



- (51) **International Patent Classification:**  
*H01L 31/042* (2006.01) *H01L 31/18* (2006.01)
- (21) **International Application Number:**  
PCT/KR2012/002605
- (22) **International Filing Date:**  
5 April 2012 (05.04.2012)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**  
10-2011-0032959 8 April 2011 (08.04.2011) KR
- (71) **Applicant (for all designated States except US):** **LG INNOTEK CO., LTD.** [KR/KR]; Seoul Square, 541, Namdaemunno 5-ga, Jung-gu, Seoul 100-714 (KR).
- (72) **Inventor; and**
- (75) **Inventor/Applicant (for US only):** **LEE, Seung Yup** [KR/KR]; Seoul Square, 541, Namdaemunno 5-ga, Jung-gu, Seoul 100-714 (KR).
- (74) **Agent:** **SEO, Kyo Jun;** 9th Fl. Hyun Juk Bldg., 832-41, Yeoksam-dong, Gangnam-gu, Seoul 135-080 (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, 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).

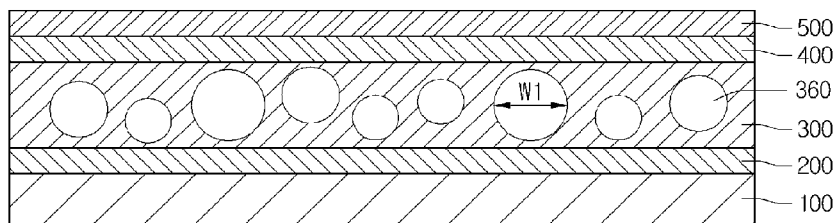
**Published:**  
— with international search report (Art. 21(3))  
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(88) **Date of publication of the international search report:**  
10 January 2013



WO 2012/138167 A3

(54) **Title:** SOLAR CELL AND METHOD OF FABRICATING THE SAME



(57) **Abstract:** Provided are a solar cell and a method of fabricating the same. The solar cell includes: a substrate; a back electrode layer on the substrate; a light absorbing layer on the back electrode layer; a buffer layer on the light absorbing layer; and a window layer on the buffer layer, wherein the light absorbing layer includes a plurality of voids.

## INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/KR2012/002605****A. CLASSIFICATION OF SUBJECT MATTER***H01L 31/042(2006.01)i, H01L 31/18(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)

H01L 31/042; H01L 31/04

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) &amp; Keywords: CIGS, porous, void

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	JP 2008-047614 A (SHOWA SHELL SEKIYU KK) 28 February 2008 See paragraph [0020] and figure 2.	1-4, 8 5-7, 9-10
Y A	JP 2006-216958 A (AISIN SEIKI CO., LTD.) 17 August 2006 See paragraphs [0012]-[0013], claim 1 and figure 1.	1-4, 8 5-7, 9-10
A	KR 10-2010-0074223 A (QUALCOMM MEMS TECHNOLOGIES, INC.) 01 July 2010 See abstract and figures 21-23.	1-10

 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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

19 NOVEMBER 2012 (19.11.2012)

Date of mailing of the international search report

**20 NOVEMBER 2012 (20.11.2012)**

Name and mailing address of the ISA/KR

Korean Intellectual Property Office  
189 Cheongsa-ro, Seo-gu, Daejeon Metropolitan  
City, 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

KIM Min Soo

Telephone No. 82-42-481-8249



**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/KR2012/002605**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2008-047614 A	28.02.2008	TW 200818528 A WO 2008-018461 A1	16.04.2008 14.02.2008
JP 2006-216958 A	17.08.2006	FR 2881881 A1 FR 2881881 B1	11.08.2006 08.06.2007
KR 10-2010-0074223 A	01.07.2010	CN 101809755 A EP 2040304 A1 JP 2010-541211 A US 2009-0078316 A1 US 2010-0236624 A1 WO 2009-042497 A2	18.08.2010 25.03.2009 24.12.2010 26.03.2009 23.09.2010 02.04.2009