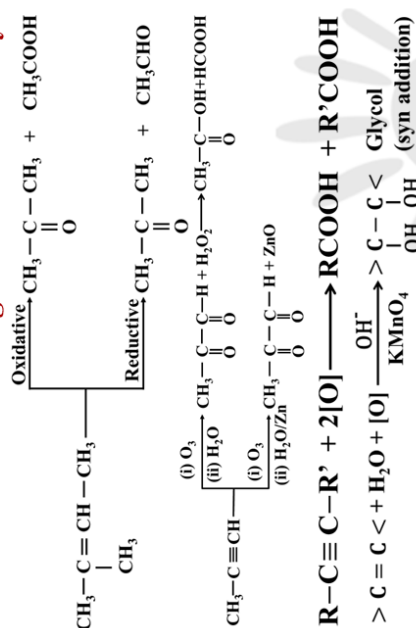
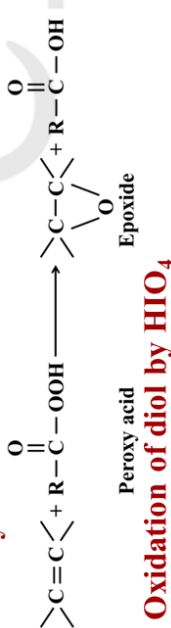


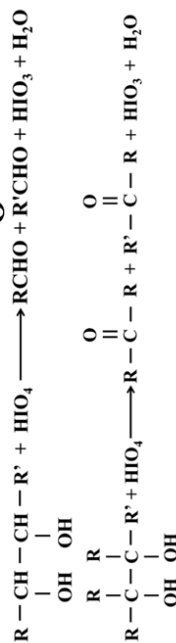
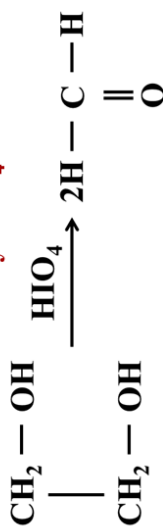
All organic oxidation reactions in one shot!!
How to remember Organic reactions easily?



Epoxidation of Alkenes By Reaction With Peroxy Acids



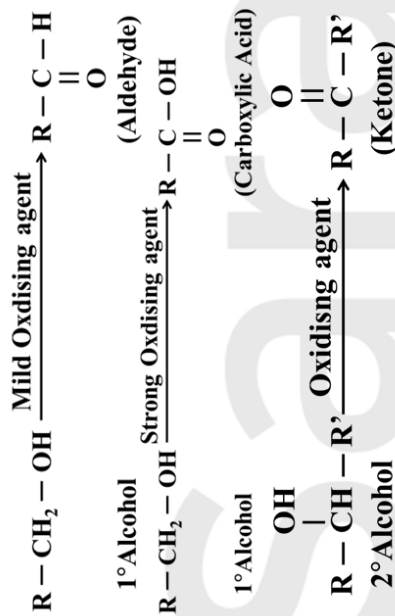
Oxidation of diol by HIO₄



MIND MAP

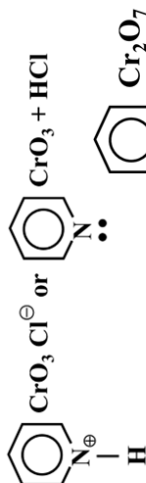
Oxidation Reaction

Oxidation of Alcohols

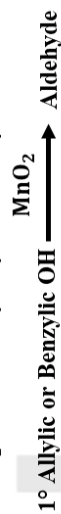


	S.O.A.	M.O.A.
1	H ⁺ /KMnO ₄	PCC
2	H ⁺ /K ₂ Cr ₂ O ₇	PDC
3	John's Reagent	MnO ₂ (allylic/benzylic)
	H ₂ CrO ₄ /H ₂ O/H ₂ SO ₄	Cu/300°
		NBS
		Oppenauer Oxidation
	1° → Acid	1° → Aldehyde
	2° → Ketone	2° → Ketone
	3° → No Reaction	3° → No Reaction

PCC (Pyridinium Chloro Chromate)



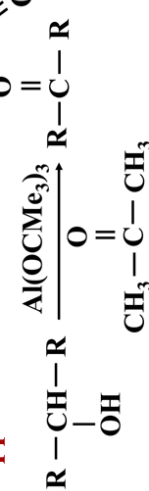
MnO₂-Oxidises only Allylic or Benzylic - OH.



No effect on 3° ROH and on Carbon-Carbon multiple bond.

