

Publication

An Efficient Method for the Surface Functionalization of Luminescent Quantum Dots with Lipoic Acid Based Ligands

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We describe herein an operationally advantageous general methodology for efficiently activating lipoic acid based compounds, a family of popular surface ligands for semiconductor nanocrystals, through the use of a borohydride exchange resin, and the use of the activated species to replace the native surface ligands of quantum dots. The procedure enabled phase transfer of the nanocrystals between polar and aqueous media and, if unsubstituted lipoic acid was used, a facile adjustment of their solubility in a wide range of solvents with varying polarity (from hexane to water). We show that the protocol is applicable to different types of nanocrystals and a variety of lipoic acid based ligands, and that the resulting quantum dots maintain their optical properties, in particular, an intense luminescence, and long-term colloidal stability.

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