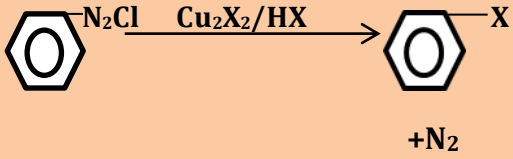
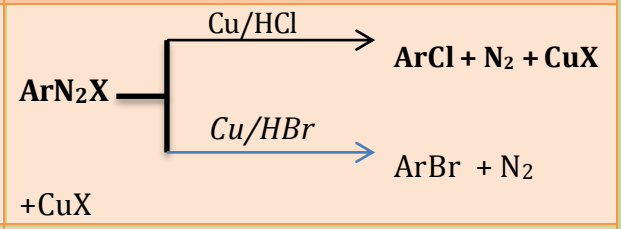
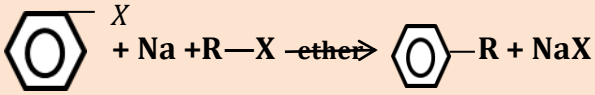
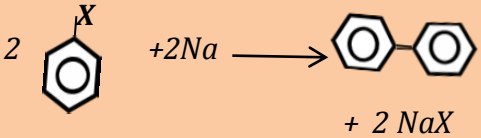
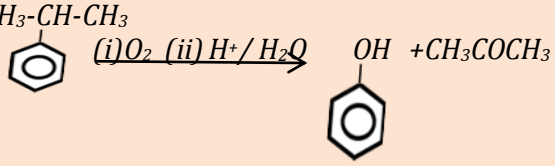
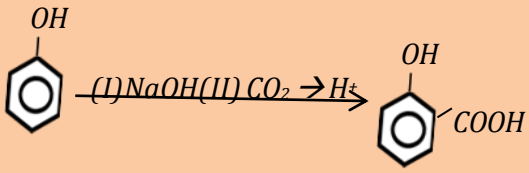
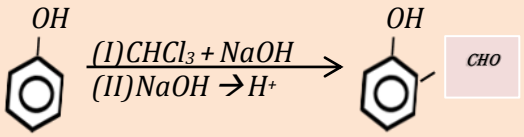
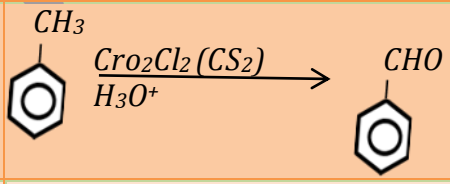
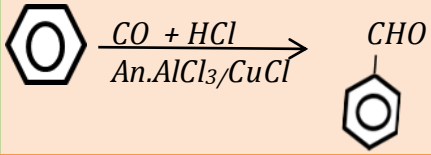
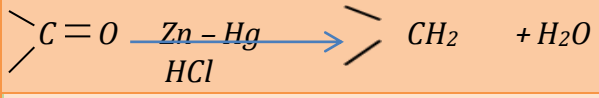
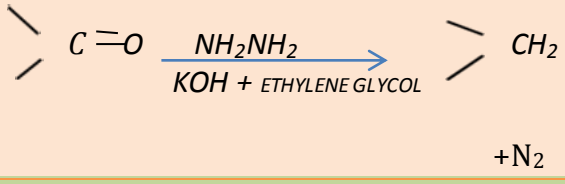
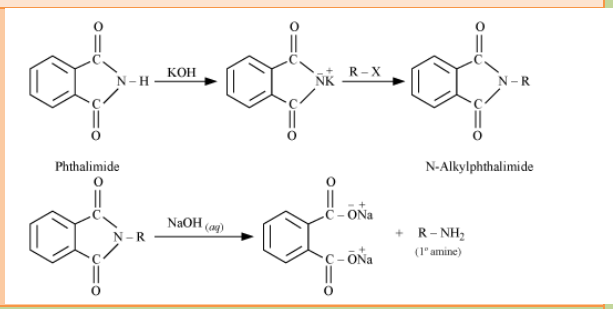
ORGANIC CHEMISTRY : NAME REACTIONS

