

Phosphorous pentoxide catalyzed Fructose dehydration into 5-Hydroxymethylfurfural in Ionic liquid

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A metal-free dehydration of fructose was performed using phosphorous pentoxide (P₂O₅), acting both as a catalyst and water-absorbing reagent, in 1-butyl-3-methylimidazolium chloride ([bmim]Cl) solvent. A yield of 81.2% 5-hydroxymethylfurfural (5-HMF) was achieved under mild reaction condition of 50°C in 60 min. Another remarkable feature of the reaction is the absence of formation of rehydration products such as levulinic acid or formic acid as compared with other catalytic systems. Solid inorganic anhydrides and acids were used to compare the yield of 5-HMF formed with P₂O₅. This work was supported by Priority Research Centers Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education, Science and Technology (2012-0006693).