

BIMETALLIC PSEUDOPEPTIDE COMPLEXES AND THEIR USE AS CATALYSTS AND IN CO₂ ACTIVATION AND CONVERSION

DESCRIPTION OF THE TECHNOLOGY

Global warming is an issue of growing concern. In its production processes, industry generates waste flows with a high content of CO₂, a greenhouse gas that makes a significant contribution to this effect.

The Supramolecular and Sustainable Chemistry Group of the Department of Inorganic and Organic Chemistry of the Universitat Jaume I, inspired by nature, where plants are able to capture energy from sunlight and convert CO₂ into chemical energy and organic matter, has developed a catalyst that can transform CO₂ into high value-added chemicals, especially cyclic carbonates.

This catalytic system can create useful products from diluted CO₂ under mild pressure and temperature conditions and in an enantioselective manner. Thus, this catalyst can contribute to the development of a circular and sustainable economy, in which a waste product of one industry

such as CO₂ becomes a raw material for another industry.

The invention, protected by a patent, makes it possible to obtain high value-added products such as cyclic carbonates, which are important industrial chemicals that have various applications in environmentally friendly solvents, lithium-ion batteries, paints and coatings, resins, precursors for polymeric materials and polymer processing in fine chemistry.

This invention can be classified as environmental within the field of synthetic chemistry. More specifically, the invention focuses on the development of active catalysts for transforming CO₂ into high value-added products

SECTORS FOR COMMERCIAL APPLICATION

- Industrial sector
 - Industries that generate waste streams with high CO₂ content.
 - Industries in the fine chemicals or pharmaceutical sector using chiral cyclic carbonates as intermediates.

TECHNICAL ADVANTAGES AND COMMERCIAL BENEFITS

- Advantages
 - The catalysts are capable of performing under mild conditions without the need for any auxiliary substances.
 - The catalysts do not need noble metals to work.
 - The presence of amino acids in the structure enables the catalysts to be biodegradable. In addition, they allow the kinetic resolution of epoxides to be effective.
 - The system has a very high activity, obtaining excellent selectivities for the desired cyclic carbonate.

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- Benefits
 - Reuse of residual energy (circular economy).
 - Obtaining chiral products (high value-added) from racemic reagents.
 - Cost savings.
 - Reduction in the amount of waste generated in catalysis.

STAGE OF DEVELOPMENT OF TECHNOLOGY

Validated at the experimental level in the laboratory.

INDUSTRIAL AND INTELLECTUAL PROPERTY RIGHTS

This invention is protected by means of an application for a Spanish patent with reference number P202230050 and filing date 21-01-2022.

COLLABORATION SOUGHT

Development and adaptation of the technology to particular applications through specific agreements and a subsequent licensing agreement with companies.

IMAGES RELATED

CO²

CONTACT DETAILS

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