

Click Chemistry

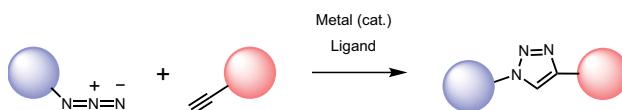


Click Chemistry

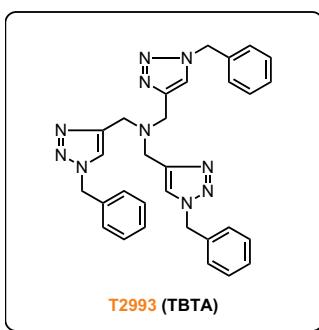
"Click Chemistry" is a term which was first described by K. B. Sharpless of the *Scripps Research Institute* in 2001 to describe reactions that afford products in high yields and in excellent selectivities by carbon-hetero bond formation reactions. The term "Click" means joining molecular pieces as easily as clicking together the two pieces of a seat belt buckle. In general, the definition of click chemistry is described as follows:

1. give very high chemical yields of desired products
2. combination of readily available simple building blocks
3. generate almost no byproducts
4. simple product isolation by non-chromatographic methods
5. reaction proceeds in water, as well as in organic solvents

While there are a number of reactions that fulfill this criteria, the Huisgen 1,3-dipolar [3 + 2] cycloaddition¹⁾ of azides and alkynes has emerged as the frontrunner. In general, the 1,2,3-triazole ring is not almost oxidized or reduced, which makes it possible to strongly connect two substrates.



In the Huisgen reaction, metal catalysts, such as copper sulfate, are generally required for reaction acceleration. In especial, it has been reported that the combination of tris[(1-benzyl-1*H*-1,2,3-triazol-4-yl)methyl]amine (TBTA) (**T2993**) and catalysts shows excellent reactivity.²⁾

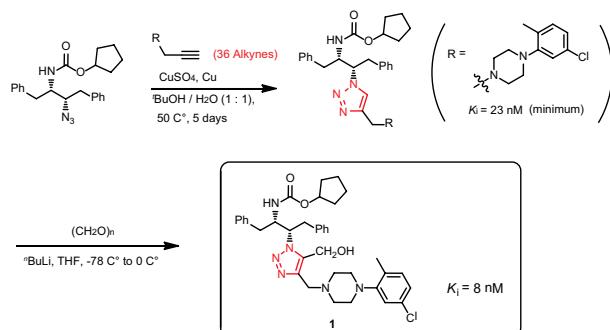


This reaction system affords desired products in almost 100% yield with no need of repurification, such as recrystallization or column chromatography. Thus, this methodology is an eco-friendly reaction. Moreover, the combination of various alkynes and azides allows it to rapidly construct large compound libraries, and 1,2,3-triazole itself exhibits various kinds of biological activities, such as anti-allergenic or anti-bacterial activities. In addition, the reaction proceeds even in water, and thus, click chemistry has been widely used in many research fields as below.

● Research of Various Pharmaceutical Lead Candidates

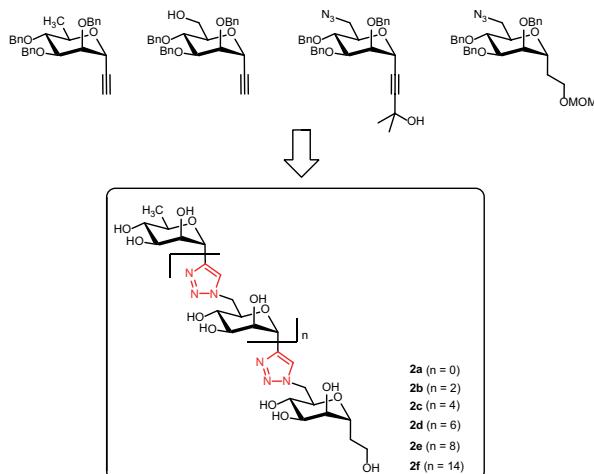
a) Application of Anti-HIV Agent Discovery³⁾

Whiting and Sharpless *et al.* have reported the synthesis of a series of 1,4-disubstituted-1,2,3-triazoles as potential candidates for HIV protease inhibitors in a combination of azide-containing fragments with a diverse array of functionalized alkyne-containing building blocks by using click chemistry. After further optimization, it was revealed that **1** has the highest activity, exhibiting 8 nM of K_i value.



b) Research of *Mycobacterium Tuberculosis* Cell Wall Synthetase⁴⁾

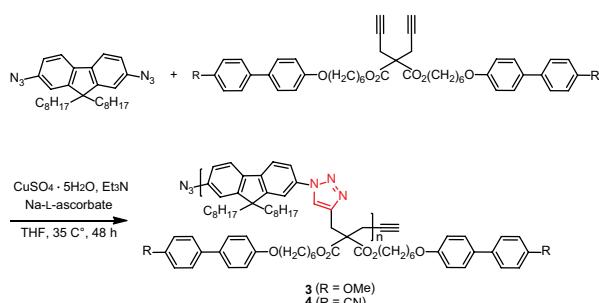
Dondoni *et al.* have reported the synthesis of a set of C-oligomannosides (**2a-f**) through click chemistry using a 1,2,3-triazole ring as the interglycosidic linker. The compounds **2a-f** inhibit mannosyltransferases, which are involved in the biosynthesis of the cell envelope of *Mycobacterium tuberculosis* cell wall synthetase. Among them, the hexamer ($n = 4$) **2c** and octamer ($n = 6$) **2f** show the highest activities $IC_{50} = 0.14$ and 0.22 mM, respectively.



● Synthesis of Functional Materials

Click chemistry has been also successfully applied into polymer synthesis or material science. For example, Kang and Jin *et al.* have reported the synthesis of side-chain liquid-crystal polymers **3** and **4** by

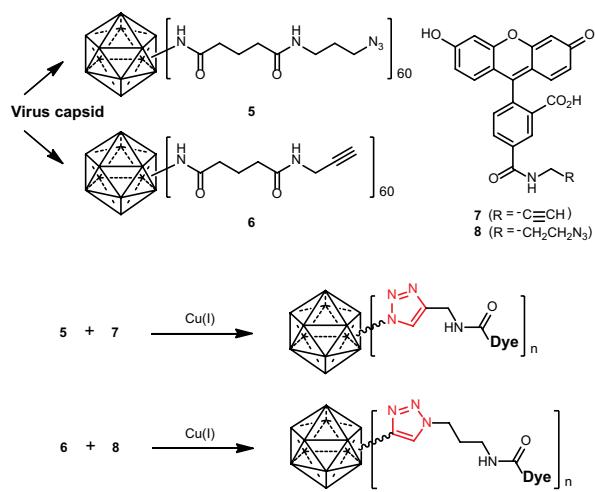
using click chemistry. According to their results, the dye-sensitized solar-cell fabricated from **3** gives a power-conversion efficiency of 4.11%.⁵⁾



Bioscience

Bioconjugation (example: surface modification of virus)⁶⁾

In general, viruses are made up of a number of protein subunits, and capsids, which enclose DNA or RNA, are formed as protein shells. In particular, in the case of spherical viruses, the capsids have an icosahedral symmetry form with sixty protein subunits. Finn and Sharpless *et al.* have reported the modification of the exterior surface of a spherical virus, *cowpea mosaic virus* by azides or alkynes, followed by the labeling of these species using fluorescein dye-azide or alkyne by click chemistry.



