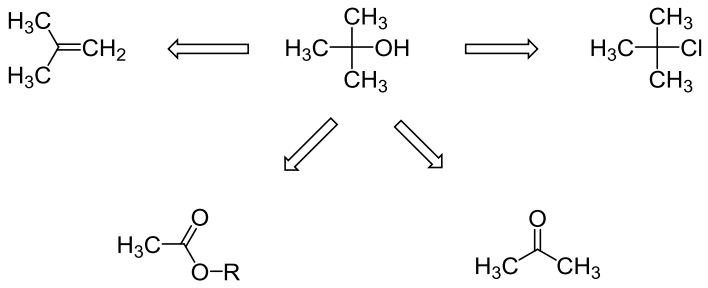
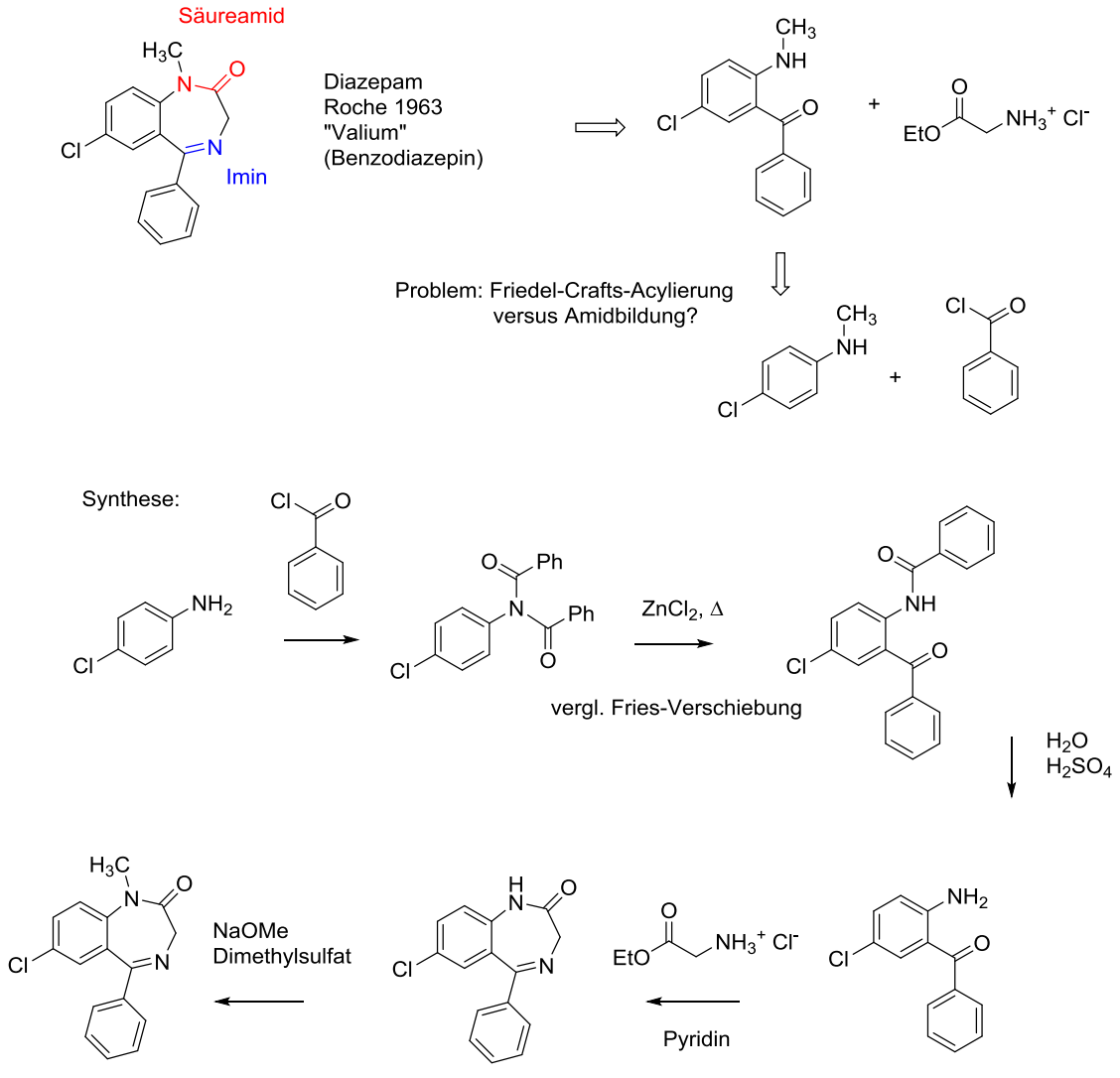
Übungsaufgaben Syntheseplanung

