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化学转化膜对镁合金抗腐蚀性的影响

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摘 要：利用扫描电镜、X射线衍射和质量损失等手段，研究预处理前后的表面形貌及质量变化和锡酸盐化学转化膜层表面形貌及其相组成，采用盐雾和湿热实验箱检验膜层的抗腐蚀性能。结果表明：预处理前后镁合金表面相组成基本不变，质量减少主要发生在酸洗阶段，但变化不大；由于发生化学腐蚀和电化学腐蚀，预处理后表面在相界处出现较深的狭缝。化学转化膜层主要由Mg、$Al_{12}Mg_{17}$和$MgSnO_3 \cdot 3H_2O$组成，表面由细小近球形颗粒密积而成，颗粒之间存在缝隙。经盐雾和湿热检测，化学转化膜层可以大大提高镁合金基体的抗腐蚀性。

关键字： 镁合金；锡酸盐；化学转化膜；抗腐蚀性

Effect of chemical conversion film on corrosion resistance of magnesium alloy

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Abstract: The changes of morphology and mass in the process of pretreatment, the morphology and the phase constitution of chemical conversion film formed by stannate were studied using scanning electron microscope, X-ray diffraction and the mass loss method. The corrosion resistance of film were studied by salt spay test and damp test. The results show that the phase constitution before and after pretreatment is almost changeless and the mass diminishes a litter during acidic solution, and because of chemistry and electrochemistry corrosion, the deep micro flaw appears near between α and β phases. The conversion film is mainly composed of Mg, Al12Mg17 and MgSnO3·3H2O, and the fine sphericity grain forms on the surface. The film can provide a good protection for the magnesium alloy.

Key words: magnesium alloy; stannate; chemical conversion film; corrosion resistance

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