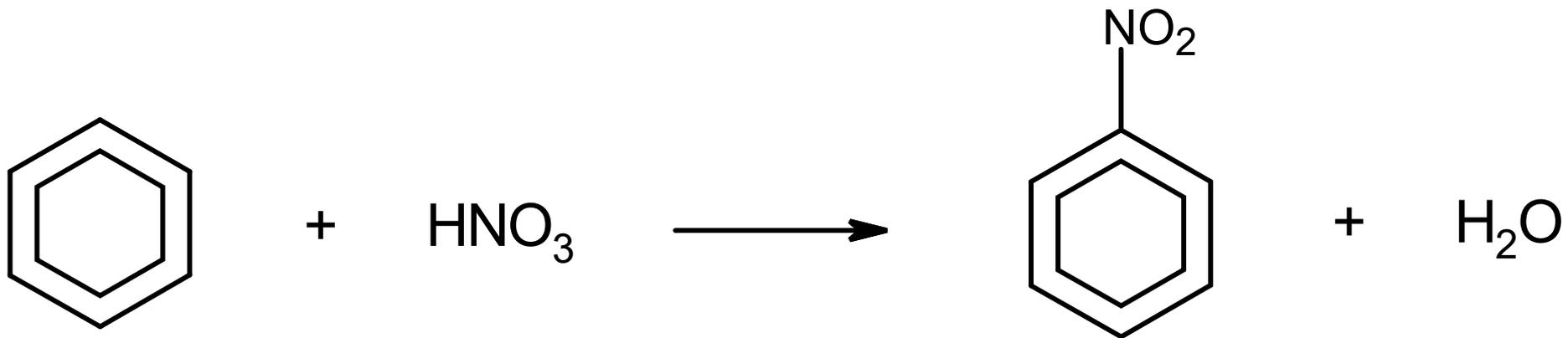WWW.CHEMSHEETS.CO.UK

REACTIONS OF AROMATICS

NITRATION – Electrophilic substitution
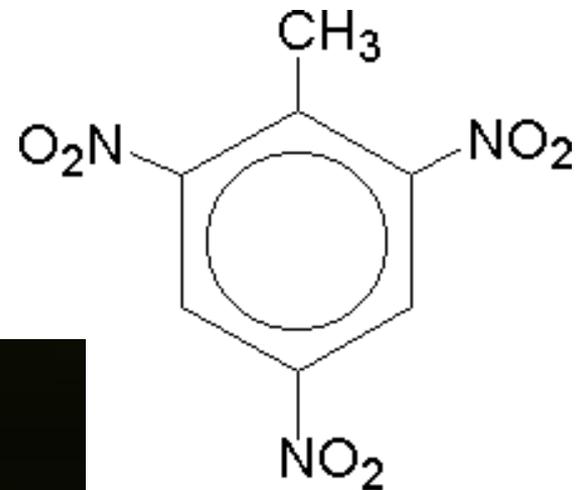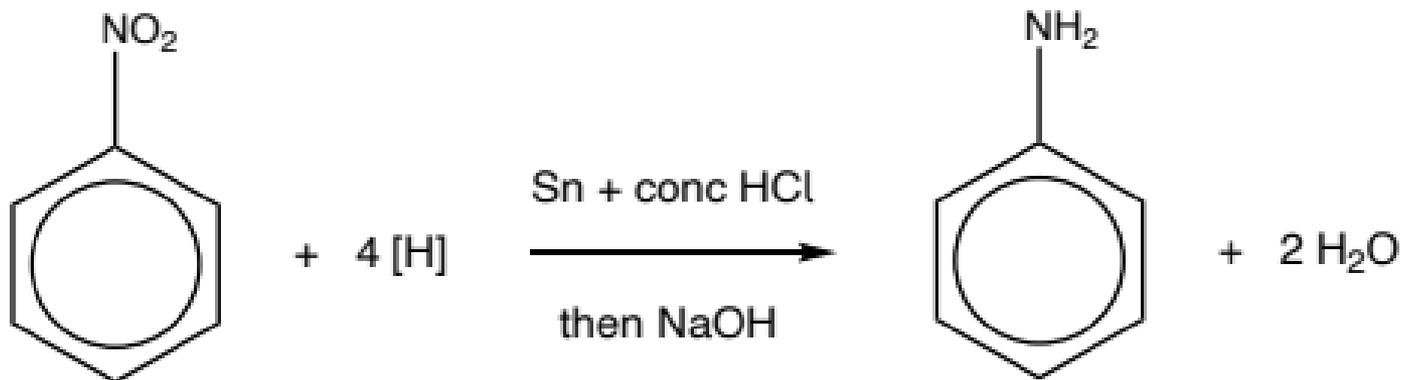

