

ARJUNA

JEE AIR 2024

ATDB.uno

Physical Chemistry

Redox Reaction



Lecture No.- 01

By- Dr. Gopal Chaturvedi Sir
(GC Sir)

**GURUKUL**

Topics to be Covered

Topic

✓ Oxidation and reduction

Topic

✓ Oxidant and Reductant

Topic

✓ Redox Reaction

ATDB.uno

Topic : Redox Reaction



Reduction + Oxidation

ATDB.uno

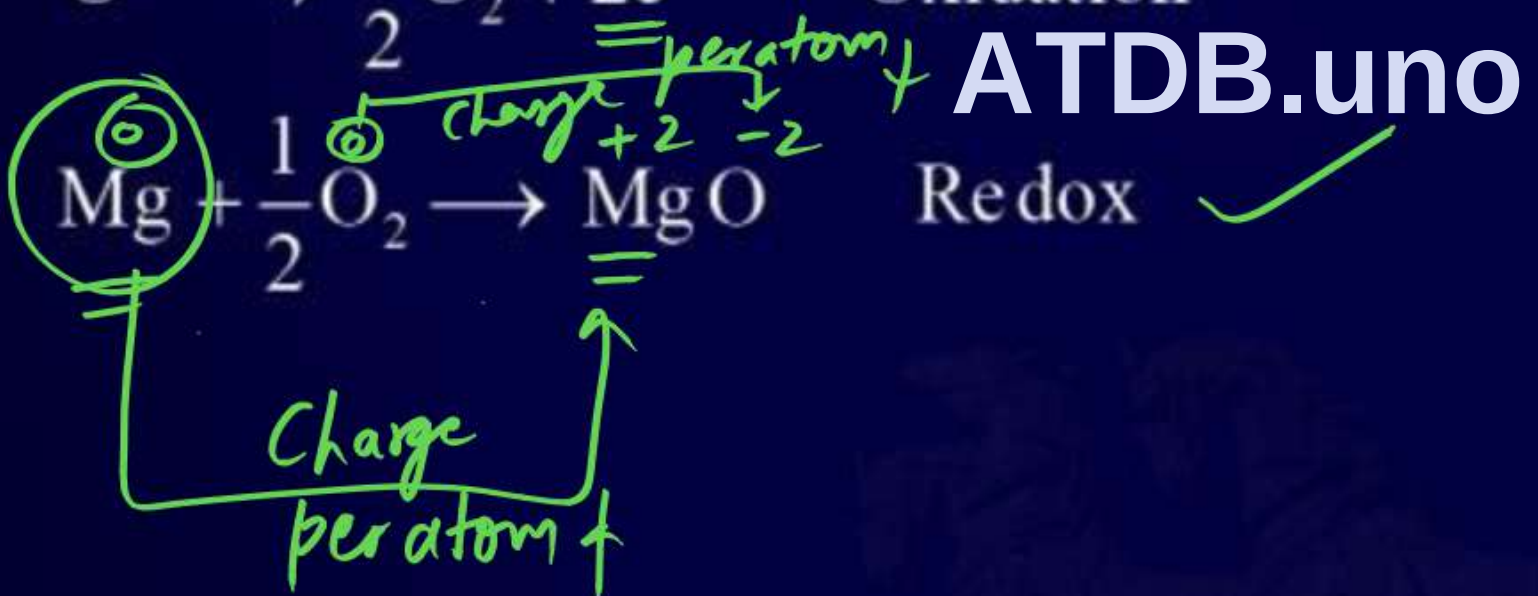
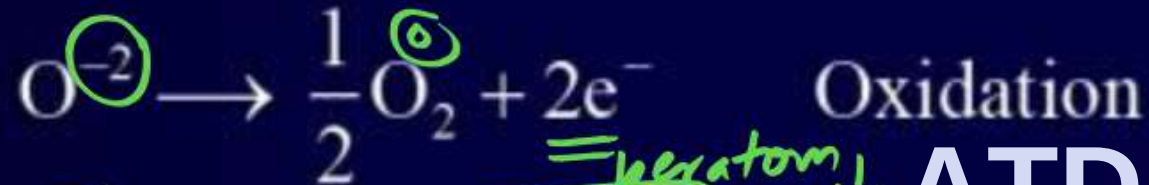


