W0103

Microcrystal Diffraction With Synchrotron Radiation: When is a Powder Not A Powder? William Clegg, School of Natural Sciences, Univ. of Newcastle upon Tyne, & CCLRC Daresbury Laboratory, UK.

Single-crystal diffraction with synchrotron radiation has been relatively neglected by 'small-molecule' crystallographers compared with our biological colleagues. The combination of very high intensity X-rays from a third-generation, or even a second-generation, storage ring with sensitive and fast area detectors provides a means for obtaining useful diffraction patterns from crystals of dimensions corresponding to coarse powder grains. The scattering intensity depends on unit cell volume and contents as well as crystal size, and results from micron-sized crystals of simple inorganic salts and minerals are actually less impressive than those from rather larger microcrystals of organic compounds and metal complexes.

SR single-crystal diffraction facilities are being developed world-wide. In the UK, following the establishment of a spectacularly successful beamline several years ago, this is now being exploited in a service mode for chemists, with national research council funding support, opening up access to a wide user base; this is a potentially useful model for other SR facilities.

Prospects for combined studies using both single-crystal and powder diffraction data from microcrystalline materials will also be discussed, exploiting the advantages of both techniques together.