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Neutron Shielding of Bismuth Added Heavy Metal Oxide Glasses

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Abstract: Radiation shielding is essential in environments exposed to neutron radiation, particularly in nuclear reactors, radiotherapy rooms, and industrial radiography facilities. This study investigates the neutron shielding effectiveness of bismuth-added heavy metal oxide glasses with the general formula $(60-x) \text{B}_2\text{O}_3 - 20\text{SiO}_2 - x \text{Bi}_2\text{O}_3 - 12\text{ZnO} - 8\text{BaO}$ (ZBiB) at $x = 0$ and 12 mol%. The role of Bi_2O_3 is used as a modifier in the glass matrix, and its influence on neutron attenuation property is estimated in this study with the help of Monte Carlo simulation tools. The gamma attenuation properties are explored in the study [1].

References:

- [1] A. N. D'Souza *et al.*, "Gamma ray shielding and thermoluminescence investigation of bismuth added heavy metal oxide glasses," *Radiation Physics and Chemistry*, vol. 188, p. 109598, Nov. 2021.