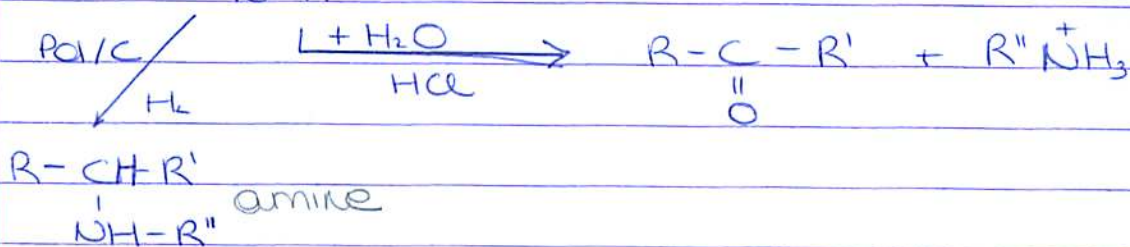
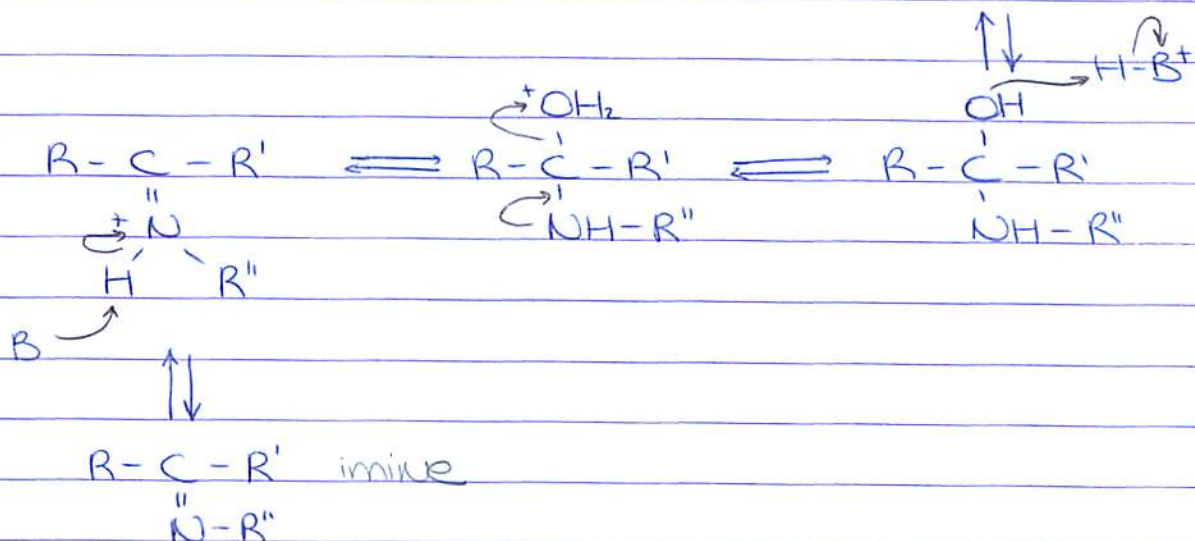
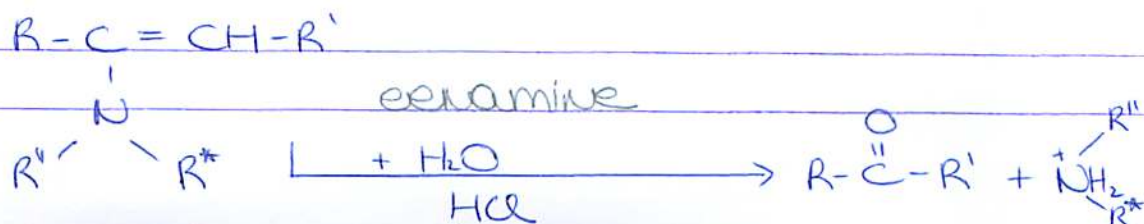
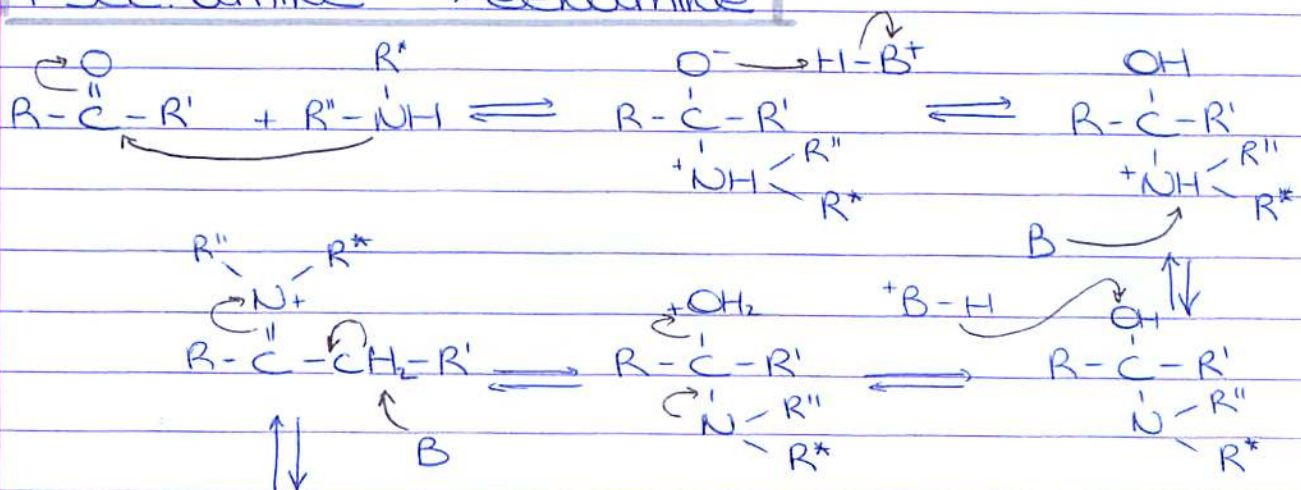


