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Effect of Time and Temperature on Growth of PbSe Nanorods SHREEDHAR KANDEL, ZHOUFENG JIANG, SHAILENDRA CHILUWAL, LIANGFENG SUN, Bowling Green State University — Colloidal nanostructured materials are promising for applications in optoelectronic devices. Beyond sizetuning as in quantum dots, shape-tuning of the material at the nanometer scale also results in novel optical and electronic properties. The applications demand high quality and structure-well-controlled materials, which is still underdeveloped. We have synthesized PbSe nanorods in wide temperature range 110-170 °C and different growth times from 25 sec to 5.5 minutes. Here we report the effect of growth time and temperature on the size of nanorod formed. The photoluminescence, absorption and TEM measurements done on different samples taken at different reaction conditions shows that we have good control over size. The photoluminescence decay from the nanorods is nearly single-exponential, indicating minimal surface traps on the nanorods. Also it is seen that the one dimensional growth of the crystal is not possible without adding chloroalkane cosolvent during the synthesis.

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