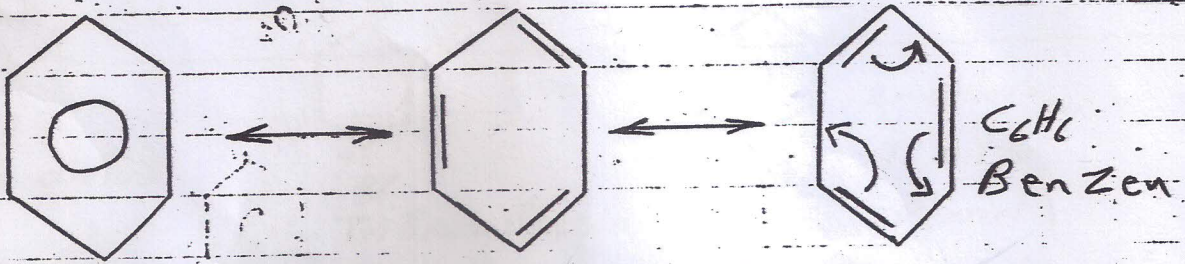
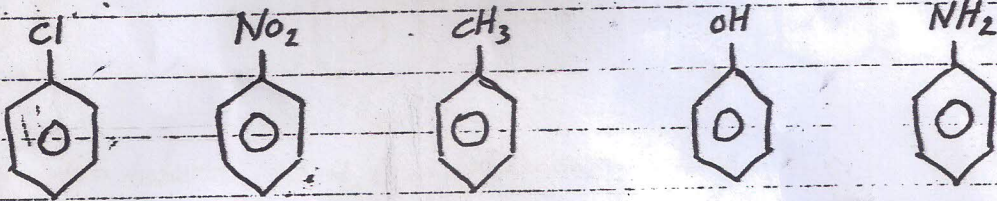


# الهيدروكربونات العطرية (كيمياء)

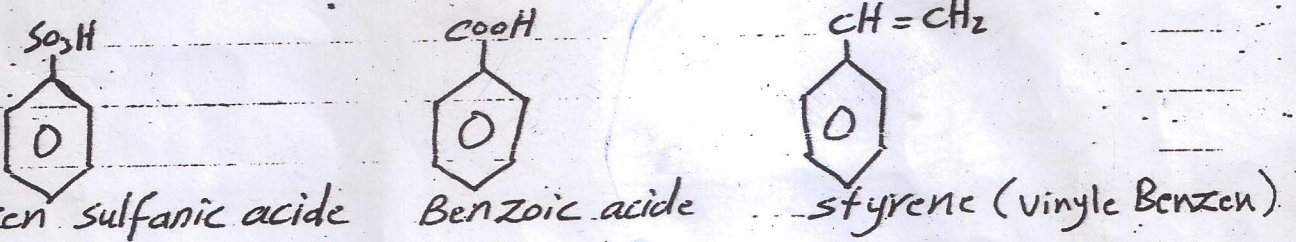
## Aromatic Hydrocarbone



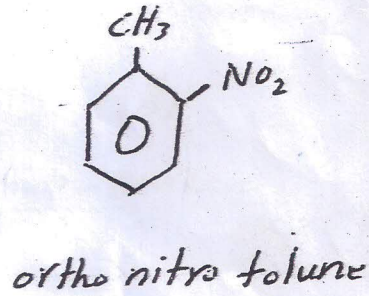
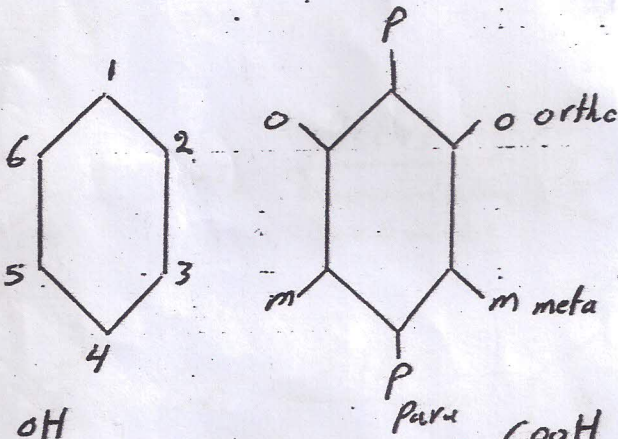
kekule formula هذا المركب يستخدم فقط في تفاعلات الاضافة



chlor. Benzen Nitro Benzen Toluene Phenol Aniline



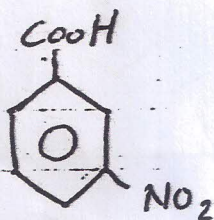
Benzen sulfanic acide Benzoic acide styrene (vinyle Benzen)



