130b Nano-Crystalline Metastable and Stable Carbides of Molybdenum for Hydrogenation/Dehydrogenation Reactions

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MoC_x has been shown to have the H/DH properties of noble-metal catalysts, but at a lower cost. Current preparation techniques for the carbides, high-temperature reduction in the presence of methane and hydrogen, are effective but inconvenient, and result in particles of relatively large size. A novel, simpler procedure yields 3nm-sized particles of more uniform size. Variation of the procedure results in either metastable MoC or stable MoC2. The particle size can also be altered, so that size-selectivity principles can be used in catalyst design. The reactivity of these catalysts has been examined with respect to that of Pt/alumina.