Jianming Xu
Pan Ming Huang
Editors

Molecular Environmental Soil Science at the Interfaces in the Earth's Critical Zone

ZHEJIANG UNIVERSITY PRESS
浙江大学出版社

Springer

Jianming Xu
Pan Ming Huang

Molecular Environmental Soil Science at the Interfaces in the Earth's Critical Zone

With 132 figures

ZHEJIANG UNIVERSITY PRESS
浙江大学出版社

Springer

图书在版编目（CIP）数据

地球关键区界面反应：分子水平的环境土壤科学＝Molecular Environmental Soil Science at the Interfaces in the Earth's Critical Zone：英文／徐建明，黄盘铭主编. —杭州：浙江大学出版社，2009.10
ISBN 978-7-308-06602-0

Ⅰ.地… Ⅱ.①徐…②黄… Ⅲ.环境土壤学－国际学术会议－文集－英文 Ⅳ.X144－53

中国版本图书馆 CIP 数据核字（2009）第 160469 号

Not for sale outside Mainland of China
此书仅限中国大陆地区销售

地球关键区界面反应：分子水平的环境土壤科学

徐建明　黄盘铭　主编

责任编辑　黄娟琴
封面设计　Frido Steinen-Broo
出版发行　浙江大学出版社
网址：http://www.zjupress.com
Springer-Verlag GmbH
网址：http://www.springer.com
排　　版　杭州中大图文设计有限公司
印　　刷　杭州富春印务有限公司
开　　本　880mm×1230mm　1/16
印　　张　22.75
字　　数　1021 千
版 印 次　2009 年 10 月第 1 版　2009 年 10 月第 1 次印刷
书　　号　ISBN 978-7-308-06602-0（浙江大学出版社）
ISBN 978-3-642-05296-5（Springer-Verlag GmbH）
定　　价　230.00 元

版权所有 翻印必究　印装差错 负责调换
浙江大学出版社发行部邮购电话（0571）88925591

Jianming Xu
Pan Ming Huang

Molecular Environmental Soil Science at the Interfaces in the Earth's Critical Zone

Editors

Jianming Xu (Zhejiang University, Hangzhou, China)
Pan Ming Huang † (University of Saskatchewan, Saskatoon, Canada)

Organizing Committee

Chair	Jianming Xu (China)	
Co-Chair	Pan Ming Huang † (Canada)	
Members	Antonio Violante (Italy)	Koji Wada (Japan)
	Hwei Hsien Cheng (USA)	Renfang Shen (China)
	Jacques Berthelin (France)	Richard G. Burns (Australia)
	Jianmin Zhou (China)	Winfried E. H. Blum (Austria)

International Scientific Committee

Albert Lee Page (USA)
Benny K. G. Theng (New Zealand)
Baoshan Xing (USA)
Caixian Tang (Australia)
Domy C. Adriano (USA)
David Coleman (USA)
Donald Lewis Sparks (USA)
Fusuo Zhang (China)
Glenn A. Waychunas (USA)
G. J. Churchman (Australia)
Geoffrey Michael Gadd (UK)
Garrison Sposito (USA)
Galina Vasilievna Motuzova (Russia)
Haruo Shindo (Japan)
I. Koegel-Knobner (Germany)
Isaac Shainberg (Israel)
Jeffrey A. Baldock (Australia)
Joe Boris Dixon (USA)
Jill F. Banfield (USA)
Jay Gan (USA)
Joseph J. Pignatello (USA)
Jianjun Wu (China)
Jean-Marc Bollag (USA)
Jinshui Wu (China)
Ken Racke (USA)
Kiyoto Sakurai (Japan)
Murray B. McBride (USA)
M. Chino (Japan)
Malcolm E. Sumner (USA)
Michael F. Hochella Jr. (USA)
Morris Schnitzer (Canada)
Margaret S. Torn (USA)
Nicola Senesi (Italy)
Philippe Hinsinger (France)
Rattan Lal (USA)
Ravi Naidu (Australia)
Satish C. B. Myneni (USA)
Scott Fendorf (USA)
Sabine Goldberg (USA)
Siobhán Staunton (France)

此为试读,需要完整PDF请访问: www.ertongbook.com

Shu Tao (China)
Scott X. Chang (Canada)
Udo Schwertmann (Germany)
Ward Chesworth (Canada)
Yongguan Zhu (China)
Yongmin Luo (China)
Zucong Cai (China)
Zhihong Xu (Australia)

