Electronic Supplementary Material (ESI) for RSC Advances.

Supporting information

Preparation of high-surface-area Ni/α-Al_2O_3 catalysts for improved CO methanation

Youjun Liu,[a,b] Jiajian Gao,[b] Qing Liu,[b] Fangna Gu,[b,*] Xiaopeng Lu,[a,b]

Lihua Jia,[a,*] Guangwen Xu,[b] Ziyi Zhong,[c] and Fabing Su[b,*]

[a] *College of Chemistry and Chemical Engineering, Qiqihaer University, Qiqihaer161006, Heilongjiang Province, China*

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

[c] *Institute of Chemical Engineering and Sciences, A*star, 1 Pesek Road, Jurong Island, 627833, Singapore*

*Corresponding author: fngu@ipe.ac.cn (F. Gu), jlh29@163.com (L. Jia), fbsu@ipe.ac.cn (F. Su), Tel.: +86–10–82544850, Fax: +86−10−82544851

Table S1 Physical and chemical properties of the catalyst.

Catalyst	S_{BET}[a] ($m^2 \cdot g^{-1}$)	Ni particle size (nm)	
		by XRD[b]	by TEM
Ni/CAH-C	65	20	80–110

[a] surface area, derived from BET equation;

[b] crystal size of Ni, derived from XRD by Debye–Scherrer equation;

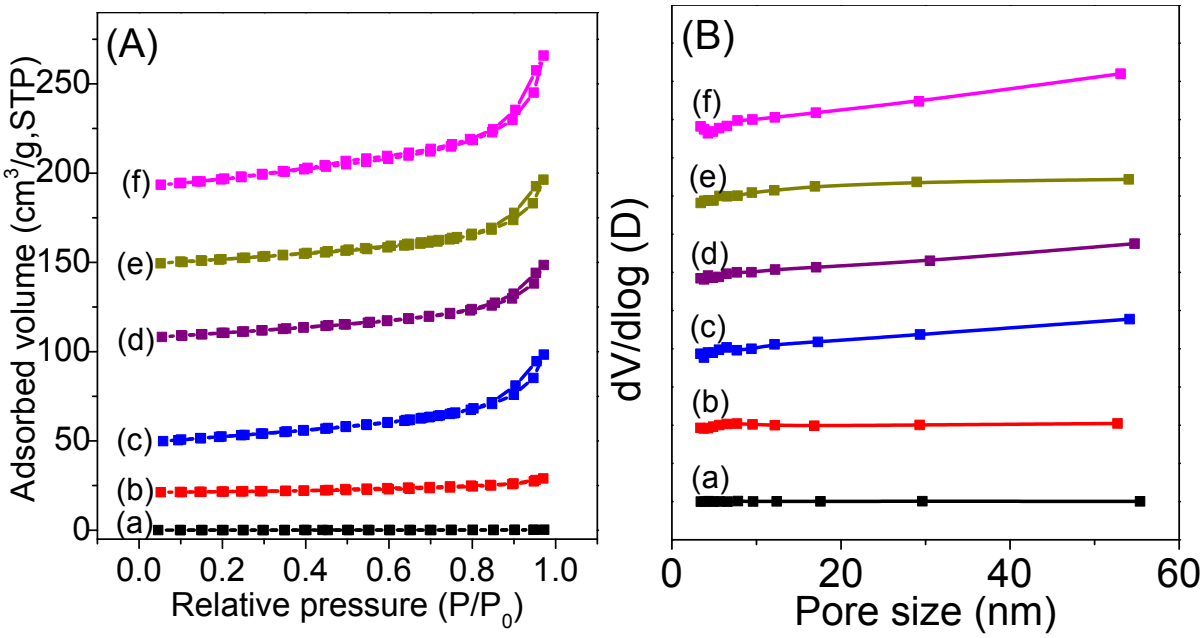

Fig. S1 N_2 adsorption-desorption isotherms (A) and pore-distribution curves (B) of the samples: (a) A, (b) Ni/A-I, (c) AH, (d) Ni/AH-I, (e) Ni/AH-C, and (f) Ni/CAH-C. (For clarity, the isotherms of Ni/A-I, AH, Ni/AH-I, Ni/AH-C and Ni/CAH-C were vertically shifted curve by 20, 40, 100, 140, 180, respectively).

