

Contents

Preface <i>by G. Nützmann, P. Viotti, P. Aagaard</i>	v
--	---

1 Processes

The unsaturated zone – a neglected component of nature D. Ronen, S. Sorek	3
Use of stable isotope analysis to assess biodegradation of petroleum hydrocarbons in the unsaturated zone. Laboratory studies, field studies, and mathematical simulations D. Bouchard, D. Hunkeler, P. Höhener, R. Aravena, M. Broholm, P. Kjeldsen	17
A model assessing bioavailability of persistent organic pollutants in soil G. Fragoulis, M. Trevisan, E. Puglisi, E. Capri	39
Geochemical changes under variably saturated conditions during artificial recharge via ponded infiltration – A field study J. Greskowiak, G. Massmann, H. Prommer, G. Nützmann, A. Pekdeger	51
Transport of Cr(VI), Ni(II) and Mn(II) through metallurgical wastes. Batch and column experiments R. Rodríguez, L. Candela	65
Modeling adsorption-desorption processes of Cu on montmorillonite and the effect of competitive adsorption with a cationic pesticide T. Undabeytia, S. Nir, G. Rytwo, C. Serban, E. Morillo, C. Maqueda	79
NMR spectroscopy: a tool to study interactions between organic pollutants and soil components? A.M. Delort, B. Combourieu, N. Haroune, P. Besse, M. Sancelme	93

2 Modelling

Incorporating geomicrobial processes in reactive transport models of subsurface environments P. Regnier, A.W. Dale, C. Pallud, Y. van Lith, S. Bonneville, C. Hyacinthe, M. Thullner, A.M. Laverman, P. Van Cappellen	107
--	-----

Consequences of Different Kinetic Approaches for Simulation of Microbial Degradation on Contaminant Plume Development	
D. Schäfer, A. Manconi, S. Grandel, A. Dahmke	127
Natural Attenuation in the unsaturated zone and shallow groundwater: coupled modeling of vapor phase diffusion, biogeochemical processes and transport across the capillary fringe	
U. Maier, P. Grathwohl	141
Enhancement of solute spreading in soils due to particle-facilitated transport and preferential flow	
S. Bold, R. Liedl, P. Grathwohl	157
Multiphase and Multi-component Interactions through the Unsaturated Saturated Zone Field and Model Study	
S. Sorek, M. Kuznetsov, A. Yakirevich, D. Ronen	171
Solute contaminant transport in variably saturated dual-porosity/dual permeability chalk: field tracer experiments and modelling	
S. Brouyère	187
Integration of pedotransfer functions and topographical data to obtain soil hydraulic properties at catchment scale	
M. Palladino, N. Romano, A. Santini	197
Analytical Model for Gravity-Driven Drainage	
G. Severino, A. Comegna, A. Sommella	209

3 Integration

Hydrogeophysical characterization of subsurface solute transport at the Krauthausen test site: experiments and numerical modelling	
H. Vereecken, A. Kemna, A. Tillmann, J. Vanderborght, A. Verweerd	219
Tracer Experiments on Field Scale for Parameter Estimation to calibrate Numerical Transport Models	
J. Fank, G. Rock	239
Biogeochemical modeling of reactive transport applied to laboratory and field studies on jet-fuel contamination	
P. Aagaard, J.B.S. Knudsen, M.R. Klonowski, G. Breedveld, Z. Zheng	251

Assessing the potential for natural or enhanced in-situ bioremediation at a TCE-contaminated site by coupling process analysis and modeling F. Aulenta, A. Di Fazio, M. Leccese, M. Majone, M. Petrangeli Papini, S. Rossetti, N. Stracqualursi, V. Tandoi, P. Viotti	265
Partial source treatment by in-situ technologies – a review of limits, advantages and challenges S. Grandel, A. Dahmke	279

Reactive Transport in Soil and Groundwater
Processes and Models

Nützmann, G.; Viotti, P.; Aagaard, P. (Eds.)

2005, XVIII, 298 p., Hardcover

ISBN: 978-3-540-26744-7