

19 JUL 2002

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

(19) World Intellectual Property Organization
International Bureau

162162

(43) International Publication Date
16 August 2001 (16.08.2001)

PCT

(10) International Publication Number
WO 01/58874 A1(51) International Patent Classification⁷: C07D 213/53,
C07F 15/02, C08F 10/00, 4/70CM Amsterdam (NL). VAN ZON, Arie; Badhuisweg 3,
NL-1031 CM Amsterdam (NL).

(21) International Application Number: PCT/EP01/01506

(22) International Filing Date: 9 February 2001 (09.02.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
00301036.0 9 February 2000 (09.02.2000) EP(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, 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, 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, GW, ML, MR, NE, SN, TD, TG).(71) Applicant: SHELL INTERNATIONALE RESEARCH
MAATSCHAPPIJ B.V. [NL/NL]; Carel van Bylandtlaan
30, NL-2596 HR The Hague (NL).

(72) Inventors: DE BOER, Eric, Johannes, Maria; Badhuisweg 3, NL-1031 CM Amsterdam (NL). DEULING, Hendrikus, Hyacinthus; Badhuisweg 3, NL-1031 CM Amsterdam (NL). VAN DER HEIJDEN, Harry; Badhuisweg 3, NL-1031 CM Amsterdam (NL). MEIJBOOM, Nicolaas; Badhuisweg 3, NL-1031 CM Amsterdam (NL). VAN OORT, Aart, Bartus; Badhuisweg 3, NL-1031

Published:

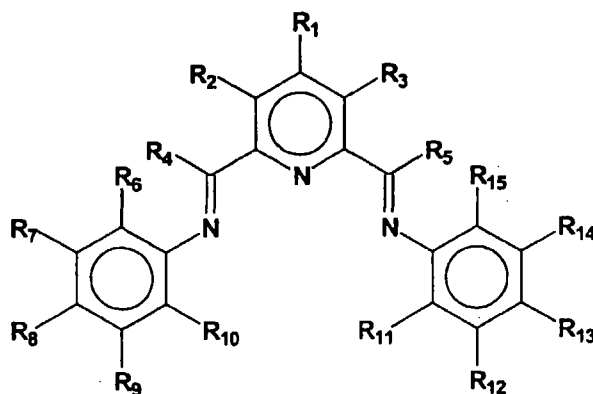
- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

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.



ACTION

(54) Title: NON-SYMMETRICAL LIGANDS AND CATALYST SYSTEMS THEREOF FOR ETHYLENE OLIGOMERISATION TO LINEAR ALPHA OLEFINS



(I)

(57) Abstract: Non-symmetrical ligands of formula (I); bis-aryliminepyridine MX_n complexes comprising a non-symmetrical ligand of formula (I), wherein M is a metal selected from Fe or Co, n is 2 or 3, and X is halide, optionally substituted hydrocarbyl, alkoxide, amide, or hydride; $[\text{bis-aryliminepyridine } \text{MY}_{p \cdot L_n}][\text{NC}^-]_q$ complexes, comprising a non-symmetrical ligand of formula (I), wherein Y is a ligand which may insert an olefin, M is Fe or Co, NC^- is a non-coordinating anion and $p+q$ is2 or 3, matching the formal oxidation of the metal atom M, L is a neutral Lewis donor molecule and $n=0, 1, \text{ or } 2$; and processes for the production of alpha-olefins from ethylene, using said complexes.

WO 01/58874 A1