

TOPIC : Redox Reactions

| Pre-Content/content<br>Post-Content                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Learning Outcome/Objectives                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | General                                                                                                                                                                                                                                                                                                                                    | Specific                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <p><u>Pre-Content</u></p> <p>Motivating questions related to Oxidation and reduction reaction.</p> <p><u>Content</u></p> <p>Classical Idea of Redox Reactions-Oxidation and Reduction Reactions , Redox Reactions in Terms of Electron Transfer Reactions , Oxidation Number , Redox Reactions and Electrode Processes</p> <p><u>Post-content</u></p> <p>Environmental issues like Hydrogen Economy (use of liquid hydrogen as fuel) and development of 'Ozone Hole' have started figuring under redox phenomenon.</p> | <p>Students will be able to</p> <ul style="list-style-type: none"> <li>✓ <b>Recall</b> the concept of Oxidation and reduction reaction</li> <li>✓ <b>Describe</b> redox reaction in terms of various concepts;</li> <li>✓ <b>Explain</b> the mechanism of redox reaction;</li> <li>✓ <b>Understand</b> the phenomenon of redox;</li> </ul> | <p>Students will be able to</p> <ul style="list-style-type: none"> <li>✓ <b>Give examples</b> of various reactions as redox reactions.</li> <li>✓ <b>Identify</b> redox reactions as a class of reactions in which oxidation and reduction reactions occur simultaneously;</li> <li>✓ <b>Define</b> the terms oxidation, reduction, oxidant (oxidising agent) and reductant (reducing agent);</li> <li>✓ <b>Explain</b> mechanism of redox reactions by electron transfer process;</li> </ul> |

## Home Work /Assignments

NCERT back exercise is given as homework.

Assignment sheet is also given

Questions taken in the class were also asked to solve.

| Teacher's Activity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Student's Activity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Teacher's Observation And Remedial |
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| <p>Students will be asked to recall their previous knowledge in the interactive session. Based on which the concept of Oxidation and reduction reaction will further be taken.</p> <p>Different examples of oxidation reduction will be taken (all are ex of oxidation)</p> <p>a. <math>\text{CH}_4(\text{g}) + 2\text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + 2\text{H}_2\text{O}</math> ( Addition of oxygen)</p> <p>b. <math>2\text{H}_2\text{S}(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{S}(\text{s}) + 2\text{H}_2\text{O}</math> (removal of hydrogen )</p> <p>c. <math>\text{Mg}(\text{s}) + \text{F}_2(\text{g}) \rightarrow \text{MgF}_2(\text{s})</math> (Addition of electronegative element)</p> <p>d. Loss of electron</p> <p>concept of half reactions will be explained using examples.</p> <p><math>2\text{Na}(\text{s}) \rightarrow 2\text{Na}^+(\text{g}) + 2\text{e}^-</math><br/> <math>\text{Cl}_2(\text{g}) + 2\text{e}^- \rightarrow 2\text{Cl}^-(\text{g})</math></p> <p>With this, oxidizing and reducing agent will also be explained.</p> | <p>Students will recall the concept of Oxidation and reduction reaction</p> <p>Based on which they will be able to explain the other differences between the two.<br/>(other concepts)</p> <p>They will write the examples for the differences between oxidation and reduction.</p> <p>They will write the half reaction of the given reaction using electron.</p> <p><math>2\text{Na}(\text{s}) \rightarrow 2\text{Na}^+(\text{g}) + 2\text{e}^-</math><br/> <math>\text{Cl}_2(\text{g}) + 2\text{e}^- \rightarrow 2\text{Cl}^-(\text{g})</math></p> <p>They will make a note of table explaining oxidizing and reducing agent.</p> |                                    |

Teaching Aids : Active inspire,

Methodology/Innovative Methods: Discussion, Recall, Explanation, Question-Answer method, problem solving

Interdisciplinary Links: Environmental Science, Maths

Coordinator

Vice-Principal

Principal

TOPIC : **Redox Reactions**

| Pre-Content/content<br>Post-Content                                                                                                                                                                                                                                                                                                                                                                                 | Learning Outcome/Objectives                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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|                                                                                                                                                                                                                                                                                                                                                                                                                     | General                                                                                                                                                                                                                                                                                                                                                                                                                                          | Specific                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p><b>Content</b></p> <p>Classical Idea of Redox Reactions-Oxidation and Reduction Reactions , Redox Reactions in Terms of Electron Transfer Reactions , Oxidation Number , Redox Reactions and Electrode Processes</p> <p><b>Post-content</b></p> <p>Environmental issues like Hydrogen Economy (use of liquid hydrogen as fuel) and development of 'Ozone Hole' have started figuring under redox phenomenon.</p> | <p>Students will be able to</p> <ul style="list-style-type: none"> <li>✓ <b>Understand</b> the phenomenon of redox;</li> <li>✓ <b>Acquire</b> the knowledge about balancing of redox reaction;</li> <li>✓ <b>Explain</b> about the electrode processes ;</li> <li>✓ To promote <b>understanding</b> about the things around us</li> <li>✓ <b>Explain</b> how environmental water quality depends on a variety of dissolved substances</li> </ul> | <p>Students will be able to</p> <ul style="list-style-type: none"> <li>✓ <b>Use</b> the concept of oxidation number to identify oxidant and reductant in a reaction;</li> <li>✓ <b>Classify</b> the redox reaction into combination (synthesis), decomposition, displacement and disproportionation reaction;</li> <li>✓ <b>Write</b> a comparative order among various reductants and oxidants;</li> <li>✓ <b>Balance</b> chemical equations using (i) oxidation number (ii) half reaction method;</li> <li>✓ <b>Learn</b> the concept of redox reactions in terms of electrode processes in electrochemical cell;</li> </ul> |

Home Work /Assignments

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Assignment sheet is also given

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| Teacher's Activity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Student's Activity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Teacher's Observation And Remedial |
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| <p>Rules to calculate the oxidation number of an element will be explained by taking various examples.</p> <p>Several examples will be given for drilling of concept.</p> <p>Oxidation and reduction will be explained using oxidation number.</p> <p>Types of reactions will be asked from students and then it will be asked to validate that whether they are redox or not?</p> <p>Balancing of redox reaction using oxidation number method and ion-electron method will be explained in both acidic and basic medium.</p> $\text{Cr}_2\text{O}_7^{2-}(\text{aq}) + 3\text{SO}_3^{2-}(\text{aq}) + 8\text{H}^+(\text{aq}) \rightarrow 2\text{Cr}^{3+}(\text{aq}) + 3\text{SO}_4^{2-}(\text{aq}) + 4\text{H}_2\text{O}(\text{l})$ <p>Several examples will be taken for practice.</p> <p>Electrochemical cell will also be explained using redox reaction.</p> <p>Revision test will be taken</p> | <p>Students will note down the Rules to calculate the oxidation number of an element</p> <p>Based on which they will solve the various examples taken in the class</p> <p>They will write the examples for the Oxidation and reduction using oxidation number.</p> <p>They will write types of reactions and will find out whether they are redox or not.</p> <p>They will make a note to steps solving balancing of redox reaction and will solve many during session</p> <p>Students will solve the NCERT intext questions and back exercise.</p> <p>They will also solve the worksheet given</p> <p>They will take a class test for balancing of redox reaction</p> |                                    |

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