

Course Chem 343 Lecturer Gellman  
Day Monday Date 11/16/15  
Notes Taken By Justin Total # of Pages 5

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Recall: Oxidation and Reduction rxns in organic chemistry. (General concept - categorize rxns for memory & recognition).

- 3 possibilities — 1) Rxns in which organic component is oxidized  
2) \_\_\_\_\_ is reduced.  
3) rxns w/ no redox change.

Must be able to identify carbon oxidation states (see pp. 476 - 482)  
→ We will use a simpler scheme.

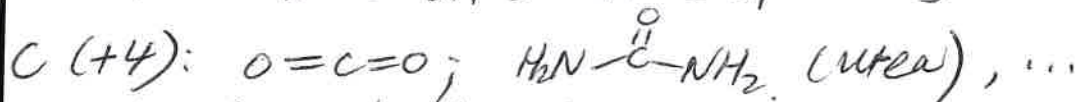
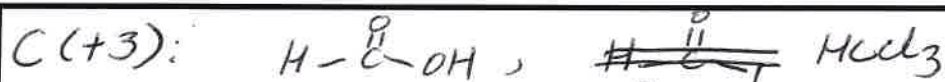
Our approach:

- Carbon ox. states defined for each C atom, 0 to +4.
- Increment C ox. state by +1 for a bond to a more electronegative atom - O, N, halogens, most commonly.
- No change increment for single bonds to C or to H.

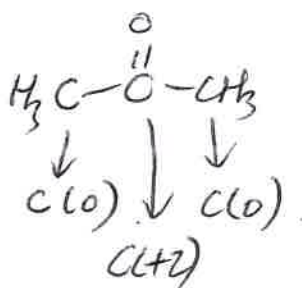
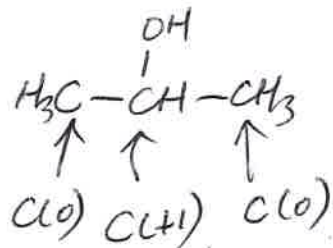
Examples (one Carbon)

- C (0):  $\text{CH}_4$   
C (+1):  $\text{CH}_3\text{OH}$ ,  $\text{CH}_3\text{NH}_2$ ,  $\text{CH}_3\text{Cl}$ , ...  
C (+2):  $\text{H}-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$ ,  $\text{CH}_2\text{Cl}_2$ , ...

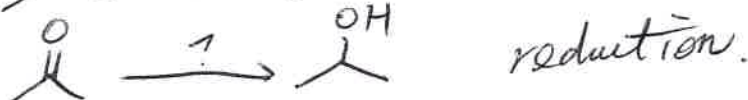
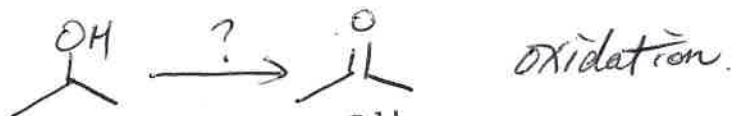
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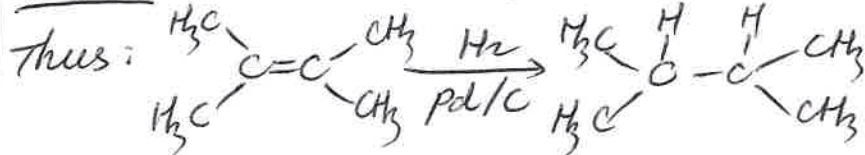
Applicable: molecules of any size, per-carbon basis.



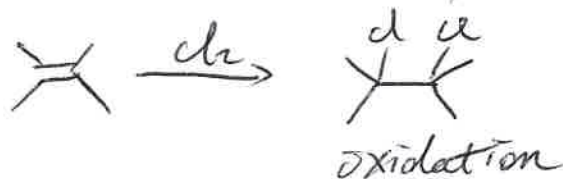
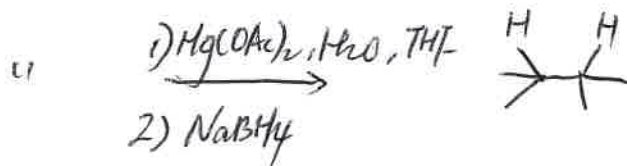
Categorize organic rxns:



Note: In alkene, each C (+1/2)



No change

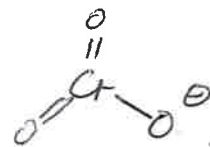
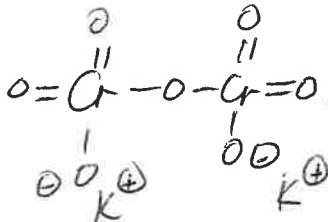
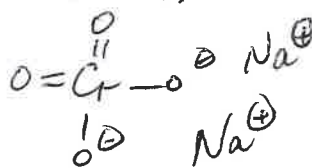


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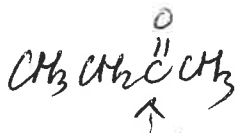
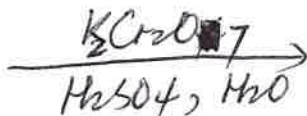
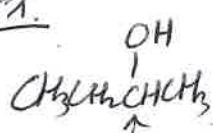
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### Oxidation of alcohols:

Common oxidizing agents are Cr(VI) complexes.



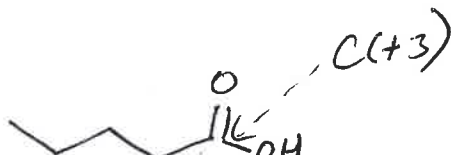
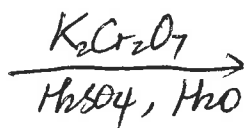
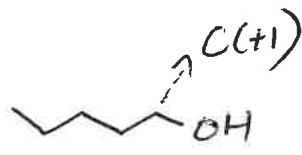
Ex.



← Jones rxn.

2° alcohol

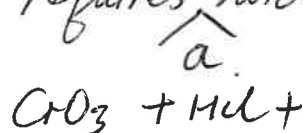
Ketone



Recognize this  
a 2-stage  
~~oxidation~~  
(via aldehyde)

If 1° alcohol ox. occurs in aqueous solutions, cannot stop @ C(+2) (i.e. @ aldehyde) — see text.

We can stop @ C(+2) if rxn occurs in nonpolar solvent — requires non-polar source of Cr(VI).



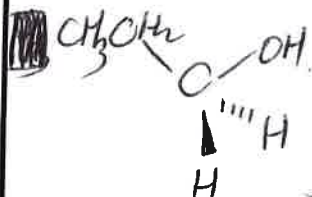
"pyridinium chlorochromate"  
(PCC)



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What abt H's on C1



Not equivalent!  
"enantiotopic"