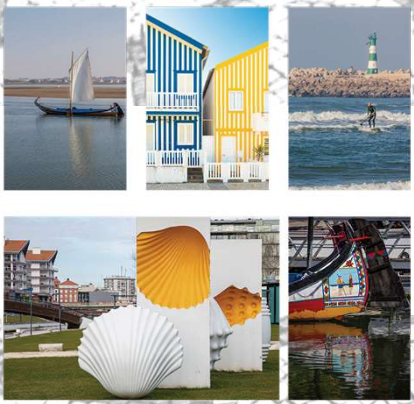

Book of Abstracts

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Abstract book of the XI National Meeting on Catalysis and Porous Materials and the II Meeting of the Carbon Group

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Removal of naproxen from aqueous matrices by adsorption using activated carbons obtained from olive stones

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Water pollution is a global problem that humanity must overcome in the twenty-first century. Contaminants of emerging concern (CECs), such as pharmaceuticals, are chemical substances present in different matrices at trace concentrations. Non-steroidal anti-inflammatory drugs (NSAIDs) are some of the most prescribed drugs worldwide and several studies report their presence in various hydric media including drinking water, surface water, and sewage water. Unfortunately, conventional wastewater treatment plants (WWTPs) are inefficient in the removal of CECs. In the last years many researchers have directed their efforts to the study of removal processes and the development of new water treatment methods to address with the removal of CECs. Of considerable interest is the possibility of using biomass wastes to prepare an effective adsorbent and its use in the removal of pharmaceuticals.

Adsorption is a treatment process based on accumulation of the adsorbate (pollutant) on the adsorbent surface that has been successful used for the optimization of WWTP. Carbon-based materials (CBMs), such as activated carbons, chars, carbon black, carbide-derive and nanostructured carbons have shown incredible efficiency as adsorbents.[1] Traditionally, they are produced from anthracite, coal or peat. However, nowadays biomass residues (*e.g.* walnut shell, olive stones) has become an essential element for their production, due to the lower cost of biomass and its renewable nature.[2] Such materials have shown high potential as low-cost adsorbents for the removal of drugs from aqueous solutions.[2-3] The removal of several NSAIDs was studied by several researchers using diverse CBMs, such as activated carbon.[4]

In this communication, our group will present experimental results obtained for the removal of naproxen, used as model pollutant representative of NSAIDs from aqueous solution using four types of activated carbon prepared from olive stones. Results include the study of the main operating conditions that affect the adsorption process efficiency with the most promising prepared adsorbent. Some of these conditions are adsorbate initial concentration, solvent pH, adsorbent/adsorbate concentration ratio, temperature and contact time. The experimental methodology also includes the preparation and activation of the adsorbents, the measurement of the main physicochemical properties of all the adsorbents and the experimental determination of the equilibrium adsorption isotherms using different temperatures.

References

[1] Álvarez-Torrellas et al.; *Chem. Eng. J.*, **2018**, 347, 595-606. [2] Diaz de Tuesta et al.; *J. Environ. Chem. Eng.*, **2021**, 9, 105004. [3] Quesada et al.; *Chemosphere*, **2019**, 222, 766-780. [4] Lach et al.; J.; *E3S Web of Conferences*, **2018**, 44, 00089.

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