

1. Does the oxidizing agent react at the anode or at the cathode in a galvanic cell? Explain
2. What is the function of the salt bridge? What kind of electrolyte should be used in a salt bridge?
3. Write the balanced equation for the galvanic cell reaction expressed using shorthand notation below.
$$\text{Ni}_{(s)} \mid \text{Ni}^{2+}_{(aq)} \parallel \text{Cl}_{2(g)} \mid \text{Cl}^{-}_{(aq)} \mid \text{C}_{(s)}$$

Draw a galvanic cell that employs the above reaction. Label anode, cathode, salt bridge, direction of electrons and ion flow.

4. What is the relationship between thermochemical quantity and electrochemical quantity? Show equation and give example that's not from the notes.

5. Explain the significance of the standard hydrogen electrode (SHE) in the tabulation of standard reduction potentials of other species.
6. Use the Nernst equation to solve for the values for n and Q , and calculate the cell potential, E_{cell} for
$$\text{Al}_{(s)} \mid \text{Al}^{3+}(\text{aq}, 0.15\text{M}) \parallel \text{Cu}^{2+}(\text{aq}, 0.025\text{M}) \mid \text{Cu}_{(s)}$$
7. Discuss the spontaneity of an electrolytical reaction in terms of its standard emf (E°_{cell}). If a reaction has an equilibrium constant $K < 1$, is E° positive or negative? What is the value of K when $E^{\circ} = 0$?
8. If a sample of iron and a sample of zinc come into contact, the zinc corrodes but the iron does not. If a sample of iron comes into contact with a sample of copper, the iron corrodes but the copper does not. Explain this phenomenon.
9. Write the half-reactions and cell reaction occurring during electrolysis of molten salt, CaCl_2 .