Great Idea ...

Or

Very Bad Idea?

Gatorade Cucumber Lime, 28 oz, 15 Units

Brand: Gatorade Thirst

4.5 out of 5 stars 41 ratings

15 pack

$50.99 ($3.40 / Count)

Get $50 off instantly: Pay $0.99 ~~$50.99~~ upon approval for the Amazon Rewards Visa Card. No annual fee.

Size: **28 Fl Oz (Pack of 15)**

2 Set 28 Fl Oz (Pack of 15) 1 option from $100.00	3 Set 28 Fl Oz (Pack of 15) - -
4 Set 28 Fl Oz (Pack of 15) - -	**28 Fl Oz (Pack of 15)** **$50.99** **($3.40 / Count)**

Item Form	Liquid
Flavor	Lime
Package Information	Bottle
Volume	28 Fluid Ounces
Package Weight	425 Ounces

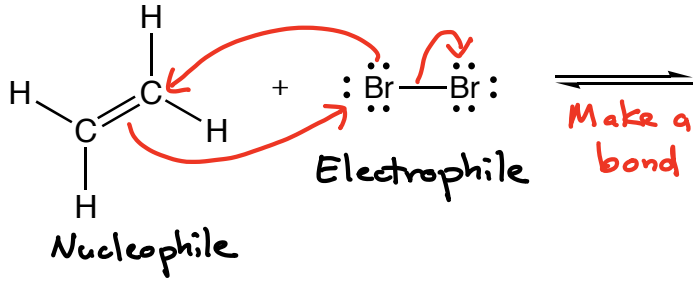
Alkene Reaction Stereochemistry Possibilities

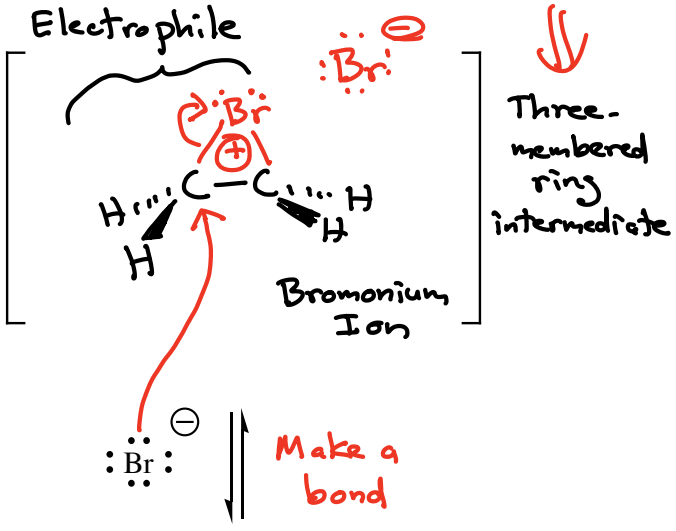
Anti → groups add to opposite faces of the original double bond

Syn → groups add to the same face of the original double bond

Mixed → groups add both anti and syn in the reaction

Alkene Halogenation

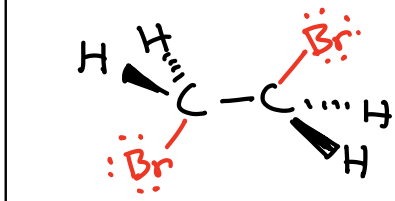




Called "anti" addition stereochemistry

The top face of the intermediate is "blocked" by the Br atom, so the :Br:⊖ nucleophile must react from the opposite face

Gives only a "trans" product – never "cis"



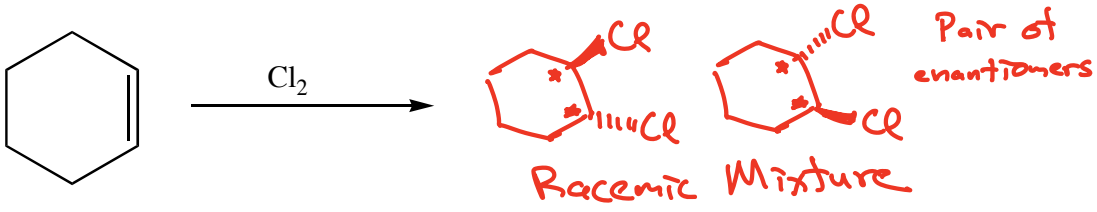
Products

Summary: Alkenes react with X_2 to give a three-membered ring intermediate, then a new bond is made by $X^{\ominus}$ reacting from behind the C-X bond of the intermediate.

