

Graphene oxide functionalized with Brønsted acidic ionic liquids is 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 produced heterogeneous catalyst having high surface area and high dispersion of active sites (ILs). Among the catalysts prepared, Brønsted acidic ILs (GO-IL-HSO₄) functionalized GO showed highest glucose conversion and yield for HMF. Reaction mechanism of HMF formation from glucose over Brønsted acidic IL functionalized GO was also investigated. In addition, effect of different anions, effects of temperature, catalyst amount, and different solvents were also studied. This work was supported by the National Research Foundation of Korea (NRF) funded by the Ministry of Education (No.2009-0093816).