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

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Catalysts with various MoO<sub>3</sub> and Al<sub>2</sub>O<sub>3</sub> contents were successfully prepared by a reaction of acidic SiO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub> supports with aqueous slurry of MoO<sub>3</sub><sup>1</sup>. The saturated adsorption amount of MoO<sub>3</sub> corresponded with the amount of Al<sub>2</sub>O<sub>3</sub> 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<sub>3</sub> crystalline phase in the catalysts. The highest activity in hydrodesulfurization (HDS) of 1-benzothiophene was observed over CoMo/SiO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub> catalyst with 17 wt.% Al<sub>2</sub>O<sub>3</sub> (Fig. 1). The acidity of the SiO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub> 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 SiO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub> supports were preserved after deposition of the sulfidic CoMo phase. The main factor influencing these properties was found to be the Al<sub>2</sub>O<sub>3</sub> content.

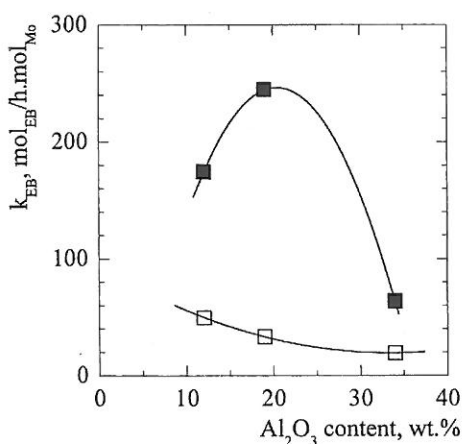


Fig. 1: Dependence of the HDS activity of the prepared Mo (open squares) and CoMo (filled squares) catalysts on Al<sub>2</sub>O<sub>3</sub> content.

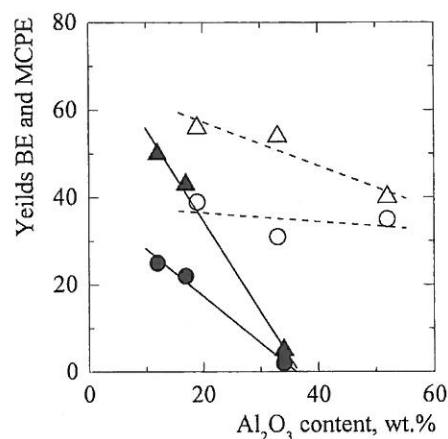


Fig. 2: Dependence of cumene cracking and cyclohexene isomerization on Al<sub>2</sub>O<sub>3</sub> content in the supports (open points, dash lines) and sulfide CoMo catalysts (filled points, solid lines); benzene BE (circles) and methylcyclopentene MCPE (triangles).

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### References:

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