

Synthesis of metallic oxide dispersed on silica as a catalyst for thermal decomposition of vacuum residue

추고연, 조동우, 안민희, 박종호, 김권일<sup>†</sup>

한국에너지기술연구원

(kikim@kier.re.kr<sup>†</sup>)

Human life will significantly have depended on crude oil as energy and fuel. As the crude oil becomes heavier all over the world, low-grade heavy oil fraction comprises 30–40% in the total. Upgrading of heavy oil can make up for the rising portion of the production cost due to high oil prices and cope with environmental problems resulted from oil use. Further, as the heavy oil fraction contains a great quantity of sulfur and metal components, direct conversion into less heavy oil fraction is difficult through a general catalytic process. In this work, two different types of metallic oxide nanoparticles, Fe<sub>2</sub>O<sub>3</sub> and NiO were dispersed through impregnation and calcination on silica obtained by sol-gel, as catalysts for thermal decomposition of vacuum residue that is a heavy fraction of oil. The thermal decomposition behavior of vacuum residue with each catalyst mixed, was studied using thermogravimetric analysis.