GURUKUL

Oxidation:

loss of e⁻ or increases in oxidation number or addition of oxygen or more EN element or removal of hydrogen (classical concept)

Example:

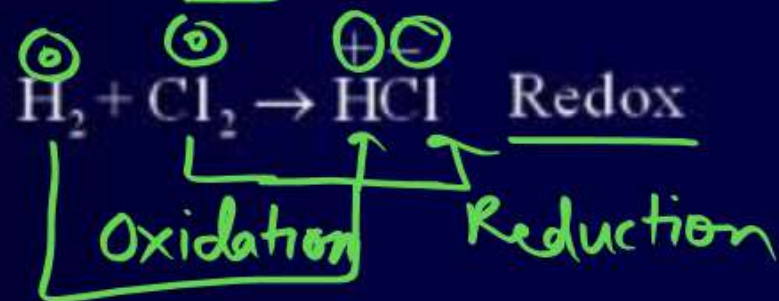
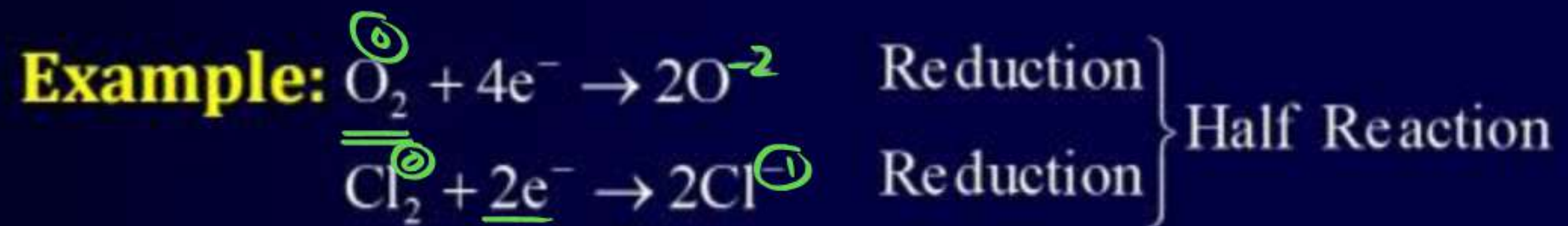




GURUKUL

Reduction :

Gain of e^- or decreases in oxidation number or addition of hydrogen *or less EN*
(classical concept)



ATDB.uno



Topic : Oxidant And Reductant



GURUKUL

Substance
which oxidise
other substance
get reduce itself
(Oxidising Agent)

Substance
which reduce
other substance
get oxidise itself
(Reducing Agent)

Topic : Redox Reaction

(Types of Redox Reaction)

