(36) **Today**

Section 7.7 - 7.11 Electrophilic Addition Reactions

Next Class (37)

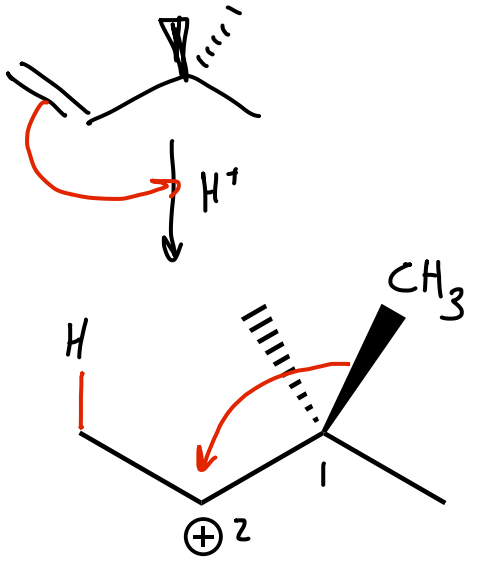
Section 8.2 and 8.3 Halogenation and Halohyrins

the rxns we did in lab

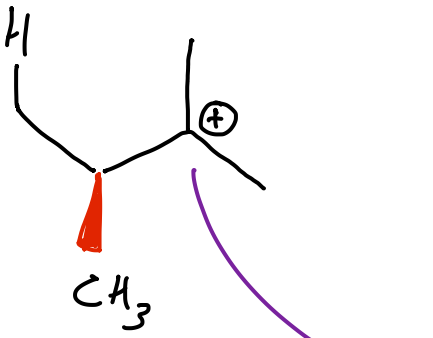
Please Hand in Test Corrections for Test 3 on Your Way Out

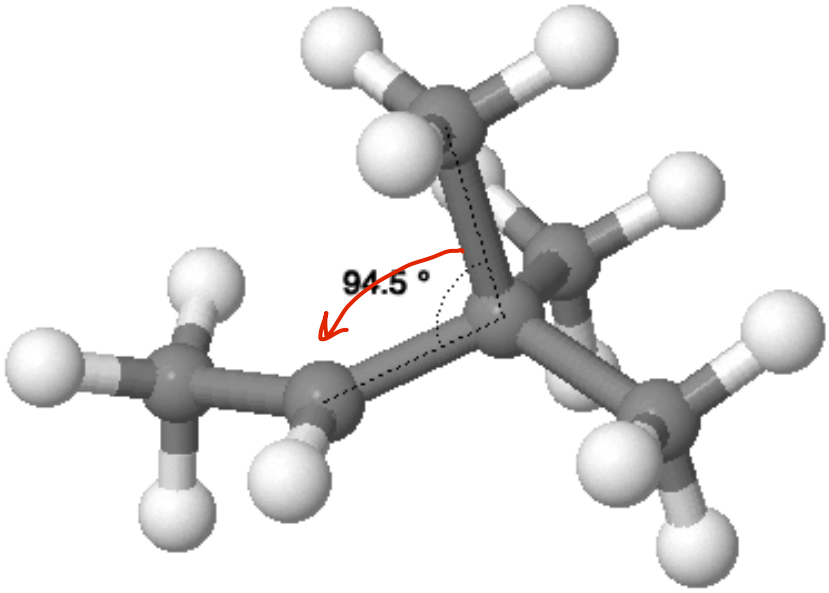
Final Is Scheduled for Monday, December 18 from 12:20 to 2:20

The final will be approximately 1 page each from tests 1, 2, and 3, and 1.5 to 2 pages on alkene nomenclature, stability, carbocations, and electrophilic addition.



