

Development of Carbon-Coated Alumina Support for Hydrodemetallization

Takashi Mashio¹, Takuya Ito¹, Koji Nakabayashi^{1, 2}, Jin Miyawaki^{1, 2, 3}, and Seong-Ho Yoon^{1, 2*}

¹*Interdisciplinary Graduate School of Engineering Science, Kyushu University, Kasuga, Fukuoka 816-8580, Japan.*

²*Institute of Materials Chemistry and Engineering, Kyushu University, Kasuga, Fukuoka 816-8580, Japan.*

³ *International Institute for Carbon-Neutral Energy Research, Kyushu University, Fukuoka, Fukuoka 819-0395, Japan.*

ABSTRACT

Coke is easily deposited on the surface catalyst support, which is one of the important reasons to deteriorate the catalytic activity during the hydrodemetallization (HDM) of heavy oil. In order to prevent such a deposition on the surface of catalyst support, we tried to make the pyrolytic carbon-coating on the surface of alumina support. Degree of the pyrolytic carbon-coating was carefully controlled by pyrolysis of ethylene gas at 600°C. NiMo catalysts for HDM treatment were supported on the carbon coated alumina (CA), which were coated by different amounts of pyrolytic carbon, to obtain NiMo/CA catalyst. In this study, Lower Fars Crude-Atmospheric residue was used as target oil for HDM. We confirmed that the deposition of coke on the catalyst was effective to reduce the amount of coke deposition during HDM. The details concerning preparation conditions and the HDM activity of the catalyst will be reported in the presentation.