

1 1.5 points

In the decomposition of cobalt (II) chloride, what substance is being oxidized?
 $\text{CoCl}_2(\text{s}) \rightarrow \text{Co}(\text{s}) + \text{Cl}_2(\text{g})$

- Co
 CoCl_2
 Cl

2 1.5 points

Balance the skeletal equation of hydrazine with chlorate ions, shown below:
 $\text{N}_2\text{H}_4(\text{g}) + \text{ClO}_3^-(\text{aq}) \rightarrow \text{NO}(\text{g}) + \text{Cl}^-(\text{aq})$

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

- 1
 2
 6
 4
 3

3 1.5 points

Identify the reducing agent in the reaction in question 2.

- ClO_3^-
 NO
 Cl^-
 N_2H_4

4 1.5 points

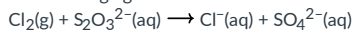
In the reaction between lead (II) sulfide and oxygen gas, what is the oxidizing agent?



- O_2
 S
 Pb
 PbS
 O

5 1.5 points

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
 S^{2+}
 Cl_2

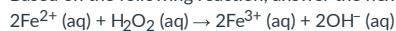
6 1.5 points

Balance the reaction in question 5 using oxidation and reduction half-reactions. What is the smallest possible integer coefficient of SO_4^{2-} in the combined balanced equation?

- 2
 1
 4
 3

7 1.5 points

Based on the following reaction, answer the next 2 questions:



Which species is the oxidizing agent?

- H_2O_2
 Fe^{3+}
 OH^-
 H
 Fe^{2+}
 O

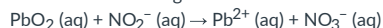
8 1.5 points

Using the same reaction as the previous problem, how many electrons were transferred as it is balanced?

- 0
 2
 1
 6
 5
 4
 3

9 1.5 points

Balance the following reaction in basic conditions:

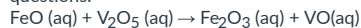


What is the coefficient of water? Is it a product or a reactant?

- 4, product
 4, reactant
 2, reactant
 1, product
 2 product
 1, reactant

10 1.5 points

Balance the following reaction in acidic conditions and answer the next three questions:



How many total electrons are transferred in this reaction?

- 2
 5
 6
 3

11 1 point

Using the same reaction as the previous problem, what was the oxidation state of V in V_2O_5 ?

- 5
 2
 10
 6

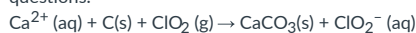
12 1 point

Using the same reaction from question 10, what is the reducing agent?

- FeO
 V_2O_5
 V
 Fe
 O

13 1 point

Balance the following reaction in basic conditions and answer the following questions:



What is the oxidation state of C in $CaCO_3(s)$?

- 2
 +4
 +2
 0
 -4

14 1.5 points

Using the reaction from the previous problem, what is the coefficient on water? Is it a product or reactant?

- 1, product
 1, reactant
 3, product
 6, product
 6, reactant
 3, reactant

15 1.5 points

Using the same reaction from question 13, what is the total number of electrons transferred?

- 1
 6
 2
 4

16 1.5 points

Silver is plated on copper by immersing a piece of copper into a solution containing silver (I) ions. In the plating reaction, copper...

- is reduced and is the reducing agent.
 is oxidized and is the reducing agent.
 is oxidized and is the oxidizing agent.
 is reduced and is the oxidizing agent.

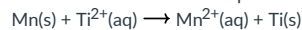
17 1.5 points

In an electrolytic cell, the negative terminal is the (cathode/anode) and is the site of the (oxidation/reduction) half-reaction.

- anode, reduction
 cathode, reduction
 anode, oxidation
 cathode, oxidation

18 1.5 points

Consider the cell reaction represented by the skeletal equation:



What is the proper shorthand notation for this reaction?

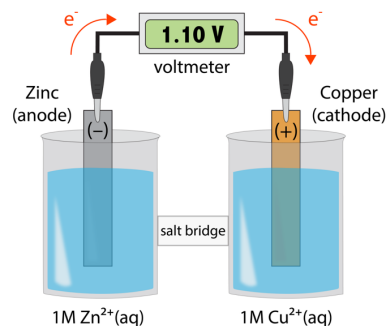
- $Mn^{2+}(aq) | Mn(s) || Ti(s) | Ti^{2+}(aq)$
 $Mn(s) | Mn^{2+}(aq) || Ti^{2+}(aq) | Ti(s)$
 $Ti(s) | Ti^{2+}(aq) || Mn^{2+}(aq) | Mn(s)$
 $Ti^{2+}(aq) | Ti(s) || Mn(s) | Mn^{2+}(aq)$

19 1.5 points

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

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

20 1.5 points



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

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

21 1.5 points

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
 oxidation takes place at the cathode
 electrolytes are added to carry electrons between electrodes