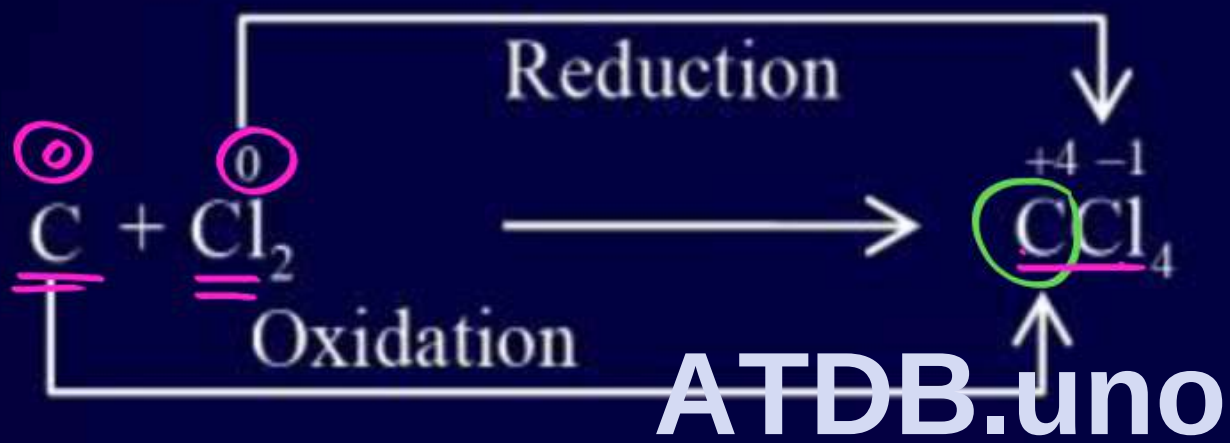
ATDB.uno

Redox reaction → reduction and oxidation both process takes place in the reaction *(Simultaneously)*



