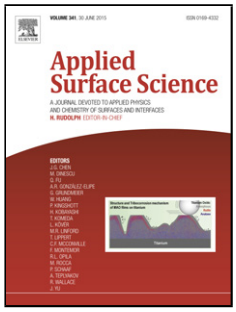

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Modifying surface properties of KIT-6 zeolite with Ni and V for enhancing catalytic CO methanation

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Highlights:

3D-mesoporous KIT-6 zeolite was superficially modified with different amounts of Ni and V.

V species could enhance CO dissociation via electron transfer from V species to Ni^0.

Addition of proper V content favored H_2 uptake and Ni dispersion.

Ni,V-modified catalyst exhibited the enhanced low-temperature catalytic performance.

20Ni-2V/KIT-6 showed the best catalytic performance among all the catalysts.

Abstract

The surface of the KIT-6 zeolite was modified with different amounts of Ni and V to promote the catalytic properties for CO methanation. A series of xNi-yV/KIT-6 with various Ni and V contents were prepared by the incipient-wetness impregnation method. The modified surfaces were characterized using N_2 adsorption-desorption, Brunauer-Emmett-Teller (BET), X-ray diffraction (XRD), hydrogen temperature-programmed reduction (H_2-TPR),