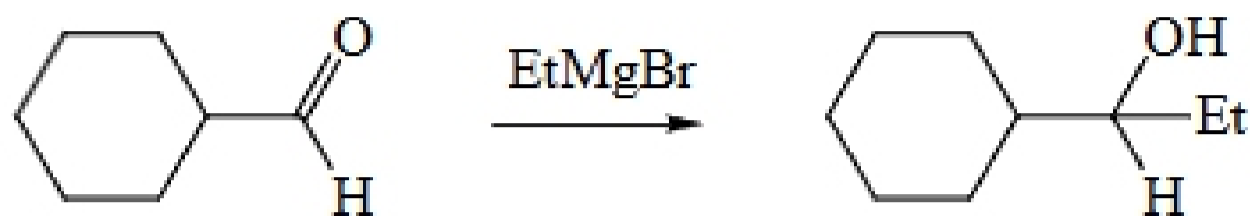
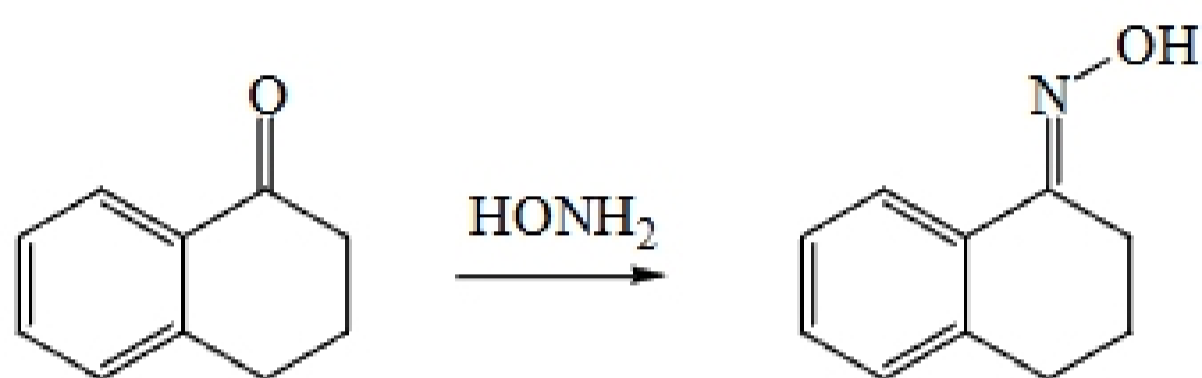


1. (20 pts.) Draw the *major* product of each of the following reactions. Do not draw mechanisms! Assume aqueous workup in all cases (that is, draw neutral products).

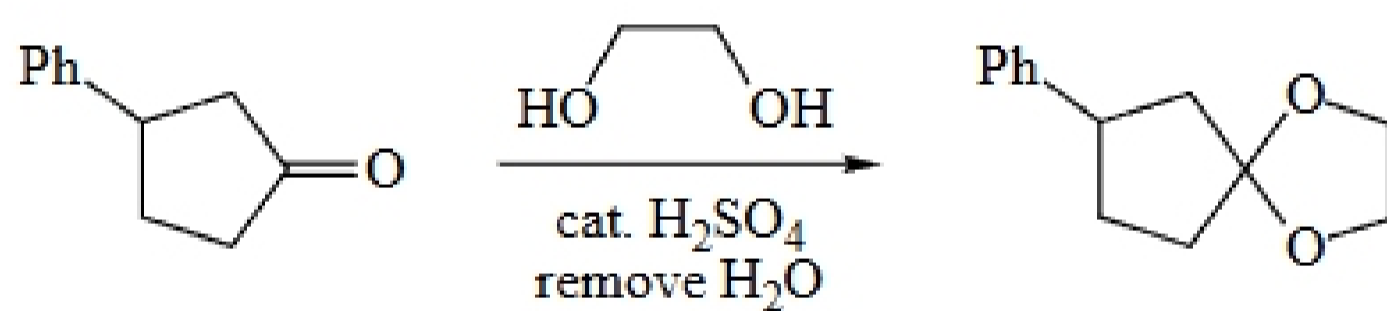
(a)



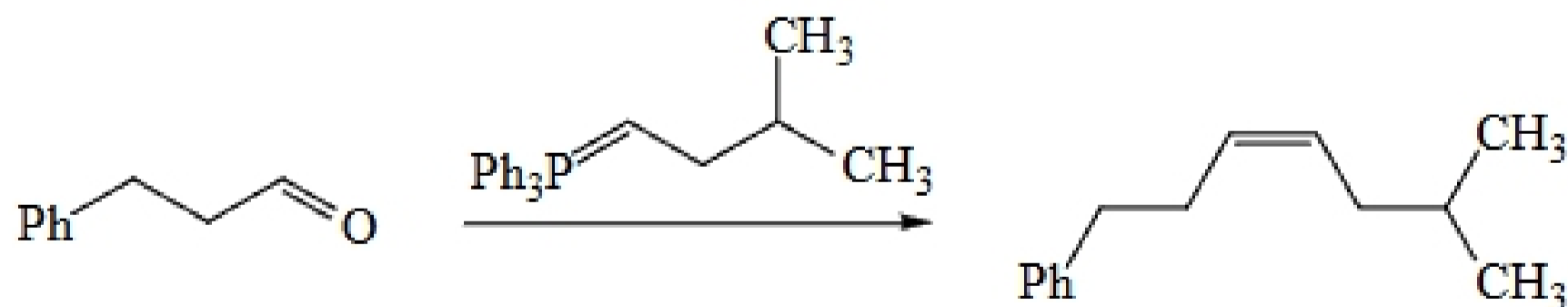
(b)



