

Accepted Manuscript

A comparative study on the effect of ionic liquid composition on the contributions of faradaic current in ionic liquid carbon paste electrodes by chemometrics method

J. Tashkhourian, B. Hemmateenejad, S. Ahmadpour, E. Talebanpour Bayat



PII: S1572-6657(17)30501-5
DOI: doi: [10.1016/j.jelechem.2017.07.016](https://doi.org/10.1016/j.jelechem.2017.07.016)
Reference: JEAC 3404

To appear in: *Journal of Electroanalytical Chemistry*

Received date: 24 March 2017

Revised date: 5 July 2017

Accepted date: 11 July 2017

Please cite this article as: J. Tashkhourian, B. Hemmateenejad, S. Ahmadpour, E. Talebanpour Bayat, A comparative study on the effect of ionic liquid composition on the contributions of faradaic current in ionic liquid carbon paste electrodes by chemometrics method, *Journal of Electroanalytical Chemistry* (2017), doi: [10.1016/j.jelechem.2017.07.016](https://doi.org/10.1016/j.jelechem.2017.07.016)

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.

A Comparative Study on the Effect of Ionic Liquid Composition on the Contributions of Faradaic Current in Ionic Liquid Carbon Paste Electrodes by Chemometrics Method

J. Tashkhourian*, B. Hemmateenejad*, S. Ahmadpour, E. Talebanpour Bayat

Department of Chemistry, Faculty of Science, Shiraz University, Shiraz, 71454, Iran

Abstract

The total current of electroanalytical data is assumed to be composed of three main constituents including faradaic current, step charging current and induced charging current. The contribution of each type of current in total current can be related to the structure and composition of the electrode as well as the nature of the analyte and supporting electrolyte. By using multivariate curve resolution-alternating least square (MCR-ALS), as a powerful chemometrics technique, total current can be deconvoluted to its three components. In this study, the contribution of faradaic current in total current at carbon ionic liquid electrodes (CILE) was investigated. The main focus was on the effect of the molecular structure of ionic liquid and its weighting percent in the electrode. The studied ionic liquids were heptylpyridinium hexa-fluorophosphate, decylpyridinium hexa-fluorophosphate and dodecylpyridinium hexa-fluorophosphate at four different compositions. Results showed that structure of ionic liquid and its weighting has a significant effect on faradaic current contribution. The contribution of the relative faradaic current varies in the range of 27% and 37% whereas the contribution of the charging current is much higher and that of induced charging current represents the least contribution.

Keywords: Carbon Ionic Liquid Electrode, Faradaic Current, Charging Current, Chemometrics, MCR-ALS

Corresponding authors: E-mail address: hemmatb@sums.ac.ir (B. Hemmateenejad),

Tashkhourian@susc.ac.ir (J. Tashkhourian)

Download English Version:

<https://daneshyari.com/en/article/4907624>

Download Persian Version:

<https://daneshyari.com/article/4907624>

[Daneshyari.com](https://daneshyari.com)