GURUKUL

Example:



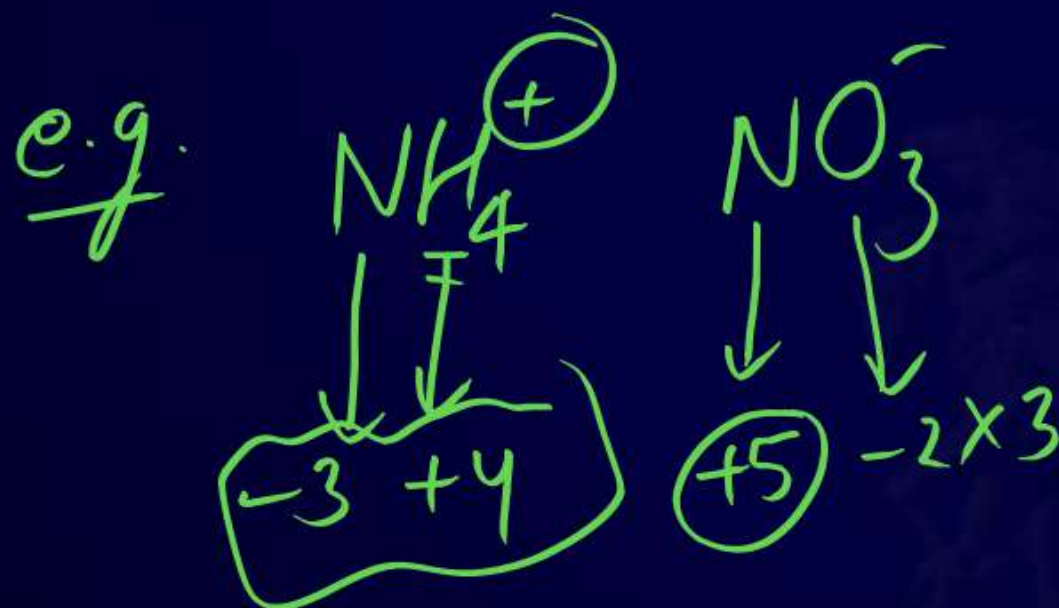
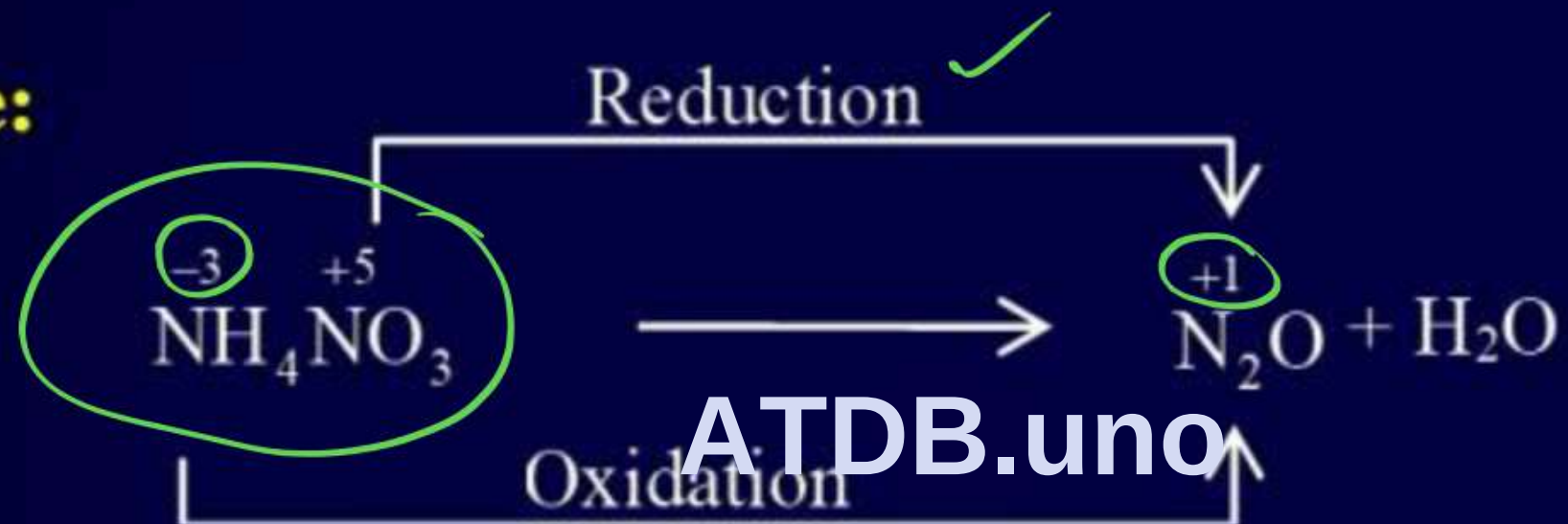
ATDB.uno



