

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

(19) World Intellectual Property
Organization

International Bureau

(43) International Publication Date
12 October 2023 (12.10.2023)



(10) International Publication Number
WO 2023/194809 A1

(51) International Patent Classification:

B01J 29/00 (2006.01) **B01J 35/10** (2006.01)

B01J 29/035 (2006.01) **C10G 11/05** (2006.01)

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/IB2023/050189

(22) International Filing Date:

10 January 2023 (10.01.2023)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

2201002112 07 April 2022 (07.04.2022) TH

(71) Applicant: **PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED** [TH/TH]; 555/1 Energy Complex, Building A, 14th – 18th Floor, Vibhavadi Rangsit Road, Chatuchak, Chatuchak, Bangkok, 10900 (TH).

(72) Inventors: **PENG PANICH, Sitthiphong**; c/o 555/1 Energy Complex, Building A, 14th – 18th Floor, Vibhavadi Rangsit Road, Chatuchak, Chatuchak, Bangkok, 10900 (TH). **THAVORNPRASERT, Kaew-arpha**; c/o 555/1 Energy Complex, Building A, 14th – 18th Floor, Vibhavadi Rangsit Road, Chatuchak, Chatuchak, Bangkok, 10900 (TH). **SINGTEE, Apipornchai**; c/o 555/1 Energy Complex, Building A, 14th – 18th Floor, Vibhavadi Rangsit Road, Chatuchak, Chatuchak, Bangkok, 10900 (TH).

(74) Agent: **CHANGCHUMNI, Manoon** et al.; c/o Rouse & Co. International (Thailand) Limited, Unit 6E 04-07, 6th Floor The PARQ 88 Ratchadaphisek Road, Khlong Toei, Bangkok, 10110 (TH).

(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, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS,

(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).

Published:

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

(54) Title: A CATALYST FOR LIGHT OLEFINS PRODUCTION AND A PROCESS OF LIGHT OLEFINS PRODUCTION BY USING A CATALYST THEREOF

(57) Abstract: The present invention relates to a catalyst for light olefins production from catalytic cracking of hydrocarbon having 4 to 7 carbon atoms, wherein said catalyst has core-shell structure comprising zeolite core selected from ferrierite, ZSM-5, or mixture thereof, and silicalite shell having MFI structure, and said catalyst has the following characteristics: a) the weight ratio of shell to core greater than 0 but less than 4; b) the mole ratio of silica to alumina (SiO₂/Al₂O₃) from 60 to 550; c) the hierarchical pores comprising micropores having pore size in the range of 0.1 to 2 nm, mesopores having pore size in the range of 2 to 50 nm, and macropores having pore size greater than 50 nm, wherein the proportion of volume of mesopores and macropores to the total pore volume is in the range from 0.35 to 0.90, and said mesopores comprise pores having pore size from 2 to 5 nm, wherein the proportion of volume of pores having pore size from 2 to 5 nm to the total pore volume is in the range from 0.08 to 0.30. The catalyst according to the invention provides high conversion of the reactant and especially high selectivity to light olefins. Moreover, this invention also relates to the process of light olefins production by using the catalyst thereof.



WO 2023/194809 A1