

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
29 December 2022 (29.12.2022)



(10) International Publication Number
WO 2022/268859 A1

(51) International Patent Classification:
C07D 301/12 (2006.01)

(21) International Application Number:
PCT/EP2022/066967

(22) International Filing Date:
22 June 2022 (22.06.2022)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
21181263.1 23 June 2021 (23.06.2021) EP

(71) Applicants: **BASF SE** [DE/DE]; Carl-Bosch-Strasse 38, 67056 Ludwigshafen am Rhein (DE). **DOW GLOBAL TECHNOLOGIES LLC** [US/US]; 2211 H.H. Dow Way, 48674 Midland (US).

(72) Inventors: **PARVULESCU, Andrei-Nicolae**; Carl-Bosch-Strasse 38, 67056 Ludwigshafen am Rhein (DE). **TELES, Joaquim Henrique**; Carl-Bosch-Strasse 38, 67056 Ludwigshafen am Rhein (DE). **RIEDEL, Dominic**; Carl-Bosch-Strasse 38, 67056 Ludwigshafen am Rhein (DE). **SEGBERS, Dylan**; Scheldelaan 600, 2040 Antwerpen (BE). **BERGAMO, Massimo**; Buetzflether Sand 2, 21683 Stade (DE). **VAN NEER, Franciscus Johannes Robertus**; Dowweg 5, 4542 NM Hoek (NL). **WEIDENBACH, Meinolf**; Buetzflether Sand 2, 21683 Stade (DE).

(74) Agent: **ALTMANN STÖSSEL DICK PATENTANWÄLTE PARTG MBB**; Andreas Altmann, Isartorplatz 1, 80331 München (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, 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, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:
— of inventorship (Rule 4.17(iv))

(54) Title: PROCESS FOR THE PREPARATION OF A LIQUID MIXTURE COMPRISING METHANOL, WATER AND HYDROGEN PEROXIDE

(57) Abstract: The present invention relates in a first aspect to a process for the preparation of a liquid mixture comprising methanol, water and hydrogen peroxide, the process comprising: (i) providing a feed stream comprising methanol, and a feed stream comprising an aqueous hydrogen peroxide solution; (ii) combining the feed stream comprising the methanol and the feed stream comprising the aqueous hydrogen peroxide solution provided according to (i) at a point in time t_1 , so that a combined stream comprising methanol, hydrogen peroxide and water is obtained; (iii) filtrating the combined stream obtained according to (ii) at a point in time t_2 , through a filtration device, thereby obtaining a liquid mixture comprising methanol, hydrogen peroxide and water; wherein the period of time between t_1 and t_2 is at least 8 seconds. In a second aspect, the invention relates to the use of a liquid mixture obtained or obtainable from the process of the first aspect for the preparation of propylene oxide. A third aspect of the invention is directed to a method for the preparation of propylene oxide comprising: (i) providing a feed stream comprising methanol, a feed stream comprising an aqueous hydrogen peroxide solution and a feed stream comprising propylene; (ii) combining the feed stream comprising the methanol and the feed stream comprising the aqueous hydrogen peroxide solution provided according to (i) at a point in time t_1 , so that a combined stream comprising methanol, hydrogen peroxide and water is obtained; (iii) filtrating the combined stream obtained according to (ii) at a point in time t_2 , through a filtration device, thereby obtaining a liquid mixture comprising methanol, hydrogen peroxide and water; (iv) combining the feed stream comprising propylene either with the combined stream obtained in (ii) or with the liquid mixture obtained in (iii), thereby obtaining a liquid mixture comprising methanol, hydrogen peroxide, water and propylene; (v) bringing the liquid mixture obtained according to (iv) in an epoxidation zone in contact with an epoxidation catalyst comprising a zeolitic material having a framework structure comprising Si, O, and Ti under epoxidation reaction conditions, thereby obtaining in the epoxidation zone a mixture comprising propylene oxide, methanol and water; wherein the period of time between t_1 and t_2 are at least 8 seconds. In a fourth aspect, the invention relates to propylene oxide, obtained or obtainable from the method according to the third aspect.

WO 2022/268859 A1

[Continued on next page]

Published:

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