

Study of crystallization kinetics of TeO₂-Na₂O-MgO glass using Ozawa method: influence of europium

Abstract :

The study of the crystallization kinetics of rare-earth doped glass stimulated much interest especially for crystallization process. In this work transparent Eu₂O₃ doped glasses with composition TeO₂ - Na₂O - MgO were prepared using conventional melt-quenching technique. The amorphous nature of glass was confirmed using X-ray diffraction method. The influence of Eu³⁺ content on the crystallization kinetics of the glass such as activation energy (E_a) was thoroughly evaluated under non-isothermal conditions using DTA. The crystallization kinetic at different heating rate from 5 degrees C min⁽⁻¹⁾ to 25 degrees C min⁽⁻¹⁾ at different crystallization temperature (T_p) were examined and verified using Ozawa method. The result showed that the activation energy (E_a) was decreased with the increasing of the dopant concentration from 319.8 eV to 93.5 eV.