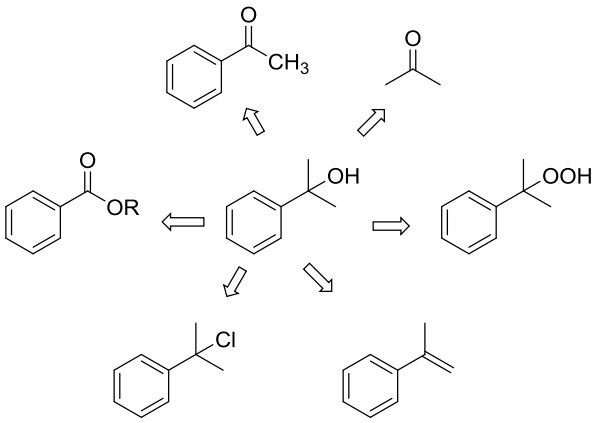
Aufgabe 1: Alkohole 1



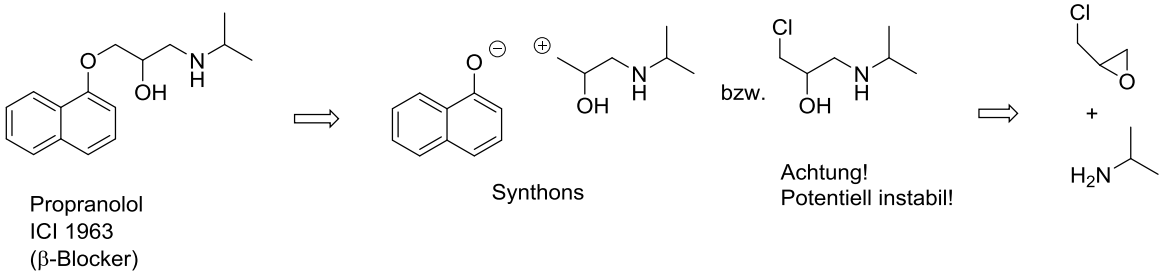
Aufgabe 2: Heterocyclen 1



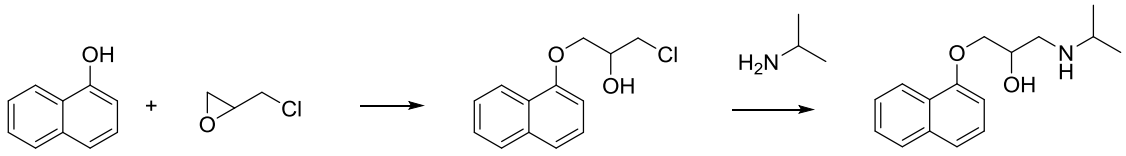
Aufgabe 3: Alkohole 2



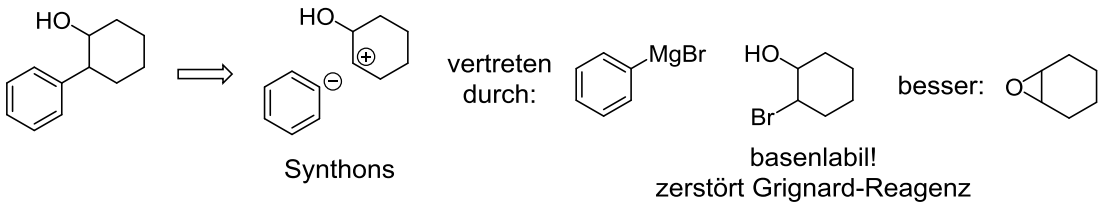
Aufgabe 4: Heterocyclen 2

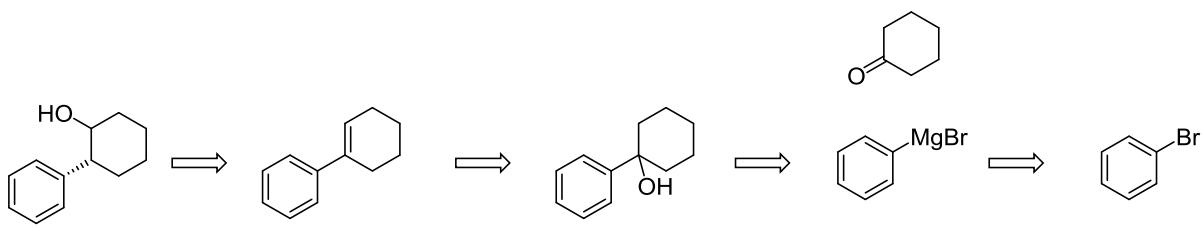


Industrielle Synthese:

