

Name: _____
 Blk: _____ Date: _____

Electrochemistry
 Class Starter from lessons 10-13

1. What happens to **iron** as it corrodes?
 A. It loses electrons and is reduced.
 B. It gains electrons and is reduced.
 C. It loses electrons and is oxidized.
 D. It gains electrons and is oxidized.

2.) i. A molten binary salt, ZnCl₂, undergoes **electrolysis**, the **anode** reaction is:

- A.) $Zn \rightarrow Zn^{2+} + 2e^{-}$
 B.) $Cl_2 + 2e^{-} \rightarrow 2Cl^{-}$
 C.) $2Cl^{-} \rightarrow Cl_2 + 2e^{-}$
 D.) $Zn^{2+} + 2e^{-} \rightarrow Zn$

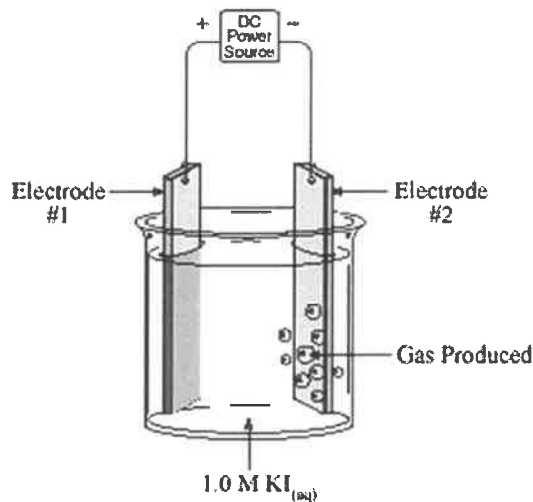
ii. A molten binary salt, ZnCl₂, undergoes **electrolysis**. The **cathode** reaction is:

- 3.) Consider the overall reaction of the rechargeable nickel-cadmium battery:
 i. Which of the following occurs at the **anode** as the reaction proceeds?
 ii. Which of the following occurs at the cathode as the reaction proceeds?



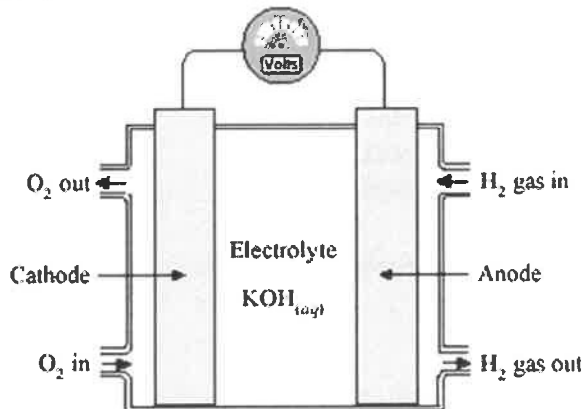
- A.) Cd gains 2e⁻ and forms Cd(OH)_{2(s)}
 B.) NiO₂ gains 2e⁻ and forms Ni(OH)_{2(s)}
 C.) NiO₂ loses 2e⁻ and forms Ni(OH)_{2(s)}
 D.) Cd loses 2e⁻ and forms Cd(OH)_{2(s)}

- 4.) Which of the following describes the cell? {Electrode 1; Electrode 2; Gas Produced}



- A.) anode; cathode; oxygen
 B.) anode; cathode; hydrogen
 C.) cathode; anode; hydrogen
 D.) cathode; anode; oxygen

- 5.) H_2 and O_2 combine to produce H_2O under **basic conditions**.
- The reaction at the **anode** is:
 - The reaction at the **cathode** is:



- $2\text{H}_2 + 4\text{OH}^- \rightarrow 4\text{H}_2\text{O} + 4\text{e}^-$
- $4\text{OH}^- \rightarrow \text{O}_2 + 2\text{H}_2\text{O} + 4\text{e}^-$
- $\text{O}_2 + 2\text{H}_2\text{O} + 4\text{e}^- \rightarrow 4\text{OH}^-$
- $2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2$

6. A **1.0 M $\text{Zn}(\text{SO}_4)_2$ (aq)** solution is **electrolyzed** using a **copper anode** and an inert **carbon cathode**. Predict the half-reactions that will occur and describe what you would observe at each electrode. **(5 marks)**

Anode half-reaction: _____

Anode observation: _____

Cathode half-reaction: _____

Cathode observation: _____

Overall reaction and E° value:
