Journal Name

ARTICLE

Supporting Information

Reduced recombination with optimized barrier layer on TiO_2 in PbS/CdS core shell quantum dot sensitized solar cells

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S1. Cross-Sectional view of SEM image

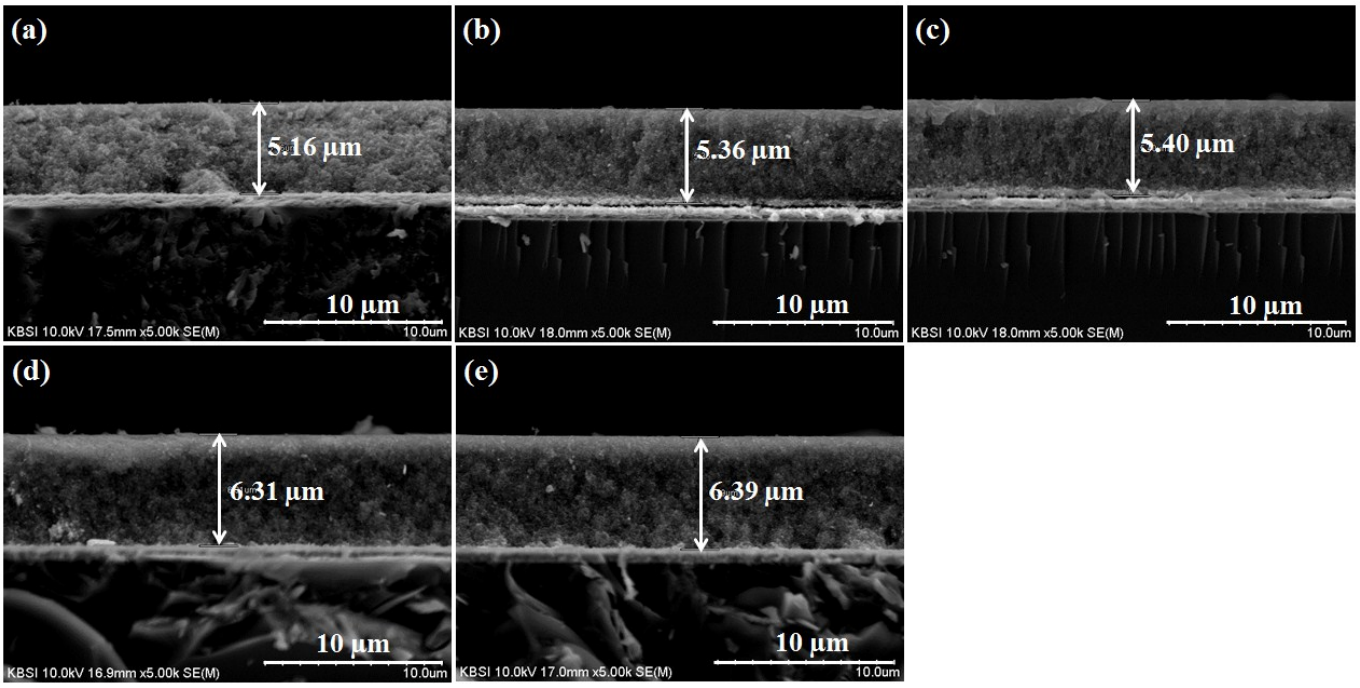

Fig. S1 Cross-sectional view of SEM of (a) TiO_2, (b) TiO_2/MgO, (c) TiO_2/Al_2O_3, (d) TiO_2/MgO/Al_2O_3 and (e) TiO_2/Al_2O_3/MgO electrodes

S2. EDX Analysis

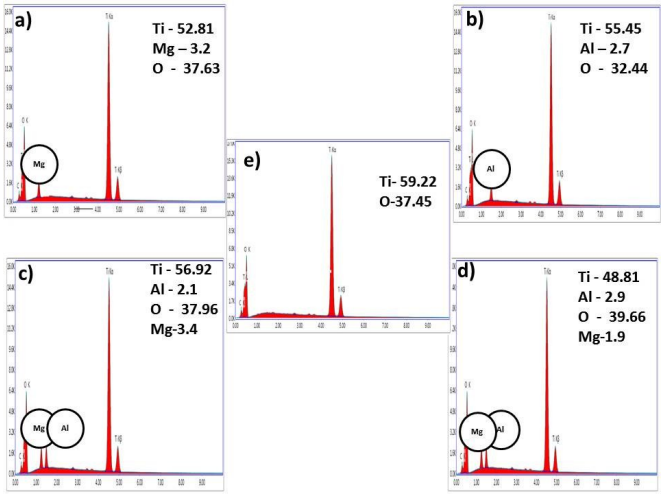

Fig. S2 EDX analysis of a) TiO_2/MgO b)TiO_2/Al_2O_3 c) TiO_2/MgO/Al_2O_3 d) TiO_2/Al_2O_3/MgO e) Bare TiO_2

S3. AFM (Atomic Force Microscopy) analysis of PbS/CdS

The smoothest film with a root-mean square (RMS) roughness value of 10.83 nm was due to the PbS/CdS electrode. The power conversion efficiency of solar cells mainly depends on the low roughness of the surface. A reduction in the surface roughness of PbS/CdS tends to improve the conversion efficiency of the QDSSCs, which affects the optical properties.[1]

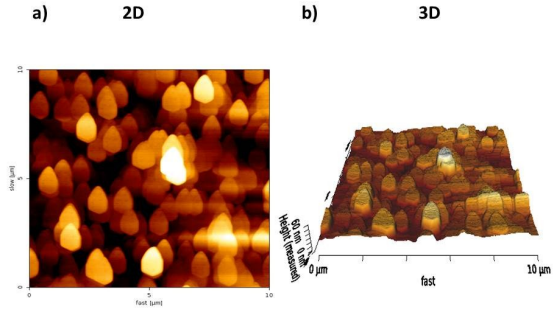

Fig. S3 2D (a and b) and 3D AFM images of PbS/CdS sensitized electrodes on the surface of TiO_2

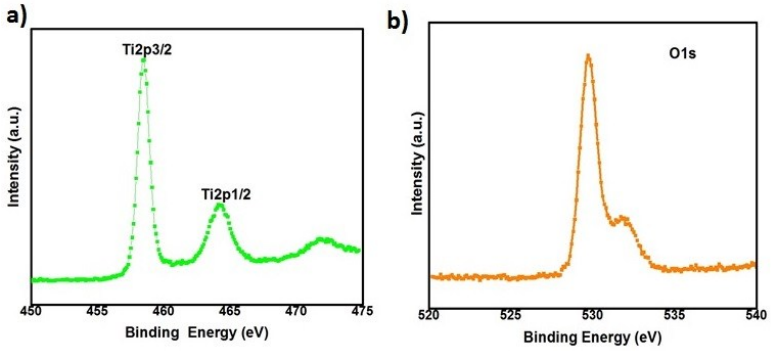

Fig. S4 XPS spectra of a) Ti (b) O