Abstract

A theoretical model of an electrocatalytic processes taking place at conducting polymer modified electrodes is discussed. In this model the diffusion of solution species, charge carriers and chemical reaction within the film are taken into account. The model involves the system of non-linear non-steady-state reaction diffusion equations. Analytical expressions pertaining to the concentrations are obtained in terms of second-order reaction rate constant. Also simple theoretical expression of transient current is derived. In this paper, a powerful analytical method, called Homotopy analysis method (HAM) is used to obtain approximate solutions for a non-linear partial differential equation. The obtained approximate solution in comparison with the numerical ones is found to be in satisfactory agreement.
Theoretical and Numerical Analysis of Electrocatalytic Processes at Conducting Polymer Modified Electrodes

References


Index Terms

Computer Science

Applied Sciences

Keywords

Electrocatalysis; Polymer Modified Electrode; Polyaniline; Non-linear Differential Equations; Homotopy Analysis Method; Simulation