Effect of Co addition to monometallic Pt catalysts in the aqueous phase reforming(APR)

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Hydrogen has been attracting the attention as a clean energy for the future that can solve the environmental and energy problems simultaneously. Conventional method for production of hydrogen is the natural gas steam reforming which is low economic efficiency. For that reason, the research on the production of hydrogen from oxygenated hydrocarbons (xylose) has been actively studied. In the previous research, Pt was reported as promising material to produce the hydrogen, but it is not economical with respect to precious metal. In this presentation, Co has been applied to enhance the conversion of xylose by adding to Pt monometallic catalyst. Addition of Co is to promote the functionality of Pt by increasing the rate of the WGS reaction on the surface or by decreasing CO binding energy on PtCo surfaces, which assists in removing the surface CO generated by the C–C cleavage. As a result, PtCo catalysts show the high activity about 2 times with regard to conversion of hydrogen in comparison Pt catalysts also, confirms that stability of catalyst structures during the long terms of APR reaction.