Photocyclization of 2-Benzyloxy-4-methoxybenzophenone

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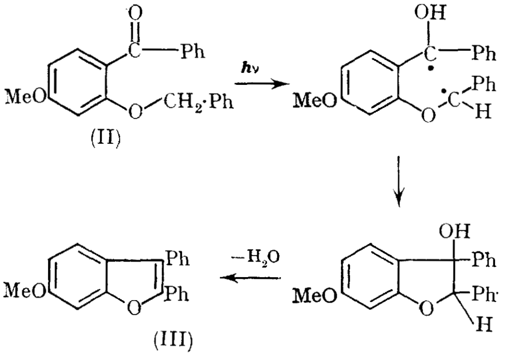
Summary The photolysis of 2-benzyloxy-4-methoxybenzophenone produced 2,3-diphenyl-6-methoxybenzofuran presumably *via* internal hydrogen transfer in the excited state followed by cyclization of the resulting diradical.

ALTHOUGH the photochemistry of 2-hydroxybenzophenone has been studied extensively, little is known about the photochemistry of its ethers. Leary and Oliver reported that 2-methoxybenzophenone is photolytically demethylated to give 2-hydroxybenzophenone in low yield.[1] The photolysis of 4,6-di-t-butyl-2-methoxybenzophenone (I) results in a cyclization reaction involving the carbonyl carbon and the 6-t-butyl group to give 5-butyl-7-methoxy-3,3-dimethyl-1-phenylindan-1-ol.[2] We report a photocyclization having an apparent mechanistic similarity to the cyclization of (I). When 2-benzyloxy-4-methoxybenzophenone (II) was photolyzed in benzene solution (Rayonet RPR-100, 3100 Å lamps), 2,3-diphenyl-6-methoxybenzofuran (III), m.p. 121—122°, was obtained in greater than 50% yield. The structure was established by comparison with an authentic sample, prepared from benzoin and *m*-methoxyphenol by the method of Wacek.[3] 2-Hydroxy-4-methoxybenzophenone was also obtained in 8% yield. The following mechanism probably accounts for the formation of (III).



This reaction provides a simple synthesis for a variety of substituted 2,3-diarylbenzofurans.

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[1] G. Leary and J. Oliver, *Tetrahedron Letters*, 1968, 299.

[2] E. J. O'Connell, jun., *J. Amer. Chem. Soc.*, 1968, **90**, 6550.

[3] A. Wacek and H. Däubner-Rettenbacher, *Montash.*, 1951, **81**, 266.