

## 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.

## Most relevant projects

- > **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.
- > **SIRENA:** Siloxane removal from sewage biogas in waste-to-energy processes: adsorption and regeneration by AOPs. Spanish Ministry of Science and Education. CTQ2011-24114. 2011-2015.

## Most relevant publications

- > 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** (2017), *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.
- > A. Cabrera-Codony, M.A. Montes-Morán, M. Sánchez-Polo, M. J. Martín, R. González-Olmos (2014). **Biogas upgrading: optimal activated carbon properties for siloxane removal**, *Environmental Science and Technology*, 48(12), pp. 7187-7195.
- > E. Vega, M.J. Martín, R. González-Olmos (2014). **Integration of advanced oxidation processes at mild conditions in wet scrubbers for odorous sulphur compounds treatment**. *Chemosphere*, (109), 113-9.
- > M. Canals, R. González-Olmos et al (2013). **Robust iron coordination complexes with N-based neutral ligands as efficient Fenton-like catalysts at neutral pH**. *Environmental Science and Technology* 47(11), 9918-9927.
- > A. Anfruns, J. Gabarró, R. González-Olmos et al (2013). **Coupling anammox and advanced oxidation-based technologies for mature landfill leachate treatment**. *Journal of Hazardous Materials*, 258-259, 27-39.
- > R. González-Olmos, M. J. Martín et al (2012). **Fe-zeolites as heterogeneous catalysts for solar Fenton-like processes at neutral pH: Mechanistics and applicability in compound parabolic collector pilot plant**. *Applied Catalysis B: Environmental*, 125, 51-58.