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PREPARATION AND PROPERTIES OF SILICA-ALUMINA SUPPORTED Mo AND CoMo HYDRODESULFURIZATION CATALYSTS

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Catalysts with various MoO_3 and Al_2O_3 contents were successfully prepared by a reaction of acidic $\text{SiO}_2\text{-Al}_2\text{O}_3$ supports with aqueous slurry of MoO_3 ¹. The saturated adsorption amount of MoO_3 corresponded with the amount of Al_2O_3 in the supports. The deposited and sulfided Mo species were accessible for promotion by Co. X-ray diffraction and Raman measurements did not show MoO_3 crystalline phase in the catalysts. The highest activity in hydrodesulfurization (HDS) of 1-benzothiophene was observed over $\text{CoMo/SiO}_2\text{-Al}_2\text{O}_3$ catalyst with 17 wt.% Al_2O_3 (Fig. 1). The acidity of the $\text{SiO}_2\text{-Al}_2\text{O}_3$ supports modified by dealumination (leaching with nitric acid) and the sulfided CoMo catalysts were studied in terms of cyclohexene isomerization and cumene cracking (Fig. 2). It was found that the acidic properties of the modified $\text{SiO}_2\text{-Al}_2\text{O}_3$ supports were preserved after deposition of the sulfidic CoMo phase. The main factor influencing these properties was found to be the Al_2O_3 content.

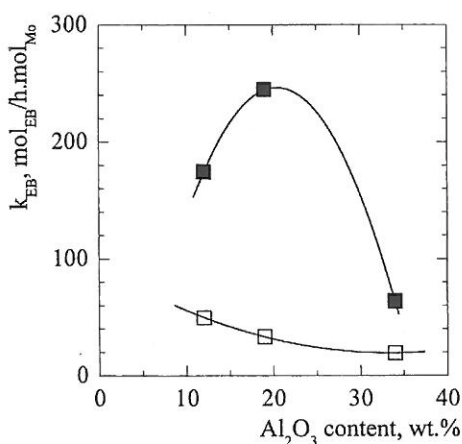


Fig. 1: Dependence of the HDS activity of the prepared Mo (open squares) and CoMo (filled squares) catalysts on Al_2O_3 content.

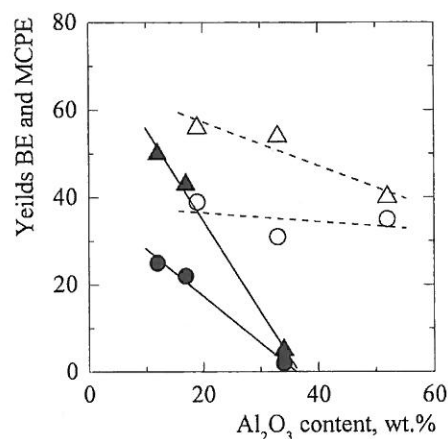


Fig. 2: Dependence of cumene cracking and cyclohexene isomerization on Al_2O_3 content in the supports (open points, dash lines) and sulfide CoMo catalysts (filled points, solid lines); benzene BE (circles) and methylcyclopentene MCPE (triangles).

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References:

- ¹ Kaluža, L.; Gulková, D.; Vít, Z.; Zdražil, M. *Fuel* **2013**, *112*, 272–276.