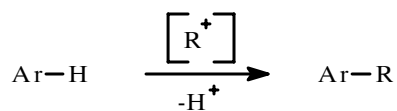
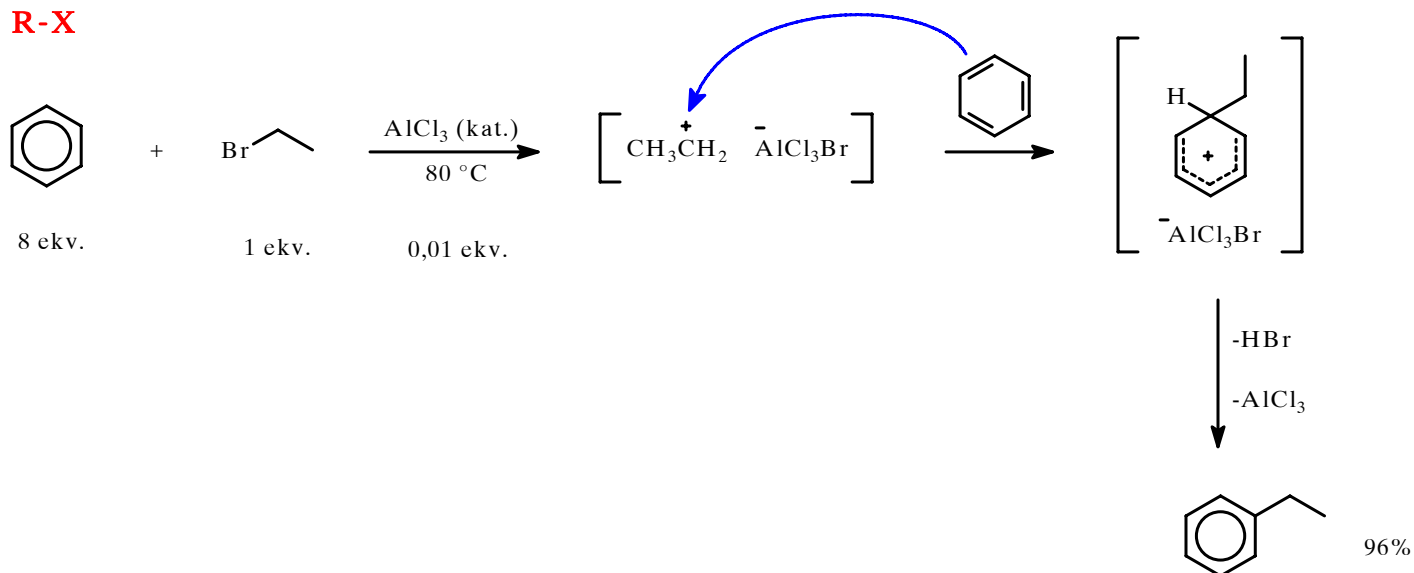


Friedel-Crafts-ovo alkilovanje

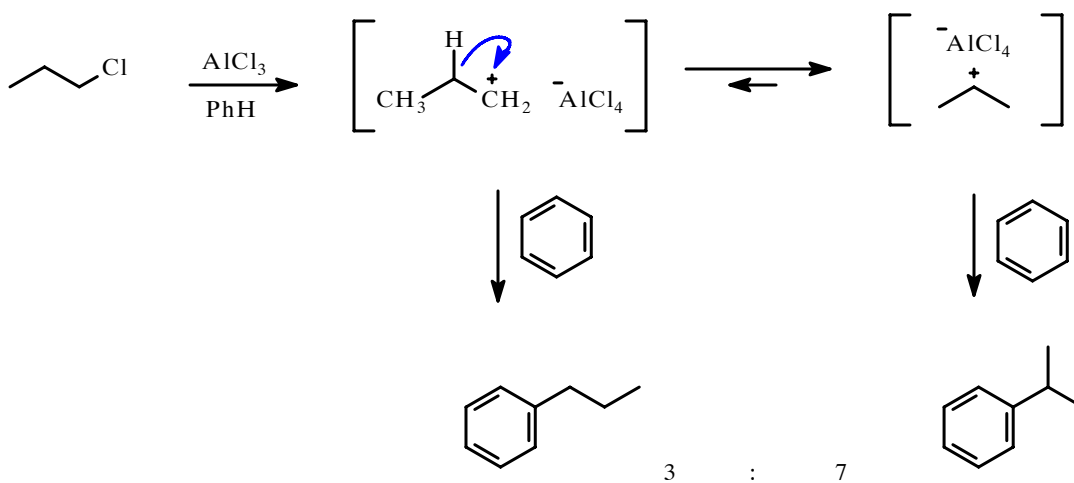


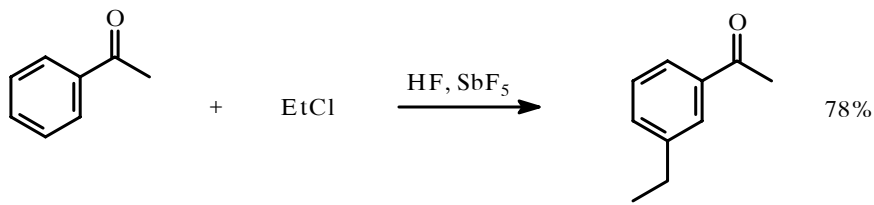
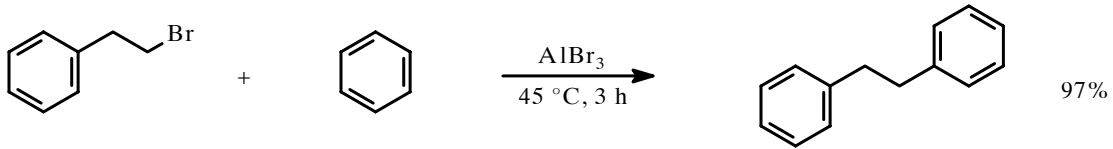
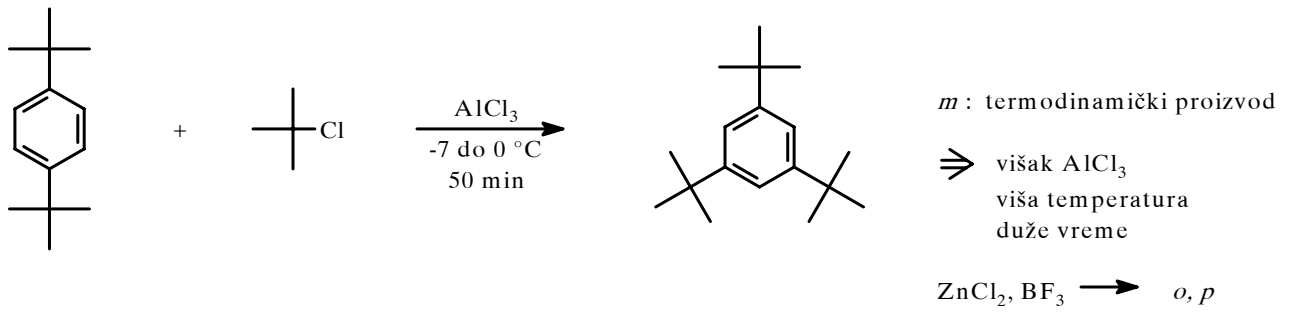
Prekursori R^+	Katalizatori
R-X (X = F > Cl > Br > I)	$\text{AlCl}_3 > \text{SbCl}_5 > \text{FeCl}_3 > \text{SnCl}_4 > \text{ZnCl}_2 > \text{BF}_3$
R-OH	$\text{H}_2\text{SO}_4, \text{HF}, \text{H}_3\text{PO}_4, \text{BF}_3$
Alkeni	$\text{HF-BF}_3, \text{HCl-AlCl}_3, \text{HF}, \text{FeCl}_3, \text{BF}_3$

R-X

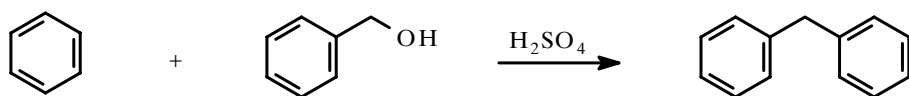
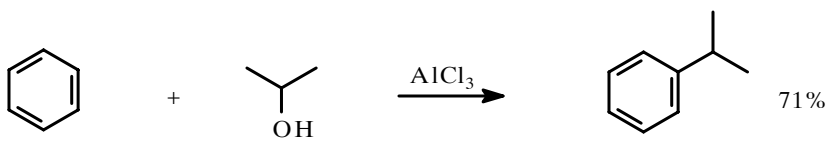
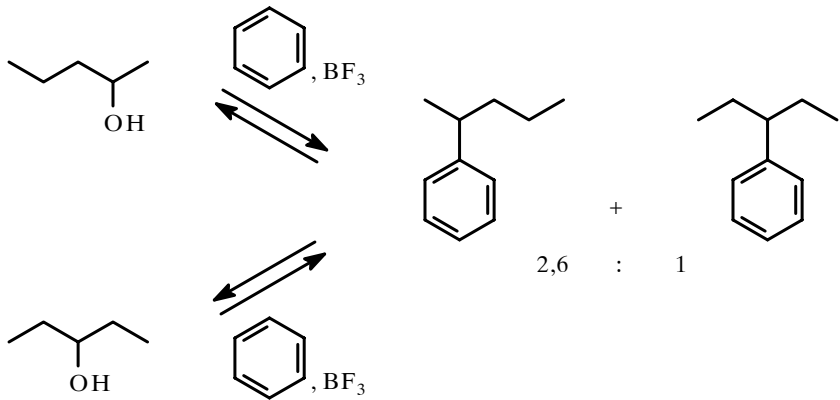


