

Name: _____

Quiz #7

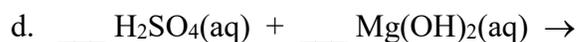
CHEM 1411 — Spring 2019

Due Thursday, March 7 by 8:00 am

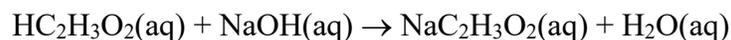
Late papers will not be accepted!

Neutralization Reactions

1. Complete and balance the following neutralization reactions. **Be sure to include phase labels!** If no reaction occurs, write "NR." (20 pts)



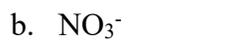
2. In a titration, 15.00 mL of a solution of vinegar containing acetic acid, HC₂H₃O₂, is titrated to its end point with 11.05 mL of 0.3824 M NaOH.



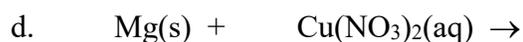
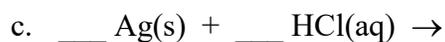
What is the concentration (in M) of acetic acid in the vinegar solution? (10 pts)

Oxidation-Reduction Reactions

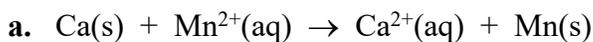
3. What is the oxidation state of N in each of the following species? (10 pts)



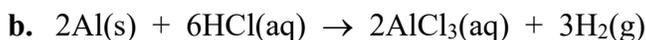
4. Use the activity series to predict whether the following single-displacement reactions occur. If the reaction occurs, write a balanced molecular equation (including phase labels). If no reaction occurs, write "NR" after the arrow. (20 pts)



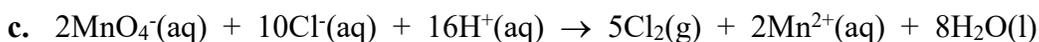
5. In the following reactions, identify the oxidizing agent, and the reducing agent. (Use the entire formula of the reactant, including the phase label, for the oxidizing and reducing agent.) (10 pts)



oxidizing agent _____ reducing agent _____



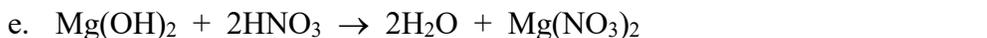
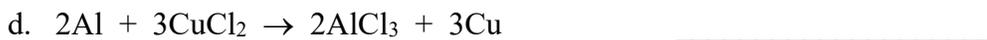
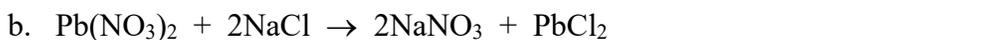
oxidizing agent _____ reducing agent _____



oxidizing agent _____ reducing agent _____

Identifying Reactions

6. Identify the following reactions as **precipitation reactions**, **neutralization reactions**, or **oxidation-reduction reactions**. (10 pts)



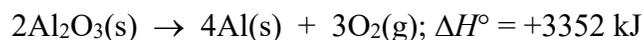
Energy Changes

7. Change in energy: (10 pts)
- Calculate the energy change, ΔE , when $q = -47$ kJ and $w = +88$ kJ.

 - Calculate the energy change, ΔE , when the system releases 125 kJ of heat while 104 kJ of work is done on the system.

Thermochemical Equations

8. When aluminum oxide, Al_2O_3 , is heated to high temperatures, it decomposes to produce aluminum metal by the following thermochemical equation: (10 pts)



- If 100.0 g of Al_2O_3 is to be decomposed, how much heat energy will be required?

- How many grams of aluminum will be produced if 1680 kJ of heat energy is used?