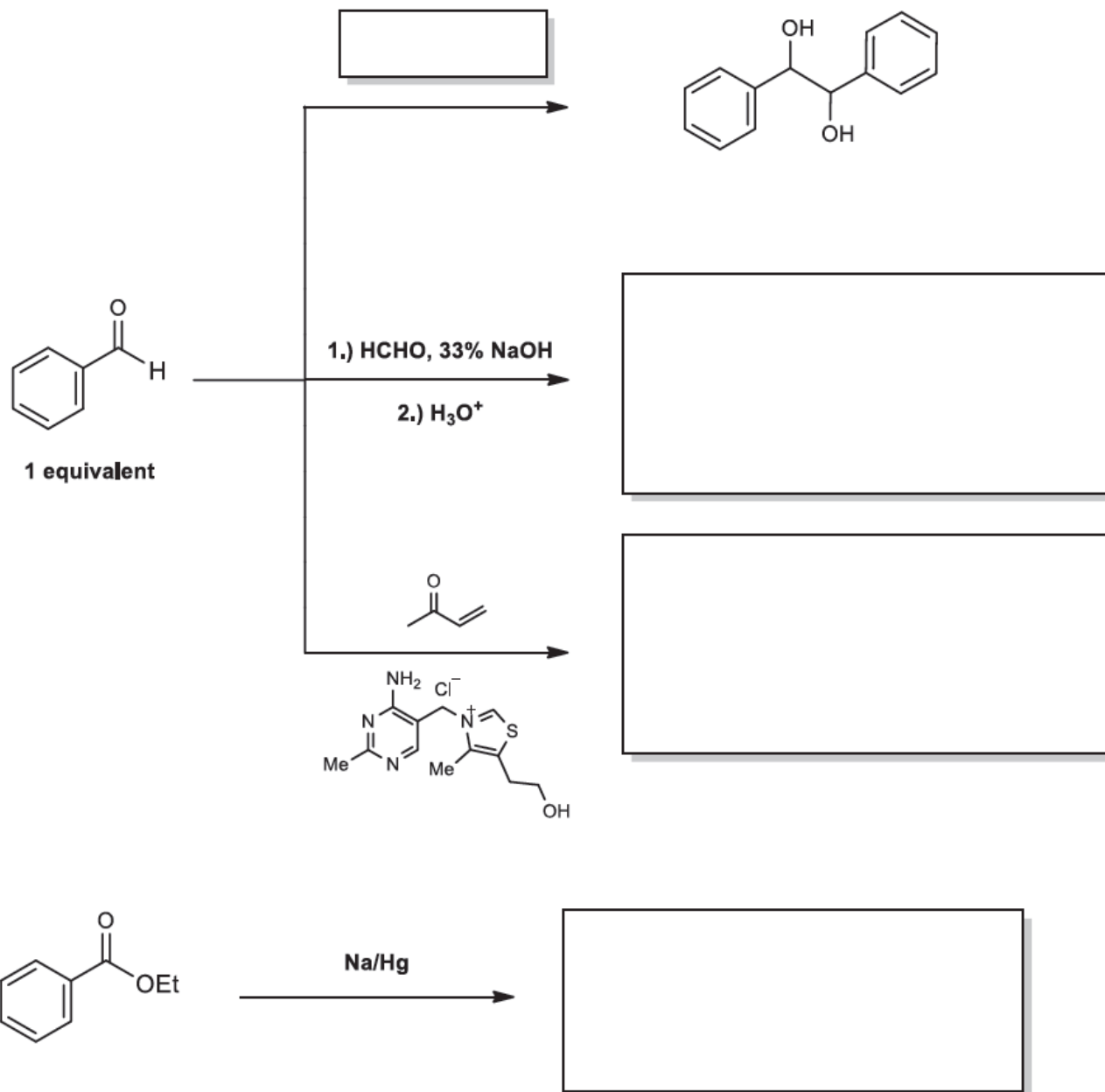
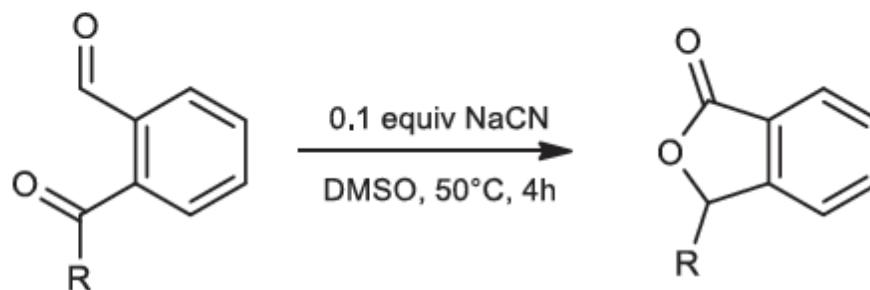


