

CARBOXYLIC ACID & DERIVATIVES ^{1.}

29-04-2020 (Lecture -6)

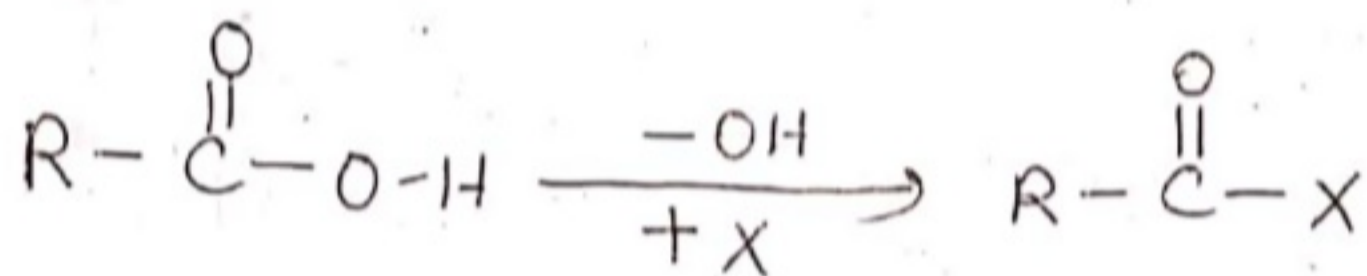
Deg-I (Hons.)
P-II, Ch-6, G-'B'

TOPIC - PREPARATION, PROPERTIES AND USES OF ACID HALIDES

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ACID HALIDES (ACYL HALIDES)

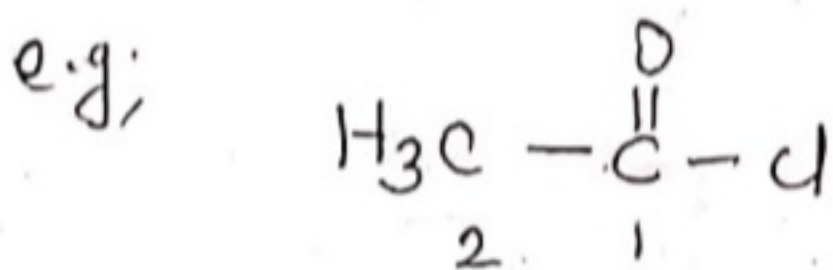
Acid halides are the derivatives of acids in which the $-OH$ group of carboxyl group has been replaced by a halogen atom.



Acid halides are also referred to as acyl halides.

The acyl Group is $R-\overset{\text{O}}{\parallel}{\text{C}}-$

They are named by dropping the ending $-ic$ acid from either the common name or the IUPAC name and adding suffix $-yl$ chloride.

