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Optimization, equilibrium, kinetic modeling and ... Results from this study implied that chemical adsorption on the heterogeneous surface of *E. coli* E and optimization of adsorption parameters provides a highly efficient

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bioadsorbent. Equilibrium Isotherm, Kinetic Modeling, Optimization, and Characterization Studies of Cadmium Adsorption by Surface-Engineered Escherichia coli Iran Biomed J.

Equilibrium Isotherm, Kinetic Modeling, Optimization, and ... Kinetic models with relatively high  $R^2$  and low SE values were considered as the best-fitted models. Adsorption isotherms To investigate the influence of different SR on P adsorption, 0.12, 0.2, and 0.3 g of zeolite equilibrated with 30 mL solution containing 30, 45, 60, 75, or 90 mg P L<sup>-1</sup> as potassium dihydrogen phosphate in 0.01 M CaCl<sub>2</sub> on an end over end shaker for 40 hours.

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Investigation of Taguchi optimization, equilibrium ...

Abstract. A series of experimental studies has been carried out using a novel, sustainable adsorbent to remove Tartrazine dye, namely, a steam activated carbon obtained from pecan nut shells. The dye also known as acid yellow 23 has been used in the food industry but is now classified as a carcinogen. The experimental equilibrium data has been used to test four equilibrium isotherm models and then the best fitting model was optimised to minimise the mass of adsorbent used to save costs in ...

Equilibrium, Kinetic and Optimization Studies for the ... equilibrium and kinetic models had to be compared. Adsorption kinetic models are usually divided into two

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subgroups. The first ones are the non-structural models which may agree quite well with the experimental data; nonetheless, these do not include parameters describing adsorbent structure and are thus more or less of an interpolative nature.

### COMPARISON OF ADSORPTION EQUILIBRIUM AND KINETIC MODELS ...

They concluded that the kinetic model has more accurate results than equilibrium model. Finally, Jones et al. identified a set of linearly independent reactions and developed a kinetic models for the furnace flame and anoxic zones, WHB, and catalytic reactors. They used a set of plant data for optimal estimation of the kinetic parameters.



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Thermo-kinetic modeling and optimization of the sulfur ...  
The reactor model was simulated based on a discrete lumped model approach to kinetic modeling. The kinetic and product distribution parameters were fine-tuned using available industrial data. The real-coded elitist nondominated sorting genetic algorithm was used to carry out the multi-objective optimization study.

Modeling, Simulation, and Multi-objective Optimization of ...  
Stationary modeling considers the system working at an equilibrium point, where metabolite concentrations are constant over time. On the other hand, dynamic modeling acknowledges the changes metabolite concentrations suffer over time. Both approaches for phenotype prediction will be

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discussed and compared in this section.

Frontiers | A Review of Dynamic Modeling Approaches and ...

In addition, the SEM micrographs of before binding copper ions (a 1, b 1, c 1) revealed that rough, porous and various thick surfaces which might upgrade the efficiency of removal Cu (II) from aqueous water. Download : [Download high-res image \(2MB\)](#) Download : [Download full-size image](#). Fig. 2.

Biosorption of copper ions from aqueous solution using ...

Modeling and optimization of Hg 2+ ion biosorption by live yeast *Yarrowia lipolytica* 70562 from aqueous solutions under artificial neural network-genetic algorithm and response surface methodology: kinetic and equilibrium study

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Modeling and optimization of Hg<sup>2+</sup> ion biosorption by live ...  
Investigation of Taguchi optimization, equilibrium isotherms, and kinetic modeling for phosphorus adsorption onto natural zeolite of clinoptilolite type June 2018 Adsorption Science and Technology ...

(PDF) Investigation of Taguchi optimization, equilibrium ...  
Stationary modeling considers the system working at an equilibrium point, where metabolite concentrations are constant over time. On the other hand, dynamic modeling acknowledges the changes metabolite concentrations suffer over time. Both approaches for phenotype prediction will be discussed and compared in this section.

