Investigation of Copper Oxide Thin Films for Photoelectrochemical Splitting of Water

Patrik Novák[1, a)], Marián Janík[1], Milan Pavúk[1], and Miroslav Mikolášek[2]

[1] *Institute of Nuclear and Physical Engineering, Faculty of Electrical Engineering and Information Technology, Slovak University of Technology in Bratislava, Ilkovičova 3, 812 19 Bratislava, Slovak Republic*
[2] *Institute of Electronics and Photonics, Faculty of Electrical Engineering and Information Technology, Slovak University of Technology in Bratislava, Ilkovičova 3, 812 19 Bratislava, Slovak Republic*

[a)]Corresponding author: patrik.novak@stuba.sk

Abstract. The work deals with the structural investigation of Cu_2O structures for photoelectrochemical splitting of water by means of X-ray diffraction and AFM. Potentiostatic electrodeposition of Cu_2O layers under illumination and in the dark was carried out on Ag, Au and ITO coated glass substrates. It was found relations between deposition parameters, microstructure and photoelectrochemical properties. Light caused higher growth rate, because the photogenerated carriers contributed to the reduction of the electrolyte. Higher growth rate implied larger crystallites, more textured and less stressed layers. Larger crystallites with better quality can lead to higher photoresponse due to better charge carrier collection.