# Synthesis and TL and OSL characterization of ($MgB_2O_4$-$MgB_4O_7$): Ce:Li and ($MgB_2O_4$-$MgB_4O_7$): Dy:Li glasses for dosimetry

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In this work we aim to investigate some structural and dosimetric properties of new $MgB_2O_4$-$MgB_4O_7$ borate glasses with different structural combinations, doped with 0.5% and 1.0% by weight of $Ce_3$+, $Dy_3$+ and Li. These glasses were produced by fusion method and rapid cooling. The compounds used are from Sigma Aldrich with a purity of 99.99%. The dosimetric characterization was performed using thermoluminescent (TL) and optically stimulated luminescence (OSL) techniques. Characteristics such as linearity, reproducibility and fading were evaluated after samples had been irradiated with beta source ($^{90}Sr$+$^{90}Y$). X-ray diffraction analyses confirmed that no crystalline phases were formed after heat treatment. The doped borates glasses presented high TL and OSL sensitivity, indicating a possible application for dosimetry. Although the fading of the TL and OSL signals are intense in the first few hours after irradiation, the signals tend to stabilize allowing evaluation of absorbed doses after days.

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