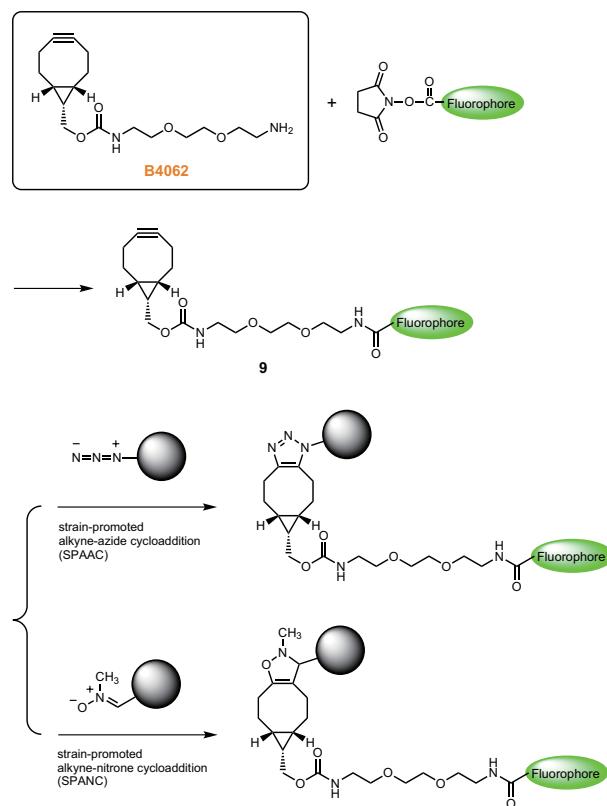
Thus, click chemistry has been widely used as a methodology of synthesizing novel molecules in a number of research fields. Other than these applications, click chemistry also has been applied in various fields, such as the synthesis of dendrimers,⁷⁾ dendrons,⁸⁾ calyxarenes,⁹⁾ rotaxanes,¹⁰⁾ catenanes,¹¹⁾ the development of chemical sensors,¹²⁾ and the labeling of DNA.¹³⁾

Copper-free Click Reaction

As described above, click chemistry also has been used for imaging labeling and tracking labeling of biomolecules. However, the reaction is not suitable for labeling of living systems because it needs a highly-

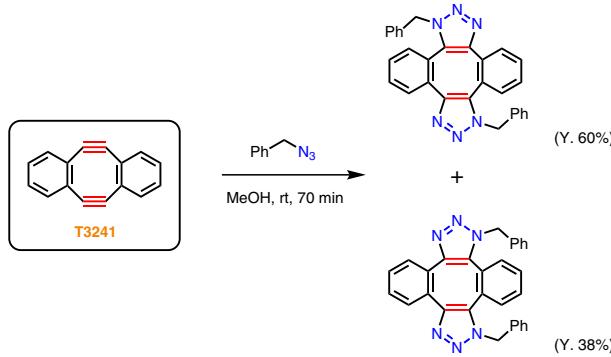
concentrated copper(I) species, thus, bioorthogonal reactions such as metal-free click chemistry also have been developed.

N-(1*R*,8*S*,9*s*)-bicyclo[6.1.0]non-4-yn-9-ylmethyloxycarbonyl-1,8-diamino-3,6-dioxaoctane (BCN- amine) (**B4062**) is a linker having a strained structure with cyclooctyne, and it is used for the copper-free click reaction to azides. For example, **B4062** bonded to a fluorophore (**9**) has resulted in labeling of an azidohomoalanine-containing virus capsid protein without copper(I) species.¹⁴⁾ In addition, **B4062** can be applied to not only strain-promoted alkyne-azide cycloaddition (SPAAC)¹⁵⁾ but also strain-promoted alkyne-nitrone cycloaddition (SPANC).¹⁶⁾



Additionally, Hosoya *et al.* have reported the "double-click reaction" applying 5,6,11,12-tetradehydronaphthalene-5,11,12,12-tetrahydrobenzo[a,e]cyclooctene (**T3241**)¹⁷⁾ in click chemistry. The high reactivity of the two alkyne moieties allows the reaction to proceed smoothly without using metal catalysts, such as a copper salt.¹⁸⁾

Metal-Free Double-click Reaction

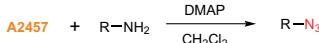
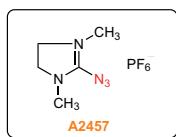


TCI offers a variety of azide and terminal acetylene compounds readily available in the field of click chemistry as below. In addition, azidation and ethynylation reagents are also listed in this brochure.

● Azidation Reagent

Organic azide compounds can be synthesized in a simple manner by the reaction of sodium azide with halogenated alkyl compounds, or the reaction with trifluoromethanesulfonyl azide and primary amines, however, these azide sources potentially have highly explosive character, which makes it difficult to handle. 2-Azido-1,3-dimethylimidazolinium hexafluorophosphate (**A2457**), which was developed by Kitamura *et al.*, is a crystalline diazotransfer reagent having high thermal stability and low explosibility. The differential scanning calorimetry (DSC) experiment of **A2457** has revealed that the exothermic decomposition temperature was approximately 200 °C. Moreover, **A2457** has tested negative for the impact and friction-sensitivity tests.¹⁹⁾

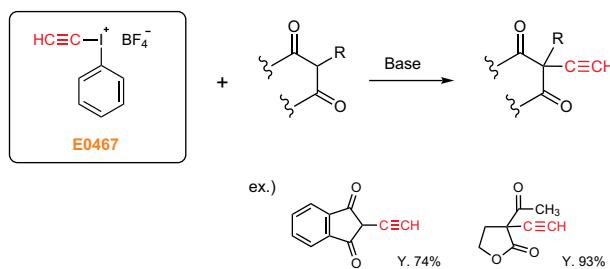
Under basic conditions, **A2457** reacts with several kinds of primary amines in a short time to afford the corresponding diazo compounds in high yields.²⁰⁾ In these reactions, the by-products can be removed by conventional extraction procedures due to their high solubility in water.



Entry	R	A2457(eq.)	DMAP (eq.)	Temp.	Time (h)	Yield (%)
1	Ph	1.15	1.1	rt	2.5	87
2	4-MeC ₆ H ₄	1.15	1.1	rt	1.5	94
3	4-AcC ₆ H ₄	1.15	3	50 °C	5	83
4	4-O ₂ N ₂ C ₆ H ₄	2	3	50 °C	4	61
5	1-naphthyl	1.3	1.1	50 °C	1.5	92
6	PhCH ₂ CH ₂	1.15	5 ^{a)}	rt	0.25	74
7	1-adamantyl	1.15	1.1	rt	0.33	71

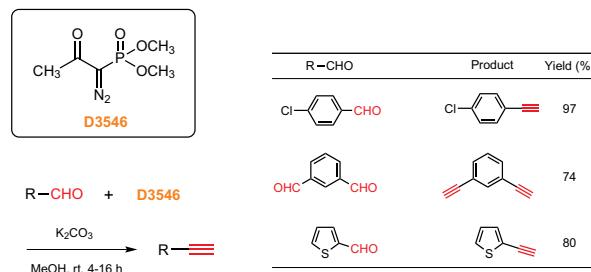
^{a)} Et₃N is used instead of DMAP.

been at the center of attention in many fields, as this method does not use highly toxic heavy metal compounds, and the reaction proceeds under mild conditions.

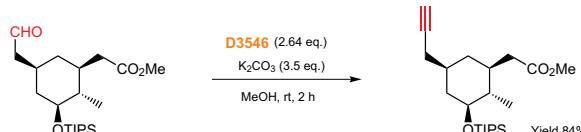


Additionally, (1-diazo-2-oxopropyl)phosphonate (**D3546**) is a reagent for the synthesis of terminal alkynes, which was developed by Ohira and Bestmann *et al.*^{21,22)} **D3546** reacts with aldehydes in the presence of potassium carbonate and methanol to give the one homologated terminal alkynes in high yields. **D3546** is widely known as the "Ohira-Bestmann reagent" after its discoverers and the reaction proceeds in mild conditions without using strong bases.

(Application 1)²²⁾



(Application 2)²³⁾



● Ethynylation Reagents

A number of ethynylation reagents have been developed for the synthesis of terminal acetylenes. For example, ethynyl(phenyl) iodonium tetrafluoroborate (**E0467**) is an electrophilic ethynylation reagent developed by Ochiai *et al.*, which reacts with active methylene compounds to afford the corresponding α -ethynylated products in high yields under mild conditions. As for other existing electrophilic ethynylation reagents, ethyl lead triacetate has been exploited, which is prepared from ethynyl(trimethyl)stannane and lead tetraacetate. However, preparation of this reagent requires the use of heavy metal compounds, which make it an unattractive procedure. The ethynylation procedure using this reagent requires careful control of the reaction conditions. The ethynylation method using **E0467** has

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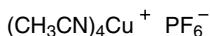
The list of products

We introduce our products according to their structure.

