Supporting Information

Synthesis of Multifunctional Metal-Organic Frameworks and Tuning the Functionalities by Organic Pendant of Ligand

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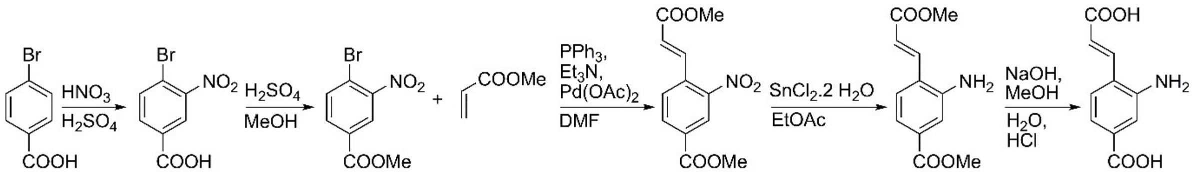
Experimental Section

A. Synthesis of ligands

Synthesis of 3-amino-4-(2-carboxyvinyl)benzoic acid (H_2CVB-NH_2)



Scheme S1. Preparation of 3-amino-4-(2-carboxyvinyl)benzoic acid.

(a) 4-bromo-3-nitrobenzoic acid: 4-Bromobenzoic acid (10.00 g, 49.75 mmol) was slowly added in small portions (in about 1 h) to a mixture of fuming HNO_3 (3.4 mL, 93 %) and concentrated H_2SO_4 (120 mL) at 0 ^oC. The resulting mixture was further stirred at RT for 2 h. The clear solution was then poured over ice; the precipitate formed was filtered and washed with a copious amount of water. The product was dried under vacuum at 80 ^oC and used without further purification. Yield: 11.80 g (96 %). ^1H NMR (300 MHz, d_6-DMSO, 25 ^oC): δ=8.43 (s, 1H; Ar-H), 8.05 ppm (m, 2H; Ar-H).

(b) methyl 4-bromo-3-nitrobenzoate: 4-bromo-3-nitrobenzoic acid (11.80 g, 47.96 mmol) was suspended in methanol (200 mL), to which concentrated H_2SO_4 (20 mL) was added. The mixture was refluxed overnight, and then methanol was removed by evaporation. When the reaction mixture was cooled to RT, solid resulted, which was extracted with CH_2Cl_2 (150 mL x 3). The collected organic phase was washed with saturated $NaHCO_3$ solution and dried over $MgSO_4$. The solvent was evaporated under reduced pressure to yield a crystalline pale yellow solid, which was dried under vacuum at RT and used without further purification. Yield: 11.70 g (94 %). ^1H NMR (300 MHz, $CDCl_3$, 25 ^oC): δ=8.47 (s, 1H; Ar-H), 8.08 (d, J = 8.29, 1H; Ar-H), 7.86 (d, J = 8.29 Hz, 1H; Ar-H), 3.99 ppm (s, 3H; -Me).

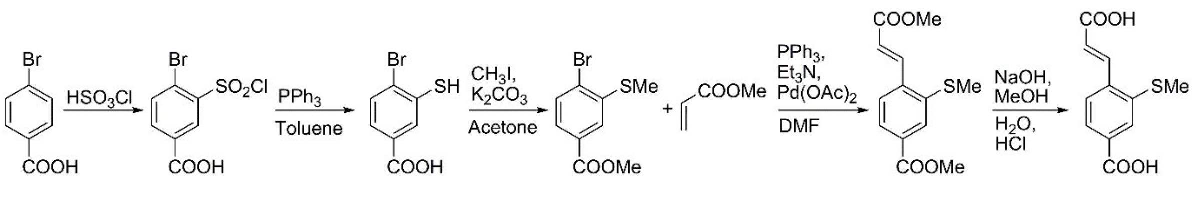
(c) methyl 4-(3-methoxy-3-oxoprop-1-enyl)-3-nitrobenzoate: methyl 4-bromo-3-nitrobenzoate (5.30 g, 20 mmol), palladium acetate (0.052 g, 0.23 mmol), and triphenylphosphine (0.120 g, 0.46 mmol) were added to a Schlenk flask and outgassed for 2 h. To this, were added anhydrous N,N-dimethylformamide (8 mL), anhydrous triethylamine (4.0 mL, 30 mmol), and methyl acrylate (10 mL, 110 mmol) under N_2. The clear solution was heated at 110 ^oC and stirred for 20 h. The black-colored solution was cooled to RT, added to ice water, and acidified with concentrated HCl until the solution became strongly acidic. The brown precipitate formed was extracted with CH_2Cl_2 (200 mL x 5). The combined organic layer was washed with water, dried over $MgSO_4$, and evaporated under reduced pressure to yield brown solid. The resulting product was purified by silica gel column chromatography by eluting CH_2Cl_2, which gave rise to a pale yellow solid. Yield: 2.70 g (51 %). ^1H

NMR (300 MHz, $CDCl_3$, 25 °C): δ=8.68 (s, 1H; Ar-H), 8.29 (m, 1H; Ar-H), 8.13 (d, J = 15.82 Hz, 1H; =C-H), 7.74 (d, J = 8.10, 1H; Ar-H), 6.45 (d, J = 15.82 Hz, 1H; =C-H), 4.00 (s, 3H; -Me), 3.86 ppm (s, 3H; -Me).

(d) methyl 3-amino-4-(3-methoxy-3-oxoprop-1-enyl)benzoate: methyl 4-(3-methoxy-3-oxoprop-1-enyl)-3-nitrobenzoate (2.65 g , 10 mmol) and $SnCl_2.2H_2O$ (11.28 g, 50 mmol) were dissolved in ethyl acetate (200 mL). The solution was refluxed for 2 h, cooled to RT, and then saturated $NaHCO_3$ solution was added to make the solution basic. The sticky precipitate formed was filtered through a CELITE pad and washed with ethyl acetate. The filtrate was put into a separating funnel and the organic layer was separated, the aqueous layer was washed with ethyl acetate (100 mL x 2). The combined organic layer was dried over $MgSO_4$ and evaporated under reduced pressure. The product was purified by silica gel column chromatography by eluting a 1:1 mixture of ethyl acetate and hexane to yield a pale yellow crystalline solid. Yield: 2.10 g (89 %). ^{1}H NMR (300 MHz, $CDCl_3$, 25 °C): δ=7.81 (d, J = 16.00 Hz, 1H; =C-H), 7.41 (m, 3H; Ar-H), 6.44 (d, J = 15.80 Hz, 1H; =C-H), 4.10 (br. s, 2H; $-NH_2$), 3.91 (s, 3H; -Me), 3.83 ppm (s, 3H; -Me).

(e) 3-amino-4-(2-carboxyvinyl)benzoic acid (H_2CVB-NH_2): methyl 3-amino-4-(3-methoxy-3-oxoprop-1-enyl)benzoate (2.10 g, 8.92 mmol) and NaOH (5.00 g, 125 mmol) were suspended in methanol (200 mL), stirred and refluxed overnight. The methanol was evaporated and the solid was dissolved in water (~100 mL) and carefully acidified with 3 N HCl until pH became 4 - 5. The precipitate formed was filtered, washed with water and dried under vacuum to yield yellow solid. Yield: 1.55 g, (84%). ^{1}H NMR (300 MHz, [D_6]DMSO, 25 °C): δ=7.81 (d, J = 15.8, 1H; =C-H), 7.52 (d, J = 8.30, 1H; Ar-H), 7.33 (s, 1H; Ar-H), 7.07 (d, J = 8.20 Hz, 1H; Ar-H), 6.38 (d, J = 15.6, 1H; =C-H), 5.79 ppm (br. s, 2H; $-NH_2$). Elemental analysis calcd (%) for $C_{10}H_9NO_4$: C 57.97, H 4.38, N 6.76; found: C 57.48, H 4.45, N 7.01. FTIR (KBr pellet): ῦ = 2824 (amino), 1683 (carboxylate), 1617 cm $^{-1}$ (alkene).

Synthesis of 4-(2-carboxyvinyl)-3-(methylthio)benzoic acid (H_2CVB-SMe)



Scheme S2. Preparation of 4-(2-carboxyvinyl)-3-(methylthio)benzoic acid.

(a) 4-bromo-3-(chlorosulfonyl)benzoic acid: 4-bromobenzoic acid (10.0 g, 49.7 mmol) was added in small portions to chlorosulfonic acid (25 mL) at 0 °C, and the clear solution was heated overnight at 130 - 140 °C. The solution was cooled to RT and added dropwise to an ice/water mixture (500 mL). The precipitate formed was filtered, washed with water, and dried in air. The solid was then

dissolved in diethyl ether (150 mL) and dried over Na_2SO_4 and evaporated until the dull white powder was formed, which was used without further purification. Yield = 10.9 g, 73 %. ^{1}H NMR (300 MHz, [D$_6$]DMSO, 25 °C): δ=8.46 (d, J = 1.9 Hz, 1H; Ar-H), 7.73 ppm (m, 2H; Ar-H).

(b) 4-bromo-3-mercaptobenzoic acid: 4-bromo-3-(chlorosulfonyl)benzoic acid (12.0 g, 40.0 mmol) was suspended in anhydrous toluene (200 mL), and purged with N_2 gas. To this suspension, PPh_3 (31.5 g, 120.0 mmol) was added by small portions. On complete addition, the starting material was dissolved. The solution was stirred for about 20 min at RT under N_2 purging. To this, aqueous NaOH (200 mL, 15 %) was added, and then the aqueous layer was separated, washed with toluene, and acidified with conc. HCl. The precipitate formed was extracted with EtOAc (300 mL), dried over $MgSO_4$, and evaporated under reduced pressure to yield white colored solid, which was used without further purification. Yield: 5.9 g, 63 %. ^{1}H NMR (300 MHz, [D$_6$]DMSO, 25 °C): δ=8.14 (br., 1H; Ar-H), 7.62 ppm (br., 2H; Ar-H).

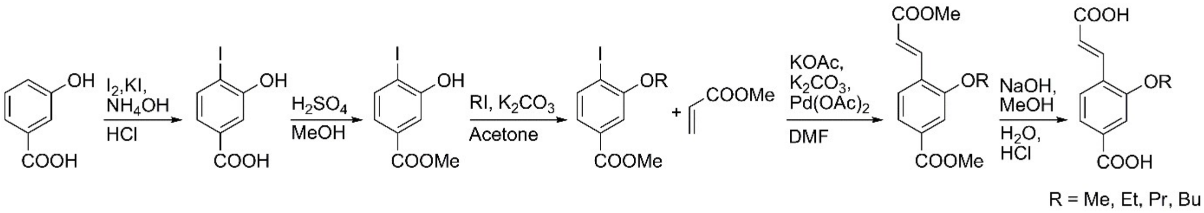
(c) methyl 4-bromo-3-(methylthio)benzoate: 4-bromo-3-mercaptobenzoic acid (5.9 g, 25.3 mmol) was dissolved in dry acetone (200 mL) and K_2CO_3 (6.0 g, 43.4 mmol), and CH_3I (20 mL, excess) was added and refluxed overnight. The mixture was evaporated under reduced pressure and extracted with CH_2Cl_2 and washed with H_2O. The CH_2Cl_2 layer was dried over MgSO4 and evaporated under reduced pressure to yield pale yellow liquid, which was used without further purification. Yield: 6.3 g, 95 %. ^{1}H NMR (300 MHz, $CDCl_3$, 25 °C): δ=7.78 (s, 1H; Ar-H), 7.63 (m, 2H; Ar-H), 3.96 (s, 3H; OMe), 2.55 ppm (s, 3H; SMe).

(d) Methyl 4-(3-methoxy-3-oxoprop-1-enyl)-3-(methylthio)benzoate: palladium acetate (0.052 g, 0.23 mmol), and triphenylphosphine (0.120 g, 0.46 mmol) were put in a Schlenk tube and outgassed for 2 h. To this, were added a solution of methyl 4-bromo-3-(methylthio)benzoate (2.61 g, 10 mmol) in anhydrous N,N-dimethylformamide (5 mL), anhydrous triethylamine (2.0 mL, 15 mmol), and methyl acrylate (5 mL, 55 mmol) under N_2. The mixture was stirred at 110 °C for 48 h. The solution was cooled to RT, added to ice water, and acidified with concentrated HCl. The precipitate formed was extracted with CH_2Cl_2 (100 mL x 3). The combined organic layer was washed with water, dried over $MgSO_4$, and evaporated under reduced pressure to yield brown material, which was purified by silica gel column chromatography by eluting CH_2Cl_2 to result in a yellow solid. Yield: 1.65 g (62 %). ^{1}H NMR (300 MHz, $CDCl_3$, 25 °C): δ=8.13 (d, J = 16.0 Hz, 1H; =C-H), 7.96 (s, 1H; Ar-H), 7.82 (d, J = 7.9 Hz, 1H; Ar-H), 7.57 (d, J = 8.10, 1H; Ar-H), 6.45 (d, J = 15.8 Hz, 1H; =C-H), 3.95 (s, 3H; -OMe), 3.84 (s, 3H; -OMe), 2.55 ppm (s, 3H; -SMe).

(e) 4-(2-carboxyvinyl)-3-(methylthio)benzoic acid (H_2CVB-SMe): methyl 4-(3-methoxy-3-oxoprop-1-enyl)-3-(methylthio)benzoate (1.60 g, 6.00 mmol) and NaOH (1.0 g, 25 mmol) were dissolved in methanol (150 mL) and refluxed overnight. The methanol was removed by evaporation. The solid formed was dissolved in water (~100 mL) and acidified with HCl to yield yellow

precipitate, which was filtered, washed with water, and dried under vacuum. Yield: 1.40 g, (98%). ^{1}H NMR (300 MHz, [D$_6$]DMSO, 25 °C): δ=12.93 (br. s, 2H; -COOH), 7.93 (d, J = 15.8, 1H; = C-H), 7.85 (br. m, 2H; Ar-H), 7.74 (br. s, 1H; Ar-H), 6.60 (d, J = 15.6, 1H; =C-H), 2.58 ppm (br. s, 3H; SMe). Elemental analysis calcd (%) for $C_{11}H_{10}O_4S$: C 55.45, H 4.23; found: C 53.45, H 4.49. FTIR (KBr pellet): ῦ = 1689 (carboxylate), 1629 cm $^{-1}$ (alkene).

Synthesis of 3-alkyloxy-4-(2-carboxyvinyl)benzoic acid (H$_2$CVB-O*R*)



Scheme S3. Preparation of 3-alkyloxy-4-(2-carboxyvinyl)benzoic acids.

(a) 3-hydroxy-4-iodobenzoic acid: The compound was synthesized by the reported method.[S1] The product was used in the next step without further purification. ^{1}H NMR (300 MHz, [D$_6$]DMSO, 25 °C): δ=10.68 (br. s, 1H; =O-H), 7.81 (m, 1H; Ar-H), 7.44 (m, 1H; Ar-H), 7.14 ppm (m, 1H; Ar-H).

(b) methyl 3-hydroxy-4-iodobenzoate: The mixture of 3-hydroxy-4-iodobenzoic acid (10.6 g, 40.0 mmol), conc.H_2SO_4 (30 mL), and methanol (300 mL) were refluxed overnight with stirring. The clear solution was evaporated under reduced pressure, extracted with CH_2Cl_2, washed with water, dried over MgSO4. The solvent was removed by evaporation under reduced pressure to yield dull-white crystalline precipitate, which was used in the next step without further purification. Yield: 9.70 g (87 %). ^{1}H NMR (300 MHz, $CDCl_3$, 25 °C): δ=7.78 (m, 1H; Ar-H), 7.66 (m, 1H; Ar-H), 7.35 (m, 1H; Ar-H), 3.94 ppm (s, 3H; -CH_3).

(c) methyl 4-iodo-3-methoxybenzoate: methyl 3-hydroxy-4-iodobenzoate (5.56 g, 20 mmol), K_2CO_3 (2.40 g, 60 mmol) and iodomethane (4.0 mL, 64 mmol) were mixed with dry acetone (50 mL), and then refluxed overnight. The solvent was evaporated to dryness under reduced pressure, and then water (100 mL) was added and extracted with CH_2Cl_2 (100 mL x 3). The combined CH_2Cl_2 layer was washed with water, dried over $MgSO_4$, and then evaporated under reduced pressure, which gave rise to pale yellow liquid, which was used in the next step without further purification. Yield = 5.70 g (97 %). ^{1}H NMR (300 MHz, $CDCl_3$, 25 °C): δ=7.87 (d, J = 8.1 Hz, 1H; Ar-H), 7.46 (s, 1H; Ar-H), 7.38 (d, J = 7.0 Hz, 1H; Ar-H), 3.96 (s, 3H; Me), 3.94 ppm (s, 3H; Me).

(d) methyl 3-ethoxy-4-iodobenzoate: The compound was synthesized by a similar method to that used for the synthesis of *methyl 4-iodo-3-methoxybenzoate*, using iodoethane (5.0 mL, 62.5 mmol). Yield = 5.80 g (95 %). ^{1}H NMR (300 MHz, $CDCl_3$, 25 °C): δ=7.86 (m, 1H; Ar-H), 7.43 (m, 1H; Ar-

H), 7.36 (m, 1H; Ar-H), 4.17 (q, J = 7 Hz, 2H; CH_2), 3.92 (s, 3H; CH_3), 1.53 ppm (t, J = 7 Hz, 3H; CH_3).

(e) methyl 4-iodo-3-propoxybenzoate: The compound was synthesized by a similar method to that used for *methyl 4-iodo-3-methoxybenzoate*, using iodopropane (6.0 mL, 61.8 mmol). Yield = 6.15 g (96 %). ^{1}H NMR (300 MHz, $CDCl_3$, 25 °C): δ=7.86 (d, J = 8.1 Hz, 1H; Ar-H), 7.43 (d, J = 1.9 Hz, 1H; Ar-H), 7.36 (dd, J = 8.1, 1.9 Hz, 1H; Ar-H), 4.17 (t, J = 6.4 Hz, 2H; CH_2), 3.93 (s, 3H; CH_3), 1.90 (m, 2H; CH_2), 1.12 ppm (t, J = 7.3 Hz, 3H; CH_3).

*(f) methyl 3-butoxy-4-iodobenzoate***:** The compound was synthesized by a similar method as that used for *methyl 4-iodo-3-methoxybenzoate*, using iodobutane (7.0 mL, 61.5 mmol). Yield = 6.41 g (96 %). ^{1}H NMR (300 MHz, $CDCl_3$, 25 °C): δ=7.86 (d, J = 8.1 Hz, 1H; Ar-H), 7.43 (d, J = 1.7 Hz, 1H; Ar-H), 7.36 (dd, J = 8.0, 1.9 Hz, 1H; Ar-H), 4.10 (t, J = 6.3 Hz, 2H; CH_2), 3.93 (s, 3H; CH_3), 1.85 (m, 2H; CH_2), 1.59 (m, 2H; CH_2), 1.02 ppm (t, J = 7.3 Hz, 3H; CH_3).

(g) methyl 3-methoxy-4-(3-methoxy-3-oxoprop-1-enyl)benzoate: methyl 4-iodo-3-methoxybenzoate (5.70 g, 19.50 mmol), palladium acetate (0.11 g, 0.50 mmol), potassium acetate (1.96 g, 19.97 mmol) and K_2CO_3 (3.50 g, 25.36 mmol) were added to a Schlenk flask and outgassed for 2 h. To this, were added anhydrous N,N-dimethylformamide (10 mL), and methyl acrylate (6 mL, 66.21 mmol) under N_2. The mixture was stirred at 90 °C for 48 h. The solution was cooled to RT, added to ice water, and acidified with concentrated HCl. The brown precipitate formed was extracted with CH_2Cl_2 (150 mL x 3). The combined CH_2Cl_2 layer was washed with water, dried over $MgSO_4$. The solvent was removed by evaporation under reduced pressure until brown material resulted. The product was purified by silica gel column chromatography by eluting CH_2Cl_2, which gave rise to white solid. Yield: 3.70 g (76 %). ^{1}H NMR (300 MHz, $CDCl_3$, 25 °C): δ=8.00 (d, J = 16.2 Hz, 1H; =C-H), 7.62 (m, 3H; Ar-H), 6.61 (d, J = 16.2 Hz, 1H; =C-H), 3.97 (s, 3H; CH_3), 3.95 (s, 3H; CH_3), 3.83 ppm (s, 3H; -CH_3).

(h) 4-(2-carboxyvinyl)-3-methoxybenzoic acid (H_2CVB-OMe): methyl 3-methoxy-4-(3-methoxy-3-oxoprop-1-enyl)benzoate (3.7 g, 14.8 mmol) and NaOH (2.4 g, 60.0 mmol) were added in methanol (200 mL), and the mixture refluxed overnight. Methanol was evaporated under reduced pressure, the precipitate formed was dissolved in water and acidified with conc. HCl. The precipitate formed was filtered by suction, washed with water, and dried under vacuum at 100 °C to yield a white powder. Yield = 2.80 g (85 %). ^{1}H NMR (300 MHz, [D_6]DMSO, 25 °C): δ=7.82 (m, 2H; =C-H, Ar-H), 7.56 (m, 2H; Ar-H), 6.62 (d, J = 16.2, 1H; =C-H), 3.93 ppm (s, 3H; -CH_3). Elemental analysis calcd (%) for $C_{11}H_{10}O_5$: C 59.46, H 4.54; found: C 58.42, H 4.35. FTIR (KBr pellet): ῦ = 1690 (carboxylate), 1628 cm^{-1} (alkene).

(i) methyl 3-ethoxy-4-(3-methoxy-3-oxoprop-1-enyl)benzoate: The compound was synthesized by a similar method to that used for *methyl 3-methoxy-4-(3-methoxy-3-oxoprop-1-enyl)benzoate*, using methyl 3-ethoxy-4-iodobenzoate (5.75 g, 18.78 mmol). Yield: 4.20 g (85 %). ^{1}H NMR (300 MHz, $CDCl_3$, 25 °C): δ=8.00 (d, J = 16.2 Hz, 1H; =C-H), 7.60 (m, 3H; Ar-H), 6.63 (d, J = 16.2 Hz, 1H; =C-H), 4.19 (q, J = 7.0 Hz, 2H; CH_2), 3.95 (s, 3H; CH_3), 3.83 (s, 3H; -CH_3), 1.51 ppm (t, J = 7.0 Hz, 3H; -CH_3).

(j) 4-(2-carboxyvinyl)-3-ethoxybenzoic acid (H_2CVB-OEt): The compound was synthesised by a similar method to that used for *4-(2-carboxyvinyl)-3-methoxybenzoic acid*, using methyl 3-ethoxy-4-(3-methoxy-3-oxoprop-1-enyl)benzoate (4.20 g, 15.90 mmol). Yield = 3.52 g (94 %). ^{1}H NMR (300 MHz, [D_6]DMSO, 25 °C): δ=7.82 (m, 2H; =C-H, Ar-H), 7.53 (m, 2H; Ar-H), 6.64 (d, J = 16.2, 1H; =C-H), 4.18 (q, J = 6.8 Hz, 2H; CH_2), 1.41 ppm (t, J = 6.9 Hz, 3H; -CH_3). Elemental analysis calcd (%) for $C_{12}H_{12}O_5$: C 61.01, H 5.12; found: C 59.93, H 5.79. FTIR (KBr pellet): $\tilde{\upsilon}$ = 1690 (carboxylate), 1627 cm^{-1} (alkene).

(k) methyl 4-(3-methoxy-3-oxoprop-1-enyl)-3-propoxybenzoate: The compound was synthesised by a similar method to that used for *methyl 3-methoxy-4-(3-methoxy-3-oxoprop-1-enyl)benzoate*, using methyl 4-iodo-3-propoxybenzoate (6.10 g, 19.05 mmol). Yield: 4.70 g (89 %). ^{1}H NMR (300 MHz, $CDCl_3$, 25 °C): δ=8.00 (d, J = 16.2 Hz, 1H; =C-H), 7.59 (m, 3H; Ar-H), 6.64 (d, J = 16.2 Hz, 1H; =C-H), 4.07 (t, J = 6.5 Hz, 2H; CH_2), 3.94 (s, 3H; CH_3), 3.82 (s, 3H; CH_3), 1.93 (m, 2H; CH_2), 1.10 ppm (t, J = 7.4 Hz, 3H; -CH_3).

