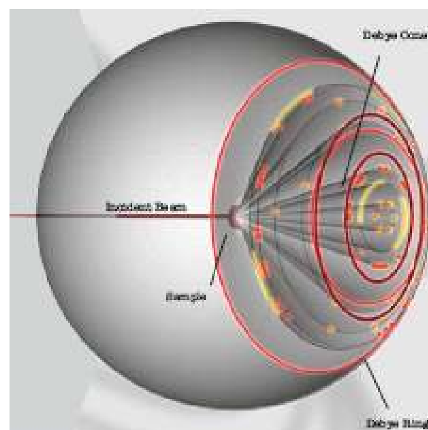
Super High Speed X-ray Diffraction Analysis

X-Ray Diffraction (XRD) is a non-destructive technique for analyzing a wide range of materials, including metals, minerals, plastics, ceramics and semiconductors. Throughout industry and research institutions, XRD has become an indispensable method for materials investigation, characterization, and quality control.

The Department of Process Engineering and Applied Science at Dalhousie University has recently acquired a high speed state-of-the-art Bruker D8 Advance XRD system.

Fundamental elements include a precise x-ray diffractometer, a high speed LynxEye™ detector, and Cu and Co x-ray tubes. The system is also equipped with a sample handling station that enables users to sequentially analyze up to nine different specimens in an automated, unattended manner. The D8 is easy to use and requires minimal operator training prior to successful application.

The LynxEye™ detector is the heart of the instruments high speed capabilities. This 1-D detector is based on compound silicon strip technology and can instantly scan a 2θ angular range of 3°. Compared to a simple point detector, the LynxEye™ dramatically increases measured intensities without sacrificing resolution or peak shape. LynxEye™ records a typical pattern in approximately 1/200th of the time required using a point detector, with identical data quality and enhanced point count intensity.



DALHOUSIE
University
Faculty of Engineering

X-ray Diffraction Facility
Materials Engineering
Department of Process Engineering and Applied Science

What Can XRD Offer You?

The D8 ADVANCE XRD system has the ability to perform a full range of tasks, including:

- Qualitative and quantitative phase identification.
- Crystal structure solution.
- Crystallite size determination.
- Micro strain and residual stress analysis.
- Preferred orientation and crystallographic texture determination.

The system employs a full software package, DIFFRAC*plus*, for both basic and advanced analysis. Useful features include:

- 2-D or 3-D data evaluation and presentation.
- Peak search and creation of d/I-files.
- Background subtraction.
- Data smoothing (Savitzky-Golay method or Fourier filtering).
- Automatic Kα_2-stripping (Rachinger method)
- Calculation of profile parameters such as line position, center of gravity, integrated area and half width.

In combination with the latest PDF database from the International Centre for Diffraction Data (ICDD), the system can automatically identify over 175,000 inorganic, organic, and mineralogical phases.

Other powerful options that are available include:

- Display of PDF stick patterns.
- Display of all database information.
- Display of hkl-indices for patterns.
- Automatic comparison of the x-ray diffraction pattern obtained from an unknown sample to reference patterns from the extensive ICDD database. The major crystalline phases in an unknown sample can then be rapidly identified.

System Availability

- The system is available for external usage by academic and industrial users alike.
- Fees are administered on a pay per use basis.
- Samples can be submitted directly to the Department for analysis.
- Alternatively, users can be trained for a modest fee and then utilize the instrument on an as-needed basis.
- Once trained, users can then book instrument time on-line using the FACES scheduling system

Location

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For More Information

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