7th International Conference on
GREEN CHEMISTRY & TECHNOLOGY
June 18-20, 2018 | Dublin, Ireland
Andres Moreno Moreno, J Ind Environ Chem 2018, Volume 2 | DOI: 10.4066/2591-7331-C1-001

MICROWAVE CATALYTIC CONVERSION OF LIGNOCELLULOSIC WASTES INTO BIOFUEL PRECURSORS

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Biography

Andres Moreno Moreno has completed his PhD degree in Organic Chemistry from Universidad de Castilla-La Mancha, Spain in 1990. He carried out Post-doctoral studies at University of Oxford and University of Paris-Sud. He became Assistant Professor in Organic Chemistry in 1995. In 2015, he obtained a full-time Professor position by Spanish Educational Government.

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Biomass has been recognized as the most promising renewable resource for the production of high value bio-chemicals, as 5-hydroxymethylfurfural (HMF) and levulinic acid (LA) which are biofuel precursors. Our research group works on agro food and lignocellulosic residues focusing on their carbohydrate contents. Carbohydrates are dehydrated in acidic medium at high temperature to obtain HMF and LA, which are interesting compounds as they involve in obtaining renewable precursors for the production of biofuels. The aim of this work involves the carbohydrate dehydration from the beer bagasse and the study of other agro-industrial wastes. Thereby environmentally friendly techniques, such as microwave radiation as energy source will be used for meeting some of the Green Chemistry Principles. Thus, we have obtained good HMF and LA recoveries, calculated by quantitative NMR (qNMR) and we compare these results when the reactions are carried out with conventional heating. Moreover, we have been able to obtain biofuel precursors from waste using a green and environmentally friendly energy such us microwave radiation. Also, we have developed different methods to obtain one precursor or other changing experimental conditions. As conclusion, a method based on Green Chemistry Principles has been developed, being clean and environmental-friendly practices and thanks to the use of microwave energy. This method approaches the problem of the sugarcane bagasse, beer bagasse and melon rind as a residue and tries to palliate it; also they have been transformed in a source of biofuel precursors.

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