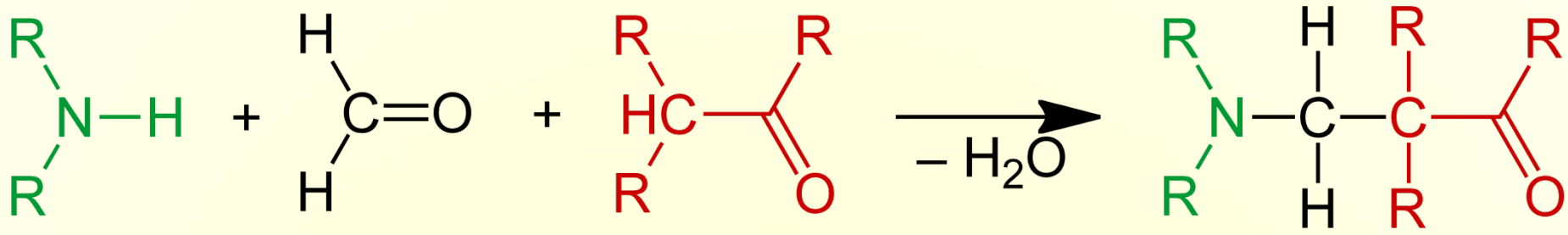
MANNICH REACTION

2016-5-10

WZQ

MANNICH REACTION

Mannich reaction

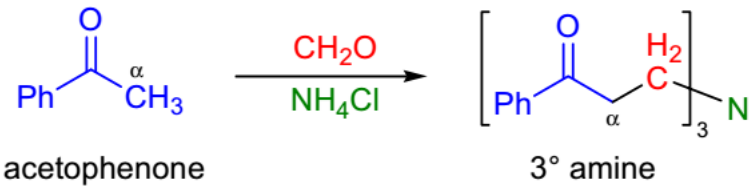


The Mannich reaction is an organic reaction which consists of an amino alkylation of an acidic proton placed next to a **carbonyl functional group** by **formaldehyde** and a **primary or secondary amine or ammonia.**

The final product is a β-amino-carbonyl compound also known as a Mannich base

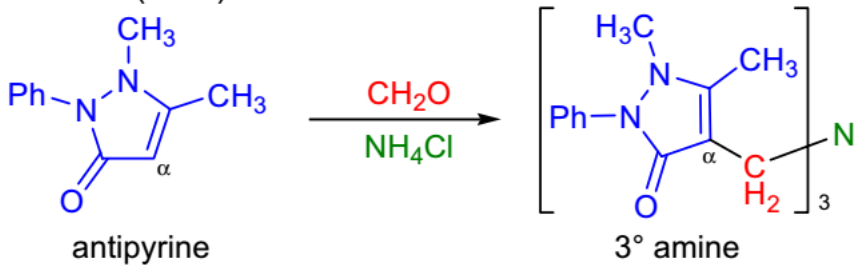
MANNICH REACTION

Tollens and von Marle (1903):



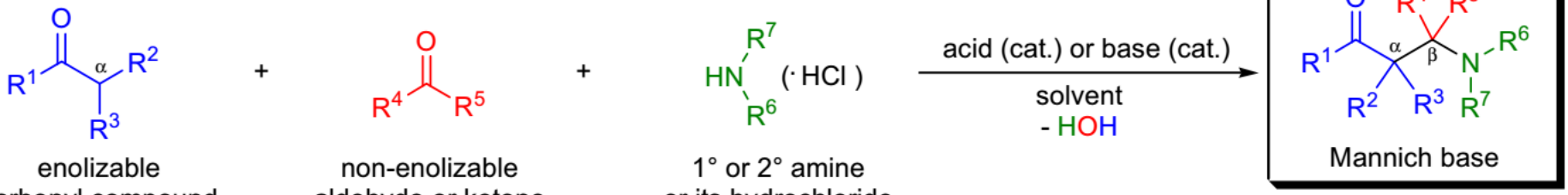
acetophenone — 3° amine

Mannich (1917):



antipyrine — 3° amine

Mannich reaction:



enolizable carbonyl compound — non-enolizable aldehyde or ketone — 1° or 2° amine or its hydrochloride

R^1 = H, alkyl, aryl, OR; R^{2-3} = H, alkyl, aryl; R^{4-5} = H, alkyl, aryl; R^6 = H, alkyl, OH, NH_2; R^7 = H, alkyl; solvent = ROH, H_2O, AcOH

