Mn^{2+} doping inside glass substrate utilizing metal ion beam implantation technique

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Abstract

The Korea multi-purpose accelerator complex (KOMAC) has been providing metal ion beam services such as Cr^{+}, Fe^{+}, Co^{+}, Cu^{+}, Mg^{+} and Ni^{+} using a modified Bernas ion source for diverse users. In this study, metal ion implantation facilitated by KOMAC has been utilized to implant Mn^{+} ions into a glass substrate. First, phosphate glass substrate doped with $CeBr_3$ was fabricated following melt-quenching technique and then Mn^{+} ion beam was irradiated with flounces of 5×10^{16} ions/cm^2. The irradiated sample was heat-treated at 400 °C, and characterized by absorption, excitation, and emission spectra. The presence of Mn^{2+} and the existence of energy transfer from Ce^{3+} to Mn^{2+} were explored by characteristic emission and excitation spectra. The emission intensity of Mn^{2+} was significantly higher when excited by Ce^{3+} excitation than Mn^{2+}.

The full text can be found at the following link:

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