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# Oxidative Deoximation with Sodium Perborate[1]

B. P. Bandgar [a] , S. I. Shaikh [a] & Suresh Iyer [b]
[a] Dept. of Chem., P.G. and Research Centre, R.B.N.B. College, Shrirampur, 413709, Maharashtra, India
[b] Division of Organic Chemistry (Synthesis), NCL, Pune, 411008, Maharashtra, India
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SYNTHETIC COMMUNICATIONS, 26(6), 1163-1168 (1996)

# OXIDATIVE DEOXIMATION WITH SODIUM PERBORATE[1]

B.P. Bandgar,*[a] S.I. Shaikh[a] and Suresh Iyer[b]

[a] Dept. of Chem., P.G. and Research Centre,
R.B.N.B. College, Shrirampur-413709, Maharashtra, India.
[b] Division of Organic Chemistry (Synthesis),
NCL, Pune - 411008, Maharashtra, India.

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**ABSTRACT :** An efficient and convenient conversion of oximes to corresponding carbonyl compounds with sodium perborate in glacial acetic acid is reported.

Regeneration of carbonyl compounds from stable and readily prepared aldoximes and ketoximes has received attention in recent years.[2-10] Since oximes can be prepared from non-carbonyl compounds,[11-19] the regeneration of carbonyl compounds from oximes provides an alternative method for the preparation of aldehydes and ketones. However, many of these methods to generate carbonyl compounds from oximes involve reagents which are either expensive or not readily available.[20-31]

Sodium perborate is a very cheap, large scale industrial chemical, safe and easily handled oxidant, which has been shown to be versatile oxidising

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* To whom correspondence should be addressed



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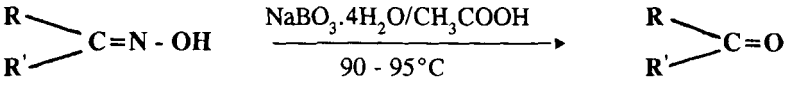
agent.[32-35] We report here usefulness of sodium perborate in glacial acetic acid for the oxidative cleavage of oximes to corresponding carbonyl compounds in good yields. The reaction is most suitable for the conversion of ketoximes to ketones. However, the deoximation of aldoximes requires longer reaction time and could give overoxidation product, carboxylic acid and as a result of this, yields of corresponding aldehydes are low (entries 9 and 10).




Scheme

In conclusion, the present procedure of deoximation with sodium perborate provides a very convenient and efficient method for the generation of carbonyl compounds from oximes, particularly ketoximes. This procedure can be easily scaled up and given the cheapness of the sodium perborate together with its non-toxic nature, ease of hadling and absence of effluent or by-product problems, it could well prove to be the oxidising reagent of choice.

## Experimental

All oximes were prepared using standard synthetic methods.[36] All glassware was oven-dried. The solvents were distilled before use. Sodium perborate tetrahydrate (Aldrich) was used as obtained.

## General Procedure

A mixture of oxime (5 mmol), glacial acetic acid (30 mL) and sodium perborate tetrahydrate (20 mmol) was stirred at 90 - 95°C for the specified time (Table). The rection was monitored by TLC. After completion of the reaction, the reaction mixture was cooled to room temperature. The product was

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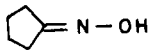
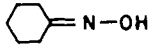
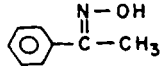
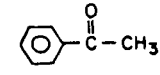
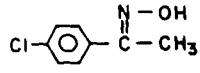
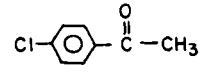
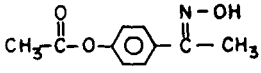
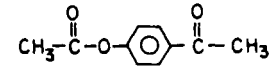
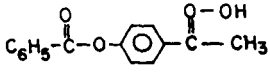
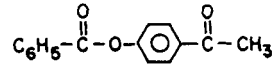
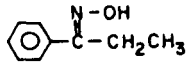
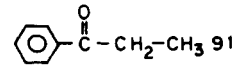
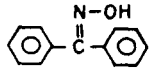
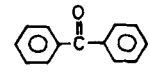
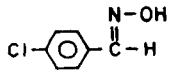
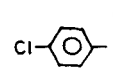
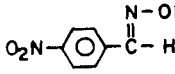
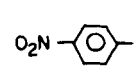
Table : Oxidative Cleavage of Oximes with Sodium Perborate.

| Entry | Oxime | Reaction Time, h | Product[a] | Yield[b] % |
|---|---|---|---|---|
| 1 |  | 8 |  | 89 |
| 2 |  | 5 |  | 80 |
| 3 |  | 6·5 |  | 88 |
| 4 |  | 3·5 |  | 83 |
| 5 |  | 3 |  | 86 |
| 6 |  | 3 |  | 75 |
| 7 |  | 1·5 |  | 91 |
| 8 |  | 5 |  | 87 |
| 9 |  | 12·25 |  | 43 |
| 10 |  | 12 |  | 40 |

a. All products were characterized by IR and $^1$H-NMR spectra and by comparison with authentic samples.

b Isolated yields.

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extracted with ether (4 x 10 mL) and washed with 10% sodium bicarbonate (2 x 10 mL) and water. The ether extract was dried over anhydrous $Na_2SO_4$. Removal of ether under reduced pressure afforded product in good yield and almost pure form.

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