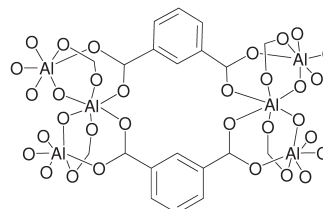


ALUMINUM (Compounds)

13-0300 Aluminum hydroxide isophthalate MOF (CAU-10, Isophthalate:Al=0.9-1.0) (1416330-84-1)
 $\text{Al}(\text{OH})(\text{C}_6\text{H}_4\text{O}_2)_x$, $x = 0.9-1.0$; white solid; SA: 620-640; P.Vol. 0.23-0.27
 Note: Particle size: 0.4-0.7 micron, Thermal stability: 400°C, Activation temperature: 150°C
 Sold under license from Inven2 AS for research purposes only. PCT/GB2009/001087.

500mg
2g



Technical Note:

- MOF exhibits water adsorption characteristics which make it a promising adsorbent for application in heat-exchange processes (ref 1).

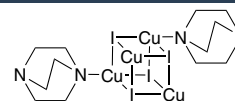
References:

- Water adsorption behaviour of CAU-10-H: a thorough investigation of its structure-property relationships, J. Mater. Chem. A, **2016**, 4, 11859, Dominik Frohlich, Evangelia Pantatosaki, Panagiotis D. Kolokathis, Karen Markey, Helge Reinsch, Max Baumgartner, Monique A. van der Veen, Dirk E. De Vos, Norbert Stock, George K. Papadopoulos, Stefan K. Henninger and Christoph Janiak
- Structures, Sorption Characteristics, and Nonlinear Optical Properties of a New Series of Highly Stable Aluminum MOFs., Chem. Mater. **2013**, 25, 17-26, Helge Reinsch, Monique A. van der Veen, Barbara Gil, Bartosz Marszalek, Thierry Verbiest, Dirk de Vos, and Norbert Stock

COPPER (Compounds)

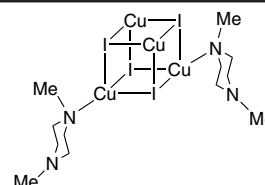
29-3015 Bis(1,4-diazabicyclo [2.2.2]octane)tetra (copper(I) iodide) (CuI_4 (DABCO)₂) (928170-42-7)
 $\text{C}_{12}\text{H}_{24}\text{Cu}_4\text{I}_4\text{N}_4$; FW: 986.15; yellow powdr.; SA: >514; P.Vol. 0.25
air sensitive

500mg
2g



29-0550 Bis(N,N'-dimethylpiperazine)tetra[copper(I) iodide], 98% MOF (1401708-91-5)
 $(\text{CuI})_2(\text{C}_6\text{H}_{14}\text{N}_2)_2$; FW: 990.18; white powdr.
moisture sensitive, (store cold)

500mg
2g



Technical Note:

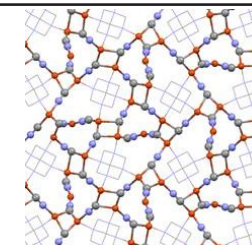
- The copper iodide, N,N'-dimethylpiperazine complex is a 3D photoluminescent, fairly open network, with a lambda max excitation of 321 nm and a lambda max emission of 525nm.

References:

- Dalton Trans., **2012**, 41, 11663

29-0565 (Hexamethylenetetramine)penta[copper(I) cyanide], 98% MOF (1042093-98-0)
 $\text{C}_6\text{H}_{12}\text{N}_4(\text{CuCN})_5$; FW: 588.00; white powdr.
hygroscopic, (store cold)

500mg
2g



Technical Note:

- The copper cyanide hexamethylenetetramine complex is a 3D photoluminescent, very densely-packed, network of tetradentate ligands with a lambda max excitation of 282 and 304nm, and a lambda max emission of 417 and 522nm.

