Advanced electron and ion microscopy methods for materials characterization

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Summary

The goal of this symposium is to highlight recent developments for electron and ion microscopy methods and their application for microstructural, physical and chemical characterization of materials. Particular attention will be focused on novel imaging and microanalysis techniques in SEM and TEM.

The environmental SEM (ESEM) enables analysis of ceramics, polymers, gel, soft tissues. The high resolution low voltage SEM can be applied for imaging of beam sensitive materials. EBSD crystal structure analysis of (sub)micron-areas gives the possibilities of crystal orientation mapping and texture examination. High accuracy X-ray microanalysis with higher detection limit (ppm) can be performed by SEM combined with micro X-ray fluorescence (μ-XRF). The development of Monte Carlo simulation give the improvement of quantitative X-ray microanalysis of nanoparticles, nanolayers etc.

Rapid advances in TEM and STEM instrumentation create the possibilities to obtain information about the materials nanostructure and chemical composition with extremely high spatial and energy resolution. Application of aberration corrected TEM and STEM, high spatial resolution EDX and EELS, electron tomography as well as the orientation mapping by precession electron diffraction for materials science characterization will be addressed for in-situ and ex-situ analysis.

This symposium will bring together electron-microscopists and materials scientist to discuss breakthroughs and challenges in materials characterization as well as prospects for future applications.