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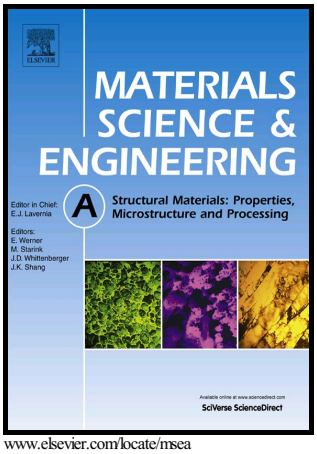

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Initiation and propagation of microcracks in Cu thin films on flexible substrates through the thickness direction during a cyclic bending test

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ABSTRACT

The initiation and propagation of microcracks in the copper thin film on flexible polyimide substrates was examined through the thickness direction following cyclic bending test using a focused ion beam (FIB) and electron backscattering diffraction (EBSD) technique. The EBSD observations of the cross-sectional plane clearly indicated that intergranular fracture was predominant during the initiation and propagation of microcracks. During the cyclic bending testing, through the thickness direction microcracks were propagated mostly along the high-angle grain boundaries (HAGBs) that separated the neighboring grains with a high Schmid factor (SF), instead of at the twin boundaries (TBs).

Keywords: Thin film, Bending test, Electron backscattering diffraction (EBSD), Focused ion beam (FIB), Grain boundaries.