References:

- Inorg. Chem., **2007**, 46, 8897
- Inorg. Chem., **2008**, 47, 6947
- Inorg. Chem. Acta., **2010**, 364, 102
- Dalton Trans., **2012**, 41, 11663

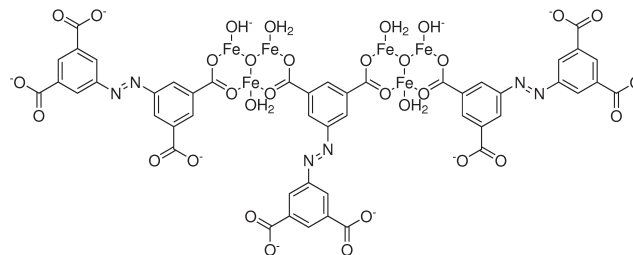
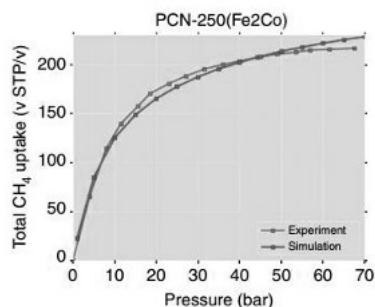
IRON (Compounds)

26-3725 Iron azobenzene tetracarboxylic, Porous [PCN-250(Fe)], CONEKTIC™ F250 (1771755-22-6)
 Dark red-brown powdr.
 Note: Sold in collaboration with framergy for research purposes only. PCT/GB2014/053506

500mg
2g
10g

Technical Note:

- Metal-Organic Framework (MOF) exhibiting superior uptake of hydrogen and methane. Stable in water and aqueous solutions.



References:

- Nat. Commun., **2014**, 5, 5723
- Sci. Technol. Adv. Mater., **2015**, 16, 054202

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IRON (Compounds)

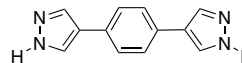
- 26-2340 Iron(III) 1,3,5-benzenetricarboxylate hydrate, porous (F-free MIL-100(Fe), KRICT F100) [Iron trimesate] (1257379-83-1)**
 $[\text{Fe}_3\text{O}(\text{H}_2\text{O})_2(\text{OH})(\text{C}_6\text{H}_3(\text{COO})_3)_2] \cdot \text{XH}_2\text{O}$; red solid; SA: 2120 (Langmuir); 1950 (BET); P.Vol. 1075
 Note: Sold under agreement with KRICT for research and development purposes only.
 Patents US 8507399 B2, US 8252950 B2.



500mg
2g

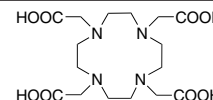
NITROGEN (Compounds)

- 07-0435 1,4-Di(4'-pyrazolyl)benzene, min. 97% H₂BDP (1036248-62-0)**
 $\text{C}_{12}\text{H}_{10}\text{N}_4$; FW: 210.24; pale yellow solid
 Note: Ligand for MOF synthesis.



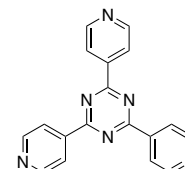
500mg
2g

- 07-1942 1,4,7,10-Tetraazacyclododecane-N,N',N'',N'''-tetraacetic acid, min. 98% DOTA (60239-18-1)**
 $\text{C}_{16}\text{H}_{28}\text{N}_4\text{O}_8$; FW: 404.42; white powdr.
 Note: Ligand for MOF synthesis.



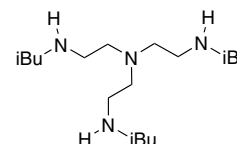
250mg
1g
5g

- 07-3235 2,4,6-(Tri-4-pyridinyl)-1,3,5-triazine, min. 97% TPT (42333-78-8)**
 $\text{C}_{18}\text{H}_{12}\text{N}_6$; FW: 312.33; off-white powdr.
 Note: Ligand for MOF synthesis



250mg
1g
5g

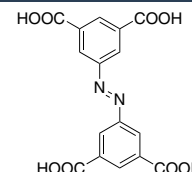
- 07-3110 Tris(isobutylaminoethyl)amine, min 97% (331465-73-7)**
 $\text{C}_{18}\text{H}_{42}\text{N}_6$; FW: 314.55; colorless to pale yellow, viscous liq.
hygroscopic
 Note: Ligand for MOF synthesis.



