

Electronic supplementary information

SiO₂-Stabilized Ni/t-ZrO₂ Catalysts with Ordered Mesopores: One-pot Synthesis and Their Superior Catalytic Performance in CO Methanation

Xiaoyan Wang ^{a,b}, Qing Liu ^b, Jiaying Jiang ^{a,*} Guojing Jin ^b,

Huifang Li ^b, Fangna Gu ^{b,*}, Guangwen Xu ^b, Ziyi Zhong ^c and Fabing Su ^{b,*}

^a *School of Materials Science and Engineering, Shaanxi Normal University, Xi'an, Shaanxi, 710062, China*

^b *State Key Laboratory of Multiphase Complex Systems, Institute of Process Engineering, Chinese Academy of Sciences, Beijing 100190, China*

^c *School of Chemical & Biomedical Engineering, Nanyang Technological University (NTU), 62 Nanyang Drive, Singapore 637459*

Content

Item	Page
Figure. S1	2
Figure. S2	2
Figure. S3	3

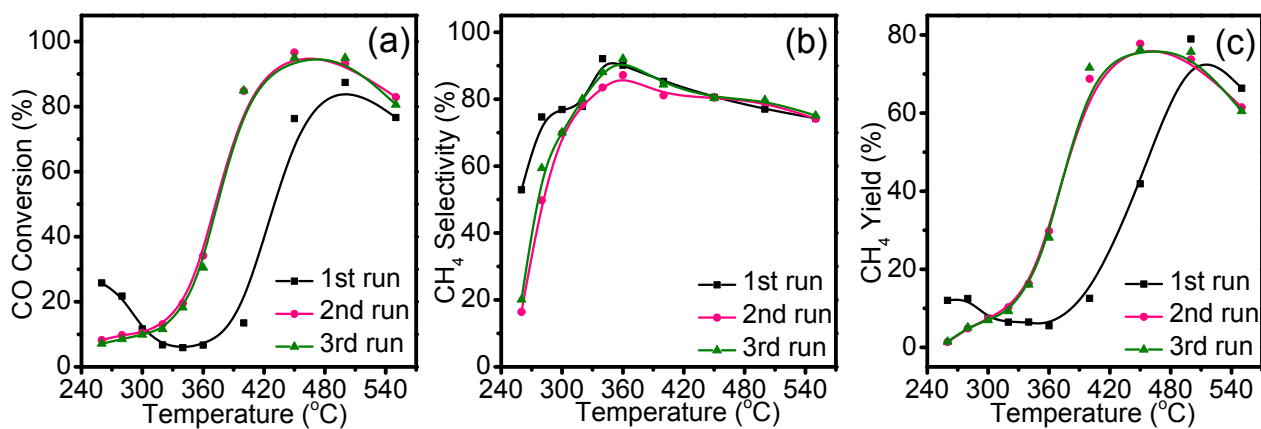


Figure S1. Catalytic properties of the 20NiZ-t: (a) CO conversion, (b) CH₄ selectivity and (c) CH₄ yield. Feed gas composition: 20 vol % CO, 60 vol % H₂, N₂ balance, WHSV = 30000 mL g⁻¹ h⁻¹.

