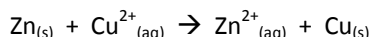


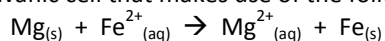
Electrochemistry Practice Questions

1. What are the products of electrolysis of molten NaCl in a voltaic cell?
2. What are the products of electrolysis of aqueous solution of NaCl in a voltaic cell and is it different than question #1?
3. Predict the products that will form when a solution of KBr undergoes electrolysis. Write the equation for the net cell reaction.
4. The following spontaneous reaction occurs when metallic zinc is dipped into a solution of copper sulfate.

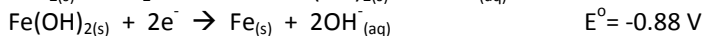
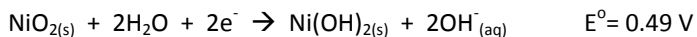


Describe a galvanic cell that could take advantage of this reaction. What are the half-cell reactions? Make a sketch of the cell and label the cathode and anode, the charges on each electrode, the direction of ion flow, and the direction of electron flow.

5. Sketch and label a galvanic cell that makes use of the following spontaneous redox reaction.



6. The standard cell potential of the silver-copper galvanic cell has a value of 0.46 V. The cell reaction is $2\text{Ag}^{+}_{(aq)} + \text{Cu}_{(s)} \rightarrow 2\text{Ag}_{(s)} + \text{Cu}^{2+}_{(aq)}$. What is the value of the reduction potential of Ag^{+} if the reduction potential of Cu^{2+} is 0.34 V.
7. What is the overall cell reaction and the standard cell potential of a galvanic cell employing the following half-reactions?



8. What is the overall cell reaction and the standard cell potential of a galvanic cell employing the following half-reactions?



9. Using the positions of the half-reactions in the table of standard reduction potentials to predict the spontaneous reaction when Ni and Fe are added to a mixture of Ni^{2+} and Fe^{2+} .
10. Using the positions of the half reactions in the table of standard reduction potentials to predict the spontaneous reaction when Br^{-} , SO_4^{2-} , H_2SO_3 , and Br_2 are mixed together.
11. Which of the following reactions occur spontaneously in the forward direction?
 - a) $\text{Br}_{2(aq)} + \text{Cl}_{2(g)} + 2\text{H}_2\text{O} \rightarrow 2\text{Br}^{-}_{(aq)} + 2\text{HOCl}_{(aq)} + 2\text{H}^{+}_{(aq)}$
 - b) $3\text{Zn}_{(s)} + 2\text{Cr}^{3+}_{(aq)} \rightarrow 3\text{Zn}^{2+}_{(aq)} + 2\text{Cr}_{(s)}$
12. What happens to the pH of the solution near the cathode and anode during the electrolysis of aqueous KNO_3 ?
15. What is the overall reaction for the previous question's reaction?