



MEM chloride

For the protection of alcohols

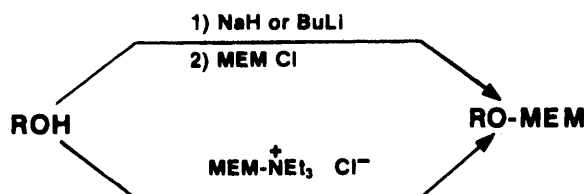


MEM chloride

The recent introduction¹ of β -methoxyethoxy-methyl (MEM) ethers as protected derivatives of primary, secondary, and tertiary alcohols provides a valuable addition to the organic chemist's armamentarium of protective methods. Because of the ease of formation and specificity of cleavage conditions, the MEM group serves as a valuable addition to the more traditional hydroxyl protecting groups such as tetrahydropyranyl and benzyl.

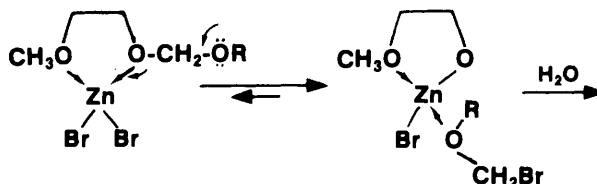
MEM ethers are stable to strong bases, organometallic reagents, oxidizing agents and mild acids.

The formation of MEM ethers can be effected either under aprotic basic conditions by reaction of the sodium or lithium salt of the alcohol with MEM chloride in THF or dimethoxyethane, or under aprotic neutral conditions by reaction of the alcohol with MEM-triethylammonium chloride in acetonitrile. Although the ammonium salt is hygroscopic, it can be prepared readily from MEM chloride and triethylamine.



MEM ethers can also be prepared from the alcohol and MEM chloride in the presence of diisopropylethylamine in CH₂Cl₂. Yields of the MEM derivatives by these methods are excellent, usually exceeding 90%.

MEM ethers are cleaved by either anhydrous zinc bromide or titanium tetrachloride in methylene chloride solution at room temperature. The specificity of the cleavage conditions is hypothesized to be due to the formation of a cyclic complex with the Lewis acid (ZnBr₂, TiCl₄) which facilitates the cleavage of the



MEM ether. Thus, the cleavage of methoxymethyl ethers is markedly slower than that of the corresponding MEM derivative under the same conditions. THP, benzyl, acetyl, benzoyl, *t*-butyldimethylsilyl and other silyl protecting groups are readily and selectively cleaved in the presence of MEM ethers.

Reference:

- 1) E.J. Corey, J.-L. Gras, and P. Ulrich, *Tetrahedron Lett.*, 809 (1976).

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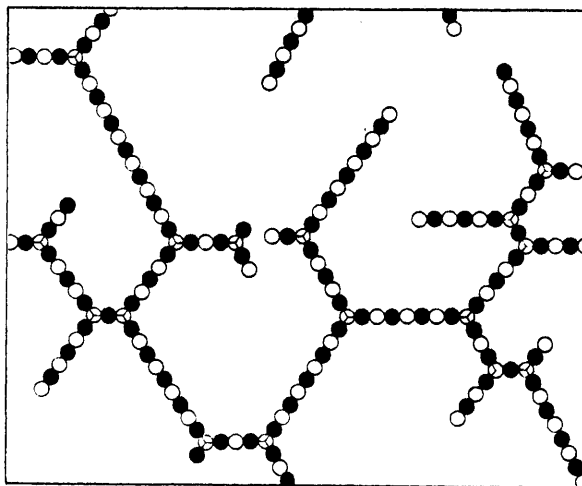
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