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Micro X-ray Powder Diffraction Using Loops. Nattamai S.P. Bhuvanesh, Joseph H. Reibenspies, Dept. of Chemistry, Texas A&M Univ., College Station, TX 77842.

Micro X-ray powder diffraction has a significant importance in a variety of disciplines including physics, chemistry, geology, and forensic studies. We have developed a novel method for μXRPD based on pinhole X-ray sources, area detectors, and sample mounted on nylon loops attached to magnetic bases. Our approach exploits the advantages of single crystal methods to overcome a number of limitations of conventional X-ray powder diffraction. Besides reducing the amount of sample necessary for collecting powder diffraction data (from a μg to few ng), it is possible to avoid preferred orientation completely by this method. Also, using a cryostat, low temperature phase transformations can be studied easily. Since the time necessary to collect the powder data is reduced considerably by the use of a 2-D detector (multiwire or image plates) dynamic diffraction (time dependent studies) can be done conveniently. We have also examined the possibility of *ab-initio* structure analysis of samples with reasonable complexity using microgram samples by our method. The results from our recent investigations of μXRPD beam will be presented.