Journal of Organometallic Chemistry, 77 (1974) C22—C24

Preliminary communication

THE STANNYLATION OF CARBONYL-STABILISED PHOSPHORUS YLIDS, AND TIN-ASSISTED ELIMINATION REACTIONS

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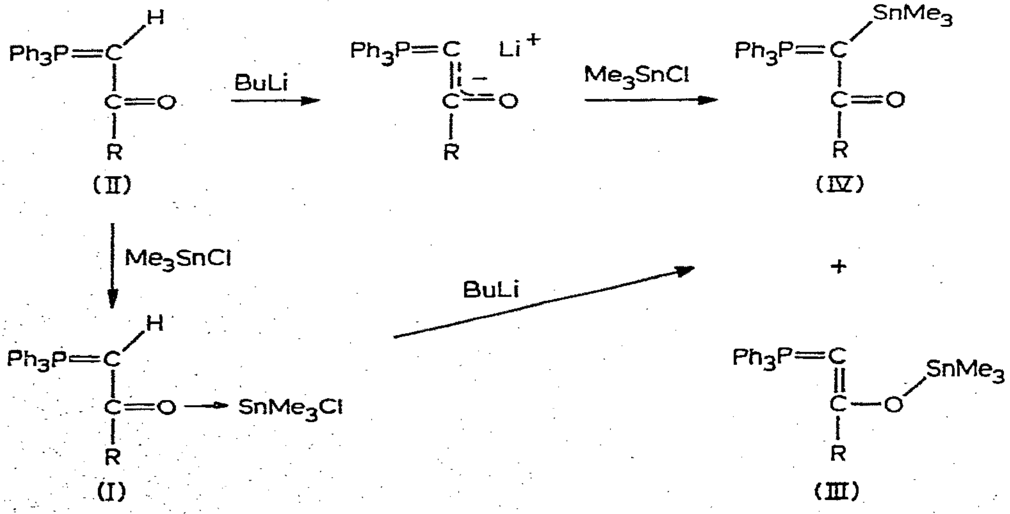
(Received June 14th, 1974)

Summary

The interaction of organotin halides with lithium salts of mono-substituted phosphorus ylids and also with disubstituted ylids is described.

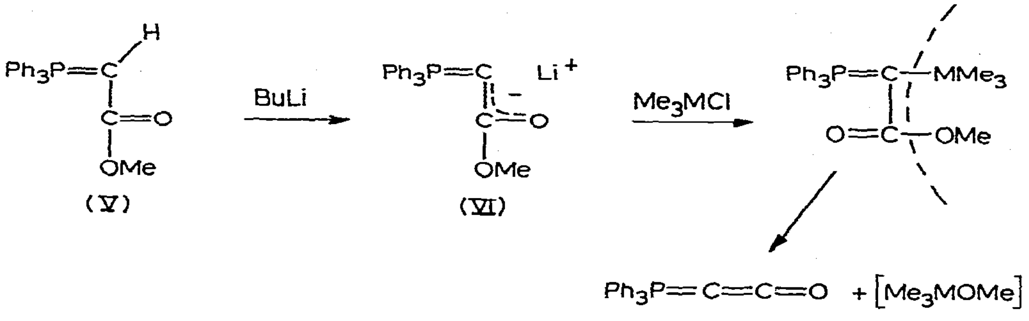
The interaction of carbonyl-stabilised phosphorus ylids with triorganotin halides leads to the formation of 1/1 complexes [1,2] I in which the ligand is attached to the metal via the carbonyl group rather than the methine carbon atom [3]. Lithiation of *C*-acyl phosphorus ylids II with butyllithium results in the formation of the orange lithium derivative, which on treatment with organotin halides yields maroon-red mixtures of isomeric *O*- and *C*-stannylated phosphorus ylids, III and IV, respectively (Scheme 1).



Scheme 1

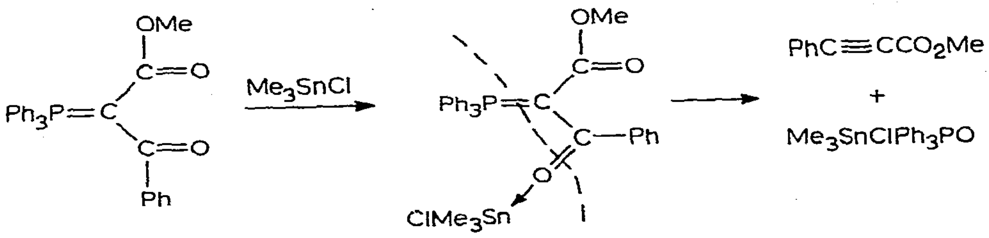
The presence of both isomers is indicated by the observation of two methyl-tin resonances in the ^{1}H NMR spectrum, and also, in the case of the analogous dimethyltin derivative, two quadrupole split resonances in the tin-119*m* Mössbauer spectrum. Lithiation of the complex I affords an apparently identical product mixture.

The reaction of the *C*-carbomethoxyphosphorus ylid V with butyllithium similarly gives the lithium derivative VI. However, reaction of VI with Me_3MCl (M = Si, Sn) results in the immediate decolourisation of the orange-red reaction mixture, from which triphenylphosphine ketene VII was isolated in both cases. The production of VII is rationalised by Scheme 2 involving elimination of Me_3MOMe from the metallated intermediate.



Scheme 2

C,C-Disubstituted phosphorus ylids do not form isolable complexes with tri- and di-organotin halides. Instead, the addition of the appropriate quantity of organotin halide promotes the rapid formation of functionally substituted acetylenes at room temperature via the elimination of the triphenylphosphine oxide complex of the tin halide, e.g. Scheme 3.



Scheme 3

The synthetic use of this type of elimination is under further intensive study in this laboratory.

Acknowledgement

We thank the Science Research Council for support in the form of a maintenance grant (to JB).

References

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