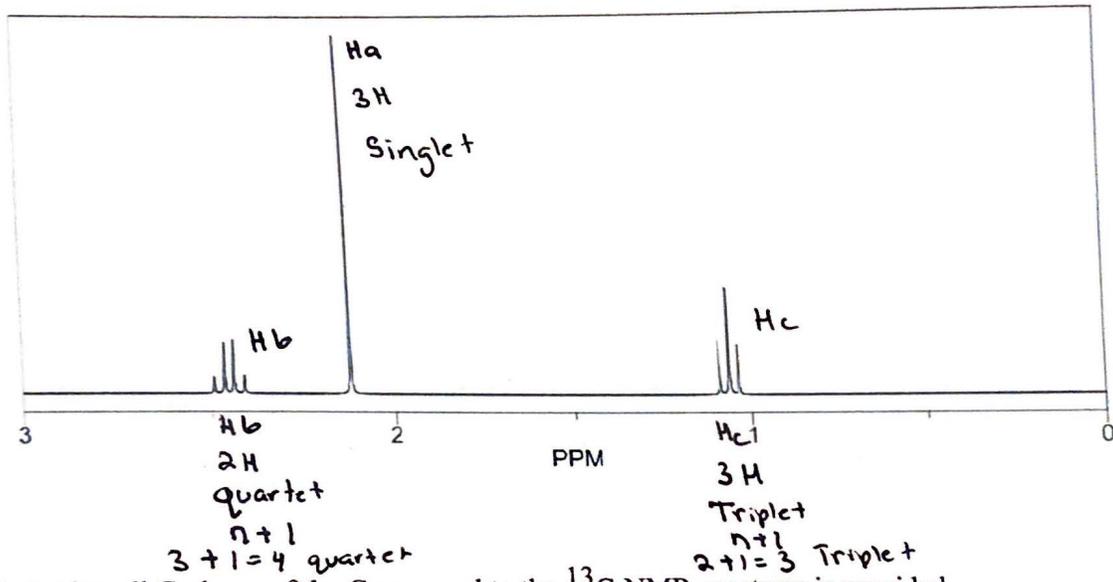
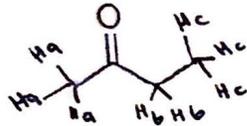
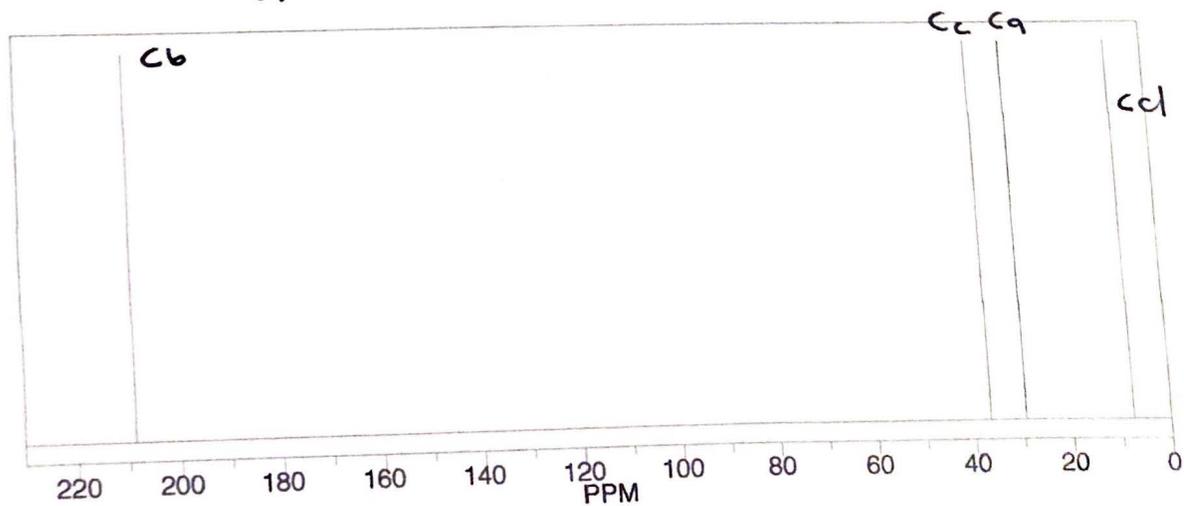
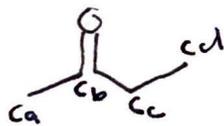


