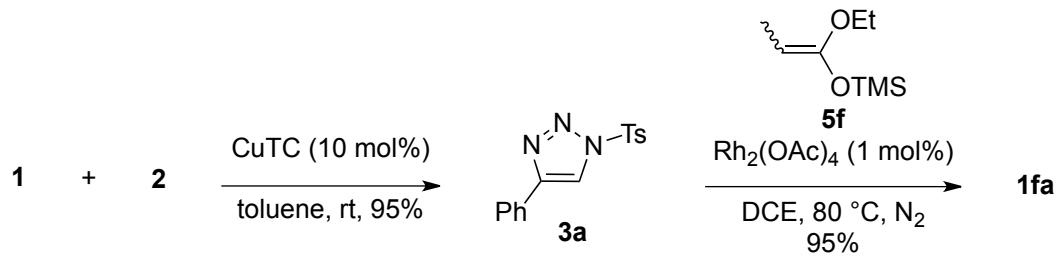
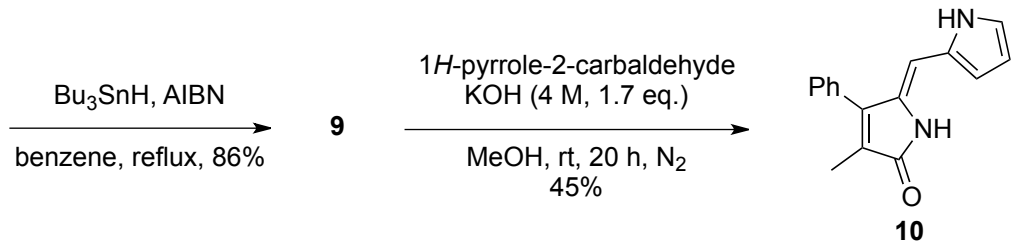
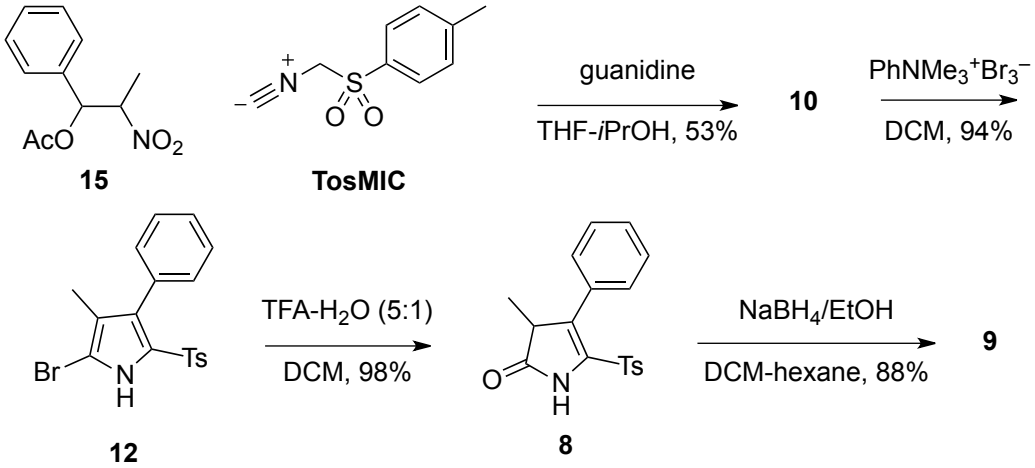
Rhodium-Catalyzed transannulation and Barton-Zard Reaction Synthesis of 3-pyrrolin-2-one



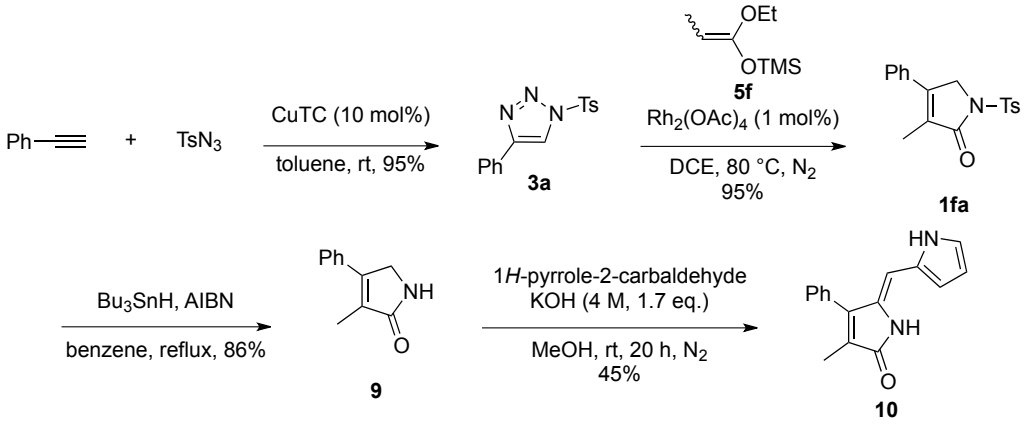


The compound **9** can be synthetized in 4 steps. The first step is a Barton-Zard reaction between (*p*-toluenesulfonyl)methyl isocyanide and 2-nitro-1phenylpropanol acetate :

