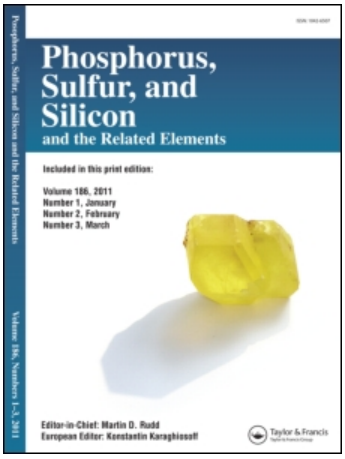


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# Hydroxyalkylation of α-Phosphonylated α-Silylated Allylic Carbanions. An Unexpected Cyclization Reaction

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# HYDROXYALKYLATION OF α-PHOSPHONYLATED α-SILYLATED ALLYLIC CARBANIONS. AN UNEXPECTED CYCLIZATION REACTION

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Abstract When reacted with aldehydes, *in situ* generated title carbanions **2** can give phosphonodienes (**4** or **6**), phosphonolactones (**5** or **8**) or phosphonoalcohols **7**, depending on structure of reagents and on reaction conditions.

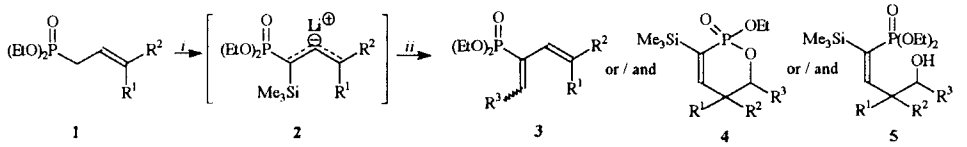
## INTRODUCTION

Carbanions derived from γ-substituted allylic-type phosphonates **1** show high α-regioselectivity in their reactions with electrophiles [1-3]. We have recently proved that the nucleophilic reactivity of such anions is dramatically modified by the presence of trimethylsilyl group in the α position [4]. We hereby present results concerning the reactivity of these *in situ* generated carbanions **2** towards aldehydes (Scheme).



## RESULTS

In the cinnamyl series ($R^1$=H, $R^2$=Φ), usual Peterson reaction occurs giving phosphonodienes **3**, in excellent yield. In the prenyl series ($R^1$=$R^2$=Me), γ-regioselective reaction is observed, leading to phosphonolactones **4**, as the sole product with aromatic aldehydes, or as the major product with aliphatic aldehydes (minor product is diene **3**). In the crotyl series ($R^1$=H, $R^2$=Me), strict γ-regioselectivity is observed with aromatic or aliphatic aldehydes : phosphonoalcohols **5** can be isolated after acidic hydrolysis at -70°C. By raising the reaction temperature or by warming **5** near 50°C, phosphonolactones **4** are obtained, in very good yield and with good diastereoselectivity.




1 2 3 4 5

*i* : 1/ LDA, THF, -70°C; 2/ $Me_3SiCl$, -70°C. *ii* : 1/ $R^3CHO$; $H_3O^+$

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