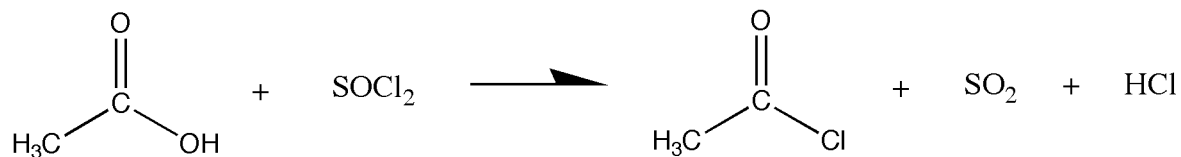


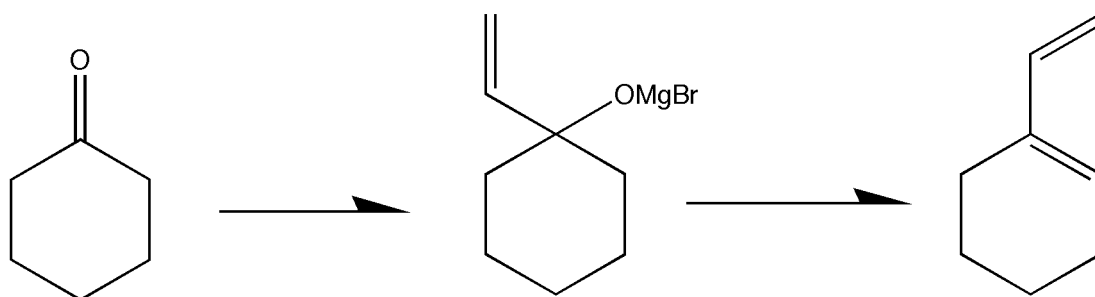
Exercise 3: Reactions with carbonyl groups II

1. There was some concern as to how the extremely reactive acyl chloride group could be generated. A pathway for such a reaction involves the use of thionyl chloride, SOCl_2 , according to the following reaction:

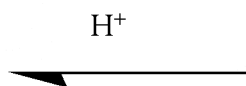
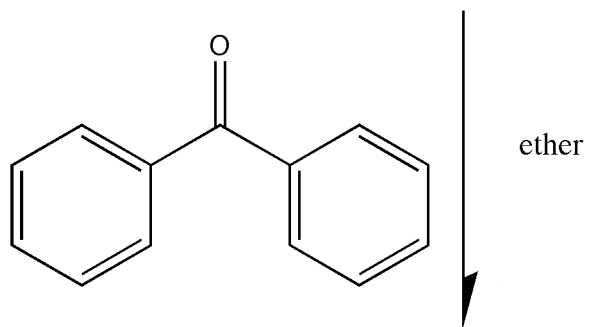
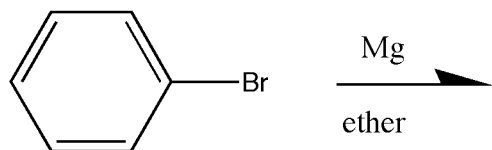


Give the mechanism for this reaction. Hint: The first step involves making a sulfonate ester.

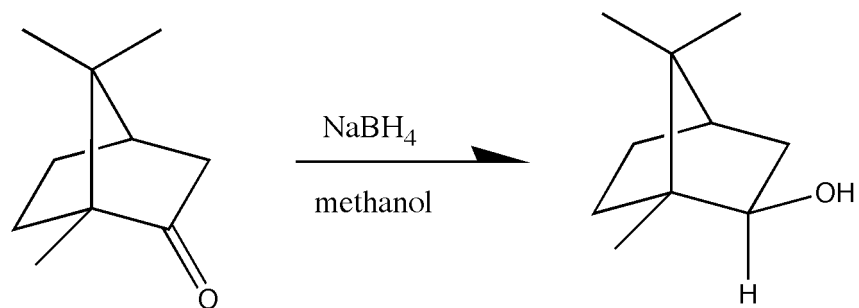
2. Give the reagents need for the following synthesis:

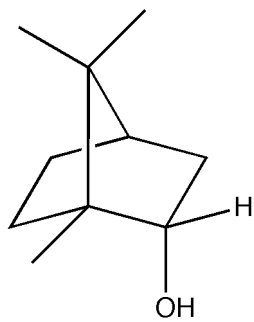


3. Fill in the appropriate structures at each step:



4. The reduction of camphor to isborneol by sodium borohydride is a common organic chemistry lab experiment. Give the mechanism for this reaction (you may find a suitable abbreviation for the non-carbonyl parts of the molecule):





5. Why isn't borneol made?
original hydride attack.

Hint: Consider the geometry of the