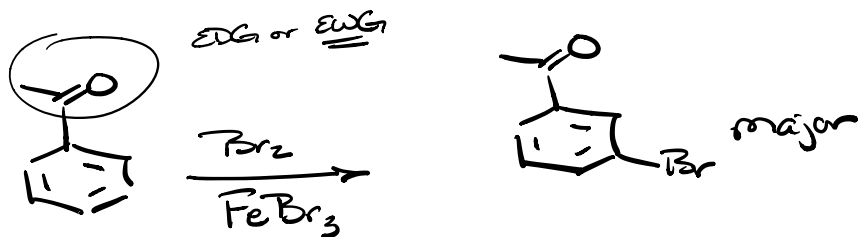


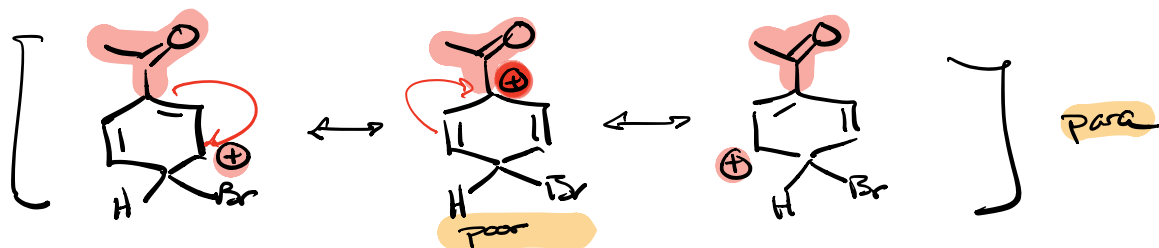
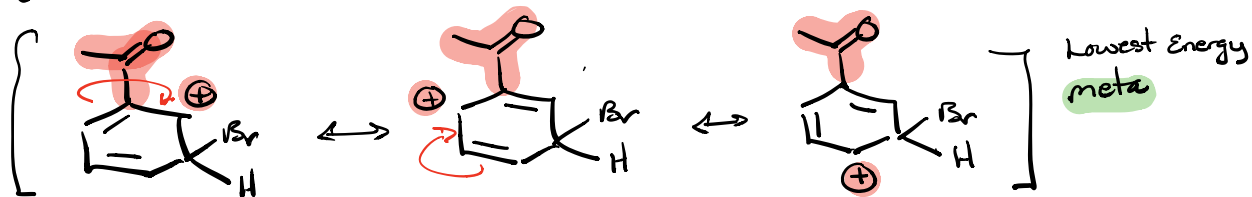
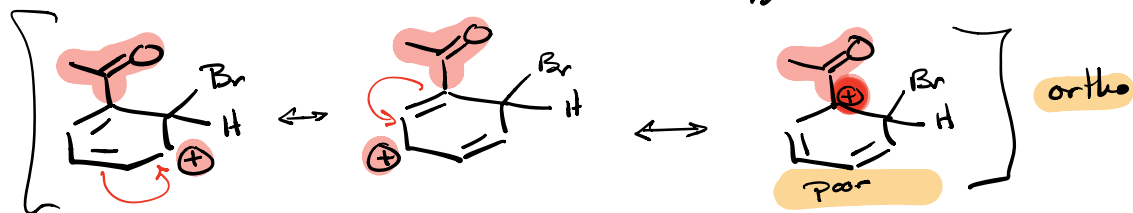
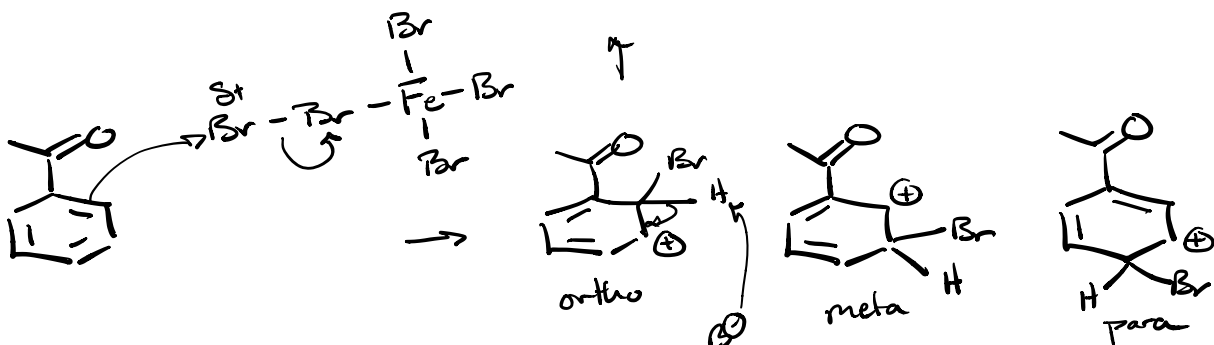
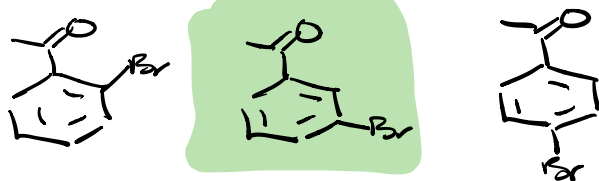
Electrophilic Aromatic Substitution

