

ARJUNA

JEE AIR 2024

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Physical Chemistry

Redox Reaction




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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

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Topic : Redox Reaction



Reduction + Oxidation

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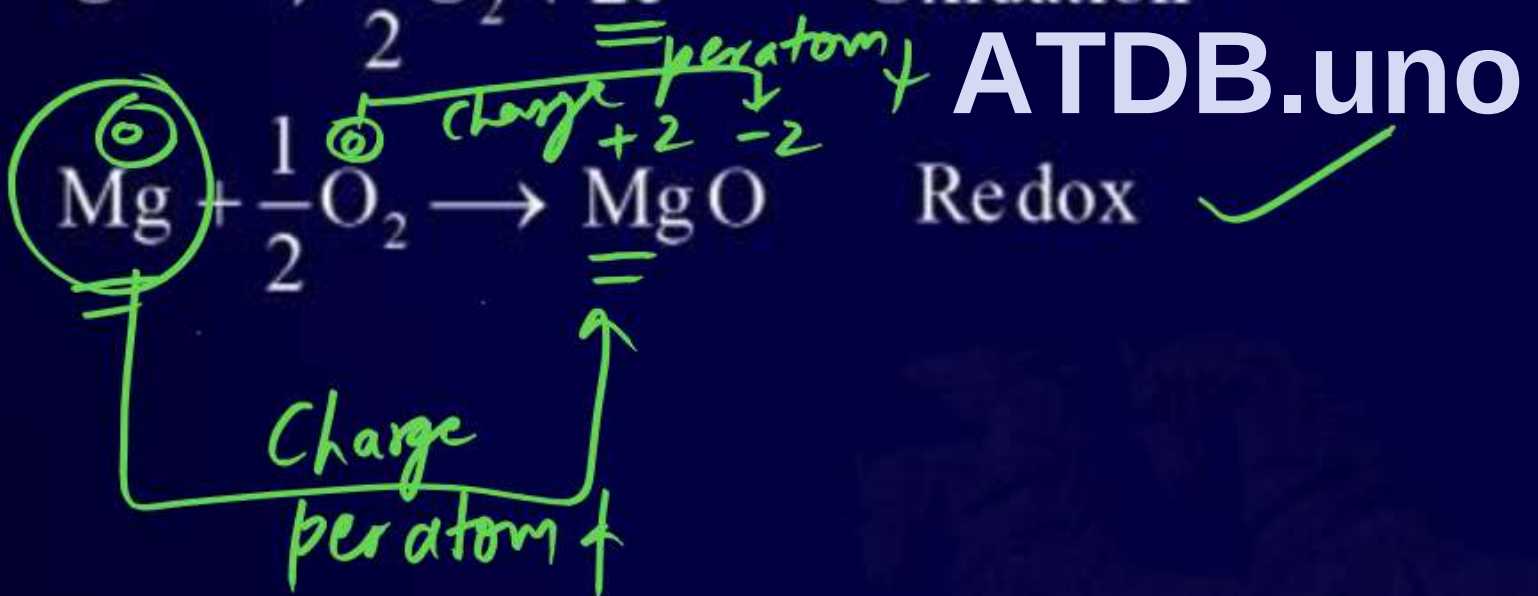
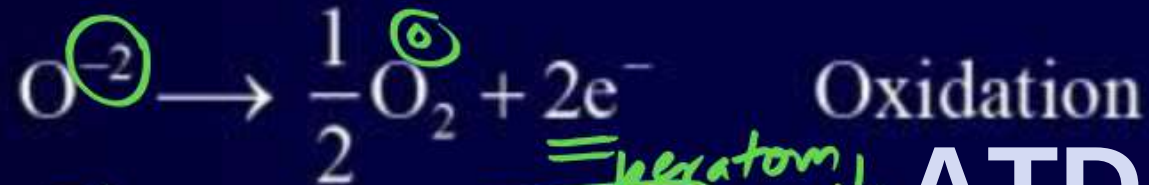


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Oxidation:

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

Example:

