

Hydrogenolysis of sorbitol to ethylene glycol on the Sm-modified CeO₂-ZrO₂

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The conversion of polyols, derived from biomass such as sorbitol, mannitol and xylitol, was investigated to produce a valuable ethylene glycol selectively in a batch reactor. The CeO₂-ZrO₂ mixed metal oxide catalysts modified with samarium without noble metals showed a higher conversion of sorbitol to ethylene glycol. The catalyst was synthesized by the coprecipitation with different weight ratios of samarium from 0 to 20wt% in the matrices of CeO₂-ZrO₂ using the nitrate precursor. The optimal concentration of samarium was found to be around 15wt%, and the superior activity for the hydrogenolysis of sorbitol seems to be attributed to the surface acidity and the active oxygen species, which were further confirmed by the characterizations of XRD, BET, and TPR.