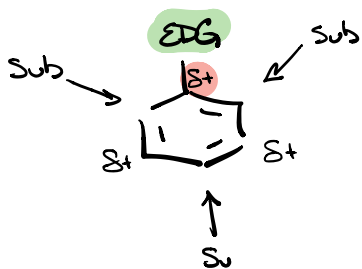
Problem Session



① EWG

② o,p director
or m director



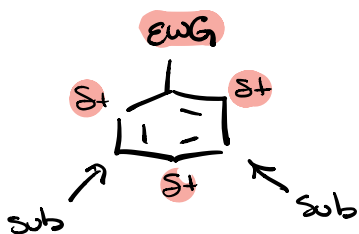


EDG are O,P - directors

EDG \leq CH₃ ortho major

EDG $>$ CH₃ para major

* EDG \leq CH₃ & one ortho blocked
 \Rightarrow para major



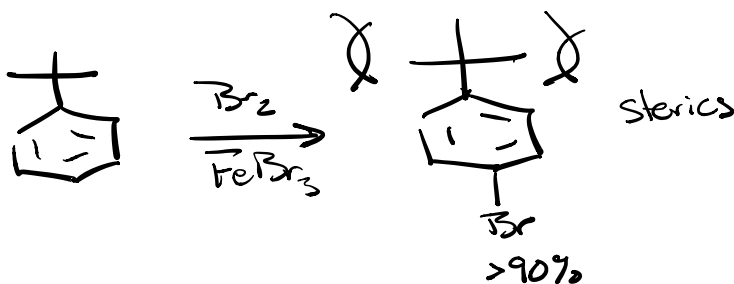
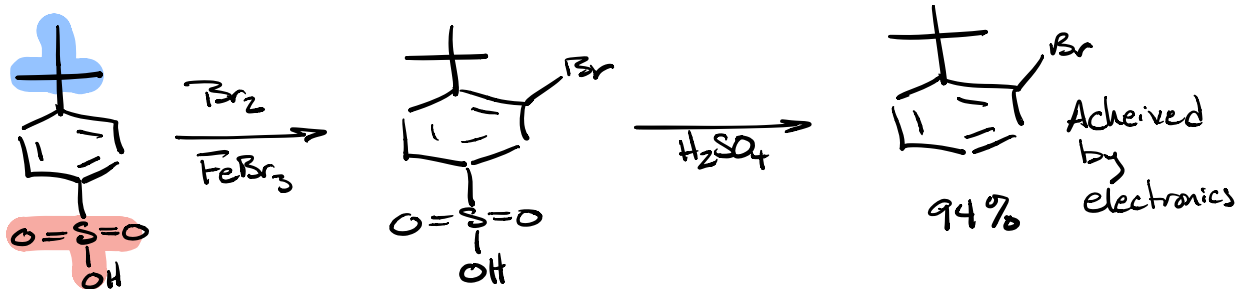
EWG are m-directors

sterics are ~~not~~ a factor

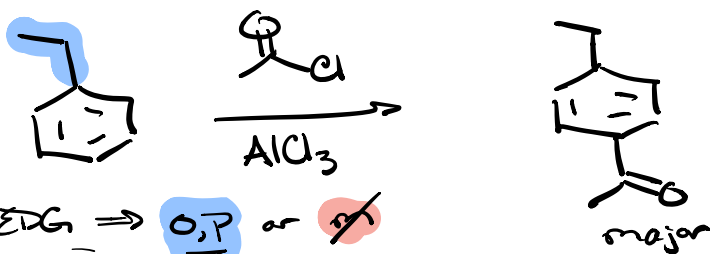
* When there is a competition between two or more substituents, the stronger donating group directs.

