

THE PHOTOCHEMISTRY OF BENZENE AT 2537 Å^o

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S U M M A R Y

o The photochemical reactions of benzene at 2537 Å in aqueous solutions, in the vapour phase, and in the liquid phase were investigated. Some of the products of the irradiations in the presence of oxygen and under inert atmospheres were identified from their spectroscopic properties and chemical reactions.

Irradiation of aqueous solutions in the presence of oxygen yielded an aldehydic product [1] and hydrogen peroxide in equimolar quantities. In the absence of oxygen only the aldehyde was formed. The formation of the aldehyde in the presence of oxygen was suppressed by the presence of sodium chloride, potassium chloride and potassium bromide.

In the vapour phase phenol and mucondialdehyde were the major products for the irradiations in the presence of oxygen. In the absence of oxygen, phenol and biphenyl were the products arising from the interaction of a long-lived intermediate with water and benzene respectively.

The photo-oxidation of liquid benzene yielded mucondialdehyde, 2,4,6,8,10-dodecapentadienedial and phenolic products. Under inert conditions a cumulene of formula $C_{24}H_{24}$ was obtained. There was also some evidence for the formation of fulvene and benzvalene.