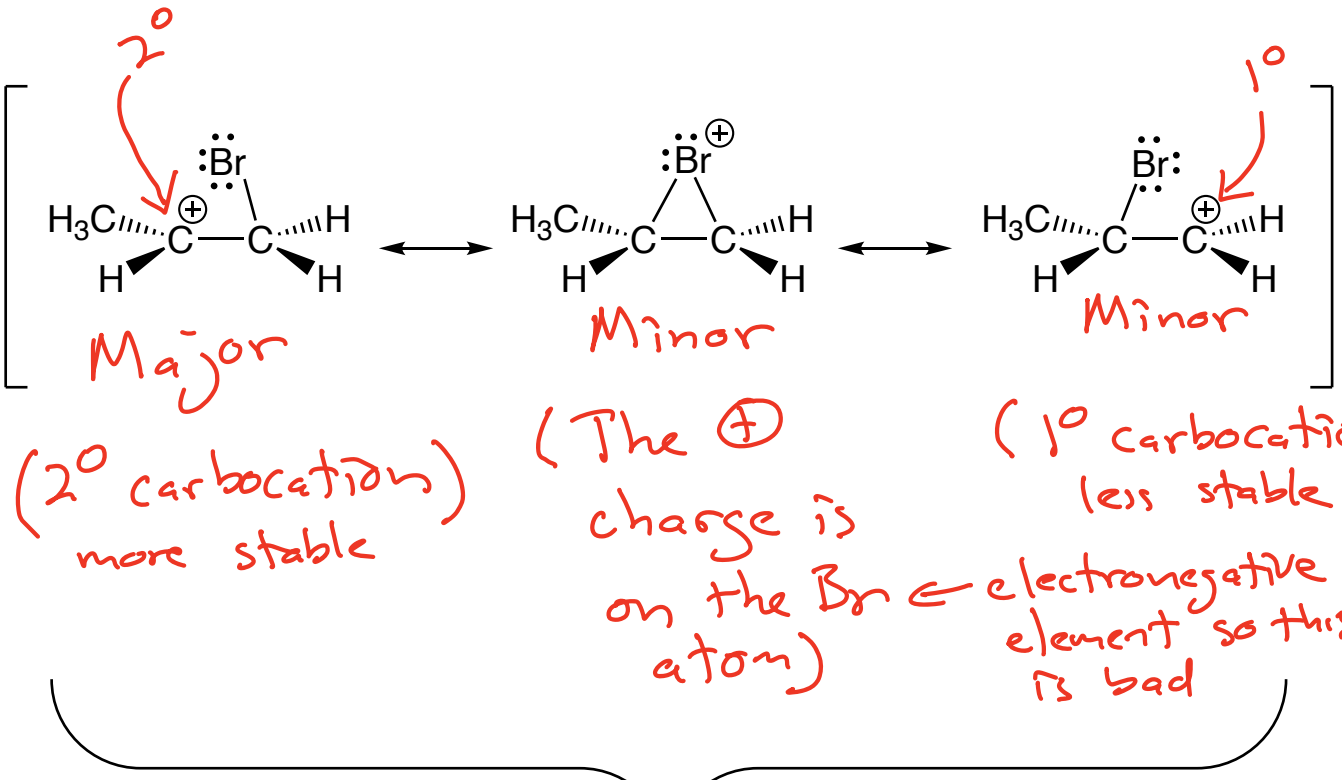
Regiochemistry: Not applicable → Br is on both atoms

