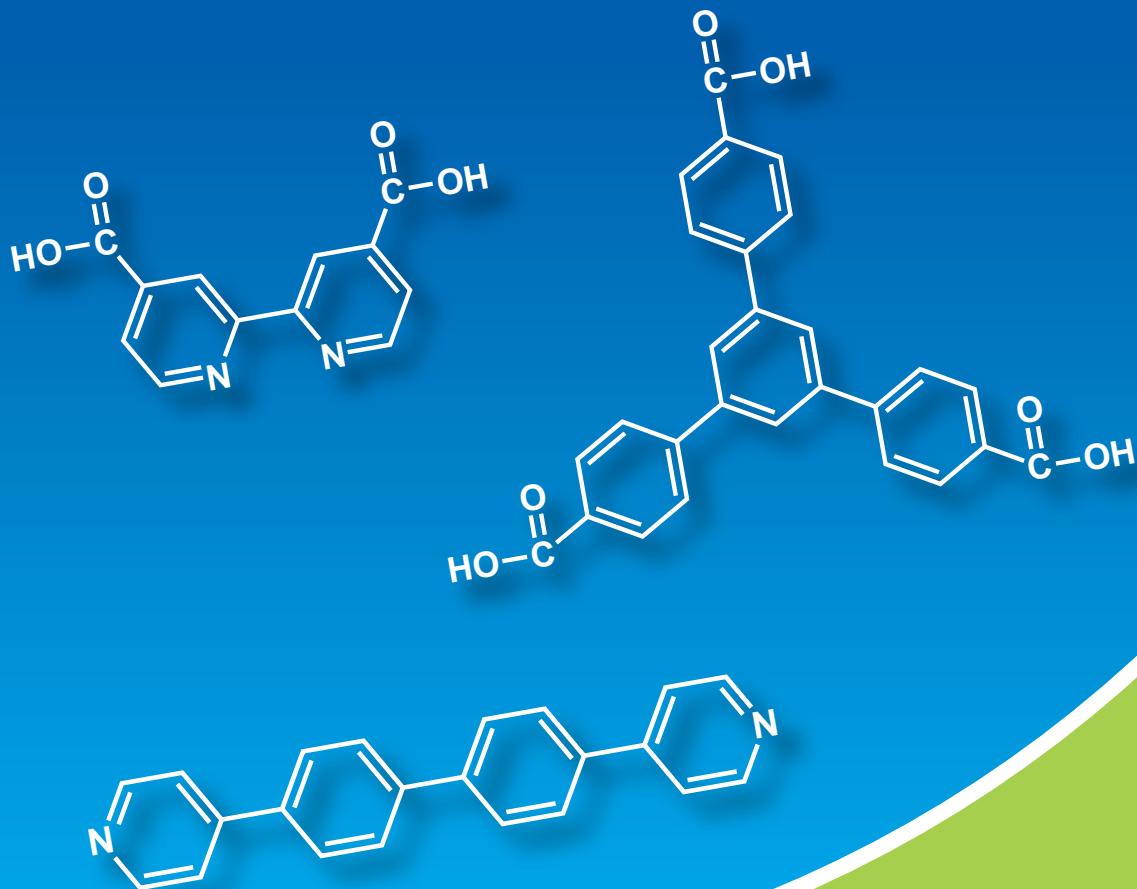


# Organic Linker Molecules for Metal Organic Frameworks (MOFs)



Oxygenated Organic Linkers

Nitrogenated Organic Linkers

Other Organic Linkers

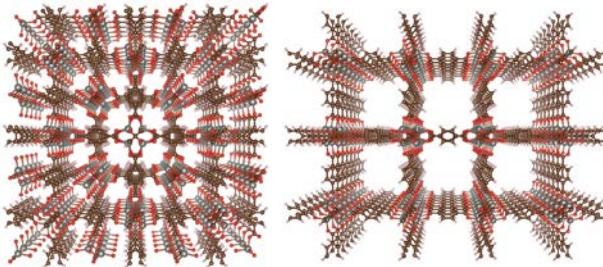
# Organic Linker Molecules for Metal Organic Frameworks (MOFs)

More than 20,000 examples of metal organic frameworks (MOFs) and porous coordination polymers (PCPs) have been reported to date. The unique structures of MOFs and PCPs have allowed for extensive and varied chemical combinations between metal ions and organic ligands.<sup>1,2)</sup> MOFs and PCPs feature porous coordination networks with extensive surface area, exceeding that of activated carbon and zeolite. The nanometer sized pores are capable of absorbing small molecules, and are expected to be used in applications for gas storage and separation, sensors, and for catalysis.

