

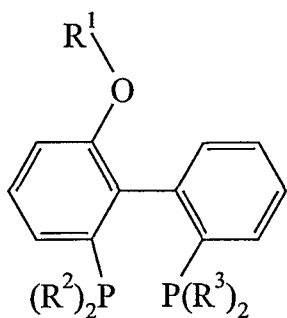
(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
12 January 2006 (12.01.2006)

PCT

(10) International Publication Number
WO 2006/002729 A1

- (51) International Patent Classification⁷: **C07F 9/50**, 15/00, B01J 31/24, C07C 43/225
- (21) International Application Number: PCT/EP2005/006063
- (22) International Filing Date: 6 June 2005 (06.06.2005)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 04014911.4 25 June 2004 (25.06.2004) EP
- (71) Applicant (for all designated States except US): **LONZA AG** [CH/CH]; Münchensteinerstrasse 38, CH-4052 Basel (CH).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **METTLER, Hanspeter** [CH/CH]; Finkenweg 12, CH-3930 Visp (CH). **LEROUX, Frédéric** [DE/FR]; 13, rue Saint Yvieix, F-67760 Gambsheim (FR). **SCHLOSSER, Manfred** [DE/CH]; Av. Parc Rouvraie 24, CH-1018 Lausanne (CH).
- (74) Common Representative: **LONZA AG**; Münchensteinerstrasse 38, CH-4052 Basel (CH).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:**
— with international search 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.

(54) Title: PROCESS FOR THE PREPARATION OF ASYMMETRICALLY SUBSTITUTED BIARYLDIPHOSPHINES



(I)

(57) Abstract: Provided is a process for the preparation of asymmetrically substituted biaryldiphosphine ligands of the formula (I); wherein R¹ is C₁₋₆-alkyl or C₃₋₁₀ Cycloalkyl optionally being substituted with one or more halogen atoms, and R² and R³ are independently selected from the group consisting of aryl, C₅₋₁₀-cycloalkyl and C₁₋₆-alkyl, wherein each aryl moiety is optionally substituted with one or more substituents selected from the group consisting of halogen atoms, nitro, amino, C₁₋₆-alkyl, C₁₋₆-alkoxy and di-C₁₋₆-alkylamino groups, and each C₁₋₆-alkyl, C₁₋₆-alkoxy, di-C₁₋₆-alkyl-amino and C₅₋₁₀-cycloalkyl group in R² and R³ optionally being substituted with one or more halogen atoms, from 2,2',6,6'-tetrabromobiphenyl by a sequence of halogen-metal exchanges and subsequent reactions.