

Hydrogen spillover phenomenon in noble metal modified clay-based hydrocracking catalysts. Ali, M. A.; Kimura, T.; Suzuki, Y.; Al-Saleh, M. A.; Hamid, H.; Inui, T. Research Institute, Center for Refining and Petrochemicals, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia. *Applied Catalysis, A: General* (2002), 227(1-2), 63-72. Publisher: Elsevier Science B.V., CODEN: ACAGE4 ISSN: 0926-860X. Journal written in English. CAN 136:403928 AN 2002:135104 CAPLUS (Copyright (C) 2008 ACS on SciFinder (R))

Abstract

Homemade clay-based catalysts and a com. hydrocracking catalyst were evaluated for hydrocracking activity using vacuum gas oil (VGO) from Saudi Arabian light crude oil. The clay-based catalysts were prepd. in our labs. by cobalt loading and one of them was impregnated with a noble metal belonging to group VIII of the periodic table. The reactions were conducted in both flow and batch reaction system. The amt. of sats. were found to increase while aroms. and polars were decreasing with the increase in conversion of feed to lighter products. The cracking activities of both clay-based catalysts were found better than the catalyst C (com.). In the flow reactor, at 360° reaction temp., the activity of catalyst A (having noble metal) was 2 times more than that of the catalyst B (without noble metal), while 2.5 times more than that of the com. catalyst. Similarly, at 380° and 400° temps., the activity of catalyst A was 2 times more than that of the catalyst C and substantially higher than that of catalyst B. In the batch reactor, higher cracking and HDS activity were obsd. for catalyst A and more sats. were found in the reaction product as well. The amt. of carbon deposited was found to be lower on the spent clay catalyst A. This study clearly shows that even in hydrocracking of VGO which contains complex hydrocarbons and substantial amts. of sulfur, nitrogen and metals, hydrogen spillover phenomena do occur.