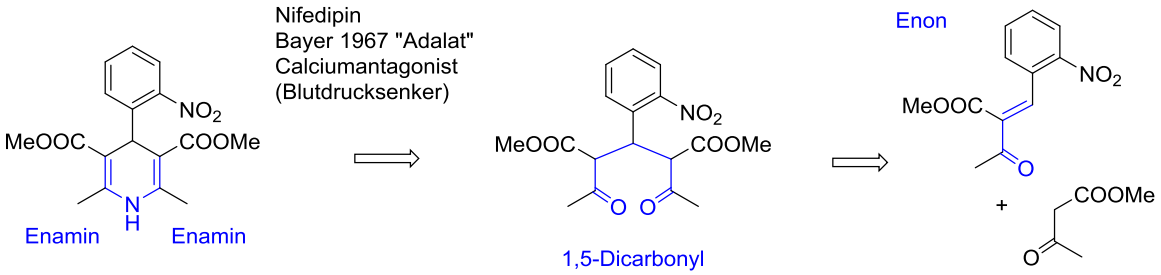


Aufgabe 5: Alkohole 3





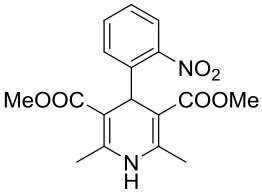
Aufgabe 6: Heterocyclen 3



Industrielle Synthese:

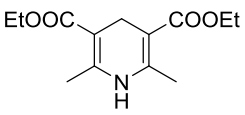
NH_3
z.B. als
NH_4OAc

als
Mehrkomponenten-
reaktion in
hoher Ausbeute

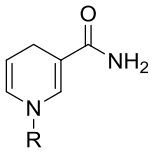


siehe auch:

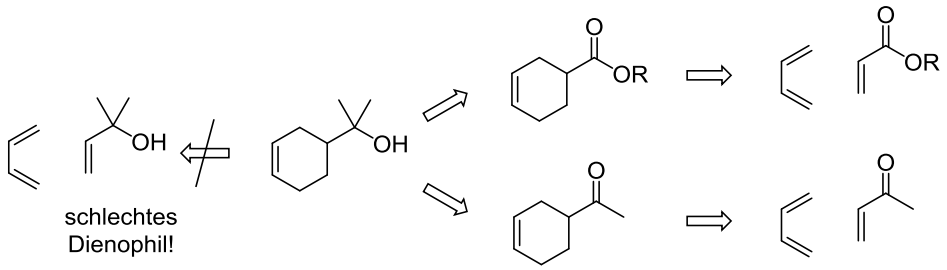
Hantzsch-Ester

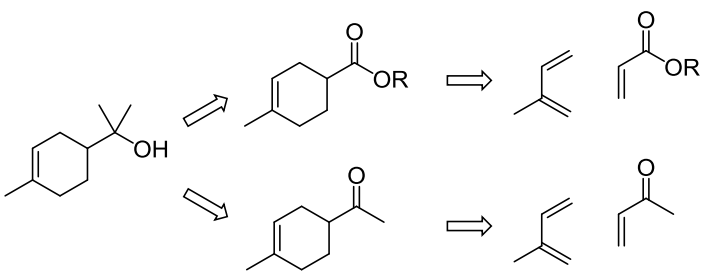


NADH



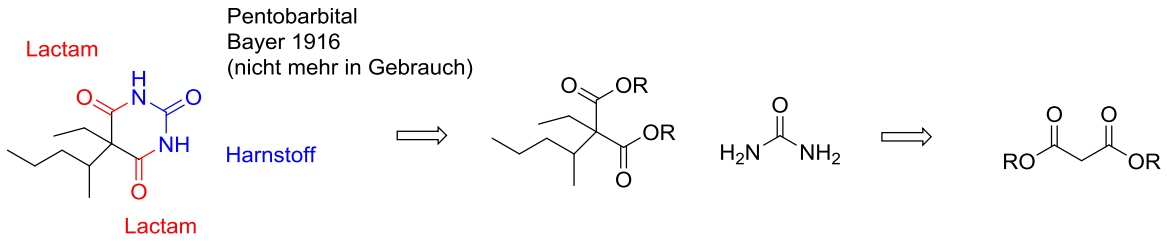
Aufgabe 7: Alkene 1



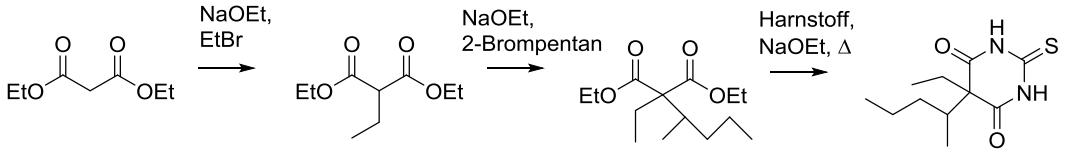


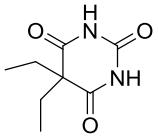
beachte
Partialladungs-
modell!

