

Supplementary Information

Microwave Effect on the Surface Composition of the Urushibara Ni Hydrogenation Catalyst and Improved Reduction of Acetophenone

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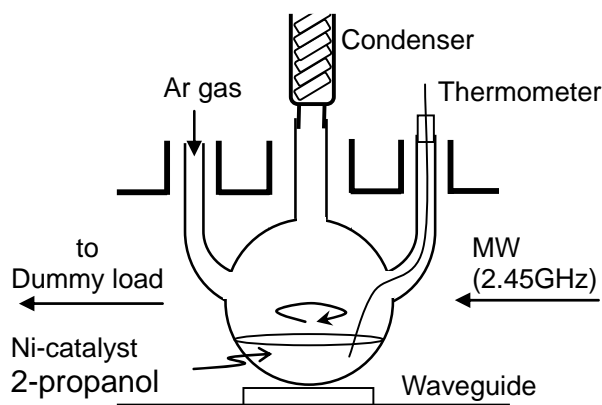


Fig. 1S – Schematic illustration of the reflux system of the 2.45 GHz microwave system operated in the single mode.

Analyses of reagent and product

Acetophenone: ¹H-NMR data (CDCl₃, relative to TMS): δ = 2.38 ppm (s, 3H), 7.26 ppm (t, 2H), 7.38 ppm (t, 1H), 7.77 ppm (d, 2H). GC-MS data (EI⁺, 1.3 kV): m/z (intensity) = **120** (28, {M}), 105 (90), 77 (100), 63 (6), 51 (67), 45 (1).

1-Phenylethanol: ¹H-NMR data (CDCl₃, relative to TMS): δ = 1.40 ppm (d, 3H, J = 7.0 Hz), 3.03 ppm (s, 1H), 4.77 ppm (q, 1H, J = 6.5 Hz), 7.07 ppm (t, 1H), 7.16 ppm (t, 2H), 7.20 ppm (d, 2H). GC-MS data (EI⁺, 1.3 kV): m/z (intensity) = **122** (47, {M}), 120 (60), 105 (89), 77 (100), 63 (20), 51 (75), 45 (15).