500mg
2g

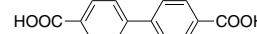
OXYGEN (Compounds)

- 08-0125 3,3',5,5'-Azobenzene tetracarboxylic acid, TazbH₄, 97% (365549-33-33)**
 $\text{C}_{16}\text{H}_{10}\text{N}_2\text{O}_8$; FW: 358.26; yellow-orange powdr.
 Note: Ligand for MOF Synthesis



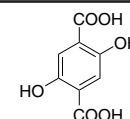
1g
5g

- 08-0175 [1,1'-Biphenyl]-4,4'-dicarboxylic acid, min. 98% (787-70-2)**
 $\text{C}_{14}\text{H}_{10}\text{O}_4$; FW: 242.23; white to pale-yellow solid
 Note: Ligand for MOF synthesis.



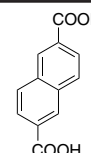
5g
25g

- 08-1220 2,5-Dihydroxyterephthalic acid, 98% H₂DOBDC (610-92-4)**
 $\text{C}_6\text{H}_4(\text{OH})_2(\text{COOH})_2$; FW: 198.13; yellow powdr.
 Note: Ligand for MOF Synthesis



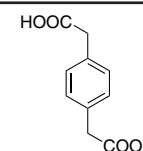
1g
5g
25g

- 08-1235 2,6-Naphthalenedicarboxylic acid, min. 98% (1141-38-4)**
 $\text{C}_{10}\text{H}_6(\text{COOH})_2$; FW: 216.19; white powdr.; m.p. >300°
 Note: Ligand for MOF synthesis.



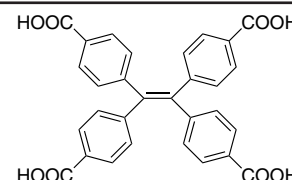
5g
25g

- 08-1165 1,4-Phenylenediacetic acid, 97% (7325-46-4)**
 $\text{C}_8\text{H}_8(\text{CH}_2\text{COOH})_2$; FW: 194.18; white to off-white solid
 Note: Ligand for MOF synthesis.



1g
5g

- 08-3060 1,1,2,2-Tetra(4-carboxylphenyl)ethylene, 99% H₄TCPE (1351279-73-6)**
 $\text{C}_{30}\text{H}_{20}\text{O}_8$; FW: 508.48; pale yellow powdr.
 Note: Ligand for MOF synthesis.



25mg
100mg

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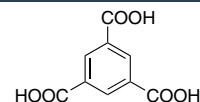
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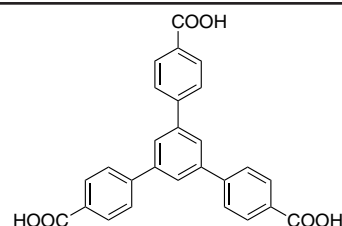
OXYGEN (Compounds)

08-0195 **1,3,5-Tricarboxybenzene, min. 95% (Trimesic acid) BTC (554-95-0)**
 $C_6H_3(COOH)_3$; FW: 210.14; white powdr.
 Note: Ligand for MOF synthesis.



50g
250g

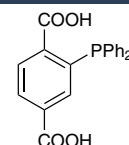
08-0635 **1,3,5-Tris(4-carboxyphenyl)benzene, min. 98% BTB (50446-44-1)**
 $C_{27}H_{18}O_6$; FW: 438.43; white to yellow solid; m.p. 322-327°
 Note: Ligand for MOF synthesis.



1g
5g

PHOSPHORUS (Compounds)

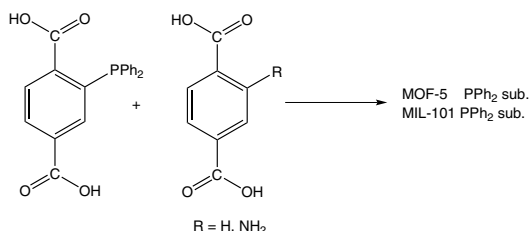
15-7170 **2-(Diphenylphosphino)terephthalic acid, 98% (1537175-69-1)**
 $C_{20}H_{18}O_4P$; FW: 350.30; white powdr.
 Note: Ligand for MOF synthesis. Developed at the Paul Scherrer Institute, Switzerland PCT/EP2013/051405.



