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Crystallization behavior of Al₈₇Ni₅La₇Zr₁ metallic glass

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Abstract: Nano-crystalline-amorphous Al based alloys with minor additions of rare earth elements and transition metals are of technical interest, because of their extraordinary high mechanical strength. This strengthening effect depends strongly on the alloy composition and the pathway of crystallisation. The crystallisation behaviour of Al₈₇Ni₆La₇ and of Al₈₇Ni₅La₇Zr metallic glass was studied with complementary methods such as XRD, TEM and 3D-AP. The amorphous matrix of the Zr-containing glass shows fluctuations of all minor elements on the nanometer scale. It is suggested, that these fluctuations act as nucleation zones for the crystallization of the glass during annealing.

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