

Equations Test Review 2011

Name: KEY 2011

Part 1: Balance and label type of reaction. (S = Synthesis, D = Decomposition, SR = Single Replacement, DR = Double Replacement, C = Combustion).

- 1) $\underline{1} \text{ Mg}_{(s)} + \underline{2} \text{ HCl}_{(aq)} \rightarrow \underline{1} \text{ H}_2_{(g)} + \underline{1} \text{ MgCl}_2_{(s)}$ Type of Reaction: SR
- 2) $\underline{4} \text{ Fe}_{(s)} + \underline{3} \text{ O}_2_{(g)} \rightarrow \underline{2} \text{ Fe}_2\text{O}_3_{(s)}$ Type of Reaction: S
- 3) $\underline{2} \text{ C}_4\text{H}_{10(g)} + \underline{13} \text{ O}_2_{(g)} \rightarrow \underline{8} \text{ CO}_2_{(g)} + \underline{10} \text{ H}_2\text{O}_{(l)}$ Type of Reaction: C
- 4) $\underline{1} \text{ Fe}_2\text{O}_3_{(s)} + \underline{3} \text{ H}_2_{(g)} \rightarrow \underline{2} \text{ Fe}_{(s)} + \underline{3} \text{ H}_2\text{O}_{(l)}$ Type of Reaction: SR
- 5) $\underline{1} \text{ Pb}(\text{NO}_3)_2_{(aq)} + \underline{2} \text{ KI}_{(aq)} \rightarrow \underline{1} \text{ PbI}_2_{(s)} + \underline{2} \text{ KNO}_3_{(aq)}$ Type of Reaction: DR
- 6) $\underline{1} \text{ P}_4\text{O}_{10(s)} + \underline{6} \text{ H}_2\text{O}_{(l)} \rightarrow \underline{4} \text{ H}_3\text{PO}_4_{(s)}$ Type of Reaction: S

Part 2: Complete and balance the following equations. Add states to both reactants and products.

- 1) $\underline{2} \text{ Na}_{(s)} + \underline{2} \text{ H}_2\text{O}_{(l)} \rightarrow \underline{2} \text{ NaOH}_{(aq)} + \underline{1} \text{ H}_2_{(g)}$
- 2) $\underline{2} \text{ C}_3\text{H}_6 + \underline{9} \text{ O}_2_{(g)} \rightarrow \underline{6} \text{ CO}_2_{(g)} + \underline{6} \text{ H}_2\text{O}_{(l)}$
- 3) $\underline{1} \text{ Co}(\text{HCO}_3)_2_{(s)} \rightarrow \underline{1} \text{ CoO}_{(s)} + \underline{1} \text{ H}_2\text{O}_{(l)} + \underline{2} \text{ CO}_2_{(g)}$
- 4) $\underline{\quad} \text{ Ni}_{(s)} + \underline{\quad} \text{ Al}_2(\text{SO}_4)_3_{(aq)} \rightarrow \underline{\text{NO RXN}}$
- 5) $\underline{\quad} \text{ H}_2_{(g)} + \underline{\quad} \text{ I}_2_{(s)} \rightarrow \underline{2} \text{ HI}_{(s)}$
- 6) $\underline{3} \text{ Mg}_{(s)} + \underline{1} \text{ N}_2_{(g)} \rightarrow \underline{1} \text{ Mg}_3\text{N}_2_{(s)}$
- 7) $\underline{1} \text{ Cu}(\text{OH})_2_{(s)} \rightarrow \underline{1} \text{ CuO}_{(s)} + \underline{1} \text{ H}_2\text{O}_{(l)}$
- 8) $\underline{\quad} \text{ Li}_2\text{CO}_3_{(s)} \rightarrow \underline{1} \text{ Li}_2\text{O}_{(s)} + \underline{1} \text{ CO}_2_{(g)}$
- 9) $\underline{\quad} \text{ LiOH}_{(aq)} + \underline{\quad} \text{ NaNO}_3_{(aq)} \rightarrow \underline{\text{NO RXN}}$
- 10) $\underline{\quad} \text{ H}_2\text{SO}_4_{(aq)} + \underline{2} \text{ KOH}_{(aq)} \rightarrow \underline{1} \text{ K}_2\text{SO}_4_{(aq)} + \underline{2} \text{ H}_2\text{O}_{(l)}$
- 11) $\underline{\quad} \text{ Cl}_2_{(g)} + \underline{2} \text{ KI}_{(aq)} \rightarrow \underline{2} \text{ KCl}_{(aq)} + \underline{1} \text{ I}_2_{(s)}$
- 12) $\underline{2} \text{ AgNO}_3_{(aq)} + \underline{\quad} \text{ MgCl}_2_{(aq)} \rightarrow \underline{2} \text{ AgCl}_{(s)} + \underline{1} \text{ Mg}(\text{NO}_3)_2_{(aq)}$

Part 3: Matching - Use options in box on right.

