

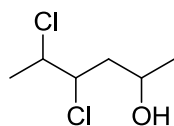
## PRACTICE PROBLEMS UNIT 9

Note: Reaction topics 9B, 9C and 9E are grouped at the end of the problem set under "R".

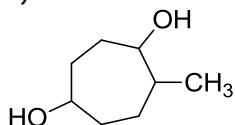
### 9A. Provide IUPAC names for chain and cyclic alcohols.

9A.1 Name the following alcohols.

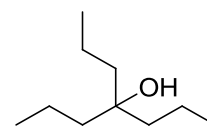
a)



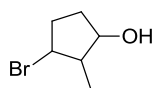
d)



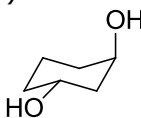
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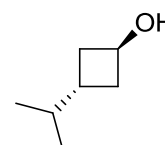
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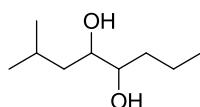
e)



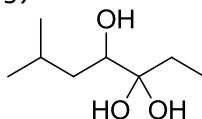
i)



c)



g)

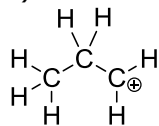


### 9D. Predict the likely rearrangement of a given cation

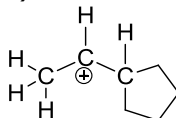
9D.1 What drives the rearrangement of carbocations?

9D.2 Determine if the following carbocations will rearrange. If so, draw the most likely rearrangement and show electron flow for the rearrangement with curved arrows

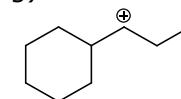
a)



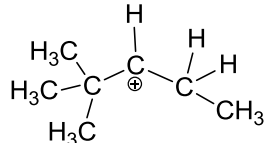
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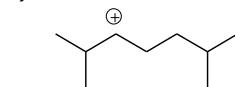
g)



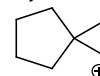
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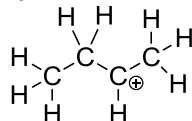
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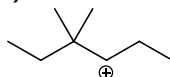
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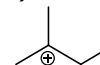
c)



f)



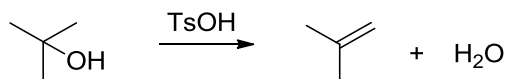
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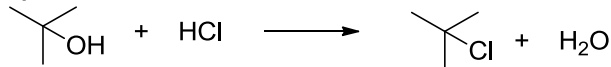
## 9F - Draw the SN1/E1 mechanism of dehydration and halogenation of alcohols with strong

9F.1 Provide a mechanism for the following reactions. Include intermediates, if any, and use curved arrows to show electron flow.

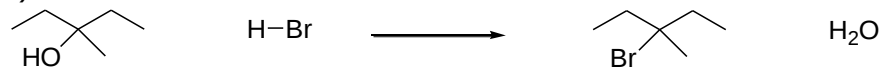
a)



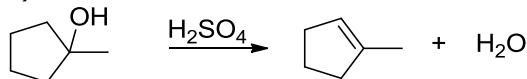
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c)



d)



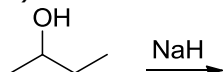
## 9B. Synthesize 1° and methyl alcohols using the S<sub>N</sub>2 reaction

## 9C. Synthesize alkenes from alcohols

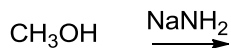
## 9E. Convert alcohols into good leaving group using strong acid, $\text{SOCl}_2$ , $\text{PBr}_3$ , or $\text{TsCl}$

9R.1 Predict the product of the following reactions.

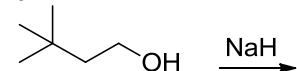
a)



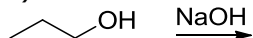
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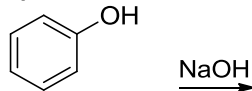
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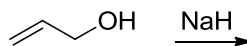
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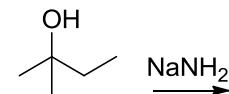
e)



f)



g)



9R.2 Predict the product of the following molecules reacted with sodium hydroxide.

