REACTIONS OF DI-SUBSTITUTED CYCLOIMMONIUM YLIDES WITH CYCLOPROPENES

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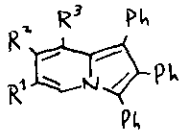
As a part of our studies on the reactions of strained cyclic olefines, reactions of pyridinium dicyanomethylides and dialkoxycarbonylmethylides with 1,2,3-triphenylcyclopropene (TPP) and diphenylcyclopropenethione (DPT) were examined.

Pyridinium and mono- or di-substituted-pyridinium dicyanomethylides undergo 1,3-dipolar cycloadditions to TPP in refluxing DMF producing the corresponding 1,2,3-triphenylindolizines (I) and 5-cyano-6,7,8- or 4-cyano-1,2,3-triphenyl-4H-quinolizines (*II or III*). The formation of 4H-quinolizines may predominate depending on the structures of ylides and the 1:1 adducts (IV) are also obtained in some cases.

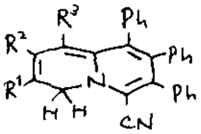
The similar reactions of the dialkoxycarbonylmethylides with TPP give the indolizines and/or *the 1:1 adducts only in poor yield.*

On the other hand, with DPT the pyridinium dicyano-, dimethoxycarbonyl-, diethoxycarbonyl-, and methoxycarbonylcyanomethylides react in acetonitrile at room temperature as a nucleophile to afford 7-azaindenethione (V), 7-oxaindenethione (*VI*), *2-pyranethione* (VII), 2-thiopyranone (VIII), or 2-pyranone derivatives (IX).

The structures of the products and the possible mechanisms for thier formations are discussed.



(I)



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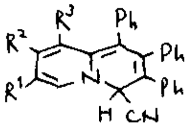

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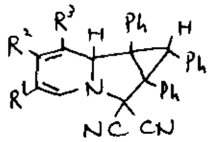

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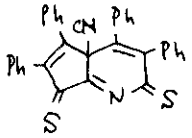

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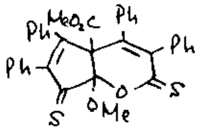
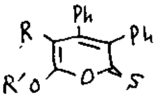
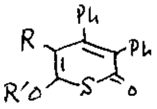


(VI)



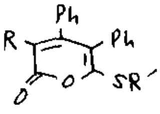
(VII)

$\left(\begin{array}{l}R=CO_2Me\\R'=Me\end{array}\right.$



(VIII)

$\left(\begin{array}{l}R=CO_2Et\\R'=Et\end{array}\right.$



(IX)

$\left(\begin{array}{l}R=CO_2Me\\R'=Me\end{array}\right.$ $\left(\begin{array}{l}R=CN\\R'=Et\end{array}\right.$