

2,4-Dinitrophenylhydrazine:

Aldehyde → yellow

Ketone → orange / red ppt

Sodium Bisulphite:

• Aldehyde + Small methyl ketones

↓
white ppt

Tollen's test:

Sodium

Nitroprusside:

• Ketone

• Wine red

orange red ppt

• Aliphatic + Aromatic aldehyde

• Silver mirror (fig)

• Fehling's soln also give this test

• Terminal alkyne → white ppt
(no mirror)

Fehling test: (Tartarate)

• Aliphatic aldehyde

• Brick Red ppt (Cu_2O)

Benedict test: (citrate)

• Aliphatic aldehyde

• Brick Red ppt (Cu_2O)

Preview from Notesale.co.uk
Page 11 of 29

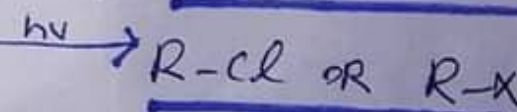
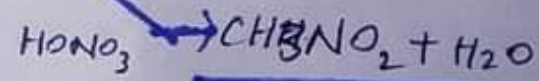
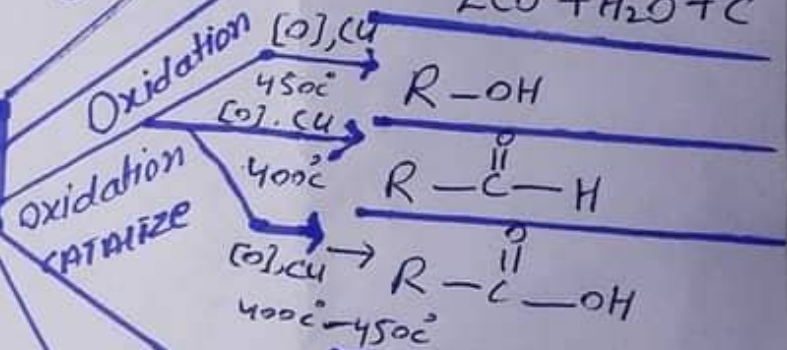
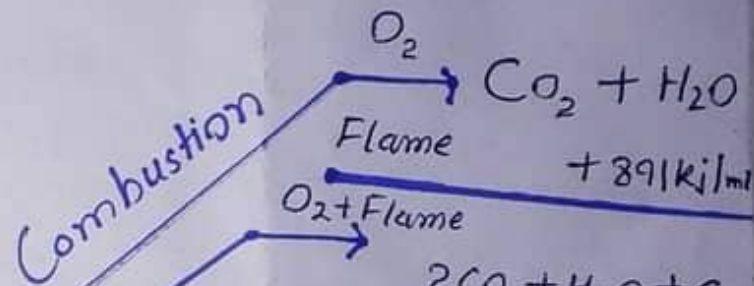
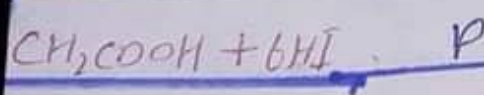
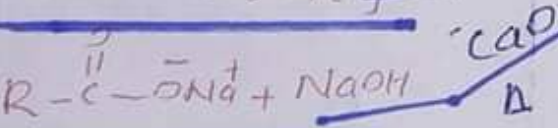
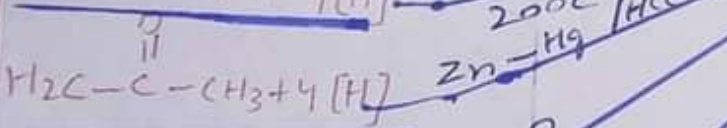
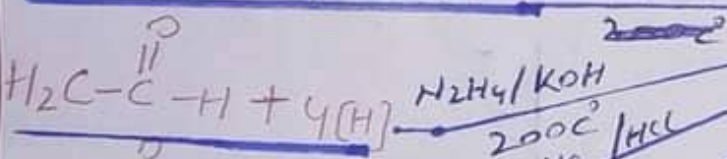
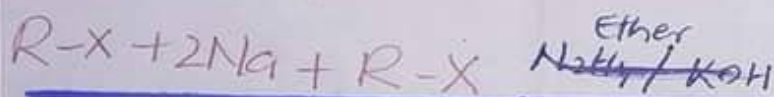
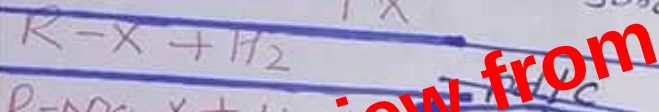
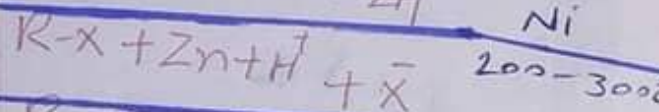
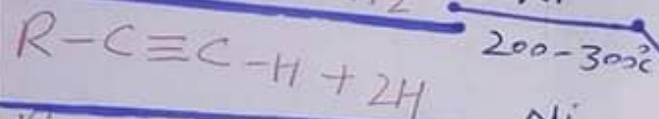
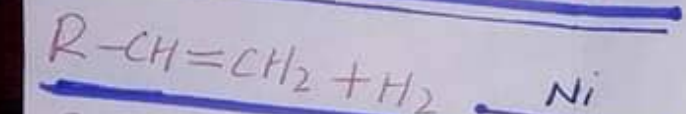
PREPARATIONS:-

