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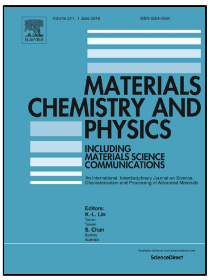

Comparative study of gamma ray shielding competence of WO_3-TeO_2-PbO glass system to different glasses and concretes

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Comparative study of gamma ray shielding competence of WO_3-TeO_2-PbO glass system to different glasses and concretes

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Abstract

The photon attenuation coefficients of $20WO_3$-(80-x) TeO_2-xPbO (where x=10, 12.5, 15, 17.5 and 20 mol %) tellurite glasses have been studied in the energy region of 1 keV–100 GeV. The addition of PbO into the glass system increases the mass attenuation coefficients and decreases the mean free path and the half value layer. Moreover, WTP5 which contains 20 mol% of PbO shows the highest radiation shielding capability. In addition, tellurite glasses have been compared with other glass systems, some standard shielding concretes and three commercial window glasses in terms of mass attenuation coefficients, mean free path and half value layer. The G-P fitting method also used to evaluate the exposure buildup factor of the present glasses. The exposure buildup factor of the present samples has also been compared with the other glasses, lead and concretes. It has-been found that the glasses under study have higher values of mass attenuation coefficients than that of commercial window glasses. Also, it has been found that the present glasses have lower mean free path, thus possess better shielding properties than different concrete samples and other selected glasses.

Keywords: Shielding; Glass; Mass attenuation coefficient; G-P fitting method.

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