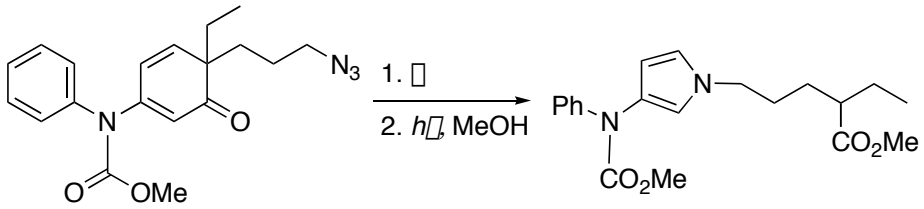
Mind Bending Mechanisms

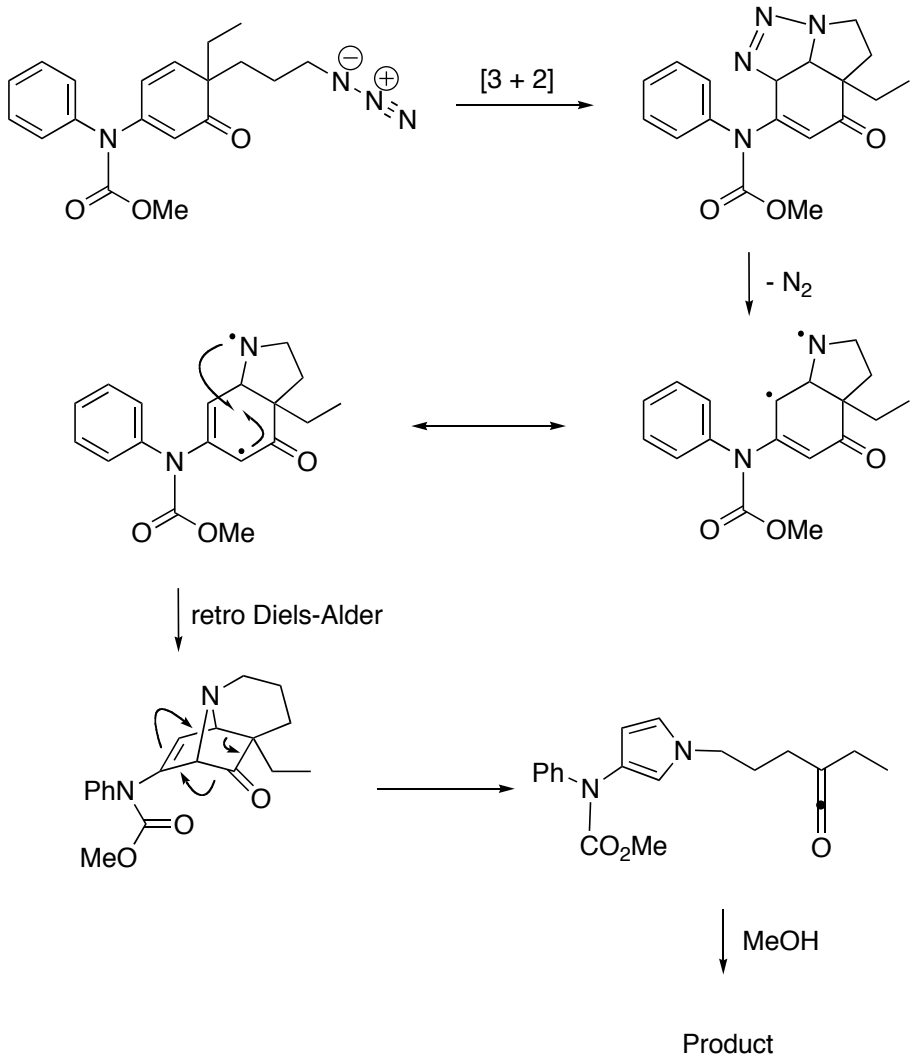
Baran Lab

Hafensteiner

Pyrroles are abundant in both natural products and pharmaceuticals. The Schultz group has demonstrated the following pyrrole synthesis (*J. Org. Chem.* **1980**, *45*, 2040-2041).



