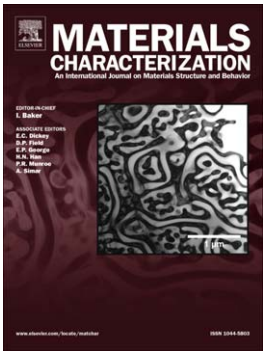

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Peng Qu, Liming Zhou, Viola L. Acoff

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Deformation Textures of Aluminum in a Multilayered Ti/Al/Nb Composite Severely Deformed by Accumulative Roll Bonding

Peng Qu[1], Liming Zhou[2], and Viola L. Acoff [*]

Department of Metallurgical and Materials Engineering, The University of Alabama, Tuscaloosa, AL 35487, United States

[1] Email Address: qp9911@uab.edu (P.Qu)
[2] Email Address: lzhou1@crimson.ua.edu (L.Zhou)
* Corresponding author. Tel.: +1 205 348 2080
Email Address: vacoff@eng.ua.edu (V.L. Acoff)
Mailing Address: Box 870202, Metallurgical and Materials Department, the University of Alabama, Tuscaloosa, AL 35487-0202, United States

Abstract

The accumulative roll bonding process was carried out to produce multilayered Ti/Al/Nb composites up to four cycles. Scanning electron microscopy, transmission electron microscopy electron backscattered diffraction and nanoindentation were employed to investigate the microstructural and texture evolution. A homogenous distribution of Ti/Nb necking layers in Al matrix was achieved after four ARB cycles. Grain refinement was observed to increase with increasing number of ARB cycles. The fraction of high-angle grain boundaries as also increased. Strong recrystallization texture appeared for high number of ARB cycles due to the adiabatic heat that occurs during ARB processing. The shear band at the Ti/Al interface reduced the intensity of the cold rolling fiber textures of Al. There was no evidence of shear component from the orientation distribution function results.

Keywords: Accumulative roll bonding; EBSD; Aluminum composite; Texture evolution