GURUKUL

(a) **Intramolecular redox Reaction** :→ Reduction and oxidation takes place within a molecule

Example:





GURUKUL

(b) **Intermolecular Redox Reaction** :→ Reduction and oxidation takes place in different molecules.

Example:





Some other type of reaction:

ATDB.uno



GURUKUL

Combination redox Reaction:

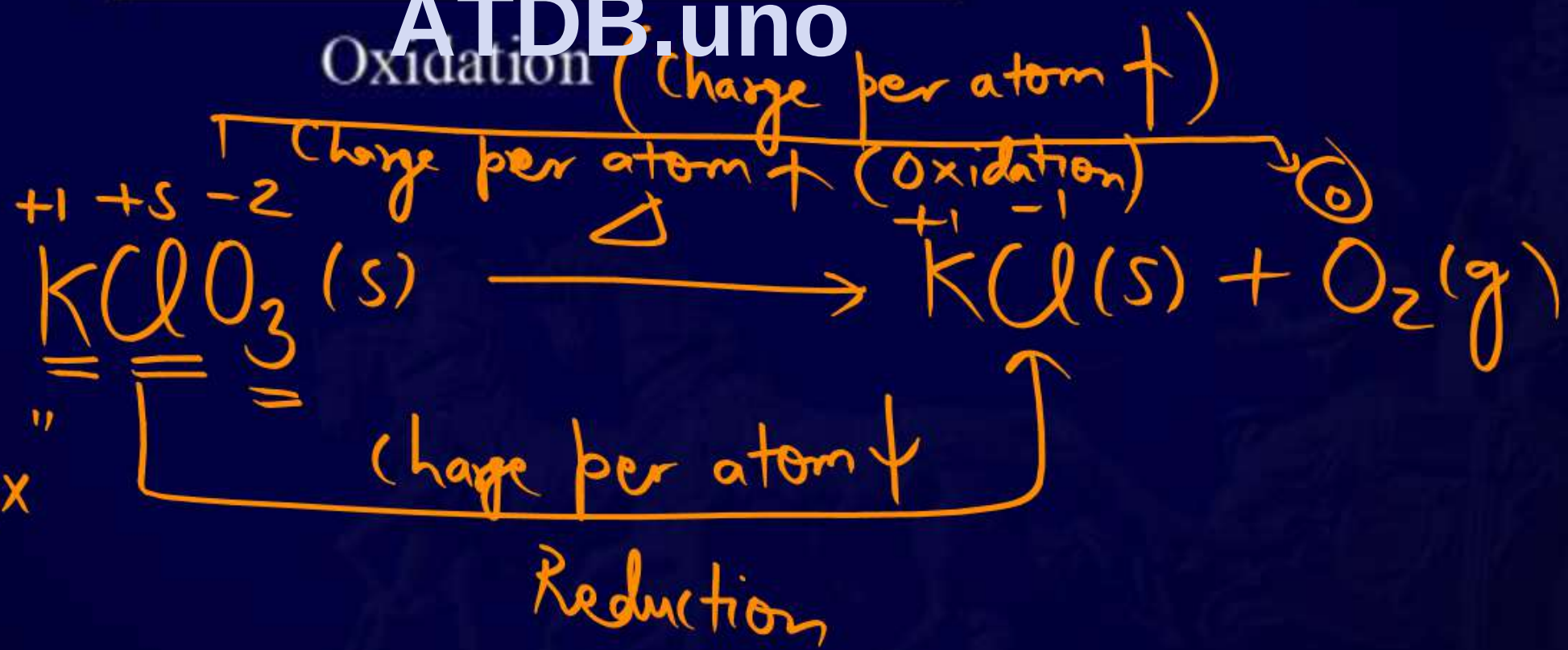
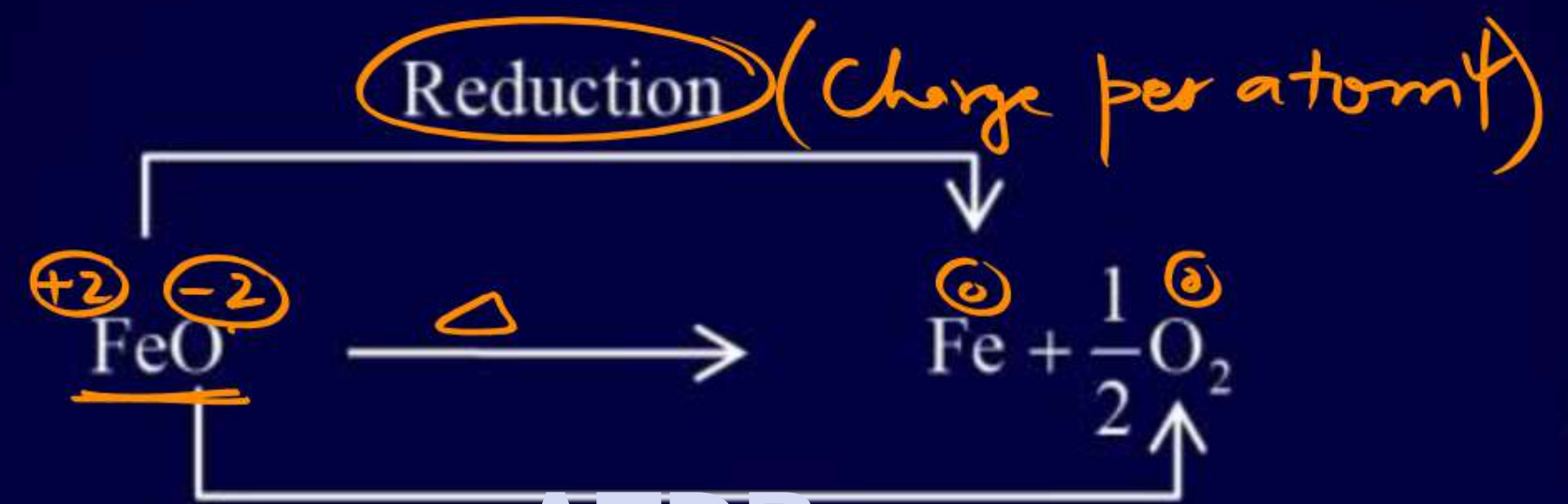
Small element combine and form large molecule



ATDB.uno

Intermolecular Redox Reaction.

