ISGC 2019
May 13th - 17th

N°77 / OC
TOPIC(s) : Homogenous, heterogenous and biocatalysis / Alternative technologies

Coupling polymetallic bio-based catalysis and woody species: an original innovation paradigm for green acetalisation and oxidative esterification

AUTHORS

Claude GRISON / LABORATOIRE DE CHIMIE BIO-INSPIRÉE ET D'INNOVATIONS ÉCOLOGIQUES (CHIMECO), CHIMECO CAP DELTA, 1682 RUE DE LA VALSIÈRE, GRABELS
Pierre-Alexandre DEYRIS / LABORATOIRE DE CHIMIE BIO-INSPIRÉE ET D'INNOVATIONS ÉCOLOGIQUES (CHIMECO), CHIMECO CAPDELTA 1682 RUE DE LA VALSIERE, GRABELS
Pauline ADLER / LABORATOIRE DE CHIMIE BIO-INSPIRÉE ET D'INNOVATIONS ÉCOLOGIQUES (CHIMECO), CHIMECO CAPDELTA 1682 RUE DE LA VALSIERE, GRABELS

PURPOSE OF THE ABSTRACT

Advances in green catalysis have promoted the development of ecological catalysis encountered in most of the main transformations of organic chemistry. Taking advantage of the remarkable capacity of certain plants to hyperaccumulate transition metals into shoots or roots, we have addressed the direct use of metals derived from contaminated plant wastes as supported Lewis acid catalysts, coupling agents, oxidising and reducing catalysts in green chemistry. This approach constituted the first example of chemical catalyst based on phytotechnologies.
Here, we will show that the concept can be extended to common and abundant plant species that are surprisingly appropriated for chemical catalysis. We will present that Salix, Willow, Birch, Plane and Linden trees can be used to produce bio-based and original Lewis acid catalysts. The catalytic potential of these species will be illustrated through two representative transformations, acetalisation and oxidative esterification.
More generally, these novel polymetallic catalytic ecomaterials will be used to generate bio-based molecules and chemicals for future applications and will serve as a bridge between ecological and chemical catalysis.

FIGURES

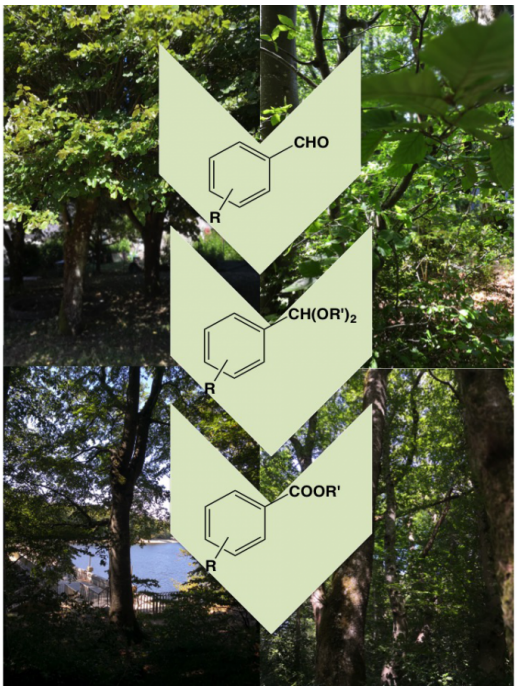

FIGURE 1

Woody trees and bio-based Lewis acid catalysis

Salix, Willow, Birch, Plane and Linden trees can be used to promote acetalisation and oxidative esterification

FIGURE 2

KEYWORDS

Bio-based catalysis | Polymetallic catalytic ecomaterials | Woody species | Oxidative esterification

BIBLIOGRAPHY