

# Total Synthesis of ( $\pm$ )- Waihoensene

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PRESENTED BY: ALLISON VANECEK

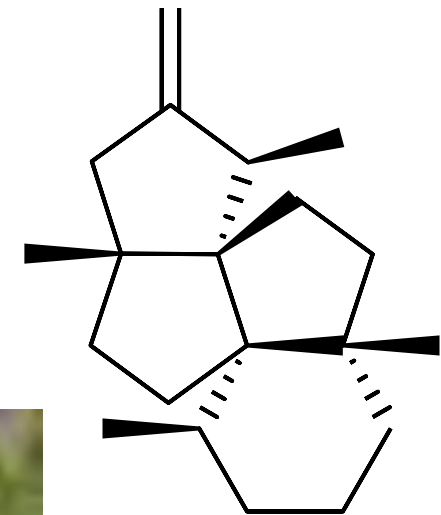
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# Waihoensene

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Isolated from New Zealand podocarp, *Podocarpus totara*  
*var waihoensis*

Belongs to a class of tetracyclic diterpenes



**Waihoensene**

# Total Synthesis

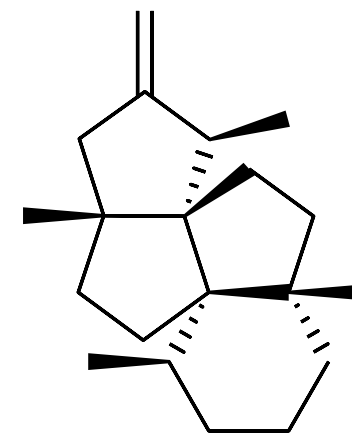
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Synthesis of (±)-Waihoensene was published in 2017

- Achieved in 18 steps
- 0.58% overall yield

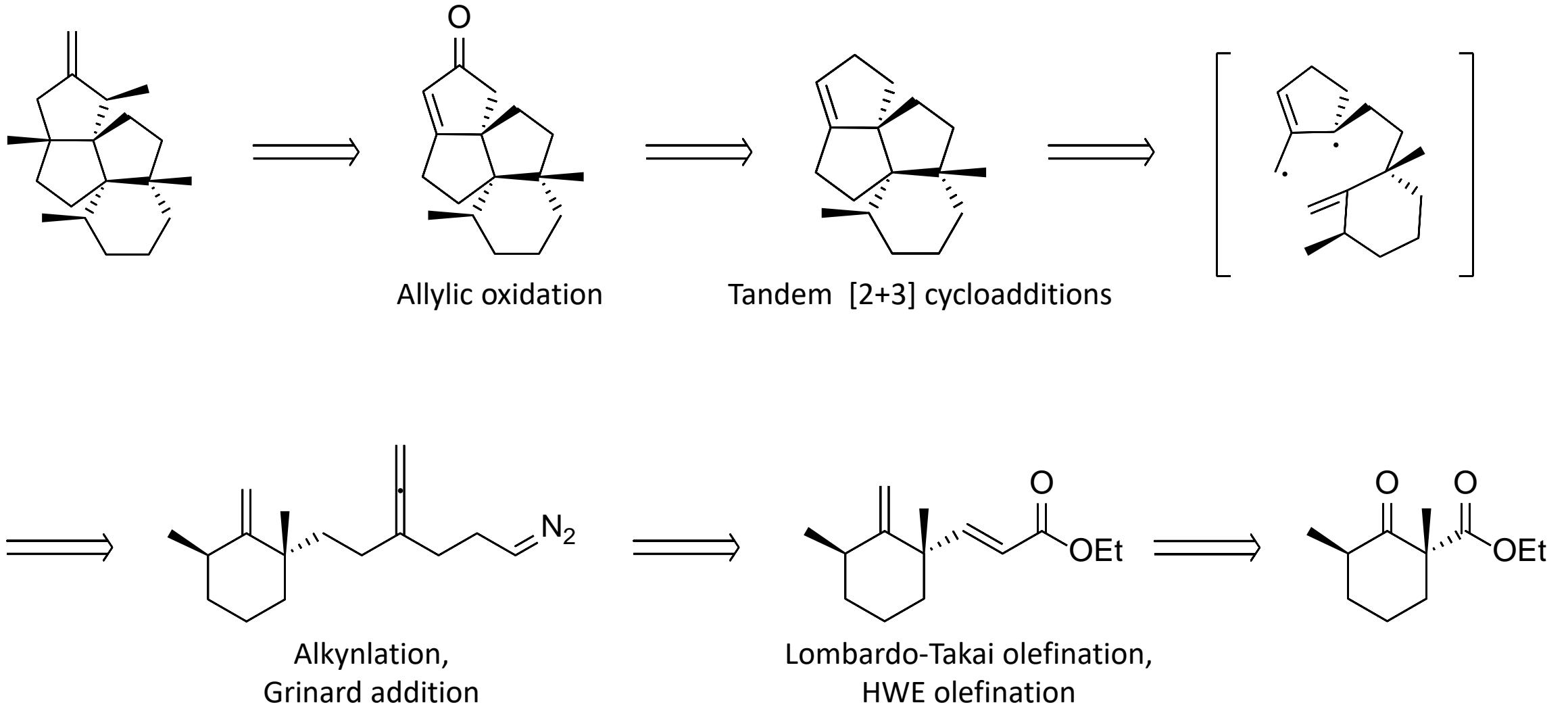
Key Transformation:

