Two articles concerning current "nanoarchitecture" strategies for improving electrode efficiency

A novel nano-architecture for ZnO thin films on (100) Si, GaAs and InP single crystal wafers by L-MBE as value in nano-robotic (machining) device fabrication efforts

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Summary: A pulsating molecular laser beam was used to deposit zinc oxide thin films on SIS semiconductor wafers for multi-junction solar cells. The film growth was studied on various substrates such as glass, Silicon, Gallium Arsenide, and Indium Phosphide, varying the temperature also from room temperature to 300 ^{o} C. Electron Microscopes and Atomic Force Microscopes showed improvements of the crystalline and surface nature of ZnO thin films with respect to substrate temperatures and substrates. Better surface archituecture was observed at the higher temperatures. Also, the architecture was better on InP than on Si and GaAs.

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2. Effects of Electrode Structure on Photoelectrochemical Properties of ZnO Electrodes Modified with Porphyrin_Fullerene Composite Layers with an Intervening Fullerene Monolayer

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Photocurrent generation was improved by first covering the ZnO electrodes with fullerene acid molecules in a monolayer, then spin coating the modified surface with zinc porphyrin and fullerene acid molecules. The greater photocurrent generation efficiency in charge separation seems to be due to the added fullerene monolayer. The cell's performance was optimized by altering the length and diameter of the ZnO nanorods and the density of the ZnO nanorod array.
This study will provide valuable information on the design of electrode structures and the donor-acceptor combination so as to improve the cell performance in dye-sensitized bulk heterojunction solar cells.

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