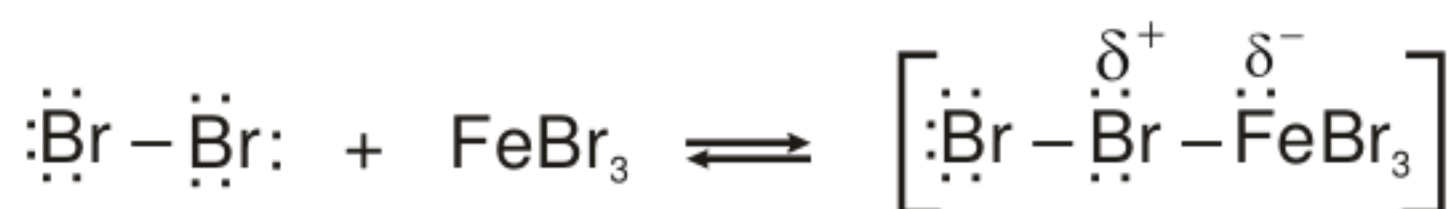


Electrophilic aromatic substitution :

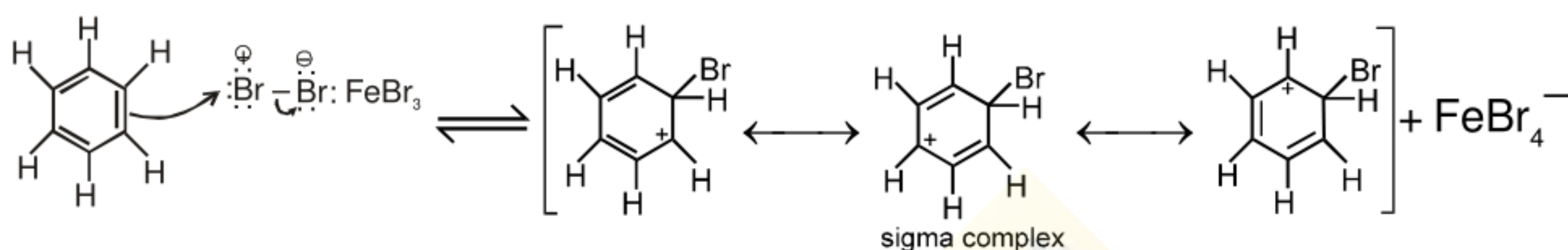
(a) Bromination of Benzene :

Bromination follows the general mechanism for electrophilic aromatic substitution. Bromine itself is not sufficiently electrophilic to react with benzene, but a strong Lewis acid such as FeBr_3 catalyzes the reaction.

