

Photoluminescence study in 152 MeV Xe ion irradiated MgAl₂O₄ single crystals.

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Laser confocal microscopy technique (60ps laser pulse excitation at 445nm) and a Time Correlated Single Photon Counting (TCSPC) technique have been used to study the photoluminescence (PL) in 152 MeV Xe ion irradiated MgAl₂O₄ single crystals. It was shown that radiation defects produced by swift xenon ions give rise to broad luminescence band positioned in the 470-800 nm wavelength range. The measurements of the PL decay curves have evidenced that lifetime of defect-related PL signal gradually increases from 6 to 10 ns in 500-620 nm spectral range and decreases with ion fluence increasing. The decrease of the luminescence intensity observed after fluences ~1013 cm⁻² is attributed to overlapping of individual ion track core regions.

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