

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
12 March 2009 (12.03.2009)

PCT

(10) International Publication Number
WO 2009/030642 A1

(51) International Patent Classification:
C08F 10/02 (2006.01) *C08L 23/06* (2006.01)
C08F 2/00 (2006.01)

(21) International Application Number:
PCT/EP2008/061366

(22) International Filing Date: 29 August 2008 (29.08.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
07253487.8 3 September 2007 (03.09.2007) EP

(71) Applicant (for all designated States except US): **INEOS MANUFACTURING BELGIUM NV** [BE/BE]; Scheldelaan 482, B-2040 Antwerpen (BE).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **KOCH, Benoit** [BE/BE]; Rue de Lens-Saint-Servais, 8, B-4280 Hannut (BE). **MARISSAL, Daniel** [BE/FR]; 5 allée des cèdres, F-13620 Carry Le Rouet (FR). **PARISEL, Marc** [BE/BE]; Ravenlaan 18, B-1800 Vilvoorde (BE). **WALWORTH, Brent, R.** [US/BE]; Nijverheidsstraat 50, B-9100 Sint-niklaas (BE).

(74) Agent: **SMITH, Julian Philip Howard**; Compass Patents LLP, 120 Bridge Road, Chertsey Surrey KT16 8LA (GB).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, 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, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, 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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- of inventorship (Rule 4.17(iv))

Published:

- with international search report

(54) Title: SLURRY PHASE POLYMERISATION PROCESS

(57) Abstract: Process for producing a multimodal polyethylene in at least two reactors connected in series, in which 20-80wt% of a high molecular weight (HMW) polymer is made in suspension in a first reactor and 20-80wt% of a low molecular weight (LMW) polymer is made in suspension in a second reactor, wherein the ratio of the average activity in the LMW reactor to the average activity in the HMW reactor is from 0.25 and 1.5, where average activity in each reactor is defined as the rate of polyethylene produced in the reactor (kgPE/hr) / [ethylene concentration in the reactor (mol%) x residence time in the reactor (hours) x feed rate of catalyst into the reactor (g/hr)], residence time being defined as the mass of the polymer in the reactor (kg)/the output rate of polymer from the reactor (kg/hr), and wherein the volume of the second reactor is at least 10%, preferably at least 30% and more preferably at least 50% greater than the volume of the first reactor, and the ratio of length to diameter of the first reactor, L/D(1), is greater than that of the second reactor, L/D(2), and preferably at least 20% greater.



WO 2009/030642 A1