

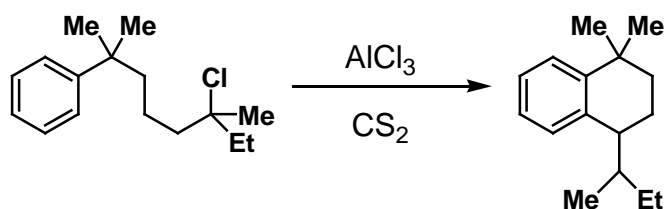


## CHEM 8410\_6410\_4410 – Organic Synthesis

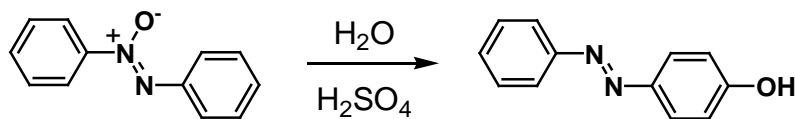
THE UNIVERSITY OF  
**TOLEDO**  
1872

**Problem Set 5:** This problem set is now available at ([www.blackboard.utoledo.edu](http://www.blackboard.utoledo.edu)). It will be due in my mailbox 15 days (05/01/15) from today (04/16/15). Grades will be administered as follows: 5 (exceptional effort), 4 (complete), 3 (incomplete or inadequate effort), 2 (poor effort), 0 (nonexistent). **No late problem sets will be accepted.**

1. **Problem:** Draw the mechanism for the following.



2. **Problem:** Draw the mechanism for the following. The following pieces of information should help you: (1) When  $^{18}\text{O}$ -labeled water is used as solvent, the product is labeled. (2) When the *N* in the starting material is selectively labeled with  $^{15}\text{N}$ , the label is found to be randomly distributed in the product. (3) The key intermediate is dicationic.



3. **Problem:** Draw the mechanism for the following. **Note the stereochemistry of the product!!!** What does this tell you about the mechanism?

