

(19) World Intellectual Property  
Organization  
International Bureau



WIPO | PCT



(10) International Publication Number

WO 2022/036094 A8

(43) International Publication Date  
17 February 2022 (17.02.2022)

## (51) International Patent Classification:

B01J 20/22 (2006.01) B01J 20/34 (2006.01)  
B01J 20/30 (2006.01)

## (21) International Application Number:

PCT/US2021/045741

## (22) International Filing Date:

12 August 2021 (12.08.2021)

## (25) Filing Language:

English

## (26) Publication Language:

English

## (30) Priority Data:

62/706,389 13 August 2020 (13.08.2020) US

(71) Applicant: **EXXONMOBIL TECHNOLOGY AND ENGINEERING COMPANY** [US/US]; 1545 Route 22 East, P.O. Box 900, Annandale, NJ 08801-0900 (US).

(72) Inventors: **ABNEY, Carter, W.**; 123811 Kohl Road, Athens, WI 54411 (US). **FALKOWSKI, Joseph, M.**;

61 New Street, Hampton, NJ 08827 (US). **ABDULKARIM, Mary, S.**; 22 Prospect Street, Palisades Park, NJ 07650 (US). **IVASHKO, Anna, C.**; 26 Riverside Drive, Denville, NJ 07834 (US). **SEO, Julie, J.**; 101 West Main Street, Apartment 18, Clinton, NJ 08809 (US). **PETERS, Aaron, W.**; 53 Meadow Lane, New Hope, PA 18938 (US). **KAPELEWSKI, Matthew, T.**; 38 Coryell Street, Lambertville, NJ 08530 (US). **MAJANO SANCHEZ, Gerardo**; 132 Bayberry Row, Basking Ridge, NJ 07920 (US). **SATTLER, Wesley**; 24 Oak Knoll Lane, Bedminster, NJ 07921 (US). **WESTON, Simon, C.**; 68 Sidney School Road, Annandale, NJ 08801 (US).

(74) Agent: **CARTER, Lawrence, E.** et al.; Shook, Hardy & Bacon L.L.P., 2555 Grand Boulevard, Kansas City, MO 64108 (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,

(54) Title: METHODS OF SYNTHESIZING AND RECYCLING METAL-ORGANIC FRAMEWORK SYSTEMS

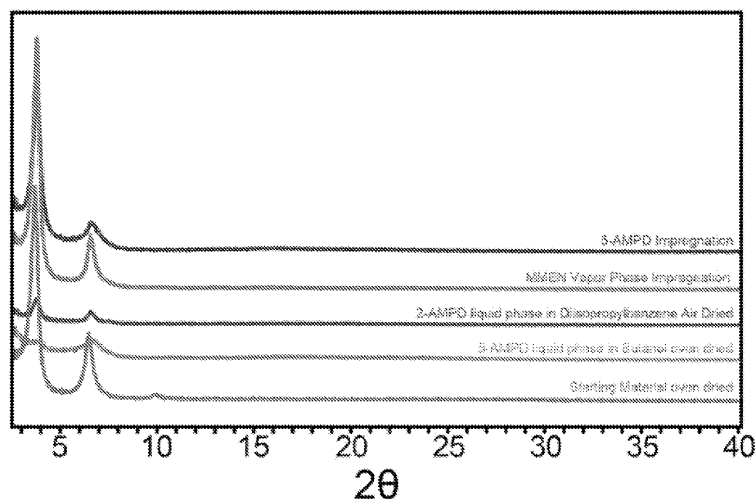


FIG. 2

(57) Abstract: Provided herein are methods of novel methods of synthesizing a metal-organic framework system by vapor-phase appending of a plurality of ligands appended to a metal-organic framework. Also, provided are methods of recycling metal-organic framework systems by detaching the ligand and re-appending the same ligand or appending a different ligand to the metal-organic framework to provide a recycled or repurposed metal-organic framework system.

[Continued on next page]

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DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,  
HR, HU, ID, IL, IN, IR, IS, IT, 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).

**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))*

**(48) Date of publication of this corrected version:**

10 November 2022 (10.11.2022)

**(15) Information about Correction:**

see Notice of 10 November 2022 (10.11.2022)