Photoelectrochemical Properties of Nanostructured Copper Oxides Formed Sonoelectrochemically

P. Grez^{1,*}, C. Rojas¹, I. Segura¹, C. Heyser¹, L. Ballesteros², C. Celedón³, and R. Schrebler¹

¹ Instituto de Química, Pontificia Universidad Católica de Valparaíso, Avda. Universidad 330, Curauma, Placilla, Valparaíso Casilla, 4059 Valparaíso, Chile

² Laboratorio de Síntesis Inorgánica y Electroquímica, Facultad de Ciencias, Universidad de Chile. Las Palmeras#3425, Ñuñoa, Santiago-Chile

³ Departamento de Física, Universidad Técnica Federico Santa María, P.O. Box 110-V, Valparaíso, Chile

*E-mail: paula.grez@pucv.cl

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In this work nanostructured copper oxides (Cu_xO) were prepared by ultrasound-assisted anodization of copper foils. These Cu_xO nanostructures were characterized morphologically and structurally by SEM and XRD, respectively. The bandgap value was determined by diffuse reflectance measurements. The electrochemical characterization included Mott Schottky plots and electrochemical techniques. From these measurements it was possible to establish that the formed phase corresponded to p- Cu_2O . The best results in the cathodic photocurrent response for the system $\text{Cu|p-Cu}_2\text{O|10 mM KI, 1 mM KI}_3$ in 50 mM $\text{Na}_2\text{B}_4\text{O}_7$ (pH 9.2) were obtained with oxides prepared at 75°C, 100V in ethylene glycol contained 5% wt H_2O and 0.5 wt% NH_4Cl .

Keywords: nanostructured copper oxides, sonoelectrochemical synthesis, photoelectrochemical properties

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