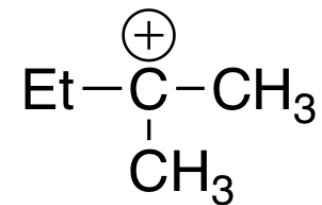
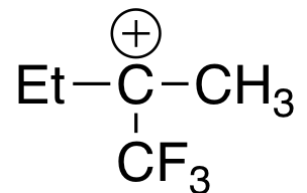
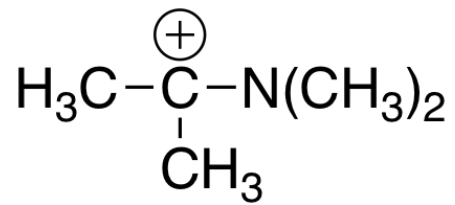


Nucleophilicity/Basicity Clarification

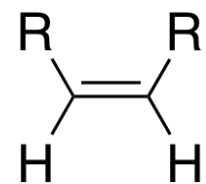
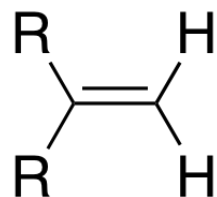
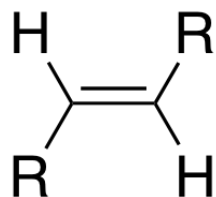
Nucleophile	Relative Rate	Strength	Base	pKa Conj. Acid
HSO_4^- , H_2PO_4^- , RCOOH	<0.01	Very Weak	HSO_4^- , H_2PO_4^- , RCOOH , Cl^- , I^- , Br^-	-11 to -3
ROH	1	Weak	ROH	-2
H_2O , NO_3^-	100		H_2O , NO_3^-	-1.5
F^-	500	Fair	F^-	3
Cl^- , RCO_2^-	20×10^3		RCO_2^- , N_3^-	5
NH_3 , $(\text{CH}_3)_2\text{S}$	300×10^3		NH_3 , $(\text{CH}_3)_2\text{S}$ CN^- , HS^- , RS^- , $(\text{CH}_3)_3\text{P}$,	7-9
N_3^- , Br^-	600×10^3	Good	OH^- , CH_3O^-	15-17
OH^- , CH_3O^-	2×10^6		H^- , R^-	22-50
CN^- , HS^- , RS^- , $(\text{CH}_3)_3\text{P}$, I^- , H^-	$>100 \times 10^6$	Very Good		

A Little More on Carbocations and Alkenes

Choose the most stable carbocation.

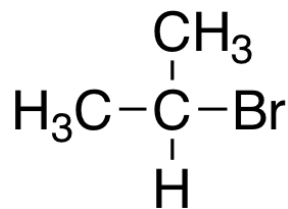


Choose the most stable alkene.



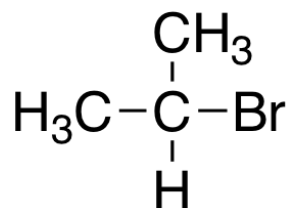
Practice Problems

Determine three unique sets of reagents for substitution reactions that for the following compound. Choose reagents that DO NOT lead to elimination products.

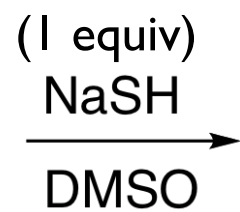
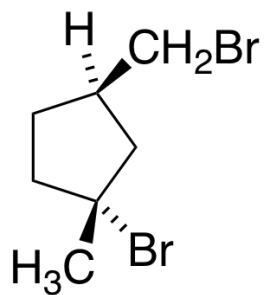


Practice Problems

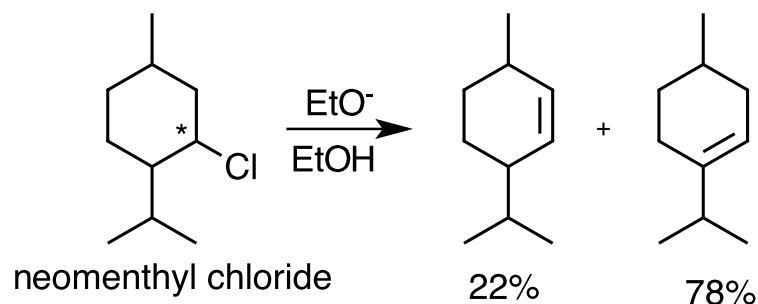
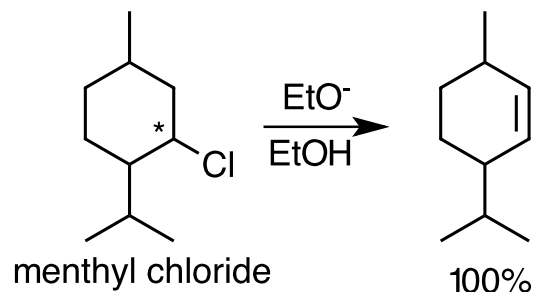
Determine three unique sets of reagents for elimination reactions that for the following compound. Choose reagents that DO NOT lead to substitution products.



Practice Problems



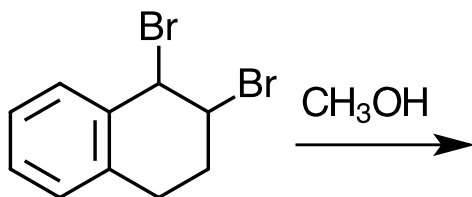
Challenge Problem



Determine the relative stereochemistry of menthyl chloride and neomenthyl chloride using the reaction data above and the following information:

- 1) Menthyl chloride and neomenthyl chloride differ only in the stereochemistry of the carbon bearing the chlorine.
- 2) Menthyl chloride exists in the most stable cyclohexane configuration.

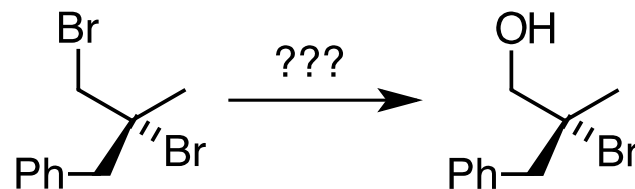
Challenge Problems



A single substitution product is observed. Draw the structure. Explain.

Would you expect any elimination products to form? How? Why?

Challenge Problem



Can you find a set of reagents for this transformation? What competitions do you need to be concerned with?