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SCIENTIFIC PORTFOLIO

Advanced Oxidation Processes and Adsorption (AOPA)

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Name of scientists in charge

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Technology description

> Adsorption on porous materials for air, gas and water treatment.
> Advanced oxidation processes (fenton-like systems, ozone and UV radiation).
> New strategies to obtain porous carbon adsorbents from waste materials.
> Coupling of adsorption and oxidation technologies to biological systems.

Pilot plant for gas adsorption

Laboratory at UdG Faculty of Sciences

Research expertise

> Analysis of gaseous contaminants.
> Analysis of odor causing compounds.
> Adsorption for treating of gaseous and water streams.
> Competitive adsorption of multicomponent gas streams.
> Modification of activated carbon to obtain tailored adsorbents.
> Strategies for odor control.
> Thermal and oxidative regeneration of exhausted adsorbents.
> Studies on catalytic materials for heterogeneous reactions.
> Biogas upgrading: removal of siloxanes and VOCs.

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Most relevant projects

> SHERLOCK: A StEp forward in the ResiLient management Of DrinKing Water Utilities. From applied research to full-scale validation. Spanish Research National Agency. PID2020-112615RA-I00. 2021-2023.

> WATSON: ToWard the development of an EDSS for wAter Treatment works: from basic reSearch to Optimal operatioN at full-scale. Spanish Ministry of Science. CTM2017-83598-R. 2018-2020.

> SILCAP: Selective sILoxane capture for indoor pCo Air Purifiers. ACCIÓ (Marie Scklodowska Curie COFUND – Tecniospring+ fellowship). TECSPR16-1-0045. 2017-2019.

> BiogasApp: Innovative technologies for biogas upgrading: from basic research to technology assessment. Spanish Ministry of Economy and Competitiveness. CTQ2014-53718-R. 2015-2017.

Most relevant publications

> Cabrera-Codony A., Ruiz B., Gil R.R., Popartan L.A., Santos-Clotas E., Martín M.J., Fuente E. (2021). **From biocollagenic waste to efficient biogas purification: Applying circular economy in the leather industry,** *Environmental Technology & Innovation*, Volume 21, 101229

> Santos-Clotas E., Cabrera-Codony A., Martín M.J. (2020). **Coupling adsorption with biotechnologies for siloxane abatement from biogas,** *Renewable Energy*, Volume 153, Pages 314 – 323.

> Santos-Clotas E., Cabrera-Codony A., Comas J., Martín M.J. (2020). **Biogas purification through membrane bioreactors: Experimental study on siloxane separation and biodegradation**, *Separation and Purification Technology*, Volume 2381, Article number 116440.

> Santos-Clotas E., Cabrera-Codony A., Boada E., Gich F., Muñoz R., Martín M.J. (2019). **Efficient removal of siloxanes and volatile organic compounds from sewage biogas by an anoxic biotrickling filter supplemented with activated carbón**, *Bioresource Technology*, Open Access, Volume 294, Article number 122136.

> A. Cabrera-Codony, E. Santos-Clotas, C.O. Ania, M.J. Martín (2018). **Competitive siloxane adsorption in multicomponent gas streams for biogas upgrading**, *Chemical Engineering journal* (344), pp 565-573.

> A. Cabrera-Codony, R. González-Olmos, M. J. Martín (2017). **Zeolites as recyclable adsorbents/catalysts for biogas upgrading: removal of octamethylcyclotetrasiloxane**, *Chemical Engineering Journal* (307), pp 820-827.

> A. Cabrera-Codony, R. González-Olmos, María J. Martín (2015). **Regeneration of siloxane-exhausted activated carbon by advanced oxidation processes**, *Journal of Hazardous Materials*, 285(21), 501-508.

> E. Vega, M. Sánchez-Polo, Rafael González-Olmos, María J. Martín (2015). **Adsorption of odorous sulfur compounds onto activated carbons modified by gamma irradiation**, Journal of Colloid and Interface Science, 457, November 2015, 78-85.

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