Supplementary material (ESI) for Journal of Materials Chemistry

Supporting information

Solid-solid conversion of ordered crystalline mesoporous metal oxides under reducing atmosphere

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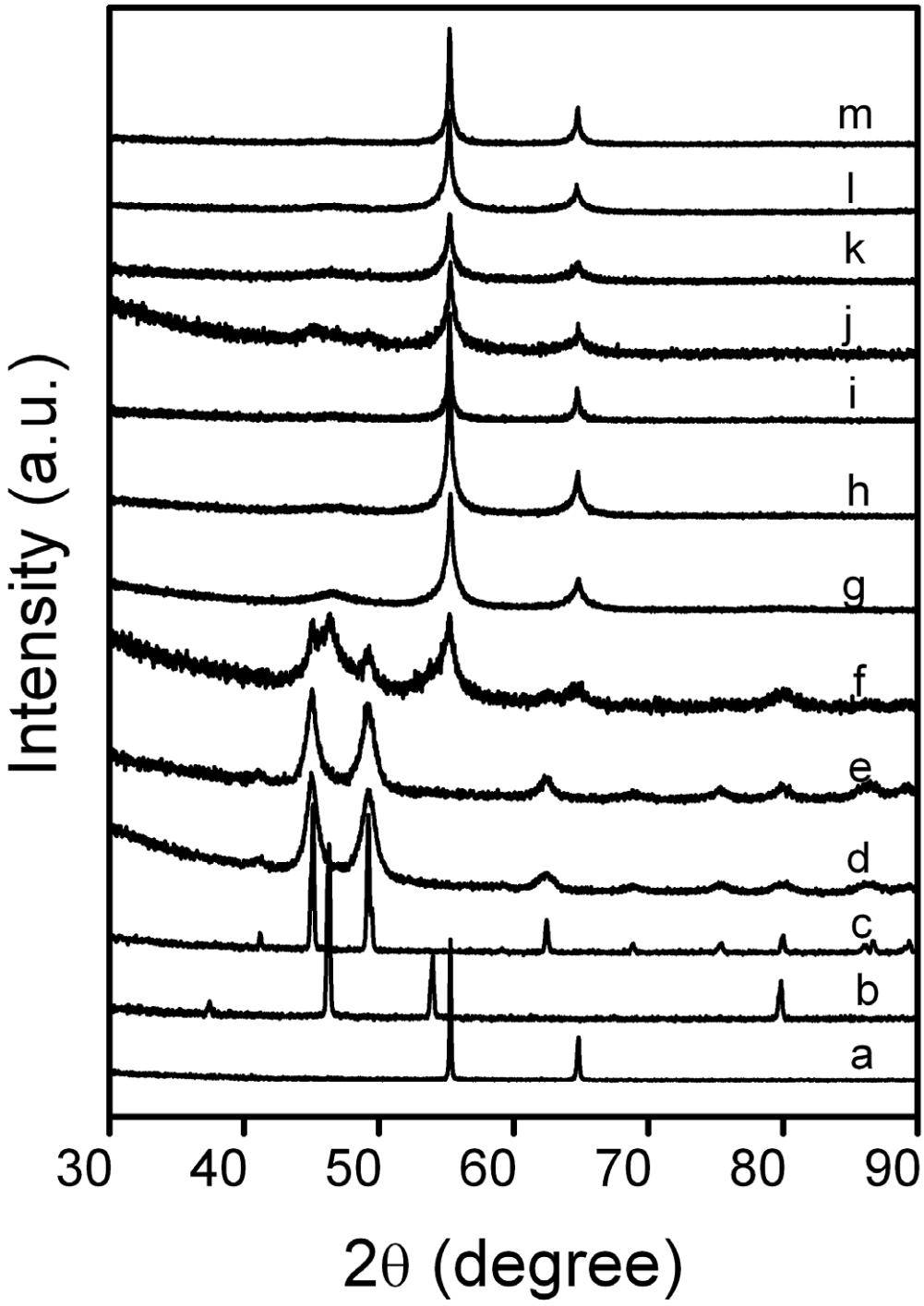

Figure S1 XRD patterns of (a) bulk Cu, (b) bulk Cu_2O, (c) bulk CuO, (d) mesoporous CuO, after reduction of mesoporous CuO at 170 °C for (e) 1 h, (f) 2 h, (g) 3 h, (h) 4 h, and (i) 5.5 h, and at (j) 180 °C for 2 h, (k) 200 °C for 2 h, (l) 220 °C for 2 h, and (m) 250 °C for 2 h.