50mg
250mg

Technical Note:

- Starting material for the construction of diphenylphosphino-substituted MOFs.



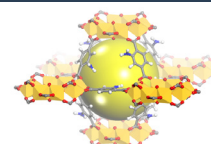
Tech. Note (1)
Ref. (1)

References:

- Ind. Eng. Chem. Res.*, **2014**, 53, 9120.

TITANIUM (Compounds)

22-1070 **Hexakis[μ-(2-amino-1,4-benzenedicarboxylato)][tetra-μ-hydroxyocta-μ-oxooctatitanium], NH₂-MIL-125(Ti), CONEKTIC™ T125 (1309760-94-8)**
 $C_{48}H_{34}N_8O_{36}Ti_8$; FW: 1653.74; yellow powdr.; SA: ~1530; P.Vol. ~0.74
 Note: Sold in collaboration with framergy for research purposes only.
 Patents: US8940392; EP2398812; JP5850750; KR101732623; CA2750746.



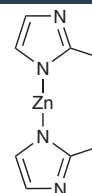
250mg
1g

ZINC (Compounds)

30-4015 **Zinc 2-methylimidazole MOF (ZIF-8) (59061-53-9)**
 HAZ $C_8H_{10}N_4Zn$; FW: 227.58; white solid; SA: 1813; P.Vol. 0.65

Technical Notes:

- Use of ZIF-8 in the separation of alkanes, alkenes and aromatics
 - Separation of xylene isomers
Micropor. Mesopor. Mat., **2013**, 173, 1.
 - Separation of C6 Paraffins
Ind. Eng. Chem. Res., **2012**, 51, 4692.
 - Effective separation of propylene/propane binary mixtures
J. Membrane Sci., **2012**, 390-391, 93.
- Use of ZIF-8 as a catalyst and catalyst-support
 - Catalytic activity of ZIF-8 in the synthesis of styrene carbonate
Chem. Commun., **2013**, 32, 36.
 - Iridium nanoparticles stabilized by metal organic frameworks: synthesis, structural properties and catalytic performance
Dalton Trans., **2012**, 41, 12690.
 - Zeolitic imidazole frameworks: Catalysts in the conversion of carbon dioxide to chloropropene carbonate
ACS Catalysis, **2012**, 2, 180.
 - Expanding applications of metal-organic frameworks: zeolite imidazolate framework ZIF-8 as an efficient heterogeneous catalyst for the Knoevenagel reaction
ACS Catalysis, **2011**, 1, 120.
- Use of ZIF-8 in gas purification
 - MOF-containing mixed-matrix membranes for CO₂/CH₄ and CO₂/N₂ binary gas mixture separations
Sep. Purif. Technol., **2011**, 81, 31.
 - Porous polyethersulfone-supported Zeolitic Imidazolate Framework Membranes for hydrogen separation



1g
5g

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ZIRCONIUM (Compounds)**40-1109 Zirconium aminobenzenedicarboxylate MOF (UiO-66-BDC-NH₂, BDC-NH₂:Zr=0.9-1.0)**

(1260119-00-3)

Zr₆O₄(OH)₄(C₆H₃NO₂)₆, X = 5.4-6.0; yellow solid; SA: 800-850; P.Vol. 0.31-0.35

Note: Particle size: 0.1-0.5 micron, Thermal stability: 300°C, Activation temperature: 150°C

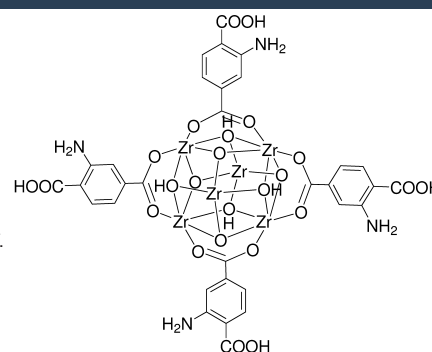
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Technical Notes:

1. Useful MOF for adsorption of CO₂ applications (ref 1).
2. Catalyst MOF used in the conversion of toxic agents to non-toxic products (ref 2).

