

Photothermal Measurements of Microcrystalline CdSeS Glasses

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This talk will discuss the apparatuses and experimental results obtained for continuous and pulsed laser excited photothermal spectroscopy of CdSeS microcrystal glasses. CdSeS microcrystal glass is found to have a positive temperature-dependent refractive index. These glass samples expand with laser-induced heating, as measured using photothermal reflection. This should give rise to a negative temperature-dependent refractive index change. The positive refractive index change is attributed to properties of the semiconductor microcrystal within the glasses. In particular, the measurements are consistent with temperature-induced charge carrier density increases in the semiconductor microcrystals, which give rise to the increased refractive index, which exceeds the negative refractive index changes due to the thermal expansion of the glass matrix.