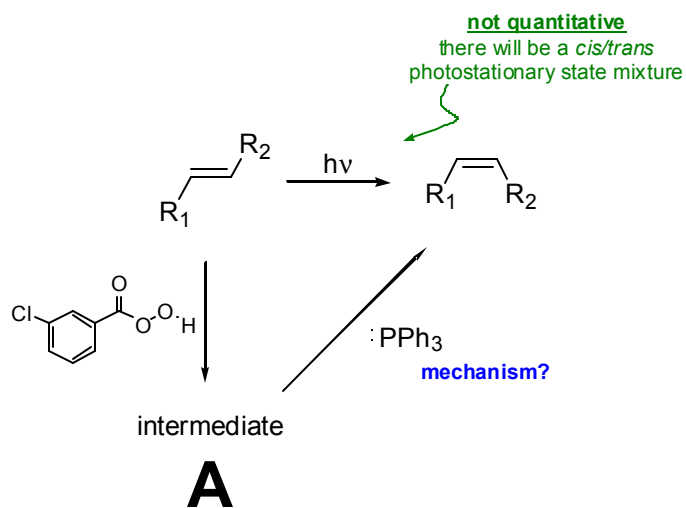


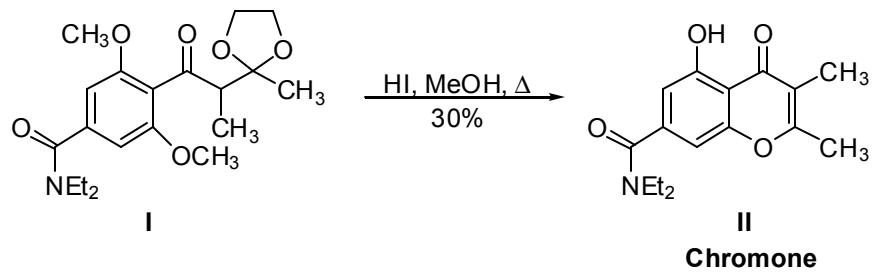
Section Problem Set

Carbonyl Chemistry and Carboxylic Acid Derivatives

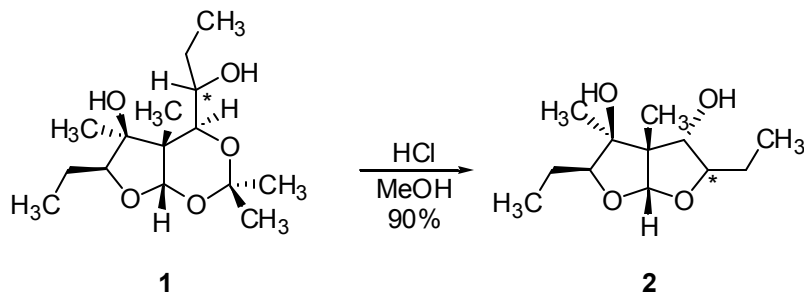
Problem 1 An alternative to using UV irradiation to effect *cis/trans* isomerization of an olefin is treatment with *m*-chloroperbenzoic acid followed by triphenylphosphine. Provide a structure for the intermediate **A** and a mechanism for the second step.



Problem 2 (from Fall 2003 Chem 30 Problem Set #2). Recently, Evans and coworkers developed a concise synthesis of chromone (compound II), an intermediate on their synthetic route to the natural product stachyflin A. In a single-pot process that provides a lot of bang for the buck, compound I is transformed into chromone when heated at reflux in methanolic hydroiodic acid. Provide a mechanism for this transformation.



