

Co-ordination Compounds ^{1.}

Degree-II (H) , Paper-III , Group-B

06/11/2020

Some Important Terms Used In Co-ordination Chemistry Ligands

* The species (molecule or ion) which have at least one lone pair of electron and that can donate its lone pair of e^- to a metal cation or atom.

e.g. $:NH_3$, $H_2\ddot{O}:$, $:\ddot{F}:^-$, OH^- , $:CO:$

ie; * Ligands are Lewis bases

* Ligands are nucleophile.

Classification of Ligands

1. Monodentate Ligands

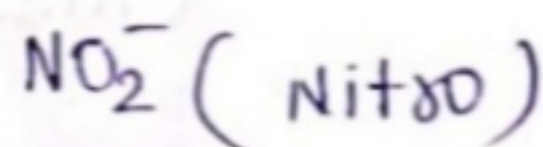
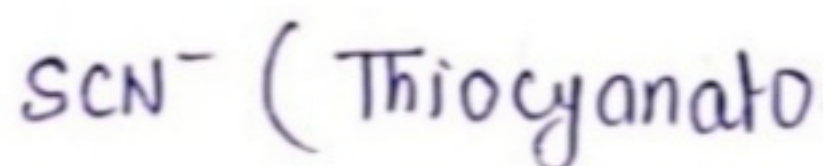
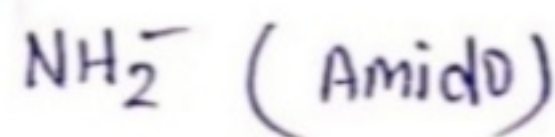
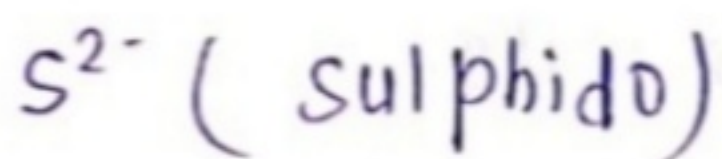
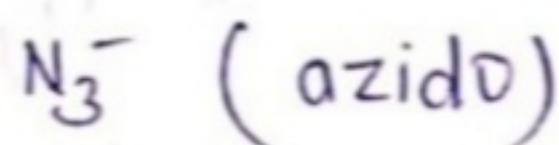
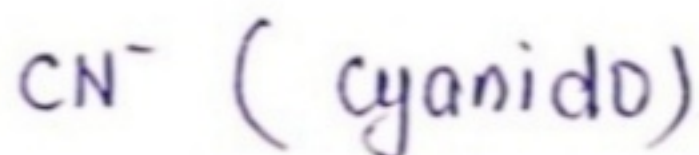
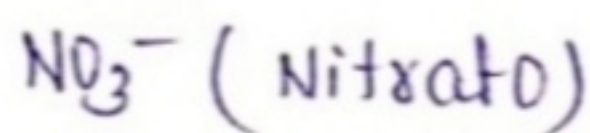
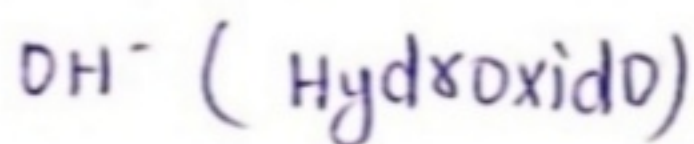
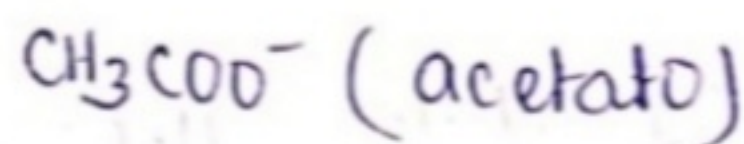
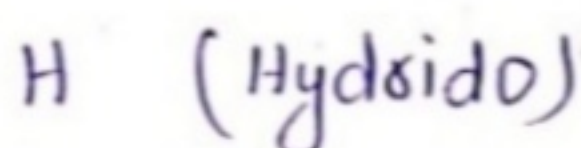
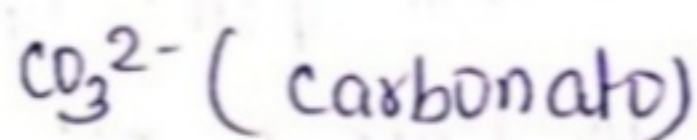
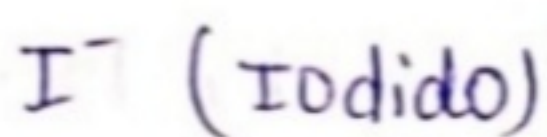
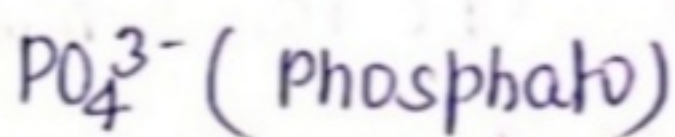
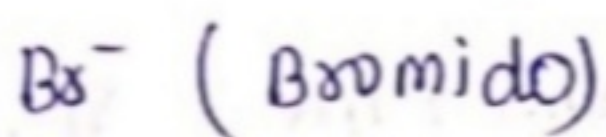
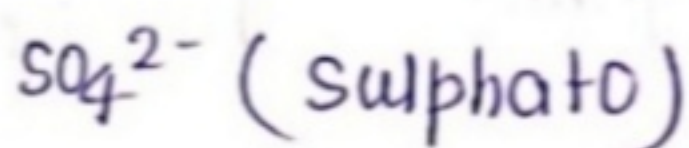
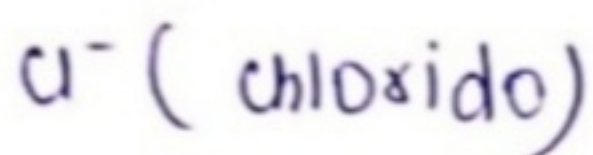
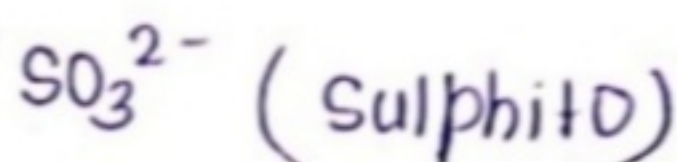
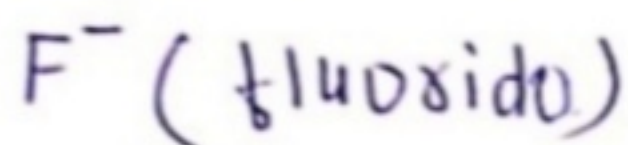
dentate — tooth or teeth

