

A Useful Protecting Group (Ph₂P(O)) Reagent for Terminal Ethynes for the Synthesis of Electronic Devices

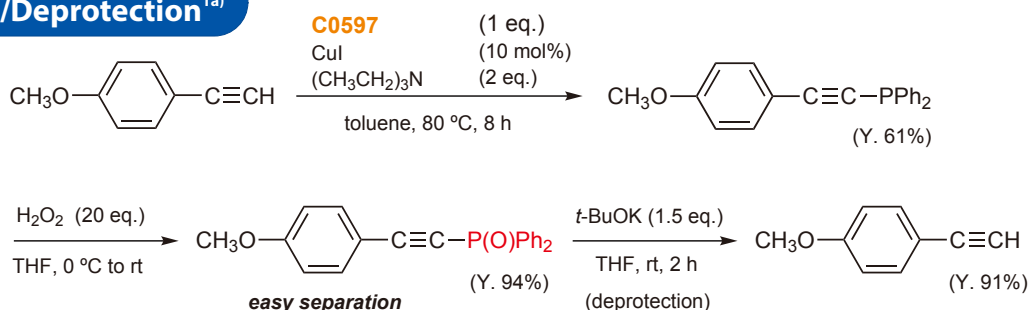


Advantages

- Useful for the Protection of Terminal Ethynes
- Stable under Coupling and Acidic Conditions
- Applied for the Synthesis of Phenyleneethynylenes

Ph₂P(O) is a new terminal alkyne protecting group, developed by Orita and Otera *et al.* This protecting group can be introduced readily to terminal alkynes by CuI catalyzed phosphination using chlorodiphenylphosphine **[C0597]** and subsequent oxidation with H₂O₂. The high polarity of the phosphoryl group enables easy separation of the desired products from the lower polar hydrocarbon byproducts. The Ph₂P(O)-protected ethynes can be easily deprotected by treatment with *t*-BuOK.¹⁾

Protection/Deprotection^{1a)}

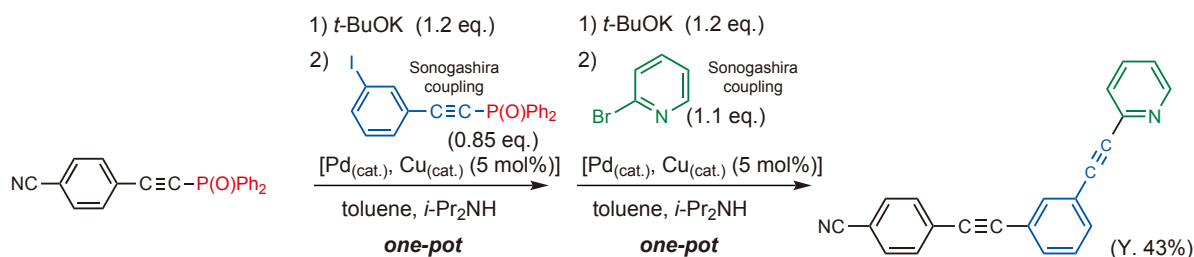


1) a) X. Yang, D. Matsuo, Y. Suzuma, J.-K. Fang, F. Xu, A. Orita, J. Otera, S. Kajiyama, N. Koumura, K. Hara, *Synlett* **2011**, 2402.

b) X. Yang, S. Kajiyama, J.-K. Fang, F. Xu, Y. Uemura, N. Koumura, K. Hara, A. Orita, J. Otera, *Bull. Chem. Soc. Jpn.* **2012**, 85, 687.