National Scientific and Organizing Committee of China

Changqing Song	National Natural Science Foundation of China, Beijing
Changyong Huang	Zhejiang University, Hangzhou
Dongmei Zhou	Institute of Soil Science, CAS, Nanjing
Fan Liu	Huazhong Agricultural University, Wuhan
Gengxin Pan	Nanjing Agricultural University, Nanjing
Haizhen Wang	Zhejiang University, Hangzhou
Hang Li	Southwest University, Chongqing
Jiachun Shi	Zhejiang University, Hangzhou
Jianjun Wu	Zhejiang University, Hangzhou
Jianming Xu	Zhejiang University, Hangzhou
Jizheng He	Research Center for Eco-Environmental Sciences, CAS, Beijing
Lixiang Zhou	Nanjing Agricultural University, Nanjing
Lizhong Zhu	Zhejiang University, Hangzhou
Min Liao	Zhejiang University, Hangzhou
Minggang Xu	The Chinese Academy of Agricultural Sciences, Beijing
Mingkui Zhang	Zhejiang University, Hangzhou
Qiaoyun Huang	Huazhong Agricultural University, Wuhan
Qimei Lin	China Agricultural University, Beijing
Qixing Zhou	Institute of Applied Ecology, CAS, Shenyang
Renkou Xu	Institute of Soil Science, CAS, Nanjing
Sen Dou	Jilin Agricultural University, Changchun
Shenggao Lu	Zhejiang University, Hangzhou
Shiqiang Wei	Southwest University, Chongqing
Xin Jiang	Institute of Soil Science, CAS, Nanjing
Xingmei Liu	Zhejiang University, Hangzhou
Xudong Zhang	Institute of Applied Ecology, CAS, Shenyang
Yahai Lu	China Agricultural University, Beijing
Yan He	Zhejiang University, Hangzhou
Yingxu Chen	Zhejiang University, Hangzhou

Sponsors

International Union of Soil Sciences (IUSS)
The International Union of Pure and Applied Chemistry (IUPAC)
Organisation for the Prohibition of Chemical Weapons (OPCW)
National Natural Science Foundation of China (NSFC)
Soil Science Society of China (SSSC)
Y.C. Tang Disciplinary Development Fund
Zhejiang University
Zhejiang Provincial Natural Science Foundation of China
Zhejiang Provincial Key Laboratory of Subtropical Soil and Plant Nutrition

Preface

Resource depletion and environmental problems are challenging the world for its sustainability. The theme of the International Symposium of Molecular Environmental Soil Science at the Interfaces in the Earth's Critical Zone (ISMESS) is of special significance for understanding environmental pollution and global change processes. The Critical Zone (CZ) is the system of coupled chemical, biological, physical, and geological processes operating together to support life at the Earth's surface. Further advance on the frontiers of knowledge on this subject matter requires scientists to cross disciplines and scales to integrate understanding of processes in the CZ, ranging in scale from the environmental mineral-organism-humus-water-air interfaces to the impact on the globe and humankind. These fundamental interactive processes in the CZ have an enormous impact on ecosystem productivity, services, and integrity, and on human welfare.

Carbon is a major component of soils. Globally, the mass of soil organic carbon is more than that of carbon in living matter and in the atmosphere combined. However, the CO_2 emission from the soil to the atmosphere is the primary mechanism of soil carbon loss. Agricultural practices and land use conversion contribute substantially (approx. 32%) to the total anthropogenic CO_2 emission. Soil organo-mineral-microbe interactions affect carbon turnover and sequestration. Our understanding of the role of mineral colloids in carbon transformation, dynamics, and sequestration in the environment would contribute to developing innovative management strategies to minimize its impact on climate change.

The interfacial interactions at the soil-plant(root)-microbe interface (rhizosphere) profoundly affect the physicochemical and biological processes such as transformation, fate, and toxicity of heavy metals and organic pollutants. Microbial population in the rhizosphere can be 10~100 times larger than the population in the bulk soils. Therefore, the rhizosphere is bathed in root exudates and microbial metabolites and the chemistry and biology at the soil-root interface is governed by biotic (plant roots, microbes) and abiotic (physicochemical reactions) interactions, and thus differs significantly from those in bulk soil. Little is known about the physicochemical and biological interfacial interactions in the rhizosphere, especially at the molecular level. The dynamics, transformations, bioavailability, and toxicity of metal pollutants and anthropogenic organics should be influenced enormously by the chemistry and biology of the rhizosphere.

