

H₂ Chemisorption and Microcalorimetry in Ordered Mesoporous Metal/CMK-3 Nanocomposites

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Discovery of effective hydrogen storage carbon material is of great importance for the development of future energy source. In this study, we synthesized hexagonal-shaped ordered mesoporous metal/CMK-3 nanocomposites by studding the CMK-3 surfaces with metal catalysts. Physical properties of the nanocomposites were investigated by means of X-ray diffractometry, X-ray photoelectron spectroscopy, scanning electron microscopy, inductively coupled plasma mass spectrometry, and Brunauer-Emmett-Teller surface area analysis, and hydrogen chemisorption and microcalorimetry were carried out in a pressure-concentration-temperature apparatus. The metal catalysts promote more efficient hydrogen chemisorption and induce spill over of individual hydrogen atoms onto the carbon support.