Abstract Submitted
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Chiral Quantum Dots[1] MILAN BALAZ, University of Wyoming, Department of Chemistry, Laramie, WY, USA — Chiral optically active semiconductor quantum dots (chiral QDs) represent appealing building blocks for assembly of nanomaterials with modular structural, electronic and chiroptical properties. Chirality in QDs can originate from several distinct phenomena that can concurrently modulate the observed chiroptical and optical properties (e.g. chiral surface, orbital hybridization). We will use our experimental and theoretical data to elaborate on the origin of capping ligand induced chirality in achiral colloidal QDs [1]. We will present a simple method to prepare chiral QDs by post-synthetic chiral ligand functionalization of achiral QDs. Importantly, capping ligands can be used not only to induce but also to control chiroptical activity of QDs. Enantiomers of chiral ligands induce mirror-image chirality in QDs, and chiroptical properties of QDs can be further modulated by the chemical structure of capping ligands as well as the size of QDs.

[1] U. Tohgha, K. K. Deol, A. G. Porter, S. G. Bartko, J. K. Choi, B. M. Leonard, K. Varga, J. Kubelka, G. Muller, M. Balaz, Ligand induced circular dichroism and circularly polarized luminescence in CdSe quantum dots, ACS Nano, 2013, 7, 11094-11102

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