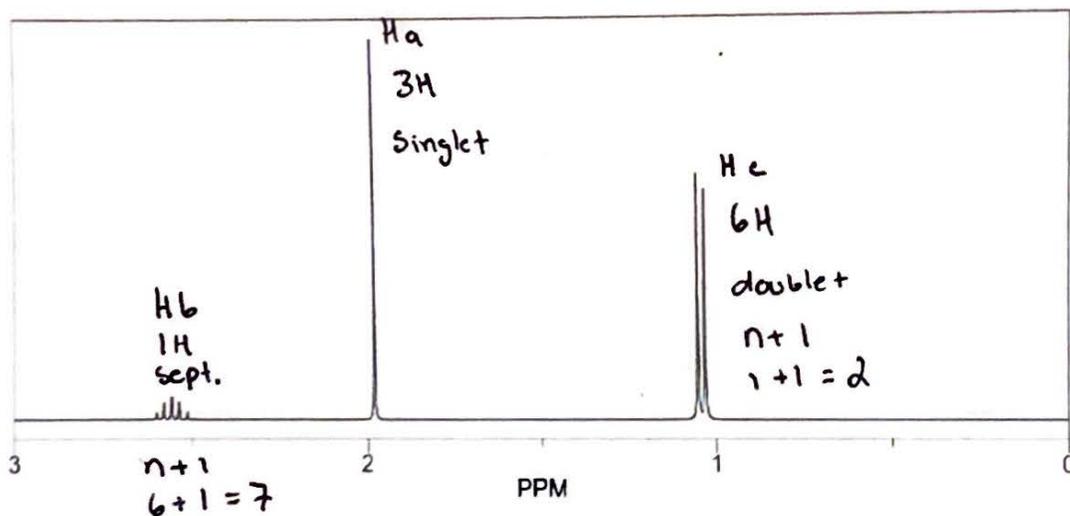
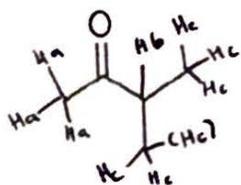
1a. Assign all ^1H of the Compound to the ^1H -NMR spectrum is provided.



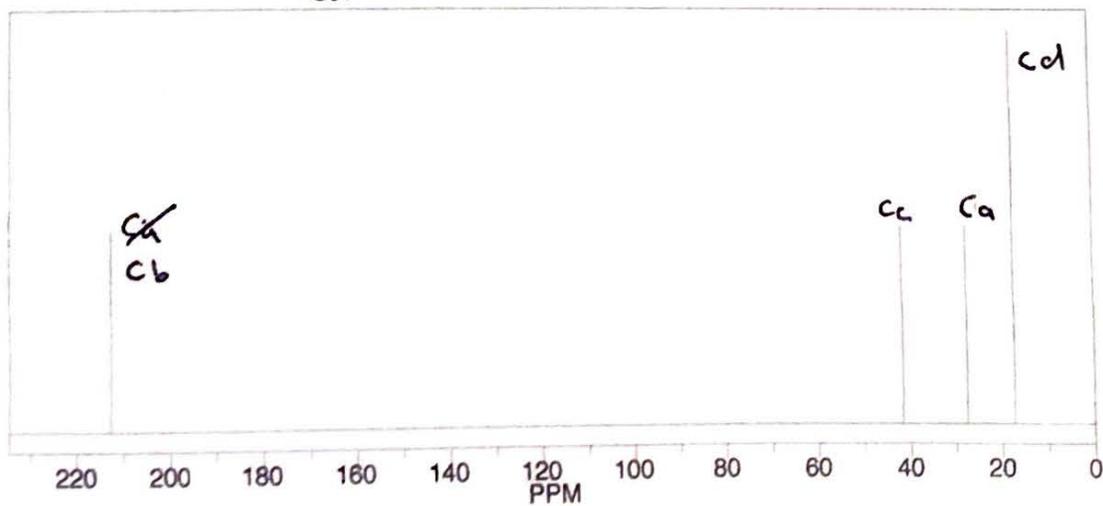
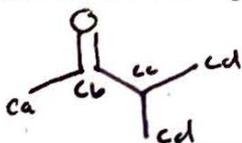
1b Assign all Carbons of the Compound to the ^{13}C -NMR spectrum is provided.