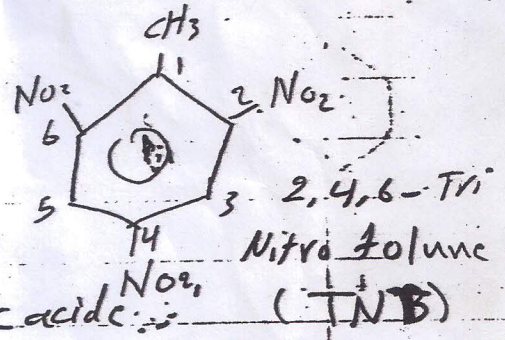
ortho nitro toluene



Para Bromo phenol

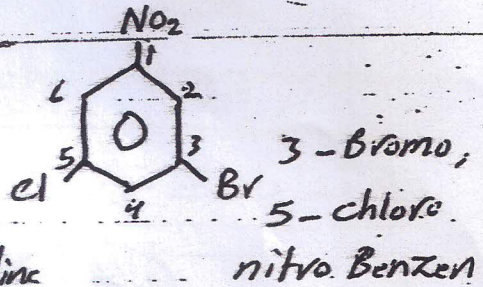
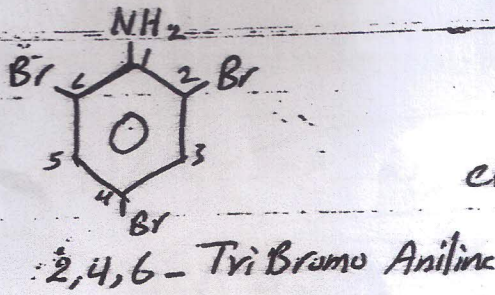
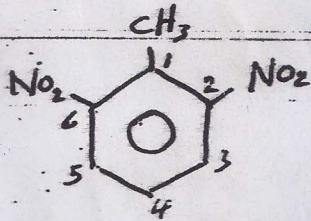
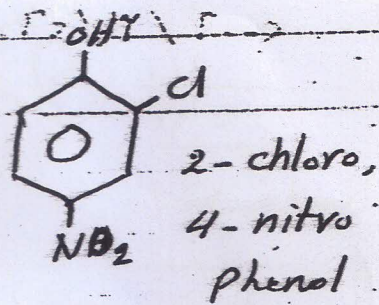
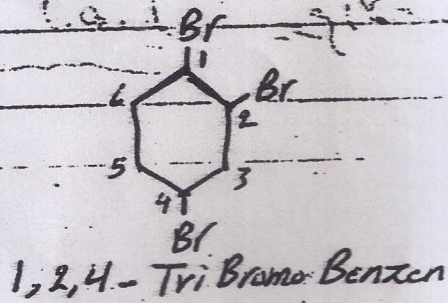
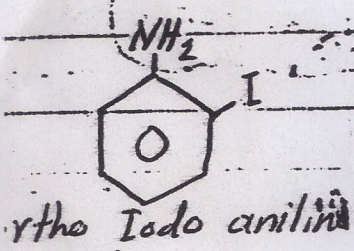


meta Nitro Benzoic acide



2,4,6-Tri Nitro toluene (TNT)

(Not-Feasible)  
غير ممكن (مجدري)

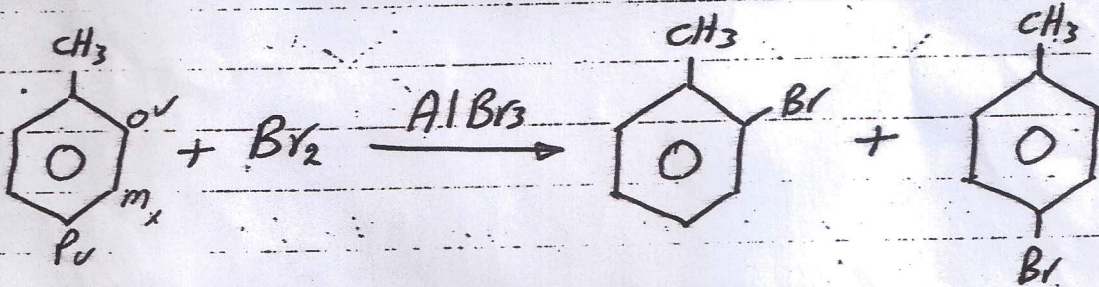
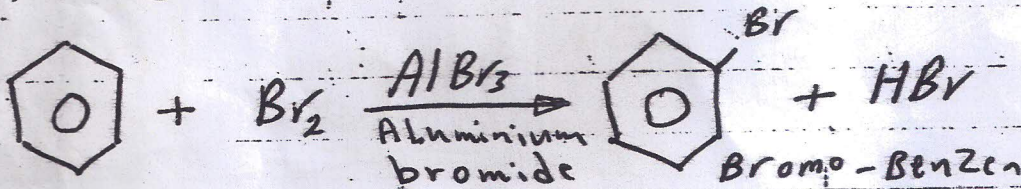


الهيدروكربونات الأروماتية  
تفاعلات البنزين

Benzen Reactions:

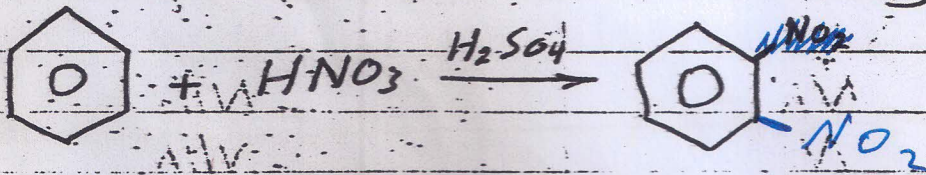
1) Halogenation

① الهلجنة



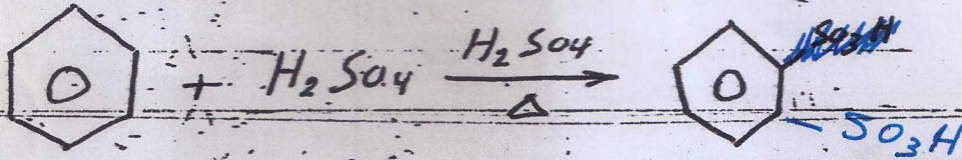
## 2) Nitration

⑤ النترية



## 3) Sulfonation

⑥ السلفنة

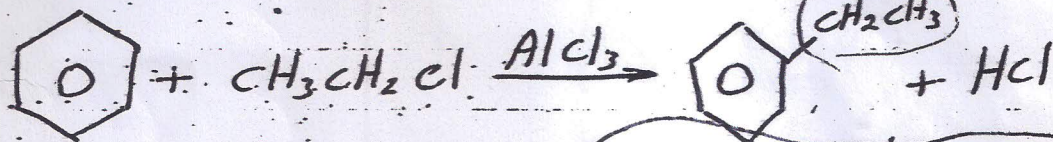


## 4) Friedel-Crafts Reaction

④ تفاعلات فريدل كرافتس

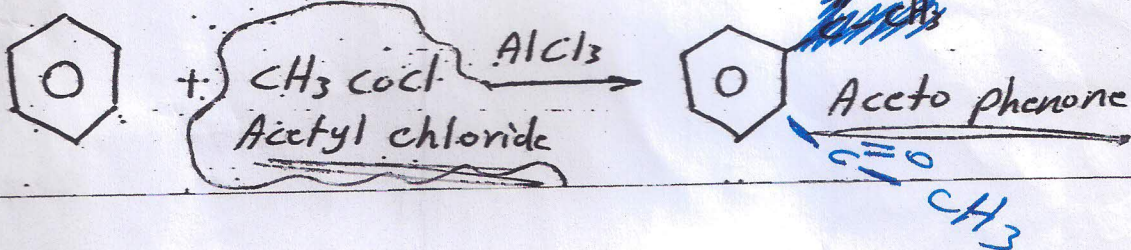
### A) Alkylation

① تفاعلات الألكلة



### B) Acylation

② تفاعلات الأسيلاية



التوجيه (ملف التمرين)

