Metal-Support Interaction on Pt/Al_2O_3

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In this study, we investigated the effects of alumina surface properties (number of sites and surface characteristics) on interaction between Pt and aluminas by XRD, ethanol TPD, H_2 pulse-chemisorption, H_2-TPR and HAADF-STEM. By comparing the amounts of dissociative ethanol and maximum desorption rates (T_d) on ethanol TPD, we could prepare model aluminas with different number of sites and surface characteristics. H_2 chemisorption and STEM on supported Pt/Al_2O_3 showed that Pt was more highly dispersed on aluminas with higher number of sites and higher maximum desorption rates (T_d). H_2-TPR showed high-temperature reduction peaks around 370 °C, which might be related with Pt-O-Al.