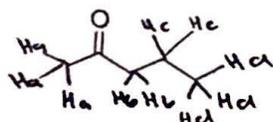
2a Assign all ^1H of the Compound to the ^1H -NMR spectrum is provided.



2b Assign all Carbons of the Compound to the ^{13}C -NMR spectrum is provided.



3. a. How many ^1H NMR signals does each compound exhibit? Also, provide the **Splitting patterns of each Hydrogen**. b. How many ^{13}C -NMR signals does each compound exhibit?



4 ^1H signals

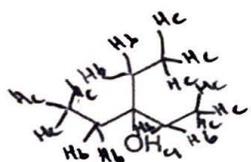
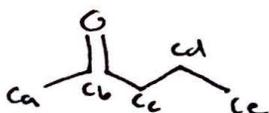
5 ^{13}C signals

H_a , Singlet, 3H

H_b , ~~doublet~~ Triplet, 2H

H_c , Sextet, 2H

H_d , Triplet, 3H



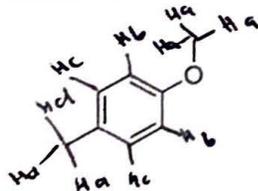
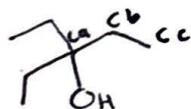
3 ^1H signals

3 ^{13}C signals

H_a , Singlet, 1H

H_b , Quartet, 6H

H_c , Triplet, 9H



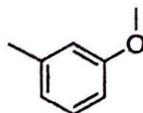
6 ^{13}C signals

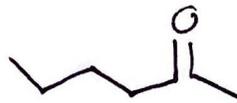
H_a , Singlet, 3H

H_b , doublet, 2H

H_c , doublet, 2H

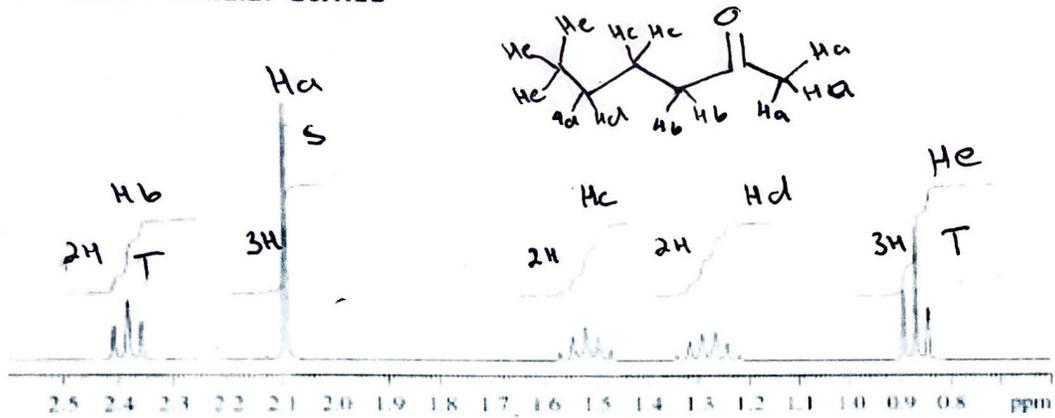
H_d , Singlet, 3H



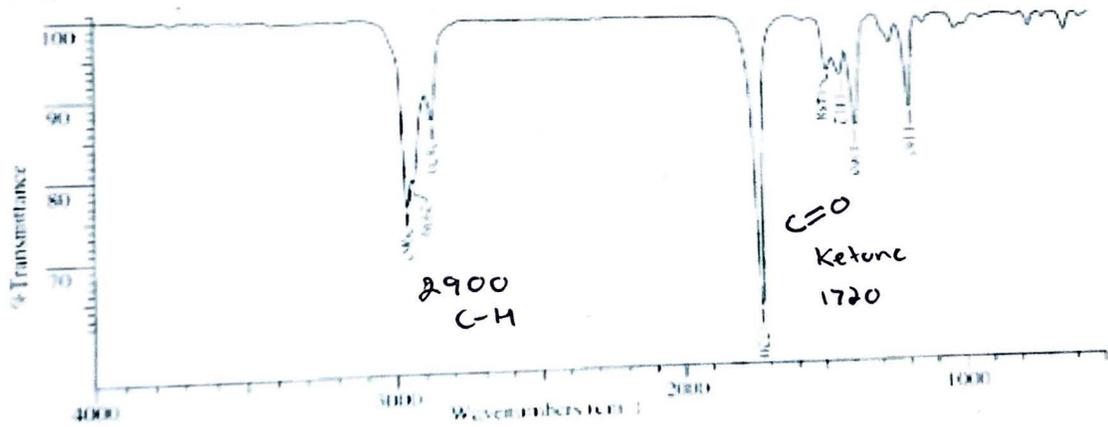


Molecular Formula: $C_6H_{12}O$

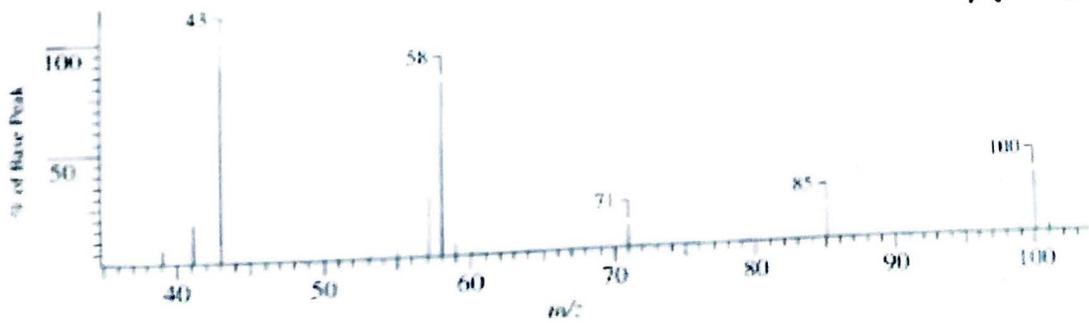
4.



