

Development of supported Ru nanoparticles for efficient hydrogen charging of LOHC compounds

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Recently, liquid organic hydrogen carrier (LOHC) system has been attracting attention as a technique that can very effectively (dis)charge and transport hydrogen. In the hydrogenation for charging hydrogen, Ru catalysts were the most efficient than Pt, Pd, and Rh. Ru<sub>3</sub>(CO)<sub>12</sub> is known to be the most active Ru precursor for the synthesis of supported Ru catalysts. Therefore, understanding the activation of Ru<sub>3</sub>(CO)<sub>12</sub> on different support materials is of great importance to tune the properties and activities of Ru nanoparticles. Supported Ru catalysts on Al<sub>2</sub>O<sub>3</sub>, ZrO<sub>2</sub>, and MgO were investigated in the hydrogenation of LOHC compounds. Consequently, the surface area and OH group of support materials strongly affected the hydrogenation activity of supported Ru catalysts.