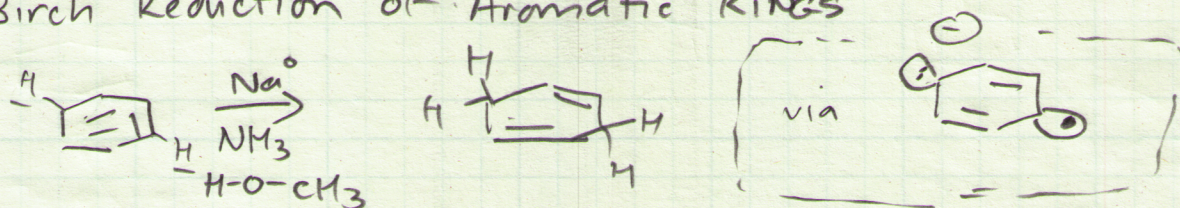


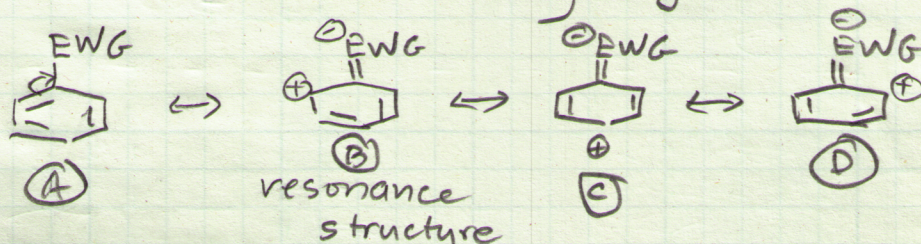
Birch Reduction of Aromatic Rings



See NOTES from 03-14-2025

Substituent effects on Birch Regioselectivity

EWG: electron withdrawing group
 EDG: " donating group

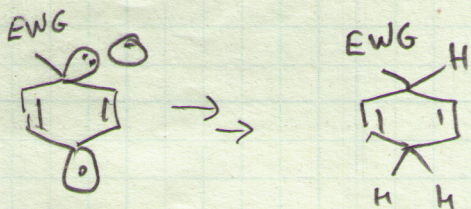


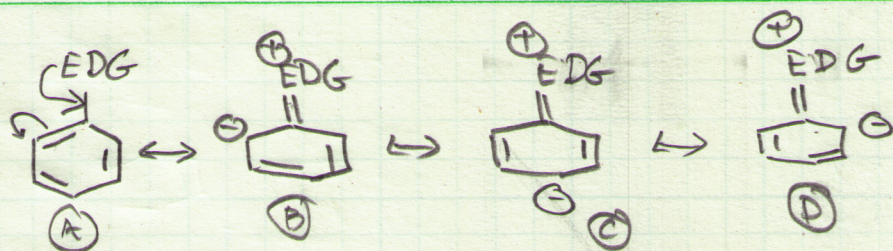
Also notice inductive electron withdrawal at the ipso carbon of the aromatic ring; i.e., the carbon attached to the substituent



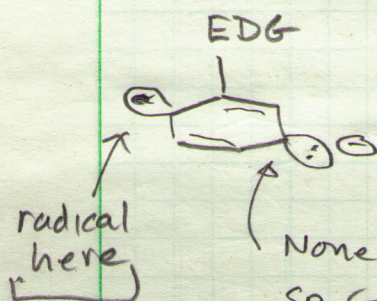
ipso C. has δ^+ charge that can support a $(-)$ charge or Radical
 the δ^+ is a direct consequence of the dipole created by the EWG!

$\therefore$ a Birch Reductⁿ intermediate is supported by a combination of the dipole and resonance structure C above





ipso C has δ^- charge in this scenario and thus cannot support a $(-)$ charge or radical as well. This direct induction effect creates Birch reductⁿ selectivity directing the anion and radical.

