

Abstract Submitted
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Characterization of Multi-Component Bi-containing Chalcogenide Glasses with Raman and Fluorescence Spectroscopy ANTHONY THAI, Austin Peay State Univ — Bismuth is shown to be a unique dopant in chalcogenide glasses (ChG), leading to a number of interesting phenomena: conduction type reversal from p- to n-type, strong thermo-electric effect, topological insulating behaviour and more. In addition, strong the crystallization ability of Bi can be used to form quantum dots in the structure of amorphous ChG. In this work, we have investigated ChG of the $\text{Bi}_x\text{Ga}_y(\text{GeSe}_4)_{50-\frac{x+y}{2}}(\text{GeTe}_4)_{50-\frac{x+y}{2}}$ family by Raman and Fluorescence spectroscopy as potential host matrices for Bi-based quantum dots. No fluorescence signal was observed for any of the studied compositions in the 450-1800 nm spectral range under the 300-750 nm excitation. It was found, however, that Bi-based crystallites are formed even under the influence of the probe laser used in Raman spectroscopy. So, quantum dots can be induced in the studied materials by laser pulses, opening a broad range of possible applications.

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