

Photocurrent of CdSe nanocrystals on singlewalled carbon nanotube- field effect transistor

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Abstract : CdSe nanocrystals (NCs) have been decorated on singlewalled carbon nanotubes (SWCNTs) by combining a method of chemically modified substrate along with gate-bias control. CdSe/ZnS core/shell quantum dots were negatively charged by adding mercaptoacetic acid (MAA). The silicon oxide substrate was decorated by octadecyltrichlorosilane (OTS) and converted to hydrophobic surface. The negatively charged CdSe NCs were adsorbed on the SWCNT surface by applying the negative gate bias. The selective adsorption of CdSe quantum dots on SWCNTs was confirmed by confocal laser scanning microscope. The measured photocurrent clearly demonstrates that CdSe NCs decorated SWCNT can be used for photodetector and solar cell that are operable over a wide range of wavelengths.

Key Words : carbon nanotubes, quantum dot, field effect transistor, photodetector, photoluminescence

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