

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
27 July 2023 (27.07.2023)



(10) International Publication Number
WO 2023/141405 A1

(51) International Patent Classification:

C10G 47/20 (2006.01) C10G 49/04 (2006.01)
B01J 29/08 (2006.01) C10G 49/08 (2006.01)
B01J 29/14 (2006.01) B01J 29/89 (2006.01)
B01J 29/16 (2006.01) B01J 37/00 (2006.01)

LY, MA, MD, 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.

(21) International Application Number:

PCT/US2023/060705

(22) International Filing Date:

16 January 2023 (16.01.2023)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

17/577,691 18 January 2022 (18.01.2022) US

(71) Applicants: SAUDI ARABIAN OIL COMPANY

[SA/SA]; 1 Eastern Avenue, Dhahran, 31311 (SA). JGC
CATALYSTS & CHEMICALS LTD. [JP/JP]; Solid
Square East Tower 16F, 580 Horikawa Cho Saiwai Ku,
Kawasaki, Kanagawa 2120013 (JP). JAPAN COOPER-
ATION CENTER FOR PETROLEUM AND SUS-
TAINABLE ENERGY [JP/JP]; 58 FL., Sunshine 60
Building, 3-1-1, Higashi Ikebukuro, Toshima-ku, Tokyo,
170-6058 (JP).

(71) Applicant (for US only): ARAMCO SERVICES COM-

PANY [US/US]; 1200 Smith Street, Two Allen Building,
Houston, Texas 77002 (US).

(72) Inventors: KOSEOGLU, Omer Refa; c/o Saudi Arabian
Oil Company, 1 Eastern Avenue, Dhahran, 31311 (SA).

HODGKINS, Robert, Peter; c/o Saudi Arabian Oil Com-
pany, 1 Eastern Avenue, Dhahran, 31311 (SA). UCHIDA,
Koji; c/o JGC Catalysts & Chemicals LTD., Solid Square
East Tower 16F, 580 Horikawa Cho Saiwai Ku, Kawasaki,
Kanagawa 2120013 (JP).

(74) Agent: CRISPINO, Ralph, J. et al.; One Barker Avenue,
Fifth Floor, White Plains, New York 10601 (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,

(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, 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, 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: CATALYSTS WITH MODIFIED ACTIVE PHASE DISPERSION AND METHOD TO PREPARE CATALYSTS WITH MODIFIED ACTIVE PHASE DISPERSION

(57) Abstract: Catalyst particles comprising one or more active metal components and methods for manufacturing such catalyst particles are provided. The particles are a composite of a granulating agent or binder material such as an inorganic oxide, and an ultra-stable Y (hereafter "USY") zeolite in which some of the aluminum atoms in the framework are substituted with zirconium atoms and/or titanium atoms and/or hafnium atoms. The one or more active phase components are incorporated prior to mixing the binder with the post-framework modified USY zeolite, extruding the resulting composite mixture, and forming the catalyst particles. The one or more active phase components are incorporated in the post-framework modified USY zeolite prior to forming the catalyst particles.



WO 2023/141405 A1