



- (51) **International Patent Classification:**
C08F 10/02 (2006.01) *C08F 4/6592* (2006.01)
- (21) **International Application Number:**
PCT/EP2012/055586
- (22) **International Filing Date:**
29 March 2012 (29.03.2012)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
11160808.9 1 April 2011 (01.04.2011) EP
- (71) **Applicant** (for all designated States except US):
LANXESS ELASTOMERS B.V. [NL/NL]; Mijneweg 1,
NL-6167 AC Geleen (NL).
- (72) **Inventors; and**
- (75) **Inventors/Applicants** (for US only): **DOREMAELE, Van**
Gerardus Henricus Josephus [NL/NL]; Op de Hoef 6,
NL-6132 HN Sittard (NL). **ZUIDEVELD, Martin Alex-**
ander [NL/BE]; Bauweg 43a, B-4720 Kelmis (BE).
- (74) **Agent:** **HERBOLD, Matthias**; c/o Lanxess Deutschland
GmbH, 51369 Leverkusen (DE).
- (81) **Designated States** (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,

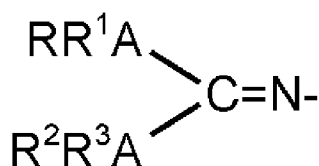
AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO,
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR,
KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME,
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD,
SE, SG, SK, SL, SM, ST, SV, SY, TH, 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, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ,
UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, 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, 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))

(54) **Title:** BORANE ACTIVATED TITANIUM CATALYST SYSTEM COMPRISING GUANIDINE AND DIENE LIGANDS



(57) **Abstract:** The invention relates to a catalyst system for the polymerization of olefins comprising a metal complex of formula CyLMD and an activating cocatalyst, wherein M is titanium, Cy is a cyclopentadienyl-type ligand, D is a diene, L is a guanidine-containing ligand of the formula wherein each A is independently selected from nitrogen or phosphorous and R, R¹, R² and R³ are independently selected from the group consisting of hydrogen, hydrocarbyl, silyl and germlyl residues, substituted or not with one or more halogen, amido, phosphido, alkoxy, or aryloxy radicals, and the activating cocatalyst is a boron compound represented by the general formula BR⁴R⁵R⁶, wherein B is a boron atom in the trivalent valence state and R⁴, R⁵ and R⁶ are individually selected from the group consisting of halogen atom, hydrocarbyl, halogenated hydrocarbyl, substituted silyl, alkoxy or di-substituted amino residue. The invention further relates to a process for the preparation of a polymer comprising at least one aliphatic or aromatic hydrocarbyl C₂₋₂₀ olefin wherein the at least one aliphatic or aromatic olefin is contacted with the catalyst system of the present invention.