The deprotecting ethynes can be transformed to more expanded aryethynes by the Sonogashira coupling with aryl halides. This synthetic approach can be applied to a one-pot synthesis of phenyleneethynylenes used for electronic devices by deprotection followed by coupling reactions.²⁾

A Synthesis Example of Phenyleneethynylene^{2a)}



2) a) L. Peng, F. Xu, Y. Suzuma, A. Orita, J. Otera, *J. Org. Chem.* **2013**, 78, 12802.

b) L. Peng, F. Xu, K. Shinohara, A. Orita, J. Otera, *Chem. Lett.* **2014**, 43, 1610.

c) L. Peng, F. Xu, K. Shinohara, T. Nishida, K. Wakamatsu, A. Orita, J. Otera, *Org. Chem. Front.* **2015**, 2, 248.



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Related Products (Ar-C≡CH)

A1122 3-Ethynylaniline	10g	E0939 1-Ethynylpyrene	200mg / 1g
B2301 1-Butyl-4-ethynylbenzene	5g / 25g	E0967 1-Ethynyl-4-(phenylethynyl)benzene	200mg / 1g
B3701 1-Bromo-4-ethynylbenzene	1g / 5g	E0987 4-Ethynylbenzaldehyde	1g
B4608 1-Bromo-2-ethynylbenzene	1g / 5g	E1029 1-Ethoxy-4-ethynylbenzene	1g / 5g
C2670 1-Chloro-4-ethynylbenzene	1g / 5g	E1078 5-Ethynyl-1,2,3-trifluorobenzene	1g
C2750 1-Chloro-2-ethynylbenzene	1g / 5g	E1130 4-Ethynylbenzenesulfonamide	200mg / 1g
D2151 1,4-Diethynylbenzene	1g / 5g	E1169 1-Ethynyl-2,4-difluorobenzene	1g / 5g
D2496 1,3-Diethynylbenzene	1g / 5g	E1170 1-Ethynyl-4-(trifluoromethoxy)benzene	1g / 5g
D4233 4,4'-Diethynylbiphenyl	200mg / 1g	E1175 1-Ethynyl-3,5-dimethoxybenzene	200mg / 1g
D4878 1,5-Diethynyl-2,4-dimethylbenzene	1g / 5g	F0470 1-Ethynyl-4-fluorobenzene	1g / 5g
E0196 Ethynylbenzene	25mL / 100mL / 500mL	T2760 1,3,5-Triethynylbenzene	1g / 5g
E0505 4-Ethynylaniline	10g / 25g	T3151 Tetrakis(4-ethynylphenyl)methane	100mg / 1g
E0563 1-Ethynyl-4-pentylbenzene	5g / 25g	D4275 3,6-Diethynylcarbazole	200mg / 1g
E0564 1-Ethynyl-4-hexylbenzene	5g / 25g	D5097 2,6-Diethynylpyridine	200mg / 1g
E0603 4-Ethynylanisole	1g / 5g / 25g	E0340 2-Ethynylpyridine	1mL / 5mL
E0626 1-Ethynyl-4-(trifluoromethyl)benzene	1g / 5g	E0560 3-Ethynylpyridine	1g / 5g
E0654 1-Ethynyl-2-fluorobenzene	5g	E0561 4-Ethynylpyridine	100mg / 500mg
E0655 4-Ethynyltoluene	5g / 25g	E0579 4-Ethynylphthalic Anhydride	1g / 5g
E0665 3-Ethynyltoluene	1g / 5g / 25g	E0892 3-Ethynylthiophene	1g / 5g
E0749 1-Ethyl-4-ethynylbenzene	5g / 25g	E0915 2-Ethynylthiophene	1g / 5g
E0750 1-Ethynyl-4-propylbenzene	5g / 25g	E1043 4-Ethynylpyridine Hydrochloride	1g / 5g
E0894 4-Ethynyltriphenylamine	1g	E1055 9-(4-Ethynylphenyl)carbazole	1g / 5g
E0933 2-Ethynyl-naphthalene	100mg		

Introduction of the Researcher



Professor **Akihiro Orita**

Orita Lab

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content of the research

Orita's laboratory has been working on the development of these methodologies.

- 1) Developing functional materials through acetylene derivative synthesis
- 2) Selective synthesis using organotin compounds

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