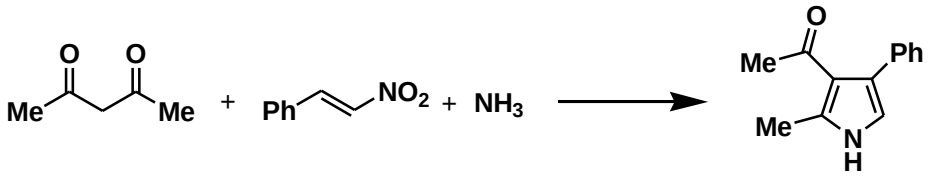
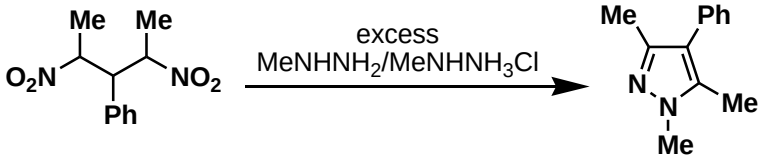
THE UNIVERSITY OF TOLEDO 1872

Problem Set 4: This problem set is now available at (www.blackboard.utdl.edu). It will be due in class 9 days (04/05/18) from today (03/27/18). Grades will be administered as follows: 10 (exceptional effort), 8 (complete), 5 (incomplete or inadequate effort), 2 (poor effort), 0 (nonexistent). ***No late problem sets will be accepted.***

1. **Problem:** The following is a general reaction for the formation of pyrroles. In this condensation, any of the three reaction constituents may be varied. (Ono, "The Nitro Group in Organic Synthesis" Wiley-VCH, 2001, Chapter 10, pp 326-328). Since it is not clear what the "inorganic" reaction product is, provide the most reasonable mechanism possible with the reagents provided.

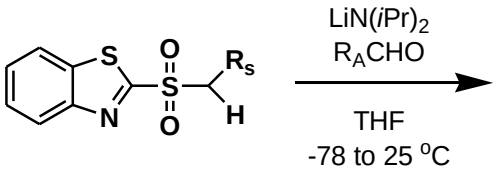


2. **Problem:** We've been focused on Charged Affinity Patterns recently in class. Here is a good exercise that deals with the versatility of the nitro group. Provide a detailed mechanism for the following reaction.



3. **Problem:** The stereoselective construction of *trans* olefins through carbanion-mediated condensation processes has still not been rendered general. One transformation that may be used in certain circumstances is the "one-step" Julia transformation illustrated.

   Draw out each of the intermediates that might be anticipated in the transformation of the compound shown below, to the olefinic products. Surmise what the stereochemical implications are for this reaction.


LiN(iPr)2
RACHO
THF
-78 to 25 °C
S
N
O
S
O
RS
H