

Competitive Exams: Chemistry MCQs (Practice-Test 10 of 31)

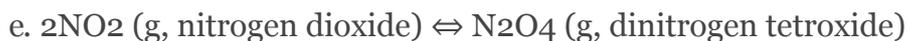
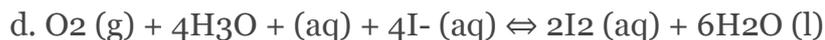
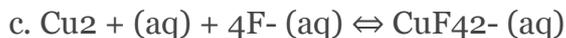
- In recitation, you studied the electrochemistry involved in the "fruit clock" If an orange is used to power the fruit clock, which of the following statements is TRUE?
 - Free electrons flow through the orange to maintain electrical neutrality.
 - The orange allows the Zn^{2+} and Cu^{2+} ions produced in the reaction to mix thereby maintaining electrical neutrality.
 - The orange functions as the anode.
 - The orange functions as the salt bridge by maintaining electrical neutrality.
 - The acids present in the orange are oxidized at the anode to produce hydrogen gas.
- Which of the following reactions IS a reduction-oxidation reaction?
 - formation of N_2 in automobile airbags: $2NaN_3(s) \rightarrow 2Na(l) + 3N_2(g)$
 - combustion of propane in a gas grill: $C_3H_8(g) + 5O_2(g) \rightarrow 3CO_2(g) + 4H_2O(g)$
 - decomposition of hydrogen peroxide (H_2O_2) by light: $2H_2O_2(aq) \rightarrow 2H_2O(l) + O_2(g)$
 - All of these are reduction-oxidation reactions.
 - None of these are reduction-oxidation reactions.
- Which of the following metals could be used successfully to galvanize iron?
 - Ni
 - Cu
 - Sn
 - Co
 - Mn
- Calculate the standard cell potential (in V) for the following reaction at 25°C. $2Cr(s) + 3Ni^{2+}(aq) \rightarrow 2Cr^{3+}(aq) + 3Ni(s)$
- The layer of zinc on a piece of galvanized iron can be removed by placing it in a concentrated solution of acid. Calculate the standard cell potential (in V) for this reaction.

6. A beaker contains a small amount of gold dust (Au (s)). Which of the following aqueous solutions, when added to the beaker, would dissolve the gold dust (i.e.. convert Au (s) to $\text{Au}^{3+} + (\text{aq})$)?
- $\text{Cr}_2\text{O}_7^{2-}$ (acidic solution)
 - H_2O_2 (acidic solution)
 - Br_2
 - Zn^{2+}
 - Al^{3+}
7. Which of the following statements best describes what will happen when liquid bromine (Br_2) is poured into a beaker containing aluminum metal?
- Br_2 will be reduced; Al will be oxidized
 - Br_2 will be oxidized; Al will be reduced
 - Br_2 will function as the reducing agent; Al will function as the oxidizing agent
 - A reaction will not occur.
 - It is impossible to tell.
8. Consider the following galvanic cell reaction at 25°C, $4\text{Cr}^{2+} + (\text{aq}) + \text{O}_2 (\text{g}) + 4\text{H}_3\text{O}^+ + (\text{aq}) \rightarrow 4\text{Cr}^{3+} + (\text{aq}) + 6\text{H}_2\text{O} (\text{l})$ Which of the following statements best describes what would happen to the cell potential if the concentration of Cr^{2+} is increased?
- The cell potential would become less positive.
 - The cell potential would become more positive.
 - The cell potential would remain the same.
 - It is impossible to tell.
9. Which of the following half-reactions is involved in the STANDARD HYDROGEN ELECTRODE?
- $\text{Pt}^{2+} + (\text{aq}) + 2\text{e}^- \rightarrow \text{Pt} (\text{s})$
 - $2\text{H}_3\text{O}^+ + (\text{aq}) + 2\text{e}^- \rightarrow 2\text{H}_2\text{O} (\text{l}) + \text{H}_2 (\text{g})$
 - $\text{H}_2\text{O}_2 (\text{aq}) + 2\text{H}_3\text{O}^+ + (\text{aq}) + 2\text{e}^- \rightarrow 4\text{H}_2\text{O} (\text{l})$
 - $\text{O}_2 (\text{g}) + 2\text{H}_2\text{O} (\text{l}) + 4\text{e}^- \rightarrow 4\text{OH}^- (\text{aq})$
 - None of the above:

10. A concentration cell containing aqueous solutions of $\text{Cu}(\text{NO}_3)_2$ and solid copper metal is constructed so that the Cu^{2+} ion concentration in the cathode half-cell is 0.66 M. Calculate the concentration of the Cu^{2+} ion in the anode half-cell if the cell potential for the concentration cell at 25°C is 0.034 V.
11. Consider a galvanic cell based on the following overall reaction, $\text{Fe}(\text{s}) + 2\text{Ag}^+(\text{aq}) \rightarrow \text{Fe}^{2+}(\text{aq}) + 2\text{Ag}(\text{s})$. Calculate the cell potential (in V) for this reaction at 25°C when the concentration of Ag^+ ions is 0.050 M and the concentration of Fe^{2+} ions is 1.50 M.
12. Which of the following metal ions will plate out on a piece of galvanized iron which has NOT had the layer of Zn metal removed?
- Cu^{2+}
 - Au^{3+}
 - Ni^{2+}
 - All of these.
 - None of these.
13. Which of the following best explains why concentration cells must be run under non-standard conditions in order for them to do electrical work?
- A concentration cell can only do electrical work when either NH_3 or NaOH is added to one of the half-cells.
 - A concentration cell cannot do electrical work at 25°C.
 - The change in free energy for a concentration cell is always negative under standard conditions.
 - A concentration cell has a cell potential equal to zero under standard conditions.
 - A concentration cell can only do electrical work when the cell is run under standard conditions.
14. Which of the following statements about a salt bridge in a voltaic cell is TRUE?
- Free electrons flow through the salt bridge to maintain electrical neutrality in the two half-cells.
 - The salt bridge allows the ions present in the two half-cells to mix extensively.
 - The wire must be connected directly to the salt bridge in order for the salt bridge to be able to maintain electrical neutrality in the two half-cells.
 - In some cases, a salt bridge functions as the anode.

e. Ions from the electrolyte in the salt bridge flow into each half-cell to maintain electrical neutrality.

15. Which of the following reactions can be used to construct a voltaic cell?



Discussions & Questions

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[1 Answer](#)

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- Examrace on 06-Feb-2018