Solid acid catalysed formation of ethyl levulinate and ethyl glucopyranoside from mono- and disaccharides

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Sulfonic acid functionalised SBA-15 (SO3H-SBA-15), sulfated zirconia and beta, Y, ZSM-5 and mordenite zeolite catalysts have been applied for the dehydration of sugars to ethyl levulinate and ethyl-D-glucopyranoside (EDGP) using ethanol as solvent and reactant. The SO3H-SBA-15 catalyst showed a high catalytic activity for the selective conversion of fructose to ethyl levulinate (57%) and glucose to EDGP (80%) at 140 °C, whereas the disaccharide sucrose yielded a significant amount of both products. The SO3H-SBA-15 catalysts were found to be highly active compared to the zeolites under identical reaction conditions.