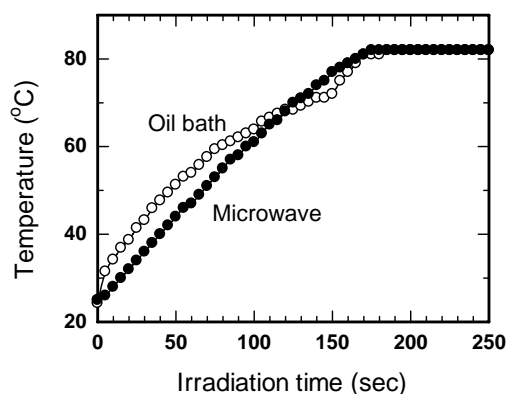
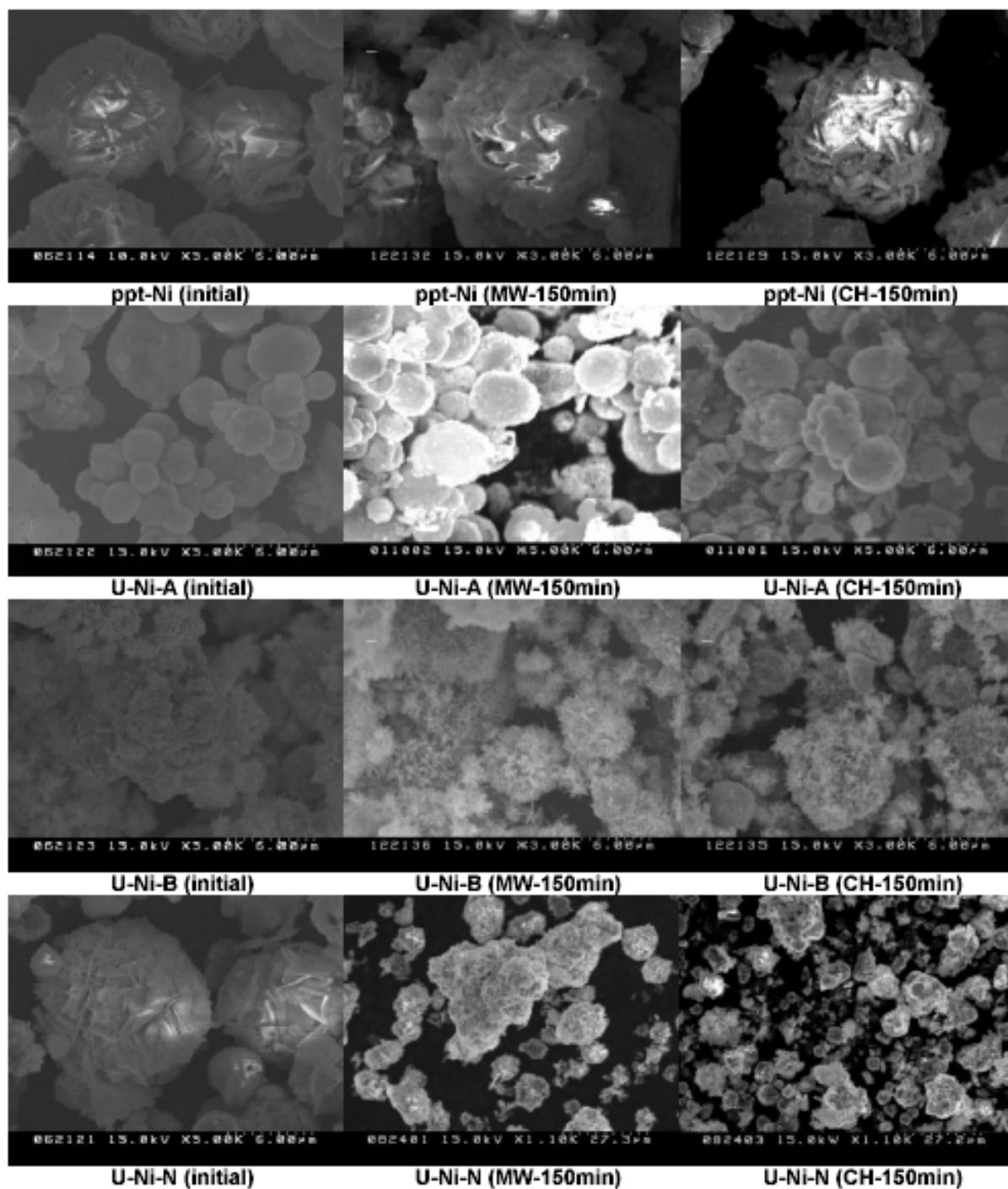


Fig. 2S – Temperature time profiles of heating 2-propanol by microwave radiation (power, 100 Watts) and by conventional heating with an oil bath.



