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Advances in the Catalytic Conversion of Biomass Components to Ester Derivatives: Challenges and Opportunities

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Deadline for manuscript submissions:
closed (28 February 2022)

Message from the Guest Editor

This Special Issue reports the recent advances in the catalytic conversion of model/real biomass components to ester derivatives. Biomass has received significant attention as a sustainable feedstock. However, many of these still suffer from several disadvantages, such as weak catalytic performances, harsh reaction conditions, a high processing cost, and questionable sustainability. An emblematic example is the acid-catalyzed hydrothermal route for levulinic acid production, already upgraded to that of higher value alkyl levulinates, obtained by esterification or directly by biomass alcoholysis. Many other chemical processes benefit from esterification, such as the synthesis of bio-diesel, which includes mono-alkyl esters of long-chain fatty acids prepared from renewable vegetable oils and animal fats, or that of cellulose esters, mainly acetates, for textile uses. Even pyrolysis bio-oil should be stabilized by esterification to neutralize the acidity of carboxylic acids and moderate the reactivity of other typical biomass-derived compounds, such as sugars, furans, aldehydes, and phenolics.