ORGANIC CHEMISTRY 1 LECTURE GUIDE 2019

BY RHETT C. SMITH

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Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

ISBN 978-1074137434

Organic Chemistry 1
Lecture Guide 2019

By Rhett C. Smith, Ph.D.

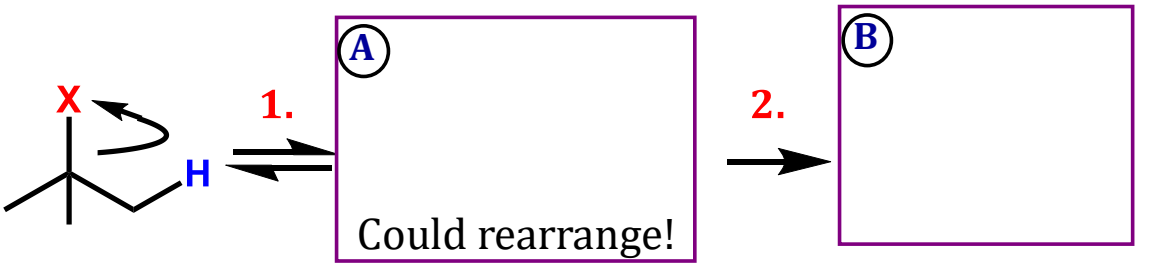
Companion Books from the Proton Guru:

Organic Chemistry 1 Reactions and Practice Problems 2019

by Rhett C. Smith

Organic Chemistry 1 Primer 2019,

by Rhett C. Smith, Andrew G. Tennyson, and Tania Houjeiry

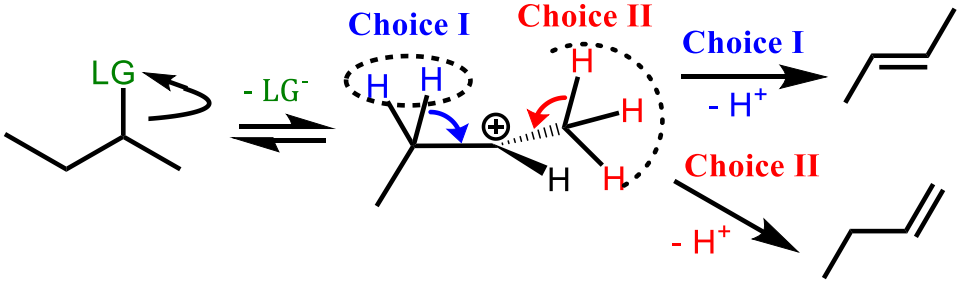


This is the E1 reaction: Heterolysis then electrophilic elimination. **Heterolysis is rate-limiting**, as in S_N1. The intermediate carbocation can also rearrange. In fact, many aspects of E1 are similar to S_N1:

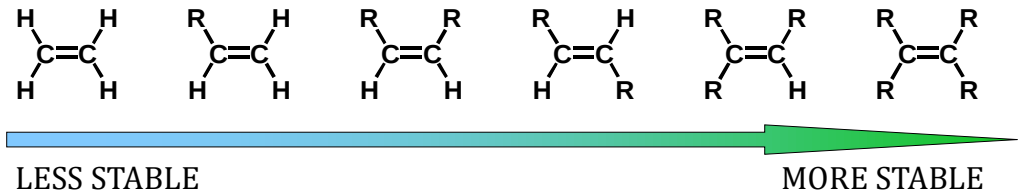
Rate Law:	C
Substrate:	D
Leaving Group:	E
Solvent:	F

Notes

Once heterolysis occurs to generate the carbocation intermediate, there may be more than one possible electrophilic elimination to consider:



We know that stability is important in predicting product distribution. Alkene stabilities have been measured (more on how in **Lecture Topic III.2**) and found follow this trend (R = a hydrocarbon substituent):

