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    Titolo   Digital simulation in electrochemistry / / Dieter Britz

    Pubbl/distr/stampa   Berlin ; ; New York, : Springer, c2005

    ISBN   3-540-31524-1

    Edizione   [3rd completely rev. and extended ed. /]

    Descrizione fisica   1 online resource (XIII, 338 p. 252 illus.)

    Collana   Lecture notes in physics, , 0075-8450 ; ; 666

    Disciplina   541/.37

    Soggetti   Electrochemistry - Data processing

    Lingua di pubblicazione   Inglese

    Formato   Materiale a stampa

    Livello bibliografico   Monografia

    Note generali   "The book is accompanied (on the webpage http://www.springerlink.
                         com/openurl.asp?genre=journal&issn=1616-6361&volume=666) by a
                         number of example procedures and programs, all in Fortran 90/95"--
                         Pref.

    Nota di bibliografia Includes bibliographical references (p. [313]-329) and index.

    Nota di contenuto   Basic Equations -- Approximations to Derivatives -- Ordinary
                         Differential Equations -- The Explicit Method -- Boundary Conditions
                         -- Unequal Intervals -- The Commonly Used Implicit Methods -- Other
                         Methods -- Adsorption -- Effects Due to Uncompensated Resistance
                         and Capacitance -- Two-Dimensional Systems -- Convection --
                         Performance -- Programming -- Simulation Packages -- Tables and
                         Formulae -- Some Mathematical Proofs -- Procedure and Program
                         Examples -- References -- Electronic Supplementary Material.

    Sommario/riassunto   The book shows how to numerically solve the parabolic partial
                         differential equations (pdes) encountered in electroanalytical chemistry.
                         It does this in a didactic manner, by first introducing the basic
                         equations to be solved and some model systems as text cases, for
                         which solutions exist. Then it treats basic numerical approximation for
                         derivatives and techniques for the numerical solution of ordinary
                         differential equations, from which the more complicated methods for
                         pdes can be derived. The major implicit methods are described in
                         detail, and the handling of homogeneous chemical reactions, including
                         coupled and nonlinear cases, is detailed. More advanced techniques are
                         presented briefly, as well as some commercially available program
                         packages. This third edition, still the only text on the subject, is
                         structured more didactically then the previous editions. It brings the
                         coverage of electrochemical digital simulation up to date, including

many new techniques developed since the early 1990s. A number of example procedures and programs are made available as supplementary material in the online version of this book.