

(43) International Publication Date
22 March 2012 (22.03.2012)

(51) International Patent Classification:

C08G 77/04 (2006.01) C07F 7/21 (2006.01)
C08L 83/04 (2006.01) C08G 77/06 (2006.01)

(21) International Application Number:

PCT/KR2011/006864

(22) International Filing Date:

16 September 2011 (16.09.2011)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

10-2010-0091767

17 September 2010 (17.09.2010)

KR

(71) Applicant (for all designated States except US): **KOREA INSTITUTE OF SCIENCE AND TECHNOLOGY** [KR/KR]; 39-1, Hawolgok-dong, Seongbuk-gu, Seoul 136-791 (KR).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **HWANG, Seung Sang** [KR/KR]; #211-503, Hyundai 2 Cha Apt., 288, Hagye-dong, Nowon-gu, Seoul 139-941 (KR). **BAEK, Kyung Youl** [KR/KR]; #A-204, KIST scientist Apt., 39-1, Hawolgok-dong, Seongbuk-gu, Seoul 136-130 (KR). **LEE, He Seung** [KR/KR]; 233-518, Jangwi-dong, Seongbuk-gu, Seoul 136-140 (KR). **HONG, Soon Man** [KR/KR]; #105-801, Samsung Cheongdam Park Apt., 60, Cheongdam-dong, Gangnam-gu, Seoul 135-952 (KR). **KWAK, Soon Jong** [KR/KR]; #A-105, KIST scientist Apt., 39-1, Hawolgok-dong, Seongbuk-gu, Seoul 136-130 (KR). **KOO, Chong Min** [KR/KR]; #104-101, Ssangyong Apt., 1127, Pung-dong, Ilsandong-gu, Goyang-si, Gyeonggi-do 410-757 (KR).

(74) Agent: **KIM, Sun-young**; Korea Coal Center, 10th Floor, 80-6, Susong-dong, Chongro-ku, Seoul 110-727 (KR).

(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, 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, 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:

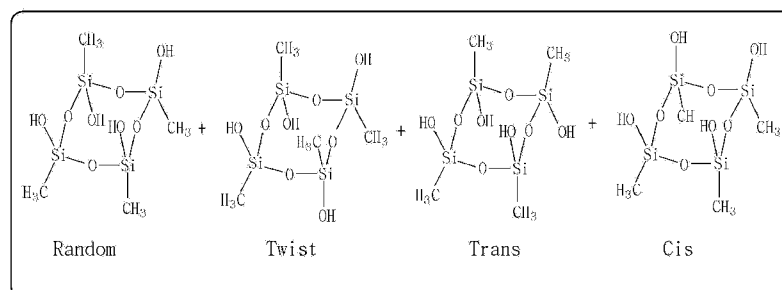
- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(88) Date of publication of the international search report:

28 June 2012

(54) Title: A COMPOSITION COMPRISING A MONOMER FOR POLYMERIZING BRANCH-TYPE SILSESQUIOXANE POLYMER, BRANCH-TYPE SILSESQUIOXANE POLYMER SYNTHESIZED FROM THE SAME AND A METHOD FOR SYNTHESIZING THE SAME

[Fig. 1]



(57) Abstract: A monomer composition for polymerizing a branch-type silsesquioxane polymer is disclosed. The monomer composition includes hydroxy-substituted cyclic siloxane in a solvent, and the hydroxy-substituted cyclic siloxane includes stereoisomers of cyclic siloxane of cis, trans, random and twist structures at controlled ratios. Also disclosed are a branch-type silsesquioxane polymer synthesized by polymerizing the monomer composition for polymerizing a branch-type silsesquioxane polymer, and a method for synthesizing the same. In accordance with the disclosure, the isomers can be isolated stably at desired ratios. The isolated isomers may be polymerized into polymers of various types. Since the polymers exhibit low dielectric property, they may be utilized as low dielectric materials.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2011/006864**A. CLASSIFICATION OF SUBJECT MATTER***C08G 77/04(2006.01)i, C08L 83/04(2006.01)i, C07F 7/21(2006.01)i, C08G 77/06(2006.01)i*

