

G11 Chemistry: Class 5 Homework**MULTIPLE CHOICE: Circle the correct answer. [10 marks]**

1. Based on the solubility rules, which one of the following compounds should be *insoluble* in water?
A) Na_2SO_4
B) BaSO_4
C) CuSO_4
D) MgSO_4
E) Rb_2SO_4
2. Based on the solubility rules, which one of the following compounds should be *insoluble* in water?
A) CaCO_3
B) $(\text{NH}_4)_2\text{CO}_3$
C) Na_2CO_3
D) K_2CO_3
E) KNO_3
3. Based on the solubility rules, which one of the following should be *soluble* in water?
A) Hg_2Cl_2
B) Na_2S
C) Ag_2CO_3
D) Ag_2S
E) BaSO_4
4. Based on the solubility rules, which one of the following should be *soluble* in water?
A) CaSO_4
B) BaSO_4
C) PbSO_4
D) K_2SO_4
E) AgCl
5. Based on the solubility rules, which one of the following should be *soluble* in water?
A) $(\text{NH}_4)_3\text{PO}_4$
B) $\text{Ca}_3(\text{PO}_4)_2$
C) AlPO_4
D) Ag_3PO_4
E) $\text{Mg}_3(\text{PO}_4)_2$

6. Based on the solubility rules, which of the following will occur when solutions of $\text{ZnSO}_4(\text{aq})$ and $\text{MgCl}_2(\text{aq})$ are mixed?

- A) ZnCl_2 will precipitate; Mg^{2+} and SO_4^{2-} will be spectator ions.
- B) ZnSO_4 will precipitate; Mg^{2+} and Cl^- will be spectator ions.
- C) MgSO_4 will precipitate; Zn^{2+} and Cl^- will be spectator ions.
- D) MgCl_2 will precipitate; Zn^{2+} and SO_4^{2-} will be spectator ions.
- E) No precipitate will form.

7. Based on the solubility rules, which of the following will occur if solutions of $\text{CuSO}_4(\text{aq})$ and $\text{BaCl}_2(\text{aq})$ are mixed?

- A) CuCl_2 will precipitate; Ba^{2+} and SO_4^{2-} are spectator ions.
- B) CuSO_4 will precipitate; Ba^{2+} and Cl^- are spectator ions.
- C) BaSO_4 will precipitate; Cu^{2+} and Cl^- are spectator ions.
- D) BaCl_2 will precipitate; Cu^{2+} and SO_4^{2-} are spectator ions.
- E) No precipitate will form.

8. Which of the following is the correct *net ionic equation* for the reaction that occurs when solutions of $\text{Pb}(\text{NO}_3)_2$ and NH_4Cl are mixed?

- A) $\text{Pb}(\text{NO}_3)_2(\text{aq}) + 2\text{NH}_4\text{Cl}(\text{aq}) \rightarrow \text{NH}_4\text{NO}_3(\text{aq}) + \text{PbCl}_2(\text{s})$
- B) $\text{Pb}^{2+}(\text{aq}) + 2\text{Cl}^-(\text{aq}) \rightarrow \text{PbCl}_2(\text{s})$
- C) $\text{Pb}^{2+}(\text{aq}) + 2\text{NO}_3^-(\text{aq}) + 2\text{NH}_4^+(\text{aq}) + 2\text{Cl}^-(\text{aq}) \rightarrow 2\text{NH}_4\text{NO}_3(\text{aq}) + \text{PbCl}_2(\text{s})$
- D) $\text{NH}_4^+(\text{aq}) + \text{NO}_3^-(\text{aq}) \rightarrow \text{NH}_4\text{NO}_3(\text{s})$
- E) No reaction occurs when the solutions are mixed.

9. Predict the products of the following single displacement reaction.



- A) $\text{Cu}(\text{s}) + \text{FeSO}_4(\text{aq})$
- B) $\text{Fe}(\text{s}) + \text{Cu}(\text{s}) + \text{SO}_4(\text{aq})$
- C) $\text{CuS}(\text{s}) + \text{Fe}_2\text{SO}_4(\text{aq})$
- D) $\text{FeCuSO}_4(\text{aq})$
- E) $\text{FeO}(\text{s}) + \text{CuSO}_3(\text{aq})$