IR Spectrum

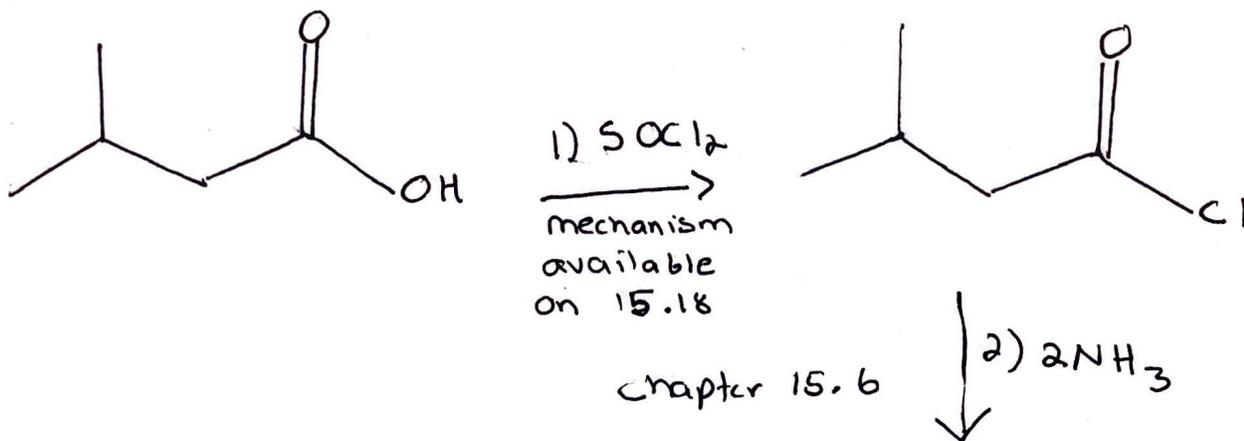


MS Spectrum

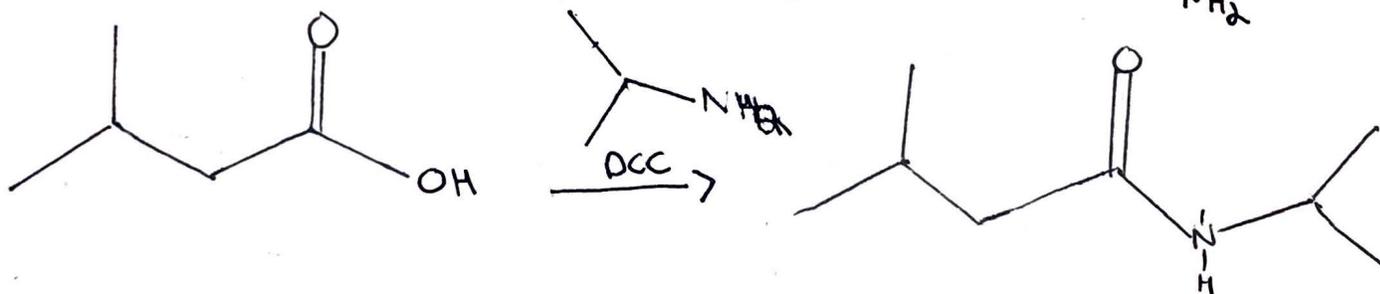


Work sheet 2 Solutions

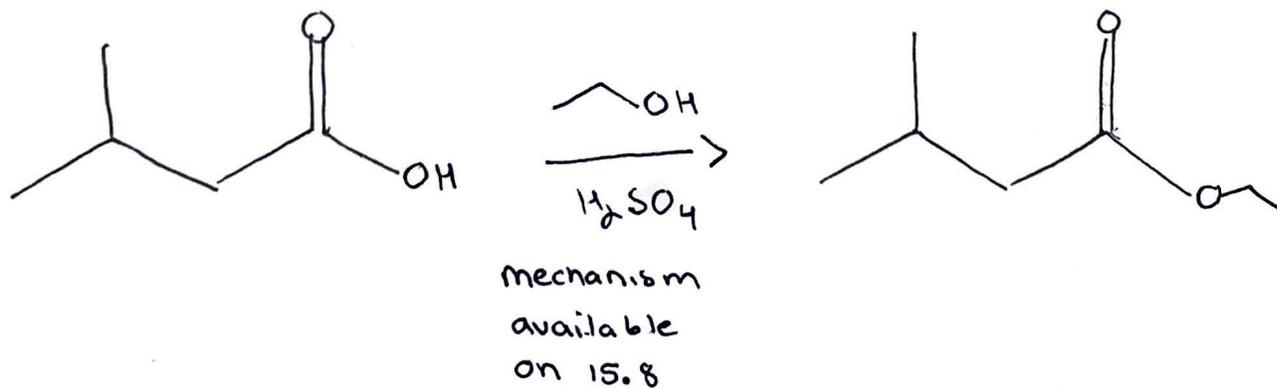
