

论文

铝合金中单层Mg-GP, Si-GP区的高分辨电子显微镜图像的计算机模拟

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摘要:

Al-Mg-Si合金析出强化相的前驱相(GP区)的形成对于析出强化的性能有重要影响,但是由于其尺度极其微小,往往很难直接观察. 本文通过对Al-Mg-Si合金中可能存在的单层富Mg及富Si GP区的不同厚度、不同存在形态进行全方位计算机模拟,确认了GP区成像的存在条件. 单层富Mg或富Si GP区在不被铝合金基体包裹的试料中可以形成清晰的高分辨电子显微镜像,并且Mg-GP区与Si-GP区呈现出相反的对比. 这为GP区的高分辨电镜观察提供了可靠的理论依据.

关键词: 计算机模拟 高分辨电子显微镜 GP区

The computer simulation of the high-resolution electron microscope images about monolayer Mg-GP, Si-GP zone in aluminum alloy

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Abstract:

The formation of precursor phases (GP zones) of Al-Mg-Si alloy has important influence on the property of ageing precipitated phase. But the size of GP zone is very small, which is difficult to observe directly. The computer simulation of the high-resolution electron microscope images about the Mg-rich and Si-rich monolayer GP zone was carried out. The simulation results showed that clear high-resolution electron microscope image could be obtained when the GP zones located on the surface of Al matrix. The simulation images also indicated that the Mg-rich and Si-rich GP zones had the opposite comparison. These results provide a reliable theoretical basis for the GP zone study in Al-Mg-Si alloy.

Keywords: computer simulation high resolution electron microscope GP zone

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