Metal Catalysts & Ligands · · · · ·	7	Cu-free Click Reaction Reagents · · ·	14
Azides · · · · · · · · · · ·	7	Azidation Reagents · · · · · · ·	15
Organic Azides	7	Ethynylation Reagents	15
PEG Azides	8		
Sugar Azides	8		
Terminal Alkynes · · · · ·	9		
Aliphatic Hydrocarbons	9		
Aromatic Hydrocarbons	10		
Alcohols	11		
Carboxylic Acids & Esters	12		
Amines	12		
Heterocyclic Compounds	13		
Steroids	13		
Polyethylene Glycols (PEG)	13		
Others	14		

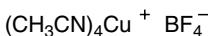
Metal Catalysts & Ligands

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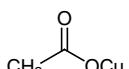
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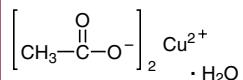
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Tetrafluoroborate
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A1540 5g 25g



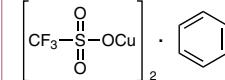
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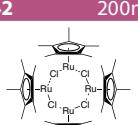
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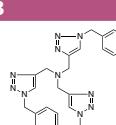
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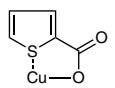
Chloro(pentamethylcyclopentadienyl)ruthenium(II) Tetramer
CAS RN: 113860-07-4

T2993 1g 5g



Tris[(1-benzyl-1H-1,2,3-triazol-4-yl)methyl]amine (TBTA)
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C2312 1g 5g



Copper(I) 2-Thiophenecarboxylate
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C1952 25g 300g



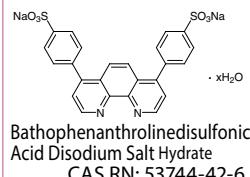
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B0989 1g

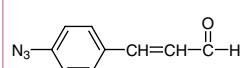


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Azides

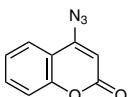
Organic Azides

A0971 5g



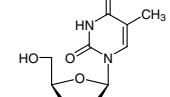
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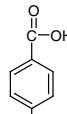
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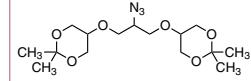
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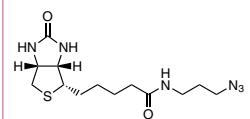
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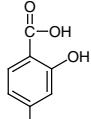
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A2524 100mg



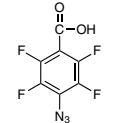
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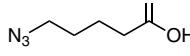
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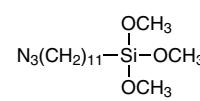
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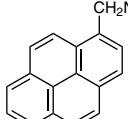
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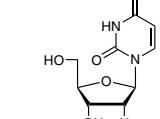
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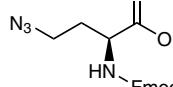
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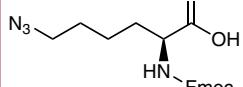
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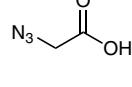
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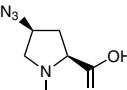
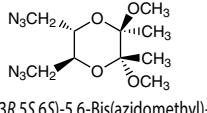
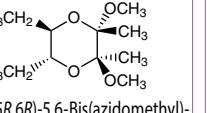
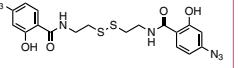
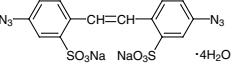
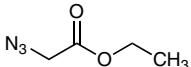
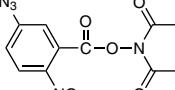
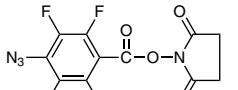
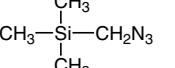
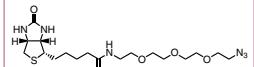
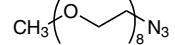
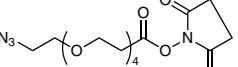
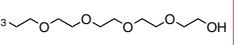
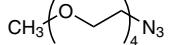
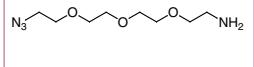
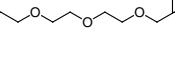
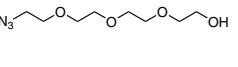
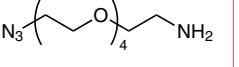
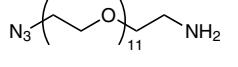
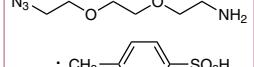
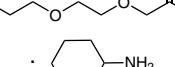
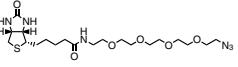
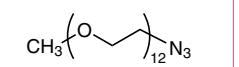
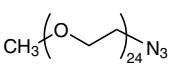
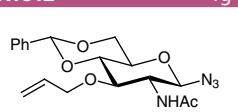
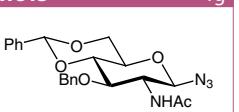
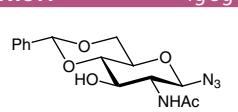
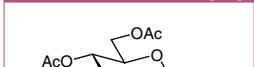
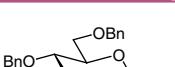
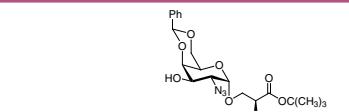
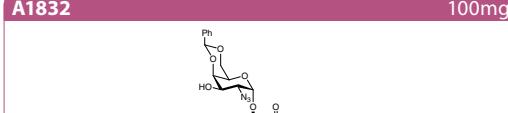
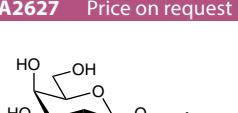
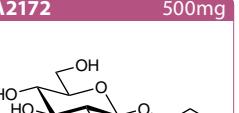
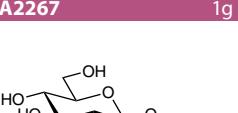
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CAS RN: 159610-89-6

