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The effect of pressing load on 8 mol% yttria stabilized zirconia grade 204ns-g

Abstract

The aim of this study is to understand the compaction characteristics of as received granulated 8 mol% yttria-stabilized zirconia (8YSZ). The samples were compacted at different loads and sintered at 1550° C with the heating rate of 5°C/min for 5 hours. The densification, morphology analysis and crystal structure of the sintered were compared. The densification of granulated 8YSZ achieved 67% as increasing pressing load (0.1 tonne to 0.4 tonne). Rietveld quantitative phase analysis demonstrates that the tetragonal-ZrO2 phase reduces in granulated 8YSZ. The amount of cubic-ZrO2 phase dramatically dropped for both granulated as the pressing load increased. From the morphology analysis, granulated sample found to be porous observed on the surface as compaction load applied. Compaction load has no significant effect on the densification of granule sintered 8YSZ in the current study. The maximum densification was only reached 67% by using granulated 8YSZ powder with 0.4 tonne pressing load.

Keywords

Pressing load; X-ray diffraction; Yttria stabilized zirconia