

# Contents

## Preface

### Waste minimisation and management

- 1 **Cleaner production in the chemical industry** C. Alzamora Rumazo, A. Pryor, F. Ocampo Mendoza, J. Campos Villareal, J. M. Robledo and E. Rodriguez Mercado
- 9 **Improvement of river water quality – the results of industrial effluent minimisation** J. Zagorc-Končan and A. Žgajnar Gotvajn
- 15 **Minimisation strategy of petrochemical wastewater organic load** H. El Khorassani, P. Trebuchon, H. Bitar and O. Thomas
- 23 **Testing and implementation of an advanced wastewater reclamation and recycling system in a major petrochemical plant** J.M. Wong
- 29 **B.O.O. Case: water management project for the use of reclaimed wastewater and desalted seawater for the “Antonio Dovali Jaime” refinery, Salina Cruz, Oaxaca, Mexico** C. Baron, L.O. Equihua and J.P. Mestre

### Waste and wastewater characterisation

- 37 **Pollutant characteristics of the pyrolysis of petrochemical wastewater sludge by an electric furnace** H-L. Chiang, T-C. Chen, J-H. Tsai and Y-C. Hsu
- 43 **Toward a standardization of the microbial inoculum for ready biodegradability testing of chemicals** G. Vazquez-Rodriguez, G. Goma and J. L. Rols
- 47 **From UV spectra to degradability of industrial wastewater/definition and use of a “shape factor”** C. Muret, M.F. Pouet, E. Touraud and O. Thomas

### Physiochemical processes

- 55 **A kinetic model that describes removal of chromium VI from rinsing waters of the metal finishing industry by electrochemical processes** S.A. Martinez, M.G. Rodriguez and C. Barrera
- 63 **The recovery of precious metals from acidic effluents using sodium formate** H.G. Julsing and R. I. McCrindle
- 71 **Recovery and encapsulation of heavy metals on refinery spent hydrotreating catalyst** D. D. Sun, J. H. Tay and C. Easton
- 79 **Adsorption and stabilization of nickel ions on fly ash/lime mixing** P. Ricou-Hoeffler, V. Héquet, I. Lécuyer and P. Le Cloirec
- 85 **Comparative study on polyvinyl alcohol and alginate for cell immobilization in biosorption** Y.P. Ting and G. Sun
- 91 **Selective biosorption of lanthanide (La, Eu, Yb) ions by an immobilized bacterial biomass** A-. C. Texier, Y. Andrès and P. Le Cloirec
- 95 **Photocatalytic degradation of wastewater from manufactured fiber by titanium dioxide suspensions in aqueous solution: a feasibility study** Y.H. Hsieh, K.H. Wang, R.C. Ko and C.Y. Chang
- 101 **Catalytic photodegradation of alkyl surfactants** S. Gelover, T. Leal, E.R. Bandala, A. Roman, A. Jimenez and C. Estrada
- 107 **Optimisation of the operation variables of a supercritical water oxidation process** M.J. Cocero, D. Vallelado, R. Torio, E. Alonso and F. Fdez-Polanco

- 115 **Treatment of high organic-loaded industrial effluents** L.A. Castillo Rivera, A. Sillet, J. Roussy, J-R. Degorre Dumas and O. Thomas
- 119 **Production of activated carbon from petroleum coke and its application in water treatment for the removal of metals and phenol** R.M. Ramírez Zamora, R. Schouwenaars, A. Durán Moreno and G. Buitrón
- 127 **Nitrogen and organics removal from industrial wastewater using natural zeolite media** Y-C. Chung, D-H. Son and D-H. Ahn

### **Wastewater treatment: aerobic processes**

- 135 **Studies on activated sludge response to variations in the composition of a synthetic surfactant-containing feed effluent** G. Carvalho, E. Paul, J.M. Novais and H.M. Pinheiro
- 145 **Aerobic biodegradation of organic synthesis wastewater** P. Mijaylova Nacheva, E. Ramírez Camperos, J. Mendoza Roque and M. Inés Rocha Barrón
- 153 **Methyl tertiary-butyl ether (MTBE) biodegradation in batch and continuous upflow fixed-biofilm reactors** K. Acuna-Askar, A. J. Englande, Jr., C. Hu and G. Jin
- 163 **Observer-based time-optimal control of an aerobic SBR for chemical and petrochemical wastewater treatment** A. Vargas, G. Soto, J. Moreno and G. Buitrón
- 171 **COD removal of phenolic wastewater by biological activated carbon-sequencing batch reactor in the presence of 2,4-DCP** S-R. Ha, L. Qishan and S. Vinitnantharath
- 179 **Adaptation of an inoculum to 2,4,6-trichlorophenol biodegradation in an activated-sludge bioreactor** P. Olguin Lora, M. Sjölund, C. Tracol and J. Morvan
- 185 **Treatment of a 2,4-dichlorophenoxyacetic acid (2,4-D) contaminated wastewater in a membrane bioreactor** J.F. Buenrostro-Zagal, A. Ramírez-Oliva, S. Caffarel-Méndez, B. Schettino-Bermúdez and H. M. Poggi-Varaldo
- 193 **Improvement of industrial wastewater treatment by aerated lagoon: case studies** C. Fonade, J. L. Rols, G. Goma, N. Doubrovine, M. Bermejo and J.P. Grasa

