Supplementary information:

Strong metal-support interactions between Ni and ZnO particles and their effect on the methanation performance of Ni/ZnO

Weixing Wang,[a, b, c] Xuekuan Li,[a] Ye Zhang,[a] Rong Zhang,[a] Hui Ge,[a] Jicheng Bi,*[a] Mingxing Tang*[a]

[a] *Institute of Coal Chemistry, Chinese Academy of Sciences, Taiyuan 030001, China. E-mail: mxtang@sxicc.ac.cn; bjc@sxicc.ac.cn*

[b] *University of Chinese Academy of Sciences, Beijing 100049, China*

[c] *School of Chemistry & Chemical Technology, Southwest Petroleum University, Chengdu, Sichuan, 650100, China*

*Correspondence to Mingxing Tang and Jicheng Bi Tel: +86-0351-4046547, Fax: +86-0351-4046547, E-mail: *mxtang@sxicc.ac.cn* (*M*. Tang); *bjc@sxicc.ac.cn* (*J*. Bi)

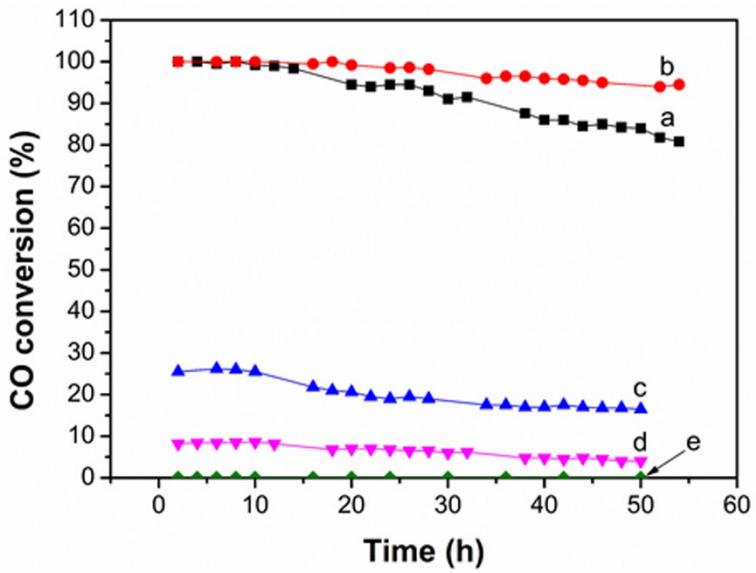

Figure S. 1. The stabilities for CO methanation over the Ni/γ-Al_2O_3 sample reduced at 500 °C (a) and Ni/ZnO samples reduced at 350 °C (b), 400 °C (c), 450 °C (d) and 500 °C (e). Reaction conditions: temperature = 380 °C; pressure = 0.1 MPa; GHSV = 1000 h^{-1}.

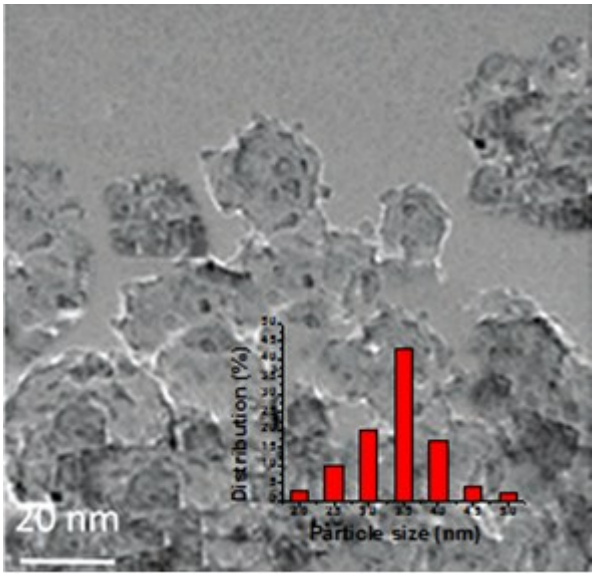

Figure S.2. The TEM image of the Ni/ZnO sample reduced at 350 °C after 300 h reaction time. The inset is Ni particles size distribution histogram.

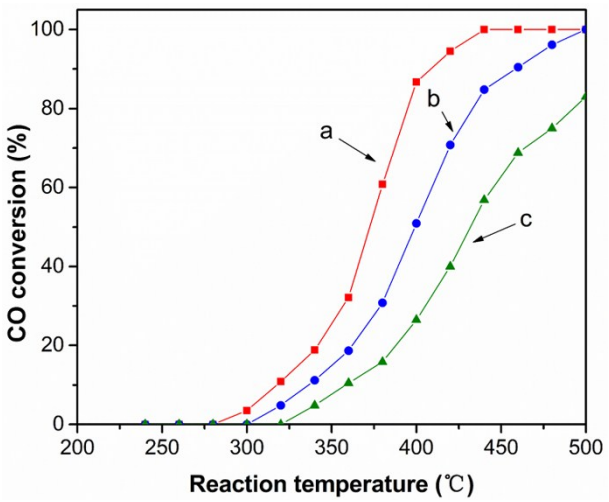

Figure S.3. CO conversion over Ni/ZnO samples reduced at 400 °C (a), 450 °C (b) and 500 °C (c) after they were in situ re-oxidized in air flow of 50 mL/min at 200 °C for 2 h and subsequently re-reduced in H_2 flow of 50 mL/min at 350 °C for 3 h.