conc HNO_3

conc H_2SO_4
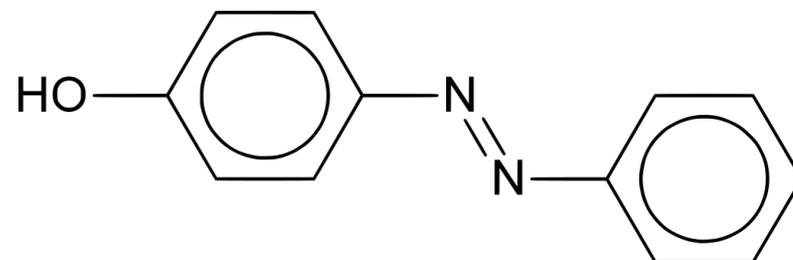
50°C

Aromatic NITRO compounds - USES

TNT (trinitrotoluene)
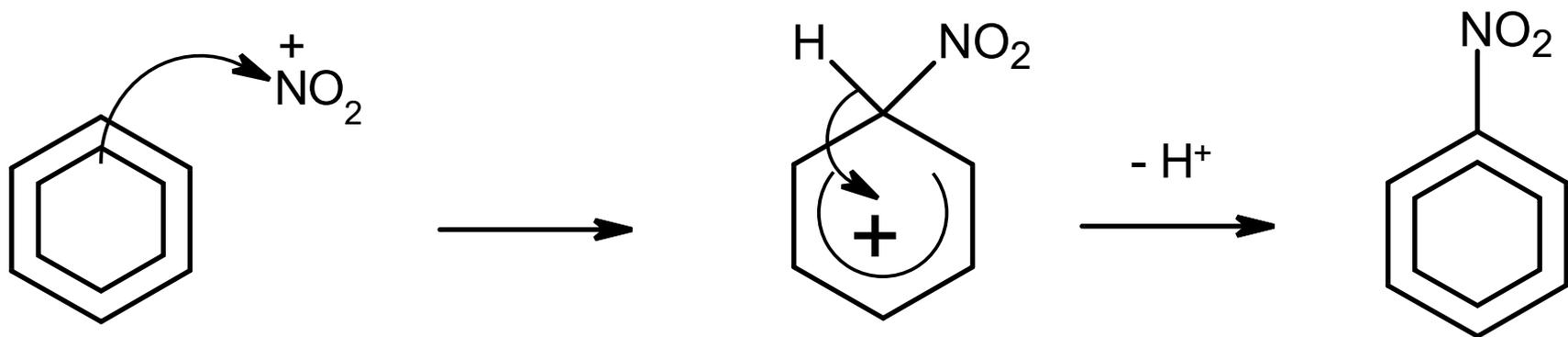
Aromatic NITRO compounds - USES

Making primary amines
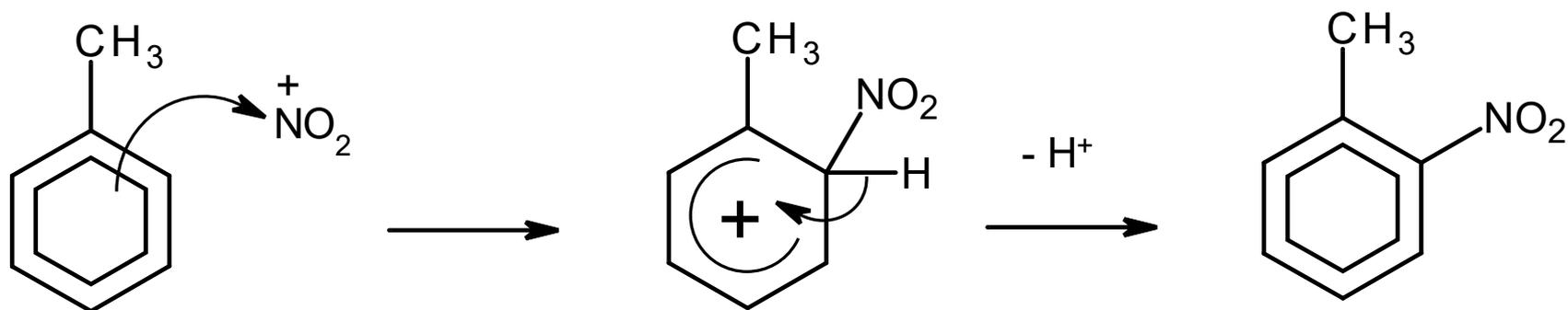(used to make azo
dyes)
e.g. a yellow azo dye

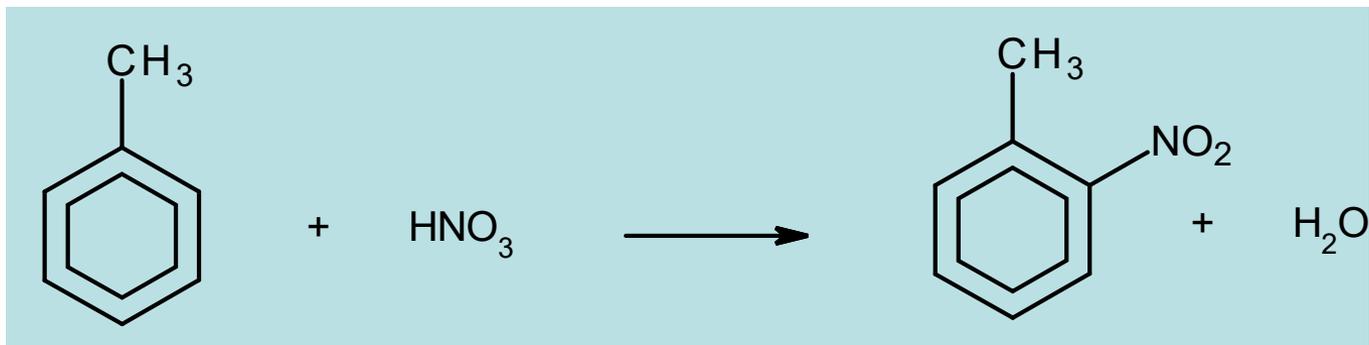# NITRATION – Electrophilic substitution
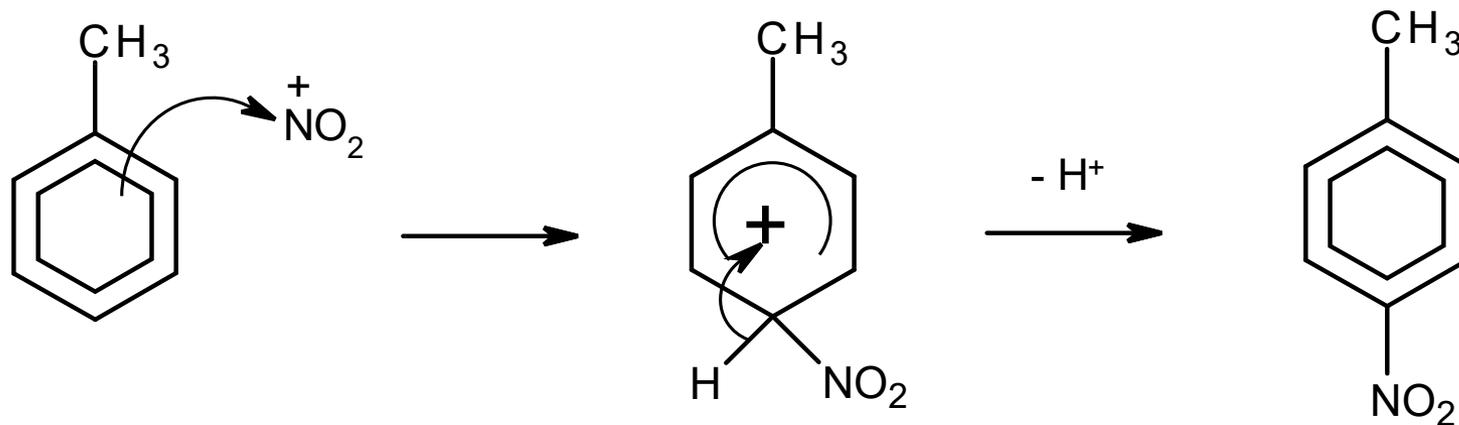
electrophile = NO_2^+ (nitronium ion)