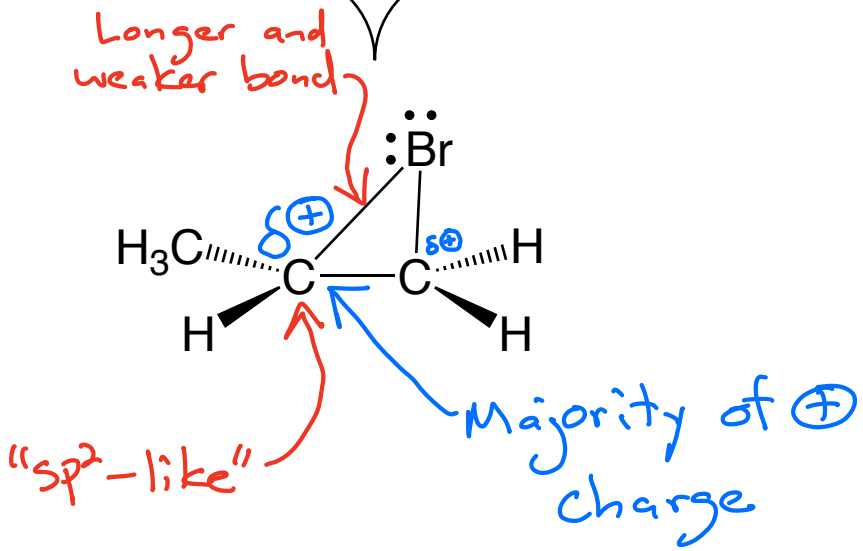
Stereochemistry: Anti addition geometry → trans products

Example:



How to think about unsymmetrical halonium ions



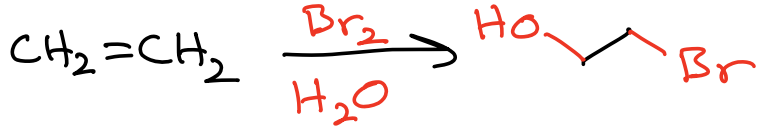


Complication → Some intermediates and products are chiral

Solution → Label all chiral centers in intermediates and products IN MECHANISM QUESTIONS with an asterisk (*) and write "Racemic" if appropriate. No need to draw all of the stereoisomers → just one of them using wedges and dashes.

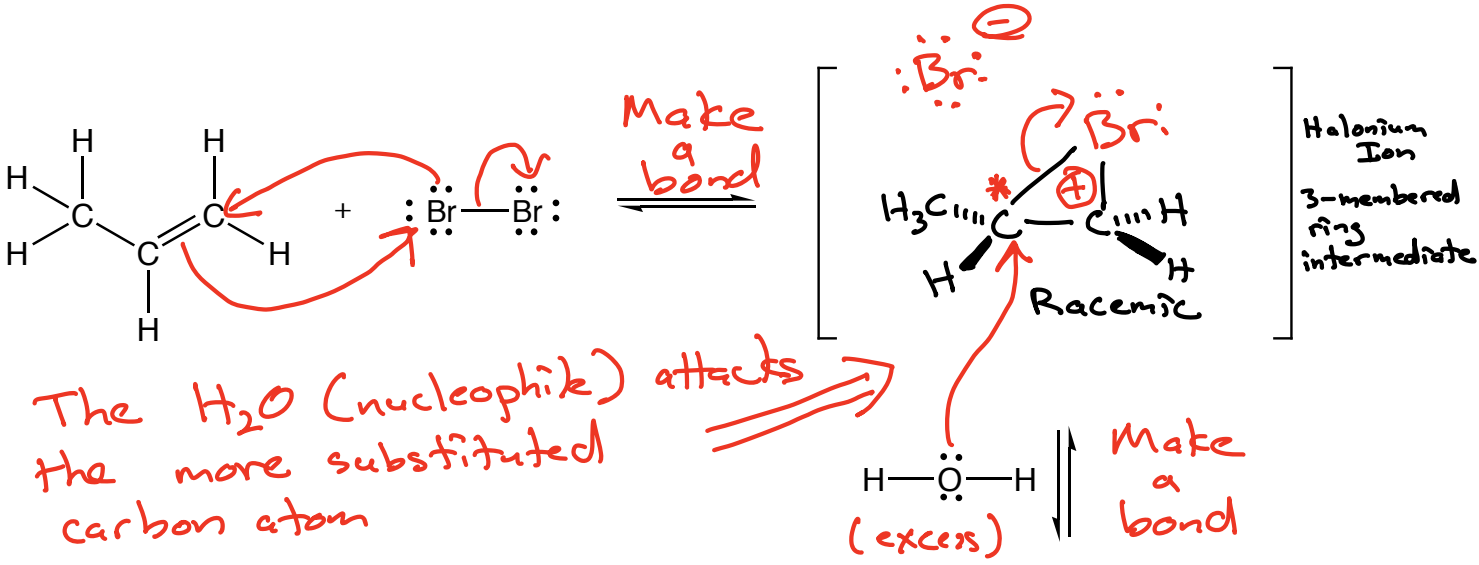
Again this is for mechanism problems only

