

Unit Review: If you can do all of this, then chances are, you are ready for the test!

Complete this review and show Mr. Yeung the completed version for 3 extra % on the test. Must be completely finished!

1. Compare and Contrast Oxidation and Reduction by completing the following table:

/10

Oxidation	Reduction
Present Definition:	Present Definition:
Example:	Example:
Mnemonic Device:	Mnemonic Device:

2. Why must oxidation and reduction reactions occur together?

/1

3. Determine whether the following reactions are either oxidation or reduction reactions

/3

- a) $\text{Na} \rightarrow \text{Na}^{1+} + 1\text{e}^{1-}$ _____
- b) $\text{F} + 1\text{e}^{1-} \rightarrow \text{F}^{1-}$ _____
- c) $\text{Ti}^{3+} \rightarrow \text{Ti}^{4+} + 1\text{e}^{1-}$ _____

4. State the oxidation number for the element in **bold**.

/6

- a) $\text{Na}_2\text{Cr}_2\text{O}_7$ Cr: _____
- b) $\text{H}_2\text{C}_2\text{O}_4$ C: _____
- c) MnSO_4 S: _____
- d) NH_4NO_3 N: _____

- | | |
|----------------------------------|------------|
| e) MgSO_3 | S : _____ |
| f) Na_2O_2 | O : _____ |
| g) N_2O_5 | N : _____ |
| h) $\text{Zn}(\text{NO}_2)_2$ | Zn: _____ |
| i) KNO_3 | N : _____ |
| j) HClO_3 | Cl: _____ |
| k) $\text{Fe}_2(\text{MnO}_4)_3$ | Fe : _____ |
| l) CaH_2 | H: _____ |

5. Identify whether each of the following are REDOX or NOT REDOX reactions.

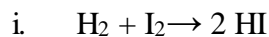
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- | | |
|---|-------|
| a) $2 \text{NO}_2 \rightarrow \text{N}_2\text{O}_4$ | _____ |
| b) $2 \text{Mg} + \text{O}_2 \rightarrow 2 \text{MgO}$ | _____ |
| c) $\text{Mg} + 2 \text{Ag}^+ + 2 \text{NO}_3^- \rightarrow \text{Mg}^{2+} + 2 \text{NO}_3^- + 2 \text{Ag}$ | _____ |
| d) $2 \text{SO}_2 + \text{O}_2 \rightarrow 2 \text{SO}_3$ | _____ |
| e) $\text{MgO} + \text{SO}_3 \rightarrow \text{MgSO}_4$ | _____ |

6. For each of the following redox reactions identify the following:

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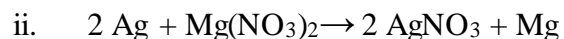
- element oxidized
- element reduced
- oxidizing agent
- reducing agent
- number of electrons transferred



element oxidized: _____ element reduced: _____

oxidizing agent: _____ reducing agent: _____

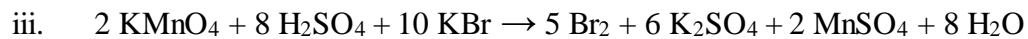
number of electrons transferred: _____



element oxidized: _____ element reduced: _____

oxidizing agent: _____ reducing agent: _____

number of electrons transferred: _____



element oxidized: _____ element reduced: _____

oxidizing agent: _____ reducing agent: _____

number of electrons transferred: _____



element oxidized: _____ element reduced: _____

oxidizing agent: _____ reducing agent: _____

number of electrons transferred: _____

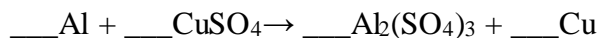
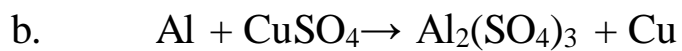
7. Balance the following redox reactions. Show your work, including oxidation numbers and write your final answer in the box provided. State the oxidizing agent, reducing agent and the total number of electrons that are transferred for each reaction.



____ HNO_3 + ____ $\text{C}_2\text{H}_6\text{O}$ + ____ $\text{K}_2\text{Cr}_2\text{O}_7 \rightarrow$ ____ KNO_3 + ____ $\text{C}_2\text{H}_4\text{O}$ + ____ H_2O + ____ $\text{Cr}(\text{NO}_3)_3$

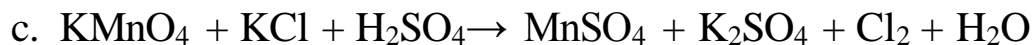
Oxidizing agent: _____ Reducing agent: _____

Total # of electrons transferred: _____



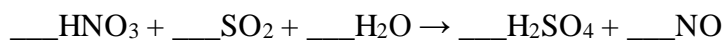
Oxidizing agent: _____ Reducing agent: _____