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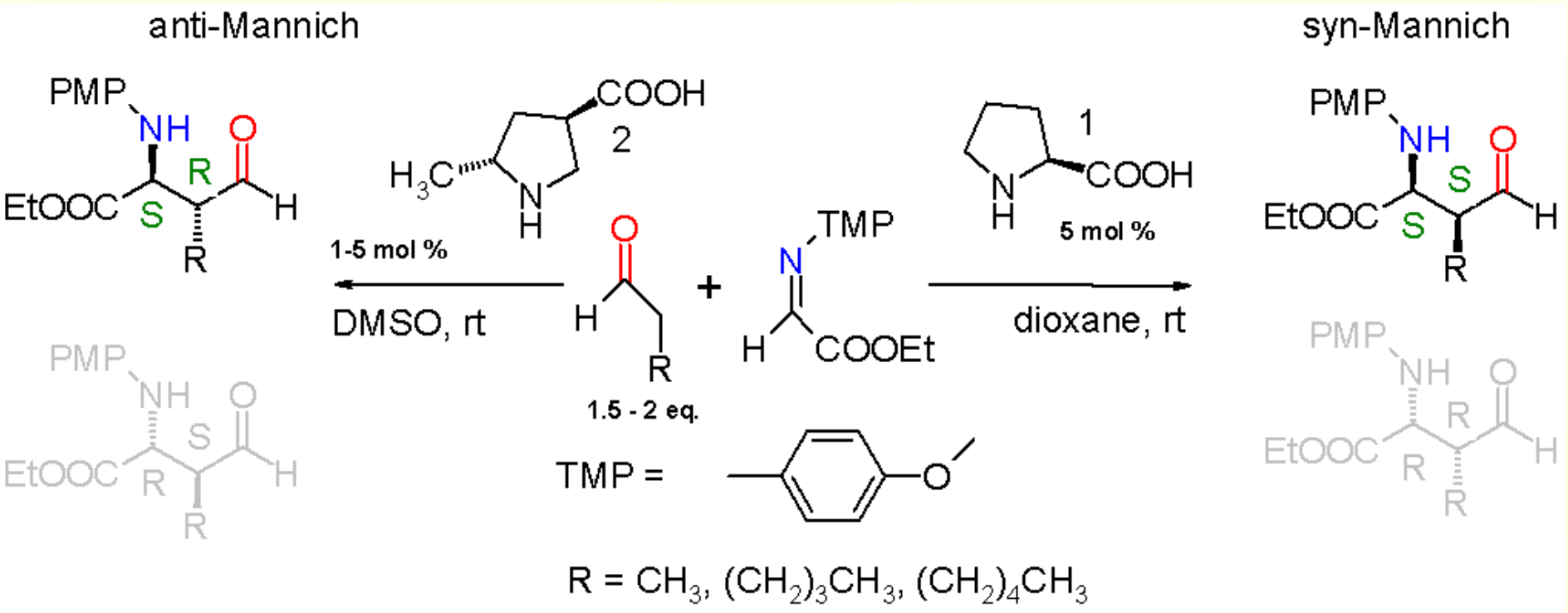
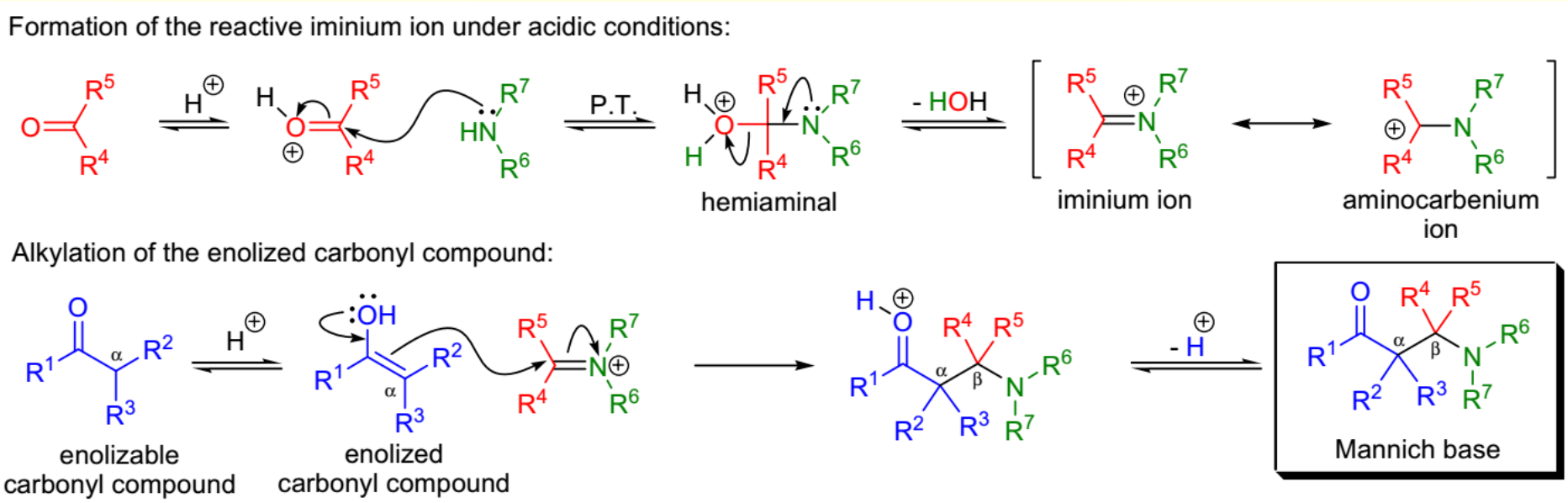
Asymmetric Mannich reactions



