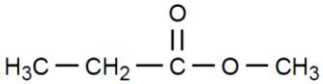
Karlsruher Institut für Technologie

Organische Chemie I – Teil 16

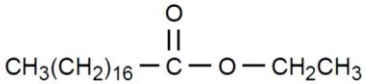
Stefan Bräse
Institut für Organische Chemie & Institut für Biologische und Chemische Systeme

Allgemeines I

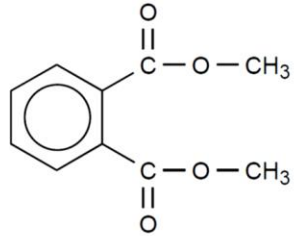
- Aus sauer katalysierter Veresterung einer Carbonsäure mit einem Alkohol
- Nomenklatur:
  - Carbonsäure und Alkylrest des Alkohols
  - Suffix: „Ester“
  - z.B. Essigsäureethylester
  - Alkylrest und Trivialnamen für Säurerest RCOO, z.B. Ethylacetat
  - IUPAC: Alkylalkanoat, z.B. Ethylethanoat
- Funktionelle Gruppe:
  - Estergruppe „-COOR“
  - Alkoxycarbonyl- oder Alkyloxycarbonyl-Gruppe



Propionsäuremethylester
Methylpropionat
Methylpropanoat



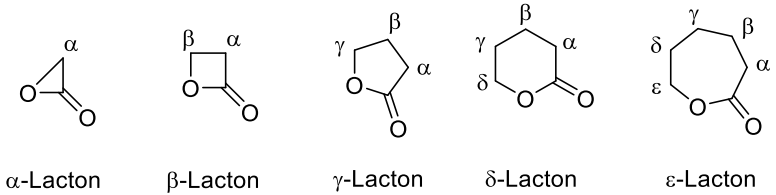
Stearinsäureethylester
Ethylstearat
Ethyloctadecanoat



Phthalsäuredimethylester
Dimethylphthalat

Allgemeines II

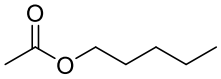
- Cyclische/intramolekulare Ester: Lactone
  - Position des Alkohols in der Kette: α-, β-, γ-, δ-, ε-Lacton

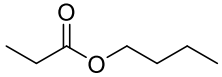


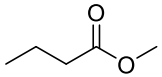
α-Lacton β-Lacton γ-Lacton δ-Lacton ε-Lacton

