中国有色金属学报
中国有色金属学报(英文版)
中国科学技术协会 主管
中国有色金属学会 主办

论文摘要

中国有色金属学报
ZHONGGUO YOUSEJINSHUXUEBAO XUEBAO
第17卷 第8期 (总第101期) 2007年8月

[PDF全文下载]

文章编号：1004-0609(2007)08-1385-06

铝合金阳极氧化膜的勃姆石溶胶封闭

周 琦1, 2，贺春林3，才庆魁3，邵忠宝1，朱学松2

(1. 东北大学 材料与冶金学院，沈阳 110004；
2. 沈阳理工大学 环境与化学工程学院，沈阳 110168；
3. 沈阳大学 表面工程研究所，沈阳 110044)

摘 要：将铝合金阳极氧化膜浸入勃姆石(AlOOH)溶胶中进行封闭。以溶胶封闭膜表面密度、磷-铬酸质量损失、酸性点滴实验、染色实验为评价标准，对溶胶封闭进行了正交实验，然后研究溶胶的pH值、试片浸入溶胶时间对封闭膜表面密度和磷-铬酸质量损失的影响，获得如下的较优工艺条件：溶胶pH值为4~6，试片浸入溶胶时间为30 min，烘干封闭膜的温度为80 ℃，烘干时间为6 h。溶胶法封闭后膜的点滴试液变色时间可达33 min，磷-铬酸质量损失低于3 g·m^{-2}。极化曲线显示溶胶封闭膜的腐蚀电流密度比重铬酸盐封闭膜的降低2个数量级，其原因是溶胶不仅封闭了氧化膜的孔隙，而且在氧化膜的表面形成溶胶凝胶涂层。

关键字： 铝合金；阳极氧化膜；AlOOH；封闭

Sealing of anodized films on Al alloy with boehmite sol

ZHOU Qi1, 2, HE Chun-lin3, CAI Qing-kui3, SHAO Zhong-bao1, ZHU Xue-song2

(1. School of Materials and Metallurgy, Northeastern University, Shenyang 110004, China;
2. School of Environment and Chemical Engineering, Shenyang Ligong University, Shenyang 110168, China;
3. Institute of Surface Engineering, Shenyang University, Shenyang 110044, China)

Abstract: The anodised film on Al alloy was dipped in boehmite sol so as to replace dichromate salt sealing used in common. The orthogonal experiment evaluation criterions for sol sealing include mass density of sealed film, mass loss in solution of phosphoric acid mixed with chromic acid, acidic dropping test and dyeing test. The effects of pH of sol and dipping time in the sol on the surface density and mass loss of sealed films were investigated. The films exhibit good properties under conditions of dipping in sol with pH value maintained at 4−6 for 30 min, and then dried at 80 ℃ for 6 h. The time of dropping test of sealed films is up to 33 min. The mass loss rate is lower than 3 g·m^{-2}. The polarization curves show that the corrosion current density of sol sealed film is about 2 orders of magnitude lower than that of the film sealed by sodium bichromate, the reason is that sol particles can not only seal pores of anodized film, but also form sol-gel coating on

anodized film.

Key words: aluminum alloy; anodized film; Al(OOH); sealing

地 址：湖南省长沙市岳麓山中南大学内 邮编： 410083

电 话： 0731-8876765，8877197, 8830410 传真： 0731-8877197

电子邮箱： f-ysxb@mail.csu.edu.cn