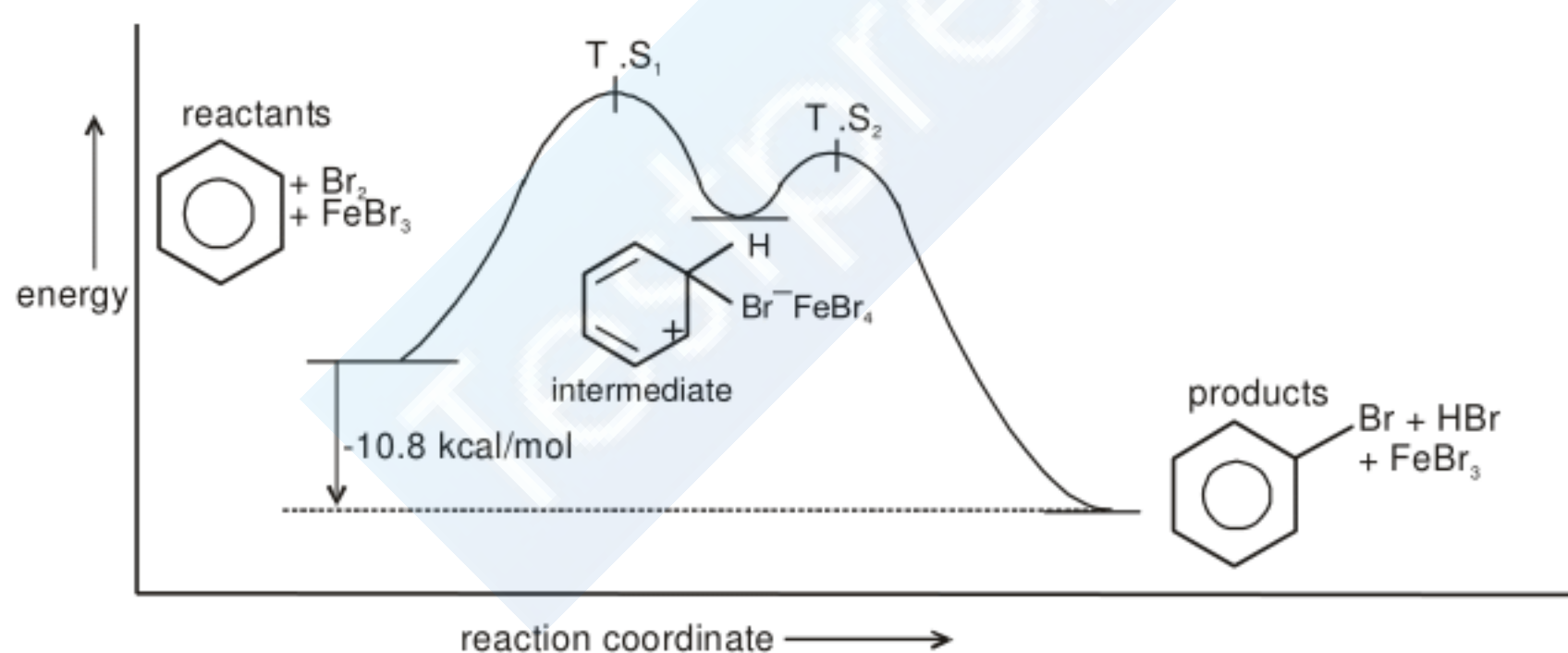
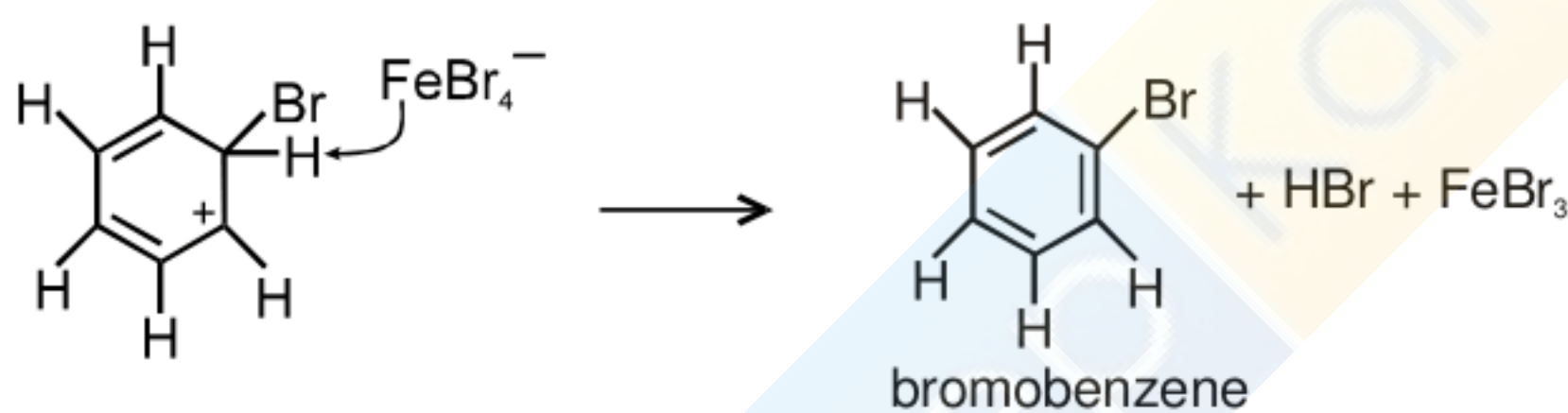
Step 1 : Formation of a stronger electrophile.