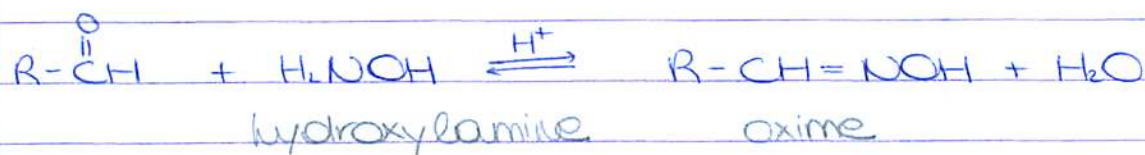
+ ^v amine \rightarrow imine



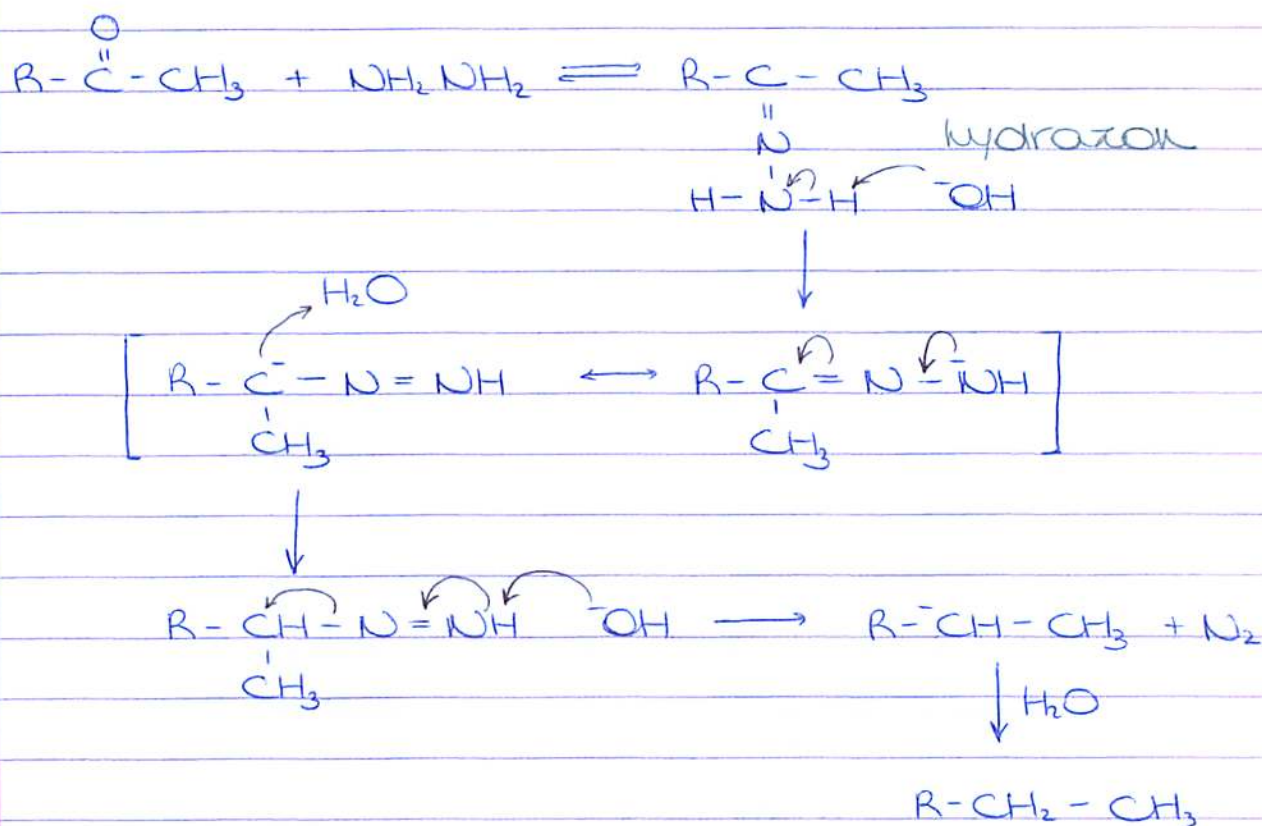
+ sec. amine \rightarrow sec amine



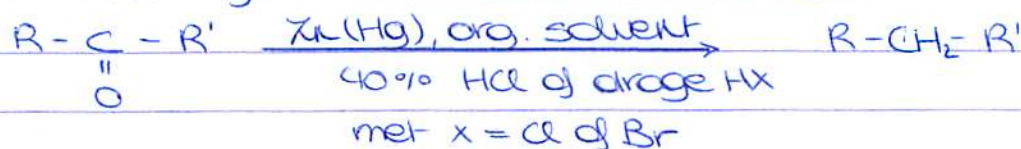
+ hydroxylamine \rightarrow Oxime



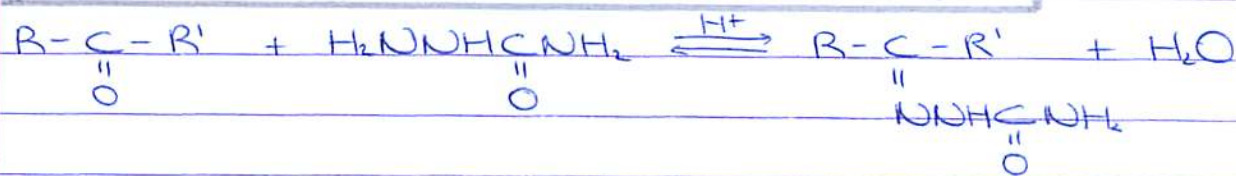
+ hydrazine \rightarrow hydrazone \rightarrow alkaan
 = Wolff-Kischner reductie reductie



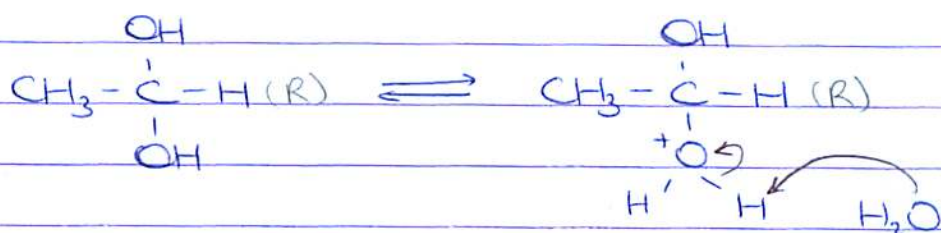
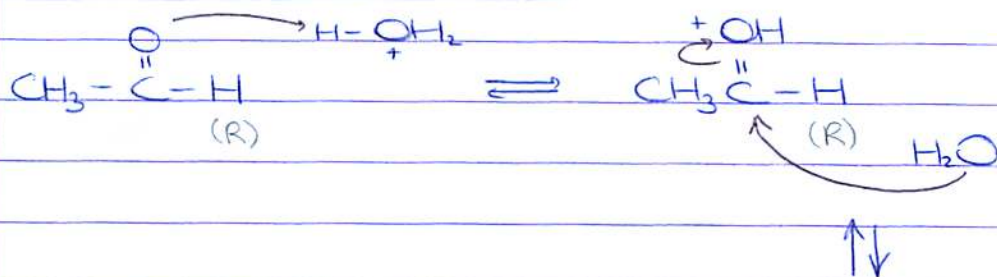
alternatief: Clemmensen reductie



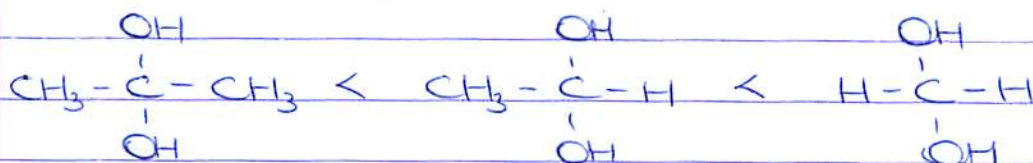
+ semicarbazide \rightarrow semicarbazone



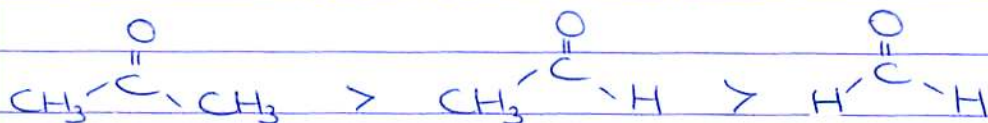
+ $H_2O \rightarrow$ hydraat



opmerking: evenwicht afh. van stabiliteit van keton / aldehyd en hydraat

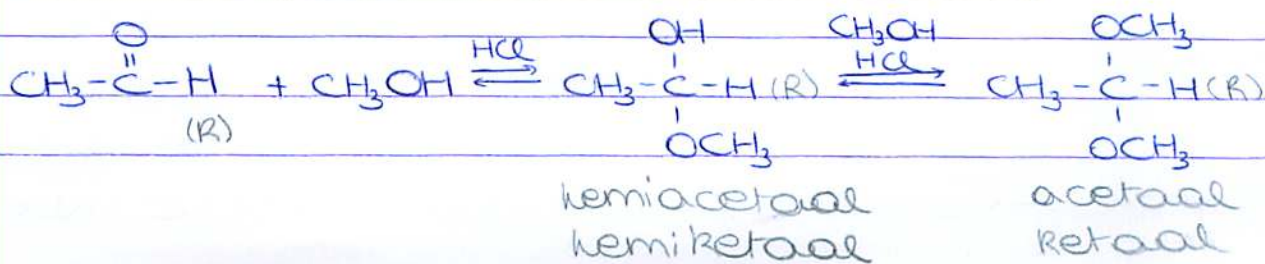


\rightarrow sterische interactie

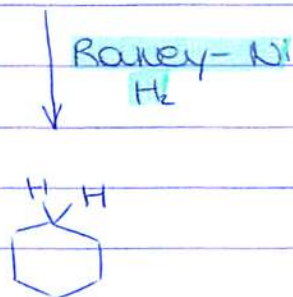
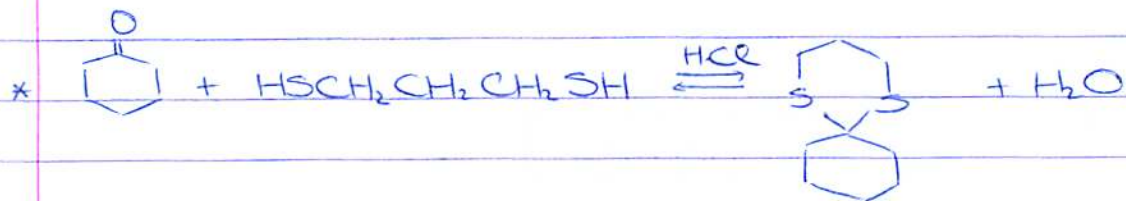
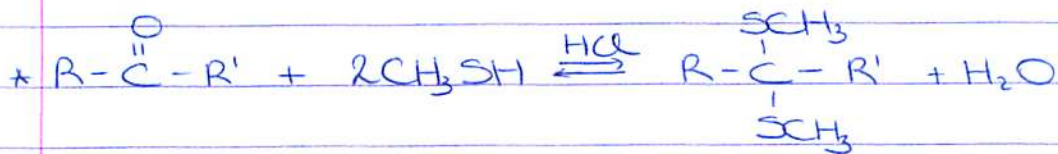