$$HNO_3 + 2H_2SO_4 \rightarrow NO_2^+ + 2HSO_4^- + H_3O^+$$

$$HNO_3 + 2H_2SO_4 \rightarrow NO_2^+ + 2HSO_4^- + H_3O^+$$

Electrophilic substitution

$$HNO_3 + 2H_2SO_4 \rightarrow NO_2^+ + 2HSO_4^- + H_3O^+$$

Electrophilic substitution

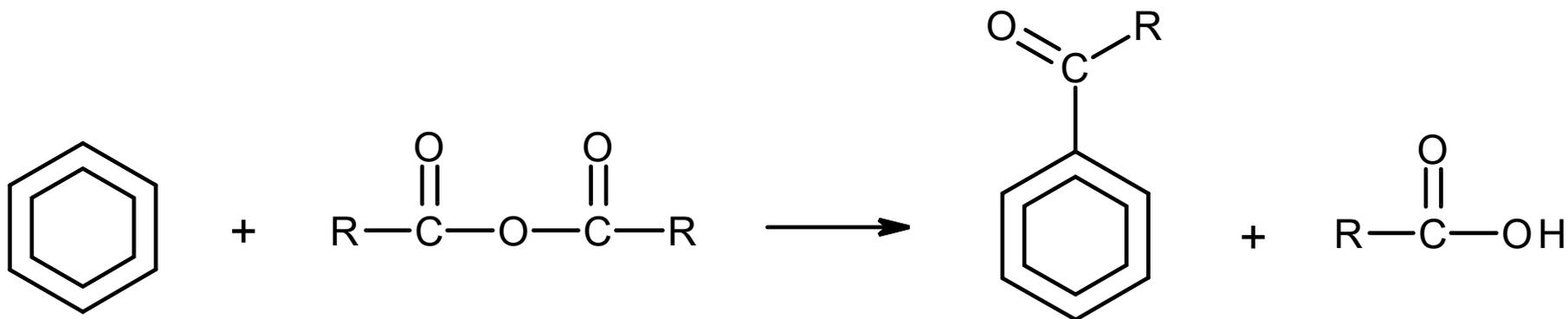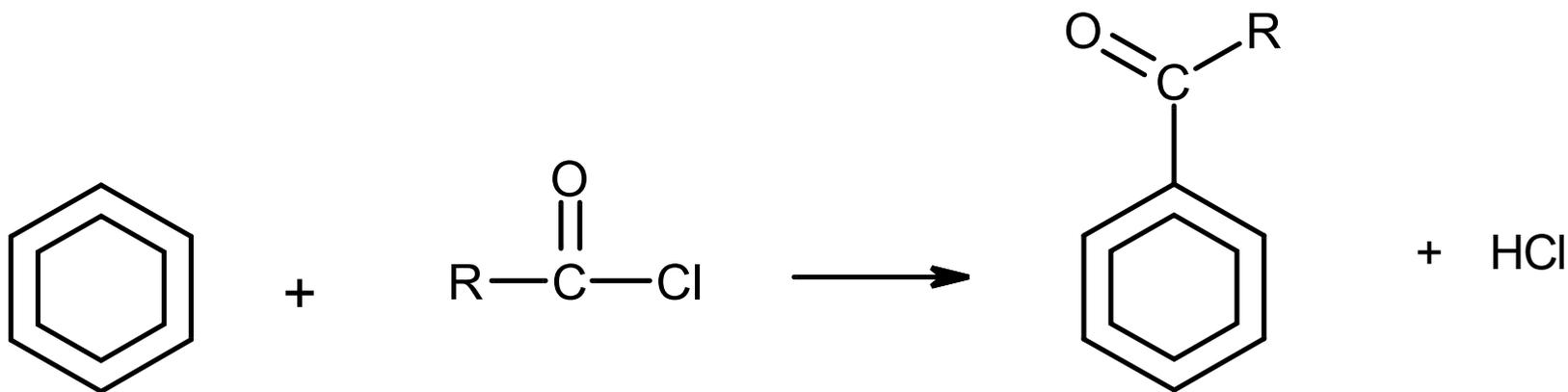$$HNO_3 + 2H_2SO_4 \rightarrow NO_2^+ + 2HSO_4^- + H_3O^+$$

