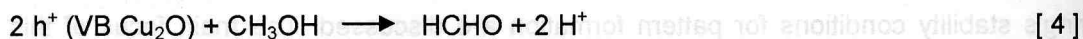
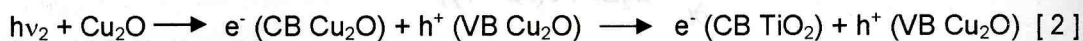
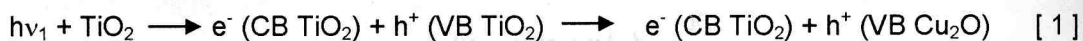


**Sacrificial photoreduction of water with Cu<sub>2</sub>O coated TiO<sub>2</sub>**M K I Senevirathna\*<sup>1</sup>, P K D D P Pitigala<sup>1</sup> and V P S Perera<sup>1,2</sup><sup>1</sup> *Institute of Fundamental Studies, Hanthana Road, Kandy*<sup>2</sup> *Department of Physics, Open University of Sri Lanka, Nawala, Nugegoda*

For a long time TiO<sub>2</sub> base catalysts have been studied for photogeneration of hydrogen from water. In this paper we report a TiO<sub>2</sub> base catalyst in which Cu<sub>2</sub>O islets are deposited for sacrificial photoreduction of water. In the preparation of the catalyst, TiO<sub>2</sub> powder dispersed in a 2,4 dihydroxybenzoic acid was boiled. Then 10 mL of Cu(NO<sub>3</sub>)<sub>2</sub> (1.2x10<sup>-2</sup> M) is added and sintered, after evaporating of the solution. Energy band positions of the two semiconductors promote the electron hole separation and deposition of the Cu<sub>2</sub>O as islets enhance the photo reduction of H<sub>2</sub>O to H<sub>2</sub>. Different TiO<sub>2</sub>/Cu<sub>2</sub>O percentages are tested and optimum yield of ~2 ± 0.1 mL/ h of H<sub>2</sub> under irradiation of 1200 W/ m<sup>2</sup> light intensity is obtained for 1% of Cu<sub>2</sub>O on TiO<sub>2</sub> particles. The charges transfer process involved in H<sub>2</sub> liberation is shown below.



The activity of the photocatalyst depends on translocation of electrons and holes created in band gap excitation of TiO<sub>2</sub> and Cu<sub>2</sub>O respectively. Another important finding of this investigation is small islets of copper oxide adhered to TiO<sub>2</sub> remains stable in the Cu(I) state and the catalytic activity is enhanced by depositing Cu<sub>2</sub>O as fine islets on TiO<sub>2</sub>.