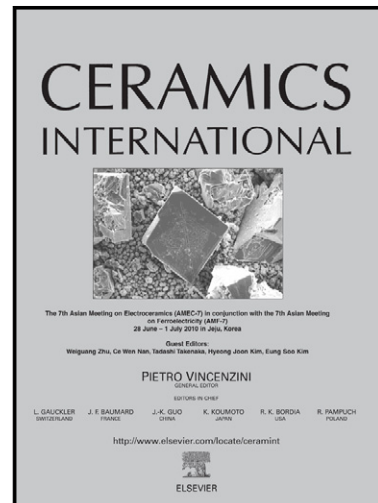


# Author's Accepted Manuscript

Surface metallization of alumina ceramics: Effects of sintering time and substrate etching

Zhiqin Zheng, Yong Zhang, Facheng Yi, Chen Chen, Xiaozhen Song



[www.elsevier.com/locate/ceramint](http://www.elsevier.com/locate/ceramint)

PII: S0272-8842(14)00670-1  
DOI: <http://dx.doi.org/10.1016/j.ceramint.2014.04.119>  
Reference: CER18487

To appear in: *Ceramics International*

Received date: 18 November 2013  
Revised date: 27 February 2014  
Accepted date: 22 April 2014

Cite this article as: Zhiqin Zheng, Yong Zhang, Facheng Yi, Chen Chen, Xiaozhen Song, Surface metallization of alumina ceramics: Effects of sintering time and substrate etching, *Ceramics International*, <http://dx.doi.org/10.1016/j.ceramint.2014.04.119>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

## Surface metallization of alumina ceramics: effects of sintering time and substrate etching

Zhiqin Zheng<sup>a</sup>, Yong Zhang<sup>b,\*</sup>, Facheng Yi<sup>a</sup>, Chen Chen<sup>b</sup>, Xiaozhen Song<sup>b</sup>

<sup>a</sup> *School of Materials Science and Engineering, Southwest University of Science and Technology, Mianyang, Sichuan, 621010 PR China*

<sup>b</sup> *State Key Laboratory of New Ceramics and Fine Processing, Institute of Nuclear and New Energy Technology, Tsinghua University, Beijing, 100084 PR China*

\* Corresponding author. Tel: +86 10 80194055; Fax: +86 10 89796022.

E-mail: yzhang@tsinghua.edu.cn (Y. Zhang)

### Abstract

Surface metallization of alumina ceramics was prepared by a screen-printing process. The effects of sintering time and substrate etching on the morphology, surface resistivity and mechanical properties of Ag films were studied by scanning electron microscopy-back-scattered electron imaging (SEM-BSI), four-point probe method and tensile test, respectively. The lowest surface resistivity and the highest adhesion strength of Ag films were achieved in the samples sintered at 600 °C for 20 min. Moreover, the Ag films still remained the lowest surface resistivity and the highest adhesion strength after the alumina substrate was etched with 30 wt% sodium hydroxide aqueous solution. Based on the obtained experimental results, a model was proposed for the formation of glass network within the interpenetrating Ag at the interface of Ag film/Alumina substrate during the sintering process.

*Keywords:* Screen-printing; ceramics metallization; surface resistivity; adhesion strength

Download English Version:

<https://daneshyari.com/en/article/10625250>

Download Persian Version:

<https://daneshyari.com/article/10625250>

[Daneshyari.com](https://daneshyari.com)