## Friedel-Crafts Alkylation

Generic example:

Bonds Bonds **Formed** Broken

Lewis acid

C-H

- · R-X must be an alkyl halide (typically alkyl chorides, bromides, or iodides)
- Lewis acid often AlCl<sub>3</sub> but can vary widely (e.g. TiCl<sub>4</sub>, ZrCl<sub>4</sub>)

does not work for





alkenyl halides

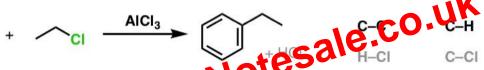
alkynyl halides

## Friedel-Crafts Alkylation

Specific example:

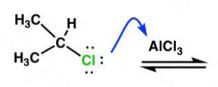
**Bonds Formed**  **Bonds** Broken





Step 1: Activation of Electrip th Lewig Acia

des, full dissociation to a carbocation



AICI4 Carbocation

0

" Activated " electrophile AlCl<sub>4</sub> is a better leaving group than CI Θ

weakened C-Cl bond

weakened C-Cl bond

For primary (and methyl) alkyl halides, it is unlikely that a "free" carbocation is present:

" Activated " electrophile