

Topic 6: Redox Reactions

Knowledge	Application
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Subtopic 6.1: Concepts of Oxidation and Reduction

<p>A range of reactions, including reactions of metals, combustion, and electrochemical processes, can be considered as redox reactions.</p> <p>Oxidation and reduction can be defined in terms of combination with oxygen, transfer of electrons, or change in oxidation number.</p>	<p>Identify oxidation and reduction in given equations.</p> <p>Write oxidation and reduction half-equations, in neutral and acidic conditions, given reactant and product species.</p> <p>Combine half-equations to write a chemical equation.</p> <p>Determine the oxidation states of atoms in elements and monatomic ions, and in compounds and polyatomic ions.</p>
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Subtopic 6.2: Metal Reactivity

<p>Metals differ in their tendency to lose electrons; more reactive metals lose electrons more easily.</p> <p>A more reactive metal is able to donate electrons to the ion of a less active metal in a displacement reaction.</p> <p>Differences in metal reactivity can be represented as a metal activity series.</p> <p>The reactivity of a metal affects its ability to react with other chemicals.</p>	<p>Write equations and half-equations for reactions between a metal and the ion of a less active metal.</p> <p>Determine whether a reaction will occur between a metal and a solution containing the ions of another metal, given a metal activity series containing both metals.</p> <p>Investigate the reactions of various metals with water and acidic solutions.</p> <p>Compare the vigour of reactions of different metals with their position on the metal activity series.</p> <p>Write equations and half-equations for reactions between a given acid and a nominated active metal.</p>
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Subtopic 6.3: Electrochemistry

<p>Electrochemical reactions involve a flow of electrons during a chemical reaction.</p> <p>Galvanic cells produce electrical energy from spontaneous redox reactions.</p> <p>Galvanic cells are commonly used as portable sources of electric current.</p>	<p>Identify the anode and cathode and their charges, and the direction of ion and electron flow, in a galvanic cell, given sufficient information.</p> <p>Draw a diagram of a galvanic cell, given sufficient information.</p> <p>Write electrode half-equations for a galvanic cell, given sufficient information.</p> <p>Compare the operation of different types of batteries.</p>
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