

# ARJUNA

## JEE AIR 2024

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**Physical Chemistry**

### Redox Reaction



**Lecture No.- 01**

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(GC Sir)**

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# Topics to be Covered

**Topic**

✓ Oxidation and reduction

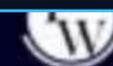
**Topic**

✓ Oxidant and Reductant

**Topic**✓ Redox Reaction **ATDB.uno**



# Topic : Redox Reaction



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Reduction + Oxidation

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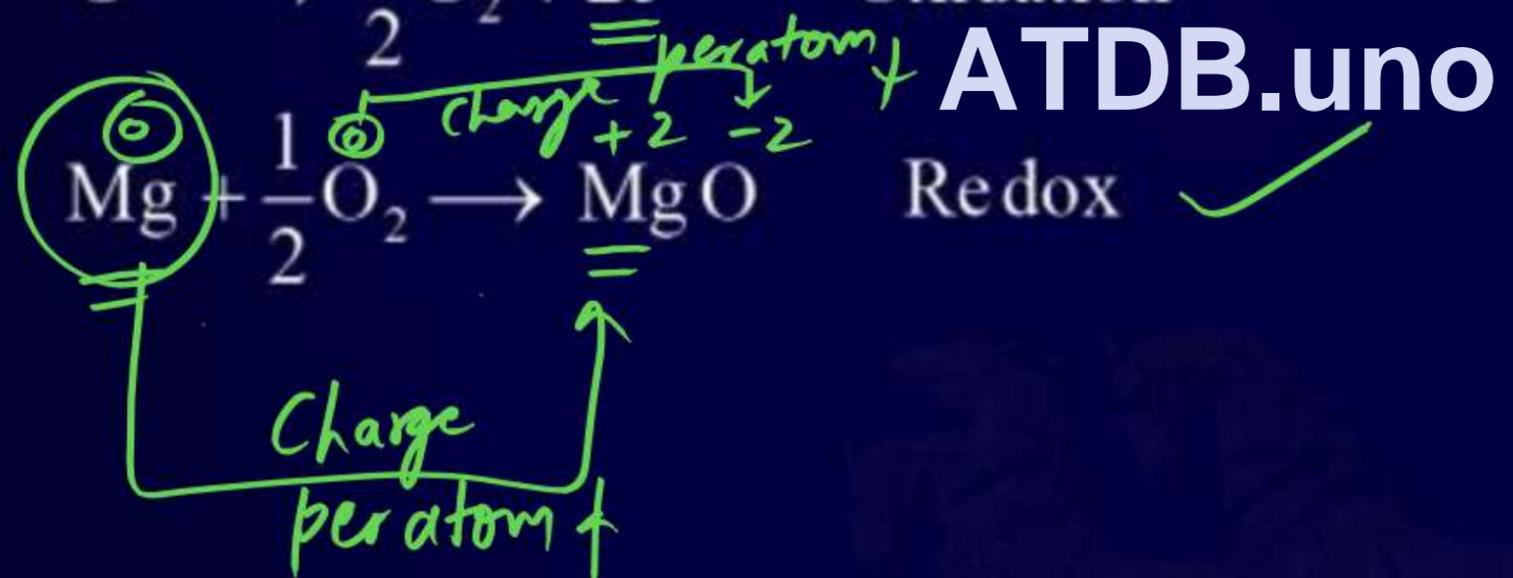
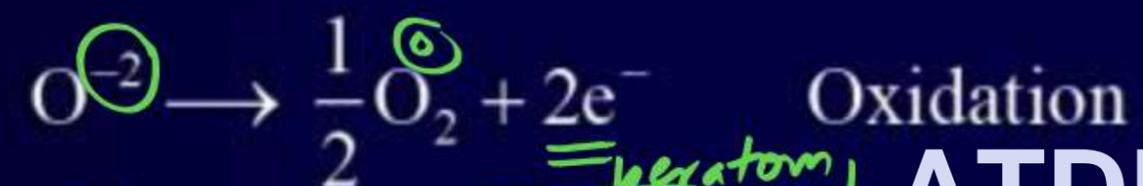
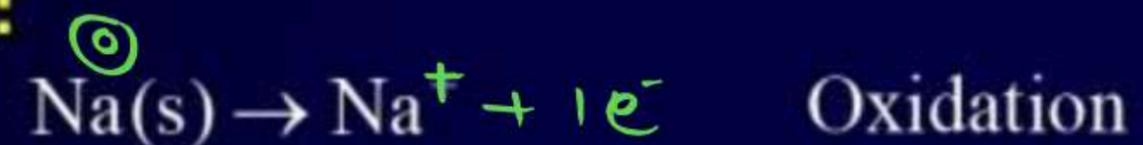