Journal of the American Chemical Society ***124*** *(9): 1866–1867*

MANNICH REACTION

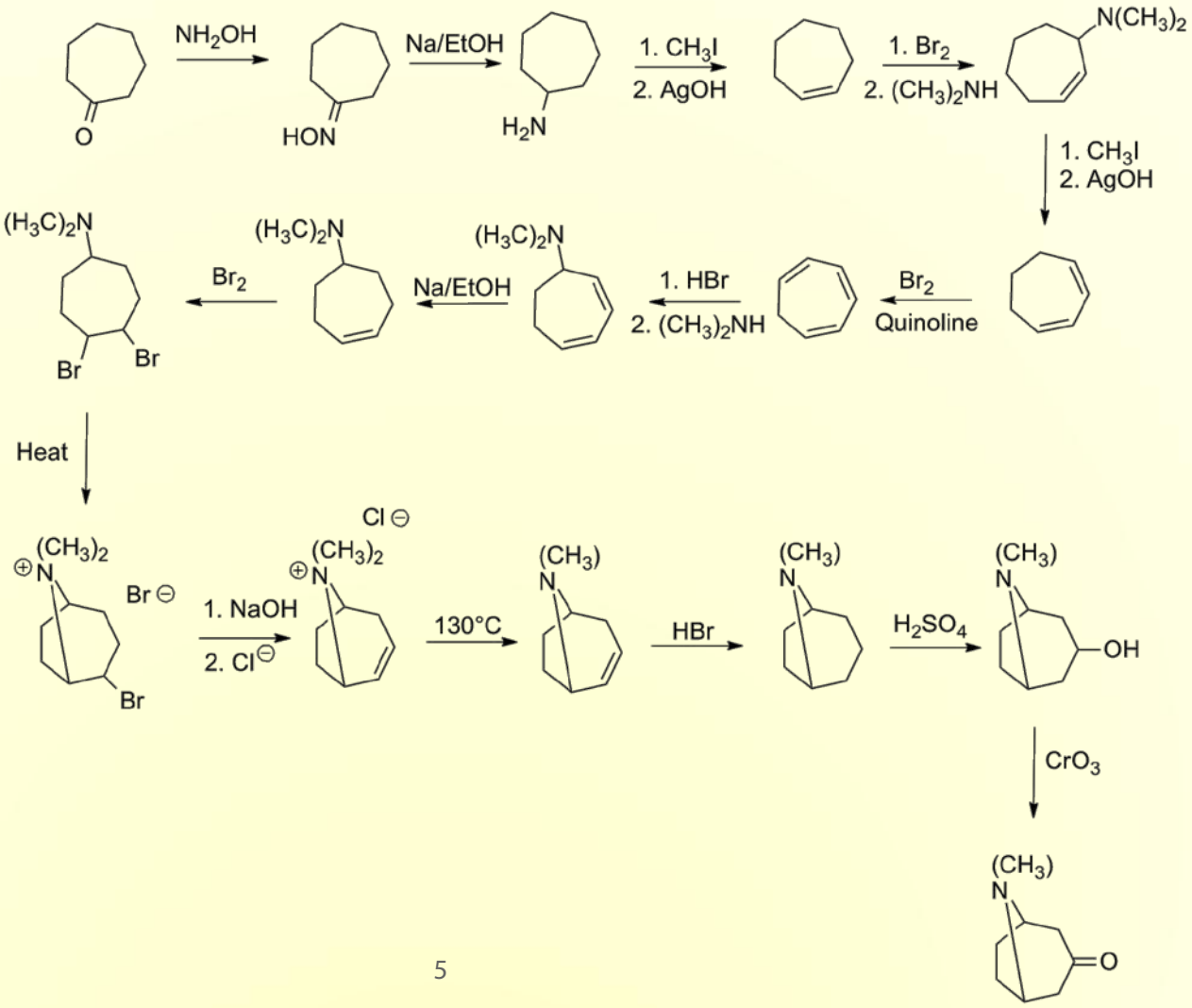
Mechanism:



Generally it is the addition of resonance-stabilized carbon nucleophiles to iminium salts and imines

MANNICH REACTION

Applications： Tropinone



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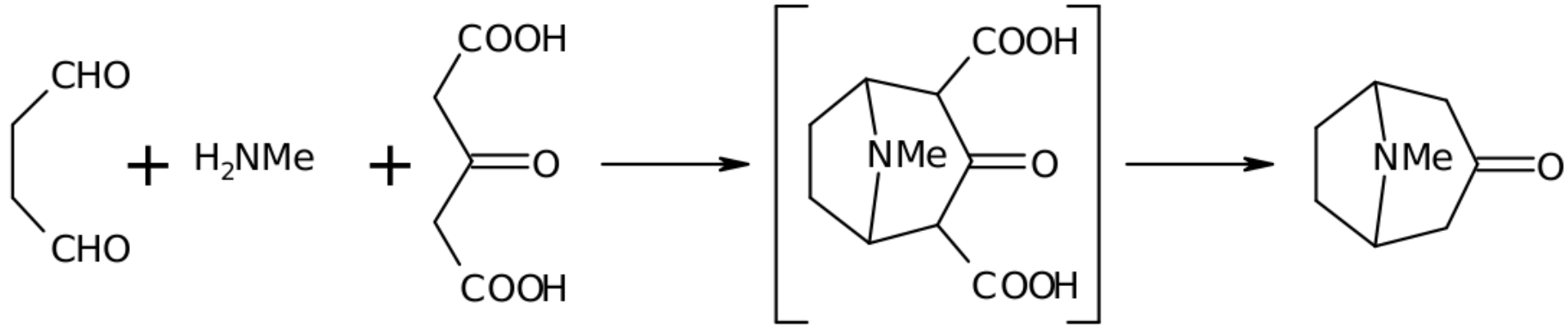
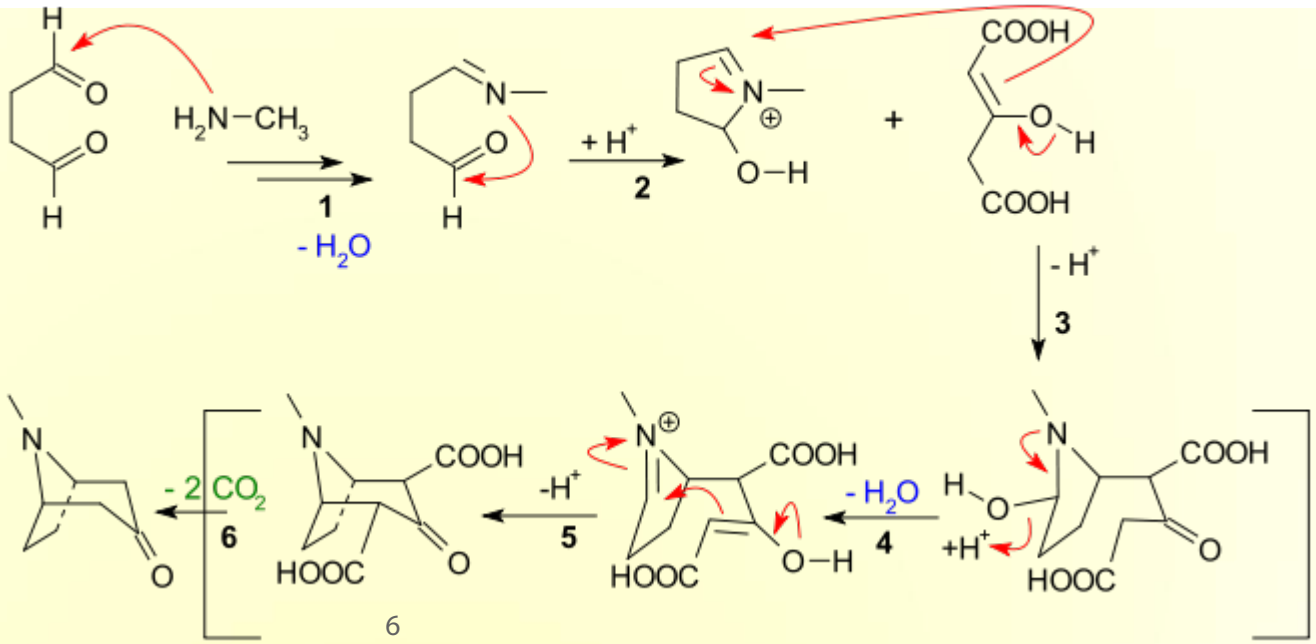
Applications： Tropinone



