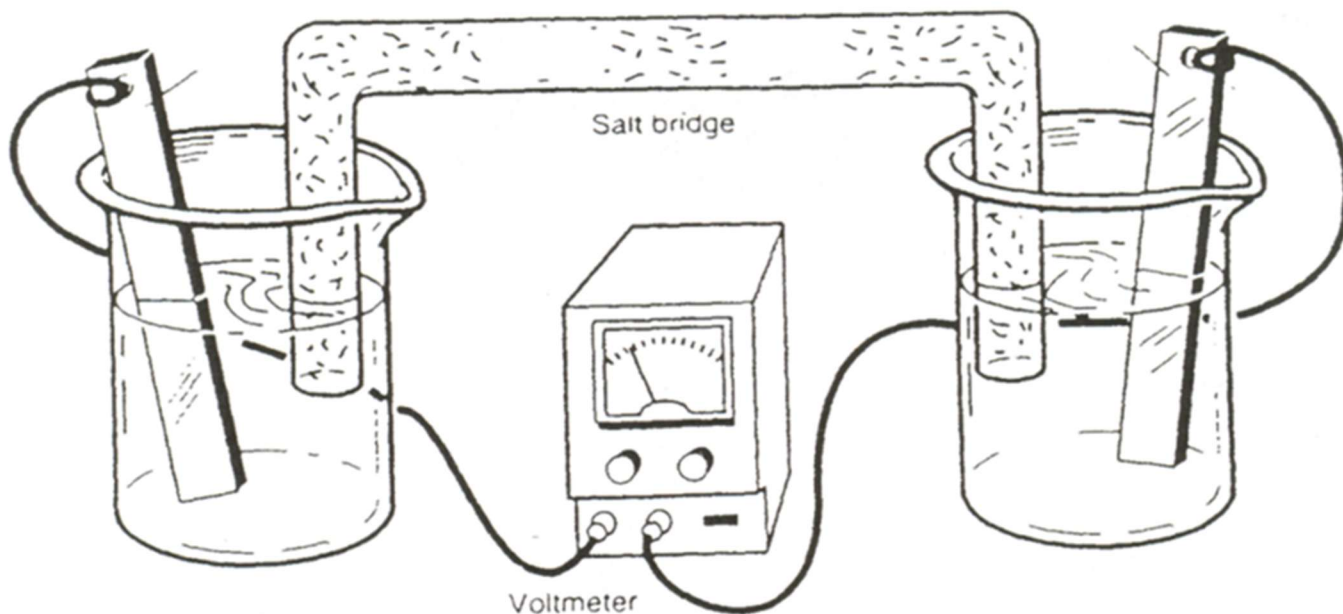


# Practice Celebration REDOX

- \_\_\_ 1. What is the oxidation number of carbon in the hydrogen carbonate ion?  
A. +1      B. +4      C. +5      D. -6
- \_\_\_ 2. Which of these would be an example of a NON-SPONTANEOUS redox?  
A. using a 9-volt battery      B. using a voltaic cell  
C. the electrolysis of water      D. starting a car with a battery
- \_\_\_ 3. We lit magnesium metal on fire, and it synthesized into magnesium oxide.  
Which of these shows the half oxidation reaction?  
A.  $\text{Mg} \rightarrow \text{Mg}^{+2} + 2\text{e}^-$       B.  $\text{Mg}^{+2} + 2\text{e}^- \rightarrow \text{Mg}^0$   
C.  $\text{O}_2^0 \rightarrow \text{O}^{-2}$       D.  $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$
- \_\_\_ 4. In an electrolytic cell, which is true:  
A. reduction happens at the anode  
B. reduction happens at the cathode  
C. oxidation happens at the cathode  
D. oxidation + reduction happen between the cathode + anode
- \_\_\_ 5. The salt bridge  
A. allows for the flow of electrons      B. allows for the flow of electricity  
C. stops the flow of ions      D. allows for the flow of ions
- \_\_\_ 6. The electrode that loses mass is  
A. cathode      B. anode      C. both cathode and anode      D. neither
- \_\_\_ 7. Which species is oxidized in this reaction?  $\text{Zn}_{(\text{s})} + \text{HCl}_{(\text{aq})} \rightarrow$   
A. Zn      B. HCl      C.  $\text{H}^+$       D.  $\text{Cl}^-$
- \_\_\_ 8. Which is a reason that a battery would run out of "juice"?  
A. too many electrons      B. run out of cathode  
C. clog salt bridge with ions      D. run out of anode
- \_\_\_ 9. In this reaction is completed, which species is reduced?  
 $\text{Ca}_{(\text{s})} + \text{HCl}_{(\text{aq})} \rightarrow ?$       A. Ca      B.  $\text{H}^+$       C.  $\text{Cl}^-$       D. HCl
- \_\_\_ 10. Reduction happens at the cathode is true for:  
A. voltaic cells only      B. electrolytic cells only  
C. voltaic and electrolytic cells      D. 12-volt rechargeable batteries only
- \_\_\_ 11. The salt bridge in a voltaic cell must be:  
A. aqueous      B. solid      C. gaseous      D. able to go over small rivers

12. Fully label the diagram below showing strontium electrode in strontium fluoride solution at left, a salt bridge with sodium chloride solution, and on right, iron in iron (III) bromide solution.