- Intramolecular trimethylenemethane (TMM) diyl mediated tandem cycloaddition



**Waihoensene**

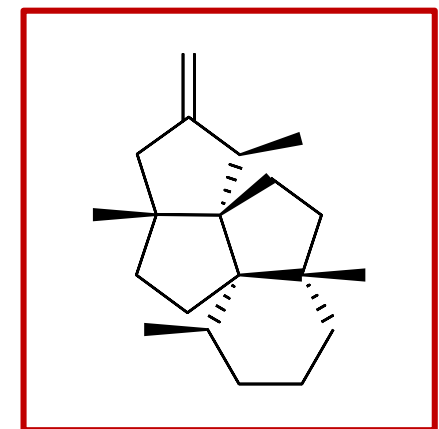
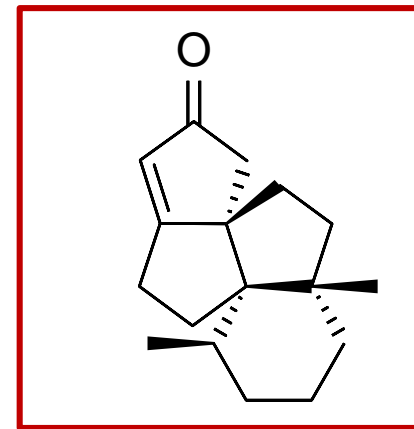
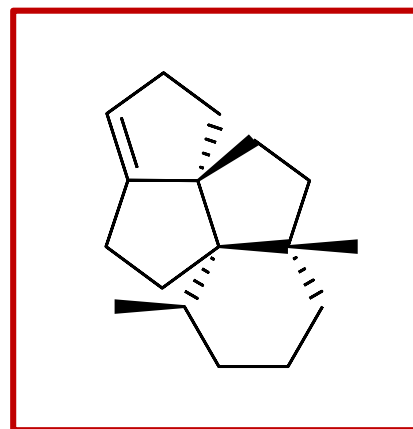
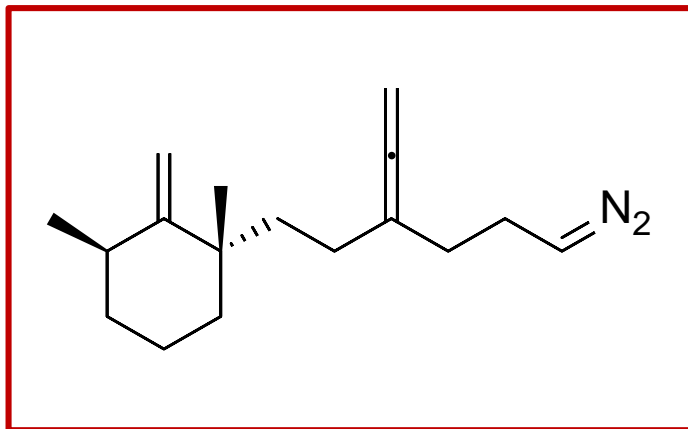
# Retrosynthetic Design