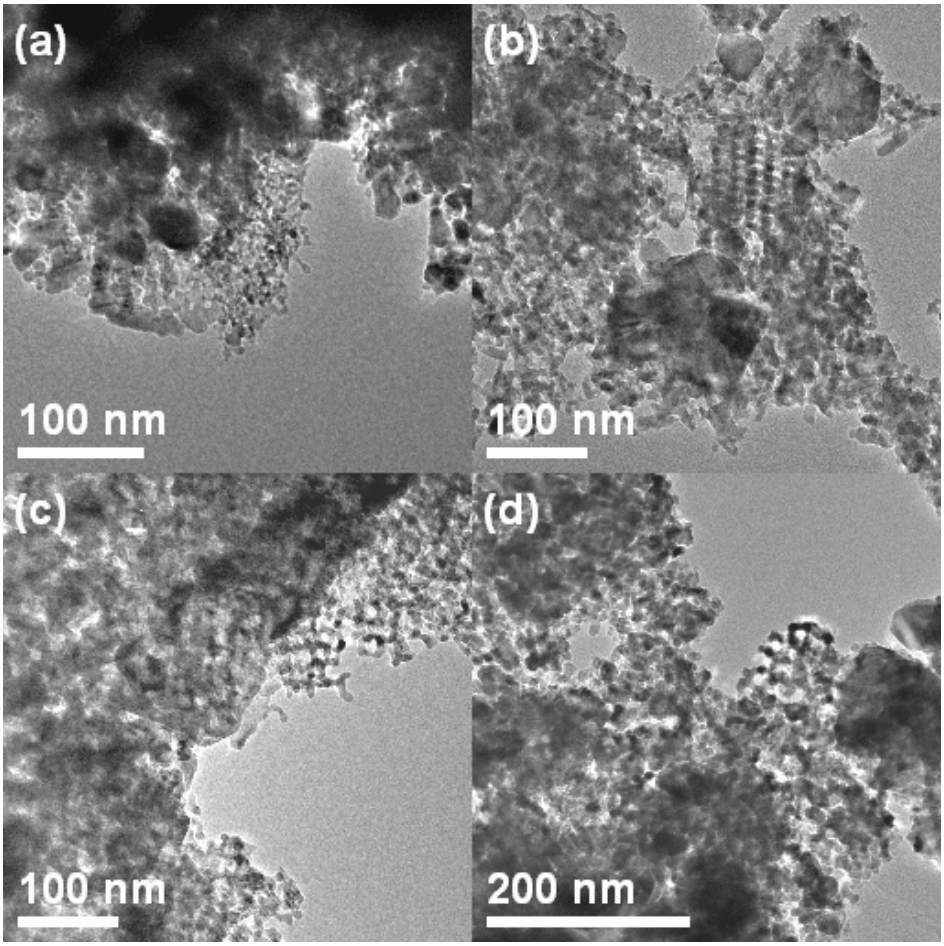

Figure S2 Typical TEM images of the reduction products of (a) mesoporous CoO (under 5% H_2 in Ar at 350 °C for 1 h), (b) mesoporous Fe_3O_4 (under 5% H_2 in Ar at 410 °C for 1 h), (c) mesoporous Mn_3O_4 (under 5% H_2 in Ar at 400 °C for 1 h) and (d) mesoporous NiO (under 5% H_2 in Ar at 380 °C for 1 h).

