SnO_2-P_2O_5-B_2O_3 유리구조 및 열적 특성

안용태[1,2], 최병현[1], 지미정[1], 고영수[1], 김형순[2]
요업(세라믹)기술원[1], 인하대학교[2]

Structure and thermal properties of SnO_2-B_2O_3-P_2O_5 glasses

Yong-Tae An[1,2], Byung-Hyun Choi[1], Mi-Jung Ji[1], Young-Soo Ko[1], Hyung-Sun Kim[2]
Korea Institute of Ceramics ENG. & TECH[1]., Inha Univ.[2]

Abstract : SnO_2-B_2O_3-P_2O_5 system were prepared by melt-quenching technique in the compositional series containing 50, 55 and 60mol.% of SnO_2. A large glass-forming region was found at the phosphate side of the ternary system with homogeneous glasses containing up to 5-25mol.% of B_2O_3. For these glasses, thermal expansion coeffient(α), glass transition temperature(Tg), and glass softening temperature(Ts), were determined. The values α decrease with increasing B_2O_3 content, while Tg and Ts increased. The reason for the observed changes is local structure of the glasses. Local structure of the glasses was investigated by Raman and FT-IR measurements, suggesting that the number of bridging oxygens decreased whereas the non-bridging oxygen concentration increased with increasing SnO_2 content in the glasses.

Key Words : Pb-free, SnO_2-B_2O_3-P_2O_5, low-transition temperature