(l) 4-(2-carboxyvinyl)-3-propoxybenzoic acid (H_2CVB-OPr): The compound was synthesised by a similar method to that used for *4-(2-carboxyvinyl)-3-methoxybenzoic acid*, using methyl 4-(3-methoxy-3-oxoprop-1-enyl)-3-propoxybenzoate (4.70 g, 16.88 mmol). Yield = 3.90 g (92 %). ^{1}H NMR (300 MHz, [D_6]DMSO, 25 °C): δ=7.82 (m, 2H; =C-H, Ar-H), 7.53 (m, 2H; Ar-H), 7.56 (m, 2H; Ar-H), 6.65 (d, J = 16.2, 1H; =C-H), 4.08 (t, J = 6.3 Hz, 2H; CH_2), 1.80 (m, 2H; CH_2), 1.02 ppm (m, 3H; -CH_3). Elemental analysis calcd (%) for $C_{13}H_{14}O_5$: C 62.39, H 5.64; found: C 61.68, H 6.12. FTIR (KBr pellet): $\tilde{\upsilon}$ = 1690 (carboxylate), 1627 cm^{-1} (alkene).

(m) methyl 3-butoxy-4-(3-methoxy-3-oxoprop-1-enyl)benzoate: The compound was synthesised by a similar method to that used for *methyl 3-methoxy-4-(3-methoxy-3-oxoprop-1-enyl)benzoate*, using methyl 3-butoxy-4-iodobenzoate (6.40 g, 19.15 mmol). Yield: 4.00 g (68 %). ^{1}H NMR (300 MHz, $CDCl_3$, 25 °C): δ=8.00 (d, J = 16.2 Hz, 1H; =C-H), 7.59 (m, 3H; Ar-H), 6.64 (d, J = 16.2 Hz, 1H; =C-H), 4.12 (m, 2H; CH_2), 3.95 (s, 3H; CH_3), 3.83 (s, 3H; CH_3), 1.88 (m, 2H; CH_2), 1.55 (m, 2H; CH_2), 1.03 ppm (m, 3H; -CH_3).

(n) 3-butoxy-4-(2-carboxyvinyl)benzoic acid (H_2CVB-OBu): The compound was synthesised by a similar method to that used for *4-(2-carboxyvinyl)-3-methoxybenzoic acid*, using methyl 3-butoxy-4-

(3-methoxy-3-oxoprop-1-enyl)benzoate (4.00 g, 13.68 mmol). Yield = 3.50 g (96 %). ^{1}H NMR (300 MHz, [D_6]DMSO, 25 °C): δ=7.83 (m, 2H; =C-H, Ar-H), 7.53 (m, 2H; Ar-H), 6.65 (m, 1H; =C-H), 4.11 (m, 2H; CH_2), 1.77 (m, 2H; CH_2), 1.47 (m, 2H; CH_2), 0.97 ppm (m, 3H; -CH_3). Elemental analysis calcd (%) for $C_{14}H_{16}O_5$: C 63.62, H 6.10; found: C 62.85, H 5.86. FTIR (KBr pellet): ῦ = 1689 (carboxylate), 1627 cm $^{-1}$ (alkene).

B. Synthesis of MOFs

All MOFs were synthesized by using H_2CVB-XR by a similar method to the synthesis of [Zn_4O(CVB-NH_2)$_3$]•18DMF•H_2O (**SNU-170**) described in the main text.

Synthesis of [Zn_4O(CVB-SMe)$_3$]•7DMF•3H_2O (SNU-171). The compound was synthesised by a similar method to that for **SNU-170**, using H_2CVB-SMe (0.024 g, 0.101 mmol). Yield: 0.025 g (48 %). Anal. Calcd for $C_{54}H_{79}N_7O_{23}S_3Zn_4$: C, 41.79; H, 5.13; N, 6.32. Found: C, 41.80; H, 5.22; N, 6.23. FTIR (KBr pellet): ῦ = 1671 (DMF), 1610 cm $^{-1}$ (carboxylate).

Synthesis of [Zn_4O(CVB-OMe)$_3$]•7DMF•3H_2O (SNU-172). The compound was synthesized by a similar method to that for **SNU-170**, using H_2CVB-OMe (0.023 g, 0.104 mmol). Yield: 0.030 g (60 %). Anal. Calcd for $C_{54}H_{79}N_7O_{26}Zn_4$: C, 43.13; H, 5.29; N, 6.52. Found: C, 43.46; H, 5.24; N, 6.70. FTIR (KBr pellet): ῦ = 1671 (DMF), 1610 cm $^{-1}$ (carboxylate).

Synthesis of [Zn_4O(CVB-OEt)$_3$]•7DMF•2H_2O (SNU-173). The compound was synthesized by a method similar to the synthesis of **SNU-170**, using H_2CVB-OEt (0.024 g, 0.102 mmol). Yield: 0.025 g (49 %). Anal. Calcd for $C_{57}H_{83}N_7O_{25}Zn_4$: C, 44.81; H, 5.48; N, 6.42. Found: C, 45.02; H, 5.67; N, 6.10. FTIR (KBr pellet): ῦ = 1671 (DMF), 1608 cm $^{-1}$ (carboxylate).

Synthesis of [Zn_4O(CVB-OPr)$_3$]•16DMF•3H_2O (SNU-174). The compound was synthesized by a method similar to the synthesis of **SNU-170**, using H_2CVB-OPr (0.025 g, 0.100 mmol). Yield: 0.040 g (53 %). Anal. Calcd for $C_{87}H_{154}N_{16}O_{35}Zn_4$: C, 46.53; H, 6.91; N, 9.98. Found: C, 45.45; H, 7.44; N, 9.73. FTIR (KBr pellet): ῦ = 1671 (DMF), 1602 cm $^{-1}$ (carboxylate).

Synthesis of [Zn_4O(CVB-OBu)$_3$]•15DMF•3H_2O (SNU-175). The compound was synthesized by a method similar to the synthesis of **SNU-170**, using H_2CVB-OBu (0.027 g, 0.102 mmol). Yield: 0.040 g (54 %). Anal. Calcd for $C_{87}H_{153}N_{15}O_{34}Zn_4$: C, 47.18; H, 6.96; N, 9.48. Found: C, 45.80; H, 7.00; N, 9.48. FTIR (KBr pellet): ῦ = 1671 (DMF), 1601 cm $^{-1}$ (carboxylate).

Synthesis of [Zn_4O(CVB-SMe)$_1$(CVB-OMe)$_2$]•7DMF•3H_2O (SNU-176). The compound was synthesized by a method similar to the synthesis of **SNU-170**, using H_2CVB-SMe (0.012 g, 0.050 mmol) and H_2CVB-OMe (0.011 g, 0.050 mmol). Yield: 0.030 g (40 %). Anal. Calcd for

$C_{54}H_{79}N_7O_{25}SZn_4$: C, 42.67; H, 5.24; N, 6.45. Found: C, 42.97; H, 5.28; N, 6.87. FTIR (KBr pellet): $\tilde{\upsilon}$ = 1671 (DMF), 1605 cm $^{-1}$ (carboxylate). The ratio between CVB-SMe^{2-} and CVB-OMe^{2-} were confirmed by the NMR analysis of the activated sample, digested in DCl/D_2O (35%), and dissolved in DMSO (Fig. S10).

C. References

S1 G. S. Cockerill, P. C. Levett, D. A. Whiting, *J. Chem. Soc., Perkin Trans. 1,* **1995**, 1103-1113.

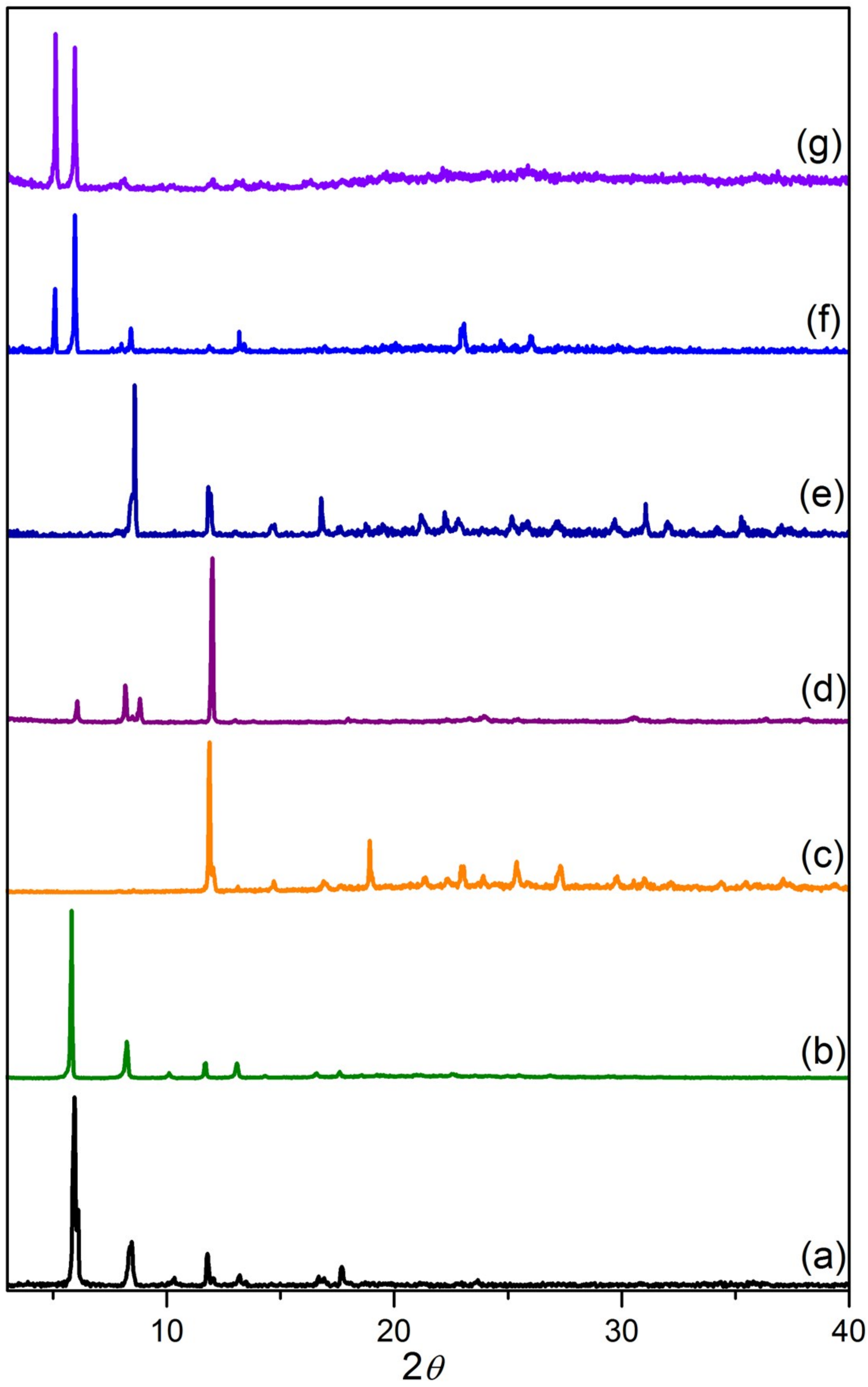


Fig. S1 The PXRD patterns of as-synthesized samples: (a) **SNU-70**, (b) **SNU-170**, (c) **SNU-171**, (d) **SNU-172**, (e) **SNU-173**, (f) **SNU-174**, and (g) **SNU-175**.

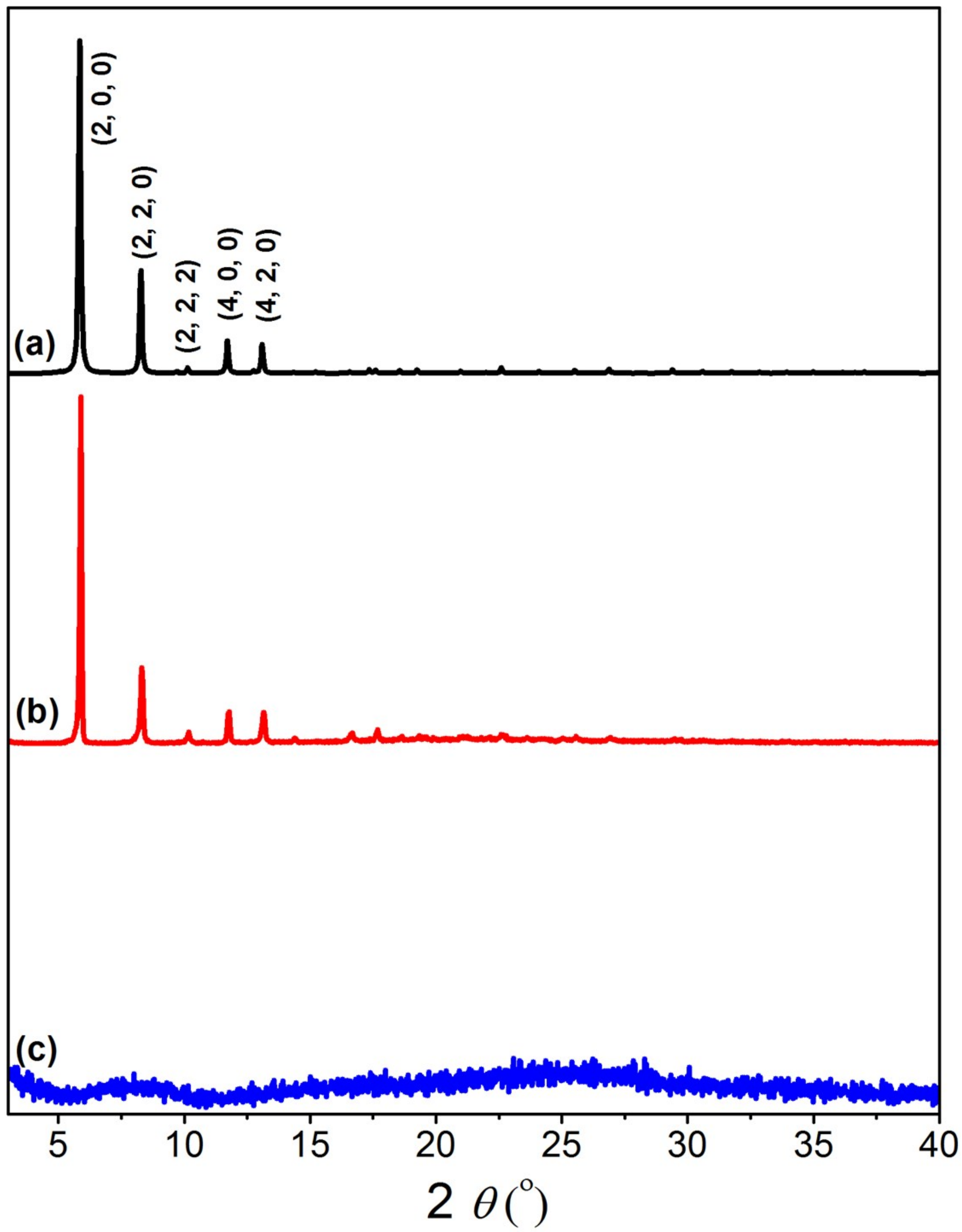


Fig. S2 The PXRD patterns of **SNU-170**: (a) simulated from the X-ray crystallographic data, (b) measured for as-synthesized sample, and (c) measured after activation with supercritical CO_2.

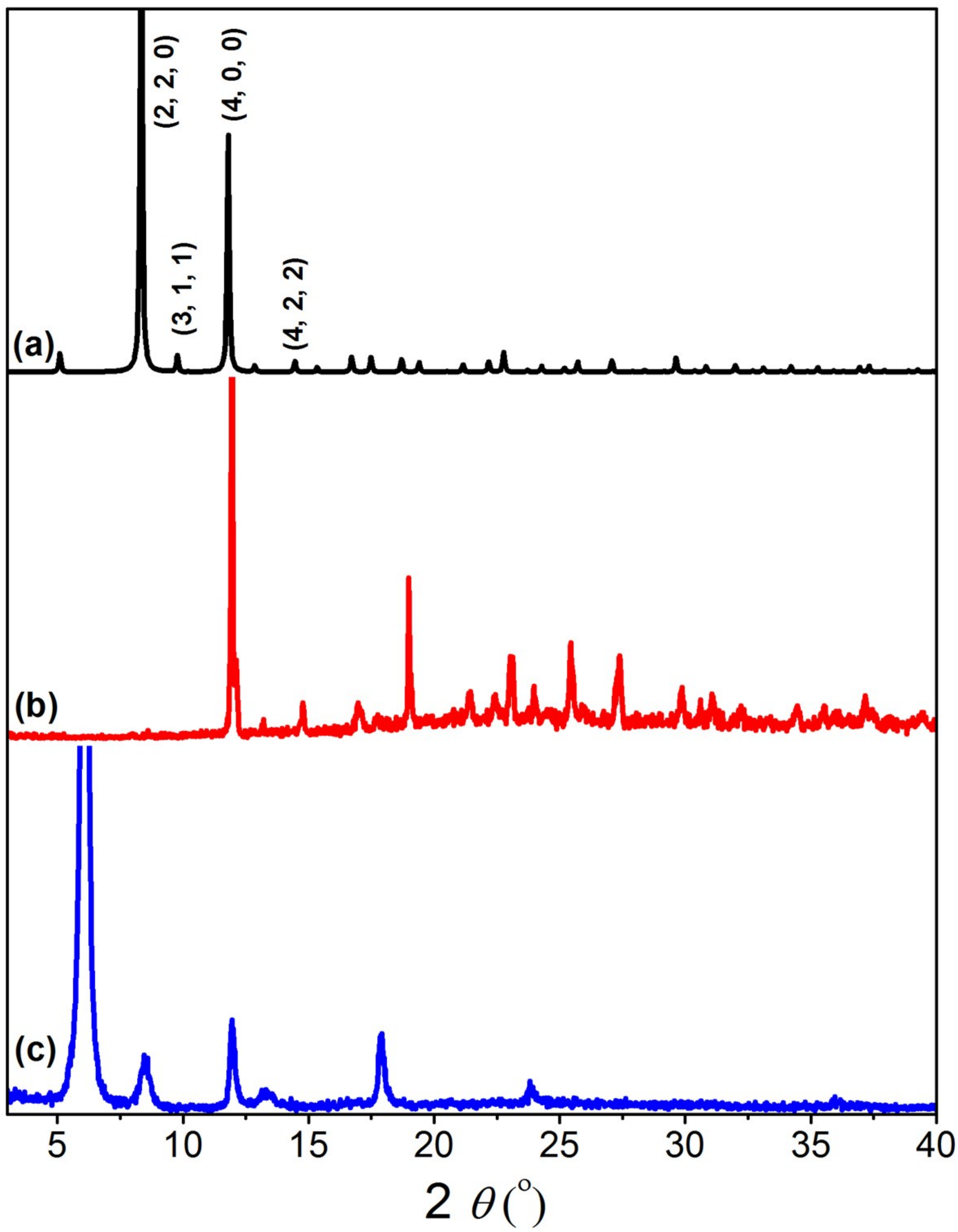


Fig. S3 The PXRD patterns of **SNU-171**: (a) simulated from the X-ray crystallographic data, (b) measured for as-synthesized sample, and (c) measured after activation with supercritical CO_2.

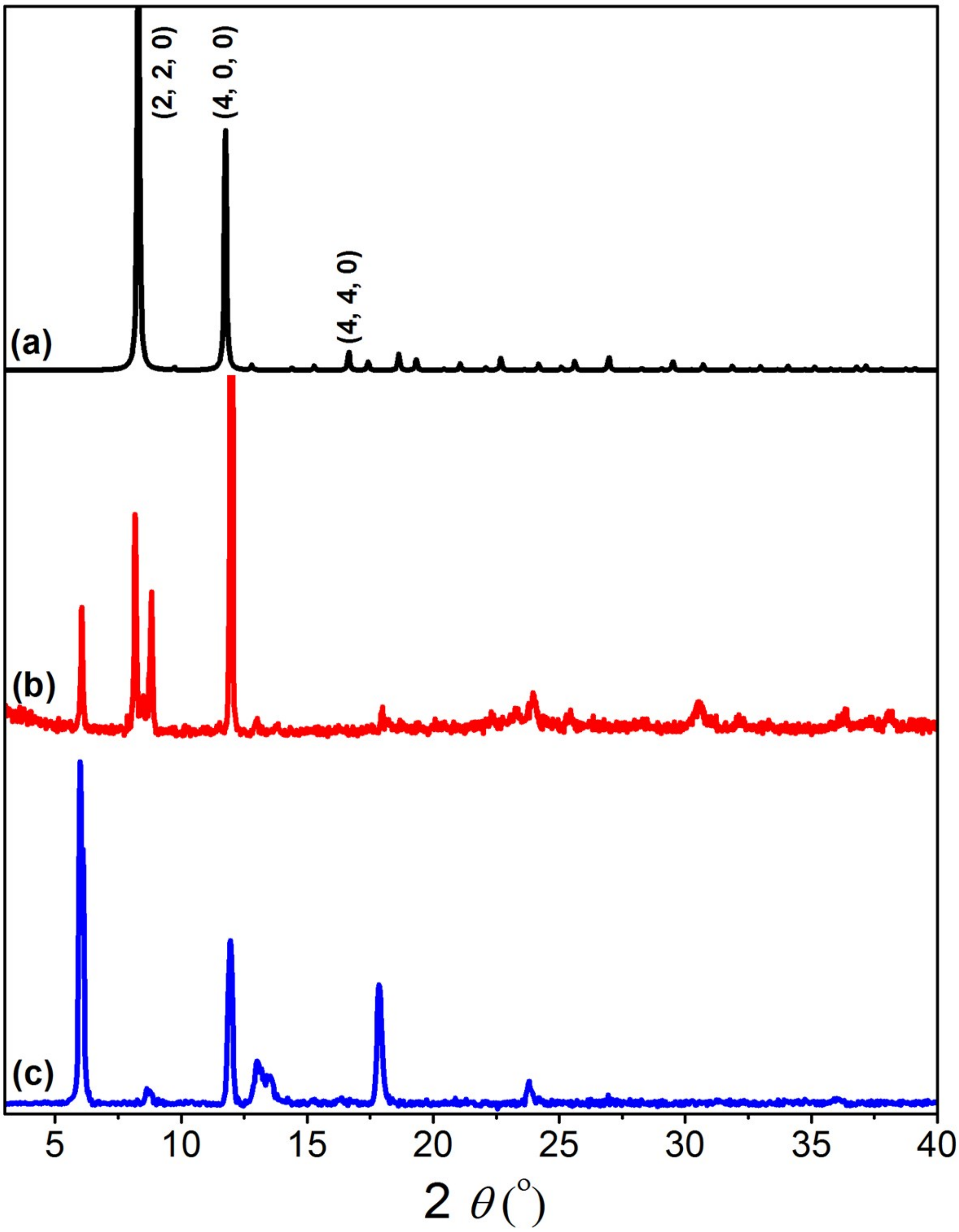


Fig. S4 The PXRD patterns of **SNU-172**: (a) simulated from the X-ray crystallographic data, (b) measured for as-synthesized sample, and (c) measured after activation with supercritical CO_2.

