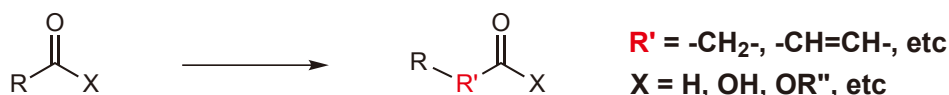


Carbon Homologation / Degradation Reagents



Carbon Homologation / Degradation Reaction means transformation reactions, in which organic compounds such as aldehydes, ketones, or carboxylic acids are converted to the corresponding higher or lower homologs by inserting or removing carbon-carbon chains (i.e. methylene group).

Homologation Reaction



Degradation Reaction



The reactions are important transformation methods in organic synthesis, thus, a number of procedures have been reported so far. From classical well-known reactions to recent reports, some examples are systematically described as below.

Aldehydes → One-carbon homologated acetylenes



Carbon Tetrabromide

25g / 100g / 500g

[T0038]

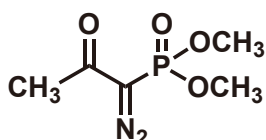


Triphenylphosphine

25g / 100g / 500g

[T0519]

Corey-Fuchs Alkyne Synthesis



Ohira-Bestmann Reagent

1g / 5g

[D3546]

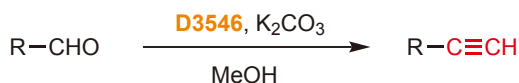
Ohira-Bestmann Reagent

(10% in Acetonitrile)

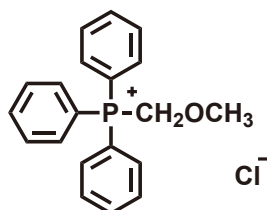
5g / 25g

[D5048]

Ohira-Bestmann Reagent



Aldehydes & Ketones → One-carbon homologated aldehydes

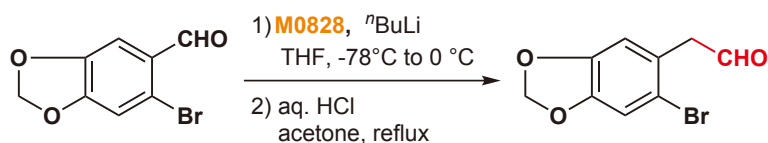


(Methoxymethyl)-
triphenylphosphonium Chloride

25g / 100g / 500g

[M0828]

Wittig Reaction

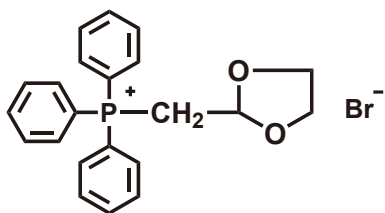


K. C. Nicolaou, A. F. Stepan, T. Lister, A. Li, A. Montero, G. S. Tria, C. I. Turner, Y. Tang, J. Wang, R. M. Denton, D. J. Edmonds, *J. Am. Chem. Soc.* **2008**, *130*, 13110.



Carbon Homologation / Degradation Reaction

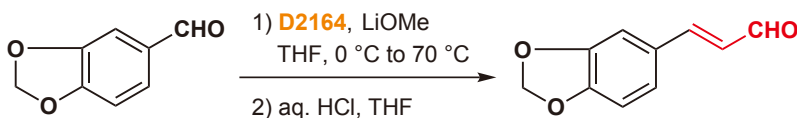
Aldehydes → Two-carbon homologated aldehydes



(1,3-Dioxolan-2-yl)-
methyltriphenylphosphonium Bromide

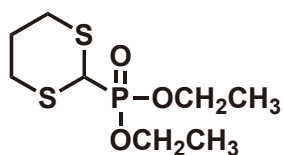
5g / 25g
[D2164]

Wittig Reaction



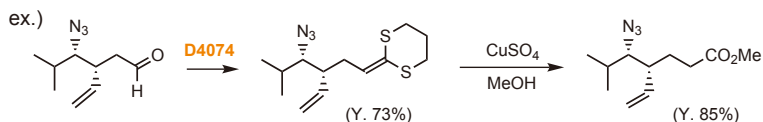
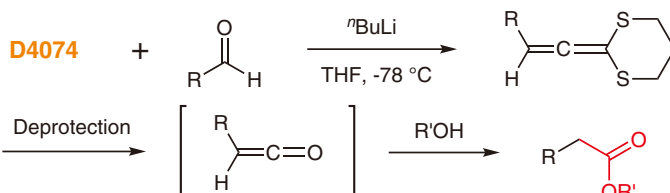
T. M. Cresp, M. V. Sargent, P. Vogel, *J. C. S. Perkin Trans. 1*, **1974**, 37.

Aldehydes → One-carbon homologated carboxylic esters



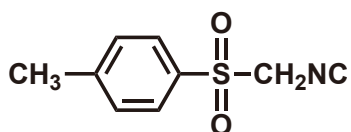
Diethyl (1,3-Dithian-2-yl)phosphonate

5g
[D4074]



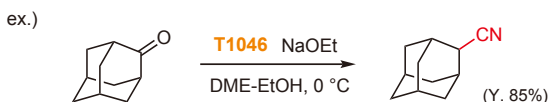
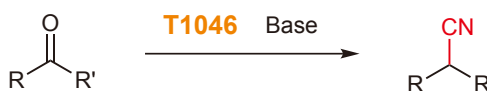
S. Hanessian, D. K. Maji, S. Govindan, R. Matera, M. T. Blomley, *J. Org. Chem.* **2010**, 75, 2861.

Ketones → One-carbon homologated nitriles



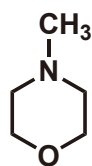
p-Toluenesulfonylmethyl Isocyanide (TosMIC)

5g / 25g
[T1046]



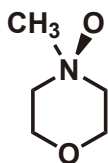
O. H. Oldenziel, A. M. V. Leusen, *Tetrahedron Lett.* **1973**, 1357.

Aldehydes → One-carbon degraded aldehydes



4-Methylmorpholine

25mL / 500mL
[M0370]

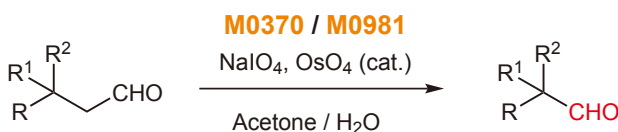


4-Methylmorpholine N-Oxide

5g / 25g
[M2192]

4-Methylmorpholine N-Oxide
(50% in Water, ca. 4.8mol/L)

25mL / 500mL
[M0981]



D. Belotti, G. Andreatta, F. Pradaux, S. Bouz, J. Cossy, *Tetrahedron Lett.* **2003**, 44, 3613.

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