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Effect of sintering temperature on the preparation and characterization of green glass ceramic from rice husk ash as a matrix

Abstract

Powder metallurgy technique were proved successful net-shape technology which suitable for the production of green glass ceramic (GGC) from rice husk ash (RHA) as a glass matrix, and characterized by good physical and mechanical properties of glass ceramic composite. In this research, the glass sample was formed by mixing varying percentage of weight of silica, flux and additives. The aim of this work is to study the effect of the sintering temperature to the physical and mechanical properties of GGC. The samples were mixed in different volume fraction of additives which is 5%, 10% and 15% in constant composition of RHA and flux. The mixture was consolidated into rigid die compaction at 300 MPa, then sintered at 450, 550 and 750 °C. Vickers hardness test were investigated. The glass composite were then characterize by scanning electron microscopy (SEM). The GGC with 10% additives at sintering temperature 550 °C shows highest hardness strength which is about 213.0 HV.

Keywords

Green glass ceramic; Powder metallurgy; Rice husk ash; Sintering temperature