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

C08G 77/04; C08G 77/02; H01L 21/312; C07F 7/08; C07F 7/21; H01L 21/31; H01L 23/58; B32B 27/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: silsesquioxane, cyclic siloxane, solvent, stereoisomer, cis, trans, random, twist

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2006-0175683 A1 (SHIN, HYEON JIN and JEONG, HYUN DAM) 10 August 2006 See the whole document	1-18
A	US 2006-0159938 A1 (LEE, JIN GYU et al.) 20 July 2006 See the whole document	1-18
A	WO 2001-046295 A1 (HYBRID PLASTICS) 28 June 2001 See the whole document	1-18
A	US 2009-0269942 A1 (SHIN, HYEON JIN et al.) 29 October 2009 See the whole document	1-18

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

27 APRIL 2012 (27.04.2012)

Date of mailing of the international search report

27 APRIL 2012 (27.04.2012)

Name and mailing address of the ISA/KR

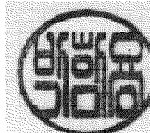
Korean Intellectual Property Office
Government Complex-Daejeon, 189 Cheongsu-ro,
Seo-gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

PARK Hamyong

Telephone No. 82-42-481-8409



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2011/006864

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006-0175683 A1	10.08.2006	KR 10-2006-0090478 A US 7338689 B2	11.08.2006 04.03.2008
US 2006-0159938 A1	20.07.2006	KR 10-1119141 B1 KR 10-2006-0084659 A	19.03.2012 25.07.2006
WO 2001-046295 A1	28.06.2001	AU 2000-65244 A1 AU 2001-249465 A8 AU 2001-29109 A1 AU 2001-49465 A1 AU 2002-365208 A1 CN 100544836 C CN 101142332 A0 CN 101151298 A0 CN 101180301 A0 CN 101203378 A0 CN 101278003 A0 CN 101405132 A CN 101511576 A CN 101657473 A CN 1214034 C0 CN 1377361 A0 CN 1909978 A CN 1909978 C0 EP 1208105 A1 EP 1208105 A4 EP 1208105 B1 EP 1268635 A1 EP 1268635 B1 EP 1268635 B8 EP 1711278 A2 EP 1789254 A2 EP 1841592 A2 EP 1848762 A2 EP 1856190 A2 EP 1888599 A1 EP 1928948 A2 EP 1931351 A2 EP 1960444 A2 EP 2125908 A1 JP 2003-510337 A JP 2003-533553 A JP 2007-019449 A JP 2007-523968 A JP 2008-512559 A JP 2008-530257 A JP 2008-530312 A JP 2008-537731 A JP 2008-545709 A	05.03.2001 08.10.2001 03.07.2001 08.10.2001 02.09.2003 30.09.2009 12.03.2008 26.03.2008 14.05.2008 18.06.2008 01.10.2008 08.04.2009 19.08.2009 24.02.2010 10.08.2005 30.10.2002 07.02.2007 07.02.2007 29.05.2002 20.11.2002 04.10.2006 02.01.2003 27.07.2005 28.09.2005 18.10.2006 30.05.2007 10.10.2007 31.10.2007 21.11.2007 20.02.2008 11.06.2008 18.06.2008 27.08.2008 02.12.2009 18.03.2003 11.11.2003 25.01.2007 23.08.2007 24.04.2008 07.08.2008 07.08.2008 25.09.2008 18.12.2008

