

Alkene Reactions

Notes		Reaction	Reagent(s)	Product(s)
	1.	Addition, Hydrogen (Reduction)	H ₂ (Ni, Pd, Pt)	Alkanes
Anti	2.	Addition, Halogens	X ₂ , CCl ₄	Dihalides
Carbocations Markovnikov	3.	Addition, Hydrogen Halides	HX	Alkyl Halides
Carbocations Markovnikov	4.	Addition, Sulfuric Acid	H ₂ SO ₄	Alkyl Sulfates
Carbocations Markovnikov	5.	Addition, Water (Hydration)	H ₂ O, H ⁺	Alcohols
X is Electrophile, Markovnikov	6.	Addition, Aqueous Halogens	X ₂ (aq)	Alcohols with Halide
Markovnikov	7.	Oxymercuration- Demercuration	H ₂ O or ROH, Hg(OAc) ₂ or (Hg(TFA) ₂ ; then NaBH ₄	Alcohols or Ethers
Anti- Markovnikov	8.	Hydroboration- Oxidation	(BH ₃) ₂ ; then H ₂ O ₂ , NaOH	Alcohols
Anti- Markovnikov	9.	Addition, Free Radical	HBr, Peroxide	Alkyl Halides

	10.	Addition, Carbenes	CH ₂ CO or CH ₂ N ₂ or CHCl ₃ , t-BuOK & hν	3 Membered Rings
	11.	Epoxidation	PBA (C ₆ H ₅ CO ₃ H)	Epoxides
	12.	Hydroxylation	KMnO ₄ , Syn HCO ₃ H, Anti	Diols
	13.	Allylic Hydrogenation	X ₂ , □ or NBS	Alkenes with Halide
	14.	Ozonolysis	O ₃ : then Zn, H ₂ O	=CH ₂ → O=CH ₂ (formaldehyde) =CHR → O=CHR (aldehyde) =CHR ₂ → O=CR ₂ (ketone)
	15.	Vigorous Oxidation	KMnO ₄ , □	=CH ₂ → CO ₂ (carbon dioxide) =CHR → RCO ₂ H (carboxylic acid) =CR ₂ → O=CR ₂ (ketone)