Aufgabe 8: Heterocyclen 4

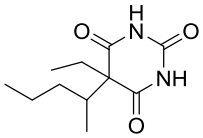


Industrielle Synthese:



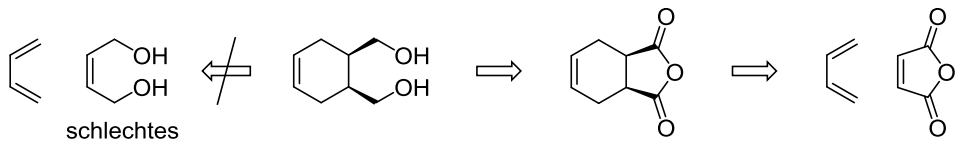


Barbital
E. Fischer / Merck 1903
("Veronal", nicht mehr in Gebrauch)

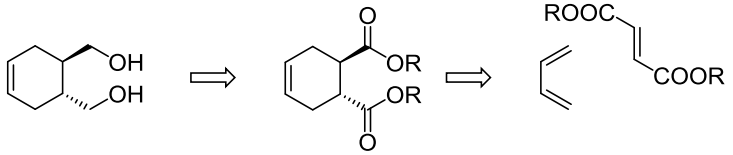


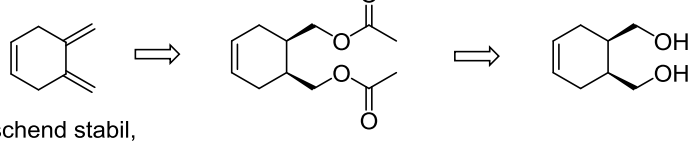
Thiopental
(als "Trapanal" zur
Narkoseeinleitung verwendet)

Aufgabe 9: Alkene 2

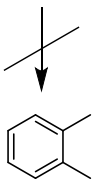


schlechtes
Dienophil!

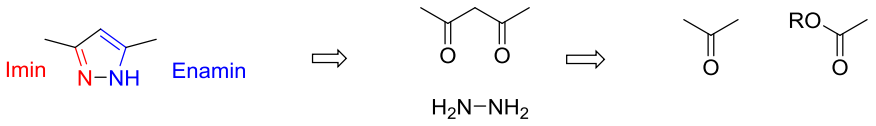


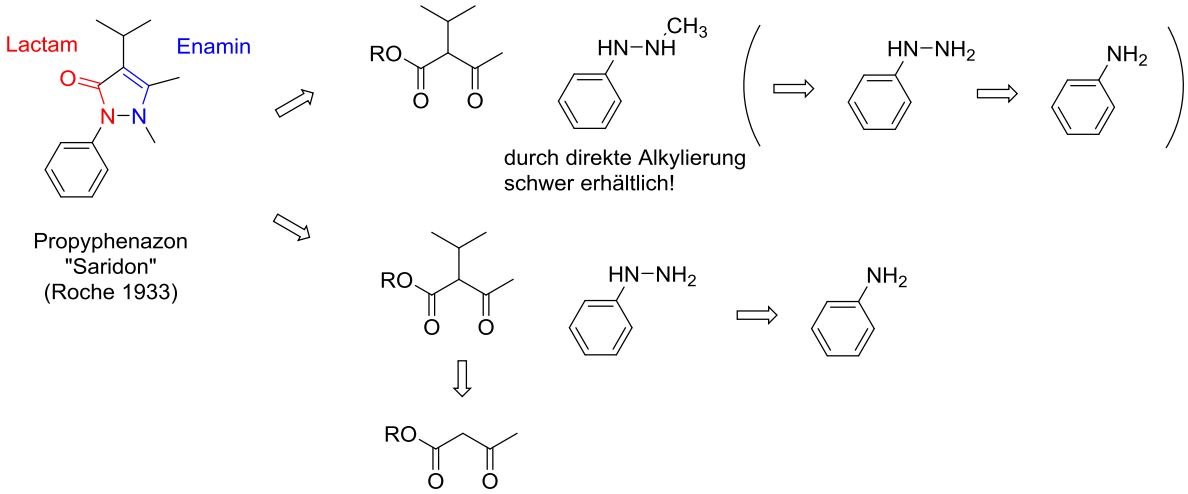


überraschend stabil,
da suprafaciale 1,3-H-
Verschiebung verboten!

