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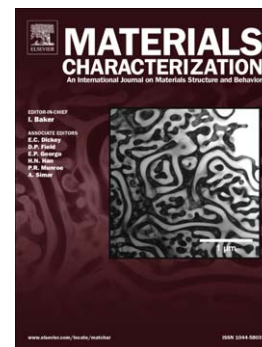
Microstructural evolution of 2099 Al<sub>3</sub>Sc/Li alloy during friction stir welding process

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Abstract: Microstructural evolution of friction stir welded 2099 Al-Li alloy was evaluated. Friction stir welding (FSW) resulted in significant grain refinement, dissolution of original phases  $T_1$  ( $Al_2CuLi$ ) and  $\delta'$  ( $Al_3Li$ ), and precipitation of ultrafine  $\delta'$  phases in the nugget zone (NZ). In the heat affected zone (HAZ), heavy precipitation of  $T_1$  phases led to a peak hardness of 105 HV. A strong rotated Cube texture  $\{013\}\langle 100 \rangle$  was obtained in the base metal (BM). After FSW the NZ was characterized by shear texture  $\{111\}\langle 110 \rangle$ , while Bass texture  $\{110\}\langle 112 \rangle$  and S texture  $\{123\}\langle 634 \rangle$  were developed in the thermo-mechanically affected zone (TMAZ). Compared with the BM, the dislocation density was decreased in the welding zones, which resulted from recovery and recrystallization.

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