mono — one

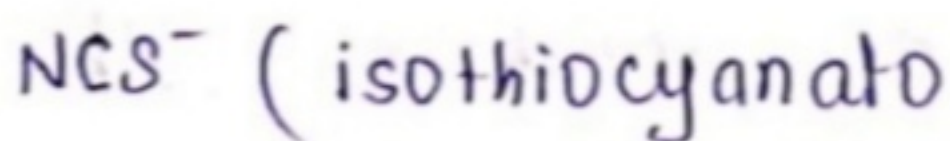
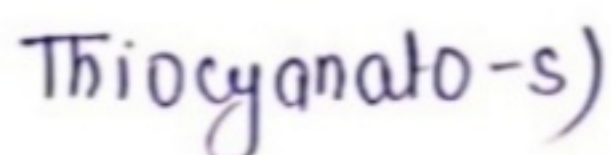
Monodentate — cut with single tooth, i.e.; donate one electron pair.



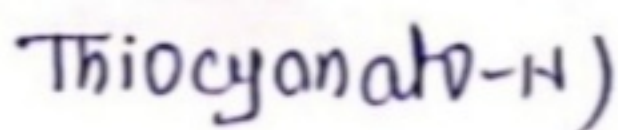
e.g.



or



or



Neutral Ligands

3.

R_3P - Trialkyl Phosphine

where ($R = CH_3, C_2H_5, C_6H_5$)

$(CH_3)_3P \rightarrow$ Trimethyl phosphine

$(C_6H_5)_3P \rightarrow$ Triphenyl phosphine

$NH_3 \rightarrow$ Ammine

$R-NH_2 \rightarrow$ Alkyl amine

$CH_3-NH_2 \rightarrow$ Methylamine

$C_2H_5NH_2 \rightarrow$ Ethylamine

$(CH_3)_2NH \rightarrow$ Dimethylamine

$(CH_3)_3N \rightarrow$ Trimethylamine

$CO \rightarrow$ Carbonyl

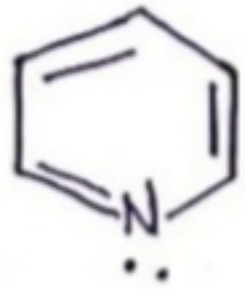
$CS \rightarrow$ Thiocarbonyl

$NO \rightarrow$ Nitrosyl

$NS \rightarrow$ Thionitrosyl

$H_2O \rightarrow$ Aqua

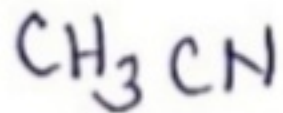
4.



— Pyridine (py)



— Pyrazine (pz)



— acetonitrile

Positive Ligands

NO^+ — It is more electronegative hence not use nitrosonium cation, only nitrosyl use.

2nd