5a

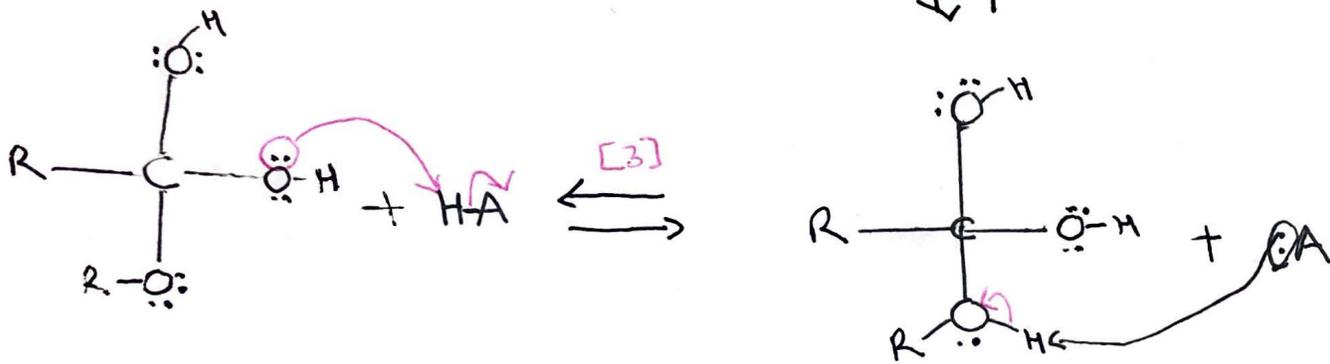
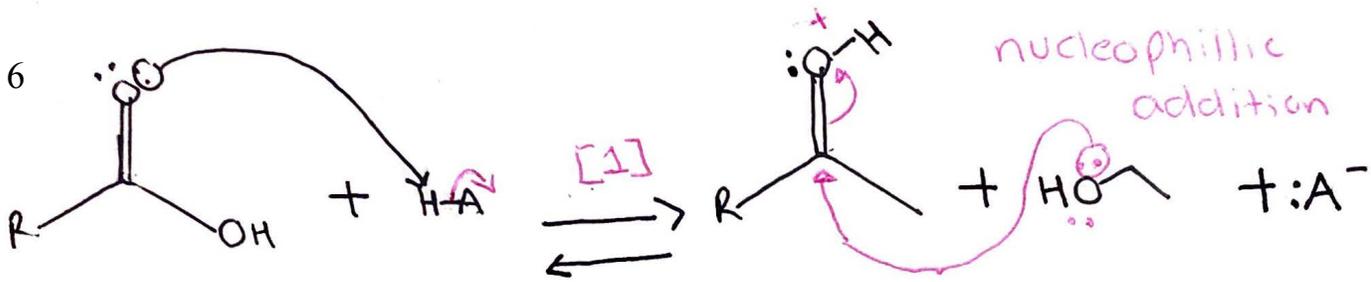


5b

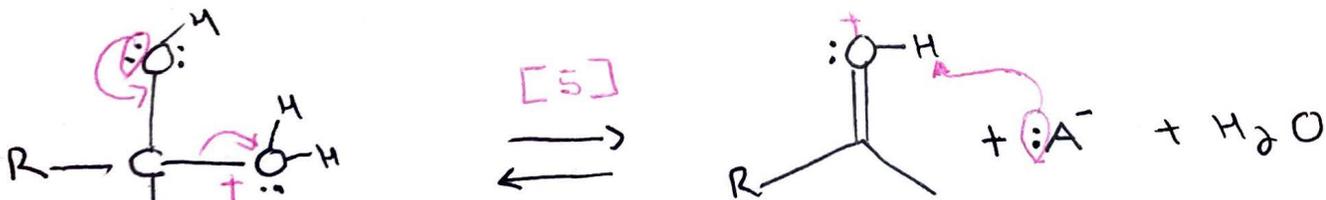


5c