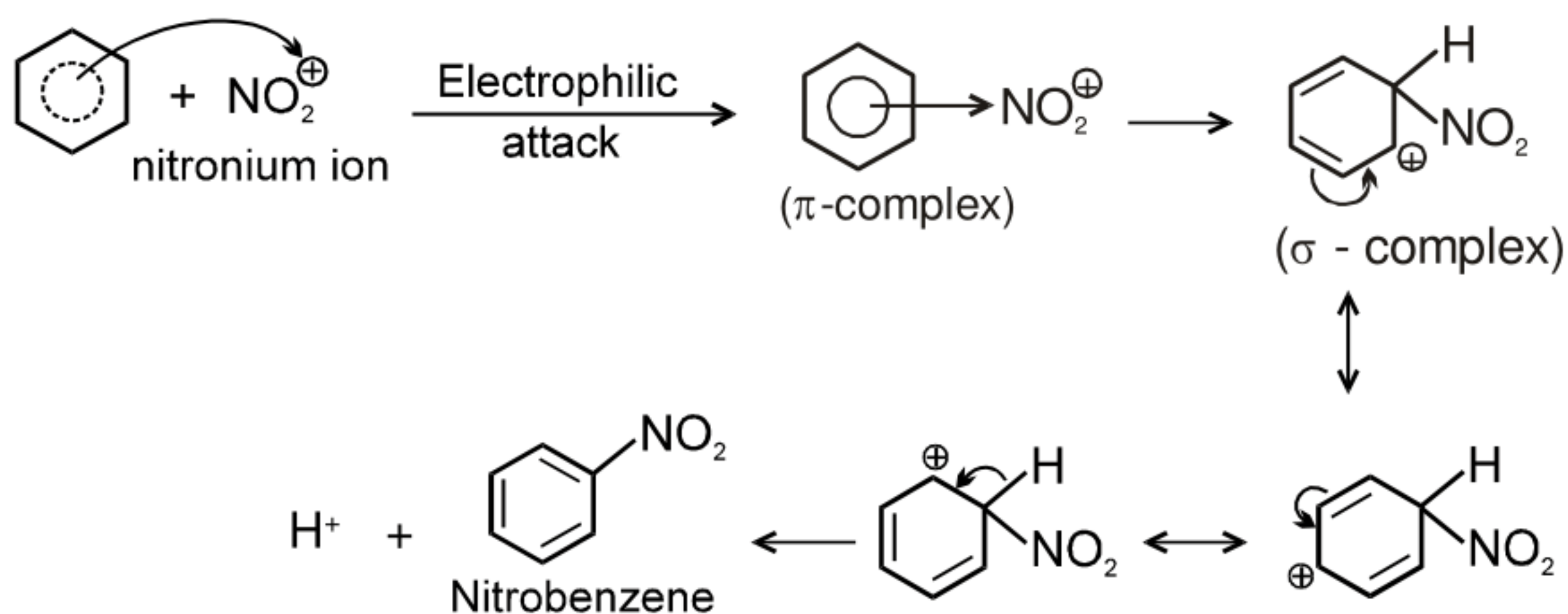
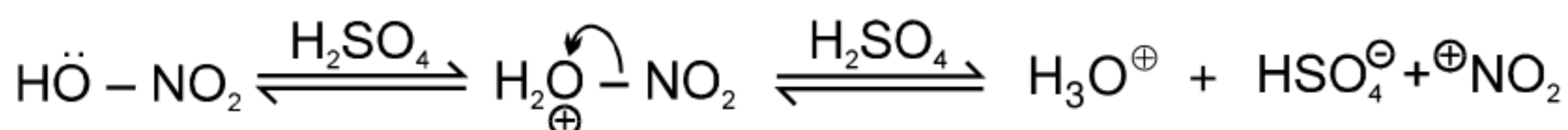
Step 2 : Electrophilic attack and formation of the sigma complex.



