed information on specific Bruker AXS products and systems, please complete and return this form. Check the box corresponding to the products that interest you and mail or fax the form back to us. On the back cover of this brochure, you will find the address and fax number of our nearest Bruker AXS branch office. If you would like technical assistance, we will be happy to answer questions and suggest options that will successfully integrate Bruker AXS X-ray solutions into your work process.

Lab Report XRD 73
D2 CRYSO
Determination of the Radius of Curvature on Bent Crystals

Introduction
 The D2 CRYSO is a desktop diffraction instrument with high energy dispersion X-ray diffraction (HEDD). Due to its flexible sample handling the D2 CRYSO is the right tool for both, heavy (100mm diameter) and light (10mm diameter) samples. In addition, the easy-to-use software of the D2 CRYSO enables routine operation and data evaluation with minimum to no user intervention.

Method
 For measuring the radius of curvature the following method was applied. For a circular bent single crystal with the bending radius R the angle θ between surface normal on location x and the z -axis (Figure 1) can be described by equation 1:

Conclusion
 Considering a bent plate which is rigidly supported parallel to the crystal's surface and if the orientation angle θ is 0° in the region (Figure 1) is determined, an average equation applies:

Introduction
 A newly designed X-ray tube with industrial 100 mm diameter has the optimal capabilities of the D2 CRYSO. Fully software supported, the crystallographic operation of single crystals up to 100 mm diameter can be investigated with spatial resolution. Fully supported, the D2 CRYSO determines the operation map of the sample based on customer defined measurement goals.

Introduction
 The operation maps are graphically displayed in atomically, the results can be listed in a table. The entire set of measurement data and the results of the evaluation process are automatically stored in a program file for archiving and potential later data evaluation purposes.

Conclusion
 The report describes the measurements on several bent single crystal samples such as Si-substrate of a multilayer, a sapphire crystal, and SiC-epitaxial layers.





D8 ADVANCE with DAVINCI design

Advantages for the next era of X-ray diffraction

- Push-button switch between Bragg-Brentano and geometries
- ITE with integrated virtual diffractometer
- CLICK for alignment-free optics switch without tools
- Real-time component recognition and configuration
- Fast and easy switching from line to point focus

XRD




Lab Report XRF 100
S8 TIGER plus GEO-QUANT M
Grade Control of Bauxite for Aluminium and Refractory Production by XRF

Introduction
 Due to its light weight aluminium is becoming more important in construction, packaging as well as in car and aircraft manufacturing. Bauxite is the most important aluminium ore and consists of several minerals. The typical grade of bauxite consists in the Bayer process in containing 50-55% Al₂O₃ in mixture with iron, silicon, fluorine and TiO₂. Bauxite with higher concentration of SiO₂ is typically only suitable for the production of special aluminium, chemical and other products. Therefore the aluminium value strongly depends not only on the aluminium concentration, but also on the content of several components. The most significant disruptive Si by fluorescence (XRF) spectrometry is the interference between the excitation of iron spectra and not the grade control due to the wide image line in industrial processes and the advanced analytical performance, especially for the determination of major and minor light elements. By using the laser method, the sample preparation for the accurate analysis and precision is more simplified. The accurate analysis and precision with WDXRF are far superior compared to other analytical methods based on digestion preparation.

Method
 Another important advantage for WDXRF is the flexibility of the selection. Since the instrument is released only once during the installation, WDXRF perfectly fits in industrial processes with a specialized quality regime. Only in maintenance intervals such as monitoring process fluctuations are required for other analytical methods. Calibration sets on daily basis. Therefore WDXRF can be run in daily routine by your analytical experts.

Conclusion
 This lab report demonstrates the analytical performance of the WDXRF spectrometer S8 TIGER in combination with the GEO-QUANT M solution for the grade control of bauxite.

Introduction
 The S8 TIGER WDXRF spectrometer comes in three different power versions: 1.2 and 10W. The excitation power levels determine the size of the analytical sample (throughput). The standard measurement mode for a given analytical precision is achieved by using EMAX excitation power. The high intensity and wide-area X-ray tube with Rhodium

Brochure Request Form

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