

# Environmental Science and Pollution Research

Volume 22 • Number 2 • January 2015

## Special Issue: Advanced Oxidation Technologies: Advances and Challenges in IberoAmerican Countries

Guest Editors: Vítor J. P. Vilar, Sixto Malato, Dionysios D. Dionysiou

### Advanced oxidation technologies: advances and challenges in Iberoamerican countries

V.J.P. Vilar · S. Malato · D.D. Dionysiou 759

### Solar energy for wastewater treatment: review of international technologies and their applicability in Brazil

R.B.P. Marcelino · M.T.A. Queiroz · C.C. Amorim · M.M.D. Leão · F.F. Brites-Nóbrega 762

### Synthesis and characterization of TiO<sub>2</sub> and TiO<sub>2</sub>/Ag for use in photodegradation of methylviologen, with kinetic study by laser flash photolysis

D.D. Ramos · P.C.S. Bezerra · F.H. Quina · R.F. Dantas · G.A. Casagrande · S.C. Oliveira · M.R.S. Oliveira · L.C.S. Oliveira · V.S. Ferreira · S.L. Oliveira · A. Machulek Jr. 774

### Influence of activated carbon upon the photocatalytic degradation of methylene blue under UV-vis irradiation

J. Matos · R. Montaña · E. Rivero 784

### Photocatalytic degradation of indigo carmine by hydrothermally synthesized Bi<sub>2</sub>MoO<sub>6</sub> in presence of EDTA

C. Sánchez Trinidad · A. Martínez-de la Cruz · E. López Cuéllar 792

### TiO<sub>2</sub> sol-gel for formaldehyde photodegradation using polymeric support: photocatalysis efficiency versus material stability

M.S. Curcio · M.P. Oliveira · W.R. Waldman · B. Sánchez · M.C. Canela 800

### Synthesis and characterization of N-modified titania nanotubes for photocatalytic applications

R.A.R. Monteiro · F.V.S. Lopes · R.A.R. Boaventura · A.M.T. Silva · V.J.P. Vilar 810

### Solar photocatalytic gas-phase degradation of *n*-decane—a comparative study using cellulose acetate monoliths coated with P25 or sol-gel TiO<sub>2</sub> films

S.M. Miranda · F.V.S. Lopes · C. Rodrigues-Silva · S.D.S. Martins · A.M.T. Silva · J.L. Faria · R.A.R. Boaventura · V.J.P. Vilar 820

### Performance evaluation of different solar advanced oxidation processes applied to the treatment of a real textile dyeing wastewater

D.R. Manenti · P.A. Soares · T.F. Silva · A.N. Módenes · F.R. Espinoza-Quiñones · R. Bergamasco · R.A. Boaventura · V.J. Vilar 833

### Application of solar photo-Fenton at circumneutral pH to nanofiltration concentrates for removal of pharmaceuticals in MWTP effluents

S. Miralles-Cuevas · I. Oller · J.A.S. Pérez · S. Malato 846

### Controlled formation of reactive Fe particles dispersed in a carbon matrix active for the oxidation of aqueous contaminants with H<sub>2</sub>O<sub>2</sub>

J.C. Tristão · F.G. de Mendonça · R.M. Lago · J.D. Ardisson 856

### Application of a montmorillonite clay modified with iron in photo-Fenton process. Comparison with goethite and nZVI

M.A. De León · M. Sergio · J. Bussi · G.B. Ortiz de la Plata · A.E. Cassano · O.M. Alfano 864

### Fenton-like processes and adsorption using iron oxide-pillared clay with magnetic properties for organic compound mitigation

A.A. Tireli · I.R. Guimarães · J.C.S. Terra · R.R. da Silva · M.C. Guerreiro 870

### Steel wastes as versatile materials for treatment of refractory wastewaters

S.V. dos Santos · C.C. Amorim · L.N. Andrade · N.C.Z. Calixto · A.B. Henriques · J.D. Ardisson · M.M.D. Leão 882

### Phenol degradation using the mixed material clay/Fe immobilized on glass slides

L.Y. Taketa · F. Ignachewski · J.C. Villalba · F.J. Anaissi · S.T. Fujiwara 894

### Ozonation and peroxone oxidation of ethylenethiourea in water: operational parameter optimization and by-product identification

S. Bottrel · C. Amorim · V. Ramos · G. Romão · M. Leao 903

### Kinetics of the degradation of *n*-butyl benzyl phthalate using O<sub>3</sub>/UV, direct photolysis, direct ozonation and UV effects

