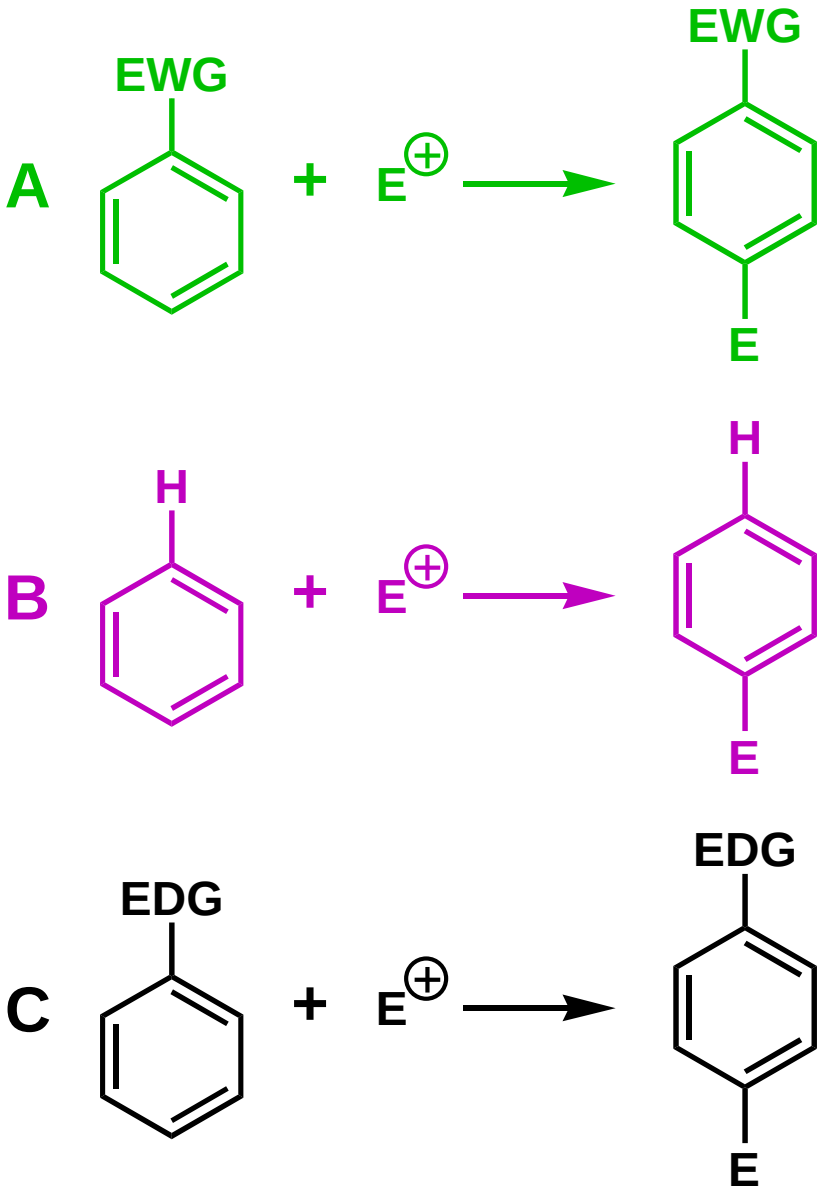
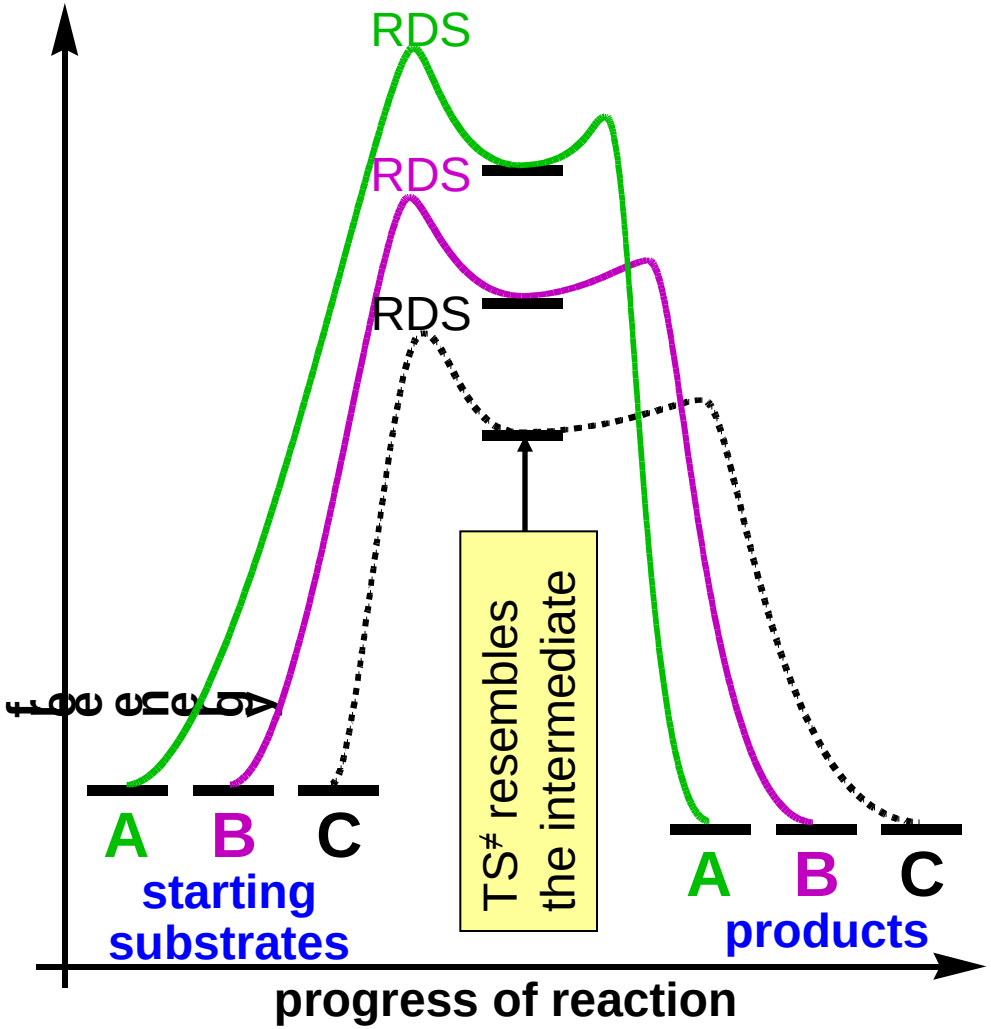
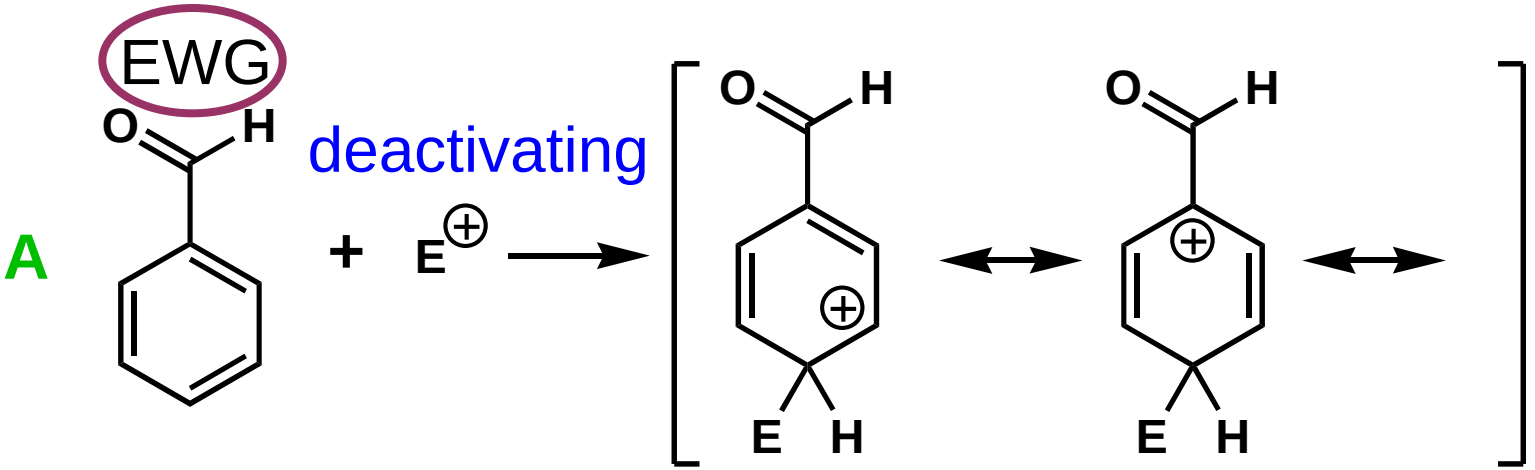
Rationalizing Substituent Effects for Electrophilic Aromatic Substitution Reactions

