Densification behavior of snO2-glass composites developed from the incorporate of silica xerogeland snO2

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Abstrak

In this investigation, SnO2-glass composites were produced by mixing SnO2 and amorphous silica xerogel (SX) extracted from sago waste ash. The composition was prepared by adding 5 mol% of SnO2 into SX; the samples were dry pressed and sintered in a temperature range between room temperature and 1500oC. Their properties were characterized on the basis of the experimental data obtained using Archimedes' principle, X-ray diffraction (XRD), Fourier transformed infra-red (FTIR), and a scanning electron microscopy (SEM). It was found that the bulk density increased along with the sintering temperature. In the temperature range from 1300oC to 1500oC, the glass ceramic reached a bulk density of about 2.5 g/cm3. The results of the interpretation of XRD patterns, FTIR spectra, and SEM images allow us to conclude that this increase in density was due to an increased degree of crystallinity of SnO2 in the silica xerogel composite.