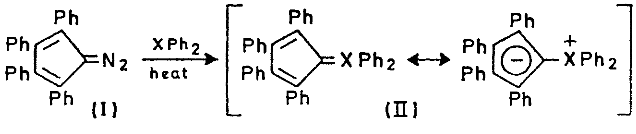
A Telluronium Ylide

By BRIAN H. FREEMAN and DOUGLAS LLOYD*
(*Department of Chemistry, Purdie Building, University of St. Andrews, Fife*)

Summary A telluronium ylide has been prepared and some of its properties examined.

SINCE sulphonium[1] and selenonium[2] ylides (II; X = S, Se) and also ylides containing each of the Group V elements from nitrogen to bismuth[3,4] have been prepared by thermal decomposition of diazotetraphenylcyclopentadiene(I) in the presence of the appropriate carbene-acceptor, the corresponding reaction in diphenyl telluride was investigated.



X = S or Se or Te

Addition of ether and petroleum (b.p. 40—60°) to the cooled reaction mixture precipitated a solid, m.p. 175° (decomp.) (from benzene–petroleum) which, from its mode of preparation, analysis and spectra, we believe to be the telluronium ylide (II; X = Te).

Mass spectra under routine operating conditions showed large peaks corresponding to diphenyl telluride and no signals corresponding to the ylide, but at low electron voltage, peaks due to the parent ylide were also recorded. It seems likely that at high electron voltages, the ylide is cleaved completely to give the diphenyl telluride cation leaving the tetraphenylcyclopentadiene moiety as a neutral fragment.[5]

Unlike most tetraphenylcyclopentadienylides of Group V and VI elements but like the pyridinium[6] and triphenylbismuthonium[4] homologues, the u.v. spectrum of (II; X = Te) varies with the polarity of the solvents [λ_{max} (benzene) 280 and 347 nm; λ_{max} (methanol) 252, 280sh, and 335 nm], although the differences are smaller in this case.

Like its diphenylsulphonium and diphenylselenonium analogues, this telluronium ylide is an extremely weak base. Addition of perchloric acid to an ethanolic solution of (II; X = Te) produces no change in its u.v. spectrum, indicating that it is not protonated to any extent under these conditions. Longer exposure to acid or contact with strong acids leads to destruction of the ylide.

No fulvene could be isolated from an attempted reaction of (II; X = Te) with *p*-nitrobenzaldehyde, nor could either an anil or anil oxide be obtained by reaction with nitrosobenzene.[7] In both cases decomposition of the ylide apparently supervened. A similar breakdown occurred when t.l.c. of the ylide was attempted.

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[1] D. Lloyd and M. I. C. Singer, *Chem. and Ind.*, 1967, 118.

[2] D. Lloyd and M. I. C. Singer, *Chem. Comm.*, 1967, 390.

[3] I. B. M. Band, D. Lloyd, M. I. C. Singer, and F. I. Wasson, *Chem. Comm.*, 1966, 544; D. Lloyd, M. I. C. Singer, M. Regitz, and A. Liedhegener, *Chem. and Ind.*, 1967, 324; M. Regitz and A. Liedhegener, *Tetrahedron*, 1967, **23**, 2701; D. Lloyd and M. I. C. Singer, *Chem. and Ind.*, 1967, 510, 787.

[4] D. Lloyd and M. I. C. Singer, *Chem. Comm.*, 1967, 1042.

[5] For this suggestion we are grateful to our colleague Dr. R. K. Mackie, to whom we are also indebted for the mass spectra.

[6] D. Lloyd and J. S. Sneezum, *Tetrahedron*, 1958, **3**, 234.

[7] *Cf.* D. Lloyd and M. I. C. Singer, *Chem. and Ind.*, 1968, 1277.