

The effects of seed layer thickness on the properties of ZnO nanorod photoelectrode for dye-sensitized solar cells

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The ZnO nanorod photoelectrodes for dye-sensitized solar cells (DSSC) were grown on ZnO seed layer/FTO using hydrothermal method. The ZnO seed layers with various thicknesses were fabricated by magnetron sputtering method. The ZnO nanorods were synthesized in a solution of zinc nitrate hexahydrate and hexamethylenetetramine at 90°C for 24 h. As the seed layer thickness was increased from 200 nm to 600 nm, the average diameter of the ZnO nanorod increased from 100±10 nm to 250±10 nm. The diameter of a ZnO nanorod strongly depends on the grain size of the seed layer, which acts as a base for the ZnO nanorod. As the results, the maximum values of energy conversion efficiency of ZnO nanorod photoelectrode DSSC indicated 0.91% with seed layer thickness of 600 nm.

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