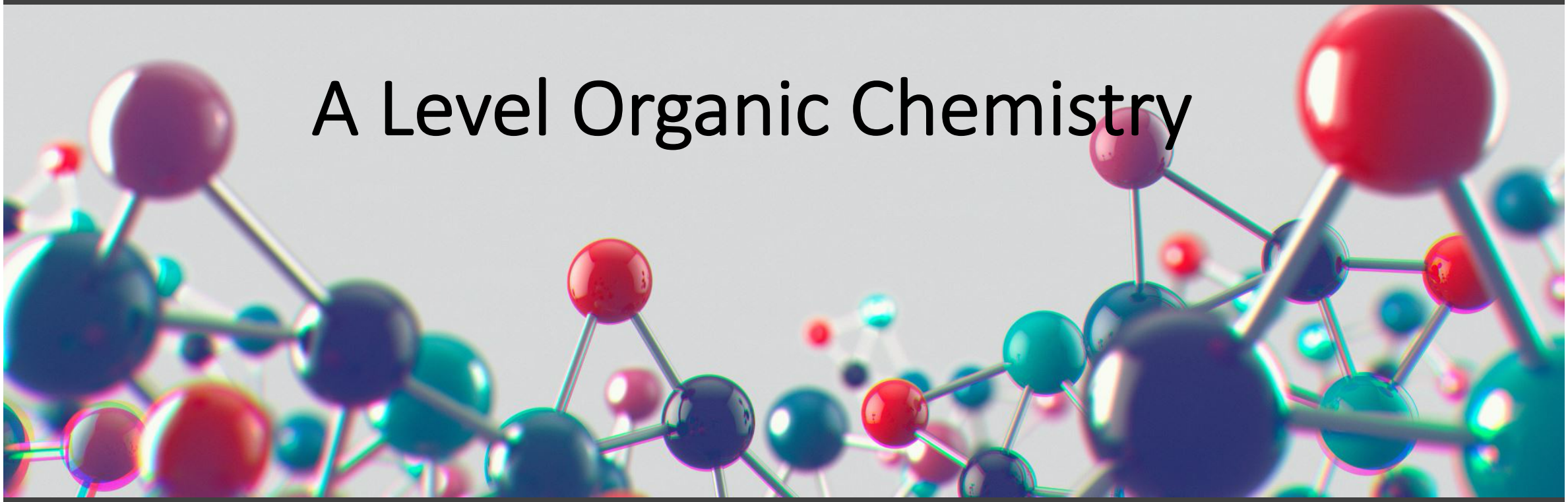


A Level Organic Chemistry

Acyl Halides

Download slides at ChemistryTuition.Net

Acyl Halides Synthesis

Sulphur dichloride oxide (thionyl chloride) is a liquid at room temperature and has the formula $SOCl_2$.

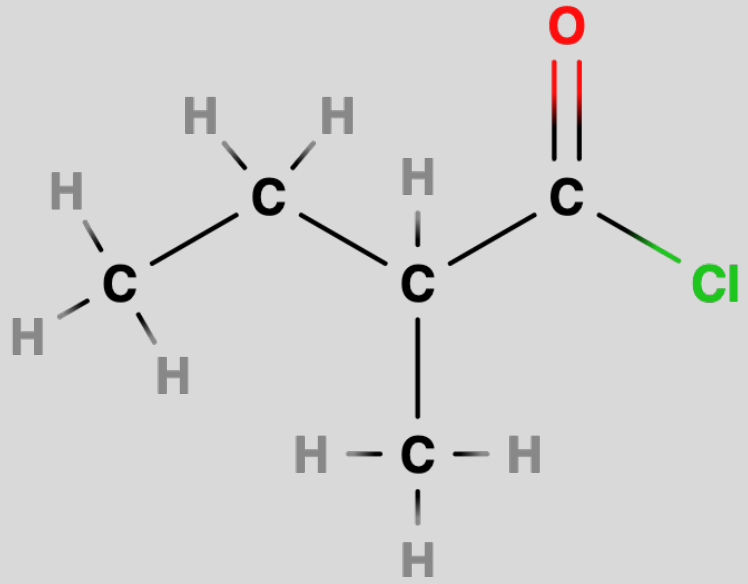
The sulphur dichloride oxide reacts with carboxylic acids to produce an acyl chloride, and sulphur dioxide and hydrogen chloride gases are given off.

