# Quantum Dot Sensitized Solar Cells Using Phosphoric Acid Treated High Electrocatalytic Copper Sulfide Counter Electrodes

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Here in we report improved photovoltaic performance of quantum dot sensitized solar cells (QDSSCs) based on phosphoric acid (H3PO4) treated copper sulfide (CuS) counter electrodes (CEs) with TiO2/CdS/CdSe/ZnS photoanodes and a polysulfide electrolyte. CuS CEs with different concentration of H3PO4 were deposited on fluorine-doped tin oxide (FTO) glass surfaces via widely adopted chemical bath deposition (CBD) method. Scanning electron microscopy (SEM) images indicate that well-dispersed CuS nanoparticles helps to promote high electrocatalytic activity, which delivers fast electron transport from FTO substrate to the reaction sites and improve the photovoltaic properties of QDSSCs. The catalytic activity results displays that H3PO4 treated CuS CEs can effectively catalyze the reduction of polysulfide electrolyte. The TiO2/CdS/CdSe/ZnS QDSSC with 4 ml H3PO4 treated CuS CE exhibited an excellent power conversion efficiency (PCE) of 4.20% under one sun illumination, which was far better than that of the bare CuS CEs.