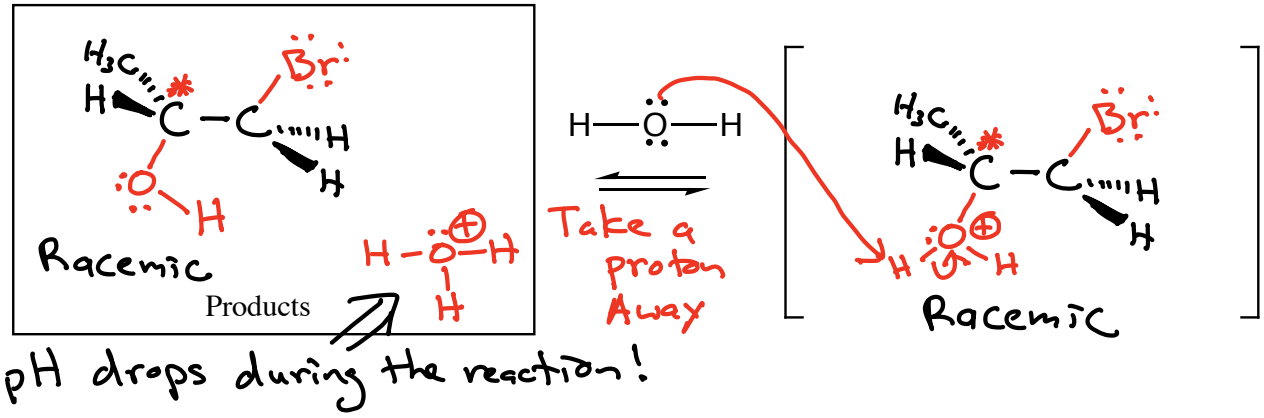
New overall reaction: Halohydrin Formation



Called a halohydrin

Alkene Hydrohalogenation



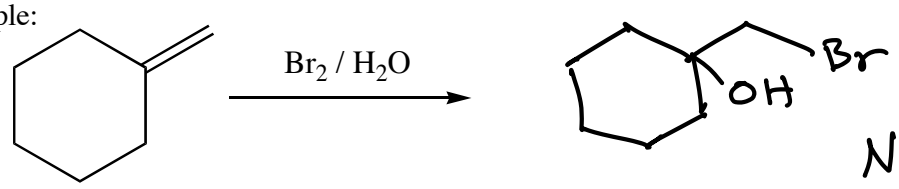


Summary: Alkene reacts with X_2 to give a 3-membered ring intermediate (halonium ion) → H_2O attacks the more substituted C atom and we take a proton away to give the halohydrin product.

Regiochemistry: Markovnikov (OH on more substituted C atom)

