

AS 90696

Describe oxidation - reduction processes

Level 3 Credits 3

This achievement standard involves describing oxidation-reduction processes.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
Describe oxidation-reduction processes.	Explain and apply oxidation-reduction processes.	Discuss oxidation-reduction processes.

- Definitions of oxidation and reduction
 - in terms of loss/gain of electrons
 - in terms of oxidation number
 - determination of oxidation numbers

- Electrochemical cells
 - their properties
 - the use of reduction potentials
 - spontaneity of oxidation-reduction reactions
 - calculations related to electrochemical cells
 - applications involving electrochemical cells (details of particular cells eg dry cell will be provided as required)
 - electrode potentials defined as standard electrode potentials, E° . Units volts, symbol V. eg Redox couple E°/V not E° (V)
 - Cell diagrams eg $Zn^{2+} / Zn -0.76$ oxidant and reductant in different phases - the vertical line represents a phase boundary; $Fe^{3+}, Fe^{2+} +0.77$ oxidant and reductant in same phase
 - Half cells: an electrode and the couple it is in contact with, eg: $Zn (s) / Zn^{2+} (aq)$
OR $Fe^{3+} (aq), Fe^{2+} (aq) / Pt$

Standard reduction potentials will be included where required

- Knowledge of appearance and state of the following reactants and the product to which they are converted in an oxidation-reduction reaction

Oxidants will be limited to:

- O_2
- Cl_2 & I_2
- Fe^{3+}
- dilute acid (with metals)
- H_2O_2
- MnO_4^- (reacting in acidic, basic or neutral conditions)
- Cu^{2+}
- $Cr_2O_7^{2-}/H^+$
- OCl^-
- concentrated HNO_3
- IO_3^-
- MnO_2

Reductants will be limited to:

- Metals
- C & CO
- H₂
- Fe²⁺
- Br⁻ & I⁻
- H₂S
- SO₂ & SO₃²⁻
- S₂O₃²⁻
- H₂O₂
- H₂C₂O₄

Appropriate information relating to other oxidants or reductants will be provided

Calculations involving mole ratios

ADDITIONAL NOTES