A study on Metal Dispersion and Characteristics of HI Decomposition over Pt/Al_2O_3 Catalyst by Treating Heat Condition

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In HI decomposition, Pt/Al_2O_3 have been studied by several researchers. However, metal dispersion of Pt/Al_2O_3 was decreased because during HI decomposition sintering occurred that platinum atoms were agglomerated. Also, it brought catalytic deactivation. This study was conducted to search the heat treatment condition that minimize sintering. Particulary, optimum heat atmosphere, time, and temperature condition were considered. First of all, although Pt/Al_2O_3 treated in hydrogen atmosphere had low platinum dispersion between 13 and 18%, its catalytic activity was relatively stable. However, Pt/Al_2O_3 treated in oxygen atmosphere had the highest platinum dispersion at 500 ℃, 61.52 %. On the other hand, it was difficult to observe the effect of platinum dispersion and catalytic activity on the heat treatment time in hydrogen atmosphere. When adding oxygen heat treatment at 500 ℃ before heat treatment in hydrogen atmosphere, the platinum dispersion was increased by about 20~30 %, and their initial HI conversion was stable.