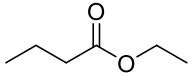
Vorkommen

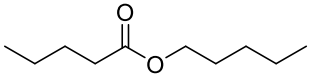
- Aromastoffe


Birnenessenz


Rumessenz

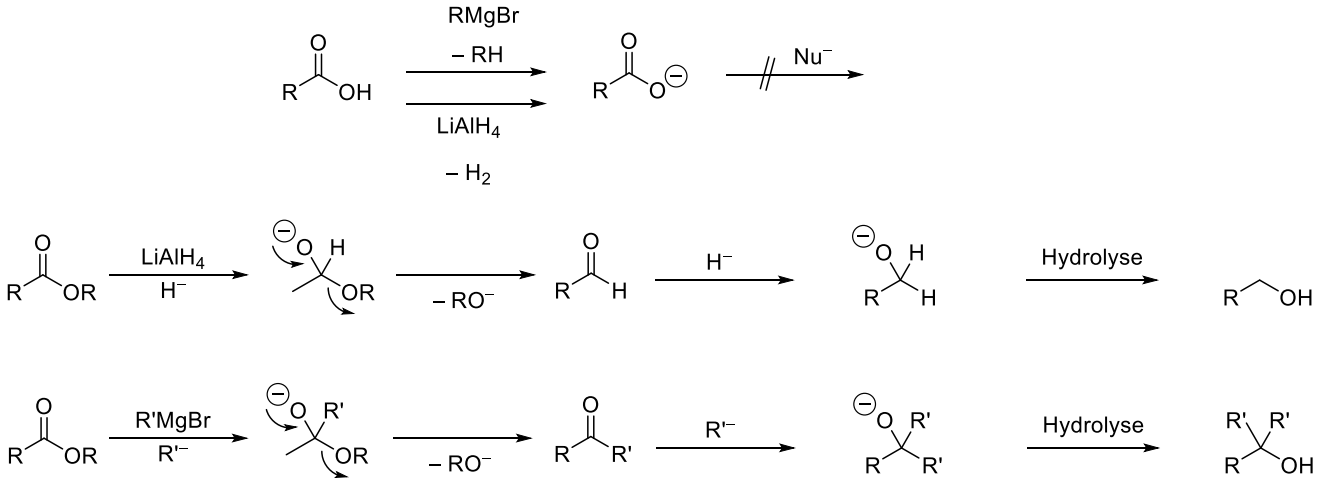

Ananasessenz


Pfirsichessenz


Apfelessenz

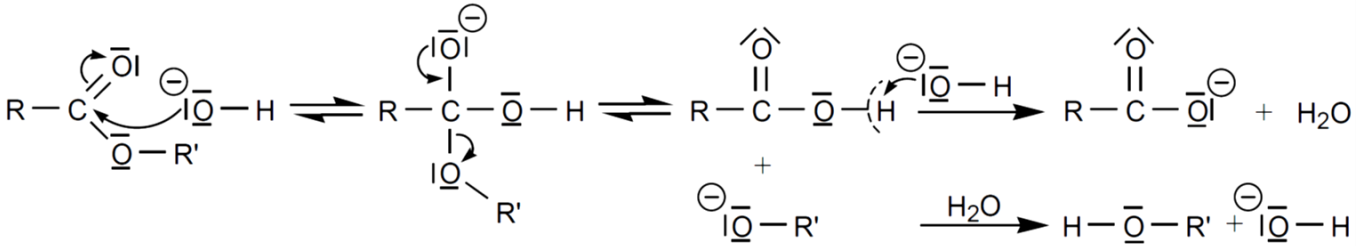
- Fette, Öle, Wachse

Reaktionen – Reduktionen

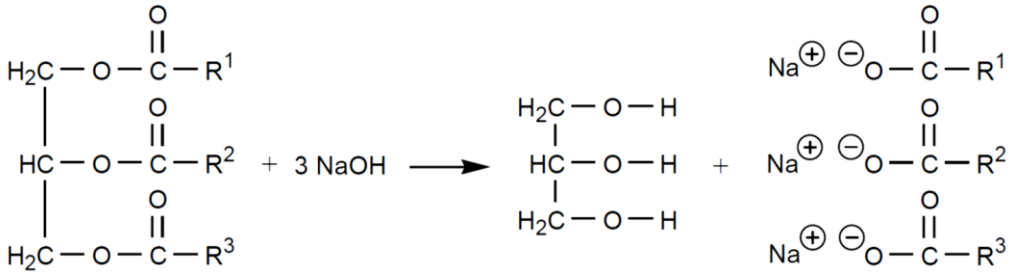


Reaktionen – Esterspaltung I