Total # of electrons transferred: _____



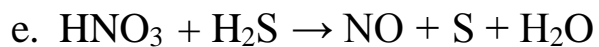
Oxidizing agent: _____ Reducing agent: _____

Total # of electrons transferred: _____



Oxidizing agent: _____ Reducing agent: _____

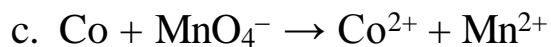
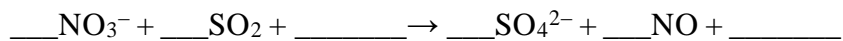
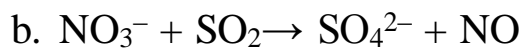
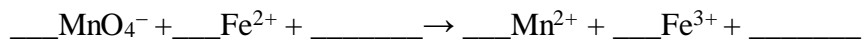
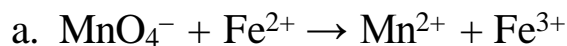
Total # of electrons transferred: _____

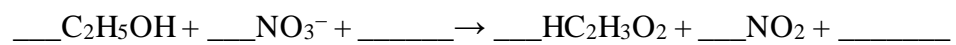
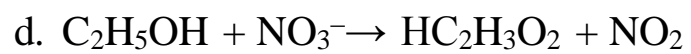
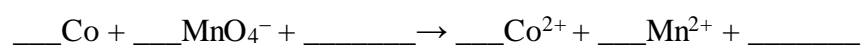


Oxidizing agent: _____ Reducing agent: _____

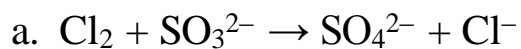
Total # of electrons transferred: _____

8. Balance the following redox reactions in **acidic** solutions. Show all steps including the oxidation numbers. Write the balanced reaction in the box provided.

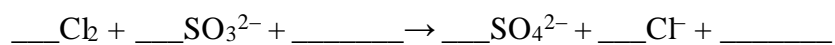




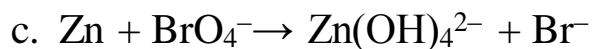
9. Balance the following redox reactions in a **basic** solution. Show all of your work! Write the balanced reaction in the box provided.



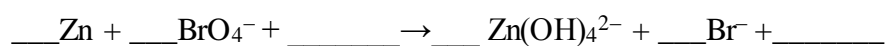
Balanced Reaction:



Balanced Reaction:



Balanced Reaction:



1. Identify if the following compounds are soluble or insoluble. (1 mark each)

- a. barium hydroxide _____
- b. aluminum nitrate _____
- c. magnesium phosphate _____
- d. copper (I) iodide _____
- e. strontium carbonate _____
- f. copper (II) chloride _____
- g. barium sulfide _____
- h. iron (III) sulfate _____

2. Complete the following reactions. If no reaction occurs, write "no reaction". Make sure to include the proper states in brackets. (2 marks for each reaction)

a. sodium hydroxide and nickel (II) chloride

Balanced Molecular Equation:



Complete Ionic Equation:



Net Ionic Equation:



b. ammonium phosphate and barium chloride

Balanced Molecular Equation:



Complete Ionic Equation:



Net Ionic Equation:



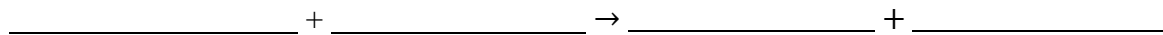
c. ammonium sulfate and rubidium carbonate

Balanced Molecular Equation:



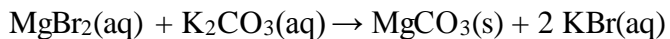
d. copper (II) chloride and sodium sulfide

Balanced Molecular Equation:



e. magnesium bromide and potassium carbonate

Balanced Molecular Equation:



3. Answer the following questions, showing all your work. (2 marks each)

- a) What volume of 0.240 mol/L sulfuric acid can be neutralized by 50.0 mL of 0.360 mol/L sodium hydroxide?
- b) Concentrated hydrochloric acid (11.7 mol/L) is added to a spill of 5.00 L of sodium hydroxide solution with a concentration of 2.00 mol/L. What volume of acid is required to neutralize the spill?
- c) A clumsy chemistry teacher (not this one, of course) spills 75.0 mL of concentrated sulfuric acid (18.0 mol/L). He has a stock solution of 1.00 mol/L sodium hydroxide on hand to neutralize the spill. How much base does he need to neutralize the spill?
- d) If 0.750 mL of an antacid containing magnesium hydroxide is completely neutralizes 0.100 L of 0.100 mol/L hydrochloric acid solution, what is the concentration of the antacid?