

Effect of Coke Deposit on the Hydrodesulfurization Activity over CoMo Catalysts Supported on Al-MCM-41 and Al-MCM-48

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Two different mesoporous materials, MCM41(one-dimensional channel) and MCM-48(three-dimensional channel), were used as supports for CoMo sulfide catalysts to investigate the effect of different channel connectivity on the catalytic activity of thiophene hydrodesulfurization. The aluminosilicate mesoporous materials (Al-MCM-41 and Al-MCM-48) were prepared through post impregnation of AlCl_3 into the siliceous mesoporous materials, MCM-41 and MCM-48, respectively. The aluminosilicatesupported CoMo catalysts showed higher activity than their siliceous counterparts. The acidity of the aluminosilicate supports as measured by NH_3 -TPD might help to crack the thiophene so as to improve the HDS activity. The CoMo (3:7)/Al-mesoporous materials showed the highest activity up to 10 h for a given Si/Al ratio. It is expected that CoMo catalysts with Co/Mo atomic ratio of 3/7 having three-dimensional mesopore structures would be more useful for HDS process than the same catalysts with one-dimensional mesopore structure.