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Mezinárodní spolupráce v oblasti „*in vivo*“ zobrazovacích technik
Laboratoř Metalomiky a Nanotechnologií

Vás zve na seminář:

CdTe quantum dots synthesis and characterization

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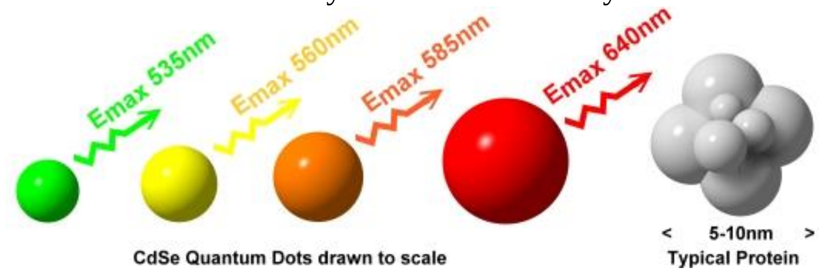
Abstrakt

Semiconductor nanocrystallites (quantum dots, QDs) whose radii are smaller than the bulk exciton Bohr radius constitute a class of materials intermediate between molecular and bulk forms of matter. Quantum confinement of both the electron and hole in all three dimensions leads to an increase in the effective band gap of the material with decreasing crystallite size. Although nanocrystallites have not yet completed their evolution into bulk solids, structural studies indicate that they retain the bulk crystal structure and lattice parameter. Recent advances in the synthesis of highly monodisperse nanocrystallites have paved the way for numerous spectroscopic studies assigning the quantum dot electronic states and mapping out their evolution as a function of size. In 1993 the Bawendi group developed a synthetic method for producing monodisperse cadmium chalcogenide nanocrystals. The injection of precursors above a critical temperature creates a nucleation event and this is followed by rapid cooling to a growth temperature where no further nucleation is favorable. Since 1993, the Bawendi group has pursued the synthesis of novel semiconductor nanocrystals. The unique c axis of the wurtzite CdSe structure allows for the growth of nanoscale heterostructures upon the terminal faces of the c axis. This has been exploited in the synthesis of CdSe/CdTe nanobarbells to spatially separate excitons for the potential purpose of creating more efficient solar cell materials.



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