

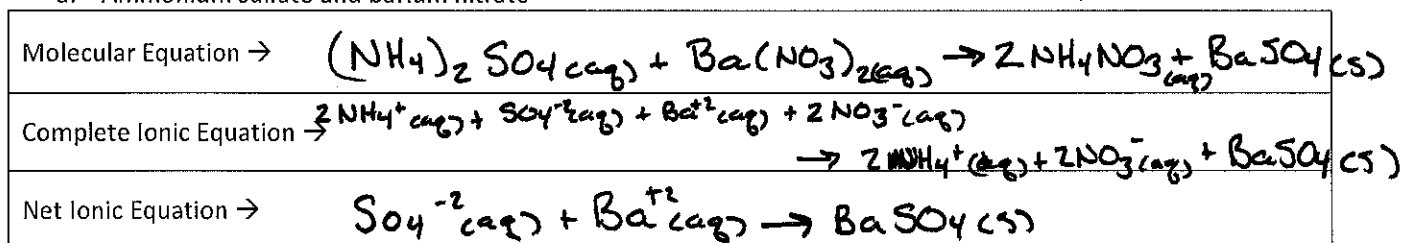
Practice Opportunity C

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

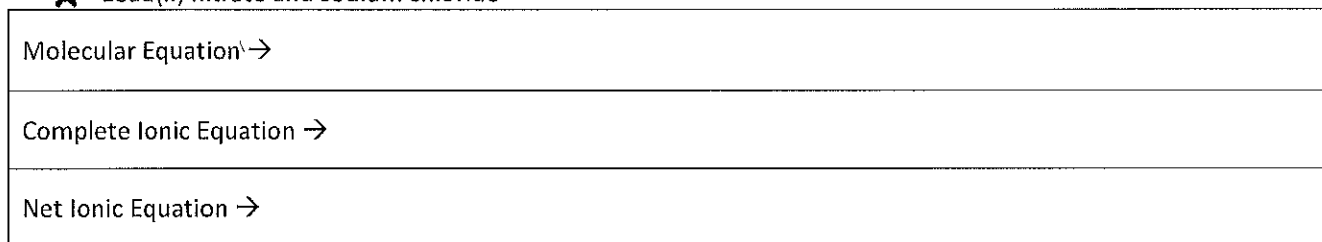
Substance	Soluble or Insoluble	Substance	Soluble or Insoluble
a. aluminum nitrate	Sol	h. zinc chloride	Sol
b. magnesium chloride	Sol	i. lead(II) nitrate	Sol
c. rubidium sulfate	Sol	j. lead(II) sulfate	Insol
d. nickel(II) hydroxide	Insol	k. sodium iodide	Sol
e. lead(II) sulfide	Insol	l. cobalt(III) sulfide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

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.