\rightarrow inductief e^- donerend effect

+ alcohol \rightarrow (hemi)acetaal / ketaal

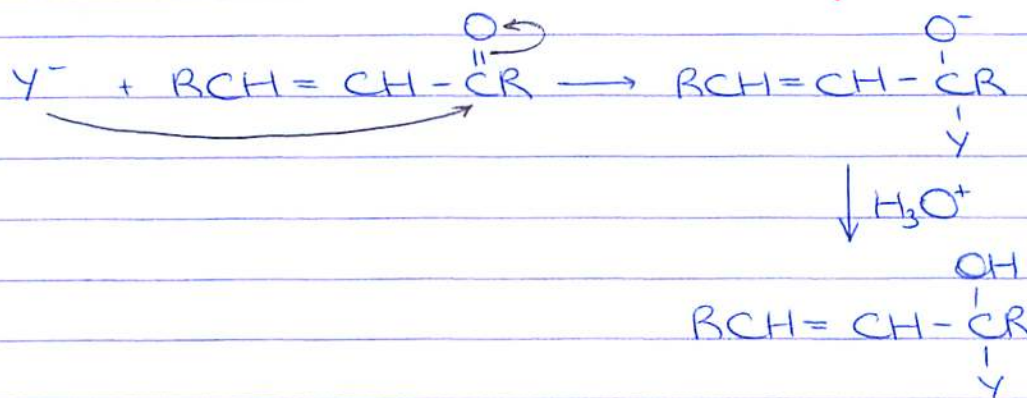


+ S-nucleofielen \rightarrow Thioacetalen / Ketalen



1,2-additie

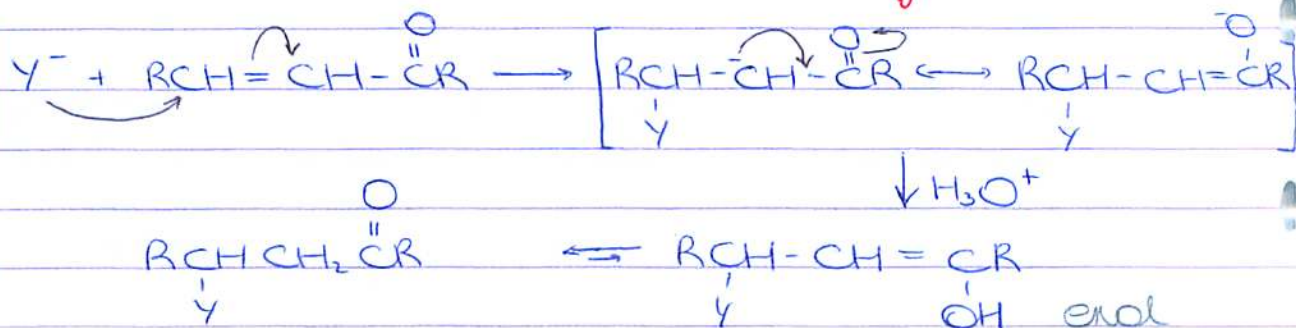
sterke basen !



vb. met $NaBH_4$ en EtOH

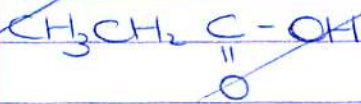
1,4-additie

zwakke basen !

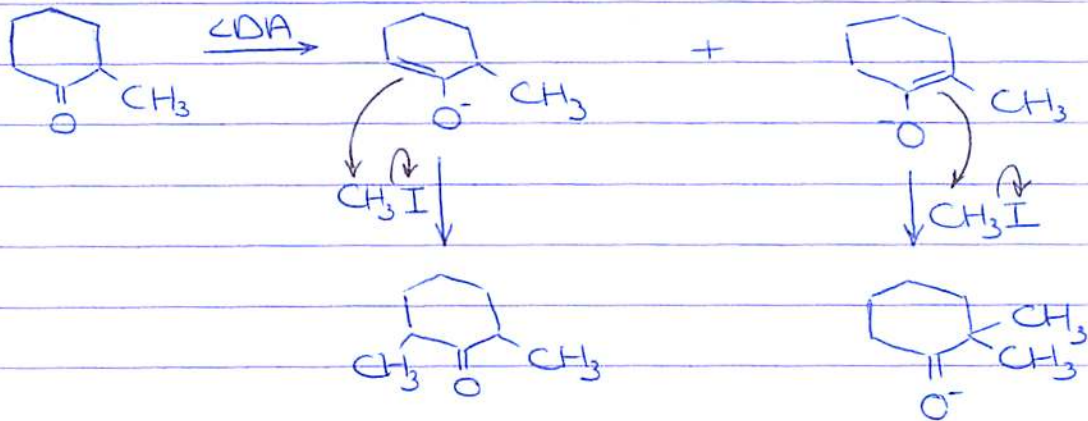
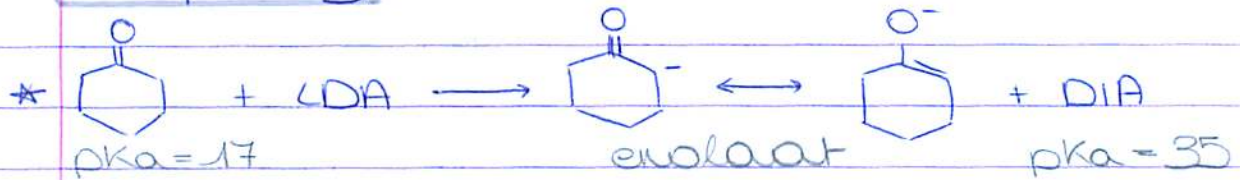


\rightarrow sterk gepromoot door sterische hinder

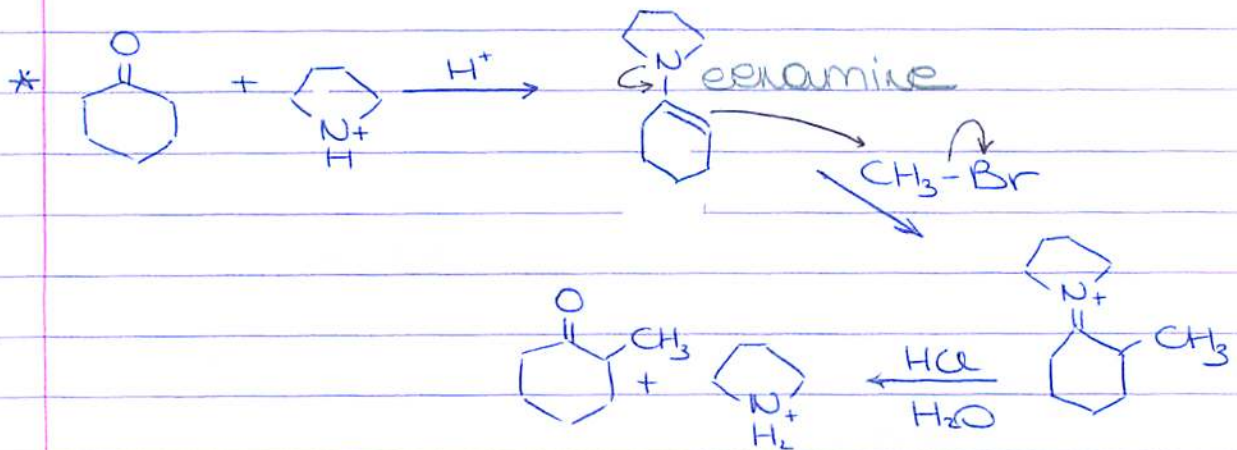
④ Hell-Volhard-Zelinsky (zuur)



Alkylering



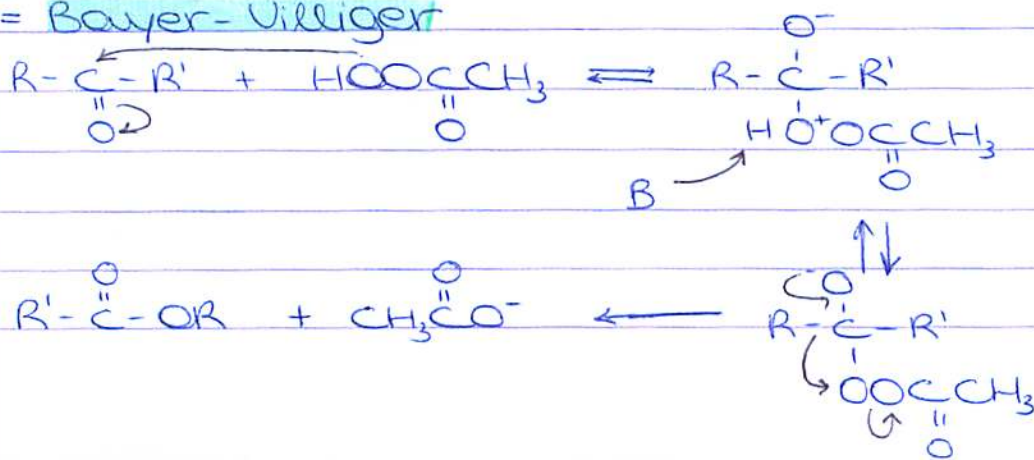
welke gevormd wordt is afk. van
 reactietemp. en de base