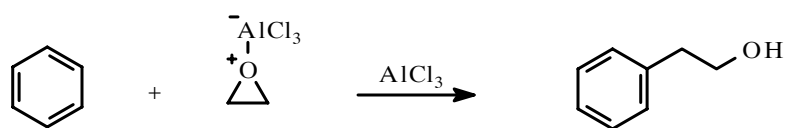
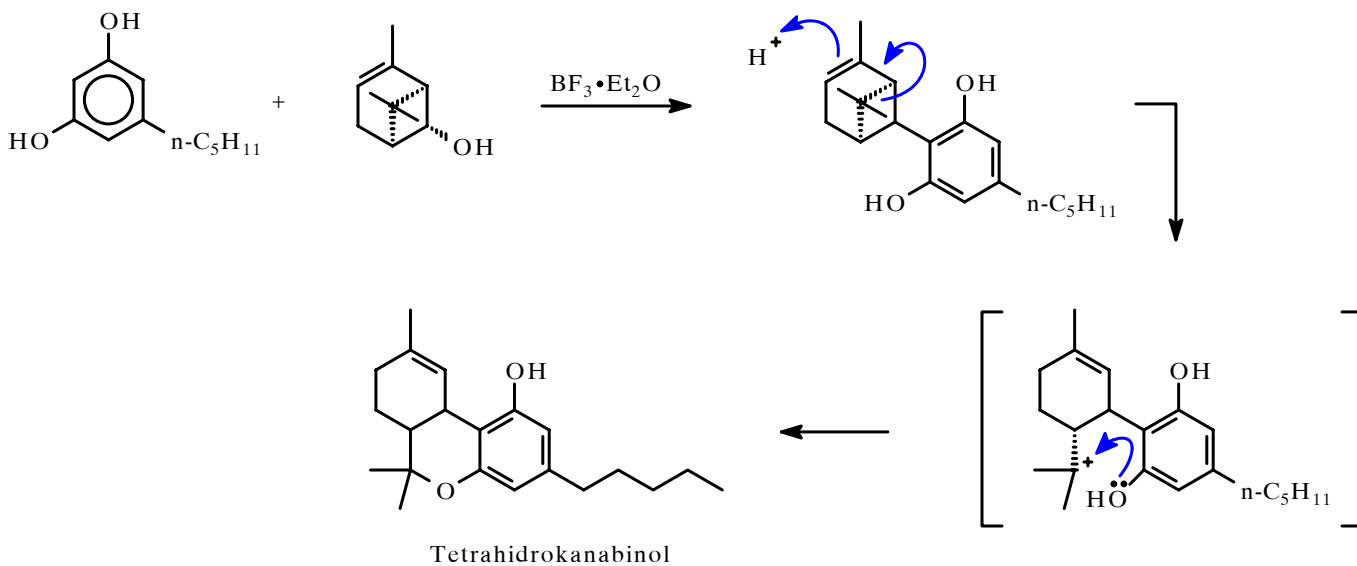
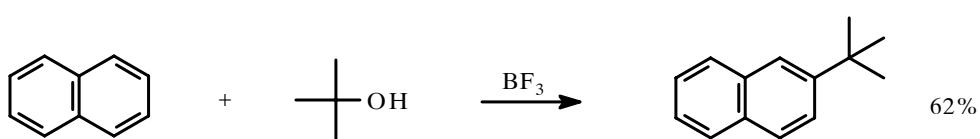
* Sporedne reakcije: izomerizacija
polialkilovanje



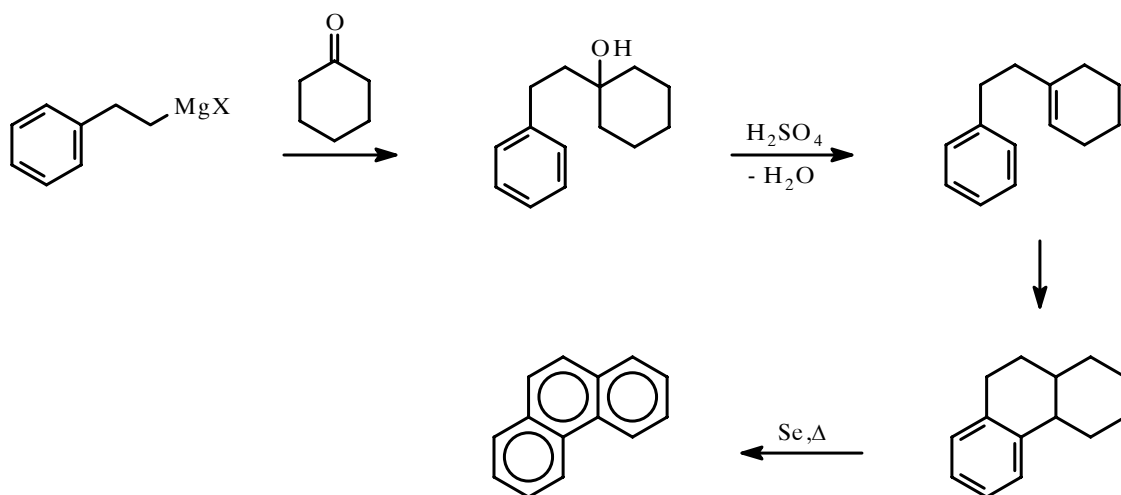
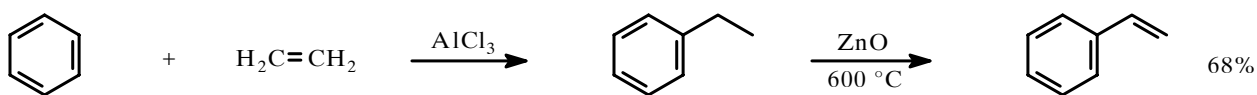


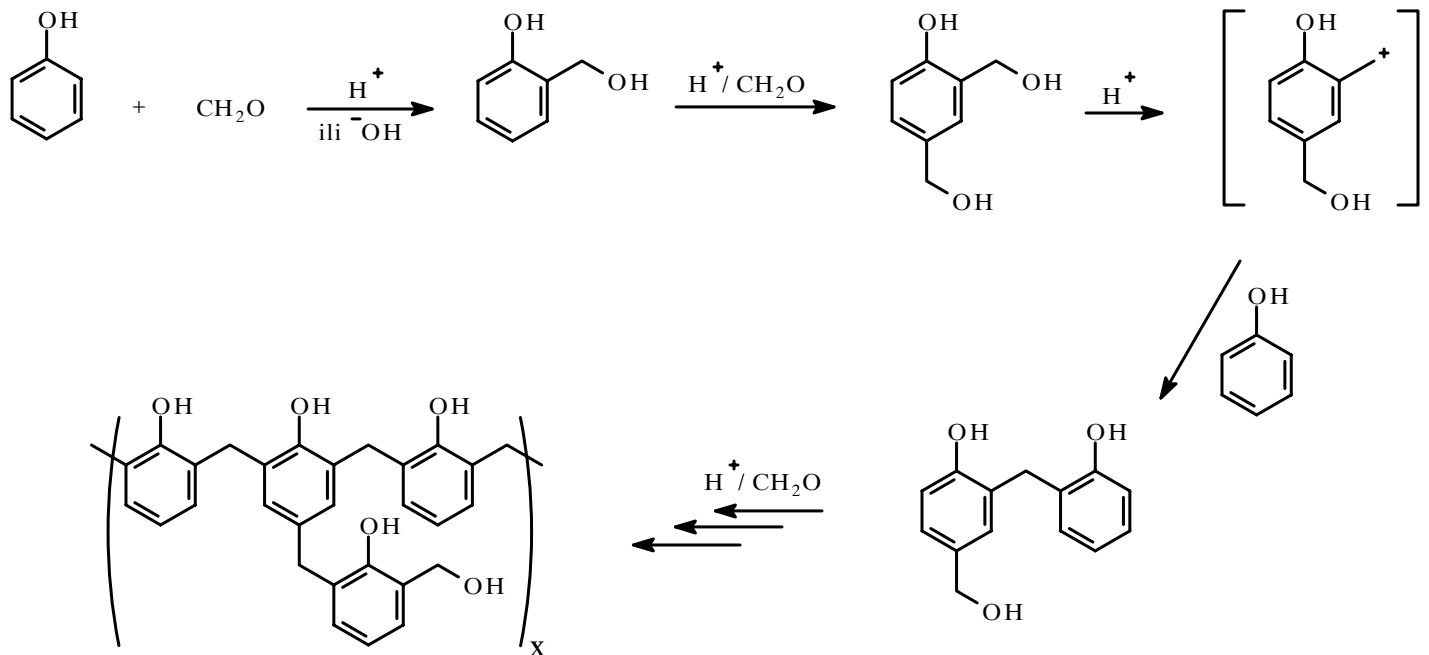
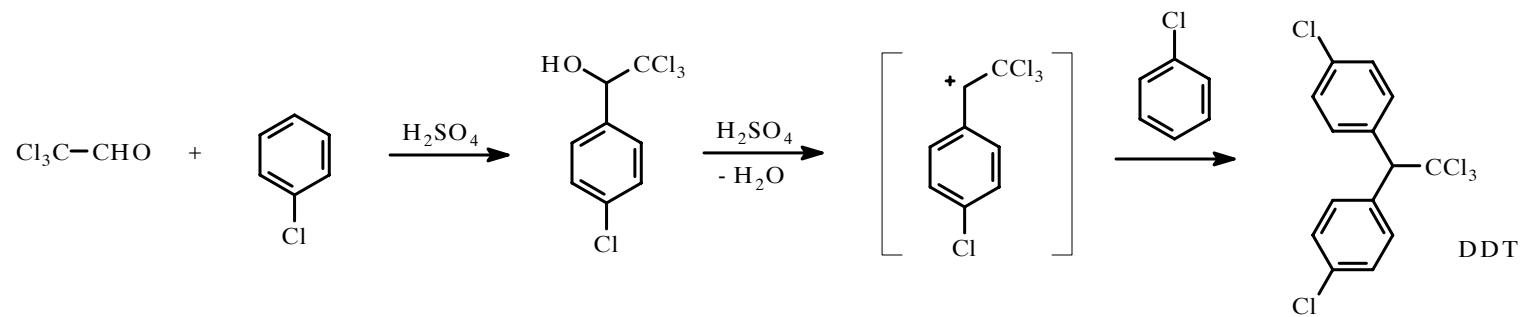
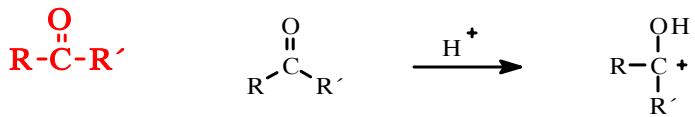
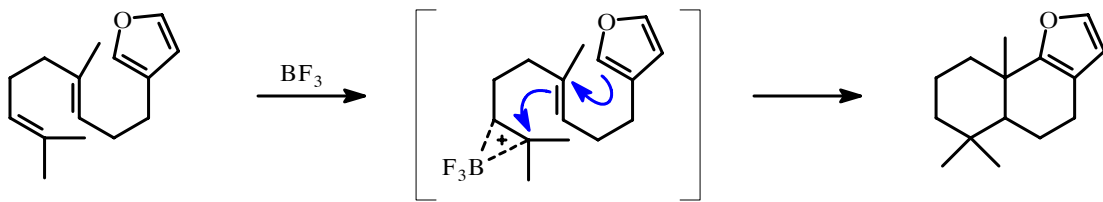
R-OH 1 ekv. LA





