

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
8 November 2001 (08.11.2001)

PCT

(10) International Publication Number
WO 01/083844 A3

(51) International Patent Classification⁷: **C23C 18/14**

(21) International Application Number: PCT/US01/13659

(22) International Filing Date: 27 April 2001 (27.04.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/561,744 28 April 2000 (28.04.2000) US

(71) Applicant: **EKC TECHNOLOGY, INC.** [US/US]; 2520
Barrington Court, Hayward, CA 94545 (US).

(72) Inventors: **HILL, Ross, H.**; 294 Hart Street, Coquit-
lam, British Columbia V3K 4A9 (CA). **SHI, You, Mao**;
115-542 Rochester Avenue, Coquitlam, British Columbia
V3K 2V2 (CA).

(74) Agents: **BALANCIA, Victor, N.** et al.; Pennie & Ed-
monds LLP, 1155 Avenue of the Americas, New York, NY
10036 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, 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, UZ, VN, YU, ZA, ZW.

(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:
16 January 2003

*For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

(54) Title: METHOD FOR DEPOSITING METAL AND METAL OXIDE FILMS AND PATTERNED FILMS

(57) Abstract: The invention is directed to a photoresist-free method for depositing films composed of metals, such as copper, or its oxides from metal complexes. More specifically, the method involves applying an amorphous film of a metal complex to a substrate. The metal complexes have the formula $M_fL_gX_h$, wherein M is selected from the group consisting of Ti, V, Cr, Au, Mn, Fe, Co, Ni, Cu, Zn, Si, Sn, Li, Na, K, Ba, Sr, Mo, Ru, Pd, Pt, Re, Ir, and Os, L is a ligand of the formula $(R_2NCR_2'CO)$ wherein R and R' are independently selected from H, C_nH_m and $C_nH_mA_xB_y$ wherein A and B are independently selected from main group elements and f, g, h, n, m, x and y represent integers and wherein X is an anion independently selected from N_3 , NCO, NO_3 , NO_2 , Cl, Br, I, CN, OH, H and CH_3 . These films, upon, for example, thermal, photochemical or electron beam irradiation may be converted to the metal or its oxides. By using either directed light or electron beams, this may lead to a patterned metal or metal oxide film in a single step.



WO 01/083844 A3