Thermal decomposition redox Reaction:



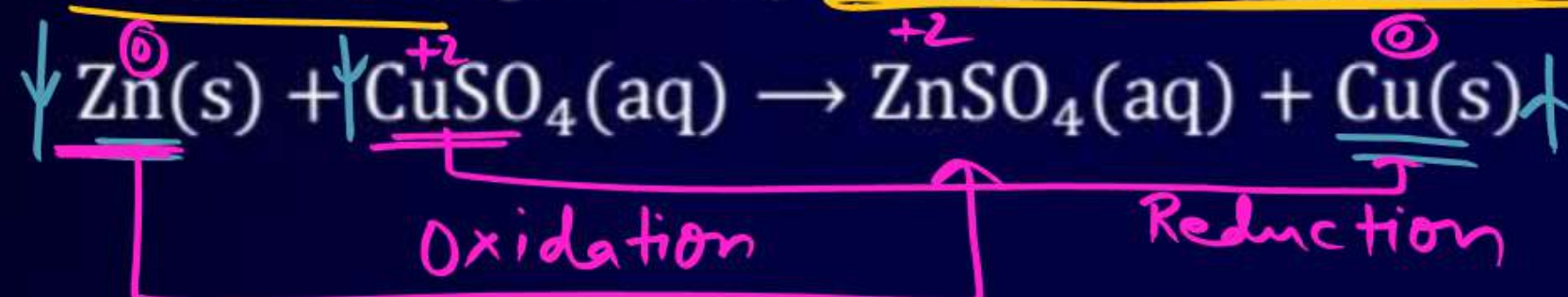
"Intramolecular Redox"



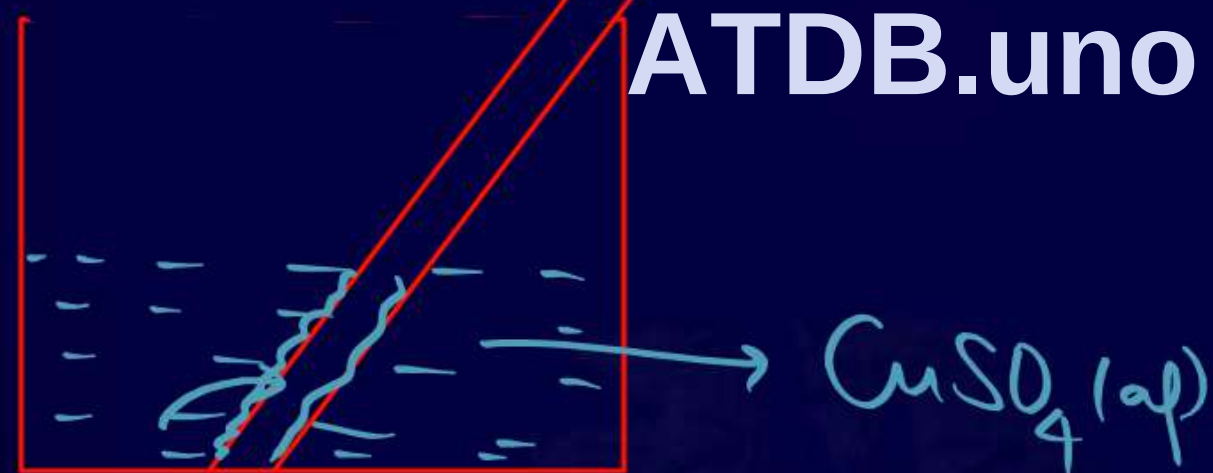
GURUKUL

(1) Metal displacement reaction:

Metal ion displaced by more electropositive metal from their salt solution.



Intermolecular redox Reaction

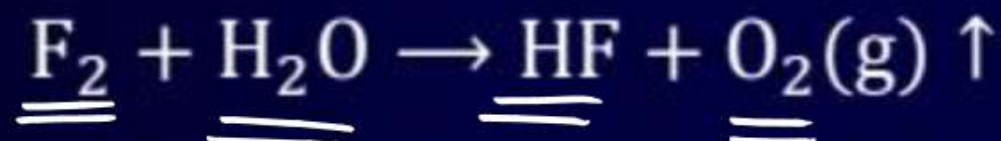
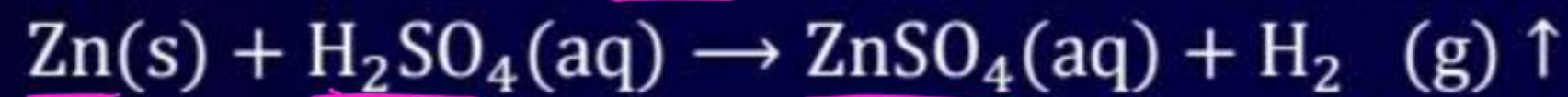
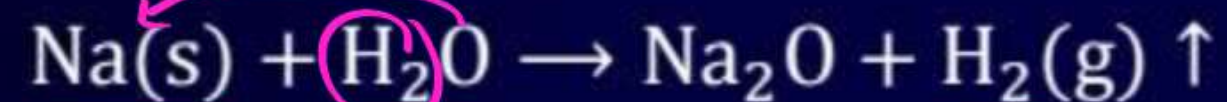