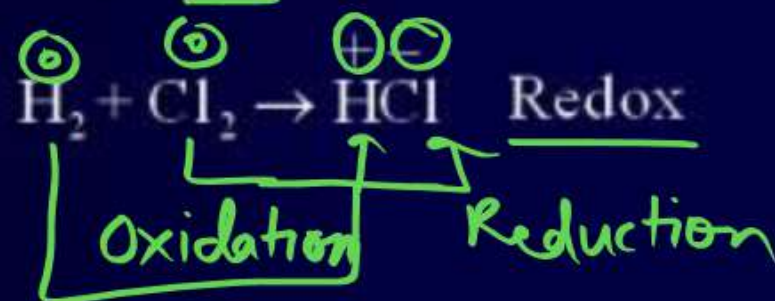
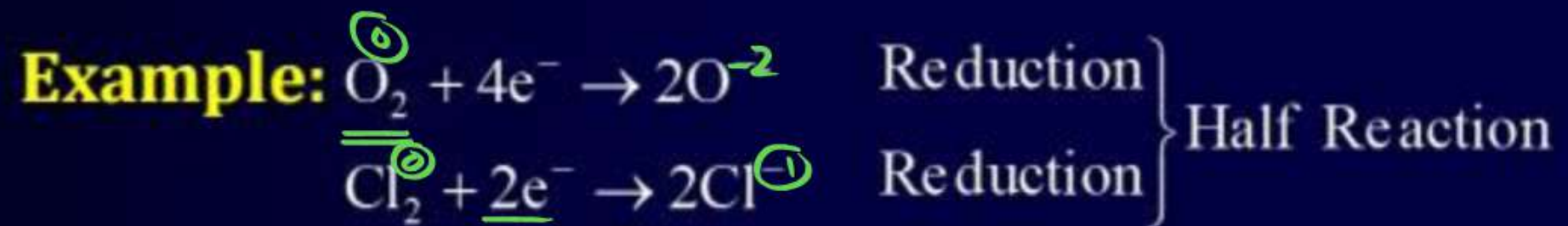




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Reduction :

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



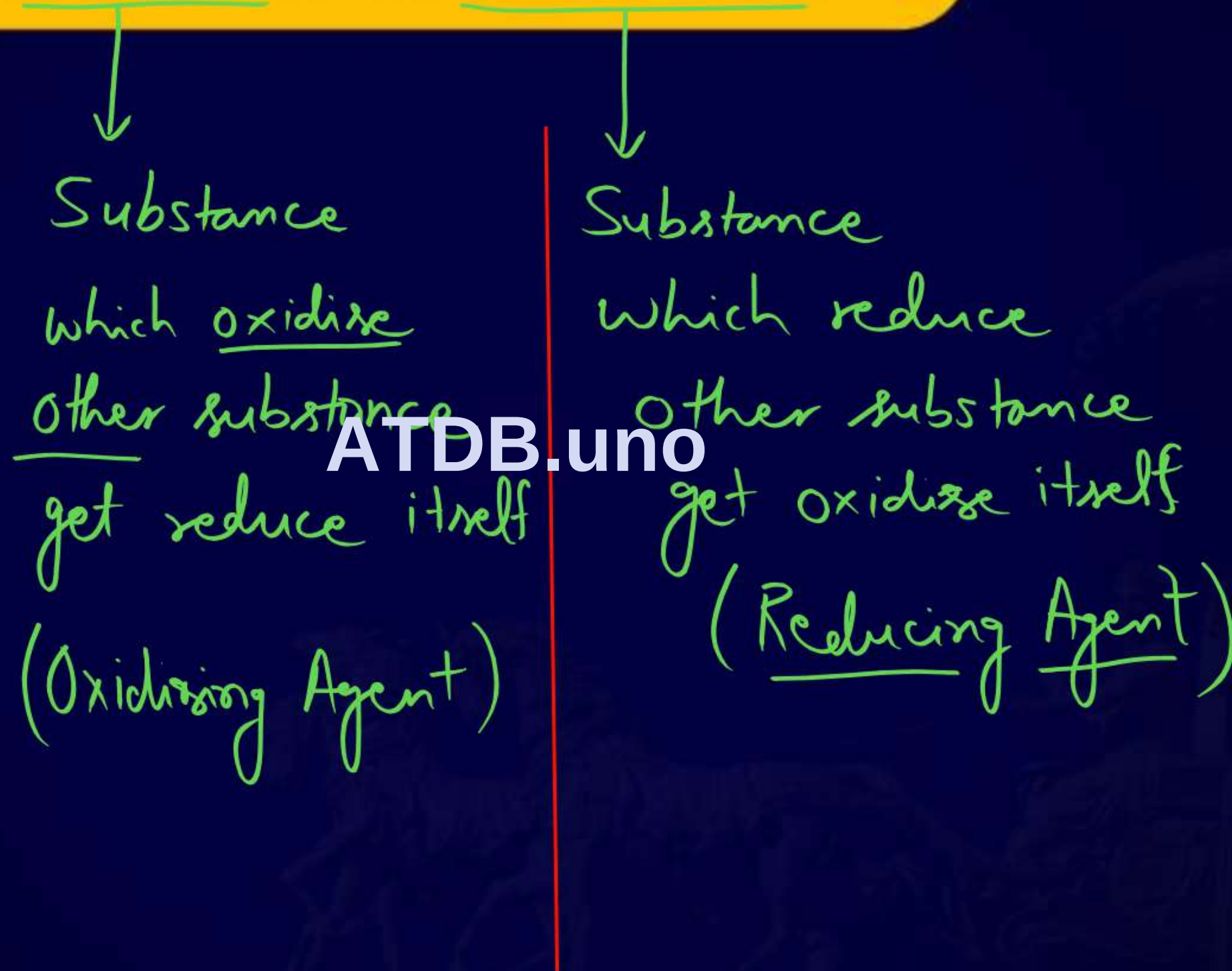
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Topic : Oxidant And Reductant