(تغير الميضية) الموصلة ميثا

(المجاميع الميضية) اربو وبارا

المجاميع الموجبة m

المجاميع الموجبة P.O

$NR_3^+$  - ثلاثي الكيل امنيوم

$NO_2$  - نيترو

$CN$  - سيانو

$SO_3H$  - سلفونيل

$COOH$  - كربوكسي

$CHO$  - ألدهايد

$CO R$  - كيتون

$NH_2$  - امينو

$NHR$  - الكيل امينو

$NR_2$  - ثنائي الكيل امينو

$OH$  - هيدروكسي

$OR$  - الكوكسي

$R$  - الكيل

$X$  - الهالوجينات  
Cl, Br

31

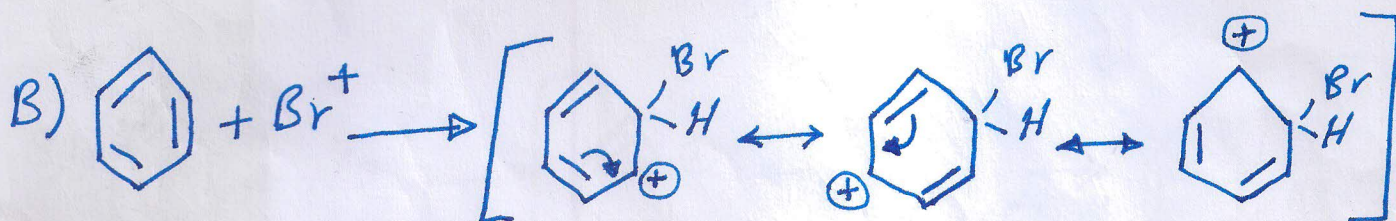
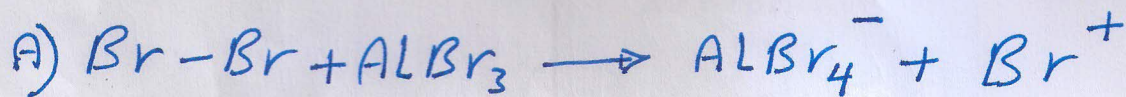
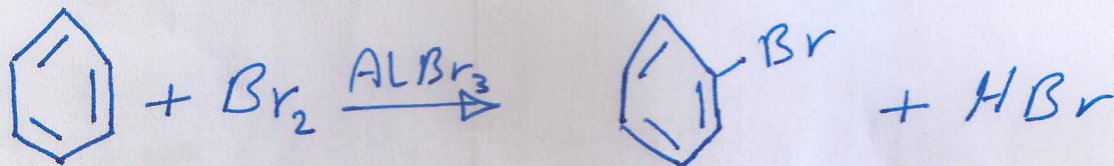
# Organic chemistry

