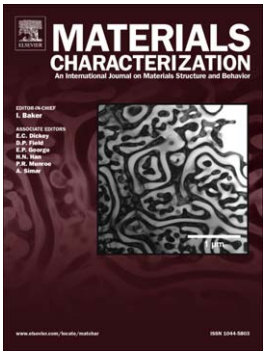

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PII: S1044-5803(16)30455-7
DOI: doi:10.1016/j.matchar.2016.12.021
Reference: MTL 8507

To appear in: *Materials Characterization*

Received date: 4 October 2016
Revised date: 7 November 2016
Accepted date: 22 December 2016

Please cite this article as: Minárik Peter, Čížek Jakub, Veselý Jozef, Hruška Petr, Hadzima Branislav, Král Robert, Nanocrystalline aluminium particles inside Mg-4Li-4Al-2RE magnesium alloy after sever plastic deformation, *Materials Characterization* (2017), doi:10.1016/j.matchar.2016.12.021

Nanocrystalline aluminium particles inside Mg-4Li-4Al-2RE magnesium alloy after sever plastic deformation

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Abstract

Detailed microstructure characterization of ultra-fine grained LAE442 magnesium alloy processed by ECAP was performed by transmission electron microscopy and positron annihilation spectroscopy. Formation of FCC aluminium particles in the magnesium matrix and intensive segregation of aluminium at dislocations was observed. In situ annealing in the transmission electron microscope together with the analysis of the positron annihilation spectrum showed the limited stability of Al particles and Al segregation at temperatures below the processing temperature. It was suggested that the formation of observed Al nanoparticles is caused by the synergic effect of high external stresses during ECAP and the presence of Li atoms dissolved in the Mg matrix.

Keywords

magnesium; particles; positron annihilation; segregation