



(51) International Patent Classification:
C12P 5/02 (2006.01)

(21) International Application Number:
PCT/EP2020/060979

(22) International Filing Date:
20 April 2020 (20.04.2020)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10 2019 110 387.8
18 April 2019 (18.04.2019) DE

(71) Applicant: **ELECTROCHAEA GMBH** [DE/DE]; Semmelweisstrasse 3, 82152 Planegg (DE).

(72) Inventors: **GAASTRA, Imko**; c/o ELECTROCHAEA GMBH, Semmelweisstrasse 3, 82152 Planegg (DE). **HOERL, Manuel**; c/o ELECTROCHAEA GMBH, Semmelweisstrasse 3, 82152 Planegg (DE). **LARDON, Laurent**; c/o ELECTROCHAEA GMBH, Semmelweisstrasse 3, 82152 Planegg (DE). **HAFENBRADL, Doris**; c/o ELECTROCHAEA GMBH, Semmelweisstrasse 3, 82152 Planegg (DE). **POPP, Felix**; c/o ELECTROCHAEA

GMBH, Semmelweisstrasse 3, 82152 Planegg (DE). **HEIN, Mich**; c/o ELECTROCHAEA GMBH, Semmelweisstrasse 3, 82152 Planegg (DE). **KNUDSEN, Hans**; c/o ELECTROCHAEA GMBH, Semmelweisstrasse 3, 82152 Planegg (DE). **FORNERO, Jeff**; c/o ELECTROCHAEA GMBH, Semmelweisstrasse 3, 82152 Planegg (DE).

(74) Agent: **FLEUCHAUS, Andrea** et al.; Fleuchaus & Gallo Partnerschaft mbB, Steinerstr. 15/A, 81369 München (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, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, 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.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, 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,

(54) Title: METHANATION METHOD IN A BIOREACTOR UNDER CONTINUOUS CELL-RETENTION CONDITIONS

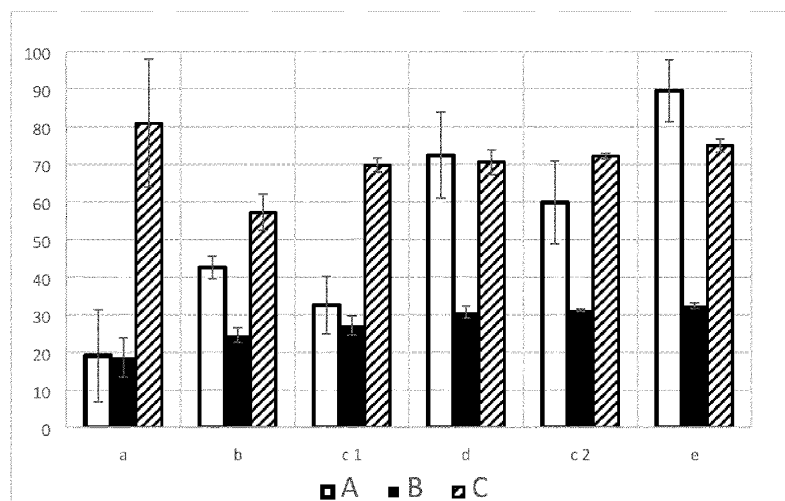


Fig. 5

(57) Abstract: The present invention refers to a method to convert H₂ and CO₂ into methane by methanogenic microorganisms in a bioreactor in a continuous production process for methane enriched gas compositions, while culturing the methanogenic microorganisms under cell retention conditions and continuously removing metabolic water in the cell culture medium.

[Continued on next page]

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, 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))*
- *with amended claims (Art. 19(1))*