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Effect of SrO on radiation attenuation properties of boro-tellurate glass systems at a high energy region.

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In this study the effect of radiation ionization of the 40SrO–30B2O_3–10TeO_2–20Bi_2O3, 35SrO–30B_2O_3–10TeO_2–25Bi2O_3, 30SrO–30B_2O_3–10TeO_2–30Bi_2O_3, 25SrO–30B_2O_3–10TeO_2 35Bi_2O_3, 20SrO–30B_2O_3–10$TeOS_2$–40Bi_2O_3 glass was investigated using the Phy-X/PSD, XCOM simulation Software and ratified using the geant4 simulation. Between the high energy region between 1 MeV and 15 MeV, the mass attenuation coefficients (MAC), linear attenuation coefficient (LAC), and Effective atomic number of all the glasses under investigation were calculated. The results show that increasing the concentration of Bi_2O_3 in these glasses improves its radiation shielding ability. The half value layer (HVL), tenth value layer (TVL) and mean free path (MFP) of the glass were investigated and the results show that glasses with a high concentration of Bi_2O_3 attenuated high amount of photons at a smaller thickness. It was also observed 20SrO 30B_2O_3–10$TeOS_2$–40Bi_2O_3 glass has better radiation shielding compared to other radiation shielding materials that have been investigated.

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