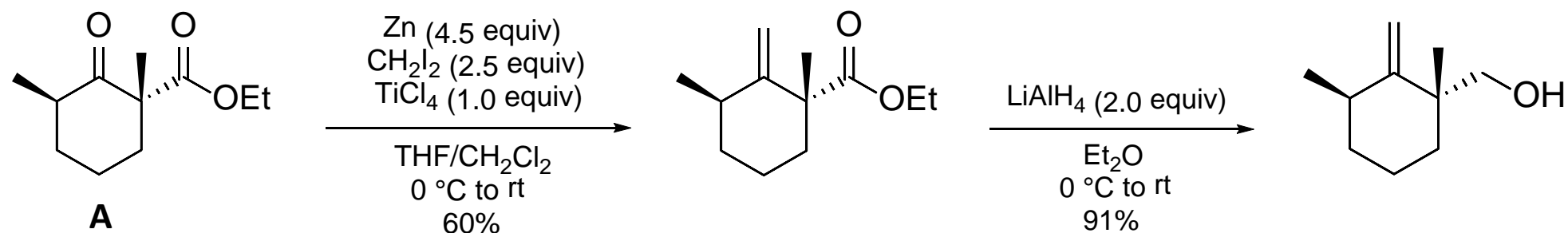
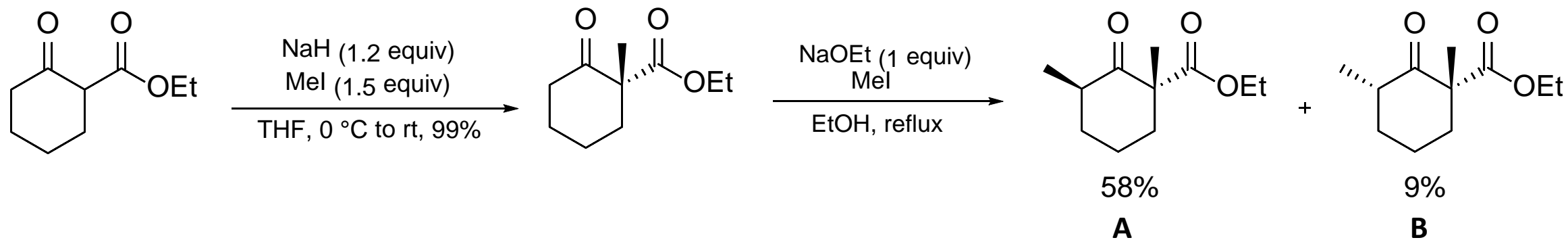
# Scope of Total Synthesis

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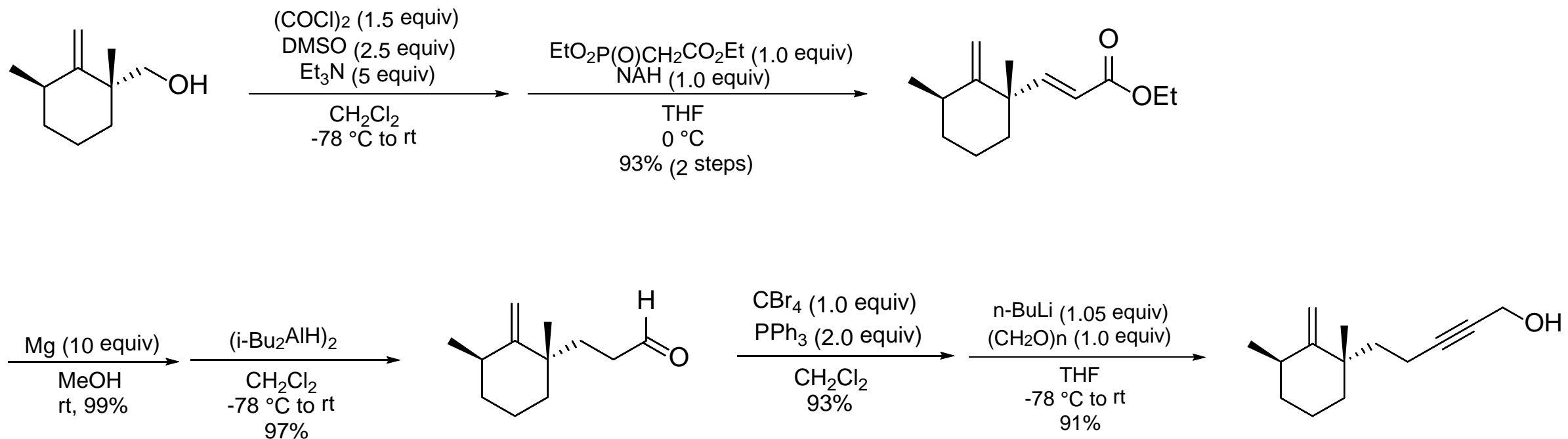
- 1) Synthesis of allenyl diazo compound
- 2) Formation of tetracyclic core
- 3) Formation of enone
- 4) Final methylation and methylenation steps