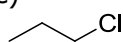
a)



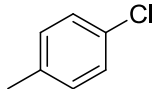
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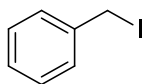
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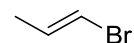
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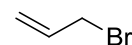
e)



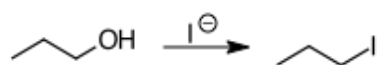
f)



g)



9R.3 a) Why is the reaction below a poor/slow reaction? b) What reagent(s) should be used instead?



9R.3 Predict the major product of 2-butanol with the following reagents.

a) HCl

d) NaOH

g) TsOH

b) TsCl, pyridine

e) PBr<sub>3</sub>

i) HBr

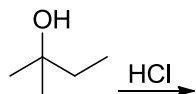
c) H<sub>2</sub>SO<sub>4</sub>

f) SOCl<sub>2</sub>

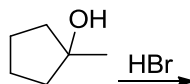
j) POCl<sub>3</sub>

9R.4 Predict the major product of the following reactions.

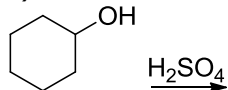
a)



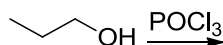
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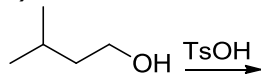
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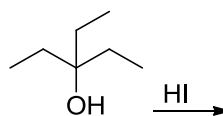
f)



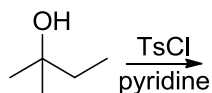
c)



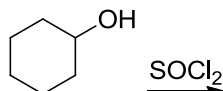
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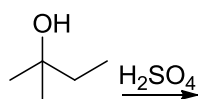
d)



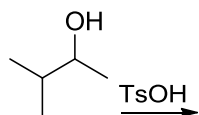
h)



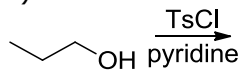
i)



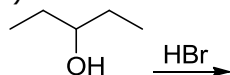
j)



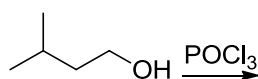
k)



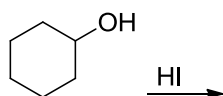
l)



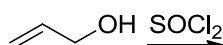
m)



n)

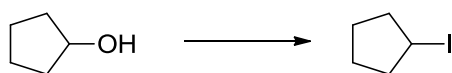


o)

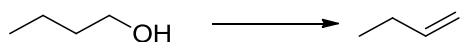


9R.5 Fill in the appropriate reagent for each transformation.

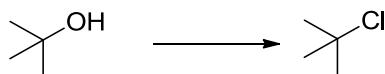
a)



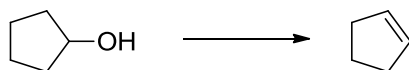
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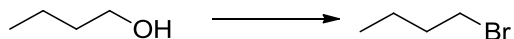
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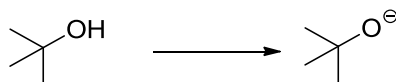
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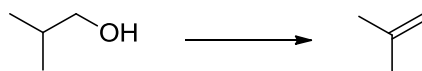
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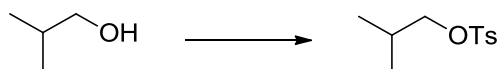
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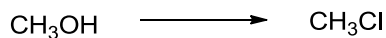
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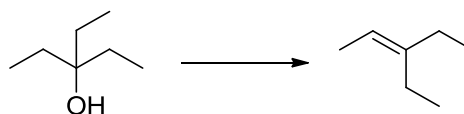
h)



i)

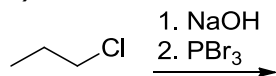


j)

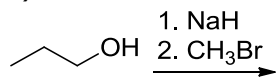


9R.6 Predict product of the following multistep syntheses.

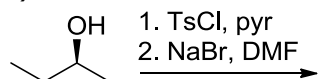
a)



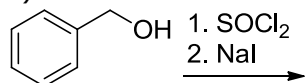
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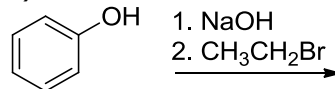
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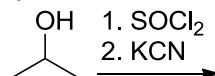
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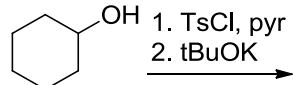
e)



f)



g)



h)

