

论文

AZ91D镁合金微弧氧化过程中的火花放电现象研究

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摘要:

火花放电是微弧氧化处理过程中的一种代表性现象.在电火花的影响下,镁合金氧化试样的表面形貌、元素分布以及表面电位分布等都发生了显著的变化.研究发现,火花放电能够在氧化膜中留下大量的放电微孔,并且加速电极表面的氧化以及溶液中粒子在电极表面的沉积.火花放电具有明显的成膜作用,使膜层内部更加致密,放电区域的表面电位正移.另外,氧气的存在,对于电火花的尺寸和放电的剧烈程度具有明显的促进作用.

关键词: 火花 微弧氧化 镁合金 元素分布 电位分布

SPARK DISCHARGES DURING THE MICRO-ARCOXIDATION OF AZ91D MAGNESIUM ALLOYS

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Abstract:

Spark discharge is the representative phenomenon of micro-arc oxidation (MAO) method. Accompanied with the spark discharge, the cell voltage presents oscillations within the range of several volts, and the surface morphologies, the element distribution as well as the surface potential distributions of the anodic layer are significantly changed. It was found that spark discharges resulted in a great deal of discharge pores in the oxide layer, accelerated the oxidation and the deposition of electrolytic particles. Due to the melting effect of the sparks, compact internal layer was formed underneath the outer loose layer, and the surface potential over the spark zone was greatly enhanced. In addition, it was found that oxygen played a key role in determining the intensity and the size of sparks, and abundant oxygen resulted in intensive and larger sparks.

Keywords: spark micro-arc oxidation magnesium alloy element distribution potential distribution

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