

## **Combined texture-microstructure-phase-structure analysis of textured ceramics**

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The controlled development of texture in polycrystalline materials appears to be more and more essential in ceramic processing, since potential applications require materials with macroscopic properties comparable to the anisotropic properties of the crystal structures. Texture analysis is consequently recognized as a really important tool in the characterisation of oriented ceramics. However, a quantitative texture analysis of these materials is usually not a simple task. In most cases, the diffraction spectra are very complex with many partially or fully overlapping diffraction peaks and with several crystallographic phases. The X-ray defocusing effect limits also the pole figure coverage and obstructs the analysis. To overcome this problem, the combination of Rietveld, WIMV and Popa approaches, for instance as implemented in the MAUD software (Materials Analysis Using Diffraction), permits a comprehensive new approach to crystal structure-texture-microstructure analysis. The increasing number of papers, based on such kind of methodology, illustrates the interest of many researchers in materials science to the combined analysis. In this study, we report the application of this method to different ceramic materials with different textures, crystallographic structures, microstructures.... Orientation distributions (OD) were determined from neutron and X-ray diffraction on curved position-sensitive detectors (D1B (ILL) & INEL CPS 120). We demonstrate here the efficiency and reliability of iterative combination of algorithms for structure determination (Rietveld), microstructure (Popa) and OD calculation (WIMV) in the case of oxide ceramic materials.