Electrophilic substitution

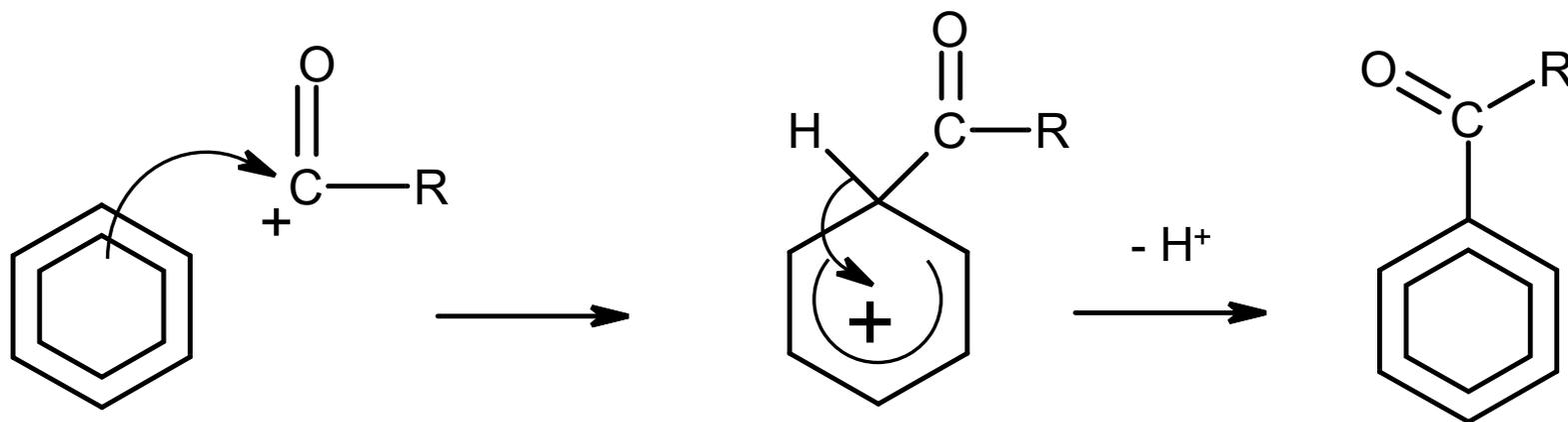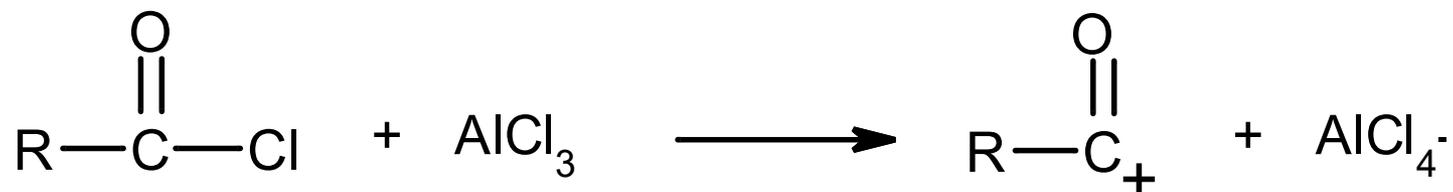# FRIEDEL-CRAFTS ACYLATION – Electrophilic substitution

AlCl$_3$
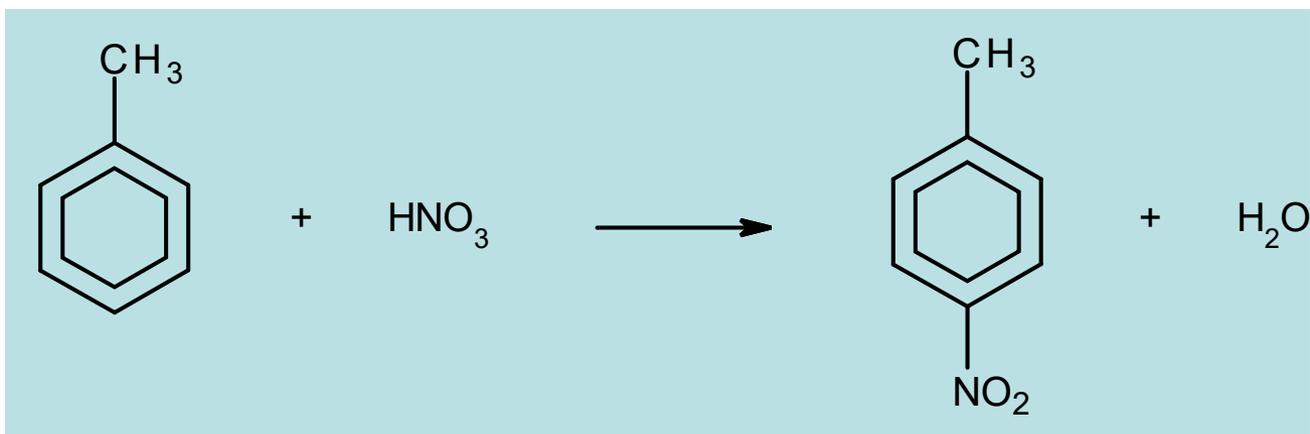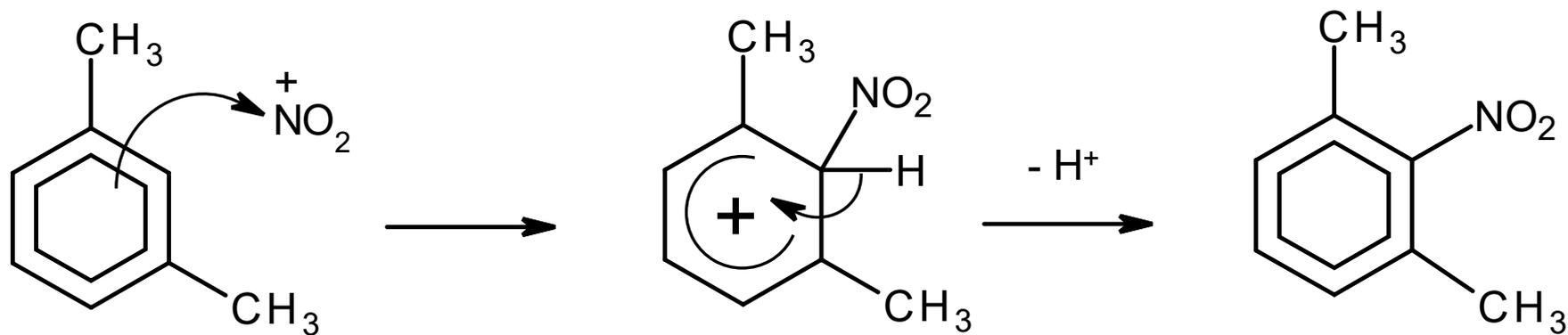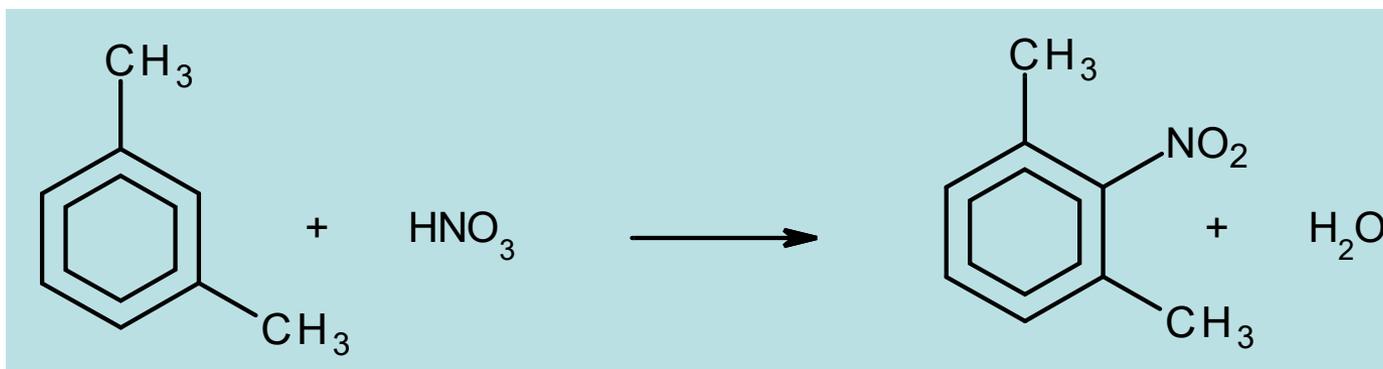
Acyl chloride / acid anhydride

