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RESEARCH TOPICS

Since 2003, I have carried out my research activity in the group Advanced Separation Processes under the leadership of Prof. Inmaculada Ortiz. Currently my research activity is focused on the following topics:

- Research and development of advanced separation processes based on the use of liquid membrane technology. In particular, I have worked on the application of these technologies to the treatment of industrial effluents containing metallic pollutants such as chromium, zinc, iron, etc.
- Mathematical modelling and optimization of advanced separation processes.
- Development of novel advanced oxidation processes to carry out the degradation/mineralization of recalcitrant compounds.

PROJECTS

European Projects:

“Towards an Innovative Galvanic Industry”

“The application of green technologies for sustainable water purification and reuse”

National Projects:

“Research and Development of Reactive Separations. Contribution to Sustainable Technological Development (CTQ2008-00690/PPQ)”.

“Mass Transport in Separation Process with Selective Membranes: Development of Mathematical Models and Experimental Validation (BQU2002-03357)”.

“Optimal Design of Metal Valorization Processes for the Treatment of High Toxicity Effluents (CTQ2006-14360).”

“Diseño y caracterización de nanomaterials magnéticos como agentes de separación”
– SODERCAN S.A.

“Estudio de alternativas de mejora en el diseño de quemadores para encimeras de gas”
– BSH Electrodomésticos España S.A.

PUBLICATIONS

- S.S. Hosseini, E. Bringas, N.R. Tan, M. Ghahramani, M.A. Alaei Shahmirzadi. 2016. Recent progress in development of high performance polymeric membranes and materials for metal plating wastewater treatment. A review. *Journal of Water Process Engineering* 9, 78-110.
- E. Bringas, J. Saiz, I. Ortiz. 2015. Removal of As(V) from groundwater using functionalized magnetic adsorbent materials: Effects of competing ions. *Separation and Purification Technology* 156, 606-707.
- S.V. Jadhav, E. Bringas, G.D. Yadav, I. Ortiz, K. Martahe. 2015. Arsenic and fluoride contaminated groundwaters: A review of current technologies for contaminants removal. *Journal of Environmental Management* 162, 306-325.
- J. Laso, V. García, E. Bringas, A. Urtiaga, I. Ortiz. 2015. Selective recovery of zinc from spent pickling baths by the combination of membrane-based solvent extraction and electrowinning technologies. *Separation & Purification Technology* 151, 232-242.
- J. Gómez-Pastora, E. Bringas, I. Ortiz. 2014. Recent progress and future challenges on the use of high performance magnetic nano-adsorbents in environmental applications. *Chem. Eng. J.* 256, 187-204.
- J. Saiz, E. Bringas, I. Ortiz. 2014. New functionalized magnetic materials for As⁵⁺ removal. Adsorbent regeneration and reuse. *Ind. Eng. Chem. Res.* DOI: 10.1021/ie500912k.
- J. Saiz, E. Bringas, I. Ortiz. 2014. Functionalized magnetic nanoparticles as new adsorption materials for arsenic removal from polluted waters. *J. Chem. Technol. Biotechnol.* 89, 909-918.
- E. Bringas, M.F. San Román, A. Urtiaga, I. Ortiz. 2013. Integrated use of liquid membranes and membrane contactors: Enhancing the efficiency of L-L reactive separations. *Chemical Engineering and Processing: Process Intensification* 67, 120-129.
- V. García, N. Dibán, E. Bringas, I. Ortiz, A. Urtiaga. 2012. The use of emulsion pertraction technology as an eco-innovative membrane process for the galvanic industry. *Procedia Engineering* 44, 187-190.
- E. Bringas, Ö. Köysüren, D.V. Quach, M. Mahmoudi, E. Aznar, J.D. Roehling, M.D. Marcos, R. Martínez-Mañez, P. Stroeve. 2012. Triggered-release in lipid bilayer-capped mesoporous silica nanoparticles containing SPION using an alternating magnetic field. *Chem. Comm.* 48, 5647-5649.
- E. Bringas, M.F. San Román, A. Urtiaga, I. Ortiz. 2012. Membrane contactors (NDSX and EPT): An innovative alternative for the treatment of effluents containing metallic pollutants. *International Journal of Environment and Waste Management* 9 (3-4), 201-220.
- E. Bringas, J. Saiz, I. Ortiz. 2011. Kinetics of ultrasound-enhanced electrochemical oxidation of diuron on boron-doped diamond electrodes. *Chem. Eng. J.* 172, 1016-1022.
- E. Bringas, R. Mediavilla, A.M. Urtiaga, I. Ortiz. 2011. Development and validation of a dynamic model for regeneration of passivating baths using membrane contactors. *Comp. Chem. Eng.* 35(5), 918-927.

M.F. San Román, E. Bringas, R. Ibáñez, I. Ortiz. 2010. Liquid membrane technology: Fundamentals and review of its applications. *Journal of Chemical Technology and Biotechnology* 85, 2-10.

A. Urtiaga, E. Bringas, R. Mediavilla, I. Ortiz. 2010. The role of liquid membranes in the selective separation and recovery of zinc for the regeneration of Cr(III) passivation baths. *J. Membr. Sci.* 356(1-2), 88-95.

OTHER RESULTS

PhD. Supervisor

Design of functionalized magnetic nanoadsorbents for the removal of arsenic from polluted groundwater. Juan Saiz Conde. University of Cantabria. ETS de Ingenieros Industriales y de Telecomunicación. May 22nd, 2015.