

Chemical Engineering Journal 99 (2004) 281-284



# Subject Index of Volume 99

#### Acid

Influence of pretreating activated sludge with acid and surfactant prior to conventional conditioning on filtration dewatering, 137

# Acidithiobacillus spp.

A semiempirical model for bacterial growth and bioleaching of *Acidithiobacillus* spp., 77

### Activated sludge

Influence of pretreating activated sludge with acid and surfactant prior to conventional conditioning on filtration dewatering, 137

#### Adsorption

Remediation of wastewater containing heavy metals using raw and modified diatomite, 177

### Anaerobic-aerobic treatment

Microbial decolorization of reactive azo dyes in a sequential anaerobic– aerobic system, 169

#### Aromatic amines

Microbial decolorization of reactive azo dyes in a sequential anaerobic– aerobic system. 169

#### Axial flow structure

Axial flow structure at the varying superficial gas velocity in a downer reactor 5

# Backwashing

Treatment of a polluted stream by a fixed-bed biofilm reactor with sludge discharger and backwashing system, 265

# Benzen

Modeling of the deactivation kinetics for the combustion of ethyl acetate and benzene present in the air stream over ZSM-5 catalyst loaded with chromium, 161

# Benzoic acid

Gas phase oxidation of benzoic acid to phenol over nickel oxide catalysts, 227

# Bioleaching

A semiempirical model for bacterial growth and bioleaching of *Acidithiobacillus* spp., 77

# Bioreactors

Optimal control of bioreactors: a simultaneous approach for complex systems, 23

# Bipolar electrodes

The experimental optimization of the electrosynthesis of manganese(III) acetate in a bipolar packed-bed reactor, 257

# Bubble column

Effect of superficial gas velocity on gas hold-up profiles in foaming liquids in bubble column reactors, 53

# Bubble size

Effect of hydrodynamics on mass transfer in a gas-liquid oscillatory baffled column, 59

# 1,3-Butadiene

Selective hydrogenation of 1,3-butadiene: improvement of selectivity by using additives, 45

# n-Butanol

Effect of superficial gas velocity on gas hold-up profiles in foaming liquids in bubble column reactors, 53

#### 1-Butene

Selective hydrogenation of 1,3-butadiene: improvement of selectivity by using additives, 45

# Catalytic partial oxidation

Partial oxidation of light paraffins to synthesis gas in short contact-time reactors, 219

### Ceramic media

Treatment of a polluted stream by a fixed-bed biofilm reactor with sludge discharger and backwashing system, 265

#### Chemical reactors

Multivariable control configurations for composition regulation in a fluid catalytic cracking unit, 187

#### CO<sub>2</sub> absorbent

Effect of carbon dioxide absorbent on initial hydrogen production from epoxy resin under high-temperature and -pressure steam conditions, 125

# Coking

Modeling of the deactivation kinetics for the combustion of ethyl acetate and benzene present in the air stream over ZSM-5 catalyst loaded with chromium, 161

# Complex dynamic

Complex dynamic behaviour of methanol synthesis in the ring reactor network, 117

# Composition control

Multivariable control configurations for composition regulation in a fluid catalytic cracking unit, 187

# Conceptual design

Application of side reactors on ETBE reactive distillation, 35

# Confinement effects

Effectiveness factor for zeolite catalysed isomerization reactions, 105 Correlation effects

Effectiveness factor for zeolite catalysed isomerization reactions, 105 Corrugated plate

Experimental analysis of a corrugated plate photocatalytic reactor, 145 Countercurrent flow

Mass transfer coefficient for two-phase countercurrent flow in a packed column with a novel internal, 273

# Cross-linked chitosan

Simulation of a fixed bed adsorber packed with protonated cross-linked chitosan gel beads to remove nitrate from contaminated water, 153

# Cr-ZSM-5

Modeling of the deactivation kinetics for the combustion of ethyl acetate and benzene present in the air stream over ZSM-5 catalyst loaded with chromium, 161

# $H_{\rm D}/D$ ratio

Effect of superficial gas velocity on gas hold-up profiles in foaming liquids in bubble column reactors, 53

# Deactivation

Modeling of the deactivation kinetics for the combustion of ethyl acetate and benzene present in the air stream over ZSM-5 catalyst loaded with chromium, 161

