

**JOHN PAUL
COLLEGE**

**Internal Assessment Resource
Chemistry Level 2**

Achievement Standard 91167

Demonstrate understanding of oxidation-reduction

Tutorial Practice Script

3 credits

Name

This script is NOT an official assessment

Internal Assessment Resource

Achievement Standard Chemistry 91167: Demonstrate understanding of oxidation-reduction

Resource reference: Chemistry 2.7A

Resource title: Tutorial Practice Script

Credits: 3

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of oxidation-reduction.	Demonstrate in-depth understanding of oxidation-reduction.	Demonstrate comprehensive understanding of oxidation-reduction.

Student instructions

Introduction

In this assessment activity, you are required to explore the reactions of chemical reactions involve in electron transfer.

You are to complete the test to demonstrate these understandings

This is an **individual closed book** assessment.

This assessment is under examination condition, any form of communication with other students will consider as cheating.

You will be assessed on your understanding of oxidation numbers, electron transfer in reactions, and balancing oxidation-reduction equations. You will also be assessed on your ability to relate this understanding to experimental observations.

The duration of this assessment is **2 hours**

2 hour will be assign for **written work**

There is **NO** practical component on this assessment

This is a **close book** assessment

Table of ions is **provided**

Unbalanced $\frac{1}{2}$ equations (not in any particular order) is **provided**

Calculator is **permitted**

Part 1 – Redox reactions

Discuss the following three reactions:

For each reaction:

- Predict and explain the observation for each reaction relating them to species
- Balanced $\frac{1}{2}$ equations and write an overall equation (ignoring spectator ions)
- For each $\frac{1}{2}$ equation, classify them as **oxidation** or **reduction**
- Discuss these reaction either by oxidation number or electron transfer

Reaction One

Hydrochloric acid reacts with Zinc metal.

Reaction Two

Acidified Potassium dichromate solution was added to a Sodium iodide.

Part 2 – Hydrogen peroxide reactions

Hydrogen peroxide can undergo many **different reactions**

Observations:

Reaction 1: Acidified hydrogen peroxide will react with potassium permanganate solution

Reaction 2: Acidified hydrogen peroxide solution reacts with potassium sulfite solution.

For each reaction above:

- Predict and explain the observation for each reaction relating them to species
- Balanced $\frac{1}{2}$ equations and write an overall equation (ignoring spectator ions)
- For each $\frac{1}{2}$ equation, classify them as **oxidation** or **reduction**
- Discuss (Compare and contrast) these two overall reactions by identifying which reaction hydrogen peroxide is undergoing oxidation (acting as reducing agent) and which hydrogen peroxide is undergoing reduction (acting as oxidizing agent)

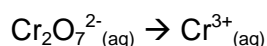
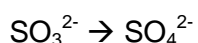
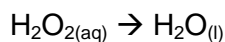
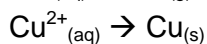
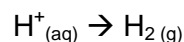
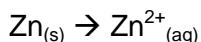
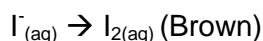
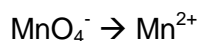
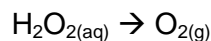
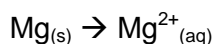
Resource page

Table of common ions

(unless stated, ions are colourless in solution)

1+	2+	3+	3-	2-	1-
Na ⁺ Sodium	Mg ²⁺ Magnesium	Cr ³⁺ Chromium (III) (Green)	PO ₄ ³⁻ Phosphate	CO ₃ ²⁻ Carbonate	Br ⁻ Bromide
NH ₄ ⁺ ammonium	Ca ²⁺ Calcium	Al ³⁺ Aluminium			Cl ⁻ Chloride
K ⁺ Potassium	Cu ²⁺ Copper (II) (Blue)	Fe ³⁺ Iron (III)† (orange/brown)		Cr ₂ O ₇ ²⁻ Dichromate (orange)	F ⁻ Fluoride
H ⁺ Hydrogen*	Pb ²⁺ Lead			O ²⁻ Oxide	HCO ₃ ⁻ Hydrogen carbonate
Li ⁺ Lithium	Fe ²⁺ Iron (II) (Pale green)			SO ₄ ²⁻ Sulfate	HSO ₃ ⁻ Hydrogen sulfite
Cu ⁺ Copper (I)	Zn ²⁺ Zinc			S ²⁻ Sulfide	OH ⁻ Hydroxide
Ag ⁺ Silver	Sn ²⁺ Tin			SO ₃ ²⁻ Sulfite	OCl ⁻ Hypochlorite
	Ba ²⁺ Barium			HPO ₄ ²⁻ Hydrogen phosphate	I ⁻ Iodide
	Hg ²⁺ Mercury (II)			S ₂ O ₃ ²⁻ Thiosulfate	NO ₃ ⁻ Nitrate
	Mn ²⁺ Manganese				NO ₂ ⁻ Nitrite
					MnO ₄ ⁻ Permanaganate (purple)

Useful unbalanced ½ equations



Assessment schedule: Chemistry 91167 Tutorial Practice Script

Evidence/Judgements for Achievement	Evidence/Judgements for Achievement with Merit	Evidence/Judgements for Achievement with Excellence
<p>For Three out of Five reactions both in part one and two</p> <p>Identified name or formula of species from observation</p> <p>And</p> <p>Describes reaction as oxidation or reduction process base on either oxidation number change (for one species) or loss or gain of electrons (this evidence could be provided by $\frac{1}{2}$ equations).</p>	<p>For Three out of Five reactions both in part one and two</p> <p>Achieve plus: Balanced $\frac{1}{2}$ equation (either oxidation or reduction) which is linked to electron transfer Or Oxidation number change (for both species)</p> <p>AND</p> <p>BOTH $\frac{1}{2}$ reactions must be correctly identify as oxidation or reduction base on change in oxidation number or transfer of electrons. (this evidence could be provided by $\frac{1}{2}$ equations)</p>	<p>For Three out of Five reactions both in part one and two</p> <p>Merit plus: Fully balanced $\frac{1}{2}$ equations and overall equation is linked to electron transfer or oxidation number change (for all species)</p> <p>And</p> <p>Observation (colour and state of species)</p> <p>And</p> <p>Each process must be correctly identified as oxidation or reduction</p>