

Optical and thermal properties of $K_2O-WO_3-TeO_2$ glasses

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Tellurium oxide based glasses are of scientific and technical interest on account of their high refractive indices, high dielectric constants and good infrared transmissions, and recently have been considered as promising materials for use in optical fiber or nonlinear optical devices. Recently, we succeeded in fabricating transparent glass-ceramics and discovered that some glass-ceramics show second harmonic generation. It should be pointed out that the information on the thermal stability and crystallization behaviors of TeO_2 -based glasses is limited as compared to their structural and electrical properties. In addition the non-linear optical studies on the transparent TeO_2 -based glass-ceramics are also limited. Thus it is important to explore these functional materials in more details.

The purpose of this paper is to examine the thermal stability, physical and optical properties of $K_2O-WO_3-TeO_2$ glasses, whose glass-ceramics show SHG. Formation kinetics of a cubic crystalline phase in $K_2O-WO_3-TeO_2$ glasses were investigated and obtained from differential thermal analysis.