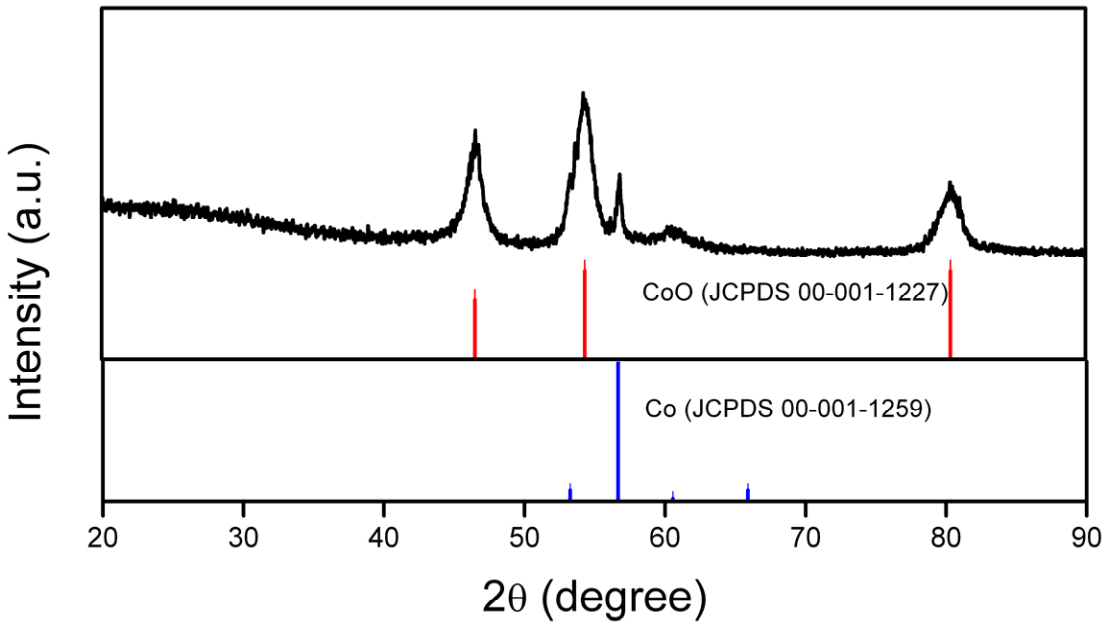

Figure S3 XRD pattern of the reduction product of mesoporous CoO under 5% H_2 (balance Ar) at 350 °C for 1 h. It consists of a mixture of CoO and Co.

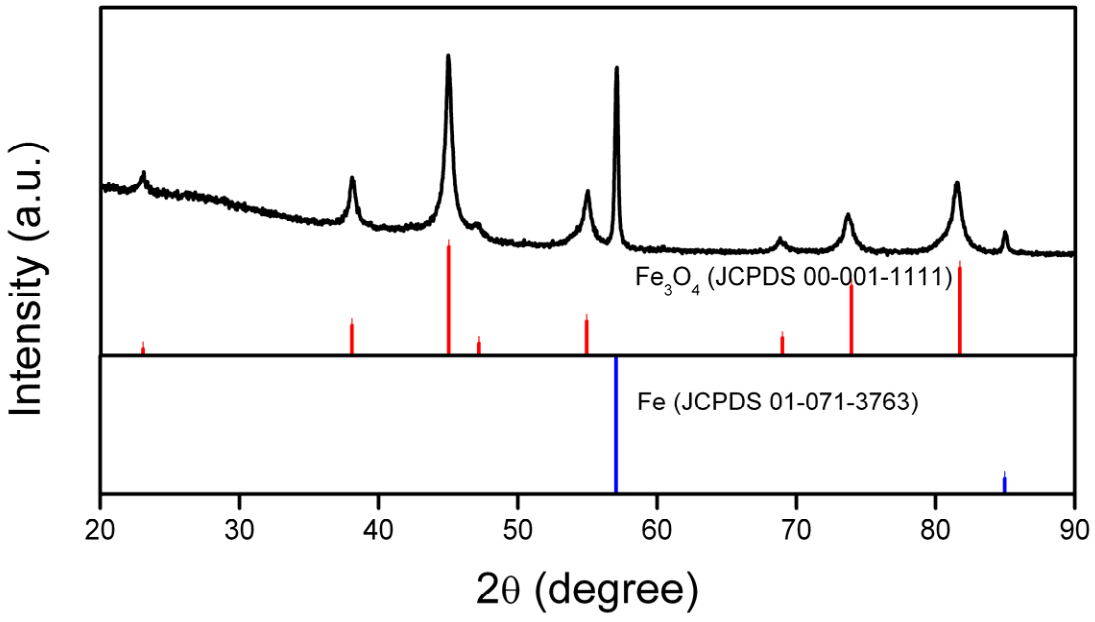

Figure S4 XRD pattern of the reduction product of mesoporous Fe_3O_4 under 5% H_2 (balanced with argon) at 410 °C for 1 h. It consists of a mixture of Fe and Fe_3O_4.

