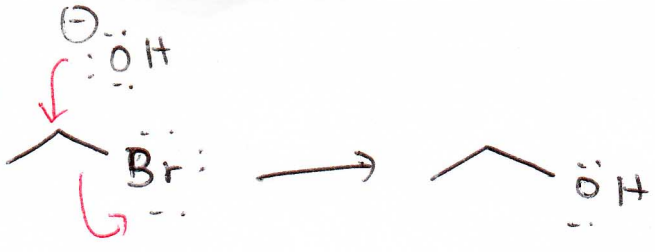
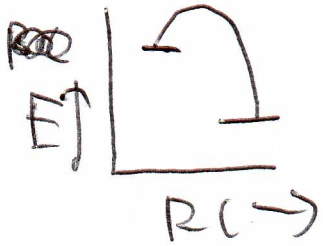
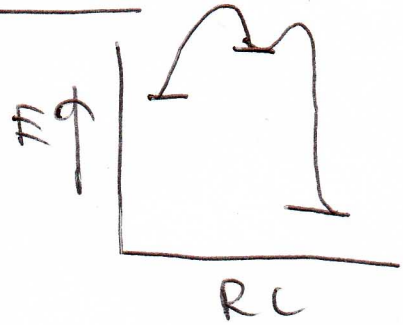
SN2





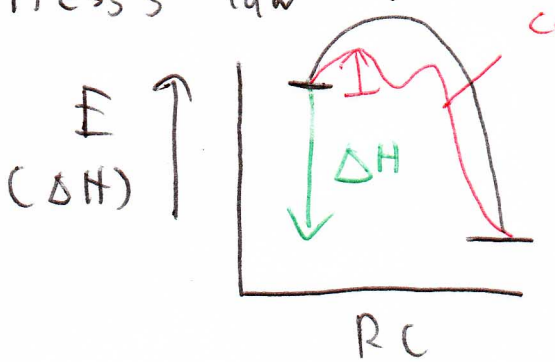
SN1



Mechanism – cationic vs. anionic,
stepwise vs. concerted

Kinetics
RCD, RLS, E_a, energy distribution diagrams

Thermodynamics
Hess's law



A catalyst lowers the E_a of rxn by providing a new rxn pathway.

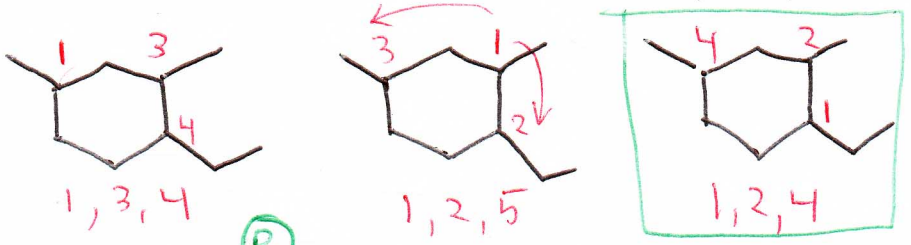
$\Delta G = -RT \ln K$

A catalyst does not change ΔH (or ΔG), since Hess's law states that those values only depend on the identity of the products and reactants. Thus, ~~the~~ a catalyst will not affect the balance of products and reactants @ equilibrium.

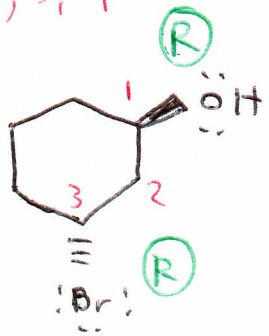
Equilibrium – 3 definitions ([ ], rate, E)
– Le Châtlier's principle

Delocalization and resonance

Stereochemistry — R + S, achiral vs chiral
- loss, retention, + inversion of stereochemistry
- racemic mixtures; optical activity

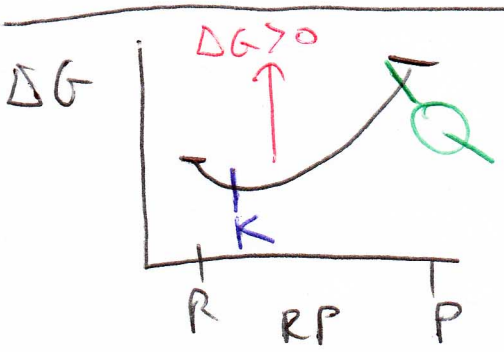


correct numbering



(1R, 3R)-3-bromocyclohexanol

Hyperconjugation



Weak acid - an acid that only minimally dissociates

$HA \rightleftharpoons H^+ + A^-$ $\quad K_a = \frac{[H^+][A^-]}{[HA]}$

$\Delta G = -RT \ln K$

Weak acid! $K_a \ll 1 \longrightarrow \Delta G > 0$

$pH \equiv -\log_{10}[H^+]$

Neutral: $[H^+] \simeq [OH^-]$

Auto-ionization of water: $H_2O \rightleftharpoons H^+ + OH^-$

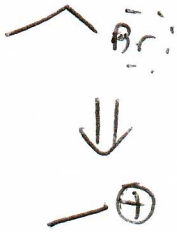
@ 25°C $\quad [H^+] = 1.0 \times 10^{-7} M \Rightarrow$ pH 7

Neutralized! # mols acid = # mols of base

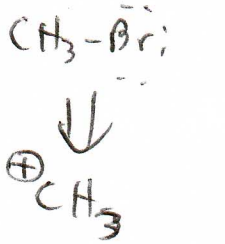
3°

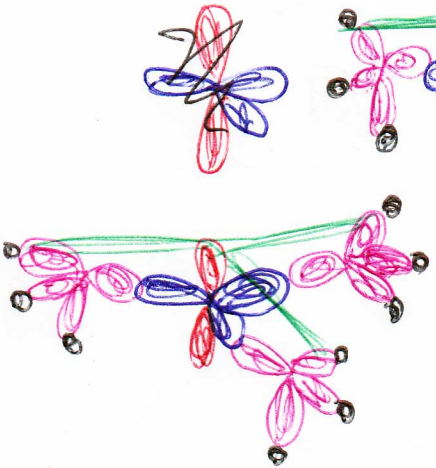
2°

1°

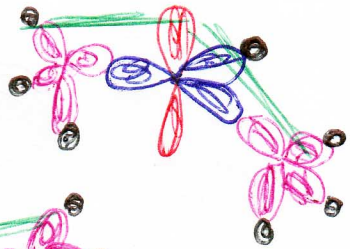


0°

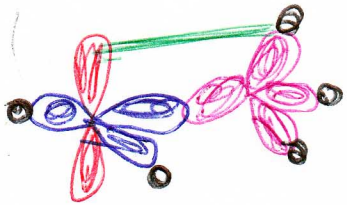




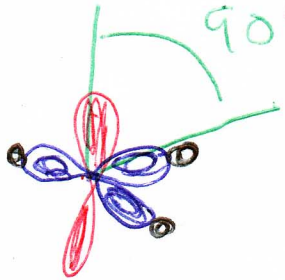
3 H.C.



2 H.C.



1 H.C.



0 H.C.

The greater amount of hyperconjugation, the more stable the carbocation.