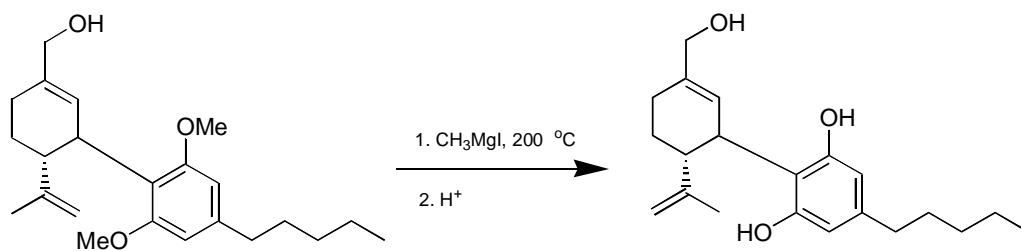
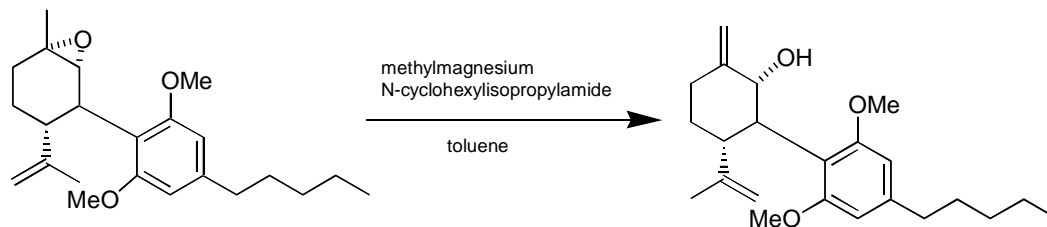


Shown below are two preparative steps in the recent synthesis of a metabolite (7-hydroxycannabidiol) of cannabidiol, a compound found in various preparations of *Cannabis sativa*. Interest in cannabidiol and its metabolites centers on the variety of nonpsychotropic pharmacological effects that the compound possesses.

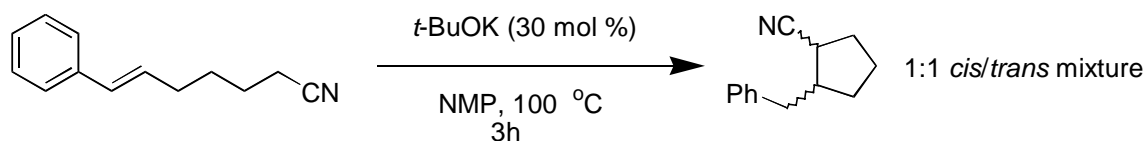
Provide a reasonable mechanism, including proper use of curved arrow formalism, that shows how the transformations occur. Show all products and byproducts.



(over)

The example below is illustrative of a recently-developed method for modification of the double bond in variously-substituted styrenes.

Provide a reasonable mechanism, including proper use of curved arrow formalism, that shows how the given transformation occurs. Show all products and byproducts, and explain why NMP is advantageous as a solvent for this system. Explain, by way of your mechanistic scheme, why a mixture of diastereomers, rather than a single isomer, is formed.



The example below is illustrative of a recently-developed method for preparation of “push-pull” alkenes. Such alkenes are of interest in the construction of non-linear optical devices.

Provide a reasonable mechanism, including proper use of curved arrow formalism, that shows how the given transformation occurs. Show all products and byproducts, and explain why Hünig’s base is advantageous as a component of the reaction system.

What do you think that the term ‘push-pull’ means within the present context? Draw structures that illustrate your idea.

