

Densification and crystallization of nonstoichiometric cordierite glass with excess MgO synthesized from kaolin and talc

Abstract

Densification and crystallization behaviors of nonstoichiometric cordierite synthesized from minerals through the glass route are reported in this paper. DTA of glass powder was conducted under isothermal and nonisothermal conditions. The activation energy was calculated from the dilatometry test at constant heating rate by using Arrhenius equation to observe their densification behavior. The densification and crystallization of composition with MgO mole ratio of 3.4 and 4.0 below 900°C were confirmed using nonisothermal DTA and dilatometry. However, samples below 2.6 mol MgO were not fully densified and crystallized when isothermally heated for 2 h. When MgO content was increased 2.0–3.0 mole ratio, the activation energy for densification decreased, but it increased for MgO mole ratio ≥ 3.4 .