$$CH_3CH_2COOH + SOCl_2 \rightarrow CH_3CH_3COCl + HCl + SO_2$$

Propanoyl chloride

Naming Acyl Halides

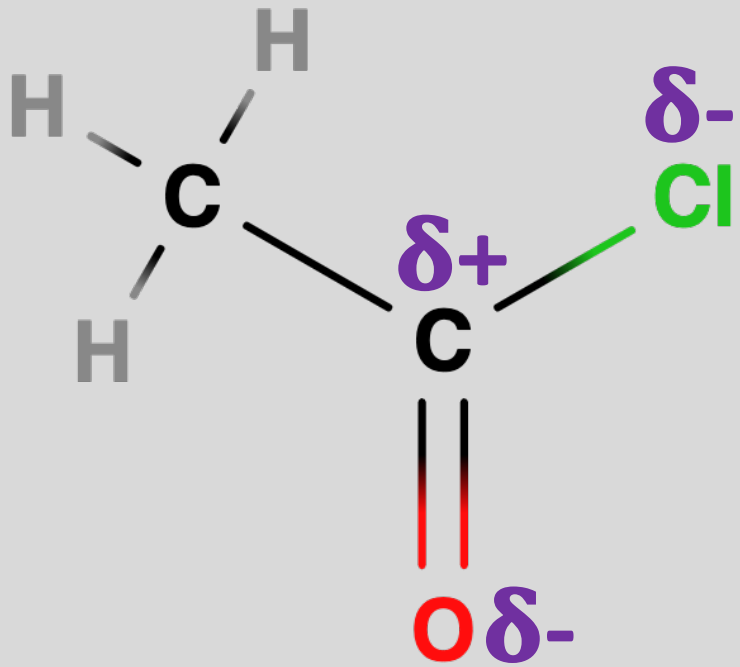
carboxylic acid name	acyl chloride name	acyl chloride formula
ethanoic acid	ethanoyl chloride	CH_3COCl
propanoic acid	propanoyl chloride	CH_3CH_2COCl
butanoic acid	butanoyl chloride	$CH_3CH_2CH_2COCl$



