



(51) International Patent Classification:
C23F 1/18 (2006.01) **C23F 1/02** (2006.01)

(21) International Application Number:
PCT/US2011/047927

(22) International Filing Date:
16 August 2011 (16.08.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2010-181485 16 August 2010 (16.08.2010) JP
2011-175477 11 August 2011 (11.08.2011) JP

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

(72) Inventors; and

(75) Inventors/Applicants (for US only): **YOSHIDA, Yutaka** [JP/JP]; c/o Sanyo Chemical Industries, Ltd., 11-1, Ikkyo-nomoto, Higashiyama-ku, Kyoto, Kyoto (JP). **KOJI, Yukiichi** [JP/JP]; c/o ATMI Japan KK, 3-7-18, Mita, Minato-ku, Tokyo, Tokyo (JP).

(74) Agent: **FUIERER, Tristan**; Moore & Van Allen PLLC, P.O. Box 13706, Research Triangle Park, North Carolina 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, 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.

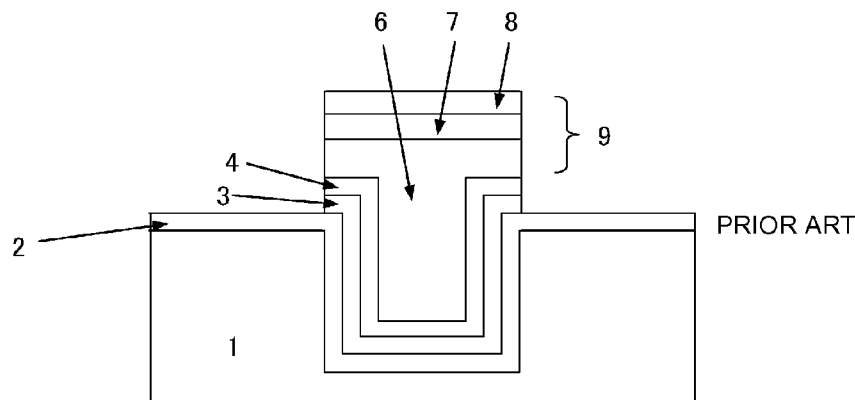
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, 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))

(54) Title: ETCHING SOLUTION FOR COPPER OR COPPER ALLOY

Figure 6



(57) Abstract: A solution for selectively etching copper or a copper alloy from a microelectronic device, wherein the device simultaneously includes copper or a copper alloy and nickel-containing material, the solution being an etching solution for copper or a copper alloy comprising a chelating agent having an acid group in a molecule, hydrogen peroxide, and a surfactant having an oxyethylene chain in a molecule.