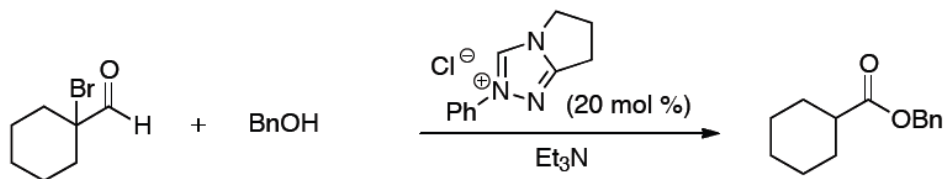
1 Provide the missing reagent(s) or product. What are the names of these reactions?



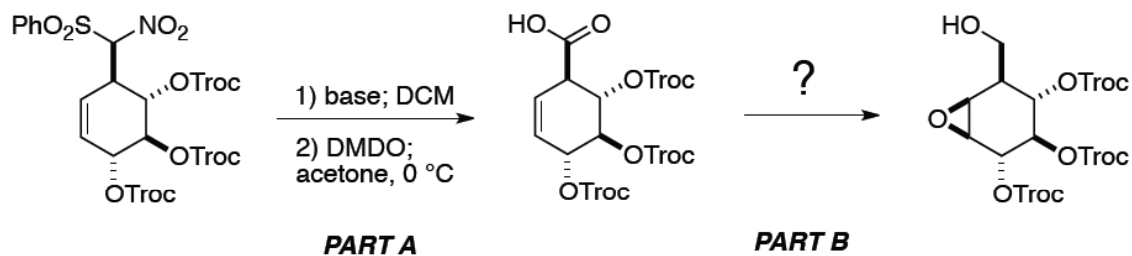
- 2 The following reaction is a cyanide-catalyzed (nucleophile catalysis) variant of a redox neutral reaction that we encountered in the lecture. What is the name of the parent redox neutral reaction? Provide a detailed mechanism for the transformation below.



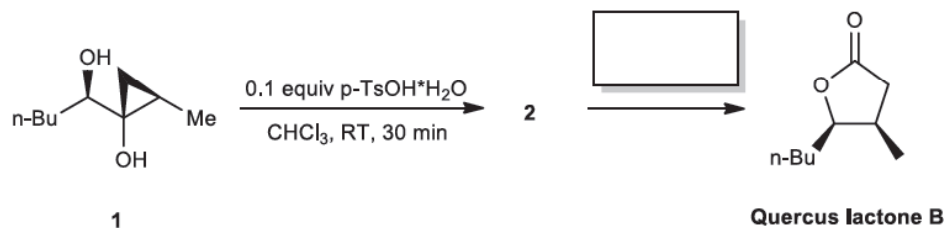
- 3 For the following NHC (N-heterocyclic carbene) catalyzed internal redox reaction, provide a detailed mechanism for the transformation.



- 4 In the synthesis below, provide the name and the mechanism for the reaction in Part A. For Part B, provide the missing reagents. Make your that your sequence is appropriate.



- 5 The synthesis of Quercus lactone B was accomplished using a redox neutral reaction from precursor 1 via intermediate 2



- Provide a detailed mechanism for the transformation of 1 to 2.
- Give the missing reagent(s) for the synthesis of Quercus lactone B from 2.
- In both steps, a migration takes place. Explain, for both steps, which group migrates preferentially.
- What are the names of the two reactions?