

W0039

Micro-diffraction: Versatility in X-ray Analysis. R.G. Tissot, M.A. Rodriguez, Sandia National Laboratories*, Albuquerque, NM, 87125, USA.

Micro-diffraction is a highly versatile tool in x-ray analysis that bridges the gap between single crystal and wide-angle x-ray diffraction. Advances in incident beam optics, including pinhole collimators, total reflection collimators and mirror optics allows the x-ray beam to be modified with little or no divergence at spot sizes as small as 10 microns for conventional x-ray sources to sub-micron spots for synchrotron sources. Development of area detectors such as two-dimensional multi-wire detectors, charge coupled devices and image plates allows the capture of a larger portion of the diffraction cone thus obtaining more diffraction information at shorter analysis time than conventional linear detectors. Thus with the combination of optics and detectors and a wide variety of sample stages available, a number of sample types and geometries can be analyzed. This allows the use of various x-ray diffraction techniques making micro-diffraction a highly versatile tool for both research and industrial applications.

The x-ray diffraction laboratory as part of the Material & Process Center at Sandia National Laboratories receives a large variety of samples. The laboratory maintains two wide-angle diffractometers, a single crystal diffractometer and three micro-diffraction systems. The micro-diffraction systems in the laboratory will be described and several micro-diffraction applications at Sandia will be discussed as well as several examples of industrial applications.

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