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Development of Hydrodesulfurization Catalysts Using Molybdenum Complex with Molybdenum-sulfur Bonds (Part 1) Effect of Activation Method on Catalytic Activity

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The catalytic precursors of alumina-supported molybdenum dithiocarbamate (Mo-DTC) and molybdenum dithiophosphate (Mo-DTP) were assessed as catalysts for hydrodesulfurizastion (HDS). The effect of the activation method on catalytic activity was evaluated for the HDS of dibenzothiophene (DBT). Catalysts derived from alumina-supported Mo-DTC or Mo-DTP after activation with H_2S or H_2 showed HDS activity comparable to that of conventional Mo catalyst prepared with ammonium heptamolybdate. Various activation procedures for the Mo complex precursors were investigated. Mo-DTC and Mo-DTP precursors activated with N_2 and H_2O showed much higher catalytic activity. Moreover, the selectivity for biphenyl of the Mo-DTC and Mo-DTP catalysts, which indicates the capacity of direct desulfurization, was higher than that of the sulfided conventional Mo catalyst.

Keywords: Hydrodesulfurization, Dibenzothiophene, Molybdenum dithiocarbamate, Molybdenum dithiophosphate, Molybdenum complex decomposition, Activation method

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