

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

(19) World Intellectual Property
Organization

International Bureau

(43) International Publication Date
10 November 2022 (10.11.2022)



(10) International Publication Number
WO 2022/235777 A1

(51) International Patent Classification:

C07F 7/21 (2006.01) *C08G 77/46* (2006.01)
C08G 77/04 (2006.01) *C08G 77/18* (2006.01)
C08G 77/20 (2006.01) *G02B 1/04* (2006.01)
C08G 77/388 (2006.01)

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))

(21) International Application Number:

PCT/US2022/027644

(22) International Filing Date:

04 May 2022 (04.05.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/183,901 04 May 2021 (04.05.2021) US

(71) Applicant: **ACUITY POLYMERS, INC.** [US/US]; 1667
Lake Ave. Suite 303, Building 59, Rochester, New York
14615 (US).

(72) Inventors: **FERRAR, Wayne**; 30 Shagbark Way, Fair-
port, New York 14450 (US). **BONAFINI, James A.**; 16027
Lomond Shore West, Kendall, New York 14476 (US).

(74) Agent: **MCGUIRE, Katherine H.**; 1900 Bausch & Lomb
Place, Rochester, New York 14604 (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, 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,

(54) Title: TRANSPARENT POLYMERIC MATERIALS WITH HIGH OXYGEN DIFFUSION CONTAINING DI-FUNCTIONAL
POSS CAGES WITH HYDROPHILIC SUBSTITUENTS

(57) Abstract: A new class of silicone monomers, providing transparent materials and imparting hydrophilic properties have been developed. These materials are incorporated into ophthalmic devices such as soft and rigid gas permeable (RGP) contact lenses. These new silicone monomers include Polyhedral Oligomeric Silsesquioxane (POSS) with two polymerizable groups and six organofunctional groups. These types of structures incorporate at least two available sites for polymerization allowing for the incorporation of the silsesquioxane cage into the backbone of a macromolecule. Additional functional sites allow the design of specific chemical features which address needed material properties.



WO 2022/235777 A1