



## 论文摘要

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### 稀土元素Nd和Dy对铸态ZK10镁合金组织及性能的影响

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**摘要:** 利用光学显微镜、扫描电子显微镜、X线衍射分析及力学性能测试等设备和方法, 研究稀土元素Nd和Dy对铸态ZK10镁合金显微组织及力学性能的影响。结果表明: ZK10镁合金中分别加入Nd和Dy均能细化晶粒, 且Nd和Dy同时加入的效果优于单一加入的效果, 当同时加入质量分数为0.2% Nd和0.6% Dy时, 合金的平均晶粒尺寸由原来的150 μm细化至60 μm, 使ZK10合金的抗拉强度和屈服强度分别提高至191.0 MPa和69.0 MPa, 伸长率达到16.6%, 与未加入稀土的ZK10合金相比分别提高89%, 43%和232%。

**关键词:** ZK10镁合金; 稀土; Nd; Dy; 显微组织; 力学性能

### Effect of Nd and Dy on microstructure and mechanical properties of as-cast ZK10 magnesium alloy

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**Abstract:** The effect of Nd and Dy on the microstructure and mechanical properties of as-cast ZK10 magnesium alloy was studied by using optic microscope (OM), scanning electron microscope (SEM), X-ray diffraction (XRD), mechanical property testing, etc. The results show that the grain size is refined by the addition of Nd or Dy, especially combined addition is better than single addition. With the addition of 0.2% Nd and 0.6% Dy, the grain size is reduced from 150 μm to 60 μm. Combined addition with two rare earths (RE) elements makes the tensile strength, yield strength and elongation of ZK10 alloy increase to 191.0 MPa, 69.0 MPa, and 16.6%, increasing by 89%, 43%, 232% respectively, compared with ZK10 alloy without RE element.

**Key words:** ZK10 magnesium alloy; rare earth; Nd; Dy; microstructure; mechanical properties

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