Nanoparticles are discrete nanometer (10^{-9} m) scale assemblies of atoms. A significant fraction of atoms are exposed on surfaces rather than contained in the particle interior of nanoparticles. The biogeochemical and ecological impacts of nanomaterials are some of the fastest growing areas of research today, with not only vital scientific but also environmental, economic, and societal consequences. Little is known about the distribution, formation, transformation, structural and surface chemistry of environmental nanoparticles and their biogeochemical and ecological impacts.

Material cycling and energy flow processes are affected both by abiotic and biotic factors, which affect ecosystem integrity and the environmental quality. However, there are great knowledge gaps on how and to what extent the processes are affected by the interfacial interactions of environmental nanoparticles, especially at the molecular level. The research on this subject matter should, therefore, be an issue of intense interest on a global scale for years to come.

The objective of this symposium is to provide a forum for the interactions and communication of soil chemists, mineralogists, microbiologists, and physicists with allied scientists including pure chemists, biologists, environmental scientists, ecologists, and ecotoxicologists to address the current state-of-the-art on "Molecular Environmental Soil Science". The main sessions of the symposium were: 1) The Role of Mineral Colloids in Carbon Turnover and Sequestration and the Impact on Climate Change; 2) Biogeochemical Interfacial Reactions and the Transformation, Transport and Fate of Vital and Toxic Elements; 3) Anthropogenic Organics, Crop Protection and Ecotoxicology; 4) Environmental Nanoparticles: Distribution, Formation, Transformation, Structural and Surface Chemistry, and Biogeochemical and Ecological Impacts; and 5) Environmental Processes & Ecosystem Health. Two eminent scientists of the International Union of Pure and Applied Chemistry (IUPAC)

were invited to serve as Plenary Lecturers (IUPAC Lecturers) and 18 world renowned leading scientists were invited to give lectures in the 5 sessions of the symposium.

The symposium was held in Zhejiang University, Hangzhou, China on October 10-14, 2009. Zhejiang University, founded in 1897, is a key comprehensive university whose academic and research endeavors cover eleven disciplines, namely philosophy, literature, history, education, science, economics, law, management, engineering, agriculture and medicine. The University now has 112 specialties for undergraduate studies, and it is entitled to confer masters degrees in 317 programs and doctoral degrees in 283 programs. Under its administration there are 14 National Key Laboratories, 2 National Engineering Research Centers and 3 National Engineering Technology Centers. Besides, it has set up 35 national key specialties and 43 post-doctor stations. Soil Science in Zhejiang University is the National Key Discipline of China.

The participants of this symposium represent five continents: Asian delegates from China, Iran, Pakistan, Vietnam, D.P.R. Korea and R.O. Korea; European scientists from Austria, Belgium, France, Italy, the UK, Russia and Spain; Australasian participants from both Australia and New Zealand; delegates from the USA, Canada and Brazil in the Americas; and representatives from Egypt, Kenya and South Africa on the African continent.

It is the first time to hold such an international symposium in China. The IUPAC Project Committee has contributed to funding the symposium under the program for conferences on New Directions in Chemistry. The Project Committee noted that the Conference identifies, and builds on, the need to view and understand the CZ at the molecular level. It will provide a novel interface that will facilitate the integration of contributions from traditionally separate disciplines. It will add a molecular and nanoparticle dimension to a field of endeavor that has traditionally been viewed on a different scale (dimension). It will identify and focus on emerging challenges for research that will be predominantly cross-discipline in nature. It will help to secure the appreciation of the relevance of chemistry to this field that is of utmost importance to sustain humankind. Therefore, it is hoped that the symposium would lead to identification of gaps in knowledge and as such to provide future research directions and promote research on soil processes at the interfaces at the molecular level in the Earth's Critical Zone. It is expected to advance the frontiers of knowledge on biophysico-chemical processes in soil and related environmental systems and their biogeochemical and ecological impacts and also to promote education in this extremely important and challenging area of science for years to come.