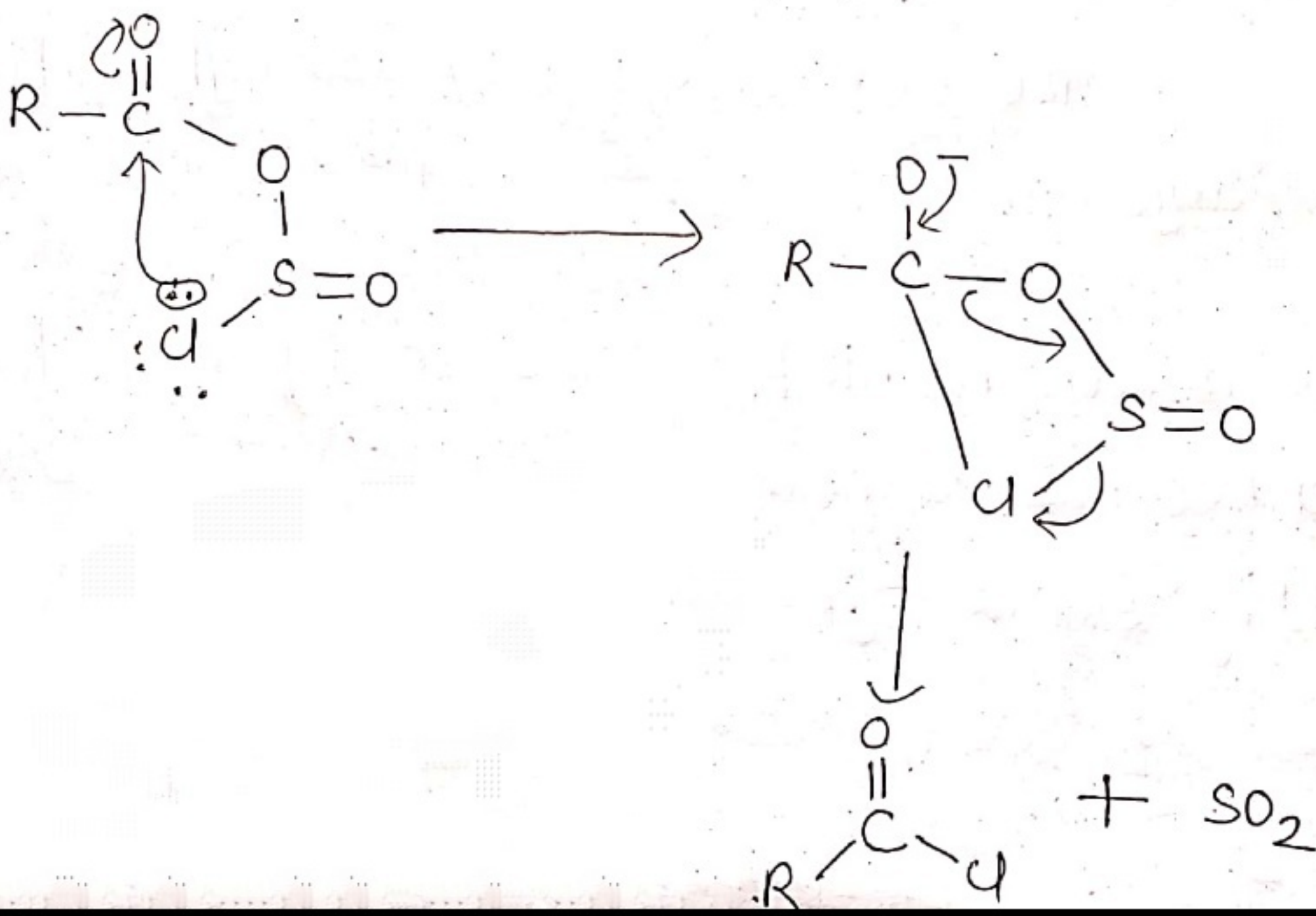
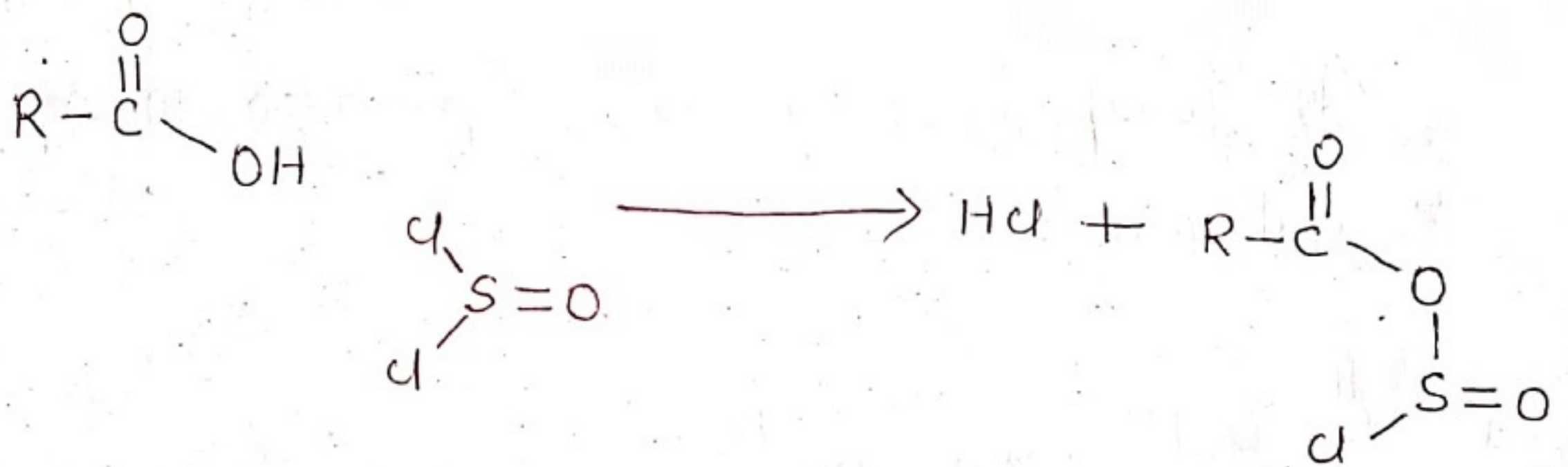
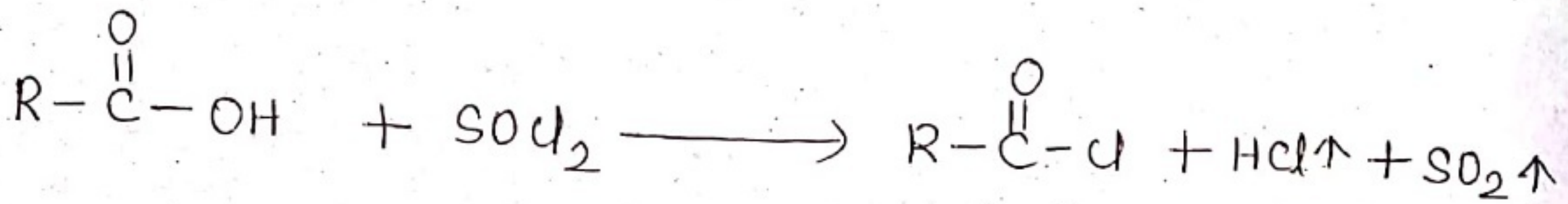


