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Photorefractivity of Organic-Inorganic Hybrid Composites Photosensitized with Nickel-Sulfide Nanocrystals

The photorefractivity of organic-inorganic hybrid composites doped with nickel sulfide (NiS) nanocrystals is described. The nanocrystals were characterized using visible-absorption spectroscopy, energy-dispersive X-ray spectroscopy, and transmission electron microscopy. The nanocrystals were further modified by ligand exchange, lowering the over-modulation voltage without sacrificing diffraction efficiency as well as increasing the two-beam coupling gain coefficient. Photoconductivity measurements were used to determine the overall quantum efficiency of the photorefractive samples. The measurements represent a significant increase in photorefractivity when compared to other organic-inorganic hybrid photorefractive composites.

Tyler Martin Fears is a student of Physics and Chemistry at the University of Missouri at Rolla.