M.E. Lovato · M.B. Gilliard · A.E. Cassano · C.A. Martín 909

### Ultrasonic degradation of sulfadiazine in aqueous solutions

A.M. Lastre-Acosta · G. Cruz-González · L. Nuevas-Paz · U.J. Jáuregui-Haza · A.C.S.C. Teixeira 918

### Kinetic modeling of the photocatalytic degradation of clofibric acid in a slurry reactor

A. Manassero · M.L. Satuf · O.M. Alfano 926

### Photonic efficiency of the photodegradation of paracetamol in water by the photo-Fenton process

E. Yamal-Turbay · E. Ortega · L.O. Conte · M. Graells · H.D. Mansilla · O.M. Alfano · M. Pérez-Moya 938

## REVIEW ARTICLES

### Phytoremediation: role of terrestrial plants and aquatic macrophytes in the remediation of radionuclides and heavy metal contaminated soil and water

S. Sharma · B. Singh · V.K. Manchanda 946

### Application of molecularly imprinted polymers in wastewater treatment: a review

D.-L. Huang · R.-Z. Wang · Y.-G. Liu · G.-M. Zeng · C. Lai · P. Xu · B.-A. Lu · J.-J. Xu · C. Wang · C. Huang 963

**Content of lead and cadmium in aboveground plant organs of grasses growing on the areas adjacent to a route of big traffic**

K. Jankowski · A.G. Ciepiela · J. Jankowska · W. Szulc · R. Kolczarek · J. Sosnowski · B. Wiśniewska-Kadżajan · E. Malinowska · E. Radzka · W. Czeluściński · J. Deska **978**

**RESEARCH ARTICLES****Soil genotoxicity assessment—results of an interlaboratory study on the *Vicia* micronucleus assay in the context of ISO standardization**

S. Cotelle · A. Dhyévre · S. Muller · P. Cheron · N. Manier · P. Pandard · A. Echairi · J. Silvestre · M. Guiresse · E. Pinelli · L. Giorgetti · M. Barbaferi · V.C. Silva · F. Engel · C.M. Radetski **988**

**Soil microbial community toxic response to atrazine and its residues under atrazine and lead contamination**

Q. Chen · B. Yang · H. Wang · F. He · Y. Gao · R.A. Scheel **996**

**Design of optimal groundwater remediation systems under flexible environmental-standard constraints**

X. Fan · L. He · H.-W. Lu · J. Li **1008**

**Distribution of metals and brominated flame retardants (BFRs) in sediments, soils and plants from an informal e-waste dismantling site, South China**

J. Wang · L. Liu · J. Wang · B. Pan · X. Fu · G. Zhang · L. Zhang · K. Lin **1020**

**Degradation of polycyclic aromatic hydrocarbons in soil by a tolerant strain of *Trichoderma asperellum***

G. Zafra · A. Moreno-Montaña · Á.E. Absalón · D.V. Cortés-Espinosa **1034**

**Aerosol optical properties under the condition of heavy haze over an urban site of Beijing, China**

H. Che · X. Xia · J. Zhu · H. Wang · Y. Wang · J. Sun · X. Zhang · G. Shi **1043**

**Effects of the joint exposure of decabromodiphenyl ether and tetrabromobisphenol A on soil bacterial community structure**

W. Zhang · L. Chen · S. An · K. Liu · K. Lin · R. Fu **1054**

**Necrotic bark of common pine (*Pinus sylvestris* L.) as a bioindicator of environmental quality**

A. Chrzan **1066**

**The influence of the environmental management system on the environmental impact of seaport companies during an economic crisis: Lithuanian case study**

O. Anne · V. Burskyte · Z. Stasiškiene · A. Balciunas **1072**

**Optimization of the condition for adsorption of gallic acid by *Aspergillus oryzae* mycelia using Box-Behnken design**

Z. Zhang · Q. Pang · M. Li · H. Zheng · H. Chen · K. Chen **1085**

**A multi-residue method for determination of 70 organic micropollutants in surface waters by solid-phase extraction followed by gas chromatography coupled to tandem mass spectrometry**

E. Terzopoulou · D. Voutsas · G. Kaklamanos **1095**

**Effect of different sulfides on cadmium distribution during sludge combustion based on experimental and thermodynamic calculation approaches**

J.-Y. Liu · J.-W. Fu · S.-Y. Sun · X.-A. Ning · Y.-J. Wang · T. Chen · G.-Q. Luo · W.-M. Xie · Z.-Y. Yang · Z.-X. Zhuo **1113**