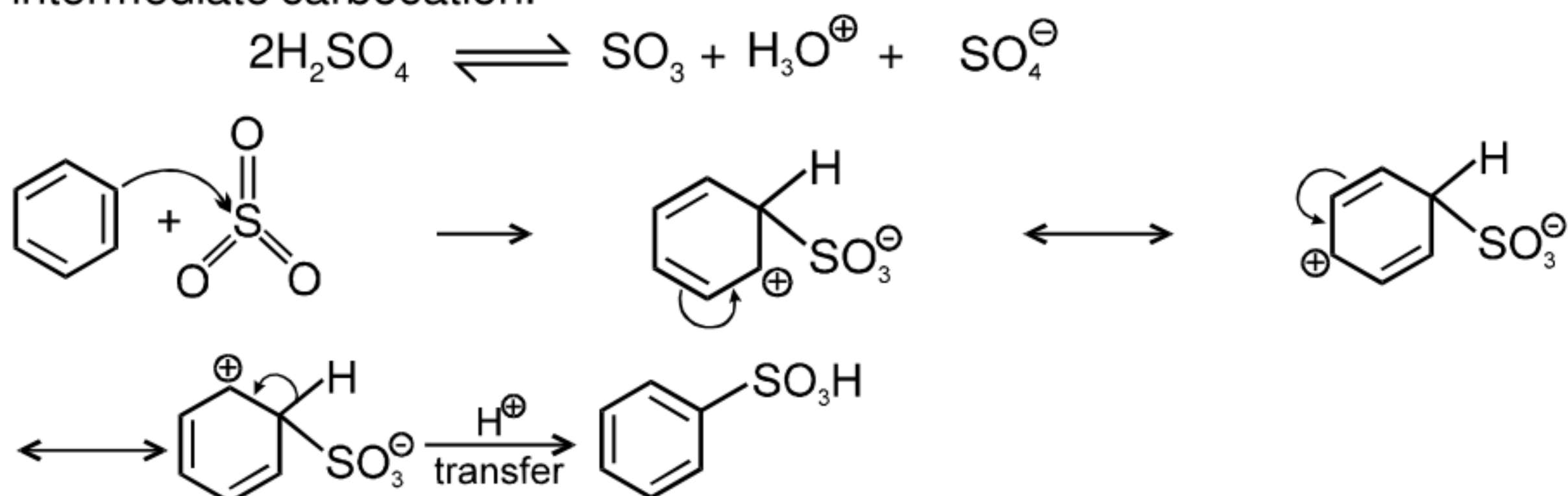
Step 3 : Loss of a proton gives the products.



(b) Nitration :

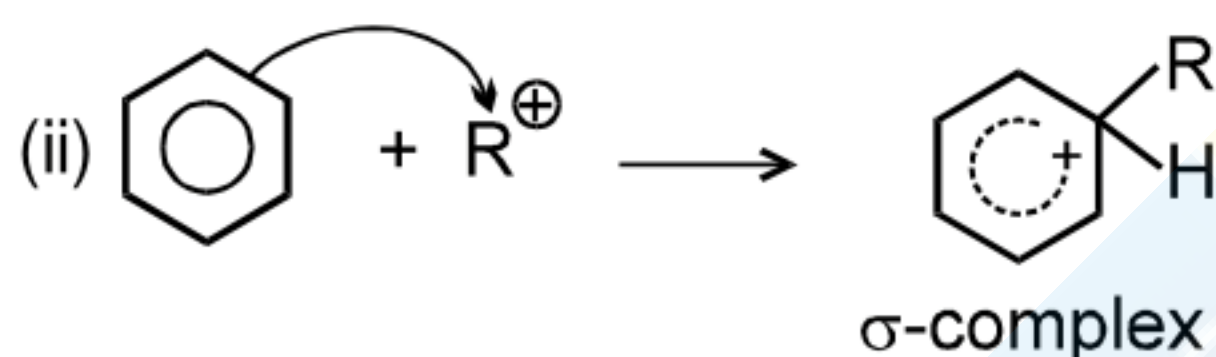
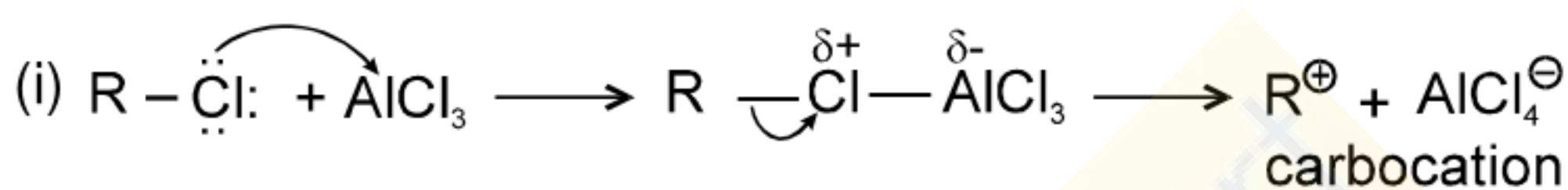


