

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
19 August 2004 (19.08.2004)

PCT

(10) International Publication Number
WO 2004/070078 A1

(51) International Patent Classification⁷: **C23C 16/40**,
16/455

(74) Agents: MATKIN, Mark, S. et al.; Wells St. John P.S.,
601 West First Avenue # 1300, Spokane, WA 99201-3828
(US).

(21) International Application Number:
PCT/US2004/003046

(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, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(22) International Filing Date: 3 February 2004 (03.02.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/358,764 4 February 2003 (04.02.2003) US

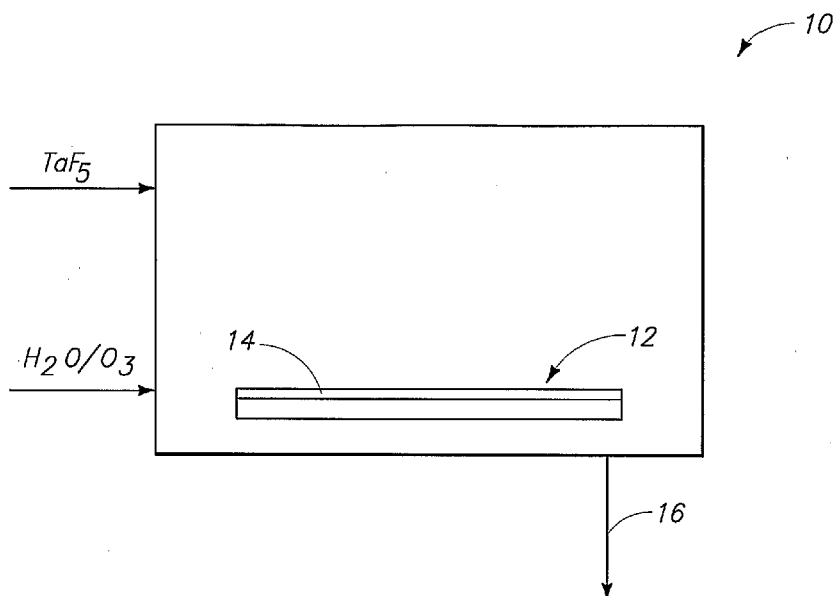
(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), Euro-
pean (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR,
GB, GR, HU, IE, IT, LU, MC,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

(71) Applicant (for all designated States except US): MI-
CRON TECHNOLOGY, INC. [US/US]; 8000 South
Federal Way, Boise, ID 83716 (US).

(72) Inventors: VAARTSTRA, Brian, A.; 3417 Braden Lane,
Nampa, ID 83686 (US). DOAN, Trung, Tri; 101 Lasuen
Court, Los Gatos, CA 95032 (US).

[Continued on next page]

(54) Title: METHOD OF FORMING A Ta₂O₅ COMPRISING LAYER



(57) Abstract: A substrate is positioned within a deposition chamber. Gaseous precursors comprising TaF₅ and at least one of H₂O and O₃ are fed to the deposition chamber under conditions effective to deposit a Ta₂O₅ comprising layer on the substrate. A substrate is positioned within a deposition chamber. A first species is chemisorbed onto the substrate within the chamber to form a first species monolayer from a gaseous first precursor comprising TaF₅. The chemisorbed first species is contacted with a gaseous second precursor comprising at least one of H₂O and O₃ to react with the first species to form a monolayer comprising Ta and O. The chemisorbing and contacting are successively repeated under conditions effective to form a mass of material on the substrate comprising Ta₂O₅.

WO 2004/070078 A1

**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*

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.