

Reactions of Alkynes

<u>Product</u>	<u>Type of Reaction (name)</u>	<u>Reaction Conditions</u>	<u>Regiochemistry</u>	<u>Stereochemistry</u>
alkynes sections 9.5-9.6	Alkylation of terminal alkynes	NaNH ₂ , THF, primary alkylbromide or alkyl iodide	product is an internal alkyne	
alkanes section 9.9	Hydrogenation (Reduction)	H ₂ , Pd/C		
alkenes section 9.9-9.10	Hydrogenation (Reduction) Dissolving Metal Reduction	H ₂ , Lindlar Catalysts Li in liq. NH ₃	syn addition of H ₂ to give cis-alkene anti addition of 2 H's to give trans-alkene	
vinyl halide section 9.11	Electrophilic Addition	HX (1 equivalent), anhydrous	Markovnikov	trans-addition of H-X
1,1-dihaloalkane (gem-dihalide) section 9.11	Electrophilic Addition	HX (excess), anhydrous	Markovnikov	
1,2-Dihaloalkene section 9.13	Electrophilic Addition	X ₂ (1 equivalent), anhydrous		trans addition of X-X
1,1,2,2-tetrahalo-alkane section 9.13	Electrophilic Addition	X ₂ (excess), anhydrous		
ketones	Hydration of Internal Alkynes Oxymercuration Hydroboration	HgSO ₄ , H ₃ O ⁺ 1. BH ₃ 2. H ₂ O ₂ , NaOH	Markovnikov Anti-Markovnikov	
methyl ketones section 9.12	Hydration of Terminal Alkynes Oxymercuration	HgSO ₄ , H ₃ O ⁺	Markovnikov	
aldehydes	Hydration of Terminal Alkynes Hydroboration	1. BH ₃ 2. H ₂ O ₂ , NaOH	Anti-Markovnikov	
carboxylic acids section 9.14	Oxidative Cleavage	1. O ₃ 2. Zn (ozonolysis)		

