

Effect of melting temperatures on the crystallization and densification of $2.8\text{MgO}\cdot 1.5\text{Al}_2\text{O}_3\cdot 5\text{SiO}_2$ glass-ceramic synthesized from mainly talc and kaolin

Abstract

Single phase α -cordierite with low sintering temperature was produced from $2.8\text{MgO}\cdot 1.5\text{Al}_2\text{O}_3\cdot 5\text{SiO}_2$ chemical formulation using mainly talc and kaolin. The effect of melting temperature to the densification, crystallization and properties of α -cordierite glass-ceramic was investigated. XRD patterns indicate that, melting at 1350, 1385 and 1400 °C are not sufficient to completely transform the crystalline mixture of compound to fully amorphous phase. DTA peaks demonstrate that the crystallinity of phase, the onset of crystallization temperature, increased as the melting temperature raise. Similar observation trends can be seen from their micrographs, density, dielectric and CTE measurements. Temperature of melting has significantly affected the properties of glass-ceramic.