

PHOTOLYSIS OF DIARYLIODONIUM SALTS IN AQUEOUS ALKALINE SOLUTION

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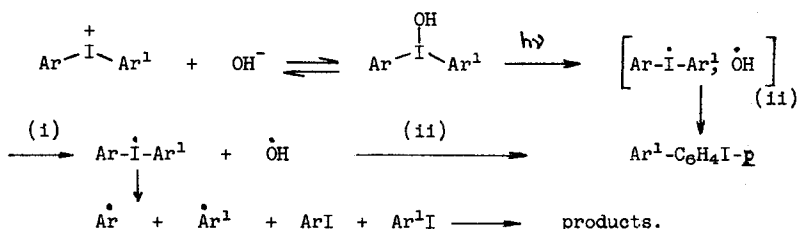
The carbon-halogen bond is readily cleaved by ultraviolet radiation.<sup>1</sup> Several groups have investigated the photochemical decomposition of diaryliodonium salts in a variety of solvents. Photochemical decomposition of diphenyliodonium iodide in chloroform gave benzene, iodobenzene, iodine and diphenyliodonium triiodide.<sup>2</sup> When diphenyliodonium iodide is photolysed in labelled benzene the major products are biphenyl in which one ring is labelled, and unlabelled iodobenzene.<sup>3</sup>

The recent publication of Knapezyk and co-workers<sup>4</sup> prompted us to report our results concerning the photolysis of diaryliodonium salts in aqueous alkali. In particular we were interested in the prospect of a biaryl synthesis.

Photolysis of diphenyliodonium hydroxide in aqueous sodium hydroxide solution with a high pressure mercury vapour lamp gave as the major products 4-iodobiphenyl and biphenyl (ca.10% of each). The minor products were terphenyls and iododerivatives of terphenyls (mass spec.). No phenols were formed.

Photolysis of 4-methoxydiphenyliodonium hydroxide<sup>5</sup> in aqueous sodium hydroxide solution gave 4-methoxybiphenyl and 4-methoxy-4-iodobiphenyl (ca.10% of each). Traces of biphenyl and 4,4'-dimethoxybiphenyl were also present.<sup>b)</sup>

The mechanism proposed by Knapezyk is in agreement with our results and is summarised in the reaction scheme.



The biphenyl and the 4-methoxybiphenyl are readily accounted for by pathway (i), whereas the para-iodobiphenyl derivatives may be produced from the intermediate radical  $\text{Ar-I-Ar}^1$  before it decomposes to Ar and  $\text{Ar}^1$  through a radical cage intermediate  $[\text{Ar I-Ar}^1]$ , pathway (ii). It seems unlikely that the Ar radicals would react with iodobenzene to give exclusively p-iodobiphenyls.

p-Iodobiphenyls have not previously been observed as products from the photolysis of diaryliodonium salts.

#### Footnotes.

- a) Author to which enquires should be addressed.
- b) All products were characterised by n.m.r. , mass spec. and in some cases by comparison with authentic samples.

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