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# 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

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