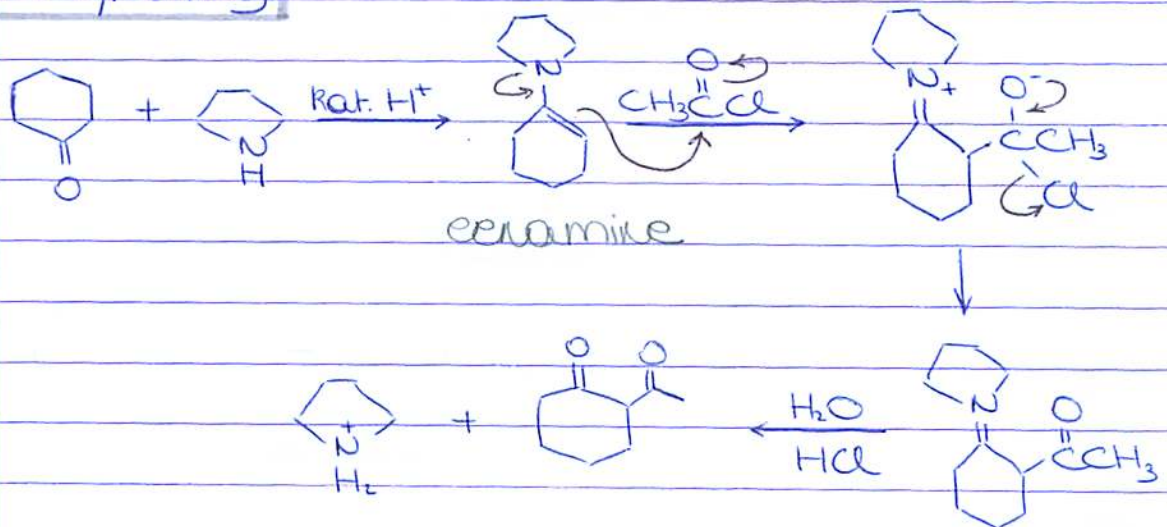
Keton \rightarrow ester

oxidatie

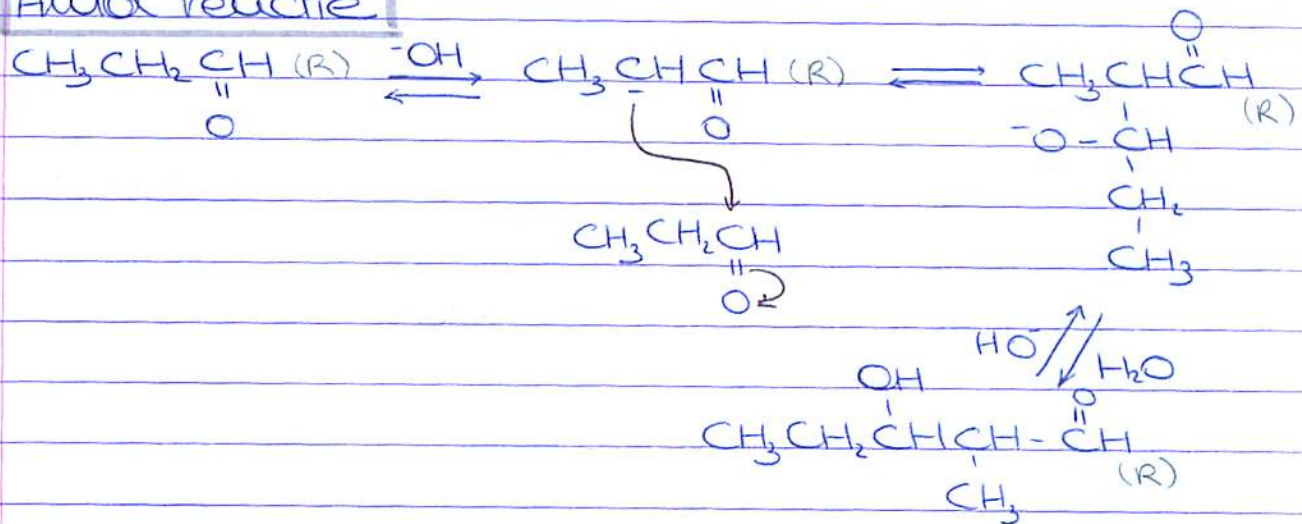
= Bayer-Villiger



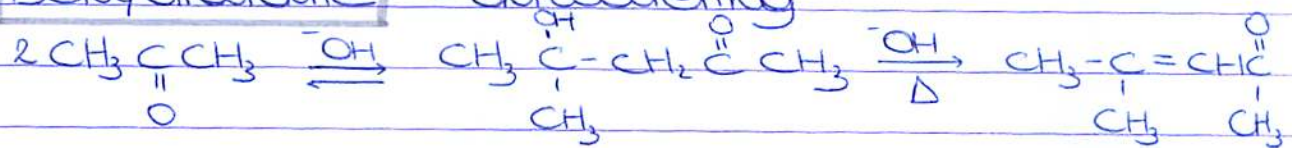
Acyliering



Aldol reactie



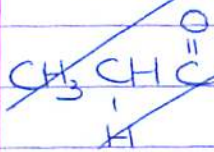
Dehydratatie = outwatering



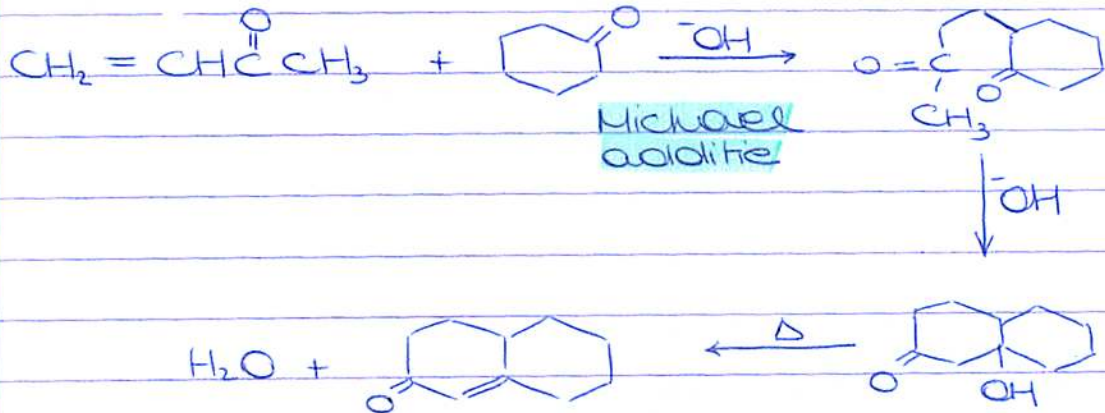
Gemengde aldol condensatie

→ mengsel v. producten

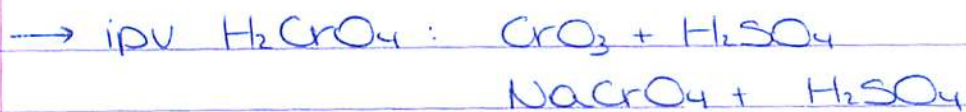
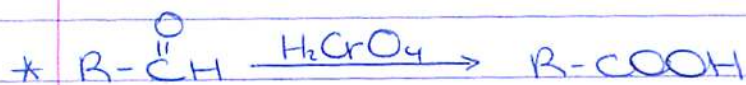
Claissen condensatie



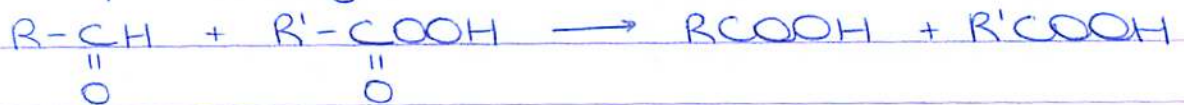
Robinson annulering



Aldehyd → carboxzuur oxidatie



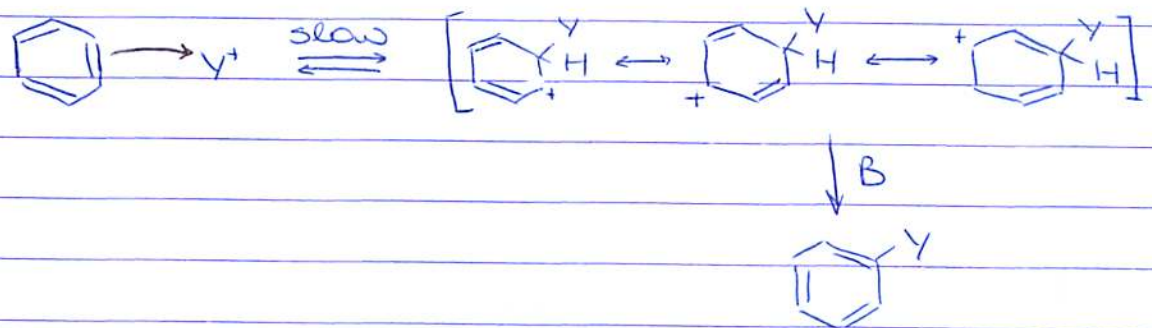
* Bayer-Villiger



peroxyzuur

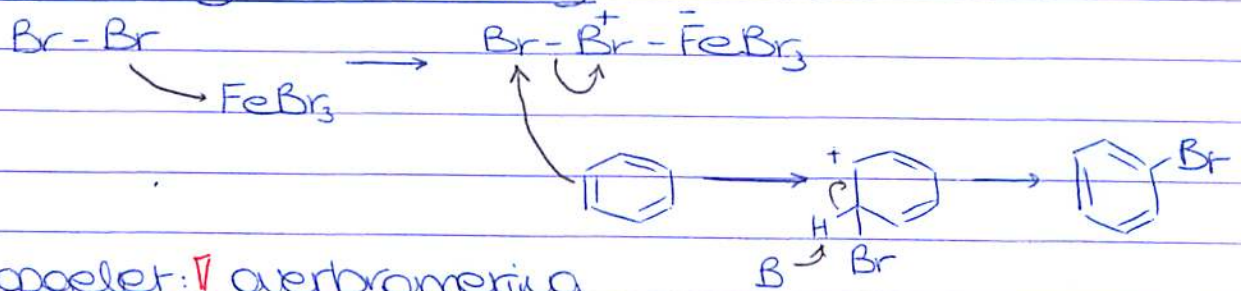
Benzene

Niet heel reactief \rightarrow moet aan een Katalysator
 \rightarrow substitutie maar geen additie



