

Electronic Supplementary Information (ESI)

1. Catalyst synthesis

The catalyst was prepared by an in-situ addition of 1wt % solution of Pt salt in a mixture of surfactant and silica precursor and the detailed method was described elsewhere (M. Chatterjee et al Catal. Lett. 1999, 61, 199). Briefly, the sources of silicon and Pt are tetraethylorthosilicate (95 %, TEOS) (Wako, Japan), chloroplatinic acid (98.5 %, Aldrich), respectively. Cetyltrimethylammonium bromide (99%, Merck) was used as template to obtain the mesoporous structure. Under the stirring condition, the Pt salt solution followed by the TEOS (5.0 g) have been added to the starting gel, containing template (2.39 g) and sodium hydroxide (0.33 g) in deionized water (27.0 g). The stirring was further continued for 2 h. Finally, the resultant gel was autoclaved at 140 °C for 48 h. The molar composition of the gel was: 1 TEOS: 0.27 CTABr: 0.34 Na₂O: 62.5 H₂O. The resultant material is filtered, dried and then calcined at 550 °C for 10 h in air. The total amount of metal loading was ~1%. All the catalyst was primarily characterized by X-ray diffraction (XRD), transmission electron microscopy (TEM) and X-ray photoelectron spectroscopy (XPS).

2. Hydrogenation of 2-cyclohexene-1-one

The hydrogenation of *2-cyclohexene-1-one* was carried out in a 50 ml batch reactor containing catalyst and the substrate placed in an oven with fan heater to maintain the constant temperature. Hydrogen of desired pressure was first introduced into the reactor. Liquid CO₂ was charged into the reactor using a high pressure liquid pump (JASCO). The reaction mixture was stirred continuously with a teflon coated magnetic

bar during the reaction. After the reaction, the reactor was cooled by ice water and depressurized carefully by the backpressure regulator. The liquid mixture was identified by GC/MS and analyzed quantitatively by GC (HP 6890) equipped with flame ionization detector. Quantification of the products was obtained by a multipoint calibration curve for each product. For recycle studies the catalyst was separated from the reactant and product then recharged with fresh reactant. The hydrogenation in organic solvents has also been performed by the above method using conventional organic solvent (5 ml) instead of CO₂. The selectivity to each product was calculated by the following expression $S_i = C_i / \sum C_p$, where C_i is the concentration of the product 'i' and $\sum C_p$ is the total concentration of the product.