The book of proceedings is composed of extended abstracts that present new ideas, methods, findings, and experiences on the 5 sessions of the symposium. All the extended abstracts have been subject to peer review by external referees, by International Scientific Committee members of the symposium, and by the editors of the proceedings. On behalf of the Organizing Committee, we would like to thank members of the International Scientific Committee and the authors for their invaluable collaboration. Special thanks are extended to our sponsors: The International Union of Soil Sciences, The International Union of Pure and Applied Chemistry, Organization for the Prohibition of Chemical Weapons, National Natural Science Foundation of China, Soil Science Society of China, Y.C. Tang Disciplinary Development Fund, Zhejiang University, Zhejiang Provincial Natural Science Foundation of China, and Zhejiang Provincial Key Laboratory of Subtropical Soil and Plant Nutrition. Valuable personal time of Mr. Jianjun Wu, Dr. Yan He, concerning the careful revising, typesetting and proof-checking of this book is also greatly acknowledged.

Dr. Jianming Xu
Chair of the Organizing Committee
ISMESS 2009

Dr. Pan Ming Huang †
Co-Chair of the Organizing Committee
ISMESS 2009

August 2009

Contents

Plenary Lectures by IUPAC Scientists (1)

Advances in the Use of Synchrotron Radiation to Elucidate Environmental Interfacial Reaction Processes and Mechanisms in the Earth's Critical Zone

Donald Lewis Sparks (3)

Microbial Role in Global Biogeochemical Cycling of Metals and Metalloids at the Interfaces in the Earth's Critical Zone

Geoffrey Michael Gadd (5)

Session 1 The Role of Mineral Colloids in Carbon Turnover and Sequestration and the Impact on Climate Change (9)

Soils as Source and Sink of Environmental Carbon Dioxide

Rattan Lal (11)

Impacts of Mineral Colloids on the Transformation of Biomolecules and Physical and Chemical Protection of Soil Organic Carbon

Pan Ming Huang † (13)

Unravelling the Biogeochemical Cycles of Carbon and Nutrients in Forest Ecosystems: Innovative Approaches with Advanced Stable Isotope and NMR Techniques as well as Soil Chemical and Physical Methods

Zhihong Xu (17)

Effects of Soil Management from Fallow to Grassland on Soil Microbial and Organic Carbon Dynamics

Yuping Wu, Sarah Kemmitt, Jianming Xu, Philip C Brookes (20)

Effect of Long-term Fertilization on the Sequestration Rate of Physical Fractions of Organic Carbon in Red Soil of Southern China

Minggang Xu, Xiaogang Tong, Xiujun Wang (23)

Abiotic Catalysis of the Maillard and Polyphenol-Maillard Humification Pathways by Soil Clays from Temperate and Tropical Environments

Ailsa Ghillaine Hardie, James Joseph Dynes, Leonard Myrell Kozak, Pan Ming Huang † (26)

Effect of Organic Matter Application on CP-MAS-^{13}C-NMR Spectra of Humic Acids from a Brown Soil

Sen Dou, Kai Li (29)

The Composition and Organic Carbon Distribution of Organo-mineral Complex in a Black Soil as Influenced by Land-use Change and Long-term Fertilization

Xiaozeng Han, Xueying Hou, Haibo Li (32)

Characterization of Dissolved Organic Matter Derived from Rice Straw at Different Decay Stages

Hualin Chen, Jiangmin Zhou (35)

Organic Fertility of Severely Eroded Soils: Effect of Organic and Inorganic Fertilization and Cropping Patterns

Wiqar Ahmad, Farmanullah Khan, Muhammad Naeem (38)

Session 2 Biogeochemical Interfacial Reactions and the Transformation, Transport and Fate of Vital and Toxic Elements (41)

Role of Biomolecules in Influencing Transformation Mechanisms of Metals and Metalloids in Soil Environments
Antonio Violante (43)

Biogeochemical Processes of Arsenic in Paddy Soils
Yongguan Zhu, Wenju Liu, Guilan Duan, Paul Williams, Guoxin Sun (47)

Soil Microorganism-mineral-organic Matter Interactions and the Impact on Metal Mobility
Jacques Berthelin (49)

Rhizosphere Processes and Management for Improving Nutrient Use Efficiency and Crop Productivity
Fusuo Zhang, Jianbo Shen, Jingying Jing, Long Li, Xinping Chen (52)