- Basische Hydrolyse (Natriumhydroxid) – Verseifung

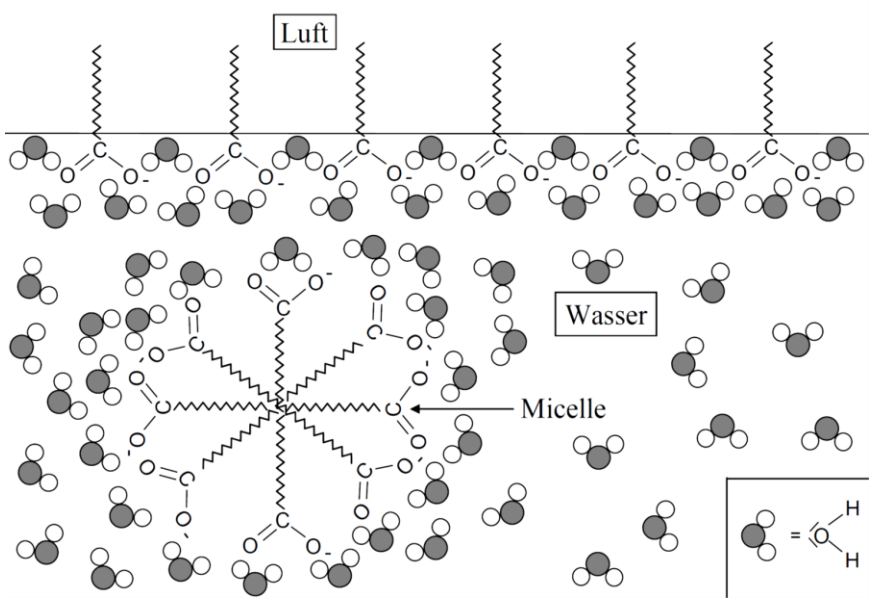


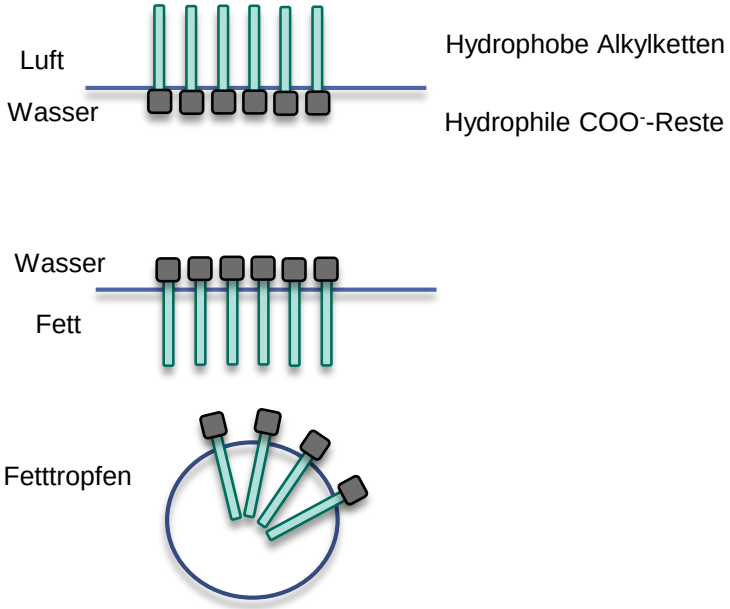
- Seifengewinnung



Einschub – Seifen

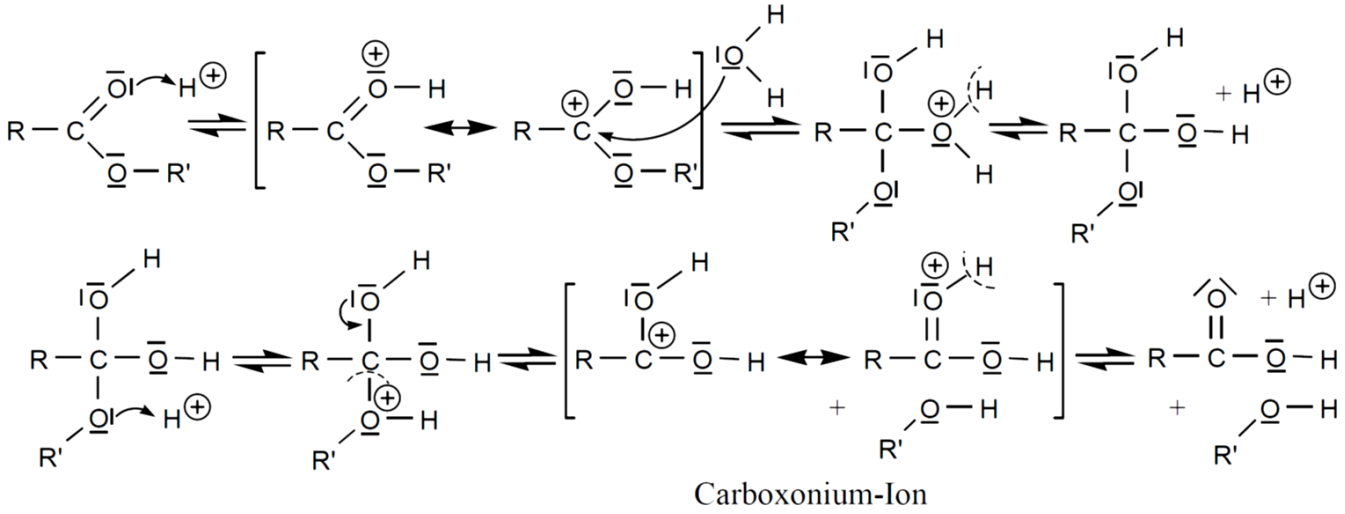
- Seifenwirkung



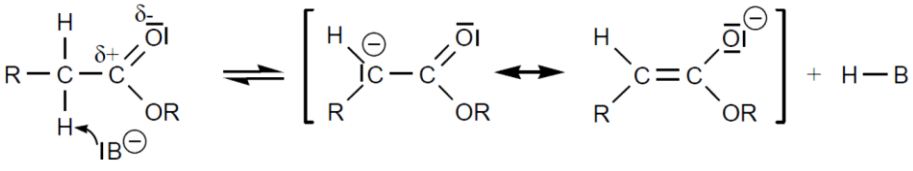


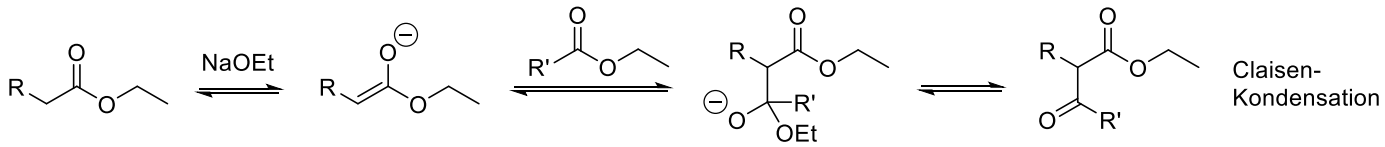
Reaktionen – Esterspaltung II

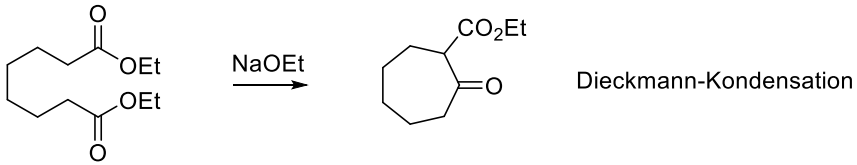
- Saure Hydrolyse und Umesterung