Topic : Redox Reaction

(Types of Redox Reaction)

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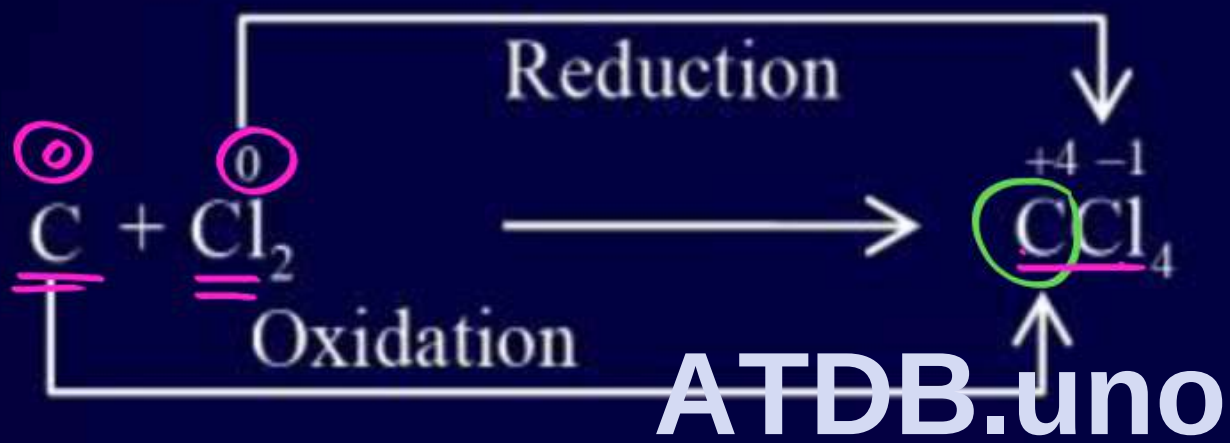
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Redox reaction → reduction and oxidation both process takes place in the reaction (*Simultaneously*)



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Example:



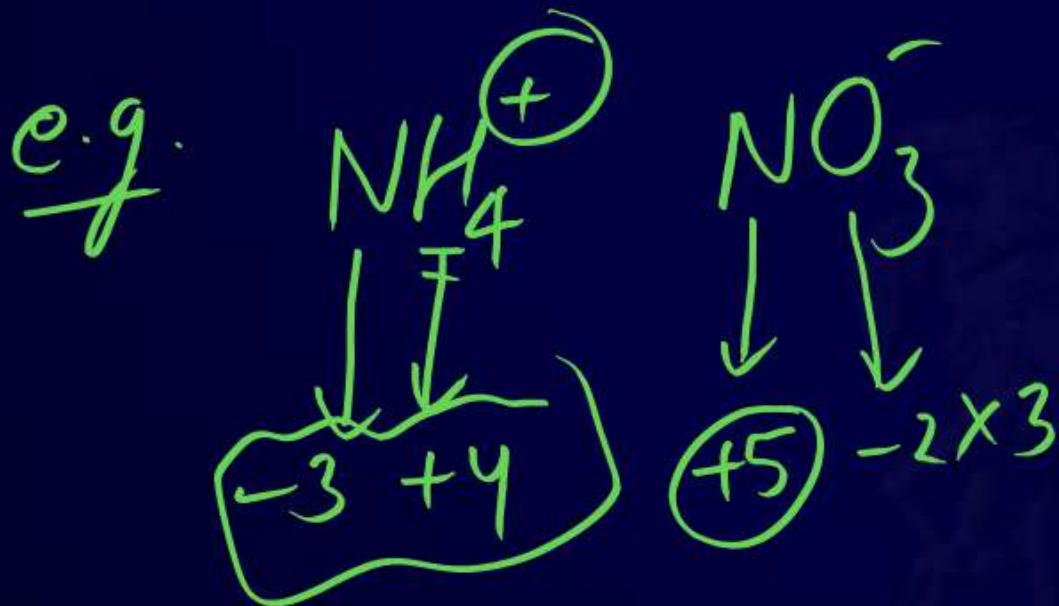
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Reduction ✓

$\text{NH}_4^+ \text{NO}_3^-$ → $\text{N}_2\text{O} + \text{H}_2\text{O}$

Oxidation

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

Example:





Some other type of reaction:

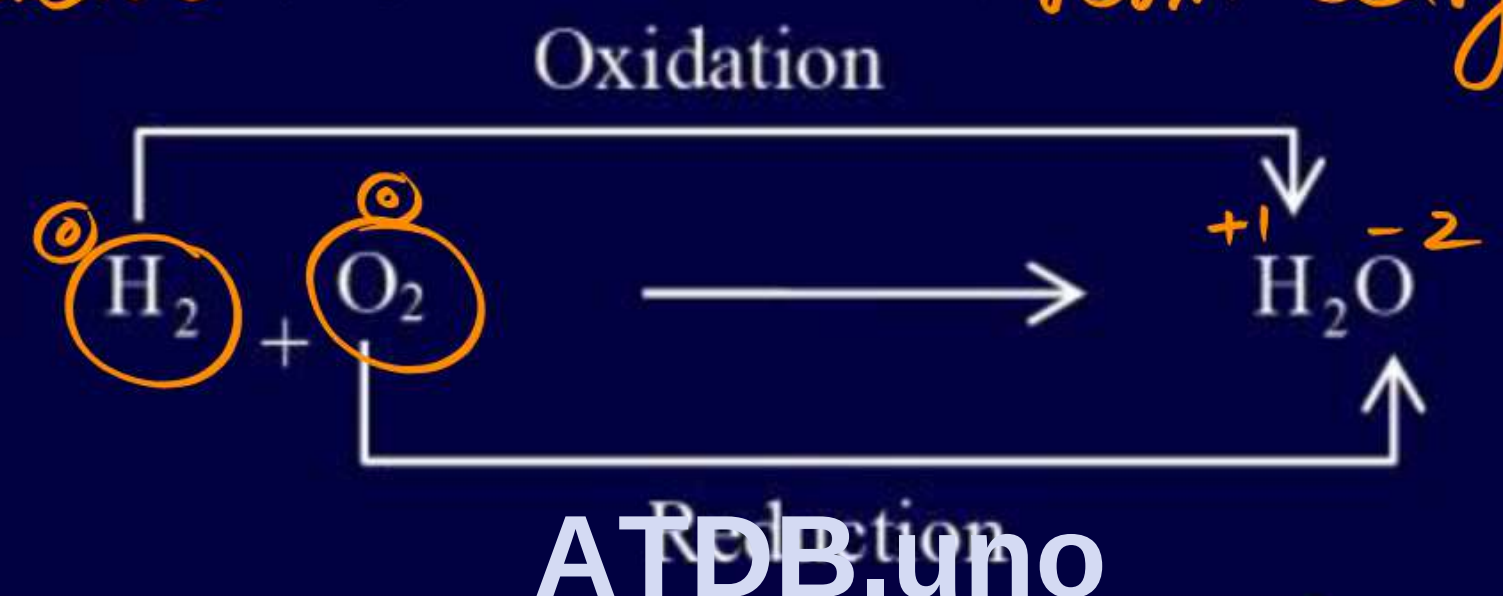
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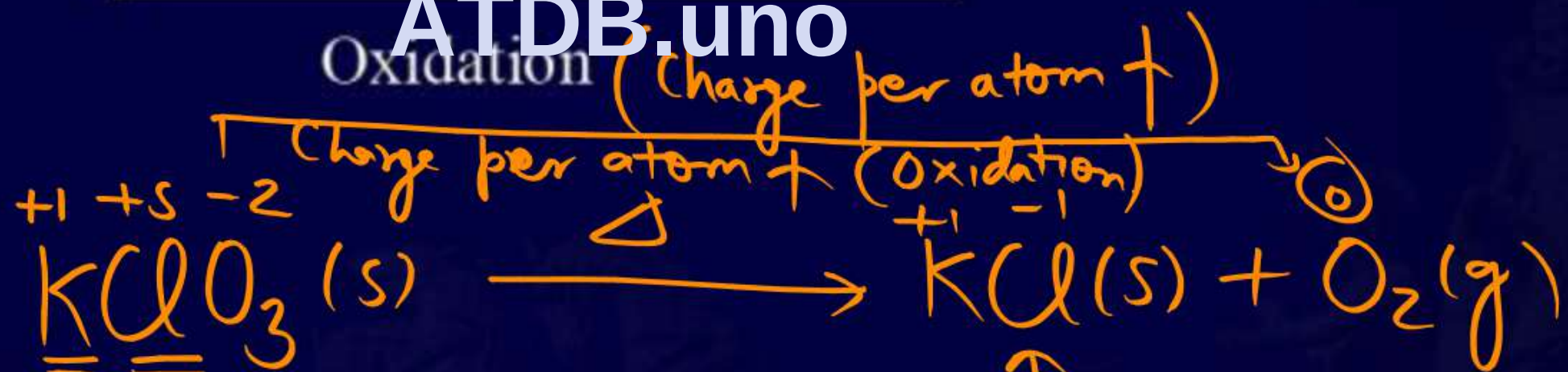
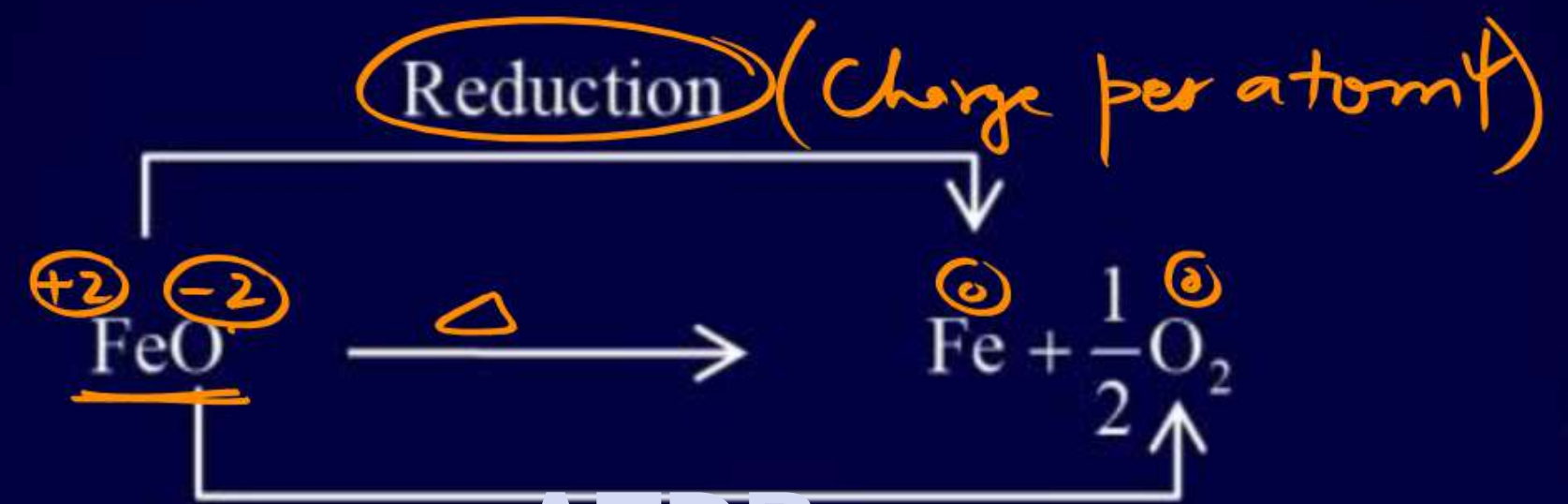
Combination redox Reaction:

Small element combine and form large molecule



Intermolecular Redox Reaction.

Thermal decomposition redox Reaction:



"Intramolecular Redox"

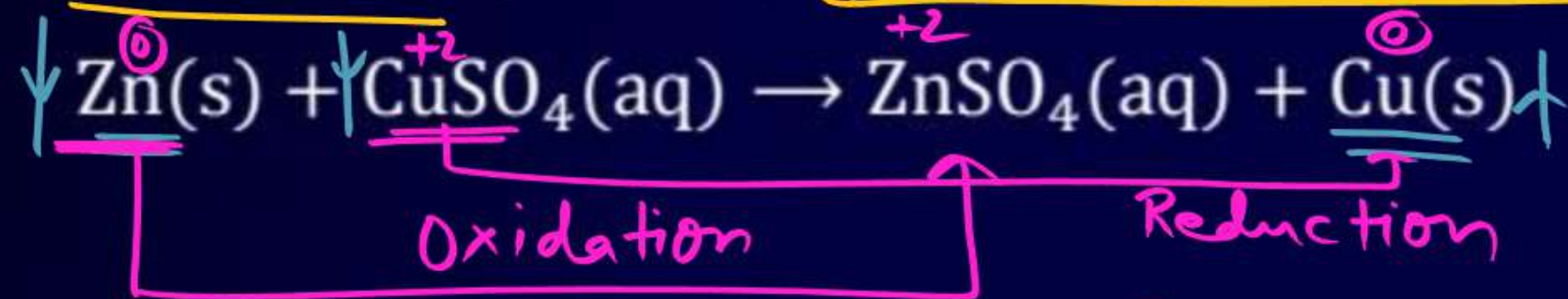
Reduction



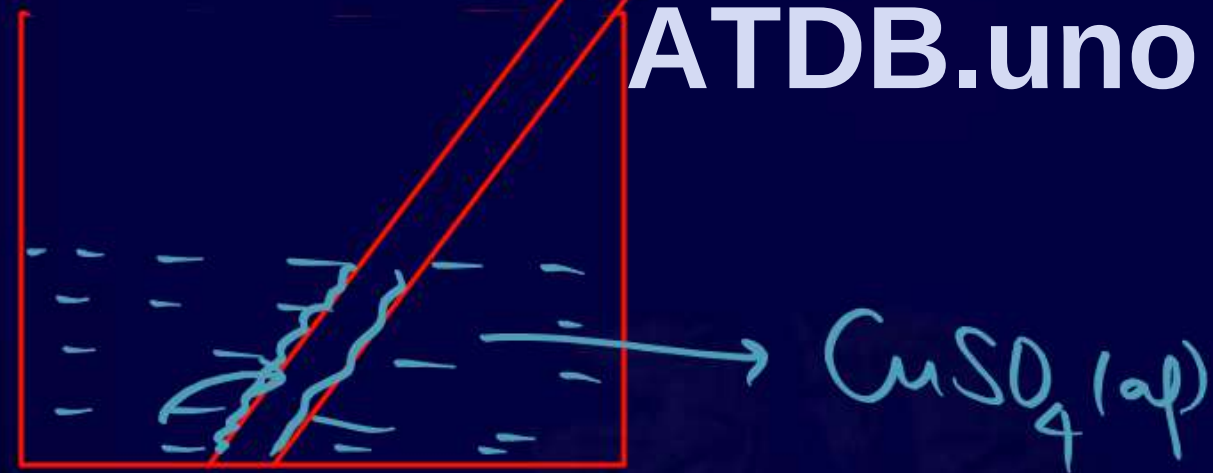
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(1) Metal displacement reaction:

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



Intermolecular redox Reaction

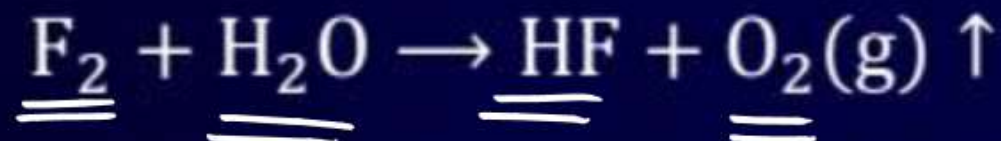
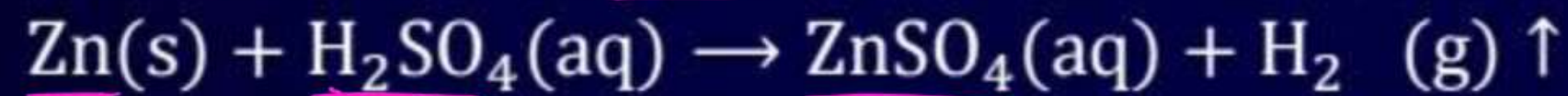
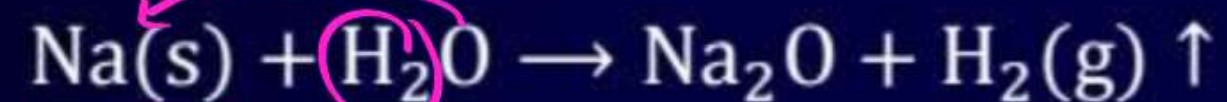




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(2) Non – metal displacement reaction:

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



F is more electro negative than O

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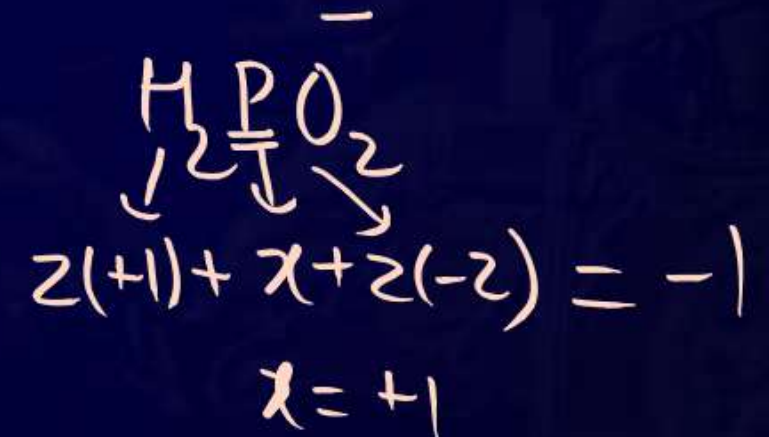
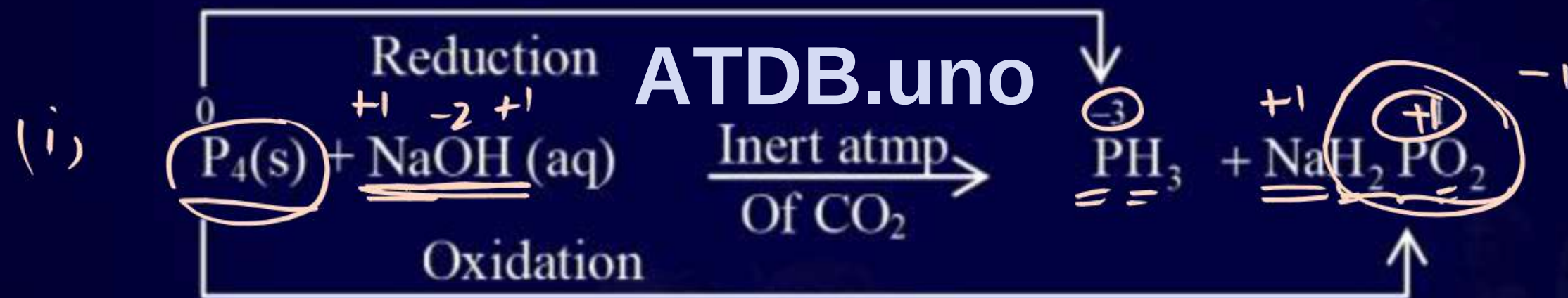
Intermolecular Redox reaction



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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.

