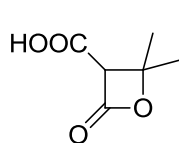


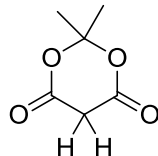
Meldrum's acid in carbon-carbon bond-forming processes

Proposed by
Ioulia

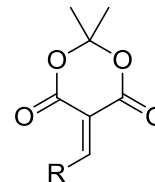
Meldrum's acid was first synthesized in 1908 by Meldrum, but the correct structure was elucidated only in 1948. Its unique properties and complex reactivity make it a molecule of great interest. In particular, the 5 position is nucleophilic whereas the 4 and 6 carbonyls are highly electrophilic.



Meldrum's proposed structure

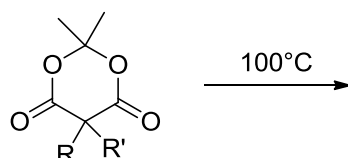


confirmed structure. pKa ~ 4.9 in H₂O

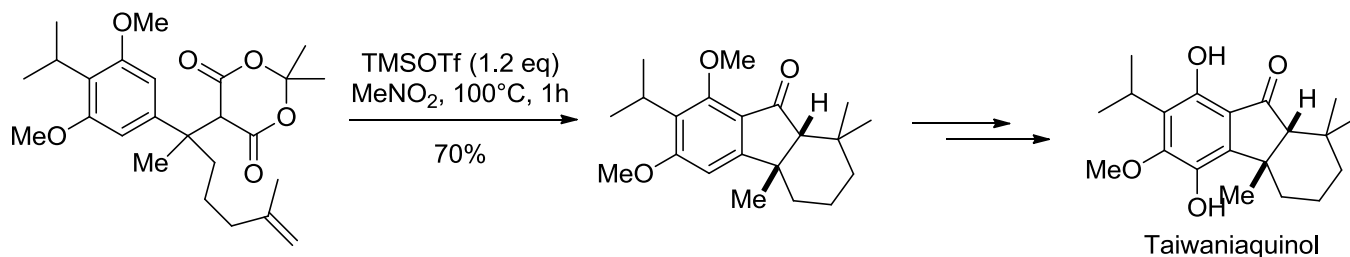


5-alkylidene Meldrum's acid

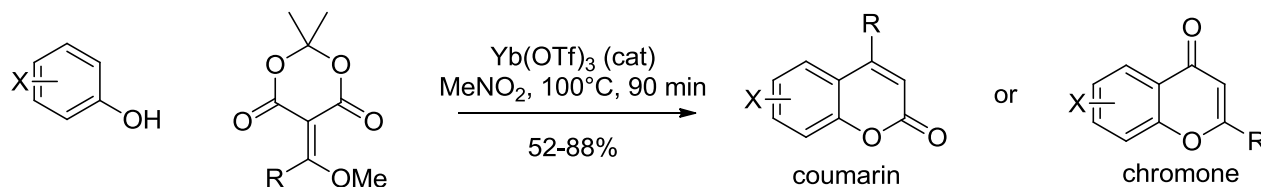
1. Propose a synthesis for Meldrum's acid, and its alkyldiene.
2. Meldrum's acid is thermally unstable, forming highly reactive intermediates, and releasing CO₂ and acetone. Propose a product and a mechanism for this reaction. What is the product if R' = H ?



3. Meldrum's acid is an acylating agent. Meldrum's acid was used during the synthesis of Taiwaniaquinol. Propose a mechanism.



4. Meldrum's acid alkyldienes are 10¹¹ times more reactive than their alkyldiene malonate analogs. They are used for the synthesis of coumarins and chromones. Propose a mechanism.



X = EDG

The outcome depends on the substituents.

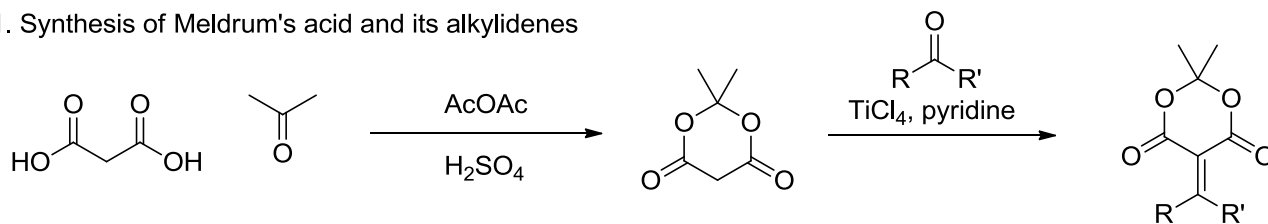
They are also excellent dienophiles.

Ref : Dumas, A.M.; Fillion, E. *Acc. Chem. Res.* **2010**, *43*, 440-454.

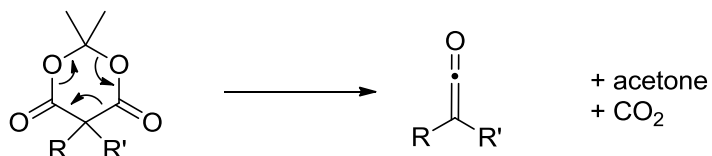
Meldrum's acid in carbon-carbon bond-forming processes

Proposed by Ioulia

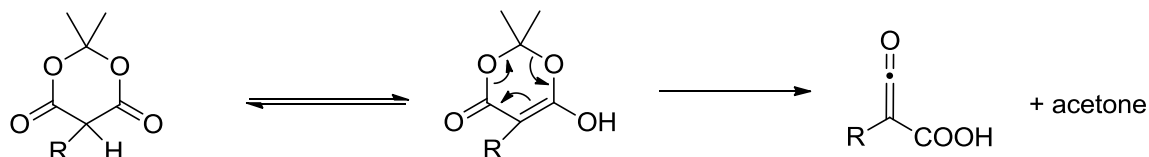
1. Synthesis of Meldrum's acid and its alkylidenes



2.



if $\text{R}' = \text{H}$ Retro- hetero Diels Alder reaction



3. Meldrum's acid as an acylating agent

