

Investigation of 90RWG –10Na₂O –0.01Cu₂O thermoluminescence glass on the effective atomic number and elastic properties

In this work, thermoluminescence radiation dosimeter type 90RWG –10Na₂O –0.01Cu₂O was investigated on their elastic properties and structural properties. The effective atomic number was also compared between theoretical and experimental value. The glass samples were prepared by melt quenching technique. All samples were melted at temperature 1250 °C for 4 hr and annealed at temperature 500 °C for 2 hr. Then, the elastic moduli (bulk modulus, Young's modulus Poisson's ratio and micro-hardness) were calculated before and after gamma irradiation at 1 kGy. FTIR spectroscopy was measured in wave number range 400 - 4000 cm⁻¹ in order to study structure of the glass samples before and after gamma irradiation. The linear attenuation coefficient was measured using the narrow beam transmission method. The results of elastic properties and structural properties before and after gamma irradiation suggested the detriment of bridging oxygens in glass network from gamma irradiation exposure.

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