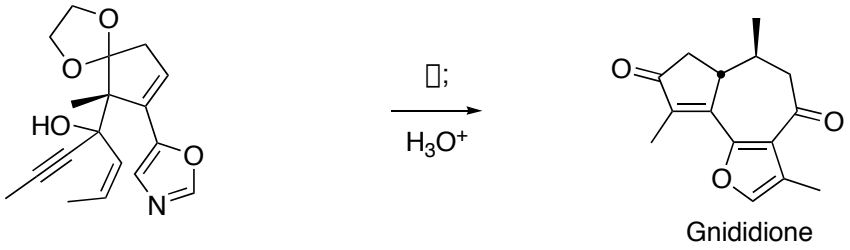
Provide one or more plausible mechanisms for this transformation.



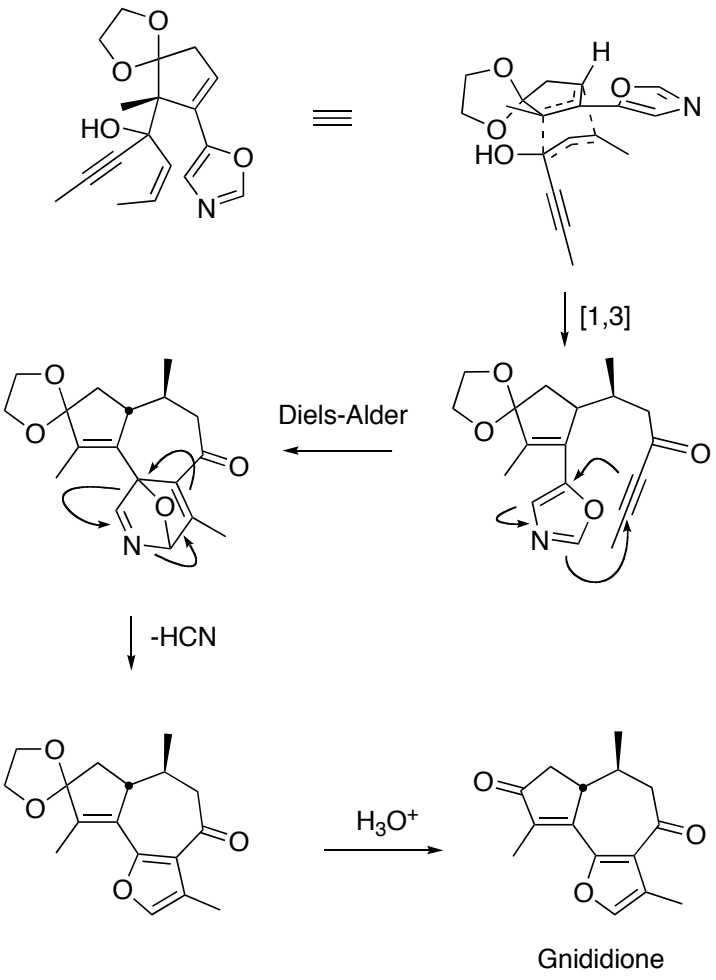
Mind Bending Mechanisms

Baran Lab ***Hafensteiner***

Cycloadditions and rearrangements were the hallmark of Jacobi's synthesis of (±)-Gnididione and (±)-Isognididione (*J. Org. Chem.* 1990, *55*, 202-209) . It was postulated that (±)-Gnididione could be synthesized using the following transformation. This hypothesis was proven in the hood and is shown below.



Provide one or more plausible mechanisms for this transformation including a transition state that accounts for stereochemistry.

