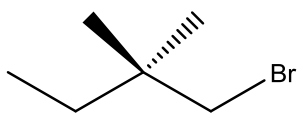
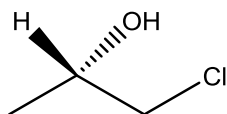


Which compounds can be used to successfully prepare a Grignard reagent for alcohol synthesis by subsequent reaction with aldehydes or ketones, followed by a mild acid aqueous work up? For those that cannot, explain why.

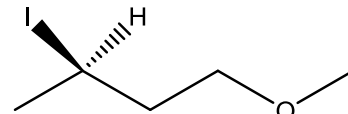
A



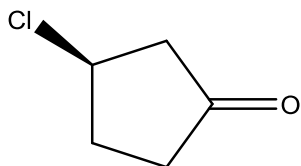
B



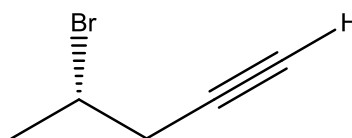
C



D

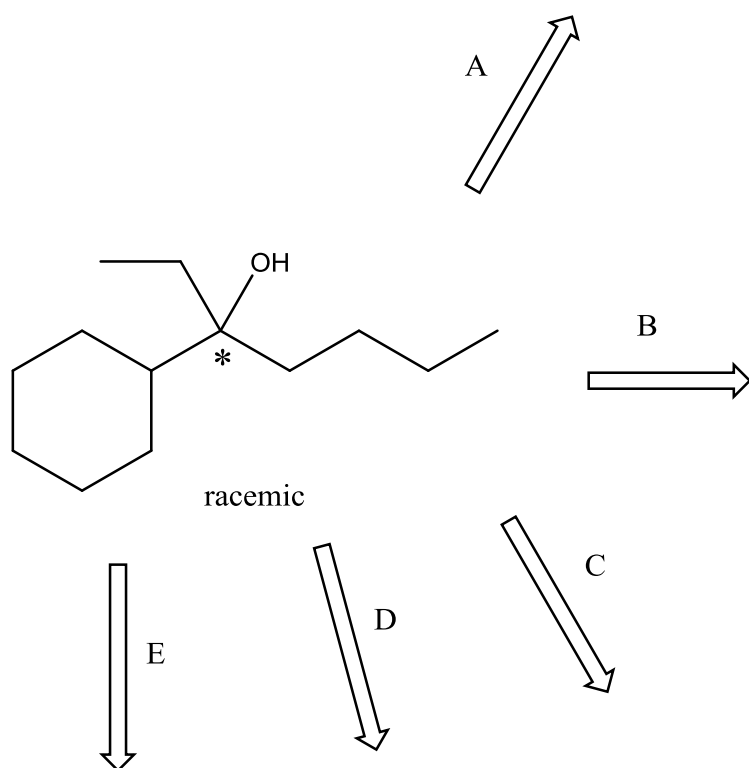


E

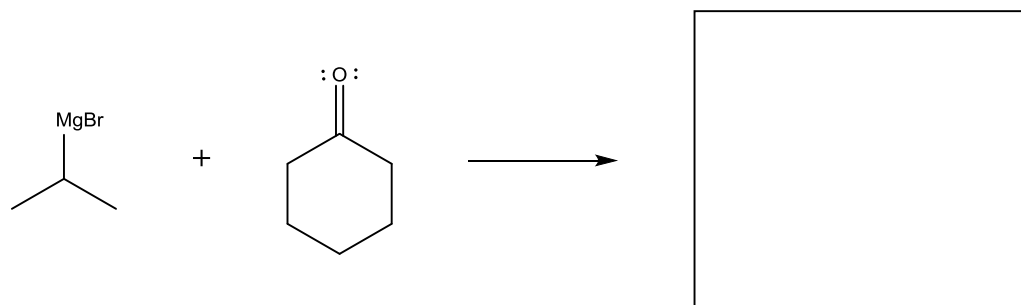


