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Portuguese Young Chemists Meeting

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BOOK OF ABSTRACTS

**9TH PORTUGUESE YOUNG
CHEMISTS MEETING**

28-30 April 2025,
University of Algarve



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- OC27.** *José F. Malta*, New Hygromorphic Cellulose-Based Meshes to Efficiently Collect Water from The Air
- OC28.** *Catarina Ribeiro*, Proton-Electron Dual Conductivity in a Tetrathiafulvalene-Phosphonate Metal-Organic Framework
- OC29.** *Francisca Carvalho*, Design, Synthesis, and Evaluation of Small Molecule Inhibitors Targeting SARS-COV-2
- OC30.** *João Felicidade*, Data-Driven Discovery of a New Fluorescent BASHY Dye for Bioimaging
- OC31.** *Tiago M. P. Santos*, Biomass-derived Cyclopentenones as Linkers for Therapeutic Peptide Cyclization
- OC32.** *Ana Alves*, Synthesis, Preparation and Characterization of Polymersome Systems Loaded with Anti-Glioblastoma Small Molecules

Flash communications

April 28th (afternoon)

- FC1.** *Elisa M. Brás*, Empowering the Next Generation of Chemists: The Role of IYCN in Shaping a Sustainable Future
- FC2.** *Álvaro Carmo Delcán*, Influence of Ni-based Catalysts Architecture Deposited by Magnetron Sputtering for Alkaline Membrane Electrolyzers
- FC3.** *Melissa Giacomet Mezzalana*, Dry Purification of Ethanolic Biodiesel through Adsorption using Almond Shell based Materials
- FC4.** *Gabrielle Tokawa Morizaki*, Removal of Metformin from Aquatic Matrices using Cork-based Adsorbents
- FC5.** *João Borges*, Supramolecular Hydrogels Assembled by Quaternized Chitosan/Alginate Polyelectrolyte Complexation for Biomedical Applications
- FC6.** *A. S. Castro*, Cellulose Acetate and Ionic Liquids Composites for Colorimetric Detection of Iron in Water Matrixes
- FC7.** *Tiago Dias*, Synthesis and Spectroscopic Characterization of Luminescent Europium(III) Complexes Supported on Rice Husk Ash

Poster communications

Analytical Chemistry

- PC1.** Molecularly Imprinted Polymer Nanoparticles for BSA Detection: Characterization and Analytical Performance
- PC2.** Fluoroquinolones: Optimising Extraction and Chromatographic Methods – Preliminary Data

FC4. Removal of Metformin from Aquatic Matrices using Cork-based Adsorbents

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Anthropogenic activities associated with industrial development, urbanization, and population growth have significantly contributed to the presence of various pollutants in aquatic environments [1]. Among these contaminants, emerging micropollutants have raised considerable concern. The detection and quantification of these substances require advanced analytical techniques due to their occurrence at extremely low concentrations ($\mu\text{g/L}$ to ng/L). These pollutants pose substantial environmental and human health risks [2-4], particularly pharmaceuticals [5]. Metformin, a pharmaceutical prescribed for the treatment of type 2 diabetes, is increasingly detected in aquatic environments due to its incomplete metabolism and widespread prescription. Some studies indicate that metformin can stimulate the expression of genes associated with endocrine hormone pathways, while its chlorinated byproducts in drinking water exhibit toxic effects on aquatic ecosystems [6-7]. Several treatment strategies have been investigated for removing pharmaceuticals from wastewater, with adsorption emerging as a practical approach. Activated carbons, particularly those derived from renewable biomass such as cork, have gained attention due to their high efficiency and cost-effectiveness in the removal of organic pollutants from wastewater [8]. The present study investigates the efficiency of metformin removal from aqueous matrices using cork-based adsorbent materials. The proposed methodology encompasses the production of adsorbents via physical and chemical activation. The physical activation involved the carbonization of cork at 550°C for 1 hour. In contrast, the chemical activation comprised a pre-carbonization step at 550°C for 1 hour and impregnation with KOH at a 1:5 ratio (biochar: KOH). The impregnated material was then carbonized at 750°C for 1 hour. The characterization of the adsorbents includes calculation of carbonization yield, determination of the point of zero charge (pHpzc), analysis of acidic and basic surface sites, FTIR, TGA and BET. Kinetic and equilibrium adsorption studies will be carried out later. For this purpose, a metformin quantification method using HPLC was developed.

References

- [1] P. Bhatt, G. Bhandari, M. Bilal, *Journal of Environmental Chemical Engineering*, 10.3 (2022) 107598.
- [2] G. Vettorello, V.V. Brandt, M.C. Dallazen *et al.*, *Caderno Pedagógico*, 14.1 (2017) 72-83.
- [3] P. P. Ribas, E.O. dos Santos, C.C. Costa *et al.*, *Revista Brasileira de Meio Ambiente*, 9.1 (2021). 165-175.
- [4] Y. Luo, W. Guo, H.H. Ngo *et al.*, *Science of the Total Environment*, 473 (2014) 619.
- [5] M. Alnajjar, A. Hethnawi, G. Nafie *et al.*, *Journal of Environmental Chemical Engineering*, 7.3 (2019) 102994.
- [6] L. Wu, L. Wang, C. Huang *et al.*, *Microchemical Journal*, 200 (2024) 110422.
- [7] E.P. Ambrosio-Albuquerque, L.F. Cusioli, R. Bergamasco *et al.*, *Environmental Toxicology and Pharmacology*, 83 (2021) 103588.
- [8] V. Rojas-Candia, D. Arismendi, E. Carasek *et al.*, *Brazilian Journal of Analytical Chemistry*, 10 (2024) 30744.

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