#### Diatomite

Remediation of wastewater containing heavy metals using raw and modified diatomite, 177

#### Dissolution

Structural modelling for the dissolution of non-porous ores: dissolution with sporulation, 89

#### Donnan dialysis

Mass transfer characterization of Donnan dialysis in a bi-ionic chloridenitrate system, 69

#### Downcomer

Liquid holdup in turbulent bed contactor, 203

#### Downer reactor

Axial flow structure at the varying superficial gas velocity in a downer reactor, 5

### Effectiveness factor

Effectiveness factor for zeolite catalysed isomerization reactions, 105 Electrochemical oxidation

The experimental optimization of the electrosynthesis of manganese(III) acetate in a bipolar packed-bed reactor, 257

#### Equilibrium-limited reactions

Complex dynamic behaviour of methanol synthesis in the ring reactor network, 117

#### Esters

Kinetics on the hydrolysis of fatty acid esters in subcritical water, 1 FTRE

Application of side reactors on ETBE reactive distillation, 35 Ethyl acetate

Modeling of the deactivation kinetics for the combustion of ethyl acetate and benzene present in the air stream over ZSM-5 catalyst loaded with chromium, 161

# Fatty acids

Kinetics on the hydrolysis of fatty acid esters in subcritical water, 1 Filtration

Remediation of wastewater containing heavy metals using raw and modified diatomite, 177

# Filtration dewatering

Influence of pretreating activated sludge with acid and surfactant prior to conventional conditioning on filtration dewatering, 137

# Fixed-bed biofilm reactor

Treatment of a polluted stream by a fixed-bed biofilm reactor with sludge discharger and backwashing system, 265

# Fluid catalytic cracking

Multivariable control configurations for composition regulation in a fluid catalytic cracking unit, 187

# Fluid oscillation

Effect of hydrodynamics on mass transfer in a gas-liquid oscillatory baffled column, 59

# Fluidization

Liquid holdup in turbulent bed contactor, 203

# Forced unsteady-state reactors

Complex dynamic behaviour of methanol synthesis in the ring reactor network, 117

# Gas holdup

Effect of hydrodynamics on mass transfer in a gas-liquid oscillatory baffled column, 59

# Gas velocity

Axial flow structure at the varying superficial gas velocity in a downer reactor, 5

# Gas-liquid-solid reactors

Mass transfer coefficient for two-phase countercurrent flow in a packed column with a novel internal, 273

# Gasoline

Kinetic study of *iso*-octane steam reforming over a nickel-based catalyst, 131

#### Groundwater

Simulation of a fixed bed adsorber packed with protonated cross-linked chitosan gel beads to remove nitrate from contaminated water, 153

# H<sub>2</sub> from C<sub>2</sub>–C<sub>3</sub> paraffins

Partial oxidation of light paraffins to synthesis gas in short contact-time reactors, 219

### Heavy metals

Remediation of wastewater containing heavy metals using raw and modified diatomite, 177

#### Heterogeneous catalysis

Gas phase oxidation of benzoic acid to phenol over nickel oxide catalysts, 227

# High-temperature and -pressure steam

Effect of carbon dioxide absorbent on initial hydrogen production from epoxy resin under high-temperature and -pressure steam conditions, 125

# Hold-up profiles

Effect of superficial gas velocity on gas hold-up profiles in foaming liquids in bubble column reactors, 53

# Hydrogen

Effect of carbon dioxide absorbent on initial hydrogen production from epoxy resin under high-temperature and -pressure steam conditions, 125

# Hydrolysis

Kinetics on the hydrolysis of fatty acid esters in subcritical water, 1

#### Industrial scraps

On the use of industrial scraps for the treatment of zinc hydrometallurgical wastes by self-propagating reactions, 247

#### Internal

Mass transfer coefficient for two-phase countercurrent flow in a packed column with a novel internal, 273

# Intraparticle heterogeneity

Structural modelling for the dissolution of non-porous ores: dissolution with sporulation, 89

# Ion exchange membrane

Mass transfer characterization of Donnan dialysis in a bi-ionic chloridenitrate system, 69

# Isomerization

Effectiveness factor for zeolite catalysed isomerization reactions, 105 iso-Octane

Kinetic study of *iso*-octane steam reforming over a nickel-based catalyst, 131

# Isoprene

Selective hydrogenation of 1,3-butadiene: improvement of selectivity by using additives, 45

