

Dr. Marcos Fallanza Torices

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RESEARCH TOPICS

My research interests focus on advanced separation processes in industrial, environmental and biomedical applications. In the group Advanced Separation Processes led by Prof. Inmaculada Ortiz. I mainly work on the separation of gas and liquid mixtures by different membrane technologies, salinity gradient energy recovery by reverse electrodialysis and the implementation of microseparations for biomedical applications.

PUBLICATIONS

1. Ortiz-Martínez, V.M., Gómez-Coma, L., Tristán, C., Pérez, G., Fallanza, M., Ortiz, A., Ibañez, R. & Ortiz, I. 2020, "A comprehensive study on the effects of operation variables on reverse electrodialysis performance", *Desalination*, vol. 482.
2. Basauri, A., González-Fernández, C., Fallanza, M., Bringas, E., Fernandez-Lopez, R., Giner, L., Moncalián, G., de la Cruz, F. & Ortiz, I. 2020, "Biochemical interactions between LPS and LPS-binding molecules", *Critical reviews in biotechnology*, vol. 40, no. 3, pp. 292-305.
3. Gómez-Coma, L., Ortiz-Martínez, V.M., Fallanza, M., Ortiz, A., Ibañez, R. & Ortiz, I. 2020, "Blue energy for sustainable water reclamation in WWTPs", *Journal of Water Process Engineering*, vol. 33.
4. Gómez-Coma, L., Ortiz-Martínez, V.M., Carmona, J., Palacio, L., Prádanos, P., Fallanza, M., Ortiz, A., Ibañez, R. & Ortiz, I. 2019, "Modeling the influence of divalent ions on membrane resistance and electric power in reverse electrodialysis", *Journal of Membrane Science*, vol. 592.
5. Ortiz-Imedio, R., Gomez-Coma, L., Fallanza, M., Ortiz, A., Ibañez, R. & Ortiz, I. 2019, "Comparative performance of Salinity Gradient Power-Reverse Electrodialysis under different operating conditions", *Desalination*, vol. 457, pp. 8-21.
6. Basauri, A., Gomez-Pastora, J., Fallanza, M., Bringas, E. & Ortiz, I. 2019, "Predictive model for the design of reactive micro-separations", *Separation and Purification Technology*, vol. 209, pp. 900-907.
7. Gómez-Pastora, J., González-Fernández, C., Fallanza, M., Bringas, E. & Ortiz, I. 2018, "Flow patterns and mass transfer performance of miscible liquid-liquid flows in various microchannels: Numerical and experimental studies", *Chemical Engineering Journal*, vol. 344, pp. 487-497.

8. Basauri, A., Gómez-Pastora, J., Fallanza, M., Bringas, E. & Ortiz, I. 2017, *Computational analysis of facilitated transport in a microfluidic device*, "Computed Aided Chemical Engineering", vol. 40, pp. 1189-1194
9. Fallanza, M., Ortiz, A., Gorri, D. & Ortiz, I. 2013, "Polymer-ionic liquid composite membranes for propane/propylene separation by facilitated transport", *Journal of Membrane Science*, vol. 444, pp. 164-172.
10. Fallanza, M., Ortiz, A., Gorri, D. & Ortiz, I. 2013, "Propylene and propane solubility in imidazolium, pyridinium, and tetralkylammonium based ionic liquids containing a silver salt", *Journal of Chemical and Engineering Data*, vol. 58, no. 8, pp. 2147-2153.
11. Fallanza, M., Ortiz, A., Gorri, D. & Ortiz, I. 2013, "Using membrane reactive absorption modeling to predict optimum process conditions in the separation of propane-propylene mixtures", *Industrial and Engineering Chemistry Research*, vol. 52, no. 26, pp. 8843-8855.
12. Faiz, R., Fallanza, M., Ortiz, I. & Li, K. 2013, "Separation of olefin/paraffin gas mixtures using ceramic hollow fiber membrane contactors", *Industrial and Engineering Chemistry Research*, vol. 52, no. 23, pp. 7918-7929.
13. Faiz, R., Fallanza, M., Boributh, S., Jiratananon, R., Ortiz, I. & Li, K. 2013, "Long term stability of propane /propane separation using AgNO₃ solution", *Chemical Engineering Science*, vol. 94, pp. 108-119.
14. Fallanza, M., González-Miquel, M., Ruiz, E., Ortiz, A., Gorri, D., Palomar, J. & Ortiz, I. 2013, "Screening of RTILs for propane/propylene separation using COSMO-RS methodology", *Chemical Engineering Journal*, vol. 220, pp. 284-293.
15. Fallanza, M., Ortiz, A., Gorri, D. & Ortiz, I. 2012, "Experimental study of the separation of propane/propylene mixtures by supported ionic liquid membranes containing Ag + RTILs as carrier", *Separation and Purification Technology*, vol. 97, pp. 83-89.
16. Fallanza, M., Ortiz, A., Gorri, D. & Ortiz, I. 2012, "Comparison of reactive membranes containing ILs in the separation of gaseous olefin-paraffin mixtures", *Procedia Engineering*, pp. 326.
17. Faiz, R., Fallanza, M., Ortiz, I. & Li, K. 2012, "Olefin/paraffin separation using ceramic hollow fiber membrane contactors", *Procedia Engineering*, pp. 662.
18. Fallanza, M., Ortiz, A., Gorri, D. & Ortiz, I. 2011, "Improving the mass transfer rate in G-L membrane contactors with ionic liquids as absorption medium. Recovery of propylene", *Journal of Membrane Science*, vol. 385-386, no. 1, pp. 217-225.
19. Fallanza, M., Ortiz, A., Gorri, D. & Ortiz, I. 2011, "Effect of liquid flow on the separation of propylene/propane mixtures with a gas/liquid membrane contactor using Ag+ RTIL solutions", *Desalination and Water Treatment*, vol. 27, no. 1-3, pp. 123-129.
20. Ortiz, A., Fallanza, M., Gorri, D. & Ortiz, I. 2010, "Comparison of gas/liquid stirred tank and membrane contactors for the separation processes of propylene/propane mixtures using Ag + RTIL solution", *19th International Congress of Chemical and Process Engineering, CHISA 2010 and 7th European Congress of Chemical Engineering, ECCE-7*.

