Microfocus Diffraction with X-ray Synchrotron Radiation, Christian Riekel, *European Synchrotron Radiation Facility, France*. E-mail: riekel@esrf.fr

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Synchrotron radiation microdiffraction methods have been applied since about 10 years to various types of materials including alloys, minerals, polymers and biopolymers at the European Synchrotron Radiation Facility (ESRF).[1] Methods developed at the ID13 beamline span from single crystal diffraction to powder diffraction extending into the small-angle scattering range. Routinely available beam sizes for user experiments have reached the 0.7 μm scale and a number of test experiments have been performed at the 100 nm scale. Smaller beam sizes have been demonstrated and will become eventually available for user experiments.

Methodological developments allow to select single grains of a few microns diameter from a powder batch and to perform full single crystal structural analysis as shown for a number of inorganic and organic materials. Selecting the right powder grain requires the use of scanning diffractometry, which has originally been developed for the mapping of heterogeneous materials such as skin/core structures in polymer fibres or spherulitic materials. The frontier between single crystal and scanning diffractometry is therefore dissolving and future instrumentation will no longer make a distinction between both techniques.

Texture effects often gain in importance when working at the micrometer scale. As a recent example I will show texture induced by microindentation in polymeric materials. This is just one example for the mapping of deformation zones in bulk materials.

[1] C. Riekel, Rep. Prog. Phys. (2000) 63, 233-262