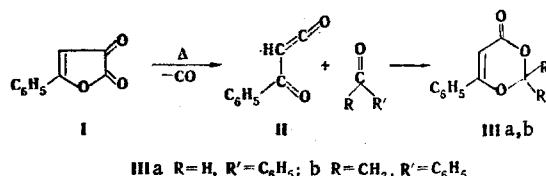


SYNTHESIS OF 2,2,6-TRISUBSTITUTED 1,3-DIOXEN-4-ONES

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It has previously been reported that 5-aryl-2,3-dihydro-2,3-furandiones (I) decompose upon heating with the release of carbon monoxide [1]. We have found that the decarbonylation of furandione I in boiling benzene in the presence of aldehydes and ketones results in the formation of 2,2,6-trisubstituted 1,3-dioxen-4-ones (III). The latter form as a result of the high-temperature elimination of carbon monoxide followed by the concerted ($4\pi + 2\pi$) cycloaddition of intermediate benzoylketene II to a carbonyl group.



For example, when a mixture of 1 g (5.7 mmole) of 5-phenyl-2,3-dihydrofuran-2,3-dione was boiled with 0.61 g (5.7 mmole) of benzaldehyde in 10 ml of dry benzene over the course of 3 h, 2,6-diphenyl-1,3-dioxen-4-one (IIIa) was obtained with a 91% yield and mp 108–110°C. IR spectrum: 1710 (COO), 1605 cm⁻¹ (C=C). PMR spectrum (CCl₄): 5.93 (1 H, s), 6.46 (1 H, s), 7.56 ppm (10 H, m, aromatic protons). 2-Methyl-2,6-diphenyl-1,3-dioxen-4-one (IIIb) was obtained in a similar manner from 5-phenylfuran-2,3-dione and acetophenone with a 62% yield and mp 100–102°C. IR spectrum: 1710 (COO), 1605 cm⁻¹ (C=C). PMR spectrum (CCl₄): 1.87 (3 H, s, CH₃), 5.65 (1 H, s), 7.83 ppm (10 H, m, aromatic protons). The data from the elemental analysis fit the calculated data.

The boiling of 2-methyl-2,6-diphenyl-1,3-dioxen-4-one with aniline in benzene over the course of 2 h yielded benzoylacetanilide.

LITERATURE CITED

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