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A Review of Dynamic Modeling Approaches and Their ...  
Equilibrium time was achieved in 60 s for both ions. The isotherm data showed the adsorption of Cu(II) and Pb(II) ions are in agreement with Langmuir model. Kinetics results exhibited the adsorption of ions fitted well with the pseudo-second order kinetic model.

Rapid Adsorption of Copper(II) and Lead(II) by Rice Straw ...  
Simultaneous optimization of R and q and simple optimization of q was more favorable than that of R from an environmental and economical view. A kinetics study was performed by examining pseudofirst-order, second-order, and intraparticle diffusion kinetic models, and the best fit was obtained for the

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pseudosecond-order kinetics model with  $q_e = (0.624 \text{ and } 2.657) \text{ mg}\cdot\text{g}^{-1}$  for (10 and 50)  $\text{mg}\cdot\text{L}^{-1}$  Cr(VI), respectively.

### Adsorption of Cr(VI) onto Elaeagnus Tree Leaves ...

This research deals with the chemical modification of activated carbon surface with the iron functional groups to enhance the adsorption ability. The modification process was optimized and the effects of three factors (temperature, reaction time, and iron concentration) on the removal abilities of iron impregnated activated carbon (I-AC) adsorbents were investigated.

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This book brings together and integrates contributions on water quality modeling, monitoring and assessment techniques; wastewater treatment technologies; and sociological approaches in a single text. Divided into twenty chapters, it offers a comprehensive reference for students, professionals and researchers working on various aspects of water environment technology. The papers published in this book – selected from those presented at the 1st International Forum on Asian Water Environment Technology, held in 2013 in New Delhi, India – highlight the water environmental problems in Asia and respective countermeasures. This book addresses water quality requirements, emphasizing the factors that affect the water environment. Treated wastewater as a new source of water is also examined, introducing

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readers to important aspects of water reuse. Selecting the most effective and proper wastewater treatment approach is actually the most essential part of generating a new water resource, as well as protecting the receiving water environments. Thus, the fundamental principles of wastewater treatment and monitoring are a major focus in this book, which is intended to help readers effectively address various water environmental problems in Asian countries.

Stochastic Optimization Algorithms have become essential tools in solving a wide range of difficult and critical optimization problems. Such methods are able to find the optimum solution of a problem with uncertain elements or to algorithmically incorporate uncertainty to solve a deterministic

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problem. They even succeed in fighting uncertainty with uncertainty. This book discusses theoretical aspects of many such algorithms and covers their application in various scientific fields.

A mechanistic kinetic model for the hydrocracking of paraffins based on the single-event kinetics approach has been studied. Several elements of the model have been improved and the parameters of the model have been estimated from experimental data on n-hexadecane hydrocracking. A detailed reaction network of elementary steps has been generated based on the carbenium ion chemistry using the Boolean relation matrices. A total of 49,636 elementary steps are involved in the hydrocracking of n-hexadecane. The rate



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coefficients of these elementary steps are expressed in terms of a limited number of single event rate coefficients. By virtue of the single event concept, the single event rate coefficients of a given type of elementary steps are independent of the structure of reactant and product. Given their fundamental nature they are also independent of the feedstock composition and the reactor configuration. There is no lumping of components involved in the generation of the reaction network. Partial lumping is introduced only at a later stage of the model development and the lumping is strictly based on the criterion that the individual components in any lump will be in thermodynamic equilibrium. This definition of lumping requires a total of 49 pure components/lumps in the kinetic model for the hydrocracking of n-hexadecane. The

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"global" rate of reaction of a lump to another lump is expressed using lumping coefficients which account for the transformation of all the components of one lump into the components of another lump through to a given type of elementary steps. The rate expressions thus formulated are inserted into a one-dimensional, three-phase plug flow reactor model. Experimental data have been collected for the hydrocracking of n-hexadecane. The model parameters are estimated by constrained optimization using sequential quadratic programming by minimizing the sum of squares of residuals between experimental and model predicted product profiles. The optimized parameters are finally used for the reactor simulation to study the effect of different process variables on the conversion and product distribution of n-

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hexadecane hydrocracking. The model is also used to predict the product distribution for the hydrocracking of a heavy paraffinic mixture consisting of C9 to C33 normal paraffins.

