Mass Balance Calculations Pulp Paper

Environmental Fate and Effects of Pulp and PaperMill EffluentsCRC Press

This book reviews the theoretical fundamentals of grey-box identification and puts the spotlight on MoCaVa, a MATLAB-compatible software tool, for facilitating the procedure of effective grey-box identification. It demonstrates the application of MoCaVa using two case studies drawn from the paper and steel industries. In addition, the book answers common questions which will help in building accurate models for systems with unknown inputs.

During the last century international trade has become indispensable for many economies. This is not only the case for trade in primary raw materials and consumer products but also for secondary (recyclable) materials. With the rapid growth of the recycling sector worldwide, trade in recyclables increased tremendously. It is striking that most of this trade flows from developed to developing countries. This book addresses the main causes of this typical trade pattern and investigates its economic and environmental effects by carrying out case studies on waste paper imports in India, waste plastics imports in China, and used-tyre trade in Europe. The book concludes by recommending policies that are aimed at preventing negative economic and environmental effects potentially resulting from trade in recyclables. The book offers new ideas to researchers who are involved in international trade, material flows, and waste management, and provides new insights for decision-makers who are interested in WTO and the Basel Convention.

This book features in-depth and thorough coverage of Minimum Impact Mill Technologies which can meet the environmental challenges of the pulp and paper industry and also discusses Mills and Fiberlines that encompass “State-of-the-Art” technology and management practices. The minimum impact mill does not mean “zero effluent”, nor is it exclusive to one bleeding concept. It is a much bigger concept which means that significant progress must be made in the following areas: Water Management, Internal Chemical Management, Energy Management, Control and Discharge of Non-Process Elements and Removal of Hazardous Pollutants. At the moment, there is no bleached kraft pulp mill operating with zero effluent. With the rise in environmental awareness due to the lobbying by environmental organizations and with increased government regulation there is now a trend towards sustainability in the pulp and paper industry. Sustainable pulp and paper manufacturing requires a holistic view of the manufacturing process. During the last decade, there have been revolutionary technical developments in pulping, bleaching and chemical recovery technology. These developments have made it possible to further reduce loads in effluents and airborne emissions. Thus, there has been a strong progress towards minimum impact mills in the pulp and paper industry. The minimum-impact mill is a holistic manufacturing concept that encompasses environmental management systems, compliance with environmental laws and regulations and manufacturing technologies.

Due to the complexity of the process operation and the requirements for high quality, low cost, safety and the protection of the environment, an increasing number of pulp and paper companies are in need of an advanced control technology to improve their process operation. This publication presents, for the first time, the theory of such an advanced control technology as well as various industrial applications associated especially with Paper Making. The reader will gain a better understanding of the most popular and advanced process control techniques and applications of these techniques in an important real-time process industry. The contents are based on the authors’ own research on modeling and advanced control in this field.

The production of forestry products is based on a complex chain of knowledge in which the biological material wood with all its natural variability is converted into a variety of fiber-based products, each one with its detailed and specific quality requirements. This four volume set covers the entire spectrum of pulp and paper chemistry and technology from starting material to processes and products including market demands. Supported by a grant from the Ljungberg Foundation, the Editors at the Royal Institute of Technology, Stockholm, Sweden coordinated over 30 authors from university and industry to create this comprehensive overview. This work is essential for all students of wood science and a useful reference for those working in the pulp and paper industry or on the chemistry of renewable resources.

The Symposium presented and discussed the latest research on new theories and advanced applications of automatic systems, which are developed for manufacturing technology or are applicable to advanced manufacturing systems. The topics included computer integrated manufacturing, simulation and the increasingly important areas of artificial intelligence and expert systems, and applied them to the broad spectrum of problems that the modern manufacturing engineer is likely to encounter in the design and application of increasingly complex automatic systems.

First published two decades ago, the first edition of Handbook of Control Room Design and Ergonomics: A Perspective for the Future became a benchmark for the field. Current-day process control encompasses a new generation of computer systems with enormous capabilities, including new display technologies. These new and emerging technologies integrated with human factors create an interconnectivity that enhances organizational development. This new edition of the handbook addresses developments in the concept of "Control Rooms". It includes modern approaches that emphasize the role of people in learning for self-development and in shaping their work environments. New in the Second Edition: Extensive coverage of the use of the control room and its related computer system outside the work of monitoring and supervising the processes Discussion and explanation of how the control room can also be used for the purposes of education and simulation training Discussion of the use of the control system for optimizing and developing the existing systems and processes A section on new ideas and philosophies about organizational design and job design as these are applied to control room related work Proposed organizational designs of the future Theoretical background about learning, learning in the workplace, and lifelong learning Creativity and learning are rapidly becoming integral parts of the design of work environments and work processes and utilize the ICT potential of modern control systems. Using original case studies, the authors describe and illustrate some creative and exciting organizational designs of the future,
including new perspectives learning, learning in the workplace, and lifelong learning. Taking a holistic view, they make a strong argument for integrating in the workplace of the new control centers in the context of society as a whole, including global concerns such as environmental protection, energy conservation, and sustainability.