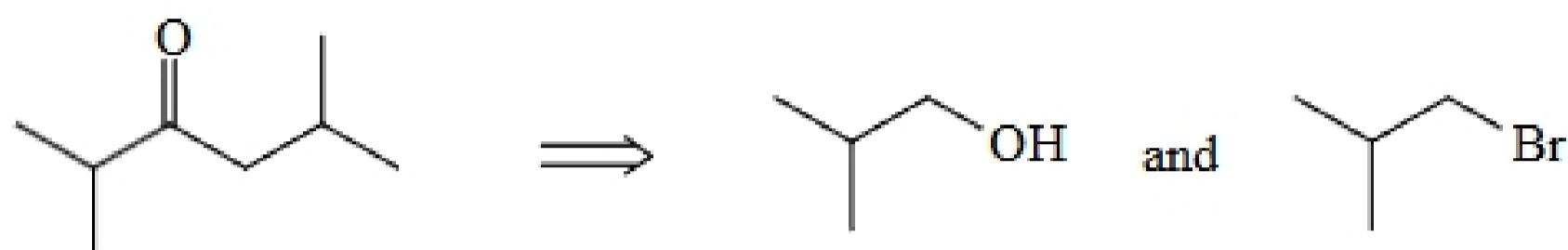
(c)



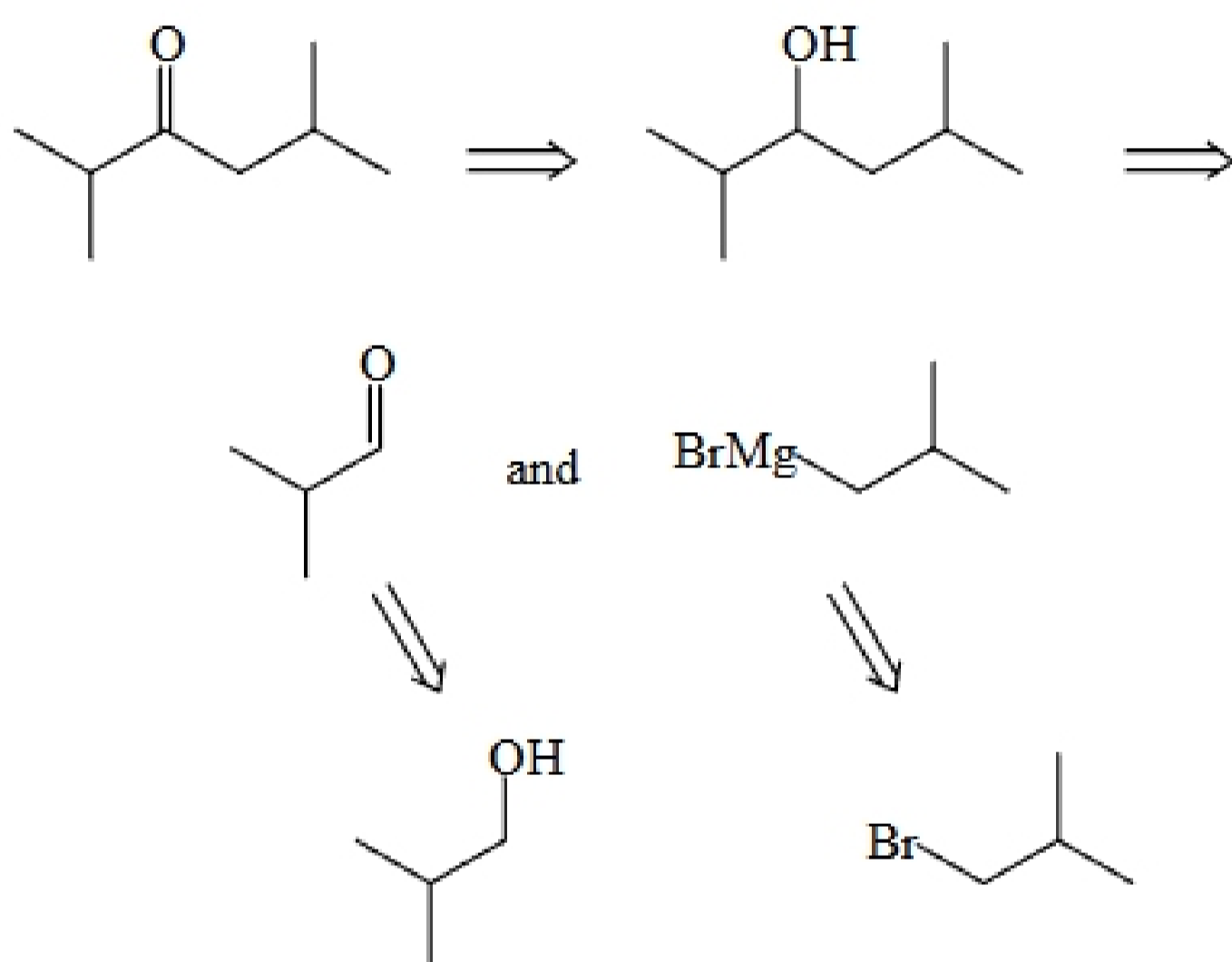
(d)



