Short Communication

Mechanism for the Formation of Cuprous Oxide Nanowires in AAO template by Electrodeposition

Babar Shazad Khan², Adnan Saeed², Sardar Sikandar Hayat³, Aiman Mukhtar¹, Tahir Mehmood^{1,*}

¹ The state key laboratory of Refractories and Metallurgy, Hubei Collaborative Innovation Center for Advanced Steels, International Research Institute for Steel Technology, Wuhan University of Science and Technology, Wuhan, P. R. China

² Department of Physics, Government College Women University, 51310, Sialkot, Pakistan

³ Department of Physics, Hazara University, 21300, Mansehra, Pakistan

*E-mail: tahir10621@yahoo.com

doi: 10.20964/2017.02.42

Received: 25 September 2016 / Accepted: 16 December 2016 / Published: 30 December 2016

The effect of potential and pH on the formation of Cu₂O and Cu nanowires in AAO template have systematically been studied by Potentiostate, XRD, SEM, TEM and EDX. The pure Cu₂O nanowires were electrodeposited at voltage (−0.3 V) and pH (8.2). At higher voltage (−0.6 V and −0.5 V) with low pH 8.2, there was co-existence of Cu and Cu₂O nanowires. At voltage −0.5 V with pH 9, the pure Cu₂O nanowires are formed. A mechanism is proposed for the formation of cuprous oxides nanowires. The formation of pure Cu₂O nanowires can be attributed to the formation of large size critical Cu nuclei, the larger size of nuclei favors the formation of pure cuprous oxides nanowires.

Keywords: Electrochemical Deposition; Cuprous Oxide; Growth; Nanowires

[FULL TEXT](#)

© 2017 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).