Ethanoyl chloride (Acetyl chloride)

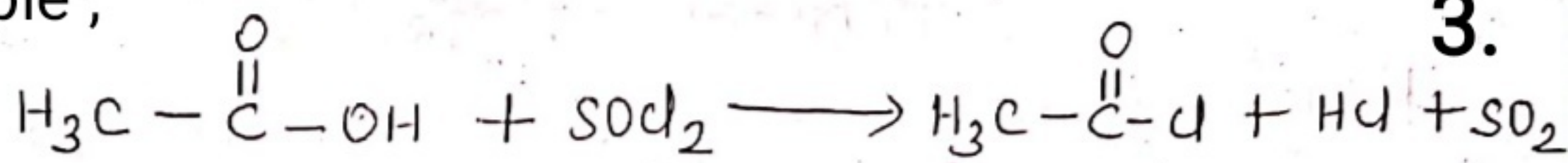
METHODS OF PREPARATION 2.

FROM CARBOXYLIC ACID

1. By reaction with thionyl chloride



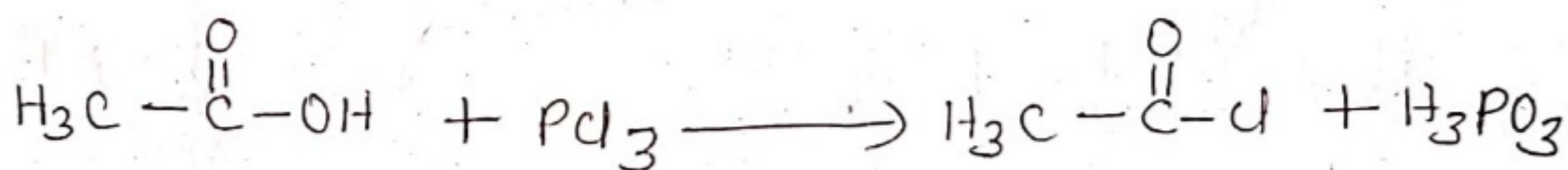
example ;



3.

This method is superior to other as the by products being gases escape leaving the acid-chloride in pure state.

