

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
29 August 2024 (29.08.2024)



(10) International Publication Number
WO 2024/177784 A1

(51) International Patent Classification:

B01J 23/62 (2006.01) **B01J 37/04** (2006.01)
B01J 35/00 (2024.01) **C07C 5/333** (2006.01)

SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN,
GQ, GW, KM, ML, MR, NE, SN, TD, TG).

(21) International Application Number:

PCT/US2024/013097

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

(22) International Filing Date:

26 January 2024 (26.01.2024)

(25) Filing Language:

English

Published:

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

(26) Publication Language:

English

(30) Priority Data:

63/485,956 20 February 2023 (20.02.2023) US

(71) Applicant: **EXXONMOBIL TECHNOLOGY AND ENGINEERING COMPANY** [US/US]; 22777 Springwoods Village Parkway, Spring, TX 77389 (US).

(72) Inventors: **BESWICK, Colin, L.**; 18 Country Place, Lebanon, NJ 08833 (US). **BAO, Xiaoying**; 4239 Albans, Houston, TX 77005 (US).

(74) Agent: **CHEN, Siwen** et al.; Exxonmobil Technology and Engineering Company, Law Department, P. O. Box 2149, Baytown, TX 77522-2149 (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, 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, MU, 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, SC, 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,

(54) Title: CATALYST SYSTEMS AND PROCESSES FOR MAKING AND USING SAME

(57) Abstract: Catalyst systems and processes for making and using same. The catalyst system can include a plurality of catalytic particles and a plurality of catalytically inert particles configured to be mixed with one another or mixed with one another. The catalytic particles can include a Group 8-10 element and a first promoter comprising Sn, Cu, Au, Ag, Ga, a combination thereof, or a mixture thereof disposed on a support. The catalytic particles can include 0.001 wt% to 6 wt% of the Group 8-10 element, up to 10 wt% of the first promoter, and the support comprises Al and at least 0.5 wt% of a Group 2 element, based on the weight of the support. The catalytically inert particles can be free of a Group 8-10 element. A composition of the catalytically inert particles and a composition of the support can be the same or different.



WO 2024/177784 A1