A3079 1g



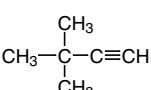
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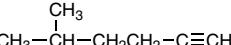
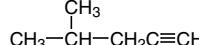
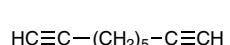
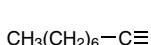
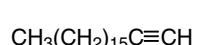
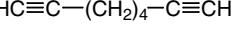
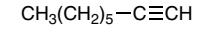
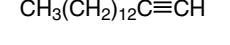
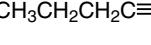
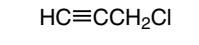
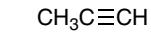
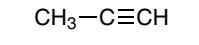
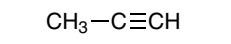
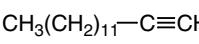
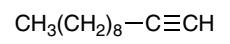
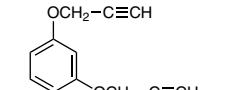
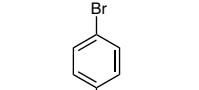
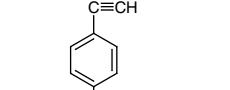
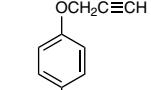
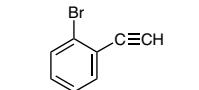
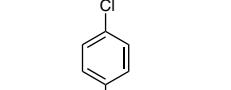
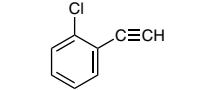
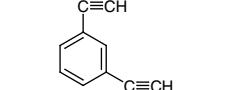
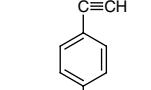
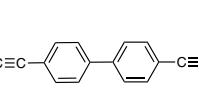
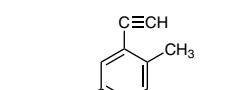
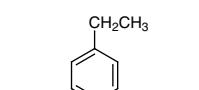
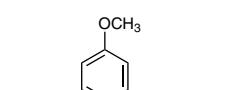
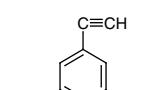
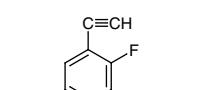
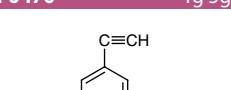
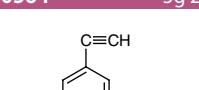
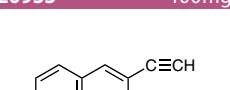
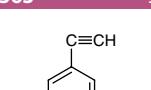
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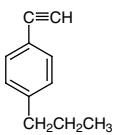
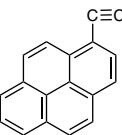
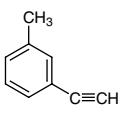
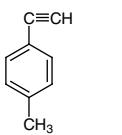
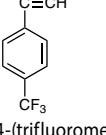
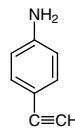
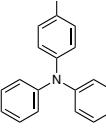
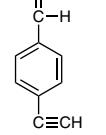
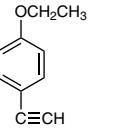
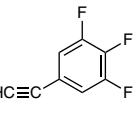
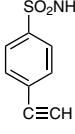
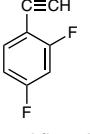
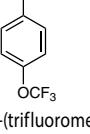
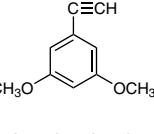
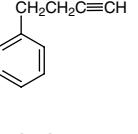
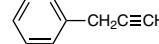
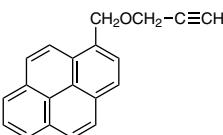
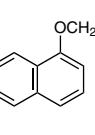
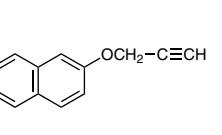
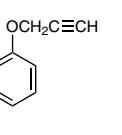
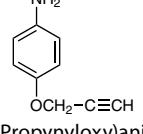
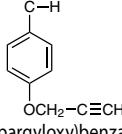
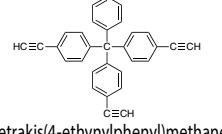
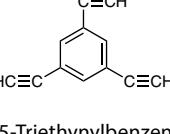
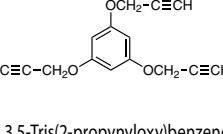
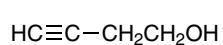
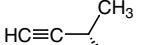
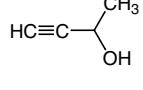
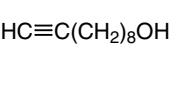
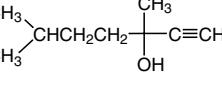
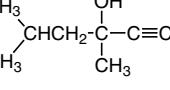
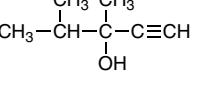
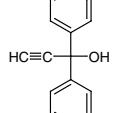
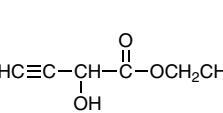
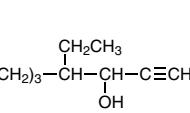
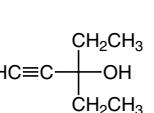
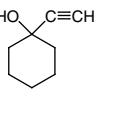
A3129 50mg 200mg  cis-4-Azido-N-Boc-L-proline CAS RN: 132622-65-2	B3693 100mg  (2R,3S,5S,6S)-5,6-Bis(azidomethyl)-2,3-dimethoxy-2,3-dimethyl-1,4-dioxane CAS RN: 832117-79-0	B3694 100mg  (2S,3S,5R,6R)-5,6-Bis(azidomethyl)-2,3-dimethoxy-2,3-dimethyl-1,4-dioxane CAS RN: 1585236-34-5	B3790 10mg  Bis[2-(4-azidosalicylamido)ethyl] Disulfide CAS RN: 199804-21-2	D1606 25g  Disodium 4,4'-Diazidostilbene-2,2'-disulfonate Tetrahydrate CAS RN: 2718-90-3
E1255 5g 25g  Ethyl Azidoacetate CAS RN: 637-81-0	S0860 10mg  N-Succinimidyl 5-Azido-2-nitrobenzoate CAS RN: 60117-35-3	S0952 200mg 1g  N-Succinimidyl 4-Azido-2,3,5,6-tetrafluorobenzoate CAS RN: 126695-58-7	T1184 1g 5g  Trimethylsilylmethyl Azide CAS RN: 87576-94-1	PEG Azides
A2523 100mg  Biotin-PEG ₃ -Azide CAS RN: 875770-34-6	A2727 25mg 100mg  Methyl-PEG ₈ -Azide CAS RN: 869718-80-9	A2388 25mg  Azido-PEG ₄ -NHS Ester CAS RN: 944251-24-5	A2500 100mg  PEG ₅ -Azide CAS RN: 86770-68-5	A2728 25mg 100mg  Methyl-PEG ₄ -Azide CAS RN: 606130-90-9
A2363 200mg 1g 5g  Azido-PEG ₃ -Amine CAS RN: 134179-38-7	A2293 1g  Azido-PEG ₃ -acetic Acid CAS RN: 172531-37-2	A2294 100mg  PEG ₄ -Azide CAS RN: 86770-67-4	A3004 50mg 250mg  Azido-PEG ₄ -Amine CAS RN: 951671-92-4	A3007 50mg 250mg  Azido-PEG ₁₁ -Amine CAS RN: 1800414-71-4
A3130 250mg 1g  Azido-PEG ₂ -Amine-Tos-OH	A3224 100mg  Azido-PEG ₂ -acetic Acid CHA Salt CAS RN: 2098500-94-6	B5546 100mg  Biotin-PEG ₄ -Azide CAS RN: 1309649-57-7	M3049 25mg  Methyl-PEG ₁₂ -Azide	M3050 25mg 100mg  Methyl-PEG ₂₄ -Azide
Sugar Azides	A3090 100mg  6A-Azido-6A-deoxy-β-cyclodextrin CAS RN: 98169-85-8	A1812 1g  2-Acetamido-3-O-allyl-4,6-O-benzylidene-2-deoxy-β-D-glucopyranosyl Azide	A1813 1g  2-Acetamido-3-O-benzyl-4,6-O-benzylidene-2-deoxy-β-D-glucopyranosyl Azide CAS RN: 80887-27-0	A1811 1g 5g  2-Acetamido-4,6-O-benzylidene-2-deoxy-β-D-glucopyranosyl Azide CAS RN: 168397-51-1
A1616 1g 5g  2-Acetamido-3,4,6-tri-O-acetyl-2-deoxy-β-D-glucopyranosyl Azide CAS RN: 6205-69-2	A1678 1g 5g  2-Acetamido-3,4,6-tri-O-benzyl-2-deoxy-β-D-glucopyranosyl Azide CAS RN: 214467-60-4	A1833 100mg  O-(2-Azido-4,6-O-benzylidene-2-deoxy-α-D-galactopyranosyl)-N-[(9H-fluoren-9-ylmethoxy)carbonyl]-L-serine tert-Butyl Ester CAS RN: 878483-02-4	G0257 1g 5g  2-[2-(2-Azidoethoxy)ethoxy]ethyl 2,3,4,6-Tetra-O-acetyl-D-galactopyranoside CAS RN: 381716-33-2	
A1832 100mg  O-(2-Azido-4,6-O-benzylidene-2-deoxy-α-D-galactopyranosyl)-N-[(9H-fluoren-9-ylmethoxy)carbonyl]-L-threonine tert-Butyl Ester CAS RN: 195976-07-9	A2627 Price on request  2-Azidoethyl 2-Acetamido-2-deoxy-β-D-galactopyranoside	A2172 500mg  2-Azidoethyl 2-Acetamido-2-deoxy-β-D-glucopyranoside CAS RN: 142072-12-6	A2267 1g  2-Azidoethyl β-D-Glucopyranoside CAS RN: 165331-08-8	

