Strategic projects

DESignSX – Hydrophobic Eutectic Solvents for Tailored Metal Separation and Recycling

60 months; €1,5M

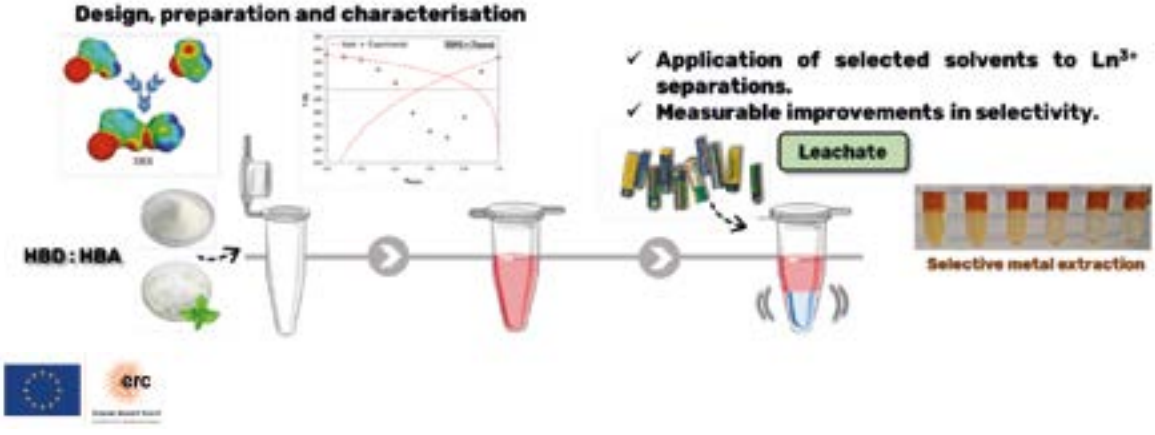
DESignSX is an European Research Council funded Starting Grant project (ERC-StG), aiming for the design, understanding, and application of alternative solvents for the separation of critical metals.

In the face of growing anthropogenic environmental pressure, societies are re-evaluating the current linear consumption model of "take-make-dispose" and shifting towards a more holistic circular economy framework. Metals are primary, yet finite, commodities, cornerstone of human history and ubiquitous in modern society, placing sustainable metallurgy at the forefront of the circular economic transition. However, the mining rates of most metals are at a historical maximum whilst the average ore grade has decreased over the last hundred years for both base and precious metals. The need to produce more from increasingly dilute and varied raw materials as lead to separation and purification processes consuming an estimated – 15% of global energy use. Conversely, electronic waste is the fastest growing global waste stream and is an important challenge due to inherent value, heterogeneity, and potential environmental impact. Sustainable metallurgy stands uniquely poised to reduce the environmental impact of existing processes whilst recovering the metal value in end-of-life devices, thereby closing the resource loop.

Over the next 5 years, DESignSX will develop novel bio-inspired hydrophobic eutectic solvents (DES) for their application to the solvent extraction separation of lanthanide cations. Despite their growing demand and geopolitical criticality, lanthanide separation remains technologically challenging due to the small monotonic variation in their properties, negatively affecting the economics of their recycling. DESignX seeks to exacerbate the steric factors defining the interactions between lanthanide and ligands, dictating the ensuing complex geometries and mutual separation selectivity, through the inclusion of complexing agents as DES components. Through careful manipulation of the DES composition, the energetic landscape of solvent may be rationally adjusted to increase the selectivity towards a given cation. Given that the separation of adjacent lanthanides occurs over dozens of extraction stages, even seemingly small increases in the separation factors yield measurable environmental and economic gains. DESignSX outcomes are expected to be transferable to other critical solvent extraction separations.

