meta-Chloroperoxybenzoic Acid (*m*-CPBA)

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Introduction

meta-Chloroperoxybenzoic acid (*m*-CPBA) is a white crystalline powder with a melting point of 90 °C. In pure form, it can be detonated by shock or by sparks, and therefore it is stored as a mixture containing less than 72% *m*-CPBA (containing water and *meta*-chlorobenzoic acid). It is soluble in dichloromethane, chloroform, ethyl acetate, alcohol, and

insoluble in hexanes, carbon tetrachloride, and water. *m*-CPBA is obtained by the reaction of *m*-chlorobenzoyl chloride with a basic solution of hydrogen peroxide in the presence of MgSO₄·7H₂O. *m*-CPBA is used as oxidizing agent in Baeyer–Villiger oxidations¹ and in the synthesis of epoxides,² oxaziridines,³ α-disulfines,⁴ sulfoxides and sulfones,⁵ N-oxides,⁶ and ketones.⁷

Table 1 Use of *m*-CPBA

(A) Troisi and co-workers developed a new synthetic pathway to sulfonamidic azobenzene derivatives **2** based on the oxidation of 2,3-dihydrobenzothiadiazines **1** with *m*-CPBA. It was shown that high yields were achieved when three equivalents of the peroxyacid were used.⁸

(B) Recently, Kitamura et al. found that oxidative fluorination of 1,3-dicarbonyl compounds **3** with hydrofluoric acid is efficiently performed with the use of stoichiometric amounts of *m*-CPBA. It is worth noting that a catalytic amount of iodoarene is needed for the reaction to proceed.⁹

(C) Bovenkerk and Esser showed that the oxidation of different benzo[c]furans **5** with *m*-CPBA afforded diketones **6**, that were used as precursors for 2-aniline-substituted isoindoles.¹⁰

(D) Nitroso esters **8**, which are attractive monomers for synthesis of different polymers with high molecular weight and regular monomer sequence, were obtained by the reaction of 4,4-dimethyl-2-oxazolines **7** with two equivalents of *m*-CPBA. Monomers with a similar structure may be obtained when 4,4-dimethyl dihydro-1,3-oxazines are used as starting materials.¹¹

(E) The double oxylactonization of **9** in the presence of *m*-CPBA and dimethyl 2,2'-((2-iodo-1,3-phenylene)bis(oxy))(2*S*,2'*S*)-dipropionate as a catalyst was a key step in total synthesis of a monocerin derivative **10**, a potentially biologically active compound. The stereochemistry is controlled by an iodoarene catalyst.¹²

(F) Rodríguez and Moran studied an interesting oxidative rearrangement of tertiary propargylic alcohols **11** to enoic acids **12** in the presence of *m*-CPBA. They suggested that the reaction proceeds by hydrogen-bond directed alkyne epoxidation followed by 1,2-aryl migration.¹³

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