Effect of Soil Hg Stress on Expression of Heat Shock Protein Gene in Springtail *Folsomia Candida*
Yurong Liu, Yuanming Zheng, Yu Da, Jizheng He (55)

Antimony, Arsenic and Other Toxic Elements in the Topsoil of an Antimony Mine Area
Xiangqin Wang, Mengchang He, Jianhong Xi, Xiaofei Lu, Jun Xie (58)

Microcalorimetric and Potentiometric Titration Studies on the Adsorption of Copper by *P. putida* and *B. thuringiensis* and Their Composites with Minerals
Linchuan Fang, Peng Cai, Pengxiang Li, Wei Liang, Qiaoyun Huang (62)

Sorption, Transformation and Migration of Zn in Some Soils with Percolated Water Regime
Galina Vasilievna Motuzova, Natalia Jurievna Barsova (66)

Speciation and Biochemical Transformations of Sulfur and Copper in Rice Rhizosphere and Bulk Soil—XANES Evidence of Sulfur and Copper Associations
Huirong Lin, Jiyan Shi, Bei Wu, Jianjun Yang, Yingxu Chen, Yidong Zhao, Tiandou Hu (69)

Population Dynamics of Ammonia Oxidizing Bacteria and Archaea and Relationships with Nitrification Rate in New Zealand Grazed Grassland Soils
Hong Jie Di, Keith C. Cameron, Jupei Shen, Jizheng He, Chris S. Winefield, Maureen O'Callaghan, Saman Bowatte (72)

Plant Clonal Systems as a Strategy for Nitrate Pollution Removal in Cold Latitudes
Derong Lin, Lijiang Hu, Hong You, Dipayn Sarkar, Baoshan Xing, Kalidas Shetty (75)

Effect of Ionic Strength on Specific Adsorption of Ions by Variable Charge Soils: Experimental Testification on the Adsorption Model of Bowden *et al.*
Renkou Xu, Jun Jiang, Cheng Cheng (78)

Estimation of the Electrostatic Repulsive Force among Charged Clay Particles in Aqueous Systems
Hang Li, Jie Hou, Xinmin Liu (81)

Kinetics of As(III) and Cr(III) Oxidation by OH-birnessites with Various Average Oxidation States (AOSs)
Xionghan Feng, Jiali Xu, Fan Liu, Wenfeng Tan (85)

Adsorption/Desorption Kinetics of Zn in Soils: Influence of Phosphate
H. Magdi Selim, Keli Zhao, Lixia Liao, Jianming Xu (88)

Bioavailability and Redistribution of Trace Metals in Soil Washed with a Sulfosuccinamate Formulation
Maria del Carmen Hernández-Soriano, Aránzazu Pea, Maria Dolores Mingorance (91)

Fractions of Cd, Zn and Their Correlation with Soil Black Carbon in Contaminated Soils Affected by a Smelting Furnace
Ling Liu, Na Li, Longhua Wu , Zhu Li, Jinping Jiang, Yugen Jiang, Xiya Qiu, Yongming Luo (94)

Formation of the Metal Complexes between Protoporphyrin IX and Divalent Metal Cations in the Environment
Chi-In Jung, Jeong-Im Yang, Chul-Ho Park, Jee-Bum Lee, Hyoung-Ryun Park (97)

此为试读,需要完整PDF请访问: www.ertongbook.com

The Impact of Urban Activities on Heavy Metal Distribution and Bioavailability Index in Selected Tropical Urban Soils

John Onam Onyatta, Charles Kibii Chepkwony, Peter Olengo Ongoma (100)

Nitrate Accumulation as Affected by Nitrogen Fertilization and Foliar Application of Micronutrients in Rocket Plant

Ayman Mohamed El-Ghamry (103)

Fractions of Heave Metals in Paddy Fields and Their Spatial Relationship to Rice Plant

Keli Zhao, Xingmei Liu, Jiachun Shi, Jianming Xu (110)

Competitive Sorption of Nickel and Cadmium in Soils

Lixia Liao, Amitava Roy, Gregory Merchan, H. Magdi Selim (112)

Interaction Effect between P and K Fertilization on Faba Bean Plant (*Vicia* faba L.) Grown under Salt Affected Soils

Mohamed Rida Abd EL-Hady Mohamed Ebrahem, Adel Mohamed Abd EL-Hameed Abd EL-Mohsen (115)