References:

1. *Carbon Dioxide Adsorption in Amine-Functionalized Mixed-Ligand Metal-Organic Frameworks of UiO-66 Topology*, Chem.Sus.Chem. **2014**, 7, 3382-3388, Ethiraj, J. Albanese, E. Civalieri, B. Vitillo, J. G. Bonino, F. Chavan, S. Shearer, G. C. Lillerud, K. P. Bordiga, S.
2. *Tailoring the Pore Size and Functionality of UiO-Type Metal-Organic Frameworks for Optimal Nerve Agent Destruction*, Inorg. Chem. **2015**, 54, 9684-9686, Gregory W. Peterson, Su-Young Moon, George W. Wagner, Morgan G. Hall, Jared B. DeCoste, Joseph T. Hupp, and Omar K. Farha
3. *Towards Metal-Organic Framework based Field Effect Chemical Sensors: UiO-66-NH₂ for Nerve Agent Detection*, Chem. Sci., **2016**, 7, 5827, Ivo Stassen, Bart Bueken, Helge Reinsch, Jos Oudenhoven, Daan Wouters, Julianna Hajek, Veronique Van Speybroeck, Norbert Stock, Philippe M. Vereecken, Rob Van Schaijk, Dirk De Vos and Rob Ameloot

500mg
2g**40-1108 Zirconium benzenedicarboxylate MOF (UiO-66-BDC, BDC:Zr=0.66-0.98)**Zr₆O₄(OH)₄(C₆H₄O₂)₆, X = 3.96-5.88; white solid; SA: 1050-1400; P.Vol. 0.42-0.58

Note: Particle size: 0.2-0.5 micron, Thermal stability: 400°C, Activation temperature: 300°C

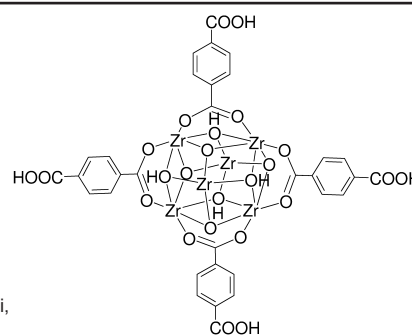
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Technical Note:

1. New zirconium-based inorganic building brick that allows the synthesis of very high surface area MOF's with unprecedented stability (ref 3).

References:

1. *Tuned to Perfection: Ironing Out the Defects in Metal-Organic Framework UiO-66* Chem. Mater. **2014**, 26, 4068-4071, Greig C. Shearer, Sachin Chavan, Jayashree Ethiraj, Jenny G. Vitillo, Stian Svelle, Unni Olsbye, Carlo Lamberti, Silvia Bordiga and Karl Petter Lillerud
2. *H₂ storage in isostructural UiO-67 and UiO-66 MOFs* Phys. Chem. Chem. Phys., **2012**, 14, 1614-1626, Sachin Chavan, Jenny G. Vitillo, Diego Gianolio, Olena Zavorotynska, Bartolomeo Civalieri, Søren Jakobsen, Merete H. Nilsen, Loredana Valenzano, Carlo Lamberti, Karl Petter Lillerud and Silvia Bordiga
3. *A New Zirconium Inorganic Building Brick Forming Metal Organic Frameworks with Exceptional Stability*. J. Am. Chem. Soc. **2008**, 130, 13850-13851, Jasmina Hafizovic Cavka, Søren Jakobsen, Unni Olsbye, Nathalie Guillou, Carlo Lamberti, Silvia Bordiga, and Karl Petter Lillerud