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2011/006864

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		JP 2009-509030 A	05.03.2009
		JP 2009-510229 A	12.03.2009
		JP 2009-520081 A	21.05.2009
		JP 2010-522264 A	01.07.2010
		KR 10-2002-0059354 A	12.07.2002
		KR 10-2007-0008546 A	17.01.2007
		KR 10-2007-0110254 A	16.11.2007
		KR 10-2007-0121648 A	27.12.2007
		KR 10-2008-0002803 A	04.01.2008
		KR 10-2008-0029970 A	03.04.2008
		KR 10-2008-0065588 A	14.07.2008
		KR 10-2008-0068033 A	22.07.2008
		KR 10-2009-0129475 A	16.12.2009
		TW 200904843 A	01.02.2009
		TW 200909462 A	01.03.2009
		US 2002-0052434 A1	02.05.2002
		US 2003-0055193 A1	20.03.2003
		US 2005-0034791 A1	17.02.2005
		US 2005-0192364 A1	01.09.2005
		US 2005-0239985 A1	27.10.2005
		US 2006-0127583 A1	15.06.2006
		US 2006-0188732 A1	24.08.2006
		US 2006-0194919 A1	31.08.2006
		US 2006-0263318 A1	23.11.2006
		US 2006-0263531 A1	23.11.2006
		US 2007-0007613 A1	11.01.2007
		US 2007-0225434 A1	27.09.2007
		US 2007-0232823 A1	04.10.2007
		US 2008-0020213 A1	24.01.2008
		US 2008-0051546 A1	28.02.2008
		US 2008-0075872 A1	27.03.2008
		US 2008-0221262 A1	11.09.2008
		US 2008-0249275 A1	09.10.2008
		US 2008-0262162 A1	23.10.2008
		US 2009-0082502 A1	26.03.2009
		US 2010-0125123 A1	20.05.2010
		US 2010-0137464 A1	03.06.2010
		US 2010-0305282 A1	02.12.2010
		US 2011-0092661 A1	21.04.2011
		US 6716919 B2	06.04.2004
		US 6911518 B2	28.06.2005
		US 6927270 B2	09.08.2005
		US 6933345 B1	23.08.2005
		US 6972312 B1	06.12.2005
		US 7193015 B1	20.03.2007
		US 7485692 B2	03.02.2009
		US 7553904 B2	30.06.2009
		US 7572343 B2	11.08.2009
		US 7612143 B2	03.11.2009
		US 7638195 B2	29.12.2009

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2011/006864

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 7723415 B2	25.05.2010
		US 7737228 B2	15.06.2010
		US 7820761 B2	26.10.2010
		US 7888435 B2	15.02.2011
		US 7897667 B2	01.03.2011
		US 8076443 B2	13.12.2011
		WO 01-72885 A1	04.10.2001
		WO 03-064490 A2	07.08.2003
		WO 03-064490 A3	07.08.2003
		WO 2001-010871 A1	15.02.2001
		WO 2005-060671 A2	07.07.2005
		WO 2005-060671 A3	07.07.2005
		WO 2006-081512 A2	03.08.2006
		WO 2006-081512 A3	03.08.2006
		WO 2006-086789 A2	17.08.2006
		WO 2006-086789 A3	17.08.2006
		WO 2006-096775 A2	14.09.2006
		WO 2006-096775 A3	14.09.2006
		WO 2006-128052 A1	30.11.2006
		WO 2006-132656 A2	14.12.2006
		WO 2006-132656 A3	14.12.2006
		WO 2007-041344 A2	12.04.2007
		WO 2007-041344 A3	12.04.2007
		WO 2008-051190 A2	02.05.2008
		WO 2008-051190 A3	02.05.2008
		WO 2008-051190 A9	02.05.2008
		WO 2008-054418 A2	08.05.2008
		WO 2008-054418 A3	08.05.2008
		WO 2008-054418 A9	08.05.2008
		WO 2008-137209 A1	13.11.2008
		WO 2008-144735 A1	27.11.2008
US 2009-0269942 A1	29.10.2009	CN 1616468 A	18.05.2005
		CN 1616468 C0	23.04.2008
		DE 602004010461 D1	17.01.2008
		DE 602004010461 T2	06.11.2008
		EP 1493746 A2	05.01.2005
		EP 1493746 A3	12.01.2005
		EP 1493746 B1	05.12.2007
		JP 04-465233 B2	26.02.2010
		JP 2005-023075 A	27.01.2005
		JP 4465233 B2	19.05.2010
		KR 10-0660265 B1	20.12.2006
		US 2005-0038220 A1	17.02.2005
		US 7576230 B2	18.08.2009
		US 7750176 B2	06.07.2010