

Hydrogen Production from Ethanol and Ethylene Glycol on Transition Metal Oxide Supported Nano-Pt Catalysts

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H₂ is considered to be the energy carrier of the future and could have an important role in reducing environmental emissions. Ethanol and ethylene glycol are appealing as primary fuels for H₂ production because they can be obtained from renewable biomass resources. Over the years, many metallic, bimetallic and metal on oxide catalysts have been developed and investigated for ethanol and ethylene glycol reforming. Most studies are focused on metals rather than the combination of both metals and oxide supports.

In the current research, Pt was dosed on different transition metal oxides such as TiO₂, CeO₂ and ZrO₂ by wetness impregnation technique. CO chemisorption experiments showed that the particle size of Pt was between 1.5-6.0nm. To find out the catalytic activity and the interaction between Pt and oxides, the catalysts were characterized with synchrotron-based X-ray diffraction (XRD) and X-ray absorption(XAS), temperature programmed reduction (TPR) and temperature programmed desorption (TPD). Part of the results will be presented.