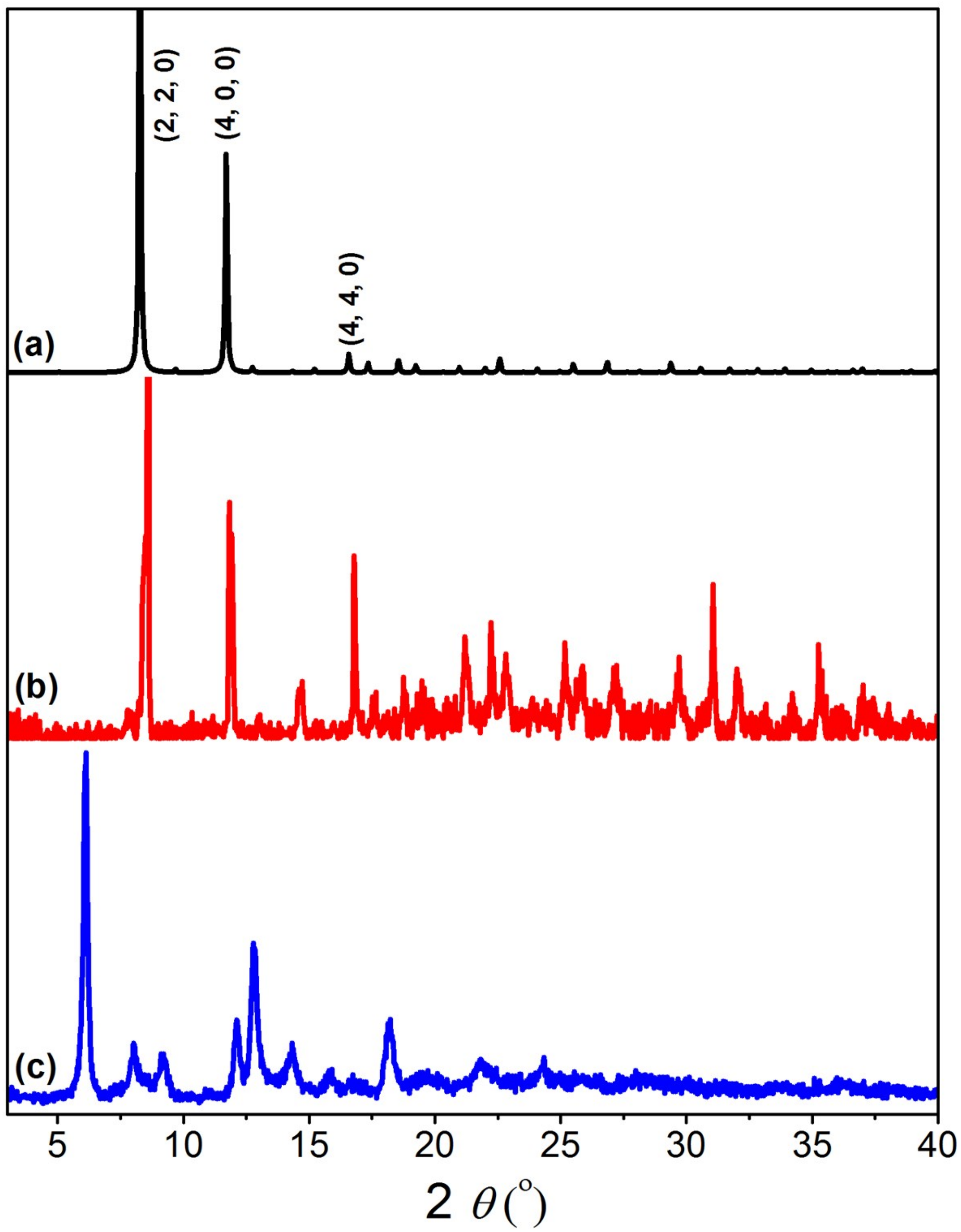


Fig. S5 The PXRD patterns of **SNU-173**: (a) simulated from the X-ray crystallographic data, (b) measured for as-synthesized sample, and (c) measured after activation with supercritical CO_2.

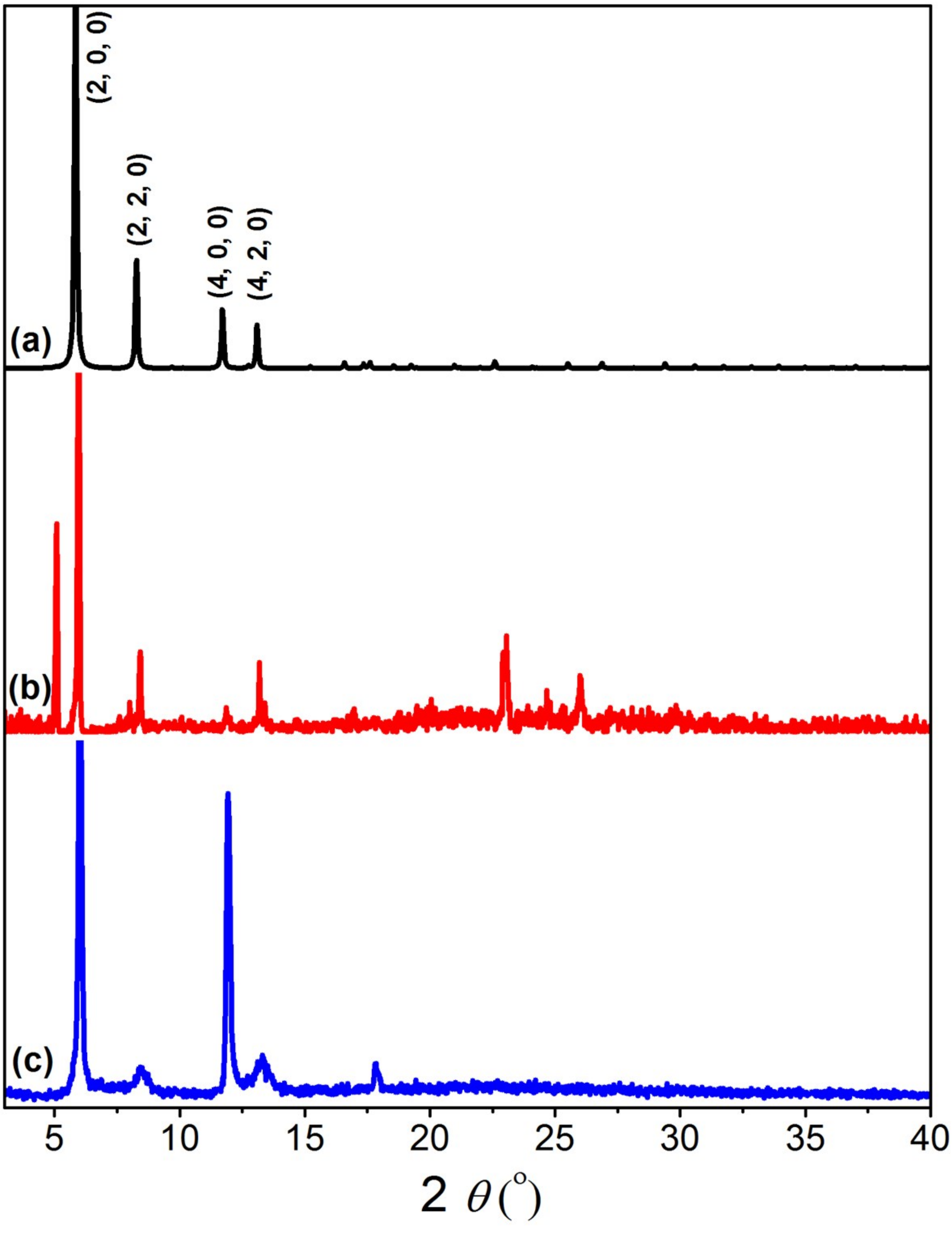


Fig. S6 The PXRD patterns of **SNU-174**: (a) simulated from the X-ray crystallographic data, (b) measured for as-synthesized sample, and (c) measured after activation with supercritical CO_2.

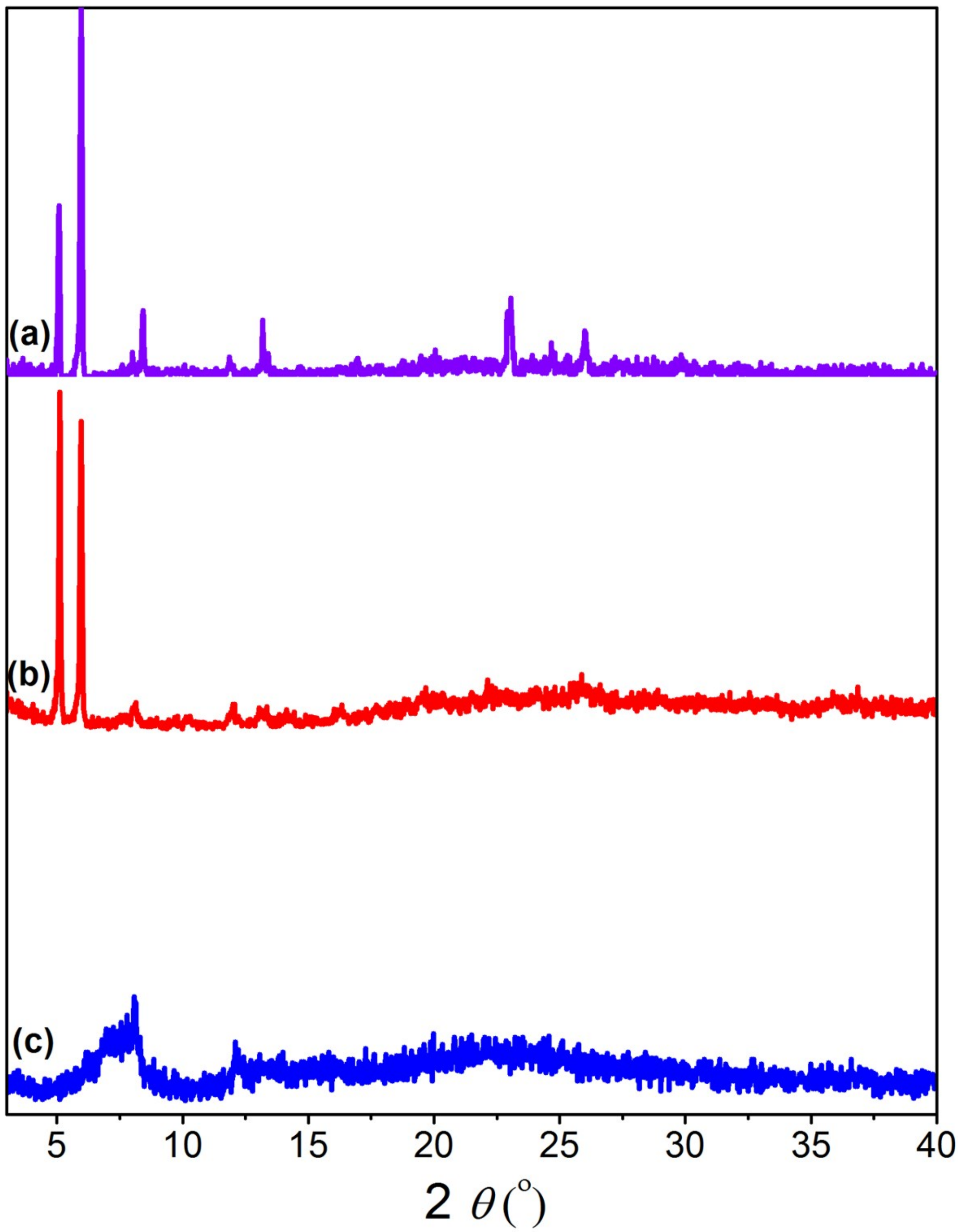


Fig. S7 The PXRD patterns of **SNU-175**: (a) measured for an as-synthesized sample of **SNU-174**, (b) measured for an as-synthesized sample of **SNU-175**, and (c) measured for **SNU-175** after activation with supercritical CO_{22}.

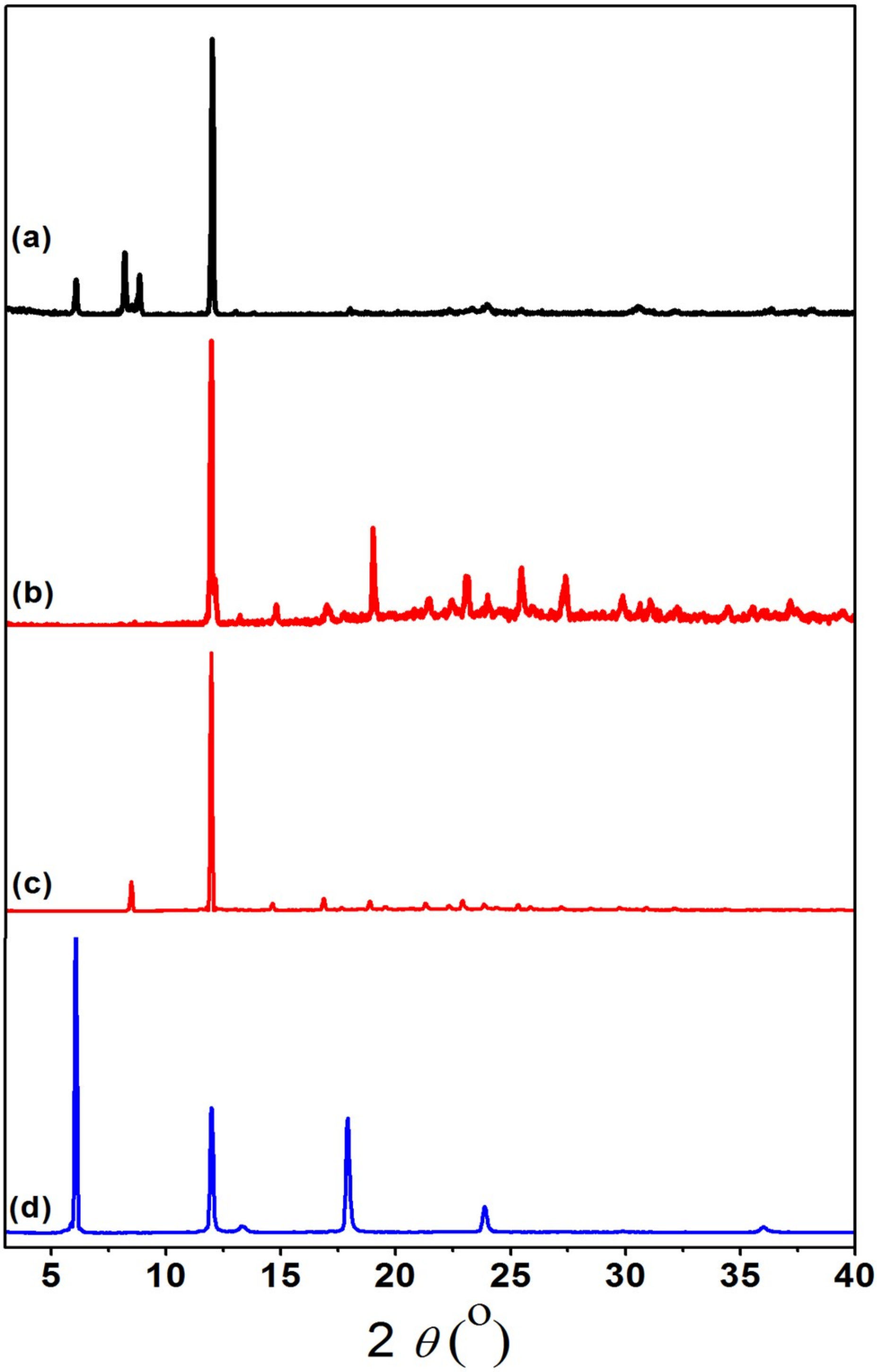


Fig. S8 The PXRD patterns of **SNU-176**: (a) as-synthesized sample of **SNU-172**, (b) as-synthesized sample of **SNU-171**, (c) as-synthesized sample of **SNU-176**, and (d) after activation of **SNU-176** by using supercritical CO_2.

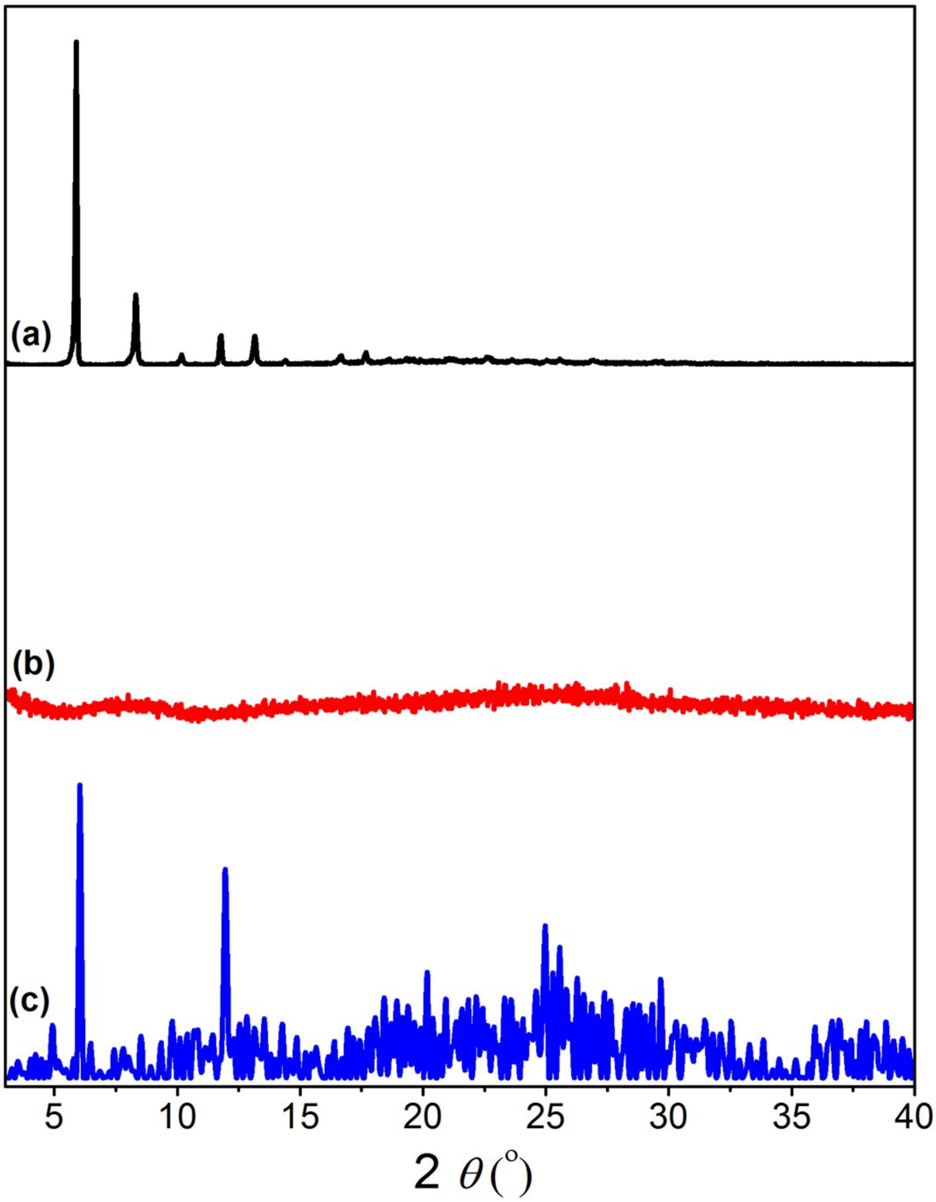


Fig. S9 The PXRD patterns of **SNU-170**: (a) as-synthesized sample, (b) **SNU-170'** resulted from the treatment with supercritical CO_2, and (c) **SNU-170'** after immersed in DMF for 1 hour.

Acquisition Time (sec)	5.3084	*Comment*	Zn_CVB_SMe_OMe_SCD/DMSO/DCl_lock_DMSO			*Date*	20 Jan 2014 18:36:00
Date Stamp	20 Jan 2014 18:36:00			*File Name*	D:\SkyDrive\DATA\NMR\140120TKP\1\PDATA\1\1r		
Frequency (MHz)	300.13	*Nucleus*	1H	*Number of Transients*	16	*Origin*	spect
Original Points Count	32768	*Owner*	root	*Points Count*	32768	*Pulse Sequence*	zg30
Receiver Gain	256.00	*SW(cyclical) (Hz)*	6172.84	*Solvent*	DMSO-d6	*Spectrum Offset (Hz)*	1853.4263
Spectrum Type	STANDARD	*Sweep Width (Hz)*	6172.65	*Temperature (degree C)*	23.600		

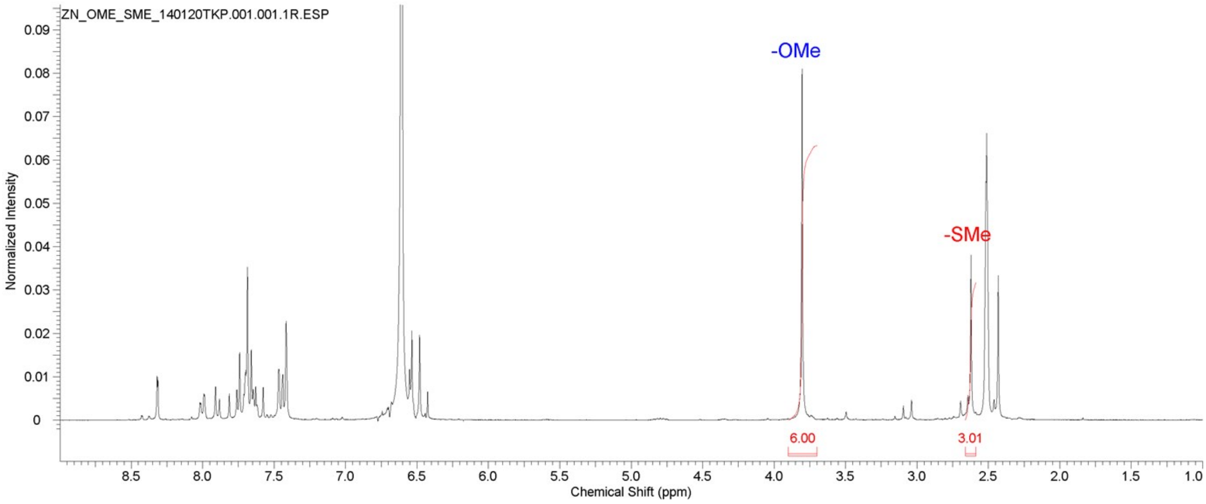


Fig. S10 [1]H NMR spectrum of $[Zn_4O(CVB\text{-}SMe)_1(CVB\text{-}OMe)_2]$ (**SNU-176'**) digested in DMSO-d_6/DCl.

