

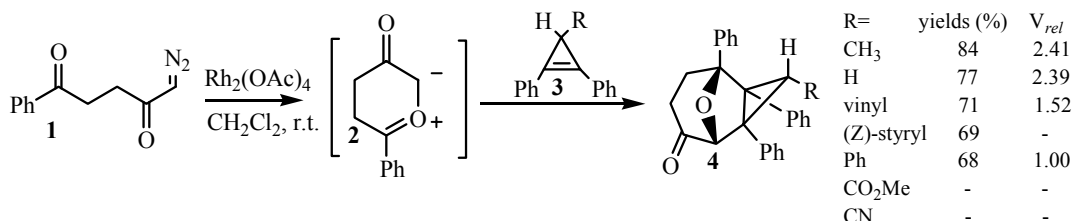
1,3-Dipolar Cycloaddition Reaction of Carbonyl Ylides with 3-Substituted 1,2-Diphenylcyclopropenes ¹

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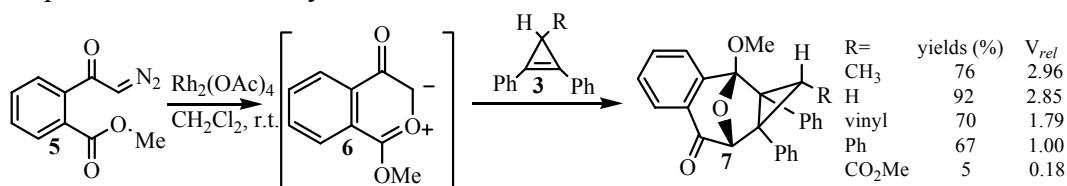
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Carbonyl ylides are reactive intermediates whose principal synthetic uses are in 1,3-dipolar cycloadditions to an appropriate dipolarophile such as various alkenes, alkynes, carbonyl compounds, thioketones.^[1] Of the different methods for carbonyl ylide formation, the interaction of a metalcarbenoid with the oxygen atom of a carbonyl group is particularly attractive because of its apparent simplicity. We became interested in exploring the potential of the carbonylylide cycloaddition across strained double bonds.^[2] In the present work we report the more detailed results of our study of reactivity of carbonyl ylides towards 3-substituted 1,2-diphenylcyclopropenes **3**. It was found that catalytic decomposition of the diazoketones **1** and **5** with Rh₂(OAc)₄ (0.3-0.5 mol%) in CH₂Cl₂ at room temperature in presence of cyclopropenes **3** resulted in the formation of the cycloadducts **4** and **7** respectively as a single stereoisomers.



Among factors strongly effected the cycloaddition reaction the sterical hindrance and the electronic nature of the substituent at 3 position of cyclopropenes **3** should be mentioned. Since carbonyl ylides possess one of the smallest of the common dipoles HOMO–LUMO energy gap,^[1] HOMO_{ylide}–LUMO_{cyclopropene} type of interaction seems to be predominant in the cycloadditions.



The structure of cycloadducts **4**, **7** have been established by spectral methods and X-ray analysis of the adduct **4** (R=styryl).

[1] Padwa A., Weingarten M.D., *Chem. Rev.* **1996**, 96, 223.

[2] (a) Molchanov A.P., Diev V.V., Kopf J., Kostikov R.R., *Zh. Org. Khim.* **2004**, 40, 458–460. (b) Molchanov A.P., Diev V.V., Magull J., Vidović D., Kozhushkov S.I., de Meijere A., Kostikov R.R., *Eur. J. Org. Chem.* **2004**, to be submitted.

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