

## Chem 345 – Organic Reactions

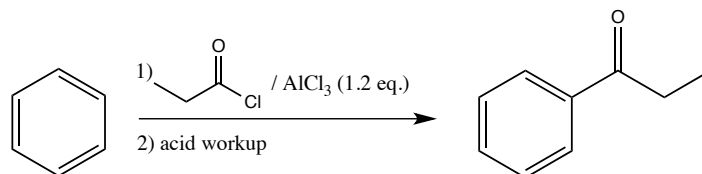
### Chapter 16

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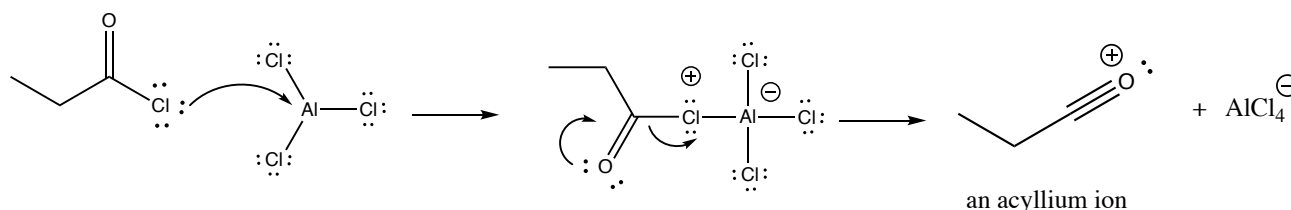
<http://www.chem.wisc.edu/areas/clc> (Resource page)

#### EAS – Friedel Crafts Acylation

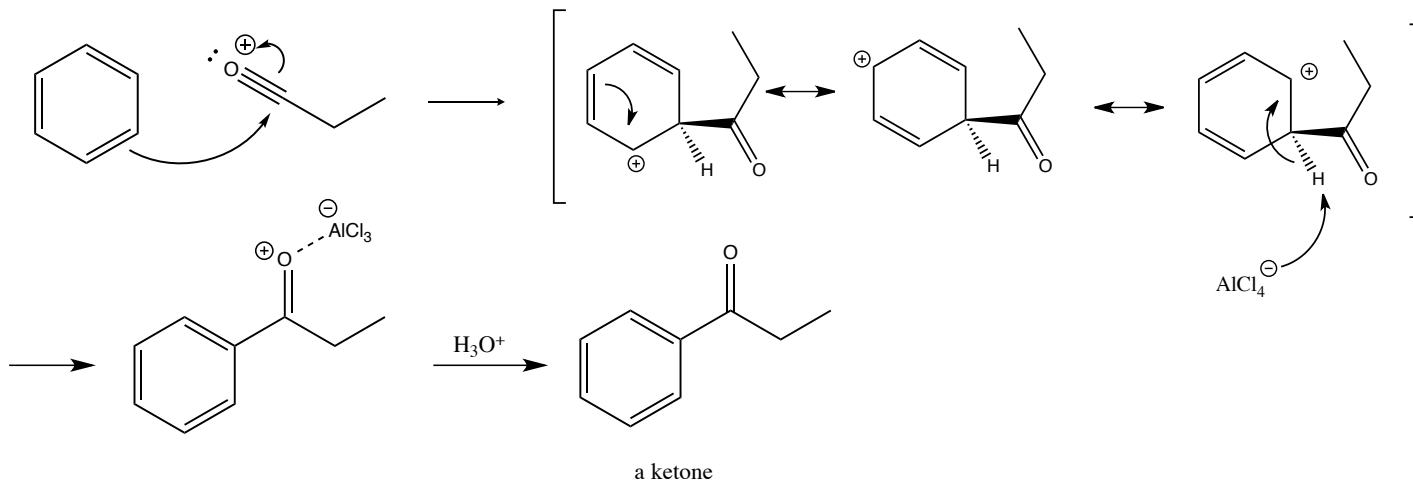
##### Reaction



##### Electrophile



##### Mechanism



For this acylation process the electrophiles are always acylium ions. They are resonance stabilized. The C-O bond is shorter than in a carbonyl. This suggests a greater contribution of the  $\text{C}^+\equiv\text{O}$  to the resonance hybrid. Notice carefully that the electrophilic portion of the acylium ion is the carbon atom not the oxygen atom.

The Friedel-Crafts acylation reaction requires at least an equivalent amount of the Lewis acid because it is bound to the product forming an adduct. Experimentally more than an equivalent is added. Then addition of slightly acid water as a second step is used to break-up the adduct.

In the case of Friedel-Crafts acylation over-acylation rarely occurs. This is due to the fact that the product of the reaction is deactivated toward EAS more so than the starting reagent.

One disadvantage of the acylation process is that in a substituted aromatic starting reagent the substituent has to activate the arene compound. Halogens or less deactivating substituents will not allow arene compounds to react.