Introduction

The importance of hypervalent iodine reagents in organic chemistry has been demonstrated in recent years, and they have been found to have several desirable properties: they are mild, selective, efficient and eco-friendly.\(^1\) 2-Iodoxybenzoic acid (IBX) has been developed as a powerful reagent for several organic transformations, and a recent surge in interest was driven by the publication of an improved method for its synthesis.\(^2\) IBX is a powerful single-electron transfer oxidant that readily accepts a new heteroatom-based ligand, and has been applied successfully for the construction of novel heterocycles.

Preparation

According to a new improved procedure, IBX can be prepared in very good yield by the oxidation of 2-iodobenzoic acid with Oxone;\(^2\) this shows advantages over the previously reported methods.\(^2\)

Abstracts

(A) IBX oxidizes 1° and 2° alcohols to the corresponding aldehydes and ketones, without any over-oxidation, in DMSO at room temperature.\(^3\) Using different solvent systems and higher temperatures, yields of 90–100% can be obtained.\(^4\) Environmentally benign ionic liquids have also been used as solvents for this transformation.\(^5\)

(B) IBX has been used to oxidize oximes and tosyl hydrazones to the corresponding carbonyl compounds.\(^6\)

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(C) IBX was used to oxidize saturated alcohols and carbonyl compounds\(^7\) to the corresponding \(\alpha,\beta\)-unsaturated carbonyl system in one pot. It can also be used to oxidize the benzylic position.\(^8\)

(D) IBX reacts with certain unsaturated N-aryl amides (anilides) to form novel heterocycles such as \(\delta\)-lactams, cyclic urethanes, hydroxylamine and aminosugar building blocks.\(^8\)

(E) In combination with an N-oxide (MPO), IBX was used to oxidize a carbonyl\(^9\) and its silyl enol ether\(^10\) to the corresponding \(\alpha,\beta\)-unsaturated compounds in high yield at ambient temperature.

(F) A regioselective oxidation of phenols to \(o\)-quinones was performed with IBX.\(^10\)

(G) Recently, IBX was used to convert nitrogen- and sulfur-containing substrates to synthetically useful intermediates.\(^11\)

References


(5) Karthikeyan, G.; Perumal, P. T. *Synlett* 2003, 2249.