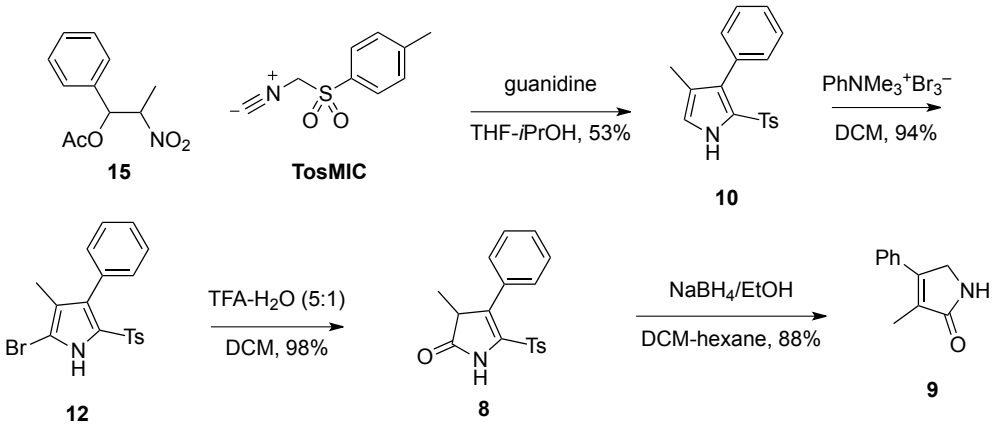


1/ Give the structure of the missing compounds (**1**, **2**, **1fa**, **9** and **10**).
2/ Proposed a mechanism for the key step (**1fa** from **3a**).
3/ Proposed a mechanism for the Barton-Zard reaction (formation of **10**).

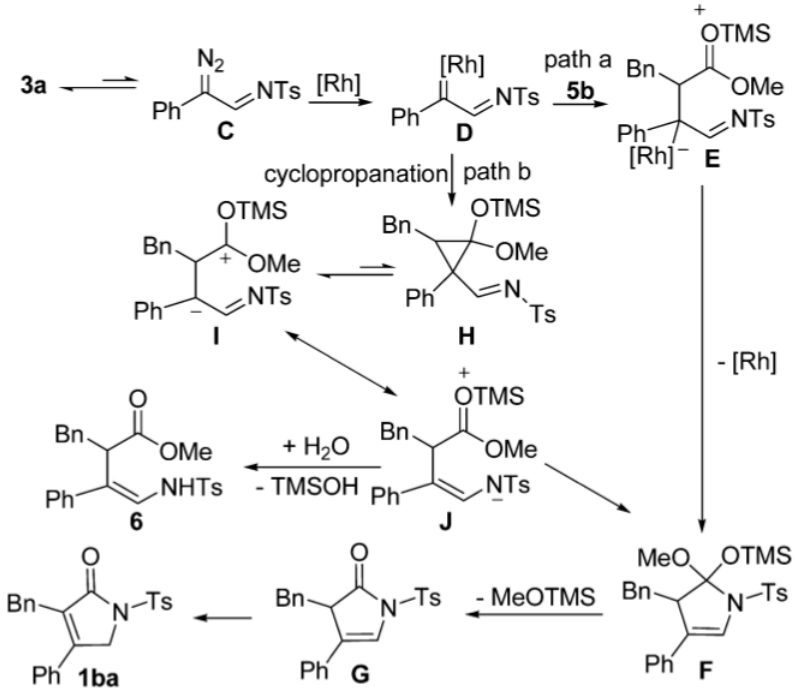
Solution:
1/



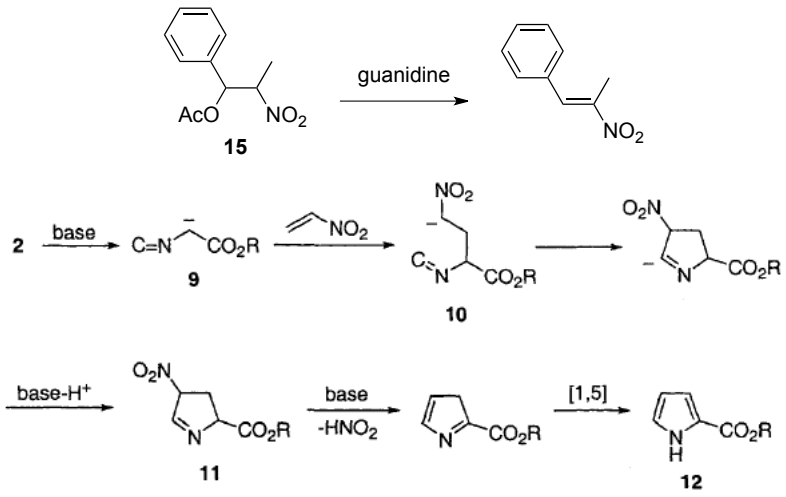
Other pathway for **9**:



2/ 2 possible mechanisms were proposed by the authors :



3/



References:
Ran, R.-Q.; Xiu, S.-D.; Wang, K.-B.; Li, C.-Y. *Org. Lett.* **2014**, ASAP (DOI: 10.1021/ol501514b)

Brower, J. O.; Lightner, D. A.; McDonagh, A. F. *Tetrahedron* **2001**, 57, 7813.

Keywords: Click Chemistry, Rhodium transannulation, Barton-Zard Reaction