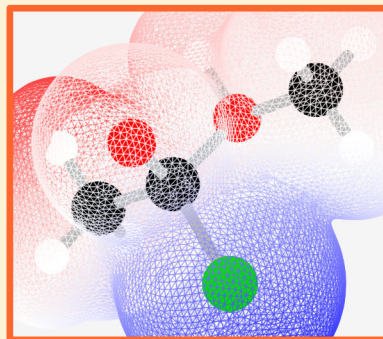


HIGHLIGHTS

- Reactivity of the carboxylic acid derivatives.
- Interconversion of the various carboxylic acid derivatives.
- Formation of acyl chlorides from carboxylic acids.
- The three general mechanisms of nucleophilic acyl substitution using anionic nucleophiles, neutral nucleophiles and acid catalysis.



Nucleophilic acyl substitution is an important reaction in synthesis & biology. All the **carboxylic acid derivatives** can be prepared using variations of this substitution mechanism. Key to the reaction is the reactivity of the carbonyl group. It is polarized, making it a **good electrophile**, but it will reform if possible. As carboxylic acid derivatives are characterized by a **leaving group** on the carbonyl it can reform. There are effectively three variations on nucleophilic acyl substitution depending on whether the nucleophile is an anion or is neutral, & whether the reaction is acid-catalyzed or not. Each reaction involves a minimum of two steps, nucleophilic addition & loss of a leaving group (or elimination). Depending on the conditions & the functional group, there may be one, or more, proton transfers. The reactivity of the carboxylic acid derivatives depends on how good the leaving group is.

CHEMISTRY CLASSICS

ADDITION TO THE CARBONYL GROUP

NUCLEOPHILIC ACYL SUBSTITUTION



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