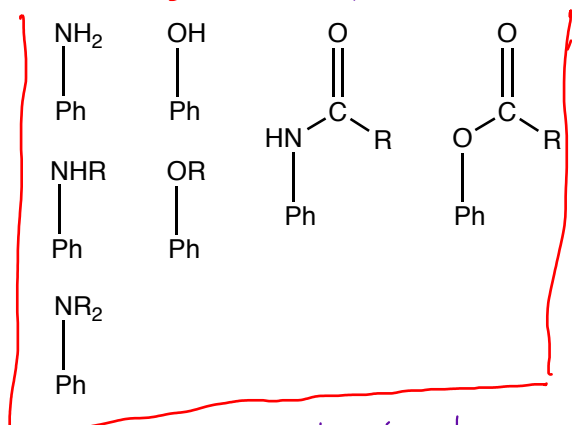
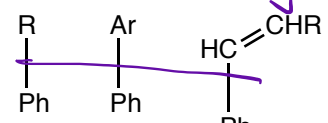


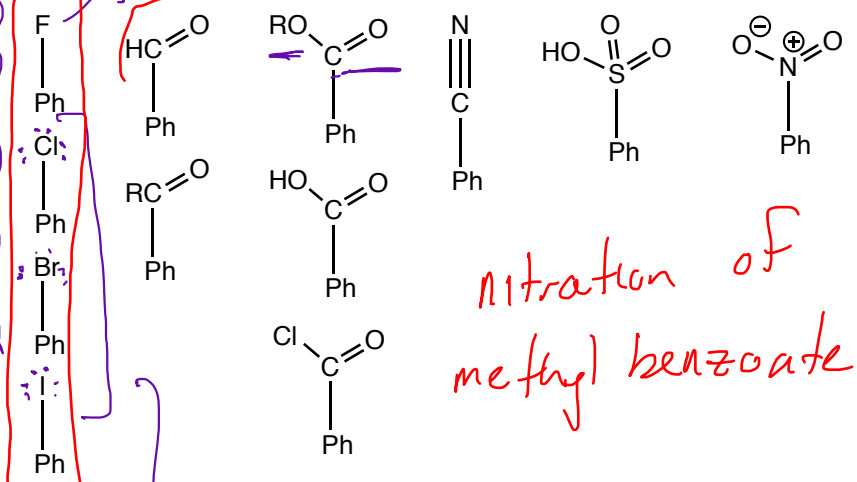
benzene rings with substituents that have lp-e's adjacent to the ring are **ortho/para directors**



e⁻ donating through the inductive effect + hyperconjugation



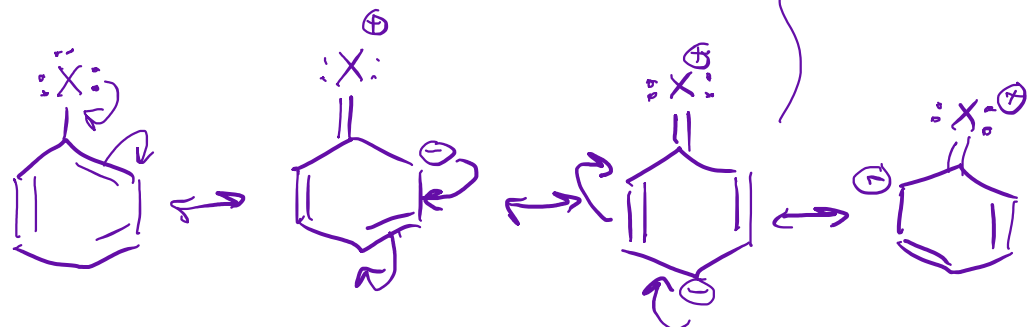
benzene
halogens just too electronegative meta directors



