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 oxidations and in the synthesis of epoxides, oxaziridines, α-disulfines, sulfoxides and sulfones, N-oxides, and ketones.

Table 1: Use of m-CPBA

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

(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.

(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.
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References

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