

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

(19) World Intellectual Property
Organization

International Bureau

(43) International Publication Date
29 December 2022 (29.12.2022)



(10) International Publication Number
WO 2022/268961 A3

(51) International Patent Classification:
C08F 210/16 (2006.01) C08F 4/659 (2006.01)

(21) International Application Number:
PCT/EP2022/067185

(22) International Filing Date:
23 June 2022 (23.06.2022)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
21181478.5 24 June 2021 (24.06.2021) EP

(71) Applicant: **BOREALIS AG** [AT/AT]; Trabrennstrasse
6-8, Austria, 1020 Vienna (AT).

(72) Inventors: **CASTRO, Pascal**; Borealis Polymers Oy,
P.O. Box 330, 06101 Porvoo (FI). **KANELLOPOULOS,**
Vasileios; Borealis Polyolefine GmbH, St.-Peter-Strasse
25, 4021 Linz (AT). **SUMERIN, Victor**; Borealis Polymers
Oy, P.O. Box 330, 06101 Porvoo (FI). **AHO, Jani**; Borealis
Polymers Oy, P.O. Box 330, 06101 Porvoo (FI).

(74) Agent: **CAMPBELL, Neil**; Dehns, St Bride's House, 10
Salisbury Square, London, EC4Y 8JD (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, BN, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO,
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH,
KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA,
MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI,
NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU,
RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM,
ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ,
UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ,
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments (Rule 48.2(h))

(88) Date of publication of the international search report:
02 February 2023 (02.02.2023)

(54) Title: PROCESS FOR POLYMERISING OLEFINS HAVING NARROW PARTICLE SIZE DISTRIBUTION

(57) Abstract: The disclosure relates to process for polymerising olefins, the process comprising polymerising ethylene, optionally in the presence of at least one other alpha olefin comonomer, preferably C4-C10 alpha olefin comonomer, preferably in a multi-stage polymerisation configuration, in the presence of a single-site polymerisation catalyst to produce a polymer component; to produce a polyethylene polymer or a polyethylene copolymer having a particle size distribution of the resulting a polyethylene polymer powder or a polyethylene copolymer powder described by a lognormal distribution having a scale parameter less than 0.5, preferably less than 0.45, in particular from 0.1 to 0.45, more preferably from 0.15 to 0.4. The disclosure further relates to a single-site polymerisation catalyst, comprising (i) a transition metal complex; (ii) a cocatalyst; and optionally (iii) a support, preferably a silica support; wherein the single-site polymerisation catalyst is characterised by a compressive strength of at least 5 MPa, preferably at least 5.5 MPa, in particular from 6 to 25 MPa, more preferably from 7 to 20 MPa, even more preferably from 7 to 15 MPa. The disclosure further relates to use of the single-site polymerisation catalyst in the preparation of a polyethylene polymer component, a polyethylene polymer, or a polyethylene copolymer and to a polyethylene polymer or a polyethylene copolymer having a particle size distribution of the polyethylene polymer or the polyethylene copolymer in powder form described by a lognormal distribution having a scale parameter less than 0.5, preferably less than 0.45, in particular from 0.1 to 0.45, more preferably from 0.15 to 0.4, preferably obtained by the present process.

WO 2022/268961 A3