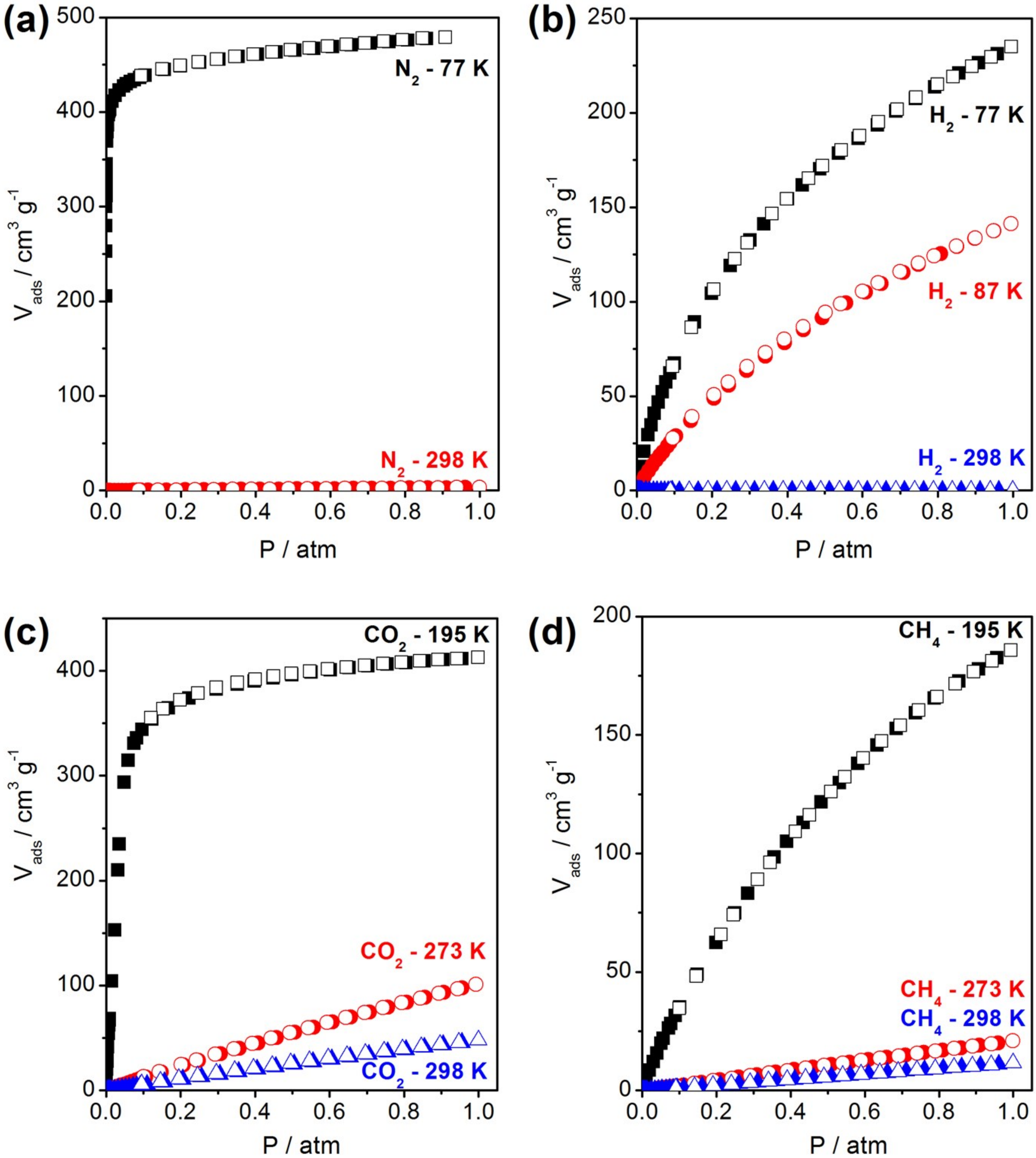


Fig. S11 Gas adsorption isotherms of **SNU-176'**: a) N_2 at 77 K (black) and 298 K (red), b) H_2 at 77 K (black), 87 K (red) and 298 K (blue), c) CO_2 at 195 K (black), 273 K (red) and 298 K (blue), and d) CH_4 at 195 K (black), 273 K (red), and 298 K(blue). Filled shapes: adsorption; open shapes: desorption

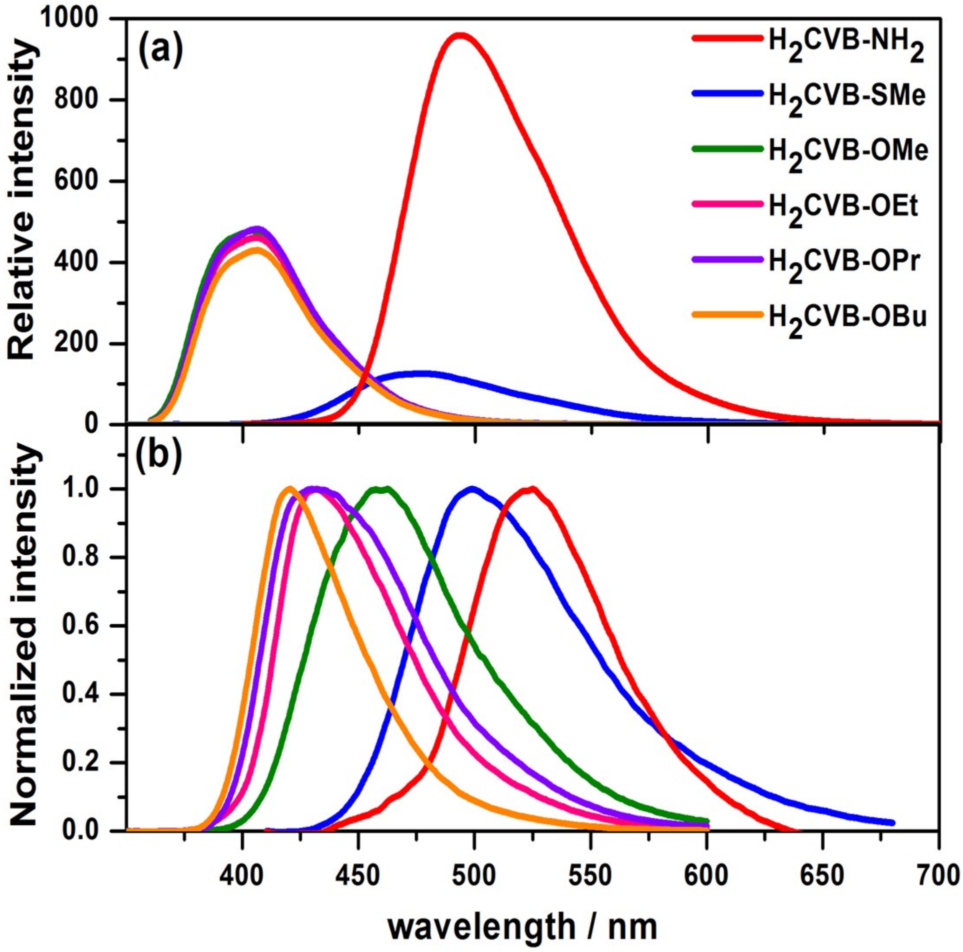


Fig. S12 Photoluminescence spectra of various ligands: (a) In the DMF solution (1 x 10^{-4} M), excitation at 395 nm for H_2CVB-NH_2, 362 nm for H_2CVB-SMe, and 350 nm for the rest of the samples. (b) Pure solid, excitation at 360 nm for H_2CVB-NH_2 and H_2CVB-SMe, and 320 nm for the rest of the samples.

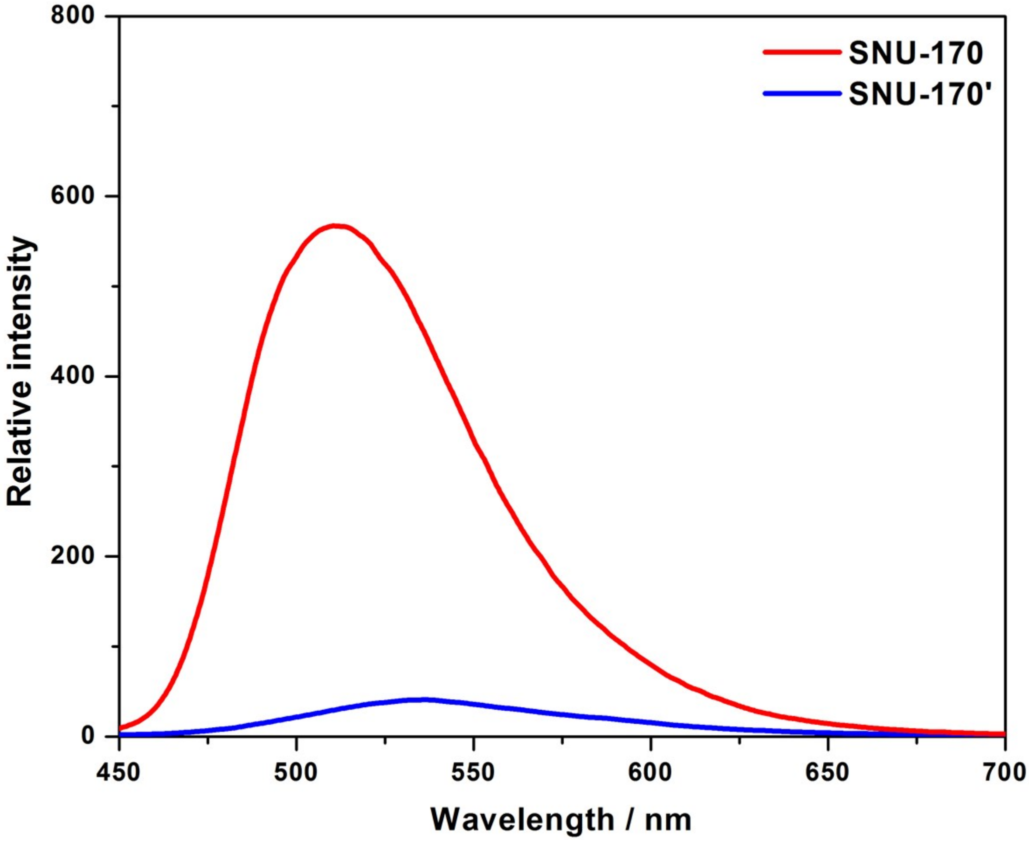


Fig. S13 Comparison of the photoluminescence intensities of as-synthesized (**SNU-170**, red) and activated (**SNU-170'**, blue) MOFs.

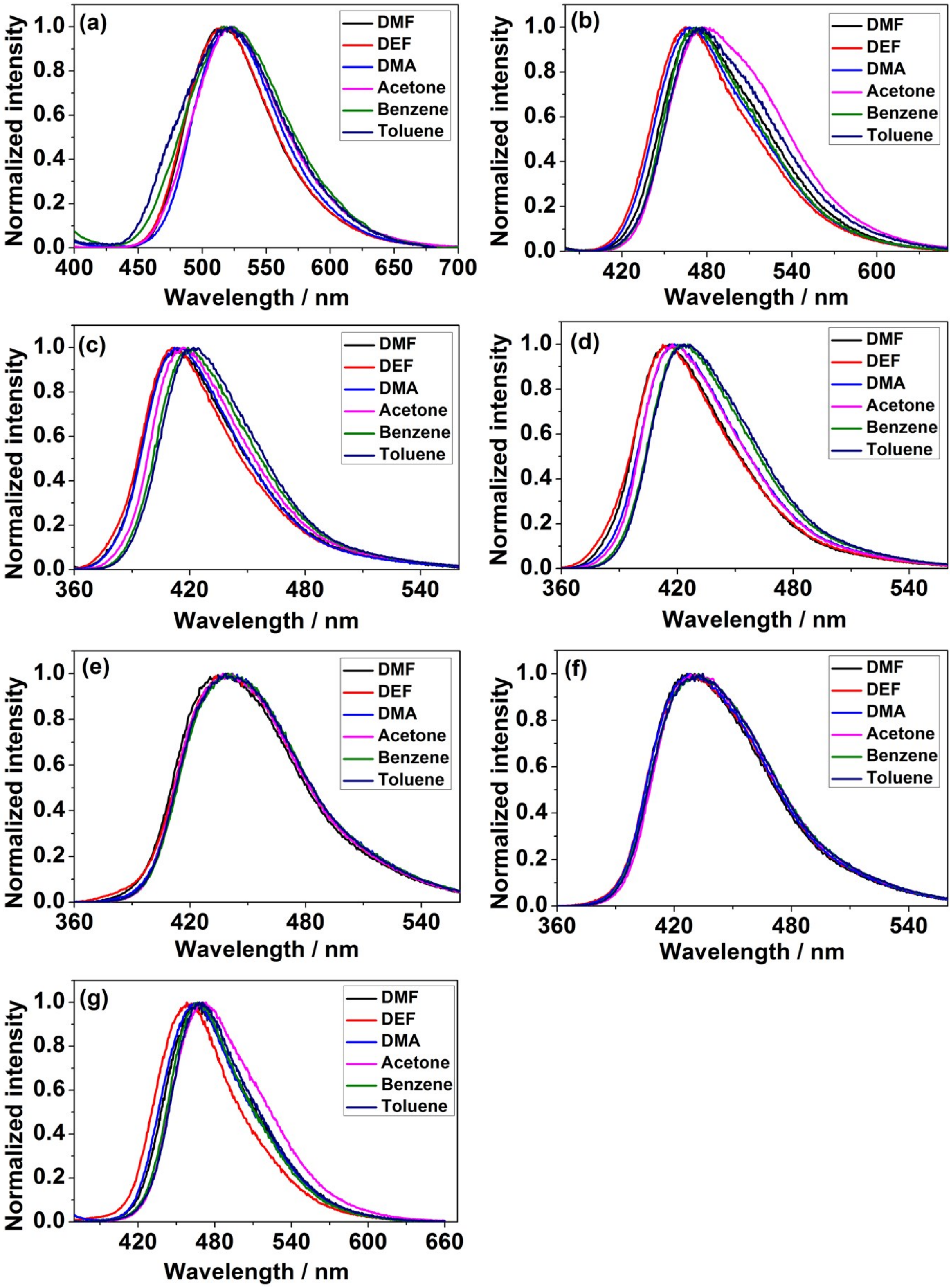


Fig. S14 Photoluminescence spectra changes of the activated MOFs on the addition of various solvents: (a) **SNU-170'**, (b) **SNU-171'**, (c) **SNU-172'**, (d) **SNU-173'**, (e) **SNU-174'**, (f) **SNU-175'**, and (g) **SNU-176'**.

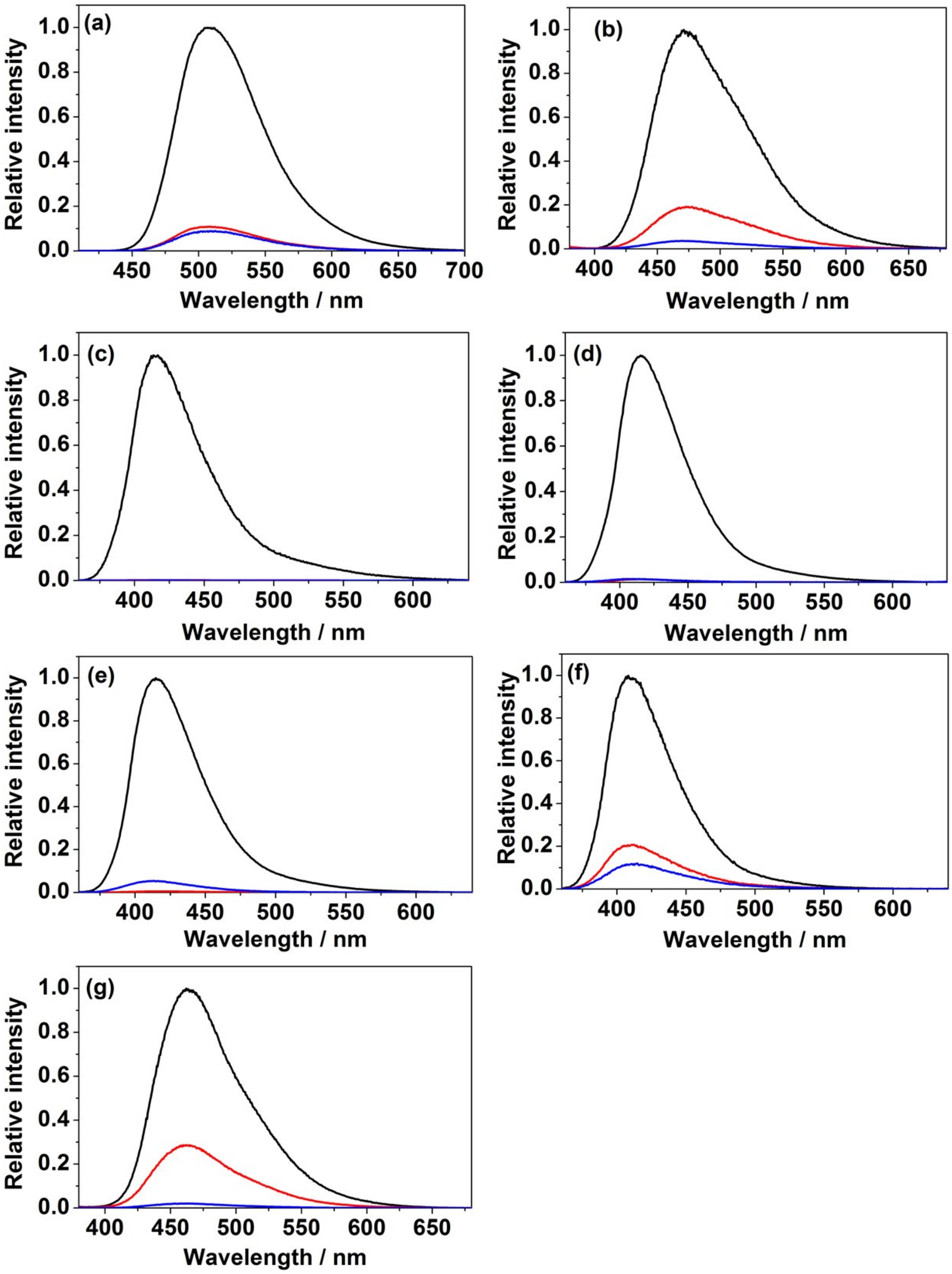


Fig. S15 Changes of photoluminescence spectra of as-synthesized MOFs on the addition of a drop of 0.5 M DMF solution of nitrobenzene (NB) and 2,4-dinitrotoluene (DNT). Black, MOF; Red, MOF + NB; Blue, MOF + DNT: (a) **SNU-170**, (b) **SNU-171**, (c) **SNU-172**, (d) **SNU-173**, (e) **SNU-174**, (f) **SNU-175**, and (g) **SNU-176**.

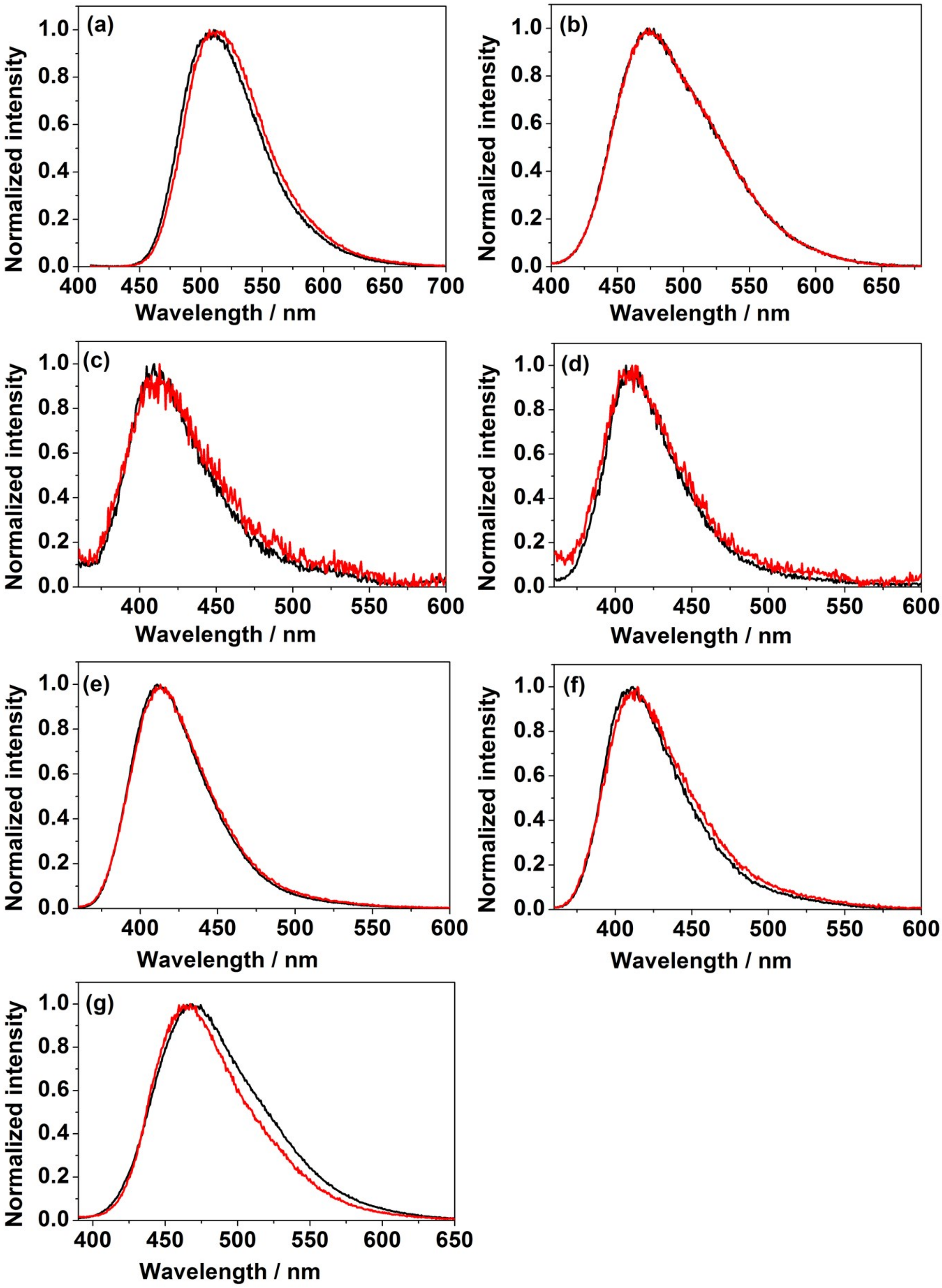


Fig. S16 Normalized luminescence spectra of as-synthesized MOFs after the addition of a drop of 0.5 M DMF solution of nitrobenzene (NB) and 2,4-dinitrotoluene (DNT). Black: MOF + NB, Red: MOF + DNT. (a) **SNU-170**, (b) **SNU-171**, (c) **SNU-172**, (d) **SNU-173**, (e) **SNU-174**, (f) **SNU-175**, and (g) **SNU-176**.

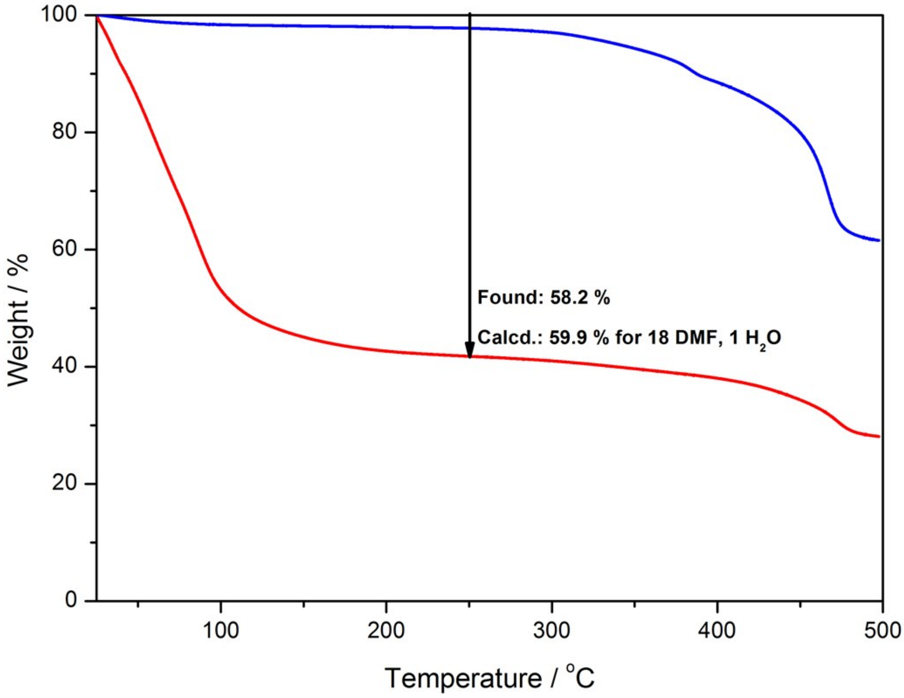


Fig. S17 TGA curves of $[Zn_4O(CVB\text{-}NH_2)_3]$•18DMF•$H_2O$ **(SNU-170**, red) and its dried sample $[Zn_4O(CVB\text{-}NH_2)_3]$ (**SNU-171'**, blue) obtained by treatment with supercritical CO_2.

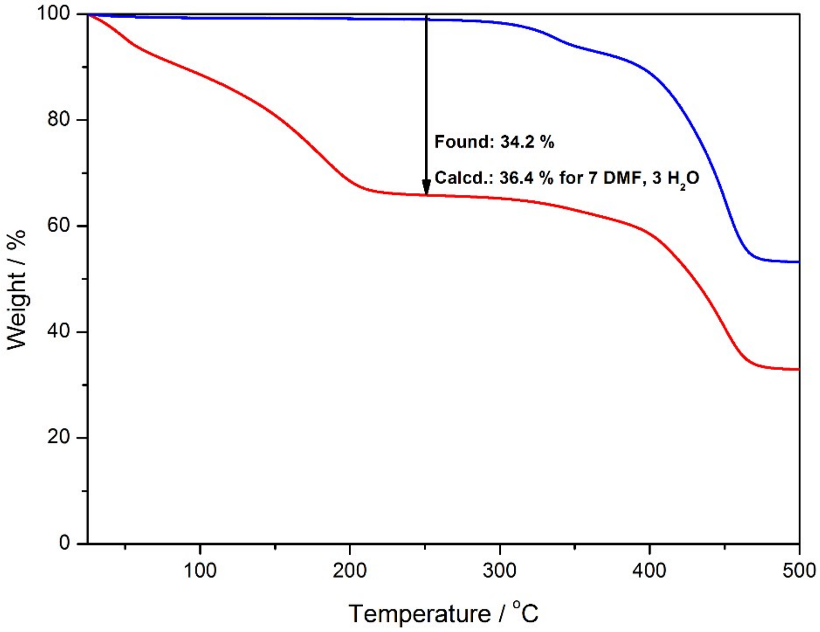


Fig. S18 TGA curves of $[Zn_4O(CVB\text{-}SMe)_3]$•7DMF•$3H_2O$ **(SNU-171,** red) and its dried sample $[Zn_4O(CVB\text{-}SMe)_3]$ (**SNU-171'**, blue) obtained by treatment with supercritical CO_2.