VERY useful in organic synthesis as it is a way of adding C atoms onto an aromatic ring.
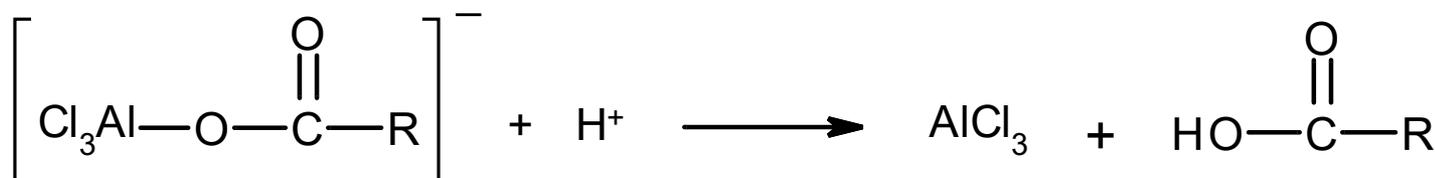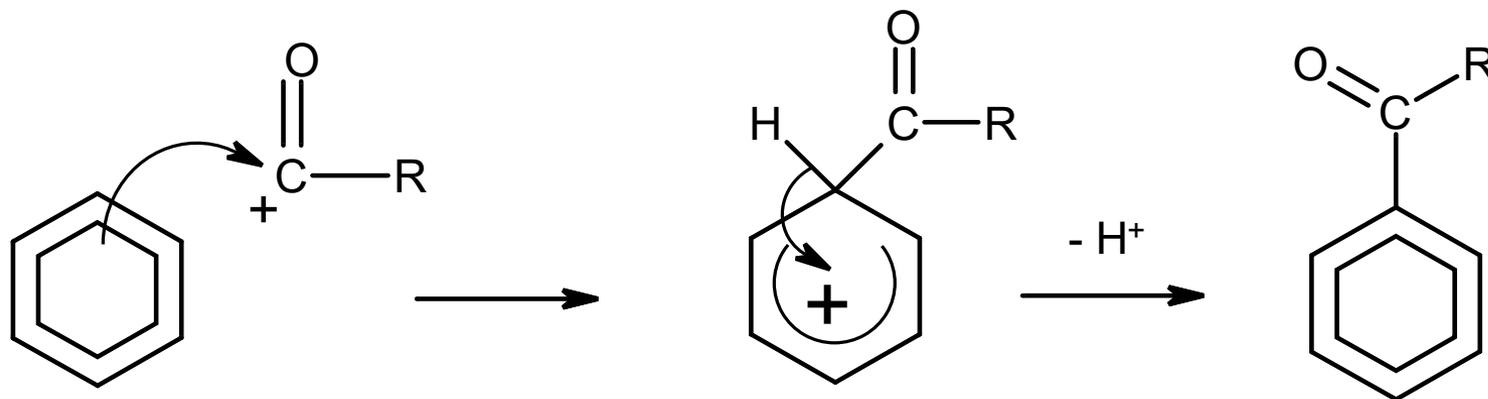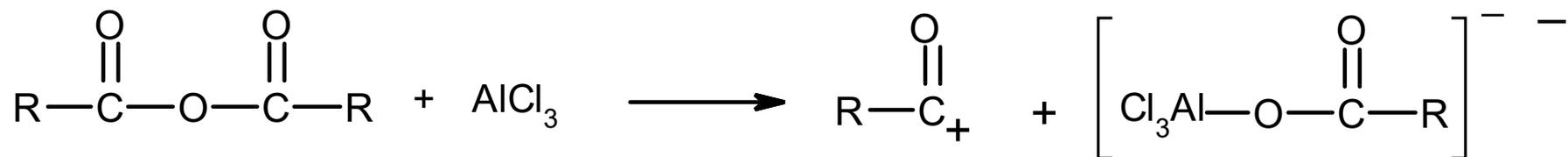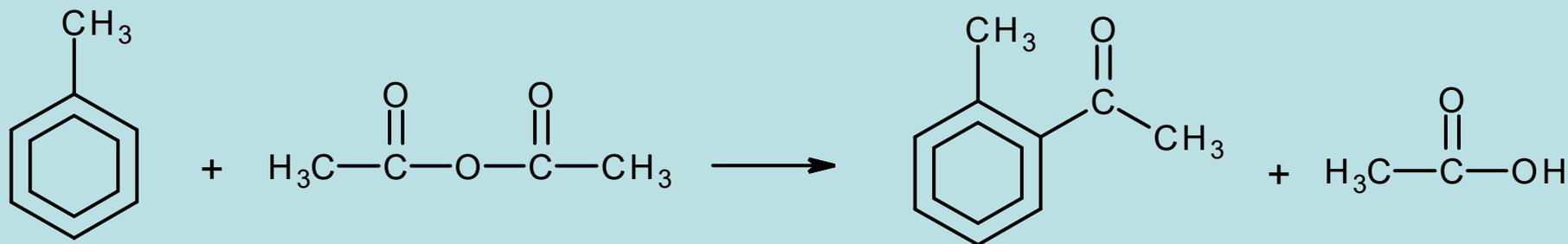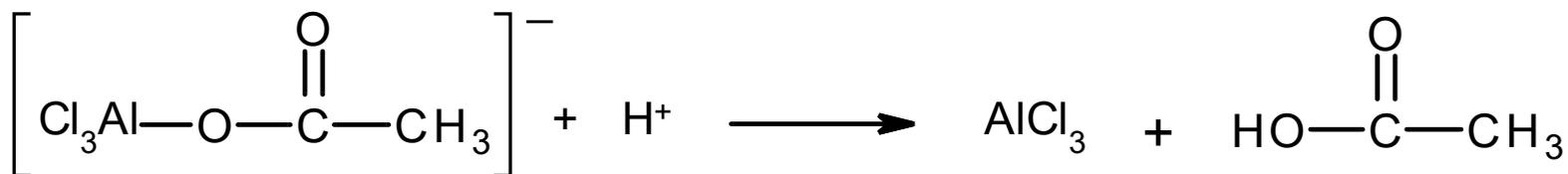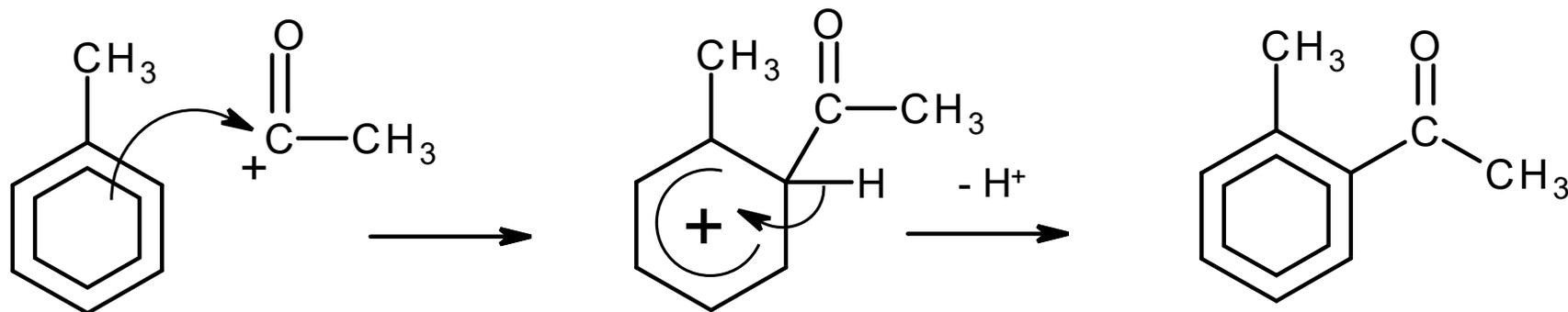
FRIEDEL-CRAFTS ACYLATION
Electrophilic substitution