**In vivo toxicity of orally administrated silicon dioxide nanoparticles in healthy adult mice**

R. Hassankhani · M. Esmaeilou · A.A. Tehrani · K. Nasirzadeh · F. Khadir · H. Maadi **1127**

**Concentrations and distribution of polybrominated diphenyl ethers (PBDEs) in soils and plants from a Deca-BDE manufacturing factory in China**

Y. Li · S. Niu · R. Hai · M. Li **1133**

**Removal of heavy metal species from industrial sludge with the aid of biodegradable iminodisuccinic acid as the chelating ligand**

Q. Wu · G. Duan · Y. Cui · J. Sun **1144**

**Root morphological responses of three hot pepper cultivars to Cd exposure and their correlations with Cd accumulation**

B. Huang · J. Xin · H. Dai · A. Liu · W. Zhou · Y. Yi · K. Liao **1151**

**The minimum detectable difference (MDD) and the interpretation of treatment-related effects of pesticides in experimental ecosystems**

T.C.M. Brock · M. Hammers-Wirtz · U. Hommen · T.G. Preuss · H.-T. Ratte · I. Roessink · T. Strauss · P.J. Van den Brink **1160**

**How do two giant panda populations adapt to their habitats in the Qinling and Qionglai Mountains, China**

X. Liu · T. Wang · T. Wang · A.K. Skidmore · M. Songer **1175**

**Simultaneously degradation of 2,4-Dichlorophenol and EDTA in aqueous solution by the bimetallic Cu-Fe/O<sub>2</sub> system**

X. Liu · J.-H. Fan · L.-M. Ma **1186**

**Insights into community-based discrimination of water quality status using an annual pool of phytoplankton in mid-subtropical canal systems**

X. Shi · Z. Sun · G. Liu · H. Xu **1199**

**Distribution of PCDD/Fs in the fly ash and atmospheric air of two typical hazardous waste incinerators in eastern China**

T. Chen · M.-X. Zhan · X.-Q. Lin · J.-Y. Fu · S.-Y. Lu · X.-D. Li **1207**

**The association between air pollutants and morbidity for diabetes and liver diseases modified by sexes, ages, and seasons in Tianjin, China**

L. Tong · K. Li · Q. Zhou **1215**

**Molecular markers in ambient aerosol in the Mahanadi Riverside Basin of eastern central India during winter**

J. Nirmalkar · M.K. Deb · D.K. Deshmukh · Y.I. Tsai · S.K. Verma **1220**

**Multiple linear regression model for bromate formation based on the survey data of source waters from geographically different regions across China**

J. Yu · J. Liu · W. An · Y. Wang · J. Zhang · W. Wei · M. Su · M. Yang **1232**

**Accelerated biodegradation of selected nematicides in tropical crop soils from Costa Rica**

J.S. Chin-Pampillo · E. Carazo-Rojas · G. Pérez-Rojas · V. Castro-Gutiérrez · C.E. Rodríguez-Rodríguez **1240**

**Effects on inorganic nitrogen compounds release of contaminated sediment treatment with in situ calcium nitrate injection**

T. Liu · J. Yuan · W. Dong · H. Wu · H. Wang **1250**

**Transformation of anthracene on various cation-modified clay minerals**

L. Li · H. Jia · X. Li · C. Wang **1261**

**Chemical extractability of As and Pb from soils across long-term abandoned metallic mine sites in Korea and their phytoavailability assessed by *Brassica juncea***

J. Han · J. Kim · M. Kim · D.H. Moon · J.-S. Sung · S. Hyun **1270**

**Evaluating the genotoxicity of urban PM2.5 using PCR-based methods in human lung cells and the *Salmonella* TA98 reverse test**

D. Traversi · P. Cervella · G. Gilli **1279**

**Spatial distribution of heavy metal contamination in soils near a primitive e-waste recycling site**

S.-X. Quan · B. Yan · F. Yang · N. Li · X.-M. Xiao · J.-M. Fu **1290**

**Environmental chemicals mediated the effect of old housing on adult health problems: US NHANES, 2009–2010**

I. Shieue · G. Bramley **1299**

**Cancer risks and long-term community-level exposure to pentachlorophenol in contaminated areas, China**

P. Cheng · Q. Zhang · X. Shan · D. Shen · B. Wang · Z. Tang · Y. Jin · C. Zhang · F. Huang **1309**

**Mathematical modelling and optimization of synthetic textile dye removal using soil composites as highly competent liner material**

P. Das · P. Banerjee · S. Mondal **1318**

**Temporal variability of MODIS aerosol optical depth and chemical characterization of airborne particulates in Varanasi, India**