In recent years, there have been emerging concerns regarding the fate and effects of pulp and paper mill effluents on the environment. Countries throughout the world are focusing attention on the implementation of regulatory and monitoring programs. In response, industry has begun to implement a variety of process and treatment technologies designed to minimize or eliminate the potential impacts. Environmental Fate and Effects of Pulp and Paper Mill Effluents explores the most active and critical current research and experimentation from around the world. This comprehensive overview examines the identity and origin of chemicals in pulp mill effluents, environmental fate of chemicals from pulp and paper mills, bioaccumulation of substances from pulp mills to fish and wildlife, field and laboratory studies of biochemical and whole organism responses associated with pulp and paper effluents, integrated monitoring and future research, and policy directions of this rapidly evolving field. Written by prominent scientists from around the world with contributions from industry, government, and academia, this important new book provides a balanced global perspective of the recent scientific findings and the challenges being faced in the immediate future.

Advanced Control and Supervision of Mineral Processing Plants describes the use of dynamic models of mineral processing equipment in the design of control, data reconciliation and soft-sensing schemes; through examples, it illustrates tools integrating simulation and control system design for comminuting circuits and flotation columns. Coverage is given to the design of soft sensors based on either single-point measurements or more complex measurements like images. Issues concerning data reconciliation and its employment in the creation of instrument architecture and fault diagnosis are surveyed. In consideration of the widespread use of distributed control and information management systems in mineral processing, the book describes the platforms and tools available for implementing such systems. Applications of the techniques described in real plants are used to highlight their benefits; information for all of the examples, together with supporting MATLAB® code can be found at www.springer.com/978-1-84996-105-9.

Taking the reader through the history of industrial waste treatment and directing them toward a new path of best practice, Industrial Waste Treatment illustrates how current treatment techniques are affected by regulatory and economic constraints, scientific knowledge and tolerances. This book provides the reader with the basis for a more effective method of waste treatment which is sustainable and supportive of industrial improvements. Overall, it provides valuable information for planners, industrial, civil and environmental engineers and government officials for a better understanding of current practices and regulatory history and how these factors relate to the ability to complete environmental solutions to industrial waste problems. Provides environmental history from a professional/technical point-of-view as a basis for total solutions engineering Includes sustainable practice necessary for the 21st Century Thoroughly explores industry and environmental regulations over the past 150 years

INDUSTRIAL PROCESSES and WASTE STREAM MANAGEMENT This book provides environmental technology students with a quick, enjoyable way to master the knowledge and skills needed to develop and implement successful, cost-effective industrial pollution control programs, especially when used in coordination with the Industrial Processes and Waste Stream Management video series produced by INTELECOM Intelligent Telecommunications. The first section of the book lays the conceptual foundations with a detailed overview of waste stream management tools and regulations and the four EPA-approved treatment methods: physical, chemical, thermal, and biological. The following 20 chapters are organized by industry, and provide a fascinating case-by-case exploration of industrial processes and how the waste streams they generate are managed in all major industries, including petroleum, chemicals, mining, metals, paint, textiles, agriculture, paper, printing, nuclear, medical, and more. Features that make Industrial Processes and Waste Stream Management an ideal introduction to the subject for environmental technology students, include: * Acclaimed, user-friendly, modular format found in all the books in the Preserving the Legacy series * Basic anatomy, physiology, and chemistry concepts that help clarify how toxins interact with living tissue * Proven, rapid-learning modular format--each chapter features learning objectives, topic summaries, chapter-end reviews, and practice questions * Helpful sidebars that highlight critical concepts * More than 175 high-quality line drawings, photographs, diagrams, charts, and tables * Numerous easy-to-perform, skill-building classroom activities * A glossary of more than 1,000 essential terms * Extensive bibliography of recommended readings in all key subject areas Industrial Processes and Waste Stream Management is also an excellent refresher/quick-reference guide for practicing environmental technicians. This book includes extended and revised versions of a set of selected papers from the 2012 International Conference on Simulation and Modeling Methodologies, Technologies and Applications (SIMULTECH 2012) which was sponsored by the Institute for Systems and Technologies of Information, Control and Communication (INSTICC) and held in Rome, Italy. SIMULTECH 2012 was technically co-sponsored by the Society for Modeling & Simulation International (SCS), GDR 13, Lionphant Simulation, Simulation Team and IFIP and held in cooperation with AIS Special Interest Group of Modeling and Simulation (AIS SIGMAS) and the Movimento Italiano Modellazione e Simulazione (MIMOS).

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This book documents the recent accomplishments of integrated forest biorefineries and their future in the pulp, paper, and fiber-processing industries. Computational Models in the Economics of Environment and Development provides a step-by-step guide in designing, developing, and solving non-linear environment-development models. It accomplishes this by focusing on applied models, using real examples as case studies. Additionally, it gives examples of developing policy interventions based on quantitative model results. Finally, it uses a simple computer program, GAMS, to develop and solve models. This book is targeted towards university lecturers and students in economic modeling and sustainable development, but is also of particular interest to researchers at sustainable development research institutes and policy makers at international sustainable development policy institutions such as the World Bank, UNDP, and UNEP.