A2377 2-Azidoethyl 2,3,4,6-Tetra-O-acetyl- β -D-glucopyranoside CAS RN: 140428-81-5	1g 5g	D4217 Disialylnonasaccharide- β -ethylazide CAS RN: 1621001-68-0	1mg	G0330 Gal[2346Ac] β (1-3)-GlcN ₃ [46Bzd]- β -MP	1g 5g	G0309 Gal[2346Ac] β (1-3)-GlcN ₃ [46Bzd]- β -MP	1g 5g	G0373 GalNAc β (1-3)GlcNAc- β -ethylazide Price on request
G0403 Gb ₃ - β -ethylazide Price on request		G0372 GlcA[3S] β (1-3)Gal β (1-4)-GlcNAc β (1-2)Man- α -ethylazide Price on request		G0337 GlcNAc β (1-2)Man- α -1-ethylazide 100mg		H1333 HNK-1 Ethylazide Price on request		L0237 LacDiNAc Dimer Ethylazide Price on request
M1643 4-Methoxyphenyl 3-O-Allyl-2-azido-4,6-O-benzylidene-2-deoxy- β -D-galactopyranoside CAS RN: 889453-83-2	1g	M1638 4-Methoxyphenyl 3-O-Allyl-2-azido-4,6-O-benzylidene-2-deoxy- β -D-glucopyranoside CAS RN: 889453-78-5	1g	M1637 4-Methoxyphenyl 2-Azido-4,6-O-benzylidene-2-deoxy- β -D-glucopyranoside CAS RN: 1430068-18-0	1g 5g	M1617 4-Methoxyphenyl 2-Azido-3,6-di-O-benzyl-2-deoxy- β -D-glucopyranoside CAS RN: 1272755-25-5	1g	T1731 1,3,4,6-Tetra-O-acetyl-2-azido-2-deoxy- α -D-galactopyranose 100mg
T2196 1,3,4,6-Tetra-O-acetyl-2-azido-2-deoxy- β -D-glucopyranose CAS RN: 80321-89-7	200mg 1g	T1733 1,3,4,6-Tetra-O-acetyl-2-azido-2-deoxy- α -D-mannopyranose CAS RN: 68733-20-0	100mg					

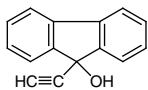
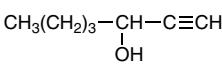
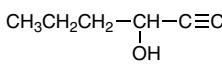
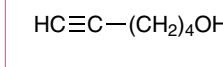
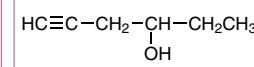
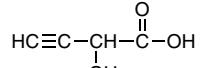
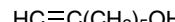
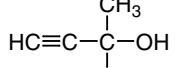
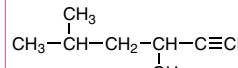
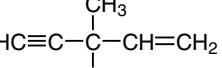
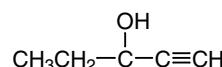
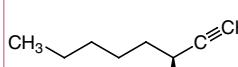
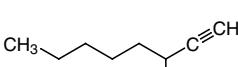
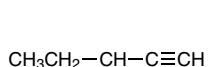
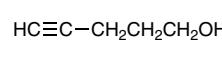
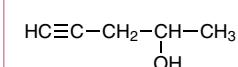
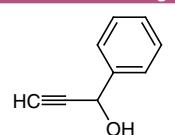
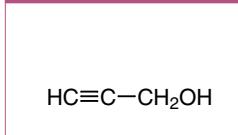
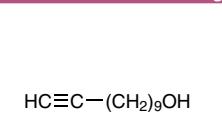
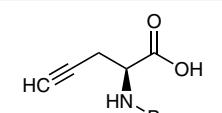
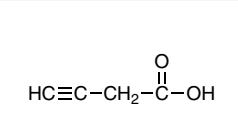
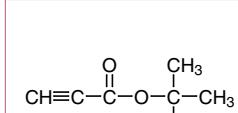
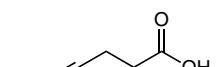
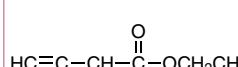
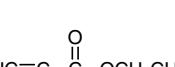
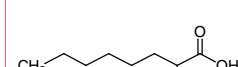
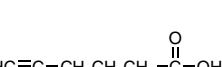
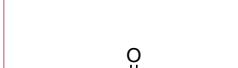
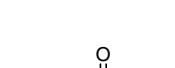
Terminal Alkynes

C1493 HC≡C-(CH ₂) ₄ Cl 6-Chloro-1-hexyne CAS RN: 10297-06-0	5mL 25mL	C1522 HC≡C-CH ₂ CH ₂ CH ₂ Cl 5-Chloro-1-pentyne CAS RN: 14267-92-6	5mL 25mL	C1984 Cyclopropylacetylene 5g 25g	5g	B3242 HC≡CCH ₂ CH ₂ Br 4-Bromo-1-butyne CAS RN: 38771-21-0	5g	C1195 Cl CH ₃ -CH-C≡CH 3-Chloro-1-butyne CAS RN: 21020-24-6
D0037 CH ₃ (CH ₂) ₇ -C≡CH 1-Decyne CAS RN: 764-93-2	5mL 25mL	B1114  3,3-Dimethyl-1-butyne CAS RN: 917-92-0	10mL 100mL	D0997 CH ₃ (CH ₂) ₉ -C≡CH 1-Dodecyne CAS RN: 765-03-7	5mL 25mL	D1724 CH ₃ (CH ₂) ₃ -C≡C-CH ₂ CH ₂ -C≡CH 1,5-Decadiyne CAS RN: 53963-03-4	1mL 5mL	D1326 HC≡C-(CH ₂) ₆ -C≡CH 1,9-Decadiyne CAS RN: 1720-38-3
H0485 HC≡C-CH ₂ CH ₂ -C≡CH 1,5-Hexadiyne (stabilized with BHT) CAS RN: 628-16-0	1g 5g	H0048 CH ₃ (CH ₂) ₄ C≡CH 1-Heptyne CAS RN: 628-71-7	25mL	H0433 CH ₃ (CH ₂) ₁₃ C≡CH 1-Hexadecyne CAS RN: 629-74-3	5mL	H0440 CH ₃ (CH ₂) ₁₄ C≡CH 1-Heptadecyne CAS RN: 26186-00-5	1g	H0483 HC≡C(CH ₂) ₃ C≡CH 1,6-Heptadiyne CAS RN: 2396-63-6
H1541 HC≡C-CH ₂ CH ₂ -CH=CH ₂ 1-Hexen-5-yne CAS RN: 14548-31-3	1g 5g			H0140 CH ₃ (CH ₂) ₃ C≡CH 1-Hexyne CAS RN: 693-02-7	25mL 250mL			

M0271  5-Methyl-1-hexyne CAS RN: 2203-80-7	M0269  4-Methyl-1-pentyne CAS RN: 7154-75-8	N0406  1,8-Nonadiyne CAS RN: 2396-65-8	N0301  1-Nonyne CAS RN: 3452-09-3	O0128  1-Octadecyne CAS RN: 629-89-0
O0147  1,7-Octadiyne CAS RN: 871-84-1	O0050  1-Octyne CAS RN: 629-05-0	P0356  1-Pentadecyne CAS RN: 765-13-9	P0068  1-Pentyne CAS RN: 627-19-0	P1272  Propargyl Bromide (80% in Toluene, ca. 9.2mol/L) CAS RN: 106-96-7
P0484  Propargyl Bromide (stabilized with MgO) CAS RN: 106-96-7	P1273  Propargyl Chloride (70% in Toluene, ca. 9.2mol/L) CAS RN: 624-65-7	P0810  Propargyl Chloride CAS RN: 624-65-7	P1881  Propyne (ca. 3-4% in Heptane) CAS RN: 74-99-7	P2152  Propyne (ca. 4% in N,N-Dimethylformamide, ca. 1.0mol/L) CAS RN: 74-99-7
P2295  Propyne (ca. 5% in Tetrahydrofuran, ca. 1mol/L) CAS RN: 74-99-7	T0761  1-Tetradecyne CAS RN: 765-10-6	U0033  1-Undecyne CAS RN: 2243-98-3	Aromatic Hydrocarbons	
B4521  1,3-Bis(2-propynyoxy)benzene CAS RN: 26627-36-1	B3701  1-Bromo-4-ethynylbenzene CAS RN: 766-96-1	B2301  1-Butyl-4-ethynylbenzene CAS RN: 79887-09-5	B4607  1,4-Bis(2-propynyoxy)benzene CAS RN: 34596-36-6	B4608  1-Bromo-2-ethynylbenzene CAS RN: 766-46-1
C2670  1-Chloro-4-ethynylbenzene CAS RN: 873-73-4	C2750  1-Chloro-2-ethynylbenzene CAS RN: 873-31-4	D2496  1,3-Diethynylbenzene CAS RN: 1785-61-1	D2151  1,4-Diethynylbenzene CAS RN: 935-14-8	D4233  4,4'-Diethynylbiphenyl CAS RN: 38215-38-2
D4878  1,5-Diethynyl-2,4-dimethylbenzene CAS RN: 1379822-09-9	E0749  1-Ethyl-4-ethynylbenzene CAS RN: 40307-11-7	E0603  4-Ethynylanisole CAS RN: 768-60-5	E0196  Ethynylbenzene CAS RN: 536-74-3	E0654  1-Ethynyl-2-fluorobenzene CAS RN: 766-49-4
F0470  1-Ethylnyl-4-fluorobenzene CAS RN: 766-98-3	E0564  1-Ethylnyl-4-hexylbenzene CAS RN: 79887-11-9	E0933  2-Ethylnylnaphthalene CAS RN: 2949-26-0	E0563  1-Ethylnyl-4-pentylbenzene CAS RN: 79887-10-8	E0967  1-Ethylnyl-4-(phenylethylnyl)-benzene CAS RN: 92866-00-7