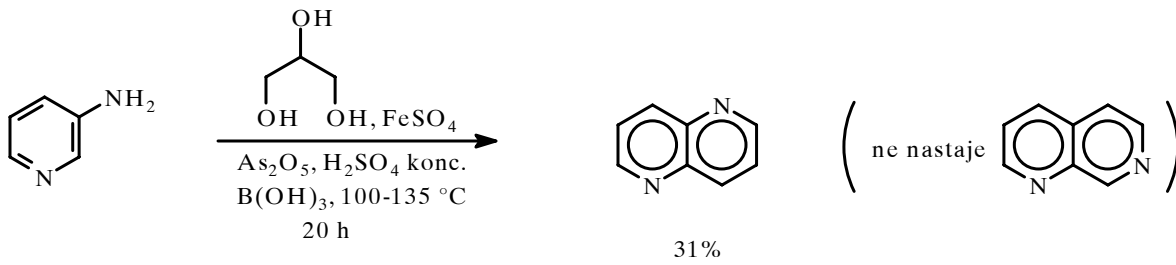
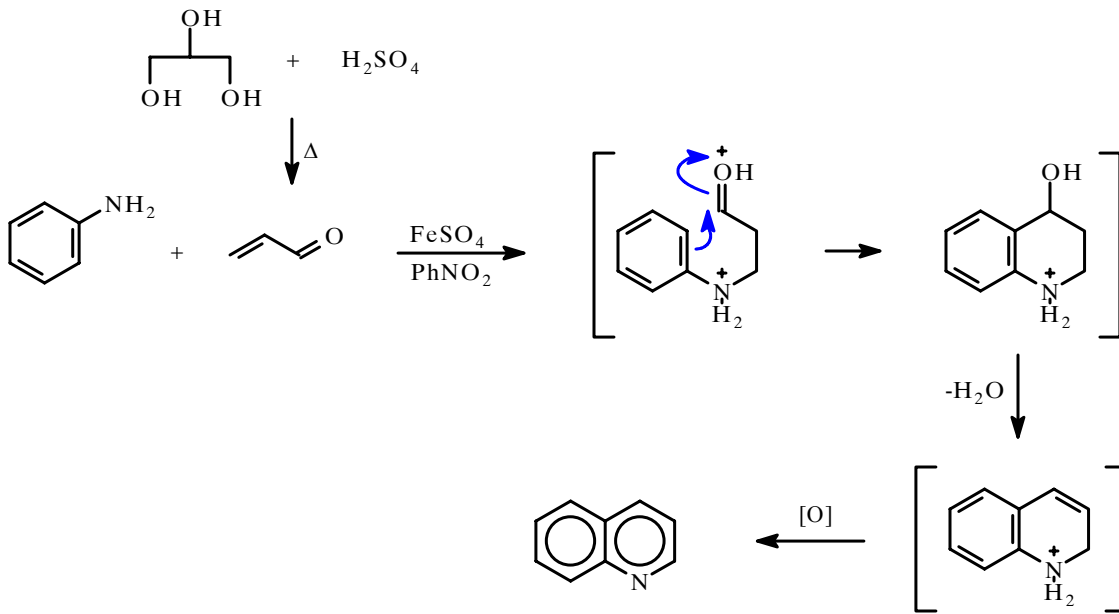
R



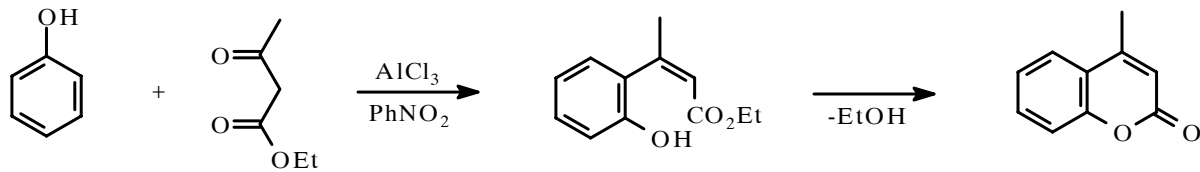


Fenol-formaldehidna smola (bakelit)

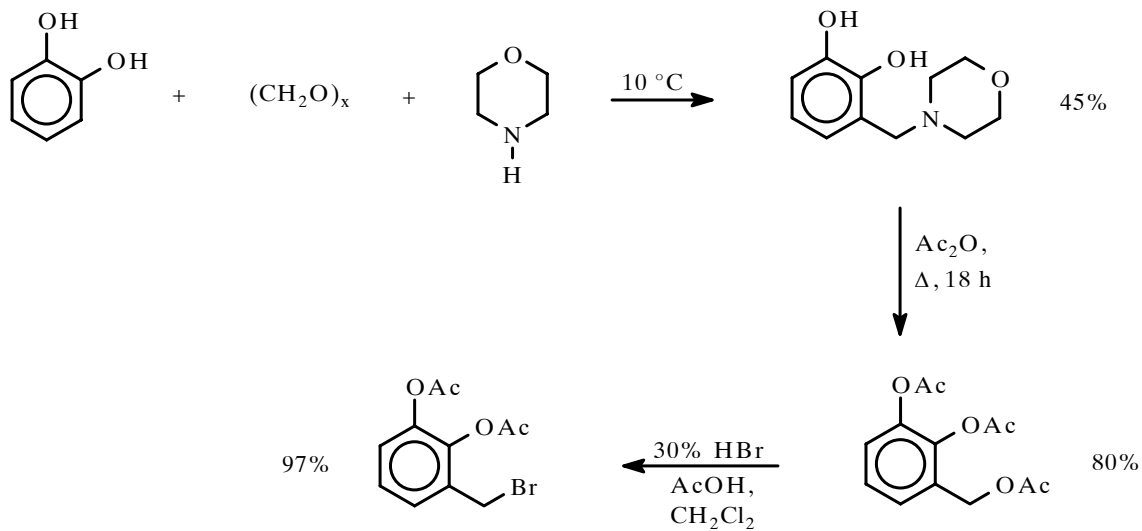
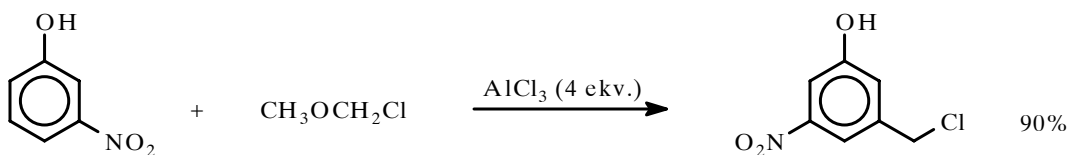
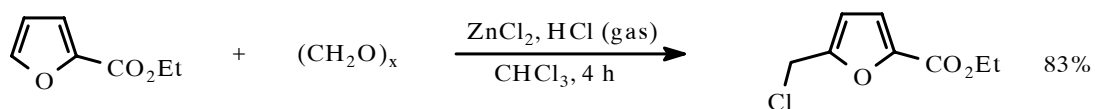
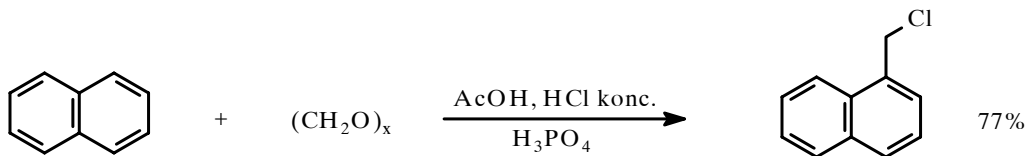
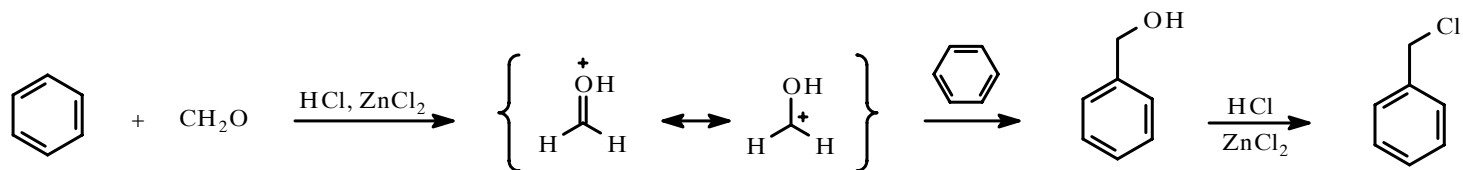
Skraup-ova sinteza hinolina



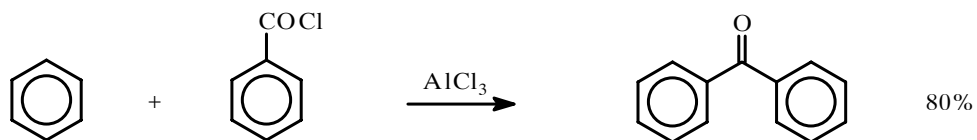
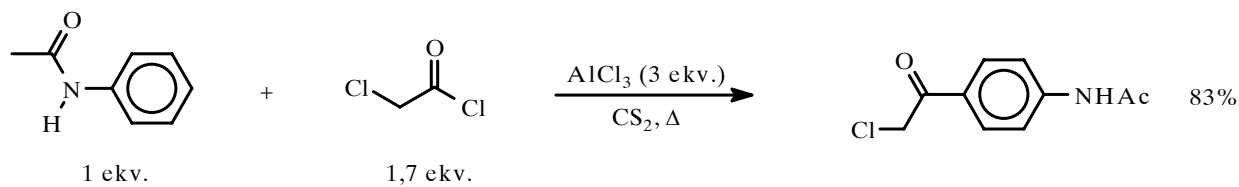
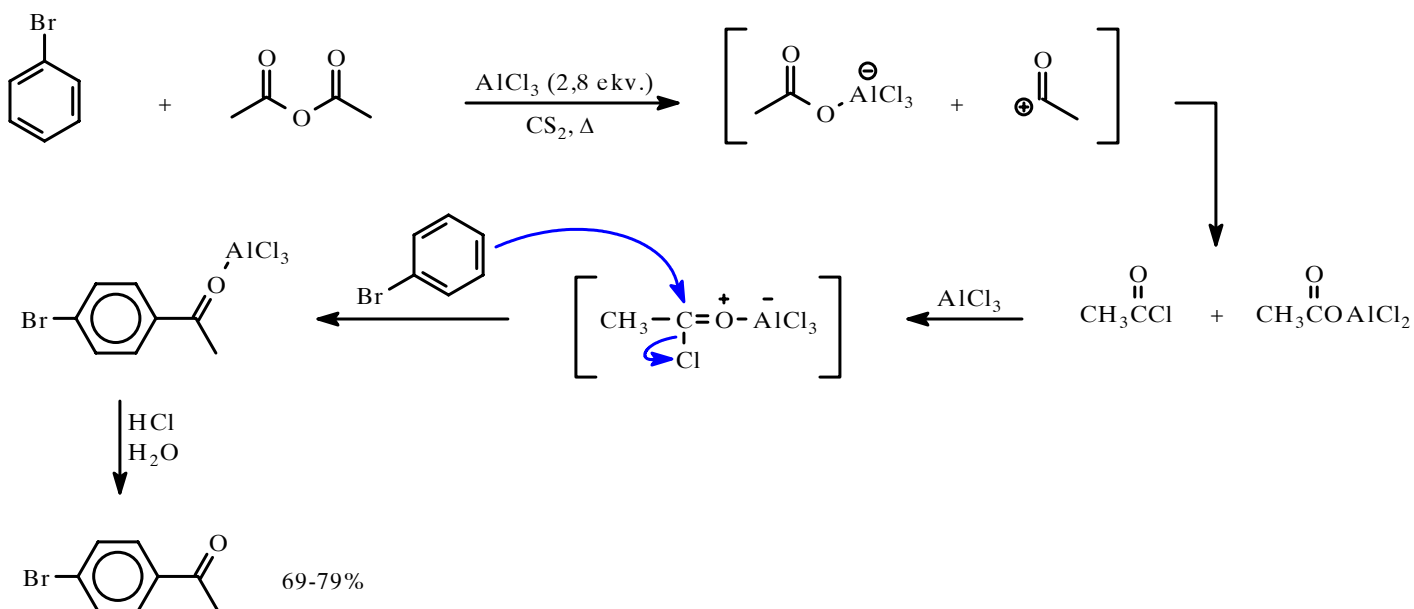
Pechmann-ova kondenzacija



