NEW METHODS FOR SYNTHESES OF FURANONE DERIVATIVES USING DIANIONS

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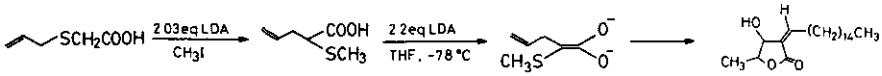
Dianions are highly reactive species toward electrophilic reagents such as carbonyl compounds, alkyl halides, and epoxides, compared with monoanions.

We present here a new methodology for the preparations of furanones using the heteroatom-containing dianions.

1. Synthesis of (±)-Dihydromahubanolide:

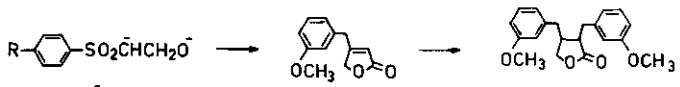
The dianion 3 of 2-(methylthio)-4-pentenoic acid (2), readily prepared from (allylthio)acetic acid (1), has been found as a new building block for the constraction of 5-methylene-2(5H)-furanone. The application of this methodology in an approach to the new synthesis of (±)-dihydromahubanolide (4) will be presented.



1 2 3 4

2. Preparation of Compound X, 3,4-bis(3-hydroxybenzyl)dihydro-2(3H)-furanone:

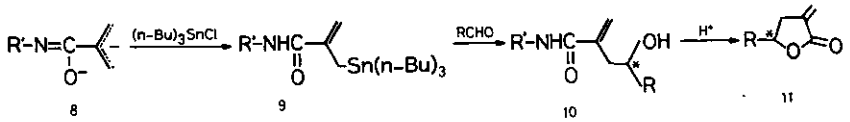
The one-pot synthesis of 4-(3-methoxybenzyl)-2(5H)-furanone (6) can be accomplished, starting from dianion 5. The precursor of Compound X was prepared by reduction of 6 with Mg in methanol followed by alkylation.



5 6 7

3. Synthesis of Optically Acitive α-Methylene-γ-butyrolactones by Remote Asymmetric Induction:

A new synthetic method has been developed for the asymmetric synthesis of α-methylene-γ-butyrolactones (11) using optically active 2-[(tributylstannyl)-methyl]propenamides (9) derived from dianions 8.



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