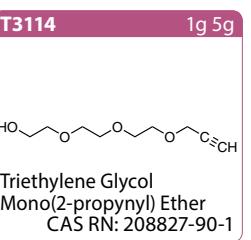
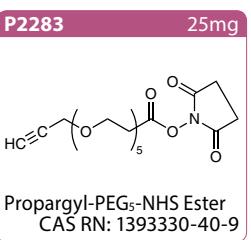
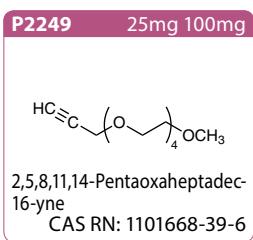
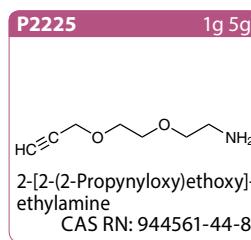
E0750 5g 25g  1-Ethynyl-4-propylbenzene CAS RN: 62452-73-7	E0939 200mg 1g  1-Ethynylpyrene CAS RN: 34993-56-1	E0665 1g 5g 25g  3-Ethynyltoluene CAS RN: 766-82-5	E0655 5g 25g  4-Ethynyltoluene CAS RN: 766-97-2	E0626 1g 5g  1-Ethynyl-4-(trifluoromethyl)benzene CAS RN: 705-31-7
E0505 10g 25g  4-Ethynylaniline CAS RN: 14235-81-5	E0894 1g  4-Ethynyltriphenylamine CAS RN: 205877-26-5	E0987 1g  4-Ethynylbenzaldehyde CAS RN: 63697-96-1	E1029 1g 5g  1-Ethoxy-4-ethynylbenzene CAS RN: 79887-14-2	E1078 1g  5-Ethynyl-1,2,3-trifluorobenzene CAS RN: 158816-55-8
E1130 200mg 1g  4-Ethynylbenzenesulfonamide CAS RN: 1788-08-5	E1169 1g 5g  1-Ethynyl-2,4-difluorobenzene CAS RN: 302912-34-1	E1170 1g 5g  1-Ethynyl-4-(trifluoromethoxy)benzene CAS RN: 160542-02-9	E1175 200mg 1g  1-Ethynyl-3,5-dimethoxybenzene CAS RN: 171290-52-1	P0358 5mL  4-Phenyl-1-butyne CAS RN: 16520-62-0
P1956 1g 5g  3-Phenyl-1-propyne (stabilized with BHT) CAS RN: 10147-11-2	P2226 200mg 1g  1-[2-Propynyloxy]methyl]pyrene CAS RN: 1115084-83-7	P2227 1g 5g  1-(2-Propynyloxy)naphthalene CAS RN: 8542-45-5	P2190 200mg 1g  2-(2-Propynyloxy)naphthalene CAS RN: 20009-28-3	P2222 5g 25g  Phenyl Propargyl Ether CAS RN: 13610-02-1
P2224 1g 5g  4-(2-Propynyloxy)aniline CAS RN: 26557-78-8	P2339 200mg 1g  4-(Propargyloxy)benzaldehyde CAS RN: 5651-86-5	T3151 100mg 1g  Tetrakis(4-ethynylphenyl)methane CAS RN: 177991-01-4	T2760 1g 5g  1,3,5-Triethynylbenzene CAS RN: 7567-63-7	T3135 200mg 1g  1,3,5-Tris(2-propynyloxy)benzene CAS RN: 114233-80-6
Alcohols		B0799 5mL 25mL  3-Butyn-1-ol CAS RN: 927-74-2	B2909 1g 5g  (R)-(+)-3-Butyn-2-ol CAS RN: 42969-65-3	B2910 1g 5g  (S)-(-)-3-Butyn-2-ol CAS RN: 2914-69-4
B1001 5mL 25mL  3-Butyn-2-ol CAS RN: 2028-63-9	D3710 5g 25g  9-Decyn-1-ol CAS RN: 17643-36-6	D1266 5mL  3,6-Dimethyl-1-heptyn-3-ol CAS RN: 19549-98-5	D0737 25mL 500mL  3,5-Dimethyl-1-hexyn-3-ol CAS RN: 107-54-0	D1276 10mL  3,4-Dimethyl-1-pentyn-3-ol CAS RN: 1482-15-1
D2495 5g 25g  1,1-Diphenyl-2-propyn-1-ol CAS RN: 3923-52-2	H0823 1g  Ethyl 2-Hydroxy-3-butynoate CAS RN: 18418-08-1	E0270 25mL 500mL  4-Ethyl-1-octyn-3-ol CAS RN: 5877-42-9	E0273 5mL 25mL  3-Ethyl-1-pentyn-3-ol CAS RN: 6285-06-9	E0297 25g 500g  1-Ethynyl-1-cyclohexanol CAS RN: 78-27-3