* Hlormetilovanje

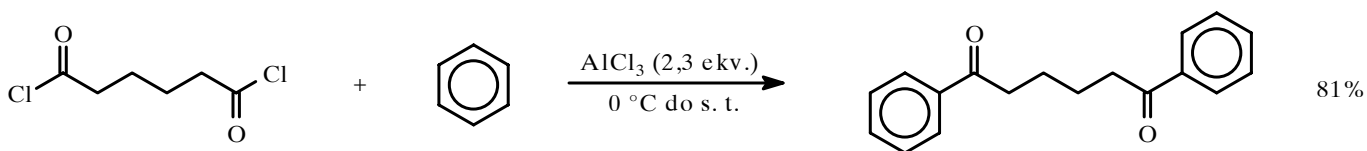
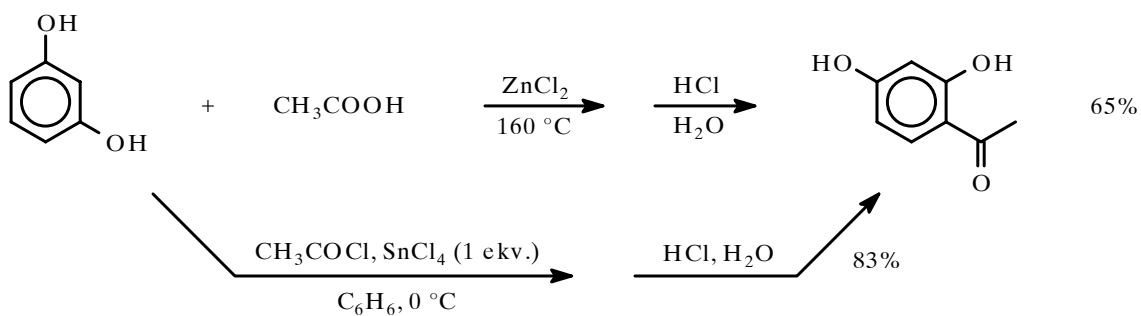
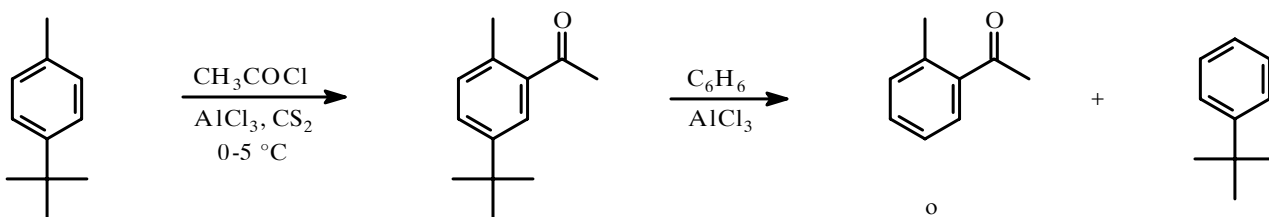
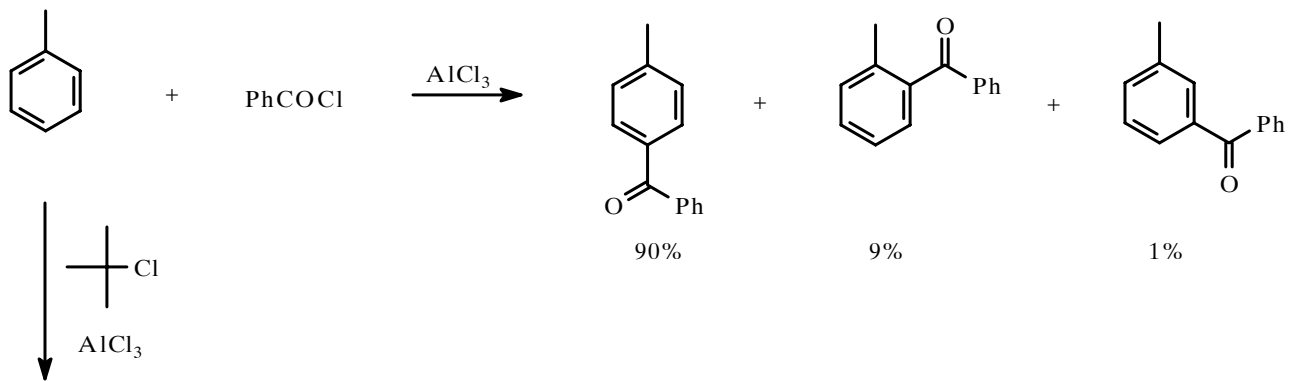


Friedel-Crafts-ovo acilovanje

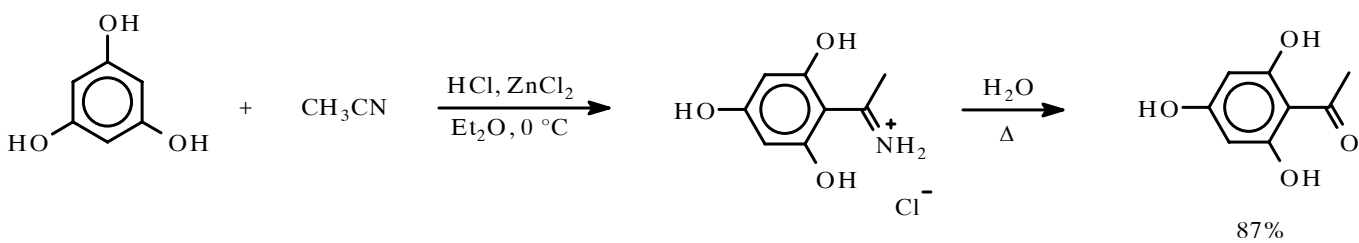


* Razlike u odnosu na alkilovanje:

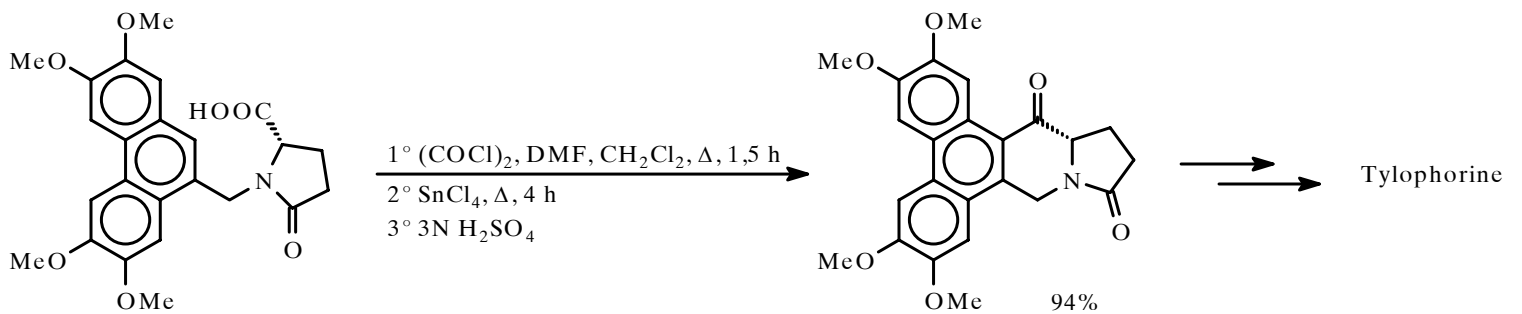
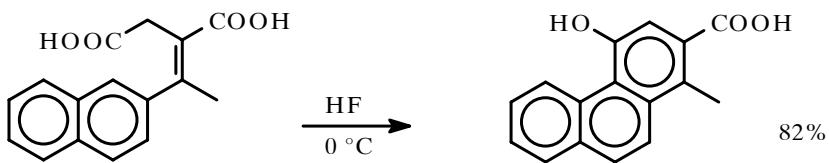
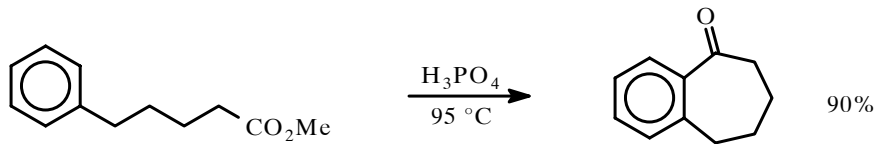
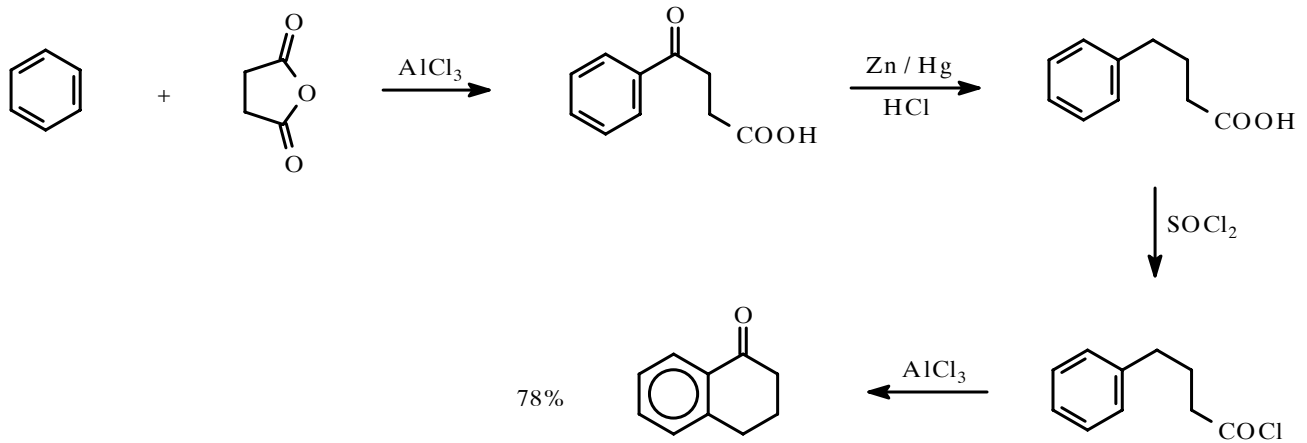
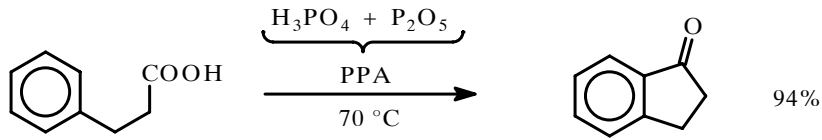
- 1) ≥ 2 ekv. LA (proizvod takođe kompleksira LA)
- 2) nema poliacilovanja (acil-grupa dezaktivira jezgro)
- 3) nema izomerizacije $\text{R}-\overset{+}{\text{C}}=\text{O}$
- 4) dominacija *p*-izomera (sterni razlozi; važan je uticaj rastvarača)



