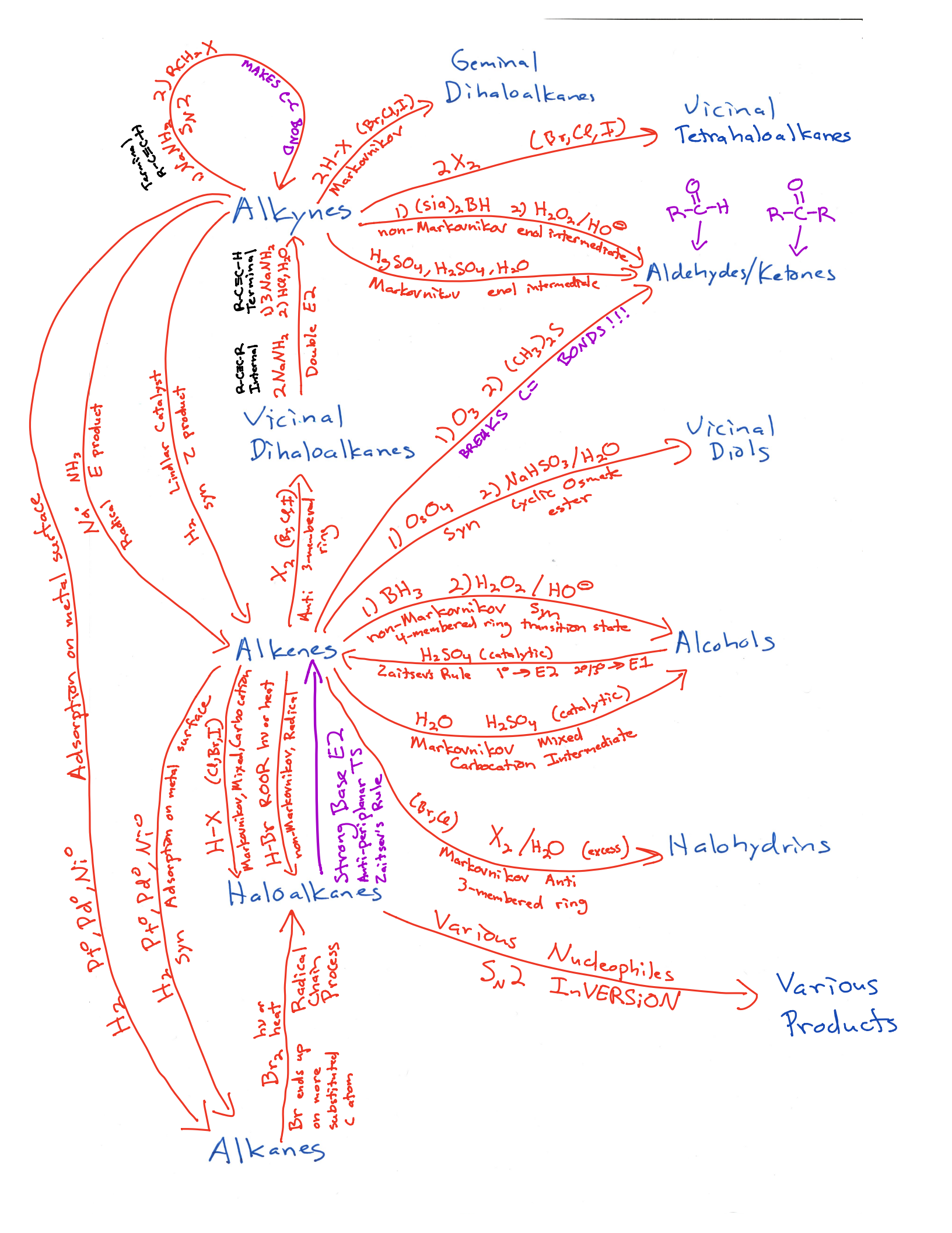
Alkynes
Terminal RC≡CH
1) NaNH2
2) RCH2X
SN2
MAKES C-C
Geminal Dihaloalkanes
2 H-X (Br, Cl, I)
Markovnikov
Vicinal Tetrahaloalkanes
2 X2 (Br, Cl, I)
1) (sia)2BH 2) H2O2/HO⊖
non-Markovnikov enol intermediate
Aldehydes/Ketones
H2SO4, H2SO4, H2O
Markovnikov enol intermediate
R-C≡C-H Terminal
1) 3 NaNH2
2) H⊕, H2O
R-C≡C-R Internal
2 NaNH2
Double E2
Vicinal Dihaloalkanes
1) O3 2) (CH3)2S
BREAKS C= BONDS!!!
1) OsO4 2) NaHSO3/H2O
Syn
cyclic Osmate ester
Vicinal Diols
X2 (Br, Cl, F)
Anti
3-membered ring
Alkenes
1) BH3 2) H2O2/HO⊖
non-Markovnikov
4-membered ring transition state
Syn
H2SO4 (catalytic)
Zaitsev's Rule
1° → E2 2°/3° → E1
Alcohols
H2O H2SO4 (catalytic)
Markovnikov
Mixed Carbocation Intermediate
(Br, Cl)
X2/H2O (excess)
Markovnikov Anti
3-membered ring
Halohydrins
Haloalkanes
H-X (Cl, Br, I)
Markovnikov, Mixed, Carbocation
H-Br ROOR hv or heat
non-Markovnikov, Radical
Strong Base E2
Anti-periplanar TS
Zaitsev's Rule
Various Nucleophiles
SN2 INVERSION
Various Products
Alkanes
H2 Pt°, Pd°, Ni°
Adsorption on metal surface
Syn
Br2 hv or heat
Radical Chain Process
Br ends up on more substituted C atom
Na° NH3
Radical
E product
Lindlar Catalyst
H2 syn
Z product