Supplementary Information

A green approach of using compressed CO₂/water as solvent for aromatic hydrogenation of benzyl alcohol and its derivatives

Hsin-Wei Lin,^a Clive H. Yen^a and Chung-Sung Tan^{*a}

^a Department of Chemical Engineering, National Tsing Hua University, No. 101, Section 2, Kuang-Fu Road, Hsinchu 30013, Taiwan. E-mail: cstan@mx.nthu.edu.tw

Catalyst charaterization

1. Transmission electron microscopy (TEM)



Fig. S1 TEM (Joel JEM-2100) image of Ru/MCM-41. The average particle size 2.6 nm were obtained by using an interactive imaging software OPTIMAS5. At least 100 particles were measured.

2. Powder X-ray diffraction (XRD)



Fig. S2 Powder X-ray Diffraction (Rigaku Ultima IV) patterns of Ru/MCM-41 (a) wide angle from 10 to 80 degree (b) small angle from 1 to 10 degree.

3. Physical properties

	Surface area	Pore diameter	Pore volume
	$[m^2 g^{-1}]$	[nm]	$[cm^{3}g^{-1}]$
MCM-41 (Aldrich)	1000	2.7	0.98
Ru/MCM-41	906	2.4	0.78

Table S1 Properties of the Ru nanoparticle incorporated in MCM-41 determinedfrom N_2 sorption measurement (Micromeritics ASAP 2010).

Catalyst recycling

- 1. After the reaction, the samples were extracted with diethyl ether, and then separated from the aqueous phase for GC-MS analysis.
- 2. The remaining aqueous solution containing the catalyst was then input to a rotary evaporator in order to remove the aqueous solution.
- 3. Ethanol was added thereafter to wash the residual catalyst powder.
- 4. The catalyst powder would be collected by filtration for the next experimental run.