- 1) b only one reactant
- 2) e burning
- 3) c use the activity series
- 4) b can be by means of electrolysis
- 5) d precipitate
- 6) d neutralization
- 7) a only one product
- 8) e usually forms $\text{CO}_2 + \text{H}_2\text{O}$

Use the following options (you may use a choice more than once).

- a) synthesis
- b) decomposition
- c) single replacement
- d) double replacement
- e) combustion

Part 4: Short Answer

- 1) What are 4 signs that a chemical reaction has occurred?

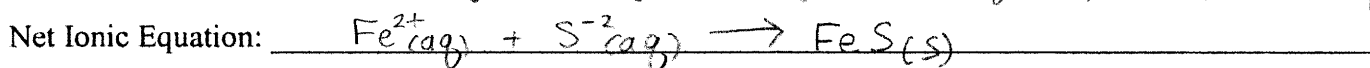
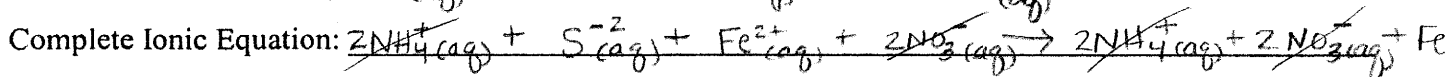
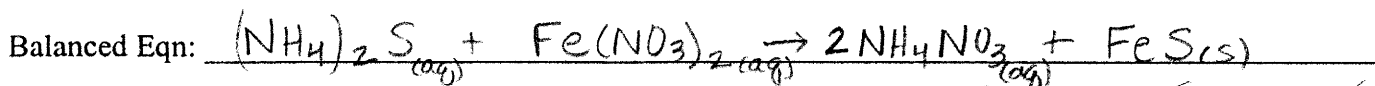
heat/light, color change, precipitate formed, gas produced

- 2) How would you determine if a solid metal will replace a metal ion in single replacement reactions?
Activity Series - see if solid metal has more activity (is higher on activity series) than metal ion.
- 3) When would you write "No Reaction" after combining two aqueous salt solutions?
If no precipitate is formed.
- 4) How does law of conservation of mass apply to reactions?
You must balance to make sure no mass is created or destroyed.
- 5) From the following choices, circle the element that would be a diatomic:

(Cl) (N) (F) Ca (Br) Na (H)

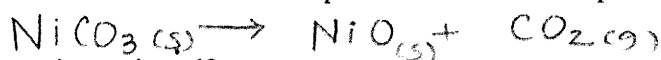
Part 5: Net Ionic Reactions

Write the balanced equation, complete ionic equation, and net ionic equation for the reaction between ammonium sulfide (aq) and iron (II) nitrate (aq).



Part 6: Lab Reactions/Demos

- 1) Write the balanced chemical equation for the decomposition of Nickel (II) Carbonate.

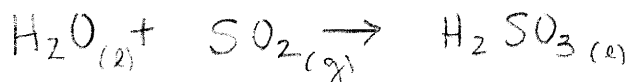


What gas is produced? CO_2

What test could be used to verify the type of gas produced?

lit splint \rightarrow goes out in presence of CO_2 gas

- 2) Write the balanced chemical equation for the reaction of water and sulfur dioxide.



What indicator could be used to determine if an acid or base is formed? Bromothymol Blue

What color should you see after adding the indicator to your product? yellow

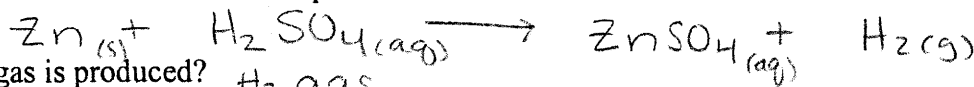
- 3) Write the balanced chemical equation for the reaction of copper (II) oxide with another compound to produce a base.



What indicator could be used to determine if a base is actually formed? Phenolphthalein

What color should you see after adding the indicator to your product? pink

- 4) Write the balanced chemical equation for the reaction of solid zinc with sulfuric acid.



What gas is produced? H_2 gas

What test could be used to verify the type of gas produced?

hold lit splint? listen for popping / bark