

IN-SITU HIGH TEMPERATURE XRD ANALYSIS OF HTSC TAPES

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ABSTRACT

The dynamic *in situ* characterization of ISD YBCO and electrodeposited Tl-1223 (on LaO, Ag, Ag-Pd substrates) was conducted using a Bruker AXS D8 diffractometer with 2D GADDS and 1D PSD detectors, Goebel mirror and a newly designed graphite environmental cell/heater. The new designed sealed graphite reactors, providing controlled heating and atmospheric conditions while being transparent to Mo K α x-rays provide the path to these observations. This type of *in situ* characterization is a novel approach for directly evaluating the kinetics of reactions at a solid/melt or solid/gas interface. The careful observation of the formation of HTSC phases, establishing their kinetics and mechanisms of orientation is essential to being able to effectively control key engineering parameters involved with the fabrication of practical HTSC wires. Results of orientation imaging microscopy (OIM) will also be presented. The OIM technique was used to explore the relationship between the various processing conditions and the formation of textured films.