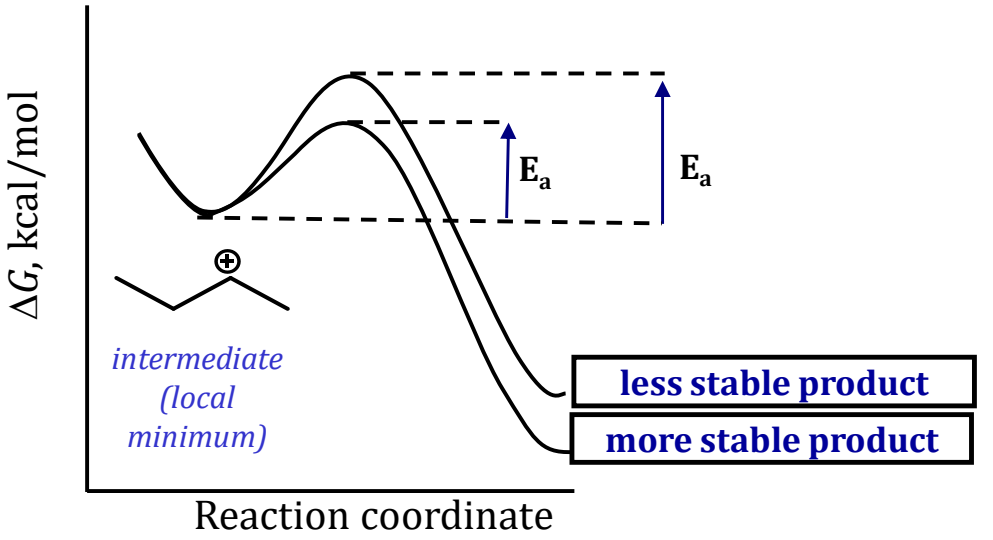


Notes

Observation = "Zaitsev's Rule:

A

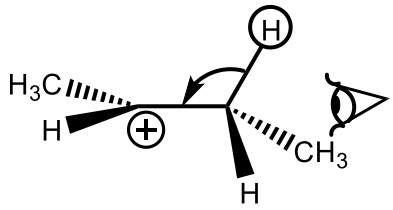
Explanation = Energy (represented by a reaction coordinate diagram)



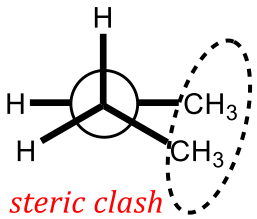
p

Notes

A

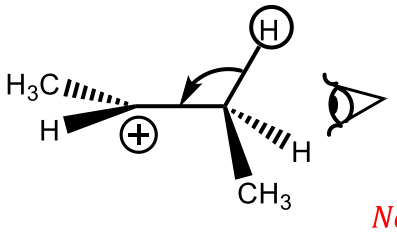


The eye sees:

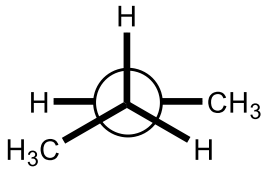


steric clash

B



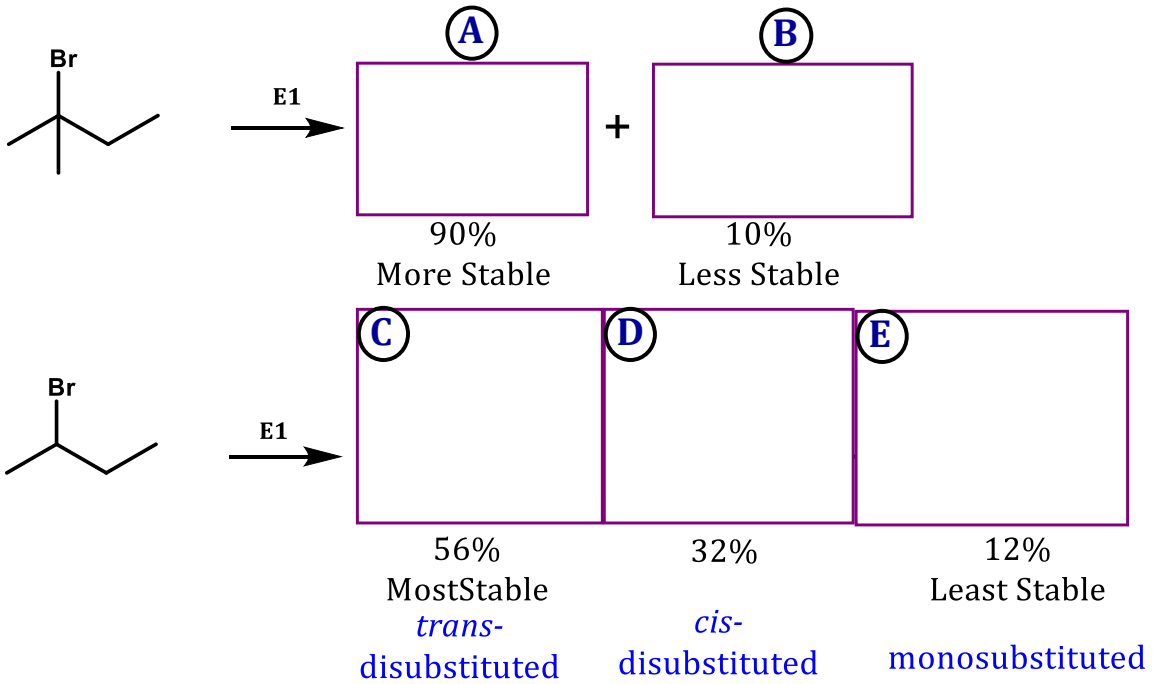
The eye sees:



No methyl-methyl clash

C

Notes


Br
E1
A
B
+
90%
More Stable
10%
Less Stable
Br
E1
C
D
E
56%
MostStable
trans-
disubstituted
32%
cis-
disubstituted
12%
Least Stable
monosubstituted

Notes