Mechanism:



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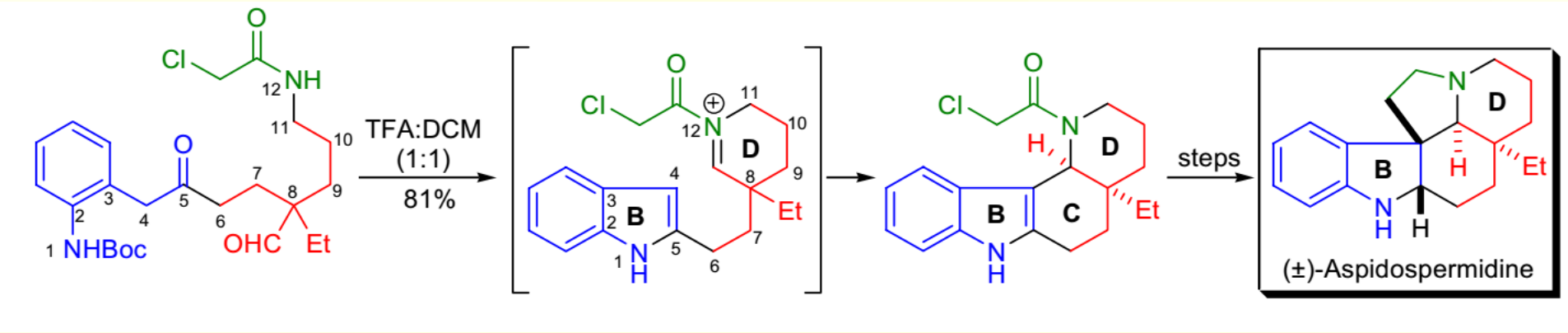
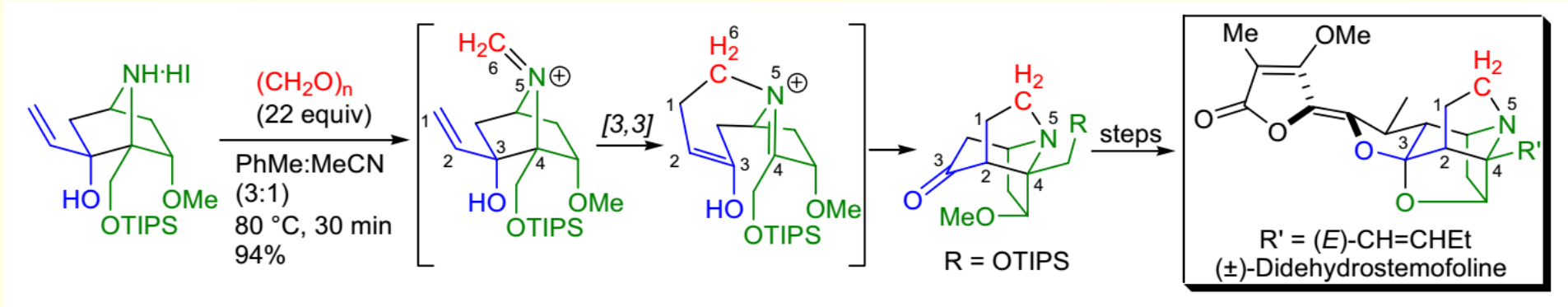
Applications：





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Applications：