Imidazole-based metal organic frameworks with a zeolitic function, the so-called ZIFs (Zeolitic Imidazolate Frameworks), have received great attention due to the thermodynamic stability, chemical stability, and particularly they are stable in water.<sup>3,4)</sup>

The 'crystal sponge method', wherein MOFs and PCPs uptake small molecules, enables us to solve the X-ray structure of small molecules by taking advantage of the crystalline nature of MOF's and PCP's. A task otherwise impossible for small molecules whom do not easily crystalize. X-ray structure analyses of amorphous and gas organic molecules are also possible by the method.<sup>5,6)</sup>

We are able to design various MOFs and PCPs by taking into account the metal coordination number and organic ligand structure, as well as identify a unique function for the given MOF or PCP by introducing additional functional groups on the organic ligand. TCI offers rich variety of organic ligands (organic linker) for the design various MOFs/PCPs.

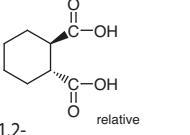
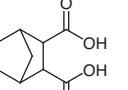
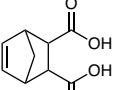
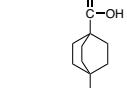
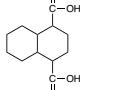
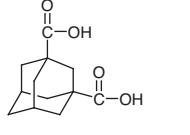
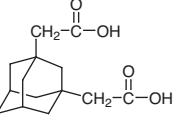
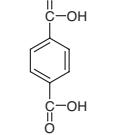
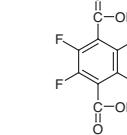
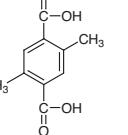
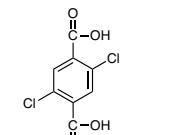
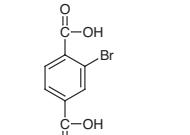
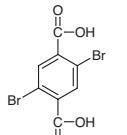
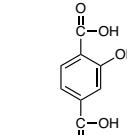
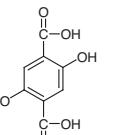
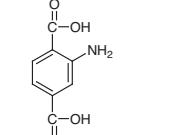
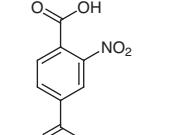
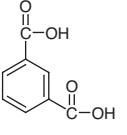
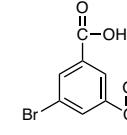
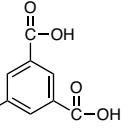
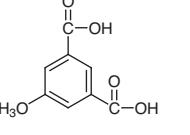
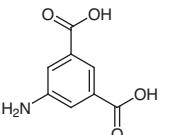
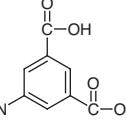
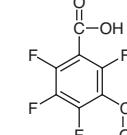
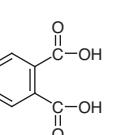
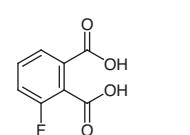
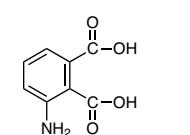
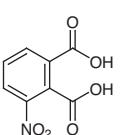
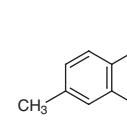
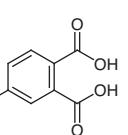
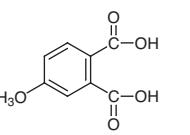
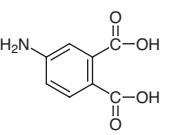
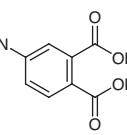
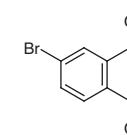
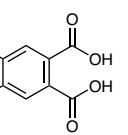
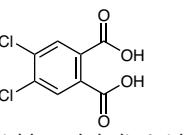
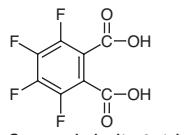
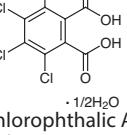
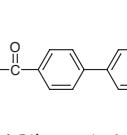
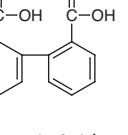


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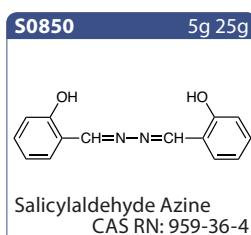
## Oxygenated Organic Linkers