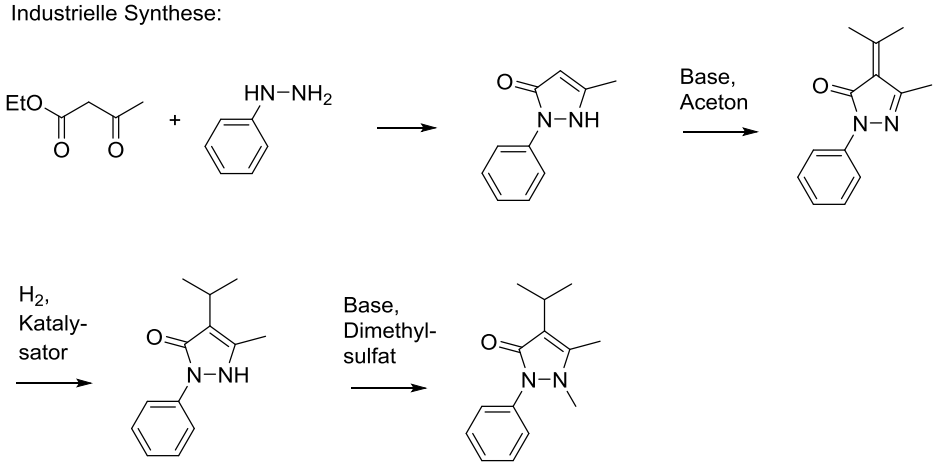


Aufgabe 10: Heterocyclen 5

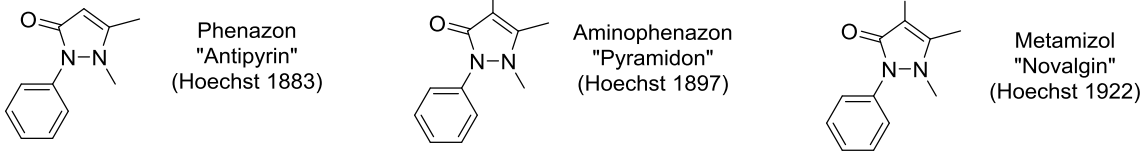




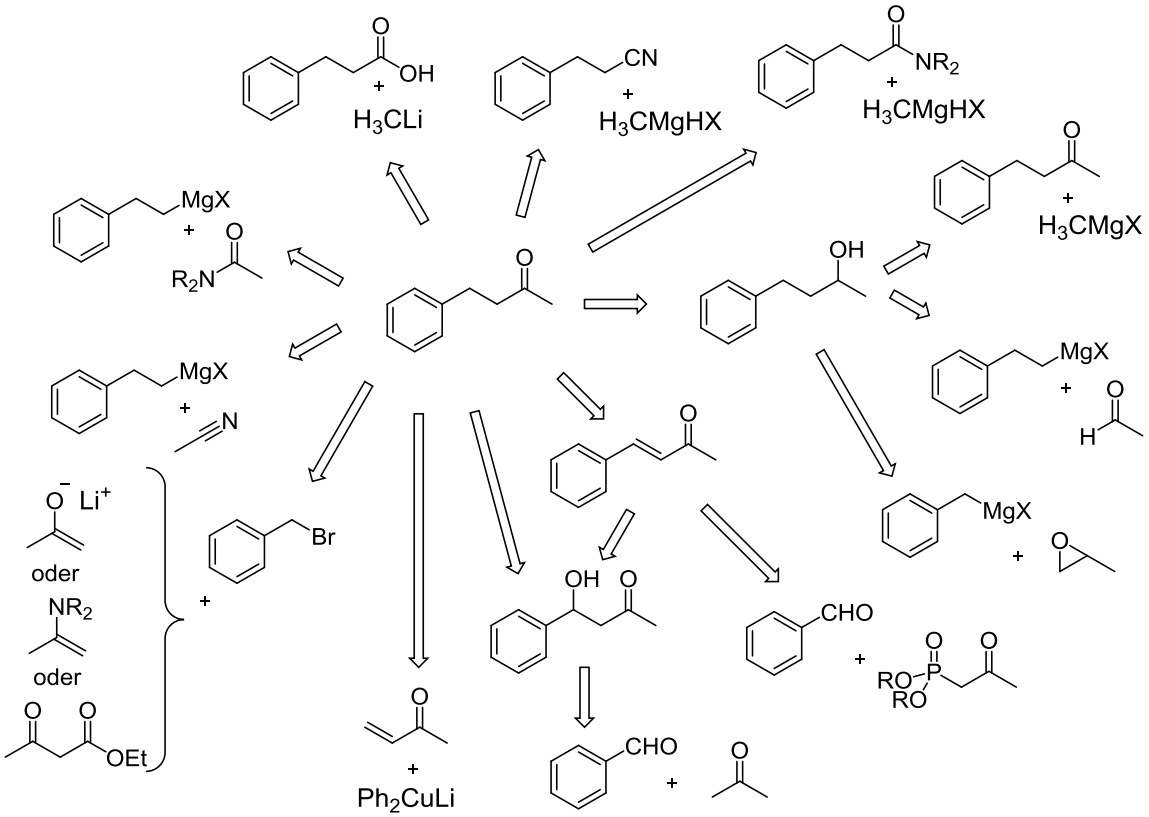
Industrielle Synthese:



Vorläufersubstanzen:

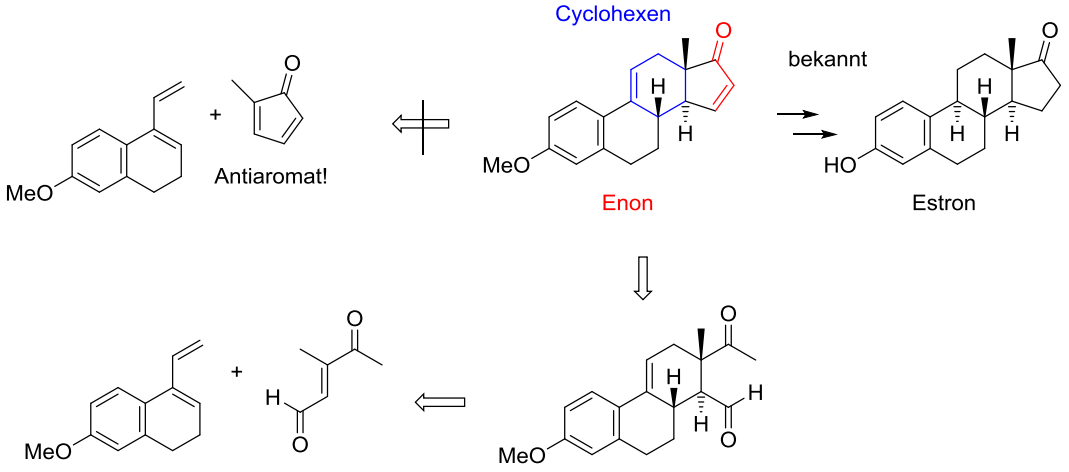


Aufgabe 11: Ketone 1



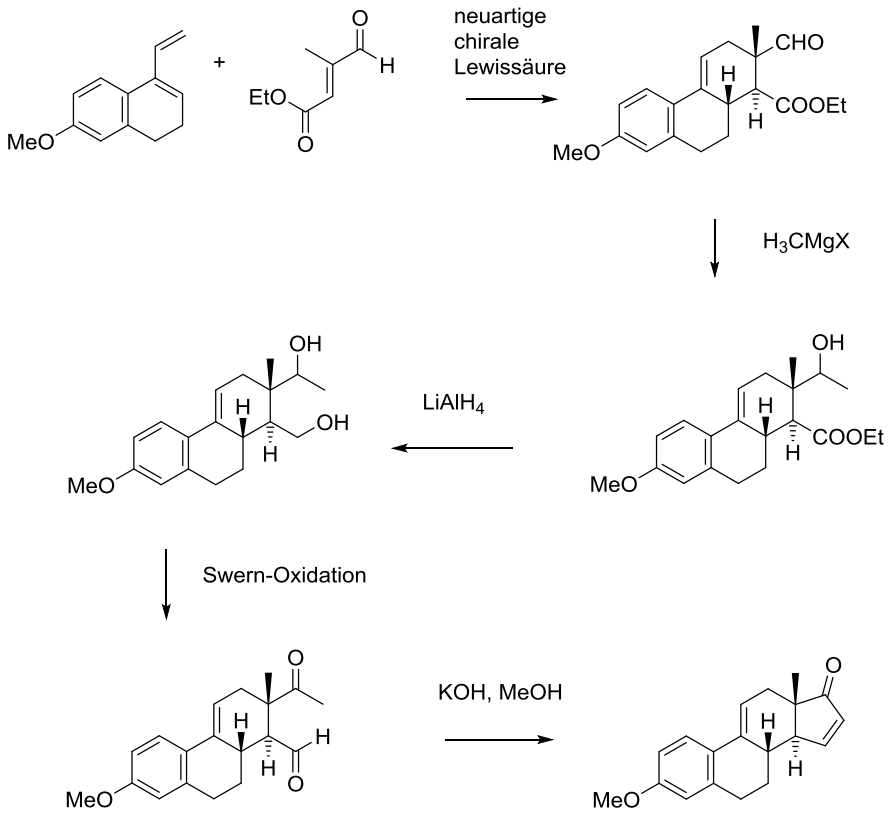
Aufgabe 12: Ketone 2

Estronsynthese nach E.J. Corey:

