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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
31 January 2019 (31.01.2019)

WIPO | PCT

(10) International Publication Number
WO 2019/022889 A1

(51) International Patent Classification:
C07C 67/39 (2006.01) *B01J 35/00* (2006.01)
C07C 69/54 (2006.01) *B01J 19/18* (2006.01)
B01J 23/52 (2006.01) *B01J 8/02* (2006.01)

(21) International Application Number:
PCT/US2018/039238

(22) International Filing Date:
25 June 2018 (25.06.2018)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
62/538,237 28 July 2017 (28.07.2017) US

(71) Applicants: **DOW GLOBAL TECHNOLOGIES LLC** [US/US]; 2040 Dow Center, Midland, MI 48674 (US). **ROHM AND HAAS COMPANY** [US/US]; 400 Arcola Road, Collegeville, PA 19426 (US).

(72) Inventors: **LIMBACH, Kirk W.**; 400 Arcola Road, Collegeville, PA 19426 (US). **KRAPTCHETOV, Dmitri A.**; 400 Arcola Road, Collegeville, PA 19426 (US). **FRICK, Christopher D.**; 400 Arcola Road, Collegeville, PA 19426 (US). **HICKMAN, Daniel A.**; 1776 Building, Midland, MI 48674 (US).

(74) Agent: **CRIMALDI, Kenneth**; Rohm and Haas Company, 400 Arcola Road, Collegeville, Pennsylvania 19426 (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, IR, IS, 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, 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, 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, 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))*

WO 2019/022889 A1

(54) Title: A METHOD FOR PRODUCTION OF METHYL METHACRYLATE BY OXIDATIVE ESTERIFICATION USING A HETEROGENEOUS CATALYST

(57) Abstract: A methode for preparing methyl methacrylate from methacrolein and methanol. The method comprises contacting in a reactor a mixture comprising methacrolein, methanol and oxygen with a heterogeneous catalyst comprising a support and a noble metal, wherein said catalyst has an average diameter of at least 200 microns, wherein oxygen concentration at a reactor outlet is from 0.5 to 7.5 mol% and wherein the reactor comprises a partition with the catalyst bed on a first side of the partition and with flow through the catalyst bed in a first direction and flow on a second side of the partition in an opposite direction.