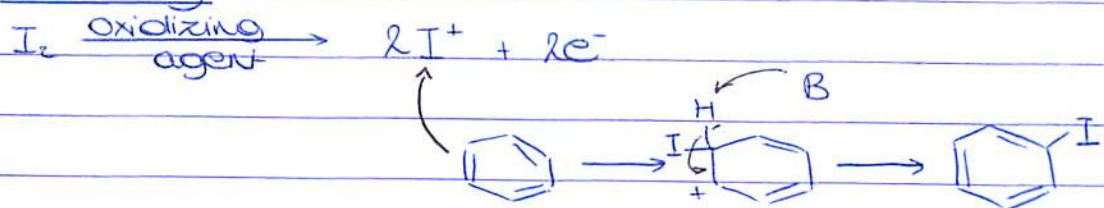
Halogenering

① Bromering en chlorering

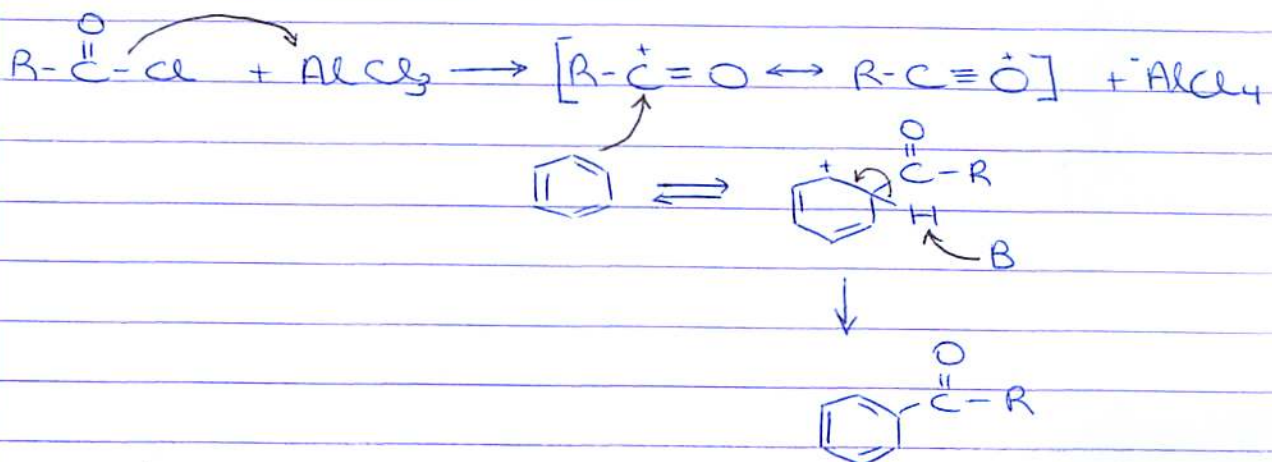


opgelet: ! overbromering

② Iodering



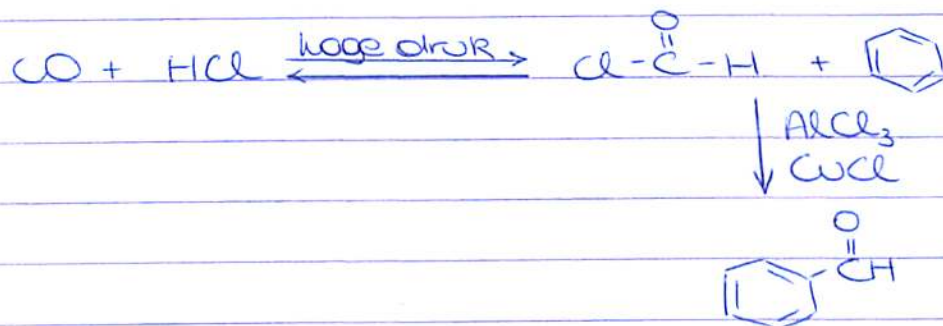
Friedel-Crafts Acylering



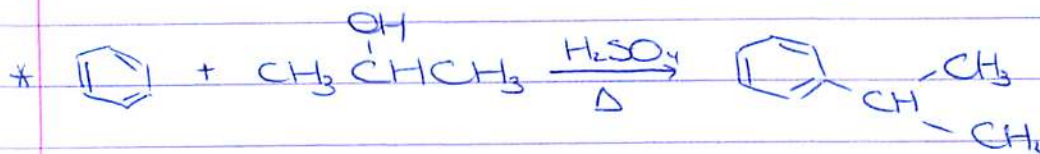
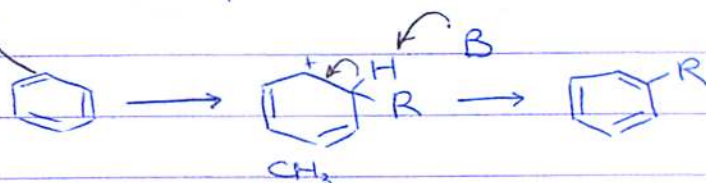
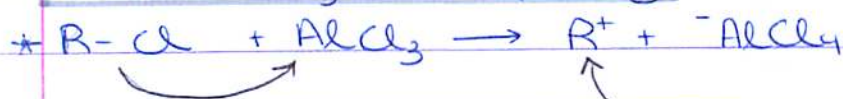
opmerking: niet bij meta-richters of bij aniline

Formylation

= Gatterman-Koch

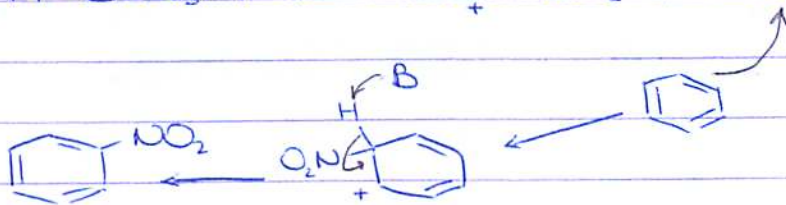


Friedel-Crafts Alkylering

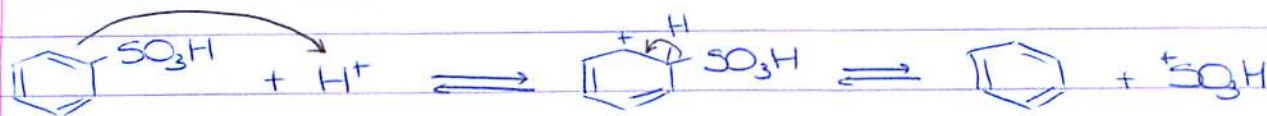


opmerking: omlegging, niet bij meta-richters. d.
bij aniline

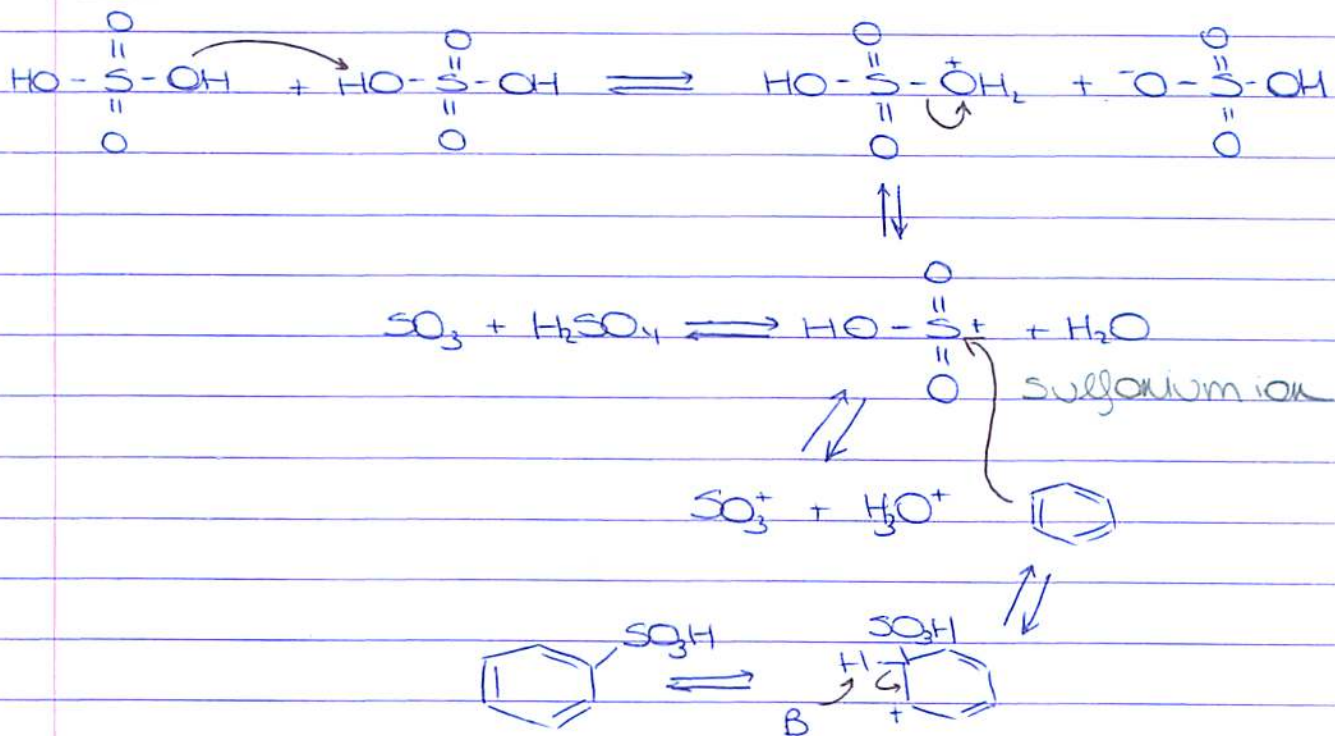
Nitrering



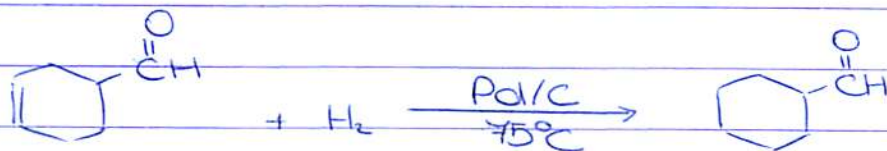
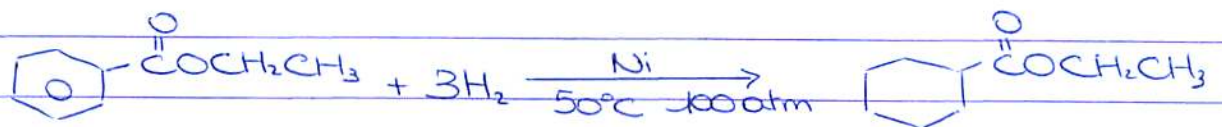
Desulfonering