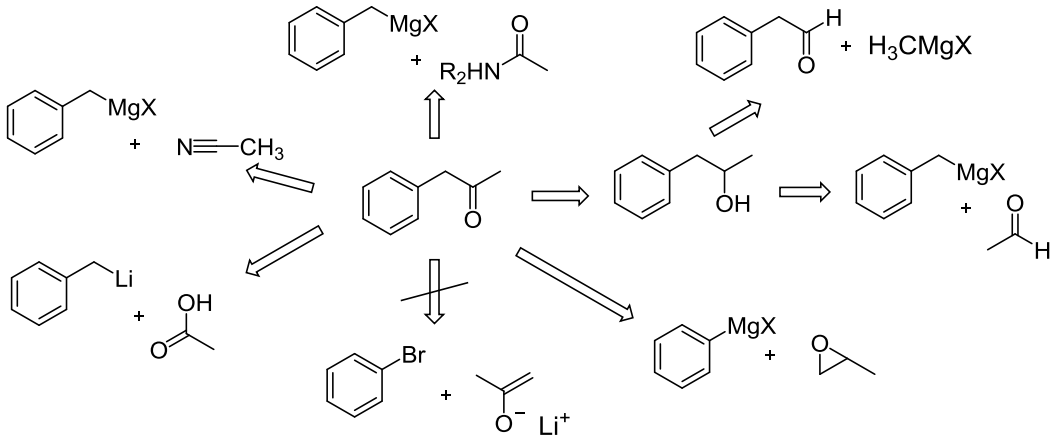


ergäbe wahrscheinlich das falsche Konstitutionsisomer, siehe Partialladungsmodell der Diels-Alder-Reaktion

Erfolgreiche Synthese:

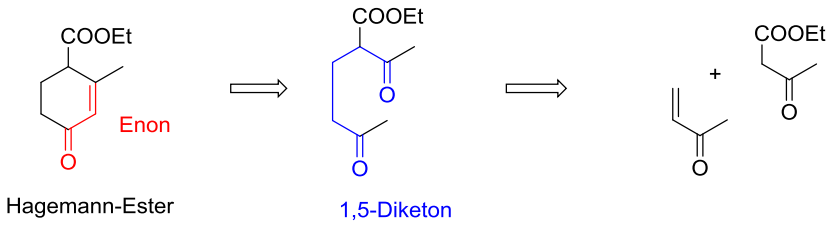


Aufgabe 13: Ketone 3



Keine S_N2- oder S_N2-Reaktion an Ar-X!
Reaktion ist jedoch möglich unter Pd-Katalyse

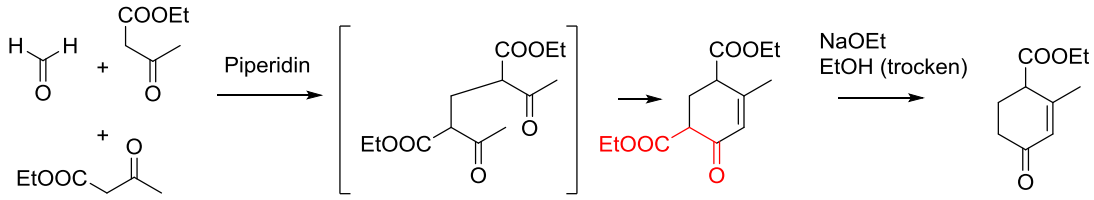
Aufgabe 14: Ketone 4



Hagemann-Ester

1,5-Diketon

Obwohl die Synthese nach diesem Schema möglich ist, bringt ein anderer Weg bessere Ausbeuten:



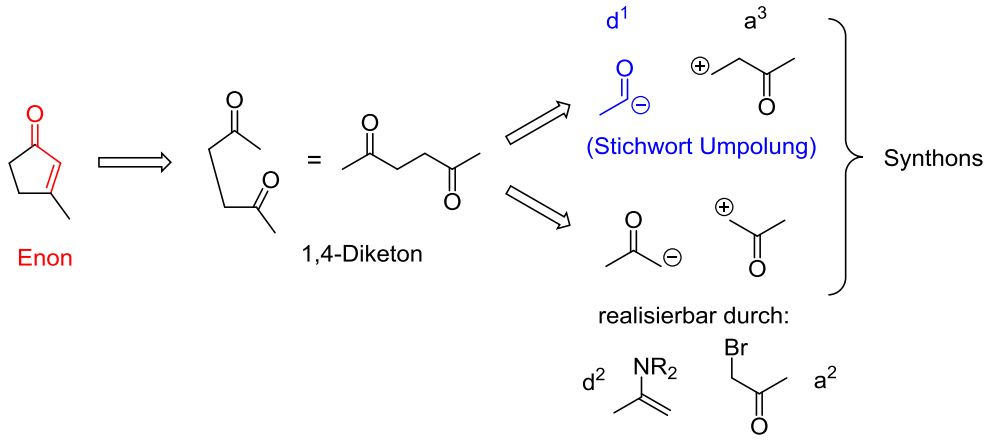
(als Paraformaldehyd)

symmetrisch!

