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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
26 June 2025 (26.06.2025)

WIPO | PCT

(10) International Publication Number
WO 2025/132334 A1

(51) International Patent Classification:
G03F 7/004 (2006.01) *G03F 7/039* (2006.01)

(21) International Application Number:
PCT/EP2024/086760

(22) International Filing Date:
17 December 2024 (17.12.2024)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
63/611,863 19 December 2023 (19.12.2023) US

(71) Applicant: **MERCK PATENT GMBH** [DE/DE]; Frankfurter Straße 250, 64293 Darmstadt (DE).

(72) Inventors: **CARJA, Ionela-Daniela**; c/o Versum Materials US, LLC, 8555 South River Parkway, Tempe, Arizona 85284 (US). **SAO, Takayuki**; c/o Versum Materials US, LLC, 8555 South River Parkway, Tempe, Arizona 85284 (US). **WATANABE, Kenta**; c/o Versum Materials US, LLC, 8555 South River Parkway, Tempe, Arizona 85284 (US). **DAMMEL, Ralph R.**; c/o Versum Materials US, LLC, 8555 South River Parkway, Tempe, Arizona 85284 (US). **HITOKAWA, Hiroshi**; c/o Versum Materials US, LLC, 8555 South River Parkway, Tempe, Arizona 85284 (US). **TAKAGI, Fumiaki**; c/o Versum Materials US, LLC, 8555 South River Parkway, Tempe, Arizona 85284 (US). **KITA, Fumio**; c/o Versum Materials US, LLC, 8555 South River Parkway, Tempe, Arizona 85284 (US).

(74) Agent: **RIPPEL, Hans Christoph**; Patentanwälte Isenbruck Bösl Hörschler PartG mbB, Seckenheimer Landstraße 4, 68163 Mannheim (DE).

(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, 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, 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).

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 2025/132334 A1

(54) Title: RESISTS USING PFAS FREE PAGS

(57) Abstract: A photoresist composition which comprises Component A at least one aryl sulfate aryl onium salt PAG (PAG), wherein in said aryl sulfate moiety its aryl moiety is either unsubstituted or substituted, and in said aryl onium salt its aryl moieties are either unsubstituted or have at least one aryl moiety substituted; Component B: a resin essentially insoluble in aqueous 0.26 N TMAH at room temperature comprises at least one type of repeat unit which contains a base solubilizing moiety masked by an acid labile group, where the catalytic cleaving of this acid labile group by an acid, formed by radiation induced fragmentation of Component A, unmasks the base solubilizing moiety and renders the resin soluble in aqueous 0.26 N TMAH at room temperature; Component C: at least one acid quencher additive having a pK_a higher than -0.5 and a boiling point of at least 150°C at 1 atmosphere; and Component D: an organic spin casting solvent.