

Library of Organic Chemistry Active Learning Resources LOCAL
Chapter 7 Alkyl Halides - Part 1 (S_N2 Substitution Reactions)

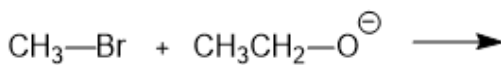


Which of the following is NOT associated with the S_N2 mechanism?

Draw curved arrow(s) to show the S_N2 mechanism, and predict the major product.

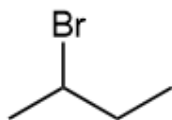
1

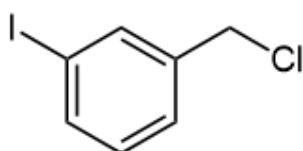
- A) steric hindrance
- B) inversion of stereochemistry
- C) carbocation stability
- D) one-step mechanism
- E) back-side attack



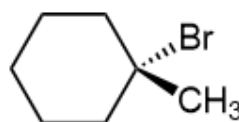
Classify each halide: a) primary b) secondary c) tertiary d) vinyl e) aryl f) methyl

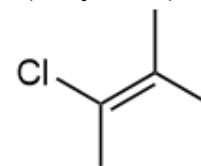
2





I _____
Cl _____





Show the expected major product when KCN reacts with:

3

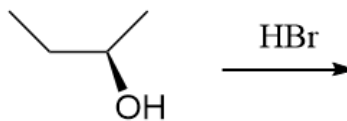
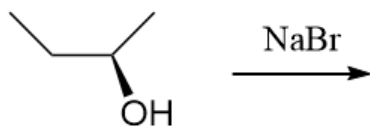
Chloroethane

4

(*R*)-3-iodohexane

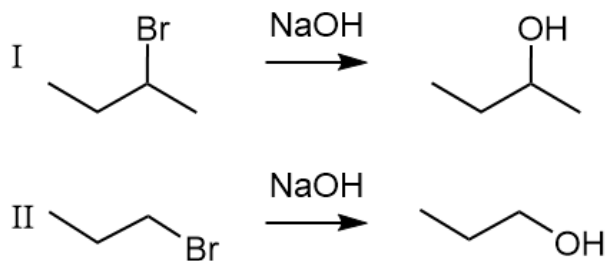
5

Predict the major product.



6

Which of the following is the **FASTER** reaction? Explain briefly.



Draw the transition state for reaction I

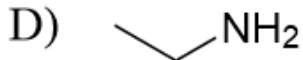
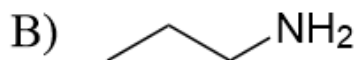
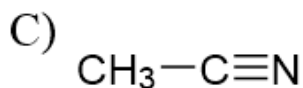
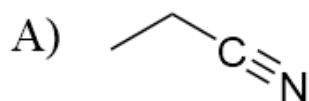
Draw the transition state for reaction II

7 Categorize each reagent as a **strong** nucleophile, a **weak** nucleophile, or **not** a nucleophile:

KCN	NaOMe	H ₂ O	KOH	(CH ₃) ₂ CHCH ₂ CH ₃
I ⁻	CH ₃ OH	NH ₃	HCl	EtONa
EtNH ₂	NaSH	CH ₃ CH ₂ OH	NH ₄ ⁺	iPrOH

3

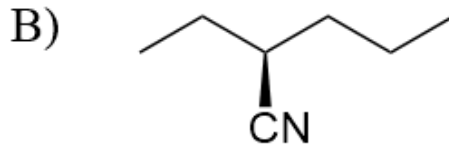
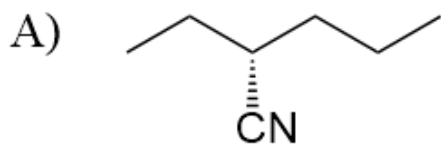
Predict the major product formed when KCN is reacted with chloroethane.



E) No Reaction

4

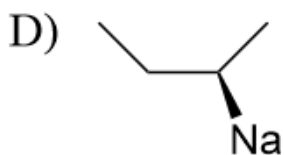
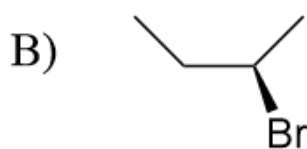
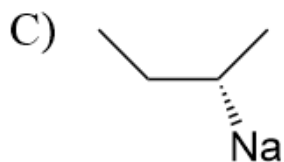
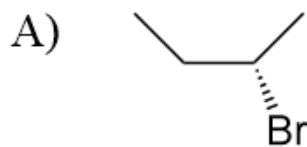
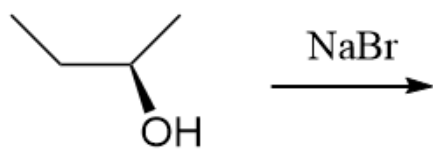
Predict the major product formed when KCN is reacted with (*R*)-3-iodohexane.



C) No Reaction

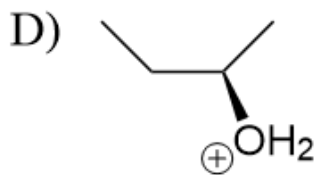
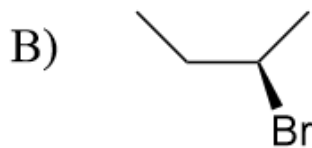
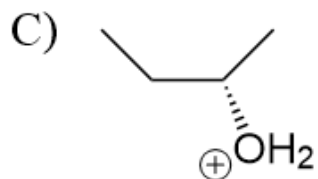
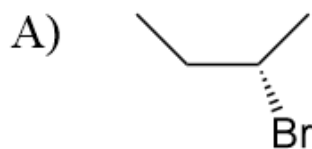
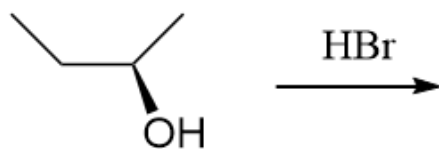
5

Predict the major product.



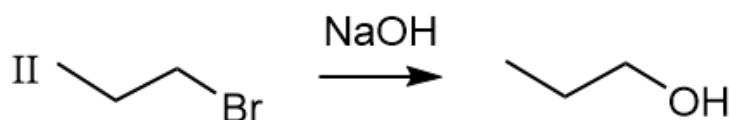
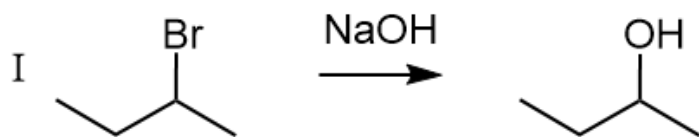
E) No Reaction

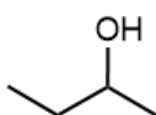
Predict the major product.

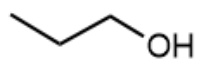


E) No Reaction

6 Which of the following is the FASTER reaction? Explain briefly.



A) I is faster because this is more stable:  CC(O)CC

B) II is faster because this is more stable:  CCCCO

C) I is faster because Br^- is a good leaving group.

D) II is faster because RBr has less sterics

E) Neither reaction should be faster.