Acylation With Acid Chlorides And Anhydrides

from chapter(s) _______ in the recommended text

A. Introduction

B. Reactions Of Acyl Halides

Under Basic Conditions

Chloride is a relatively irreversible.

\[
\text{R}\text{Cl} + \text{Nu}^- \rightarrow \text{R}\text{Nu} + \text{Cl}^- \\
\text{PT} \\
\text{H}_{3}\text{O}^+ + \text{O} = \text{O} + \text{Cl}^- \\
\text{PT} \\
\text{O}\text{O} + \text{HCl} \\
\text{PT} \\
\text{O} = \text{O} + \text{HCl}
\]
Syntheses Of Anhydrides Via Acylation Of Carboxylates

\[
\text{Ph}^+\text{Cl}^- + \text{OAc}^- \rightarrow \text{PhCOO}^-\text{OAc}^-
\]

\[
\text{Cl}^-\text{O}^-\text{O}^-\text{Ph} + \text{OAc}^-\text{O}^-\text{Ph} \rightarrow \text{Cl}^-\text{O}^-\text{O}^-\text{Ph} + \text{OAc}^-\text{O}^-\text{Ph}
\]

\[
\text{Ph}^+\text{Cl}^- + \text{OAc}^-\text{Et} \rightarrow \text{PhOAc}^+\text{O}^-\text{Et}
\]

\[
\text{BuCOCl}^- + \text{OAc}^-\text{Bu} \rightarrow \text{BuCOO}^-\text{Bu}
\]
Hydrolysis Of Acid Chlorides To Form Carboxylic Acids

the nucleophile is hydroxide, 
it is water; 
acylation of water.

under acidic conditions.
Acylation Of Alcohols To Form Esters

Indicate acid chloride and alcohol starting materials that could be used to make the following esters.

\[
\text{OCl} + \text{HO-Ph} \quad \rightarrow \quad \text{Cl} \quad \text{O} + \text{Ph} \quad \text{O} \quad \text{O}
\]

\[
\text{CH}_{2}\text{Cl} + \text{HO-Ph} \quad \rightarrow \quad \text{CH}_{2} \quad \text{O-Ph}
\]

\[
\text{PhCl} + \text{HO-} \quad \rightarrow \quad \text{Ph} \quad \text{O} \quad \text{O}
\]
Acylation Of Amines To Give Amides

Proton before chloride loss, shows it after.
gives \textit{unstable} products

\begin{align*}
\text{DMAP} & \quad \text{N-acetyl DMAP} \\
\text{good acylating agent for other nucleophiles}
\end{align*}

\begin{align*}
\text{amine?}
\end{align*}
give esters, acids, ammonia to give amides.
C. Acylation Reactions Of Carboxylic Acid Anhydrides

slightly less reactive
would be the same.
an electrophile and the
would be a good strategy.

\[
\begin{align*}
\text{AcHN} & \quad \text{CO}_2^- \\
\text{NH}_2 & \quad \text{NH} \\
\text{O} & \quad \text{O} \\
\text{O} & \quad \text{O} \\
\text{H}_2 & \quad \text{N} \\
\text{CO}_2^- & \quad \text{O} \\
\text{O} & \quad \text{O} \\
\end{align*}
\]
isatoic anhydride