R&D PROJECTS

1. Title: SUDOE ENERGY PUSH. Efficient eENERGY for Public Social Housing (SOE3/P3/E0865).
Participant entities: Fundación Centro Tecnológico en Logística Integral Cantabria (CTL, Spain), ADENE - Agência para a Energia (Portugal), Agencia de Vivienda y Rehabilitación de Andalucía (AVRA, Spain), Gestion de viviendas e infraestructuras en Cantabria S.L. (GESVICAN, Spain), Universidade do Porto (Portugal), Universidad de Cantabria (Spain), Centre National de la Recherche Scientifique (France), Universidade do Porto (Portugal), Laboratório Nacional de Energia e Geologia, IP (Portugal), APRIA Systems S.L. (Spain), A Silva Matos (Portugal), Tipee (France), Agence Locale de l'Energie et du Climat (Francia), Asociación Empresarial Centro Tecnológico de la Energía y del Medio Ambiente de la Región de Murcia, (CETENMA, Spain), CARBONE 64 SARL (France).
Duration, since: 01/09/2019 to: 30/08/2022
Main researcher: Alfredo Ortiz Sainz de Aja (IP)
Number of participants: 14
2. Title: Procesos de reacción química en combustión de quemadores de coacción a gas.
Participant entities: Universidad de Cantabria
Duration, since: 03-06-2019 to: 03-06-2020
Main researcher: Alfredo Ortiz Sainz de Aja
Number of participants: 4
3. Title: HYLANTIC. Atlantic Network for Renewable Generation and Supply of Hydrogen to Promote High Energy Efficiency (EAPA_204/2016)
Participant entities: Universidad de Cantabria, Centre National de la Recherche Scientifique (France), Universidade do Porto (Portugal), Laboratório Nacional de Energia e Geologia, IP (Portugal), APRIA Systems S.L. (Spain), A Silva Matos (Portugal), Dublin City University (Irlanda), Ulster University (Reino Unido), Auriga Energy (Reino Unido), Ulemco (Reino Unido), Pure Energy Center (Reino Unido).
Duration, since: 01/10/2017 to: 30/09/2020
Main researcher: Alfredo Ortiz Sainz de Aja (IP)
Number of participants: 15
4. Title: GRADISAL. Aplicación en Cantabria de la tecnología EDR (Electrodiálisis Reversa) a la obtención de energía renovable marina mediante gradiente salino. Fase I: Viabilidad Técnico Económica.
Participant entities: Universidad de Cantabria, MARE, Apria Systems.
Duration, since: 30/12/2016 to: 29/03/2019
Main researcher: Inmaculada Ortiz Uribe
Number of participants: 8
5. Title: Membranas compuestas selectivas y su incorporación en dispositivos microfluídicos (CTQ2016- 75158-R).
Participant entities: Universidad de Cantabria
Duration, since: 30/12/2016 to: 29/12/2020
Main researcher: Daniel Gorri Cirella.
Number of participants: 9
6. Title: PEMFC-SUDOE: sostenibilidad energética en la región SUDOE: Red PEMFCSUDOE (PEMFCSUDOESOE1/PI/E0293)
Participant entites: Universidad de Cantabria, Centre National de la Recherche Scientifique (France), Universidade do Porto (Portugal), Laboratório Nacional de Energia e Geologia, IP (Portugal), Institut National Polytechnique de Toulouse (France), ARIEMA Energia y Medioambiente S.L. (Spain), APRIA Systems S.L.

(Spain), Institut de la Filtration et des Techniques Séparatives (France), Nanoinnova Technologies (Spain).

Duration, since: 01/07/2016 to: 30/06/2019

Main researcher: Alfredo Ortiz Sainz de Aja (Coordinador e IP)

Number of participants: 12

7. Title: Investigación y desarrollo de separaciones reactivas. Contribución al desarrollo tecnológico sostenible (CTQ2008-00690/PPQ)

Participant entities: Universidad de Cantabria

Duration, since: 01/11/2008 to: 31/10/2011

Main researcher: Inmaculada Ortiz Uribe.

Number of participants: 9