The Effect of Dolomite Addition onto the Phases and Hardness of Zirconia Toughened Alumina

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MATERIALS CHARACTERIZATION USING X-RAYS AND RELATED TECHNIQUES
Edited by: Sulaiman, MA, Ahmad, ZA; Mohamed, JJ
Book Series: AIP Conference Proceedings
Volume: 2068
Article Number: UNSP 020006
DOI: 10.1063/1.5089305
Published: 2019
Document Type: Proceedings Paper

Conference
Conference: International Conference on X-Rays and Related Techniques in Research and Industry (ICXRI)
Location: Kota Bharu, MALAYSIA
Date: AUG 18-19, 2018
Sponsor(s): Univ Malaysia Kelantan; X Rays Applicat Soc Malaysia

Abstract
Zirconia toughened alumina (ZTA) is one of the composite ceramics that are widely used in load-bearing and wear-resistant applications. The composite is known for their good hardness and toughness, due to the presence of both Al2O3 and yttria stabilized zirconia (YSZ). The enhance toughness for ZTA are mostly originated from the presence of YSZ in the composite. The phase transformation from tetragonal to monoclinic that happen inside of YSZ during the presence of stress and increase its toughness. Thus, the amount of tetragonal and monoclinic phase inside of YSZ are critical to its toughness. In this research, the amount of dolomite was varied from 0 to 1.0 wt% while ratio of Al2O3 to YSZ was fixed to 4:1. The sample were prepared through the solid-state sintering method. XRD was done onto the sample to analyze the phases. XRD analysis shows that no presence of new compound in ZTA system. With addition 0.3 wt% of dolomite, Vickers hardness reached maximum of 1842.75HV.

Keywords
KeyWords Plus: MECHANICAL PROPERTIES; MICROSTRUCTURE; REFRACTORIES; COMPOSITE; WEAR

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Publisher
AMER INST PHYSICS, 2 HUNTINGTON QUADRANGLE, STE 1101, MEDVILLE, NY 11767-4501 USA

Categories / Classification
Research Areas: Materials Science; Physics
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