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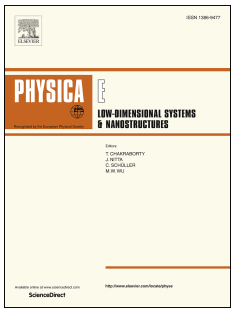

CdS nanowires formed by chemical synthesis using conjugated single-stranded DNA molecules

S.N. Sarangi, S.N. Sahu, S. Nozaki

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CdS nanowires formed by chemical synthesis using conjugated single-stranded DNA molecules

S. N. Sarangi[1,#] S. N. Sahu[1,!] and S. Nozaki [2,*]

[1] *Institute of Physics, P.O.: Sainik School, Sachivalaya Marg, Bhubaneswar-751005, India*
[2] *Graduate School of Informatics and Engineering, The University of Electro-Communications, 1-5-1 Chofugaoka, Chofu-shi, Tokyo 182-8585, Japan*

Abstract

CdS nanowires were successfully grown by chemical synthesis using two conjugated single-stranded (ss) DNA molecules, poly G (30) and poly C (30), as templates. During the early stage of the synthesis with the DNA molecules, the Cd^{2+} interacts with Poly G and Poly C and produces the (Cd^{2+})–Poly GC complex. As the growth proceeds, it results in nanowires. The structural analysis by grazing angle x-ray diffraction and transmission electron microscopy confirmed the zinc-blende CdS nanowires with the growth direction of <220>. Although the nanowires are well surface-passivated with the DNA molecules, the photoluminescence quenching was caused by the electron transfer from the nanowires to the DNA molecules. The quenching can be used to detect and label the DNAs.

Keywords: single-stranded DNA, CdS, nanowires, zinc blende, photoluminescence quenching

E-mail: sachin@iopb.res.in, * E-mail: nozaki@ee.uec.ac.jp, ! Deceased