

188d Hydrogen Production from Oxidative Steam Reforming of Methanol over

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Hydrogen production from oxidative steam reforming of methanol over M(=Pt, Pd, Cu)/CeO₂-Al₂O₃ catalysts.

For hydrogen generation fuel cells, methanol offers a lot of advantages compared to other hydrocarbons. We examined a combination of steam reforming and partial oxidation of methanol (oxidative steam reforming, OSRM) with the goal of minimizing the byproduct CO. High surface area ceria-alumina support was prepared by a sol-gel method and impregnated with the metal precursor solution to obtain the desired final metal loadings. Prior to catalyst activity tests, the catalysts were reduced in 20% H₂ at 300 ° or 400 °C. OSRM tests were carried out in an 8 channel Celero fixed bed reactor. Conversion studies were carried out as a function of temperature, oxygen to methanol ratio, water to methanol ratio. The product stream was analyzed with a CP-4900 Micro gas chromatograph. All three catalysts were found to be active for catalyzing methanol OSRM. However, the conversions as well as the amount of hydrogen generated depended strongly on the reduction temperature.