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<b>C0789</b>	25g 100g		<b>C2186</b>	5g 25g		<b>C1953</b>	1g 5g		<b>C0458</b>	25g 500g	
trans-1,4-Cyclohexanedicarboxylic Acid CAS RN: 619-82-9			cis-1,4-Cyclohexanedicarboxylic Acid CAS RN: 619-81-8			1,3-Cyclohexanedicarboxylic Acid (cis- and trans- mixture) CAS RN: 3971-31-1			(1R,2R)-1,2-Cyclohexanedicarboxylic Acid CAS RN: 46022-05-3		

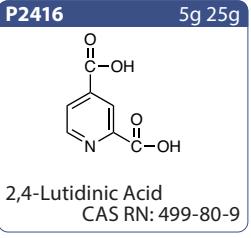
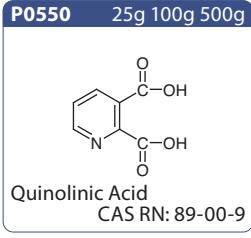
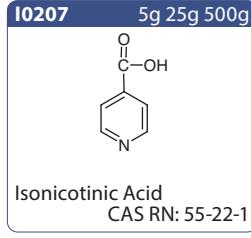
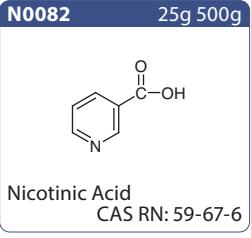
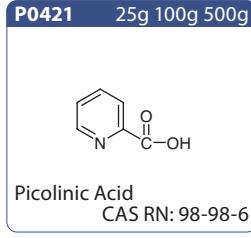
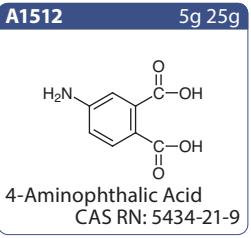
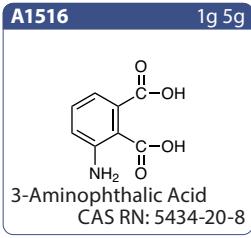
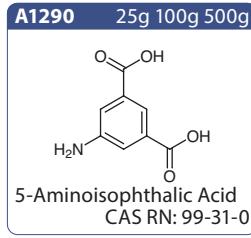
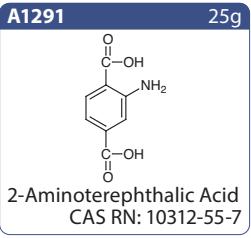
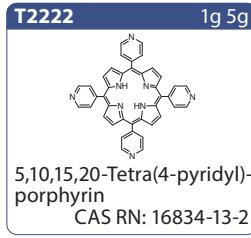
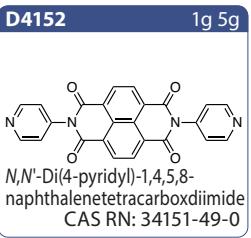
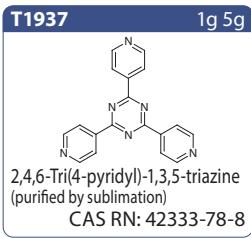
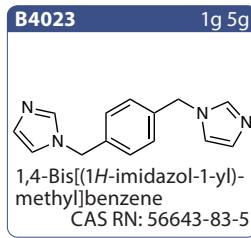
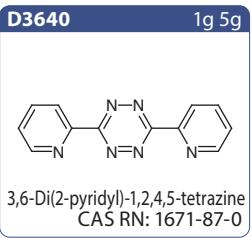
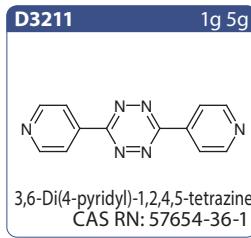
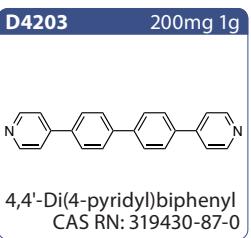
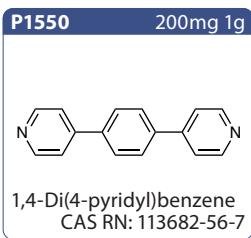
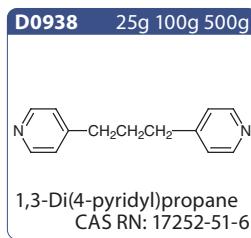
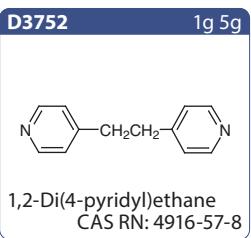
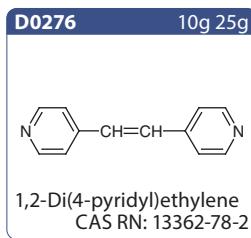
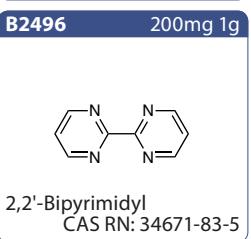
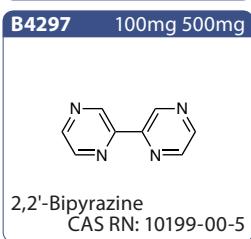
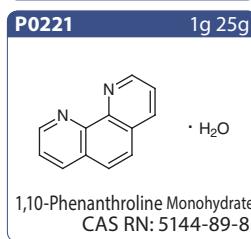
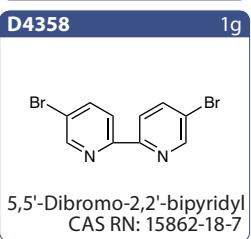
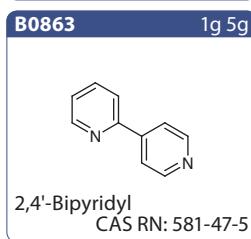
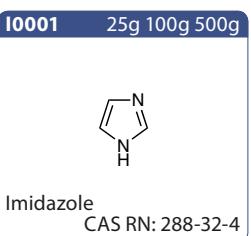
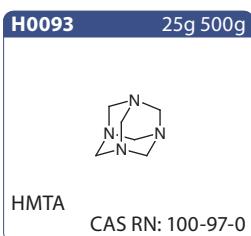
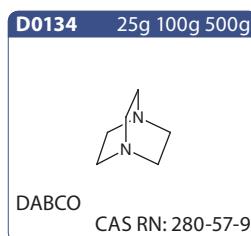
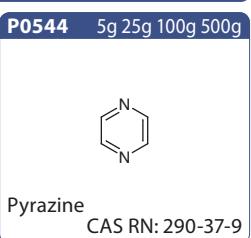
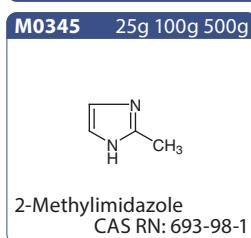
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<b>A1358</b>  1,3-Dicarboxyadamantane CAS RN: 39269-10-8	<b>A1357</b>  1,3-Adamantanediacetic Acid CAS RN: 17768-28-4	<b>T0166</b>  Terephthalic Acid CAS RN: 100-21-0	<b>T0930</b>  Tetrafluoroterephthalic Acid CAS RN: 652-36-8	<b>D2208</b>  2,5-Dimethylterephthalic Acid CAS RN: 6051-66-7