Design of a POSS-modified Zeolite Structure and the Study of the Enhancement of Ammonia-nitrogen Removal from Drinking Water

Derong Lin, Lijiang Hu, Qun Zhang, Hong You (118)

Study on Immobilizing Soil Exogenous Lead Using Phosphate Rock

Guanjie Jiang, Hongqing Hu, Yonghong Liu, Chang Yang, Haizheng Yang (121)

Long-term Fertilizer Application Alters the Balance and Vertical Distribution of Phosphorus in a Calcarosol

Dang Thanh Vu, Caixian Tang, Roger Armstrong (124)

Nitrate Nutrition But Not Rhizosphere pH Enhances Zinc Hyperaccumulation in *Thlaspi caerulescens* (Prayon)

Alison C Monsant, Gaelle Ng Kam Chuen, Yaodong Wang, Caixian Tang (127)

Adsorption of Phosphate and Arsenate on New Al_{13}-Oxalate Precipitate: Spectroscopic and Macroscopic Competitive Adsorption Investigations

Jing Liu, Fenghua Zhao (130)

Short-term Changes of pH Values and Aluminium Activity in Acid Soils after the Application of Nitrogen Fertilizers

Hejie Pi, Qingru Zeng, Zhaohui Jiang, Jianyu Liao, Xiaoyou Feng, Yulin Sun (134)

Transformation of Nitrogen and Its Effects on Metal Elements by Coated Urea Application in Soils from South China

Zhaohui Jiang, Qingru Zeng,Hejie Pi, Bohan Liao, Xiaoyou Feng, Yulin Sun (137)

Impacts of Copper on Rice Growth and Yield as Affected by Pig Manure

Jianjun Wu, Xiuling Yu, Zaffar Malik, Hao Chen, Jianming Xu (141)

The Effects of Several Amendments on Forms of Lead and Its Uptake by Two Cultivars of *Brassica Chinensis* in an Acid Red Soil

Xia Li, Jiachun Shi, Jianming Xu, Jianjun Wu (144)

Does Iron Plaque Improve the Uptake and Translocation of Lead by Broad-leaf Cattail in Lead-contaminated Soils

Shunqin Zhong, Jianming Xu, Jiachun Shi, Jianjun Wu (148)

The Influence of Zn^{2+} and Mn^{2+} on Pb^{2+} Adsorption Behaviors of Birnessite

Fan Liu, Wei Zhao, Wenfeng Tan, Xionghan Feng (151)

Removal of Arsenite in Water Using Biogenic Schwertmannite as Adsorbent

Yuehua Liao, Jianru Liang, Lixiang Zhou (154)

Wien Effect Measurements in Soil Colloidal Suspensions: A Novel Method for Characterizing the Interactions between Charged Particles and Counter Ions

Yujun Wang, Dongmei Zhou, Chengbao Li, Haowen Zhu, Wei Wang, Jun Zhou (157)

Can Zn, Ca and Sulfate Amendments Affect Cadmium Uptake in Rice (*Oryza sativa* L.)

Linfei Hu, Jianming Xu, Jianjun Wu, Murray B. McBride (161)

Dynamics of As Species in the Interface of Soil and Rice Roots under Three Water Regimes
Wenju Liu, Lina Chen, Ying Wang (164)

Extra Supply of Calcium Is Not Required for Maximal Root Growth in the Nitrate and Phosphorus-rich Patch in an Acid Soil
Chandrakumara Weligama, Caixian Tang, Peter W.G. Sale, Mark K. Conyers, De Li Liu (167)

Effect of Natural Acid Peat Application on the Phytoextraction of Cadmium from Contaminated Soils
Iksong Ham, Jianming Xu, Linfei Hu, Pan Ming Huang † (170)

Session 3 Anthropogenic Organics, Crop Protection and Ecotoxicology (179)

Interaction of Anthropogenic Organic Chemicals with Organic Matter in Natural Particles
Joseph J. Pignatello (181)

Decontamination of Soils through Immobilization of Anthropogenic Organics by Biotic and Abiotic Catalysts
Jean-Marc Bollag (182)

Effects of "Aging" on Bioreactive Chemical Retention, Transformation, and Transport in Soil
Hwei Hsien Cheng, William C. Koskinen (184)