1,2 – methyl shift

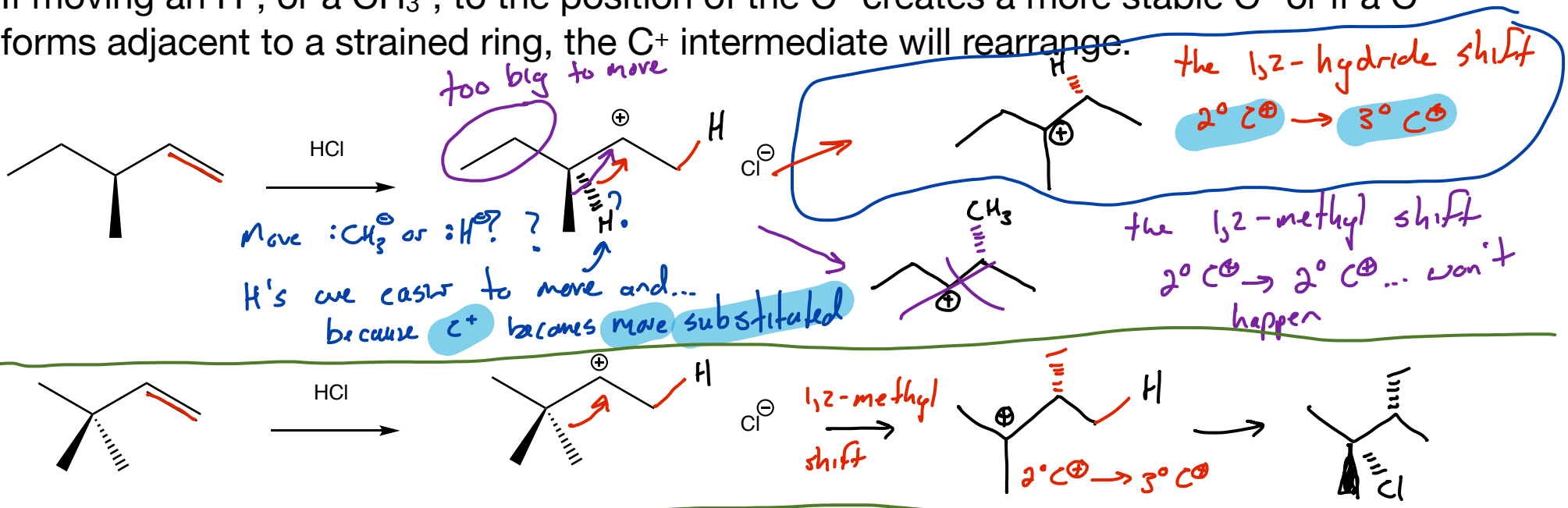


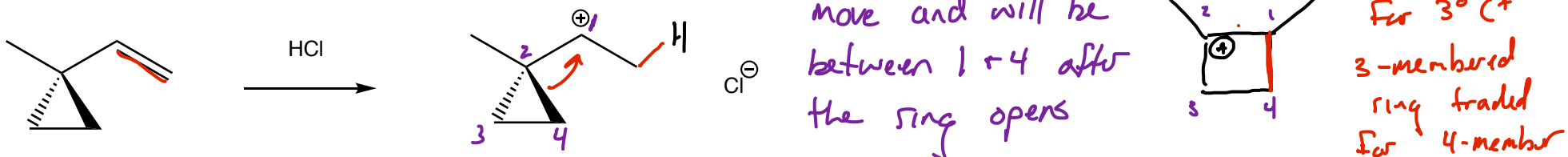


C+'s rearrange when they can create a more stable C+ on an adjacent C atom you may get a small amt. of product from this one

