

Crystallization of KNaNbTeO_6 in $\text{K}_2\text{O-Na}_2\text{O-Nb}_2\text{O}_5\text{-TeO}_2$ glasses

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Tellurium oxide based glasses are of scientific and technical interest on account of their low melting temperatures, high refractive indices, high dielectric constant and good infrared transmissions, and thus recently have been considered as promising materials for the applications in optical fibers or nonlinear optical devices. Recently, we succeeded in fabricating transparent glass-ceramics from the system TeO_2 based glass-ceramics and discovered that the crystallized glasses show a second harmonic generation. Although $\text{K}_2\text{O-Na}_2\text{O-Nb}_2\text{O}_5\text{-TeO}_2$ glass-ceramics has widely studied for the second-order nonlinear optical phenomenon and structure, the crystallization of the $\text{KNa}[\text{Nb}_{1/3}\text{Te}_{2/3}]_2\text{O}_{4.8}$ phase from precursor sample has not been investigated. In the present study, formation kinetics and crystallization behaviors of $\text{KNa}[\text{Nb}_{1/3}\text{Te}_{2/3}]_2\text{O}_{4.8}$ in $\text{K}_2\text{O-Na}_2\text{O-Nb}_2\text{O}_5\text{-TeO}_2$ glasses were investigated using X-ray diffraction patterns and differential thermal analysis. The activation energies for crystallization of $\text{KNa}[\text{Nb}_{1/3}\text{Te}_{2/3}]_2\text{O}_{4.8}$ were obtained from these data.