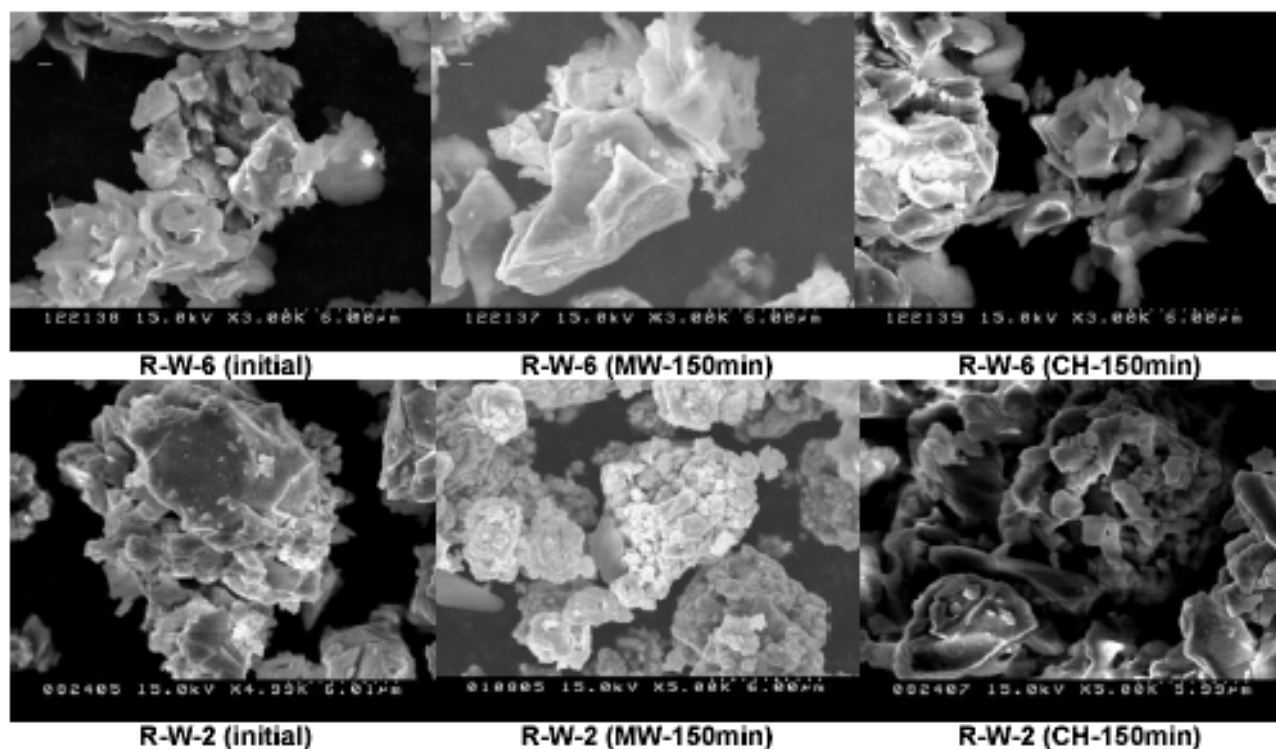
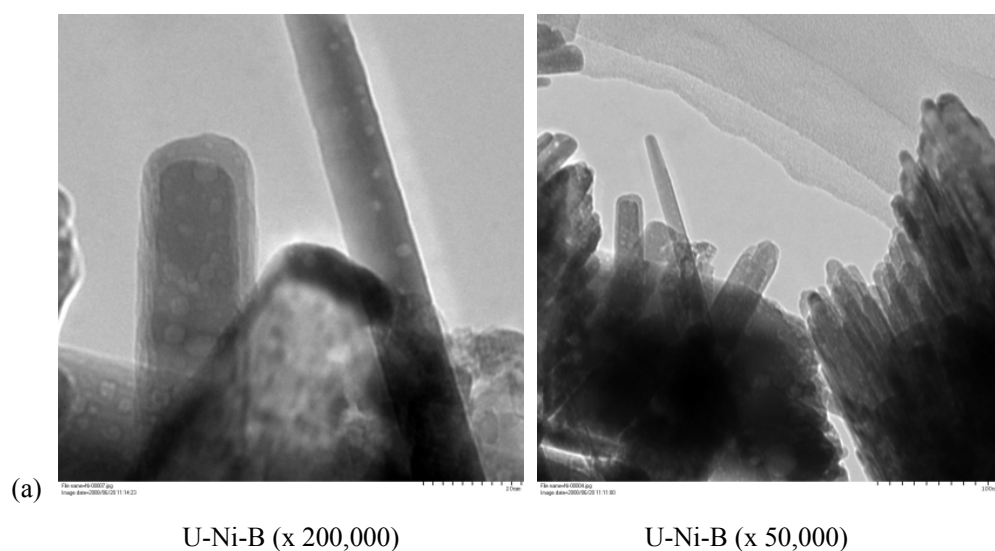


Fig. 3S – Scanning Electron Microscope images of the ppt-Ni, U-Ni-A, U-Ni-B, U-Ni-N, R-W-6 and R-W-2 catalyst specimens before and after 160 min into the hydrogenation reaction with dielectric heating (MW) and conventional heating (CH).