Stereochemistry: Anti

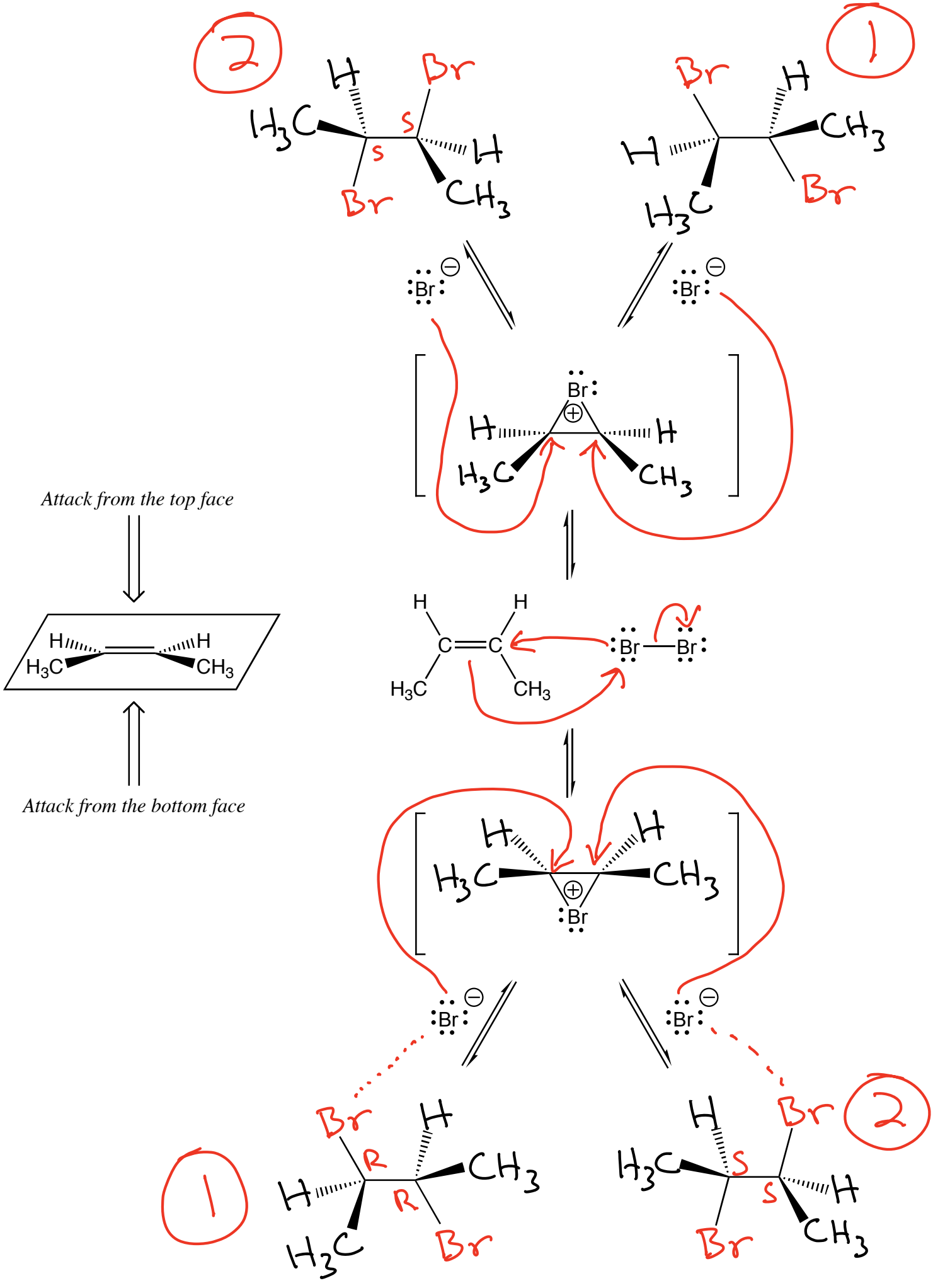
Example:

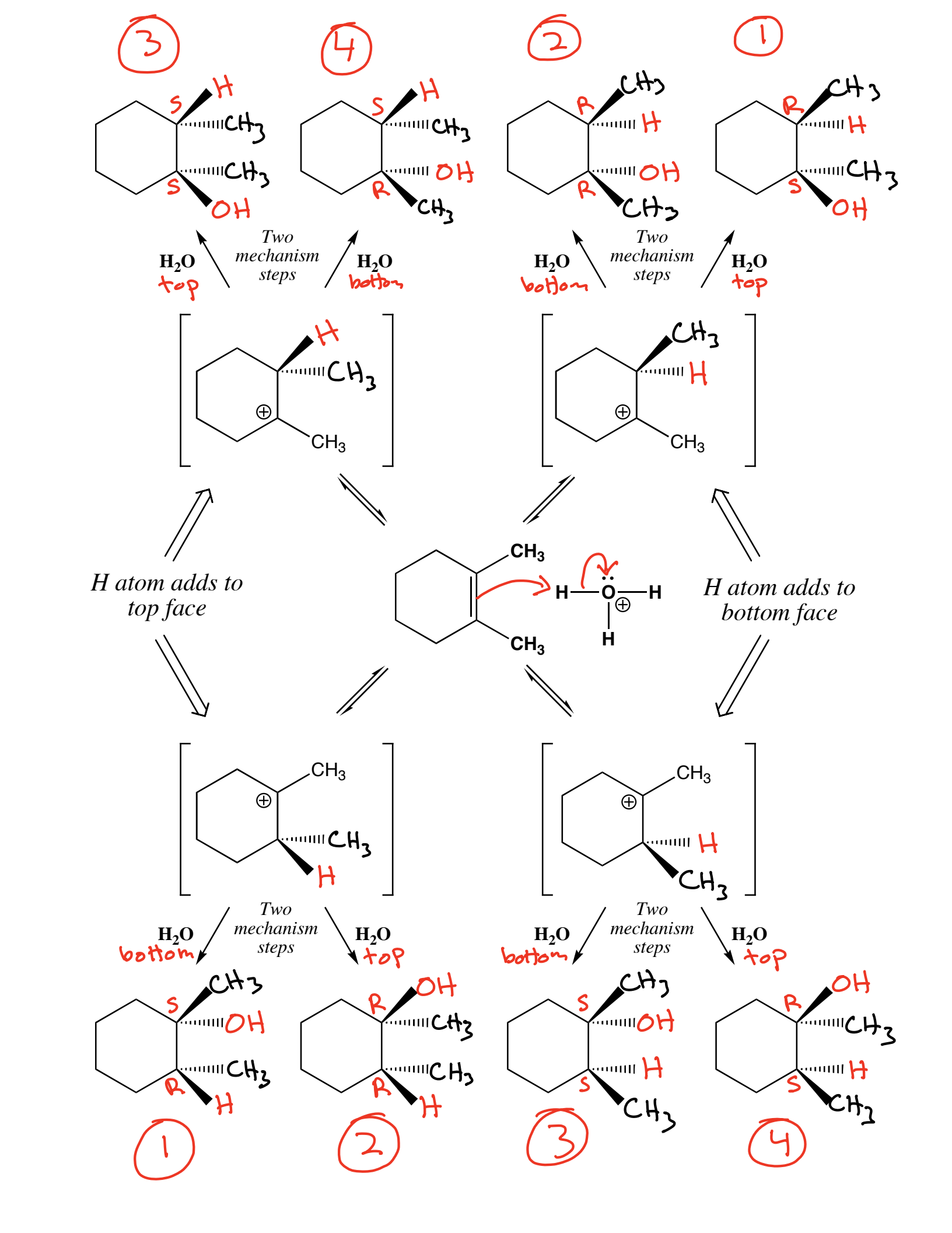


Only carbocations rearrange!

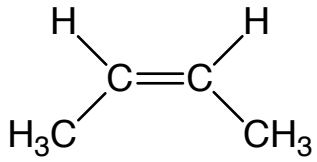
Halonium ions (3-membered ring) DO NOT

To get stereochemistry correct when predicting reaction products, you need to analyze each reaction on a <u>case by case</u> basis

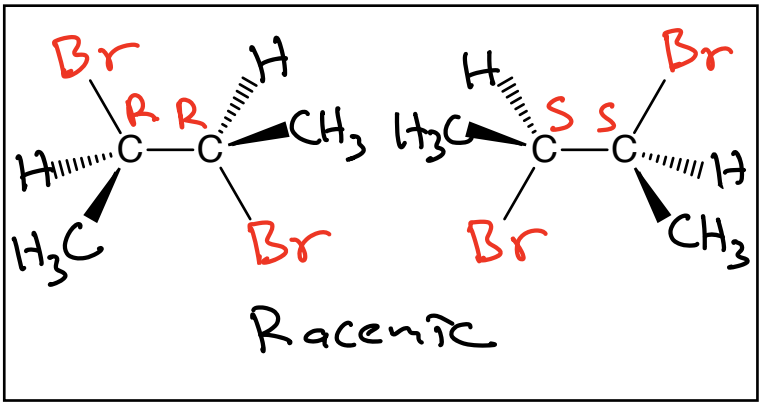

2
1
Attack from the top face
Attack from the bottom face
1
2


3
4
2
1
S
H
CH3
OH
R
Two mechanism steps
H2O top
H2O bottom
H2O bottom
H2O top
H atom adds to top face
H atom adds to bottom face
CH3
H
O
Two mechanism steps
H2O bottom
H2O top
H2O bottom
H2O top
1
2
3
4