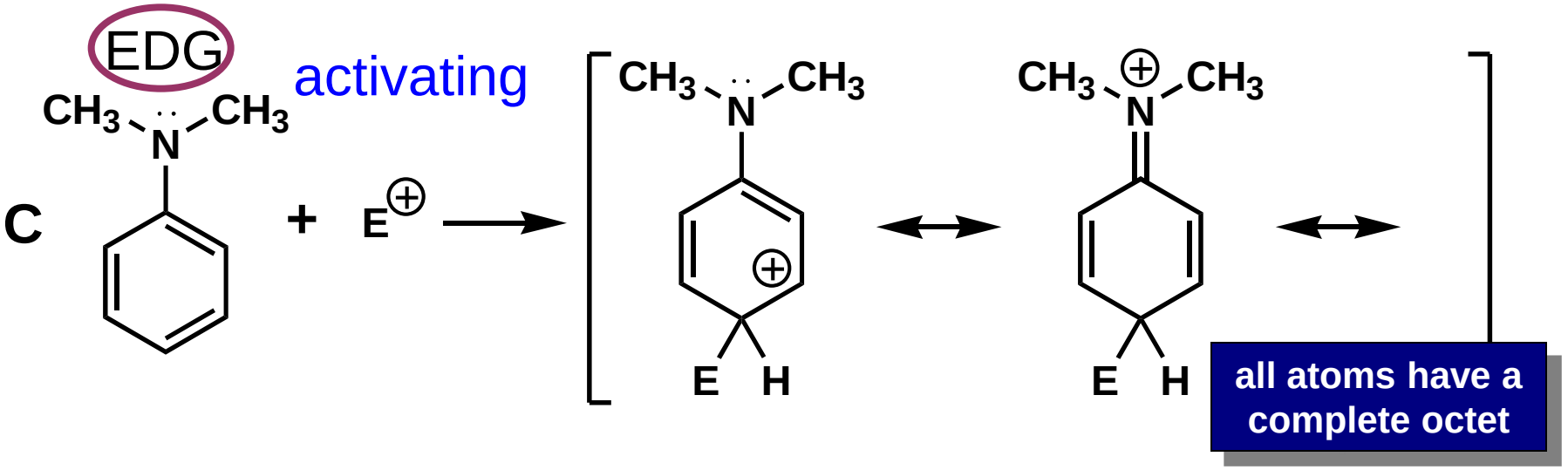


Since the benzene ring is the nucleophile, the reaction is accelerated by EDGs

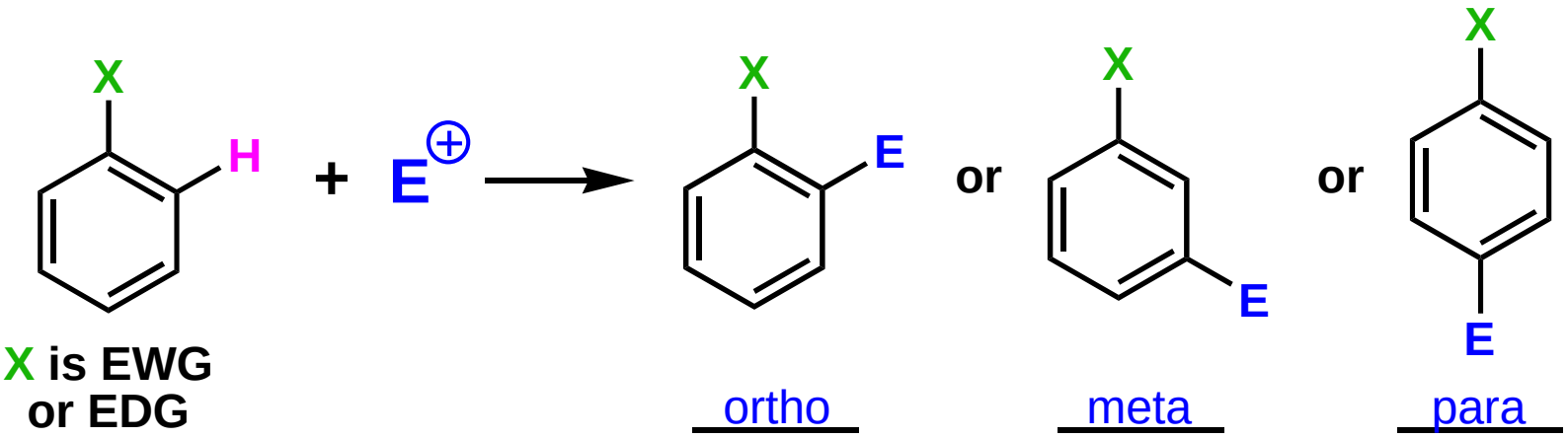


Comparing Intermediates For Rings with an EWG vs. EDG





Substituents and Regiochemistry in Electrophilic Aromatic Substitution

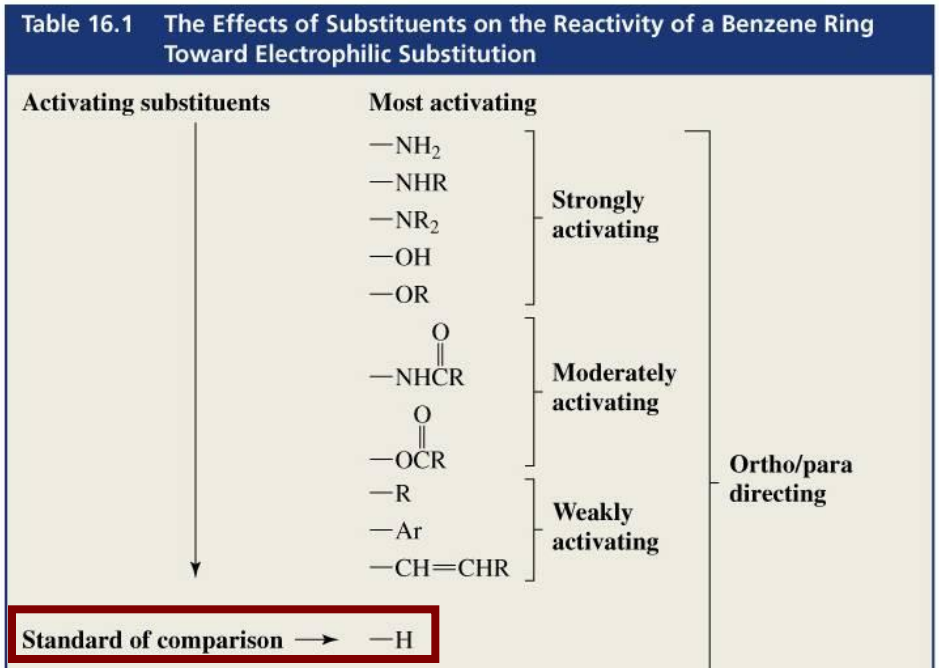


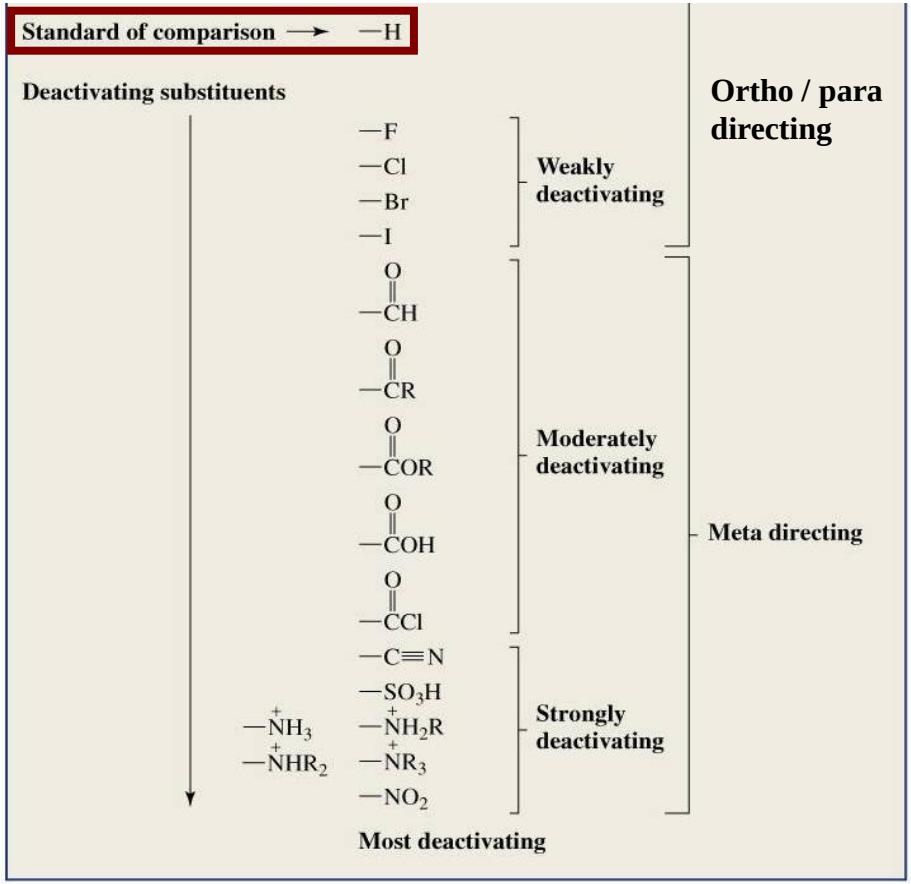
X is EWG or EDG

- All activating substituents (EDG) and weakly deactivating halogens are ortho / para directors
- All substituents more deactivating than the halogens are meta directors (i.e., the EWGs)

Substituent - Reactivity Correlation Chart

Table 16.1 The Effects of Substituents on the Reactivity of a Benzene Ring Toward Electrophilic Substitution





From P. Y. Bruice
Organic Chemistry (5th Ed.)