electrophile = RCO$^+$ (acylium ion)

$$AlCl_4^- + H^+ \rightarrow AlCl_3 + HCl$$

FRIEDEL-CRAFTS ACYLATION
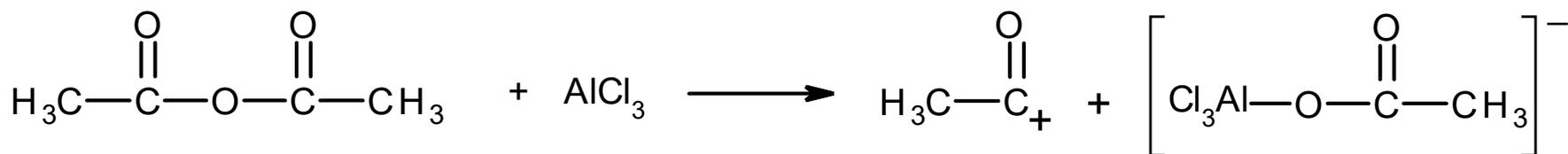## Electrophilic substitution

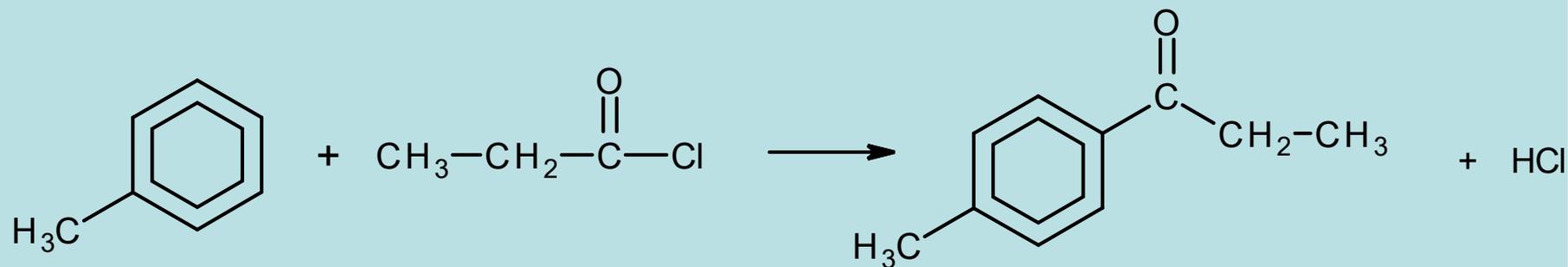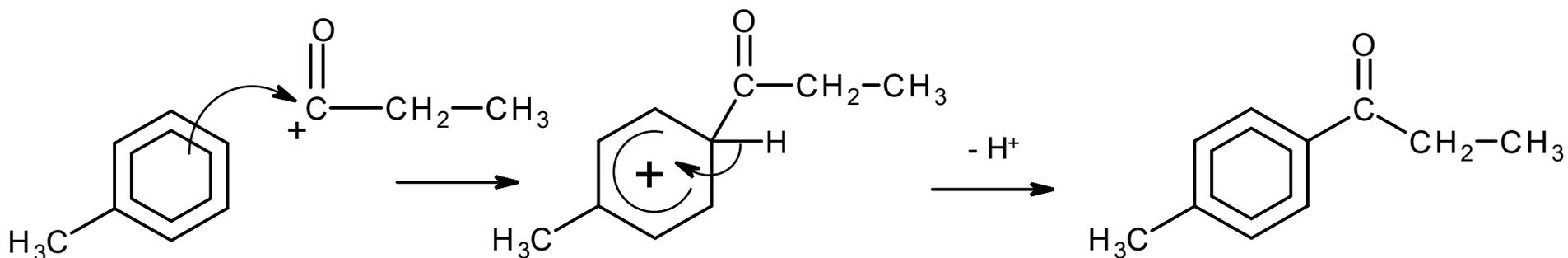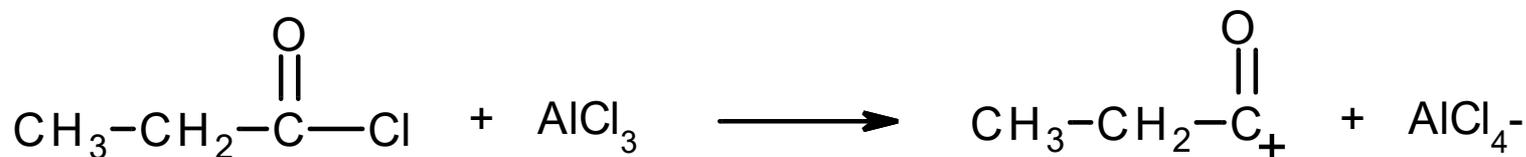electrophile = RCO$^+$ (acylium ion)

