Press Release

1st Conference on Zeolites Brings Visibility to Various Industrial Applications of Zeolites

Madrid, ES, January 9, 2025 – On November 6, 2024 the First Conference on "Sustainable Zeolites: Advances in Synthesis and Applications" took place at the Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc-CSIC) in Madrid.

Organised by IETcc, in collaboration with Trust-IT Services, the conference was part of the dissemination and diffusion activities of the Z-ONA4LIFE project. The event provided a forum for researchers, scientists and industry professionals to share and exchange knowledge on the latest advancements being made in the field of zeolites.

Event Overview

While zeolites exist naturally in the world, Z-ONA4LIFE is on a mission to generate synthetic zeolites from salt slag, or aluminium waste. This innovative process enhances waste management practices by transforming hazardous waste into a value-added and sustainable material which can be used for a variety purposes.

Leading up to the November event, Z-ONA4LIFE invited submissions of original research papers, case studies, and reviews for presentation at the conference. The event placed special emphasis on innovative synthesis routes using unconventional raw materials, as well as on the emerging applications of zeolites in various industries, regulatory aspects of zeolite adoption and the barriers in the development of industrial-scale levels of zeolite production.

The chosen abstracts and accompanying presentations demonstrated the existing and emerging innovative and alternative investigations for zeolite synthesis taking place, with a range of topics including:

- Approaches to the design of zeolite synthesis for catalytic applications, **Joaquín Pérez Pariente**, ICP-CSIC
- Zeolitization as a method of manufacturing lightweight structural materials from kaolin and marine plastic waste, **Jose Manuel Moreno Maroto**, UAM
- Zeolites in sustainable chemistry, **Isabel Díaz**, ICP-CSIC
- Computation study on how to synthesize aluminium silicates, **Germán Sastre** (ITQ, UPV-CSIC)
- Volcanic ash zeolitization process, **Sol López Andrés**, UCM
- Políticas de sostenibilidad de la UE: análisis crítico de la síntesis de zeolitas a partir de residuos, **Rita Giuffrida**, Trust-IT Services
- Feasibility of sustainable zeolites for soil decontamination, **Maria del Mar Gil Díaz**, IMIDRA
- Adsorption of sulphur dioxide on porous materials developed from municipal solid waste incineration fly ash, **Danilo Jara Echeverría** (UPM)
- Recycling of industrial and agri-food wastes in zeolite synthesis: a sustainable way to manage salt slag for salt slag management, **Rafael Carrizosa**, IETcc-CSIC

- Sustainable cements from natural mordenite as a supplementary cementitious material, **Leticia Presa**, UPM
- Synthetic zeolites: effect on the properties of cement-based materials, **Pedro Carballosa** (IETcc-CSIC)
- Transformation of fly ash into zeolite materials and their applications in environmental engineering and construction materials, **Tomas Bajda** (AGH University of Krakow)
- Stable zeolites with three-dimensional extra-large pore systems, **Miguel Ángel Camblor** (ICMM-CSIC)

Insights from a one-of-a-kind conference

The full-day event succeeded in connecting leading researchers and industry professionals to gain insights from leading researchers and industry professionals in the field of zeolite research, while showcasing novel applications of zeolites. Each expert presented a unique perspective from their specific domain, the methodologies to advance more sustainable synthesis processes aimed at minimising the consumption of raw materials, reducing economic costs and decreasing the environmental impact of waste behaviours.

An example of this is the work carried out by **Dr. Isabel Díaz** and her research group (Molecular Sieves Group, GTM) at the Institute of Catalysis and Petrochemistry, ICP-CSIC, focused mainly on the synthesis of zeolites and their novel applications in catalysis and water purification:

"Our main research area is related to sustainable chemistry, specifically the synthesis, characterization and application of zeolitic and nanoporous materials as catalysts in the production of fuels with low carbon footprint and chemical compounds with high added value (transformation of methanol into hydrocarbons) as well as the improvement of traditional processes in the energy and chemical sectors, the reduction of their environmental impact and the optimization of natural resources."

Rafael Carrizosa from GrupoMedes at IETcc-CSIC expanded on the priority of addressing the management of hazardous waste, such as salt slag, to reduce the overall environmental impact by using it as a raw material for zeolites.:

"Finding sustainable production methods is essential to avoid compromising the needs of future generations. In this respect, one of the main challenges facing society is sustainable waste management."

Download the 1st Conference Book of Abstracts

The chosen abstracts presented at the event spotlighted the range of industrial applications of zeolites and the advances in the development of more sustainable synthesis processes using unconventional raw materials.

We have developed this book of abstracts to promote the different perspectives and methodologies for the production of sustainable zeolites and bring attention to the innovative work of the selected abstract authors.

Download: https://zenodo.org/records/14221867

Advancing industrial-scale implementation of zeolites

With Z-ONA4LIFE, it takes a bold step towards a more sustainable and circular future for the aluminium industry, setting a precedent for global environmental stewardship. As the project evolves and technical advancements continue to elevate the circulatory of aluminium foundries, we will expand horizons and integrate Z-ONA zeolites into other markets as well.

This forum highlighted the growing demand for sustainable solutions to not only adhere to European sustainability objectives, spotlighting the capacity of synthetic zeolites as a tool to push Europe forward down a circular path, but how zeolites can be used in a wide-range of industrial applications, becoming a catalyst for waste management best practices.

If you would like to get in contact with us, feel free to reach out to:

- **Aurora López-Delgado,** IETcc-CSIC (Project Coordinator) alopezdelgado@ietcc.csic.es
- **Rita Giuffrida**, Trust-IT Services (Communications Manager) r.giuffrida@trust-itservices.com