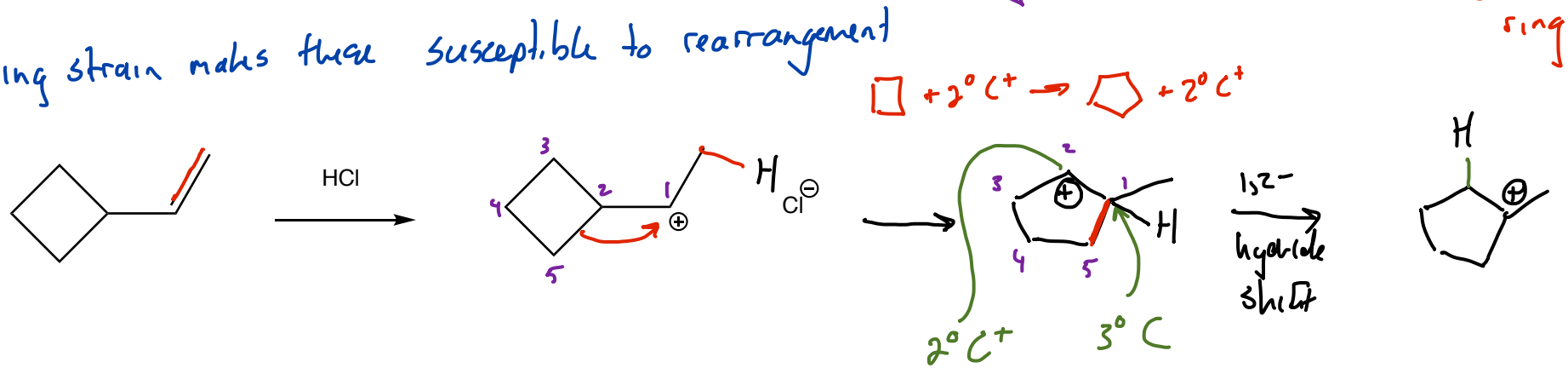
the rearranged C+ is what will react in the 2nd step

If moving an H^-, or a CH_3^-, to the position of the C^+ creates a more stable C^+ or if a C^+ forms adjacent to a strained ring, the C^+ intermediate will rearrange.





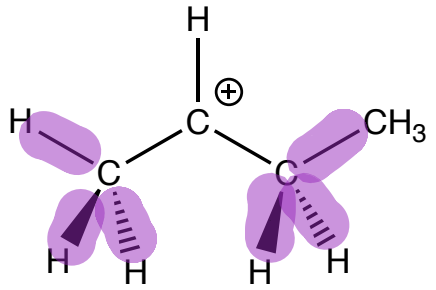
ring strain makes these susceptible to rearrangement



Stability

Getting electron density to a C^+ helps stabilize the C^+

e^-'s in σ-bonds on neighboring carbon atoms stabilize C^+'s by hyperconjugation



Stability order based on degree of substitution (there are other was to stabilize C^+'s that we will see later)

3° C^+ > 2° C^+ > 1° C^+ ← don't form under typical lab conditions

Rearranging C^+'s

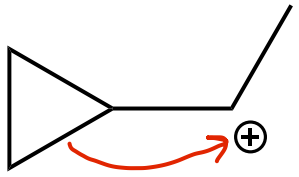
H atoms and methyl groups (CH_3's) will move from a neighboring C atom if the new C^+ would be more stable

1° C^+ will rearrange to a 2° C^+ or 3° C^+

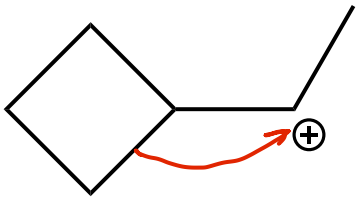
2° C^+ will rearrange to a 3° C^+

2° don't typically make new 2°... unless

Three- and four-membered rings will pop open if a C^+ forms adjacent to them.



3 goes to 4



4 goes to 5

5, 6, ?... don't do ring opening rxns

Summary, so far..

~~HF~~

Reaction starts at π bond: π bond is lost and σ bonds to electrophile and nucleophile form

Identify the electrophile: so far the H^+ of a strong acid

HCl, HBr, HI

Identify the nucleophile: the conjugate base of the strong acid, the X^- of the HX
an added nucleophile like HOH, CH_3OH, or ROH

