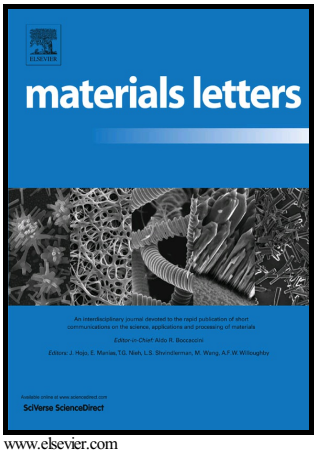

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Facile synthesis and electrical performance of silica-coated copper powder for copper electronic pastes on low temperature co-fired ceramic

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Abstract

Silica-coated copper powders with different silica content were prepared by sol-gel process. The pastes with the silica-coated copper powders were prepared and screen-printed on low temperature co-fired ceramic substrate (LTCCs) to form copper films. The films were sintered at 910 °C for 1 h under N_2 atmosphere. The morphology of silica-coated copper powder, copper film surface and cross-section were observed. The sheet resistance was also measured. The copper film with 2 wt% silica-coating on LTCCs was well dense and displayed good bonding behavior. The film had a thickness of approximate 8 μm and a sheet resistance of 6 mΩ/□.

Keywords: silica-coating; copper paste; microstructure; thick films

1. Introduction

With the rapid development of electronic industry, electronic pastes as the foundation materials of electronic components have a greater demand. Electronic pastes consist of conductor metal (Ag, Au, Pd, Cu, etc.), glass and organic vehicle[1]. The scarce of resources and the increasing price of the precious metal make it significant to develop the base metal pastes. Among the base metal pastes, copper is an ideal conductor material for electronic applications because of high electrical conductivity, high thermal