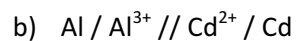
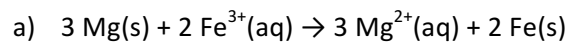


Electrochemistry Review

1. Draw labeled electrochemical cells indicating the
 - (i) electrodes (anode – cathode)
 - (ii) types of ions and their direction of motion
 - (iii) electrode reactions (oxidized – reduced)
 - (iv) the overall reaction for each of the following:
 - (v) Short hand notation
 - (vi) Total electrical potential (V)



2. For each of the following electrochemical cells indicate: The first one is done for you

- (i) identity of the cathode
- (ii) identity of the anode
- (iii) the electrode reactions
- (iv) the net reaction
- (v) line notation
- (vi) the cell potential

a) Nickel and silver electrodes

Answer:



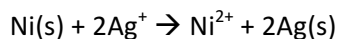
Reverse the Nickel half reaction to make the redox reaction spontaneous and also to have an oxidation half-reaction



Since, the Nickel half reaction is oxidized, it is the anode

The silver half reaction is reduced, it is the cathode.

The net reaction:



*Multiple the silver half reaction by two to balance out the number of electrons



Reactant | Product || Reactant | Product

Cell Potential:

$$+ 0.23\text{V} + 0.80\text{V} = +1.03\text{V generated}$$

b) Lead and zinc electrodes

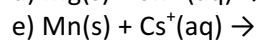
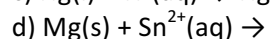
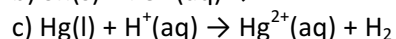
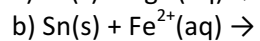
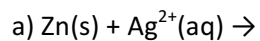
c) Magnesium and chlorine electrodes

d) Sodium and manganese electrodes

3. A silver-lead cell is set up.

- a. In which cell does reduction occur?
- b. Write the half-cell reactions and the net reaction.
- c. Which metal is the anode? Cathode?
- d. In which direction are the electrons moving?
- e. What is the cell's voltage?

4. Complete the following reactions using the Standard Electrode Potential table. Determine the net cell potential and state if the reaction will occur.



5. Write the E° voltages for each half cell reaction, the net cell reaction and the net cell voltage. Indicate if the reaction will be spontaneous as written or not. Explain your answer.

