ORGANIC CHEMISTRY 1 LECTURE GUIDE 2019

BY RHETT C. SMITH

Marketed by Proton Guru

Find additional online resources and guides at protonguru.com

Try out *Organic Chemistry 1 Primer*
and
Organic Chemistry 1 Reaction and Practice Problem Book

For concise, plain-language, study-on-your own organic help and practice

There is a lot of online video content to accompany this book at the Proton Guru YouTube Channel! Just go to YouTube and search "Proton Guru Channel" to easily find our content.

Instructors: Free PowerPoint lecture slides to accompany this text can be obtained by emailing IQ@protonguru.com from your accredited institution email account. The homepage at protonguru.com provides a link to citations to popular text books for further reading on each Lesson topic in this primer.

Executive Editor: Rhett C. Smith, Ph.D. You can reach him through our office at: IQ@protonguru.com

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

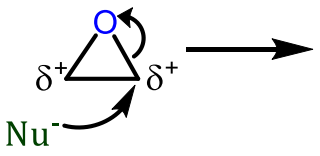
An epoxides is a specific type of ether consisting of a 3-membered ring having an oxygen atom in the ring:

A

Epoxides are much more reactive than most other ethers because:

B

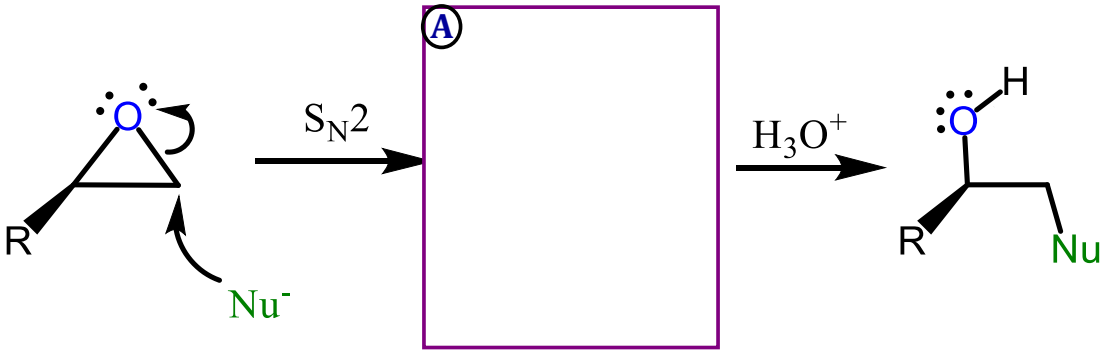
Nucleophiles can thus attack one of the electrophilic carbon atoms, alleviating the ring strain:



C

Notes

Under basic (or simply non-acidic) conditions a typical S_N2 reaction occurs, which requires a good nucleophile:



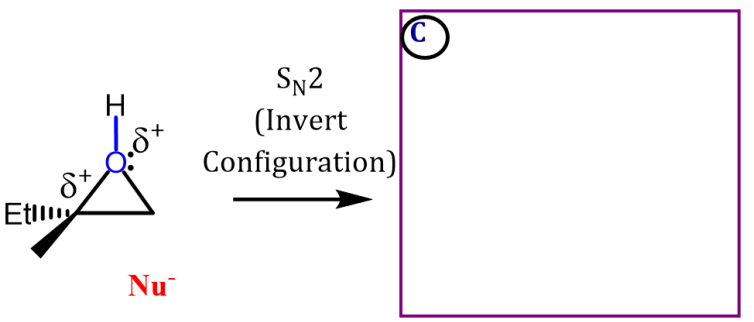
B Like other S_N2 reactions on neutral substrates, the nucleophile preferentially attacks:

Note that after ring-opening, the oxygen:

Notes

Under acidic conditions, the epoxide oxygen is protonated just as in acid cleavage of other ethers:

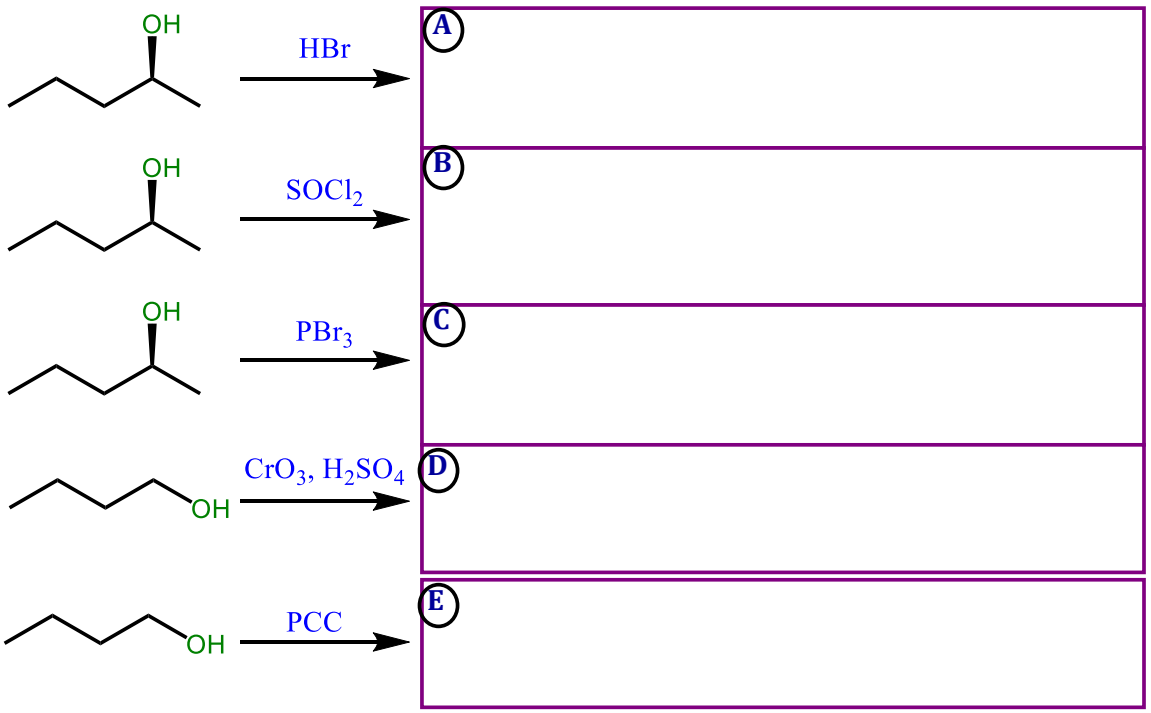
The less substituted side is attacked unless there is a tertiary site. A tertiary C next to an O with formal charge of +1 has a lot of positive charge, and will be attacked preferentially:



Under acidic conditions, the nucleophile will attack the tertiary C if there is one. Otherwise, the less-hindered side is attacked, just as under basic conditions.

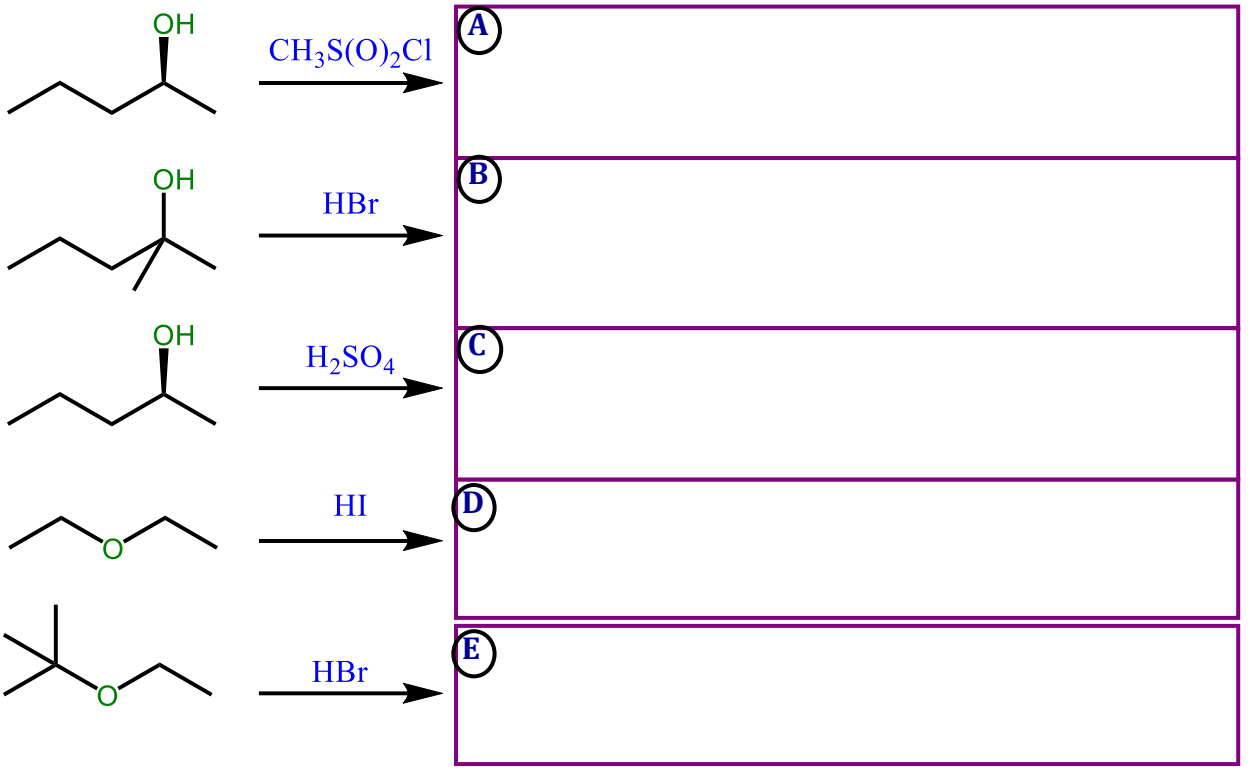
Notes

Example. Predict the major product of each reaction, showing stereochemistry where applicable.



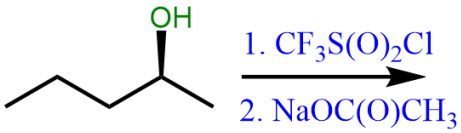
Notes

Example. Predict the major product of each reaction, showing stereochemistry where applicable.

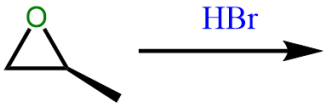


Notes

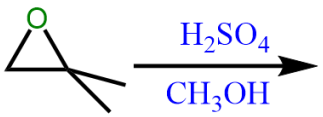
Example. Predict the major product of each reaction, showing stereochemistry where applicable.



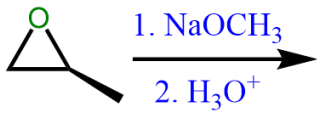
A



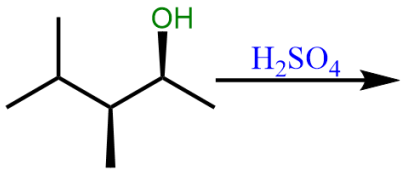
B



C



D



E

Notes