

Optical Investigation of the Electrodeposited Cuprous Oxide Film Electrodes using Photocurrent Spectroscopy

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Thermally grown Cuprous Oxide has known as a p-type semiconductor and the p-type conductivity is attributed to the Copper ion vacancies created in the crystal lattice during the oxide formation. However, we have observed, for the first time, that the cathodically deposited Cu_2O films on various metal substrates produce n-type photoconductivity. Photoelectrodes were used in a photoelectrochemical cell containing an aqueous electrolyte. Photocurrent-potential behaviour demonstrate that the photoresponse is anodic and the analysis of the spectral response measurements reveal that Cu_2O has a direct bandgap of 2.0 eV. Tentative assignment of Oxygen ion vacancies in the electrodeposited cuprous Oxide films, which would result in n- Cu_2O , is proposed.