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## Oxidation:

loss of e<sup>-</sup> or increases in oxidation number or addition of oxygen or more EN element or removal of hydrogen (classical concept)

## Example:

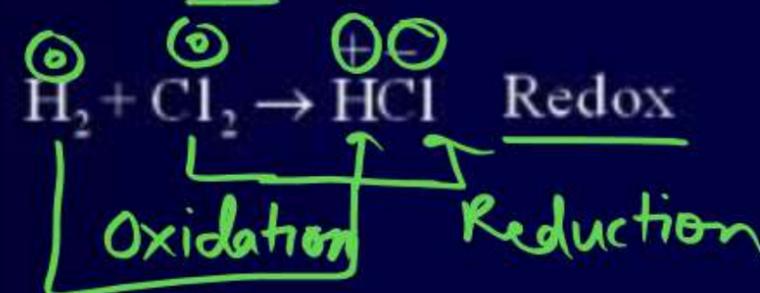
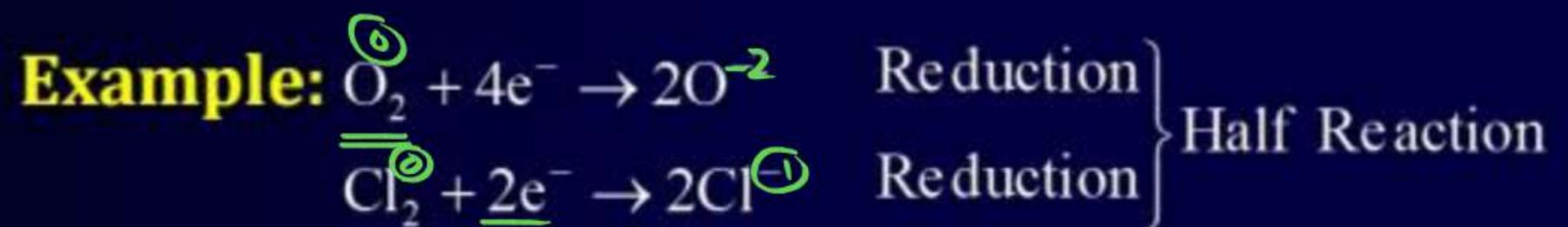




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## Reduction :

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



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# Topic : Oxidant And Reductant



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Substance

which oxidise

other substance

get reduce itself

(Oxidising Agent)

Substance

which reduce

other substance

get oxidise itself

(Reducing Agent)

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# Topic : Redox Reaction

(Types of Redox Reaction)