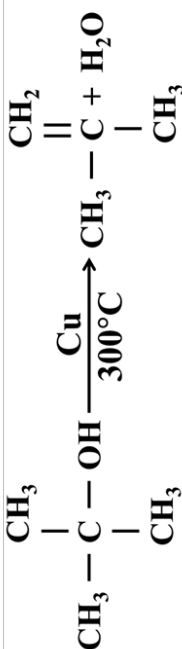


Oppenauer Oxidation

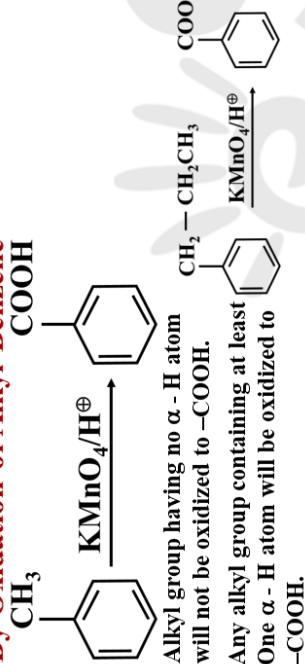


Dehydrogenation of Alcohols





By Oxidation of Alkyl Benzene (Isobutylene)



Distinguishing Test of Aldehyde and Ketone

Silver Mirror Test

Fehling Solution

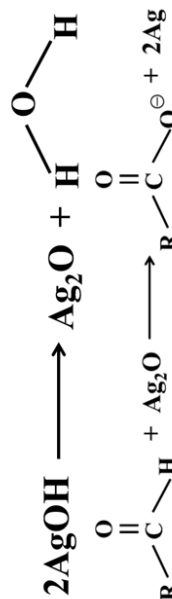
Benedict's Solution

Schiff's Reagent



Aldehydes are easily oxidized hence they act as reducing agent.

$\text{AgNO}_3 + \text{NH}_4\text{OH} \longrightarrow$ Ammonical AgNO_3 is Tollens' Reagent.



MIND MAP

Oxidation Reaction

Fehling Solution Fehling A $\longrightarrow$ aq. CuSO_4

COONa



Fehling B $\longrightarrow$ COOK

(Sodium Potassium

Tartrate or Roscheue Salt)



Imp.

Aldehydes give (brick red ppt.) with Fehling solution but ketones do not give this test. Resonance stabilised aldehydes do not give this test. Formic acid also shows this test

Compound	Tollen's	Fehling
$\begin{array}{c} \text{H} - \text{C} - \text{OH} \\ \\ \text{O} \end{array}$	✓	✓
$\begin{array}{c} \text{O} \\ \\ \text{C} - \text{CH}_3 \end{array}$	✗	✗
$\begin{array}{c} \text{O} \\ \\ \text{C} - \text{H} \end{array}$	✓	✓
PhCHO	✓	✗
	✓	✗

Imp. Ketones do not give this test.

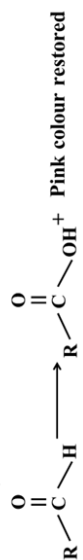
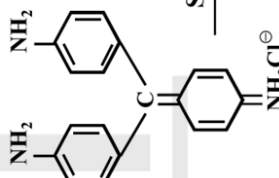
All Aldehydes, Formic Acid, Hemiacetal and α -hydroxyl ketone react with Tollens' Reagent and give Silver Mirror test.

Benedict's Solution

Sodium Citrate + $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$



Schiff's Reagent

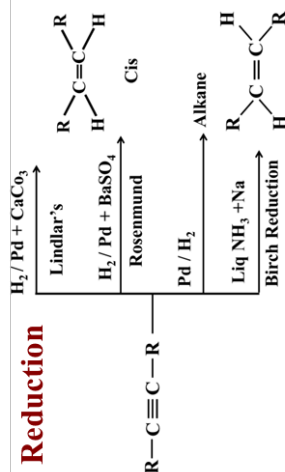


P - Rosaniline Hydrochloride Magenta colour

Imp.

Aldehydes restore the pink colour of Rosaniline Hydrochloride but ketones do not.

Reduction



H_2 in presence of Ni/Pt/Pd gives hydrogenation of all functional groups except $-\text{COOH}$.

Rosenmund's Reduction



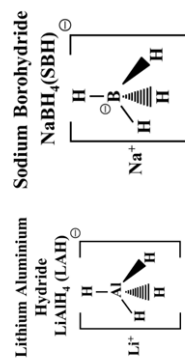
Formaldehyde can not be Prepared by this method.



Stephen's Reduction

Alkyl cyanides are reduced by SnCl_2 and HCl .