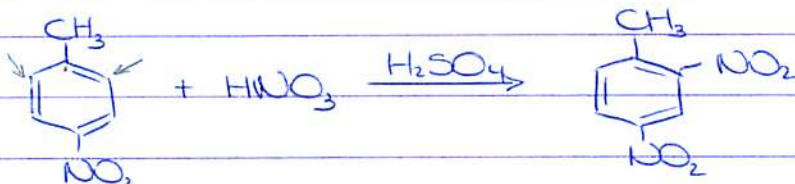
Sulfonation



Reduction



Digesubstitueerd benzene

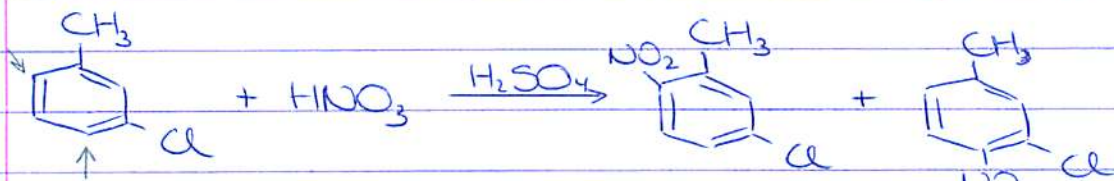


CH₃ → inductief e⁻ donor, geen resonantie

⇒ zwak activerend ⇒ ortho/para

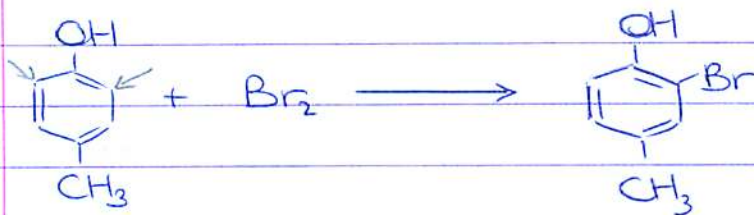
NO₂ → inductief e⁻ acceptor, resonantie acceptor

⇒ sterk desactiverend ⇒ meta



Cl → inductief e⁻ acceptor, resonantie donor

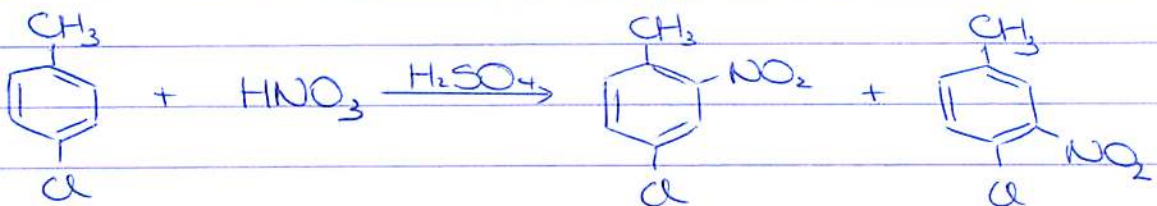
⇒ zwak desactiverend ⇒ ortho/para



OH → inductief e⁻ acceptor, resonantie e⁻ donor

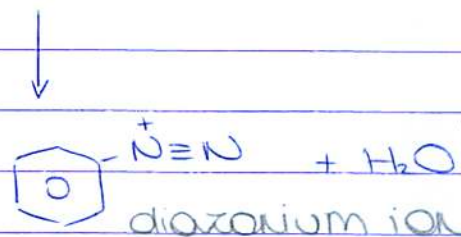
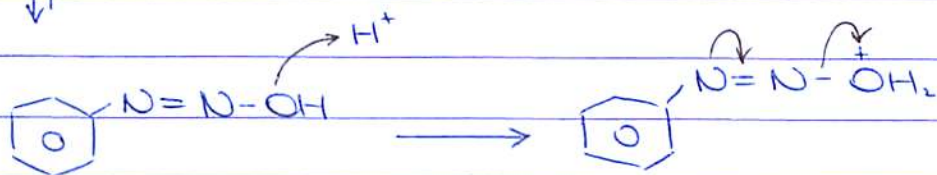
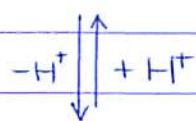
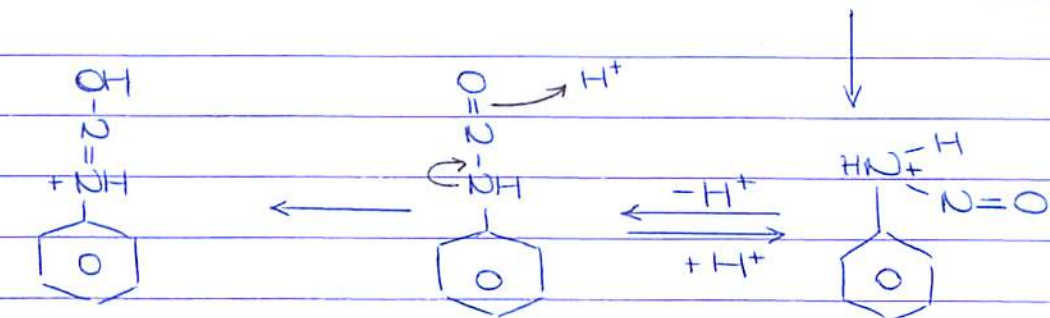
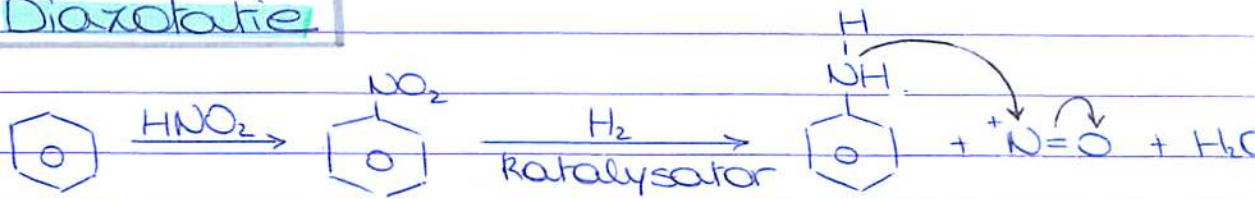
⇒ sterk activerend ⇒ ortho/para

→ dominerend effect



→ geen dominerend effect dus mengsel

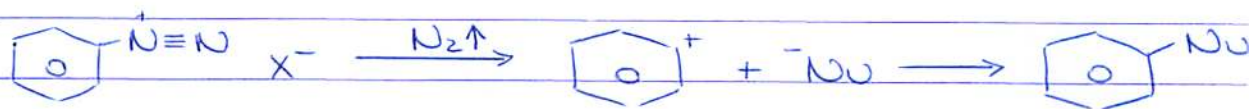
Diazotatie



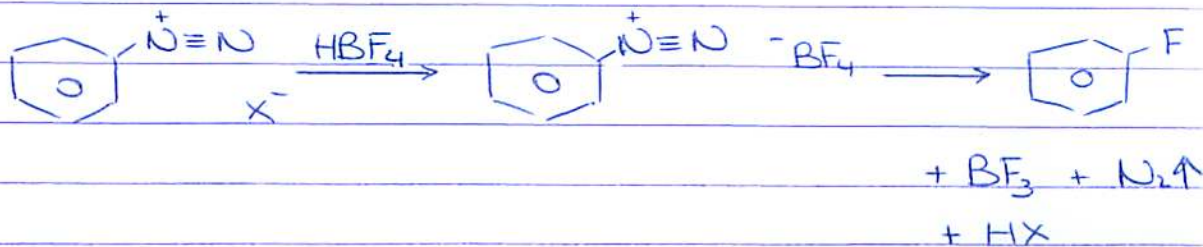
opmerking: Rau ook op niet ringen

Diazonium ion

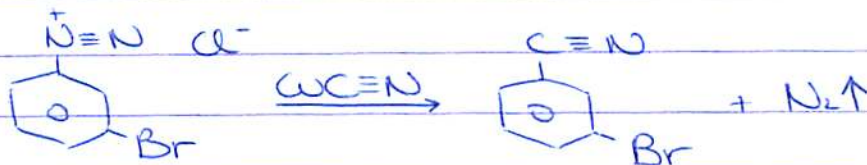
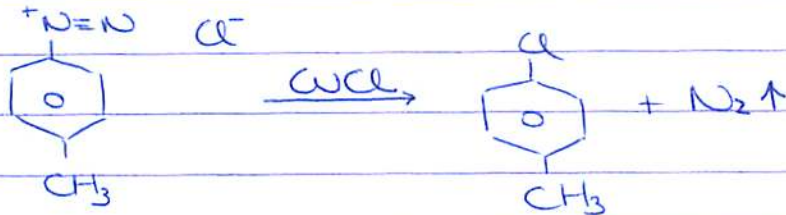
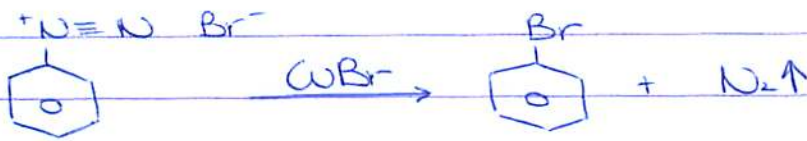
④ S_N1 via Ar^+



