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Modulating the CO methanation activity of Ni catalyst by nitrogen doped carbon

Yaping Lin^{a,b}, Pan Li^a, Tingting Cui^{a,b}, Xiulian Pan^{a,*}, Xinhe Bao^{a,*}

^a *State Key Laboratory of Catalysis, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian 116023, Liaoning, China*

^b *University of Chinese Academy of Sciences, Beijing 100049, China*

*Corresponding authors. E-mail: panxl@dicp.ac.cn; xhbao@dicp.ac.cn.

Abstract

Nitrogen doping has been proved to be an effective way to modify the properties of graphene and other carbon materials. Herein, we explore a composite with nitrogen doped C overlayers wrapping SiC substrate as a support for Ni (Ni/CN-SiC) and evaluate its effects on the methanation activity. The results show that both the activity and stability of Ni are enhanced. Characterization with STEM, XRD, XPS, Raman and H₂-TPR indicates that nitrogen doping generates more defects in the carbon overlayers, which benefit the dispersion of Ni. Furthermore, the reduction of Ni is facilitated.

Keywords

CO methanation; Ni catalyst; Carbon; Nitrogen doping; SiC

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