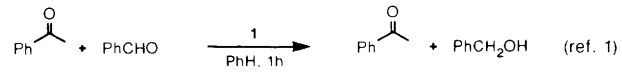
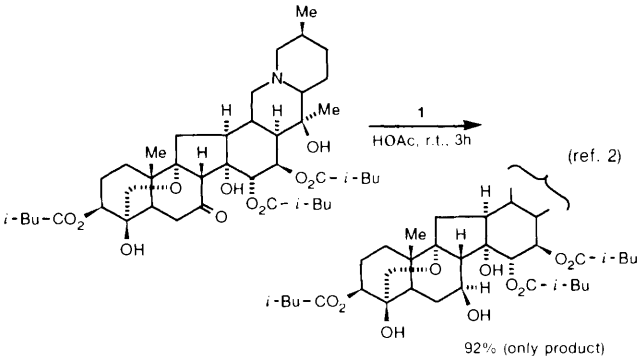
Selective Reducing Agents

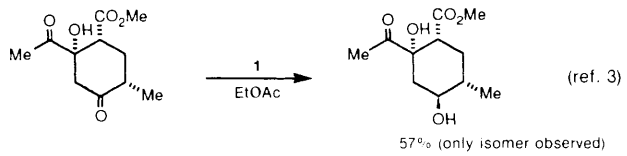
Triacetoxyborohydrides

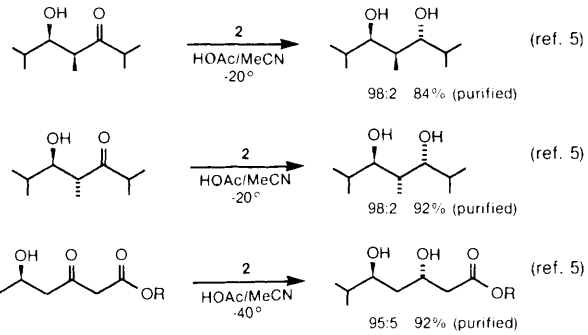
$NaBH(OAc)_3$ (1) $Me_4NBH(OAc)_3$ (2)

Triacetoxyborohydrides are mild and selective reducing agents. Gribble has shown that aldehydes may be reduced in the presence of ketones with **sodium triacetoxyborohydride (1)**.[1] Saksena and Turnbull have demonstrated this reagent's ability to reduce cyclic β-hydroxyketones stereoselectively.[2,3] Evans has reduced acyclic β-hydroxyketones with high stereoselectivity employing **sodium triacetoxyborohydride**[4] and **tetramethylammonium triacetoxyborohydride (2)**.[5] The latter reagent reduces ketones only if it can be directed by a hydroxyl group. In fact, these reactions may be run in a 1:1 acetone/acetic acid solvent mixture! Many other reductions with these reagents await discovery.[6]









References:
(1) Gribble, G.W.; Ferguson, D.C. *Chem. Commun.* **1975**, 535. (2) Saksena, A.K.; Mangiaracina, P. *ibid.* **1983**, *24*, 273. (3) Turnbull, M.D.; Hatter, G.; Ledgerwood, D.E. *Tetrahedron Lett.* **1984**, *25*, 5449. (4) Evans, D.A.; DiMare, M. *J. Am. Chem. Soc.* **1986**, *108*, 2476. (5) Evans, D.A.; Chapman, K.T. *Tetrahedron Lett.* **1986**, *27*, 5939. (6) For a review of the uses of **sodium triacetoxyborohydride**, see Gribble, G.W.; Nutaitis, C.F. *Org. Prep. Proced. Int.* **1985**, *17*, 317.

31,639-3 Sodium triacetoxyborohydride (1) **25g $12.00**
100g $32.00

31,736-5 Tetramethylammonium triacetoxyborohydride (2)
10g $10.00; 50g $27.00

We also list the following related reagent:

31,068-9 Tetramethylammonium borohydride **10g $18.00**
50g $54.00

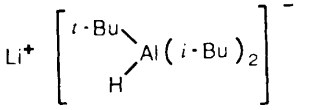
New Derivatives of Lithium Aluminum Hydride

$Li^+ [AlH(OCEt_3)_3]^-$

Lithium tri(*tert*-butoxy)aluminohydride is a widely used selective reducing agent. The above closely related reagent offers an even milder source of hydride for the chemoselective reduction of aldehydes even in the presence of unhindered ketones.

Krishnamurthy, S. *J. Org. Chem.* **1981**, *46*, 4628.

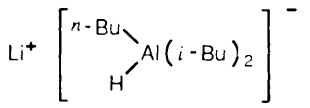
30,550-2 Lithium tris[(3-ethyl-3-pentyl)-oxy]aluminohydride, 0.5*M* solution in tetrahydrofuran **100ml $22.00**
800ml $141.00



This reagent has been used for the reduction of cyclic and bicyclic ketones to the corresponding thermodynamically less stable alcohols. Norcamphor was reduced to the endo alcohol in >99% stereoselectivity.

Kim, S.; Ahn, K.H.; Chung, Y.W. *J. Org. Chem.* **1982**, *47*, 4581.

30,327-5 Lithium *tert*-butyldiisobutyl-aluminohydride, 1.0*M* solution in petroleum ether **100ml $17.00**
800ml $88.50



The above reagent selectively reduces enones, epoxides, disulfides and other functional groups.

Kim, S.; Ahn, K.H. *J. Org. Chem.* **1984**, *49*, 1717.

30,326-7 Lithium butyldiisobutyl-aluminohydride, 1.0*M* solution in hexanes **100ml $14.00**
800ml $75.00

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