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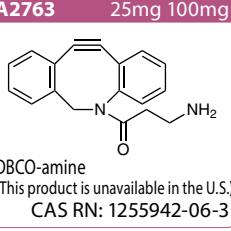
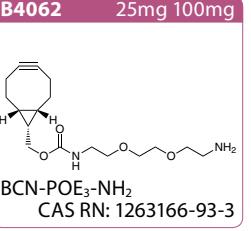
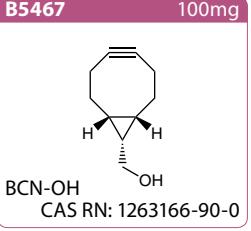
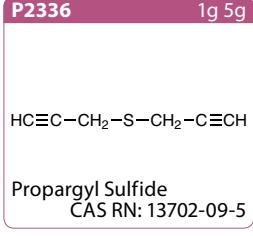
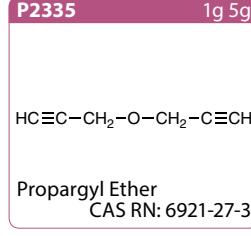
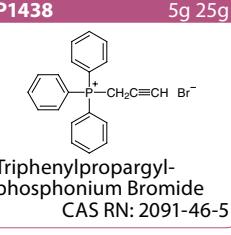
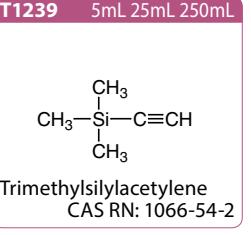
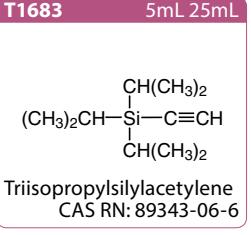
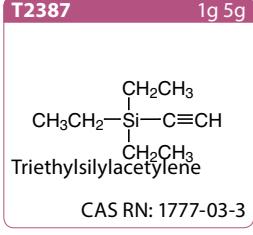
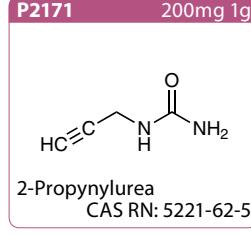
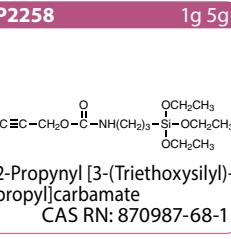
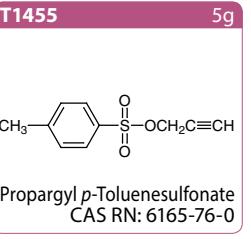
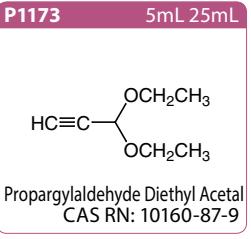
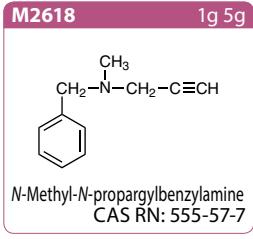
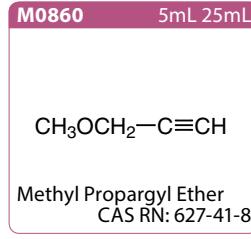
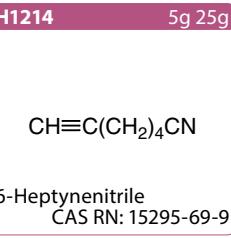
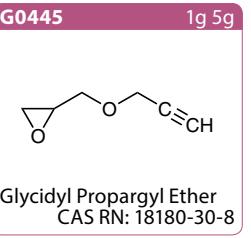
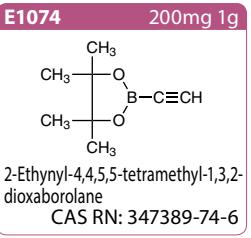
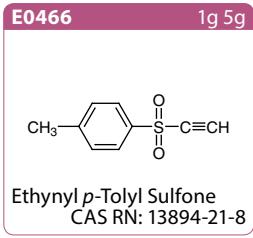
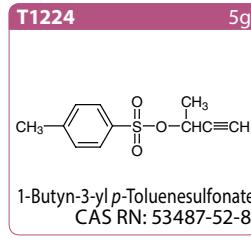
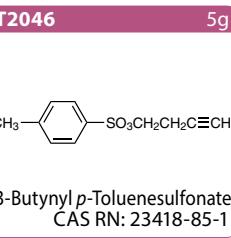
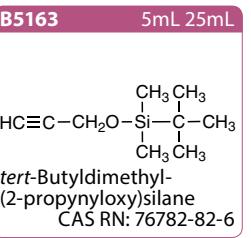
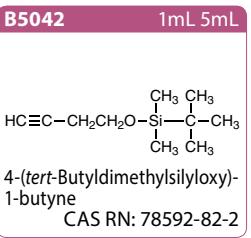
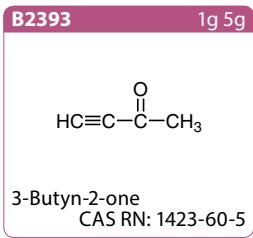
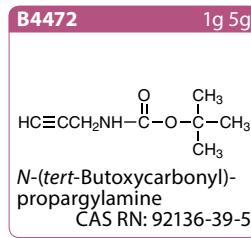
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H0905  2-Hydroxy-3-butynoic Acid CAS RN: 38628-65-8	H1474  6-Heptyn-1-ol CAS RN: 63478-76-2	M0180  2-Methyl-3-butyn-2-ol CAS RN: 115-19-5	M0961  5-Methyl-1-hexyn-3-ol CAS RN: 61996-79-0	M1312  3-Methyl-1-penten-4-yn-3-ol CAS RN: 3230-69-1	
M0396  3-Methyl-1-pentyn-3-ol CAS RN: 77-75-8	O0235  (S)-1-Octyn-3-ol CAS RN: 32556-71-1	O0196  1-Octyn-3-ol CAS RN: 818-72-4	O0445  7-Octyn-1-ol CAS RN: 871-91-0	P0069  1-Pentyn-3-ol CAS RN: 4187-86-4	
P0817  4-Pentyn-1-ol CAS RN: 5390-04-5	P0818  4-Pentyn-2-ol CAS RN: 2117-11-5	P0220  1-Phenyl-2-propyn-1-ol CAS RN: 4187-87-5	P0536  2-Propyn-1-ol CAS RN: 107-19-7	U0055  10-Undecyn-1-ol CAS RN: 2774-84-7	
Carboxylic Acids & Esters		B4007  N-(tert-Butoxycarbonyl)-L-propargylglycine CAS RN: 63039-48-5	B4969  3-Butynoic Acid CAS RN: 2345-51-9	P1038  tert-Butyl Propiolate CAS RN: 13831-03-3	
F0926  Fmoc-propargyl-Gly-OH CAS RN: 198561-07-8	H0823  Ethyl 2-Hydroxy-3-butynoate CAS RN: 18418-08-1	P0529  Ethyl Propiolate CAS RN: 623-47-2	H0964  2-Hexyl-4-pentylnoic Acid CAS RN: 96017-59-3	H0882  5-Hexynoic Acid CAS RN: 53293-00-8	
H0905  2-Hydroxy-3-butynoic Acid CAS RN: 38628-65-8	P0528  Methyl Propiolate CAS RN: 922-67-8	P0497  Propiolic Acid CAS RN: 471-25-0	U0054  10-Undecynoic Acid CAS RN: 2777-65-3	Amines	
D2794  N,N-Dimethyl-propargylamine CAS RN: 7223-38-3	D2817  3-Dibutylamino-1-propyne CAS RN: 6336-58-9	D4685  Dipropargylamine CAS RN: 6921-28-4	D4964  N,N-Dipropargyl-p-toluenesulfonamide CAS RN: 18773-54-1	P0911  Propargylamine CAS RN: 2450-71-7	

