ISGC 2022

N°1191 / PC
TOPIC(s) : Waste and side streams valorization / Homogenous, heterogenous and biocatalysis

Upgrading Renewable Carbon to Chemicals and Polymers through Catalysis

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PURPOSE OF THE ABSTRACT

In this lecture the upgrading of renewable carbon sources including CO2 and biomass related compounds will be delineated. The use of catalysis as a key enabling technology is demonstrated as a convenient way to convert low-value chemicals into value-added fine-chemicals and polymers through activation of cyclic ethers. More specifically new concepts are revealed that significantly expand the portfolio of CO2 based heterocycles, their respective polycarbonates and related biomass based polyesters. Important process aspects such as cost and accessibility of the raw materials, the use of sustainable catalysts and the creation of a better mechanistic understanding will be discussed in conjunction with selected, successful examples of non-reductive transformations of various carbon feedstock with a favorable carbon footprint, setting the stage for future developments.

FIGURES

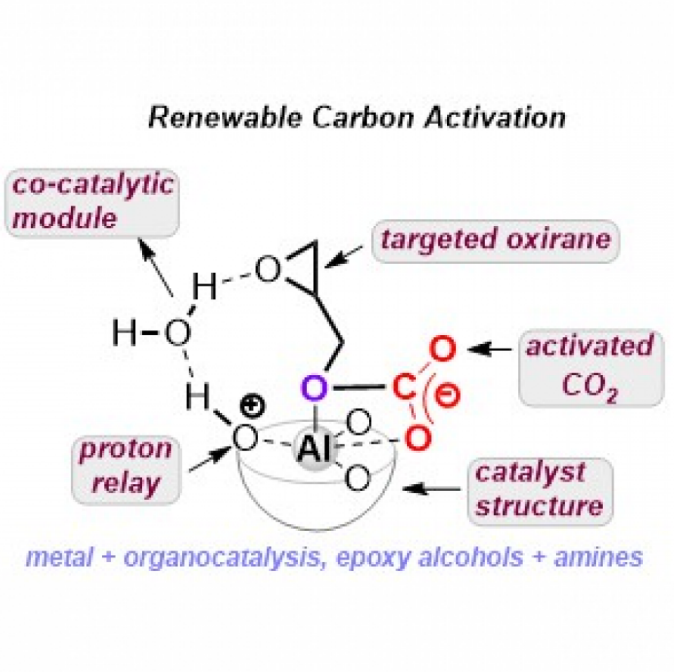

FIGURE 1

Figure to the main text

Conversion of renewable carbon by molecular catalysis

FIGURE 2

KEYWORDS

Homogeneous catalysis | CO2 based heterocycles | Biopolymers | Renewable carbon

BIBLIOGRAPHY

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