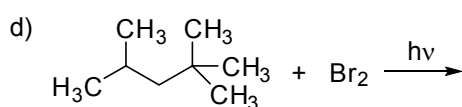
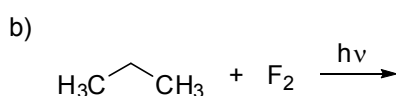
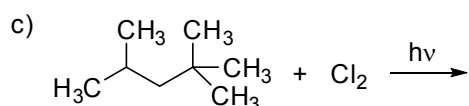
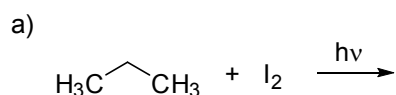


## 3. HETEROATOM SUBSTITUTION PART 1

1. Write the major organic product(s), if any, of each of the following reactions. Calculate product ratios in each if the reactions. Use relative reactivity data for  $F_2$  and  $Cl_2$  at 25 °C and for  $Br_2$  at 150 °C (Table\*). Which, if any, of the discussed reactions will give the major product with reasonable selectivity? (VS ch. 3)

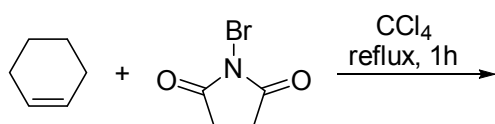


C-H bond	$F\cdot$ (25°C, gas)	$Cl\cdot$ (25°C, gas)	$Br\cdot$ (150°C, gas)
$CH_3-H$	0.5	0.004	0.002
$RCH_2-H^a$	1	1	1
$R_2CH-H$	1.2	4	80
$R_3C-H$	1.4	5	1700

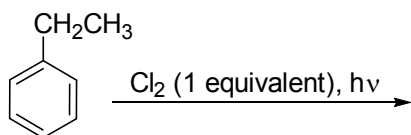
\*(VS, 5th edition, ch. 3)

2. Give the expected major product(s) of the following reactions (VS):

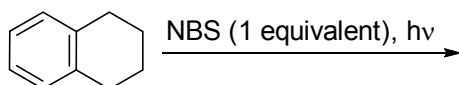
a)



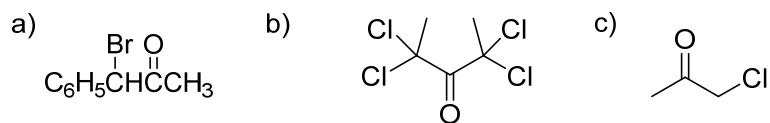
b)



c)



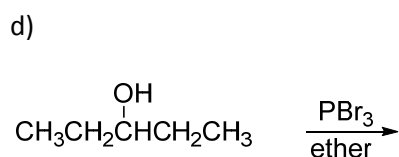
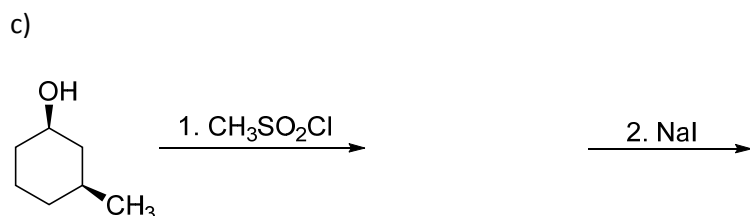
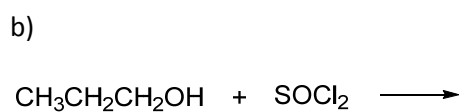
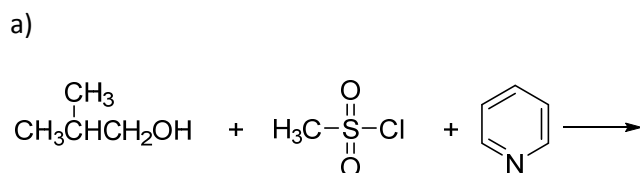
4. Describe the experimental conditions that would be best suited for the efficient synthesis of each of the following compounds from the corresponding non-halogenated ketone (VS).



5. Explain abbreviations listed in the table below.

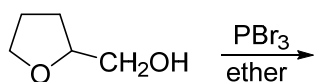
Abbreviation	Name	Formula/Composition	Application
Ms, OMs			
Ts, OTs			
DEAD			
COD			
MNNG			
ADDP			
DBU			
TMS			
DMAP			
DME			
DCC			
NMP			
(R/S)BINAP			

6. Predict the product of the reaction or reaction sequence (VS, CS).

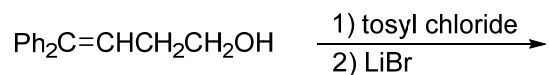


*J. Org. Chem.*, **1961**, *26*, 3645.

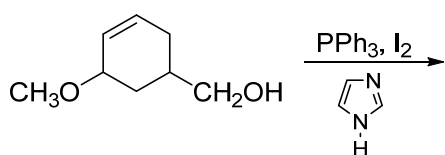
e)





DOI: 10.15227/orgsyn.023.0088 ; *Org. Synth.* **1943**, 23, 88.

f)

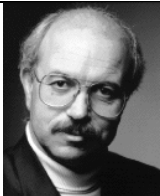

*J. Am. Chem. Soc.* **1966**, 88, 1732.

g)

*J. Org. Chem.* **1990**, 55, 2771.**7. Provide the name and details of the following name reaction.**

Chemist	Name	reactant(s)	reagent	product
	... synthesis		NaH	
	... synthesis		DEAD	
	... synthesis		$\text{PPh}_3$	
	... reaction			phosphonate ester

## Advanced Organic Chemistry

		Corey- ... macrolactonization			
		... reagent		1-Fluoro-2,4- dinitrobenzene	