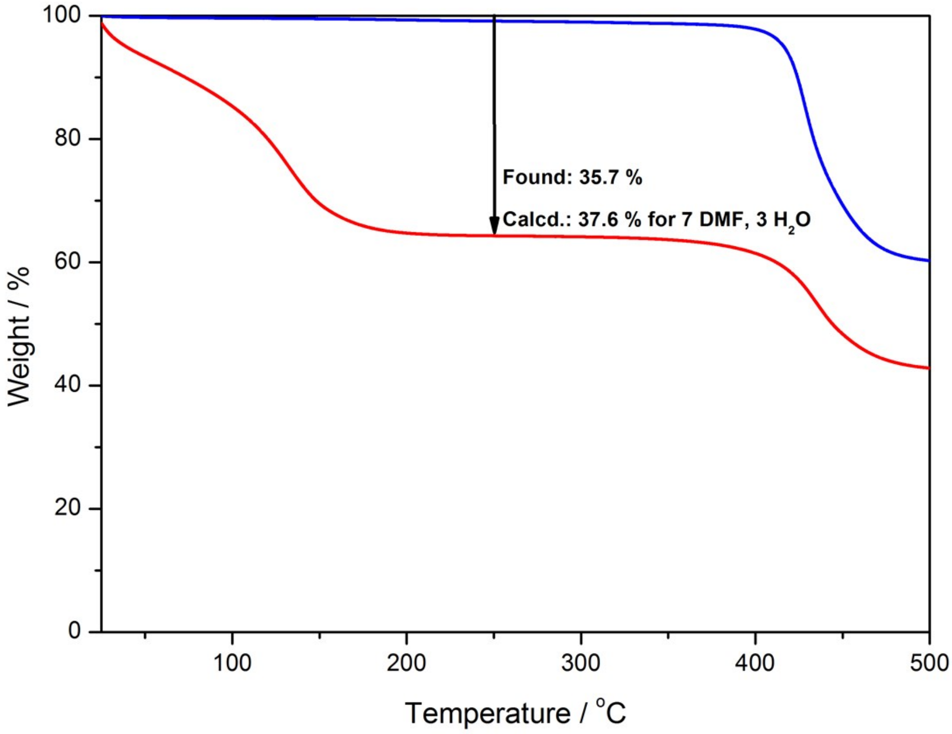


Fig. S19 TGA curves of $[Zn_4O(CVB\text{-}OMe)_3]$•7DMF•3 H_2O **(SNU-172,** red) and its dried sample $[Zn_4O(CVB\text{-}OMe)_3]$ (**SNU-172'**, blue) obtained by treatment with supercritical CO_2.

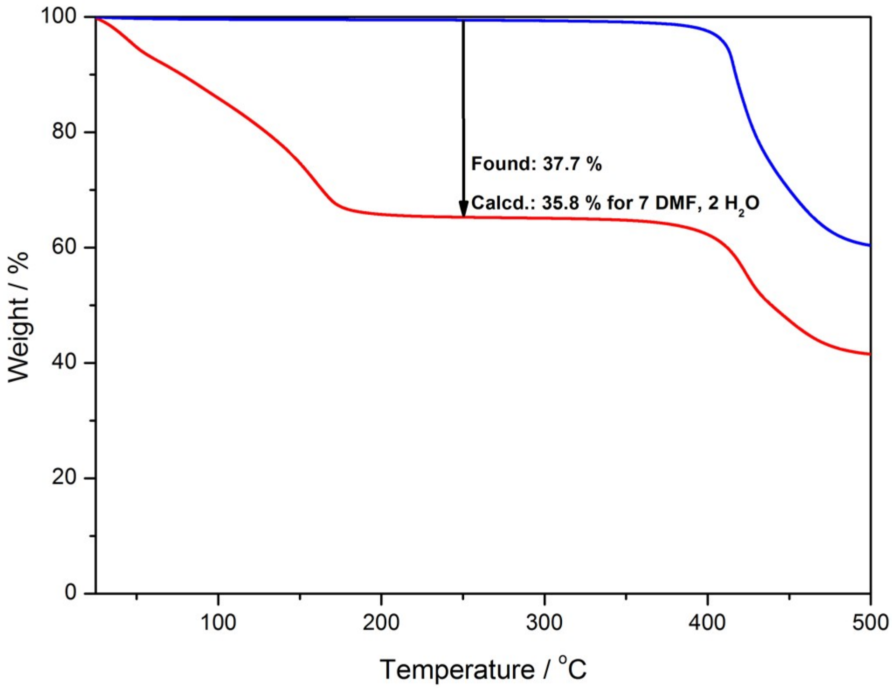


Fig. S20 TGA curves of $[Zn_4O(CVB\text{-}OEt)_3]$•7DMF•2$H_2O$ **(SNU-173,** red) and its dried sample $[Zn_4O(CVB\text{-}OEt)_3]$ (**SNU-173'**, blue) obtained by treatment with supercritical CO_2.

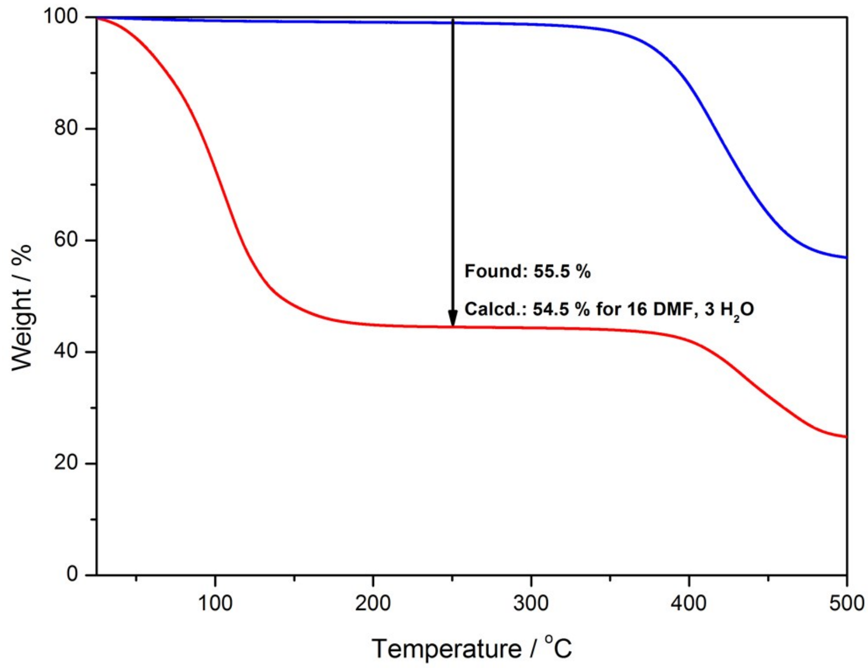


Fig. S21 TGA curves of $[Zn_4O(CVB\text{-}OPr)_3]$ •16DMF•3H_2O **(SNU-174,** red) and its dried sample $[Zn_4O(CVB\text{-}OPr)_3]$ (**SNU-174'**, blue) obtained by treatment with supercritical CO_2.

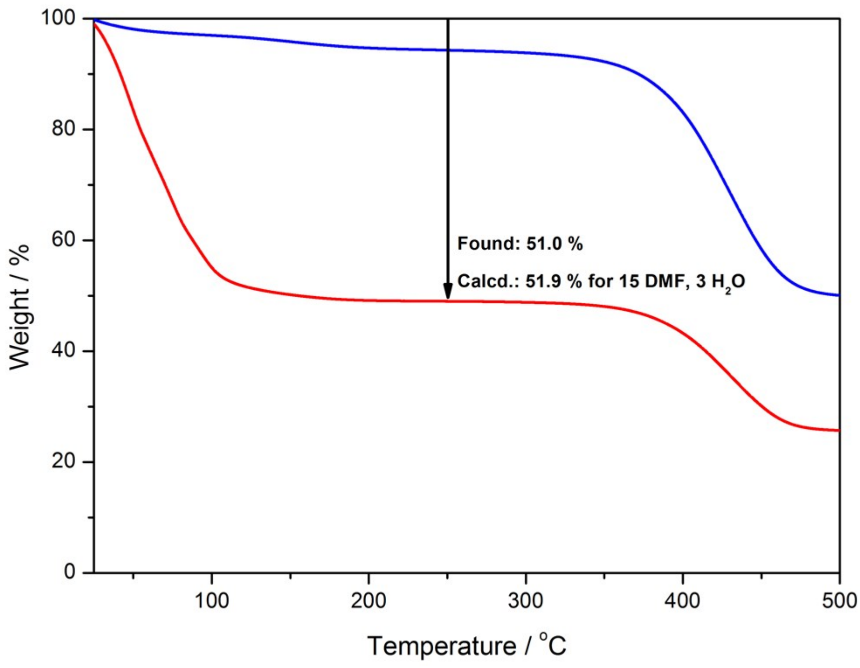


Fig. S22 TGA curves of $[Zn_4O(CVB\text{-}OBu)_3]$•15 DMF•3$H_2O$ **(SNU-175,** red) and its dried sample $[Zn_4O(CVB\text{-}OBu)_3]$ (**SNU-175'**, blue) obtained by treatment with supercritical CO_2.

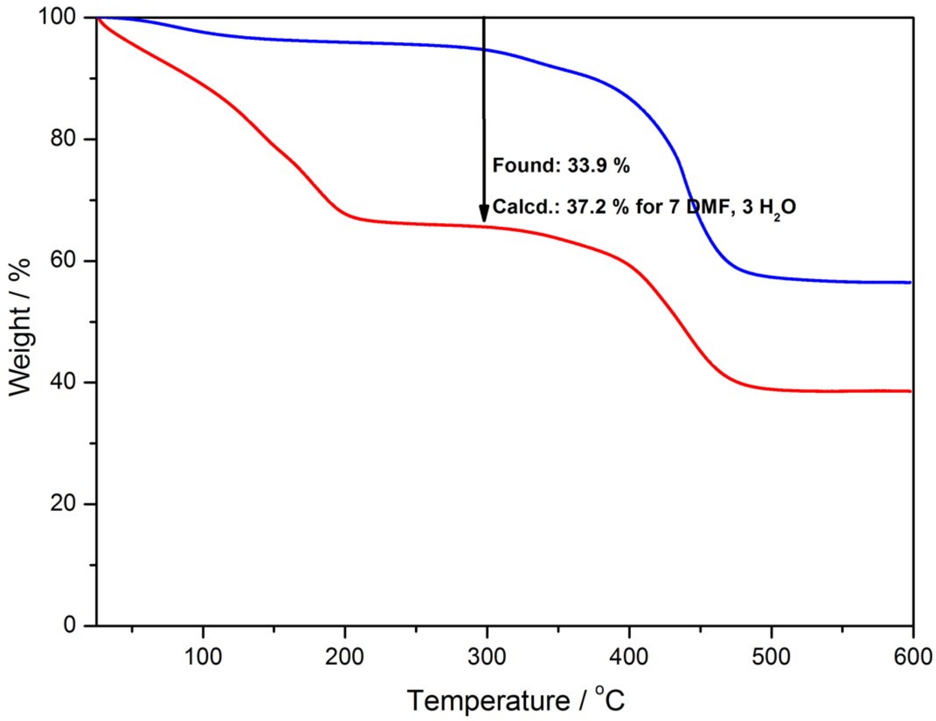


Fig. S23 TGA curves of $[Zn_4O(CVB\text{-}SMe)_1(CVB\text{-}OMe)_2]$•7DMF•$3H_2O$ **(SNU-176,** red) and its dried sample $[Zn_4O(CVB\text{-}SMe)_1(CVB\text{-}OMe)_2]$ (**SNU-176'**, blue) obtained by treatment with supercritical CO_2.

Table S1. Crystallographic data for **SNU-170** ~ **SNU-174** (squeezed data)

	SNU-170	**SNU-171**	**SNU-172**	**SNU-173**	**SNU-174**
formula	$C_{120}H_{84}N_{12}O_{52}Zn_{16}$	$C_{264}H_{192}O_{104}S_{24}$ Zn_{32}	$C_{264}H_{192}O_{104}Zn_{32}$	$C_{288}H_{240}O_{104}Zn_{32}$	$C_{156}H_{144}O_{64}Zn_{16}$
F.W.	3571.91	7889.44	7120.00	7456.63	4088.62
crystal system	cubic	cubic	cubic	cubic	cubic
space group	*Fm*-3*m*	*Fd*-3*m*	*Fd*-3*m*	*Fd*-3	*Fm*-3*m*
λ (Å)	0.70000	0.69998	0.69999	0.70000	0.70000
a (Å)	30.197(10)	29.970(10)	30.089(3)	30.222(10)	30.206(10)
V (Å^3)	27535(27)	26919(27)	27241(8)	27604(27)	27560(27)
Z	2	2	2	2	2
D_{calcd} (g cm^{-3})	0.431	0.973	0.868	0.897	0.493
T (K)	293	293	293	293	293
GOF (F^2)	1.344	1.429	1.174	1.435	1.229
R_1 [I > 2σ(I)][a]	0.0988	0.1334	0.1156	0.1054	0.0927
wR_2[I> 2σ(I)][b]	0.3146	0.3691	0.3886	0.3617	0.2909

[a] $R_1 = \sum(||F_o| - |F_c||)/\sum|F_o|$; [b] $wR_2 = [\sum w(F_o^2 - F_c^2)^2 / \sum w(F_o^2)^2]^{1/2}$; $w = 1/[\sigma^2(F_o^2) + (AP)^2 + (BP)]$, $P = (F_o^2 + 2F_c^2)/3$; A = 0.2000, B = 0.0000 for **SNU-170**; A = 0.2000, B = 0.0000 for **SNU-171**; A = 0.2000, B = 0.0000 for **SNU-172**; A = 0.2000, B = 0.0000 for **SNU-173**; A = 0.2000, B = 0.0000 for **SNU-174**.

Table S2. CO_2 separation parameters for vacuum swing adsorption (VSA) process [a]

Sample	Gas mixtures	N_1^{ads} (mol kg^{-1})	ΔN_1 (mol kg^{-1})	R (%)	α_{12}^{ads}	S
SNU-170'	CO_2:CH_4 (1:1)	0.465	0.427	91.8	4.00	7.00
	CO_2:N_2 (1:9)	0.082	0.075	92.2	7.73	7.06
SNU-171'	CO_2:CH_4 (1:1)	1.042	0.934	89.6	2.86	14.0
	CO_2:N_2 (1:9)	0.216	0.195	89.9	13.97	20.9
SNU-172'	CO_2:CH_4 (1:1)	1.104	0.985	89.2	4.35	16.6
	CO_2:N_2 (1:9)	0.235	0.211	89.7	14.9	22.6
SNU-173'	CO_2:CH_4 (1:1)	1.271	1.133	89.1	4.69	15.0
	CO_2:N_2 (1:9)	0.274	0.248	90.1	17.09	13.2
SNU-174'	CO_2:CH_4 (1:1)	0.335	0.300	89.5	4.50	6.8
	CO_2:N_2 (1:9)	0.070	0.063	90.1	-	-
SNU-176'	CO_2:CH_4 (1:1)	1.102	0.989	89.8	4.32	14.8
	CO_2:N_2 (1:9)	0.225	0.205	90.1	15.34	25.0

[a] Adsorption at 1 bar, Desorption at 0.1 bar.

Table S3. The photoluminescence spectra (λmax, nm) of the activated MOFs on the addition of various solvents [a]

	none	DMF	DEF	DMA	Acetone	Benzene	Toluene
SNU-170'	536	517	515	523	525	519	522
SNU-171'	482	473	468	468	478	473	477
SNU-172'	442	414	414	412	417	419	422
SNU-173'	440	416	417	419	418	426	424
SNU-174'	442	440	442	442	437	440	439
SNU-175'	440	427	427	428	433	433	435
SNU-176'	470	467	458	468	473	467	470

[a] A few drops of solvents were added to the activated MOFs. Measured at room temperature.

Table S4. N_2 adsorption data of **SNU-170'**, **SNU-171'**, **SNU-172'** and **SNU-173'** at 77 K.

SNU-170'		**SNU-171'**		**SNU-172'**		**SNU-173'**	
P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})
9.91E-05	47.0311	8.66E-05	171.9842	1.75E-05	82.1943	3.66E-05	124.9302
1.99E-04	74.7807	1.79E-04	215.6568	1.18E-04	211.718	1.20E-04	197.6302
3.06E-04	94.5341	2.80E-04	243.2024	2.18E-04	242.882	2.28E-04	228.7104
4.04E-04	108.4955	3.82E-04	261.9872	3.23E-04	265.2492	3.23E-04	244.5093
5.13E-04	121.582	4.83E-04	275.5355	4.29E-04	278.2017	4.24E-04	255.7349
6.01E-04	130.5536	5.84E-04	285.1517	6.07E-04	292.1352	5.98E-04	268.1802
7.04E-04	139.8179	6.85E-04	293.7318	7.15E-04	298.0606	7.15E-04	274.2604
8.12E-04	148.5998	7.86E-04	300.0394	8.02E-04	302.0418	7.94E-04	277.6163
9.15E-04	156.3689	8.88E-04	305.2063	9.09E-04	306.0811	9.42E-04	282.8511
1.03E-03	164.0691	9.96E-04	310.2336	1.02E-03	309.5943	1.02E-03	285.3744
2.03E-03	221.7157	2.01E-03	332.4378	2.06E-03	328.8336	2.08E-03	304.2663
3.05E-03	268.8091	3.01E-03	342.2072	3.00E-03	337.5705	3.00E-03	312.7791
4.03E-03	307.9705	4.02E-03	348.2296	4.02E-03	343.6697	4.02E-03	319.1465
5.04E-03	343.2114	5.02E-03	352.4864	5.01E-03	347.9435	5.05E-03	323.843
7.46E-03	412.7773	6.04E-03	355.8298	7.02E-03	353.9934	6.78E-03	329.5965
7.41E-03	412.5682	7.04E-03	358.5073	7.02E-03	353.9992	7.66E-03	331.9256
8.70E-03	442.3341	8.10E-03	360.8586	8.60E-03	357.3828	8.34E-03	333.507
9.39E-03	457.7954	9.09E-03	362.7078	9.24E-03	358.5606	9.45E-03	335.8232
9.32E-03	459.6318	1.01E-02	364.2915	9.73E-03	359.3394	1.01E-02	336.8779
1.26E-02	526.8432	2.00E-02	374.0215	2.06E-02	370.6516	1.75E-02	346.4453
2.06E-02	705.1136	2.96E-02	379.4614	2.77E-02	374.768	3.18E-02	356.0023
2.90E-02	847.9409	4.05E-02	383.7227	3.80E-02	379.0311	4.04E-02	359.7884
4.10E-02	928.0523	5.23E-02	387.1162	4.62E-02	381.723	5.07E-02	363.2395
5.38E-02	957.1841	6.09E-02	389.1702	5.69E-02	384.3025	5.70E-02	365.0163
6.15E-02	967.7363	7.10E-02	391.209	7.04E-02	386.8795	7.09E-02	368.2361
7.19E-02	978.0909	8.13E-02	392.9915	7.71E-02	387.9557	8.07E-02	370.1454
8.32E-02	987.0023	8.94E-02	394.2643	8.62E-02	389.2672	9.09E-02	371.8453
1.01E-01	998.2523	1.06E-01	396.4699	1.02E-01	391.2541	1.05E-01	373.9325
1.32E-01	1012.4454	1.49E-01	401.0316	1.53E-01	396.2746	1.56E-01	379.5744
1.79E-01	1027.4501	2.00E-01	405.138	2.05E-01	399.9819	1.99E-01	383.0686
2.49E-01	1042.3182	2.51E-01	408.7576	2.50E-01	402.3574	2.50E-01	386.3651
3.04E-01	1051.6091	3.04E-01	411.7248	2.99E-01	404.8803	3.02E-01	388.9791
3.48E-01	1057.8068	3.55E-01	414.3022	3.51E-01	407.0369	3.54E-01	391.2709
3.98E-01	1064.175	4.06E-01	416.6383	4.02E-01	408.8918	4.04E-01	393.2186
4.51E-01	1069.3932	4.56E-01	418.7985	4.54E-01	410.5016	4.56E-01	394.8942
5.01E-01	1074.3613	5.06E-01	420.8374	5.04E-01	412.1008	5.06E-01	396.4628
5.53E-01	1078.7318	5.57E-01	422.7594	5.55E-01	413.5402	5.57E-01	397.7907
6.03E-01	1082.8114	6.07E-01	424.6056	6.05E-01	414.923	6.07E-01	399.1116
6.54E-01	1086.5409	6.57E-01	426.3895	6.56E-01	416.1024	6.58E-01	400.2419
7.05E-01	1089.8182	7.08E-01	428.1083	7.06E-01	417.2369	7.07E-01	401.3244
7.55E-01	1092.9319	7.58E-01	429.8013	7.56E-01	418.3737	7.58E-01	402.3791
8.02E-01	1097.0205	8.08E-01	431.4563	8.07E-01	419.4828	8.08E-01	403.2895
8.55E-01	1100.2181	8.58E-01	433.1068	8.56E-01	420.5131	8.58E-01	404.3767
9.06E-01	1102.9773	9.04E-01	435.4429	9.07E-01	421.5533	9.08E-01	404.9837

Table S5. N_2 adsorption data of **SNU-174'**, **SNU-175'** and **SNU-176'** at 77 K.

SNU-174'		SNU-175'		SNU-176'	
P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})
8.66E-05	17.0289	9.60E-05	1.6617	1.00E-04	205.3386
1.86E-04	22.8088	2.09E-04	1.8787	1.94E-04	252.3943
2.88E-04	26.6626	3.27E-04	1.9311	2.97E-04	279.6057
3.90E-04	29.6033	4.12E-04	1.9453	4.11E-04	299.94
4.91E-04	32.0953	5.27E-04	1.9541	4.98E-04	311.0529
5.92E-04	34.3031	6.21E-04	1.9588	6.06E-04	321.6514
6.92E-04	36.2252	7.32E-04	1.9626	7.01E-04	328.8214
7.94E-04	37.9542	8.29E-04	1.9652	8.10E-04	335.6
8.94E-04	39.7491	9.23E-04	1.9672	9.27E-04	341.3828
9.95E-04	41.792	1.01E-03	1.972	1.00E-03	344.7314
2.00E-03	54.3438	2.12E-03	1.9922	2.06E-03	369.0614
3.00E-03	63.2632	3.18E-03	2.0129	3.00E-03	379.0186
4.00E-03	70.1323	4.23E-03	2.0323	4.08E-03	386.0043
5.00E-03	75.6538	5.28E-03	2.0513	5.02E-03	390.2943
6.02E-03	80.401	6.33E-03	2.0707	7.06E-03	396.8128
7.03E-03	84.3986	7.37E-03	2.0884	7.06E-03	396.8414
8.02E-03	87.7705	8.42E-03	2.1181	8.61E-03	400.37
9.01E-03	90.8667	9.47E-03	2.1409	9.27E-03	401.6571
1.00E-02	93.6374	1.05E-02	2.1648	1.02E-02	402.6757
1.91E-02	107.4798	2.12E-02	2.6631	1.66E-02	410.9485
2.93E-02	118.547	3.26E-02	2.9256	2.48E-02	417.2614
4.23E-02	124.5879	4.27E-02	3.0827	3.60E-02	422.9214
5.44E-02	127.4609	5.28E-02	3.1892	4.74E-02	427.1014
6.01E-02	128.6133	6.29E-02	3.2801	5.55E-02	429.4371
6.95E-02	130.019	7.29E-02	3.3666	6.53E-02	431.7928
7.99E-02	131.3354	8.27E-02	3.5438	7.61E-02	433.9014
9.03E-02	132.4697	9.29E-02	3.6256	9.06E-02	436.25
1.08E-01	134.0628	1.12E-01	3.7938	1.05E-01	438.4586
1.55E-01	137.1626	1.61E-01	4.1936	1.56E-01	444.3986
2.06E-01	139.8839	2.12E-01	4.6074	2.00E-01	448.3786
2.57E-01	142.3088	2.61E-01	5.0818	2.51E-01	452.05
3.07E-01	144.4787	3.11E-01	5.5457	3.02E-01	455.2885
3.56E-01	146.9241	3.61E-01	6.0552	3.54E-01	458.1229
4.08E-01	148.9554	4.11E-01	6.5848	4.05E-01	460.6386
4.58E-01	150.8744	4.61E-01	7.1404	4.56E-01	462.8614
5.08E-01	152.7395	5.11E-01	7.699	5.06E-01	465.0128
5.58E-01	154.5748	5.62E-01	8.2023	5.56E-01	467.0057
6.09E-01	156.3697	6.10E-01	9.5607	6.06E-01	468.9543
6.59E-01	158.1679	6.61E-01	10.334	6.57E-01	470.6943
7.09E-01	159.9405	7.11E-01	11.0033	7.07E-01	472.3871
7.59E-01	161.7051	7.61E-01	11.7465	7.57E-01	474.0114
8.09E-01	163.5327	8.11E-01	12.5533	8.07E-01	475.6386
8.59E-01	165.3335	8.62E-01	13.1973	8.57E-01	477.1871
9.09E-01	167.2337	9.11E-01	14.1541	9.08E-01	478.6314

Table S6. N_2 adsorption data of **SNU-170'**, **SNU-171'**, **SNU-172'** and **SNU-173'** at 298 K.