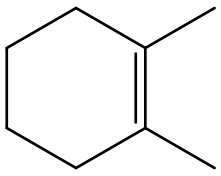
Examples

1) 

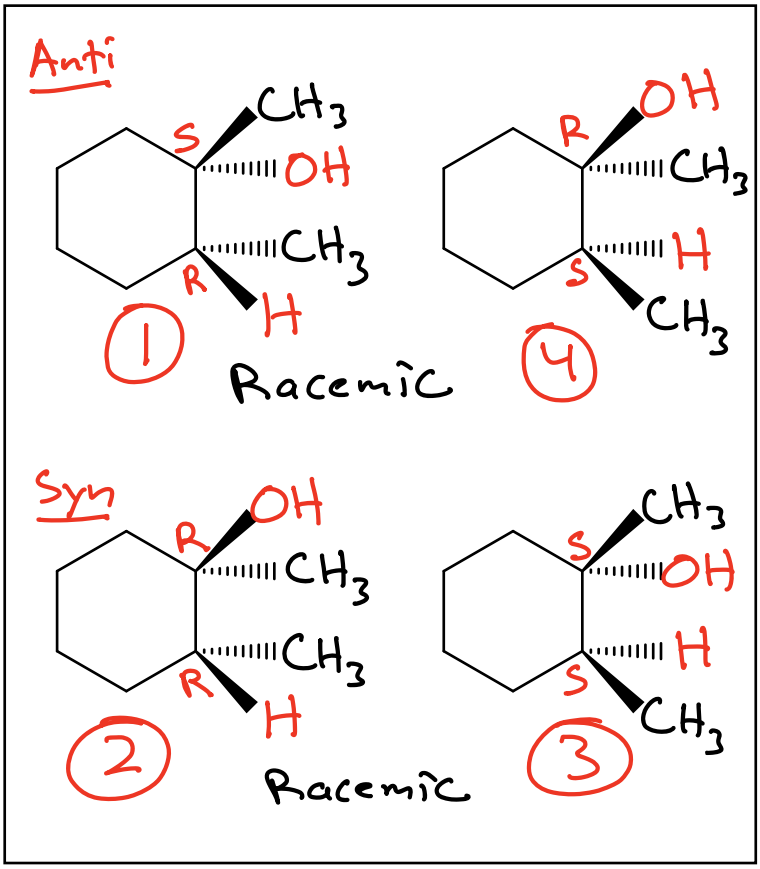
$\xrightarrow{Br_2}$



⇒ Anti

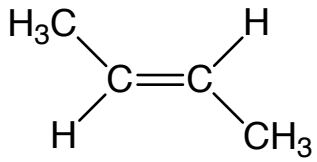
2) 

