

Methanol carbonylation to acetic acid on the heterogenized homogeneous catalysts

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The carbonylation of methanol to acetic acid has been commercialized by many companies such as the Monsanto process using rhodium-based homogeneous catalyst, the Cativa process using iridium-based catalysis and the Acetica™ process using polymer resin-supported rhodium-based catalysis. Not only to solve the problems such as the separation of homogeneous catalysts from the liquid products, but also to enhance the productivity of acetic acid on the heterogeneous catalyst, the heterogenized homogeneous catalyst using palladium-incorporated graphitic carbon nitride (g-C₃N₄) with a fixed rhodium complex was investigated in the present study. Catalytic activity test was performed at 4.0 MPa and 135 °C for 7 h in an autoclave reactor. The 10 wt. % rhodium complex supported on the palladium-incorporated g-C₃N₄ showed a higher activity and selectivity to acetic acid. The properties of the heterogenized homogeneous catalyst was characterized by XRD, N₂-sorption technique, ICP-MS and FT-IR of CO molecules and so on.