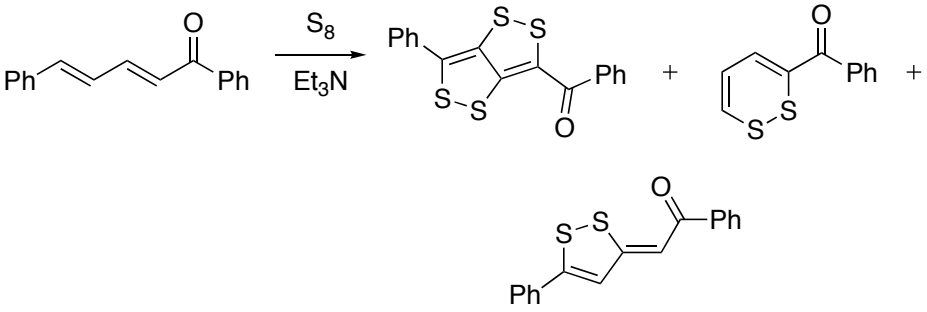


Mind Bending Mechanisms

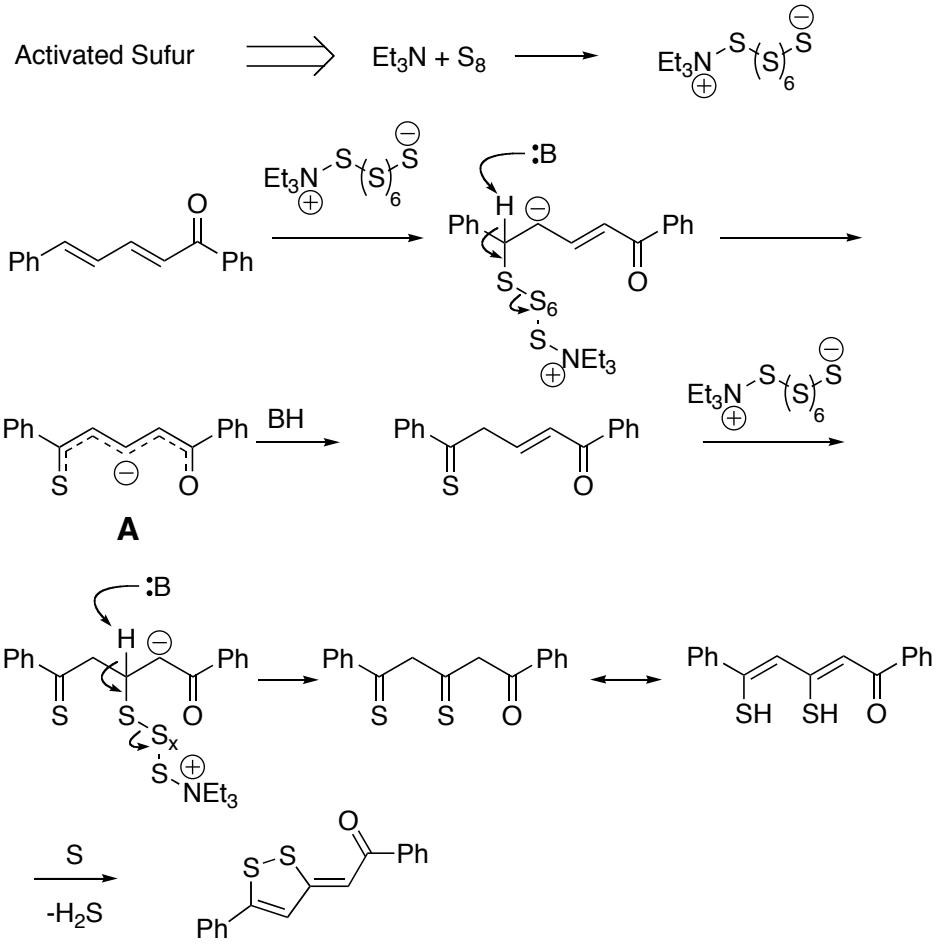
Baran Lab

Hafensteiner

Sulfur oddities have intrigued chemists from the time the odiferous yellow compound was discovered. Here is an investigation into elemental sulfur chemistry by the Purello group of the Universitá di Cantania (*Heterocycles*, **1993**, *36*, 223-229).



Provide one or more plausible mechanisms for this transformation identifiying all intermediates. Also, identify the active sulfur reagent in the above process.



