

## Calcined Tertiaries Hydrotalcites as Supports of Cobalt-Molybdenum Based Catalysts for the Hydrodesulfurization Reaction of Dibenzothiophene

**Authors :** Edwin Oviedo, Carlos Linares, Philippe Ayrault, Sylvette Brunet

**Abstract :** Nowadays, light conventional crude oils are going down. Therefore, the exploitation of heavy crude oils has been increasing. Hence, a major quantity of refractory sulfur compounds such as dibenzothiophene (DBT) should be removed. Many efforts have been carried out to modify hydrotreatment typical supports in order to increase hydrodesulfurization (HDS) reactions. The present work shows the synthesis of tertiaries MgFeAl(0.16), MgFeAl(0.32), CoFeAl, ZnFeAl hydrotalcites, as supports of CoMo based catalysts, where 0.16 and 0.32 are the Fe<sup>3+</sup>/Al<sup>3+</sup> molar ratio. Solids were characterized by different techniques (XRD, CO<sub>2</sub>-TPD, H<sub>2</sub>-TPR, FT-IR, BET, Chemical Analysis and HRTEM) and tested in the DBT HDS reaction. The reactions conditions were: Temp=325°C, P=40 Bar, H<sub>2</sub>/feed=475. Results show that the catalysts CoMo/MgFeAl(0.16) and CoMo/MgFeAl(0.32), which were the most basics, reduced the sulfur content from 500ppm to less than 1 ppm, increasing the cyclohexylbenzene content, i.e. presented a higher selective toward the HYD pathway than reference catalyst CoMo/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub>. This is suitable for improving the fuel quality due to the increase of the cetane number. These catalysts were also more active to the HDS reaction increasing the direct desulfurization (DDS) way and presented a good stability. It is advantageous when the gas oil centane number should be improved. Cobalt, iron or zinc species inside support could avoid the Co and Mo dispersion or form spinel species which could be less active to hydrodesulfuration reactions, while hydrotalcites containing Mg increases the HDS activity probably due to improved Co/Mo ratio.

**Keywords :** catalyst, cetane number, dibenzothiophene, diesel, hydrodesulfurization, hydrotreatment, MoS<sub>2</sub>

**Conference Title :** ICC 2018 : International Conference on Catalysis

**Conference Location :** Dubai, United Arab Emirates

**Conference Dates :** June 21-22, 2018