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_2SO_4	Alkyl Sulfates
Carbocations Markovnikov	5.	Addition, Water (Hydration)	H_2O, H^+	Alcohols
X is Electrophile, Markovnikov	6.	Addition, Aqueous Halogens	X_2 (aq)	Alcohols with Halide
Markovnikov	7.	Oxymercuration-Demercuration	H_2O 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_2O_2, NaOH	Alcohols
Anti-Markovnikov	9.	Addition, Free Radical	HBr, Peroxide	Alkyl Halides

	10.	Addition, Carbenes	CH_2CO or CH_2N_2, hv or $CHCl_3$, t-BuOK	3 Membered Rings
	11.	Epoxidation	PBA ($C_6H_5CO_3H$)	Epoxides
	12.	Hydroxylation	$KMnO_4$, Syn HCO_3H, Anti	Diols
	13.	Allylic Hydrogenation	X_2, heat or NBS	Alkenes with Halide
	14.	Ozonolysis	O_3: then Zn, H_2O	$=CH_2 \rightarrow O=CH_2$ (formaldehyde) $=CHR \rightarrow O=CHR$ (aldehyde) $=CHR_2 \rightarrow O=CR_2$ (ketone)
	15.	Vigorous Oxidation	$KMnO_4$, heat	$=CH_2 \rightarrow CO_2$ (carbon dioxide) $=CHR \rightarrow RCO_2H$ (carboxylic acid) $=CR_2 \rightarrow O=CR_2$ (ketone)