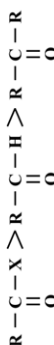
Reduction By Metallic Hydrides



It reduces most of functional group except

Alcohol

Ordinary alkene



Sodium Borohydride

It reduces only

Lithium Aluminium Hydride

It reduces all polar π bonds with oxygen containing functional groups and forms alcohol. With N and O + N containing functional groups it forms Amine

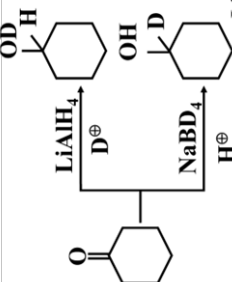
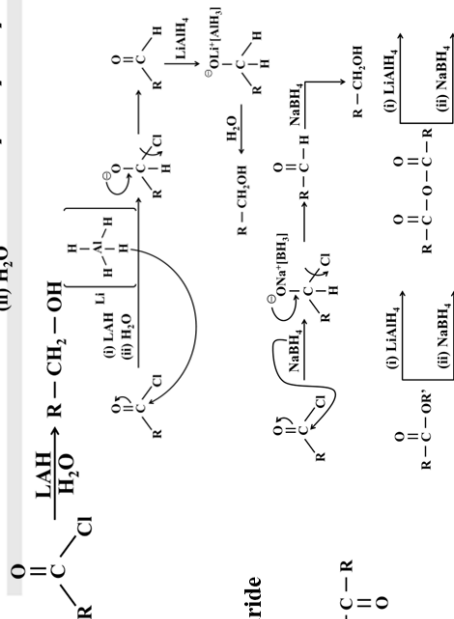
Sodium Borohydride

Lithium Aluminium Hydride

It reduces Cinnamic double bond.

Sodium Borohydride

It reacts with conjugated double bond.



Crotonaldehyde



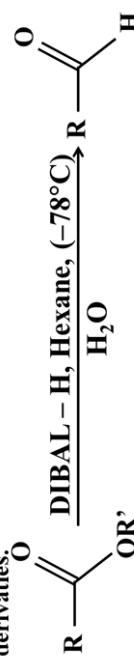
Cinnamaldehyde

Di-iso-butyl Aluminium Hydride

DIBAL-H



DIBAL-H is useful for partial reduction of cyanide and acid derivatives.



Reduction of Carbonyl Compounds to Alkane

1) Wolff Kishner Reduction 2) Clemmensen Reduction

3) Red P + HI

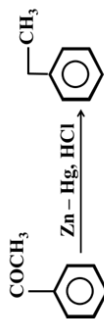
4) Mozingo Reduction

Wolff kishner Reduction

When a ketone or an Aldehyde is heated in a basic solution of Hydrazine, the Carbonyl group is converted to a Methylene group and this process is called Deoxygenation.

Clemmensen Reduction

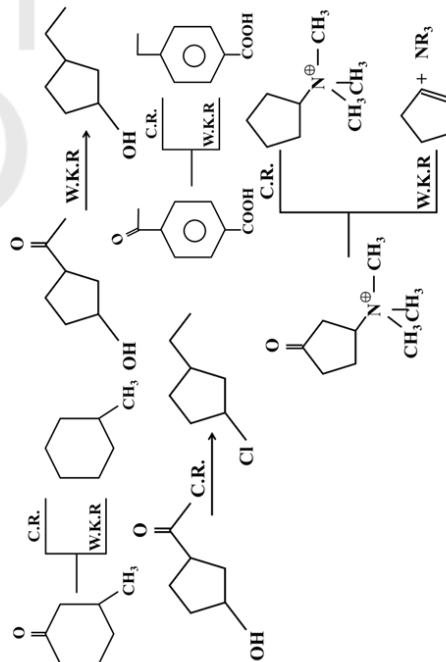
The reduction of Carbonyl groups of Aldehydes and Ketones to Methylene groups with amalgamated Zinc and concentrated Hydrochloric acid is known as Clemmensen reduction.



1. Zn-Hg/HCl and $\text{NH}_2\text{-NH}_2/\text{OH}^-/\Delta$ are both used to reduce carbonyl groups.
2. Acid and their derivatives are not reduced by these reagents

Drawback with Clemmensen Reduction

If -OH, -OR, Acetal, Ketal and C≡C are present in molecule then they react with reagents in Clemmensen reduction and hence in such cases Wolff Kishner reduction is to be used.



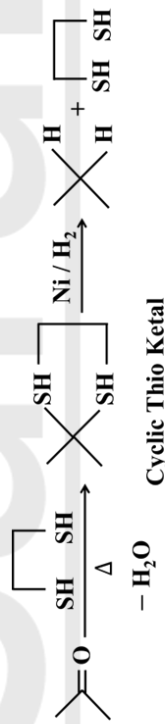
MIND MAP

Reduction

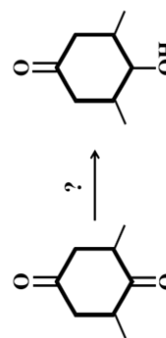
Reactions With Diols (Thiols)



Mozingo Reduction



Protection of selected groups from reduction.



Red P + HI: (Strong Reduction Agent) “(Oxygen ka dushman)”

