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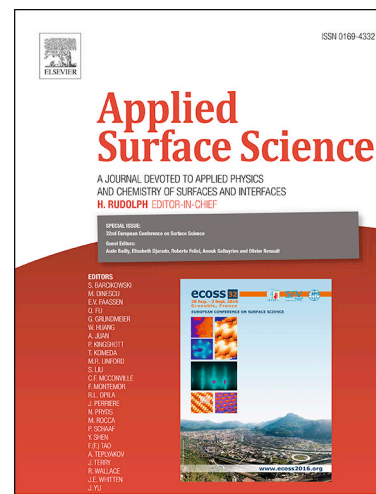
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Promising SiC support for Pd catalyst in selective hydrogenation of acetylene to ethylene

Zhanglong Guo ^{a,b}, Yuefeng Liu ^c, Yan Liu ^{b,*}, Wei Chu ^{a,*}

^a Department of Chemical Engineering, Sichuan University, 610065, China

^b Institute of Chemical and Engineering Sciences (ICES), 627833, Singapore

^c Dalian National Laboratory for Clean Energy (DNL), Dalian Institute of Chemical Physics, Chinese Academy of Sciences, 116023, China

Abstract

In this study, SiC supported Pd nanoparticles were found to be an efficient catalyst in acetylene selective hydrogenation reaction. The ethylene selectivity can be about 20% higher than that on Pd/TiO₂ catalyst at the same acetylene conversion at 90%. Moreover, Pd/SiC catalyst showed a stable catalytic life at 65 °C with 80% ethylene selectivity. With the detailed characterization using temperature-programmed reduction (H₂-TPR), powder X-ray diffraction (XRD), X-ray photoelectron spectroscopy (XPS), N₂ adsorption/desorption analysis, CO-chemisorption and thermo-gravimetric analysis (TGA), it was found that SiC owns a lower surface area (22.9 m²/g) and a broad distribution of meso-/macro-porosity (from 5 to 65 nm), which enhanced the mass transfer during the chemical process at high reaction rate and decreased the residence time of ethylene on catalyst surface. Importantly, SiC support has the high thermal conductivity, which favored the rapid temperature

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