

Author's Accepted Manuscript

Preparation and Thermal Shock Resistance of
Corundum-mullite Composite Ceramics from
Andalusite

Xiaohong Xu, Jingwen Li, Jianfeng Wu, Zhaohui
Tang, Linlin Chen, Yao Li, Chenglong Lu



PII: S0272-8842(16)31880-6
DOI: <http://dx.doi.org/10.1016/j.ceramint.2016.10.116>
Reference: CER113995

To appear in: *Ceramics International*

Received date: 12 September 2016
Revised date: 9 October 2016
Accepted date: 18 October 2016

Cite this article as: Xiaohong Xu, Jingwen Li, Jianfeng Wu, Zhaohui Tang, Linlin Chen, Yao Li and Chenglong Lu, Preparation and Thermal Shock Resistance of Corundum-mullite Composite Ceramics from Andalusite, *Ceramic International*, <http://dx.doi.org/10.1016/j.ceramint.2016.10.116>

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 a 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.

Preparation and Thermal Shock Resistance of Corundum-mullite Composite Ceramics from Andalusite

Xiaohong Xu, Jingwen Li*, Jianfeng Wu, Zhaohui Tang, Linlin Chen, Yao Li,

Chenglong Lu

State Key Laboratory of Silicate Materials for Architectures, Wuhan University of

Technology, Wuhan 430070, China

Abstract:

Corundum-mullite composite ceramics have high hardness, small plastic deformation and other excellent performances at high temperature. Corundum-mullite composite ceramics were fabricated from andalusite and α -Al₂O₃ by in-situ synthesis technology. Effects of mullite/corundum ratio and sintering temperatures on the water absorption, apparent porosity, bulk density, bending strength, thermal shock resistance, phase composition and microstructure of the sample were investigated. Results indicated that the in-situ synthesized mullite from andalusite combined with corundum satisfactorily, which significantly improved the thermal shock resistance as no crack formed after 30 cycles of thermal shock (1100 °C-room temperature, air cooling). Formula A4 (andalusite: 37.31 wt%, α -Al₂O₃: 62.69 wt%, TiO₂ in addition: 1 wt%, mullite:corundum=6:4 in wt%) achieved the optimum properties when sintering at 1650 °C, which were listed as follows: water absorption of 0.15%, apparent porosity of 0.42%, and bulk density of 3.21 g·cm⁻³, bending strength of 117.32 MPa. The phase composition of the sintered samples before and after thermal shock tests were mullite and corundum constantly. The fracture modes of the crystals were

Download English Version:

<https://daneshyari.com/en/article/5438221>

Download Persian Version:

<https://daneshyari.com/article/5438221>

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