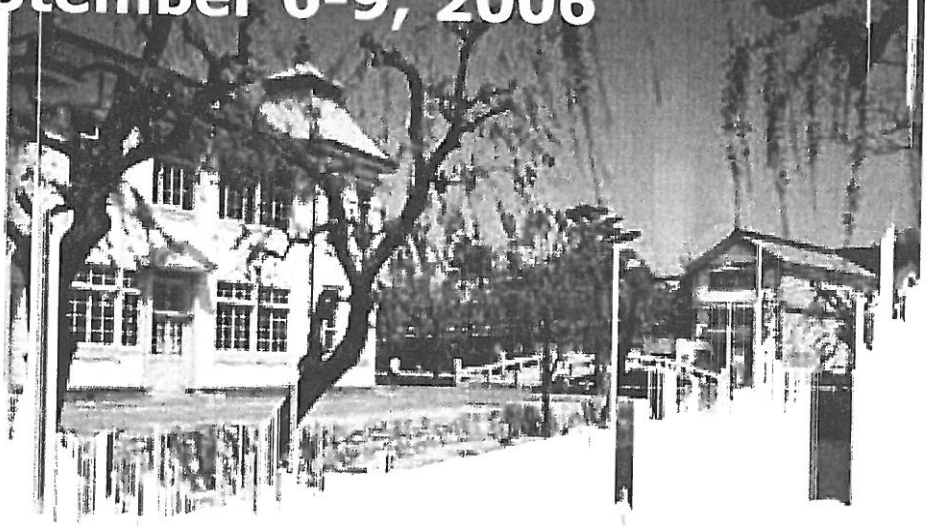
ICCCI 2006

The Second International Conference on the Characterization and Control of Interfaces for High Quality Advanced Materials, and Joining Technology for New Metallic Glasses and Inorganic Materials

Program and Abstracts

Kurashiki, Japan
September 6-9, 2006



10:45 ~ 11:00 **F-6** **Structure of Non-crystalline Silicon Oxynitride Elucidated by a High-Energy X-ray Diffraction Method**

T. Wakihara*, T. Yamakawa*, S. Kohara**, J. Tatami*, K. Komeya* and T. Meguro*
*Yokohama National University, Japan
**Japan Synchrotron Radiation Research Institute, Japan

11:00 ~ 11:15 **F-7** **Characterization of Surface Morphology of Organic and Inorganic Hybrid Thin Films - A First Trial for Artificial Cell Membrane -**

W. Manabe, H. Takano, and M. Itoh
Department of Chemical Engineering and Materials Science, Doshisha University, Japan

11:15 ~ 11:30 **F-8** **Ion Permiability and Membrane Potential of Organic and Inorganic Hybrid Thin Films - Characterization of Artificial Cell Membrane -**

R. Okamura*, H. Takano**, and M. Itoh**
*Department of Science of Environment and Mathematical Modeling, Doshisha University, Japan
**Department of Chemical Engineering and Materials Science, Doshisha University, Japan

11:30 ~ 12:00 **F-9** **Influence of Type of Cations on The Intergranular Phase Crystallisation of SiAlON Ceramics** (Invited)

N. Calis Acikbas*, A. Kara**, S. Turan**, F. Kara**, H. Mandal** and B. Bitterlich***
*MDA Advanced Ceramics, Eskisehir, Turkey
**Faculty of Engineering and Architecture, Anadolu University, Turkey
***CeramTec AG, Plochingen, Germany

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INFLUENCE OF TYPE OF CATIONS ON THE INTERGRANULAR PHASE CRYSTALLISATION OF SiAlON CERAMICS

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It is well known that β-SiAlON is a strong engineering ceramic with good oxidation and creep resistance up to 1300°C. α-SiAlON has excellent hardness, but slightly worse strength, toughness and oxidation resistance than β-SiAlON. By selecting a particular phase (or combination of two phases), it is possible to define precisely an optimum combination of mechanical properties. This can be achieved by using wide range of cations and their combinations. As α-β SiAlONs are in thermodynamic equilibrium, optimised composite materials can be produced to engineer set of particular properties for specific applications.

In this study, α-β SiAlON compositions were designed with different type of cations and at different molar ratios. The effect of the type of cations on the composition and the type of grain boundary phase (amorphous or crystalline) and the development of the resultant microstructures was determined following gas pressure sintering and further heat treatment under different conditions. The influence of the grain boundary chemistry, phase relationships and microstructure on properties is discussed.