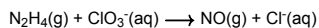


HW10 - REDOX and Electrochemical Cells

Question 1

4 pts

Balance the skeletal equation of hydrazine with chlorate ions, shown below:



The reaction takes place in basic solution. What is the smallest possible integer coefficient of ClO_3^- in the balanced equation?

- 4
- 1
- 2
- 3

Question 2

3 pts

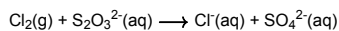
Identify the reducing agent in the reaction in question 1.

- N_2H_4
- NO
- Cl^-
- ClO_3^-

Question 3

3 pts

In the reaction of thiosulfate ion with chlorine gas in an acidic solution, what is the reducing agent?



- $\text{S}_2\text{O}_3^{2-}$
- Cl_2
- S^{2+}
- Cl

Question 4

4 pts

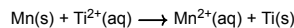
Balance the reaction in question 3 using oxidation and reduction half-reactions. What is the smallest possible integer coefficient of SO_4^{2-} in the combined balanced equation?

- 2
- 1
- 3
- 4

Question 5

4 pts

Consider the cell reaction represented by the skeletal equation:

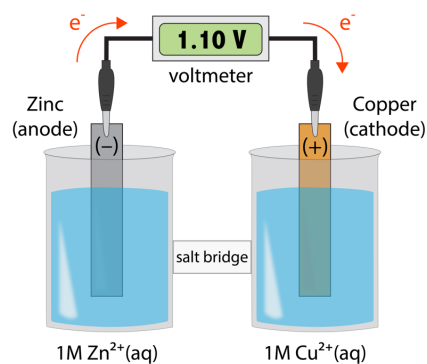


What is the proper cell diagram for this reaction?

- $\text{Mn}(\text{s}) \mid \text{Mn}^{2+}(\text{aq}) \parallel \text{Ti}^{2+}(\text{aq}) \mid \text{Ti}(\text{s})$
- $\text{Mn}^{2+}(\text{aq}) \mid \text{Mn}(\text{s}) \parallel \text{Ti}(\text{s}) \mid \text{Ti}^{2+}(\text{aq})$
- $\text{Ti}(\text{s}) \mid \text{Ti}^{2+}(\text{aq}) \parallel \text{Mn}^{2+}(\text{aq}) \mid \text{Mn}(\text{s})$
- $\text{Ti}^{2+}(\text{aq}) \mid \text{Ti}(\text{s}) \parallel \text{Mn}(\text{s}) \mid \text{Mn}^{2+}(\text{aq})$

Question 6

4 pts



In this electrochemical cell, what is the reduction half reaction?

- $\text{Cu}^{2+}(\text{aq}) + 2\text{e}^- \longrightarrow \text{Cu}(\text{s})$
- $\text{Zn}(\text{s}) \longrightarrow \text{Zn}^{2+}(\text{aq}) + 2\text{e}^-$
- $\text{Cu}(\text{s}) \longrightarrow \text{Cu}^{2+}(\text{aq}) + 2\text{e}^-$
- $\text{Zn}^{2+}(\text{aq}) + 2\text{e}^- \longrightarrow \text{Zn}(\text{s})$

Question 7

4 pts

In a galvanic cell...

- oxidation and reduction take place at the same time, but at different electrodes
- electrical energy is used to reverse spontaneous chemical reactions
- electrolytes are added to carry electrons between electrodes
- oxidation takes place at the cathode

Question 8

4 pts

In a working electrochemical cell (a galvanic cell or a battery), the cations in the salt bridge move toward the cathode.

- True
- False
- It depends on the charge of the cation.
- It is impossible to tell unless we know if the cathode is "+" or "-".