2. By reaction with phosphorus trichloride

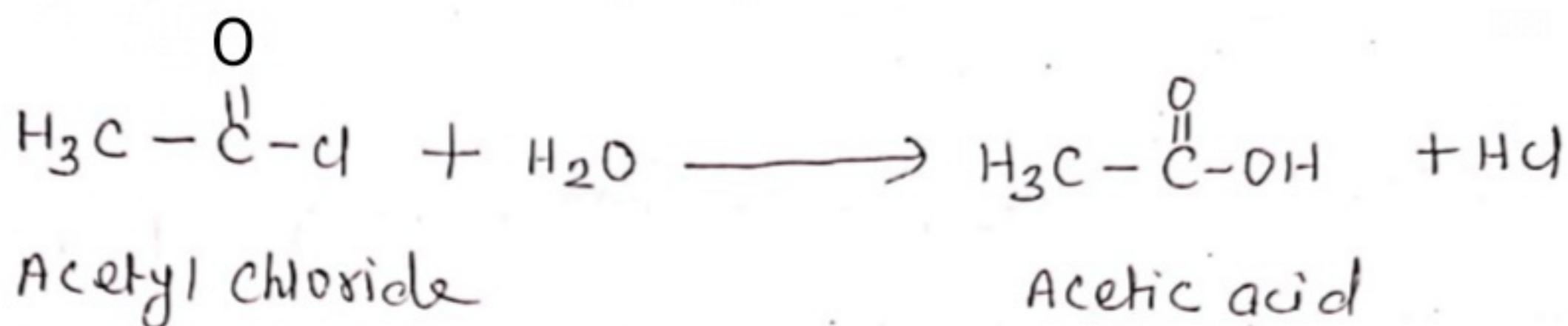


PHYSICAL PROPERTIES

- * Colourless liquids of lower boiling points than the corresponding acid.
- * They have sharp pungent smell and are lachrymators (tear-producing).
- * They are insoluble in water but slowly dissolve in it because of hydrolysis.
- * The $\text{C}=\text{O}$ stretching band in IR spectrum occurs at frequency range $1780-1850 \text{ cm}^{-1}$ //

CHEMICAL PROPERTIES

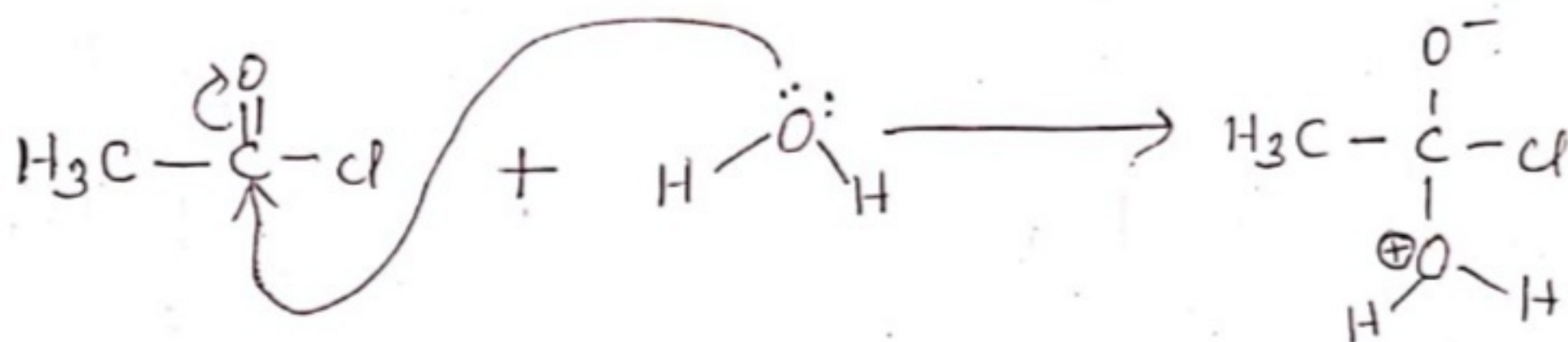
4.



