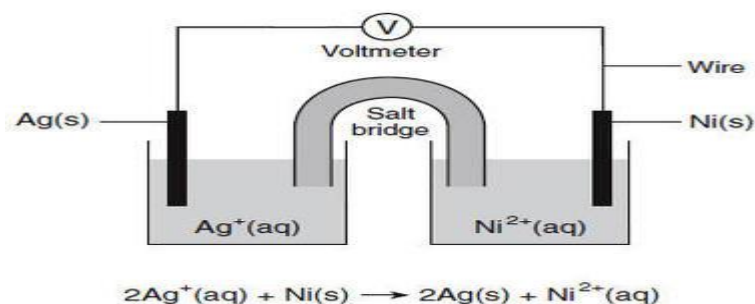


1. What reaction occurs at the anode?



- A. $\text{Ag}^+ + \text{e}^- \rightarrow \text{Ag}$
- B. $\text{Ag} \rightarrow \text{Ag}^+ + \text{e}^-$
- C. $\text{Ni}^{2+} + 2\text{e}^- \rightarrow \text{Ni}$
- D. $\text{Ni} \rightarrow \text{Ni}^{2+} + 2\text{e}^-$

2. In voltaic cells, such as those diagrammed in your text, the salt bridge _____ .

- (a) is not necessary in order for the cell to work
- (b) acts as a mechanism to allow mechanical mixing of the solutions
- (c) allows charge balance to be maintained in the cell
- (d) is tightly plugged with firm agar gel through which ions cannot pass
- (e) drives free electrons from one half-cell to the other

3. In an **electrolytic** cell the electrode at which the electrons enter the solution is called the _____ ; the chemical change that occurs at this electrode is called _____.

- (a) anode, oxidation
- (b) anode, reduction
- (c) cathode, oxidation
- (d) cathode, reduction
- (e) cannot tell unless we know the species being oxidized and reduced.

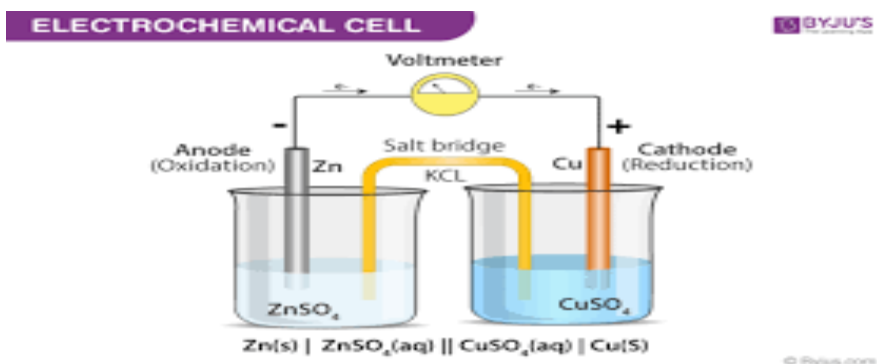
2. Which of the following statements is FALSE?

- (a) Oxidation and reduction half-reactions occur at electrodes in electrochemical cells.
- (b) All electrochemical reactions involve the transfer of electrons.
- (c) Reduction occurs at the cathode.
- (d) Oxidation occurs at the anode.
- (e) All voltaic (galvanic) cells involve the use of electricity to initiate nonspontaneous chemical reactions.

3. The half-reaction that occurs at the anode during the electrolysis of molten sodium bromide is:

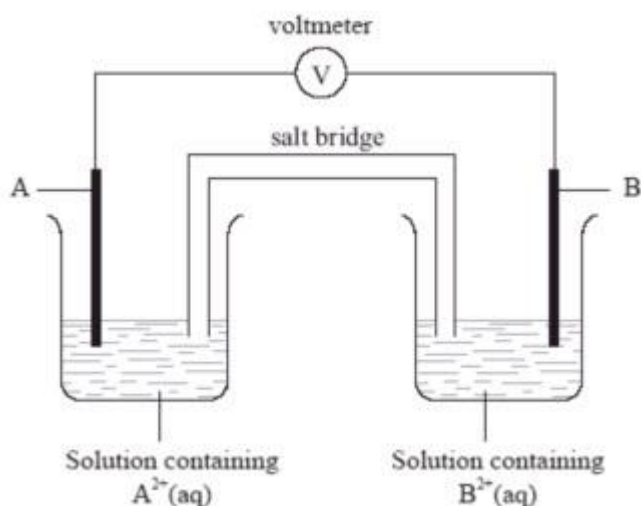
- (a) $2 \text{Br}^- \rightarrow \text{Br}_2 + 2 \text{e}^-$
- (b) $\text{Br}_2 + 2 \text{e}^- \rightarrow 2 \text{Br}^-$
- (c) $\text{Na}^+ + \text{e}^- \rightarrow \text{Na}$
- (d) $\text{Na} \rightarrow \text{Na}^+ + \text{e}^-$
- (e) $2 \text{H}_2\text{O} + 2 \text{e}^- \rightarrow 2 \text{OH}^- + \text{H}_2$

4. Consider the following diagram given below



- a. Write the half-reaction that occurs at the anode and cathode during the electrolysis? **Explain the reason.**