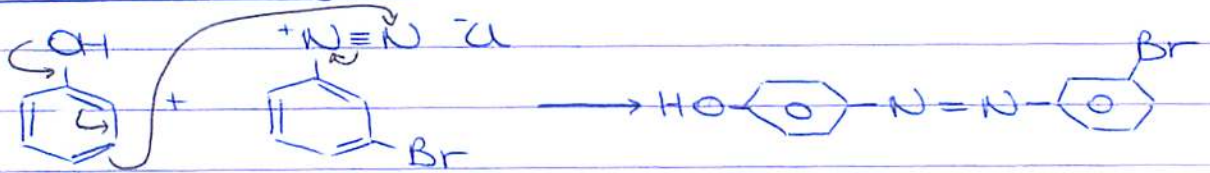
vb. Schiemann reactie



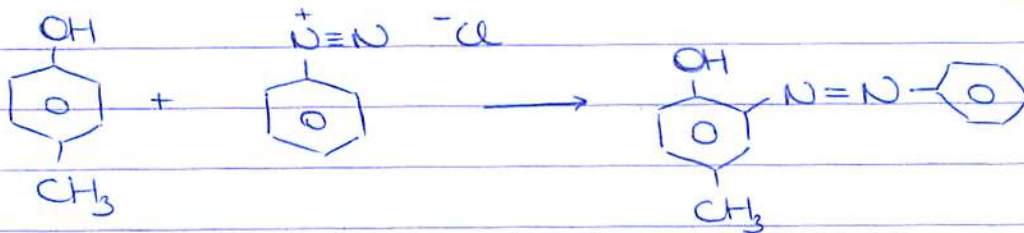
② Sandmeyer reactie via Ar⁻



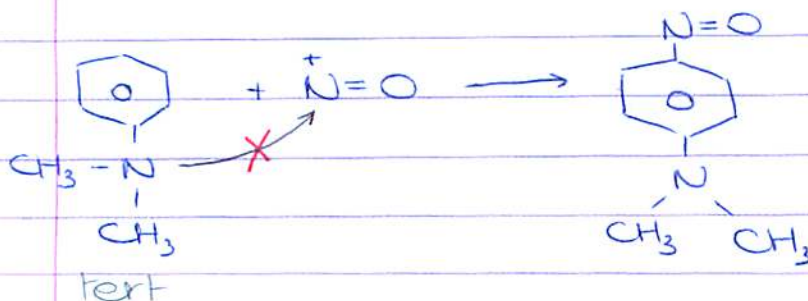
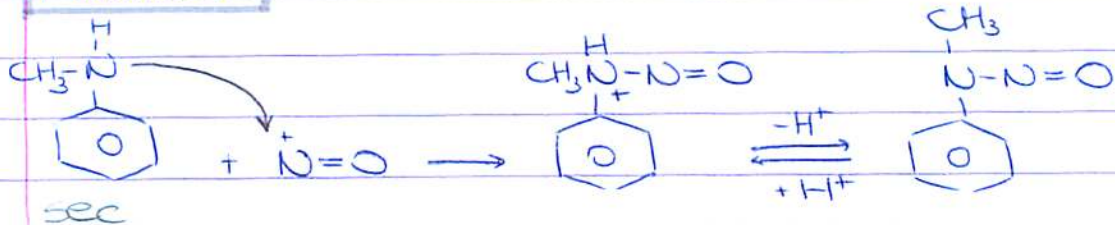
③ Als elektrofiel



azo-binding



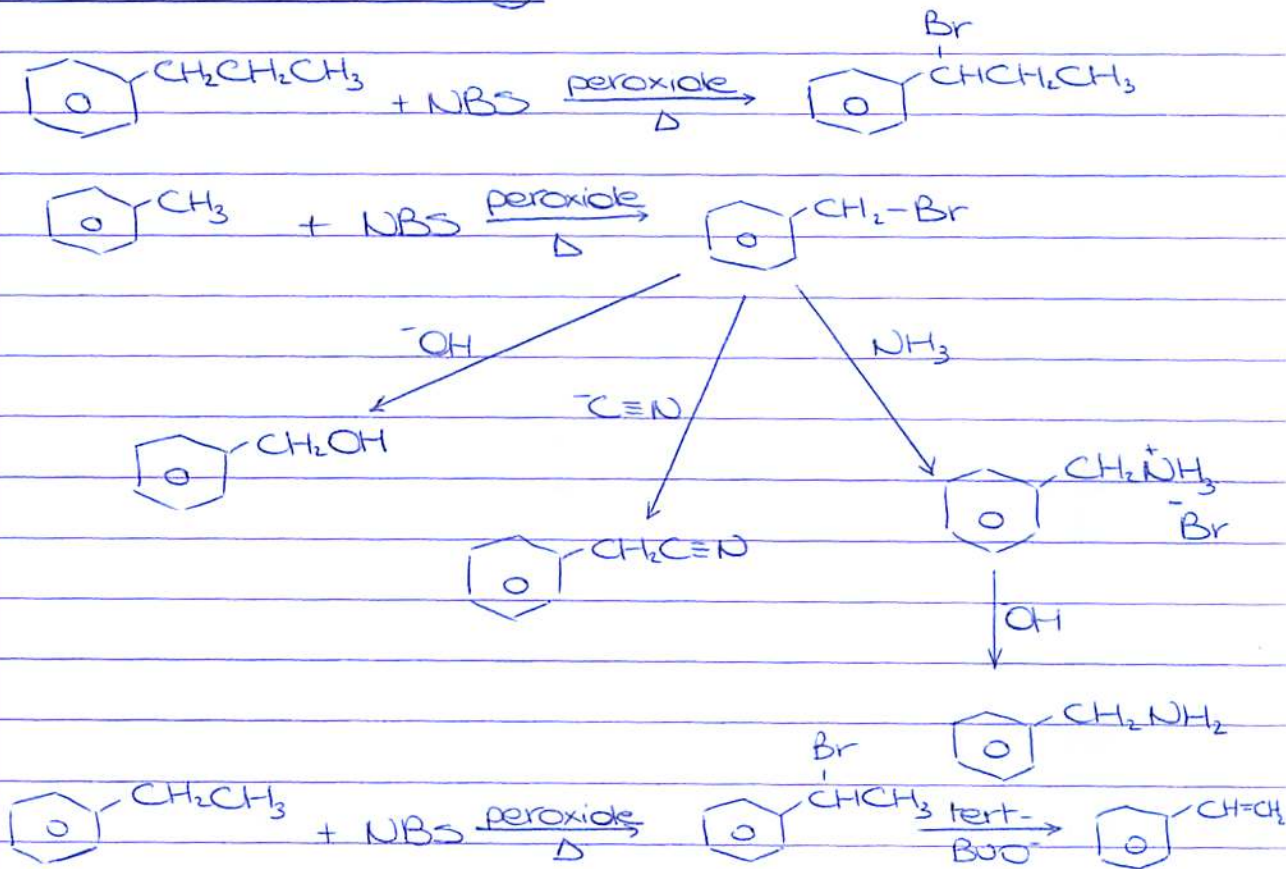
Anilinen



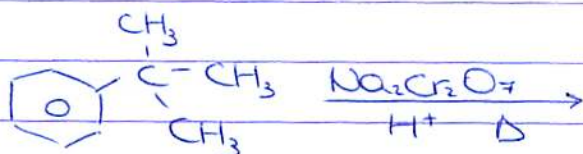
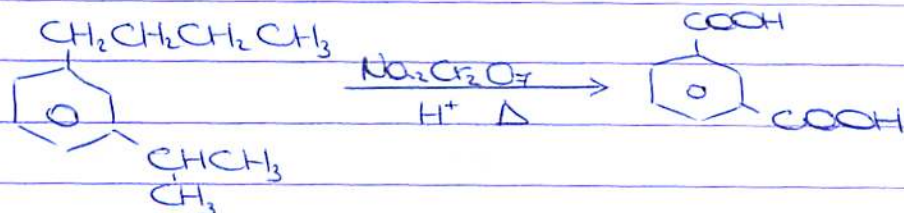
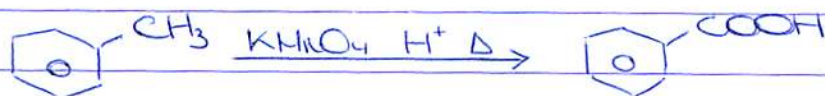
Reacties op benzeen substituent