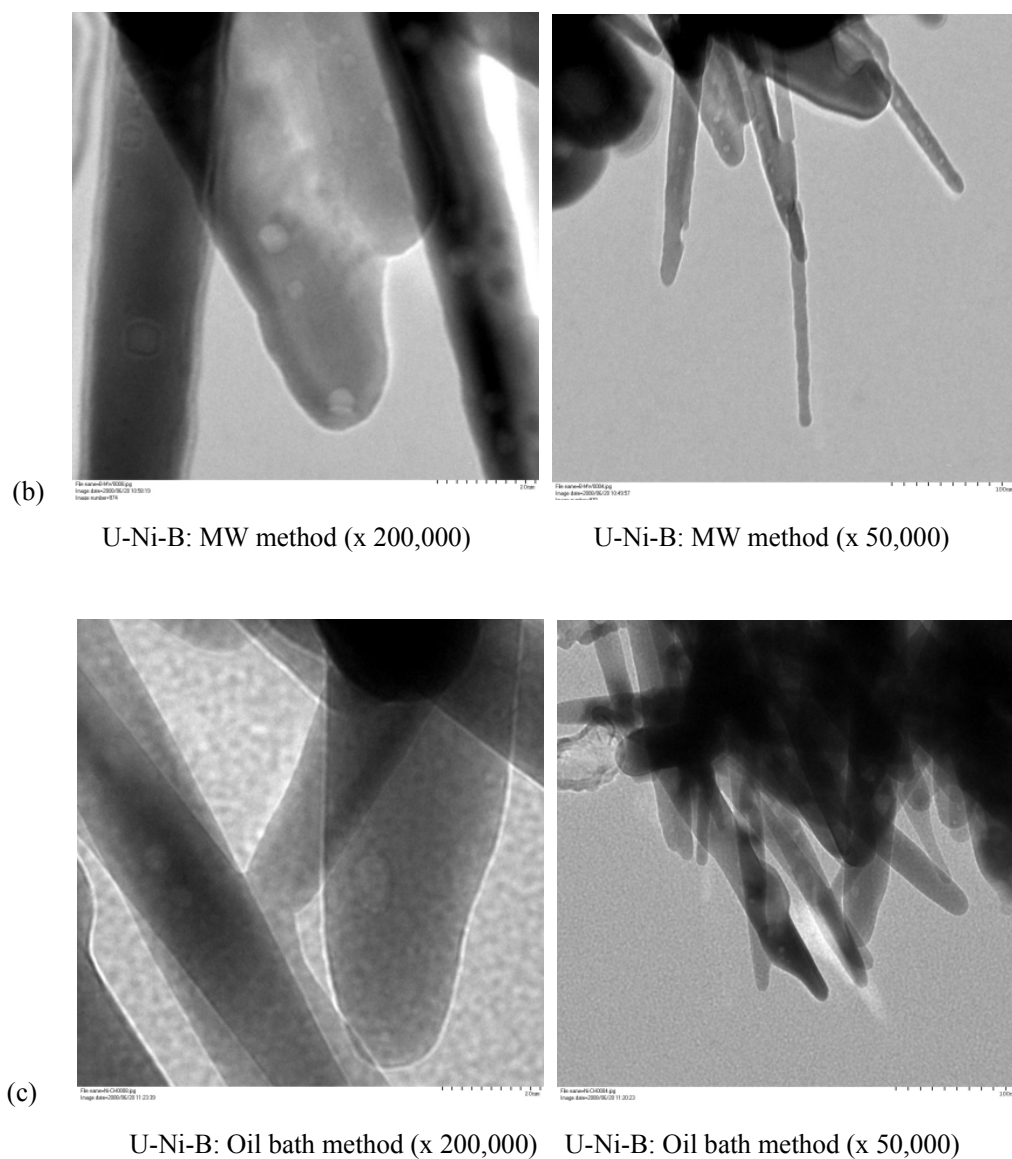


Figure 4S. – TEM micrographs for the U-Ni-B catalyst before (a) and after microwave dielectric heating (b) and conventional heating in oil bath (c).

Table 1S. - X-ray photoelectron spectroscopy (XPS) analysis of U-Ni-B catalyst before and after 150 min into the hydrogenation reaction with dielectric heating (MW) and conventional heating (CH). XPS: ULVAC-Phi Co., Ltd., ESCA-5800ci

	Zn	Ni	O
U-Ni-B	23.3	1	5.7
U-Ni-B (MW)	48	1	1.1
U-Ni-B (Oil bath)	82	1	17