27th European Symposium on Computer Aided Process Engineering, Volume 40 contains the papers presented at the 27th European Society of Computer-Aided Process Engineering (ESCAPE) event held in Barcelona, October 1-5, 2017. It is a valuable resource for chemical engineers, chemical process engineers, researchers in industry and academia, students, and consultants for chemical industries. Presents findings and discussions from the 27th European Society of Computer-Aided Process Engineering (ESCAPE) event

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Reliable models for rate-based phenomena are the backbone of model-based process design. These models are often unknown in the early design phase and need to be determined from laboratory experiments. Although model-based experimental analysis and process design are often executed sequentially, the kinetic models might not be suitable to reliably design a process. In this paper, we address this problem and present a first step on the integration of model identification and process optimization. Rather than decoupling model identification and process optimization, we use information from process optimization to design optimal experiments for improving the quality of the kinetic model given the intended use of the model.

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Sensitivities, which describe the influence of parametric uncertainties on the economic objective used in process optimization, are used as weights for optimal experimental design. This way, the confidence in the parameter values is maximized to reduce their influence on the process optimization objective. This first step on the integration of model identification and process optimization improves the predictive quality of a reaction kinetic model for process design without any further experimental effort.

A keystone reference that presents both up-to-date research and the far-reaching applications of marine biotechnology  
Featuring contributions from 100 international experts in the field, this five-volume encyclopedia provides comprehensive

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coverage of topics in marine biotechnology. It starts with the history of the field and delivers a complete overview of marine biotechnology. It then offers information on marine organisms, bioprocess techniques, marine natural products, biomaterials, bioenergy, and algal biotechnology. The encyclopedia also covers marine food and biotechnology applications in areas such as pharmaceuticals, cosmeceuticals, and nutraceuticals. Each topic in Encyclopedia of Marine Biotechnology is followed by 10-30 subtopics. The reference looks at algae cosmetics, drugs, and fertilizers; biodiversity; chitins and chitosans; aerophysinin-1, toluquinol, astaxanthin, and fucoxanthin; and algal and fish genomics. It examines neuro-protective compounds from marine microorganisms; potential uses and medical management of neurotoxic phycotoxins;

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and the role of metagenomics in exploring marine microbiomes. Other sections fully explore marine microbiology, pharmaceutical development, seafood science, and the new biotechnology tools that are being used in the field today. One of the first encyclopedic books to cater to experts in marine biotechnology Brings together a diverse range of research on marine biotechnology to bridge the gap between scientific research and the industrial arena Offers clear explanations accompanied by color illustrations of the techniques and applications discussed Contains studies of the applications of marine biotechnology in the field of biomedical sciences Edited by an experienced author with contributions from internationally recognized experts from around the globe Encyclopedia of Marine Biotechnology is a

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must-have resource for researchers, scientists, and marine biologists in the industry, as well as for students at the postgraduate and graduate level. It will also benefit companies focusing on marine biotechnology, pharmaceutical and biotechnology, and bioenergy.

