

Mesoporous Nickel metal catalyst for water-gas shift reaction

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The water gas shift (WGS) reaction allows the conversion of carbon monoxide and water to hydrogen and carbon dioxide; the WGS has become an important technology in the chemical industry, particularly in relation to the production of clean hydrogen and energy recovering systems. Being a reversible and exothermic reaction, WGS is thermodynamically favoured at high temperatures and kinetically favoured at low temperatures.

Ni-based catalysts have been recognized as an alternative catalyst. For exothermic reaction because of their high heat-conductivity that facilitate control of the heat reaction and allows a higher catalytic conversion to be maintained with the isothermal conditions in the fix-bed reactor.

In this work, a series of mesoporous metal nickel catalysts prepared by nano-replication method was evaluated in the WGS reaction. The structure of the catalysts were characterized using powder X-ray diffraction (XRD), nitrogen sorption & adsorption isotherms, transmission electron microscopy (TEM), temperature programmed study experiments.