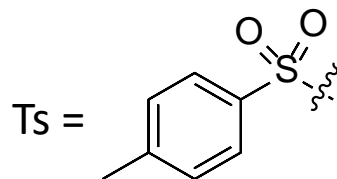
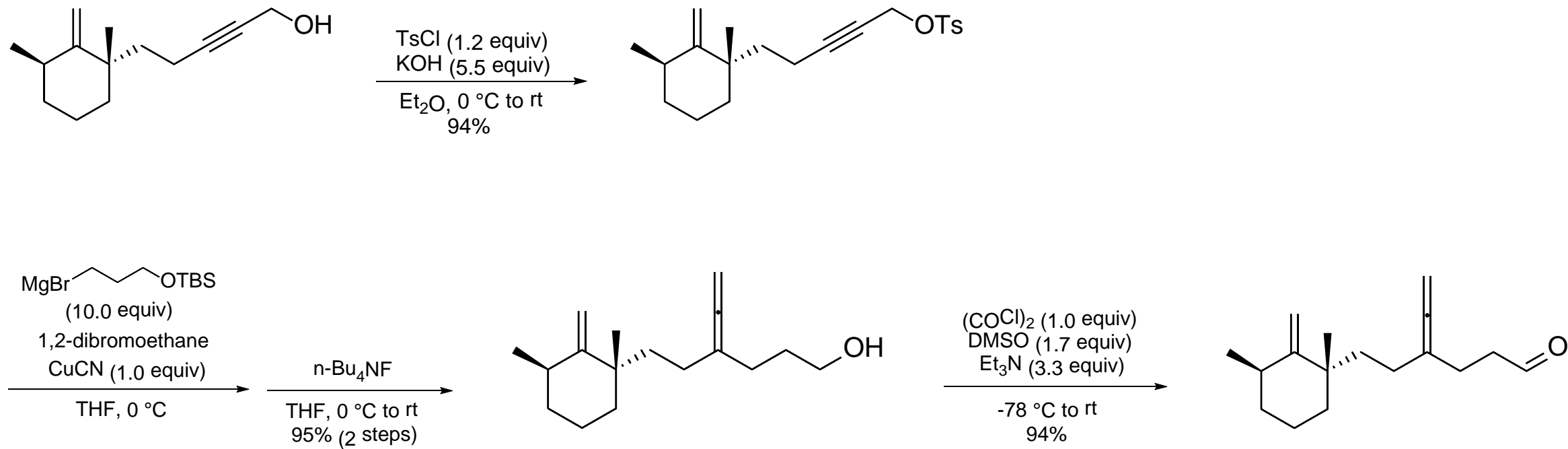
# 1) Synthesis of allenyl diazo compound



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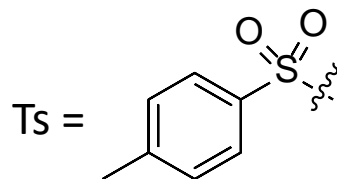
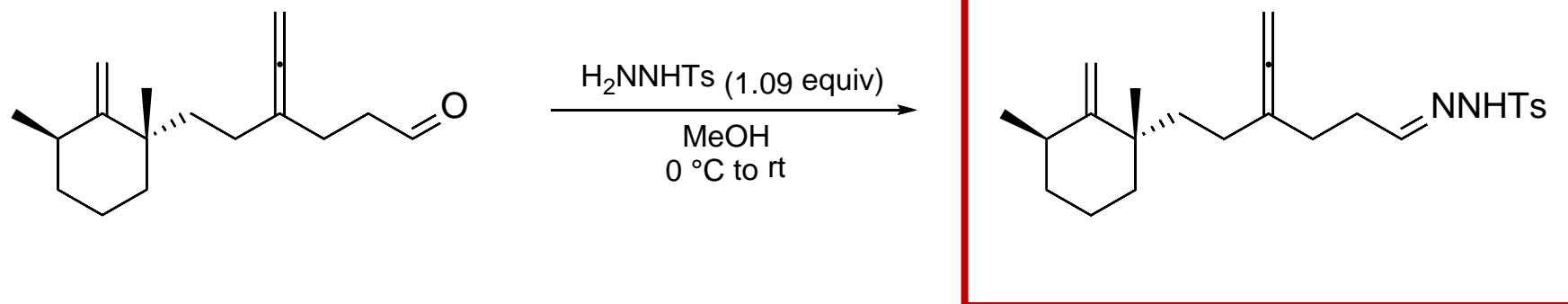


