



King Saud University
Journal of Saudi Chemical Society

www.ksu.edu.sa
www.sciencedirect.com



ORIGINAL ARTICLE

Synthesis of nanostructured films from template electrodeposition technique

Iqbal M.I. Ismail

Department of Chemistry, Faculty of Science, King Abdul Aziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

Received 27 September 2009; accepted 15 February 2010
Available online 14 April 2010

KEYWORDS

Templated electrodeposition;
Polystyrene template;
Nanostructured films

Abstract In this report, the use of a simple and versatile technique of templated electrodeposition through colloidal templates to produce nanostructured films of Pt and Au with regular submicron spherical holes arranged in a hexagonal close-packed structure is described. The templates were produced by self assembly of a monodispersed suspension of polystyrene spheres on gold substrates using capillary forces. The self assembly process was modified through the chemical modification of the gold substrate with cysteamine thiol. Films of Pt and Au were prepared by electrochemical deposition through the template. The electrochemical deposition charge and the current time curve were used to control the film height with a precision of approximately 10 nm. The colour of the nanostructured films changed as the film thickness was changed. On the other hand, high surface area of the nanostructured Pt film on top of the gold substrate was calculated using electrochemical cyclic voltammogram. About 55 roughness factor was obtained. SAXS measurements showed strong scattering at low angles indicating the presence of a well-ordered mesostructure.

© 2010 King Saud University. All rights reserved.