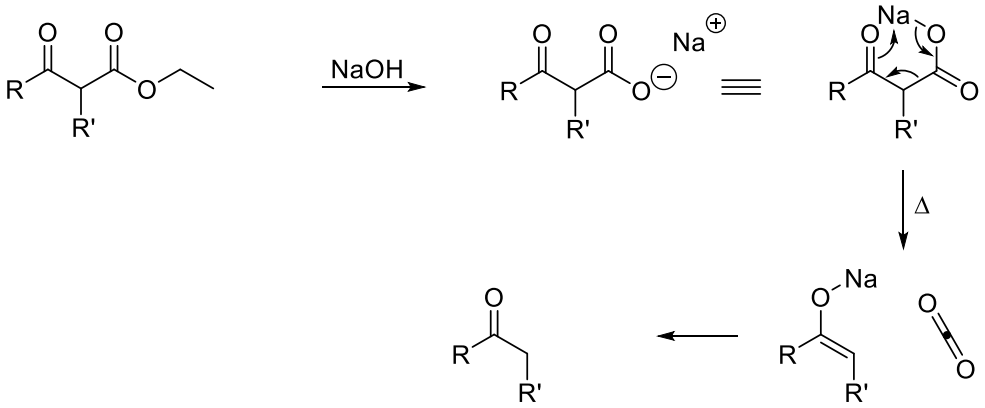
Reaktionen – CH-Azidität



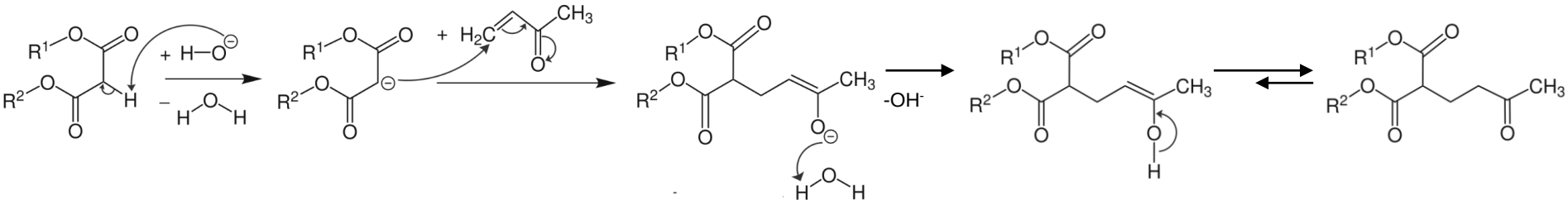




Reaktionen – Decarboxylierung

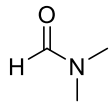


Reaktionen – Michael-Reaktion

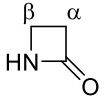


Allgemeines

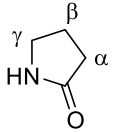
- Nomenklatur



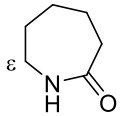
N,*N*-Dimethylformamid (DMF)