GURUKUL

(2) Non – metal displacement reaction:

Non-metal displaced by more electropositive metal or more electronegative non-metal



F is more electro negative than O

ATDB.uno

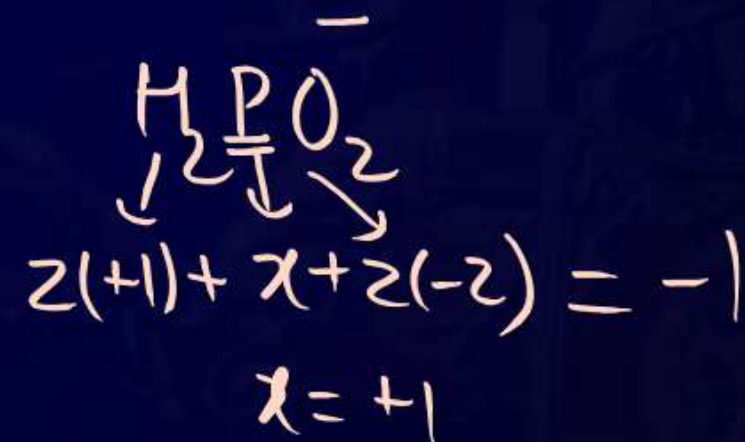
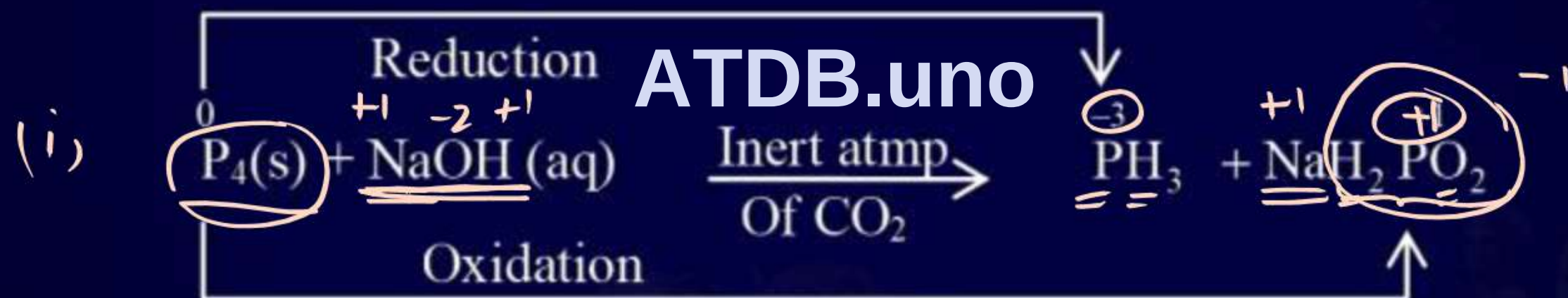
Intermolecular Redox reaction



GURUKUL

(f) Disproportion reaction:

Redox reaction in which an element from same oxidation state is converted into different oxidation state is called disproportionation reaction when non-metal reacts with strong alkali reaction shows disproportionation reaction.