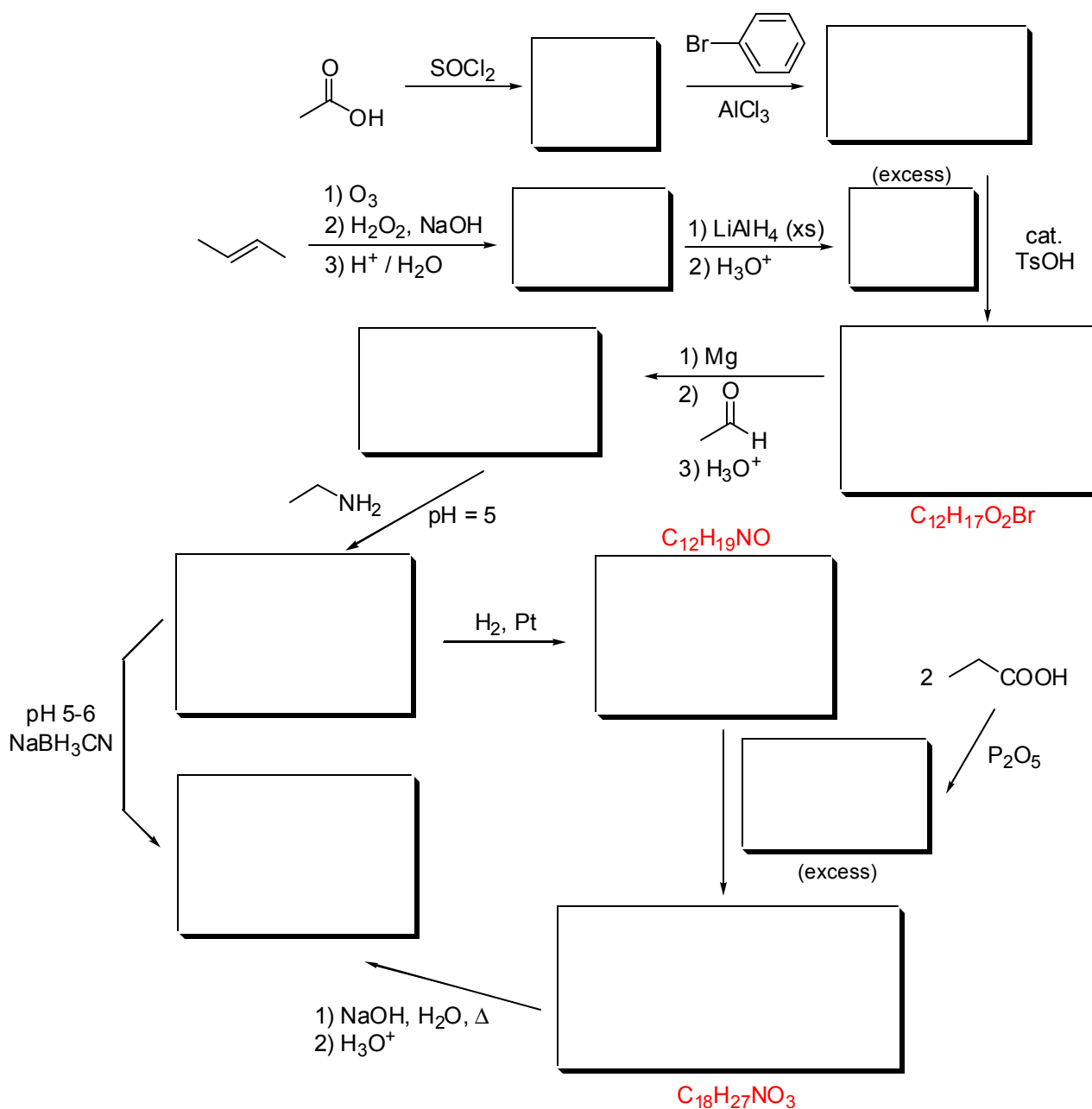
Problem 3 (also from Fall 2003 Chem 30 Problem Set #2). In a total synthesis project conducted in the lab of Prof. Stuart Schreiber at Harvard, compound **1** was converted to the bis(tetrahydrofuran) derivative **2** upon treatment with acid. Provide a mechanism for this transformation.



Problem 4 You'd better learn your reactions. We haven't been covering every single specific example in class and section, but you've still got to know them. The Loudon/Stowell study guide is a great place to pick them up. When you see a new reaction, ask yourself two questions:

- 1) What is the mechanism?
- 2) How can I use this in synthesis?

Fill in the blanks of this "roadmap" problem:



Problem 5 Given the substrates and reagents, predict the major product in the following reactions. Assume that one equivalent of the reagent is used and that acidic workups are performed in each case. Be sure to indicate stereochemistry in your products—that's the whole point of this problem!