ابن سينا  
تكملة

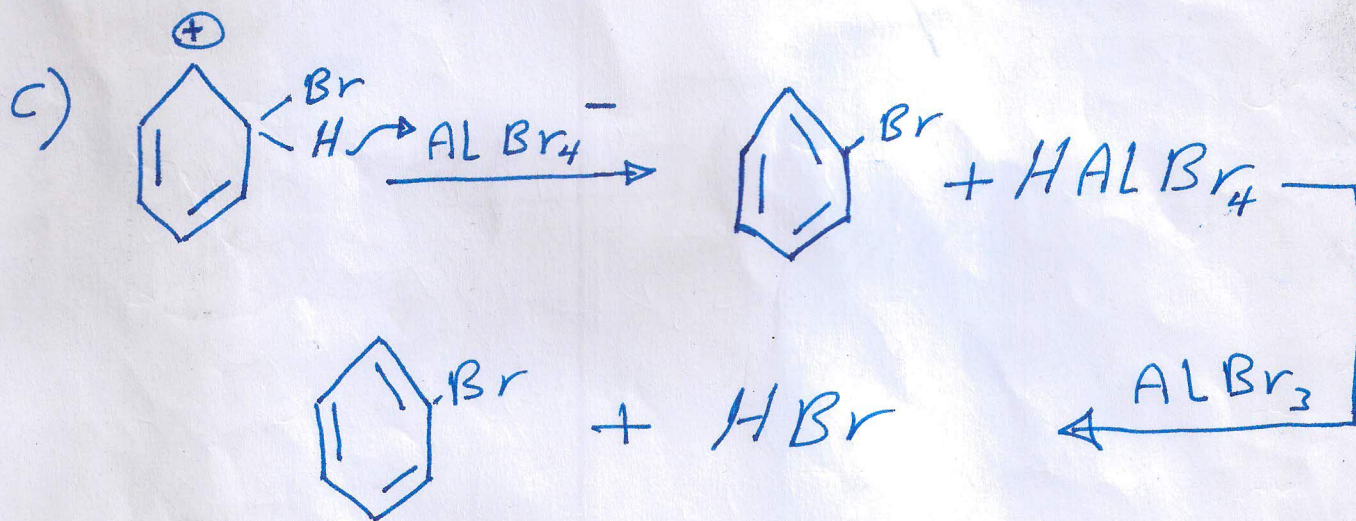
## Benzen Reactions Mechanism

ابن سينا

### ① Halogenation:-

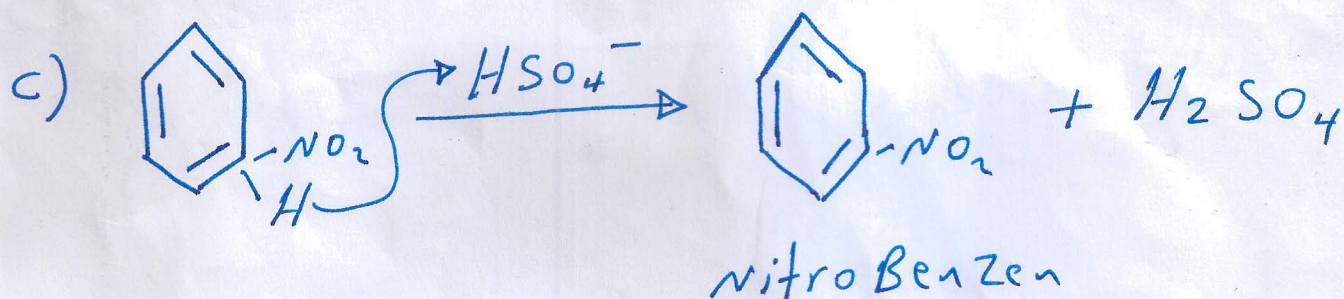
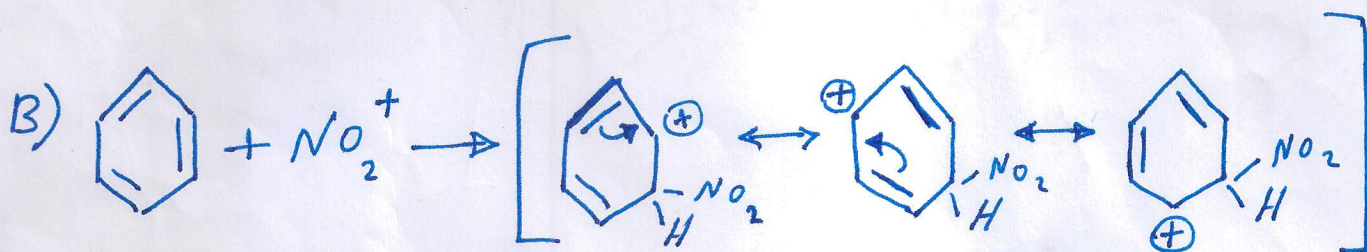
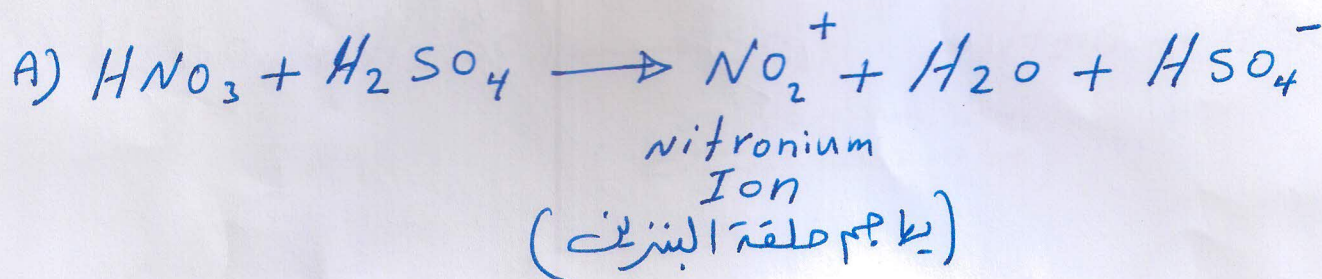
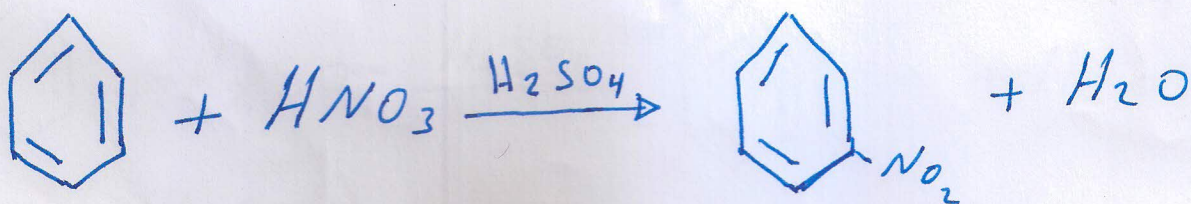


Resonance Forms

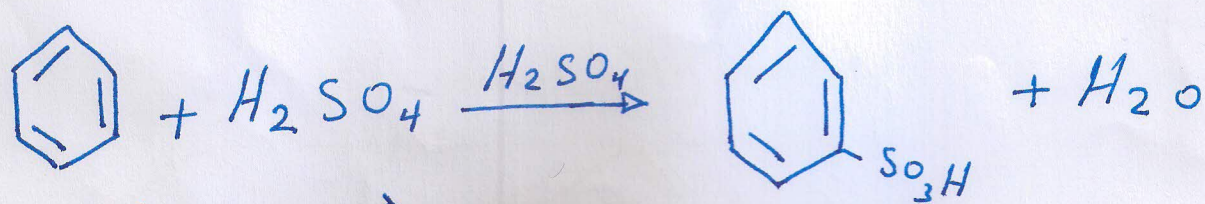


Bromo  
Benzene

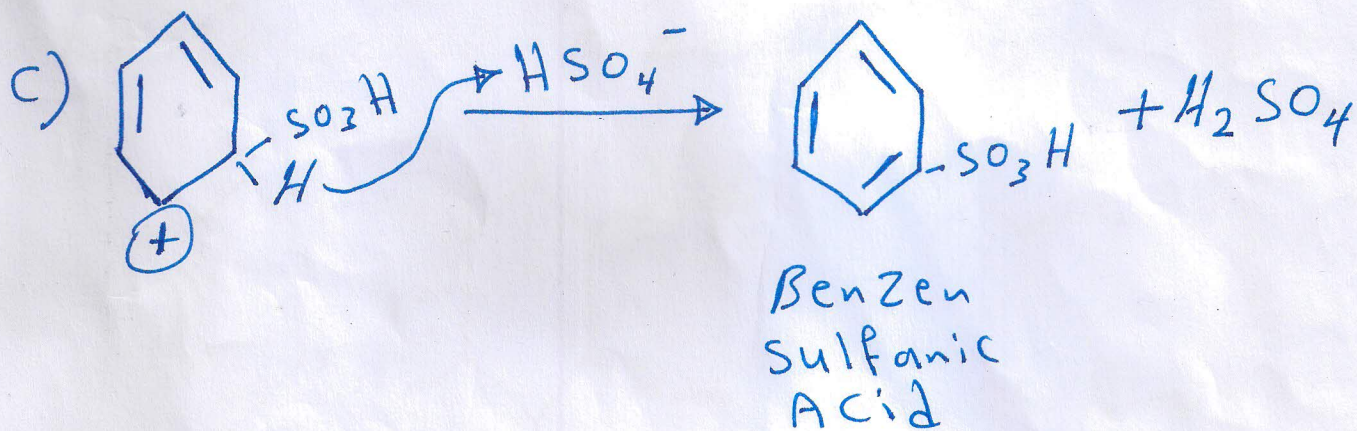
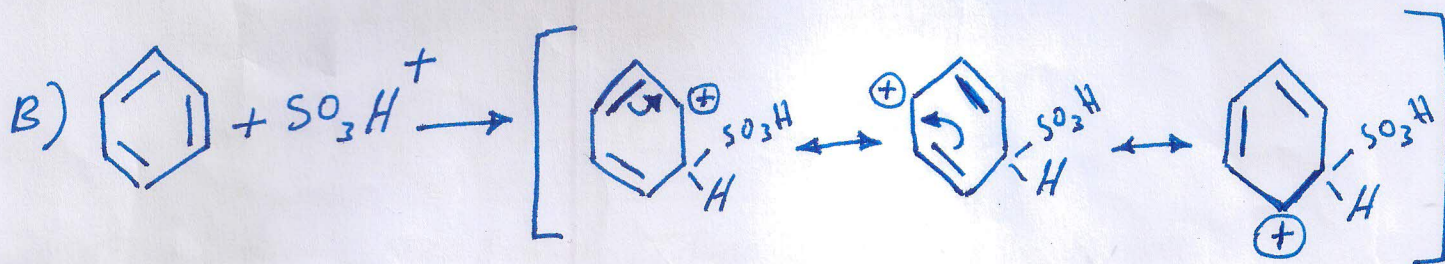
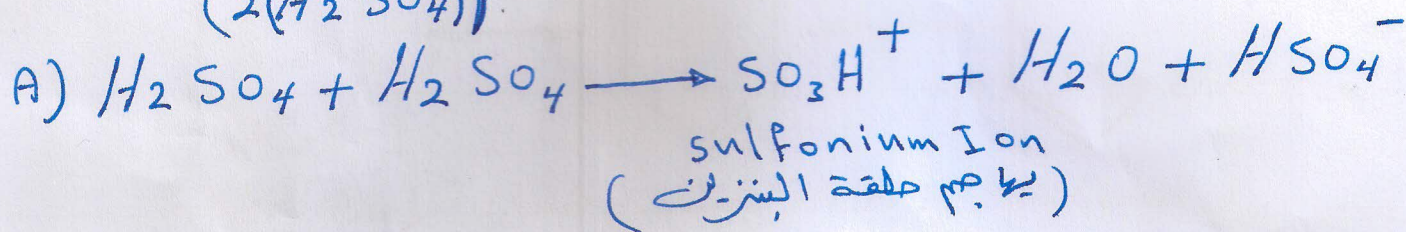
## ② Nitration:-



