

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
18 March 2004 (18.03.2004)

PCT

(10) International Publication Number
WO 2004/022605 A1

- (51) International Patent Classification⁷: **C08F 2/34**
- (21) International Application Number:
PCT/US2003/025151
- (22) International Filing Date: 12 August 2003 (12.08.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/408,431 4 September 2002 (04.09.2002) US
10/368,786 18 February 2003 (18.02.2003) US
- (71) Applicant: **UNIVATION TECHNOLOGIES, LLC**
[US/US]; 5555 San Felipe, Suite 1950, Houston, TX
77056 (US).
- (72) Inventors: **EHRMAN, Fred, D.**; 14226 Ridgewood Lake
Court, Houston, TX 77062 (US). **MUHLE, Michael, E.**;
5902 Leafy Aspen Court, Kingwood, TX 77345 (US). **SHI-
RODKAR, Pradeep, P.**; 3118 Willow Wood Trail, King-
wood, TX 77345 (US). **TRAPP, Keith, W.**; 15102 Cran-
bourne Drive, Houston, TX 77062 (US).
- (74) Agents: **FAULKNER, Kevin, M.** et al.; 5555 San Felipe,
Suite 1950, Houston, TX 77056 (US).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, 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, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC,
SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,
UG, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (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 "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

(54) Title: GAS PHASE POLYMERIZATION PROCESS

(57) Abstract: A gas phase polymerization process for producing a polyolefin composition is described, which includes passing a gaseous stream containing hydrogen gas and one or more monomers, including ethylene monomers, through a reactor that includes a fluidized bed, under reactive conditions, in the presence of a catalyst that includes metallocene, to provide a polyolefin composition, wherein in one embodiment the fluidized bulk density is 60% or more of the settled bulk density (or, a voidage of 40% or less); and wherein the voidage is controlled by a number of factors including, in certain embodiments, (a) the reactor temperature being maintained at 100 °C or below; (b) the molar ratio of hydrogen gas to ethylene introduced into the reactor being 0.015 or below.

WO 2004/022605 A1