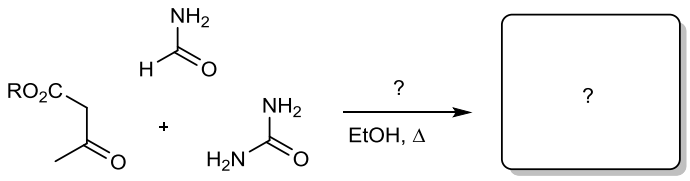
Section A

The following, hopefully not all familiar, reactions are named after the people that discovered them (I think…). Please fill out the **blanks** and work out the **mechanisms** of the reactions. Also, state the **driving force** of the reactions (I don't know the answer in some cases) and give the **names of the reactions** if you manage to find them.

1)



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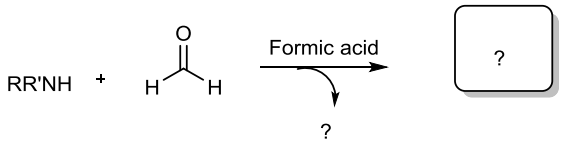

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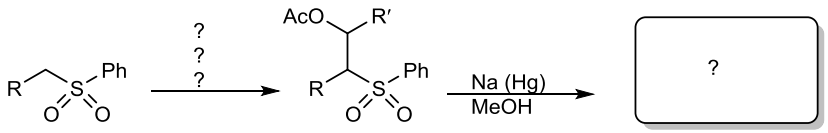

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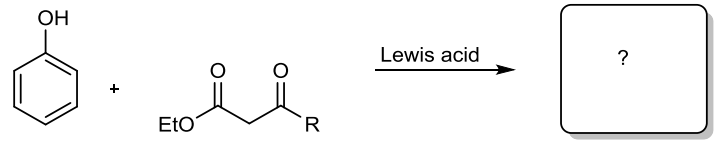

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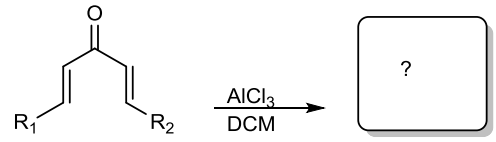
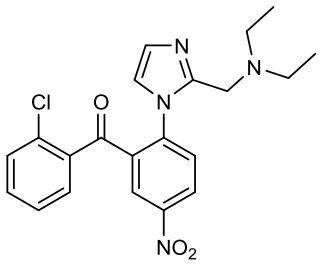


SECTION B

Can you carry-out a retrosynthetic analysis for each of the following compounds outlining the reagents and conditions necessary for the steps.

1)



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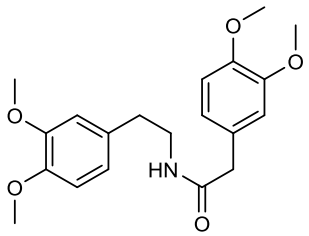

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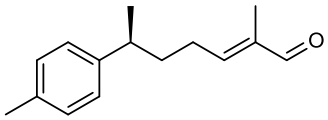

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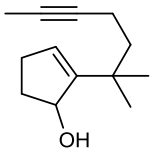
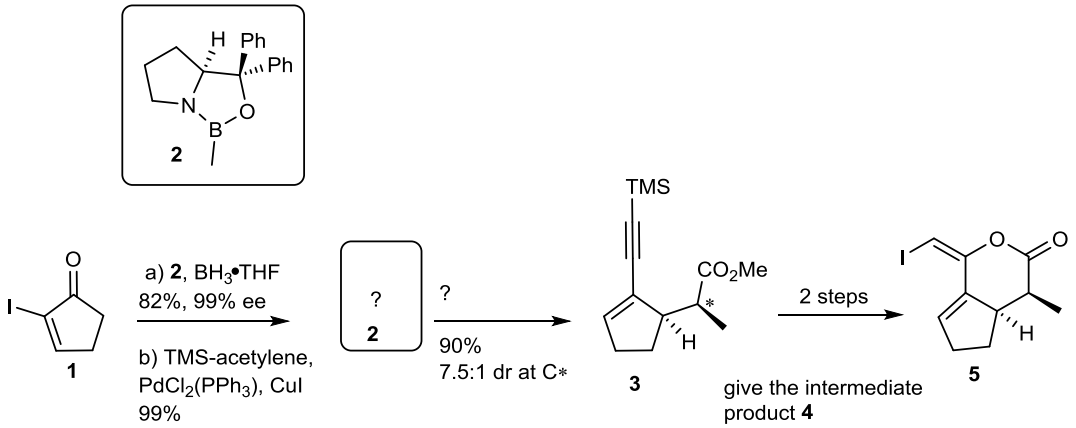


SECTION C

Compound **Z** belongs to a class of triterpenoids with a diverse range of biological activities. The asymmetric total synthesis of **Z** was achieved last year and it is the 1st time the compound has ever been synthesised. The Chemists worked out a retrosynthetic analysis and therefore divided the compound into segments to enable a convergent synthesis to obtain compound **Z.** Please fill out the blanks and give reaction mechanisms.

