

# Reactions of Alkenes

<u>Product</u>	<u>Type of Reaction (name)</u>	<u>Reaction Conditions</u>	<u>Regiochemistry</u>	<u>Stereochemistry</u>
<b>Halides</b> (Ch 6.9) (Ch. 7.10)	<u>Electrophilic Addition</u> <u>Radical Chain</u> radical addition	HX, organic solvent (anhydrous) HBr, H <sub>2</sub> O <sub>2</sub> , h	Markovnikov Addition Anti-Markovnikov	No stereochemical pref. No stereochemical pref.
<b>Dihalides</b> (Ch. 7.2)	<u>Electrophilic Addition</u>	Cl <sub>2</sub> , Br <sub>2</sub> , I <sub>2</sub> in CCl <sub>4</sub> solvent	Markovnikov-like	Anti stereochemistry
<b>Halohydrin</b> (Ch. 7.3)	<u>Electrophilic Addition</u>	X <sub>2</sub> in H <sub>2</sub> O (X=Cl, Br, I) NBS or NCS in H <sub>2</sub> O/DMSO	Markovnikov-like Markovnikov-like	Anti stereochemistry Anti stereochemistry
<b>Alcohol</b> (hydration) (Ch. 7.4) (Ch. 7.5)	<u>Electrophilic Addition</u> oxymercuration hydroboration	H <sub>3</sub> O <sup>+</sup> 1. Hg(OAc) <sub>2</sub> , H <sub>2</sub> O, THF 2. NaBH <sub>4</sub> 1. BH <sub>3</sub> , THF 2. H <sub>2</sub> O <sub>2</sub> , NaOH, H <sub>2</sub> O	Markovnikov Addition Markovnikov Addition Anti-Markovnikov	No stereochemical pref. No stereochemical pref. Syn Stereochemistry
<b>Cyclopropanes</b> (Ch. 7.6)	<u>Electrophilic Addition</u> Simmons-Smith Reaction	CHCl <sub>3</sub> , NaOH CH <sub>2</sub> I <sub>2</sub> , Zu(Cu)		Syn addition Syn addition
<b>Alkanes</b> (Ch. 7.7)	<u>Reduction (Addition)</u> catalytic hydrogenation	H <sub>2</sub> , Pd (C), solvent		Syn stereochemistry
<b>1,2-Diols (glycols)</b> (hydroxylation) (Ch. 7.8)	<u>Oxidation (Addition)</u> osmylation	1. OsO <sub>4</sub> , pyridine 2. NaHSO <sub>3</sub>		Syn addition
<b>Carbonyls</b> (Ch. 7.8) (Ch. 7.8)	<u>Oxidative Cleavage</u> Ozonolysis	1. O <sub>3</sub> 2. Zn, H <sub>3</sub> O <sup>+</sup> HIO <sub>4</sub> , H <sub>2</sub> O, THF	(Cleavage of alkenes only to give aldehydes and/or ketones) (Cleavage of 1,2-diols only to give aldehydes and/or ketones)	