# 1) Synthesis of allenyl diazo compound

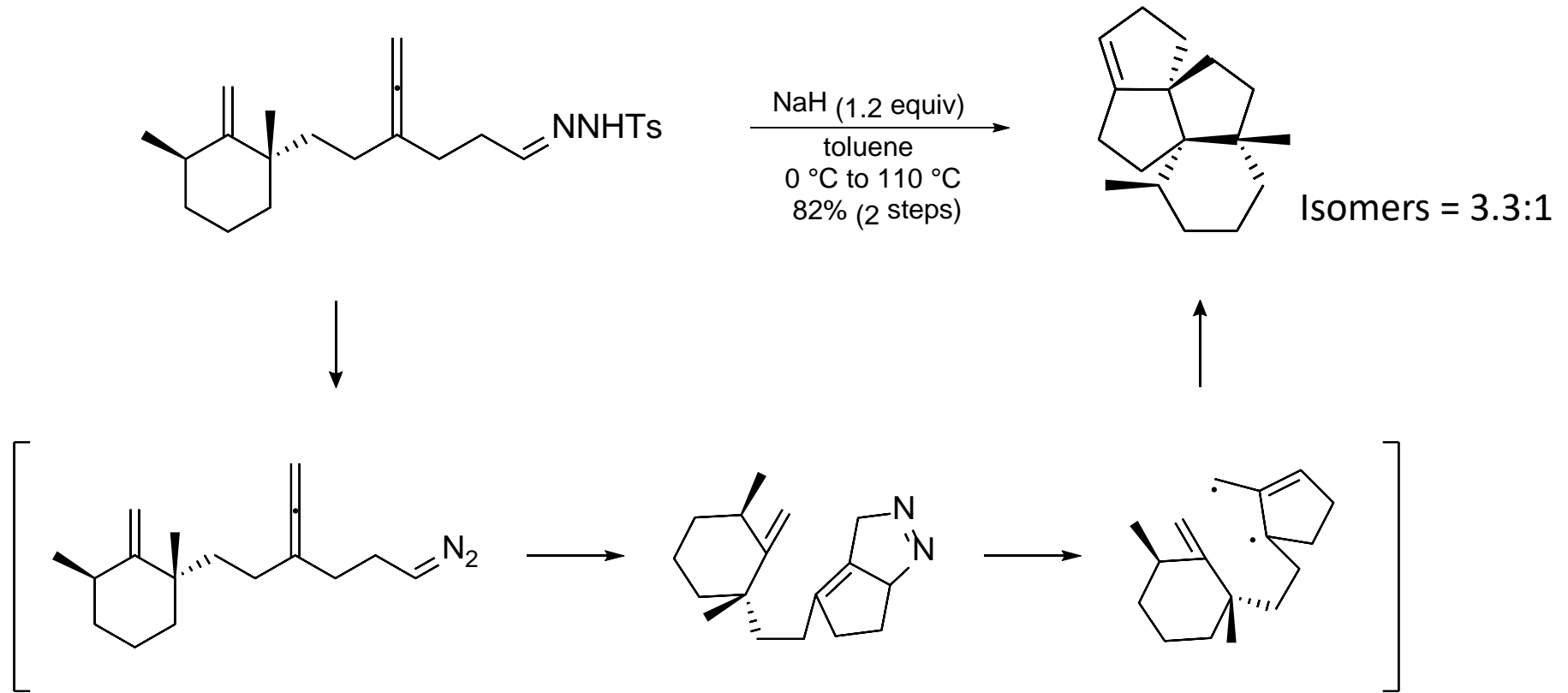