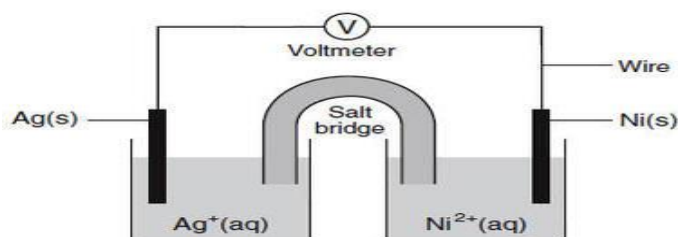
5. Metal A is more reactive than metal B. Which statement is correct? **Explain the reason.**



A, Electrons flow in the external circuit from A to B

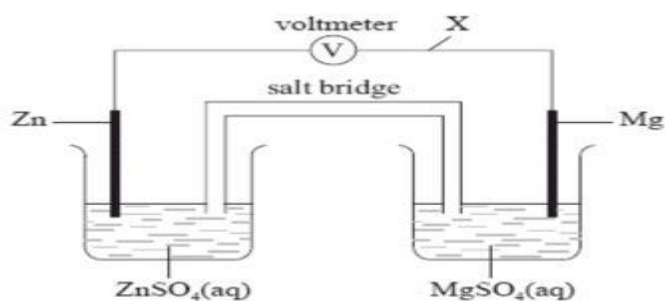
- B. Positive ions flow through salt bridge from A to B
 C. Positive ions flow in external circuit from B to A.
 D. Electrons flow through salt bridge from B to A
 6. How does an electrolytic cell differ from a galvanic cell?
 7. **In which direction does electricity flow in a voltaic cell (battery)?**

- A. Electrons flow from the cathode to the anode
 B. Electrons flow from left to right
 C. Electrons flow from anode to cathode
 D. Electrons flow from right to left
 8. **What reaction occurs at the anode? Explain the reason.**



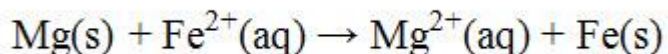
- A. $\text{Ag}^+ + \text{e}^- \rightarrow \text{Ag}$
 B. $\text{Ag} \rightarrow \text{Ag}^+ + \text{e}^-$
 C. $\text{Ni}^{2+} + 2\text{e}^- \rightarrow \text{Ni}$
 D. $\text{Ni} \rightarrow \text{Ni}^{2+} + 2\text{e}^-$

8. **Which direction do the electrons flow in wire X and which metal is oxidized? Explain the reason.**



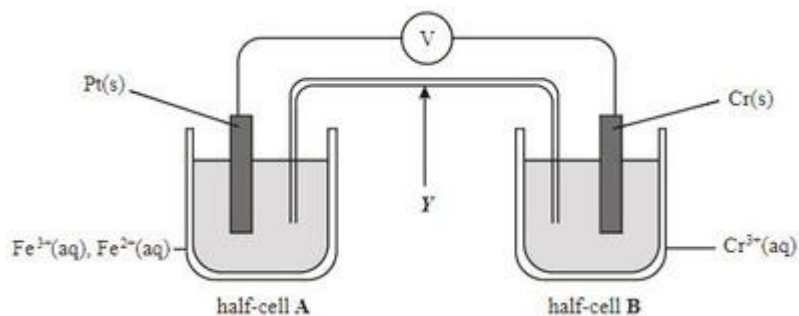
	Electron flow	Oxidized
A.	Zn to Mg	Zn
B.	Mg to Zn	Zn
C.	Zn to Mg	Mg
D.	Mg to Zn	Mg

9. Which statement is correct when the cell produces electricity?



- A. Magnesium atoms lose electrons
- B. Mass of the iron electrode decreases.
- C. Electrons flow from the iron half-cell to the magnesium half-cell.
- D. Negative ion flow from magnesium half-cell to iron half-cell

10. 8. What is the function of Y in cell below?

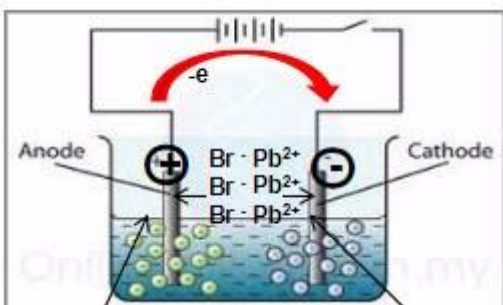


11. Reactions in voltaic cells are

- A. spontaneous, redox reactions
- B. non-spontaneous, redox reactions
- C. spontaneous, non-redox reactions
- D. non-spontaneous, non-redox reactions

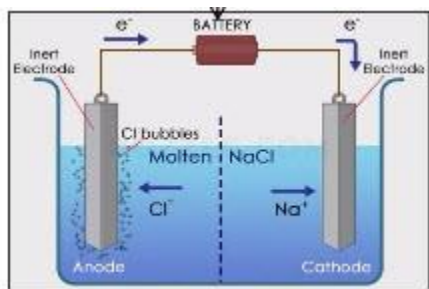
12. What are produced at positive/negative electrodes during electrolysis of molten NaCl?

13. What occurs during electrolysis of a molten salt?



- A. Electricity is produced by a spontaneous redox reaction
- B. Electricity cause a non-spontaneous redox reaction to occur
- C. Electrons flow through the molten salt
- D. Electrons are removed from both ions of the molten salt

14. What happens when molten NaCl is electrolysed in electrolytic cell?



- A. Chlorine is produced at positive electrode
- B. Sodium ions lose electrons at negative electrode
- C. Electrons flow through liquid from -ve electrode to +ve electrode
- D. Oxidation occurs at -ve electrode and reduction at +ve electrode