(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
7 February 2002 (07.02.2002)

PCT

(10) International Publication Number
WO 02/09870 A2

(51) International Patent Classification[7]: B01J 23/00

(21) International Application Number: PCT/EP01/08772

(22) International Filing Date: 30 July 2001 (30.07.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2000-22886 28 July 2000 (28.07.2000) JP

(71) Applicant *(for BB only)*: **AKZO NOBEL N.V.** [NL/NL]; Velperweg 76, NL-6824 BM Arnhem (NL).

(71) Applicant *(for all designated States except US)*: **NIPPON KETJEN CO., LTD.** [JP/JP]; Sumitomo Fudosan Shiba No.2 Building, 5-9, 1-chome, Shiba, Minato-Ku, Tokyo 105-0014 (JP).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **IKEDA, Hiroyuki** [JP/JP]; 17-4, Isoura-cho, Niihama-shi, Ehime 792-0002 (JP). **MORITA, Shinji** [JP/JP]; 17-4, Isoura-cho, Niihama-shi, Ehime 792-0002 (JP). **KATSUHISA, Fujita** [JP/JP]; 17-4, Isoura-cho, Niihama-shi, Ehime 792-0002 (JP).

(74) Agent: **SCHALKWIJK, Pieter, Cornelis**; Akzo Nobel N.V., Intellectual Property Department (Dept. AIP), P.O. Box 9300, NL-6800 SB Arnhem (NL).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 02/09870 A2

(54) Title: HYDROPROCESSING CATALYST FOR HEAVY OILS AND ITS USE

(57) Abstract: The present invention pertains to a hydroporcessing catalyst which comprises at least one metal component of Group VIB and/or Group VIII on a carrier comprising silica-alumina, the silica-alumina carrier having a ^{29}Si-NMR spectrum wherein the main maximum of the peak observed in the range of -50 ppm to -110 ppm is between about -80 ppm and about -100 ppm, and wherein the catalyst has an average pore diameter (APD) of about 10 to about 30 nm, a total pore volume of at least about 0.3 ml/g, a surface area of about 130 to about 300 m^2/g, with the %PV[APD ± 5 nm)/(PV<60 nm)] being at least about 50 %. The catalyst may be prepared by a process in which the silicon compound is incorporated into the catalyst composition by way of an organic silicon compound. The catalyst is particularly suitable for effecting at least one of hydro-desulfurisation, hydrodenitrogenation, hydrocracking, and hydrodemetallisation of heavy hydrocarbon feeds.