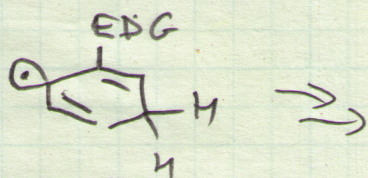


None of the resonance strs above has δ^- here so $(-)$ charge is supported and commits the regioisomerism to this position.

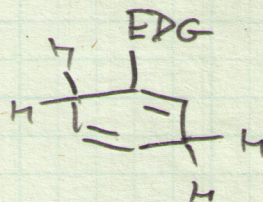
" - "

while res str (B) place δ^- here a radical can be supported; no $(-)$ formal charge is present on the C!

once this commits



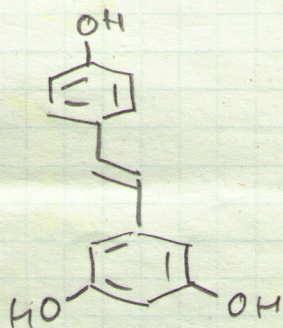
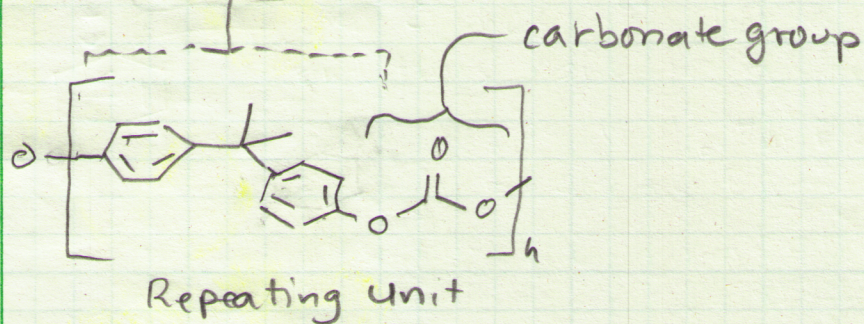
then this results



Phenols

Polycarbonate Filament in 3D Printing.

²
bisphenol : two "phenols"

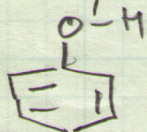


Resveratrol

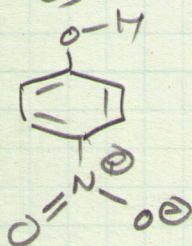
found in Wines

(cancer chemo preventative)
(reduces heart disease)

Acidity of Phenol(s)

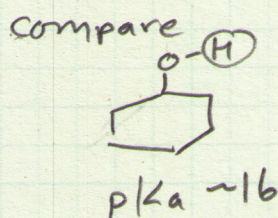
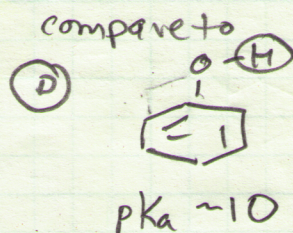
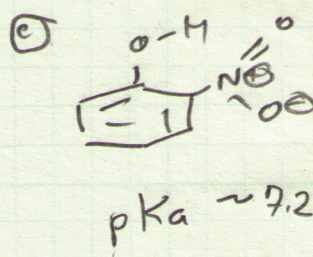
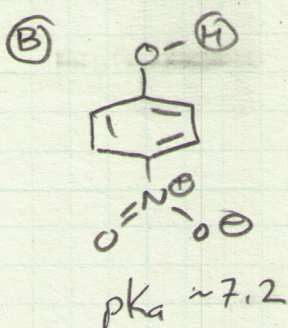
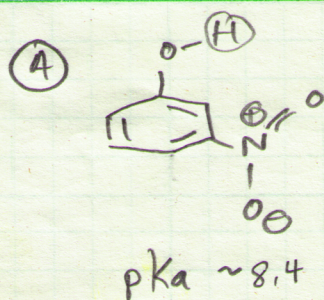


pK_a 10



$pK_a \sim 7.4$

why?



why is the pKa of (A) > B/C but < (D)?
Resonance Induction

Preparation of Phenols

NAS (Nucleophilic Aromatic Substitution)

