



(51) International Patent Classification:

H01L 21/32 (2006.01) H01L 21/311 (2006.01)
H01L 21/3105 (2006.01) H01L 21/768 (2006.01)
H01L 21/02 (2006.01)

(21) International Application Number:

PCT/US2022/040110

(22) International Filing Date:

11 August 2022 (11.08.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

17/407,504 20 August 2021 (20.08.2021) US

(71) Applicant: **APPLIED MATERIALS, INC.** [US/US];
3050 Bowers Avenue, Santa Clara, California 95054 (US).

(72) Inventors: **BHUYAN, Bhaskar Jyoti**; 3050 Bowers Avenue, Santa Clara, California 95054 (US). **SHEN, Zeqing**; 3050 Bowers Avenue, Santa Clara, California 95054 (US). **ROY, Susmit Singha**; 3050 Bowers Avenue, Santa Clara, California 95054 (US). **MALLICK, Abhijit Basu**; 3050 Bowers Avenue, Santa Clara, California 95054 (US).

(74) Agent: **BERGSTROM, James T.** et al.; 1100 Peachtree Street NE, Suite 2800, Mailstop: IP Docketing - 22, Atlanta, Georgia 30309 (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, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, 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, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, 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, KM, ML, MR, NE, SN, TD, TG).

(54) Title: SELECTIVE PATTERNING WITH MOLECULAR LAYER DEPOSITION

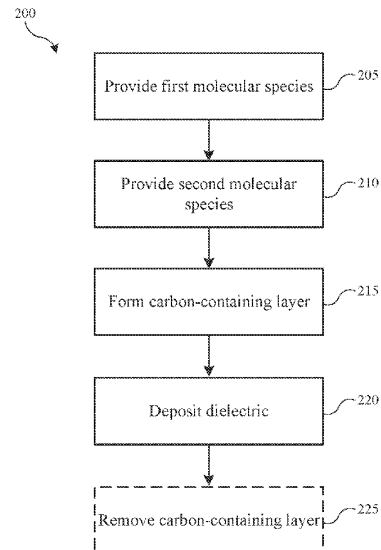


FIG. 2

(57) Abstract: Exemplary methods of semiconductor processing may include forming a layer of carbon-containing material on a substrate disposed within a processing region of a semiconductor processing chamber. The substrate may include an exposed region of a first dielectric material and an exposed region of a metal-containing material. The layer of carbon-containing material may be selectively formed over the exposed region of the metal-containing material. Forming the layer of carbon-containing material may include one or more cycles of providing a first molecular species that selectively couples with the metal-containing material. Forming the layer of carbon-containing material may include providing a second molecular species that selectively couples with the first molecular species. The methods may include selectively depositing a second dielectric material on the exposed region of the first dielectric material.

Published:

— with international search report (Art. 21(3))