

Brønsted acidic ionic liquids functionalized on graphene oxide highly efficient, selective, and recyclable catalyst for dehydration of glucose into 5-hydroxymethylfurfural (HMF)

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In this study, we report development of heterogeneous catalyst in which Brønsted acidic ILs are functionalized on graphene oxide (GO) and utilized it for dehydration of glucose into HMF. Varieties of ILs were prepared by metathesis reaction and developed different kinds of ILs functionalized GO. The functionalization of ILs on GO were produce high surface area, heterogeneous nature and also helps to disperse catalyst (IL) homogeneously in reaction mixture. Among these obtained catalysts Brønsted acidic ILs functionalized GO showed highest conversion as well selective yield of HMF in DMSO. Mechanism of formation of HMF from glucose by using Brønsted acidic functionalized GO was also determined. In addition, effect of different anions, effect of temperature, catalyst amount, and different solvents were also studied. Recyclability of catalyst was also tested. This work was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (No. 2009-0093816).