# Kinetic

Kinetics on the hydrolysis of fatty acid esters in subcritical water,

Selective hydrogenation of 1,3-butadiene: improvement of selectivity by using additives, 45

Kinetic study of iso-octane steam reforming over a nickel-based catalyst, 131

Intrinsic kinetics of first-order reactions in photocatalytic membranes and layers, 237

# Kinetic model

A semiempirical model for bacterial growth and bioleaching of *Acidithiobacillus* spp., 77

# Leaching

Structural modelling for the dissolution of non-porous ores: dissolution with sporulation, 89

# Liquid holdup

Liquid holdup in turbulent bed contactor, 203

Long chain linear alkadienes (C<sub>10</sub>–C<sub>13</sub>)

Selective liquid hydrogenation of long chain linear alkadienes on molybdenum nitride and carbide modified by oxygen, 213

Manganese oxides

Remediation of wastewater containing heavy metals using raw and modified diatomite, 177

Manganese(III) acetate

The experimental optimization of the electrosynthesis of manganese(III) acetate in a bipolar packed-bed reactor, 257

Mass transfer

Effect of hydrodynamics on mass transfer in a gas-liquid oscillatory baffled column, 59

Experimental analysis of a corrugated plate photocatalytic reactor,

Mass transfer coefficient for two-phase countercurrent flow in a packed column with a novel internal, 273

Mass transfer modelling

Mass transfer characterization of Donnan dialysis in a bi-ionic chloridenitrate system, 69

Maxwell-Stefan theory

Effectiveness factor for zeolite catalysed isomerization reactions, 105 Mean deviations

A semiempirical model for bacterial growth and bioleaching of *Acidithiobacillus* spp., 77

Methanol synthesis

Complex dynamic behaviour of methanol synthesis in the ring reactor network. 117

Mineral processing

Structural modelling for the dissolution of non-porous ores: dissolution with sporulation, 89

β-Methylglucoside

Biocatalytic esterification of  $\beta$ -methylglucoside for synthesis of biocompatible sugar-containing vinyl esters, 15

Mixed culture

Microbial decolorization of reactive azo dyes in a sequential anaerobic–aerobic system, 169

Molybdenum oxycarbide

Selective liquid hydrogenation of long chain linear alkadienes on molybdenum nitride and carbide modified by oxygen, 213

Molybdenum oxynitride

Selective liquid hydrogenation of long chain linear alkadienes on molybdenum nitride and carbide modified by oxygen, 213

MTT assay

Biocatalytic esterification of  $\beta$ -methylglucoside for synthesis of biocompatible sugar-containing vinyl esters, 15

Multivariable control

Multivariable control configurations for composition regulation in a fluid catalytic cracking unit, 187

Network

Intrinsic kinetics of first-order reactions in photocatalytic membranes and layers, 237

Nickel

Kinetic study of iso-octane steam reforming over a nickel-based catalyst, 131

Nickel oxide

Gas phase oxidation of benzoic acid to phenol over nickel oxide catalysts, 227

Nitrate

Mass transfer characterization of Donnan dialysis in a bi-ionic chloridenitrate system, 69

Simulation of a fixed bed adsorber packed with protonated cross-linked chitosan gel beads to remove nitrate from contaminated water, 153

Novozym 435

Biocatalytic esterification of  $\beta$ -methylglucoside for synthesis of biocompatible sugar-containing vinyl esters, 15

Olefins from  $C_2$ – $C_3$  paraffins

Partial oxidation of light paraffins to synthesis gas in short contact-time reactors, 219

Open loop control

Complex dynamic behaviour of methanol synthesis in the ring reactor network, 117

Optimal control

Optimal control of bioreactors: a simultaneous approach for complex systems, 23

Optimization

The experimental optimization of the electrosynthesis of manganese(III) acetate in a bipolar packed-bed reactor, 257

Orthogonal collocation

Optimal control of bioreactors: a simultaneous approach for complex systems, 23

Paragoethite waste

On the use of industrial scraps for the treatment of zinc hydrometallurgical wastes by self-propagating reactions, 247

Pd catalyst

Selective hydrogenation of 1,3-butadiene: improvement of selectivity by using additives, 45