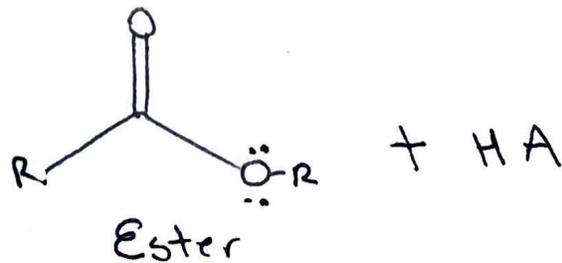




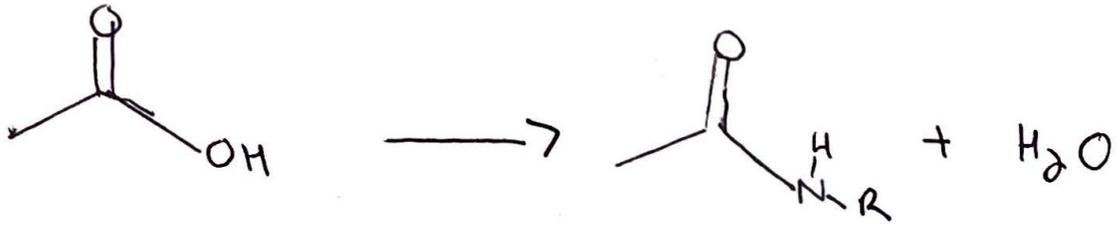
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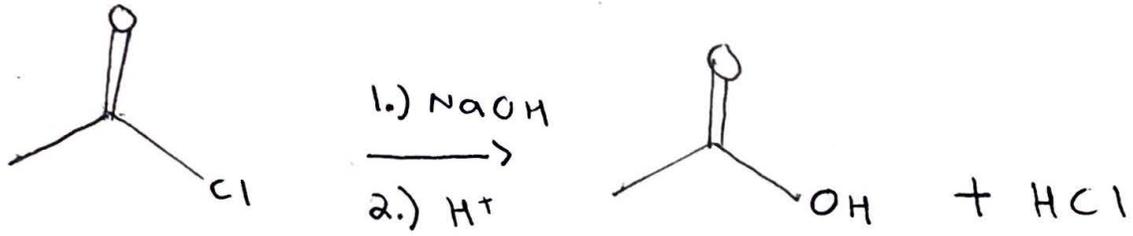
[6]



