

MS43-P6 Characterization of Zinc Oxide thin films grown on different substratesBEATRICE G. SBARCEA¹, Carmen PARASCHIV¹, Delia PATROI¹, Virgil E. MARINESCU¹, Sorina A. MITREA¹

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Al doped ZnO films were grown by Pulsed Laser Deposition. Doped ZnO films were characterized structural and optical. X-ray diffraction measurements reveal a polycrystalline structure of films and a hexagonal wurtzite crystal structure. The crystallite size for all the samples is less than 20 nm. Doped ZnO films were also characterized using Scanning Electron Microscopy and Atomic Force Microscopy. The optical transmittances of Al doped ZnO films are over 70%. Pulsed laser deposited for n-type ZnO can be applied to optoelectronic devices in order to replace the conventional ITO films.

Keywords: ZnO, X-ray diffraction, PLD**MS43-P7** Combined Analysis in 2015: XRD (Texture, Residual Stresses, Microstructure) complemented by fluorescence (XRF and GiXRF) and Electron DiffractionDaniel Chateigner¹, Luca Lutterotti², Bérenger Caby³, Magali Morales⁴, Giancarlo Pepponi⁵, Olivier Pérez¹, Philippe Boullay¹, Emmanuel Nolot³

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The 12-years old methodology called Combined Analysis using rays (x-rays, neutrons, electrons) has proved its efficiency in particular in treating QTA from diffraction spectra using x-rays, neutrons and electrons.

Its success concerning Quantitative Texture Analysis summarises as three main points:

- it avoids tricky data reductions and corrections, that depend on more or less uncontrolled parameters, these latter becoming fitted parameters that are then better estimated
- it solves the difficult overlapping peaks problem (intra- and interphases), with the use of an extended Rietveld approach
- it includes the determination of other important quantities, like residual stresses, crystal sizes and microstrains, structures ...

Not only Combined Analysis avoids false minima in the refinements when e.g. texture or structure is the only targeted aspect, but it also allows to benefit from anisotropies in real samples rather than to suffer for them during characterizations.

We will show on an In₂O₃/Ag/In₂O₃ stack, that Combined Analysis can be generalized to more characterization techniques. X-ray Specular Reflectivity is one of them, implemented for more than 10 years, and recently X-ray Fluorescence got incorporated, allowing another view of materials' elemental compositions, from low-angles oscillations and total fluorescence.

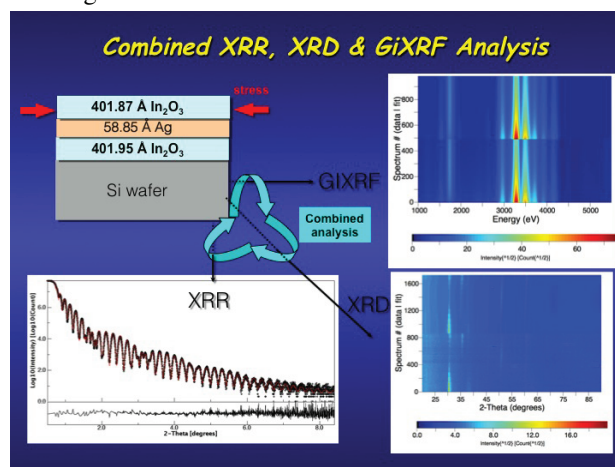


Figure 1. A XRF-GiXRF-QTA-RSA-QMA combined analysis of an In₂O₃/Ag/In₂O₃ stack

Keywords: In₂O₃ film, texture, stress, combined analysis