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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
26 June 2014 (26.06.2014)

WIPO | PCT

(10) International Publication Number
WO 2014/094123 A1

(51) International Patent Classification:
C08L 15/00 (2006.01) *C08J 3/20* (2006.01)
C08C 19/24 (2006.01)

(21) International Application Number:
PCT/CA2013/001047

(22) International Filing Date:
16 December 2013 (16.12.2013)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/738,681 18 December 2012 (18.12.2012) US

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(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, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, 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, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, 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, 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).

Published:

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

(54) Title: BUTYL RUBBER WITH INCREASED IMPERMEABILITY

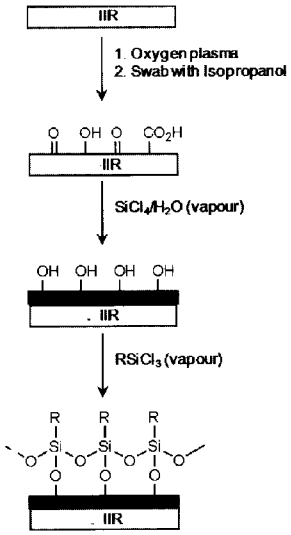


Figure 1

(57) Abstract: Surface modification methods based on a combination of plasma and chemical treatments render an unfilled butyl rubber surface highly reactive toward organosilanes, allowing formation of an organosilane self-assembled monolayer (SAM). Plasma oxidation of the butyl rubber surface followed by vapour deposition of SiCl4 produces a hydrophilic surface suitable for anchoring organosilanes. Fabrication of SAMs on this hydrophilic butyl rubber surface with n-octadecyltrichlorosilane (OTS) and trichloro(1H,1H,2H,2H-perfluorooctyl)silane (FOTS) via vapour deposition resulted in a 15% and 25% decrease in gas permeability, respectively, with no change in optical transparency of the butyl rubber.

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