21/2/2021

This too shall pass

ALKANES

REACTIONS

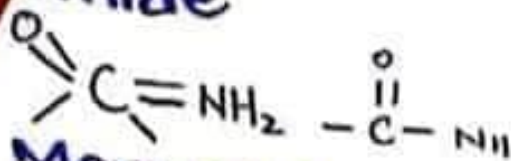


Important

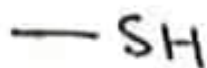
Functional Groups:

(4)

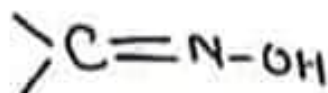
Amide



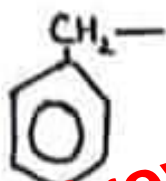
Mercapto



Oxime



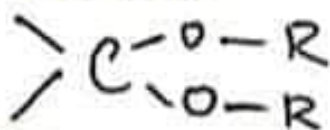
Benzyl



Benzo



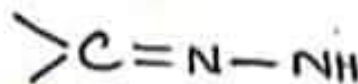
Acetal



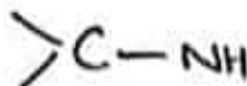
Phenyl/Aryl



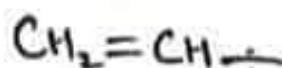
Hydrazone



Imino



Vinyl



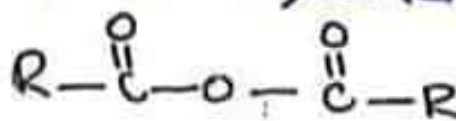
Benzol



Benzyl



Acid anhydride



acryl



Alkane

Alkene

Alkyne

Alkyl halides

General characteristics

- Saturated HCs.
- C-C (Single bond)
- C_nH_{2n+2}
- Tetrahedral
- Non planner
- sp^3 hybridization
- Bond angle 109.5°

- Unsaturated HCs.
- C=C (double bond)
- C_nH_{2n}
- Trigonal planar
- sp^2 hybridization
- Bond angle 120°

- Unsaturated HCs.
- C≡C (triple bond)
- C_nH_{2n-2}
- Linear shape.
- Planner
- sp hybridization
- Bond angle 180°

- R-X
- halogen (Functional grp)
- $C_nH_{2n+1}X$
- Tetrahedral
- Non-planner
- sp^3 hybridization
- Bond angle 109.5°

Bond length

1.54 Å (C-C)

1.34 Å (C=C)

1.19 Å (C≡C)

1.54 Å (C-C)

Preparations

- Hydrogenation of Unsaturated HCs.
- Catalyst - H_2SO_4, Ni
- Temp - $200^\circ C - 300^\circ C$
- Hydrolysis of Grignard reagent.
- $R-MgX + H_2O$

- Dehydration of Alcohol.
- Catalyst - H_2SO_4 .
- Temp - $170^\circ C$
- Dehydrohalogenation of Alkyl halides
- KOH (Alcoholic Sol).

- Dehydrohalogenation of Vicinal Dihalides
- $KOH/NaNH_2$ (Solution)
- Temp - $-33^\circ C$
- Dehalogenation of Tetrahalides
- Alcoholic Solution
- Zinc dust.

- Halogenation of Alkane.
- Temp - $400^\circ C$
- Hydrohalogenation of Alkene.
- FROM ALCOHOL.
- halogen acid. $R-OH + HX$
- Phosphorus halides
- $3R-OH + PCl_3$
- Thionyl chlorides
- $R-OH + SOCl_2$

Reactivity

- Less Reactive
- Electronegativity diff.
- Sigma bond.

- Reactive
- Reactivity $\propto$ Polarity
- Reactivity $\propto 1/B$ length
- π bond.

- Highly reactive
- π bond.
- less reactive than Alkene due to σ charac.

- More Reactive
- R-X (highly Polar)
- Order of reactivity
- $R-I > R-Br > R-Cl > R-F$

Reactions

- Substitution Reactions
- Halogenation
- $R-H + X_2 \rightarrow R-X + HX$
- Initiation (Free radical)
- Propagation (Attacking)
- Termination (Removal of signal)
- Oxidation Reaction
- Catalyst $\rightarrow Cu$
- Temp $\rightarrow 200-300^\circ C$
- Product $\rightarrow$ Alcohol.

- Addition Reactions
- Hydrogenation
- Hydrohalogenation
- Hydration
- Catalyst - H_2SO_4
- Temp - $100^\circ C$
- Halogenation
- Halohydrin (d-OH)
- Product - Halohydrins
- Epoxidation
- Ag, Temp $\rightarrow 300^\circ C$
- Ozonolysis ($2n+1=100^\circ C$)

- Addition Reactions
- Hydrogenation
- Reduction by Na Metal
- Li, NH_3
- Product - Sodium Acetylide
- Hydrohalogenation
- Hydration
- H_2SO_4, H_2SO_4 , Temp - $80^\circ C$
- Product $\rightarrow$ Carbonyl Comp.
- halogenation
- Ozonolysis - O_3
- Ozonide $\rightarrow$ Carbonyl Comp.

- Nucleophilic Substitution reactions
- SN^1 - SN^2
- 1st Order - 2nd Order
- T^+ - P^+
- Polar Solvent - Non polar
- Two step - Single step
- Oxidation changes 50% - Orientation changes 100%
- E^1, E^2 (Same)