

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
25 May 2023 (25.05.2023)



(10) International Publication Number
WO 2023/088869 A2

(51) International Patent Classification:

G03F 7/022 (2006.01) G03F 7/038 (2006.01)
G03F 7/023 (2006.01) G03F 7/039 (2006.01)
G03F 7/027 (2006.01) G03F 7/085 (2006.01)
G03F 7/032 (2006.01) G03F 7/16 (2006.01)
G03F 7/033 (2006.01)

(21) International Application Number:

PCT/EP2022/081910

(22) International Filing Date:

15 November 2022 (15.11.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/280,302 17 November 2021 (17.11.2021) US

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

(72) Inventors: **LI, Zhong**; c/o EMD Performance Materials
Corp., 70 Meister Avenue, Branchburg, New Jersey 08876
(US). **WU, Hengpeng**; c/o EMD Performance Materials
Corp., 70 Meister Avenue, Branchburg, New Jersey 08876
(US). **CHEN, Chunwei**; c/o EMD Performance Materi-
als Corp., 70 Meister Avenue, Branchburg, New Jersey
08876 (US). **LIU, Weihong**; c/o EMD Performance Mate-
rials Corp., 70 Meister Avenue, Branchburg, New Jersey
08876 (US). **CHEN, Hung-Yang**; c/o EMD Performance
Materials Corp., 70 Meister Avenue, Branchburg, New Jer-
sey 08876 (US).

(74) Agent: **RIPPEL, Hans Christoph**; Patentanwälte Isen-
bruck Bösl Hörschler PartG mbB, Seckenheimer Land-
straße 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,

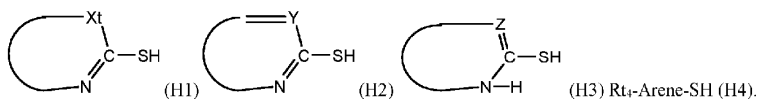
CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE,
KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU,
LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG,
NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, 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, 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:

— without international search report and to be republished
upon receipt of that report (Rule 48.2(g))

(54) Title: COMPOSITIONS AND METHODS FOR IMPROVING METAL STRUCTURE FABRICATION BY WET CHEMICAL
ETCH



(57) Abstract: One aspect of this invention is a photoresist composition comprising a thiol derivatives where the thiol moiety is attached to an SP² carbon which is part of ring which has structures (H1), (H2) (H3), or (H4), and where this thiol additive is present in a range of about 0.5 wt. % to about 3 wt. % of total solids. Another aspect of this invention is to use this photoresist composition on a metal substrate a patterned photoresist which is use as a etch mask in anisotropic wet chemical etching of the metal substate to produce a patterned metallic substrate. Yet Another aspect of this invention is a composition which comprises the above-described thiol derivatives in a spin casting solution and the process of treating a metal substrate which allows overlaid patterned photo resist to be used as an etch mask for wet chemical etching to affect anisotropic etching of the metal substate to also generate patterned metallic substate.



WO 2023/088869 A2