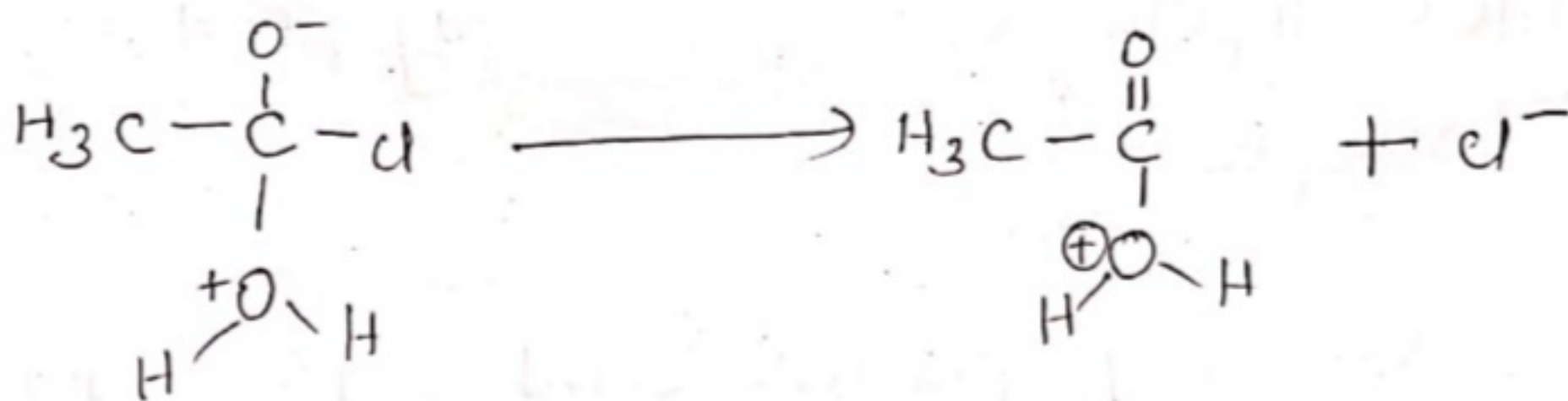
Mechanism

It is an addition-elimination reaction

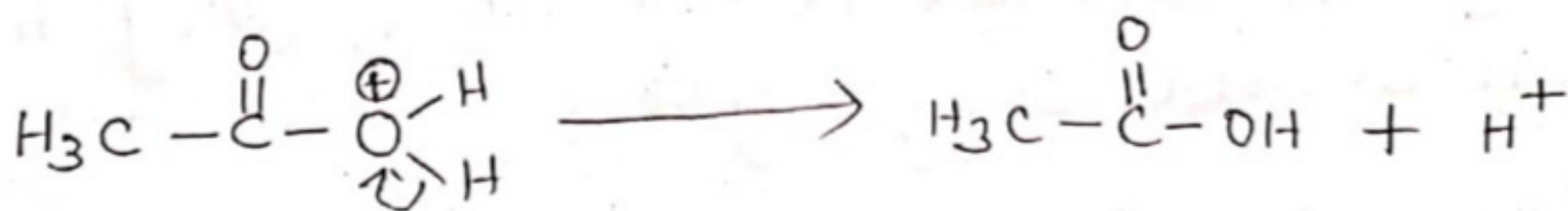
step 1. Addition of Nucleophile :-



step 2. Elimination of Cl^-



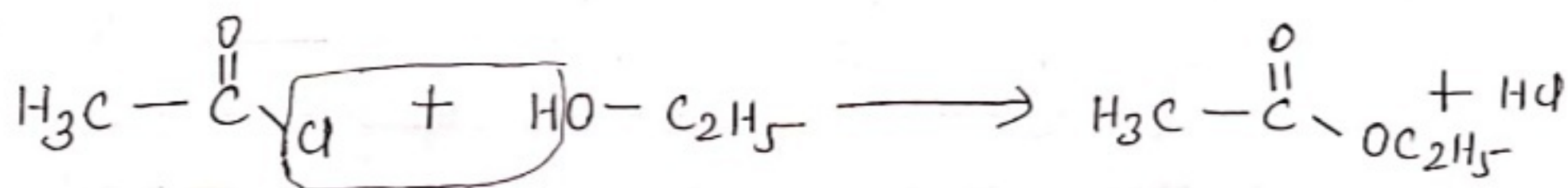
step 3. Elimination of Proton



2. Reaction with Alcohol :-

