

Color center creation in LiF crystals irradiated with 5- and 10-MeV Au ions

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NUCL. INSTRUM. & METHODS IN PHYSIC RESEARCH B 266 (2008) 2736–2740

The peculiarities of defect creation in LiF crystals by irradiation with 5- and 10-MeV Au ions have been studied using optical spectroscopy. The crystals were irradiated at room temperature with fluences from 1×10^{12} to 2×10^{14} ions/cm² at various beam current densities (1–200 nA/cm²). The short ion range in LiF allowed measurements for higher absorbed energy densities and high defect volume concentration. The efficiency of single F center and F_n and larger aggregate creation depends drastically both on ion fluence and flux (beam current). Color center creation is less effective for 5-MeV Au ions than for 10-MeV Au ions, which produce δ electrons with energies sufficient for creation of cation excitons (~ 62 eV). The peculiarities of color center accumulation in LiF crystals under MeV Au ion irradiation are considered taking into account the nonlinear kinetics of interstitials (H centers).