\Rightarrow Electronics 1st (more donating)

\Rightarrow Sterics 2nd

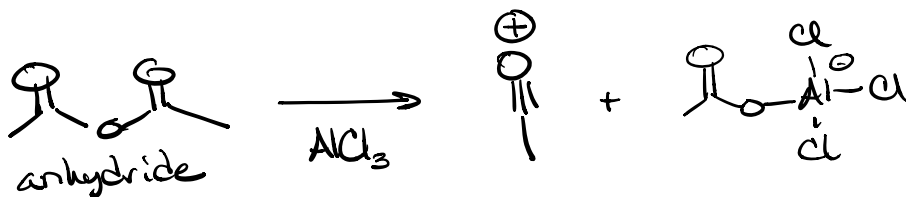
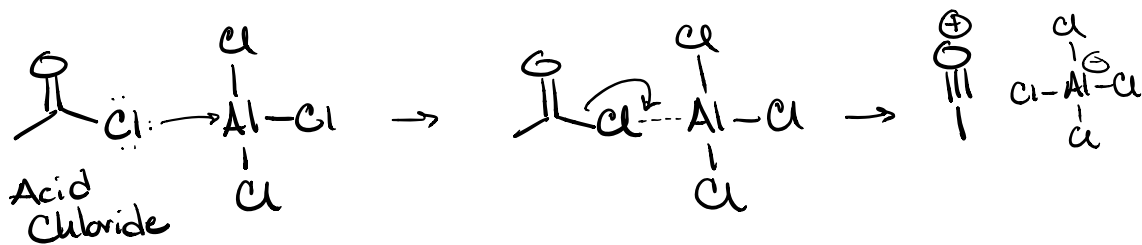


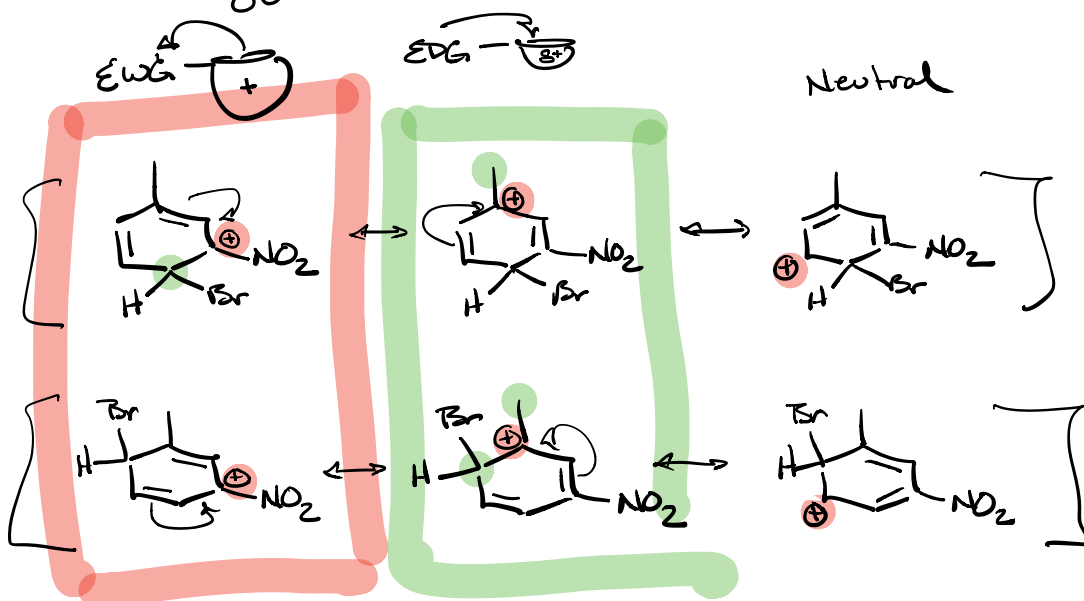
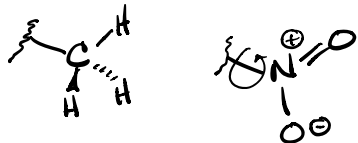
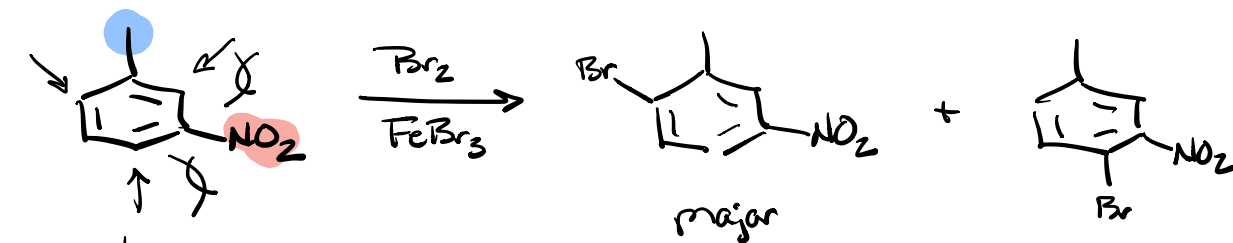
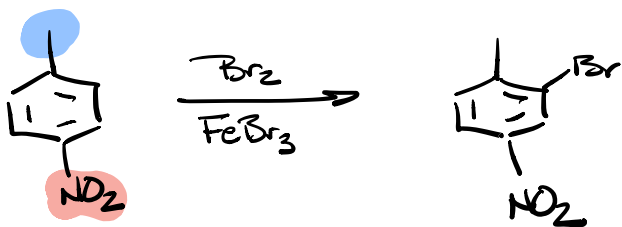
① EDG or EWG?