Mind Bending Mechanisms

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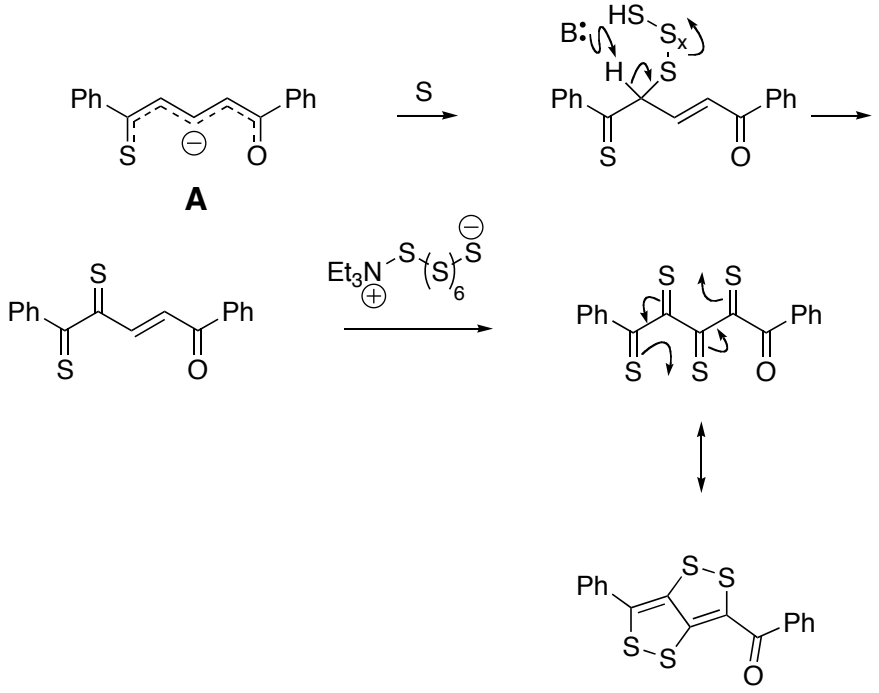
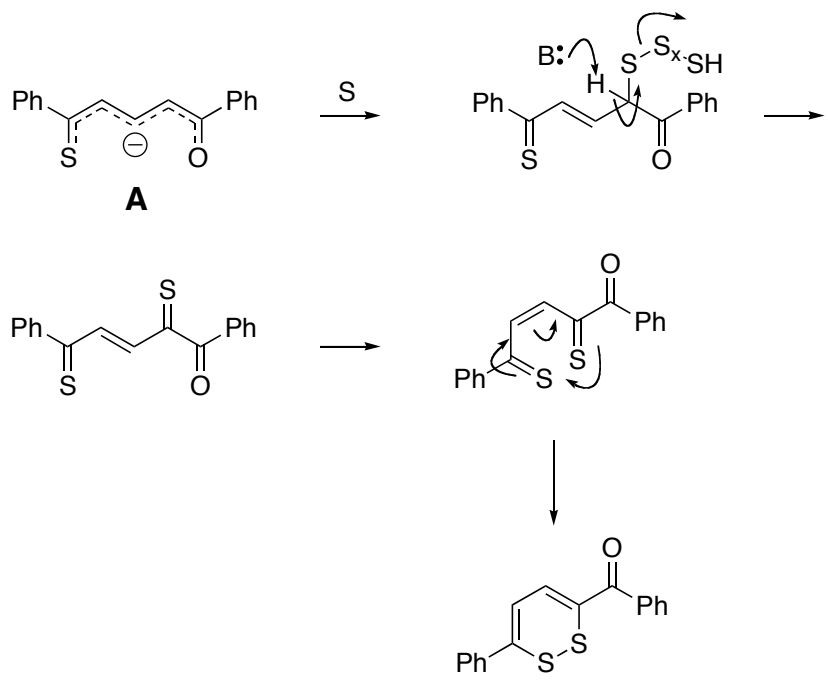
NAME

