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Catalytic Conversion of Renewable Resources into Bulk & Fine Chemicals.

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PURPOSE OF THE ABSTRACT

The limited supply of fossil resources forces us to find new ways toward fuels, energy and chemicals. Processes for the production of chemicals from biomass have been developed recently that can already compete with current fossil based products. In the lecture the routes from biomass to bulk chemicals (Adipic acid, caprolactam) via the platform chemicals levulinic acid and 5-hydroxymethylfurfural (HMF) will be described [1], [2]. In addition, we show our latest results on the formation and use of the new 6-carbon building block 1-hydroxy-2,5-hexanedione (HHD) which can be obtained from HMF by hydrogenation under aqueous conditions [3-5]. We have shown that we can convert this building block into cyclopentanones, pyrroles and hydroxyalkenes in good yields.

These platform chemicals are derived from C-6 sugars in lignocellulose. However, lignocellulose also contains between 20-40% of lignin. Thus, it is of great interest to develop new chemistry that would allow the isolation of aromatic chemicals from lignin in isolable quantities. We will discuss our latest results on the conversion of lignin into chemicals and the relationship between the type of Lignin preparation and the yield of chemicals that can be obtained from it [6]. And finally we will show first results of our research where we use plasma to convert lignin into chemicals.

FIGURES

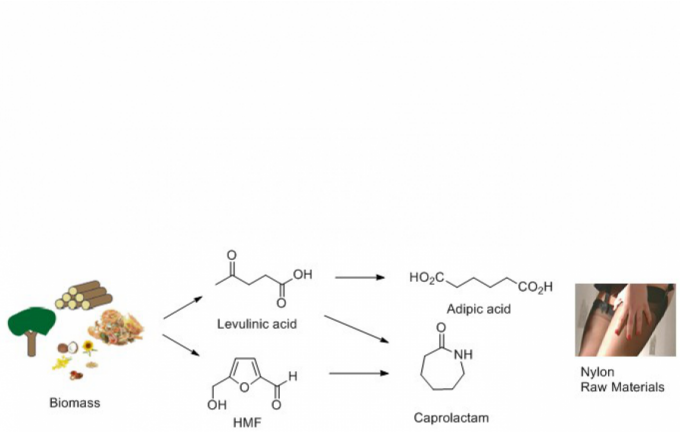

FIGURE 1

Nylon monomers from renewables

Nylon Monomers from renewables

FIGURE 2

KEYWORDS

Biomass | Renewable resources | Homogenous catalysis | Heterogeneous catalysis

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