The electrophilic reagent, SO_3 , attacks the benzene ring to form the intermediate carbocation.



(d) Friedel Craft reaction :

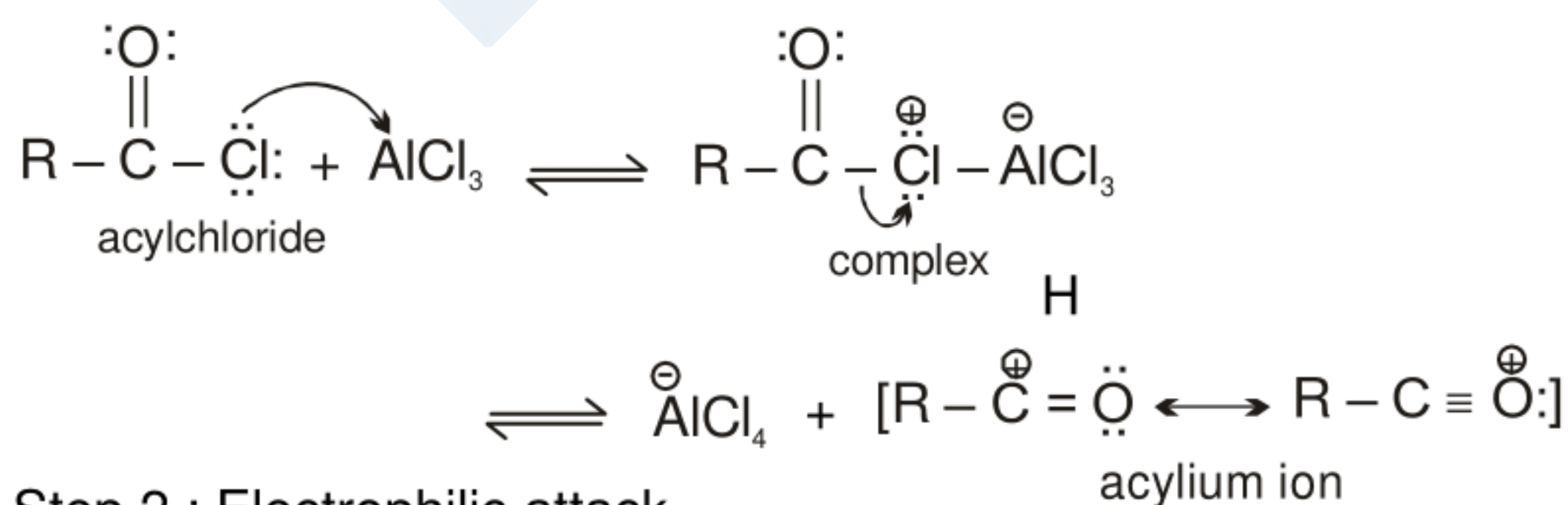
Alkylation mechanism :



