

ORGANIC CHEMISTRY 1 LECTURE GUIDE 2019

BY RHETT C. SMITH

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# Organic Chemistry 1 Lecture Guide 2019

By Rhett C. Smith, Ph.D.

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Companion Books from the Proton Guru:

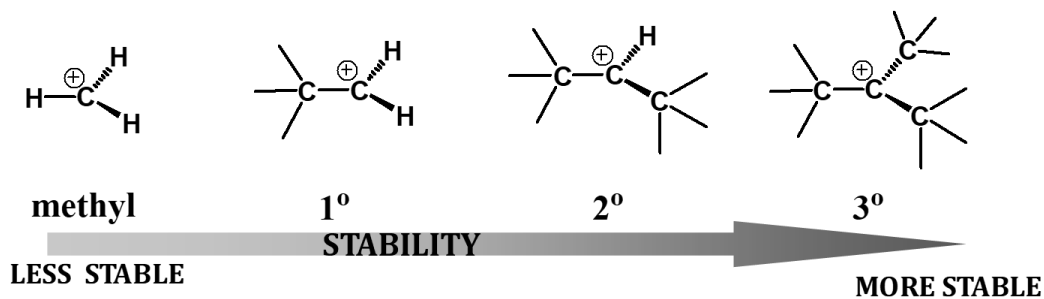
*Organic Chemistry 1 Reactions and Practice Problems 2019*

by Rhett C. Smith

*Organic Chemistry 1 Primer 2019,*

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

Ⓐ Observation

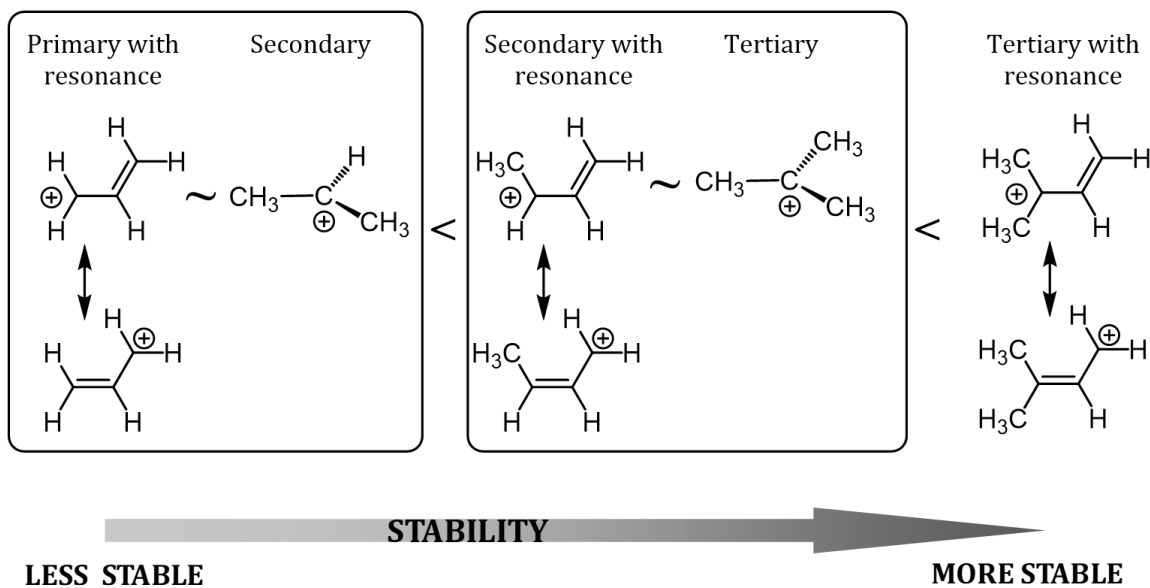


Ⓑ Explanation: Hyperconjugation

Notes

# Lecture Topic I.11: Stability of Carbocations and Alkenes

## Resonance Stabilizes Carbocations

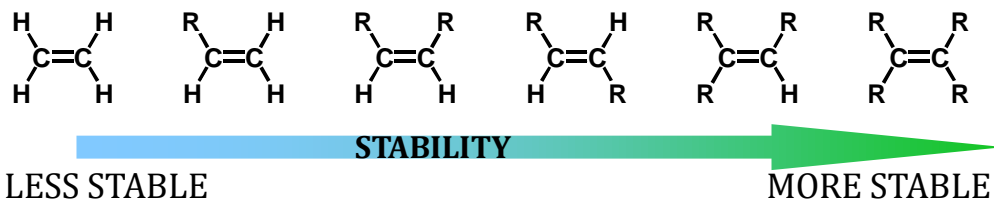


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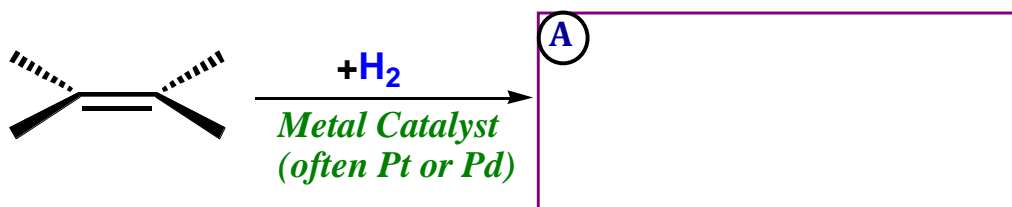
Lecture Topic I.11: Stability of Carbocations and Radicals  
Stability of Alkenes and the Hydrogenation Reaction

We observe the following trend in alkene stability:

1. More substituted = More stable



These stabilities are determined by doing a **hydrogenation** of the alkene and measuring the heat given off by the process. Hydrogenation (**addition of two H atoms to the pi bond**) is accomplished by reacting with  $\text{H}_2(g)$  and a Pd or Pt catalyst:



Notes

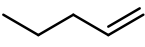
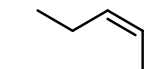
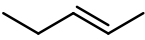
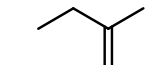
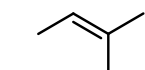
Lecture Topic I.11: Stability of Carbocations and Radicals  
Heats of Hydrogenation

Heat of Hydrogenation tells us about:

(A)

A more stable alkene has a

(B)

	Structure	heat of hydrog. (kcal/mol)	
Higher energy!! (more heat given off)		30.1	Less Stable     More Stable
↑		29.1	
		28.2	
		27.8	
		26.7	
	Lower energy!! (Less Heat Given Off)		

Notes