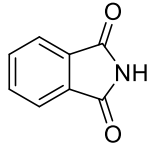
β-Lactam



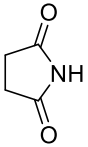
γ-Lactam



ε-Caprolactam

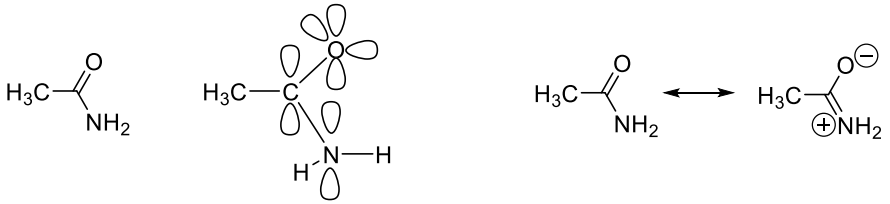


Phthalimid

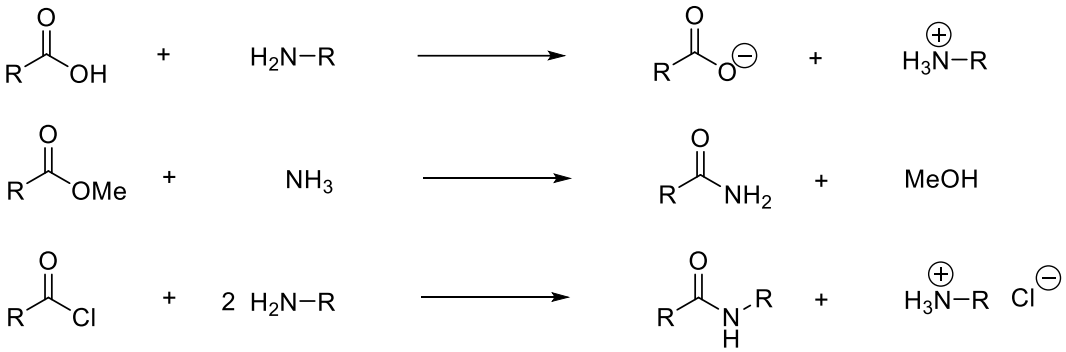


Succinimid

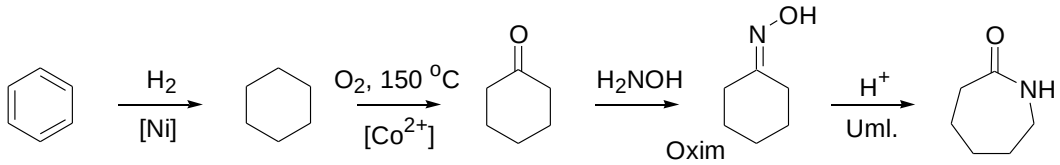
- Hybridisierung und Mesomerie:

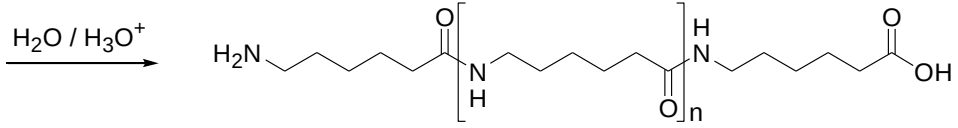


Synthese

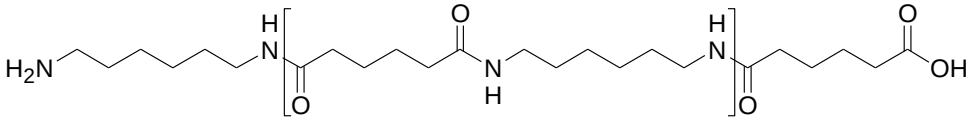


Reaktionen – Polyamide



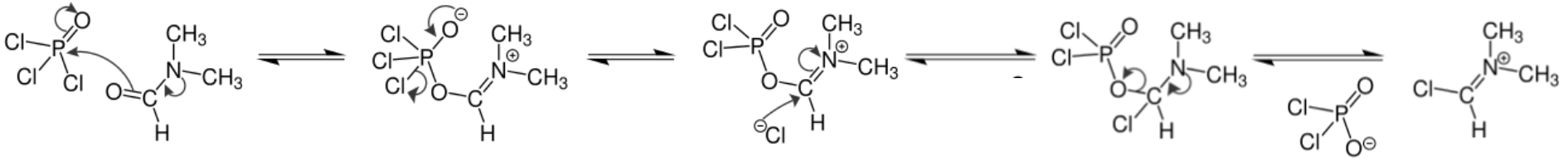


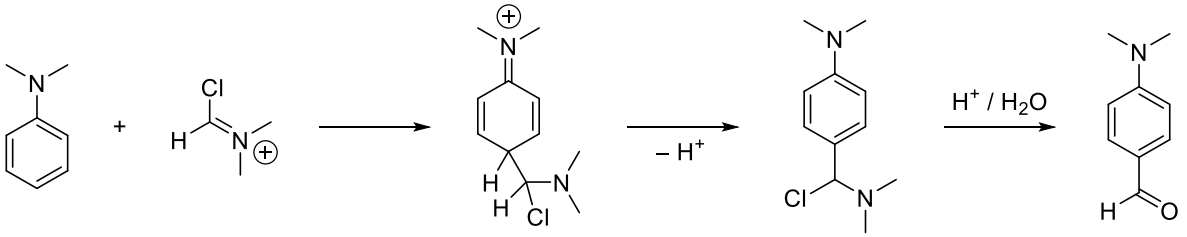
Perlon (Nylon-6)



Nylon (Nylon-6,6)

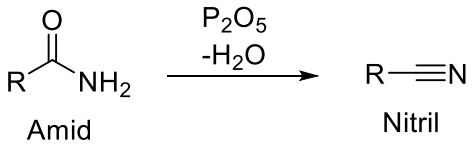
Reaktionen – Vilsmeier-Haack Reaktion



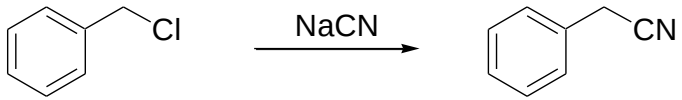


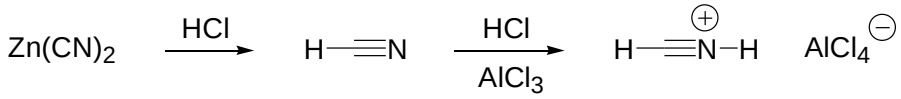
Substituenten	Dirigierung	Aktivierung
O^-	o, p	sehr stark aktiviert
NR_2, OR, NH_2	o, p	stark aktiviert
R, Ar	o, p	schwach aktiviert
H	–	
Cl, Br	o, p	schwach deaktiviert
NO_2, COR, COX, SO_3H, CN	m	stark deaktiviert
NH_3^+, NR_3^+	m	sehr stark deaktiviert

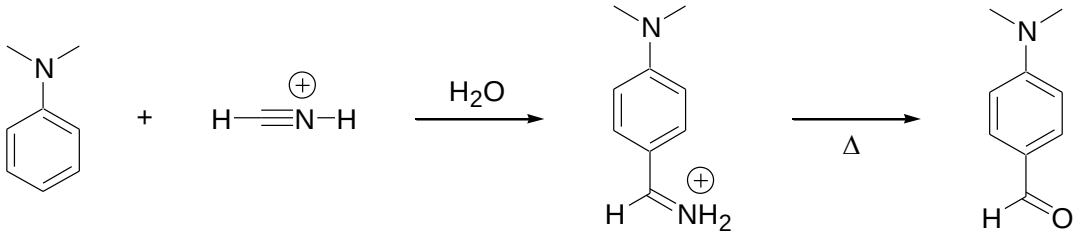
Reaktionen – Nitrile



- Labor:







Fragen?