

Abstract Submitted
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Diffusion doping and Infrared Optical Properties of Transition Metal Ions in ZnSe windows and $\text{Cd}_{0.55}\text{Mn}_{0.45}\text{Te}$ crystals EI NYEIN, UWE HOMMERICH, IVY JONES, MONIQUE CALHOUN, ERICA HAYNES, Hampton University, SUDHIR TRIVEDI, Brimrose Corporation of America — Transition metal (TM) doped II-VI semiconductors are of current interest for tunable solid state lasers in the mid-infrared (IR) spectral region as well as passive optical Q-switches. Laser action has been demonstrated at $\sim 2.3 \mu\text{m}$ from Cr: ZnSe, Cr: ZnS, Cr: CdSe, Cr: CdTe, Cr: Cr: CdMnTe, and at $\sim 4 \mu\text{m}$ from Fe: ZnSe. In this work, we report on the material preparation and IR optical properties of diffusion-doped TM ions (Cr^{2+} , Fe^{2+} , Co^{2+}) in polycrystalline ZnSe windows and $\text{Cd}_{0.55}\text{Mn}_{0.45}\text{Te}$ crystals. Different dopant sources were employed in thermal diffusion experiments including TM chloride compounds, TM selenides, and elemental TM powders. The characteristic IR absorption bands from Cr^{2+} , Co^{2+} , and Fe^{2+} doped II-VI hosts were observed in all samples, independent of the dopant source. Details of the absorption and luminescence properties of these TM: ZnSe and TM: CdMnTe samples will be presented at the conference.

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