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Chapter 3

Mathematical Modelling of Rotating Disc Electrodes and Nonlinear Diffusion Equations

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Abstract

The Rotating Disc Electrode (RDE) technique has proved to be of considerable use in the study of electrode processes. In this chapter, mathematical models for a rotating disc electrode for the steady and transient states are discussed. Rotating disc electrodes can be modeled with linear and non-linear convection differential equations of EC', EC, Disp, and ECE reactions mechanism. The exact analytical solution of the non-linear convective diffusion problem is possible only for relatively simple cases. But for more complex cases, incorporating homogeneous reaction as well as heterogeneous charge transfer, the usual approach has not been used to find the solution of the differential equations. In this chapter, the recent modeling developments (analytical solution) of the chronoamperometric and

Surface plasmon assisted enhanced visible light photocatalysis of AZO dyes using $\text{In}_2\text{S}_3/\text{Ag}$ nanohybrids

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Understanding Marine Geo-Technical Engineering, Gas Hydrate Energy Release and the Role of External Stimuli

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Abstract

In the modern world globalization is good because when trade stops war begins. In the Geo environment methane is non toxic, yet it is extremely flammable and may form explosive mixtures with air. Methane is violently reactive with oxidizers, halogen and some halogen containing compounds. Methane is also an asphyxiant and may displace oxygen in an enclosed