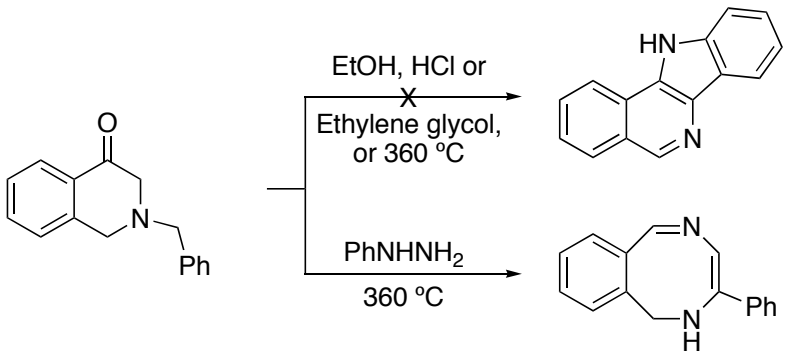




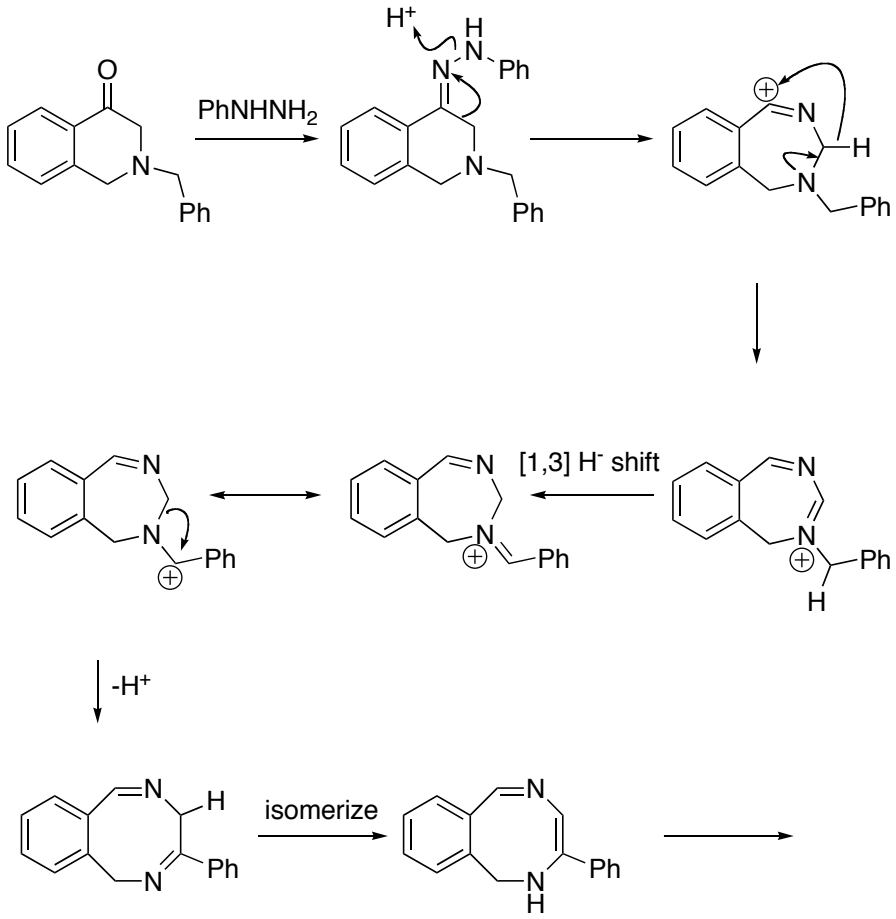
Mind Bending Mechanisms

Baran Lab *Hafensteiner*

During investigations by Prof. Cook into the synthesis of indoloisoquinolines, an interesting observation was made (*Heterocycles*, **1993**, *36*, 157-189).



Provide mechanisms for the observed and expected products.