500mg
2g**40-1112 Zirconium biphenyldicarboxylate MOF (UiO-66-BPDC/UiO-67, BPDC:Zr=0.9-1.0)**Zr₆O₄(OH)₄(C₁₄H₈O₄)₆, X = 5.4-6.0; white solid; SA: 2400-2500; P.Vol. 0.85-0.98 cm³/g

moisture sensitive

Note: Particle size: 0.4-0.7 cm³/g, Thermal stability: 450°C

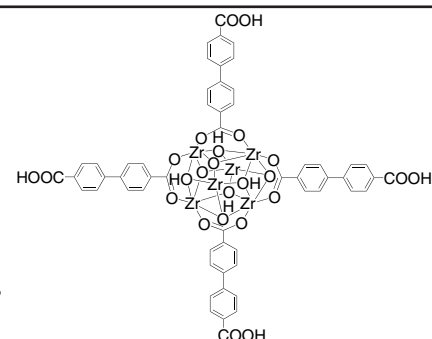
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Technical Notes:

1. Metal-organic framework showing excellent stability to water, reversible water vapor adsorption, and increased volumetric capacity for methane adsorption (ref 1)
2. Remarkable stability at high temperatures, high pressures and in the presence of different solvents, acids and bases (refs 2-3).

References:

1. *UiO-67-type Metal-Organic Frameworks with Enhanced Water Stability and Methane Adsorption Capacity*, Inorg. Chem. **2016**, 55, 1986-1991, Sigurd Øien-Ødegaard, Boris Bouchevreau, Knut Hylland, Lianpao Wu, Richard Blom, Carlos Grande, Unni Olsbye, Mats Tilset, and Karl P. Lillerud
2. *H₂ storage in isostructural UiO-67 and UiO-66 MOFs*, Phys. Chem. Chem. Phys., **2012**, 14, 1614-1626, Sachin Chavan, Jenny G. Vitillo, Diego Gianolio, Olena Zavorotynska, Bartolomeo Civalieri, Søren Jakobsen, Merete H. Nilsen, Loredana Valenzano, Carlo Lamberti, Karl Petter Lillerud and Silvia Bordiga
3. *A New Zirconium Inorganic Building Brick Forming Metal Organic Frameworks with Exceptional Stability*. J. Am. Chem. Soc. **2008**, 130, 13850-13851, Jasmina Hafizovic Cavka, Søren Jakobsen, Unni Olsbye, Nathalie Guillou, Carlo Lamberti, Silvia Bordiga, and Karl Petter Lillerud.

250mg
1g**40-1105 Zirconium 1,4-dicarboxybenzene MOF (UiO-66, BDC:Zr=1) (1072413-89-8)**C₄₈H₂₆O₃₂Zr₆; FW: 1664.06; white powder; SA: 1180-1240m²/g; P.Vol. 0.45-0.48

Note: Particle size: 0.2-0.5 micron, Thermal stability: 400°C, Activation temperature: 300°C

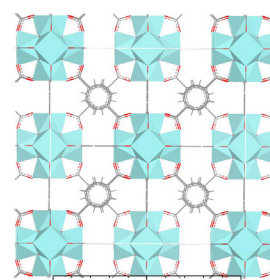
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Technical Note:

1. New zirconium-based inorganic building brick that allows the synthesis of very high surface area MOF's with unprecedented stability (ref 3).

References:

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ZIRCONIUM (Compounds)

40-1114 Zirconium Fumarate MOF (UiO-66-FA, FA:Zr=0.66-0.98)

$Zr_6O_4(OH)_4(C_4H_2O_4)_x$, $x = 3.96-5.88$; white solid; SA: 650-960; P.Vol. 0.26-0.4
Note: Particle size: 0.1-0.5 micron, Thermal stability: 200°C, Activation temperature: 130°C
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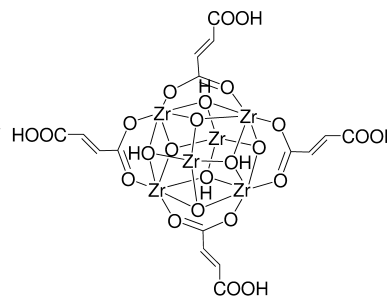
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Technical Notes:

1. Metalorganic framework used in a large number of studies for the storage of hydrogen or methane (ref 2)
2. Water adsorption in MOF's for many applications such as dehumidification, thermal batteries, and delivery of drinking water in remote areas (ref 3)

References:

