

Performance of Bimetallic Catalyst in the Oxidation of Volatile Organic Compounds

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Abstract : The catalytic activity of Pt/ γ -Al₂O₃ and Pt-Fe/ γ -Al₂O₃ catalysts was investigated to bring about the complete oxidation of 2-Propanol. Among them, Pt-Fe/ γ -Al₂O₃ was found to be the most promising catalyst based on activity. The catalysts were characterized by (XRD), (SEM), (TEM) and ICP-AES techniques. Iron loadings on Pt/ γ -Al₂O₃ had a great effect on catalytic activity, and Pt-Fe/ γ -Al₂O₃ (1.75 wt% Fe) catalyst at calcination temperature 300°C was observed to be the most active, which might be contributed to the favorable synergetic effects between Pt and Fe, high activity and the well-dispersed bimetallic phase. The combustion of 2-Propanol in the vapor phase was carried out in a conventional flow U-shape glass reactor used in the differential mode at atmospheric pressure. 2-Propanol was analyzed by a gas chromatograph VARIAN 3800 CX equipped with an FID. As observed, better performance and activity were observed for Pt-Fe/Al₂O₃ bimetallic catalyst. These results indicate that the high dispersion on support gives a positive effect on catalytic activity.

Keywords : volatile organic compounds, bimetallic catalyst, catalytic activity, low temperature

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