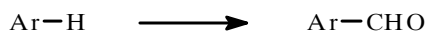
* Hoesch-ova reakcija



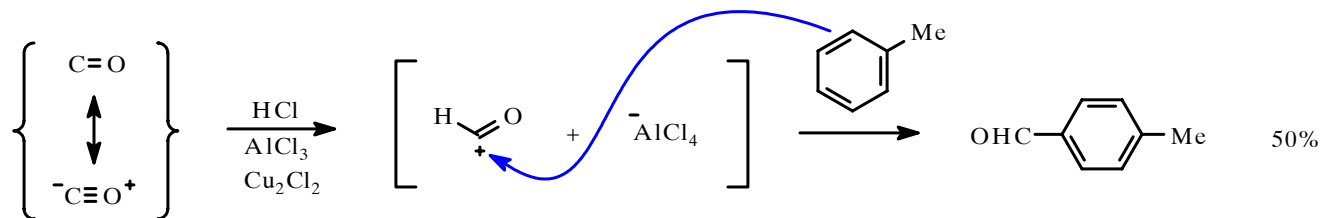
* Intramolekulsko Friedel-Crafts-ovo acilovanje



Formilovanje

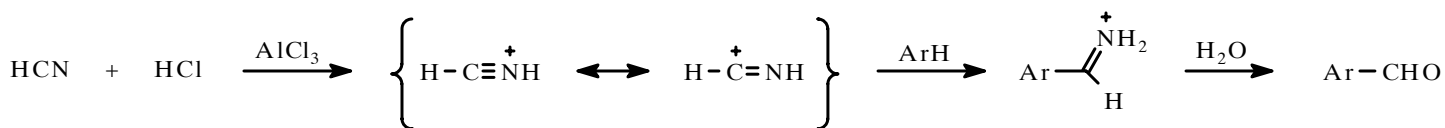


* Gattermann-Koch-ovo formilovanje



Loši rezultati sa fenolima

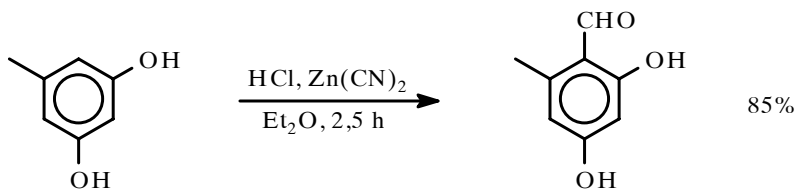
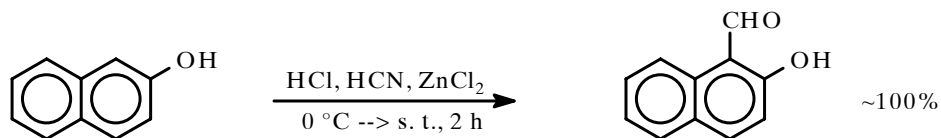
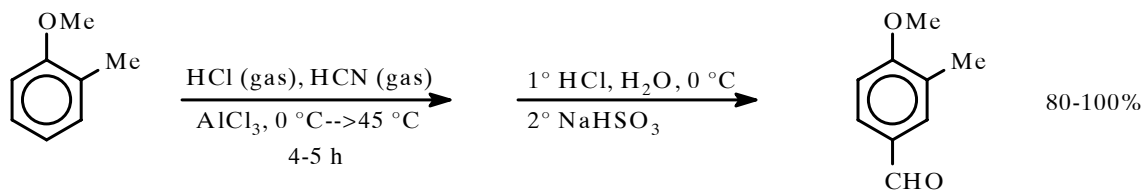
* Gattermann-ovo formilovanje

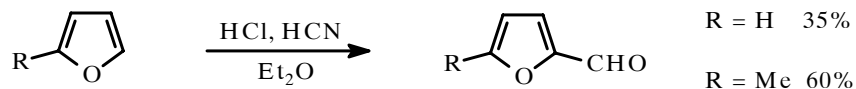
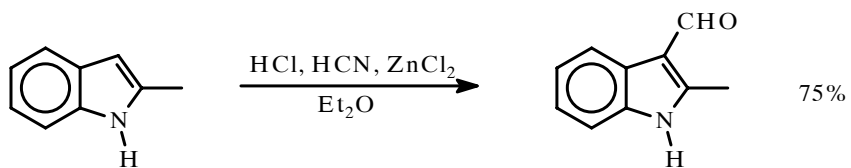
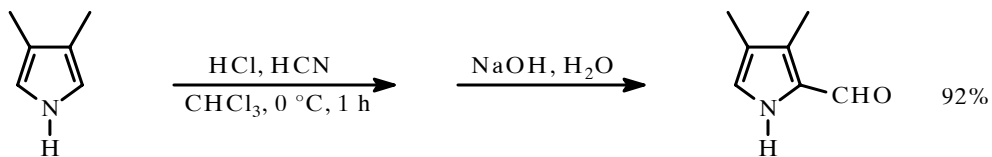


Adams-ova modifikacija: umesto HCN --> Zn(CN)₂ (zamenjuje AlCl₃)

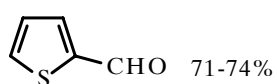
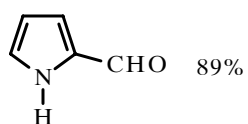
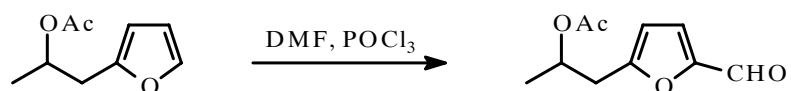
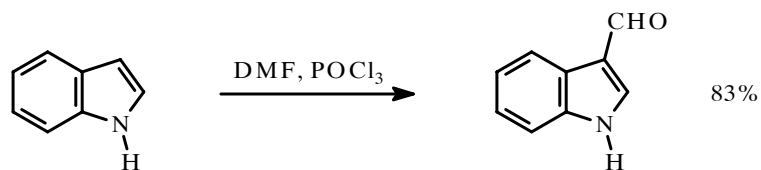
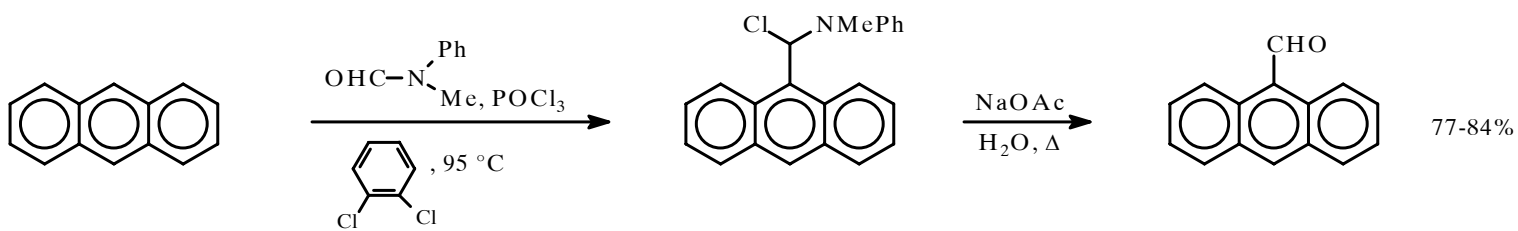
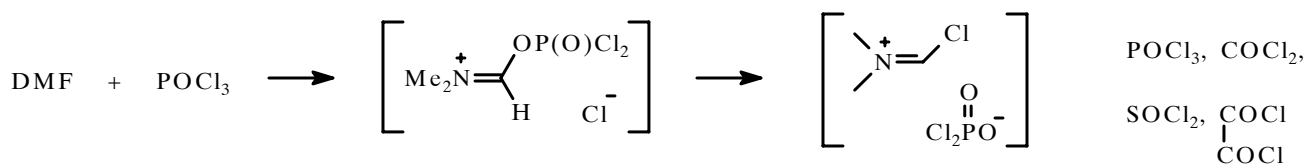
Primena Gattermann-ove reakcije: * fenoli, fenil-etri, heterocikli (alkil-furani, alkil-pirolu, indoli)