### ③ Sulfonation ; -

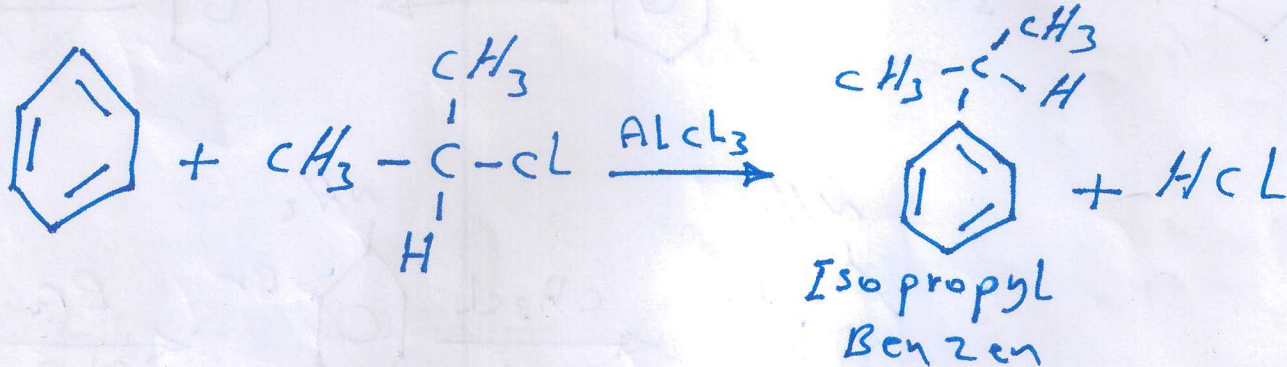
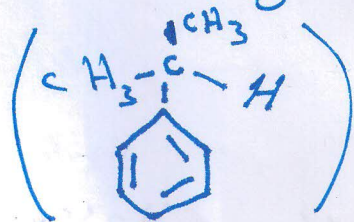


(2(H<sub>2</sub>SO<sub>4</sub>))