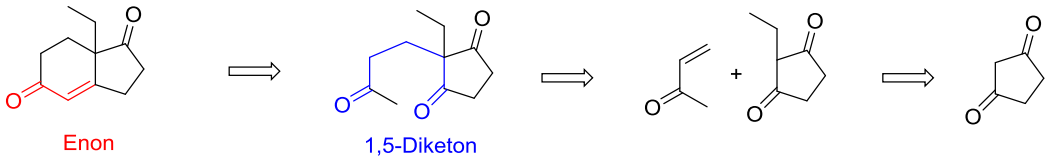
3-Ketocarbonsäureester

neuere Piperidin-katalysierte Varianten ergeben als Eintopfreaktion 90% Ausbeute!

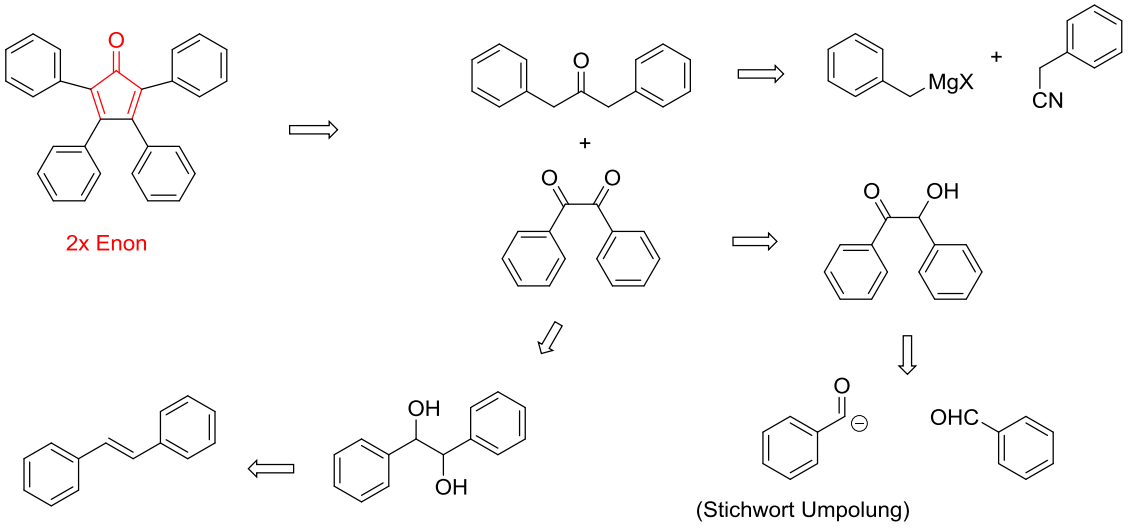
Aufgabe 15: Ketone 5



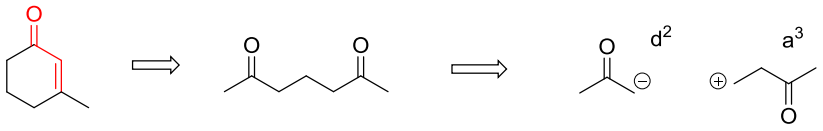
Aufgabe 16: Ketone 6



Aufgabe 17: Ketone 7

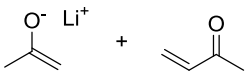


Aufgabe 18: Ketone 8



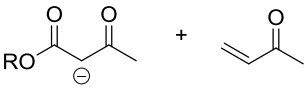
realiserbar durch:

schlecht!
Enolat ist
zu basisch!

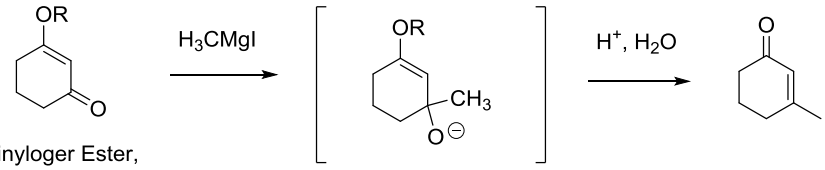


besser:

oder:



Alternativer Syntheseweg, auch für das Fünfring-Enon:



vinyloger Ester,
aus 1,3-Diketon herstellbar

Durch systematische Retrosynthese nicht leicht zu finden!
Daher: Stets Datenbanken konsultieren! (SciFinder, Reaxys)