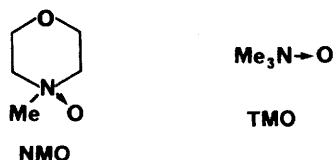


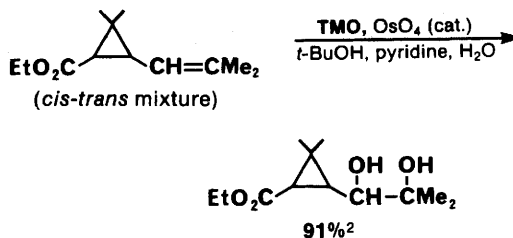
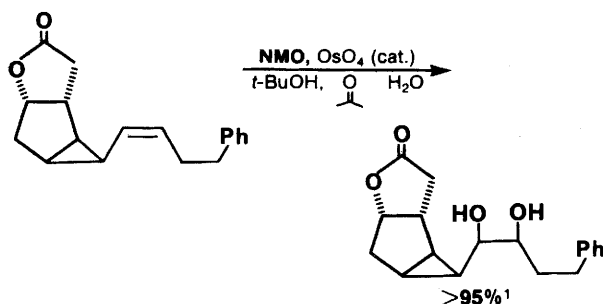
# Mild Oxidizing Agents

*cis*-Dihydroxylation of an olefin is usually effected with osmium tetroxide in conjunction with an oxidizing agent. However, over-oxidation to  $\alpha$ -ketols lowers yields and makes product purification difficult.

*N*-Methylmorpholine *N*-oxide (NMO)<sup>1</sup> and trimethylamine-*N*-oxide (TMO)<sup>2</sup> avoid this problem entirely, afford-



ing high yields of glycols even from hindered substrates containing sensitive functionality.



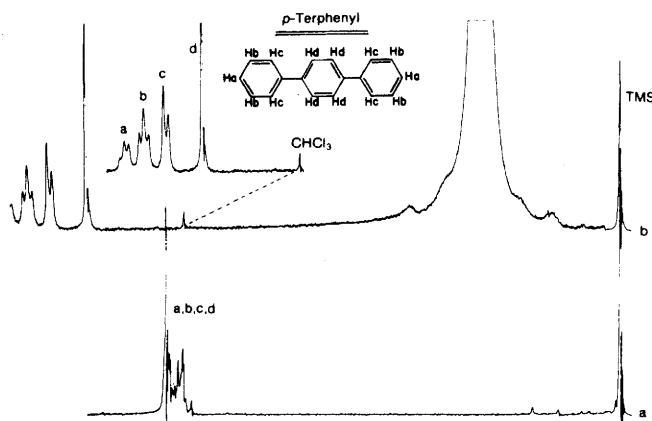
The small amount of OsO<sub>4</sub> required and the ease of workup make NMO- and TMO-mediated glycolizations inexpensive and valuable tools for organic synthesis.<sup>3</sup>

#### References:

- 1) V. vanRheenen, R.C. Kelly, and D.Y. Cha, *Tetrahedron Lett.*, 1973 (1976).
- 2) R. Ray and D.S. Matteson, *ibid.*, 21, 449 (1980).
- 3) For other examples, see S.D. Larsen and S.A. Monti, *J. Am. Chem. Soc.*, 99, 8015 (1977) and F.M. Hauser and S. Prasanna, *Synthesis*, 621 (1980).

- 22,428-6 *N*-Methylmorpholine *N*-oxide monohydrate  
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#### References:

- 1) T.J. Wenzel, T.C. Bettes, J.E. Sadlowski, and R.E. Sievers, *J. Am. Chem. Soc.*, 102, 5903 (1980).
- 2) T.J. Wenzel and R.E. Sievers, submitted for publication.

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← Proton NMR spectra of 0.1M *p*-terphenyl in CDCl<sub>3</sub> with (a) no shift reagent and (b) 0.4M Resolve-Al AgFOD™ + Resolve-Al YbFOD™.



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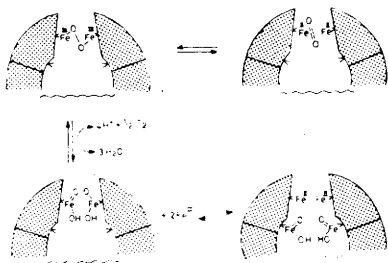
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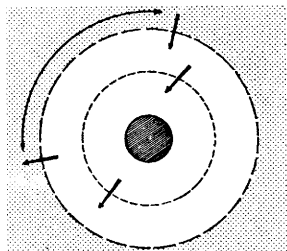
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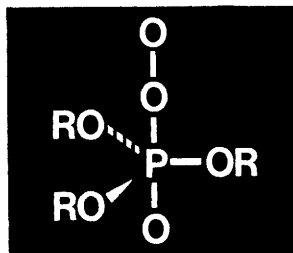
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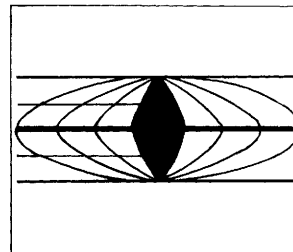
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