

CHM 3140 Organic Chemistry I, Dr. Laurie S. Starkey, Cal Poly Pomona

Additions to Alkenes (Chapter 8)

<u>Reagents</u>	<u>adds what?</u>	<u>Regiochemistry</u>	<u>Stereochemistry</u>	<u>know mechanism?</u>
HBr or HCl	-H -Cl (<i>or</i> -Br)	Markovnikov	mixed(carbocation)	yes
HBr, ROOR (peroxides)	-H -Br	<i>anti</i> -Markovnikov	mixed(radical)	yes
H ₂ O, H ₂ SO ₄	-H -OH	Markovnikov	mixed(carbocation)	yes
1) Hg(OAc) ₂ , H ₂ O 2) NaBH ₄	-H -OH	Markovnikov	mixed	no
1) BH ₃ , THF (<i>or</i> B ₂ H ₆) 2) H ₂ O ₂ , NaOH	-H -OH	<i>anti</i> -Markovnikov	<u>syn</u> addition	no
Br ₂	-Br -Br	N/A	<u>anti</u> add'n (bromonium ion)	yes
Br ₂ , H ₂ O (<i>or</i> ROH)	-Br -OH (-OR)	"Markovnikov"	<u>anti</u> add'n (bromonium ion)	yes
H ₂ , catalyst	-H -H	N/A	<u>syn</u> addition	no

Additions to Alkynes (Chapter 9)

<u>Reagents</u>	<u>adds what?</u>	<u>Regiochemistry</u>	<u>Product?</u>	<u>know mechanism?</u>
H ₂ , catalyst	(-H -H) x2	N/A	alkane	no
H ₂ , Pd, BaSO ₄ , quinoline	-H -H	N/A	<u>cis</u> alkene	no
Na, NH ₃	-H -H	N/A	<u>trans</u> alkene	no
HBr or HCl	(-H -X) x2	Markovnikov x2	dihalide	yes
Br ₂	(-Br -Br) x2	N/A	tetrahalide	yes
H ₂ O, H ₂ SO ₄ , HgSO ₄	-H -OH	Markovnikov	2° enol → ketone	yes
1) Hg(OAc) ₂ , H ₂ O 2) NaBH ₄	-H -OH	Markovnikov	2° enol → ketone	no*
1) BH ₃ , THF (<i>or</i> B ₂ H ₆) 2) H ₂ O ₂ , NaOH	-H -OH	<i>anti</i> -Markovnikov	1° enol → aldehyde	no*

*except for tautomerization

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Still to come...oxidation reactions!