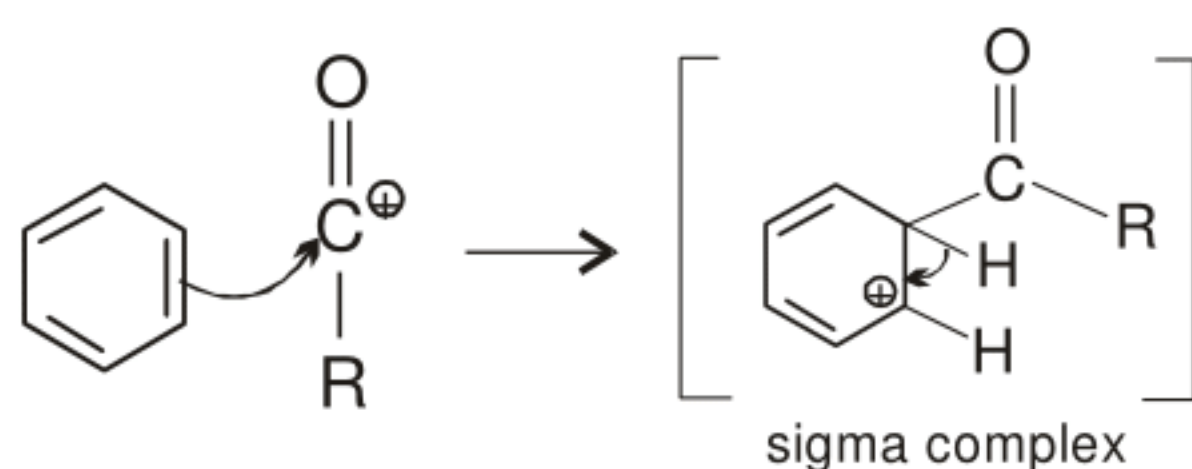
Acylation mechanism :

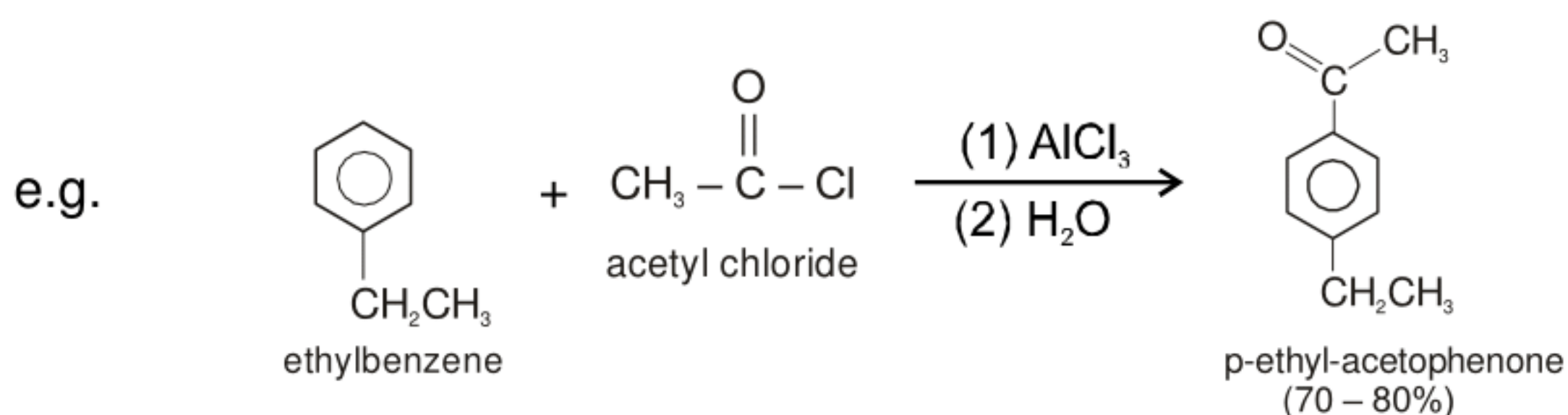
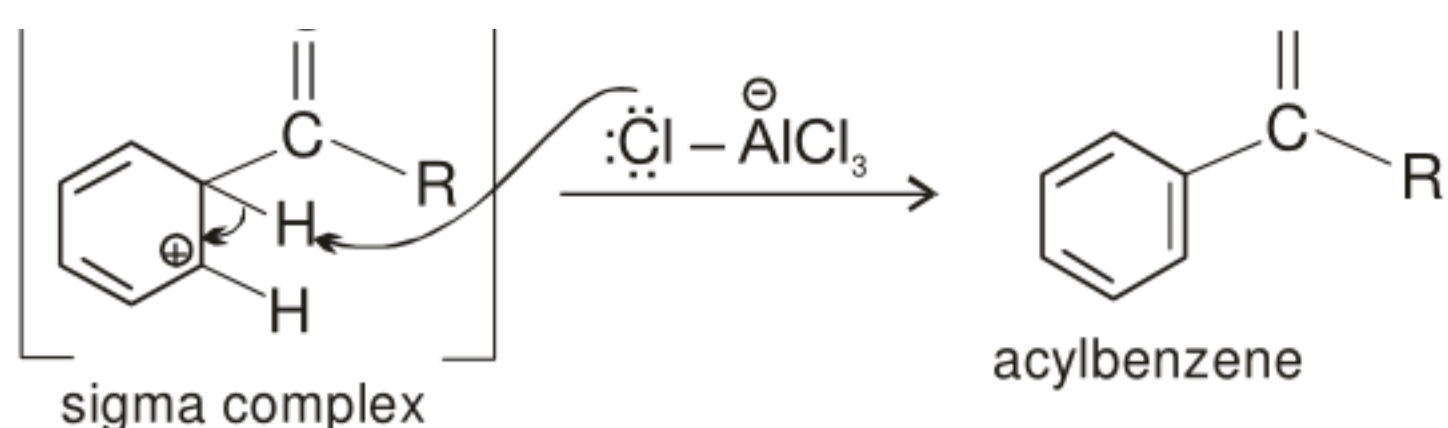
Acylation of benzene may be brought about with acid chlorides or anhydrides in presence of Lewis acids.