Retrosynthetic Analysis

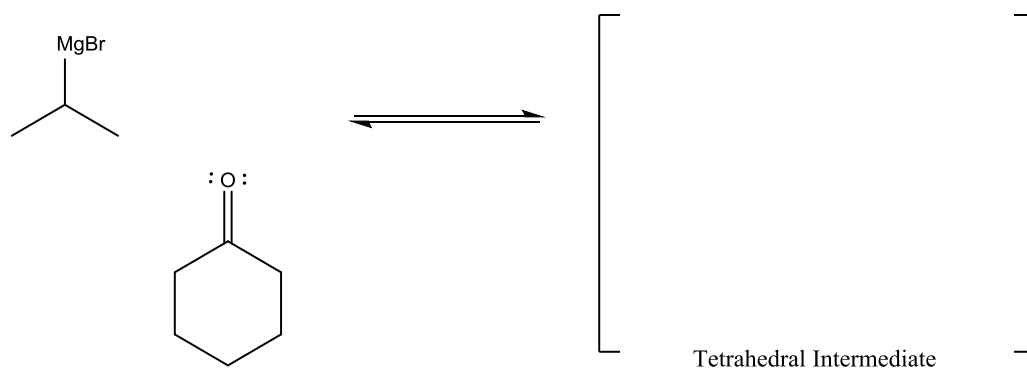
Show multiple ways to break down this tertiary alcohol into possible starting materials where one component is an organometallic compound such as a Grignard reagent. More than five ways may be possible.



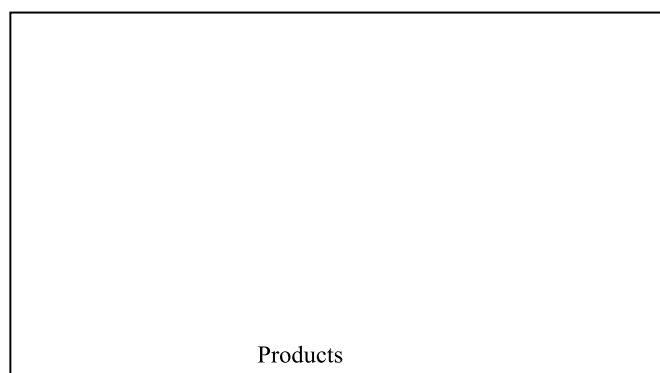
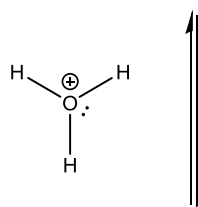
Predict the product for the following reaction after a mild acid –aqueous work up.



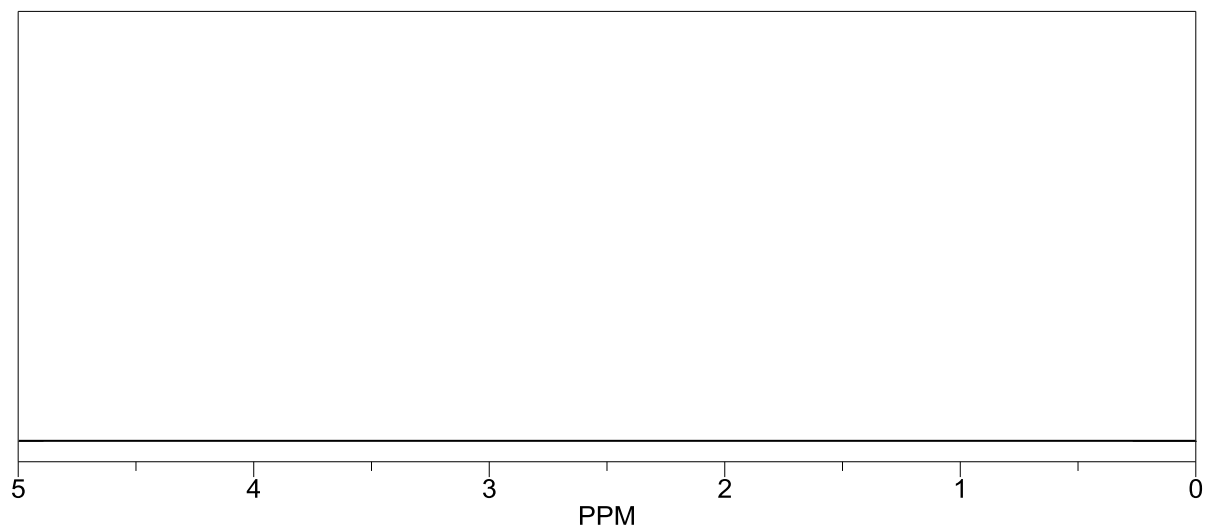
Show the mechanism for the above reaction.