SNU-170'		SNU-171'		SNU-172'		SNU-173'	
P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})
3.30E-02	0.0011	2.28E-02	0.0075	4.08E-03	0.0002	7.29E-02	0.0052
4.30E-02	0.0255	3.29E-02	0.0508	5.06E-03	0.0033	8.30E-02	0.0432
5.30E-02	0.0513	4.27E-02	0.0852	6.11E-03	0.0068	9.29E-02	0.0789
6.30E-02	0.0809	5.29E-02	0.1284	7.11E-03	0.0102	1.12E-01	0.1424
7.29E-02	0.1152	6.28E-02	0.1719	9.38E-03	0.0186	1.61E-01	0.3178
8.29E-02	0.144	7.26E-02	0.2304	1.00E-02	0.0207	2.11E-01	0.5152
9.29E-02	0.1737	8.28E-02	0.2641	1.33E-02	0.0217	2.62E-01	0.7014
1.12E-01	0.2138	9.29E-02	0.3134	2.24E-02	0.0522	3.11E-01	0.8796
1.62E-01	0.3487	1.12E-01	0.3848	3.30E-02	0.0871	3.61E-01	1.0797
2.11E-01	0.5023	1.61E-01	0.5786	4.29E-02	0.1203	4.11E-01	1.2759
2.62E-01	0.6251	2.11E-01	0.8171	5.29E-02	0.1587	4.62E-01	1.458
3.12E-01	0.7663	2.61E-01	0.9536	6.29E-02	0.1952	5.11E-01	1.6554
3.62E-01	0.8801	3.11E-01	1.1426	7.29E-02	0.2361	5.61E-01	1.8601
4.11E-01	1.0152	3.62E-01	1.3735	8.28E-02	0.2759	6.11E-01	2.0655
4.62E-01	1.1169	4.11E-01	1.5507	9.26E-02	0.3169	6.61E-01	2.252
5.11E-01	1.2403	4.61E-01	1.6533	1.12E-01	0.3876	7.11E-01	2.4535
5.62E-01	1.3437	5.11E-01	1.8813	1.61E-01	0.5681	7.61E-01	2.6652
6.12E-01	1.4722	5.61E-01	1.9728	2.11E-01	0.7661	8.11E-01	2.8787
6.61E-01	1.5697	6.11E-01	2.1871	2.61E-01	0.9387	8.62E-01	3.0583
7.11E-01	1.7132	6.61E-01	2.3013	3.11E-01	1.1216	9.11E-01	3.2815
7.62E-01	1.8175	7.11E-01	2.5233	3.61E-01	1.2897	9.61E-01	3.4979
8.11E-01	1.9016	7.61E-01	2.6529	4.11E-01	1.4707	9.99E-01	3.6719
8.61E-01	2.0094	8.11E-01	2.8253	4.61E-01	1.6332		
9.11E-01	2.139	8.62E-01	3.0401	5.11E-01	1.8168		
9.61E-01	2.2821	9.11E-01	3.1335	5.61E-01	1.9835		
9.99E-01	2.4144	9.61E-01	3.3689	6.11E-01	2.1748		
		9.99E-01	3.4261	6.61E-01	2.3394		
				7.11E-01	2.5237		
				7.61E-01	2.6968		
				8.10E-01	2.879		
				8.61E-01	3.0514		
				9.10E-01	3.2204		
				9.61E-01	3.4014		
				9.99E-01	3.5502		

Table S7. N_2 adsorption data of **SNU-174'**, **SNU-175'** and **SNU-176'** at 298 K.

SNU-174'		SNU-175'		SNU-176'	
P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})
5.62E-01	0.018	Nil	Nil	3.31E-02	0.0269
6.12E-01	0.0779			4.31E-02	0.0611
6.62E-01	0.1253			5.31E-02	0.0992
7.12E-01	0.1927			6.30E-02	0.139
7.62E-01	0.2524			7.29E-02	0.1858
8.12E-01	0.3412			8.27E-02	0.2318
8.62E-01	0.4042			9.28E-02	0.2805
9.12E-01	0.4972			1.12E-01	0.358
9.62E-01	0.5784			1.61E-01	0.5371
9.99E-01	0.6359			2.11E-01	0.7449
				2.61E-01	0.9054
				3.11E-01	1.1029
				3.61E-01	1.2479
				4.11E-01	1.4421
				4.61E-01	1.5524
				5.11E-01	1.7099
				5.61E-01	1.8763
				6.11E-01	2.0132
				6.61E-01	2.1408
				7.11E-01	2.3474
				7.61E-01	2.4608
				8.11E-01	2.6712
				8.61E-01	2.8492
				9.11E-01	2.9597
				9.61E-01	3.1163
				9.99E-01	3.3782

Table S8. H_2 adsorption data of **SNU-170'**, **SNU-171'**, **SNU-172'** and **SNU-173'** at 77 K.

SNU-170'		SNU-171'		SNU-172'		SNU-173'	
P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})
2.27E-04	0.8189	9.68E-05	0.1239	2.03E-04	0.2844	2.23E-04	0.8111
2.27E-04	0.8181	3.34E-04	0.5259	2.05E-04	0.288	2.23E-04	0.812
2.93E-04	0.8382	3.34E-04	0.5259	4.43E-04	0.6709	4.40E-04	1.6452
4.39E-04	0.8792	4.03E-04	0.6332	4.41E-04	0.6693	4.38E-04	1.6421
5.06E-04	0.8971	4.95E-04	0.7782	6.71E-04	1.0245	6.66E-04	2.4423
6.38E-04	0.931	5.94E-04	0.9328	6.67E-04	1.0199	6.63E-04	2.4334
7.07E-04	0.9485	6.95E-04	1.0861	8.80E-04	1.3412	8.93E-04	3.1731
8.38E-04	0.9816	7.96E-04	1.2383	8.76E-04	1.3359	8.88E-04	3.1583
8.99E-04	0.9963	8.98E-04	1.388	8.95E-04	1.3627	8.97E-04	3.1829
1.05E-03	1.0342	1.00E-03	1.5357	1.15E-03	1.7446	1.18E-03	4.0228
2.07E-03	1.3183	2.49E-03	3.4764	2.21E-03	3.2145	2.16E-03	6.5159
3.11E-03	1.6012	3.58E-03	4.7468	3.07E-03	4.3368	3.26E-03	8.7473
4.00E-03	1.8437	4.57E-03	5.8439	4.04E-03	5.5274	4.08E-03	10.2032
5.03E-03	2.1207	5.56E-03	6.8947	5.08E-03	6.7481	5.14E-03	11.8501
6.18E-03	2.4276	6.54E-03	7.8765	6.38E-03	8.1815	6.22E-03	13.3686
7.11E-03	2.6831	7.62E-03	8.9263	7.24E-03	9.0892	7.22E-03	14.637
8.49E-03	3.051	8.24E-03	9.5107	8.24E-03	10.1189	8.50E-03	16.164
9.29E-03	3.2609	9.35E-03	10.5337	9.11E-03	10.9741	9.16E-03	16.9081
1.18E-02	3.9268	1.09E-02	11.5063	1.01E-02	11.4315	1.06E-02	17.7563
1.96E-02	6.049	2.05E-02	19.0228	2.00E-02	19.6837	2.03E-02	26.3666
2.93E-02	8.5553	3.06E-02	25.8887	3.05E-02	27.0426	2.97E-02	33.049
3.94E-02	11.0952	4.11E-02	32.3642	4.00E-02	32.8789	4.00E-02	39.5051
4.87E-02	13.4683	4.94E-02	37.1214	5.01E-02	38.5556	5.04E-02	45.4145
5.92E-02	15.9383	6.10E-02	43.2506	5.87E-02	43.061	6.07E-02	50.6488
6.95E-02	18.1563	7.00E-02	47.5989	7.02E-02	48.736	7.09E-02	55.5457
8.02E-02	20.339	7.97E-02	52.106	8.11E-02	53.7	7.93E-02	59.3538
9.00E-02	22.4207	8.99E-02	56.5636	8.83E-02	56.8487	9.08E-02	64.2187
1.07E-01	26.1536	1.02E-01	61.3236	9.48E-02	59.5658	1.01E-01	68.2592
1.49E-01	34.9584	1.50E-01	78.4766	1.51E-01	80.2933	1.54E-01	86.774
1.98E-01	44.2659	2.01E-01	93.6876	1.93E-01	93.1083	1.99E-01	99.7663
2.49E-01	53.4523	2.39E-01	103.2198	2.43E-01	106.2896	2.51E-01	111.8743
2.99E-01	62.3282	3.02E-01	117.3054	2.94E-01	118.3518	2.99E-01	122.9232
3.49E-01	70.7093	3.42E-01	125.0696	3.53E-01	130.3067	3.38E-01	130.2407
4.00E-01	78.5927	3.90E-01	133.5771	3.91E-01	137.4731	4.02E-01	141.0151
4.51E-01	85.9241	4.40E-01	141.6493	4.39E-01	145.4772	4.42E-01	146.9895
5.00E-01	93.1732	4.92E-01	149.1323	4.89E-01	153.3036	4.90E-01	153.6314
5.51E-01	100.19	5.43E-01	155.9906	5.41E-01	160.6471	5.38E-01	160.4221
6.02E-01	106.8064	6.08E-01	163.791	5.92E-01	167.4223	5.92E-01	166.3384
6.50E-01	113.7275	6.49E-01	168.395	6.53E-01	174.7782	6.43E-01	171.8012
7.02E-01	120.1645	7.08E-01	174.6223	6.84E-01	178.2663	7.05E-01	178.6128
7.52E-01	126.2461	7.50E-01	178.7272	7.53E-01	185.6176	7.60E-01	183.1709
8.02E-01	132.2011	8.09E-01	184.1095	7.80E-01	189.2653	8.00E-01	186.3965
8.53E-01	137.8811	8.52E-01	187.767	8.54E-01	196.2746	8.59E-01	191.086
9.02E-01	143.2611	9.10E-01	192.55	8.88E-01	199.286	9.01E-01	194.2907
9.53E-01	148.7732	9.52E-01	195.807	9.31E-01	202.9969	9.59E-01	198.4581
9.99E-01	153.5734	9.97E-01	199.1019	9.76E-01	206.6715	9.97E-01	201.0709

Table S9. H_2 adsorption data of **SNU-174'**, **SNU-175'** and **SNU-176'** at 77 K.

SNU-174'		SNU-175'		SNU-176'	
P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})
1.30E-04	0.0421	1.31E-04	0.1974	9.51E-05	0.1179
2.18E-04	0.0867	2.10E-04	0.2142	3.26E-04	0.5183
3.19E-04	0.1363	3.14E-04	0.2288	3.26E-04	0.5182
4.16E-04	0.1843	4.16E-04	0.2393	3.94E-04	0.63
5.15E-04	0.2355	5.17E-04	0.2457	9.08E-04	1.438
6.17E-04	0.2842	6.18E-04	0.247	8.65E-04	1.3755
7.15E-04	0.3348	7.46E-04	0.2436	8.45E-04	1.3438
8.16E-04	0.3842	7.96E-04	0.2383	8.42E-04	1.3386
9.16E-04	0.4343	9.58E-04	0.228	9.03E-04	1.4331
1.02E-03	0.4829	1.09E-03	0.1687	1.41E-03	2.1816
2.14E-03	1.0182	2.11E-03	0.1883	2.41E-03	3.5852
3.12E-03	1.461	3.26E-03	0.1357	3.40E-03	4.8883
4.18E-03	1.9261	4.22E-03	0.142	4.41E-03	6.1501
5.02E-03	2.2465	5.31E-03	0.1306	5.45E-03	7.3824
6.09E-03	2.67	6.37E-03	0.0908	6.51E-03	8.5818
7.04E-03	3.134	7.49E-03	0.0993	7.56E-03	9.7192
8.46E-03	3.6112	8.42E-03	0.0836	8.43E-03	10.6446
9.39E-03	3.9046	9.47E-03	0.0805	9.22E-03	11.4586
1.18E-02	4.4066	1.05E-02	0.0883	1.03E-02	12.6947
2.17E-02	6.8831	2.32E-02	0.1371	1.91E-02	20.7144
2.98E-02	8.6066	3.28E-02	0.206	3.03E-02	29.4123
3.96E-02	10.6685	4.29E-02	0.2617	3.79E-02	34.7287
5.00E-02	12.6809	5.29E-02	0.3091	4.72E-02	40.7817
5.98E-02	14.5411	6.30E-02	0.3509	5.71E-02	46.6816
6.98E-02	16.3417	7.29E-02	0.4126	6.77E-02	52.2654
8.02E-02	17.9957	8.29E-02	0.4693	7.82E-02	57.3726
9.00E-02	19.629	9.30E-02	0.5261	8.88E-02	62.1989
1.08E-01	22.2935	1.12E-01	0.6137	9.98E-02	67.2129
1.52E-01	28.1542	1.61E-01	1.0647	1.54E-01	89.1253
2.02E-01	33.9605	2.11E-01	1.3964	1.99E-01	104.2623
2.52E-01	39.5436	2.61E-01	1.7632	2.49E-01	118.9634
3.03E-01	44.4536	3.11E-01	2.1509	3.01E-01	132.4956
3.54E-01	49.2959	3.61E-01	2.4238	3.38E-01	141.0687
4.04E-01	53.6789	4.12E-01	2.8063	4.01E-01	154.2343
4.55E-01	57.5845	4.61E-01	3.1472	4.41E-01	161.6686
5.04E-01	61.7313	5.12E-01	3.5273	4.87E-01	170.0914
5.56E-01	64.9202	5.61E-01	3.9422	5.38E-01	178.4057
6.05E-01	68.6247	6.11E-01	4.2331	5.89E-01	186.2029
6.56E-01	71.6793	6.61E-01	4.6168	6.40E-01	193.5071
7.06E-01	74.7325	7.11E-01	4.9977	6.90E-01	200.8486
7.56E-01	77.9456	7.58E-01	6.3337	7.42E-01	207.3829
8.07E-01	80.3785	8.11E-01	6.8438	7.93E-01	213.5757
8.57E-01	83.4354	8.61E-01	7.1981	8.57E-01	220.8386
9.07E-01	85.6855	9.11E-01	7.6281	9.09E-01	226.2257
9.57E-01	88.3446	9.61E-01	8.0472	9.59E-01	231.1429
9.99E-01	90.7094	9.99E-01	8.3126	9.96E-01	234.8043

Table S10. H_2 adsorption data of **SNU-170'**, **SNU-171'**, **SNU-172'** and **SNU-173'** at 87 K.

SNU-170'		SNU-171'		SNU-172'		SNU-173'	
P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})
1.12E-04	0.0067	1.18E-04	0.0367	9.64E-05	0.0286	9.88E-05	0.0631
1.97E-04	0.0181	2.12E-04	0.0796	2.08E-04	0.0776	2.09E-04	0.1694
3.42E-04	0.0386	3.12E-04	0.1239	3.11E-04	0.1216	2.94E-04	0.248
4.03E-04	0.0468	4.11E-04	0.1674	4.09E-04	0.1637	4.09E-04	0.3531
5.40E-04	0.0663	5.12E-04	0.2107	5.10E-04	0.2062	4.94E-04	0.4286
6.03E-04	0.0747	6.13E-04	0.2536	6.11E-04	0.2482	6.12E-04	0.5335
7.41E-04	0.0944	7.13E-04	0.2957	7.10E-04	0.29	6.95E-04	0.6069
8.03E-04	0.1026	8.14E-04	0.338	8.11E-04	0.3317	8.14E-04	0.7093
9.41E-04	0.1222	9.14E-04	0.3793	9.12E-04	0.373	8.97E-04	0.7808
1.00E-03	0.1304	1.01E-03	0.4203	1.01E-03	0.4146	1.02E-03	0.8811
2.14E-03	0.3013	2.14E-03	0.8891	2.54E-03	1.0494	2.65E-03	2.215
3.09E-03	0.4418	3.11E-03	1.2827	3.56E-03	1.4577	3.64E-03	2.9602
4.06E-03	0.583	4.13E-03	1.6808	4.54E-03	1.849	4.64E-03	3.6739
5.04E-03	0.7254	5.04E-03	2.0255	5.52E-03	2.2284	5.65E-03	4.354
6.09E-03	0.8754	6.07E-03	2.41	6.49E-03	2.6008	6.68E-03	5.0227
7.10E-03	1.0195	7.02E-03	2.6977	7.54E-03	2.9944	7.79E-03	5.7052
8.47E-03	1.2119	8.29E-03	3.1508	8.11E-03	3.209	8.47E-03	6.114
9.22E-03	1.3191	9.51E-03	3.5876	9.28E-03	3.6377	9.27E-03	6.586
1.24E-02	1.6297	1.18E-02	4.1311	1.07E-02	4.0128	1.10E-02	7.2519
2.05E-02	2.7028	2.14E-02	7.1845	1.94E-02	7.0239	1.94E-02	11.3003
3.03E-02	3.9579	3.16E-02	10.2426	3.04E-02	10.4952	2.93E-02	15.2426
4.01E-02	5.1796	4.16E-02	13.0744	3.98E-02	13.2484	4.00E-02	18.8976
5.01E-02	6.405	5.15E-02	15.7869	4.99E-02	16.0868	5.03E-02	22.1251
6.02E-02	7.6105	6.19E-02	18.4421	5.99E-02	18.7655	6.07E-02	25.1046
6.99E-02	8.7498	6.92E-02	20.2825	7.01E-02	21.3462	7.05E-02	27.7721
8.02E-02	9.9284	8.13E-02	23.2019	8.02E-02	23.8376	8.10E-02	30.4167
9.05E-02	11.098	8.91E-02	25.0197	9.03E-02	26.2146	9.07E-02	32.8138
1.07E-01	12.966	1.05E-01	28.4445	9.93E-02	28.2315	1.04E-01	35.7844
1.50E-01	17.4633	1.44E-01	36.4554	1.50E-01	38.7144	1.54E-01	46.0712
1.99E-01	22.3724	1.92E-01	45.2497	1.93E-01	46.5503	1.91E-01	52.9098
2.49E-01	27.0684	2.42E-01	53.662	2.42E-01	54.7135	2.54E-01	63.0516
3.00E-01	31.6129	2.93E-01	61.4105	2.93E-01	62.5352	2.94E-01	68.9134
3.50E-01	35.9328	3.44E-01	68.5602	3.44E-01	69.729	3.41E-01	75.3973
4.00E-01	40.1457	4.08E-01	76.7705	4.04E-01	77.5244	3.91E-01	81.7055
4.51E-01	44.0872	4.50E-01	81.7456	4.49E-01	82.9067	4.42E-01	87.6309
5.01E-01	47.9835	5.08E-01	88.3786	5.05E-01	89.4689	4.94E-01	93.2326
5.51E-01	51.7059	5.50E-01	92.8222	5.37E-01	92.8404	5.44E-01	98.5228
6.01E-01	55.3179	5.99E-01	97.6952	6.05E-01	99.9311	6.08E-01	104.6894
6.52E-01	58.7815	6.48E-01	102.7656	6.37E-01	103.0715	6.49E-01	108.2728
7.02E-01	62.2966	6.99E-01	107.4519	7.04E-01	109.5477	7.08E-01	113.6362
7.52E-01	65.5898	7.50E-01	111.8791	7.39E-01	112.5653	7.51E-01	116.8465
8.02E-01	68.8575	8.00E-01	116.1503	7.99E-01	117.7041	7.99E-01	120.6581
8.53E-01	71.99	8.51E-01	120.1206	8.37E-01	120.7912	8.48E-01	124.4221
9.03E-01	75.0863	9.01E-01	123.9945	8.83E-01	124.4311	9.09E-01	128.7791
9.53E-01	78.0825	9.51E-01	127.6074	9.49E-01	129.4176	9.52E-01	131.6314
9.98E-01	80.7644	9.98E-01	130.9964	9.85E-01	132.056	9.96E-01	134.636

Table S11. H_2 adsorption data of **SNU-174'**, **SNU-175'** and **SNU-176'** at 87 K.

SNU-174'		SNU-175'		SNU-176'	
P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})
1.22E-04	0.0011	3.28E-02	0.0551	1.17E-04	0.0356
2.15E-04	0.0107	4.35E-02	0.141	2.11E-04	0.0765
3.04E-04	0.021	5.30E-02	0.2159	3.11E-04	0.119
4.06E-04	0.033	6.31E-02	0.3156	4.11E-04	0.1609
5.07E-04	0.0451	7.30E-02	0.4311	5.11E-04	0.2025
6.06E-04	0.0572	8.30E-02	0.5436	6.11E-04	0.2439
7.07E-04	0.069	9.31E-02	0.6561	7.12E-04	0.2849
8.06E-04	0.0805	1.12E-01	0.8053	8.12E-04	0.3256
9.07E-04	0.0924	1.62E-01	1.1541	9.13E-04	0.366
1.01E-03	0.1045	2.12E-01	1.6371	1.01E-03	0.4065
2.20E-03	0.2779	2.62E-01	1.985	2.12E-03	0.8594
3.17E-03	0.4239	3.11E-01	2.4645	3.07E-03	1.2383
4.12E-03	0.5668	3.62E-01	2.8655	4.05E-03	1.6223
5.12E-03	0.7193	4.11E-01	3.3241	5.05E-03	2.0046
6.13E-03	0.8713	4.62E-01	3.6333	6.03E-03	2.3744
7.09E-03	1.0306	5.11E-01	4.1415	7.04E-03	2.7433
8.60E-03	1.2415	5.62E-01	4.4024	8.18E-03	3.1613
9.81E-03	1.5965	6.11E-01	4.7943	9.27E-03	3.5477
1.19E-02	1.9682	6.61E-01	5.1138	1.17E-02	4.1985
2.05E-02	2.955	7.12E-01	5.4883	2.11E-02	7.2865
3.05E-02	4.0793	7.61E-01	5.72	3.11E-02	10.3484
4.08E-02	5.2333	8.11E-01	6.1002	4.14E-02	13.2672
5.07E-02	6.345	8.62E-01	6.434	5.15E-02	16.0294
6.10E-02	7.4136	9.12E-01	6.715	6.13E-02	18.6109
7.06E-02	8.4137	9.61E-01	7.1873	6.89E-02	20.5083
8.09E-02	9.3938	9.99E-01	7.724	8.12E-02	23.556
9.05E-02	10.355			8.88E-02	25.375
1.09E-01	11.836			1.04E-01	28.9041
1.56E-01	15.3844			1.43E-01	37.0089
2.05E-01	19.0698			2.05E-01	48.9237
2.56E-01	22.4339			2.45E-01	55.7483
3.06E-01	25.7072			2.92E-01	63.4679
3.56E-01	28.7802			3.42E-01	71.0351
4.07E-01	31.7409			3.93E-01	78.2221
4.57E-01	34.4851			4.44E-01	85.0003
5.06E-01	37.2008			4.94E-01	91.4756
5.57E-01	39.7685			5.56E-01	99.2117
6.07E-01	42.3053			6.08E-01	105.1063
6.57E-01	44.8049			6.50E-01	109.4483
7.07E-01	47.1679			7.08E-01	115.4219
7.58E-01	49.38			7.49E-01	119.7514
8.07E-01	51.4176			8.09E-01	125.3387
8.58E-01	53.4849			8.51E-01	129.0897
9.08E-01	55.4679			8.99E-01	133.4381
9.58E-01	57.4677			9.50E-01	137.486
9.99E-01	59.1986			9.95E-01	141.1641

Table S12. CO_2 adsorption data of **SNU-170'**, **SNU-171'**, **SNU-172'** and **SNU-173'** at 195 K.

SNU-170'		SNU-171'		SNU-172'		SNU-173'	
P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})
1.09E-04	0.0966	5.35E-05	0.1376	9.87E-05	2.639	5.04E-05	0.1084
2.14E-04	0.2672	1.29E-04	1.5874	2.07E-04	5.7771	1.31E-04	3.2438
3.01E-04	0.3865	2.29E-04	3.1213	2.94E-04	7.551	2.26E-04	6.3174
4.03E-04	0.5346	3.40E-04	4.5838	4.33E-04	10.3272	3.40E-04	9.3148
5.09E-04	0.6774	4.59E-04	5.98	5.21E-04	11.7557	4.19E-04	11.2477
6.19E-04	0.8102	5.62E-04	7.0922	6.26E-04	13.2457	5.19E-04	13.0349
7.01E-04	0.9104	6.27E-04	7.733	7.24E-04	14.5084	6.23E-04	14.7038
8.18E-04	1.0484	7.77E-04	9.0851	7.94E-04	15.3662	7.20E-04	16.0507
9.01E-04	1.1462	8.30E-04	9.5557	9.26E-04	16.7884	8.23E-04	17.3935
9.96E-04	1.2558	1.01E-03	11.075	9.96E-04	17.5063	1.04E-03	20.0063
2.55E-03	3.3793	2.02E-03	18.8336	2.02E-03	27.2837	2.04E-03	29.3909
3.60E-03	4.7697	3.01E-03	25.4575	3.03E-03	34.881	3.01E-03	36.7846
4.54E-03	5.941	4.05E-03	32.0693	4.04E-03	41.661	4.00E-03	43.4552
5.63E-03	7.2807	5.09E-03	38.2371	5.03E-03	47.7567	5.01E-03	49.6934
7.05E-03	8.9342	7.05E-03	50.1071	7.18E-03	60.0451	6.96E-03	60.8855
7.06E-03	8.9358	7.05E-03	50.1188	7.18E-03	60.0525	7.75E-03	65.1982
8.78E-03	10.9201	8.51E-03	58.5696	8.52E-03	67.1471	8.41E-03	68.6209
9.57E-03	11.9384	9.32E-03	63.4974	9.28E-03	70.8465	9.22E-03	73.0048
1.06E-02	13.0259	9.64E-03	64.7975	9.45E-03	71.6436	9.56E-03	74.1501
1.68E-02	20.0866	1.61E-02	102.1505	1.56E-02	104.032	1.67E-02	109.211
2.69E-02	31.5316	2.48E-02	158.2312	2.48E-02	150.4451	2.54E-02	149.2465
3.69E-02	42.007	3.36E-02	216.3456	3.34E-02	192.9762	3.54E-02	193.5174
4.73E-02	51.5364	4.37E-02	259.5252	4.28E-02	236.1025	4.62E-02	235.7814
5.80E-02	60.055	5.44E-02	277.9187	5.09E-02	262.6475	5.58E-02	254.1372
6.67E-02	66.4066	6.51E-02	289.2369	6.28E-02	283.3377	6.45E-02	263.2849
7.64E-02	72.8182	7.58E-02	296.6217	7.36E-02	293.4246	7.64E-02	272.0744
8.61E-02	78.9923	8.56E-02	301.3622	8.99E-02	303.1516	8.40E-02	276.4105
1.02E-01	88.85	1.03E-01	307.9976	9.97E-02	307.2664	9.89E-02	283.25
1.27E-01	103.4266	1.31E-01	316.5215	1.30E-01	317.027	1.47E-01	297.6465
1.76E-01	131.2584	1.75E-01	326.1241	1.80E-01	326.6746	1.82E-01	304.2697
2.21E-01	161.9625	2.31E-01	334.3113	2.22E-01	332.3664	2.29E-01	311.3058
2.60E-01	210.9641	3.02E-01	341.8795	2.74E-01	337.5688	2.82E-01	317.4581
2.72E-01	256.9864	3.46E-01	345.8055	3.30E-01	341.8566	3.49E-01	323.6116
2.95E-01	305.9159	3.98E-01	349.3886	4.00E-01	346.0033	4.03E-01	327.6116
4.12E-01	322.6046	4.49E-01	352.6927	4.58E-01	348.7656	4.48E-01	330.4686
5.03E-01	330.5682	5.01E-01	355.6614	4.99E-01	350.4984	4.97E-01	333.5093
5.50E-01	334.2886	5.52E-01	358.0977	5.47E-01	352.3729	5.48E-01	336.2
6.01E-01	337.7682	6.03E-01	360.4809	5.98E-01	354.109	6.00E-01	338.5895
6.51E-01	341.5295	6.55E-01	362.3346	6.50E-01	355.6483	6.50E-01	340.8442
7.00E-01	345.0318	7.03E-01	364.4235	7.01E-01	357.0508	7.00E-01	343.0407
7.52E-01	348.0136	7.56E-01	366.1832	7.53E-01	358.209	7.52E-01	344.9814
8.00E-01	351.3705	8.04E-01	367.9672	8.02E-01	359.4115	8.02E-01	346.8372
8.54E-01	354.0136	8.54E-01	369.9712	8.53E-01	360.468	8.52E-01	348.5814
9.04E-01	356.3591	9.07E-01	371.3107	9.04E-01	361.4631	9.03E-01	350.3163
9.53E-01	358.8341	9.56E-01	372.6077	9.55E-01	362.377	9.54E-01	351.7663
9.99E-01	361.0182	9.99E-01	373.7788	9.99E-01	363.1877	9.99E-01	353.1581

Table S13. CO_2 adsorption data of **SNU-174'**, **SNU-175'** and **SNU-176'** at 195 K.

SNU-174'		**SNU-175'**		**SNU-176'**	
P (atm)	V_{ads} ($cm^3\ g^{-1}$)	P (atm)	V_{ads} ($cm^3\ g^{-1}$)	P (atm)	V_{ads} ($cm^3\ g^{-1}$)
9.37E-05	0.038	1.65E-04	1.6686	9.29E-05	0.9734
2.06E-04	0.0543	2.43E-04	2.2238	2.30E-04	3.0867
3.07E-04	0.0697	3.74E-04	2.7713	3.10E-04	4.0352
3.95E-04	0.0862	4.88E-04	3.3093	3.97E-04	5.1515
5.04E-04	0.1278	6.09E-04	3.747	5.00E-04	6.3711
6.00E-04	2.521	5.94E-04	3.7719	5.95E-04	7.4774
7.02E-04	3.3357	8.11E-04	4.3716	7.70E-04	9.2923
7.98E-04	3.667	8.07E-04	4.3766	8.54E-04	10.1346
9.12E-04	3.9843	1.05E-03	4.9628	9.45E-04	11.0301
1.01E-03	4.2521	1.02E-03	4.9696	1.04E-03	11.9496
2.01E-03	6.242	2.04E-03	6.9382	2.00E-03	20.1169
3.06E-03	7.9269	3.08E-03	8.3343	3.01E-03	27.6854
4.01E-03	9.2233	4.12E-03	9.4077	4.00E-03	34.6406
5.07E-03	10.5634	5.14E-03	10.5133	5.00E-03	41.1376
6.13E-03	11.7852	6.87E-03	11.7364	7.14E-03	54.1904
7.04E-03	12.7295	7.92E-03	12.8425	7.13E-03	54.1791
8.07E-03	13.7416	8.50E-03	13.1572	8.53E-03	62.3959
9.13E-03	14.7563	9.20E-03	13.516	9.29E-03	66.8683
1.02E-02	15.7506	1.02E-02	14.0427	9.58E-03	68.0363
1.95E-02	22.3883	1.72E-02	16.8665	1.57E-02	103.9124
2.92E-02	29.1346	2.70E-02	19.6867	2.37E-02	152.4814
4.12E-02	37.1775	4.02E-02	22.5121	3.25E-02	209.7729
4.97E-02	42.174	4.67E-02	23.6865	3.63E-02	234.6643
5.97E-02	47.4575	5.58E-02	25.0718	4.94E-02	293.5714
6.98E-02	52.4258	6.56E-02	26.4807	5.94E-02	314.6414
7.99E-02	57.1556	7.57E-02	27.8126	7.52E-02	330.7443
9.00E-02	61.6372	8.62E-02	29.0892	8.28E-02	335.86
1.00E-01	66.0761	1.02E-01	30.9328	9.77E-02	343.7186
1.46E-01	86.0611	1.51E-01	36.1634	1.23E-01	353.6257
1.99E-01	121.7174	2.01E-01	40.9484	1.67E-01	364.5343
2.49E-01	182.7333	2.54E-01	45.1724	2.24E-01	373.7257
3.00E-01	191.1525	3.01E-01	47.0582	2.97E-01	382.1257
3.55E-01	198.4166	3.52E-01	48.7141	3.53E-01	386.9785
3.97E-01	202.9689	4.03E-01	50.1744	3.98E-01	390.1814
4.46E-01	207.7055	4.54E-01	51.4212	4.49E-01	393.1929
4.97E-01	212.1452	5.05E-01	52.5306	4.99E-01	396.0457
5.48E-01	216.2863	5.56E-01	53.5383	5.51E-01	398.4785
5.99E-01	220.0593	6.07E-01	54.461	6.02E-01	400.6943
6.50E-01	223.4888	6.58E-01	55.2171	6.53E-01	402.67
7.01E-01	226.6646	7.09E-01	55.796	7.04E-01	404.4914
7.51E-01	229.7035	7.61E-01	56.1969	7.54E-01	406.0714
8.01E-01	232.82	8.11E-01	56.5175	8.05E-01	407.6671
8.51E-01	235.8875	8.51E-01	59.516	8.55E-01	409.0657
9.02E-01	238.5951	9.04E-01	60.5128	9.06E-01	410.3557
9.53E-01	241.1656	9.57E-01	61.2228	9.56E-01	411.5385
9.99E-01	243.5215	9.99E-01	61.9569	9.99E-01	412.6571

Table S14. CO_2 adsorption data of **SNU-170’**, **SNU-171’**, **SNU-172’** and **SNU-173’** at 273 K.

SNU-170’		SNU-171’		SNU-172’		SNU-173’	
P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})
3.00E-03	0.0298	1.21E-04	0.0021	9.77E-05	0.004	1.37E-04	0.0311
4.34E-03	0.0801	2.07E-04	0.0096	2.28E-04	0.0148	2.15E-04	0.0423
5.02E-03	0.1045	3.04E-04	0.0177	3.30E-04	0.0228	3.10E-04	0.0565
6.31E-03	0.1531	4.06E-04	0.0267	4.26E-04	0.0308	4.09E-04	0.0712
7.00E-03	0.1781	5.04E-04	0.0354	5.25E-04	0.0393	5.08E-04	0.0857
9.14E-03	0.2658	6.05E-04	0.0442	6.24E-04	0.0481	6.11E-04	0.101
9.98E-03	0.2998	7.05E-04	0.0532	7.24E-04	0.0572	7.14E-04	0.1161
1.40E-02	0.0399	8.06E-04	0.0614	8.21E-04	0.0662	8.03E-04	0.1291
2.34E-02	0.3733	9.06E-04	0.0696	9.21E-04	0.0756	9.36E-04	0.1489
3.36E-02	0.751	1.01E-03	0.079	1.02E-03	0.0852	1.09E-03	0.1369
4.35E-02	1.1404	2.21E-03	0.2295	2.14E-03	0.2315	2.02E-03	0.2856
5.36E-02	1.5589	3.19E-03	0.3513	3.15E-03	0.3626	3.06E-03	0.4501
6.32E-02	1.9559	4.19E-03	0.4728	4.17E-03	0.4948	4.12E-03	0.6151
7.34E-02	2.3575	5.24E-03	0.6015	5.15E-03	0.6225	5.17E-03	0.7795
8.39E-02	2.7864	6.25E-03	0.7258	6.19E-03	0.7577	6.24E-03	0.9458
9.34E-02	3.1826	7.20E-03	0.8407	7.18E-03	0.8864	7.05E-03	1.0701
1.12E-01	3.9391	9.02E-03	1.0654	8.42E-03	1.0476	8.02E-03	1.222
1.60E-01	5.8242	9.74E-03	1.1515	9.22E-03	1.1516	9.05E-03	1.3821
2.10E-01	7.8305	1.32E-02	1.3145	1.13E-02	1.4155	1.01E-02	1.5454
2.60E-01	9.7821	2.12E-02	2.2626	2.04E-02	2.5837	2.16E-02	3.2901
3.10E-01	11.7554	3.07E-02	3.3446	3.02E-02	3.816	3.17E-02	4.8195
3.60E-01	13.7082	4.08E-02	4.5522	4.01E-02	5.0603	3.94E-02	5.937
4.10E-01	15.7523	5.07E-02	5.6907	5.01E-02	6.2969	5.47E-02	8.1063
4.60E-01	17.7304	6.07E-02	6.7939	6.00E-02	7.5123	6.04E-02	8.901
5.10E-01	19.7118	7.07E-02	7.9402	6.99E-02	8.7101	7.17E-02	10.4536
5.60E-01	21.6042	8.07E-02	9.0657	7.99E-02	9.9024	7.95E-02	11.4933
6.09E-01	23.5443	9.06E-02	10.1665	8.99E-02	11.0788	9.16E-02	13.0905
6.60E-01	25.5805	1.08E-01	12.0596	1.02E-01	12.4445	1.06E-01	14.8871
7.09E-01	27.4723	1.50E-01	16.5733	1.49E-01	17.6566	1.56E-01	21.0676
7.60E-01	29.3341	1.99E-01	21.581	2.05E-01	23.6545	2.07E-01	26.8299
8.09E-01	31.4175	2.59E-01	27.6537	2.48E-01	28.103	2.57E-01	32.4209
8.59E-01	33.3793	3.00E-01	31.7737	3.04E-01	33.6468	3.06E-01	37.9983
9.09E-01	35.2107	3.58E-01	37.4563	3.49E-01	37.8994	3.57E-01	43.2533
9.59E-01	37.0993	4.00E-01	41.5262	4.04E-01	43.0959	4.07E-01	48.1799
9.99E-01	38.9248	4.58E-01	47.1447	4.36E-01	45.9774	4.57E-01	52.9349
		4.99E-01	51.1185	5.03E-01	52.0119	5.07E-01	57.539
		5.58E-01	56.6044	5.35E-01	54.8845	5.57E-01	62.0187
		5.99E-01	60.4425	6.03E-01	60.7544	5.98E-01	65.5543
		6.57E-01	65.6778	6.35E-01	63.5088	6.56E-01	70.588
		6.99E-01	69.5241	7.01E-01	68.9933	6.97E-01	74.026
		7.57E-01	74.753	7.35E-01	71.7663	7.57E-01	78.8616
		7.98E-01	78.5323	8.01E-01	77.1202	7.98E-01	82.1886
		8.57E-01	83.6421	8.35E-01	79.7995	8.57E-01	86.8057
		9.07E-01	88.0749	8.77E-01	83.156	8.98E-01	90.0088
		9.49E-01	91.6258	9.50E-01	88.6819	9.57E-01	94.4428
		9.93E-01	95.4681	9.81E-01	91.1098	9.95E-01	97.2726

Table S15. CO_2 adsorption data of **SNU-174'**, **SNU-175'** and **SNU-176'** at 273 K.

SNU-174'		SNU-175'		SNU-176'	
P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})
1.21E-04	0.0007	3.11E-04	0.001	1.11E-04	0.0051
2.25E-04	0.0011	4.12E-04	0.0045	2.10E-04	0.0119
3.23E-04	0.0019	5.13E-04	0.0076	3.06E-04	0.0199
4.22E-04	0.0037	6.12E-04	0.0109	4.05E-04	0.0283
5.22E-04	0.0053	7.14E-04	0.0135	5.04E-04	0.037
6.21E-04	0.0074	8.16E-04	0.016	6.04E-04	0.0459
7.21E-04	0.0091	9.15E-04	0.0183	7.04E-04	0.055
8.22E-04	0.011	1.02E-03	0.0205	8.03E-04	0.064
9.22E-04	0.0128	2.26E-03	0.078	9.04E-04	0.0731
1.02E-03	0.0143	3.22E-03	0.1211	1.00E-03	0.0822
2.34E-03	0.0828	4.21E-03	0.1644	2.20E-03	0.233
3.02E-03	0.1166	5.23E-03	0.208	3.18E-03	0.3568
4.03E-03	0.169	6.19E-03	0.2478	4.21E-03	0.4869
5.04E-03	0.2212	7.21E-03	0.2896	5.20E-03	0.6123
6.05E-03	0.2728	9.05E-03	0.3643	6.25E-03	0.745
7.36E-03	0.339	9.87E-03	0.3959	7.17E-03	0.8611
9.38E-03	0.4413	1.22E-02	0.5049	8.97E-03	1.0899
9.99E-03	0.4698	2.15E-02	0.8502	9.72E-03	1.1848
1.29E-02	0.595	3.11E-02	1.1764	1.26E-02	1.4421
2.21E-02	0.9695	4.13E-02	1.4897	2.05E-02	2.4385
3.20E-02	1.3897	5.14E-02	1.7681	3.00E-02	3.6196
4.21E-02	1.8136	6.17E-02	1.9963	4.00E-02	4.8583
5.22E-02	2.2134	7.20E-02	2.2371	5.00E-02	6.0759
6.24E-02	2.6277	8.20E-02	2.4557	6.00E-02	7.3001
7.20E-02	2.997	9.21E-02	2.6637	7.00E-02	8.5058
8.23E-02	3.3943	1.10E-01	3.0889	8.00E-02	9.7031
9.22E-02	3.7808	1.57E-01	4.021	8.99E-02	10.8887
1.11E-01	4.4704	2.09E-01	4.6637	1.07E-01	12.8482
1.59E-01	6.0386	2.59E-01	5.4192	1.49E-01	17.5751
2.09E-01	7.7417	3.09E-01	6.135	2.08E-01	24.1421
2.59E-01	9.2604	3.59E-01	6.7465	2.49E-01	28.5427
3.09E-01	10.8071	4.09E-01	7.337	3.07E-01	34.81
3.60E-01	12.23	4.59E-01	7.9002	3.58E-01	40.0637
4.08E-01	13.71	5.10E-01	8.4638	4.08E-01	45.2301
4.59E-01	15.1594	5.60E-01	8.9463	4.57E-01	50.226
5.09E-01	16.5475	6.10E-01	9.4747	5.07E-01	55.2261
5.58E-01	17.9072	6.60E-01	9.9228	5.57E-01	60.155
6.08E-01	19.2573	7.10E-01	10.338	6.07E-01	65.0307
6.59E-01	20.5566	7.60E-01	10.7134	6.57E-01	69.8499
7.09E-01	21.8628	8.09E-01	11.1731	7.06E-01	74.6584
7.59E-01	23.1135	8.60E-01	11.5837	7.56E-01	79.3431
8.09E-01	24.4264	9.10E-01	11.9354	8.06E-01	84.0881
8.59E-01	25.5988	9.60E-01	12.279	8.56E-01	88.6701
9.09E-01	26.8857	9.99E-01	12.6347	9.06E-01	93.3059
9.59E-01	27.8859			9.56E-01	97.7823
9.99E-01	29.1517			9.93E-01	101.1333

Table S16. CO_2 adsorption data of **SNU-170'**, **SNU-171'**, **SNU-172'** and **SNU-173'** at 298 K.

SNU-170'		SNU-171'		SNU-172'		SNU-173'	
P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})
1.02E-03	0.0028	2.33E-03	0.0576	1.16E-04	0.0019	1.29E-04	0.0107
2.01E-03	0.0177	3.00E-03	0.0887	2.16E-04	0.0034	2.30E-04	0.0143
3.03E-03	0.0317	4.34E-03	0.1549	3.08E-04	0.0061	3.27E-04	0.0177
4.01E-03	0.0464	5.02E-03	0.1856	4.05E-04	0.0092	4.30E-04	0.0213
5.00E-03	0.0617	6.04E-03	0.2355	5.03E-04	0.0125	5.21E-04	0.0255
6.00E-03	0.0771	7.37E-03	0.3004	6.02E-04	0.016	6.12E-04	0.0312
7.05E-03	0.0922	9.36E-03	0.4005	7.01E-04	0.0197	7.15E-04	0.0409
9.03E-03	0.1304	1.02E-02	0.4415	8.01E-04	0.0234	8.07E-04	0.0513
9.79E-03	0.1416	1.31E-02	0.5405	9.01E-04	0.0271	9.04E-04	0.0603
1.29E-02	0.1561	2.20E-02	0.9719	1.00E-03	0.0308	1.02E-03	0.0691
2.23E-02	0.2792	3.18E-02	1.4693	2.16E-03	0.0931	2.11E-03	0.1347
3.27E-02	0.464	4.18E-02	1.9796	3.17E-03	0.1483	3.04E-03	0.1901
4.28E-02	0.6008	5.20E-02	2.4905	4.19E-03	0.2037	4.08E-03	0.2531
5.24E-02	0.7979	6.18E-02	2.9776	5.18E-03	0.2551	5.13E-03	0.3175
6.29E-02	1.076	7.19E-02	3.4809	6.16E-03	0.3056	6.18E-03	0.3833
7.27E-02	1.294	8.16E-02	4.0073	7.20E-03	0.3597	7.24E-03	0.4479
8.26E-02	1.5138	9.18E-02	4.5374	8.89E-03	0.4497	8.29E-03	0.5131
9.26E-02	1.7251	1.10E-01	5.4062	9.76E-03	0.4966	9.35E-03	0.5789
1.03E-01	1.9296	1.57E-01	7.5946	1.24E-02	0.6024	1.04E-02	0.6444
1.52E-01	2.8933	2.06E-01	9.9531	2.01E-02	1.0129	2.08E-02	1.2435
2.01E-01	3.9464	2.56E-01	12.2852	2.97E-02	1.5252	3.08E-02	1.8905
2.52E-01	5.0192	3.06E-01	14.6191	3.95E-02	2.0579	4.08E-02	2.5274
3.01E-01	6.128	3.56E-01	16.8407	4.95E-02	2.6027	5.83E-02	3.6111
3.51E-01	7.2033	4.06E-01	19.0922	5.95E-02	3.1509	6.22E-02	3.8652
4.01E-01	8.3131	4.56E-01	21.3369	6.95E-02	3.6955	7.11E-02	4.4244
4.51E-01	9.4578	5.05E-01	23.6147	7.95E-02	4.2344	8.10E-02	5.024
5.01E-01	10.545	5.56E-01	25.7667	8.94E-02	4.7692	9.10E-02	5.63
5.51E-01	11.4727	6.05E-01	27.9205	1.06E-01	5.6279	1.09E-01	6.6604
6.01E-01	12.497	6.55E-01	30.0901	1.48E-01	7.6995	1.53E-01	9.251
6.51E-01	13.6372	7.05E-01	32.3158	1.94E-01	10.0798	2.02E-01	12.0514
7.01E-01	14.6694	7.55E-01	34.4798	2.44E-01	12.5267	2.52E-01	14.901
7.51E-01	15.7048	8.05E-01	36.6022	2.93E-01	14.9777	3.01E-01	17.9312
8.01E-01	16.8139	8.55E-01	38.6981	3.43E-01	17.4001	3.51E-01	20.8837
8.51E-01	17.894	9.05E-01	40.7151	3.92E-01	19.8013	4.02E-01	23.594
9.00E-01	19.0217	9.55E-01	42.6749	4.43E-01	22.149	4.52E-01	26.1551
9.51E-01	19.968	9.99E-01	44.6162	5.07E-01	24.9292	5.02E-01	28.679
9.96E-01	20.8096			5.56E-01	27.1907	5.53E-01	31.1297
				6.06E-01	29.5232	6.03E-01	33.556
				6.56E-01	31.8168	6.53E-01	35.9434
				7.06E-01	34.0656	7.03E-01	38.2547
				7.58E-01	36.1585	7.53E-01	40.5521
				8.05E-01	38.3929	8.03E-01	42.8241
				8.56E-01	40.5768	8.53E-01	45.0733
				9.08E-01	42.6193	9.03E-01	47.2743
				9.56E-01	44.648	9.53E-01	49.4449
				9.99E-01	46.5286	9.99E-01	51.4269

Table S17. CO_2 adsorption data of **SNU-174'**, **SNU-175'** and **SNU-176'** at 298 K.