Interaction of Bttoxin with Organo-mineral Surfaces and Consequences for Its Fate in the Environment
Nordine Helassa, Sylvie Noinville, Philippe Déjardin, Jean-Marc Jano, Hervé Quiquampoix, Siobhán Staunton (187)

Microbial and Abiotic Interactions between Transformation of Reducible Pollutants and Fe(II)/(III) Cycles
Fangbai Li, Shungui Zhou, Xiaomin Li, Chunyuan Wu, Liang Tao (190)

Assessment of Availability of Phenanthrene and Pyrene in Aging Soil
Wanting Ling, Yuechun Zeng, Yanzheng Gao, Xuezhu Zhu (193)

Levels, Distributions and Profiles of Polychlorinated Biphenyls in Paddy Fields from Two Towns in a Typical Electronic Waste Recycling Area of Eastern China
Xianjin Tang, Chaofeng Shen, Wenli Liu, Congkai Zhang, Yingxu Chen (196)

Phytoremediation of Contaminated Soils with Polycyclic Aromatic Hydrocarbons and Its Ecologically Enhanced Techniques
Shiqiang Wei (200)

The Contribution of Rhizosphere to Remediation of Polycyclic Aromatic Hydrocarbons (PAHs) and Their Toxicity in Soil: Evaluating with Sequential Extraction and Toxicity Risk
Bin Ma, Huaihai Chen, Yan He, Jianming Xu (203)

Spectral Studies of the Toxin of *Bt* Adsorbed by Minerals
Qingling Fu, Hongqing Hu, Shouwen Chen, Li Huang, Qiaoyun Huang, Tongmin Sa (207)

Genotypic Differences in Responses of Wheat (*Triticum durum*) Roots to Oxytetracycline
Zhaojun Li, Xiaoyu Xie, Alin Song, Ruihuan Qi, Fenliang Fan, Yongchao Liang (210)

Dynamics of Dissolved Organic Carbon in the Rhizosphere of Ryegrass (*Lolium multiflorum* L.) Induced by PCBs Pollution
Na Ding, Malik Tahir Hayat, Yan He, Haizhen Wang, Jianming Xu (213)

Dynamic Behavior of Persistent Organic Pollutants in Soil and Their Interaction with Organic Matter
Malik Tahir Hayat, Jianming Xu, Na Ding, Tariq Mahmood (217)

Effect of Crude Water Extract of *Fructus Gleditsiae Sinensis* on the Removal of Phenanthrene and Pyrene from Contaminated Soils
Ran Wei, Jun Wang, Hongyu Yang, Yi Chen, Peifen Liu, Jinzhi Ni (223)

Distribution Pattern, Sources and Potential Risks of Polycyclic Aromatic Hydrocarbons in Urban Soils of Fuzhou City, China
Jinzhi Ni, Xiaoyan Li, Juan Guo, Jun Wang, Hongyu Yang, Ran Wei (226)

Thermal Degradation of Chloroteracycline in Animal Manure and Soil
Mingkui Zhang, Huimin Zhang (229)
Enhancement of Atrazine Degradation in Paddy Soils by Organic Amendments
Chaolan Zhang, Jianming Xu, Bin Yao (232)

Session 4 Environmental Nanoparticles: Distribution, Formation, Transformation, Structural and Surface Chemistry, and Biogeochemical and Ecological Impacts (241)