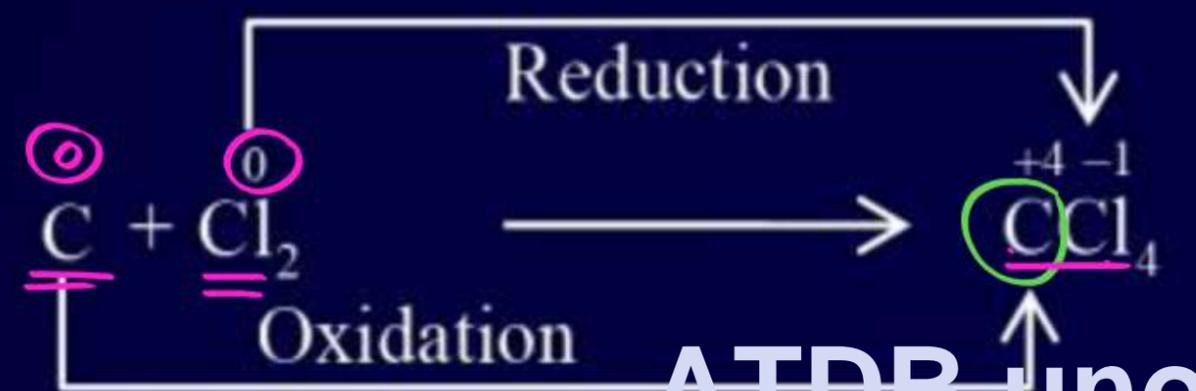
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**Redox reaction**  $\rightarrow$  reduction and oxidation both process takes place in the reaction (*Simultaneously*)

