

저온동시소성용 결정화 유리의 필러 사이즈가 열적 특성에 미치는 영향

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Effect of Al₂O₃ Particle Size on Thermal Properties of Glass-Ceramics for LTCC Material

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Abstract : Low Temperature Co-fired Ceramic (LTCC) technology has been used in electronic device for various functions. LTCC technology is to fire dielectric ceramic and a conductive electrode such as Ag or Cu thick film below the temperature of 900°C simultaneously. The glass-ceramic has been widely used for LTCC materials due to its low sintering temperature, high mechanical properties and low dielectric constants. To obtain the high strength, addition of filler, the microstructure should have various crystals and low pores in a composite. In this study, two glass frits were mixed with different alumina size(0.5, 2, 3.7 μ m) and sintered at the range of 850~950°C. The microstructure, crystal phases, thermal and mechanical properties of the composites were investigated using FE-SEM, XRD, TG-DTA, Dilatometer. When the particle size of Al₂O₃ filler increased, the starting temperatures for the densification of the sintered bodies, onset point of crystallization, peak crystallization temperature in the glass-ceramic composites decreased gradually. After sintered at 900°C, the glass frits were crystallized as CaAl₂Si₂O₈ and CaMgSi₂O₆. The purpose of our study is to understand the relationship between the Al₂O₃ particle size and thermal properties in composites.

Key Words : LTCC, alumina size, glass-ceramic composite, crystallization