NAME OF REACTION	STARTING COMPOUND/ REACTANT	TREATING WITH/REAGENT/ CONDITIONS	PRODUCT	REACTION/ REMARK
FINKELSTEIN REACTION	R—X (X=Cl or Br)	NaI in dry acetone	R—I	R—X + NaI ⟶ R—I + NaX *Dry acetone precipitates NaX formed,it facilitates forward reaction
SWARTS REACTION	R—X (X=Cl or Br)	AgF or Hg_2F_2 or CoF_2 or SbF_3	R—F	R—X + AgF ⟶ R—F + AgBr
SANDMEYER'S REACTION	BENZENE DIAZONIUM SALT	**Cu_2X_2** (X= Cl,Br,CN) /HX	ARYL HALIDE	
GUTTERMAN REACTION	*BENZENE DIAZONIUM SALT*	*HX / **Cu powder***	*ARYL HALIDE*	
WURTZ REACTION	*ALKYL HALIDES*	*Na in dry ether*	*ALKANE*	***2R +2Na ⟶ RR + 2 NaX***
WURTZ-FITTIG REACTION	*ALKYL HALIDE + ARYL HALIDE*	*Na in dry ether*	*ALKYL ARENE*	
FITTIG REACTION	*ARYL HALIDE*	*Na in dry ether*	*BIPHENYL*	
CUMENE PROCESS	*CUMENE (ISOPROPYL BENZENE)*	*(i)O_2 (ii) H^+/ H_2O*	*PHENOL*	

KOLBE'S REACTION	PHENOL	(I) NaOH (II) CO_2 FOLLOWED BY HYDROLYSIS	SALICYLIC ACID (2-HYDROXY BENZOIC ACID)	
REIMER – TIEMANN REACTION	PHENOL	(i) $CHCl_3$ + NaOH (ii) NaOH H^+	SALICYLALDEHYDE	
WILLIAMSON SYNTHESIS	ALKYL HALIDE + Na ALKOXIDE	1^0 HALOALKANE + 2^0 /3^0 ALKOXIDE	ETHER	$R—X + R'—ONa \longrightarrow R—O—R' + NaX$
ESTERIFICATION	CARBOXYLIC ACID AND ITS DERIVATIVES + ALCOHOL/ PHENOL	Con. H_2SO_4 /HCl	ESTER	$RCOOH + R'OH \rightleftharpoons RCOOR' + H_2O$
ROSENMUND REDUCTION	ACID CHLORIDE (R—COCl)	H_2 + Pd – $BaSO_4$	ALDEHYDE	$R—COCl + H_2 \xrightarrow{Pd - BaSO_4} R—CHO$ *R = alkyl / aryl
STEPHEN REDUCTION	NITRILES (R—CN)	(I) $SnCl_2$ + HCl (II) H_2O	ALDEHYDE	$R—CN + SnCl_2 + HCl \longrightarrow R—CH=NH \xrightarrow{H_2O} R—CHO$
ETARD REACTION	TOLUENE	(I) CHROMYL CHLORIDE(Cro_2Cl_2) (II) H_2O	BENZALDEHYDE	
GATTERMAN —KOCH REACTION	BENZENE AND ITS DERIVATIVES	CO + HCl + $An.AlCl_3/CuCl$	BENZALDEHYDE AND ITS DE3RIVATIVES	
CLEMMENSEN REDUCTION	ALDEHYDE OR KETONE	Zn-Hg + HCl	ALKANE	
WOLFF – KISHNER REDUCTION	ALDEHYDE OR KETONE	(i) HYDRAZINE (ii) KOH + ETHYLENE GLYCOL	ALKANE	

