

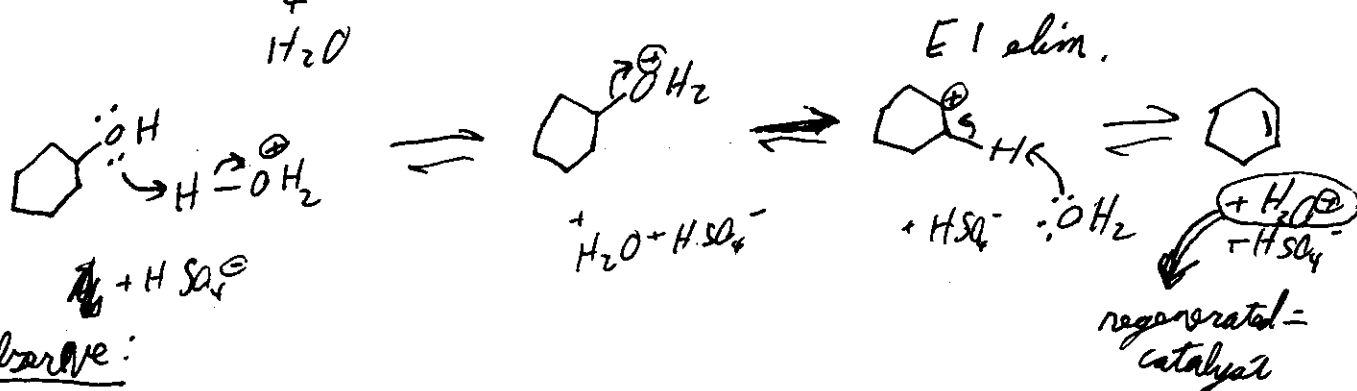
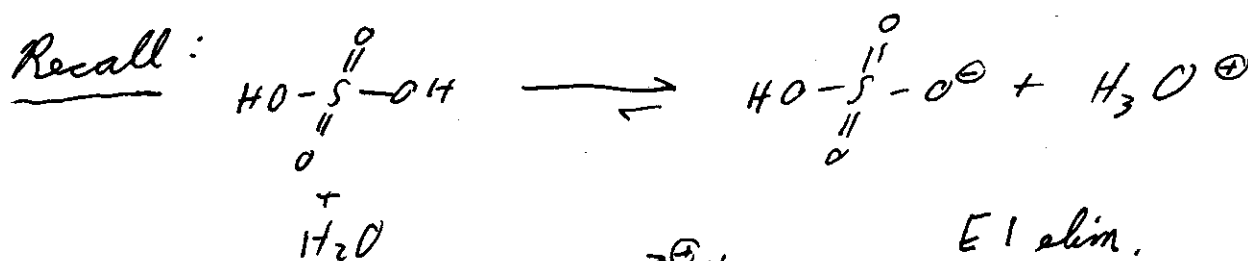
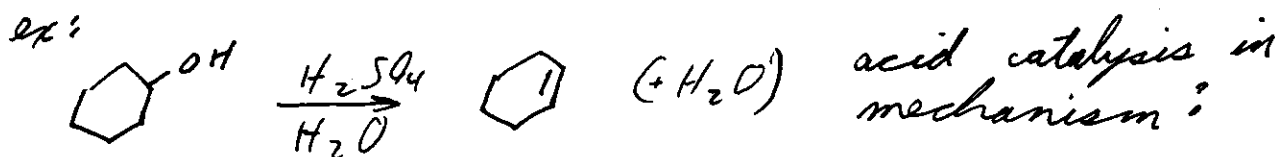
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Ch 10 alcohols (+ thiols)

Rec. Problems: 1-21, 23, 26, 27, 33, 35-37, 41-46, 52-55, 56c, 57-61

Perspective: $\begin{matrix} R \\ | \\ R'-C-X \\ | \\ R'' \end{matrix}$ $X = \text{halogen (Ch. 9)}$
 $X = OH \text{ (or SH) (Ch 10)}$

Dehydration of alcohols to form alkenes (elimination)



Observe:

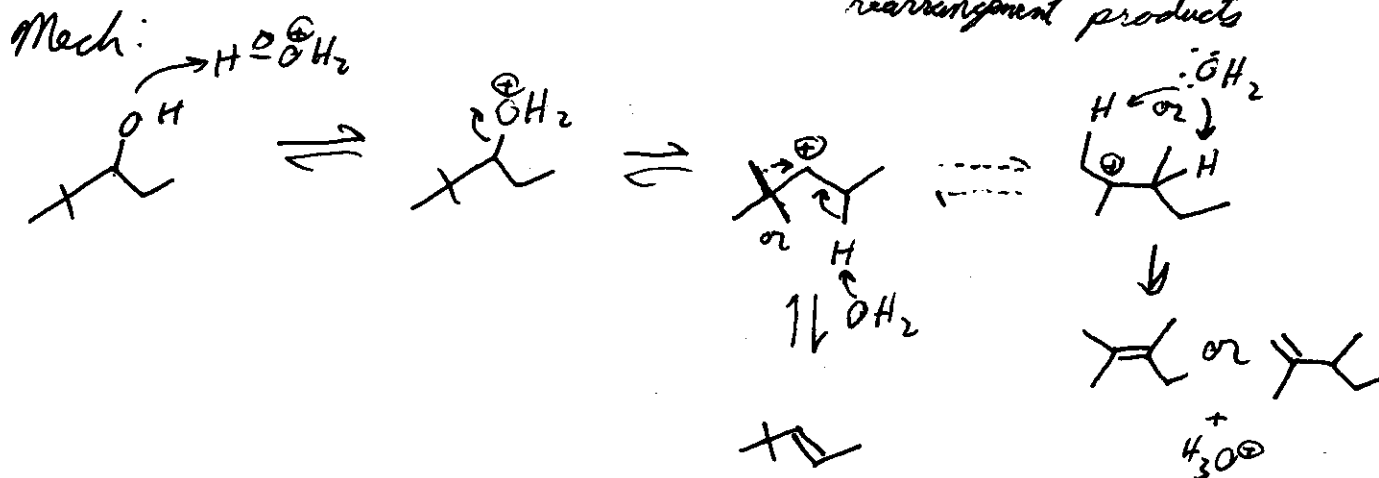
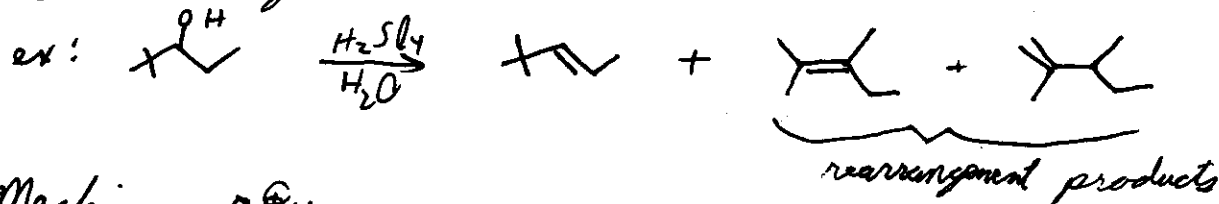
- 1) E1 !!!
- 2) Recall OH^- poor LG, but H_2O is a fine LG!!
- 3) This rxn is the reverse of acid-catalyzed hydration of alkenes. Must manipulate conditions to drive in one direction. e.g. distill off the alkene as it forms

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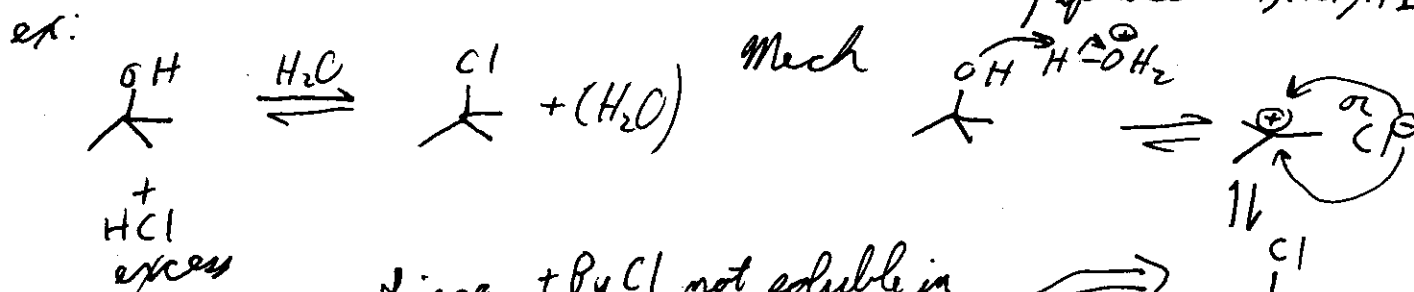
Based on prior knowledge, we expect:

1) 3° alcohols (ROH) are more reactive than 2° (1° ROH do not react via this mechanism)