1. *Water harvesting from air with metal-organic frameworks powered by natural sunlight.* Science, **2017**, 356, 430–434, Hyunho Kim, Sungwoo Yang, Sameer R. Rao, Shankar Narayanan, Eugene A. Kapustin, Hiroyasu Furukawa, Ari S. Umans, Omar M. Yaghi, Evelyn N. Wang
2. *A Facile "Green" Route for Scalable Batch Production and Continuous Synthesis of Zirconium MOFs.* Eur. J. Inorg. Chem. **2016**, 4490–4498. Helge Reinsch, Steve Waitschat, Sachin M. Chavan, Karl Petter Lillerud, and Norbert Stock
3. *Water Adsorption in Porous Metal–Organic Frameworks and Related Materials.* J. Am. Chem. Soc., **2014**, 136, 4369–4381, Hiroyasu Furukawa, Felipe Gándara, Yue-Biao Zhang, Juncong Jiang, Wendy L. Queen, Matthew R. Hudson, and Omar M. Yaghi
4. *A water-born Zr-based porous coordination polymer: Modulated synthesis of Zr-fumarate MOF.* Microporous and mesoporous materials, **2015**, 203, 186–194, Schulze, H. A., Lippke, J., König, S., Sazama, U., Fröba, M., Zahn, Gesa, Schulze, Hendrik Albert, Lippke, Jann, König, Sandra, Sazama, Uta, Fröba, Michael, Behrens, Peter



40-1106 Zirconium trans-1, 2-ethylenedicarboxylic acid MOF (UiO-66-FA, FA:Zr=1)

$Zr_6O_4(OH)_4(C_2H_2O_4)_x$; cream solid; SA: 720-770; P.Vol. 0.29-0.32
Note: Particle size: 0.1-0.5 micron, Thermal stability: 200°C, Activation temperature: 150°C
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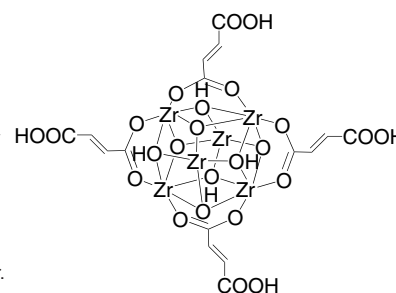
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Technical Notes:

1. Metalorganic framework used in a large number of studies for the storage of hydrogen or methane (ref 2)
2. Water adsorption in MOF's for many applications such as dehumidification, thermal batteries, and delivery of drinking water in remote areas (ref 3)

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40-1111 Zirconium trimellitate MOF (UiO-66-BDC-COOH, BDC-COOH:Zr=0.9-1.0)

$Zr_6O_4(OH)_4(C_6H_4O_6)_x$, $x = 5.4-6.0$; white solid; SA: 550-600; P.Vol. 0.25-0.27
Note: Particle size: 0.2-0.5 micron, Thermal stability: 350°C, Activation temperature: 150°C
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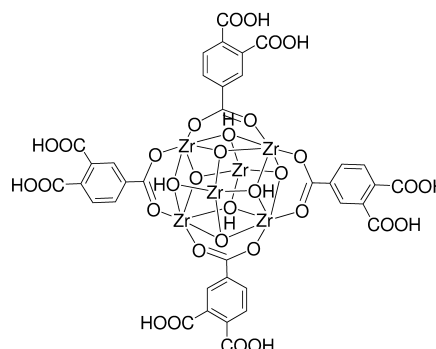
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Technical Notes:

1. MOF for which the introduction of copper markedly increases ammonia adsorption capacities (ref 1)
2. Functionalized forms show the highest selectivity, good working capacity and medium ranged CO₂ adsorption enthalpy that make these materials very promising for physi-sorption-based processes (ref 2)

References:

1. *Engineering Copper Carboxylate Functionalities on Water Stable Metal–Organic Frameworks for Enhancement of Ammonia Removal Capacities.* J. Phys. Chem. C, **2017**, 121, 3310–3319, Jayraj N. Joshi, Erika Y. Garcia-Gutierrez, Colton M. Moran, Jacob I. Deneff, and Krista S. Walton
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