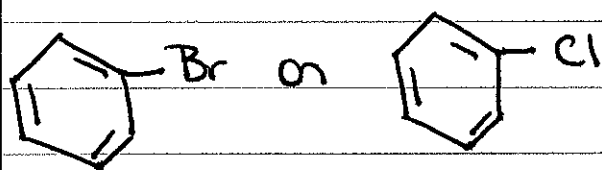
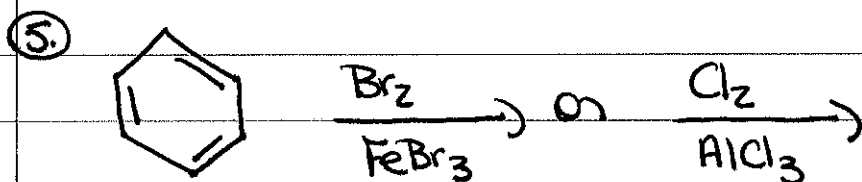


* Rxns of Benzene

- All of these mechanisms were shown & you should know them for the exam.

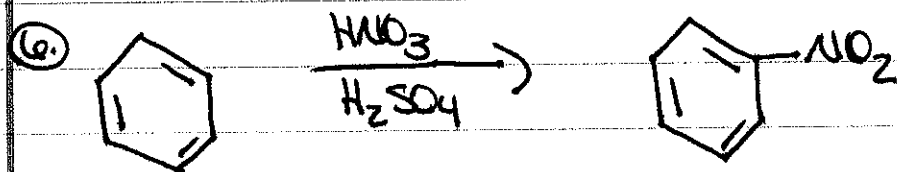
- All mechanisms are shown on answer sheets to worksheets.



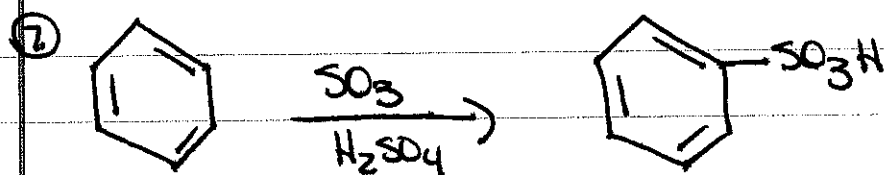
Electrophilic Aromatic Substitution (EAS):

C^+ / Arenium ion / Wheland int. :

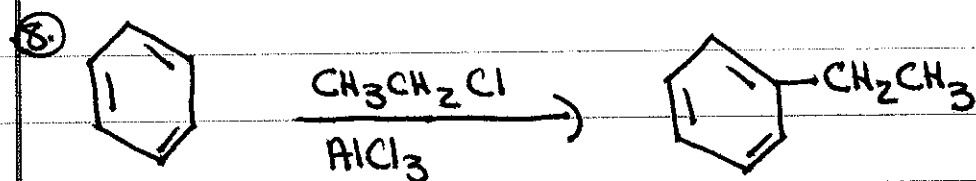
Halogenation : $\text{AlCl}_3 + \text{FeBr}_3 = \text{Catalyst}$



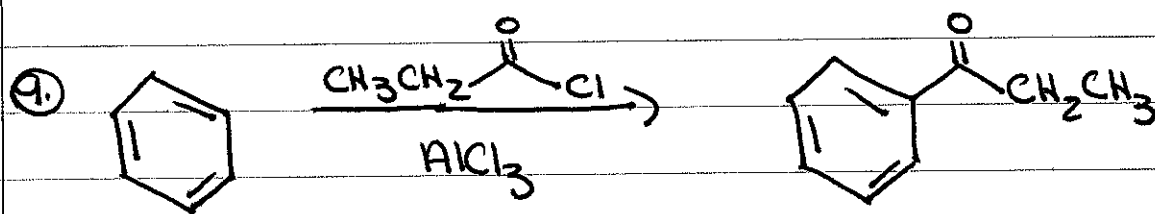
EAS: same int. as # 5: Nitration:
 H_2SO_4 = Catalyst



EAS: same int. as # 5+6 : Sulfonation:
 Reversible: H_2SO_4 = Catalyst



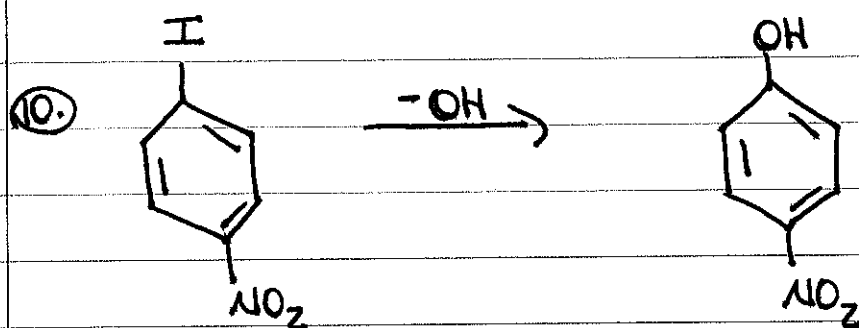
EAS: same int. as # 5, 6, + 7: Friedel Crafts
 Alkylation: AlCl_3 = catalyst



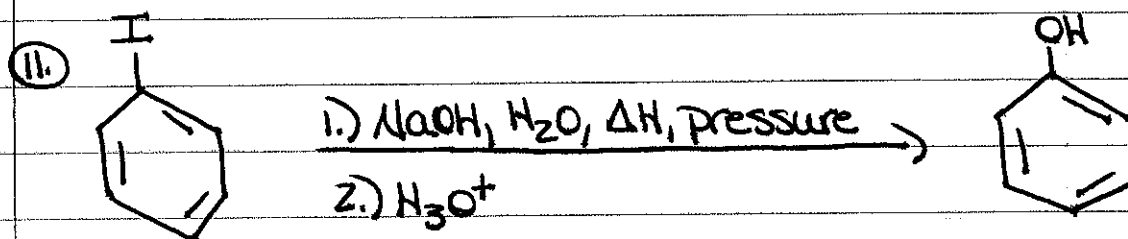
EAS: same int. as # 5, 6, 7, + 8: Friedel
Crafts Acylation: AlCl_3 = catalysts

* Problems w/ Friedel Crafts

- ① No F.C. on Deactivated Rings
- ② No F.C. on Rings w/ 1 lone pair e^-
- ③ Rearrangements can occur
- ④ Multiple Alkylations can occur



Nucleophilic Aromatic Substitution (N_{AS}):
 Addition / Elimination: Meisenheimer
 Complex int.: must have an e^- w/drawing
 substituent ortho or para to the leaving group



N_{AS}: Benzyne: Benzyne int.: $\text{E}2$ like