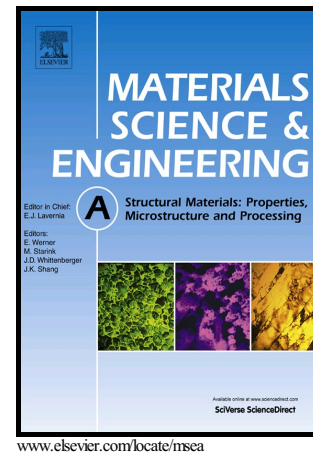


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A Constitutive Model Considering Secondary Phase Harden and Size Effect in Plastic Deformation of Cu-3wt.%Ag-0.5wt.%Zr Thin Sheet

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Abstract

The effect of grain size or the ratio of specimen thickness to grain size on the deformation behaviors of Cu-3wt.%Ag-0.5wt.%Zr thin sheet is investigated by tensile test. For investigating the role of precipitates being generated by age process on the size effect of the thin samples, a constitutive equation is constructed by considering secondary phase harden behavior and surface layer model. The results suggest that the critical feature value (grain size/thickness) of size effect is equal to 0.2~0.25 which is very similar to that of pure copper. However, because the precipitates strengthen role will weakness in the surface of specimen when there are only 4~5 grains across the specimen thickness, the size effect is presented more evident.

Keywords: Constitutive Equation; Flow Stress; Harden; Size Effect; Precipitates;

1.Introduction

With general trend of technological miniaturization in many industry areas,

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