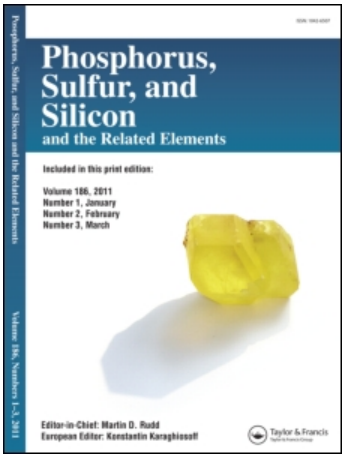

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The First Synthesis of Phosphonoacrolein

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THE FIRST SYNTHESIS OF PHOSPHONOACROLEIN

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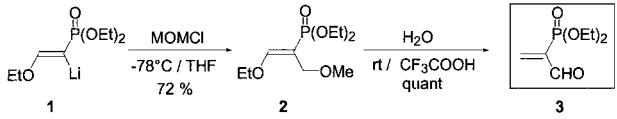
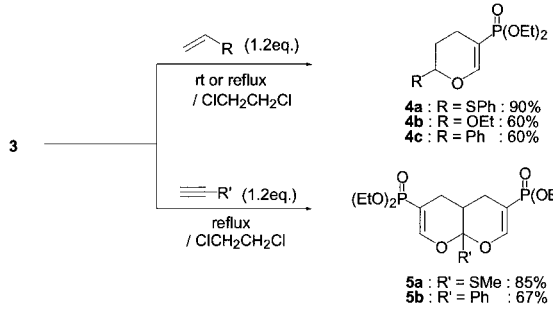
We recently reported that the α-formylvinylphosphonate moiety acts as a heterodiene in the intramolecular hetero Diels-Alder reaction.[1] In the course of study on α-formylvinylphosphonates, we have succeeded in the first synthesis of parent α-formylvinylphosphonate, phosphonoacrolein **3**. Thus, phosphonoacrolein **3** was simply synthesized according to two step procedures (Eq. 1). The acrolein **3** easily underwent the intermolecular hetero Diels-Alder reaction with electron-rich olefins and alkynes to produce the desired phosphono-substituted pyrans in good yields (Eqs. 2 and 3).

Synthesis of Phosphonoacrolein



(1)

Utility of Phosphonoacrolein (Hetero Diels-Alder Reaction of 3)



(2)

(3)

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[1] T. Minami et al., *J. Org. Chem.*, **65,** 4326 (2000).