(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
17 September 2026 (17.09.2026)

WIPO | PCT

(10) International Publication Number
WO 2026/193250 A1

(51) International Patent Classification:
C01B 13/14 (2006.01) *C01B 33/12* (2006.01)
C09C 1/36 (2006.01) *C09C 3/12* (2006.01)

(21) International Application Number:
PCT/US2026/018868

(22) International Filing Date:
12 March 2026 (12.03.2026)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
63/771,193 13 March 2025 (13.03.2025) US

(71) Applicant: **FUJIFILM ELECTRONIC MATERIALS U.S.A., INC.** [US/US]; 80 Circuit Drive, N. Kingstown, Rhode Island 02852 (US).

(72) Inventors: **JOHNSTON, James**; 450 S. Acacia, #2053, Mesa, Arizona 85204 (US). **CHEN, Yi**; 681 N Abalone Drive, Gilbert, Arizona 85233 (US). **LIANG, Yannan**; 3098 E. Linda Lane, Gilbert, Arizona 85234 (US). **HU, Bin**; 3360 S. Beverly Place, Chandler, Arizona 85248 (US). **HUANG, Ting-Kai**; 22942 S 214th Street, Queen Creek, Arizona 85142 (US). **FAN, Hanyu**; 238 E. Markwood Drive, Chandler, Arizona 85286 (US). **CHIU, Tzu-Wei**; No. 5, Aly. 1, Fuguang Lane, Zhongzheng Road, Nantou County, Caotun Township, 542 (TW). **CHEN, Chun-Fu**; 7F., No. 103, Zhuangjing 7th St., Hsinchu County, Zhubei City, 302 (TW). **CHANG, Ching-Hao**; Rm. 1, 4F., No. 268, Zhongzheng 2nd Road, Hsinchu County, Hukou Township, 303124 (TW). **TURNER, Eric**; 1901 W Madison Street, Apt. #846, Phoenix, Arizona 85009-9525 (US). **ZHANG, Yibin**; 3845 E Stanford Ave., Gilbert, Arizona 85234 (US).

(74) Agent: **WEFERS, Marc M.** et al.; Fish & Richardson P.C., P.O. Box 1022, Minneapolis, Minnesota 55440-1022 (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, MG, MK, MN, MU, 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, UY, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, CV, GH, GM, KE, LR, LS, MU, MW, MZ, NA, RW, SC, 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, ME, 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).

Declarations under Rule 4.17:
— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

Published:
— *with international search report (Art. 21(3))*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

WO 2026/193250 A1

(54) Title: CHEMICALLY MODIFIED METAL-OXIDE PARTICLES

(57) Abstract: This disclosure relates to a method for chemically modifying metal oxide particles, including a) adjusting the pH of a liquid dispersion of metal oxide particles to a pH value where the zeta potential of the metal oxide particles is from at least about -20 mV to at most about 20 mV; and b) adding a quaternary silane to the liquid dispersion of metal oxide particles to form chemically modified metal oxide particles. This disclosure further relates to polishing compositions including the chemically modified metal oxide particles, and methods of polishing semiconductor substrates using the polishing compositions.