SNU-174'		SNU-175'		SNU-176'	
P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})
5.11E-03	0.0086	5.32E-03	0.0017	7.21E-04	0.0016
6.13E-03	0.0255	6.38E-03	0.0107	8.21E-04	0.0033
7.07E-03	0.0406	7.44E-03	0.0198	9.20E-04	0.0051
9.38E-03	0.0816	8.49E-03	0.0293	1.02E-03	0.007
1.02E-02	0.0957	9.54E-03	0.0389	2.31E-03	0.0717
1.35E-02	0.0549	1.06E-02	0.048	3.01E-03	0.1062
2.27E-02	0.1625	2.27E-02	0.1632	4.35E-03	0.1752
3.25E-02	0.3755	3.28E-02	0.2924	5.01E-03	0.2087
4.30E-02	0.6162	4.26E-02	0.4086	6.00E-03	0.2601
5.26E-02	0.8448	5.28E-02	0.5271	7.34E-03	0.3294
6.28E-02	0.99	6.28E-02	0.6477	9.26E-03	0.4312
7.28E-02	1.1963	7.27E-02	0.765	1.01E-02	0.4752
8.30E-02	1.3909	8.27E-02	0.8903	1.35E-02	0.5056
9.28E-02	1.5438	9.27E-02	1.0208	2.20E-02	0.9459
1.12E-01	1.8536	1.12E-01	1.2199	3.22E-02	1.4791
1.61E-01	2.5616	1.61E-01	1.7127	4.21E-02	2.0048
2.10E-01	3.3647	2.11E-01	2.2445	5.21E-02	2.535
2.61E-01	4.05	2.60E-01	3.1095	6.22E-02	3.0675
3.10E-01	4.7398	3.09E-01	4.3808	7.22E-02	3.6019
3.61E-01	5.5537	3.61E-01	5.2328	8.22E-02	4.1331
4.10E-01	6.1584	4.11E-01	5.81	9.22E-02	4.6672
4.61E-01	6.9578	4.61E-01	6.3108	1.10E-01	5.5977
5.10E-01	7.614	5.11E-01	6.7296	1.56E-01	7.9272
5.61E-01	8.4004	5.61E-01	7.157	2.06E-01	10.4368
6.10E-01	9.0046	6.11E-01	7.5382	2.56E-01	12.8987
6.62E-01	9.8251	6.61E-01	7.9331	3.06E-01	15.3777
7.09E-01	10.3263	7.11E-01	8.3336	3.55E-01	17.7684
7.62E-01	11.1128	7.61E-01	8.6557	4.05E-01	20.1999
8.10E-01	11.5992	8.11E-01	9.0427	4.55E-01	22.5569
8.62E-01	12.3123	8.62E-01	9.3019	5.05E-01	24.9521
9.09E-01	12.7777	9.11E-01	9.6254	5.55E-01	27.2931
9.61E-01	13.6608	9.61E-01	10.0099	6.05E-01	29.6474
9.99E-01	14.0967	9.99E-01	10.2924	6.55E-01	31.925
				7.05E-01	34.265
				7.55E-01	36.5264
				8.05E-01	38.8426
				8.55E-01	41.0917
				9.04E-01	43.3739
				9.55E-01	45.6917
				9.99E-01	47.9284

Table S18. CH_4 adsorption data of **SNU-170'**, **SNU-171'**, **SNU-172'** and **SNU-173'** at 195 K.

SNU-170'		SNU-171'		SNU-172'		SNU-173'	
P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})
2.10E-04	0.0073	1.87E-04	0.0756	1.07E-04	0.0204	2.35E-04	0.2501
3.02E-04	0.0215	2.92E-04	0.1484	2.09E-04	0.0645	2.35E-04	0.2478
4.02E-04	0.0369	3.99E-04	0.2178	3.14E-04	0.1049	3.00E-04	0.3271
5.07E-04	0.0535	5.04E-04	0.2848	4.08E-04	0.1404	7.63E-04	0.9623
5.98E-04	0.0678	6.08E-04	0.3501	5.05E-04	0.177	7.25E-04	0.9187
7.49E-04	0.0928	7.12E-04	0.4137	6.03E-04	0.216	7.15E-04	0.8982
8.12E-04	0.1014	8.14E-04	0.4763	7.05E-04	0.2548	7.21E-04	0.8993
9.05E-04	0.1135	9.16E-04	0.5376	8.07E-04	0.2926	1.16E-03	1.4573
9.99E-04	0.1295	1.02E-03	0.5984	9.08E-04	0.3299	1.12E-03	1.4141
2.11E-03	0.3345	1.02E-03	0.5998	1.01E-03	0.3673	1.11E-03	1.3944
3.07E-03	0.5091	2.12E-03	1.2587	2.02E-03	0.7703	2.23E-03	2.7496
4.10E-03	0.684	3.10E-03	1.8298	3.03E-03	1.1701	3.34E-03	3.989
5.09E-03	0.8529	4.16E-03	2.4258	4.03E-03	1.556	4.43E-03	5.1052
6.08E-03	1.0007	5.02E-03	2.8982	5.03E-03	1.9374	5.48E-03	6.1106
7.10E-03	1.1622	6.19E-03	3.5298	6.09E-03	2.336	6.56E-03	7.0918
8.78E-03	1.3931	7.07E-03	3.994	7.87E-03	2.995	7.71E-03	8.0815
9.59E-03	1.51	8.74E-03	4.8649	8.53E-03	3.2325	8.21E-03	8.5
1.18E-02	1.8249	9.23E-03	5.1123	9.36E-03	3.5349	9.19E-03	9.2948
2.07E-02	2.7055	1.11E-02	6.0114	1.09E-02	4.0909	1.02E-02	10.2832
3.23E-02	3.8866	1.94E-02	10.1116	1.81E-02	6.845	1.86E-02	16.3065
4.07E-02	4.6434	3.08E-02	15.3343	2.93E-02	10.7939	3.00E-02	23.3049
5.04E-02	5.3626	3.94E-02	19.0177	3.77E-02	13.5817	3.95E-02	28.2314
6.15E-02	6.1645	5.05E-02	23.6429	4.71E-02	16.6638	5.08E-02	33.7564
7.10E-02	6.7007	5.96E-02	27.1289	5.72E-02	19.6497	5.83E-02	36.9708
8.11E-02	7.2165	6.96E-02	30.667	6.74E-02	22.5203	6.78E-02	40.7751
9.15E-02	7.6931	7.97E-02	34.0282	7.78E-02	25.3408	7.76E-02	44.6286
1.10E-01	8.5438	8.99E-02	37.4804	8.84E-02	27.9802	8.81E-02	48.5022
1.58E-01	10.6469	1.02E-01	41.3862	9.92E-02	30.6422	9.89E-02	52.3693
2.07E-01	12.7809	1.55E-01	58.6722	1.41E-01	41.9046	1.43E-01	67.215
2.58E-01	14.5743	1.99E-01	71.3855	1.89E-01	53.6654	1.93E-01	81.6484
3.08E-01	16.4272	2.56E-01	86.3214	2.39E-01	65.178	2.54E-01	96.2455
3.58E-01	18.1504	2.87E-01	94.1204	2.88E-01	75.8193	2.85E-01	103.0737
4.09E-01	19.6756	3.55E-01	109.2576	3.39E-01	86.1631	3.56E-01	115.8551
4.58E-01	21.2011	3.90E-01	116.1238	3.90E-01	95.6541	3.90E-01	121.3605
5.08E-01	22.798	4.35E-01	124.2092	4.51E-01	105.8713	4.37E-01	127.6023
5.58E-01	24.2609	4.83E-01	132.7052	4.83E-01	110.7336	4.85E-01	134.0581
6.08E-01	25.7473	5.34E-01	140.6456	5.51E-01	120.5689	5.36E-01	140.3337
6.58E-01	27.185	5.86E-01	148.1236	5.83E-01	125.0467	5.88E-01	145.7663
7.08E-01	28.5114	6.39E-01	154.9393	6.24E-01	130.7631	6.40E-01	150.9361
7.58E-01	29.8707	7.04E-01	162.676	6.71E-01	136.968	7.06E-01	156.4326
8.08E-01	31.2475	7.57E-01	168.2797	7.54E-01	145.7328	7.58E-01	160.4465
8.58E-01	32.557	8.08E-01	173.1402	8.02E-01	150.1959	8.00E-01	163.3139
9.09E-01	33.7239	8.58E-01	177.6942	8.54E-01	154.4262	8.58E-01	167.1302
9.59E-01	35.0143	9.00E-01	181.1832	9.03E-01	158.6328	9.01E-01	169.8
9.99E-01	36.1823	9.58E-01	185.7934	9.53E-01	162.7287	9.50E-01	172.357
		9.97E-01	188.5422	9.99E-01	166.1484	9.96E-01	175.0581

Table S19. CH_4 adsorption data of **SNU-174'**, **SNU-175'** and **SNU-176'** at 195 K.

SNU-174'		SNU-175'		SNU-176'	
P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})
9.50E-05	0.0363	2.62E-01	0.0034	9.52E-05	0.0124
2.10E-04	0.0517	3.12E-01	0.0629	1.96E-04	0.0658
3.08E-04	0.0648	3.62E-01	0.1601	3.02E-04	0.1146
4.11E-04	0.0787	4.12E-01	0.2369	3.95E-04	0.156
5.11E-04	0.0924	4.62E-01	0.3149	4.94E-04	0.2001
6.04E-04	0.1051	5.12E-01	0.4249	6.27E-04	0.2582
7.03E-04	0.1188	5.62E-01	0.5073	7.08E-04	0.2927
8.23E-04	0.1355	6.12E-01	0.6081	7.98E-04	0.3313
9.28E-04	0.1501	6.61E-01	0.7359	8.97E-04	0.3735
1.02E-03	0.1612	7.11E-01	0.8425	9.97E-04	0.4163
2.05E-03	0.3094	7.62E-01	0.9248	2.01E-03	0.8897
3.11E-03	0.4642	8.11E-01	1.1084	3.02E-03	1.3455
4.03E-03	0.5896	8.61E-01	1.2543	4.08E-03	1.8186
5.06E-03	0.7289	9.12E-01	1.4023	5.10E-03	2.2629
6.12E-03	0.8677	9.61E-01	1.7698	6.07E-03	2.6814
7.18E-03	1.004	9.99E-01	1.9346	7.14E-03	3.1296
8.24E-03	1.1372			8.18E-03	3.5685
9.29E-03	1.2672			9.33E-03	4.0433
1.04E-02	1.3951			1.12E-02	4.804
2.08E-02	2.4191			2.00E-02	8.3896
3.09E-02	3.3735			2.97E-02	12.0923
4.11E-02	4.2672			3.97E-02	15.7319
5.90E-02	5.6673			5.09E-02	19.7709
6.23E-02	5.9795			5.71E-02	21.8177
7.16E-02	6.6705			7.11E-02	26.2074
8.15E-02	7.3951			7.74E-02	28.0401
9.15E-02	8.097			8.97E-02	31.5453
1.10E-01	9.2856			1.02E-01	35.1843
1.56E-01	12.1389			1.49E-01	48.9149
2.06E-01	14.9964			1.99E-01	62.3057
2.56E-01	17.8377			2.49E-01	74.7583
3.06E-01	20.5434			2.85E-01	83.132
3.56E-01	23.1614			3.55E-01	98.3539
4.06E-01	25.7495			3.90E-01	105.0183
4.56E-01	28.2859			4.35E-01	113.0346
5.06E-01	30.7575			4.82E-01	121.5954
5.56E-01	33.2086			5.32E-01	129.7184
6.06E-01	35.6256			5.82E-01	137.866
6.56E-01	38.0027			6.33E-01	145.5986
7.06E-01	40.3904			6.85E-01	152.6857
7.56E-01	42.7207			7.37E-01	159.2057
8.06E-01	45.0207			7.88E-01	165.42
8.56E-01	47.3115			8.54E-01	172.5957
9.06E-01	49.6033			9.07E-01	177.7857
9.56E-01	51.8603			9.57E-01	182.4171
9.99E-01	53.971			9.94E-01	185.7257

Table S20. CH_4 adsorption data of **SNU-170'**, **SNU-171'**, **SNU-172'** and **SNU-173'** at 273 K.

SNU-170'		SNU-171'		SNU-172'		SNU-173'	
P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})
9.19E-03	0.0011	6.01E-03	0.0026	2.19E-04	0.0002	2.24E-02	0.1585
9.87E-03	0.0038	7.08E-03	0.0213	3.17E-04	0.0012	3.21E-02	0.4028
1.30E-02	0.0655	9.42E-03	0.0711	4.18E-04	0.0023	4.23E-02	0.6549
2.27E-02	0.1475	1.00E-02	0.079	5.18E-04	0.0034	6.06E-02	1.1015
3.26E-02	0.2045	1.31E-02	0.0915	6.17E-04	0.0044	6.28E-02	1.1582
4.26E-02	0.2879	2.28E-02	0.2924	7.17E-04	0.0055	7.23E-02	1.3835
5.32E-02	0.41	3.27E-02	0.4977	8.18E-04	0.0066	8.23E-02	1.6239
6.26E-02	0.4704	4.29E-02	0.6793	9.17E-04	0.0076	9.23E-02	1.8648
7.32E-02	0.5814	5.25E-02	0.8819	1.02E-03	0.0087	1.11E-01	2.3072
8.27E-02	0.6877	6.24E-02	1.1405	2.29E-03	0.0344	1.58E-01	3.4474
9.27E-02	0.7974	7.26E-02	1.3442	3.20E-03	0.0526	2.08E-01	4.6191
1.12E-01	1.0257	8.28E-02	1.5984	4.20E-03	0.0727	2.58E-01	5.7994
1.61E-01	1.5382	9.29E-02	1.8214	5.30E-03	0.0947	3.08E-01	6.9626
2.11E-01	2.0672	1.11E-01	2.2021	6.18E-03	0.1119	3.58E-01	8.1254
2.61E-01	2.6383	1.60E-01	3.2651	7.17E-03	0.1318	4.08E-01	9.2785
3.10E-01	3.2217	2.10E-01	4.348	9.01E-03	0.1697	4.58E-01	10.4261
3.61E-01	3.8039	2.60E-01	5.4209	9.77E-03	0.1852	5.08E-01	11.5615
4.10E-01	4.4507	3.10E-01	6.4661	1.28E-02	0.2285	5.58E-01	12.6808
4.61E-01	4.8747	3.60E-01	7.4989	2.17E-02	0.4105	6.08E-01	13.8021
5.11E-01	5.442	4.09E-01	8.5963	3.20E-02	0.6177	6.58E-01	14.9023
5.61E-01	5.8676	4.59E-01	9.5523	4.20E-02	0.8208	7.08E-01	15.995
6.11E-01	6.4594	5.10E-01	10.5785	5.14E-02	1.0108	7.58E-01	17.0865
6.61E-01	6.8965	5.60E-01	11.5608	6.16E-02	1.2161	8.08E-01	18.1464
7.10E-01	7.4793	6.09E-01	12.5576	7.19E-02	1.4267	8.58E-01	19.2086
7.61E-01	8.0721	6.59E-01	13.5271	8.17E-02	1.627	9.08E-01	20.2787
8.11E-01	8.5239	7.10E-01	14.5434	9.18E-02	1.8329	9.58E-01	21.3343
8.61E-01	8.9868	7.59E-01	15.5388	1.10E-01	2.1949	9.99E-01	22.2866
9.11E-01	9.555	8.09E-01	16.5288	1.56E-01	3.1308		
9.61E-01	10.0152	8.60E-01	17.4501	2.05E-01	4.1413		
9.99E-01	10.6843	9.09E-01	18.4093	2.55E-01	5.142		
		9.60E-01	19.3073	3.05E-01	6.1509		
		9.99E-01	20.2397	3.55E-01	7.1276		
				4.05E-01	8.1348		
				4.55E-01	9.1037		
				5.05E-01	10.0901		
				5.55E-01	11.0565		
				6.05E-01	12.0253		
				6.55E-01	12.9792		
				7.05E-01	13.9394		
				7.55E-01	14.8803		
				8.05E-01	15.8422		
				8.55E-01	16.7762		
				9.05E-01	17.682		
				9.55E-01	18.5909		
				9.99E-01	19.4387		

Table S21. CH_4 adsorption data of **SNU-174'**, **SNU-175'** and **SNU-176'** at 273 K.

SNU-174'		SNU-175'		SNU-176'	
P (atm)	V_{ads} ($cm^3\ g^{-1}$)	P (atm)	V_{ads} ($cm^3\ g^{-1}$)	P (atm)	V_{ads} ($cm^3\ g^{-1}$)
4.30E-02	0.0648	3.12E-01	0.018	2.33E-03	0.0217
5.31E-02	0.1325	3.62E-01	0.1402	3.23E-03	0.0395
6.32E-02	0.2024	4.12E-01	0.2529	4.04E-03	0.0563
7.27E-02	0.2923	4.62E-01	0.3874	5.04E-03	0.0777
8.28E-02	0.3156	5.12E-01	0.5163	6.25E-03	0.1033
9.27E-02	0.4127	5.62E-01	0.63	7.01E-03	0.119
1.12E-01	0.547	6.12E-01	0.7691	9.08E-03	0.1657
1.61E-01	0.9367	6.62E-01	0.8953	9.87E-03	0.1826
2.11E-01	1.4125	7.11E-01	1.0672	1.29E-02	0.2084
2.61E-01	1.7224	7.61E-01	1.2608	2.24E-02	0.4048
3.11E-01	2.2126	8.11E-01	1.4728	3.25E-02	0.6197
3.61E-01	2.5853	8.62E-01	1.5747	4.27E-02	0.8356
4.11E-01	3.0372	9.12E-01	1.719	5.23E-02	1.041
4.61E-01	3.4497	9.61E-01	1.9224	6.28E-02	1.2661
5.11E-01	3.8493	9.99E-01	1.9959	7.28E-02	1.4823
5.61E-01	4.1905			8.26E-02	1.6917
6.11E-01	4.6359			9.26E-02	1.912
6.62E-01	4.9726			1.11E-01	2.3131
7.10E-01	5.4106			1.60E-01	3.3738
7.61E-01	5.6554			2.09E-01	4.48
8.10E-01	6.1475			2.60E-01	5.5552
8.61E-01	6.4504			3.09E-01	6.6581
9.12E-01	6.8434			3.60E-01	7.6925
9.61E-01	7.1984			4.09E-01	8.7715
9.99E-01	7.6518			4.59E-01	9.8133
				5.09E-01	10.8846
				5.59E-01	11.9118
				6.09E-01	12.9254
				6.59E-01	13.9155
				7.10E-01	14.9759
				7.59E-01	15.976
				8.09E-01	16.9911
				8.59E-01	17.9751
				9.09E-01	18.9883
				9.59E-01	19.9531
				9.99E-01	20.9094

Table S22. CH_4 adsorption data of **SNU-170'**, **SNU-171'**, **SNU-172'** and **SNU-173'** at 298 K.

SNU-170'		SNU-171'		SNU-172'		SNU-173'	
P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})
1.62E-01	0.3189	1.27E-02	0.1442	2.00E-03	0.0094	2.28E-02	0.0471
2.12E-01	0.7472	2.23E-02	0.2577	3.36E-03	0.0243	3.26E-02	0.1741
2.61E-01	1.0319	3.19E-02	0.3755	4.01E-03	0.0313	4.26E-02	0.3051
3.11E-01	1.4084	4.22E-02	0.4958	5.31E-03	0.0457	6.13E-02	0.5391
3.61E-01	1.7068	5.24E-02	0.6544	6.21E-03	0.0552	6.29E-02	0.5624
4.11E-01	2.1507	6.21E-02	0.728	7.22E-03	0.0661	7.27E-02	0.6888
4.61E-01	2.452	7.18E-02	0.8493	9.15E-03	0.0885	8.26E-02	0.8165
5.11E-01	2.739	8.18E-02	0.9864	9.89E-03	0.0969	9.26E-02	0.94
5.61E-01	3.0865	9.17E-02	1.0997	1.30E-02	0.1145	1.11E-01	1.1769
6.12E-01	3.3039	1.11E-01	1.3012	2.27E-02	0.2259	1.60E-01	1.7902
6.62E-01	3.5849	1.60E-01	1.8972	3.22E-02	0.3287	2.10E-01	2.4063
7.11E-01	4.1352	2.09E-01	2.5395	4.19E-02	0.441	2.60E-01	3.042
7.61E-01	4.3341	2.59E-01	3.0927	5.25E-02	0.563	3.10E-01	3.6685
8.11E-01	4.7704	3.09E-01	3.78	6.23E-02	0.6763	3.60E-01	4.3075
8.61E-01	4.9761	3.59E-01	4.3869	7.23E-02	0.7917	4.10E-01	4.9397
9.11E-01	5.4322	4.09E-01	5.0226	8.23E-02	0.9086	4.60E-01	5.5691
9.61E-01	5.7731	4.59E-01	5.5634	9.23E-02	1.0234	5.10E-01	6.2114
9.99E-01	6.1636	5.09E-01	6.1903	1.11E-01	1.2305	5.60E-01	6.8372
		5.59E-01	6.6569	1.58E-01	1.7712	6.10E-01	7.4602
		6.09E-01	7.352	2.08E-01	2.3589	6.60E-01	8.0752
		6.59E-01	7.9488	2.58E-01	2.9282	7.10E-01	8.6984
		7.09E-01	8.6013	3.08E-01	3.5044	7.60E-01	9.3256
		7.59E-01	9.0452	3.58E-01	4.0667	8.10E-01	9.917
		8.09E-01	9.6914	4.08E-01	4.6577	8.60E-01	10.5356
		8.59E-01	10.312	4.58E-01	5.1961	9.10E-01	11.1555
		9.09E-01	10.8992	5.08E-01	5.7649	9.60E-01	11.7526
		9.59E-01	11.3384	5.58E-01	6.3348	9.99E-01	12.3071
		9.99E-01	12.0026	6.07E-01	6.8907		
				6.58E-01	7.4465		
				7.08E-01	8.024		
				7.58E-01	8.5791		
				8.08E-01	9.131		
				8.58E-01	9.6807		
				9.08E-01	10.2327		
				9.58E-01	10.7708		
				9.99E-01	11.2639		

Table S23. CH_4 adsorption data of **SNU-174'**, **SNU-175'** and **SNU-176'** at 298 K.

SNU-174'		**SNU-175'**		**SNU-176'**	
P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})	P (atm)	V_{ads} (cm^3 g^{-1})
1.12E-01	0.0514	Nil	Nil	4.31E-03	0.0083
1.61E-01	0.2658			5.04E-03	0.0151
2.11E-01	0.525			6.09E-03	0.0263
2.61E-01	0.6984			7.26E-03	0.0377
3.11E-01	0.9429			9.21E-03	0.0613
3.62E-01	1.1115			9.91E-03	0.0688
4.12E-01	1.3638			1.32E-02	0.0354
4.62E-01	1.5356			2.33E-02	0.1454
5.12E-01	1.7467			3.28E-02	0.2454
5.61E-01	1.9055			4.27E-02	0.3522
6.11E-01	2.2143			5.31E-02	0.4672
6.61E-01	2.3531			6.31E-02	0.5765
7.11E-01	2.5944			7.31E-02	0.6878
7.61E-01	2.6735			8.30E-02	0.8096
8.11E-01	2.9558			9.30E-02	0.9252
8.61E-01	3.1678			1.12E-01	1.1372
9.11E-01	3.4642			1.61E-01	1.7119
9.61E-01	3.5986			2.11E-01	2.3352
9.99E-01	3.8696			2.61E-01	2.8965
				3.11E-01	3.5343
				3.61E-01	4.0947
				4.11E-01	4.6821
				4.61E-01	5.293
				5.10E-01	5.8703
				5.61E-01	6.4348
				6.11E-01	7.0155
				6.61E-01	7.5451
				7.11E-01	8.1547
				7.61E-01	8.6802
				8.11E-01	9.2801
				8.61E-01	9.857
				9.11E-01	10.4222
				9.61E-01	11.0046
				9.99E-01	11.5466