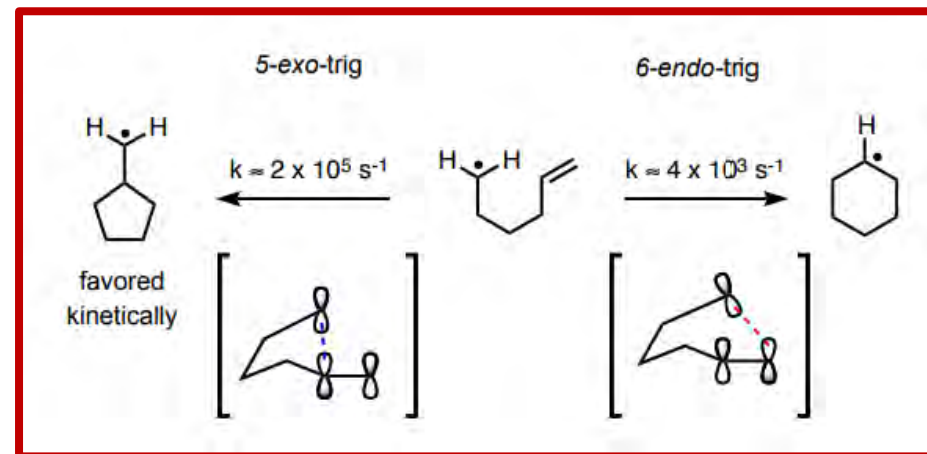
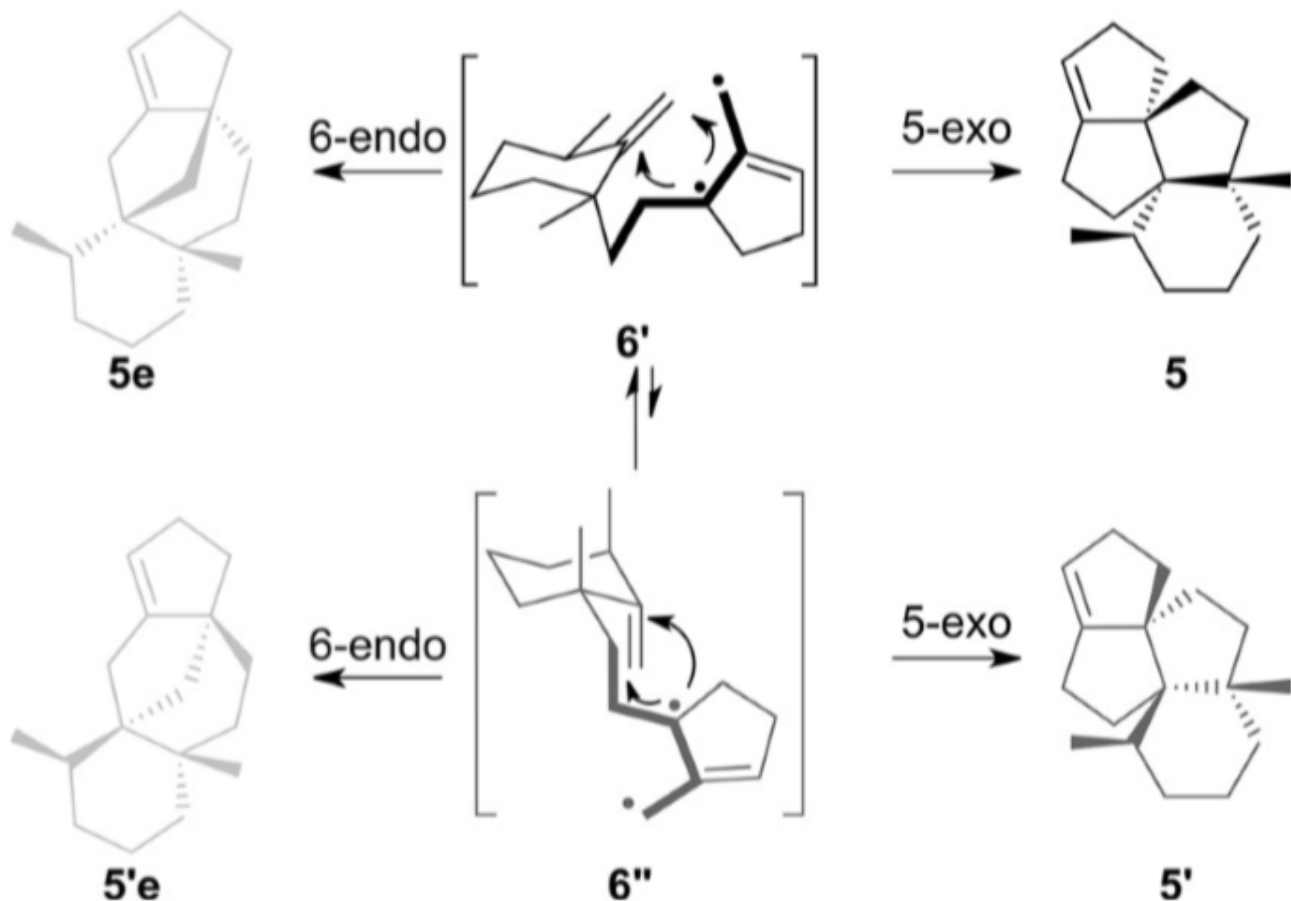
# 1) Synthesis of allenyl diazo compound