② EDG \Rightarrow O, P or ~~N~~

③ $>CH_3$ or $\leq CH_3$
 para or ortho





minor

③

1%

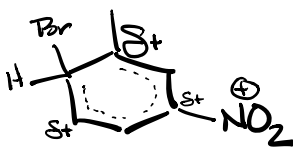
major

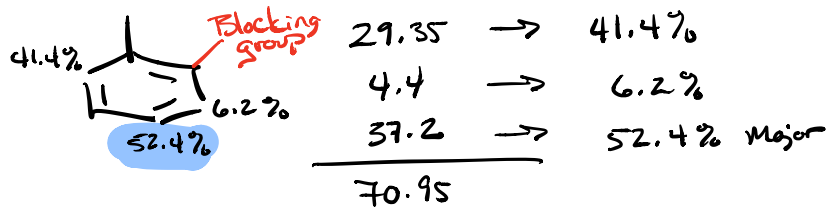
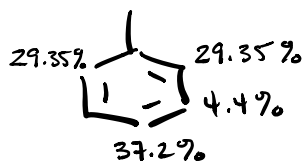
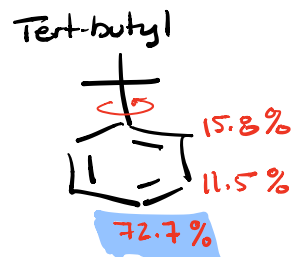
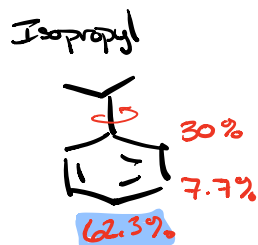
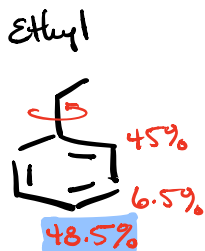
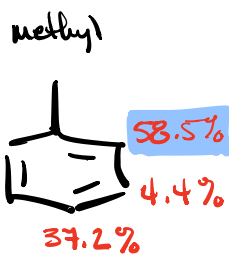
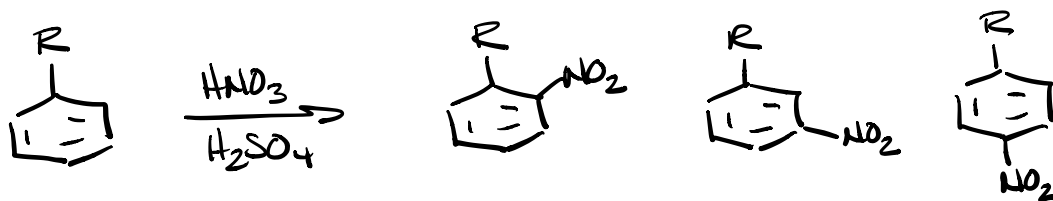
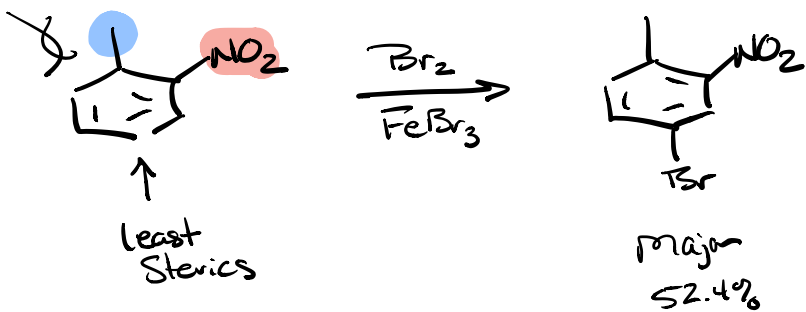
①

