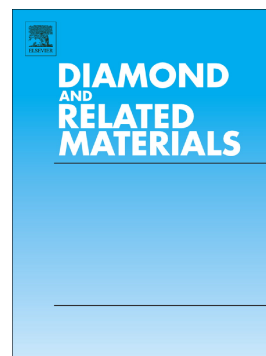


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ELECTROCHEMICAL ALTERNATIVE TO OBTAIN REDUCED GRAPHENE OXIDE BY PULSE POTENTIAL: EFFECT OF SYNTHESIS PARAMETERS AND STUDY OF CORROSION PROPERTIES

A.B. López-Oyama^{1,2*}, M.A. Domínguez-Crespo^{1*}, A.M. Torres-Huerta¹, E. Onofre-Bustamante¹, R. Gámez-Corrales³, N. Cayetano-Castro⁴.

¹*Instituto Politécnico Nacional. CICATA- Altamira. Grupo CIAMS, Km 14.5, Carretera Tampico-Puerto Industrial Altamira. C. P. 89600. Altamira, Tamps. México.*

²*CONACYT – CICATA- Altamira. Carretera Tampico-Puerto Industrial Altamira. C. P. 89600. Altamira, Tamps. México*

³*Universidad de Sonora Blvd. Rodríguez y Rosales S/N C.P. 83000. Hermosillo, Sonora, México.*

⁴*Instituto Politécnico Nacional, Centro de Nanociencias Micro y Nanotecnologías, C.P.07300 México, D.F, México.*

*Corresponding Author: tel. number: +52 55 57296000 Ext 87512

Email address: mdominguezc@ipn.mx (M.A. Domínguez), ablopezoy@conacyt.mx

Abstract

Two methods to form reduced graphene oxide (rGO) coatings are proposed as simple, rapid and reproducible alternatives to protect 304L SS substrates. The first route combines traditional Hummers' modified method and pulse electrodeposition technique (-1.6 and -2 V_{SCE}) whereas with the second one, reduction is obtained by applying the potentiostatic method (-1 to -4 V_{SCE}) in a solution containing graphite+H₂SO₄. The electrochemical results show that ERGO coatings can properly protect metallic substrates only when they are obtained with an applied potential of -4 V_{SCE}. To carry out this process, strong oxidants, extensive water amounts and long reaction times are avoided.

Keywords: Graphite, Graphene Oxide, Electrochemically Reduced Graphene Oxide, Corrosion Resistance

1. Introduction

Graphene oxide (GO) is one of the most commonly used starting materials for graphene-based applications. An important and widely applied method for synthesizing GO was developed by

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