A New Area Detector for Ultra-fast X-ray Diffraction Analysis

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A state-of-art semiconductor technology based area X-ray detector, namely D/teX-25, has recently been developed. This detector has ultra high-sensitivity and can achieve ultra high-speed X-ray diffraction (XRD) measurement up to a maximum speed of a pattern of 160º2θ in one minute or 90º2θ in about 30 seconds, which is more than 30 times faster than a conventional speed of 5º2θ per minute with a scintillation or a proportional counter. In addition to high-speed data acquisition, the D/teX-25 can provide X-ray diffraction analysis with areal resolution for the study of sample uniformity and the possible presence of large or aggregated particles in a specimen. Thus the D/teX-25 detector is useful for dynamic *in-situ* studies of various materials. Some examples of fast and/or two dimensional XRD measurements with a D/teX-25 detector will be given.

Keywords: XRD, area detector, high-speed