Fundamentals of Geoenvironmental Engineering: Understanding Soil, Water, and Pollutant Interaction and Transport examines soil-water-pollutant interaction, including physico-chemical processes that occur when soil is exposed to various contaminants. Soil characteristics relevant to remedial techniques are explored, providing foundations for the correct process selection. Built upon the authors' extensive experience in research and practice, the book



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updates and expands the content to include current processes and pollutants. The book discusses propagation of soil pollution and soil characteristics relevant to remedial techniques. Practicing geotechnical and environmental engineers can apply the theory and case studies in the book directly to current projects. The book first discusses the stages of economic development and their connections to the sustainability of the environment. Subsequent chapters cover waste and its management, soil systems, soil-water and soil-pollutant interactions, subsurface transport of pollutants, role of groundwater, nano-, micro- and biologic pollutants, soil characteristics that impact pollution diffusion, and potential remediation processes like mechanical, electric, magnetic, hydraulic and dielectric permittivity of soils. Presents a clear

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understanding of the propagation of pollutants in soils  
Identifies the physico-chemical processes in soils Covers  
emerging pollutants (nano-, micro- and biologic contaminants)  
Features in-depth coverage of hydraulic, electrical, magnetic  
and dielectric permittivity characteristics of soils and their  
impact on remedial technologies

Water, which plays an important role in every aspect of our daily lives, is the most valuable natural resource we have on this planet. Drinking, bathing, cooking, regeneration, cleaning, production, energy, and many other uses of water originate from some of its versatile, useful, basic, and unique features. The access, purification, and reuse of water on our planet, which is of course not endless and not available for direct

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use, is directly related to the water chemistry that explores its inimitable properties. This book includes research on water chemistry-related applications in environmental management and sustainable environmental issues such as water and wastewater treatment, water quality management, and other similar topics. The book consists of three sections, namely, water treatment, wastewater treatment, and water splitting, respectively, and includes 11 chapters. In these chapters, water-wastewater remediation methods, nanomaterials in water treatment, and water splitting processes are comprehensively reviewed in terms of water chemistry. The editors would like to record their sincere thanks to the authors for their contributions.

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Handbook of Nanomaterials for Wastewater Treatment: Fundamentals and Scale up Issues provides coverage of the nanomaterials used for wastewater treatment, covering photocatalytic nanocomposite materials, nanomaterials used as adsorbents, water remediation processes, and their current status and challenges. The book explores the major applications of nanomaterials for effective catalysis and adsorption, also providing in-depth information on the properties and application of new advanced nanomaterials for wastewater treatment processes. This is an important reference source for researchers who need to solve basic and advanced problems relating to the use of nanomaterials for the development of wastewater treatment processes and technologies. As nanotechnology has the potential to

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substantially improve current water and wastewater treatment processes, the synthesis methods and physiochemical properties of nanomaterials and noble metal nanoparticles make their performance and mechanisms efficient for the treatment of various pollutants. Explains the properties of the most commonly used nanomaterials used for wastewater treatment Describes the major nanoscale synthesis and processing techniques for wastewater treatment Assesses the major challenges for using nanomaterials on a mass scale for wastewater treatment

The field of Chemical Engineering and its link to computer science is in constant evolution and new engineers have a variety of tools at their disposal to tackle their everyday

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problems. Introduction to Software for Chemical Engineers, Second Edition provides a quick guide to the use of various computer packages for chemical engineering applications. It covers a range of software applications from Excel and general mathematical packages such as MATLAB and MathCAD to process simulators, CHEMCAD and ASPEN, equation-based modeling languages, gProms, optimization software such as GAMS and AIMS, and specialized software like CFD or DEM codes. The different packages are introduced and applied to solve typical problems in fluid mechanics, heat and mass transfer, mass and energy balances, unit operations, reactor engineering, process and equipment design and control. This new edition offers a wider view of packages including open source software such as R,

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Python and Julia. It also includes complete examples in ASPEN Plus, adds ANSYS Fluent to CFD codes, Lingo to the optimization packages, and discusses Engineering Equation Solver. It offers a global idea of the capabilities of the software used in the chemical engineering field and provides examples for solving real-world problems. Written by leading experts, this book is a must-have reference for chemical engineers looking to grow in their careers through the use of new and improving computer software. Its user-friendly approach to simulation and optimization as well as its example-based presentation of the software, makes it a perfect teaching tool for both undergraduate and master levels.

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