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(54) Title: PHOTOVOLTAIC CELL

(57) Abstract: The novel light conversion system includes photosensitive optoelectronic devices, or photovoltaic cells, that convert electromagnetic radiation into electrical currents without applying an external voltage. Power conversion efficiency is a primary criterion for evaluating the performance of photovoltaic cells. Photovoltaic cells with high power-conversion efficiencies are more cost effective and more suitable replacements for conventional energy sources. This novel light conversion system uses a polycrystalline organic material with unique material properties for achieving high, power-conversion efficiencies.

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/33645

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC: **H01L 31/00**( 2006.01)

USPC: 136/263

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)

U.S. : 136/263

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
 Google scholar, search terms pentacene/tetracene/hexacene, solar/photovoltaic, polycrystalline

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	J. H. Schon et al. "Efficient photovoltaic energy conversion in pentacene-based heterojunctions" Appl. Phys. Lett. 77, 2473-2475. (2000) Entire document.	1-14, 16, 17, 19, and 20 ----- 15, 18
X	R. Signerski et al. "Photoelectric properties of heterojunctions formed from di-(pyridyl)-perylene-tetracarboxylic diimide and copper phthalocyanine or pentacene". Synth. Met. 94, 135-137. (1998) Entire document.	1, 2, 5-10, 12, 14, 15, 17
Y	US 6,580,027 B2 (Forrest et al) 17 June 2003 (17.06.2003), particularly abstract.	15, 18
A	J. Puigdollers et al. "Pentacene thin-films obtained by thermal evaporation in high vacuum" Thin Solid Films, 427, 367-370. (2003), especially Figure 3.	1-20



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:		"T"
"A"	document defining the general state of the art which is not considered to be of particular relevance	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
"E"	earlier application or patent published on or after the international filing date	"X"
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	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
"O"	document referring to an oral disclosure, use, exhibition or other means	"Y"
"P"	document published prior to the international filing date but later than the priority date claimed	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
		"&"
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International application No.  
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**C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Weiher, R.L. et al. "Mixed-Mode Excitons in the Photoluminescence of Zinc Oxide-Reabsorption and Exciton Diffusion" Phys. Rev. B. 5, 623-627. (1972) Especially paragraph bridging the 1st and 2nd columns of p. 626.	1-20
A	Kelly, M.K. et al. "Optical transitions of C60 Films in the visible and ultraviolet from spectroscopic ellipsometry" Phys. Rev. B. 46, 4963-4968. Especially Figure 2.	1-20