Carbon in the COCl group is always number 1

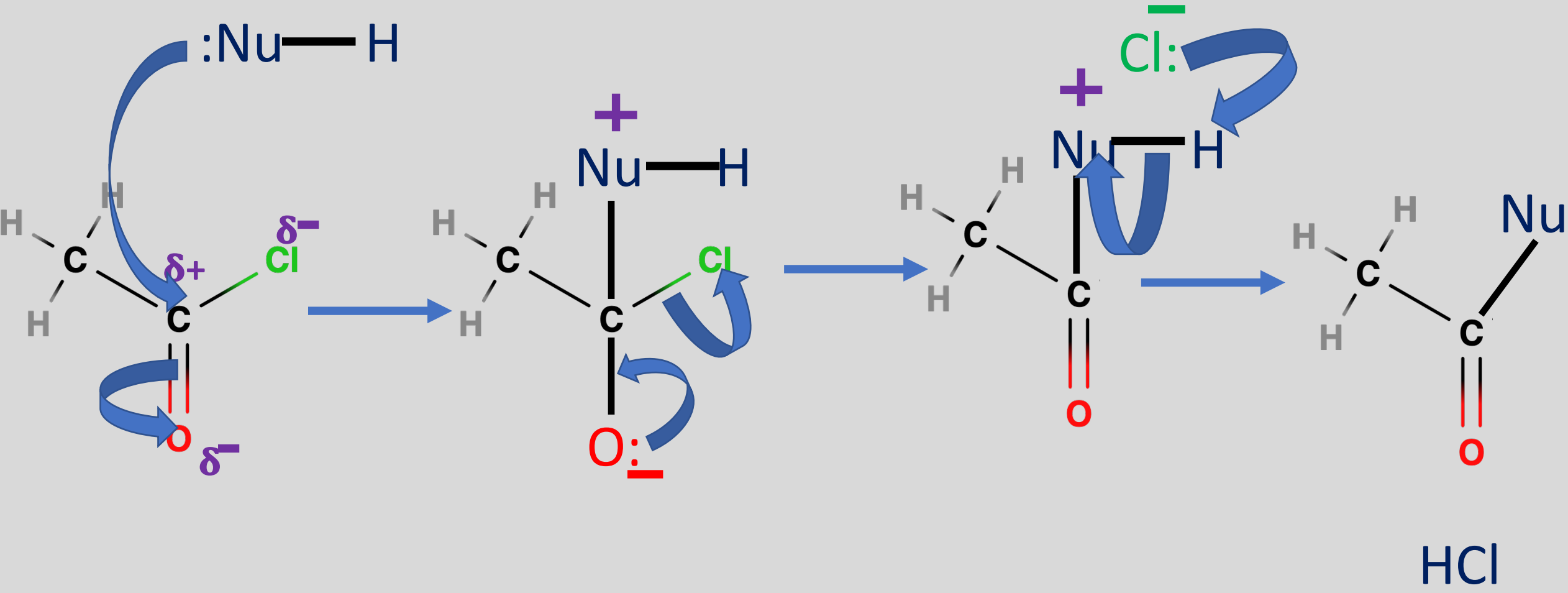
2-methyl butanoyl chloride

Reactions of Acyl Halides

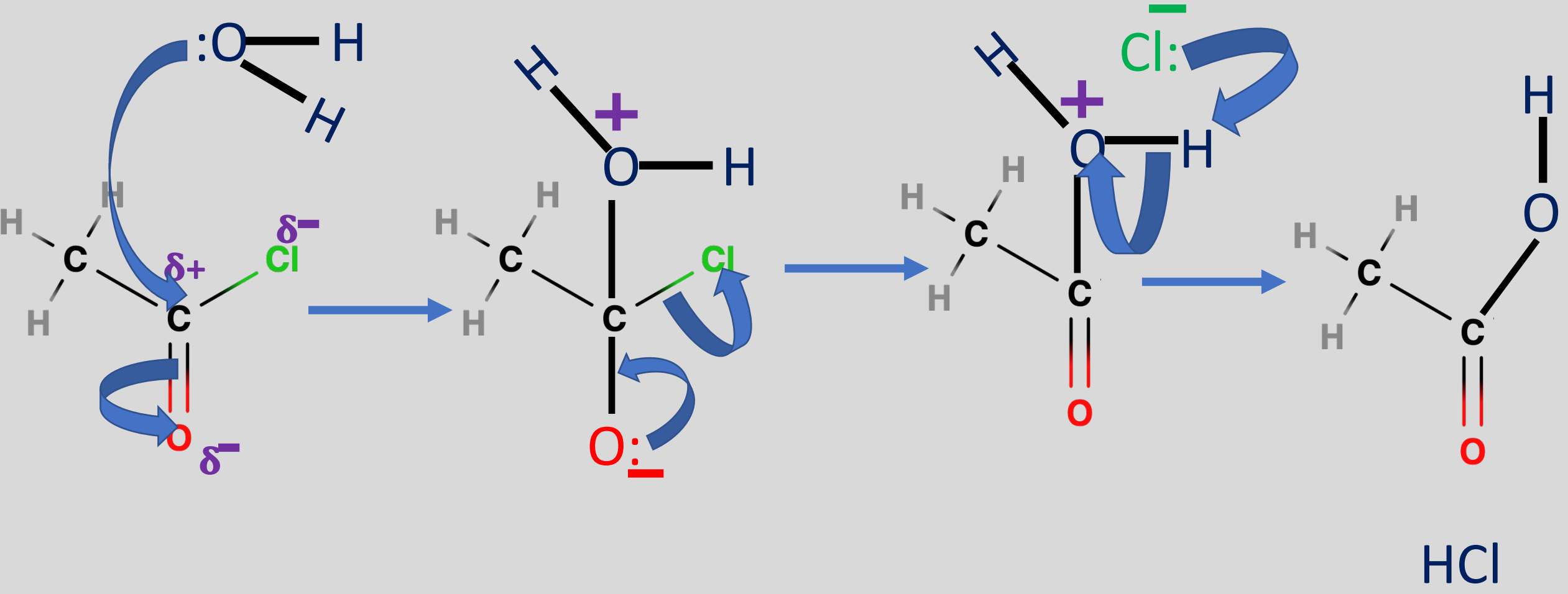


Since the C atom is **δ+** it will be attacked by nucleophiles.
Since the halide ions are good leaving groups, nucleophilic addition-elimination occurs.
Acyl halides are extremely reactive and must be stored and handled with care.
They react with water, alcohols, amines and ammonia.