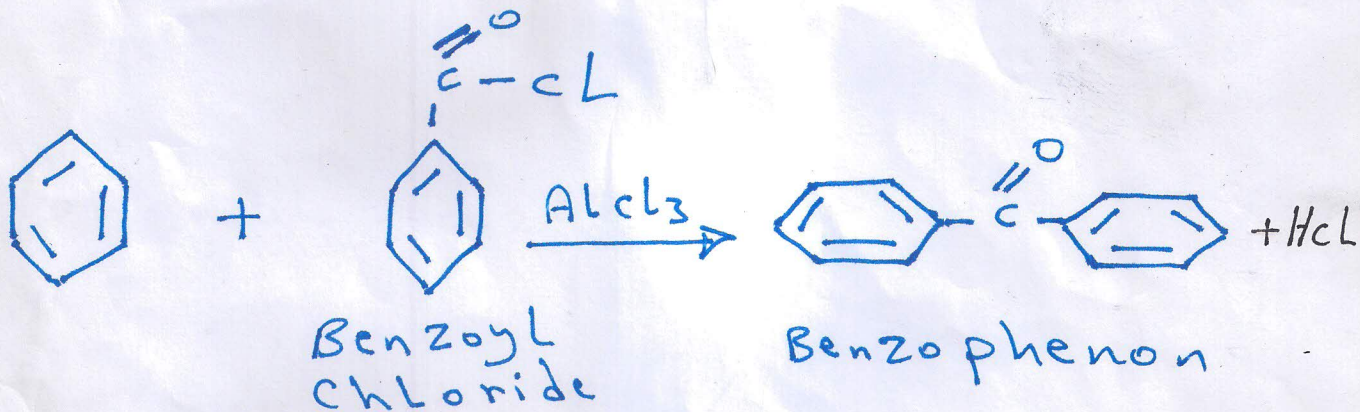


Q1 prepare each of the following started with Benzen :-

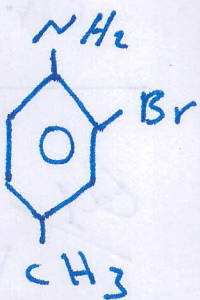
a) Iso propyl Benzen

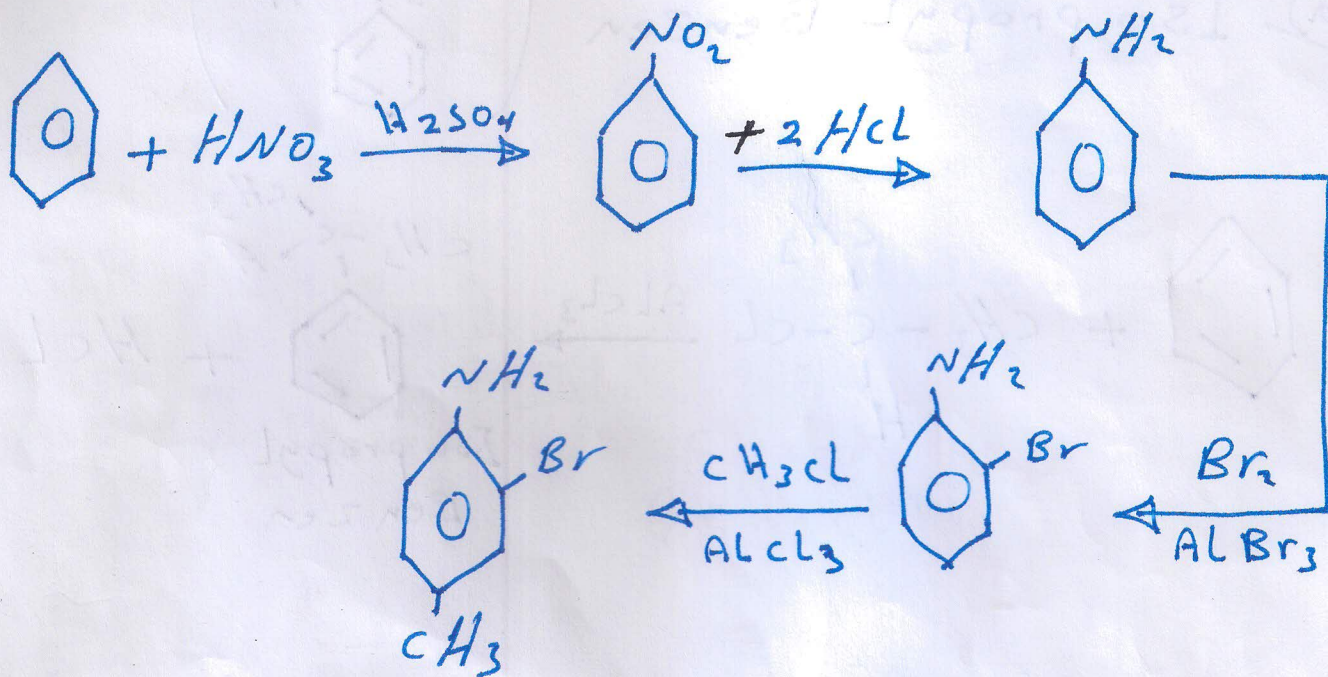


b) Benzo phenon





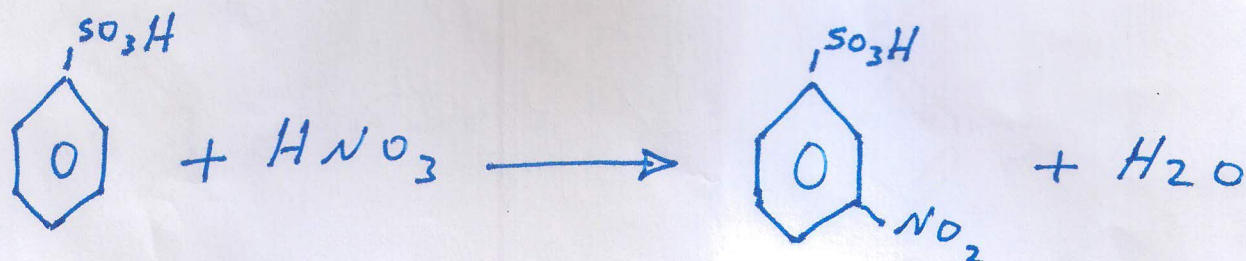
c) 2-bromo-4-methyl aniline: 



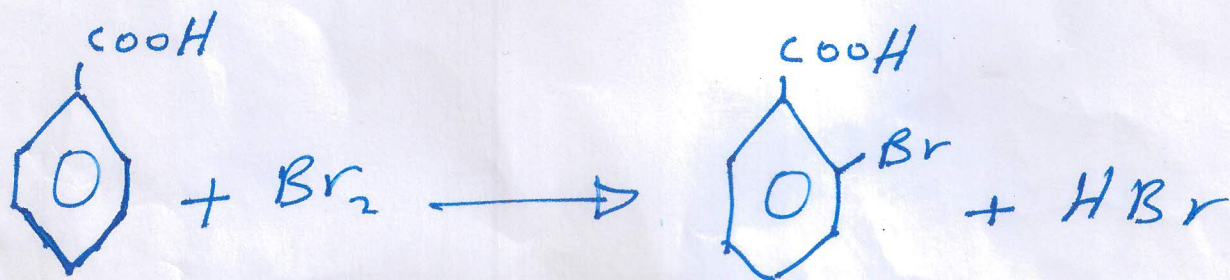
(2-bromo-4-methyl aniline)

Q2 Formulate the products from the following reactions:-

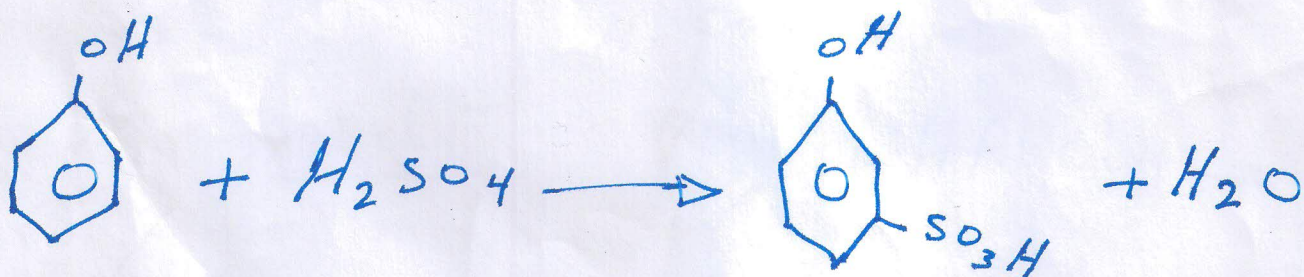
a) Benzen sulfonic Acid +  $\text{HNO}_3 \rightarrow ?$