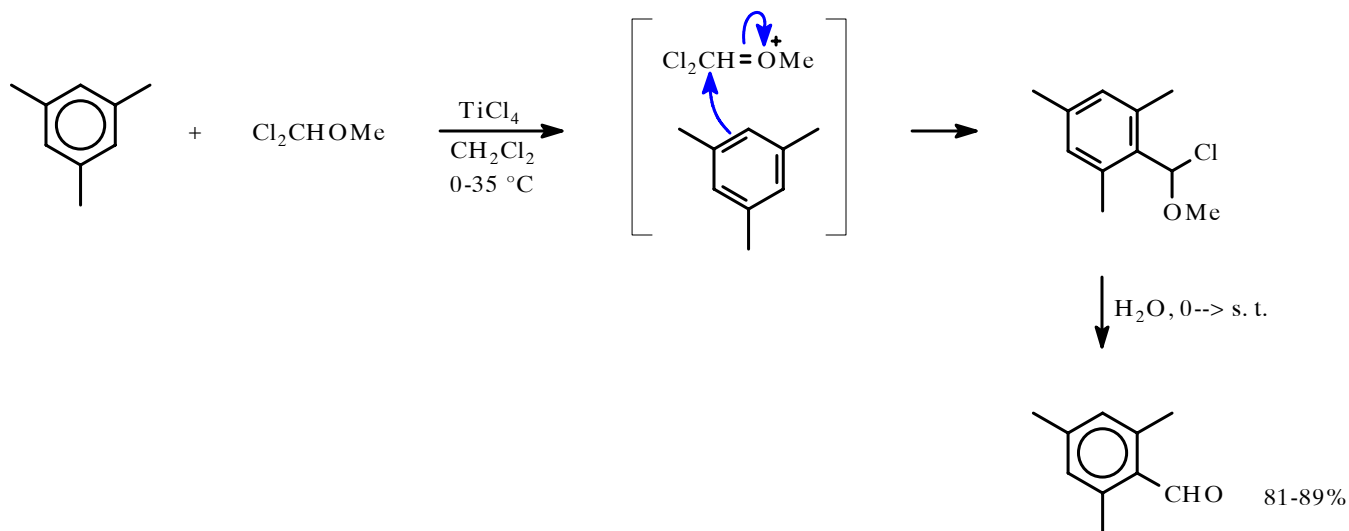
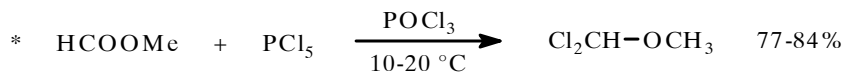
* nije za aril-amine, niti za Ar-Z (Z = e-deficitarna grupa)



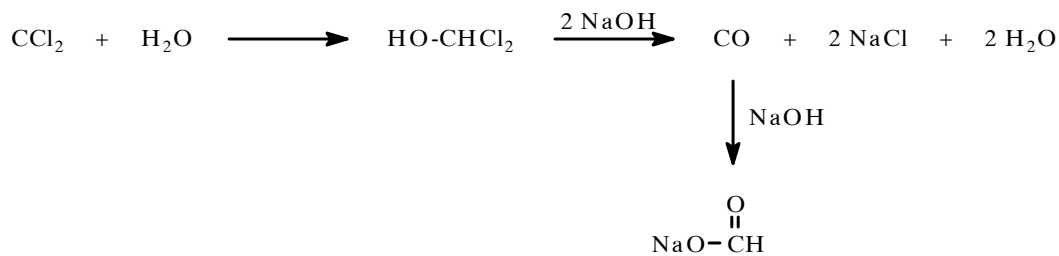
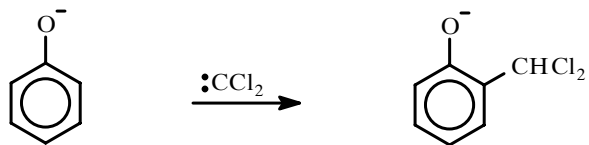
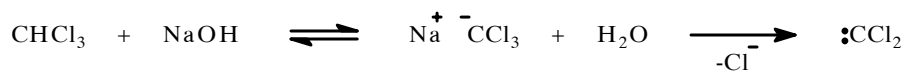
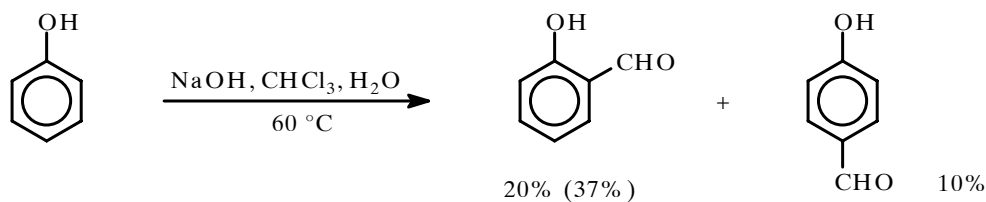


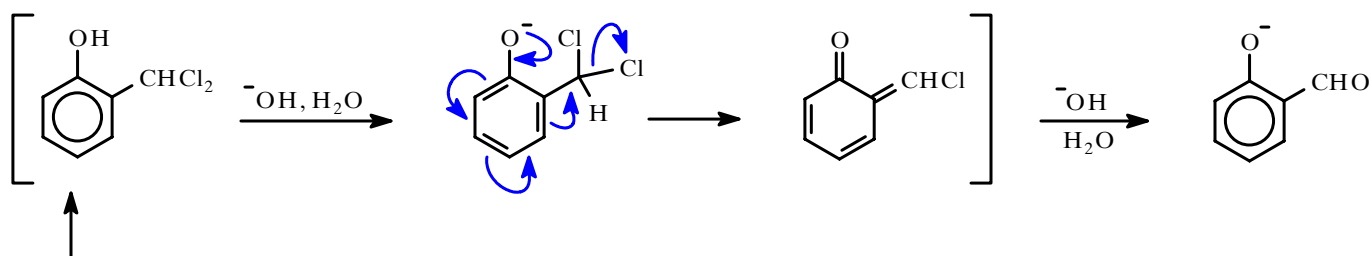
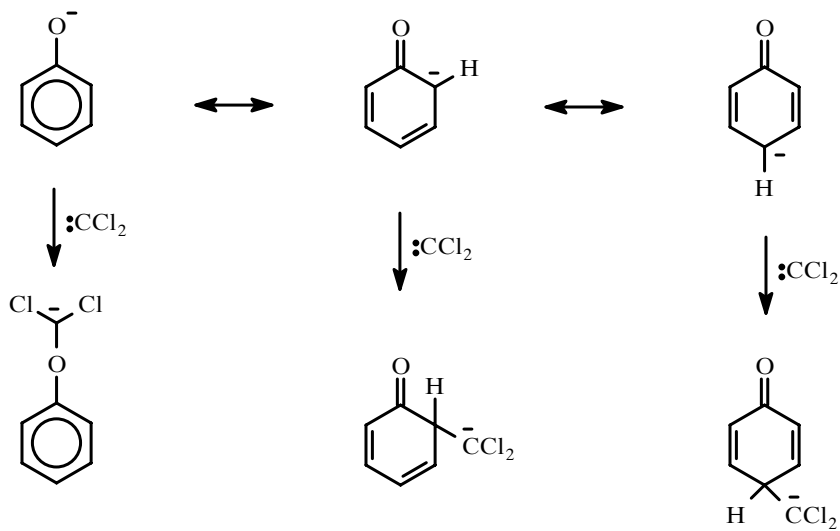
* Vilsmeier-Haack-ova reakcija



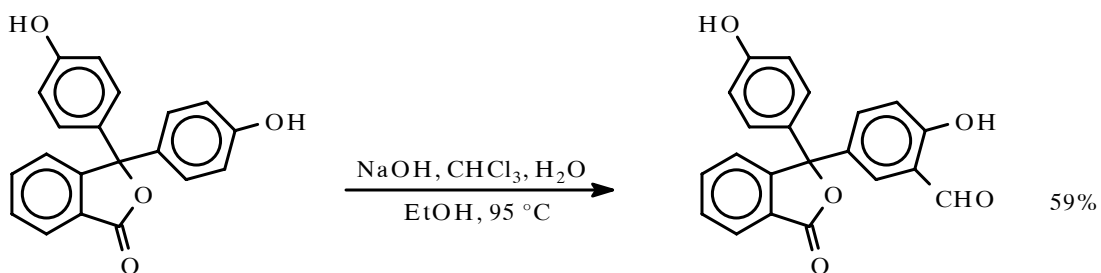
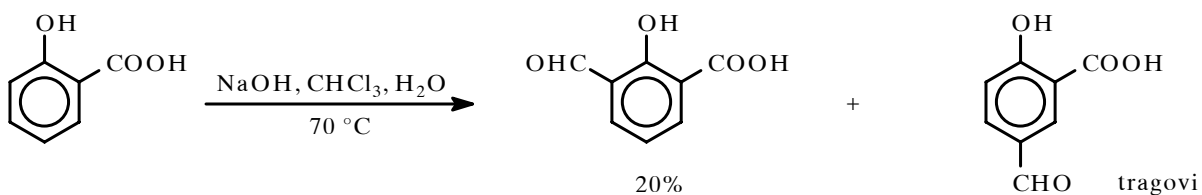
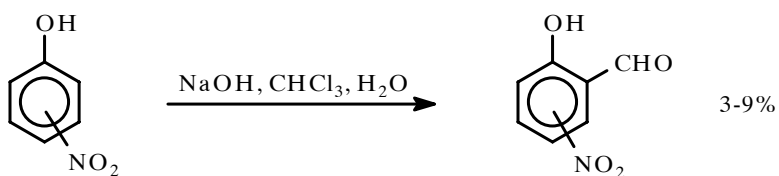
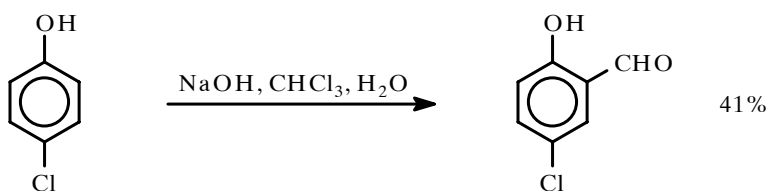


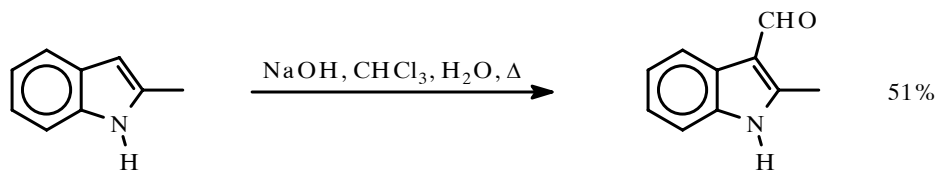
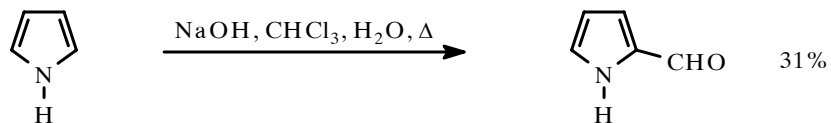
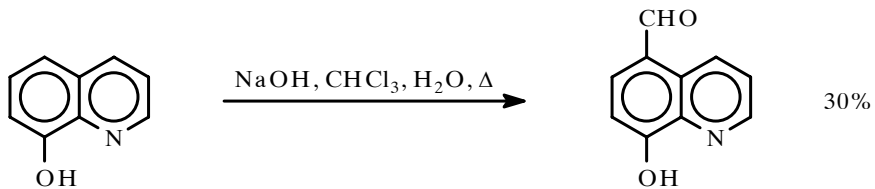
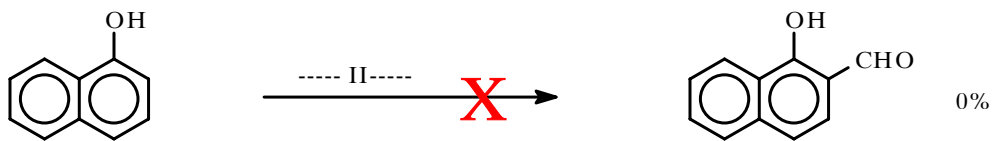
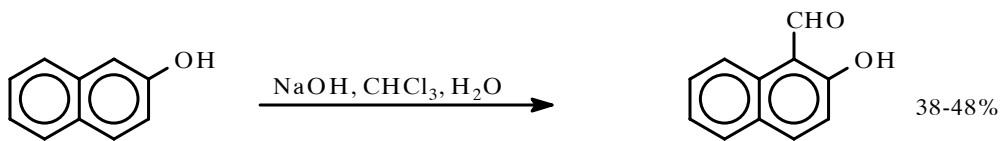
* Reimer - Tiemann-ovo formilovanje



