



CHEMISTRY 2.7

An assessment for AS90311

Describe oxidation-reduction reactions.

Credits: Three

INSTRUCTIONS

Answer **ALL** questions.

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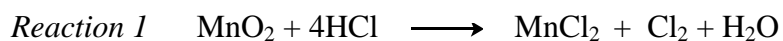
You are advised to spend 35 minutes answering these questions

QUESTION ONE: Oxidation numbers

- (a) Complete the following table by writing the oxidation number of manganese in each of the following compounds.

	Oxidation Number of Mn
KMnO_4	
MnCl_2	
MnO_2	
K_2MnO_4	

- (b) Two reactions are represented by the equations below

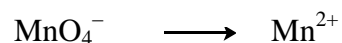


Explain, using oxidation numbers, why each of these reactions are classed as oxidation–reduction reactions.

(c) Equal volumes of acidified potassium permanganate, $\text{KMnO}_4(\text{aq})$, and iron(II) sulfate, $\text{FeSO}_4(\text{aq})$, are mixed.

(i) Describe the overall colour change for the reaction and link the different colours to the species involved.

(ii) Balance the two ion-electron half equations below and write an overall equation for the reaction taking place in acid solution.



Overall equation

(iii) Discuss the role of the oxidant and the reductant in the reaction above. Include the identity of the oxidant and the reductant in your answer.

QUESTION THREE:

(a) The salt lithium chloride (LiCl) is melted and electrolysed using graphite electrodes.

(i) Label the diagram of the electrolytic cell below with

- the anode
- the cathode
- the direction of the electron flow

(ii) Write equations for the reactions occurring at each electrode in the box beside the electrode.