b) Benzoic Acid +  $\text{Br}_2 \rightarrow ?$

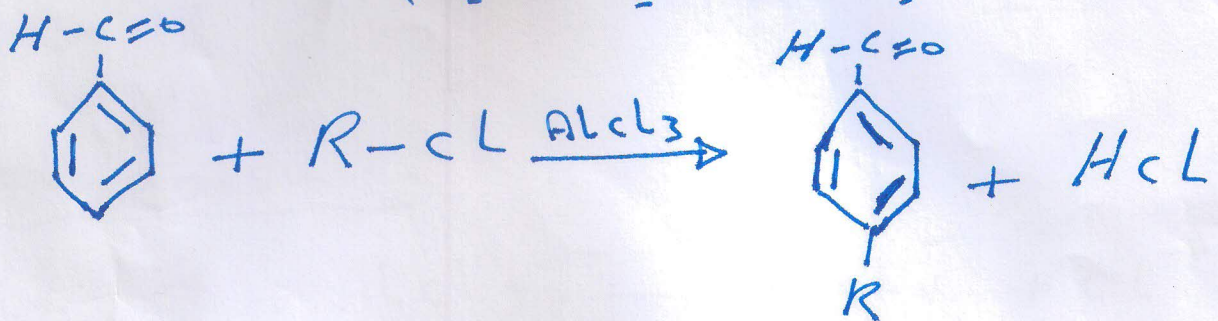


c) phenol +  $\text{H}_2\text{SO}_4 \rightarrow ?$

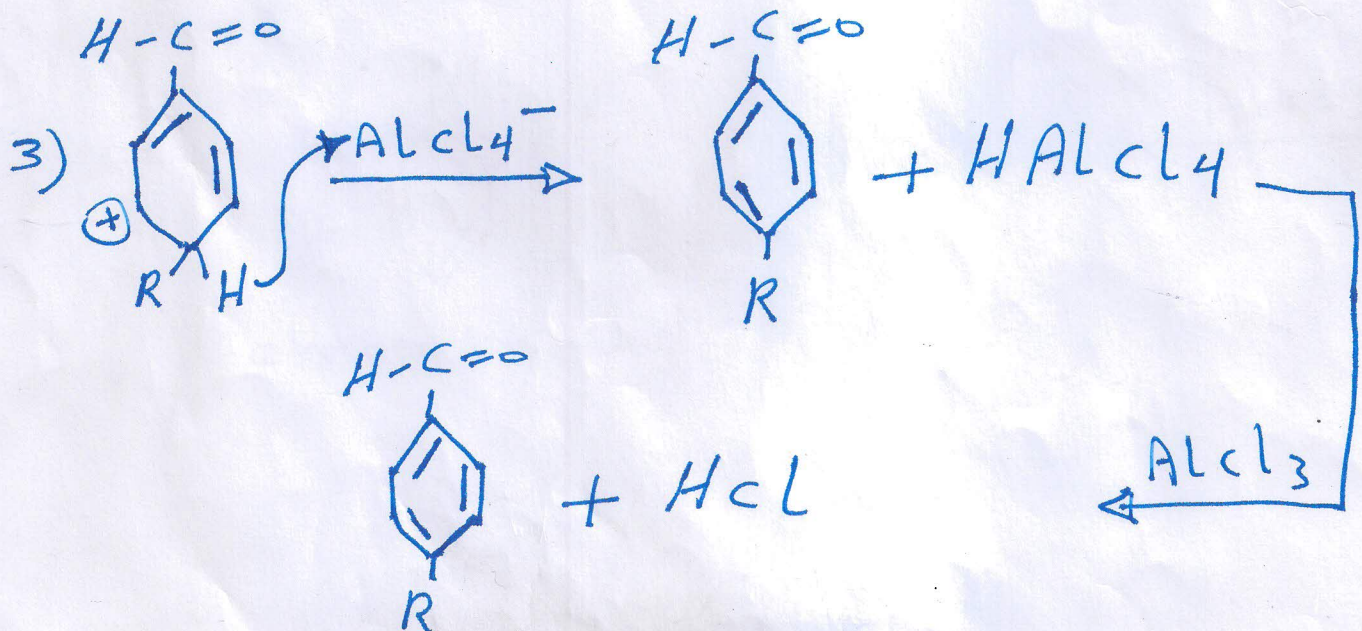
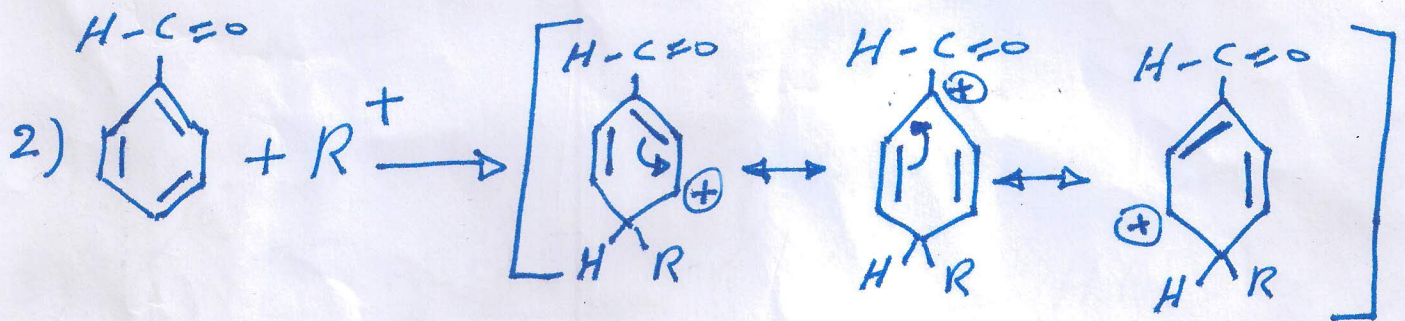
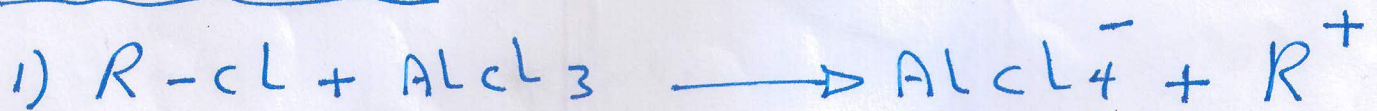