14. Write the  $\frac{1}{2}$  reactions (unbalanced, then balanced)

$\frac{1}{2}$  Ox: \_\_\_\_\_  $\frac{1}{2}$  Red: \_\_\_\_\_

$\frac{1}{2}$  Ox: \_\_\_\_\_  $\frac{1}{2}$  Red: \_\_\_\_\_

15. Write the Net Ionic Equation: \_\_\_\_\_

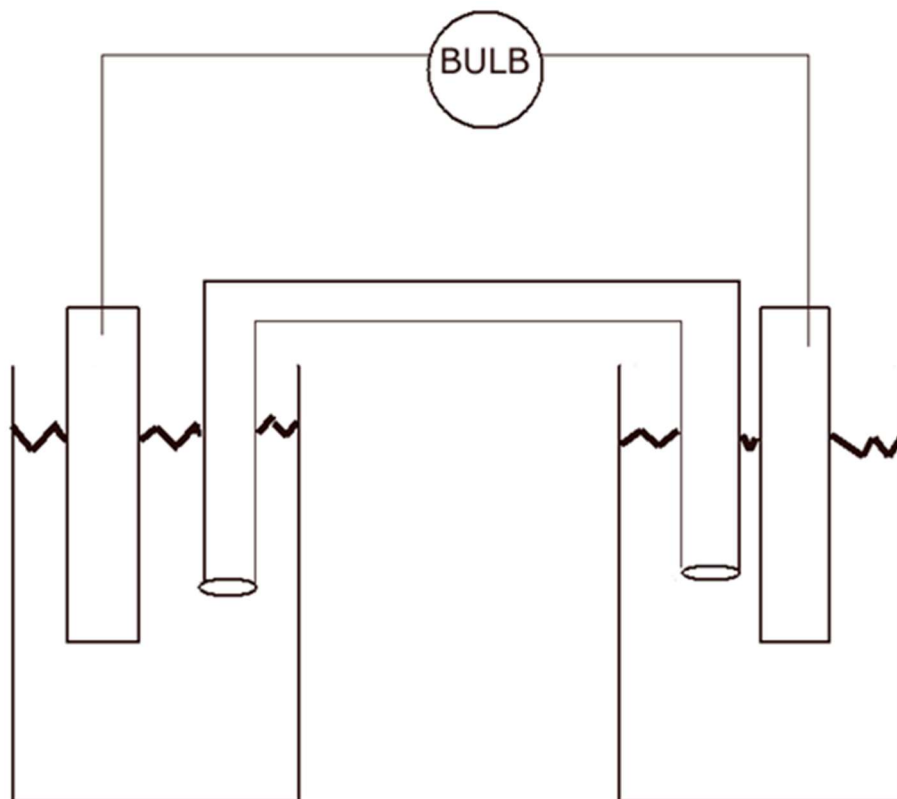
16. What is the reducing agent? \_\_\_\_\_ What is the oxidizing agent? \_\_\_\_\_

17. Which electrode loses mass? \_\_\_\_\_ Where does it go? \_\_\_\_\_

18. A voltaic cell converts \_\_\_\_\_ energy into \_\_\_\_\_ energy.

19. Describe the function of the salt bridge

Draw this in, then answer the questions. The salt bridge is ammonium chloride solution. At left is an aluminum bar in aluminum chloride solution. At right is a zinc bar in zinc nitrate solution. Fully label this voltaic cell, then show the half reactions and net ionic equation.



19. Which is the anode? A. Al B. Zn C. aluminum chloride D. ammonium chloride
20. The  $\text{NH}_4^{+1}$  will move towards the beaker with the A.  $\text{AlCl}_3(\text{AQ})$  B.  $\text{Zn}(\text{NO}_3)_2(\text{AQ})$
21. The flow of electrons goes from A. Al to Zn B. Zn to Al C.  $\text{Al}^{+3}$  to  $\text{Cl}^-$  D.  $\text{Zn}^{+2}$  to  $2 \text{Cl}^-$
22. This question has 6 choices... This reaction:  
 A. is spontaneous B. is non-spontaneous C. creates electric energy  
 D. creates chemical energy E. Both A and C F. Both A and D
23. Reduction takes place at the  
 A. anode which is aluminum B. cathode which is aluminum  
 C. anode which is zinc D. cathode which is zinc
24. The electrode that will lose mass will be the  
 A. anode which is aluminum B. cathode which is aluminum  
 C. anode which is magnesium D. cathode which is magnesium

A few more questions are on the next page.

25. In this redox reaction:  $4\text{Al} + 3\text{O}_2 \rightarrow 2\text{Al}_2\text{O}_3$  which species is oxidized?

- A. Al      B.  $3\text{O}_2$       C.  $\text{Al}^{+3}$       D. 12 electrons

26. In this redox reaction  $\text{Zn}^0 + \text{Pb}^{+2} \rightarrow \text{Zn}^{+2} + \text{Pb}^0$  which species is reduced?

- A.  $\text{Zn}^0$       B.  $\text{Pb}^{+2}$       C.  $\text{Zn}^{+2}$       D.  $\text{Pb}^0$

27 & 28. An electrolytic cell converts \_\_\_\_\_ (27) energy into \_\_\_\_\_ (28) energy.

29 & 30. A voltaic cell converts \_\_\_\_\_ (29) energy into \_\_\_\_\_ (30) energy.