$\xrightarrow[H_2SO_4\ (catalytic)]{H_2O}$

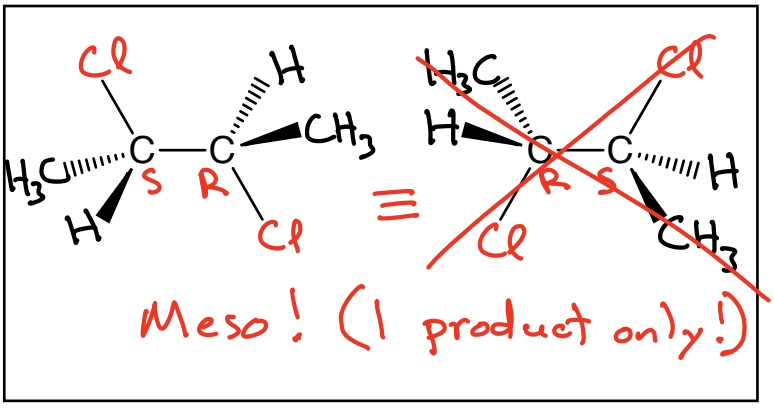


⇒ Mixed → Anti and Syn

⇒ Markovnikov

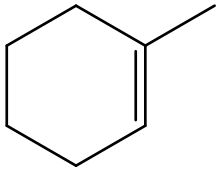
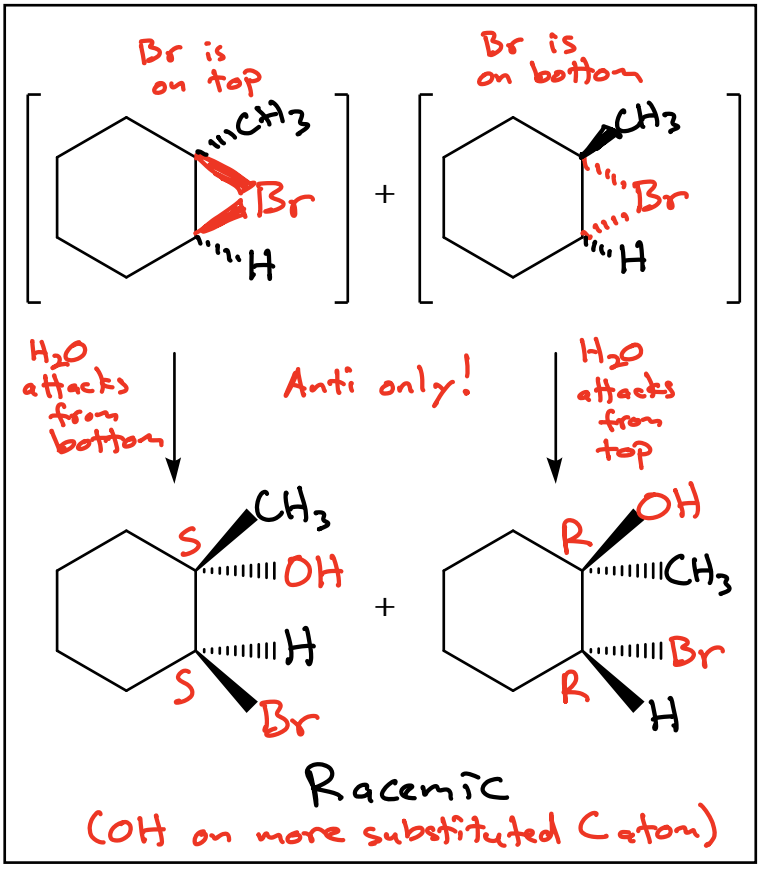
3) 

$\xrightarrow{Cl_2}$



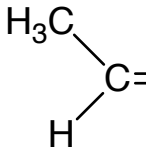
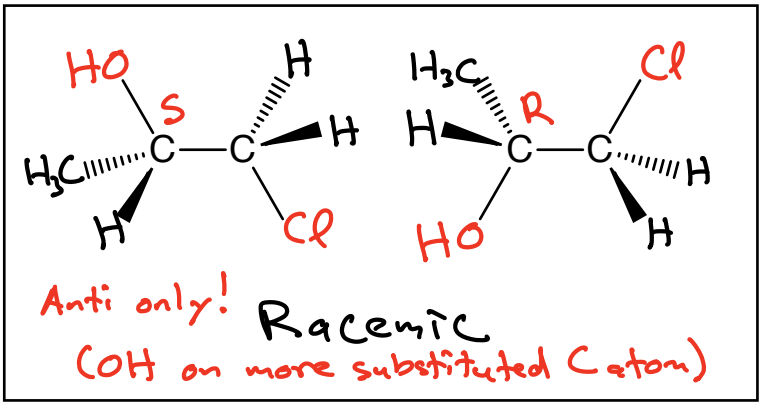
⇒ Anti

More Examples

4)  $\xrightarrow[H_2O]{Br_2}$ 

⇒ Anti

⇒ Markounikou

5)  $\xrightarrow[H_2O]{Cl_2}$ 

⇒ Anti

⇒ Markounikou

Who do you call when you need help?

When studying OChem → Call a NIRRS

Learn each of these things for every reaction → then you will be able to predict mechanisms and therefore products

Nature of the reaction; what is the starting material/product? (i.e. alkene converted to an alcohol)

Intermediate (or "**I**mportant transition state" if applicable) of the reaction, the key to the mechanism (carbocation, halonium ion, etc.)

Reagents Learn the exact way to designate the reagents for each reaction

Regiochemistry What is the regiochemistry of addition? (Markovnikov, non-Markovinikov, etc.)

Stereochemistry of addition (anti, syn or mixed)