V. Murari · M. Kumar · S.C. Barman · T. Banerjee **1329**

**Persistence and dioxin-like toxicity of carbazole and chlorocarbazoles in soil**

J. Mumbo · B. Henkelmann · A. Abdelaziz · G. Pfister · N. Nguyen · R. Schroll · J.C. Munch · K.-W. Schramm **1344**

**Erratum to: Persistence and dioxin-like toxicity of carbazole and chlorocarbazoles in soil**

J. Mumbo · B. Henkelmann · A. Abdelaziz · G. Pfister · N. Nguyen · R. Schroll · J.C. Munch · K.-W. Schramm **1357**

**Water resources: the prerequisite for ecological restoration of rivers in the Hai River Basin, northern China**

W. Tang · Z. Mao · H. Zhang · B. Shan · Y. Zhao · Y. Ding **1359**

**Polycyclic aromatic hydrocarbons (PAHs) in *Crassostrea rhizophorae* and *Cathorops spixii* from the Caroni Swamp, Trinidad, West Indies**

L.D.K. Kanhai · J.F. Gobin · D.M. Beckles · B. Lauckner · A. Mohammed **1366**

**Sorption behavior and modeling of endocrine-disrupting chemicals on natural sediments: role of biofilm covered on surface**

H. Ding · Y. Li · J. Hou · Q. Wang · Y. Wu **1380**

**Insights into assessing environmental quality status using potential surrogates of biofilm-dwelling ciliate fauna in coastal waters**

W. Zhang · Y. Liu · Y. Xu · H. Xu **1389**

**Evaluation of the genotoxicity of waters impacted by domestic and industrial effluents of a highly industrialized region of São Paulo State, Brazil, by the comet assay in HTC cells**

B.C. Manzano · M.M. Roberto · M.M. Hoshina · A.A. Menegário · M.A. Marin-Morales **1399**

**Synthesis of carbon nanospheres using fallen willow leaves and adsorption of Rhodamine B and heavy metals by them**

J. Qu · Q. Zhang · Y. Xia · Q. Cong · C. Luo **1408**

**The use of vertical constructed wetland and ultrasound in aquaponic systems**

A. Krivograd Klemenčič · T. Griessler Bulc **1420**

**Evolution of dissolved organic matter during abiotic oxidation of coal tar—comparison with contaminated soils under natural attenuation**

O. Hanser · C. Biache · M. Boulangé · S. Parant · C. Lorgeoux · D. Billet · R. Michels · P. Faure **1431**

**Olive mill waste biochar: a promising soil amendment for metal immobilization in contaminated soils**

A. Hmid · Z. Al Chami · W. Sillen · A. De Vocht · J. Vangronsveld **1444**

**Positive effects of salicylic acid pretreatment on the composition of flax plastidial membrane lipids under cadmium stress**

A. Belkadhi · A. De Haro · S. Obregon · W. Chaïbi · W. Djebali **1457**

**Photo-catalysis of bromacil under simulated solar light using Au/TiO<sub>2</sub>: evaluation of main degradation products and toxicity implications**

D. Angthararak · P. Sutthivaiyakit · C. Blaise · F. Gagné · S. Sutthivaiyakit **1468**

**Factors affecting the accumulation of perfluoroalkyl substances in human blood**

C. Gómez-Canela · M. Fernández-Sanjuan · M. Farrés · S. Lacorte **1480**

**Upregulation of antioxidant enzymes by exogenous gallic acid contributes to the amelioration in *Oryza sativa* roots exposed to salt and osmotic stress**

C. Ozfidan-Konakci · E. Yildiztugay · M. Kucukoduk **1487**

**Characterization of bacteria isolated from palaeoproterozoic metasediments for sequestration of carbon dioxide and formation of calcium carbonate**

S. Srivastava · R.K. Bharti · I.S. Thakur **1499**

**Assessment of groundwater vulnerability to anthropogenic pollution and seawater intrusion in a small tropical island using index-based methods**

N.U. Kura · M.F. Ramli · S. Ibrahim · W.N.A. Sulaiman · A.Z. Aris · A.I. Tanko · M.A. Zaudi **1512**

**EDTA enhanced plant growth, antioxidant defense system, and phytoextraction of copper by *Brassica napus* L.**

U. Habiba · S. Ali · M. Farid · M.B. Shakoor · M. Rizwan · M. Ibrahim · G.H. Abbasi · T. Hayat · B. Ali **1534**

**Contamination of commercially available seafood by key diarrhetic shellfish poisons along the coast of China**

C. Lin · Z.-S. Liu · C.-Y. Tan · Y.-P. Guo · L. Li · H.-L. Ren · Y.-S. Li · P. Hu · S. Gong · Y. Zhou · S.-Y. Lu **1545**