Electrophilic substitution

Electrophilic substitution
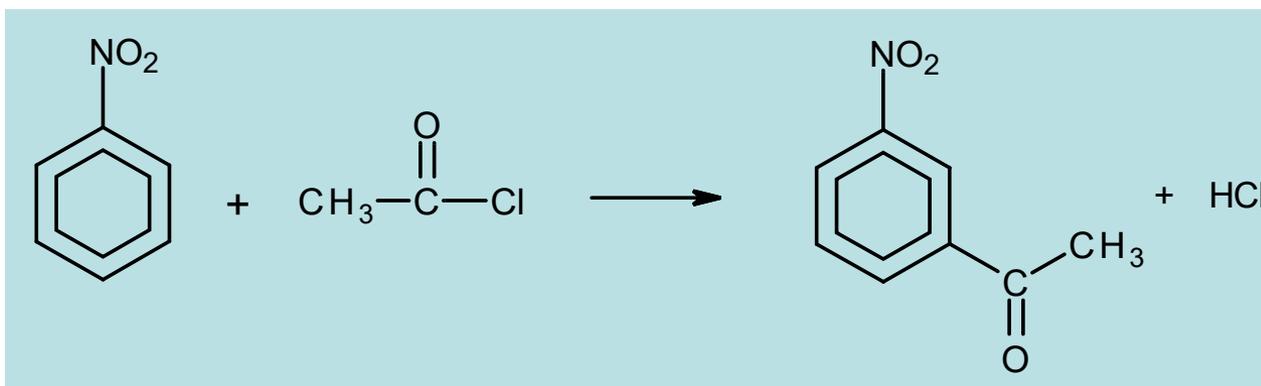

$$AlCl_4^- + H^+ \rightarrow AlCl_3 + HCl$$

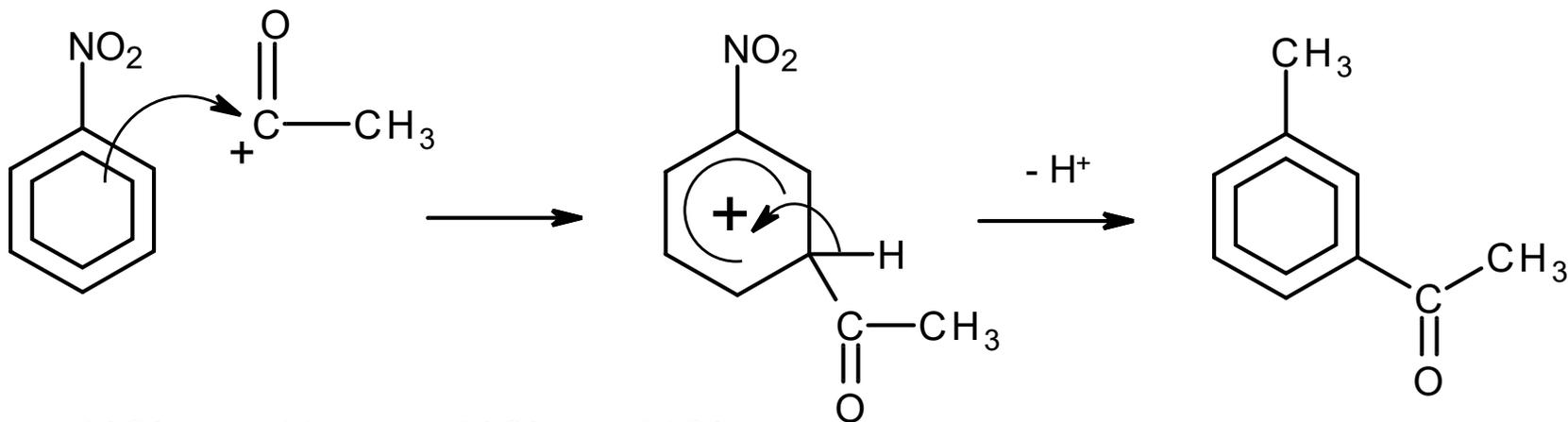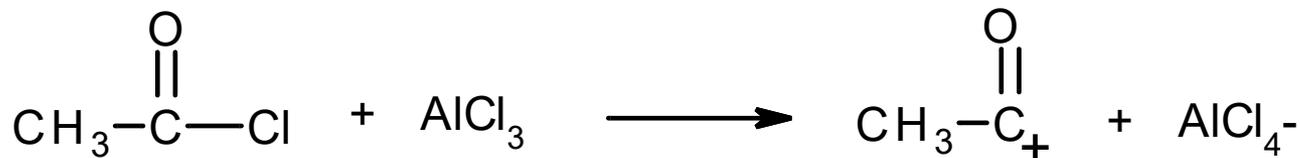**Electrophilic substitution**
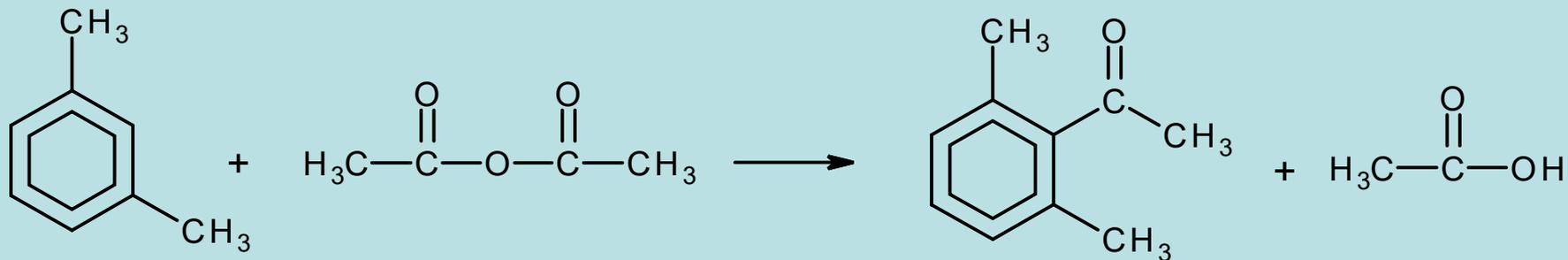

