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P-19

Wear Behavior of SiAlONs Depending on Microstructure and Mechanical Properties

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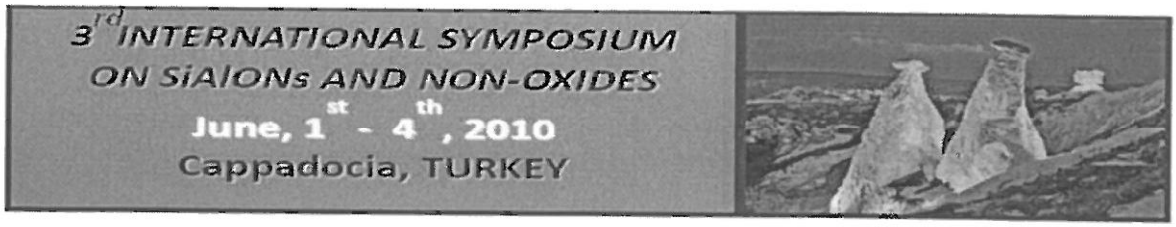
Keywords: SiAlON, wear, microstructure, hardness, fracture toughness

Abstract. Although SiAlON ceramics are potential materials due to good mechanical and chemical properties to be used in wear applications, their use has been limited until now due to high powder and processing cost. In order to solve this problem low cost refractory grade β-Si_3N_4 powder was attempted to be used to produce SiAlON ceramics.
It was observed that β-Si_3N_4 particle size is important in microstructural development in that fine β-Si_3N_4 initial particle size promotes elongated SiAlON grain morphology whereas coarse β-Si_3N_4 gives equiaxed ones. Wear behavior was studied and correlated with microstructures and mechanical properties. It was found that these low cost SiAlONs exhibit rather good wear performance under different wear conditions.



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Dear Dr. Calis,

On the behalf of the Organizing Committee of the ***3rd International Symposium on SiAlONs and Non-Oxides***, we are please to inform you that your abstract, with the title and authors;

Paper Title: **Wear Behavior of SiAlONs depend on Microstructure and Mechanical Properties**
Authors: **N. Calis Acikbas, H. Mandal, F. Kara, R. Kumar, B. Basu and B. Bitterlich**

has been accepted for a poster presentation at the ***3rd International Symposium on SiAlONs and Non-Oxides*** between 1-4 June 2010 at Cappadocia, Turkey.

All submitted manuscripts will be subjected to peer review and only accepted ones will be published in the Journal of the European Ceramic Society. The procedure for the manuscript submission will be announced soon from the web site of the symposium.

The size of your poster should be 0.9m (W) x 1.2m (H).

We would like to inform you that we haven't received your registration & accommodation forms and their fees have not been paid up to now. Registration, accommodation forms and also the information about travel to the symposium venue is available at the symposium website. Full content of the preliminary program will be soon available.

Please do not hesitate to contact us if you have any queries regarding with preparation of your manuscript and attending at the symposium.

We are looking forward to see you at Cappadocia.

Yours sincerely,

Prof. Dr. Hasan MANDAL

Prof. Dr. Katsutoshi KOMEYA

Conference Chairmen

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P-30

SiAlON Ceramics for Refractory Applications

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Keywords: SiAlON, Si_3N_4, Refractory, Ceramics, Mechanical properties

Abstract. Refractories are materials, that have high temperature strentgh and thermal shock resistance properties, can stand up the action of corrosive solids, liquids and gases at high temperatures. SiAlONs are the solid solution of Si_3N_4 and Al_2O_3. In this study, the potential of SiAlONs for refractory applications was investigated due to their high chemical durability and high thermal and mechanical properties. The aim of the study was to produce an economical material with better refractory properties than traditional refractories such as Al_2O_3 and ZrO_2. For this reason, a refractory grade β-Si_3N_4 powder was used to lower the cost of dense SiAlONs. In addition, the effect of different cation systems and different particle sizes of the starting β-Si_3N_4 powder on densification and mechanical properties were investigated. Crystallographic phases by X-ray diffaction, hardness and fracture toughness measurements by Vickers indentation, strength tests by 4 point bending test and thermal diffusivities by laser flash method were carried out. High density SiAlON with good thermal conductivity could be produced from 2 micron coarse β-Si_3N_4 powder. This material can be considered as a potential material for refractory applications.

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ABSTRACT BOOK

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