nitration of methyl benzoate

too big to be really good at π donation

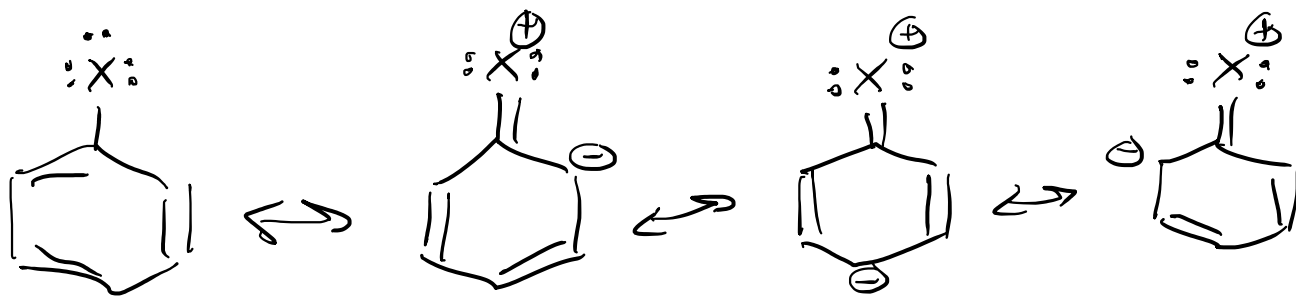
atom adjacent to the ring has a lone pair of e's



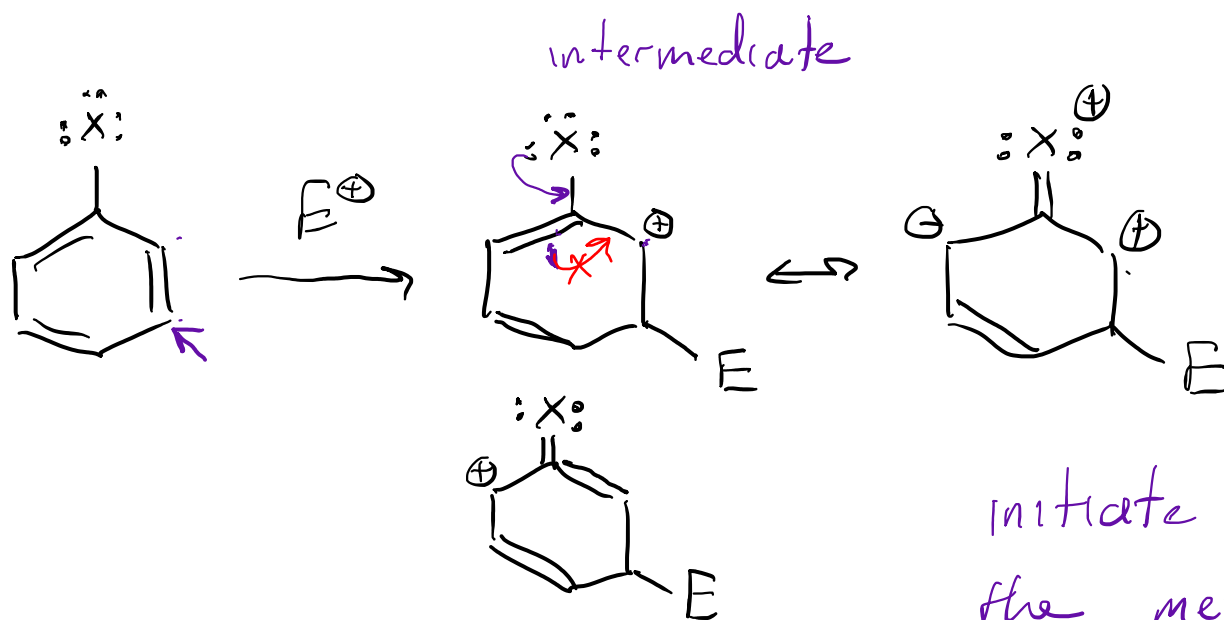
conjugation \equiv resonance \equiv extended π system

resonance effects always shows up at ortho + para positions

ortho/para director



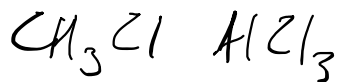
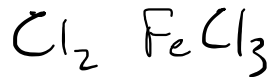
ortho + para positions are more e^- rich, more attractive to electrophiles



