

Magnetic Sulphonic Acid Catalyst: Synthesis, Characterization and Application in the Conversion of Carbohydrates to 5-HMF

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The magnetic sulphonic acid catalyst facilitated a significant activity for the conversion of carbohydrates and biomass feedstockes to 5-hydroxymethylfurfural (5-HMF), a platform chemical. Polysaccharides can interact much strongly with anions of proton donating active sites of the catalyst via their several hydroxyls, which could disrupt their inter- and intra-molecular hydrogen bonding. The prepared catalyst and its precursors were characterized by XRD, HRTEM, FT-IR, VSM and thermo-gravimetric analyses. After the reaction, catalyst could simply be recovered by using an external magnet. In this manner, tedious separation of solid catalyst from reaction mixture was avoided. This work was supported by the Basic Science Research Program through the National Research Foundation of Korea (NRF) grant funded by the Ministry of Education (No. 2009-0093816) and by the Ministry of Science, ICT & Future Planning (No. 2015R1C1A2A01054605).