

Abstract Submitted
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Photovoltaic Properties of Electrochemical Deposited Cu₂O/ZnO p-n Heterojunction¹ MINGWEI SHANG,

LIFENG DONG, 1 College of Materials Science and Engineering, Qingdao University of Science and Technology, China 2 Department of Physics, Astronomy, and Materials — In order to fabricate a Cu₂O/ZnO heterojunction, single-crystal n-type zinc oxide (ZnO) nanorod arrays and p-type cuprous oxide (Cu₂O) thin film were deposited on FTO glass respectively by electrochemical deposition method using an electrochemical workstation. The Cu₂O/ZnO heterojunctions were also deposited by electrochemical deposition method. A series of characterization and measurements were taken to indicate its properties. It was found that the diameter of ZnO nanorods increased with the increase of the concentration of ZnCl₂ during the deposition of ZnO nanorod arrays. Formation of a p-n junction between Cu₂O film and ZnO nanorod arrays were demonstrated through electrical properties measurements. The efficiency of this solar cell was also calculated. The higher external quantum efficiency of the Cu₂O/ZnO heterojunctions than that of ZnO nanorod arrays and Cu₂O film also indicates the formation of a p-n junction, which can efficiently facilitate the separation and transport of charge carriers for applications in solar cells. But some evidence shows that a weak contact/interface between ZnO nanorods and Cu₂O film resulted from solution corrosion may affect its photovoltaic properties.

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