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THE REACTION OF DIVINYLSULPHONE WITH AMINES AND PHOSPHINES

A. C. Bellaart^a

^a Department of Organic Chemistry, Eindhoven University of Technology, The Netherlands

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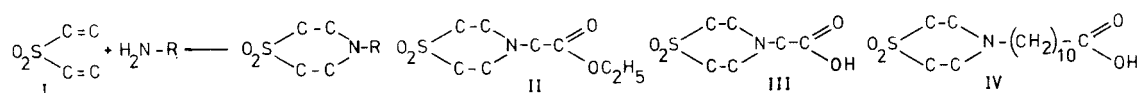
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THE REACTION OF DIVINYLSULPHONE WITH AMINES AND PHOSPHINES

A.C. Bellaart

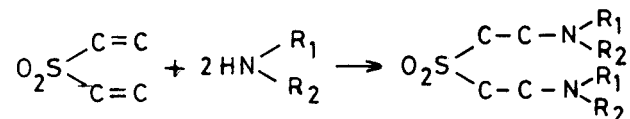
Department of Organic Chemistry, Eindhoven University of Technology, The Netherlands

Primary amines react with divinylsulphone (I) according to the following equation:



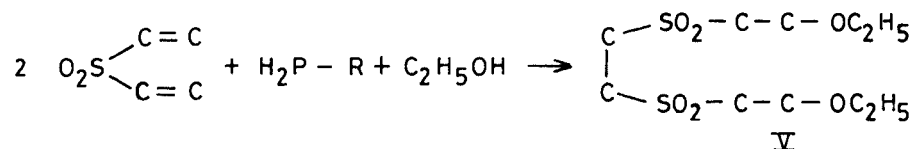
Several 4-alkyl-1,4-thiazane-1,1-dioxides and derivatives were obtained by Ford-Moore^{1,2} and Bellaart³. Ethyl-1,4-thiazane-1,1-dioxide-4-acetate (II) was obtained from I and glycine ethyl ester, III by saponification of II; 1,4-thiazane-1,1-dioxide-4-undecanoic acid (IV) from I and 11-amino undecanoic acid.

Secondary amines react with I as follows:

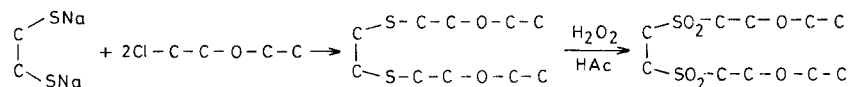


Tertiary amines do not react with I.

Primary phosphines, such as n-nonylphosphine, t-butylphosphine and tetradecylphosphine, react with I in an alcoholic solution in the following way:



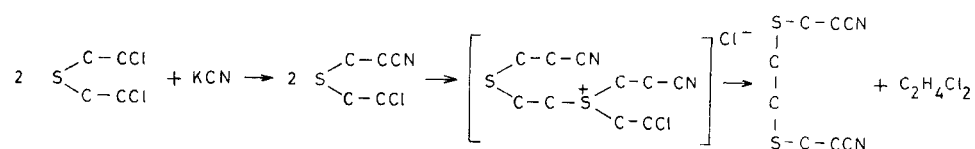
The structure of V was proved by the following synthesis:



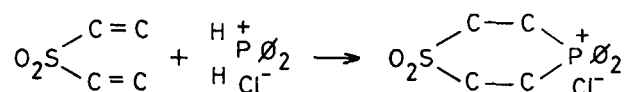
As yet we have no idea about the reaction mechanism!

A similar reaction was found by Davies⁴, who obtained, in an attempt to prepare bis-[2-cyanoethyl]sulphide from bis-[2-chloroethyl]sulphide and potassium

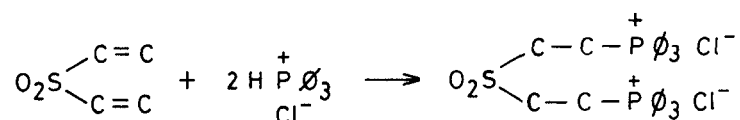
cyanide, 3,6-dithiaoctane-1,8-dinitrile. A possible reaction mechanism was given by Bell⁵:



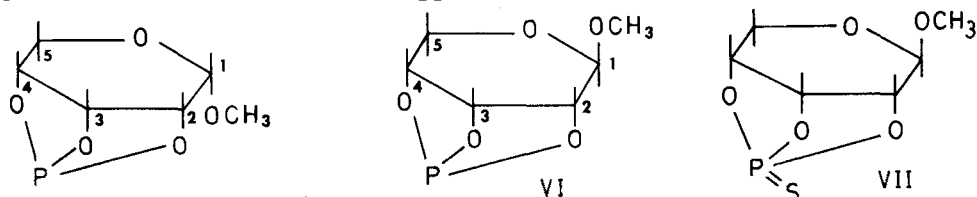
Diphenylphosphine reacts with divinylsulphone in concentrated hydrochloric acid in the following way:



Triphenylphosphine also reacts with divinylsulphone in concentrated hydrochloric acid yielding the following compound:



Quite recently⁶ we synthesized the phosphite triesters of methyl α -D-ribo-pyranoside and methyl β -D-ribo-pyranoside (VI):



By heating VI for 15 hrs on 175° with sulphur we obtained the corresponding thiophosphate VII in a very good yield.

1. A.H. Ford-Moore, J. Chem. Soc., 1949, 2433.
2. A.H. Ford-Moore, A.G. Lidstone and W.A. Waters, *Ibid* 1946, 819.
3. A.C. Bellaart, Rec. Trav. Chim., 81, 156 (1962).
4. W. Davies, J. Chem. Soc., 117, 297 (1920).
5. E.V. Bell, G.M. Bennett and A.L. Hock, J. Chem. Soc., 1927, 1803.
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