

### 论文摘要

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## LC4铝合金在格尔木盐湖大气环境中的腐蚀行为

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**摘要:** 通过在我国西北格尔木典型大气环境进行大气暴露实验, 测定LC4铝合金在该地区的腐蚀率; 利用扫描电镜(SEM)、能量色散X射线谱(EDX)、电子探针(EPMA)、红外光谱(FTIR)和X射线衍射仪(XRD)观察分析LC4铝合金腐蚀表面形貌、元素分布和腐蚀产物结构。结果表明: LC4铝合金的腐蚀以点蚀为主要特征, 比其在非盐湖大气环境中的腐蚀严重, 朝地面的腐蚀比朝天面严重, 腐蚀产物层中含有大量的氧和铝, 较多的氯和硫; 主要腐蚀产物为 $Al_2O_3$ ,  $Al_2O_3 \cdot 2SiO_2 \cdot 2H_2O$ 和 $Al_2Cl_6 \cdot 6H_2O$ ; 含氯和硫的盐参与铝合金的大气腐蚀过程, 并起到促进腐蚀的作用。

**关键字:** 铝合金; 大气腐蚀; 盐湖; 表面分析

## Corrosion behaviors of Al alloy LC4 in Geermu salt lake atmosphere

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**Abstract:** The corrosion behaviors of typical high-strength aluminum alloy LC4 was studied by atmospheric exposure test, combining the experimental techniques including mass loss, morphological check of samples and analysis of corrosion products. The products formed on aluminum alloy LC4 exposed for 12 months were characterized by X-ray diffractometry (XRD) and infrared transmission spectroscopy (IRS), the results show that the main products are  $Al_2O_3$ ,  $Al_2O_3 \cdot 2SiO_2 \cdot 2H_2O$  and  $Al_2Cl_6 \cdot 6H_2O$ . The surface morphology was observed by scanning electron microscopy (SEM). The morphology of cross section of skyward surface exposed in salt lake atmosphere for 6 months and the distributions of O, Cl, S, Si and Al were analyzed by electron probe micro analyzer (EPMA). Corrosion on field-ward surface is more severe than that on skyward surface. The character of the corrosion products is related to the abundant chloride environment.

**Key words:** aluminum alloy; atmospheric corrosion; salt lake; surface analysis

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