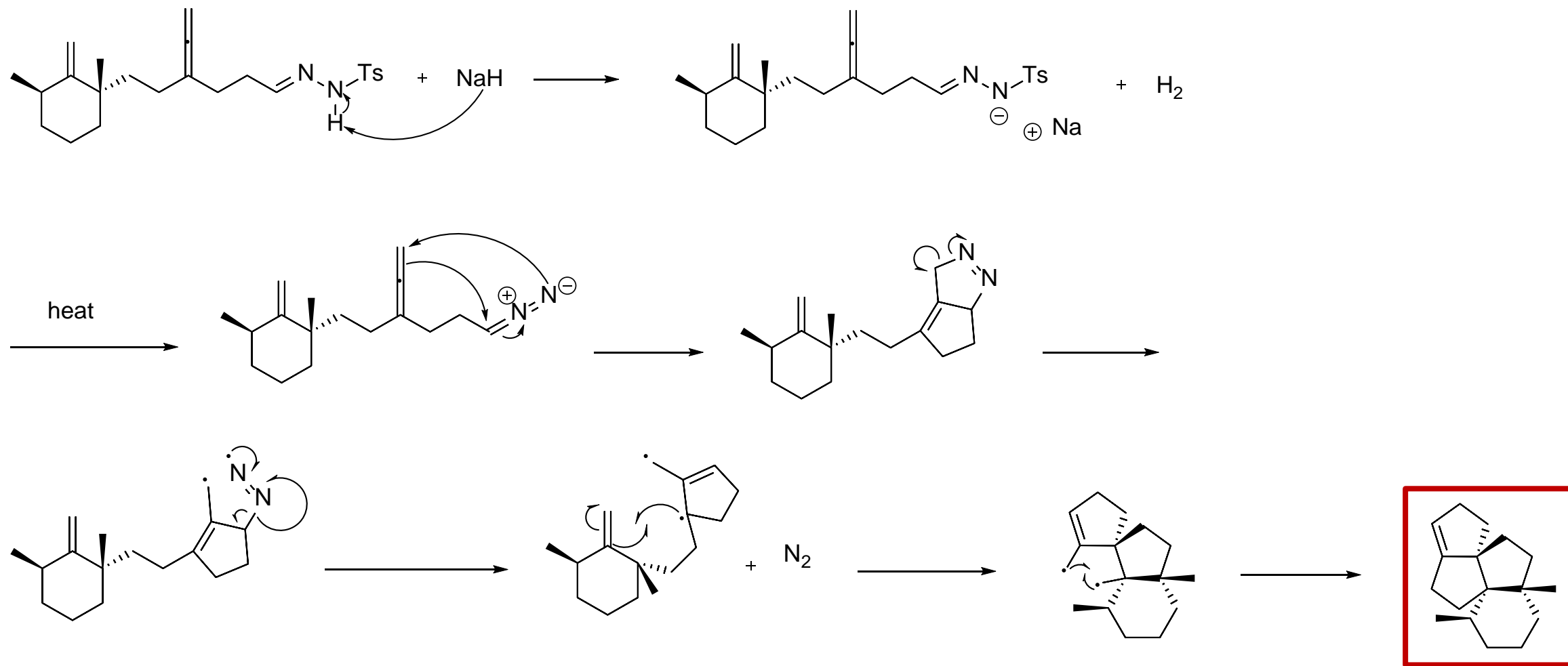
## 2) Formation of Tetracyclic Core



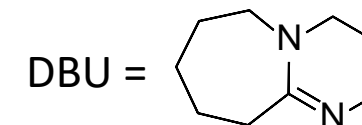
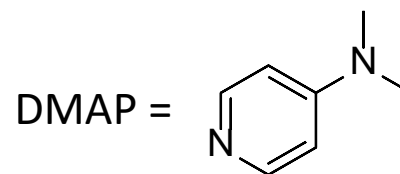
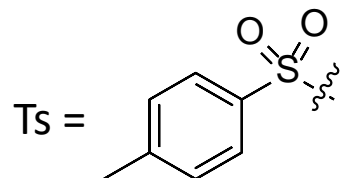
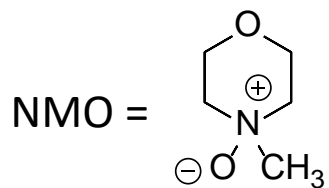
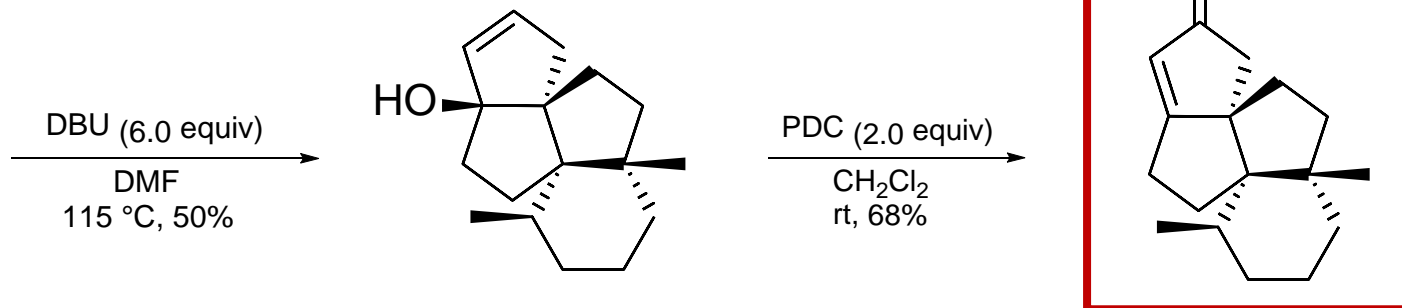