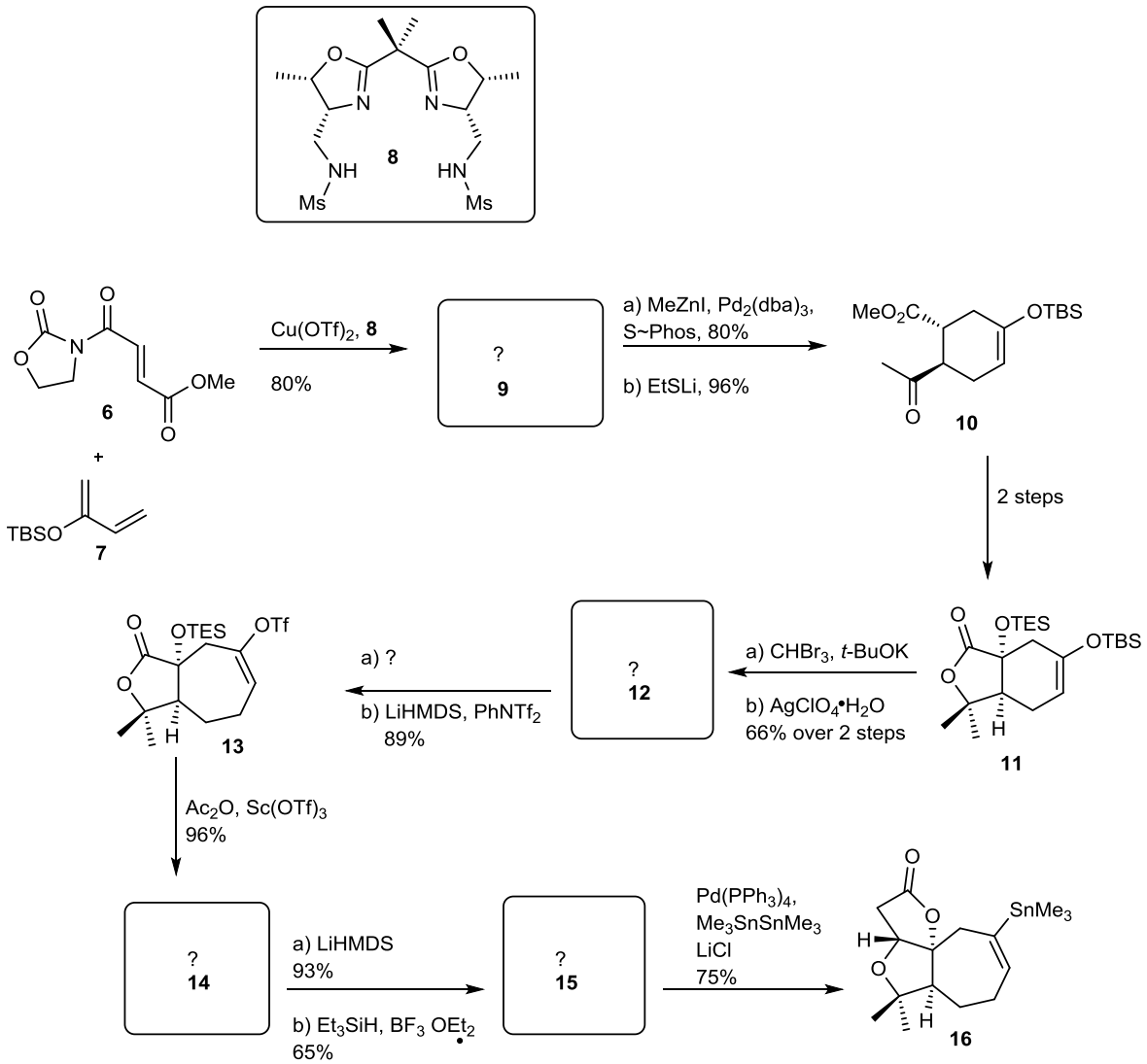
<u>Synthesis of segment 1</u>

This synthesis proceeded by an initial Corey-Bakshi-Shibata reduction followed by a Sonogashira coupling.



Synthesis of segment 2

Compound **9** was synthesised by a Cu-catalysed asymmetric Diels– Alder reaction. What do you think is the function of the copper catalyst and how is compound **8** controlling the stereochemistry of the product **9**?



Final synthesis to give compound **Z**.