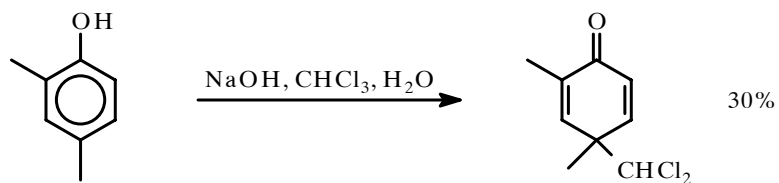


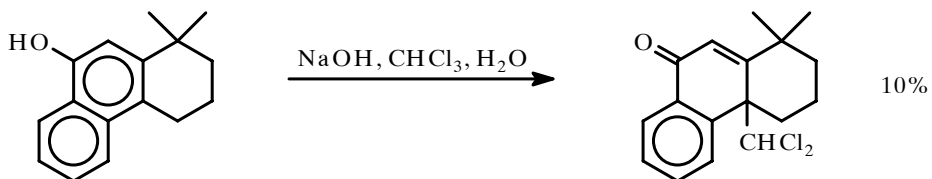
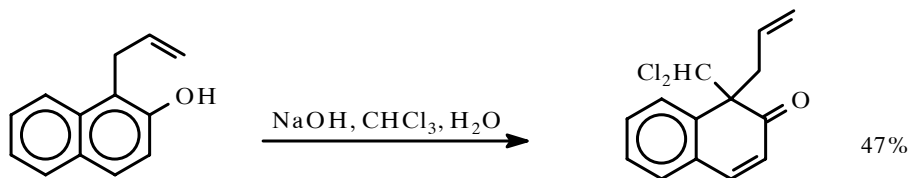
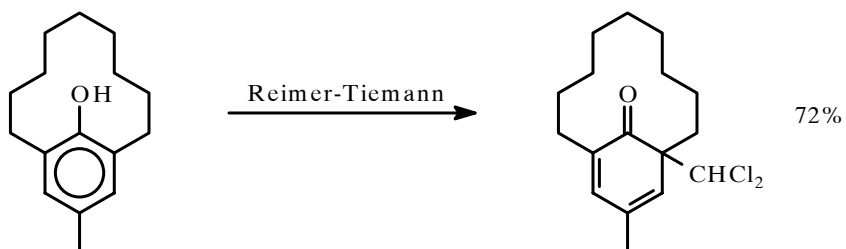
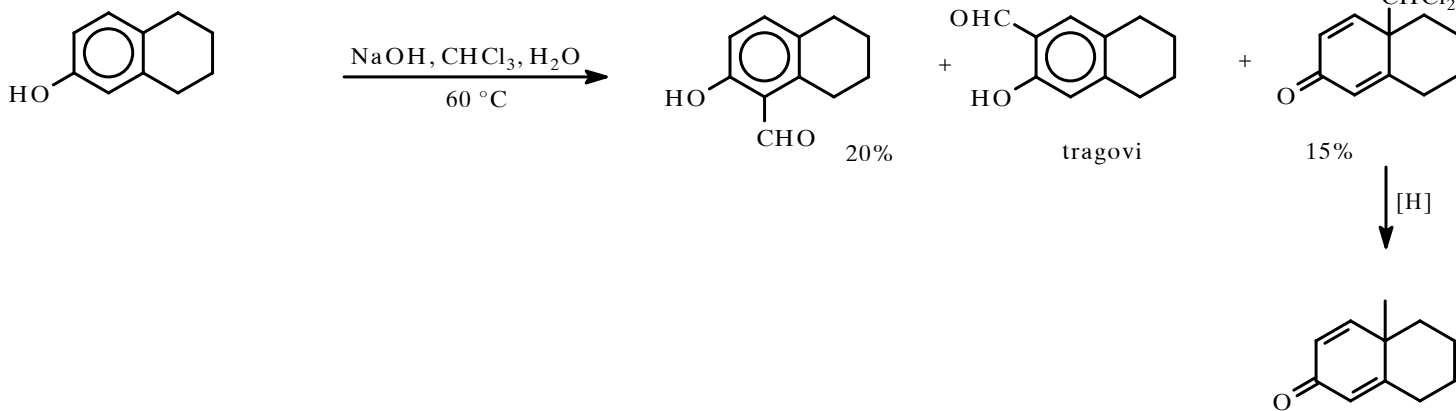
- Ne može se izolovati u uslovima RT-reakcije;
- Kada nema OH-grupe (u *o*- ili *p*-položaju) benzal-halogenidi su stabilni



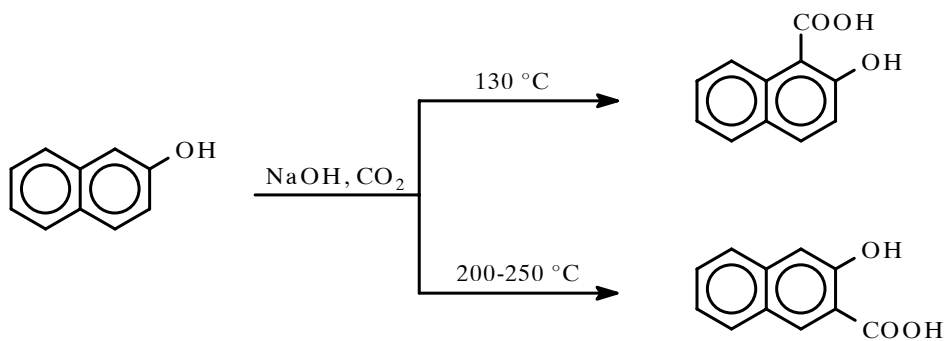
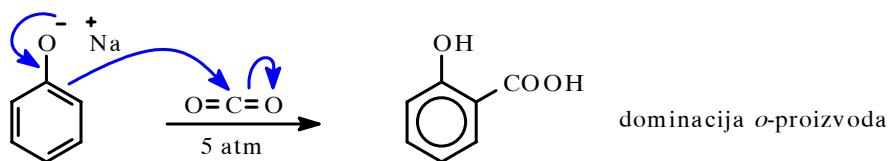


* "Abnormalni" proizvodi Reimer-Tiemann-ove reakcije

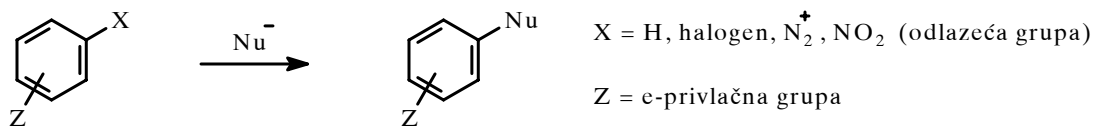




Kolbe-Schmidt-ova karboksilacija



2) Nukleofilne aromatične supstitucije

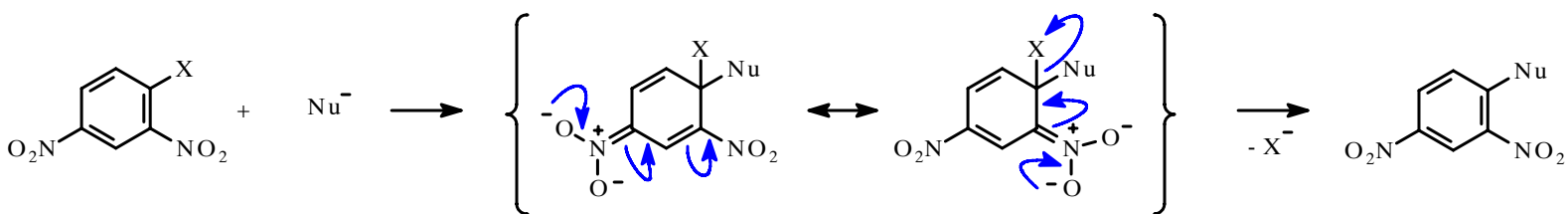


* $\text{S}_{\text{N}}\text{Ar}$

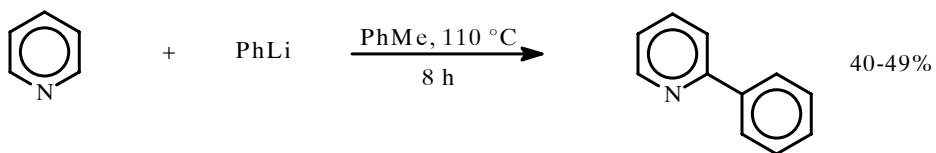
* S_{R} (preko aril-radikala)