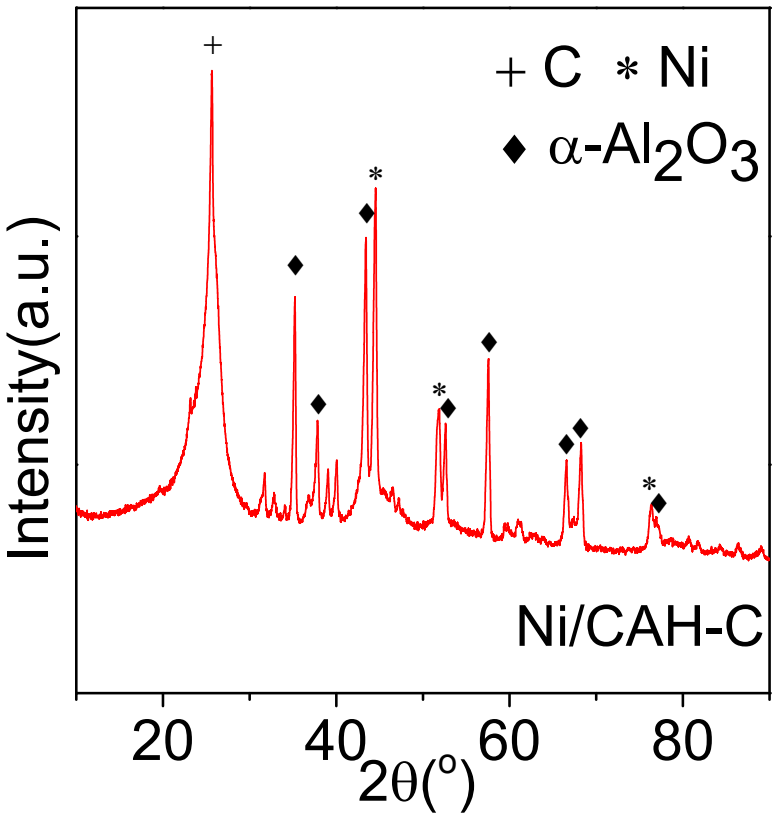

Fig. S2 The XRD pattern of the Ni/CAH-C

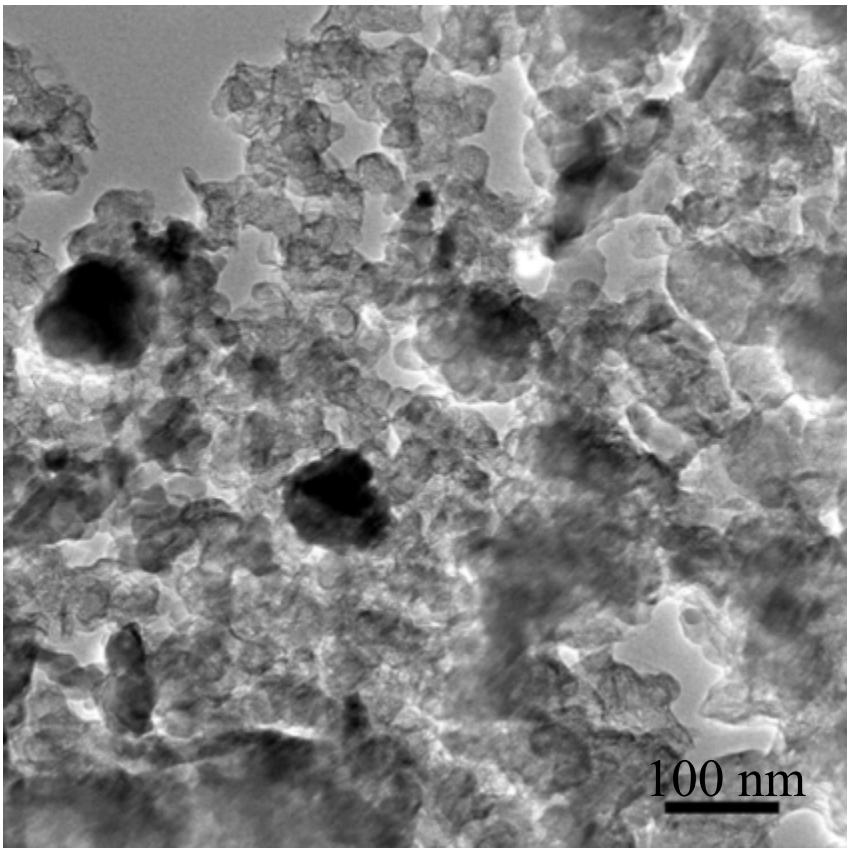

Fig. S3 TEM image of the Ni/CAH-C.