### **Waste treatment: anaerobic processes**

- 201 **Overview of the application of anaerobic treatment to chemical and petrochemical wastewaters** H. Macarie
- 215 **Role of quinones in the biodegradation of priority pollutants: a review** J.A. Field, F.J. Cervantes, F.P. van der Zee and G. Lettinga
- 223 **Formaldehyde toxicity in anaerobic systems** G. Gonzalez-Gil, R. Kleerebezem and G. Lettinga
- 231 **Methanethiol production as an indicator of toxicity in anaerobic treatment** D.H. Zitomer, D. Owens and R.E. Speece
- 237 **Degradation of phenol and p-cresol in reactors** Herbert H. P. Fang and Gong-Ming Zhou
- 245 **Immobilization strategies for bioaugmentation of anaerobic reactors treating phenolic compounds** S.R. Guiot, K. Tawfiki-Hajji and F. Lépine
- 251 **Thermophilic sulfate and sulfite reduction with methanol in a high rate anaerobic reactor** J. Weijma, J-P. Haerens, A.J.M. Stams, L.W. Hulshoff Pol and G. Lettinga
- 259 **High-rate anaerobic treatment of purified terephthalic acid wastewater** R. Kleerebezem and G. Lettinga
- 269 **Upgrade of a petrochemical wastewater treatment plant by an upflow anaerobic pond** A. Noyola, H. Macarie, F. Varela, S. Landrieu, R. Marcelo and M.A. Rosas
- 277 **Two-stage anaerobic treatment of purified terephthalic acid production wastewaters** J. C. Young, I. S. Kim, I. C. Page, D. R. Wilson, G. J. Brown, and A. A. Coccoi
- 283 **Anaerobic effluent treatment by a pilot and full-scale plant at a chemical industrial complex** P. Boulenger, W. Driessen, E. van de Werfhorst and M. Tielbaard

### **Wastewater treatment: Combined processes**

- 289 **Start-up of a sequential anaerobic/aerobic batch reactor for the mineralization of p-nitrophenol** R.M. Melgoza, M. Chew and G. Buitrón

- 293 **Treatment of wastewaters from a formaldehyde-urea adhesives factory**  
J.M. Garrido, R. Méndez and J.M. Lema

### **Textile wastewater**

- 301 **The role of (auto)catalysis in the mechanism of an anaerobic azo reduction**  
F. P. van der Zee, G. Lettinga and J. A. Field
- 309 **The use of a thermophilic anaerobic system for pretreatment of textile dye wastewater** J. R. M. Willetts, N. J. Ashbolt, R. E. Moosbrugger and M. R. Aslam
- 317 **Biotransformation of disperse blue 79 by an anaerobic sequencing batch biofilter**  
A. Cruz and G. Buitrón
- 321 **Reactive textile dye colour removal in a sequencing batch reactor** N.D. Lourenço,  
J.M. Novais and H.M. Pinheiro
- 329 **Use of a sequencing batch biofilter for degradation of azo dyes (acids and bases)**  
M. Quezada, I. Linares and G. Buitrón
- 337 **Degradation of azo dye Mordant Yellow 10 in a sequential anaerobic and bioaugmented aerobic bioreactor** N.C.G. Tan, A. Borger, P. Slenders, A. Svitelskaya,  
G. Lettinga and J.A. Field
- 345 **Comparison of three advanced oxidation processes for degradation of textile dyes** R. Aplin and T.D. Waite
- 355 **Coupling ultrafiltration and adsorption onto activated carbon cloth: application to the treatment of highly coloured wastewaters** H. Pignon, C. Brasquet and  
P. Le Cloirec
- 363 **Methanogenic biodegradation of aromatic amines** S. Kalyuzhnyi, V. Sklyar,  
T. Mosolova, I. Kucherenko, J.a Russkova and N. Degtyaryova

### **Site restoration**

- 371 **On-site and in situ bioremediation of wood-preservative contaminated groundwater** J.A. Puhakka, K.T. Järvinen, J.H. Langwaldt, E.S. Melin, M.K. Männistö,  
J.M. Salminen and M.T. Sjölund
- 377 **Diagnostic and resulting approaches to restore petroleum-contaminated soil in a Mexican tropical swamp** M. Gallegos Martínez, A. Gómez Santos, L. González Cruz,  
M. A. Montes de Oca García, L. Yáñez Trujillo, J. A. Zermeño Eguía Lis and M. Gutiérrez-Rojas
- 385 **Bioremediation of highly energetic compounds: a search for remediation technologies** J. Hawari, C.F. Shen, S.R. Guiot, C.W. Greer, D. Rho, G. Sunahara,  
G. Ampleman and S. Thiboutot
- 395 **Trichloroethylene elimination assay by natural consortia of heterotrophic and methanotrophic bacteria** E. Hourbron, S. Escoffier and B. Capdeville
- 403 **Biodegradation potential assessment of microbial consortia isolated from a diesel-contaminated soil** J. Milcic-Terzic, Y. Lopez-Vidal, M. M. Vrvic and S. Saval
- 407 **Nitrogen-fixing bacteria capable of utilising kerosene hydrocarbons as a sole carbon source** J. Pérez-Vargas, H. M. Poggi-Varaldo, G. Calva-Calva, E. Rios-Leal,  
R. Rodríguez-Vázquez, R. Ferrera-Cerrato and F. Esparza-García

### **Volatile organic compounds treatment**

- 411 **Two-stage biofiltration of sulfides and VOCs from wastewater treatment plants**  
J.S. Devanny and D.E. Chitwood
- 419 **Treatment of methanol in a dry biofilm reactor using tubular carrier** F. Thalasso,  
F. Omil, J.O. Otero and J.M. Lema
- 429 **Endogenous respiration rate in vapour phase biological reactors (VPBRs) during volatile organic compound (VOC) degradation** S. Villaverde, F. Fdz-Polanco, and  
P.A. García Encina