

### 论文摘要

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## Nd对2519铝合金组织与耐热性能的影响

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**摘要:** 利用力学性能测试、金相、X射线衍射、扫描电镜与透射电镜等研究微量Nd对2519铝合金组织与力学性能的影响。结果表明: 添加0.14% Nd提高合金的强度, 硬度最适宜; Nd元素与Cu和Al元素主要形成 $Al_8Cu_4Nd$ 金属间化合物, 并沿晶界分布。这些金属间化合物有效地阻碍高温时基体的变形和晶界的迁移, 从而提高了合金的高温强度。Nd能细化合金的时效强化相, 提高合金力学性能。添加0.14% Nd时, 合金在300℃时的抗拉强度提高15.4%, 室温抗拉强度提高4.4%; 当Nd含量进一步增加时, 合金室温及高温力学性能降低。

**关键字:** 2519铝合金; 显微组织; 力学性能; 热稳定性; 稀土; Nd

## Effect of Nd addition on microstructures and heat-resisting properties of 2519 aluminum alloy

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**Abstract:** The effect of Nd on the mechanical properties and microstructures of 2519 aluminum alloy were investigated by means of hardness test, mechanical properties test, X-ray diffraction, OM, SEM and TEM. The results show that, with addition of Nd, the hardness and strength enhance. Nd can react with Al and Cu, and the intermetallic compound  $Al_8Cu_4Nd$  forms, which disperses along the grain boundaries. The mechanical properties at elevated temperature are improved because this dispersed compound prevents the deformation of matrix and movement of the grain boundaries at elevated temperature. The aging precipitates can be refined with appropriate addition of Nd, which increases the mechanical properties of the alloy. Adding 0.14% Nd increases the tensile strength about 15.4% at 300℃ and that at room temperature by 4.4%. With further addition of Nd, the mechanical properties at room and high temperature decrease.

**Key words:** 2519 aluminum alloy; microstructure; mechanical properties; thermal stability; rear earth; Nd

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