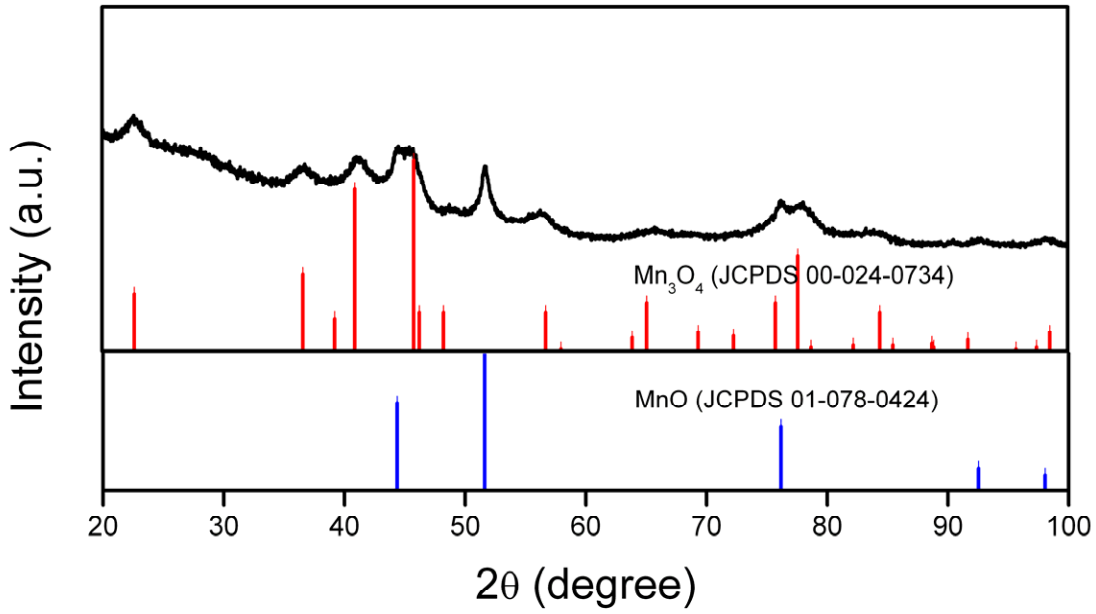

Figure S5 XRD pattern of the reduction product of mesoporous Mn_3O_4 under 5% H_2 (balanced with argon) at 400 °C for 1 h. It consists of a mixture of MnO and Mn_3O_4.

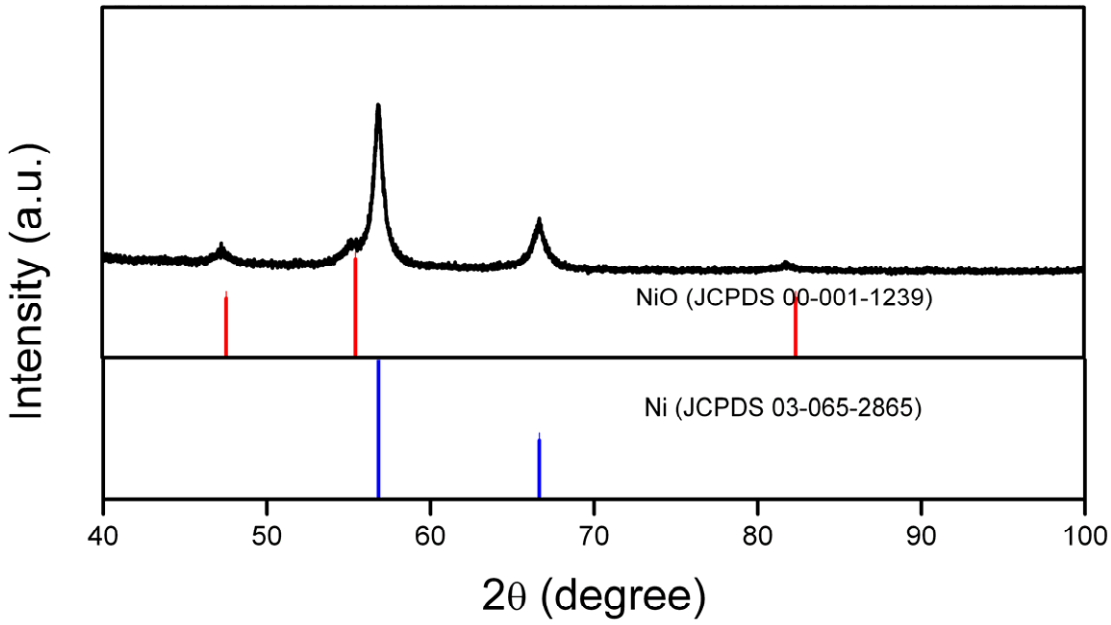

Figure S6 XRD pattern of the reduction product of mesoporous NiO under 5% H_2 (balanced with argon) at 380 °C for 1 h. It consists of a mixture of NiO and Ni.