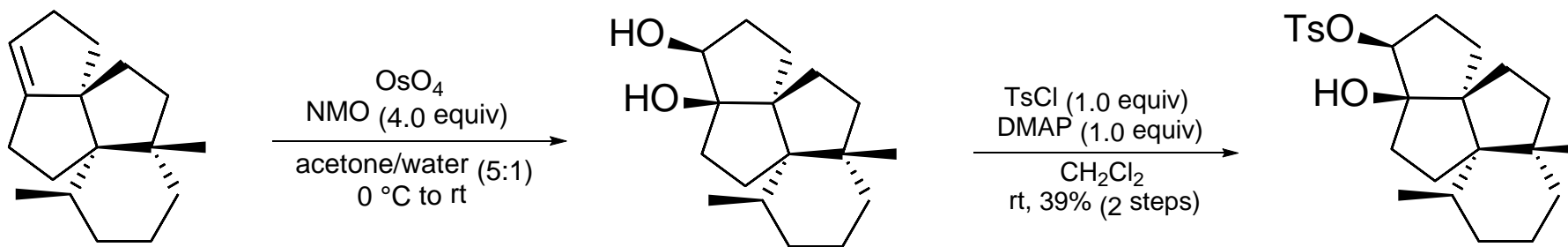
# TMM diyl transition states favors 5-exo product



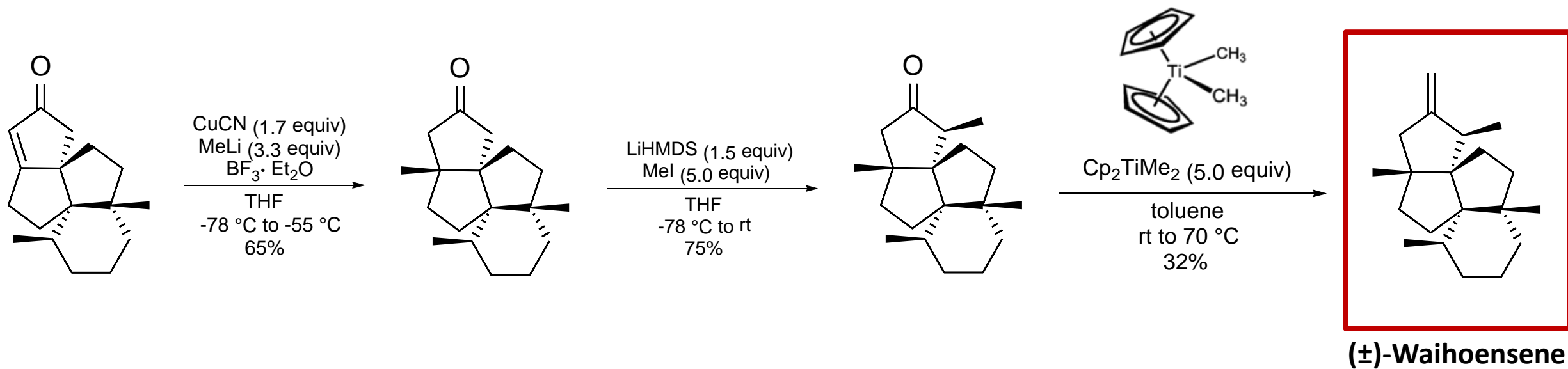
# Proposed Mechanism of Tandem Cycloadditions



# 3) Formation of enone



# 4) Final methylation and methylenation steps



Thank You  
Questions?