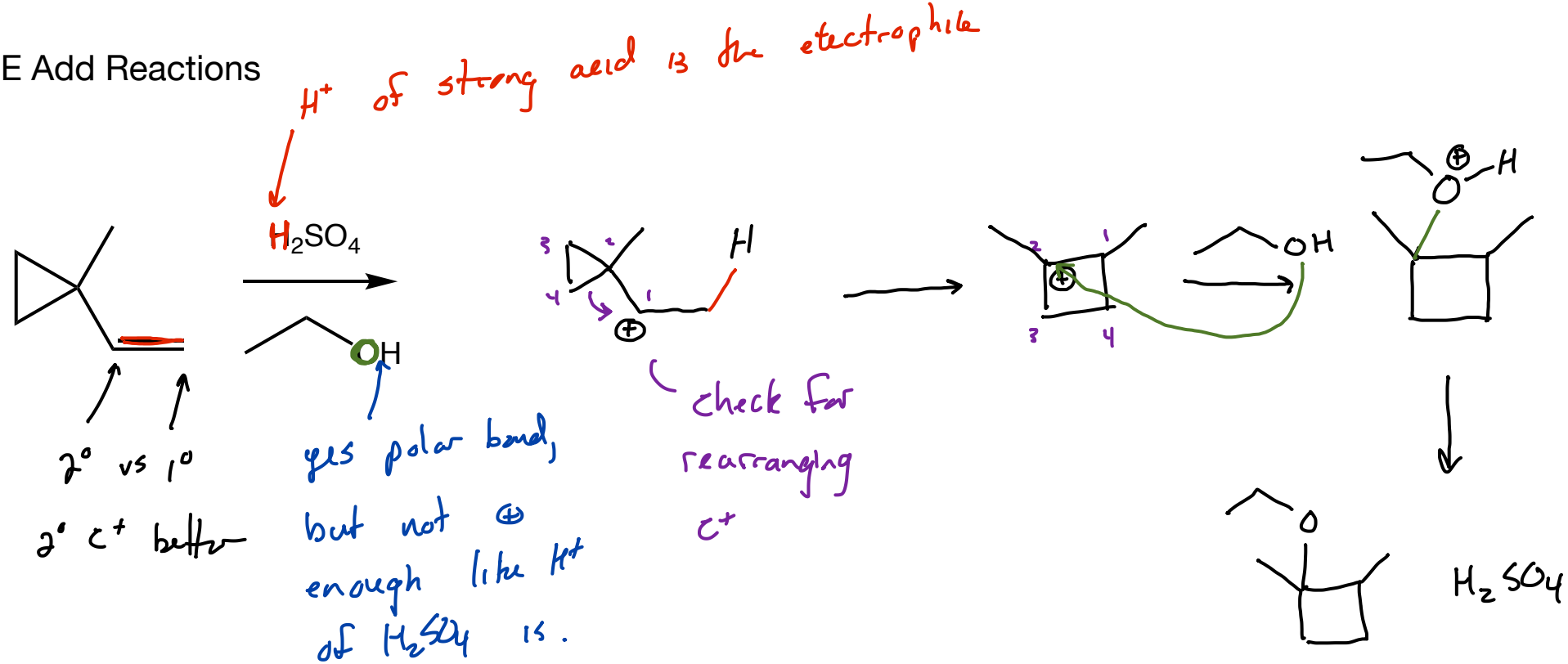
Create intermediate: open π bond and determine where the + goes (based on stability of +)
and attach electrophile to other end.
Are the ends of the double bond identical?
Yes. It doesn't matter; put the + at either end and move on.
No. Is there a reason to prefer making one end of the bond + ?
Yes. Major and minor products will form. Place the + at the end where it will be more stable and move on.
No. ~1:1 mixture of products will result. Two intermediates form, each one with a + at one end.

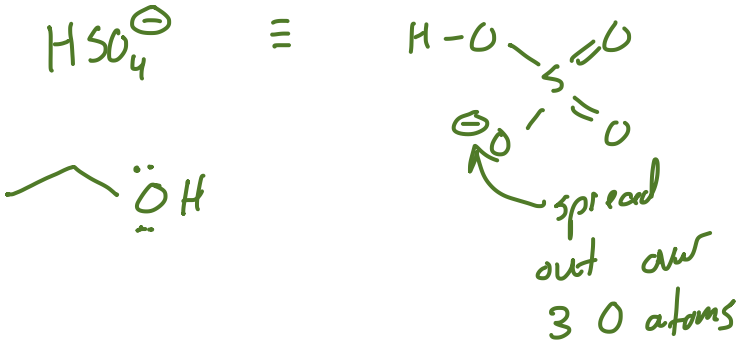
Check for carbocation rearrangement: would plus be more stable on **neighboring** C?

yes, rearrange no leave + where it is

Make a bond from the nucleophile to the C with the + charge.

E Add Reactions





E Add Reactions