**Example:**



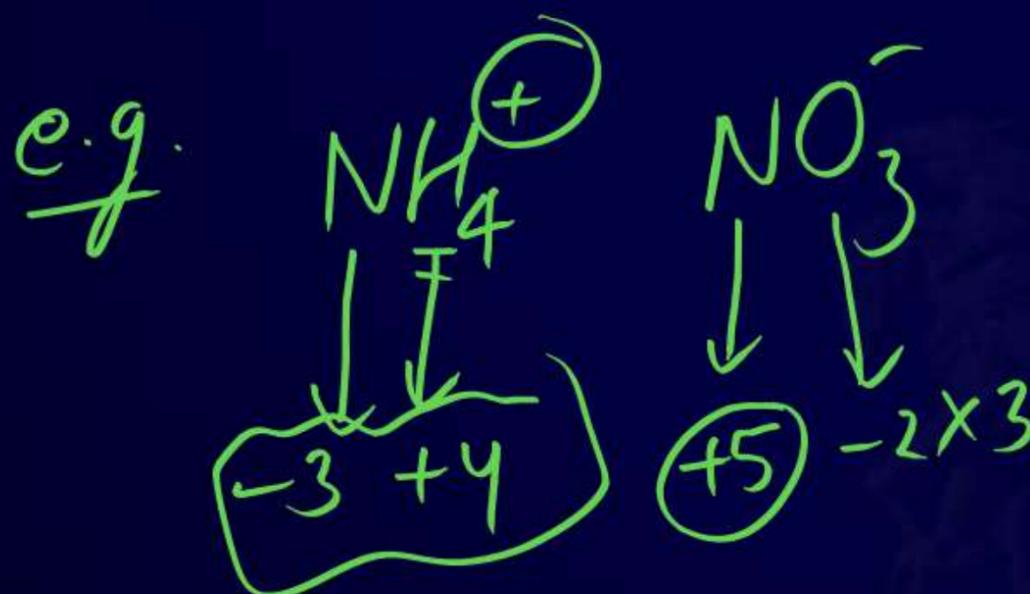
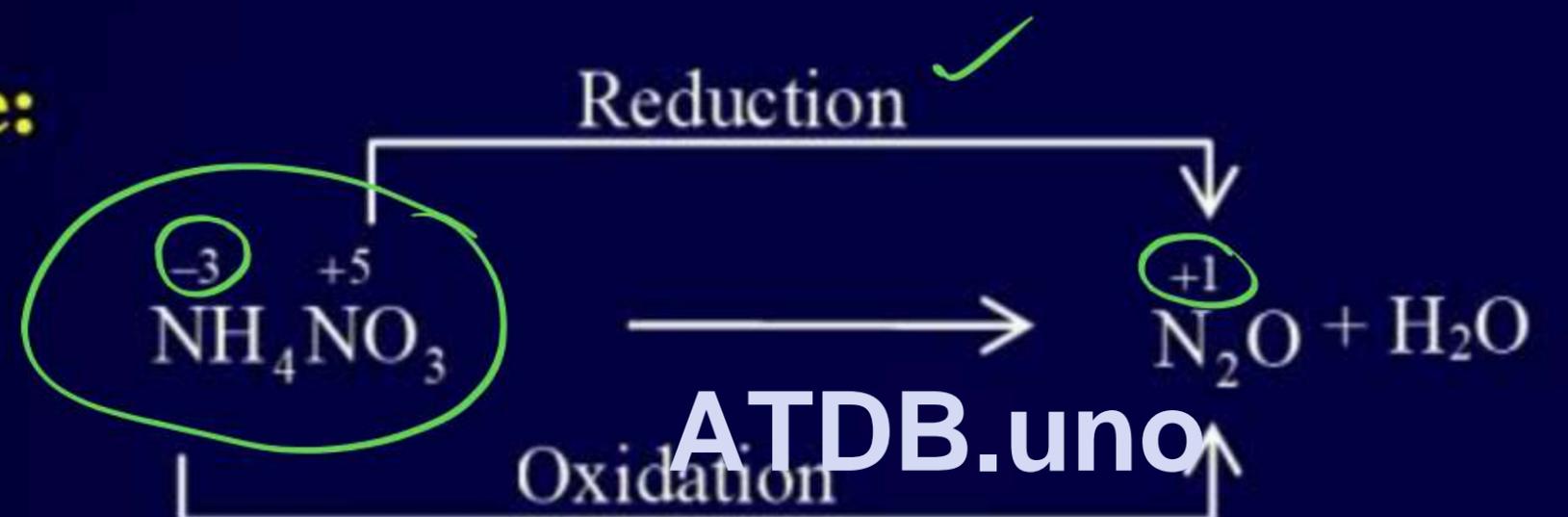
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(a) **Intramolecular redox Reaction**  $\rightarrow$  Reduction and oxidation takes place within a molecule