P0990	5g 25g	P2166	1g 5g	T2992	1g 5g	Heterocyclic Compounds		D4275	200mg 1g
HC≡CCH ₂ NH ₂ · HCl		HC≡C—O—CH ₂ —NH ₂		HC≡C—CH ₂ —N(CH ₂) ₂ —C≡CH				HC≡C—C ₆ H ₃ N—C ₆ H ₃ C≡CH	
Propargylamine Hydrochloride CAS RN: 15430-52-1		2-(2-Propynyl)ethylaniline CAS RN: 122116-12-5		Tripropargylamine CAS RN: 6921-29-5				3,6-Diethynylcarbazole CAS RN: 909342-65-0	
D5097	200mg 1g	E1055	1g 5g	E0579	1g 5g	E0340	1mL 5mL	E0560	1g 5g
HC≡C—C ₆ H ₃ N—C ₆ H ₃ C≡CH		9-(4-Ethynylphenyl)carbazole CAS RN: 262861-81-4		HOOC—C ₆ H ₃ OOC—C≡CH		HC≡C—C ₆ H ₃ N—C≡CH		HC≡C—C ₆ H ₃ N—C≡CH	
2,6-Diethynylpyridine CAS RN: 75867-46-8		4-Ethynylphthalic Anhydride CAS RN: 73819-76-8		2-Ethynylpyridine CAS RN: 1945-84-2		3-Ethynylpyridine CAS RN: 2510-23-8		5-Ethynyl-2'-deoxyuridine CAS RN: 61135-33-9	
E0561	100mg 500mg	E0915	1g 5g	E0892	1g 5g	E1043	1g 5g	E1057	50mg 200mg
HC≡C—C ₆ H ₃ N—C≡CH		HC≡C—S—C≡CH		HC≡C—C ₆ H ₃ N—C≡CH		HC≡C—C ₆ H ₃ N—C≡CH · HCl		HN—C(=O)—C≡CH—C ₆ H ₃ —C(=O)—O—C ₃ H ₅ —OH	
4-Ethynylpyridine CAS RN: 2510-22-7		2-Ethynylthiophene CAS RN: 4298-52-6		3-Ethynylthiophene CAS RN: 67237-53-0		4-Ethynylpyridine Hydrochloride CAS RN: 352530-29-1		5-Ethynyl-2'-deoxyuridine CAS RN: 61135-33-9	
E1093	50mg 200mg	E1096	200mg 1g	P1469	5g 25g	P1624	25g	P2191	200mg 1g
HC≡C—C ₆ H ₃ N—C≡CH		HC≡C—C(=O)NH—C(=O)NH—C≡CH		CH ₂ C≡CH—N(CH ₂) ₂ —CH ₂ S(=O)(=O)CH ₃		CH ₂ —C ₃ H ₆ —OCH ₂ —C≡CH		O=C—N(CH ₂) ₂ —C≡CH	
5-Ethynyl-2'-deoxycytidine CAS RN: 69075-47-4		5-Ethynyluracil CAS RN: 59989-18-3		4-Propargylthiomorpholine 1,1-Dioxide CAS RN: 10442-03-2		2-(2-Propynyl)-tetrahydropyran CAS RN: 6089-04-9		N-(2-Propynyl)succinimide CAS RN: 10478-33-8	
P2170	200mg 1g	P2228	200mg 1g	P2329	5g 25g	P2342	1g 5g	T3169	1g 5g
CH ₂ C≡CH—N(CH ₂) ₂		NH ₂ —C ₆ H ₄ —CH ₂ —C≡CH		HC≡C—C(=O)N—CH ₂ —C≡CH		HC≡C—OCH ₂ —C(=O)N—CH ₂ —C≡CH		CH ₃ —C(CH ₃) ₂ —C ₆ H ₃ —C(CH ₃) ₂ —C≡CH	
4-(2-Propyn-1-yl)morpholine CAS RN: 5799-76-8		1-(2-Propynyl)piperazine CAS RN: 52070-67-4		N-Propargylphthalimide CAS RN: 7223-50-9		N-(Propargyloxy)phthalimide CAS RN: 4616-63-1		2,2,6,6-Tetramethyl-4-(2-propynyl)oxy)piperidine 1-Oxyl Free Radical CAS RN: 147045-24-7	
Steroids		D4163	100mg	E0040	1g 5g	E0037	1g 5g	G0404	100mg 1g
		CH ₂ —C(CH ₃) ₂ —C ₆ H ₃ —C(CH ₃) ₂ —C≡CH		CH ₃ —C(CH ₃) ₂ —C ₆ H ₃ —C(CH ₃) ₂ —C≡CH		CH ₃ —C(CH ₃) ₂ —C ₆ H ₃ —C(CH ₃) ₂ —C≡CH		CH ₃ —C(CH ₃) ₂ —C ₆ H ₃ —C(CH ₃) ₂ —C≡CH	
		Desogestrel CAS RN: 54024-22-5		Ethisterone CAS RN: 434-03-7		Ethylenestradiol CAS RN: 57-63-6		Gestodene CAS RN: 60282-87-3	
L0246	1g	M0728	1g 5g	N0449	100mg 1g	N0450	100mg 1g	N0889	100mg 1g
Lynestrenol CAS RN: 52-76-6		CH ₃ O—C ₆ H ₃ —C(CH ₃) ₂ —C ₆ H ₃ —C(CH ₃) ₂ —C≡CH		CH ₃ —C(CH ₃) ₂ —C ₆ H ₃ —C(CH ₃) ₂ —C≡CH		CH ₃ —C(CH ₃) ₂ —C ₆ H ₃ —C(CH ₃) ₂ —C≡CH		(-)—Norgestrel CAS RN: 797-63-7	
Quinestrol CAS RN: 152-43-2		Mestranol CAS RN: 72-33-3		Norethisterone CAS RN: 68-22-4		Norethisterone Acetate CAS RN: 51-98-9		Ethylene Glycol 1,2-Bis(2-propynyl) Ether CAS RN: 40842-04-4	
Q0091	100mg 1g	Polyethylene Glycols (PEG)		D4580	1g	D4581	5g 25g	E1054	5g 25g
HC≡C—C ₆ H ₃ —C(CH ₃) ₂ —C ₆ H ₃ —C(CH ₃) ₂ —C≡CH				HO—CH ₂ —O—CH ₂ —O—CH ₂ —O—C≡CH		HC≡C—O—CH ₂ —O—CH ₂ —O—C≡CH		HC≡C—O—CH ₂ —O—CH ₂ —O—C≡CH	
Diethylene Glycol Mono(2-propyn-1-yl) Ether CAS RN: 7218-43-1				Diethylene Glycol Bis(2-propynyl) Ether CAS RN: 126422-57-9		Ethylene Glycol 1,2-Bis(2-propynyl) Ether CAS RN: 40842-04-4		Ethylene Glycol 1,2-Bis(2-propynyl) Ether CAS RN: 40842-04-4	

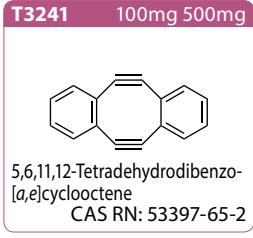
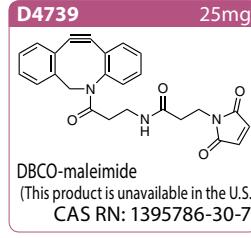
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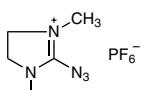
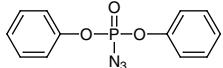
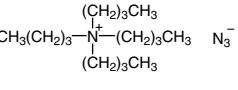
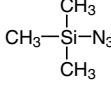
Others



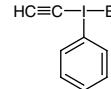
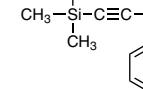
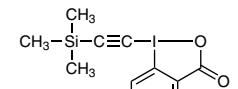
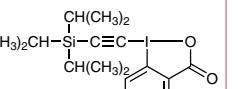
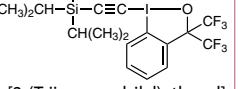
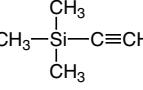
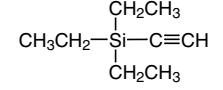
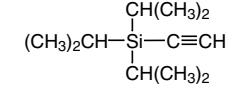
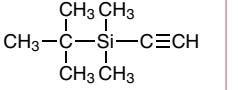
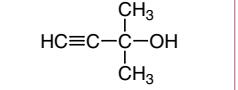
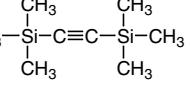
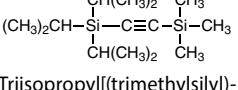
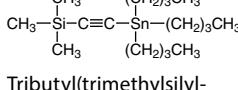
Cu-free Click Reaction Reagents



Azidation Reagents

A2457	5g		D1672	5g 25g 250g		S0489	100g		T0920	5g 25g		T0801	5g 25g 100g	
2-Azido-1,3-dimethylimidazolinium Hexafluorophosphate CAS RN: 1266134-54-6			Diphenylphosphoryl Azide CAS RN: 26386-88-9			Sodium Azide CAS RN: 26628-22-8			Tetrabutylammonium Azide CAS RN: 993-22-6			Trimethylsilyl Azide CAS RN: 4648-54-8		

Ethynylation Reagents

E0467	1g		P1239	1g		T3272	1g 5g		T3039	200mg 1g		T3590	200mg 1g	
Ethyynyl(phenyl)iodonium Tetrafluoroborate CAS RN: 127783-34-0			Trimethylsilylethyynyl(phenyl)-iodonium Tetrafluoroborate CAS RN: 127783-36-2			TMS-EBX CAS RN: 181934-29-2			TIPS-EBX CAS RN: 181934-30-5					
T1239	5mL 25mL 250mL		T2387	1g 5g		T1683	5mL 25mL		B4365	5g 25g		M0180	25mL 500mL	
Trimethylsilylacetylene CAS RN: 1066-54-2			Triethylsilylacetylene CAS RN: 1777-03-3			Triisopropylsilylacetylene CAS RN: 89343-06-6			(tert-Butyldimethylsilyl)acetylene CAS RN: 86318-61-8			2-Methyl-3-butyn-2-ol CAS RN: 115-19-5		
B1090	5g 25g		T3271	1mL 5mL		T1865	5g 25g							
BTMSA CAS RN: 14630-40-1			Triisopropyl[(trimethylsilyl)-ethynyl]silane CAS RN: 107474-02-2			Tributyl(trimethylsilyl-ethynyl)tin CAS RN: 81353-38-0								

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