

Storage efficiency of BaFBr:Eu²⁺ image plates irradiated by swift heavy ions

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Polycrystalline films of BaFBr:Eu²⁺ phosphors were irradiated with swift heavy ions (²²Ne, ⁵²Cr, ⁶⁴Zn, ¹³⁰Xe and ²³⁸U) of MeV to GeV energy. The storage efficiency was studied as a function of ion fluence (10⁶–10¹² ions/cm²) corresponding to an absorbed dose from several Gy up to MGy. The storage efficiency of the phosphor decreases with increasing energy loss and is orders of magnitude smaller than that for X-rays. This can be explained by the high electron and hole center recombination losses typical for the irradiation with heavy ions. After optical annealing, the storage parameters of ion-irradiated BaFBr:Eu²⁺ phosphors remained unchanged up to a dose of 0.1 MGy.