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Simple solvothermal synthesis of large scale single crystal PbS nanorods and their properties SYAMANTA KUMAR GOSWAMI, EUNSOON OH, Chungnam National University — PbS nanorods and quantum dots have lots of applications such as in solar cells, gas sensors, infra-red detectors etc. PbS nanorods were synthesized via a very simple and inexpensive solvothermal method. Two reagents viz. Ethylenediaminetetraacetic acid (EDTA) and PEG–PPG–PEG tri-block copolymer (P123) were employed in this growth for two special purposes. EDTA helps in slowing down the reaction and P123 plays the role of 1D structure directing agent. Comparison of the X–ray diffraction patterns of the nanowires synthesized using EDTA and without using EDTA clearly shows that the crystalline quality is significantly improved with EDTA. Transmission Electron Microscopy images and Selected Area Electron Diffraction patterns demonstrate that the nanorods are single crystalline. The average diameter of the nanorods was found to be about 18 – 20 nm. Thus, the nanorods are within the quantum regime as the exciton Bohr radius of PbS is 18 nm. Raman spectra of these samples are compared.

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