

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
26 June 2008 (26.06.2008)

PCT

(10) International Publication Number
WO 2008/075108 A1

(51) International Patent Classification:
C07C 51/14 (2006.01) *C07C 67/37* (2006.01)
C07C 57/03 (2006.01)

Ian [GB/GB]; Wilton Centre, Wilton, Redcar TS10 4RF (GB).

(21) International Application Number:
PCT/GB2007/050775

(74) Agent: **WALSH, David, Patrick**; 15 Clare Road, Halifax Yorkshire HX1 2HY (GB).

(22) International Filing Date:
20 December 2007 (20.12.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0625518.6 21 December 2006 (21.12.2006) GB

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(71) Applicant (*for all designated States except US*): **LUCITE INTERNATIONAL UK LIMITED** [GB/GB]; Queens Gate, 15-17 Queens Terrace, Southampton Hampshire SO14 3BP (GB).

(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, LV, MC, MT, 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).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **EASTHAM, Graham, Ronald** [GB/GB]; Wilton Centre, Wilton, Redcar TS10 4RF (GB). **WAUGH, Mark** [GB/GB]; Wilton Centre, Wilton, Redcar TS10 4RF (GB). **RICHARDS, Philip,**

Published:
— with international search report

(54) Title: CARBONYLATION OF CONJUGATED DIENES

(57) Abstract: A process for the carbonylation of a conjugated diene is described. The process comprises the steps of reacting a conjugated diene with carbon monoxide and a co-reactant having an active hydrogen in the presence of a solvent system and a catalyst system. The solvent system comprises a an aromatic carboxylic acid or, under some conditions, any carboxylic acid. The catalyst system is obtainable by combining: a. a metal of Group 8, 9 or 10 or a compound thereof: and b. a bidentate ligand of general formula (I) $X^1(X^2)-Q^2-A-R-B-Q^1-X^3(X^4)$ (I) A and B each independently represent lower alkylene linking groups; R represents a cyclic hydrocarbyl structure to which Q^1 and Q^2 are linked, via the said linking group, on available adjacent cyclic atoms of the cyclic hydrocarbyl structure; the groups X^1 , X^2 , X^3 and X^4 independently represent univalent radicals of up to 30 atoms having at least one tertiary carbon atom or X^1 and X^2 and/or X^3 and X^4 together form a bivalent radical of up to 40 atoms having at least two tertiary carbon atoms wherein each said univalent or bivalent radical is joined via said at least one or two tertiary carbon atoms respectively to the appropriate atom Q^1 or Q^2 ; Q^1 and Q^2 each independently represent phosphorus, arsenic or 120 antimony; and, optionally, a source of anions. When the ratio of bidentate ligand : group 8, 9 or 10 metal is greater than 10:1 (mol:mol), the reaction proceeds with any carboxylic acid.

WO 2008/075108 A1