

CORRECTED VERSION

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
10 May 2001 (10.05.2001)

PCT

(10) International Publication Number
WO 01/32951 A3

- (51) International Patent Classification⁷: **C23C 18/00**, H01L 21/768 (74) Agent: FASSE, J., Peter; Fish & Richardson P.C., 225 Franklin Street, Boston, MA 02110-2804 (US).
- (21) International Application Number: PCT/US00/30264 (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (22) International Filing Date:
2 November 2000 (02.11.2000)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/163,163 2 November 1999 (02.11.1999) US
60/223,839 8 August 2000 (08.08.2000) US
- (63) Related by continuation (CON) or continuation-in-part (CIP) to earlier applications:
US 60/163,163 (CIP)
Filed on 2 November 1999 (02.11.1999)
US 60/223,839 (CIP)
Filed on 8 August 2000 (08.08.2000)
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- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- Published:
with international search report
- (88) Date of publication of the international search report:
17 January 2002
- (48) Date of publication of this corrected version:
30 May 2002
- (15) Information about Correction:
see PCT Gazette No. 22/2002 of 30 May 2002, Section II
- 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: CHEMICAL FLUID DEPOSITION FOR THE FORMATION OF METAL AND METAL ALLOY FILMS ON PATTERNED AND UNPATTERNED SUBSTRATES

(57) Abstract: Methods are described for depositing a film or discontinuous layer of discrete clusters, of material (e.g. metals, metal mixtures or alloys, metal oxides, or semiconductors) on the surface of a substrate, e.g. a patterned silicon wafer, by i) dissolving a precursor of the material into a supercritical or near-supercritical solvent to form a supercritical or near-supercritical solution; ii) exposing the substrate to the solution, under conditions at which the precursor is stable in the solution; and iii) mixing a reaction reagent into the solution under conditions that initiate a chemical reaction involving the precursor, thereby depositing the material onto the solid substrate, while maintaining supercritical or near-supercritical conditions. The invention also includes similar methods for depositing material particles into porous solids, and films of materials on substrates or porous solids having material particles deposited in them. The invention also covers methods of preparing a plated substrate by depositing a catalytic layer followed by a plating layer.

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