

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
19 December 2024 (19.12.2024)



(10) International Publication Number
WO 2024/258526 A1

(51) International Patent Classification:

C01B 39/02 (2006.01) *B01J 35/63* (2024.01)
B01J 29/70 (2006.01) *C01B 39/46* (2006.01)
B01J 35/61 (2024.01)

(21) International Application Number:

PCT/US2024/028337

(22) International Filing Date:

08 May 2024 (08.05.2024)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

18/336,625 16 June 2023 (16.06.2023) US

(71) Applicants: **SAUDI ARABIAN OIL COMPANY** [SA/SA]; Post Office Box 5000, 31311 Dhahran (SA).
KING ABDULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY [SA/SA]; 4700 King Abdullah University of Science and Technology, 23955-6900 Thuwal (SA).

(71) Applicant (for AG only): **ARAMCO SERVICES COMPANY** [US/US]; 1200 Smith Street, Two Allen Building, Houston, Texas 77002 (US).

(72) Inventors: **PARSAPUR, Rajesh Kumar**; c/o 4700 King Abdullah University of Science and Technology,

23955-6900 Thuwal (SA). **HODGKINS, Robert Peter**; c/o Post Office Box 5000, 31311 Dhahran (SA). **KOSEOGLU, Omer Refa**; c/o Post Office Box 5000, 31311 Dhahran (SA). **HUANG, Kuo-Wei**; c/o 4700 King Abdullah University of Science and Technology, 23955-6900 Thuwal (SA). **SEDJERARI, Anissa Bendjeriou**; c/o 4700 King Abdullah University of Science and Technology, 23955-6900 Thuwal (SA).

(74) Agent: **INGLE, Cory J.** et al.; DINSMORE & SHOHL LLC, One South Main Street, Suite 1300, Dayton, Ohio 45402 (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.

(54) Title: ZEOLITE BETA PARTICLES WITH CENTER-RADIAL CONFIGURED MESOPORES AND METHODS OF MAKING THE SAME

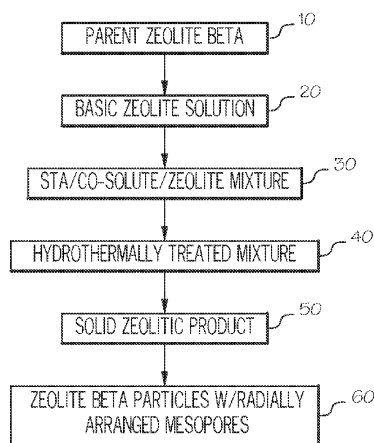


FIG. 1

(57) Abstract: Described herein are zeolite Beta particles with radially arranged mesopores and methods of making the same. In one or more embodiments, a zeolite Beta particle may include a Beta zeolitic framework including a plurality of micropores having diameters of less than or equal to 2 nm. In embodiments, the Beta zeolitic framework may include alumina and silica. In embodiments, the zeolite Beta particles disclosed herein may include a plurality of mesopores having diameters of greater than 2 nm and less than or equal to 50 nm. In embodiments, the plurality of mesopores may be arranged in a center-radial configuration, such that mesopores run from a central region of the zeolite Beta particle towards the edge of the zeolite Beta particle.

WO 2024/258526 A1

[Continued on next page]

(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, 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:

- *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))*

Published:

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