ABSTRACT:

Sustainable Catalytic Applications of *ad-hoc* Synthesized and Commercial Catalysts

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Prof. Claudia Antonetti's research has focused on applied catalysis under sustainable conditions, emphasizing the synthesis, characterization and application of ad-hoc catalysts, as well as the optimization of catalytic processes using both tailor-made and commercial systems. Her work aims at the valorization of biomasses, including waste ones, and related platform chemicals in the perspective of sustainability. Regarding the ad-hoc synthesized catalysts, several nanostructured catalysts based on metals such as Ru, Pd, Au, Cu and Ag have shown promising performances in industrially relevant reactions [1], including the selective hydrogenation of benzene, of phenol, of p-chloronitrobenzene and of cinnamic aldehyde. Among the synthesized catalysts, in recent years, the synthesis of biomass-derived catalysts [2] was investigated for the synthesis of diphenolic acid, further promoting sustainability and circular economy principles. Regarding commercial catalysts, their use for the catalytic conversion and valorization of a wide range of biomasses, including waste ones, was studied and optimized under sustainable reaction conditions [3] in the presence of heterogeneous acid systems, salts, mineral acids and metallic catalysts. These efforts led to significant results in the production of 5-hydroxymethylfurfural, alkyl levulinates, 2,5-bis(hydroxymethyl)furan and 2,5-bis(hydroxymethyl)tetrahydrofuran.

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