Development of high-performance heavy oil hydrocracking catalysts: characterization of atmospheric residue feed. Hamid, S. Halim. Department of Chemical Engineering & Petreoleum Refining and Petrochemicals Section Center for Refining and Petrochemicals, Research Institute, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia. Petroleum Science and Technology (2000), 18(7 & 8), 871-888. Publisher: Marcel Dekker, Inc., CODEN: PSTEFV ISSN: 1091-6466. Journal written in English. CAN 133:137650 AN 2000:520060 CAPLUS

Abstract

The results from characterization of the distn. residues from Saudi Arabian Light ("Arab Light") crude petroleum were given. Approx. 50% of Arab Light crude is atm. residue, which had high contents of carbon, sulfur, and nitrogen, in addn. to smaller amts. of nickel and vanadium. HPLC showed the presence of polar material 12, aroms. 27, and asphaltenes 6 wt.%. An NMR study of carbon distribution in the aliph. and arom. portions of the residue showed 21% arom. and 79% aliph. carbon, in which the aliph. carbon is present as satd. material and as side chains of aroms. and polar material. Asphaltenes were characterized for their different properties to understand its complexity. (e.g., ESR for free radical detns. at 20-625° and 30-50 bars H2). Data from ESR results at 30 bar indicated that the pressure was not enough to prevent the boiling of asphaltenes, and thus a decrease in the spin concn. was obsd. at >350°. Data at 50 bar pressure showed the adequacy of this pressure for ESR measurement. PMRTA (proton magnetic resonance thermal anal.) of asphaltenes showed a decrease in residual hydrogen with increasing temp.