



Preparation and Characterization of Co and Co-Mo Loaded on Mesoporous Silica for Hydrocracking of Waste Lubricant

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Abstract : Preparation and characterization of Co and Co-Mo loaded on gelatin template mesoporous silica for the hydrocracking catalysts of waste lubricant have been conducted. Gelatin was extracted from bovine bone at a variation of hydrolysis temperatures of 50 °C, 70 °C and 90 °C. From the FT-IR and SDS-PAGE characterization, we found that the optimum hydrolysis temperature to extract gelatin was obtained at 90 °C. Mesoporous silica (SM) was synthesized by hydrothermal method using gelatin as a template. Cobalt metal was loaded on to the SM by wet impregnation method and denoted as Co/SM. Meanwhile, Co and Mo metals were deposited on to the SM by sequential and co-deposition wet impregnation. The resulting materials were referred as Co-Mo/SM1 and Co-Mo/SM2, respectively. Hydrocracking process of waste lubricant was conducted using a stainless steel reactor of semi-batch system (weight ratio of feed/catalyst = 20:1) at a temperature of 450 °C under hydrogen flow. Liquid product of the process was weighed and analyzed by GC-MS. The SM showed a wormhole-like shaped pores, with the diameter of 4.308 nm. From the hydrocracking test, Co/SM exhibited the highest activity to produce liquid fraction (49.90 wt.%), highest selectivity to produce gasoline fraction (34.13 wt.%) and moderate coke formation (3.20 %).

Key words : gelatin, mesoporous silica, cobalt, molybdenum, hydrocracking, waste lubricant.

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