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement N.º 10.3030/101116461

More information
https://cordis.europa.eu/project/id/101116461



CURIOSOIL – Awakening Soil Curiosity to Catalyse Soil Literacyn

48 months; €6M (UAveiro: €1,2M)

CURIOSOIL is a four-year (2024-2028), EU co-funded project focused on enhancing soil education, aligned with the EU Mission "A Soil Deal for Europe." Led by Universidade de Aveiro (Sónia M. Rodrigues, DAO-UA), the project is constituted by a consortium of 14 partners from across Europe: Gaia Education Europe and ECOLISE in Belgium; REVOLVE in Spain; Faculty of Environmental Protection in Slovenia; Wageningen University, ISRIC – World Soil Information and the European School Heads Association in The Netherlands; Universita degli Studi di Palermo in Italy; University of Natural Resources and Life Sciences (BOKU) in Austria; Norwegian Institute of Bioeconomy Research (NIBIO) in Norway and European Science Communication Institute (ESCI) in Germany; and IUCN and Zurich University of the Arts in Switzerland.

CURIOSOIL has the overarching objective of understanding how to trigger Soil Curiosity and create connections between people and soil. The project aims to contribute for the integration of soil health into EU school curricula by 2030, fostering awareness, knowledge, and behavioural changes for a more resilient future.

The project will co-create with the education community a set of educational products, and course materials, and develop a "Soil Curiosity Kit" using multisensorial Soil Experiences to raise soil literacy and build a Soil Optimism narrative. The project will also co-create guidelines, and teacher's training programmes to integrate soil education in formal and non-formal education across the EU and to ensure a comprehensive approach to soil health among students. Using hands-on Soil Experiences CURIOSOIL will deepen public comprehension of soil dynamics, establishing a connection between individuals and soil.

By working in ten European countries CURIOSOIL is in an excellent position to provide materials and recommendations that are context specific and relevant for the national context of these countries. The geographical influence of the project will be further expanded by the work with the Communities of Practice (CoPs), contributing to engage a total of 16 EU and HE AC countries in the piloting of education materials.

CURIOSOIL will contribute to improve soil literacy in society aligned with the EU Soil Mission target to embed soil health in schools and educational curricula of all EU Member States by 2030 as well as lead to citizen, policy and practice increased knowledge and awareness to sustainably manage soil.

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement N.º 101112875

More information
https://curiosoil.eu
www.linkedin.com/company/curiosoil-project/?originalSubdomain=pt
www.linkedin.com/newsletters/7192085339451142146/

LIFE SeagrassRIAwild – mariculture for ria de aveiro subtidal seagrass rewilding

84 months; €3.4 M (UAveiro: €2.1 M)

Funded by the European Commission through the LIFE Programme, it gathers a consortium of 11 European partners from 4 countries led by the University of Aveiro, under the scientific coordination of João Pedro Coelho, Assistant Researcher at DBIO/CESAM.

LIFE SeaGrassRIAwild aims at taking decisive steps to reverse the current conservation status of *Zostera marina* habitat in the Ria de Aveiro and Portugal through the co-development of cost-efficient and policy relevant NbS (Nature-based Solutions).

Subtidal seagrass beds are critically endangered at the European Atlantic Coast, and in urgent need of restoration, as stated in the forthcoming EU Nature Restoration Law. *Z. marina* is presently the most endangered seagrass species in Portugal, facing extinction if measures are not taken to assure the protection of the last remaining populations. In Ria, its presence was not recorded for 10 years, but recently resurged in small intertidal patches, making this the momentum for active restoration measures implementation.

LIFE SeagrassRIAwild proposes a paradigm shift in seagrass restoration, enabling large-scale restoration programs with negligible effects on existing natural meadows, through the development of seagrass mariculture to support the plant and seed needs for rewilding. It follows a transdisciplinary approach involving academia, authorities, management agencies, local administration, end-user associations and citizens in the co-design, prioritization and implementation of restoration actions, at a large scale and using targeted and adaptable Citizen Science initiatives and synergies with other national and EU initiatives.

LIFE SeagrassRIAwild will further explore innovative NbS to potentiate synergistic effects of seagrass conservation efforts and system management needs which, if proven effective, have the potential to become an innovative management service/product for port authorities, private marinas and management agencies. These NbS will potentiate the sustainability of the project, supported by tailor-made capacity building actions and the infrastructure legacy, which will perdure in time and be made available for national restoration programmes, with the supervision of the national competent authorities.

This project has received funding from the European Union's LIFE Programme under grant agreement N.º 101114362

More information
https://life-seagrassriawild.web.ua.pt

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