<b>D1698</b>  2,5-Dichloroterephthalic Acid CAS RN: 13799-90-1	<b>B1321</b>  Bromoterephthalic Acid CAS RN: 586-35-6	<b>D3994</b>  2,5-Dibromoterephthalic Acid CAS RN: 13731-82-3	<b>H1385</b>  2-Hydroxyterephthalic Acid CAS RN: 636-94-2	<b>D3899</b>  2,5-Dihydroxyterephthalic Acid CAS RN: 610-92-4
<b>A1291</b>  2-Aminoterephthalic Acid CAS RN: 10312-55-7	<b>N0272</b>  Nitrotetraphthalic Acid CAS RN: 610-29-7	<b>I0155</b>  Isophthalic Acid CAS RN: 121-91-5	<b>B4232</b>  5-Bromoisophthalic Acid CAS RN: 23351-91-9	<b>H0794</b>  5-Hydroxyisophthalic Acid CAS RN: 618-83-7
<b>M1835</b>  5-Methoxyisophthalic Acid CAS RN: 46331-50-4	<b>A1290</b>  5-Aminoisophthalic Acid CAS RN: 99-31-0	<b>N0520</b>  5-Nitroisophthalic Acid CAS RN: 618-88-2	<b>T1374</b>  Tetrafluoroisophthalic Acid CAS RN: 1551-39-9	<b>P0287</b>  Phthalic Acid CAS RN: 88-99-3
<b>F0353</b>  3-Fluorophthalic Acid CAS RN: 1583-67-1	<b>A1516</b>  3-Aminophthalic Acid CAS RN: 5434-20-8	<b>N0243</b>  3-Nitrophthalic Acid CAS RN: 603-11-2	<b>M0560</b>  4-Methylphthalic Acid CAS RN: 4316-23-8	<b>H0609</b>  4-Hydroxyphthalic Acid CAS RN: 610-35-5
<b>M1432</b>  4-Methoxyphthalic Acid CAS RN: 1885-13-8	<b>A1512</b>  4-Aminophthalic Acid CAS RN: 5434-21-9	<b>N0244</b>  4-Nitrophthalic Acid CAS RN: 610-27-5	<b>B2257</b>  4-Bromophthalic Acid CAS RN: 6968-28-1	<b>D6038</b>  4,5-Difluorophthalic Acid CAS RN: 18959-31-4
<b>D2350</b>  4,5-Dichlorophthalic Acid CAS RN: 56962-08-4	<b>T0986</b>  Tetrafluorophthalic Acid CAS RN: 652-03-9	<b>T0070</b>  Tetrachlorophthalic Acid Hemihydrate CAS RN: 632-58-6	<b>B1191</b>  4,4'-Bibenzonic Acid CAS RN: 787-70-2	<b>D0864</b>  2,2'-Bibenzonic Acid CAS RN: 482-05-3