Q3 Formulate clearly the mechanism for each of the following reactions:-

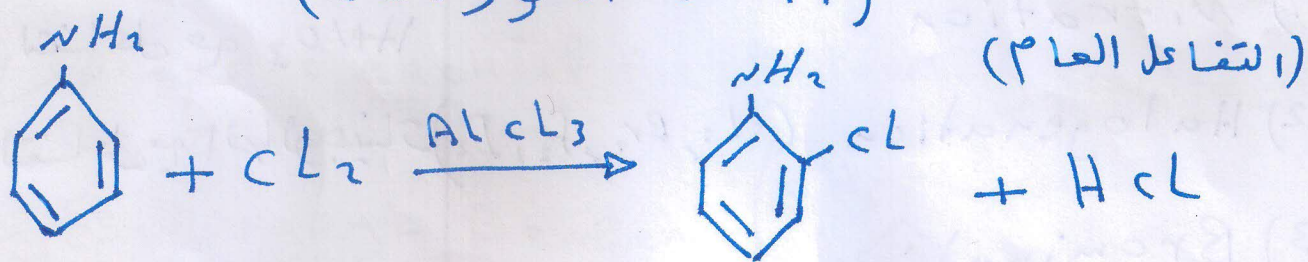
a) Alkylation for benzaldehyde:  
(ألكلة البنزaldehid)



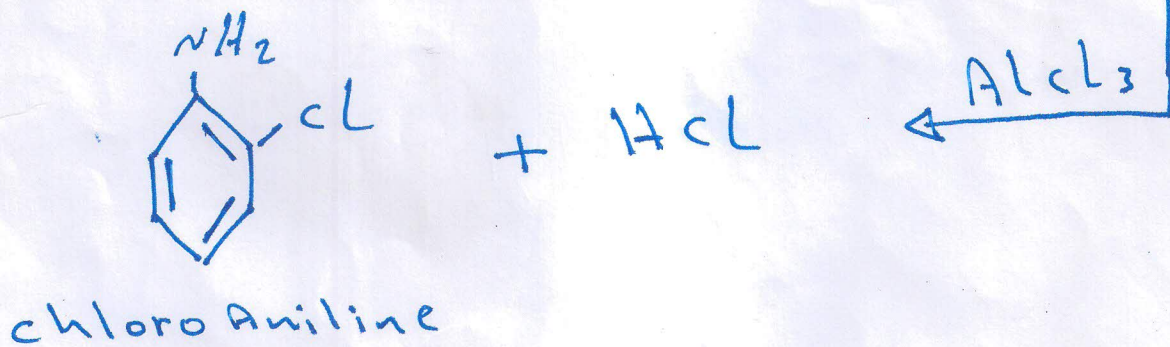
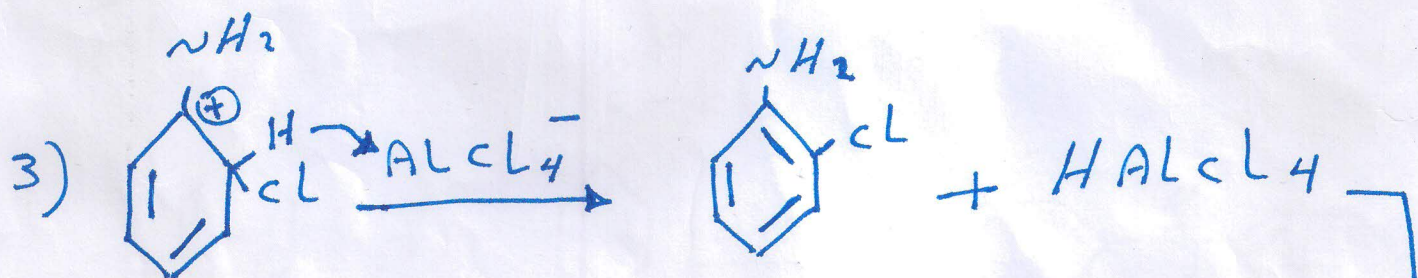
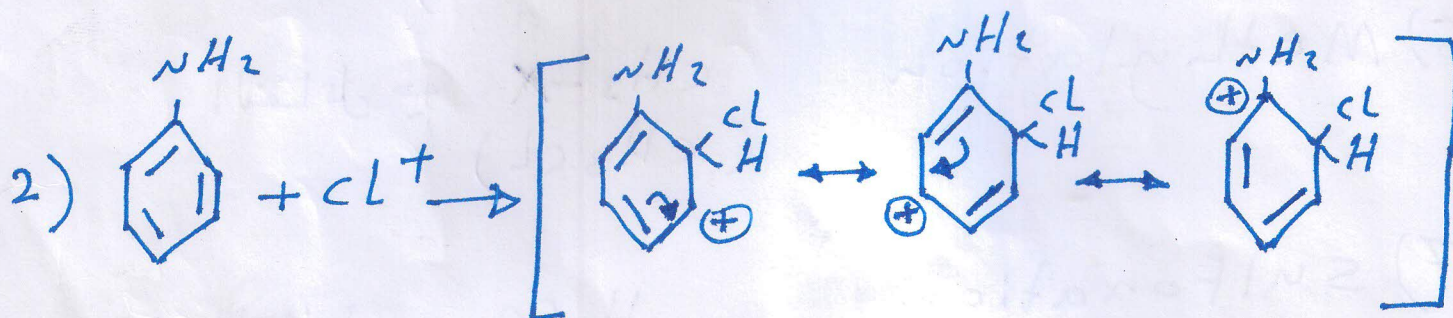
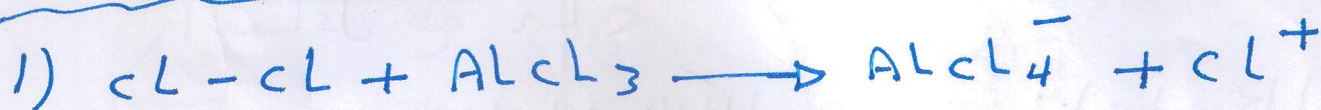
Mechanism:



b) chlorination of Aniline :-  
(أضافة الكلور  $Cl_2$ )



Mechanism :-



ملاحظات:

- 1) Nitration      التفاعل مع  $HNO_3$
- 2) Halogenation ( $Cl_2, Br_2, F_2, I_2$ )      التفاعل مع الهالوجينات
- 3) Bromination      التفاعل مع  $Br_2$
- 4) Chlorination      التفاعل مع  $Cl_2$
- 5) Alkylation      التفاعل مع هاليدات الألكيل ( $R-X$ )
- 6) Methylation      التفاعل مع  $CH_3-X$  ( $CH_3Cl$ )
- 7) Sulfonation      التفاعل مع  $H_2SO_4$