Mind Bending Mechanisms

Baran Lab

Hafensteiner

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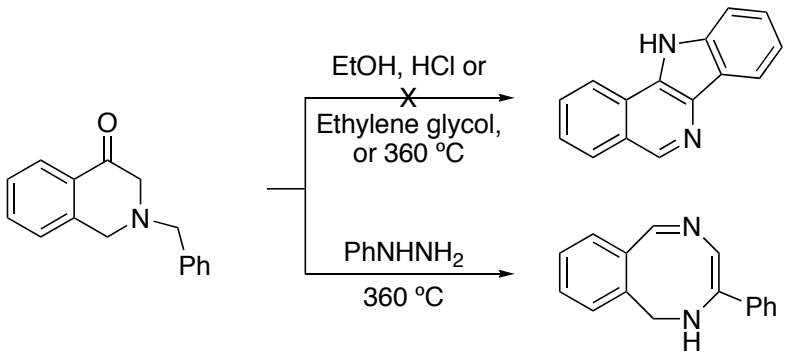
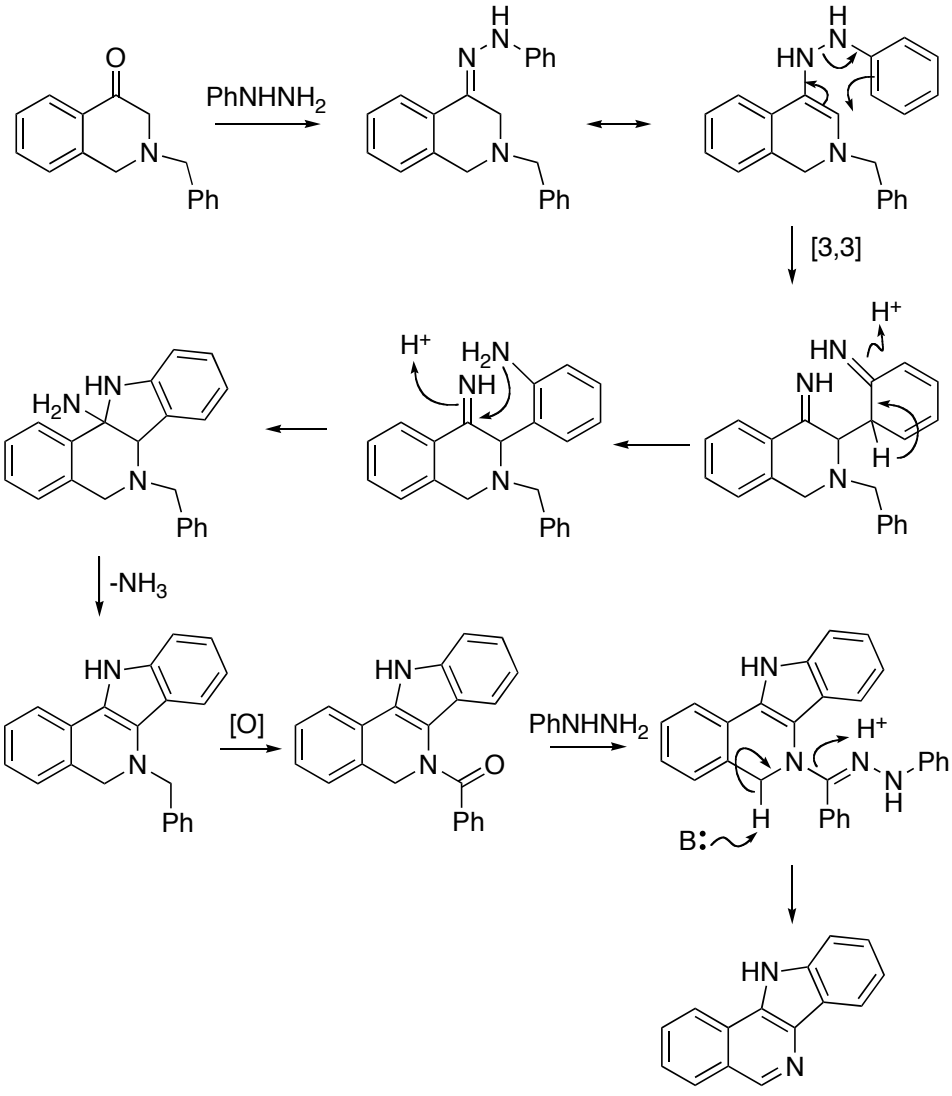


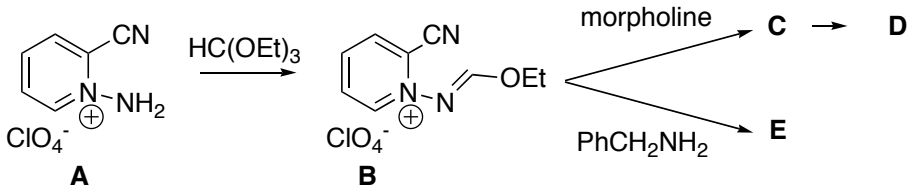
Provide mechanisms for the observed and expected products.



