

**Catalytic performances and characterization of Co oxide loaded saponite catalysts for heavy oil hydrodesulfurization.** Al-Nawad, K.; Ali, S. A.; Hamid, H.; Kimura, T.; Suzuki, Y.; Inui, T. The Research Institute, King Fahd Univ. Petroleum & Minerals, Dhahran, Saudi Arabia. Preprints - American Chemical Society, Division of Petroleum Chemistry (2000), 45(4), 674-677. Publisher: American Chemical Society, Division of Petroleum Chemistry, CODEN: ACPCAT ISSN: 0569-3799. Journal written in English. CAN 133:152863 AN 2000:576259 CAPLUS (Copyright (C) 2008 ACS on SciFinder (R))

### **Abstract**

Generally, HDS catalysts applied in industry are derived from oxides of an element of Group VIB (Mo or W) and Group VIII (Co or Ni) supported on Al<sub>2</sub>O<sub>3</sub>. Catalyst activity is supposed to be due to the presence of Group VIB elements while Group VIII elements increase hydrocracking (HC) and HDS activities and catalytic life. Recently, it has been reported that only one metal oxide (e.g., Co or Ni oxide) loaded on Al<sub>2</sub>O<sub>3</sub> or pillared montmorillonite showed higher thiophene HDS activity than Co and Mo oxide loaded on Al<sub>2</sub>O<sub>3</sub> (CoMo/Al<sub>2</sub>O<sub>3</sub>). Iwamatsu et al. (1998) reported that HDS activity of Co oxide-loaded saponite showed higher thiophene HDS activity than CoMo/Al<sub>2</sub>O<sub>3</sub> in a pulse flow reactor. Further, HDS activity was increased by the calcination of the saponite up to 600°C before Co loading. They discussed the increase of HDS activity from a microscopic point of view by using XPS and NMR. However, a consideration of both the structure change and the properties of Co species on the Co/HS (high surface saponite) from a macro physicochem. point of view were insufficient. In this paper, the relationship between the calcination temp. and the phys. properties of HS and the properties of Co species on HS characterized by TPR and TPS were discussed. The relationship between the catalytic performance evaluated with VGO and the properties of Co species was also discussed.