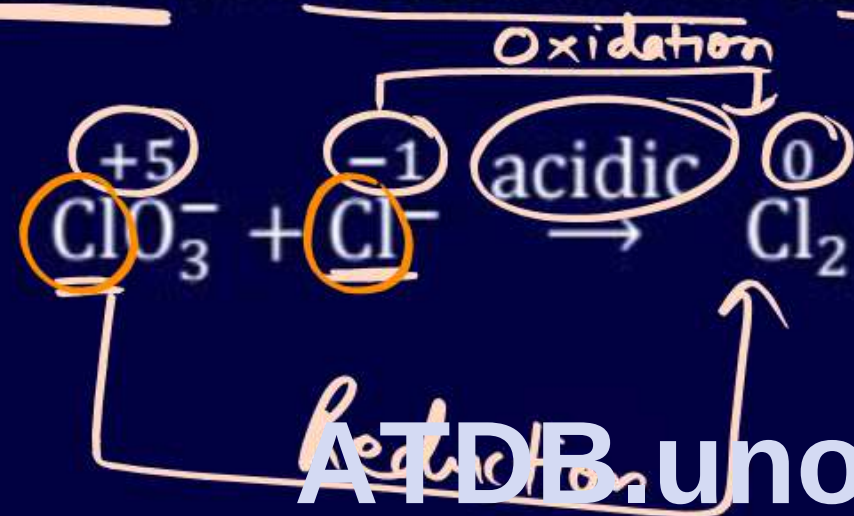




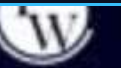
GURUKUL

(g) Comproportionation Reaction:

Reverse of disproportionation Reaction, Redox Reaction in which different oxidation state of an element is converted into same Oxidation state.



Question



GURUKUL

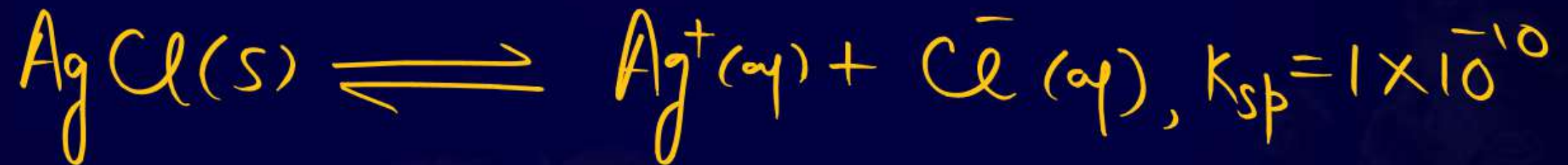
#Q. Assuming no change in volume, calculate the minimum mass of NaCl necessary to dissolve 0.010 mol AgCl in 100 L solution.

$$[K_f(\text{AgCl}_2^-) = 3 \times 10^5, K_{sp}(\text{AgCl}) = 1 \times 10^{-10}]$$

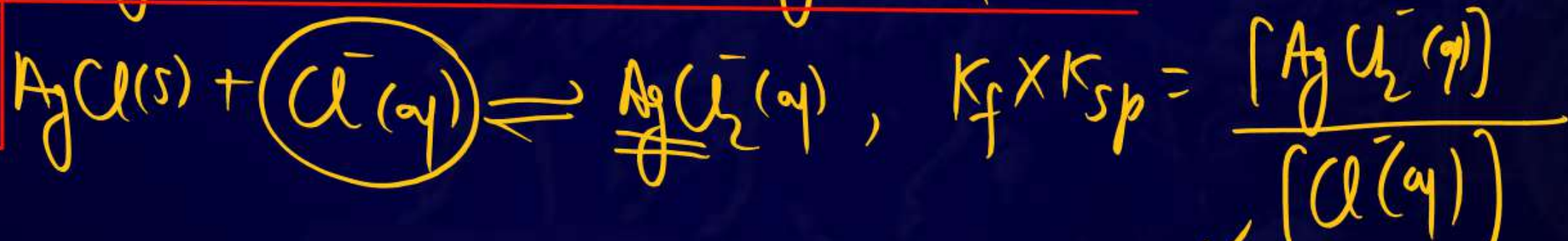
Solⁿ



ATDB.uno



Moles of Ag in
AgCl = Moles of
Ag in AgCl_2^-





Thank You

ATDB.uno