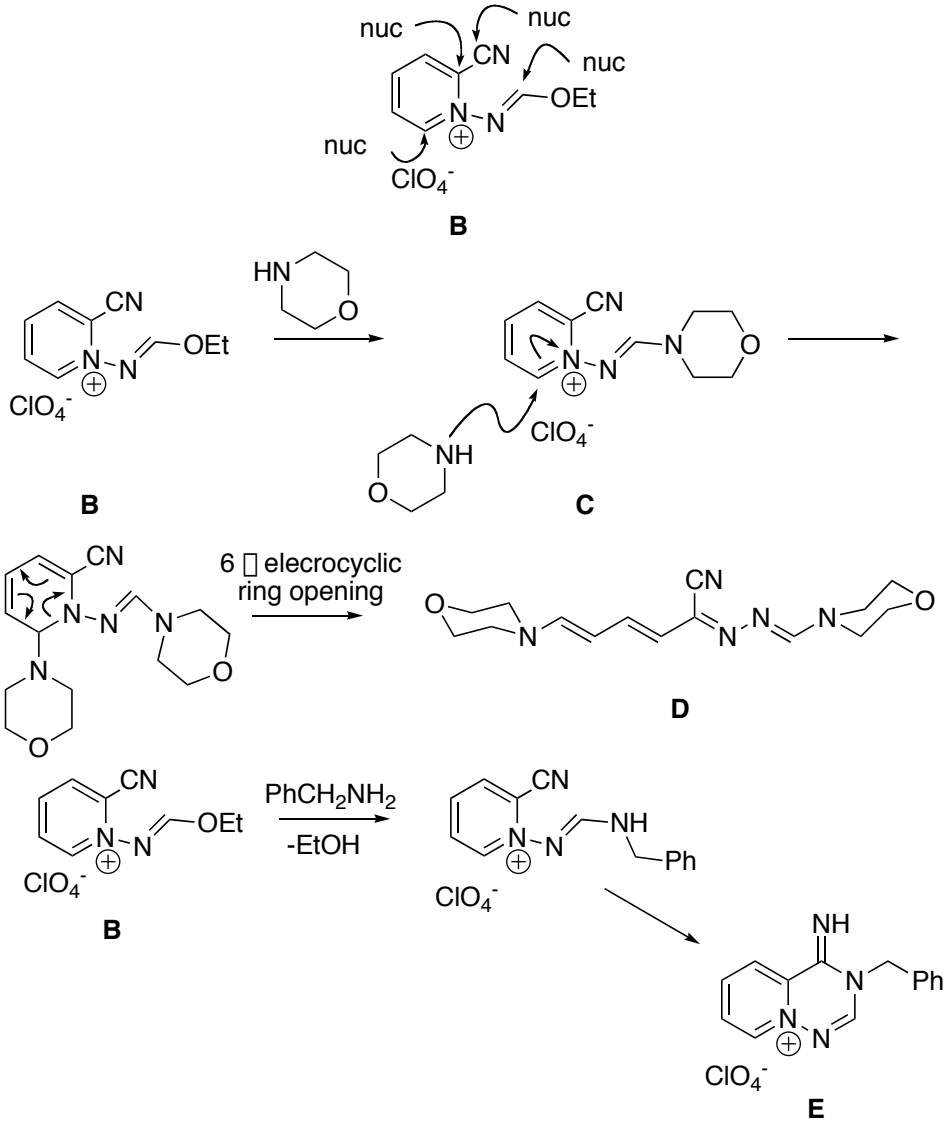
Mind Bending Mechanisms

Baran Lab ***Hafensteiner***

Pyridinium salts (*Heterocycles,* **1990**, *31*, 289-304) are reactive to both electrophiles and nucleophiles, reactivity which was exploited by the Messmer group of the Hungarian Academy of Sciences. The reactive starting block **B** was synthesized from the condensation of **A** with $HC(OEt)_3$.



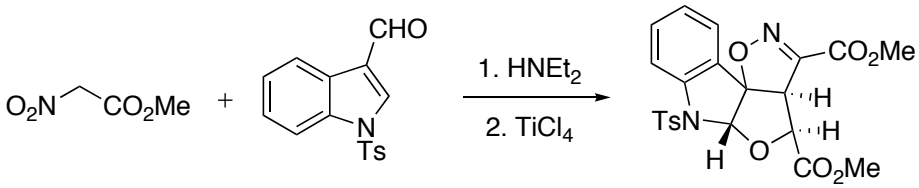
Propose a structure for **C**, **D**, and **E**. Hint: Identify the electrophilic sites of molecule **B**.



Mind Bending Mechanisms

Baran Lab ***Hafensteiner***

The Harada group has developed an efficient route to the following polycyclic architecture (*Heterocycles*, **1993**, *36*, 449-454).



Propose a plausible mechanism for the formation of the product.