

## Rearrangement of the Intermediate Betaines in Attempted Wittig Reactions

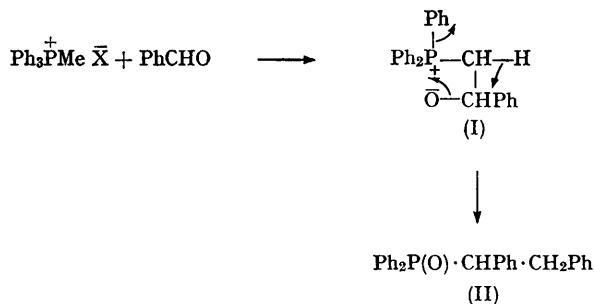
By S. TRIPPETT and B. J. WALKER

(*Department of Chemistry, The University, Leicester*)

WITTIG reactions using benzyltriphenylphosphonium halides in alcohols with alkoxide as base give high yields of olefins, despite the rapid alternative reaction<sup>1</sup> leading to triphenylphosphine oxide, toluene, and ether. However, alkyltriphenylphosphonium halides, which do not undergo alcoholysis, give only poor yields of olefins under these conditions. Thus benzaldehyde with benzyltriphenylphosphonium bromide in ethanolic sodium ethoxide gives >96% of stilbenes, while with methyltriphenylphosphonium bromide under the same conditions only 10% of styrene is obtained. We find that a major product from the latter reaction is 1,2-diphenylethyldiphenylphosphine oxide (II; 64%),<sup>2</sup> m.p. and mixed m.p. 232—233°,

formed by rearrangement of the betaine (I), perhaps as indicated. The intervention of the betaine is supported by the formation of the oxide (II) in 40% yield by the reaction of triphenylphosphine with styrene oxide in refluxing ethanol.

Phosphine oxides analogous to (II) have been obtained from methyltriphenylphosphonium halides and other aromatic aldehydes; their structures have been proved by synthesis from benzyltriphenylphosphine oxide, butyl-lithium, and the substituted benzyl halides. The rearrangements are much slower in methanol than in ethanol and correspondingly higher yields of olefins are obtained.



(Received, February 23rd, 1965.)

<sup>1</sup> M. Grayson and P. T. Keough, *J. Amer. Chem. Soc.*, 1960, **82**, 3919.

<sup>2</sup> L. Horner and P. Beck, *Chem. Ber.*, 1960, **93**, 1371.