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Application of qNMR and microwave radiation to obtain biofuel precursors from *Opuntia ficus-indica* fruit**A J Huertas-Alonso, M Salgado, A Lorente, M P Sánchez-Verdú, B Cabañas and A Moreno**
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Diminishing fossil fuel reserves and increasingly concern about environmental issues have resulted in the development of sustainable production of biofuels and chemicals. In order to maintain fossil reserves to future generations and to reduce greenhouse gas emissions, biomass has merged as the most abundant and affordable source of new fuels and chemicals. Biomass is composed mainly for carbohydrates, such as glucose, fructose or xylose. The dehydration of these carbohydrates to obtain biofuel precursors has been studied, namely 5-Hydroxymethyl-furfural (5-HMF) and Levulinic Acid (LA). Both 5-HMF and LA are precursors of a wide range of valuable products. Continuing with previous work in our research group in the field of valorization of agro-food waste to obtain biofuel precursors, herein we exposed the catalytic conversion of biomass from *Opuntia ficus-indica* fruit into 5-HMF and LA. Synergy of microwave radiation as a source of environmental friendly energy and Nuclear Magnetic Resonance Spectroscopy (NMR), let us not only carry out carbohydrates dehydration, but also identify and quantify this platform compounds (5-HMF and LA) rapidly and with low use of solvents. For that, NMR plays an important role in the field of agro-food waste valorization, because it can be used firstly to identify what kind of carbohydrates are present in the biomass, and secondly, a special application of NMR called Quantitative Nuclear Magnetic Resonance Spectroscopy (qNMR) allows to quantify the compounds obtained once the dehydration reaction has been carried out.



Figure 1: Dehydration of glucose into 5-HMF and LA

Biography

A J Huertas-Alonso obtained BSc in Chemistry at the Universidad de Castilla-La Mancha (UCLM) and his MSc in Organic Chemistry at the Universidad Complutense de Madrid (UCM) in 2016. His first contact with a research laboratory was during the last year of his Chemistry degree, in the field of sugar dehydration from wine waste to obtain 5-HMF, under the supervision of Dr. Andrés Moreno. After one year stay at the Medicinal Chemistry Institute, in the National Spanish Research Council, he is now doing his PhD at Universidad de Castilla-La Mancha, working in the valorization of agro-food waste to obtain biofuel precursors.

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