2)

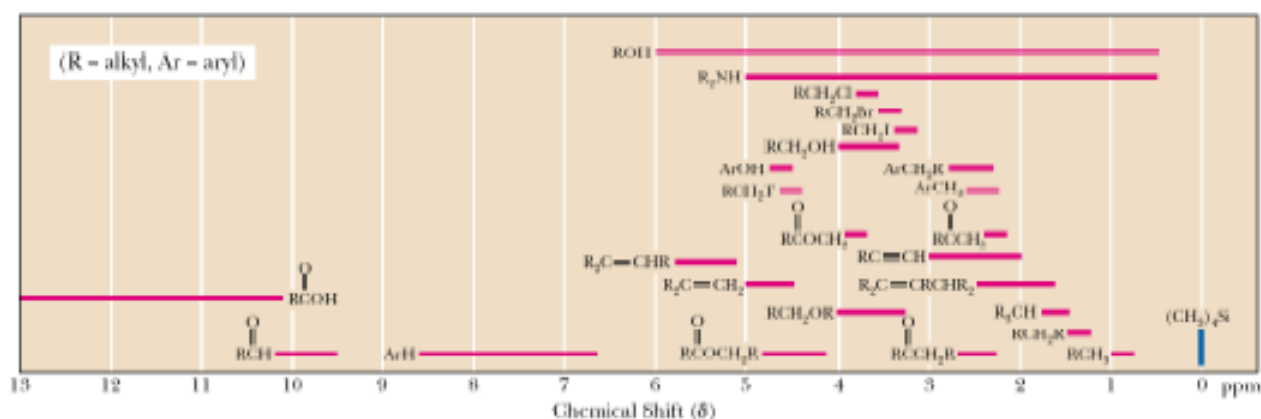


Predict the NMR Spectrum for the product from page 3 using the chemical shift info from page 5.



Type of Hydrogen (R = alkyl, Ar = aryl)	Chemical Shift (δ) [*]	Type of Hydrogen (R = alkyl, Ar = aryl)	Chemical Shift (δ) [*]
R_2NH	0.5-5.0	RCH_2OH	3.4-4.0
ROH	0.5-6.0	RCH_2Br	3.4-3.6
RCH_3	0.8-1.0	RCH_2Cl	3.6-3.8
RCH_2R	1.2-1.4	$\begin{array}{c} O \\ \\ RCOCH_3 \end{array}$	3.7-3.9
R_3CH	1.4-1.7	$\begin{array}{c} O \\ \\ RCOCH_2R \end{array}$	4.1-4.7
$R_2C=CRCHR_2$	1.6-2.6	RCH_2F	4.4-4.5
$RC\equiv CH$	2.0-3.0	$ArOH$	4.5-4.7
$\begin{array}{c} O \\ \\ RCOCH_3 \end{array}$	2.1-2.3	$R_2C=CH_2$	4.6-5.0
$\begin{array}{c} O \\ \\ RCOCH_2R \end{array}$	2.2-2.6	$R_2C=CHR$	5.0-5.7
$ArCH_3$	2.2-2.5	$\begin{array}{c} O \\ / \backslash \\ H_2C-CH_2 \end{array}$	3.3-4.0
RCH_2NR_2	2.3-2.8	$\begin{array}{c} O \\ \\ RCH \end{array}$	9.5-10.1
RCH_2I	3.1-3.3	$\begin{array}{c} O \\ \\ RCOH \end{array}$	10-13
RCH_2OR	3.3-4.0		

* Values are relative to tetramethylsilane. Other atoms within the molecule may cause the signal to appear outside these ranges.



Actual NMR Spectrum:

