REACTIVITY OF OXYGENATED 5-DEAZAFLAVINS

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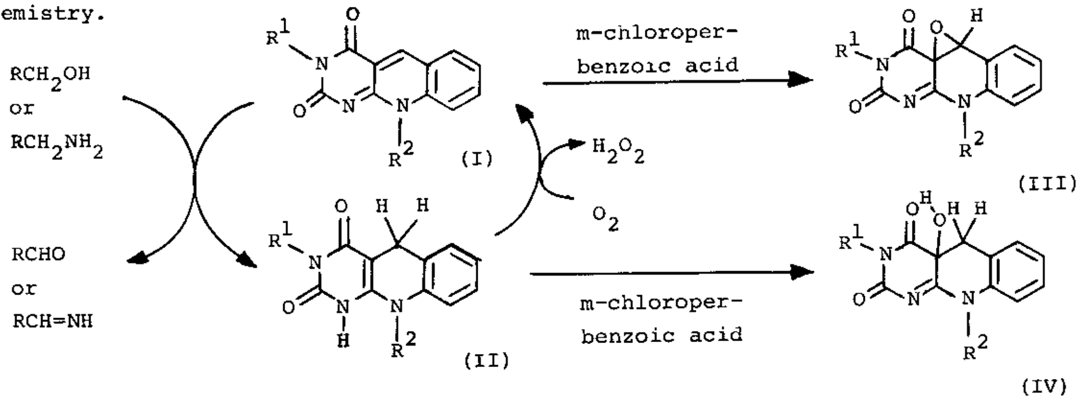
Recently, we found that 5-deazaflavin-dependent oxidation of alcohols and amines to carbonyl compounds is automatically recycled under weakly basic conditions.[1)] Hereupon, 1,5-dihydro-5-deazaflavins (II) initially formed are reoxidized to the original 5-deazaflavins (I) by adventitious oxygen (air), while oxygen may be hydrogenated to hydrogen peroxide. It may be possible that the hydrogen peroxide thus formed will partially catch the 1,5-dihydro-5-deazaflavin (II) as well as the 5-deazaflavin (I) in the autorecycling system to give birth to the corresponding oxygenated 5-deazaflavins.

Thus we have carried out the oxidation of I and II with m-chloroperbenzoic acid (which could be considered as an equivalent of hydrogen peroxide) in chloroform to afford 4a,5-epoxy-5-deazaflavin[2,3)] (III) and 5-hydro-4a-hydroxy-5-deazaflavin (IV) respectively. The reactivities of these oxygenated compounds toward several kinds of reagents were examined, which may serve as a basis for understanding reactivity of the 5-deazaflavin cofactor (e. g. coenzyme F_{420}) in biological system and also providing new revelant preparative procedure in synthetic heterocyclic chemistry.



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3) F. Yoneda, Y. Sakuma, Tetrahedron Letters, 1981, 3977.