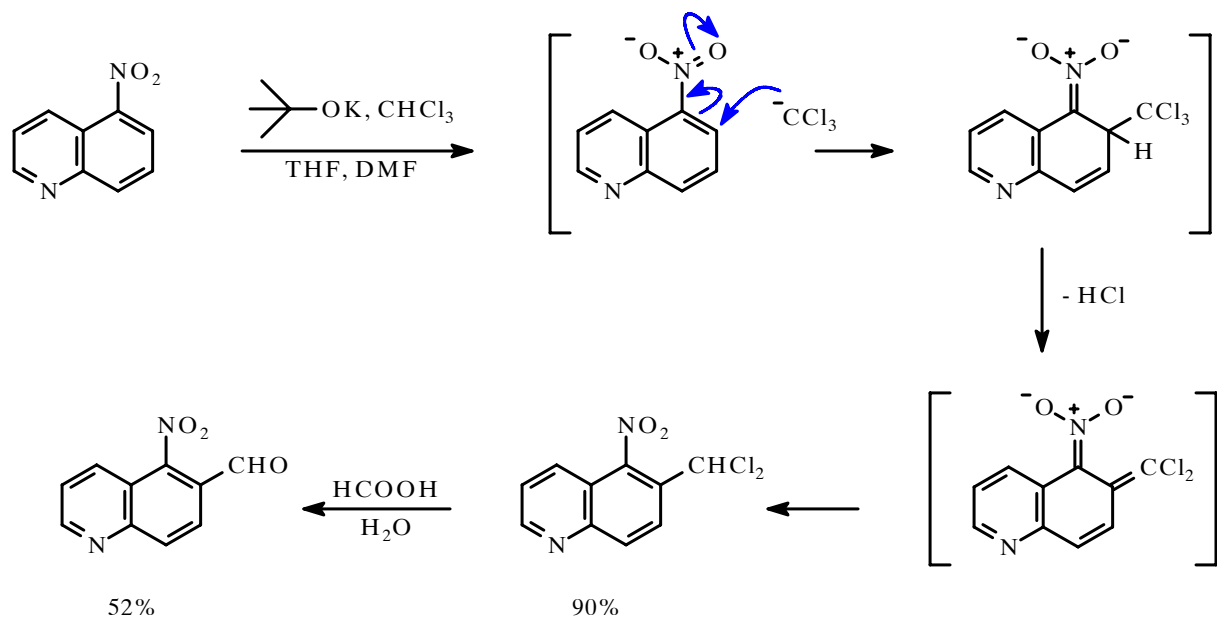
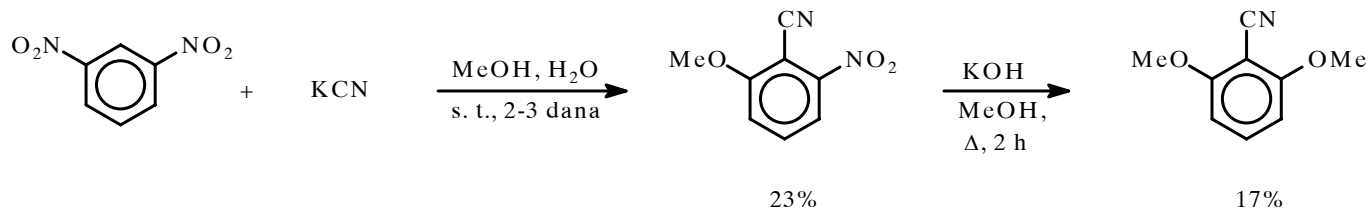
* preko benzina (dehidrobenzena)

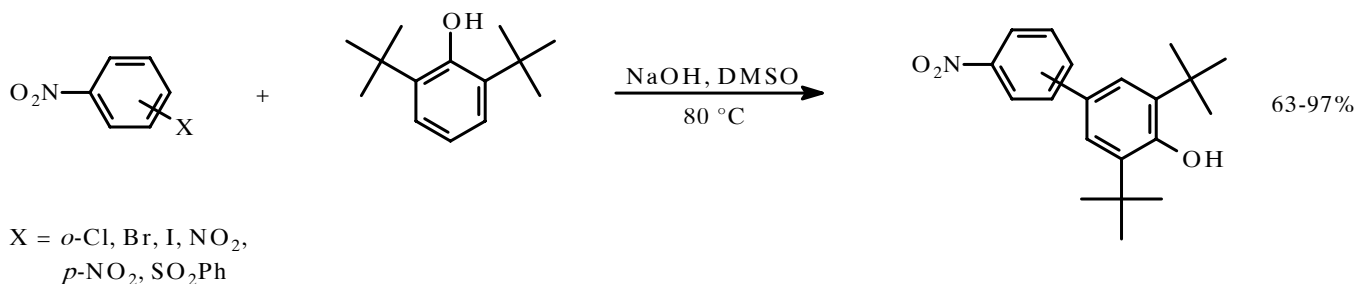
* $\text{S}_{\text{N}}\text{Ar}$



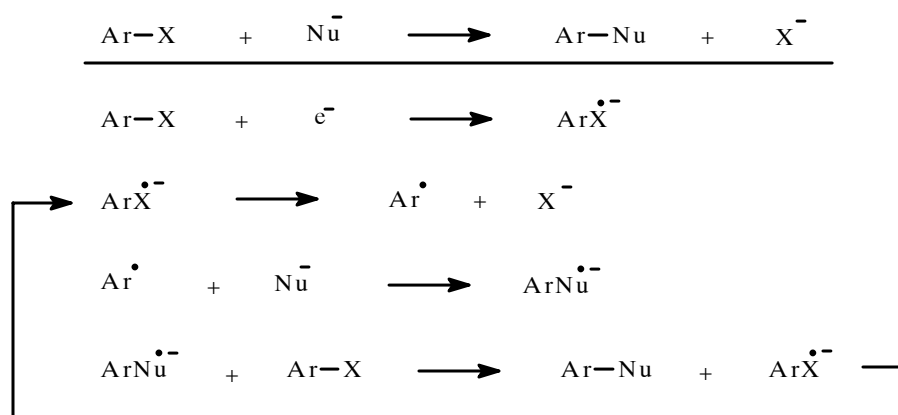
H







* $S_{RN}1$ pod dejstvom hv ili K/NH_3 liq.



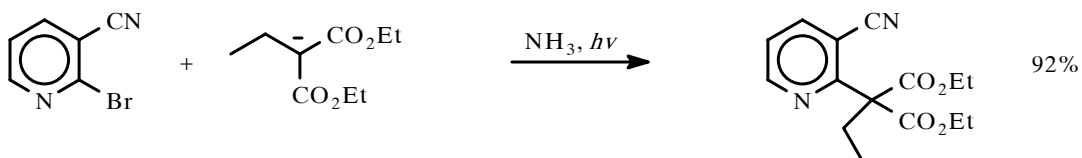
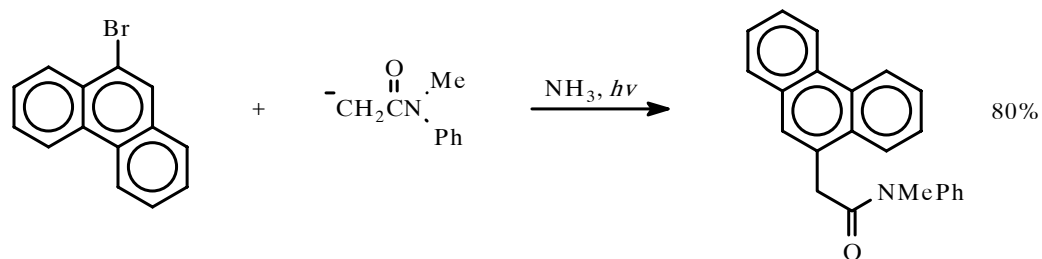
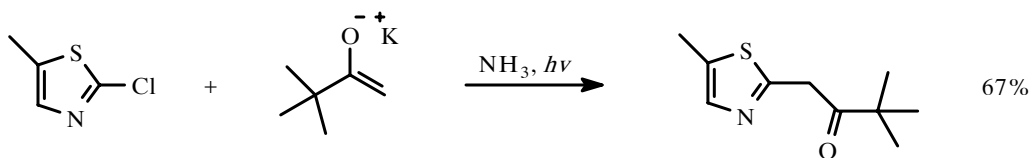
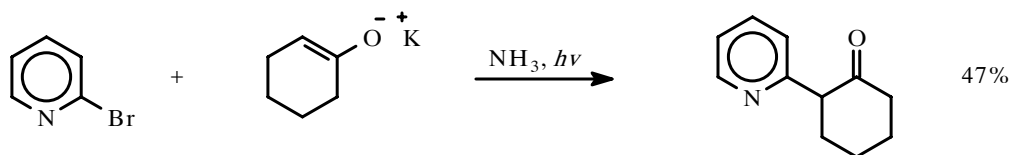
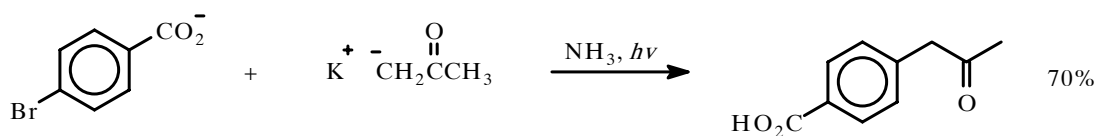
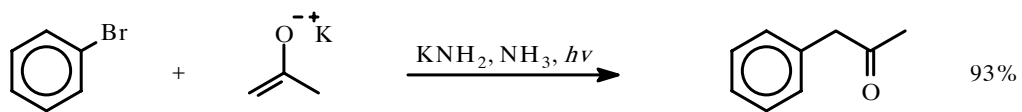
$X : I > Br > Cl > F; (\text{EtO})_2\text{P-O-}, \text{Me}_3\text{N-}$

Rastvarač: NH_3 liq., DMSO, DMF; ponekad THF, DME

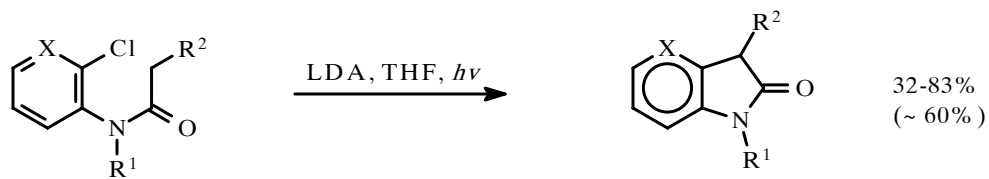
Supstituenti na Ar-jezgru: *o, m, p*- CN, C=O, MeO, NR_2 - pospešuju reakciju

COO^- , Ac, Bz - mogu biti prisutni

* Sa K / NH_3 česte su sporedne reakcije (npr. redukcija C=O grupe) \Rightarrow bolje je NH_3 / hv

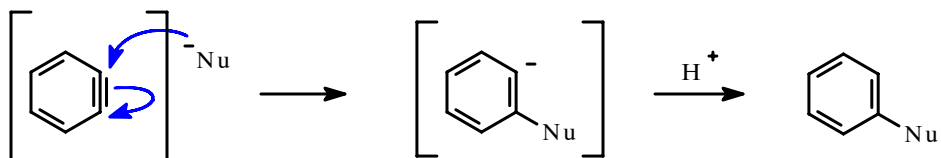


CN-grupa olakšava reakciju
1,3-dikarbonilna jedinjenja teško reaguju



X = CH, N

* Supstitucije preko benzina (dehidrobenzena)



* Preparativno dobijanje benzina: *in situ* (vidi DA)

* Sporedne reakcije: cikloadicije, dimerizacija

