

Name _____ Date _____ Block _____

Single Replacement and the Activity Series

Directions: The activity will be completed for you in class. However if you wish to check over things at home you can do this using the website below.

<http://group.chem.iastate.edu/Greenbowe/sections/projectfolder/flashfiles/redox/home.html>

As the simulation is completed answer the questions; making observations. You will answer conclusion questions after the activity.

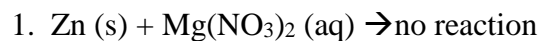
Part I:

Observations:

Metal	Initial Observation	After reacted with Mg(NO ₃) ₂	After reacted with Zn(NO ₃) ₂	After Reacted with Cu(NO ₃) ₂	After Reacted with AgNO ₃
Zinc					
Magnesium					
Copper					
Silver					

Part II:

Only some of the reaction above created a new substance. Write a balanced chemical equation for ALL substances that reacted. The first one has been done for you. Remember to check and be sure that your charges cancel out and the equation is balanced. Also include the states of matter. The first example has been done for you. *You should have one reaction per box above (16 total); write a reaction even if it is NO reaction.*

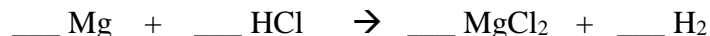


Part III. Answer the following question **using the data** from the activity.

1) If an element that reacts with an acid is considered high reactive; which element(s) would be the most highly reactive from the 4 metals provided. There may be more than one answer for this question. If you did NOT see a reaction then the metal was non reactive with the solution.

Part IV: Conclusion: Answer the following questions. Some of these questions correspond with other material from this unit, not just single replacement reactions.

1. Use the reaction below for parts a-c. Magnesium metal reacts with hydrochloric acid solution according to the following equation:



_____ a) What coefficients are necessary to balance the equation above?

a. 1, 1 \rightarrow 1, 1

c. 1, 1 \rightarrow 1, 2

b. 1, 2 \rightarrow 1, 2

d. 1, 2 \rightarrow 1, 1

_____ b). What type of chemical reaction is the reaction above?

a. synthesis/ combination

c. decomposition

b. single replacement

d. double replacement

e. combustion

_____ c. Each substance from the reaction above should have the following states indicated as:

a. (s), (l) \rightarrow (g), (aq)

c. (s), (aq) \rightarrow (aq), (g)

b. (s), (aq) \rightarrow (s), (g)

d. (aq), (aq) \rightarrow (aq), (aq)

_____ 2. Predict the product(s) of the following reaction: $\text{Ca} + \text{HCl} \rightarrow ?$

a. $\text{CaCl}_2 + \text{H}_2$

c. $\text{CaH} + \text{Cl}_2$

b. $\text{CaCl}_2 + \text{H}$

d. The reaction does not occur

___3. Predict the product(s) of the following reaction: $\text{NaCl} + \text{Ag} \rightarrow ?$

- a. NaClAg
- b. $\text{NaAg} + \text{Cl}_2$
- c. $\text{Na} + \text{AgCl}$
- d. The reaction does not occur

___4. Predict the product(s) of the following reaction: $\text{FeO} \rightarrow ?$

- a. Fe_2O_3
- b. $\text{Fe} + \text{O}$
- c. $\text{Fe} + \text{O}_2$
- d. The reaction does not occur

5. Write the following reactions from words to an equation. Be sure to balance the equations!

a) sodium hydroxide and calcium chloride react to form sodium chloride and calcium hydroxide.

b) potassium chlorate decomposes into potassium chloride and oxygen

6. Classify these reaction types.

a) $\text{Cu} + 2 \text{AgNO}_3 \text{ -----} > 2 \text{Ag} + \text{Cu}(\text{NO}_3)_2$ _____

b) $2 \text{Fe} + \text{O}_2 \text{ -----} > 2 \text{FeO}$ _____

c) $\text{CaCO}_3 + 2 \text{HCl} \text{ -----} > \text{CaCl}_2 + \text{H}_2\text{CO}_3$ _____

d) $\text{C}_3\text{H}_8 + 5\text{O}_2 \rightarrow 3\text{CO}_2 + 4\text{H}_2\text{O}$ _____