Step 1 : Formation of an acylium ion.

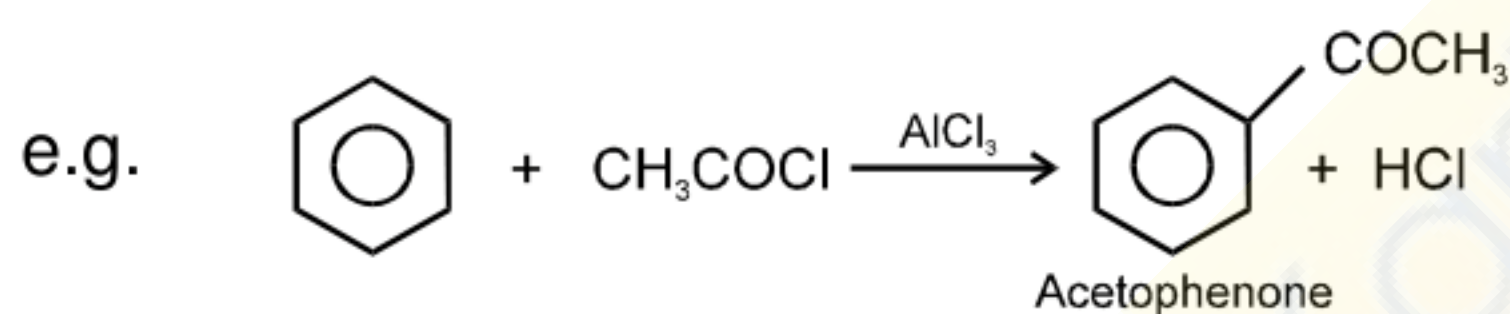


Step 2 : Electrophilic attack.





Note : Friedel-Crafts acylations are generally free from rearrangements and multiple substitution. They do not go on strongly deactivated rings.



Chemical Reactions of Benzene :

