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Sugar dehydration under microwave-assisted radiation: A new green method for the synthesis of platform chemicals

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Furfural (FF) is an organic compound which can be produced from the dehydration of pentoses, such as xylose, and it is mainly obtained under acid catalysis. Brønsted and Lewis acid, e.g. H_2SO_4 and $AlCl_3$, respectively, are normally appropriated for this reaction. Besides, this molecule is also employed for the synthesis of many interesting compounds, such as furfuryl alcohol, and it is useful for biofuel production. Levulinic acid (LA) and 5-hydroxymethylfurfural (5-HMF) can be also mentioned as platform chemicals in order to obtain biofuel. These precursors can be also produced under acid catalysis and both are generated from hexoses, such as glucose. They are recognized as high value materials for the preparation of many desired compounds (e.g. 2,5-dymethylfuran and γ-valerolactone, which have been already used as biofuels). Diminishing fossil fuel resources and climate change have caused the greater use of lignocellulosic biomass for the production of FF, 5-HMF and LA. Agroindustrial food wastes are one of the most valuable resource of this biomass, which is mainly compound by cellulose, hemicellulose and lignin, therefore it supposes an essential renewable resource in order to reduce CO_2 emissions. The main goal of this work is the synthesis of platform chemicals previously mentioned (FF, 5-HMF and LA) from agroindustrial food wastes, as almond shell and dry grape marc. Furthermore, microwave radiation as a tool for sugar hydrolysis and dehydration is an environmental friendly technique that provides us shorter reaction time, better yield and elimination of by-products.

Biography

Manuel Salgado Ramos graduated in Chemistry in 2015 from the University of Castilla-la Mancha (UCLM). He completed his master´s degree in Organic Chemistry at the Complutense University of Madrid (UCM). He has worked in some groups during his five years as a student. His research career is brief; he has presented a publication and participated in several scientific conferences. Currently, he is a PhD student at the University of Castilla-la Mancha, in the organic chemistry area in the group ´Organic Green Chemistry, Food and agroindustrial waste Chemistry´.

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