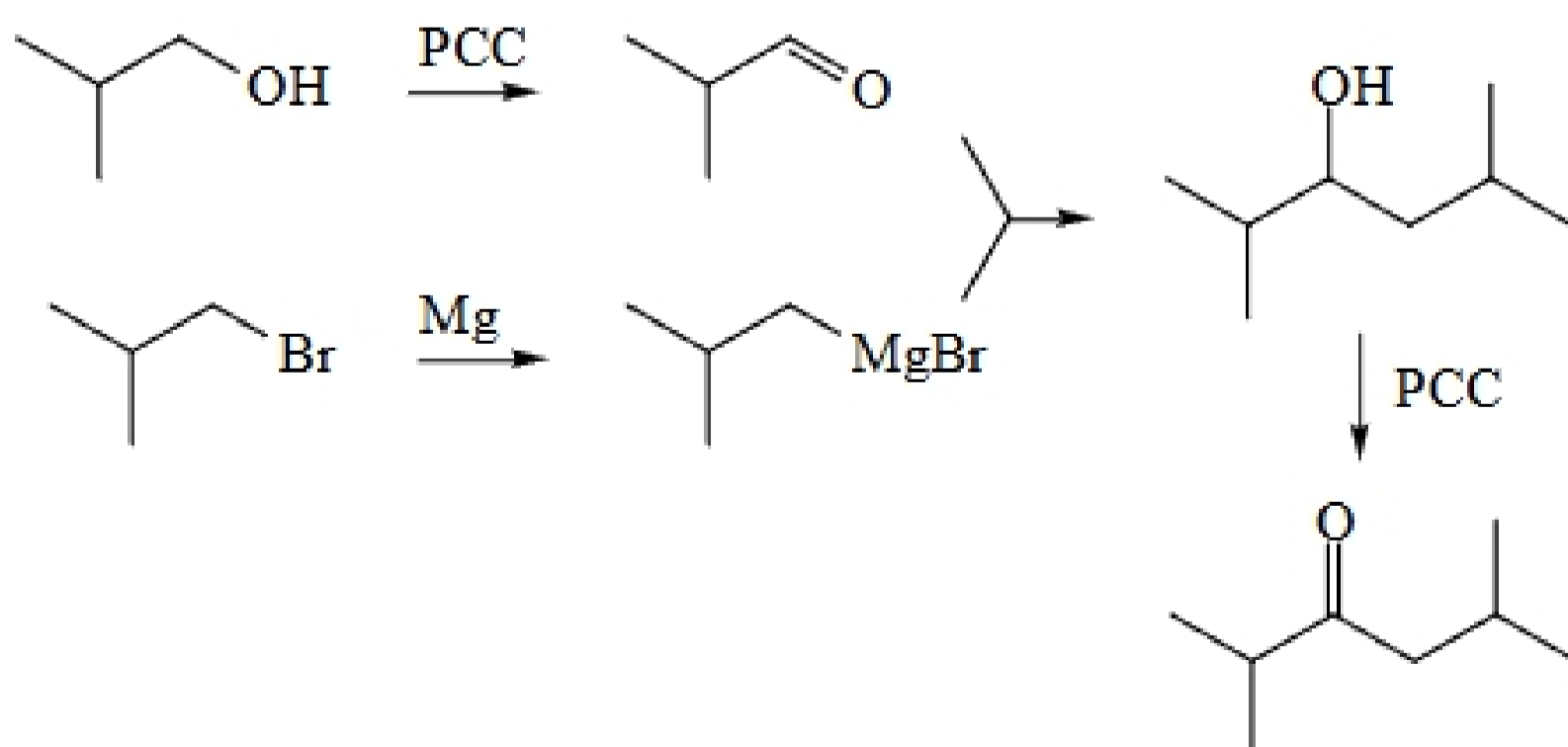
2. (20 pts.) Design a synthesis of the ketone below. *All* of the C atoms in the product must be derived from *one or both* of the two starting materials shown, but you may use any other reagents to accomplish the necessary transformations. Your synthesis will require more than two steps. Show each intermediate compound and all reagents you will need for each step. (Don't panic if you can't remember the reagents for a particular step; partial credit will be given.) Do not show mechanisms.



Retrosynthesis:



Forward:



3. (20 pts.) The following reaction is a model for the hydrolysis of sucrose to fructose and glucose. Draw a reasonable mechanism for it.

