Accepted Manuscript

Theory of square-wave catalytic adsorptive stripping voltammetry. How to obtain mechanistic information from experimental data

Sabrina N. Vettorelo, Fernando Garay

PII: S1572-6657(18)30553-8
DOI: doi:10.1016/j.jelechem.2018.08.024
Reference: JEAC 12563

To appear in: *Journal of Electroanalytical Chemistry*

Received date: 15 June 2018
Revised date: 23 July 2018
Accepted date: 16 August 2018

Please cite this article as: Sabrina N. Vettorelo, Fernando Garay , Theory of square-wave catalytic adsorptive stripping voltammetry. How to obtain mechanistic information from experimental data. Jeac (2018), doi:10.1016/j.jelechem.2018.08.024

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Theory of Square-wave catalytic adsorptive stripping voltammetry. How to obtain mechanistic information from experimental data.

Sabrina N. Vettorelo and Fernando Garay*

INFIQC-CONICET, Departamento de Físico Química, Facultad de Ciencias Químicas, Universidad Nacional de Córdoba. Pabellón Argentina, Ciudad Universitaria. 5000 Córdoba. Argentina

Abstract

The sensitivity of a catalytic adsorptive stripping voltammetric method depends mainly on the strength of adsorption of the electroactive reactant and the efficiency of the catalytic reaction. While the strength of adsorption is associated with the type of reagent and the solution pH, the efficiency of the catalytic step depends on the type and concentration of the oxidant selected for such reaction. Although the probe-and-error approach is commonly used for optimizing a given analytical signal, information about the reaction scheme and some good estimation about the rate constants of involved reactions would help a lot to optimize the analytical system.

The possibility for using the quasi-reversible maximum to study the electrode kinetics depends on the values of k_{cat}, K_{ad}, f, E_{sw}, and of course k_s. As a result of this, it is rather difficult for experimentalist and also for theoreticians to organize a strategy for detecting and understanding the effect of each variable separately. In this manuscript, it is first shown the effect of different variables on the voltammetric response, and then it is suggested a strategy for studying and estimating the values of those variables. Thus, if the experimental system matches the reaction scheme of an electrochemical reaction

Download English Version:

https://daneshyari.com/en/article/10131151

Download Persian Version:

https://daneshyari.com/article/10131151

Daneshyari.com