



(51) International Patent Classification:

C01F 7/00 (2022.01) *B01J 20/30* (2006.01)
B01D 53/02 (2006.01) *C01B 32/50* (2017.01)
B01J 20/22 (2006.01) *C01B 13/02* (2006.01)
B01J 20/28 (2006.01)

(21) International Application Number:

PCT/SG2022/050383

(22) International Filing Date:

06 June 2022 (06.06.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

10202106057Y 07 June 2021 (07.06.2021) SG

(71) Applicants: **NATIONAL UNIVERSITY OF SINGAPORE** [SG/SG]; 21 Lower Kent Ridge Road, Singapore 119077 (SG). **AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH** [SG/SG]; 1 Fusionopolis Way, #19-10 Connexis North, Singapore 138632 (SG).

(72) Inventors: **MULLANGI, Dinesh**; c/o National University of Singapore, Faculty of Engineering, Department of Materials Science and Engineering, 21 Lower Kent Ridge Road, Singapore 119077 (SG). **DENG, Zeyu**; c/o National University of Singapore, Faculty of Engineering, Department of Materials Science and Engineering, 21 Lower Kent Ridge Road, Singapore 119077 (SG). **WANG, Yuxiang**; c/o National University of Singapore, Faculty of Engineering, Department of Materials Science and Engineering, 21 Lower Kent Ridge Road, Singapore 119077 (SG). **WANG, John**; c/o National University of Singapore, Faculty of Engineering, Department of Materials Science and Engineering, 21 Lower Kent Ridge Road, Singapore 119077 (SG). **CANEPA, Pieremanuele**; c/o National University of Singapore, Faculty of Engineering, Department of Materials Science and Engineering, 21 Lower Kent Ridge Road, Sin-

gapore 119077 (SG). **ZHAO, Dan**; c/o National University of Singapore, Faculty of Engineering, Department of Materials Science and Engineering, 21 Lower Kent Ridge Road, Singapore 119077 (SG). **CHEETHAM, Anthony Kevin**; c/o National University of Singapore, Faculty of Engineering, Department of Materials Science and Engineering, 21 Lower Kent Ridge Road, Singapore 119077 (SG). **WEI, Fengxia**; c/o Institute of Materials Research and Engineering (IMRE), 2 Fusionopolis Way, Innovis #08-03, Singapore 138634 (SG).

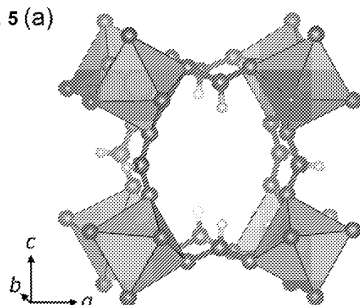
(74) Agent: **KINNAIRD, James Welsh**; Marks & Clerk Singapore LLP, Tanjong Pagar Post Office, P O Box 636, Singapore 910816 (SG).

(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, IQ, IR, IS, IT, JM, 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, 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).

(54) Title: A SIMPLE METAL-ORGANIC FRAMEWORK FOR THE SELECTIVE ADSORPTION OF CARBON DIOXIDE FROM FLUE GAS

FIG. 5 (a)



(57) Abstract: Discloses herein is an activated metal-organic framework of formula I as defined in the application, and the metal organic framework has a BET surface area of from 250 to 1,000 m²/g as obtained from a 298 K CO₂ sorption isotherm. In a particular embodiment, the activated metal-organic framework is aluminium formate (Al(HCOO)₃) or vanadium formate (V(HCOO)₃).

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*
— *before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:

02 February 2023 (02.02.2023)