Poster

THE SELF-ASSEMBLY OF CADMIUM TELLURIDE NANOWIRES FROM NANOPARTICLES

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We consider the use of nanoparticles and nanowires as potential building blocks for the fabrication of novel nanoscale devices and components. We focus our attention on semiconducting materials due to their current use in electronic and optoelectronic devices, such as solar cells, light emitting diodes, and lasers.[1] Cadmium Telluride is a direct band-gap II-IV compound semiconductor that has recently received a rise in interest within the scientific community. Direct band-gap semiconducting nanowires are particularly interesting because they can be used for the generation, wave-guiding, and detection of light on the nanoscale.

In this study, a wet chemical synthesis is used to produce highly luminescent thiol stabilized CdTe quantum dots. The band-gap of the quantum dots can be controlled during the synthesis to select the emission of the quantum dots to be between green and red. The fact that the emission falls in the visible range makes them desirable for optoelectronic devices. Interestingly, if the amount of stabilizer and the pH of the nanoparticle solution are controlled, the CdTe nanoparticles can self-assemble into 1D structures up to several microns in length.[2,3] By varying the conditions during the synthesis one can also produce CdTe nanoribbons. The aim of this study is to electronically characterize single nanowires using a multiprobe scanning tunneling microscope.

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