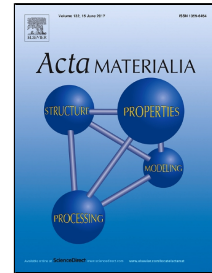


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**Micromechanical behaviour of a two-phase Ti alloy studied using grazing incidence diffraction and a self-consistent model**

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**Keywords:** elasto-plastic deformation, polycrystalline material, self-consistent model,  
grazing incidence angle, X-ray diffraction

**Abstract**

The mechanical behaviour of each phase in two-phase titanium Ti-18 was studied at room temperature under a low strain rate tensile test until fracture. Due to its selectivity, the X-ray diffraction method was applied for *in-situ* tensile test to analyse the behaviour of each phase in the direction perpendicular to the loading force. In addition, the biaxial stress states of the initial sample, as well as those of the sample during the tensile test, were determined using multi-reflection grazing incidence X-ray diffraction (MGIXD). The experimental data were compared with the prediction of an elasto-plastic self-consistent model in order to study slips on crystallographic planes and mechanical effects occurring during plastic deformation.

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