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The First Synthesis of Phosphonoacrolein

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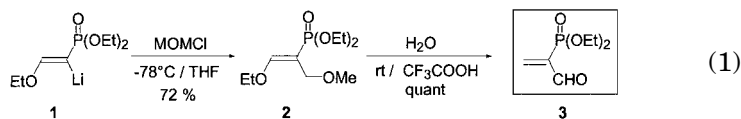
THE FIRST SYNTHESIS OF PHOSPHONOACROLEIN

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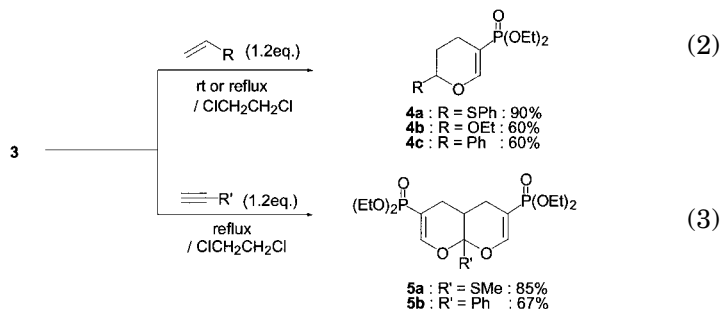
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We recently reported that the α -formylvinylphosphonate moiety acts as a heterodiene in the intramolecular hetero Diels-Alder reaction.¹ In the course of study on α -formylvinylphosphonates, we have succeeded in the first synthesis of parent α -formylvinylphosphonate, 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



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



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