

AP Chem HW 2-C

1. Using the solubility rules discussed in class predict which of the following substances are likely to be soluble in water.

Substance	Soluble or Insoluble	Substance	Soluble or Insoluble
a. aluminum nitrate		h. zinc chloride	
b. magnesium chloride		i. lead(II) nitrate	
c. rubidium sulfate		j. lead(II) sulfate	
d. nickel(II) hydroxide		k. sodium iodide	
e. lead(II) sulfide		l. cobalt(III) sulfide	
f. magnesium hydroxide		m. magnesium carbonate	
g. iron(III) phosphate		n. ammonium carbonate	

2. Complete and balance the following reactions, determining, in each case, if a precipitate is formed. Write the molecular equation, the complete ionic equation, and the net ionic equation.

- a. Ammonium sulfate and barium nitrate

Molecular Equation →
Complete Ionic Equation →
Net Ionic Equation →

- b. Lead(II) nitrate and sodium chloride

Molecular Equation →
Complete Ionic Equation →
Net Ionic Equation →

- c. Sodium phosphate and potassium nitrate

Molecular Equation →
Complete Ionic Equation →
Net Ionic Equation →

- d. Sodium bromide and rubidium chloride

Molecular Equation →
Complete Ionic Equation →
Net Ionic Equation →

e. Copper(II) chloride and sodium hydroxide

Molecular Equation →
Complete Ionic Equation →
Net Ionic Equation →

f. Chromium(III) chloride and sodium hydroxide

Molecular Equation →
Complete Ionic Equation →
Net Ionic Equation →

g. Silver nitrate and ammonium carbonate

Molecular Equation →
Complete Ionic Equation →
Net Ionic Equation →

h. Copper(II) sulfate and mercury(I) nitrate

Molecular Equation →
Complete Ionic Equation →
Net Ionic Equation →

3. Give an example how each of the following insoluble ionic compound could be produced using a precipitation reaction. Write the balanced formula and the net ionic equation for each reaction.

a. $\text{Fe}(\text{OH})_3(\text{s})$

Molecular Equation → _____ + _____ → _____ + $\text{Fe}(\text{OH})_3(\text{s})$
Net Ionic Equation →

b. $\text{Hg}_2\text{Cl}_2(\text{s})$

Molecular Equation → _____ + _____ → _____ + $\text{Hg}_2\text{Cl}_2(\text{s})$
Net Ionic Equation →

c. $\text{PbSO}_4(\text{s})$

Molecular Equation \rightarrow _____ + _____ \rightarrow _____ + $\text{PbSO}_4(\text{s})$
Net Ionic Equation \rightarrow

d. $\text{BaCrO}_4(\text{s})$

Molecular Equation \rightarrow _____ + _____ \rightarrow _____ + $\text{BaCrO}_4(\text{s})$
Net Ionic Equation \rightarrow

4. Separate samples of a solution of an unknown soluble ionic compound are treated with KCl , Na_2SO_4 , and NaOH . A precipitate forms only when Na_2SO_4 is added. Which cations could be present in the unknown soluble compound?

--

5. A sample contains at least one if not all of the following ions: Hg_2^{2+} , Ba^{2+} , and Mn^{2+} . For each of the following scenarios, what ion or ions are present in the sample solution?

a. No precipitate formed when an aqueous solution of NaCl was added to the sample solution.

--

b. No precipitate formed when an aqueous solution of Na_2SO_4 was added to the sample solution.

--

c. A precipitate formed when the sample solution was made basic with NaOH .

--