ALDOL CONDENSATION	*ALDEHYDES OR KETONES (having atleast one alpha hydrogen atom)*	*DILUTE ALKALINE LIKE NaOH*	*ALDOL FORMED CCONDENSES TO FORM UNSATURATED CARBONYL COMPOUND*	$2CH_3CHO \xrightarrow{dil\ NaOH} CH_3CH(OH)CH_2CHO \xrightarrow{\Delta} CH_3CH{=}CHCHO$
CANNIZZARO REACTION	*ALDEHYDES OR KETONES (not having alpha hydrogen atom)*	*CONCENTRATED ALKALIES*	*ALCOHOL + SALT OF CARBOXYLIC ACID*	$2HCHO + Con.\ NaOH \longrightarrow CH_3OH + HCOONa$
HELL-VOLHARD-ZELINSKY REACTION	*CARBOXYLIC ACID (having alpha hydrogen atom)*	*(i)X_2/ RED P_4 (ii)H_2O*	*ALPHA-HALOCARBOXYLIC ACID (R-CHX-COOH)*	$R{-}CH_2{-}COOH \xrightarrow[(ii)H_2O]{(i)X_2/\ RED\ P_4} R{-}CXH{-}COOH$
HOFFMANN BROMAMIDE DEGRADATION REACTION	*AMIDE*	*Br_2 + NaOH*	*PRIMARY AMINES*	$R{-}\underset{\underset{O}{\|}}{C}{-}NH_2 + Br_2 + 4NaOH \longrightarrow R{-}NH_2 + 2H_2O + Na_2CO_3 + 2NaBr$
GABRIEL PHTHALMIDE SYNTHESIS	*PHTHALMIDE*	*(i) KOH (ii) R—X (iii) NaOH*	*PRIMARY AMINE (aliphatic)*	
CARBYL AMINE REACTION	*1^0 ALKYL OR ARYL AMINE*	*CHLOROFORM +KOH*	*ISOCYNIDE (CARBYL AMINE)*	$R{-}NH_2 + CHCl_3 + 3KOH \longrightarrow R{-}NC + 3KCl + 3H_2O$ *ONLY PRIMARY AMINE UNDERGO THIS REACTION
DIAZOTISATION	*ANILINE*	*HNO_2 ($NaNO_2$ +HCl)*	*BENZENE DIAZONIUM CHLORIDE*	$C_6H_5NH_2 + HNO_2 \xrightarrow{273\text{-}278K} C_6H_5N_2^+Cl^- + NaCl + 2H_2O$

HALOFORM REACTION	*ALDEHYDE OR KETONE (having --CH_3 group attached to carbonyl carbon)*	*Na hypohalite (NaOX)*	*Na SALT OF CARBOXY LIC ACID +CHX_3*	$R\text{-}CO\text{-}CH_3 \xrightarrow{NaOX} R\text{-}CO\text{-}ONa + CHX_3$ *IODOFORM REACTION USED TO DETECT THE PRESENSE OF CH_3CO OR $CH_3CH(OH)$ GROUP

DISTINGUISING TESTS

ALCOHOL:

→ **LUCAS TEST ; LUCAS REAGENT (conc. HCl and $ZnCl_2$)**

1^0 alcohol --- turbidity only on heating

2^0 alcohol --- turbidity after 5 minutes

3^0 alcohol --- turbidity immediately

ALDEHYDES AND KETONES:

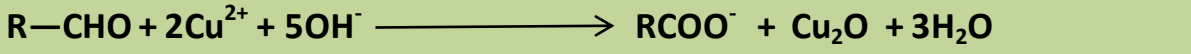
→ **TOLLEN'S TEST; TOLLEN'S REAGENT (AMMONIACAL SILVER NITRATE SOLUTION)**

ALDEHYDE ON WARMING WITH TOLLE'S REAGENT GIVES BRIGHT SILVER MIRROR,WHILE KETONE DOESN'T GIVE THIS TEST.

$$RCHO + 2[Ag(NH_3)_2]^+ + 3OH^- \longrightarrow RCOO^- + 2Ag + 2H_2O + 4NH_3$$

→ **FEHLING'S TEST; FEHLING REAGENT (COMPRISE FEHLING SOLUTION A {Aq.COPPER SULPHATE} AND FEHLING SOLUTION B {SODIUM POTTASIUM TARTARATE[ROCHELLE SALT]})**

ON HEATING FEHLING SOLUTION AND ALDEHYDE THERE FORMS AREDDISH BROWN PRECIPITATE,WHILE KETONE DOESN'T GIVE THIS TEST



AMINES:

→HINSBERG 'S REAGENT TEST (REACTION WITH BENZENESULPHONYL CHLORIDE)

1^0 AMINES REACT WITH HINSBERG'S REAGENT AND PRODUCT **DISSOLVE IN ALKALI**

2^0 AMINES REACT WITH HINSBERG'S REAGENT AND PRODUCT IS **INSOLUBLE IN ALKALI**

3^0 AMINE **DOESN'T REACT** WITH HINSBERG'S REAGENT

TECHNIQUES TO LEARN ORGANIC CHEMISTRY;

- **Study actively, with pencil or pen in hand**
- **Adopt a positive attitude about the course**
- **Try to understand the mechanism**
- **Practice daily!**