



Solution-processed Optoelectronic Devices from Colloidal Quantum Dots

By Chang-Ching Tu

SPS Mai 2014, 2014. Taschenbuch. Book Condition: Neu. 220x150x6 mm. This item is printed on demand - Print on Demand Neuware - This book contains design, synthesis, fabrication and testing of optoelectronic devices which are composed of colloidal inorganic semiconductor materials and fabricated by potentially low-cost solution-processing methods. The first part of this book demonstrates a novel fabrication method where colloidal quantum dots (QDs) are self-assembled layer-by-layer into a thin film structure through electrostatic interaction. This process allows precise control of QD thin film thickness by self-assembly and can in principle be applied to a wide range of substrates. Using such QD thin films, photoconductor photodetectors and metal-intrinsic-metal photodiodes have been demonstrated. In the second part of this dissertation, heavy-metal-free colloidal Si materials are synthesized by electrochemical etching Si wafers, followed by surface modification and ultra-sonication for dispersion of Si nano- and/or micro-particles in various solvents. Demonstrated applications include RGB photoluminescent Si phosphors, scattering-enhanced Si nano-/micro-particle composite photodetectors and hybrid Si QD-organic light-emitting-diodes (LEDs). 108 pp. Englisch.



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