



ICCE 2019 Session  
Green and sustainable chemistry strategies for agricultural and food  
waste biomass valorization

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The utilization of alternative energy sources such as biomass, wind, sun and water, is at the forefront of scientific and technological innovation, in response to the Renewable Energy EU Directive which has the target of 20% final energy consumption from renewable sources by 2020. Although, the latter three can produce vast amounts of clean power (electricity) to replace fossil raw materials such as coal and natural gas, only biomass is capable to provide liquid, solid and gaseous fuels, including high quality road and aviation fuels. Furthermore, due to its oxygenated nature, both lipid/oil and lignocellulosic biomass can be transformed to a wide range of functional platform chemicals, not available through petroleum refining, as well as high added-value materials, such as polymers, pharmaceuticals, biochar and others. This huge potential of biomass has been evolved over the last 20 years leading to the development of “biorefineries” or dedicated processes that can be integrated with petroleum refining or petrochemical industry. The sustainability of biomass valorization is further increased when wastes and by-products are being used which otherwise would require costly and in many cases environmentally hazardous disposal procedures.



Agricultural production and processing of crops as well as various sectors of food industry offer enormous amounts of biomass waste streams which in the old traditional way would have been burnt, converted to compost or used as animal feed. Actual food waste, in various forms, ranging from domestic cooking vegetable oil to expired food from super-markets, accounts for millions of tons worldwide every year, and represent a steady source of feedstock to be processed to useful chemicals. On top of all, waste biomass and food reuse and utilization can significantly contribute to “closed carbon cycle” and “circular economy” concepts towards a low-carbon and resource-efficient development. Still, in order to compete with more conventional resources and related products, economically, energetically and environmentally viable technologies, based on “Green and Sustainable Chemistry Strategies” should be developed, that will overcome important bottlenecks associated for example with the recalcitrance of the lignocellulosic structure or the high and in many cases uncontrolled reactivity of sugars towards furans, organic acids and humins. To this end, novel biological, thermochemical and chemocatalytic processes are being researched, along with technoeconomical, LCA and societal impact studies that can elucidate their industrial potential. Within the frame of the “17th International Conference on Chemistry and the Environment”, this Session invites the submission of contributions related to all the above discussed topics, in order to highlight the important role of biomass and food waste valorization via sustainable chemistry solutions towards a cleaner environment for the future.

