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## 工艺参数对镁合金熔液除气精炼的影响

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**摘要:** 利用自行研制的镁合金快速定量测氢仪研究通Ar除气处理AZ91镁合金熔液的效果, 以及通Ar流量、通Ar时间和精炼温度三因子对AZ91镁合金熔液精炼的影响。运用正交试验方法获得通Ar除气工艺的最佳工艺参数, 即通Ar流量为1.0~1.5 L/min, 通Ar时间为20~25 min, 镁合金温度为725~750 °C。从热力学和动力学角度对镁合金熔液的除气机理进行探讨, 建立导入镁合金熔液中Ar气体积的热力学关系式, 并进行动力学方面的分析。结果表明: 由于实际除氢时吸入氢, 在理想条件下所推导的除气速率的动力学方程的理论计算值与实际数值存在较大差异。

**关键字:** 镁合金熔液; 除氢; 正交试验方法; 热力学; 动力学

## Effect of technical parameters on purging and degassing of magnesium alloy melt

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**Abstract:** Purging effects of Ar fluxing were investigated with a self-developed instrument for measuring hydrogen content in magnesium alloy melt, and the influences of three factors, namely, Ar flow rate, degassing time and temperature of magnesium alloy melt on purging effects were also studied. The optimal parameters were obtained by experiments with orthogonal experimental design that the Ar flow rate is 1.0–1.5 L/min, the degassing time is 20–25 min and the temperature of magnesium melt is 725–750 °C. The degassing mechanism of magnesium alloy melt was analyzed according to the thermodynamic and dynamic theory. Thermodynamic equations of volume of Ar gas entering into magnesium alloy melt were established. Furthermore, the degassing dynamics was also analyzed. The experimental results show that the theoretical data

of the deduced dynamic equation of degassing rate under ideal conditions are not consisted with the real values because hydrogen enters into magnesium melt with degassing under real condition.

**Key words:** magnesium alloy melt; degassing; orthogonal experimental method; thermodynamics; dynamics

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