General Reaction Mechanism

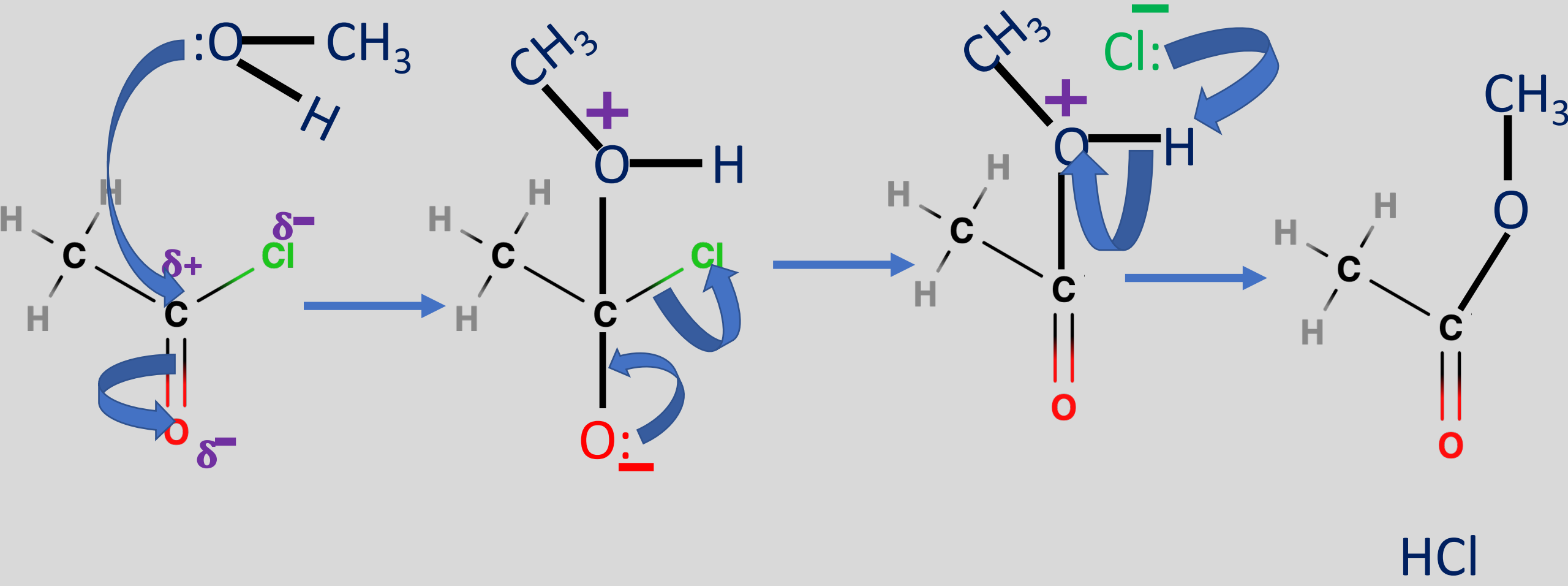


Reaction Mechanism with H_2O

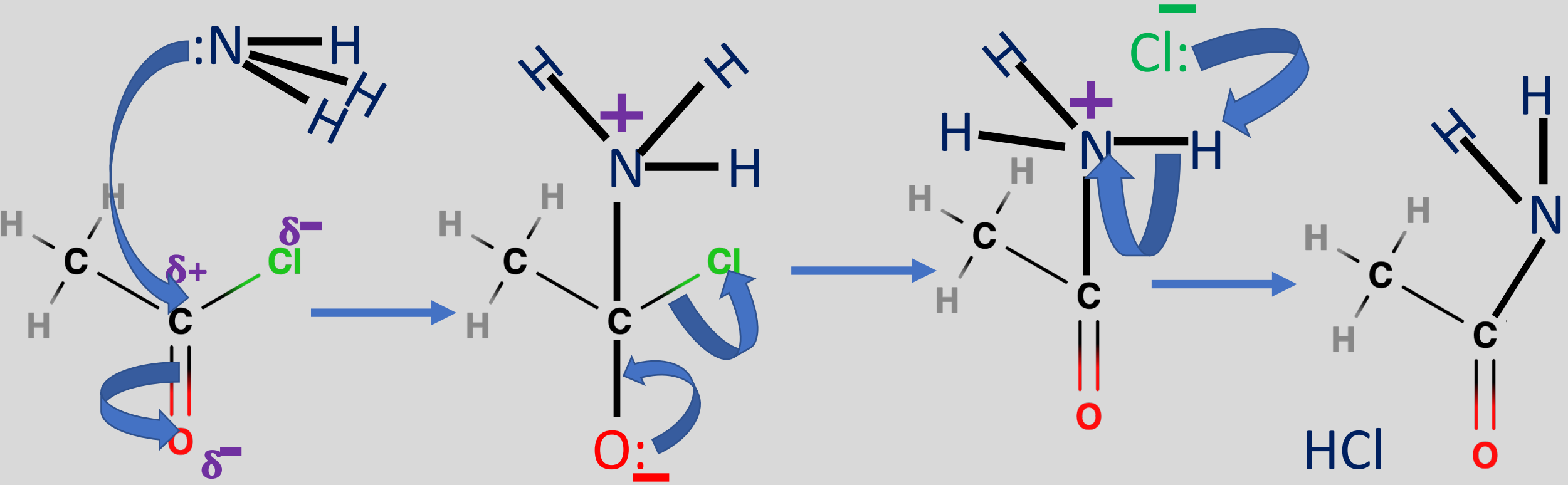


HCl

Reaction Mechanism with CH_3OH