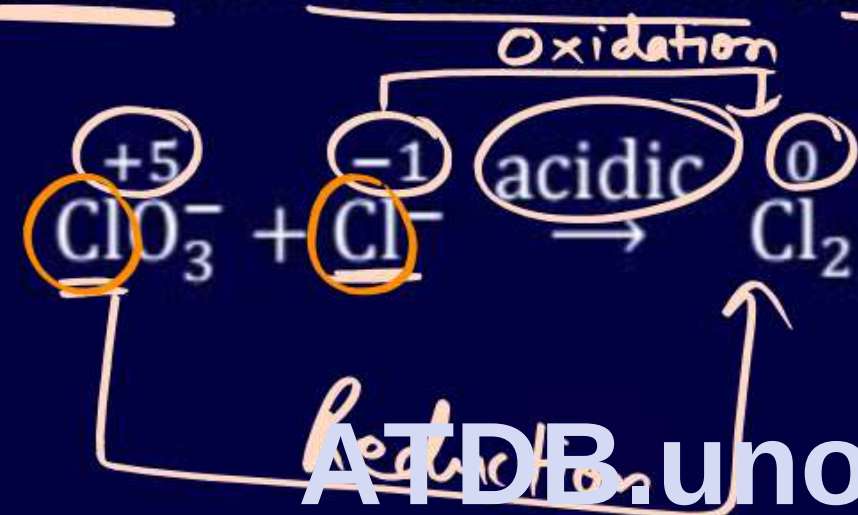




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(g) Comproportionation Reaction:

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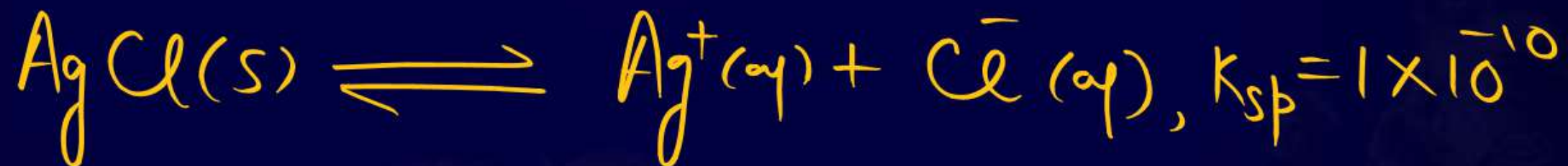
#Q. Assuming no change in volume, calculate the minimum mass of NaCl necessary to dissolve 0.010 mol AgCl in 100 L solution.

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

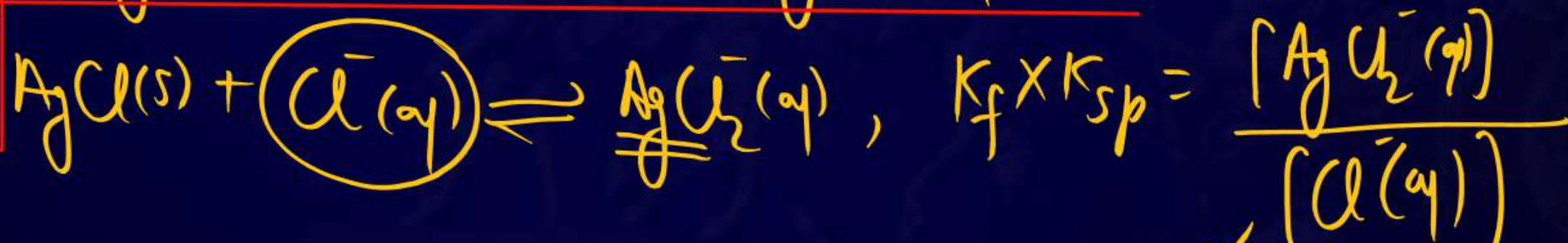
Solⁿ



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





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Thank You

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