10. Which of the following represents a *combustion reaction*?

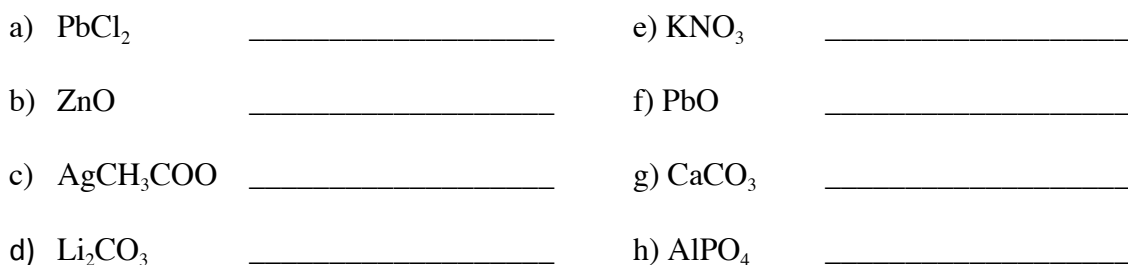
- A) $2\text{C}_2\text{H}_6(\text{g}) + 7\text{O}_2(\text{g}) \rightarrow 4\text{CO}_2(\text{g}) + 6\text{H}_2\text{O}(\text{l})$
- B) $\text{LiOH}(\text{aq}) + \text{HNO}_3(\text{aq}) \rightarrow \text{LiNO}_3(\text{aq}) + \text{H}_2\text{O}(\text{l})$
- C) $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightarrow 2\text{NH}_3(\text{g})$
- D) $2\text{Na}(\text{s}) + 2\text{H}_2\text{O}(\text{l}) \rightarrow 2\text{NaOH}(\text{aq}) + \text{H}_2(\text{g})$
- E) $2\text{Al}(\text{s}) + 3\text{H}_2\text{SO}_4(\text{aq}) \rightarrow \text{Al}_2(\text{SO}_4)_3(\text{aq}) + 3\text{H}_2(\text{g})$

SHORT ANSWER: Answer the following questions.

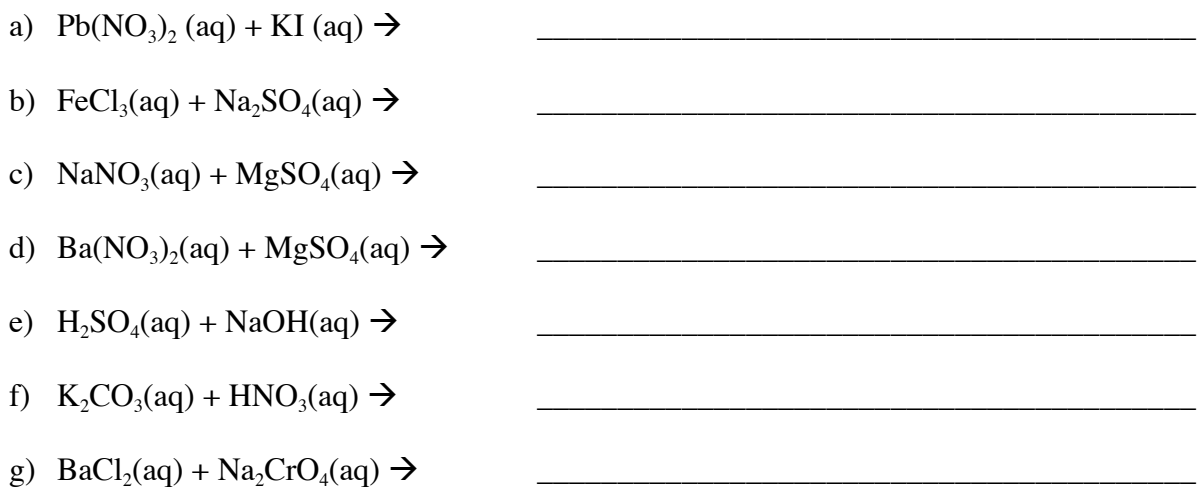
1. Using the activity series, write the balanced chemical equation for each single displacement reaction. If you predict that there will be no reaction, write "NR". **[7 marks]**



2. Decide whether each of the following salts are soluble (no precipitate) or insoluble (precipitate). **[8 marks]**



3. Write a balanced chemical equation for each double displacement reaction. Write "NR" if you predict no reaction will occur. Use the Solubility Guidelines to help you identify the precipitate. **[7 marks]**



4. Predict the result of mixing each pair of aqueous solutions. Write a balanced chemical equation if you predict that a precipitate forms. Write NR if you predict that no reaction will take place. **[5 marks]**

a. Sodium sulfide and iron(III) sulfate

b. Sodium hydroxide and barium nitrate

c. Cesium phosphate and calcium bromide

d. Sodium carbonate and sulfuric acid

e. Sodium nitrate and copper (II) sulfate

5. Mixing each pair of aqueous solutions results in a chemical reaction. Identify the spectator ions. Then write the balanced net ionic equation. **[9 marks]**

a. Sodium carbonate and hydrochloric acid

b. Sulfuric acid and sodium hydroxide

c. Ammonium phosphate and zinc sulfate