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The evolution of microstructure in annealed LaFeSi-type alloys

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Abstract

The evolution of microstructure and the phase constitution of the $\text{LaFe}_{11.0}\text{Co}_{0.8}(\text{Si}_{0.4}\text{Al}_{0.6})_{1.2}$ alloy in as-cast state and after subsequent annealing at 1323 K for 10, 20, 49 days was studied. In the $\text{LaFe}_{11.0}\text{Co}_{0.8}(\text{Si}_{0.4}\text{Al}_{0.6})_{1.2}$ alloy after arc-melting, the dominant dendritic α -Fe phase crystallizes, which is confirmed by X-ray diffraction. Annealing of the samples resulted in evolution of microstructure and the phase constitution. Prolonged annealing of the samples causes almost full homogenization of the alloy with the single-phase structure identified as $\text{La}(\text{Fe}_{0.85}\text{Co}_{0.06}\text{Si}_{0.04}\text{Al}_{0.05})_{13}$ phase of the NaZn_{13} -type structure.



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