Soil Science at the Nanoscale: A New View of Structure, Stability, and Reactivity
Patricia A. Maurice (243)
Environmental and Colloidal Behavior of Engineered Nanoparticles
Baoshan Xing (246)
Humic Substances as Natural Nanoparticles Ubiquitous in the Environment
Nicola Senesi (249)
Degradation of Organochlorine Compounds Using Zero Valent Iron (ZVI) Nano Particles Impregnated in Hydrophobic Modified Bentonite
Sandro Froehner, M. Maceno, E.C. Da Luz, K.S. Machado, F. Falcão (251)
Effect of Electrolyte on Adsorption/Desorption of Cu^{2+} on Nano-particle Mn Oxide
Wenfeng Tan, YuanPeng Wang, Fan Liu, Xionghan Feng (255)
Sorption of Selected Organic Compounds in Two Black Carbon Particles
Yang-hsin Shih, Po-Hsin Su (258)
Adsorption and Inhibition of Butyrylcholinesterase by Different Nanoparticles
Zhenyu Wang, Kai Zhang, Jian Zhao, Fengmin Li, Dongmei Gao, Baoshan Xing (262)
Characterization of Soil Clay Minerals Using Mid-infrared Spectroscopy
Changwen Du, Guiqin Zhou, Jing Deng, Jianmin Zhou (265)
Investigation Mechanism of MTBE on Wall of Carbon Nanotube (CNT) to Other Products from Air-groundwater (in Environment): MNDO
Leila Mahdavian, Mahmoud Raouf (269)
Extraction of Nanoparticles from Argosols and Ferrosols
Wenyan Li, Jianming Xu, Pan Ming Huang † (275)
Surface and Adsorption Characteristics of Black Carbon from Different Sources
Mingkui Zhang, Zhaoyun Liu (279)
A High-resolution TEM Investigation of Nanoparticles in Soils
Rui Zhu, Shenggao Lu (282)
Adsorption and Desorption of Tylosin on the Colloidal Fractions of Black Soil
Chunhong Wang, Aifang Xue, Wei Liang, Peng Cai, Qiaoyun Huang (285)

Session 5 Environmental Processes and Ecosystem Health (289)

Spatial and Temporal Dimensions of Environmental Processes in Soils—An Integrated Approach
Winfried E.H. Blum (291)
Emission, Fate and Exposure Risk of Polycyclic Aromatic Hydrocarbons in China
Shu Tao, Yanxu Zhang (293)
How Do Microbial Extracellular Enzymes Locate and Degrade Natural and Synthetic Polymers in Soil
Richard G. Burns (294)

Influence of Solution Composition on the Exfoliation of Organic Matter from a Model Soil System
Charisma Lattao, Robert L. Cook (298)
Transfer of Soil Nickel to Crops in Suburban Areas and Their Healthy Risk in Fujian Province, Southeast China
Dan Luo, Yanhui Chen, Guo Wang (301)
Transformation Dynamics and Memory Effect of Soil Amino Sugars Amended with Available Substrates
Hongbo He, Xudong Zhang (304)
Evaluating the Maturity and Quality of Solid Waste Compost through Phospholipid Fatty Acid Biomarkers
Ghulam Jilani, Jianming Xu, Yuping Wu, Zhongzhen Liu (307)
Effects of Depleted Uranium on Soil Microbial Activity: A Bioassay Approach Using ^{14}C-labeled Glucose
Rizwan Ahmad, David L. Jones (311)
Is the Alkalinity within Agricultural Residues Soluble
Clayton R Butterly, Jeffrey A Baldock, Jianming Xu, Caixian Tang (314)
Soil Micro-interfaces Control the Fate of Pollutants in Soil Environment
Jizheng He, Yuanming Zheng (317)
Soil Microbial Biomass and pH as Affected by the Addition of Plant Residues
Yunfeng Wang, Ling Zhou, Jianjun Wu, Clayton R Butterly, Caixian Tang, Jianming Xu (320)
Changes of Soil Enzyme Activities in the Process of Karst Forest Degradation in Southwest China
Fang Liu, Shijie Wang, Xiuming Liu, Yuansheng Liu, Jian Long (323)
Effect of *cry1Ab* Gene Transformation on the Microbial Mediated Decomposition of Rice Residues under Intensive Rice Cropping System
Haohao Lu, Weixiang Wu, Yingxu Chen (325)
Characterization of Microbial Community and Phosphorus-releasing Bacteria in the Sediments of a Eutrophic Shallow Lake, Eastern China
Yichao Qian, Yingxu Chen, Jiyan Shi, Liping Lou (328)
Carbon Compounds Differ in Their Effects on Soil pH and Microbial Respiration
Fatima Rukshana, Clayton R Butterly, Jianming Xu, Jeffrey A Baldock, Caixian Tang (331)
Effects of Soil Water Content on Soil Microbial Biomass and Community Structure Based on Phospholipid Fatty Acid Analysis
Yuping Wu, Yan He, Haizhen Wang, Jianming Xu (334)
Effects of Cadmium and Mercury alone and in Combination on the Soil Microbial Community Structural Diversity
Min Liao, Haijun Zhang, Shouna Yu, Chengli Chen, Changyong Huang (337)

Author Index (343)

Plenary Lectures by IUPAC Scientists

此为试读,需要完整PDF请访问: www.ertongbook.com