## Organic Linker Molecules for Metal Organic Frameworks (MOFs)

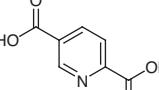
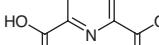
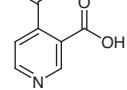
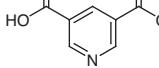
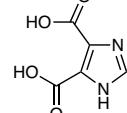
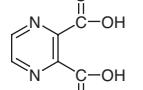
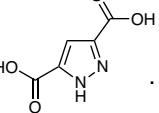
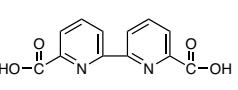
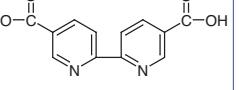
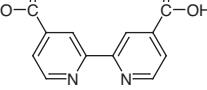
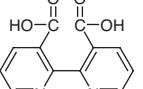
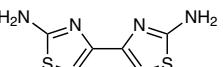
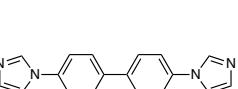
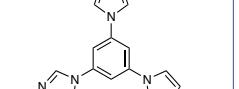
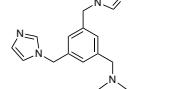
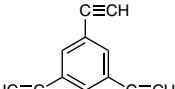
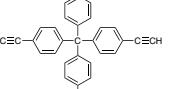
<b>N0526</b> 2,3-Naphthalenedicarboxylic Acid CAS RN: 2169-87-1	<b>N0606</b> 1,4-Naphthalenedicarboxylic Acid CAS RN: 605-70-9	<b>N0377</b> 2,6-Naphthalenedicarboxylic Acid CAS RN: 1141-38-4	<b>A1681</b> Anthraquinone-2,3-dicarboxylic Acid CAS RN: 27485-15-0	<b>D2115</b> 4,4'-Dicarboxyldiphenyl Ether CAS RN: 2215-89-6
<b>A1596</b> 4,4'-Azodibenzoic Acid CAS RN: 586-91-4	<b>F0710</b> 2,5-Furandicarboxylic Acid CAS RN: 3238-40-2	<b>T2347</b> 2,5-Thiophenedicarboxylic Acid CAS RN: 4282-31-9	<b>C2029</b> 1,3,5-Cyclohexanetricarboxylic Acid ( <i>cis</i> - and <i>trans</i> -mixture) CAS RN: 25357-95-3	<b>B0043</b> 1,3,5-Benzenetricarboxylic Acid CAS RN: 554-95-0
<b>H1592</b> Hemimellitic Acid CAS RN: 569-51-7	<b>B0042</b> Trimellitic Acid CAS RN: 528-44-9	<b>B5795</b> [1,1'-Biphenyl]-3,4',5-tricarboxylic Acid CAS RN: 677010-20-7	<b>T2647</b> 1,3,5-Tris(4-carboxyphenyl)-benzene CAS RN: 50446-44-1	<b>C2502</b> 1,2,3,4-Cyclobutane-tetracarboxylic Acid CAS RN: 53159-92-5
<b>C0856</b> 1,2,3,4-Cyclopentane-tetracarboxylic Acid CAS RN: 3724-52-5	<b>C2198</b> 1,2,4,5-Cyclohexane-tetracarboxylic Acid CAS RN: 15383-49-0	<b>B0039</b> Pyromellitic Acid CAS RN: 89-05-4	<b>B3792</b> Biphenyl-3,3',5,5'-tetracarboxylic Acid CAS RN: 4371-28-2	<b>N0770</b> 1,4,5,8-Naphthalenetetracarboxylic Acid (contains Monoanhydride) CAS RN: 128-97-2
<b>T0975</b> Tetrahydrofuran-2,3,4,5-tetracarboxylic Acid CAS RN: 26106-63-8	<b>A5015</b> TCPP CAS RN: 14609-54-2	<b>B0952</b> Benzenepentacarboxylic Acid CAS RN: 1585-40-6	<b>B0246</b> Mellitic Acid CAS RN: 517-60-2	<b>P0421</b> Picolinic Acid CAS RN: 98-98-6
<b>N0082</b> Nicotinic Acid CAS RN: 59-67-6	<b>I0207</b> Isonicotinic Acid CAS RN: 55-22-1	<b>P0550</b> Quinolinic Acid CAS RN: 89-00-9	<b>P2416</b> 2,4-Lutidinic Acid CAS RN: 499-80-9	<b>P0552</b> Isocinchomeronic Acid CAS RN: 100-26-5
<b>P0554</b> Dipicolinic Acid CAS RN: 499-83-2	<b>P0682</b> Cinchomeronic Acid CAS RN: 490-11-9	<b>P0551</b> 3,5-Pyridinedicarboxylic Acid CAS RN: 499-81-0	<b>I0003</b> 1 <i>H</i> -Imidazole-4,5-dicarboxylic Acid CAS RN: 570-22-9	<b>P1048</b> Pyrazole-3,5-dicarboxylic Acid Monohydrate CAS RN: 303180-11-2
<b>P0545</b> 2,3-Pyrazinedicarboxylic Acid CAS RN: 89-01-0	<b>B3533</b> 2,2'-Bipyridine-6,6'-dicarboxylic Acid CAS RN: 4479-74-7	<b>B3502</b> 2,2'-Bipyridine-5,5'-dicarboxylic Acid CAS RN: 1802-30-8	<b>B1876</b> 2,2'-Biisonicotinic Acid CAS RN: 6813-38-3	<b>B3622</b> 2,2'-Bipyridine-3,3'-dicarboxylic Acid CAS RN: 4433-01-6



