

UNIT 5B PRACTICE QUIZ 3 – ELECTROCHEMICAL CELLS

Do not answer these questions on this document.

Write your answers on a sheet of paper; then click on the answer sheet provided at the end of the questions.

Use your Periodic Table and the reactivity series in your course notes.

Use this information to answer questions 1 – 3:

Bryce decides to set up a galvanic cell.

He uses an iron electrode dipped in a solution of iron (II) chloride (1 mol/L) and a magnesium electrode dipped in a solution of magnesium chloride (1 mol/L).

Iron (II) chloride is green; magnesium chloride is colorless.

He connects the two electrodes with a voltmeter and connects the two solutions with a salt bridge. The voltmeter records an emf of 1.93 V.

1.	Which one of the following statements is true?	
	A	The iron electrode is the negative electrode.
	B	The iron electrode is the cathode.
	C	The following half-equation takes place at the anode: $\text{Fe}^{2+} + 2\text{e}^- \rightarrow \text{Fe}$
	D	The electrons move through the wire from iron to magnesium.
	E	Chloride ions move through the salt bridge from the MgCl_2 into the FeCl_2
1		

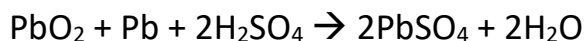
2.	Which one of the following statements is false?	
	A	The overall net ionic equation is: $\text{Fe}^{2+} + \text{Mg} \rightarrow \text{Fe} + \text{Mg}^{2+}$
	B	Chloride ions are spectator ions in this cell
	C	The overall equation is $\text{FeCl}_2 + \text{Mg} \rightarrow \text{Fe} + \text{MgCl}_2$
	D	Reduction is taking place at the cathode
	E	The magnesium electrode will get gradually bigger.
1		

3.	Which one of the following statements is false?	
	A	The iron (II) chloride solution will get gradually darker
	B	The color of the magnesium chloride solution will not change
	C	If the cell is re-charged, the following reaction will take place: $\text{Fe} + \text{Mg}^{2+} \rightarrow \text{Fe}^{2+} + \text{Mg}$
	D	The magnesium chloride solution will gradually become more concentrated
	E	In this cell, chemical energy is being converted into electrical energy.
1		

UNIT 5B – CHEMICAL REACTIONS II – REDOX REACTIONS

Use this information to answer questions 4 – 5:

The lead-acid battery is used in cars. The reaction which takes place is:



4.	Which one of the following statements is true?	
	A	The lead-acid battery is not easily rechargeable
	B	The cathode of the battery is made of Pb
	C	The electrolyte in both compartments is sulfuric acid
	D	The anode of the battery is made of PbO ₂
	E	The battery is easily portable because of its low density
1		

5.	Which one of the following statements is not true?	
	A	lead atoms are both oxidised and reduced in this reaction
	B	a disproportionation reaction takes place when the battery is charging
	C	oxidation takes place at the anode
	D	The positive terminal of the battery is made of Pb
	E	the sulfate ions are neither oxidised nor reduced
1		

6.	The electrolysis of molten calcium chloride	
	A	is one of the only ways to make calcium metal
	B	involves the following reaction at the anode: $\text{Ca}^{2+} + 2\text{e}^- \rightarrow \text{Ca}$
	C	involves the following reaction at the cathode: $\text{Cl}_2 + 2\text{e}^- \rightarrow 2\text{Cl}^-$
	D	is a way of producing an electric current
	E	is not possible
1		

7.	Which of the following processes does not take place during the electrolysis of brine (concentrated aqueous sodium chloride)	
	A	$2\text{Cl}^- \rightarrow \text{Cl}_2 + 2\text{e}^-$
	B	$2\text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{H}_2 + 2\text{OH}^-$
	C	$\text{Na}^+ + \text{e}^- \rightarrow \text{Na}$
	D	$2\text{NaCl} + 2\text{H}_2\text{O} \rightarrow \text{H}_2 + \text{Cl}_2 + 2\text{NaOH}$
	E	$2\text{Cl}^- + 2\text{H}_2\text{O} \rightarrow \text{H}_2 + \text{Cl}_2 + 2\text{OH}^-$
1		

UNIT 5B – CHEMICAL REACTIONS II – REDOX REACTIONS

8.	Which of the following is true of galvanic cells but not true of electrolytic cells?	
	A	Oxidation takes place at the anode.
	B	Reduction takes place at the cathode.
	C	The anode is the positive electrode.
	D	The anode is the negative electrode.
	E	Electrical energy is converted into chemical energy.
		1

9.	The electrolysis of aqueous copper sulfate produces	
	A	copper at the cathode and sulfur at the anode
	B	copper at the cathode and oxygen at the anode
	C	hydrogen at the cathode and oxygen at the anode
	D	hydrogen at the cathode and sulfur at the anode
	E	copper at the anode and sulfur at the cathode
		1

10.	Iron is often covered with a layer of zinc to stop it from rusting. To do this, the iron is dipped in molten zinc in a process called “galvanising”. It is not possible to electroplate iron with a layer of zinc from an aqueous solution of zinc sulfate. This is because	
	A	iron is more reactive than zinc
	B	zinc is more reactive than iron
	C	zinc is more reactive than hydrogen
	D	iron is more reactive than hydrogen
	E	oxygen is more reactive than sulfur
		1

[Go to the answer sheet](#)