

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
4 January 2007 (04.01.2007)

PCT

(10) International Publication Number
WO 2007/001485 A3

(51) International Patent Classification:
B44C 1/22 (2006.01) **B24D 3/02** (2006.01)

(21) International Application Number:
PCT/US2006/001589

(22) International Filing Date: 17 January 2006 (17.01.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/152,873 15 June 2005 (15.06.2005) US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
15 November 2007

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: FUMED SILICA TO COLLOIDAL SILICA CONVERSION PROCESS

(57) Abstract: A method of manufacturing a colloidal silica dispersion, by dissolving a fumed silica in an aqueous solvent having an alkali metal hydroxide to produce an alkaline silicate solution; removing the alkali metal via ion exchange to produce a silicic acid solution; adjusting the temperature, concentration and pH of the silicic acid solution to values sufficient to initiate nucleation and particle growth at elevated temperatures; and cooling the silicic acid solution at a rate sufficient to produce the colloidal silica dispersion. The colloidal silica particles in the colloidal silica dispersion have a mean particle size about 2 nm to about 100 nm. Also provided is a method of chemical mechanical polishing a surface of a substrate by contacting the substrate and a composition having a plurality of colloidal silica particles according to the present invention and a medium for suspending the particles. The contacting is carried out at a temperature and for a period of time sufficient to planarize the substrate.



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