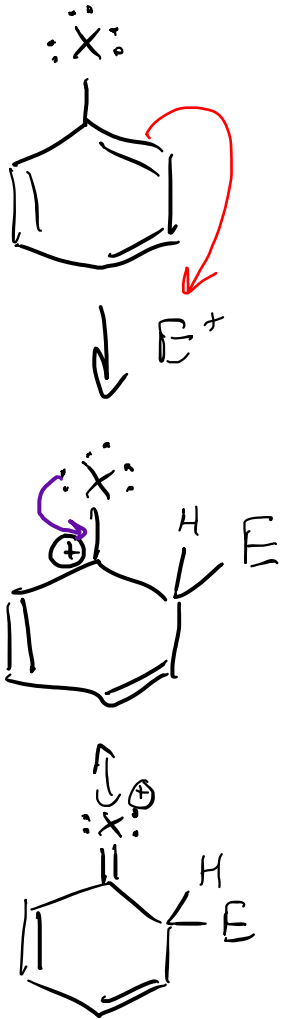
intermediate

initiate the reaction at the meta position

lone-pair e^- 's on substituents don't help

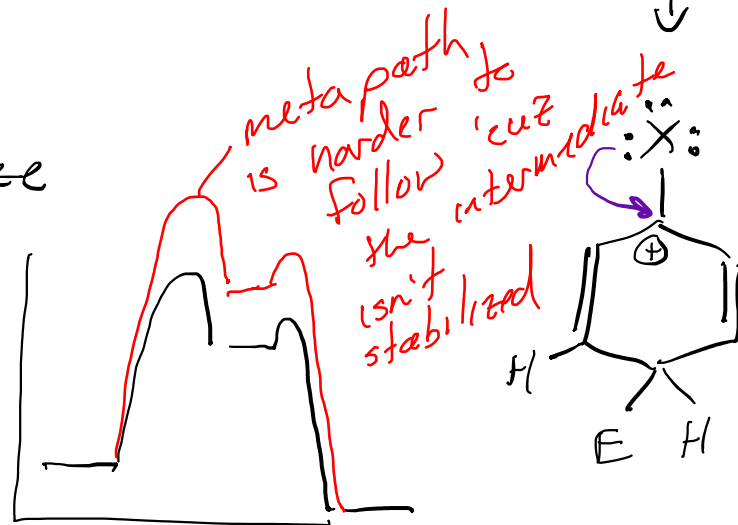


ortho

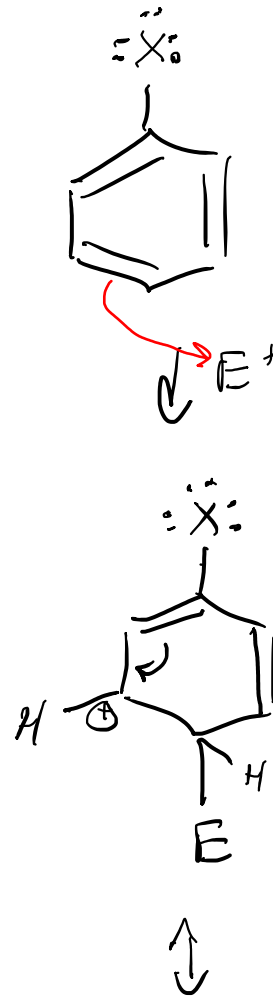


X helps to stabilize \oplus charge

1. finish drawing intermediate
2. draw resonance contributors to show how X affects stability of intermediate



para



lp e^- 's on the atom adjacent to the benzene ring can stabilize the intermediate when E^+ adds to ortho + para positions

