

What is a Galvanic Cell?

Worksheet

A galvanic cell is a spontaneous electrochemical cell where a redox reaction produces electrical current. Anode (oxidation), cathode (reduction), salt bridge (ion flow), and external wire (electron flow).

Questions

1. In a galvanic cell, where is oxidation?
A) Cathode
B) Anode
C) Salt bridge
D) External wire
2. What flows through the external circuit in a galvanic cell?
A) Ions
B) Cations only
C) Electrons
D) Anions only
3. Without a salt bridge, what happens?
A) Faster reaction
B) Electrical neutrality is lost, reaction stops
C) Current increases
D) Reaction reverses
4. In a Zn/Cu Daniell cell, Zn is the
A) Cathode, positive
B) Anode, negative
C) Cathode, negative
D) Anode, positive
5. In a Daniell cell (Cu/Zn), which electrode is the anode and which is the cathode?
6. In a galvanic cell, where do electrons flow?
7. Why is a salt bridge necessary in a galvanic cell?
8. Define: What is a galvanic cell?
9. Define: Which electrode is negative in a galvanic cell?
10. Define: Which electrode is positive in a galvanic cell?

Answer Key

1. B) Anode - Oxidation (loss of electrons) occurs at the anode.
2. C) Electrons - Electrons flow through the external wire from anode to cathode.
3. B) Electrical neutrality is lost, reaction stops - Without ion flow, charge builds up and the reaction cannot continue.
4. B) Anode, negative - Zn is oxidised (anode); it's the negative electrode.
5. Oxidation (loses electrons) is Zn: $\text{Zn} \rightarrow \text{Zn}^{2+} + 2\text{e}^{-}$ (Anode) Reduction (gains electrons) is Cu: $\text{Cu}^{2+} + 2\text{e}^{-} \rightarrow \text{Cu}$ (Cathode)
Anode: Zn (negative); Cathode: Cu (positive)
6. From anode to cathode through the external wire/circuit. Electrons cannot flow through the electrolyte (non-conductor inside). Cations move through the salt bridge to balance charge inside the cell.
7. Without it, positive charge builds up at anode (Zn produced) and negative at cathode (Cu consumed). Salt bridge allows anions to migrate toward anode and cations toward cathode. This maintains electrical neutrality and allows the reaction to continue.
8. An electrochemical cell that uses a spontaneous redox reaction to generate electrical current.
9. The anode (oxidation site, where electrons are released).
10. The cathode (reduction site, where electrons are gained).

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