**Example:**





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

**Example:**





Some other type of reaction:

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## Combination redox Reaction:

Small element combine and form large molecule

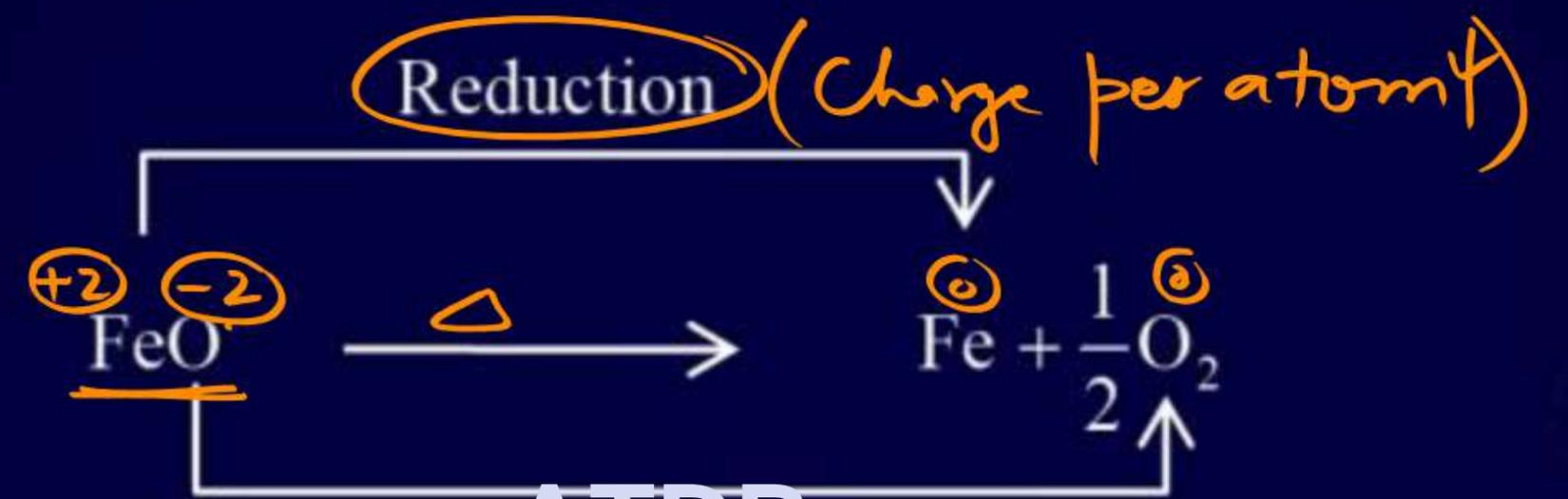


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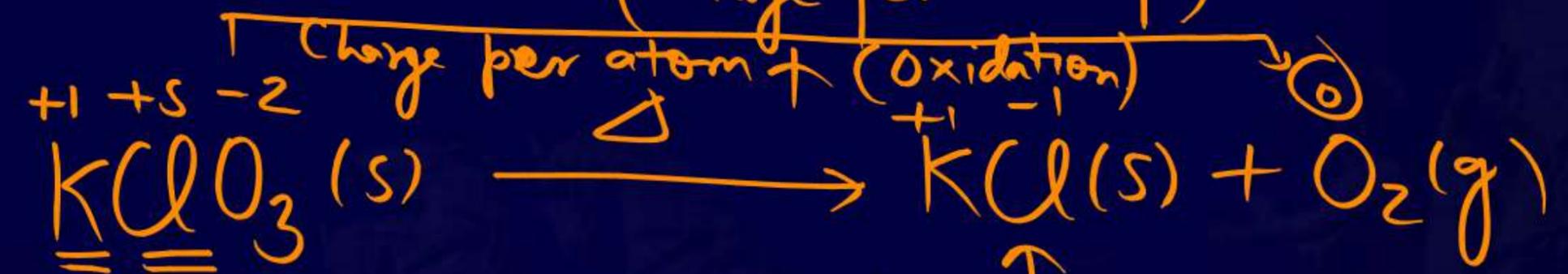
Intermolecular Redox Reaction.



# Thermal decomposition redox Reaction:

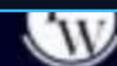


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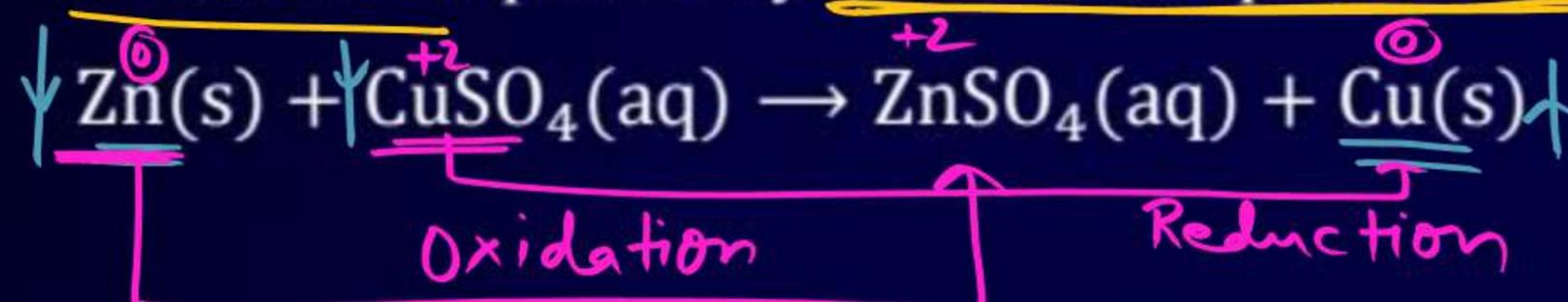
"Intramolecular Redox"