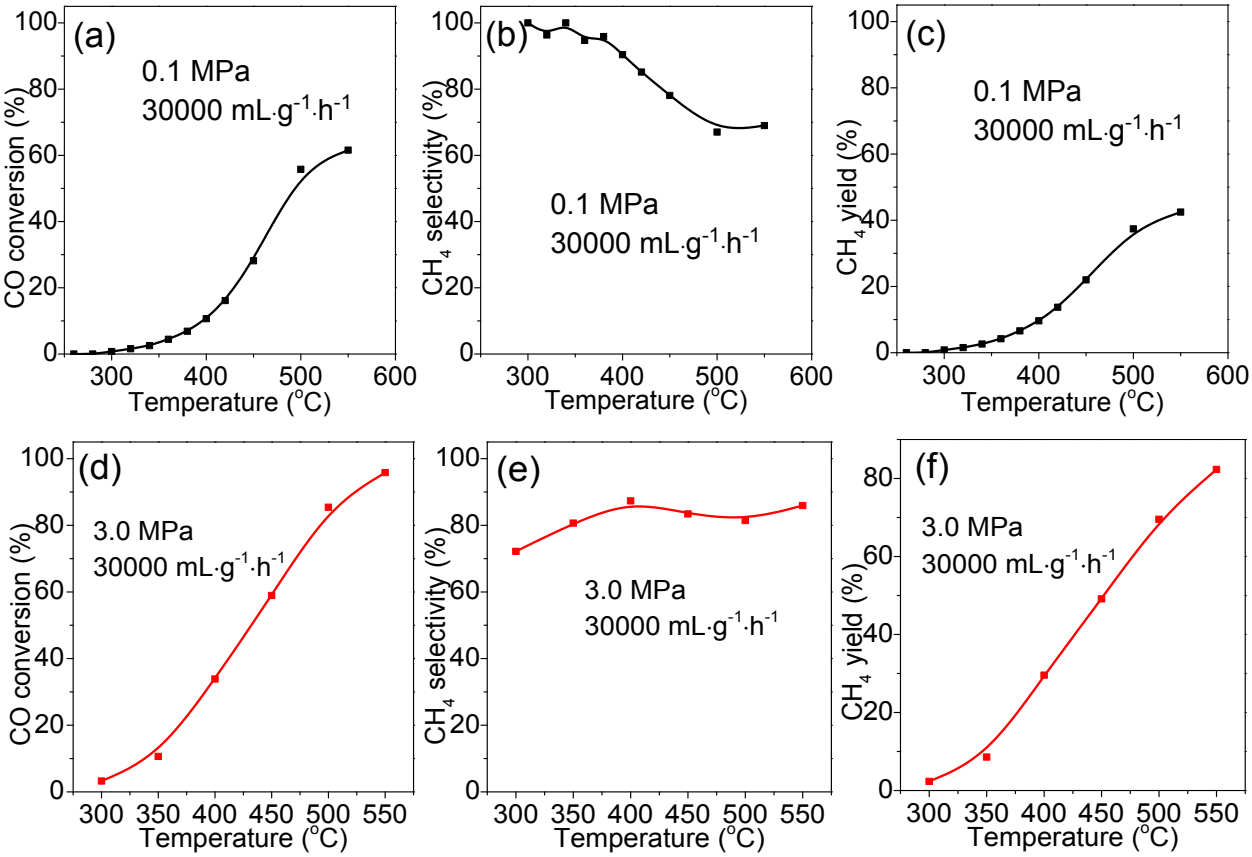

Fig. S4 Catalytic properties of the Ni/AH-C: (a) (d) CO conversion, (b) (e) CH_4 selectivity, and (c) (f) CH_4 yield.