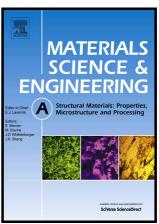
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ACCEPTED MANUSCRIPT

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.

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