

Aqueous Phase Reforming of Xylose over Pt/Al₂O₃ catalysts : Effect of Addition of Formic Acid as a Reducing Agent

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The demand for hydrogen production is expected to grow in the near future due to increasing interest in hydrogen-related technologies. Biomass is a suitable material for hydrogen production because of its abundance in nature as well as reforming process that is environmentally friendly with zero carbon footprint. Recently, researches on producing hydrogen by aqueous phase reforming of biomass have been reported. However, the obtained hydrogen yield from this reaction is very low. To solve this problem, a reducing agent was added to the reaction. Reducing agents are known to provide proton sources to convert sugar to polyols.

In this study, 2-propanol and formic acid were selected as reducing agents and tested for xylose APR. APR reaction was carried out in a semi-batch reactor. The gas product compositions were confirmed by GC and the amount of gas produced was measured by pressure variation. The liquid products were identified and their concentrations were acquired by HPLC. The results indicated that in the presence of formic acid higher xylose conversion was obtained.