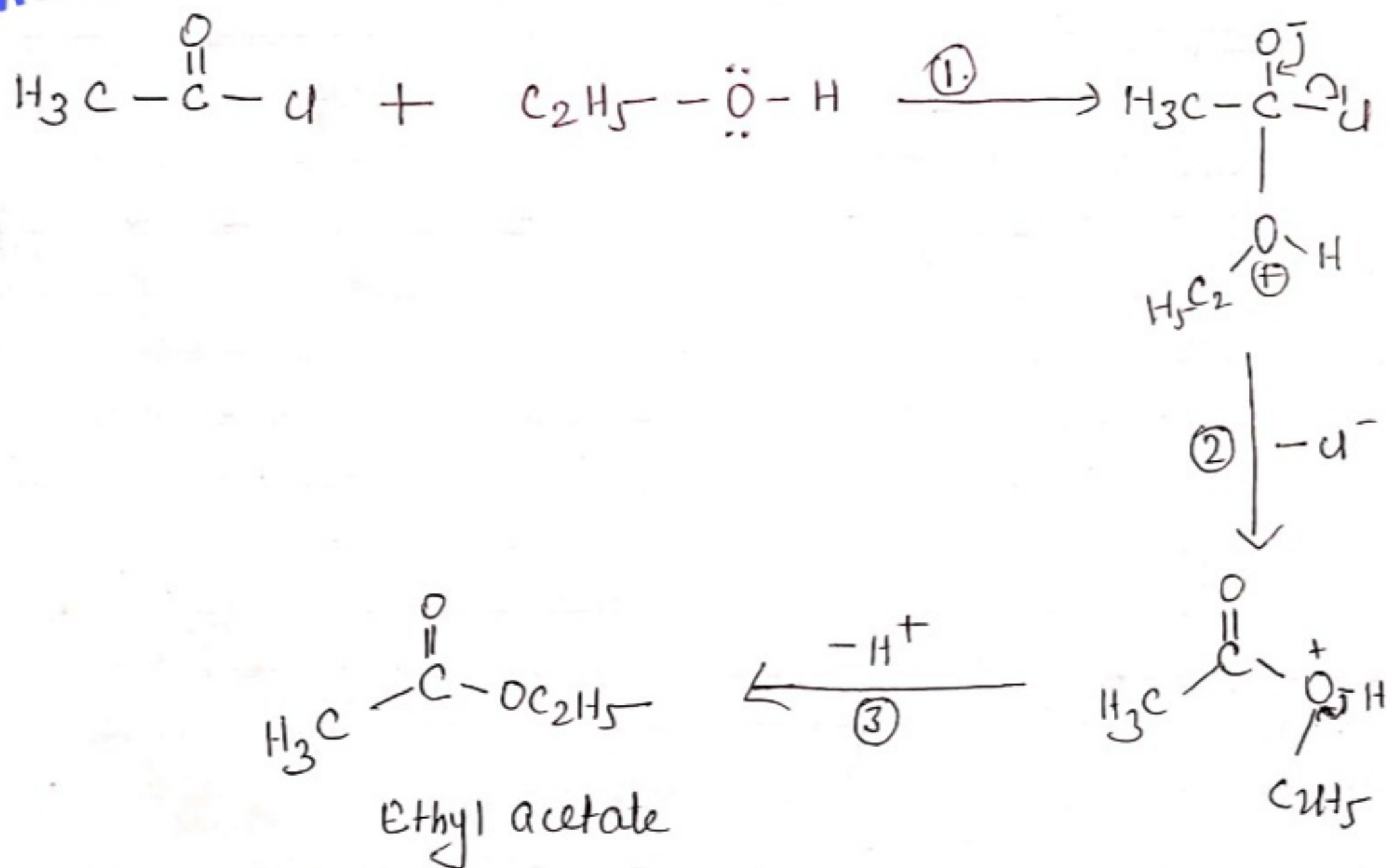
5.

They react with an alcohol when the chlorine atom is displaced by alkoxy group, $-OR'$, to produce an ester.



Mechanism

Three steps are involved



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To be continued in next lecture...