

The deactivation phenomenon of Pt/Al₂O₃ catalyst on hydrogen Iodide decomposition

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Platinum catalysts have been commonly used for HI decomposition. In previous paper, effect of support in HI decomposition using Pt catalyst were reported and Al₂O₃ was the best support to get good characteristic. In this study, the deactivation phenomenon of Pt/Al₂O₃ catalyst and reasons of this catalysts deactivation were investigated. The initial maximum conversions of Pt(0.5)/Al₂O₃, was 18.72%. About 7h later, the conversion using Pt(0.5)/Al₂O₃ catalyst reached on a steady state. As a result, the reasons of Pt catalysts deactivation were explored that 1) Transforming Pt from active to inactive because of fouling I₂ on catalyst not only active site but also supports and 2) Sintering of Pt during HI decomposition. Catalyst was prepared by impregnation method and activity tests were carried out with fixed-bed reactor. In addition, analysis methods such as BET, CO gas chemisorption, CO₂-chemisorption, XRD, TEM, and TG were used for the characteristic of the catalysts.