## Nitrogenated Organic Linkers



## Organic Linker Molecules for Metal Organic Frameworks (MOFs)

<b>P0552</b>  Isocinchomeronic Acid CAS RN: 100-26-5	<b>P0554</b>  Dipicolinic Acid CAS RN: 499-83-2	<b>P0682</b>  Cinchomeronic Acid CAS RN: 490-11-9	<b>P0551</b>  3,5-Pyridinedicarboxylic Acid CAS RN: 499-81-0	<b>I0003</b>  1 <i>H</i> -Imidazole-4,5-dicarboxylic Acid CAS RN: 570-22-9
<b>P0545</b>  2,3-Pyrazinedicarboxylic Acid CAS RN: 89-01-0	<b>P1048</b>  Pyrazole-3,5-dicarboxylic Acid Monohydrate CAS RN: 303180-11-2	<b>B3533</b>  2,2'-Bipyridine-6,6'-dicarboxylic Acid CAS RN: 4479-74-8	<b>B3502</b>  2,2'-Bipyridine-5,5'-dicarboxylic Acid CAS RN: 1802-30-8	<b>B1876</b>  2,2'-Bisisonicotinic Acid CAS RN: 6813-38-3
<b>B3622</b>  2,2'-Bipyridine-3,3'-dicarboxylic Acid CAS RN: 4433-01-6	<b>D4273</b>  2,2'-Diamino-4,4'-bithiazole CAS RN: 58139-59-6	<b>D5777</b>  4,4'-Di(1 <i>H</i> -imidazol-1-yl)-1,1'-biphenyl CAS RN: 855766-92-7	<b>T3903</b>  1,3,5-Tri(1 <i>H</i> -imidazol-1-yl)benzene CAS RN: 528543-96-6	<b>T3479</b>  1,3,5-Tris[(1 <i>H</i> -imidazol-1-yl)methyl]benzene CAS RN: 147951-02-8
<b>Other Organic Linkers</b>		<b>T2760</b>  1,3,5-Triethynylbenzene CAS RN: 7567-63-7	<b>T3151</b>  Tetrakis(4-ethynylphenyl)methane CAS RN: 177991-01-4	

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