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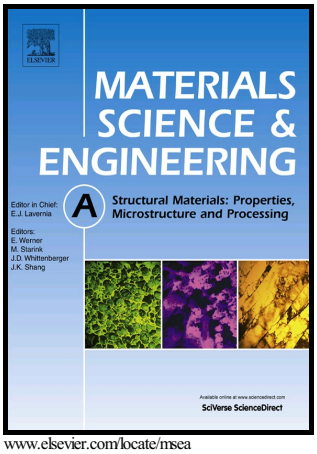

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Evolution of long-period stacking ordered structure and hardness of Mg-8.2Gd-3.8Y-1.0Zn-0.4Zr alloy during processing by high pressure torsion

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Abstract:

High pressure torsion (HPT) was performed at room temperature on a Mg-8.2Gd-3.8Y-1.0Zn-0.4Zr (wt.%) alloy containing long period stacking ordered (LPSO) phase with a 6.0 GPa pressure. The microstructure evolution and hardening mechanisms were analyzed. TEM shows that, with increasing HPT strain, the LPSO lamellar-shaped and block-shaped particles experience kink bending, fragmentation and dissolution; and eventually a supersaturated solid solution with nanosized grains is obtained. The decomposition of LPSO phase at room temperature is attributed to the high defect concentrations generated in the LPSO lamellae and blocks, and the

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