Phenol synthesis

Gas phase oxidation of benzoic acid to phenol over nickel oxide catalysts, 227

Photocatalysis

Experimental analysis of a corrugated plate photocatalytic reactor, 145

Photocatalyst

Intrinsic kinetics of first-order reactions in photocatalytic membranes and layers, 237

Photocatalytic reactor

Experimental analysis of a corrugated plate photocatalytic reactor, 145 Plug flow reactor

Simulation of a fixed bed adsorber packed with protonated cross-linked chitosan gel beads to remove nitrate from contaminated water, 153 Polluted stream

Treatment of a polluted stream by a fixed-bed biofilm reactor with sludge discharger and backwashing system, 265

Polyhydroxyalkanoates

Optimal control of bioreactors: a simultaneous approach for complex systems, 23

Pretreatment

Influence of pretreating activated sludge with acid and surfactant prior to conventional conditioning on filtration dewatering, 137

Pt/γ-Al<sub>2</sub>O<sub>3</sub> catalyst

Partial oxidation of light paraffins to synthesis gas in short contact-time reactors, 219

Rapid temperature increase

Effect of carbon dioxide absorbent on initial hydrogen production from epoxy resin under high-temperature and -pressure steam conditions, 125

Reaction

Intrinsic kinetics of first-order reactions in photocatalytic membranes and layers, 237

Reactive azo dves

Microbial decolorization of reactive azo dyes in a sequential anaerobic– aerobic system, 169

Reactive distillation

Application of side reactors on ETBE reactive distillation, 35

Reactor

Intrinsic kinetics of first-order reactions in photocatalytic membranes and layers, 237

Rh/α-Al<sub>2</sub>O<sub>3</sub> catalyst

Partial oxidation of light paraffins to synthesis gas in short contact-time reactors, 219

# Selective hydrogenation

Selective hydrogenation of 1,3-butadiene: improvement of selectivity by using additives, 45

Selective liquid hydrogenation of long chain linear alkadienes on molybdenum nitride and carbide modified by oxygen, 213

# Self-propagating reactions

On the use of industrial scraps for the treatment of zinc hydrometallurgical wastes by self-propagating reactions,247

### Semiempirical model

A semiempirical model for bacterial growth and bioleaching of *Acidithiobacillus* spp., 77

#### Short contact time

Partial oxidation of light paraffins to synthesis gas in short contact-time reactors, 219

#### Side reactor

Application of side reactors on ETBE reactive distillation, 35 Simultaneous optimization

Optimal control of bioreactors: a simultaneous approach for complex systems, 23

#### Sludge discharger

Treatment of a polluted stream by a fixed-bed biofilm reactor with sludge discharger and backwashing system, 265

# Sparger design/effect

Effect of superficial gas velocity on gas hold-up profiles in foaming liquids in bubble column reactors, 53

# Specific interfacial area

Effect of hydrodynamics on mass transfer in a gas-liquid oscillatory baffled column, 59

### Steam reforming

Kinetic study of *iso*-octane steam reforming over a nickel-based catalyst, 131

### Subcritical water

Kinetics on the hydrolysis of fatty acid esters in subcritical water, 1

#### Surfactant

Influence of pretreating activated sludge with acid and surfactant prior to conventional conditioning on filtration dewatering, 137

# Three phase fluidization

Liquid holdup in turbulent bed contactor, 203

### Transport phenomena

A semiempirical model for bacterial growth and bioleaching of *Acidithiobacillus* spp., 77

# Turbulent bed contactor

Liquid holdup in turbulent bed contactor, 203

#### Vinvl acrylat

Biocatalytic esterification of  $\beta$ -methylglucoside for synthesis of biocompatible sugar-containing vinyl esters, 15

#### Vinyl methacrylate

Biocatalytic esterification of  $\beta$ -methylglucoside for synthesis of biocompatible sugar-containing vinyl esters, 15

#### VOC combustion

Modeling of the deactivation kinetics for the combustion of ethyl acetate and benzene present in the air stream over ZSM-5 catalyst loaded with chromium, 161

# Water purification

Intrinsic kinetics of first-order reactions in photocatalytic membranes and layers, 237

### XPS

Selective liquid hydrogenation of long chain linear alkadienes on molybdenum nitride and carbide modified by oxygen, 213

# Zeolite catalysis

Effectiveness factor for zeolite catalysed isomerization reactions,