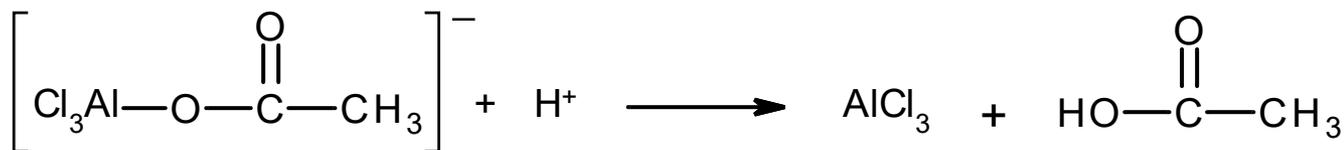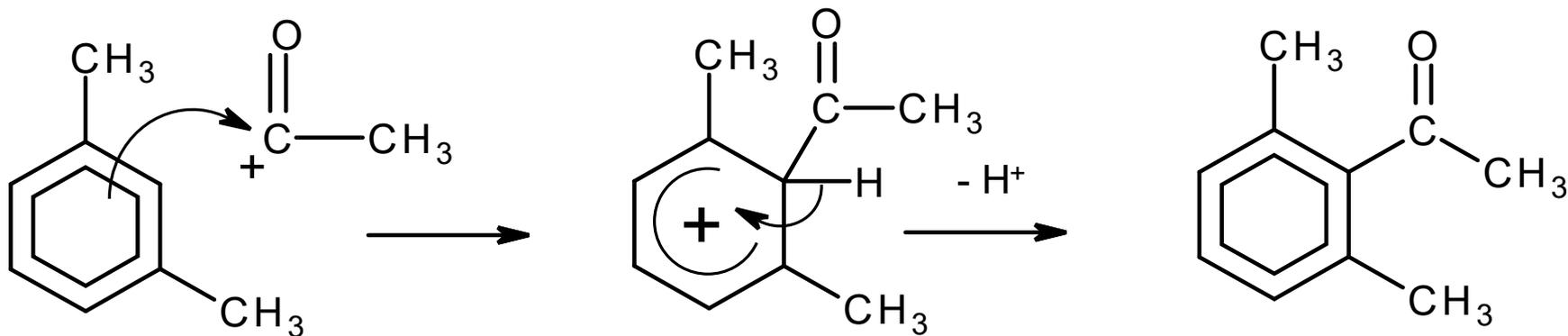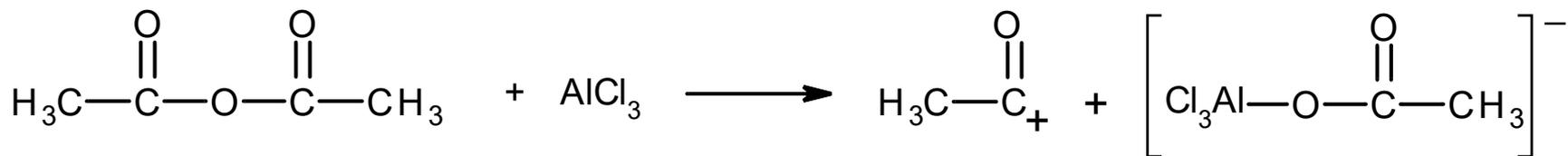$$AlCl_4^- + H^+ \rightarrow AlCl_3 + HCl$$

Electrophilic substitution

FRIEDEL-CRAFTS ACYLATION

WARNING! - do not mix

Friedel-Crafts acylation   **&**   **other acylations**
(needs AlCl$_3$)
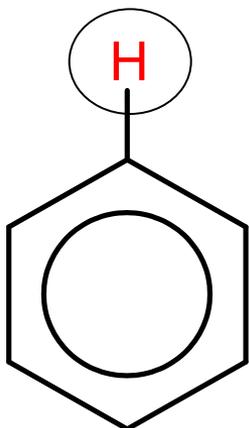
Swap H on benzene ring

for acyl group
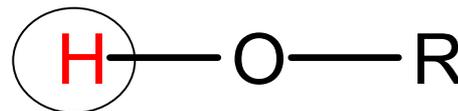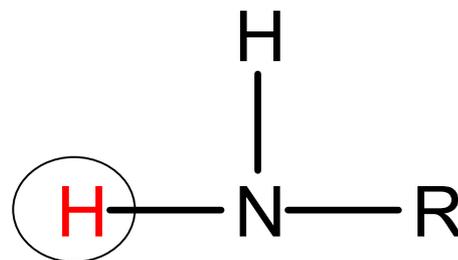
Swap H on O/N

for acyl group