Soluble Oxidants

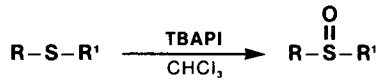
Tetrabutylammonium periodate and dichromate

Oxidation with inorganic reagents is a fundamental reaction in modern organic synthesis. The tetrabutylammonium salts of chromic and periodic acids have the advantage of being soluble in common organic solvents. The resulting homogeneous reactions are characterized by mild conditions, high reaction rates, absence of side reactions, convenient workup, increased selectivity, and high yields.

Aldrich now offers both **tetrabutylammonium periodate** (TBAPI) and **bis(tetrabutylammonium) dichromate** (TBADC). Some examples of their uses are shown below.

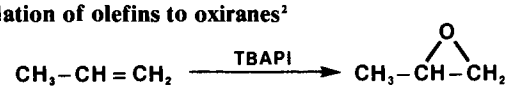
Tetrabutylammonium Periodate (TBAPI)

Selective oxidation of sulfides to sulfoxides[1]

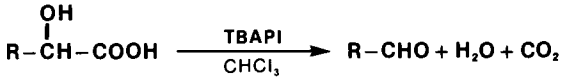


R, R¹ = alkyl, aryl — 70-90%

Oxidation of olefins to oxiranes[2]

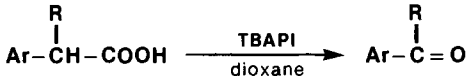


Oxidative decarboxylation of α-hydroxy carboxylic acids[1]



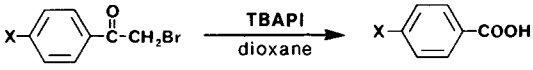
R = alkyl, aryl — 85-90%

Oxidative decarboxylation of arylacetic acids[3]



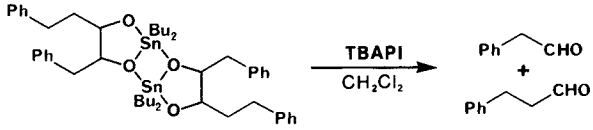
Ar = aryl; R = H, Ph — 50-85%

Oxidative cleavage of phenacyl bromides to benzoic acids[1]



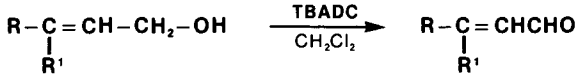
X = H, Br — 75-78%

Oxidative cleavage of covalent stannylene derivatives[4]

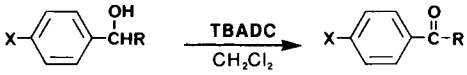


Bis(tetrabutylammonium) Dichromate (TBADC)

Oxidation of allylic and benzylic alcohols[5]

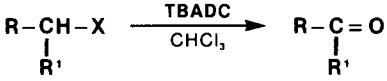


R = alkyl; R¹ = H, CH_3 — 78-82%



X = H, Cl, OCH_3, NO_2
R = H, CH_3, $CO_2C_2H_5$

Oxidation of benzyl, allyl, and secondary alkyl halides to carbonyls[6]



R = alkyl, aryl; R¹ = H, CH_3 — 72-95%
X = Cl, Br

References:

1) Santaniello, R.; Manzocchi, A.; Farachi, C. *Synthesis,* **1980**, 563.
2) Comer, W.; Lane, R. U.S. Patent 4 120 877; *Chem. Abstr.* **1979**, *90*, 54802q.
3) Santaniello, R.; Ponti, F.; Manzocchi, A. *Tetrahedron Lett.* **1980**, *21*, 2655.
4) David, S.; Thiéffry, A. *ibid.* **1981**, *22*, 2885.
5) Santaniello, R.; Ferraboschi, P. *Synth. Commun.* **1980**, *10*, 75.
6) Landini, D.; Rolla, F. *Chem. Ind. (London)* **1979**, 213.

24,705-7 Tetrabutylammonium periodate **25g $15.00**
100g $50.00

22,396-4 Bis(tetrabutylammonium) dichromate
(Note lower prices) **10g $10.00; 50g $38.00**

Among the inorganic oxidants recently listed by Aldrich are:

22,654-8 Silver perchlorate hydrate **5g $12.50**
25g $45.00; 100g $135.00

24,173-3 Barium perchlorate, anhydrous **100g $10.00**
500g $26.55

24,183-0 Potassium perchlorate, A.C.S. reagent
100g $7.00; 500g $14.50

24,184-9 Potassium perchlorate, A.C.S. reagent, 100-mesh, for Parr use **100g $7.50; 500g $20.00**

24,414-7 Sodium chlorate **100g $5.00; 1kg $7.90**

24,455-4 Barium chlorate monohydrate **100g $5.00**
500g $9.00; 2kg $27.00

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