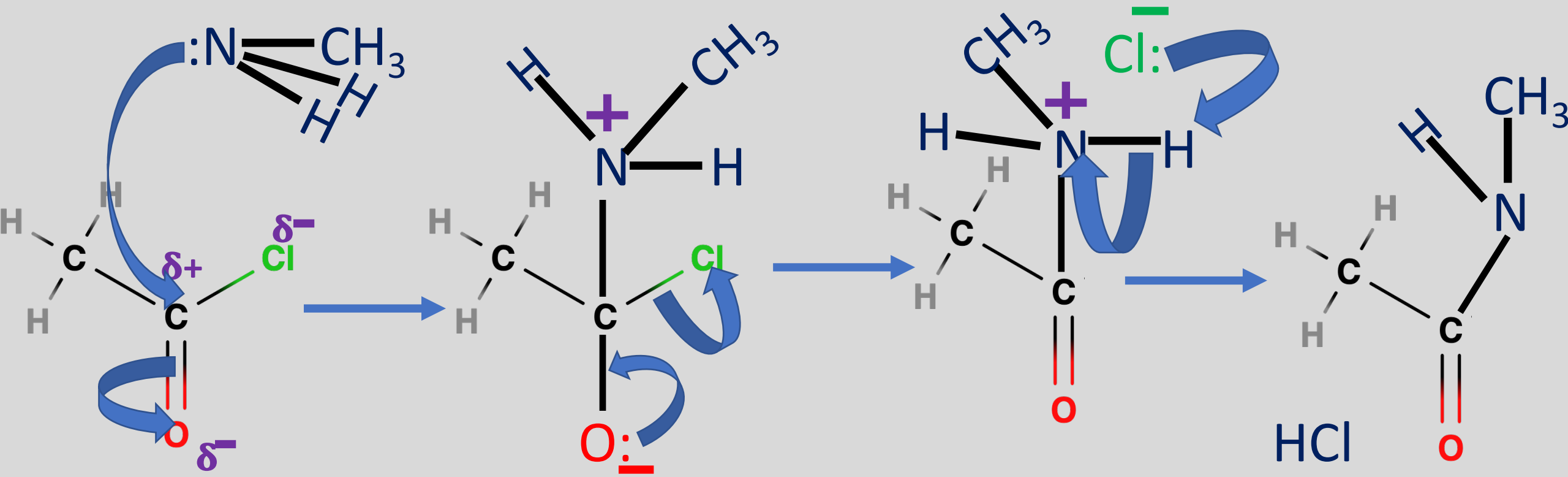


Reaction Mechanism with NH_3



$HCl + NH_3 \rightarrow NH_4Cl$

Reaction Mechanism with CH_3NH_2



$$HCl + CH_3NH_2 \rightarrow CH_3NH_3Cl$$