Alkyl substituent

① Radicale bromering



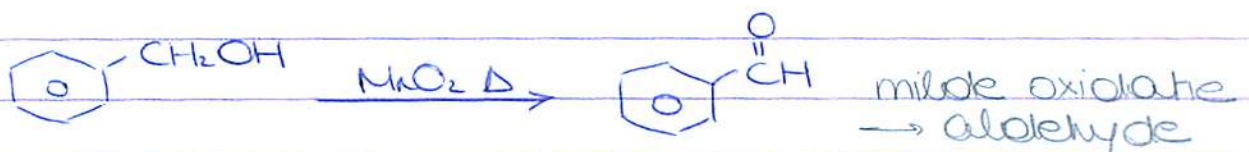
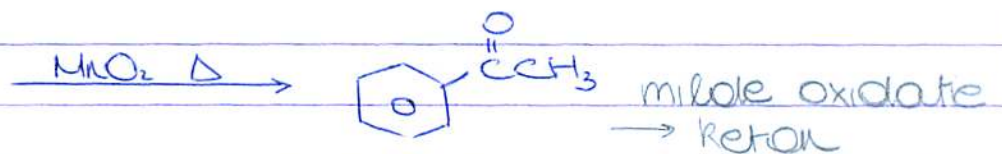
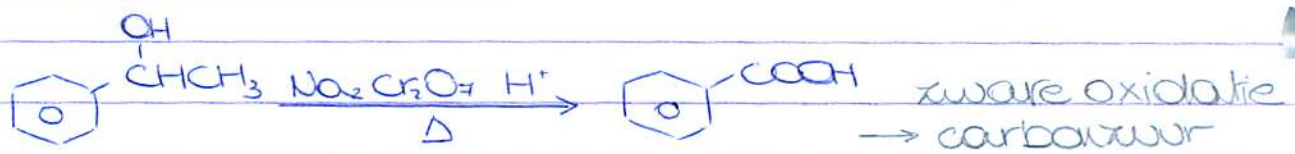
② Oxidatie: $sp^2 \quad sp^3$ $C-C-H$



X

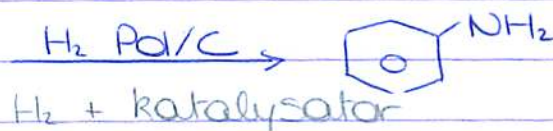
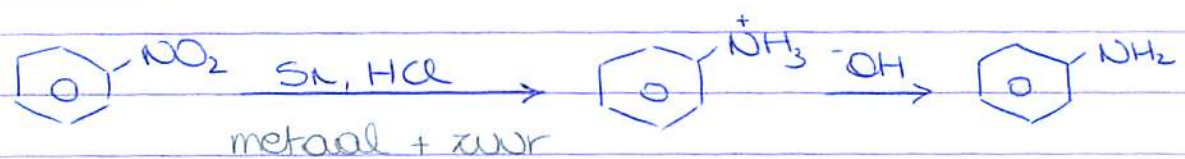
→ nood aan een benzylicke H

③ Oxidatie: $sp_2 \quad sp_3$
 $C-C-OH$



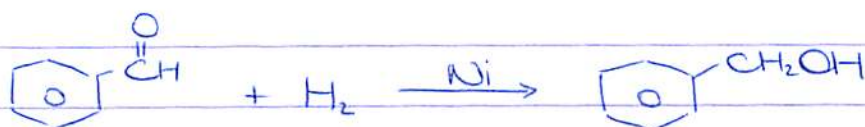
NO_2 - substituent

Reductie

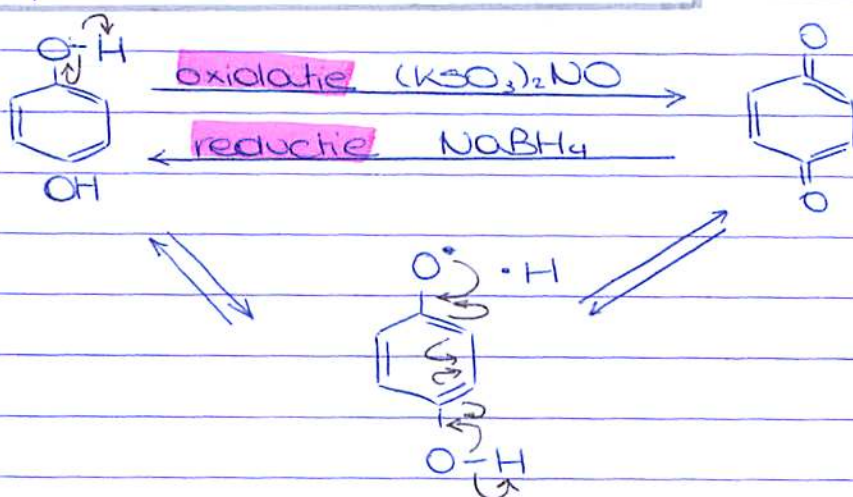


$C=C$, $C=O$ en $C=N$ substituent

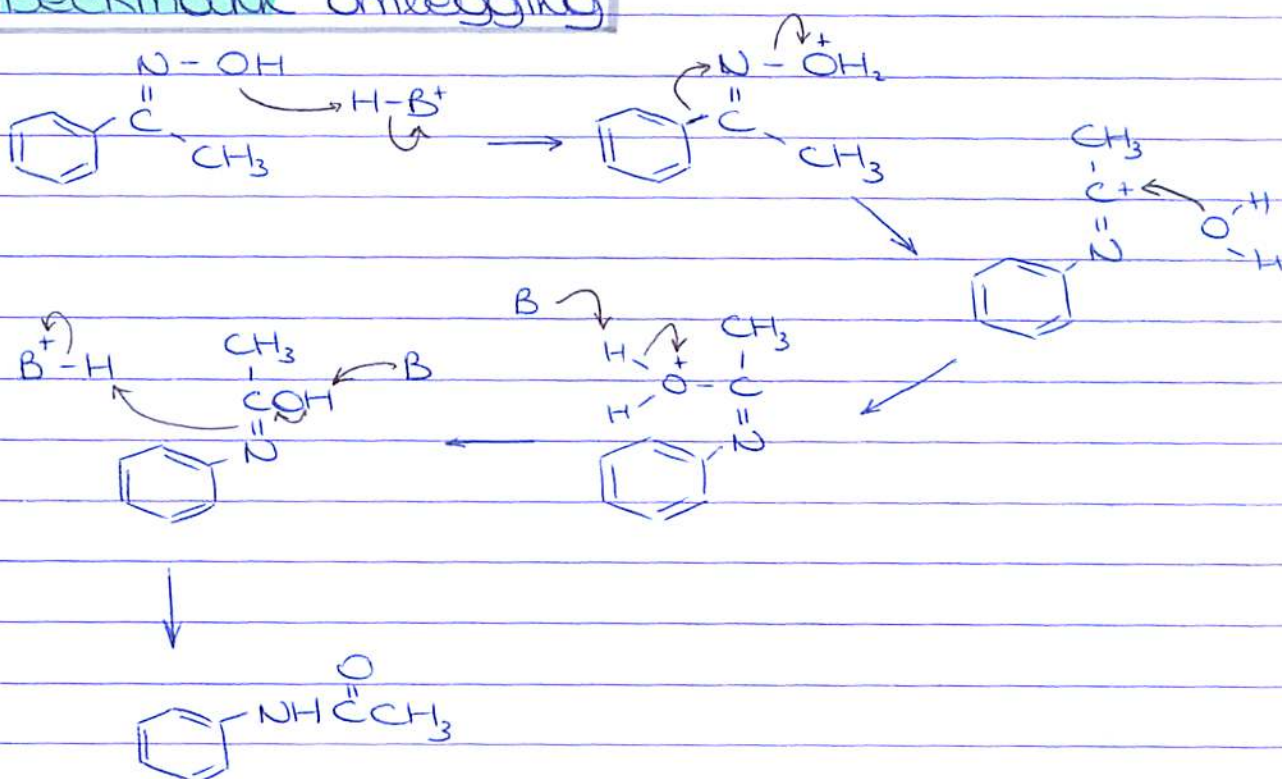
Reductie



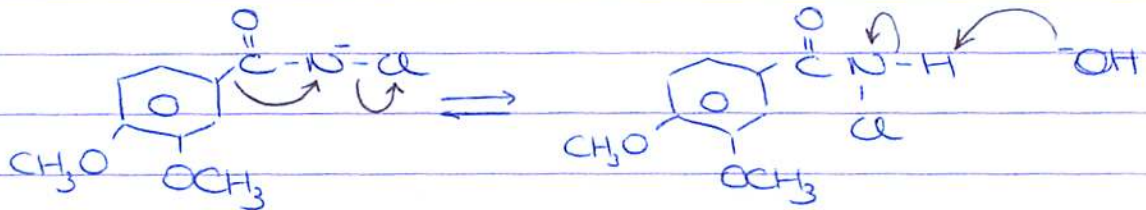
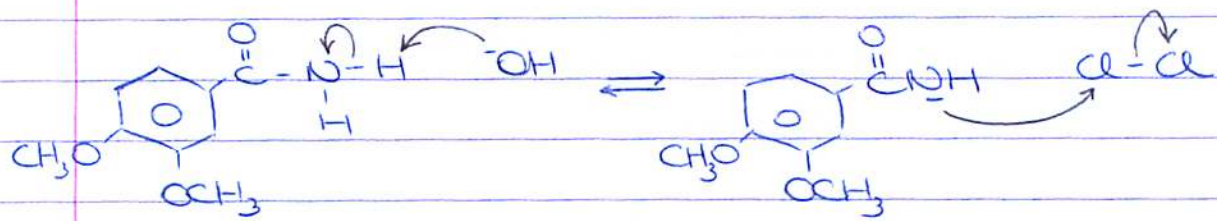
Hydrochinon \leftrightarrow chinon



Beckmann omlegging



Hoffmann omlegging



↓ omlegging