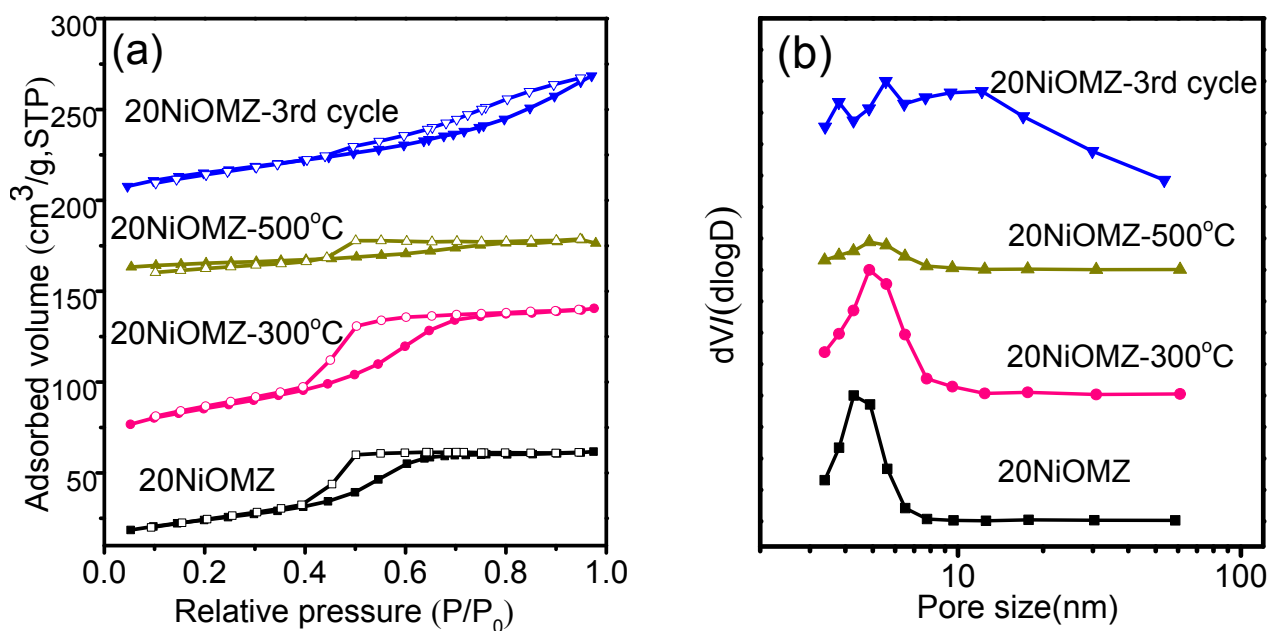


Figure S2. N₂ adsorption isotherms (a) and PSD curves (b) of the fresh catalysts and the deactivation catalysts (For clarity, the isotherms, 20NiOMZ-300 °C, 20NiOMZ-500 °C, 20NiOMZ-3rd cycle was vertically shifted for 60, 150, 200 cm³ g⁻¹, respectively).

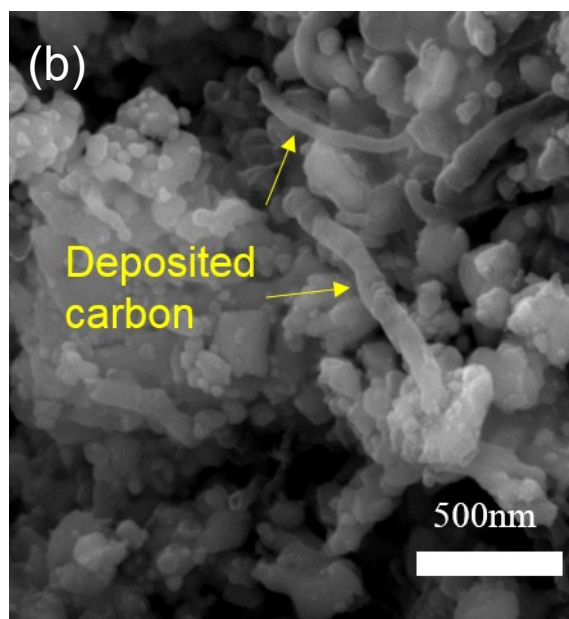
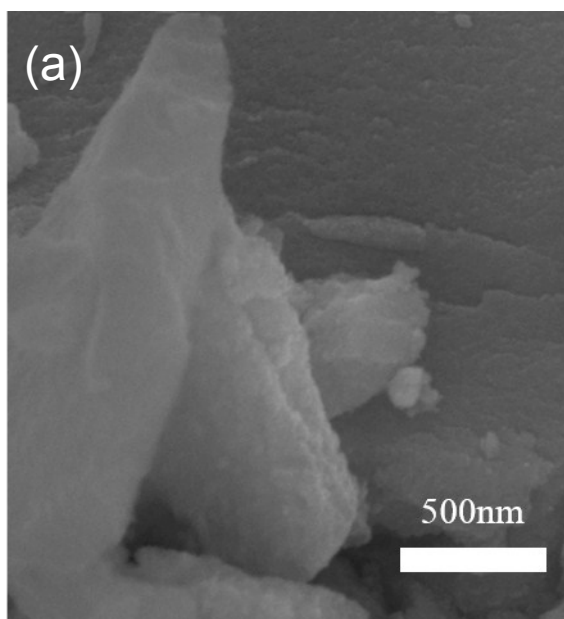


Figure S3. SEM images of used catalysts: (a) 20NiOM3ZS, (b) 20NiZ-m.