

Advanced Engineering and Research of aeroGels for Environment and Life Sciences (AERoGELS) - Technical, commercial and societal innovations on aerogels towards circular economy (ECO-AERoGELS)

The COST Action AERoGELS (CA18125) brought together leading experts from academia, industry, and regulatory bodies across Europe to advance research and technological development in aerogels. These materials, known for their extremely high nanoporosity and tunable physical and chemical properties, had already found applications in construction and aerospace, but their full potential, particularly in environmental and life sciences, remained underexplored. AERoGELS addressed major European challenges such as circular economy and active ageing by evaluating aerogels not only for their performance but also for their health and environmental impacts. Through interdisciplinary collaboration, training schools, publications, and researcher exchanges, AERoGELS significantly expanded knowledge in the field, increased industry-academia interaction, and aimed to improve European welfare through cleaner, smarter production. Its impact was recognized globally when IUPAC named aerogels one of the Top Ten Emerging Technologies in Chemistry in 2022.

The COST Innovators Grant ECO-AERoGELS (IG18125) built upon the achievements of the AERoGELS COST Action by focusing on the role of aerogels in addressing Europe's environmental and resource-related challenges within the context of circular economy and green technologies. It emphasized innovations in three areas: product development using biorefinery sources and waste valorisation; sustainable processing through efficient use of raw materials, green technologies, and aerogel reusability; and targeted applications in energy efficiency, personalized solutions, and water/air remediation. Collaboration across disciplines and between researchers and industry facilitated the identification of disruptive innovations and the creation of a business plan for their exploitation. ECO-AERoGELS also promoted long-term sustainability through widespread dissemination, training schools, and preparatory work for establishing an international aerogel association, ensuring the continued growth of the European scientific and technological ecosystem seeded by the AERoGELS COST Action.

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