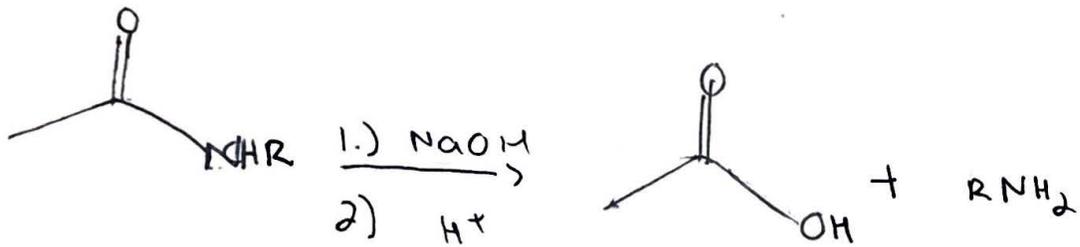
7a



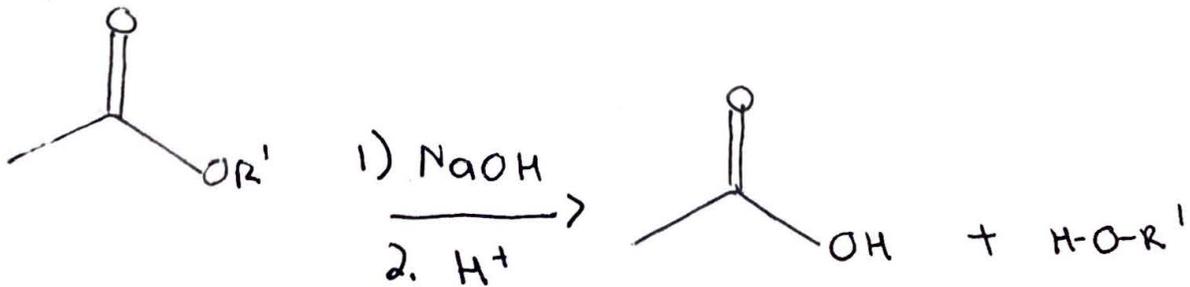
7b

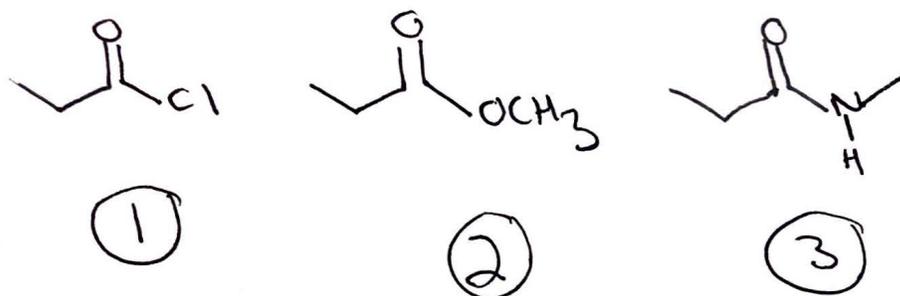


7c



7d





1 is the most reactive because ^{it} is the least stabilized by resonance from the leaving group. Cl is unable to delocalize a lone pair as good as O or N due to its larger size. Also Cl is a better leaving group.

② The ester is the second most reactive since it is not as stabilized as the amide.

- O is more electronegative and holds its lone pair tighter. O is better leaving group.