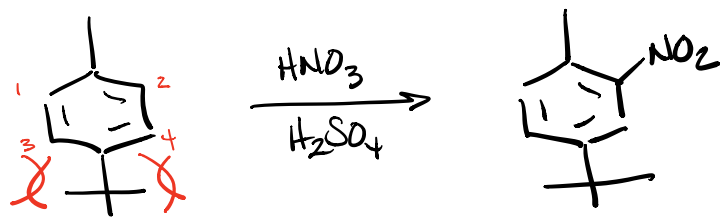
90%

②

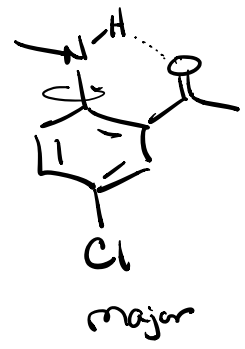
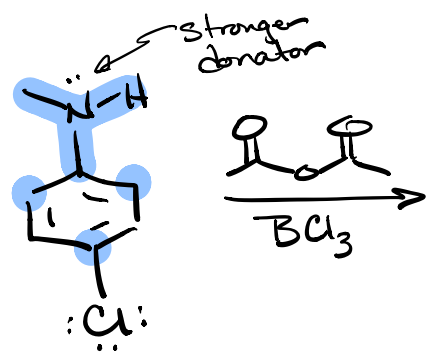
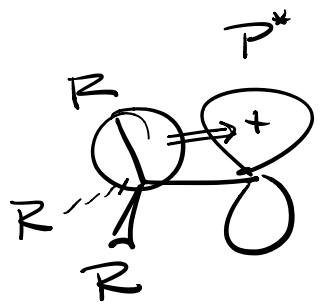
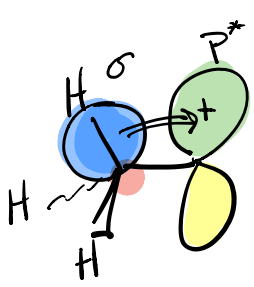
9%

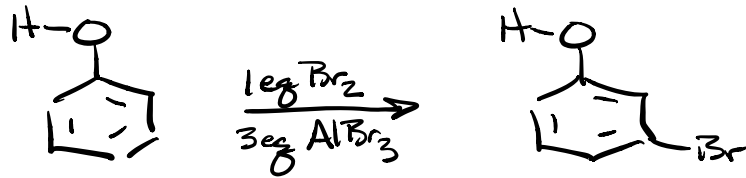
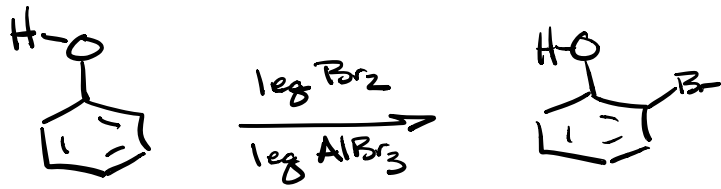






ortho to
Smaller Methyl





why?