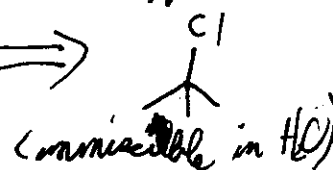
2) C⁺ rearrangement can occur



Observe substitution (rather than elimination) if use HCl, HBr, HI

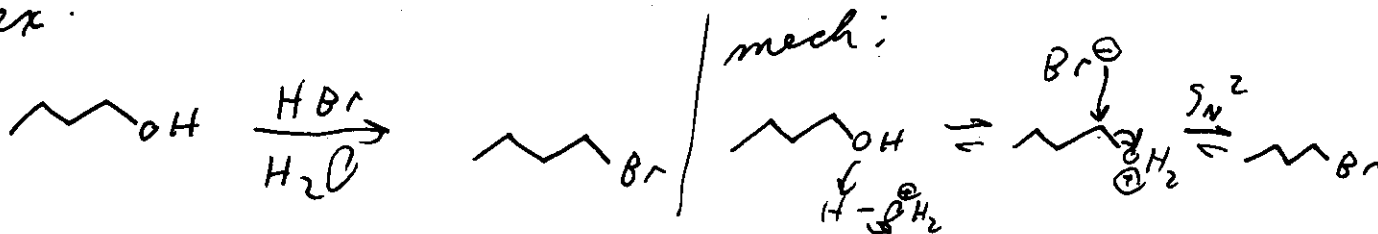


Since PbCl not soluble in H₂O, it forms another layer called "oiling out"

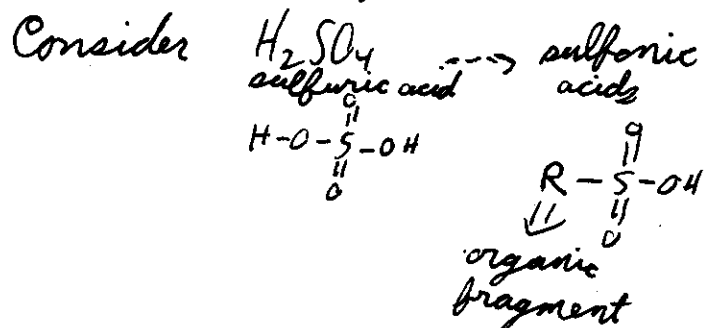


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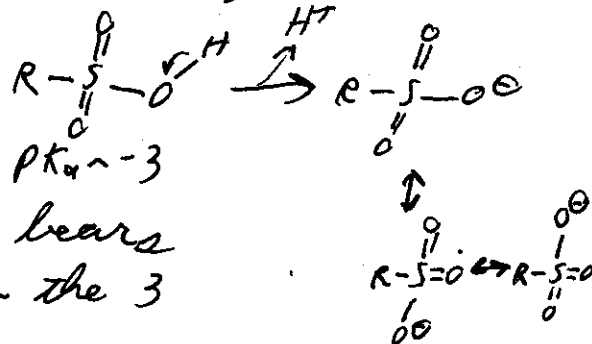
Note: S_N1 mech (operative also w/ 2° alcohols)
 see substitution also possible w/ 1° alcohols - S_N2
 ex:



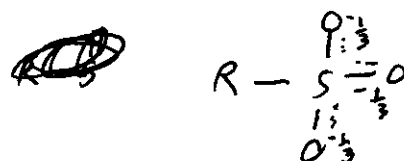
Alternative method for converting OH to a good LG
 $\Rightarrow$ conversion of OH to a "sulfonate ester" ("permanent")



Note: sulfonic acids are strong acids



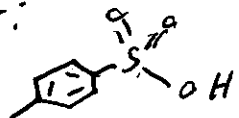
Each oxygen on sulfonic acid bears $1/3$ of the negative charge due to the 3 resonance structures



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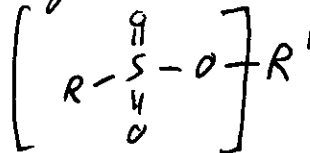
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Common ex:



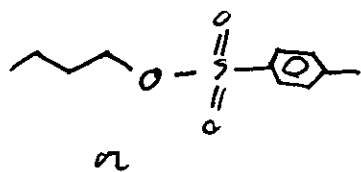
"p-toluenesulfonic acid"
 or "p-TsOH" or "TsOH"

Sulfonate ester:

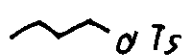


→ excellent LG!!!
 (like a halide)

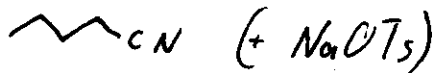
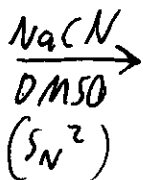
Specific ex:



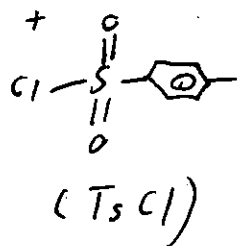
⇒ great S_{N}^2 substrate, similar to R-Br



"a tosylate"



• Many more examples of sulfonates exist & work similarly
 Formation of sulfonate ester (specifically ROTs) from ROH



$\xrightarrow[\text{(solvent)}]{\text{pyridine}}$

