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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
14 August 2025 (14.08.2025)

WIPO | PCT

(10) International Publication Number
WO 2025/168781 A1

(51) International Patent Classification:
B01J 21/08 (2006.01) *B01J 37/00* (2006.01)
B01J 23/20 (2006.01) *B01J 37/02* (2006.01)
B01J 35/40 (2024.01) *B01J 37/06* (2006.01)
B01J 35/61 (2024.01) *B01J 37/08* (2006.01)
B01J 35/63 (2024.01)

(21) International Application Number:
PCT/EP2025/053268

(22) International Filing Date:
07 February 2025 (07.02.2025)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
24461525.8 07 February 2024 (07.02.2024) EP

(71) Applicants: **SYNTHOS S.A.** [PL/PL]; ul. Chemikow 1, 32-600 OSWIECIM (PL). **ECOVYST INC.** [US/US]; 300 Lindenwood Drive, MALVERN, Pennsylvania 19355, USA (US).

(72) Inventors: **HU, Yatao Rachel**; 1403 Treeline Drive, MALVERN, Pennsylvania 19355 (US). **SHAH, Parag Rasiklal**; 25 White Pine Ct., Lafayette Hill, Pennsylvania 19444 (US). **JANKOWIAK, Ewelina**; c/o Synthos S.A., ul. Chemikow 1, 32-600 OSWIECIM (PL). **SITKO, Magdalena**; c/o Synthos S.A., ul. Chemikow 1, 32-600 OSWIECIM (PL). **KRYCA, Joanna**; c/o Synthos S.A., ul. Chemikow 1, 32-600 OSWIECIM (PL).

(74) Agent: **EISENFÜHR SPEISER PATENTANWÄLTE RECHTSANWÄLTE PARTGMBB**; Johannes-Brahms-Platz 1, 20355 Hamburg (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, 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, UY, 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, 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))*

WO 2025/168781 A1

(54) Title: SUPPORTED OXIDE CATALYST COMPRISING TANTALUM, ALUMINIUM AND SODIUM HAVING HIGH SELECTIVITY IN THE PRODUCTION OF 1,3-BUTADIENE

(57) Abstract: The present invention relates to a supported oxide catalyst comprising tantalum, aluminium and sodium. Moreover, the invention relates to a catalyst reaction tube for the production of 1,3-butadiene comprising at least one packing of the supported oxide catalyst, to a fixed bed reactor for the production of 1,3-butadiene comprising one or more of the catalyst reaction tubes, and to a plant for the production of 1,3-butadiene comprising one or more of the fixed bed reactors. The invention also relates to a process for the production of 1,3- butadiene. Finally, the present invention relates to the use of the supported oxide catalyst for the production of 1,3-butadiene from a feed comprising ethanol and acetaldehyde; and to the use of a specific amount of aluminium in a supported oxide catalyst for the production of 1,3-butadiene from a feed comprising ethanol and acetaldehyde, for increasing the selectivity of the supported oxide catalyst to 1,3-butadiene.