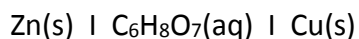


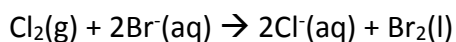
**G12 Chemistry: Class 16 Homework**

1. Write the oxidation half-reaction, the reduction half-reaction, and the overall cell reaction for each of the following galvanic cells. Identify the anode and the cathode in each case. In part(b) platinum is present as an inert electrode.
  - a.  $\text{Sn(s)} \mid \text{Sn}^{2+}(\text{aq}) \parallel \text{Tl}^{+}(\text{aq}) \mid \text{Tl(s)}$  **[5 marks]**
  
  
  
  
  
  
  
  
  
  
  - b.  $\text{Cd(s)} \mid \text{Cd}^{2+}(\text{aq}) \parallel \text{H}^{+}(\text{aq}) \mid \text{H}_2(\text{g}) \mid \text{Pt(s)}$  **[5 marks]**
  
  
  
  
  
  
  
  
  
  
2. A galvanic cell involves the overall reaction of iodide ions with acidified permanganate ions to form manganese (II) ions and iodine. The salt bridge contains potassium nitrate.
  - a. Write the half-reactions and the overall cell reaction **[1 mark]**
  - b. Identify the oxidizing agent and the reducing agent **[2 marks]**
  - c. The inert anode and the cathode are both made of graphite. Solid iodine forms on one of them. Which one? **[1 mark]**

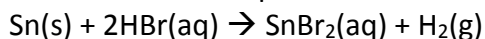
3. Pushing a zinc electrode and a copper electrode into a lemon makes a "lemon cell". In the following representation of the cell  $\text{C}_6\text{H}_8\text{O}_7$  is the formula of citric acid. Explain why the representation does not include a double vertical line. **[2 marks]**



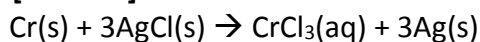
4. Write the two half-reactions for the following redox reaction. Subtract the two reduction potentials to find the standard cell potential for a galvanic cell in which this reaction occurs. **[3 marks]**



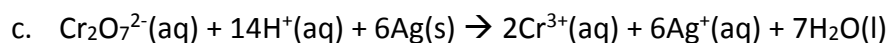
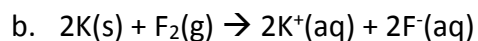
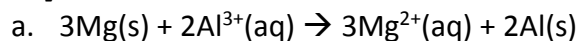
5. Write the two half-reactions for the following redox reaction. Subtract the two standard reduction potentials to find the standard cell potential for the reaction. **[3 marks]**



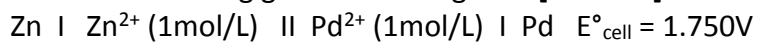
6. Write the two half-reactions for the following redox reaction. Add the standard reduction potential and the standard oxidation potential to find the standard cell potential for the reaction. **[3 marks]**



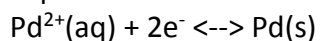
7. Determine the standard cell potential for each of the following redox reactions. **[3 marks]**



8. The cell potential for the following galvanic cell is given. **[2 marks]**



Determine the standard reduction potential for the following half-reaction.



9. Calculate the mass of zinc plated onto the cathode of an electrolytic cell by a current of 750mA in 3.25h. **[4 marks]**

10. Will the following reaction occur spontaneously at 25°C, given that  $[\text{Fe}^{2+}] = 0.60\text{M}$  and  $[\text{Cd}^{2+}] = 0.010\text{M}$ ? **[5 marks]**

