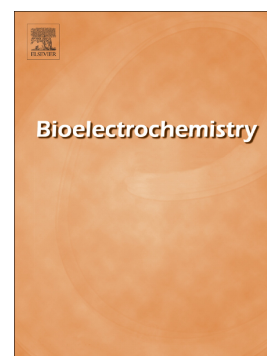


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# Effects of mould on electrochemical migration behaviour of immersion silver finished printed circuit board

Pan Yi<sup>a</sup>, Kui Xiao<sup>a,b,\*</sup>, Chaofang Dong<sup>a,b</sup>, Shiwen Zou<sup>c</sup>, Xiaogang Li<sup>a,b</sup>

<sup>a</sup>Corrosion and Protection Center, University of Science and Technology Beijing, Beijing 100083, P. R. China

<sup>b</sup>Key Laboratory for Corrosion and Protection (MOE), Beijing 100083, P. R. China

<sup>c</sup>The 703th Research Institute, the First Academy, China Aerospace Science and Technology Corporation, Beijing 100076, P. R. China

Corresponding Author: Kui Xiao; Tel.: +86-10-62333975-522;

Fax: +86-10-62334005; E-mail address: xiaokui@sina.com

**Abstract:** The role played by mould in the electrochemical migration (ECM) behaviour of an immersion silver finished printed circuit board (PCB-ImAg) under a direct current (DC) bias was investigated. An interesting phenomenon is found whereby mould, especially *Aspergillus niger*, can preferentially grow well on PCB-ImAg under electrical bias and then bridge integrated circuits and form a migration path. The cooperation of the mould and DC bias aggravates the ECM process occurring on PCB-ImAg. When the bias voltage is below 15 V, ECM almost does not occur for Ag coating. Mechanisms that explain the ECM processes of PCB-ImAg in the presence of mould and DC bias are proposed.

**Keywords:** immersion silver finished printed circuit board; electrochemical migration; *Aspergillus niger*

## 1 Introduction

Due to increasing demand for light, thin, short, small, and multi-functional electronic products, printed-circuit boards (PCBs) are becoming further miniaturized and highly integrated with time. However, with these technological advances, electronic materials are also becoming increasingly sensitive to atmospheric pollutants and prone to corrosion failure [1]. Typically, to improve the reliability or corrosion resistance of PCBs, some surface treatments (eg. electroless nickel immersion gold (ENIG), immersion silver (ImAg), immersion tin (ImSn) and an organic

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