# (1) Metal displacement reaction:

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



Intermolecular redox Reaction

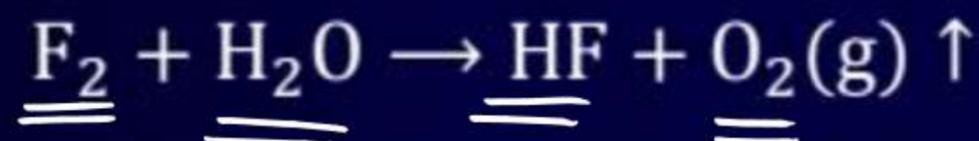
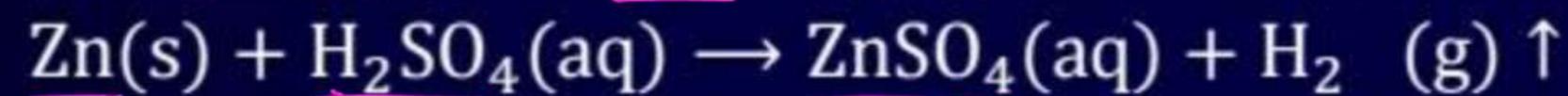
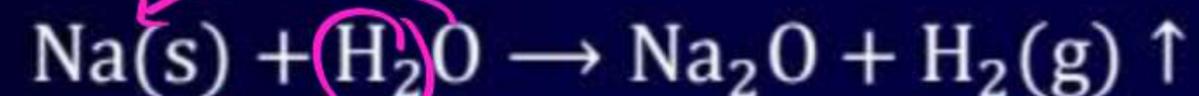




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(2) **Non – metal displacement reaction:**

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



F is more electro negative than O

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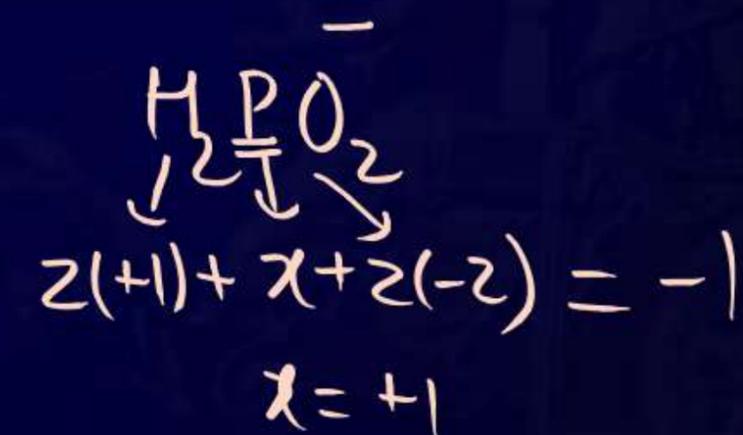
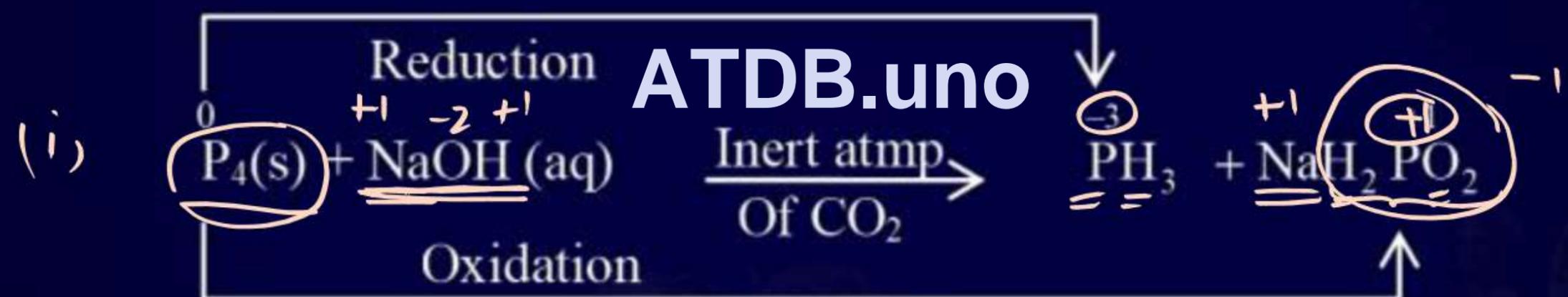
Intermolecular Redox reaction



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## (f) Disproportion reaction:

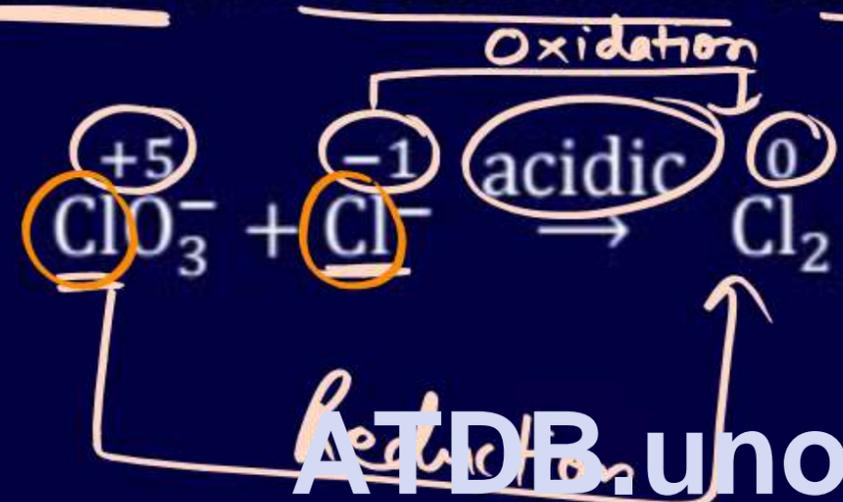
Redox reaction in which an element from same oxidation state is converted into different oxidation state is called disproportionation reaction when non-metal reacts with strong alkali reaction shows disproportionation reaction.





## (g) Comproportionation Reaction:

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



# Question



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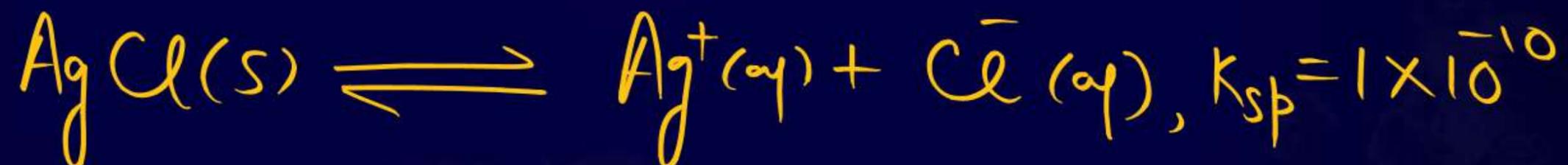
#Q. Assuming no change in volume, calculate the minimum mass of NaCl necessary to dissolve 0.010 mol AgCl in 100 L solution.

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

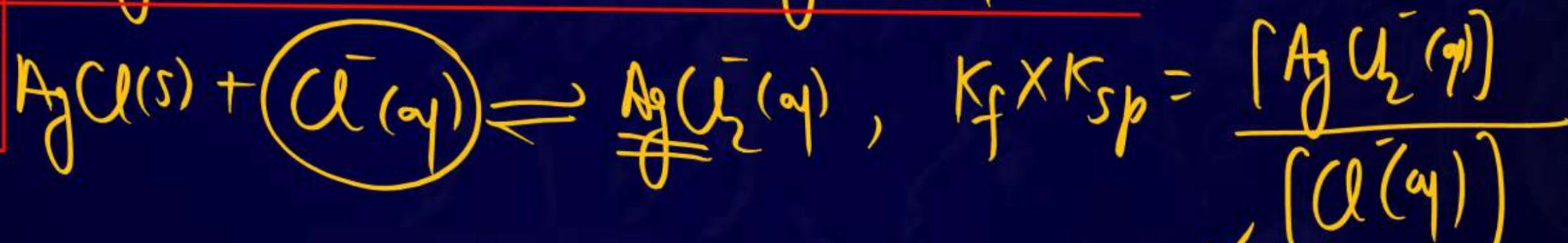
Sol<sup>n</sup>



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Moles of Ag in  
AgCl = Moles of  
Ag in  $\text{AgCl}_2^-$





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# Thank You

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