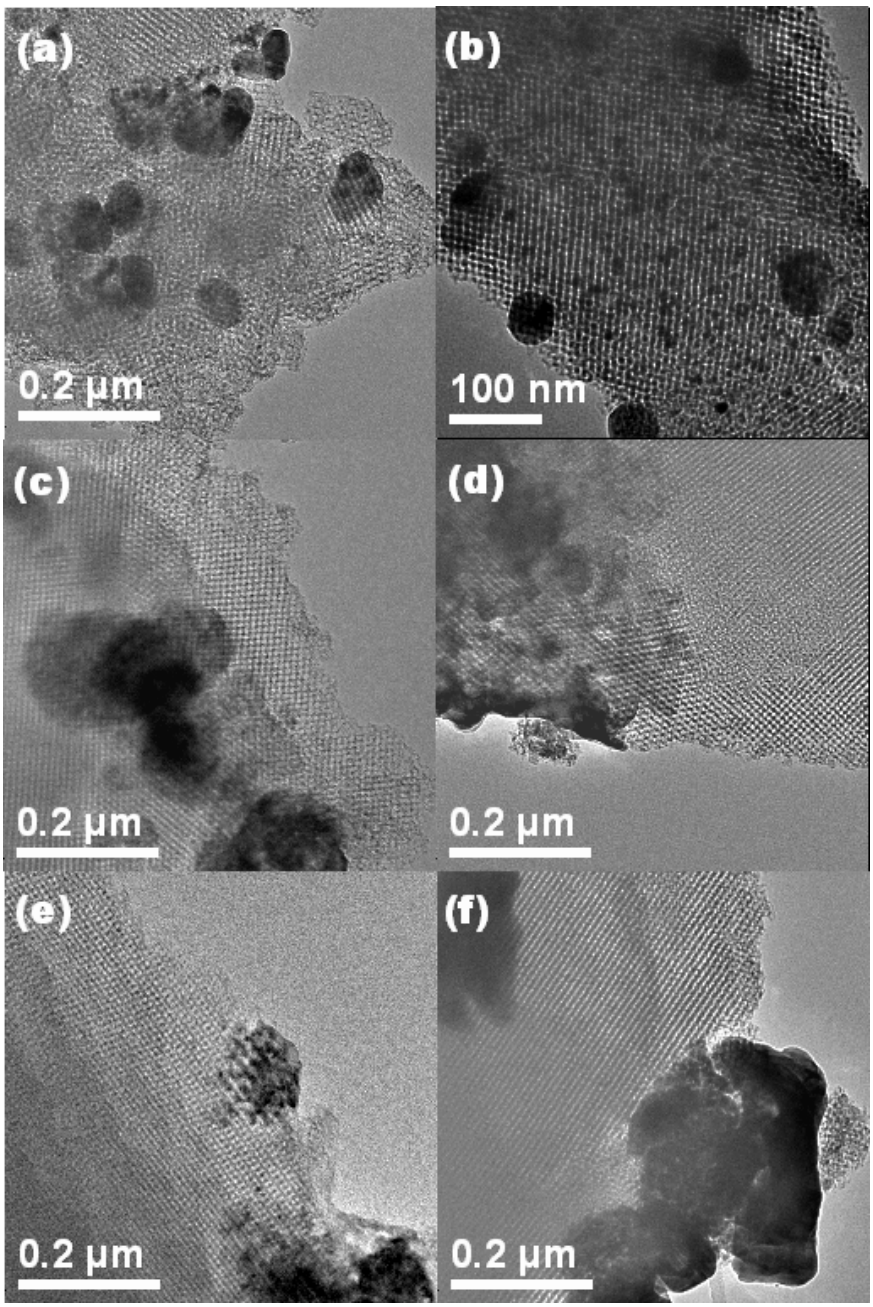

Figure S7 Typical TEM images of the reduction products of (a) mesoporous Co_3O_4/KIT-6 (under 5% H_2 in Ar at 350 °C for 2 h), (b) mesoporous CuO/KIT-6 (under 5% H_2 in Ar at 220 °C for 4 h), (c) mesoporous Fe_2O_3/KIT-6 (under 5% H_2 in Ar at 320 °C for 3 h), (d) mesoporous MnO_2/KIT-6 (under 5% H_2 in Ar at 320 °C for 2 h), (e) mesoporous Mn_2O_3/KIT-6 (under 5% H_2 in Ar at 350 °C for 3 h), (f). mesoporous NiO/KIT-6 (under 5% H_2 in Ar at 390 °C for 1 h).