(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
1 March 2012 (01.03.2012)

PCT

(10) International Publication Number
WO 2012/027667 A2

(51) International Patent Classification:
H01L 21/302 (2006.01)

(21) International Application Number:
PCT/US2011/049347

(22) International Filing Date:
26 August 2011 (26.08.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

61/377,689	27 August 2010 (27.08.2010)	US
61/378,548	31 August 2010 (31.08.2010)	US
61/437,352	28 January 2011 (28.01.2011)	US
61/437,340	28 January 2011 (28.01.2011)	US
61/476,029	15 April 2011 (15.04.2011)	US
61/492,880	3 June 2011 (03.06.2011)	US

(71) Applicant *(for all designated States except US)*: **ADVANCED TECHNOLOGY MATERIALS, INC.** [US/US]; 7 Commerce Drive, Danbury, CT 06810 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **CHEN, Tianniu** [CN/US]; 146 Sunset Ridge, Rocky Hill, CT 06067 (US). **BILODEAU, Steven** [US/US]; 20 Carriage Drive, Oxford, CT 06478 (US). **SHEU, Chimin**; c/o ATMI Taiwan Co., Ltd., 4F-7, No. 81, Shui-lee Rd., Hsin Chu, 300 (TW). **NAKANISHI, Mutsumi** [JP/JP]; c/o Sanyo Chemical Industries, Ltd., 1-40 Goyo-ohara, Nishkyo-ku, Kyoto, 615-8245 (JP). **MATSUOKA, Masahiro** [JP/JP]; c/o Sanyo Chemical Industries, Ltd., 1-40 Goyo-ohara, Nishkyo-ku, Kyoto, 615-8245 (JP). **NAKAYAMA, Fumio** [JP/JP]; c/o Intermolecular, Inc., 3011 North First Street, San Jose, CA 95134 (US). **ZHANG, Peng** [CN/US]; 22 Terkuile Road, Montvale, NJ 07645 (US). **KORZENSKI, Michael, B.** [US/US]; 110 Woodcrest Lane, Danbury, CT 06810 (US). **COOPER, Emanuel, I.** [US/US]; 25 Atherstone Road, Scarsdale, NY 10583 (US). **VECCHARELLI, Kate** [US/US]; c/o Advanced Technology Materials, Inc., 7 Commerce Drive, Danbury, CT 06810 (US). **PAYNE, Makonnen** [US/US]; c/o Internolecular, Inc., 3011 North First Street, San Jose, CA 95134 (US).

(74) Agent: **FUIERER, Tristan, A.**; Moore & Van Allen, PLLC, P.O. Box 13706, Research Triangle Park, NC 27709 (US).

(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, 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:

— *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*

WO 2012/027667 A2

(54) Title: METHOD FOR PREVENTING THE COLLAPSE OF HIGH ASPECT RATIO STRUCTURES DURING DRYING

(57) Abstract: Methods of reducing the capillary forces experienced by fragile high aspect ratio structures during drying to substantially prevent damage to said high aspect ratio structures during drying. They include modifying the surface of the high aspect ratio structures such that the forces are sufficiently minimized and as such less than 10% of the high aspect ratio features will have bent or collapsed during drying of the structure having said features thereon.