

Aqueous phase reforming of polyols for hydrogen production using supported Pt-Fe bimetallic catalysts

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3-D cubic ordered mesoporous carbon (CMK-9) supported Pt-Fe bimetallic catalysts with a range of Pt-Fe compositions were applied to the aqueous phase reforming (APR) of polyols for hydrogen production. The catalytic performance with respect to the polyol and support used was also studied. The polyols investigated include ethylene glycol (EG), glycerol, xylitol, and sorbitol. It was found that the addition of Fe to the Pt/CMK-9 catalyst significantly improved catalytic performance, with the optimum Pt:Fe ratio for APR activity being 1:3. It was also observed that, in the Pt-Fe (1:3) system, the CMK-9 support demonstrated better catalytic performance than commercially available activated carbon or alumina. In addition, the catalytic activity of the Pt-Fe/CMK-9 catalyst was successfully increased by both the effect of the water-gas shift reaction, promoted by Fe addition to Pt, and by the structural properties and nature of the CMK-9 support.