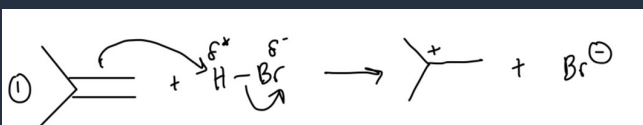


MAKING OCHEM EASY

ELECTROPHILIC ADDITION TO ALKENES

HOW TO PREDICT PRODUCTS

Remove double bond, add H to less substituted and add X to more substituted
Products are be cis or trans

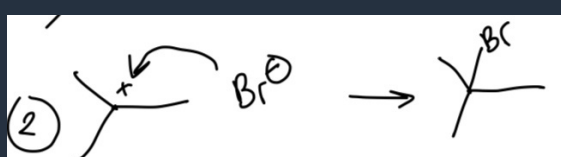


STEP TWO

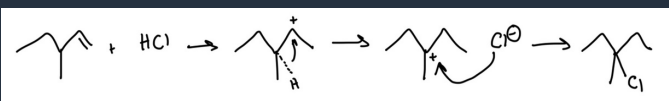
Br- attacks the carbocation (can be a frontside or backside attack) and attaches itself

MECHANISM: STEP ONE

- Pi bond behaves as a nucleophile and attacks the Hydrogen forcing Bromine to leave
- Forms the most stable carbocation intermediate with Br anion



HOW TO PICK WHICH SHIFT? EASY! IF BOTH METHYL AND H ARE AVAILABLE, PICK THE SHIFT THAT IS LIGHTER (H HAS A LIGHTER ATOMIC MASS)

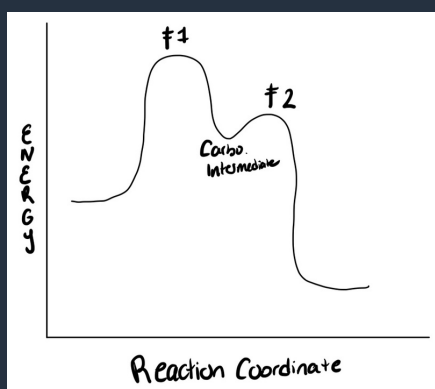


AN EXAMPLE OF CARBOCATION REARRANGEMENTS

- Rearrangements occur when there is a Hydrogen or Methyl group on a vicinal carbon where swapping the positive will produce a more stable carbocation

REACTION DIAGRAM

Two Step Mechanism corresponds to two "humps" on the graph. Step 1 (forming carbocation) is slow and requires lots of energy so it is the first and highest hump

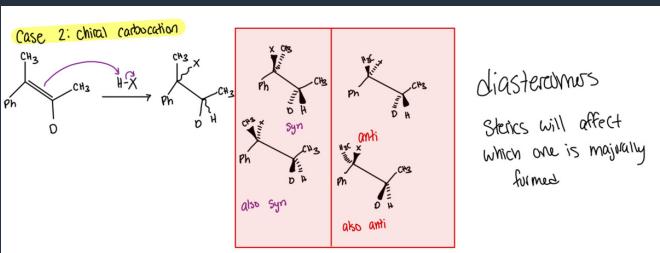
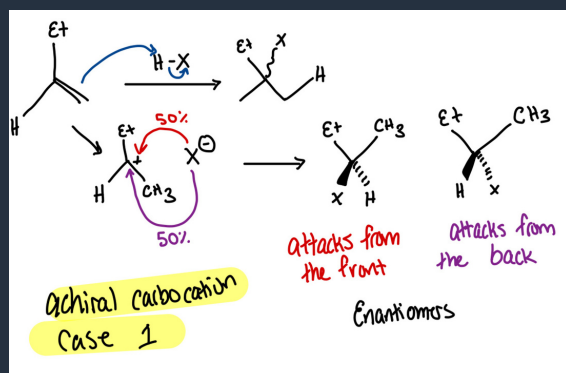


STEREOCHEMISTRY AND REGIOCHEMISTRY

- Stereochemistry - NONE (Anion can attack from either side)
- Regiochemistry - Regioselective because rearrangements can occur to form the most stable carbocation producing a Markovnikov Product

ACHIRAL CARBOCATION

Anion can attack front or back producing enantiomers



diastereomers
sterics will affect which one is majorly formed

CHIRAL CARBOCATION

Since there is no stereochemical control, this can be a messy reaction forming diastereomers. Usually, sterics will play a part in directing which products are formed

RATE DETERMINING FACTORS

factors that affect rate:
fastest - strong acids slowest - weak acids
weak acid: HF < HCl < HBr < HI strong acid

more sub. = faster