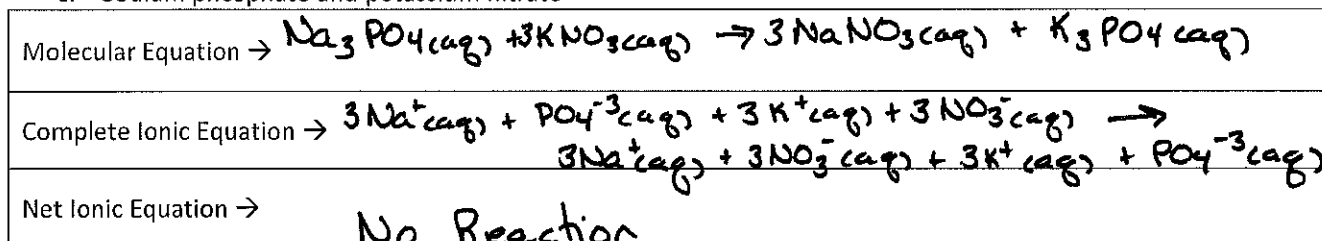
a. Ammonium sulfate and barium nitrate



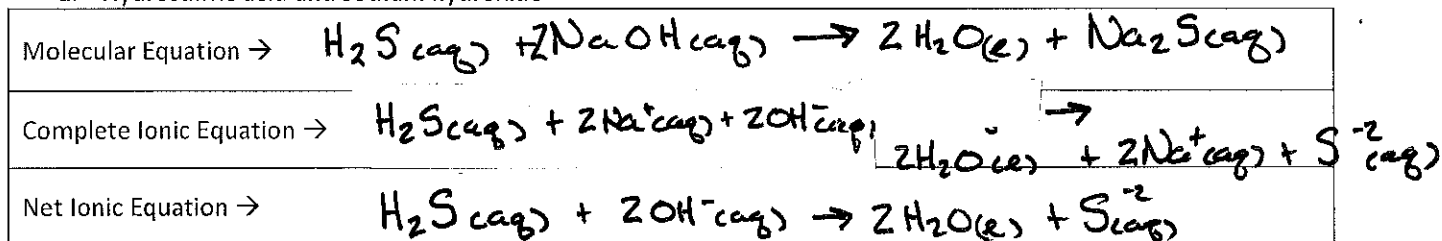
\* Lead(II) nitrate and sodium chloride



c. Sodium phosphate and potassium nitrate



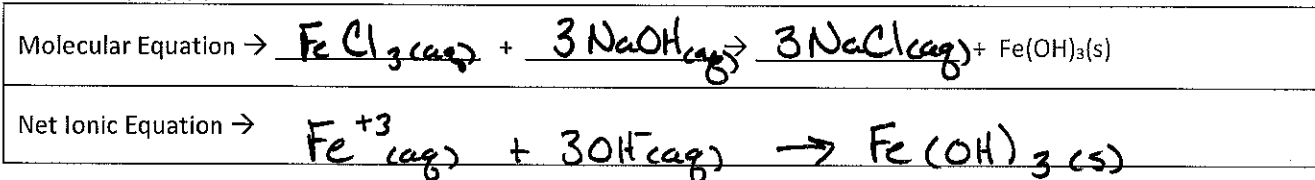
d. Hydrosulfuric acid and sodium hydroxide



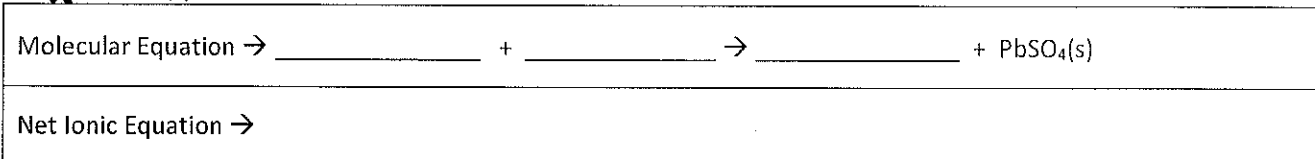
\* Weak Acids & Bases are Not Soluble

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

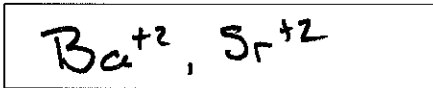


~~X~~  $\text{PbSO}_4(\text{s})$



4. Separate samples of a solution of an unknown soluble ionic compound are treated with  $\text{KCl}$ ,  $\text{Na}_2\text{SO}_4$ , and  $\text{NaOH}$ . A precipitate forms only when  $\text{Na}_2\text{SO}_4$  is added. Which cations could be present in the unknown soluble compound?

Insoluble sulfates  $\rightarrow \text{Ca}^{+2}, \text{Ba}^{+2}, \text{Hg}_2^{+2}, \text{Pb}^{+2}, \text{Sr}^{+2}, \text{Ag}^+$   
 $\text{AgCl}, \text{Hg}_2\text{Cl}_2, \text{PbCl}_2 \leftarrow$  Insoluble  $\therefore \text{Ag}^+, \text{Hg}_2^{+2}, \text{Pb}^{+2}$   
 $\text{Ca}(\text{OH})_2 \leftarrow$  Insoluble  $\therefore \text{Ca}^{+2}$

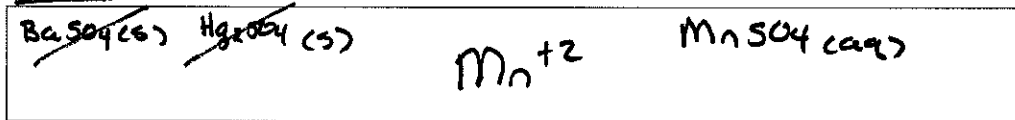


5. A sample contains at least one if not all of the following ions:  $\text{Hg}_2^{2+}$ ,  $\text{Ba}^{2+}$ , and  $\text{Mn}^{2+}$ . For each of the following scenarios, what ion or ions are present in the sample solution?

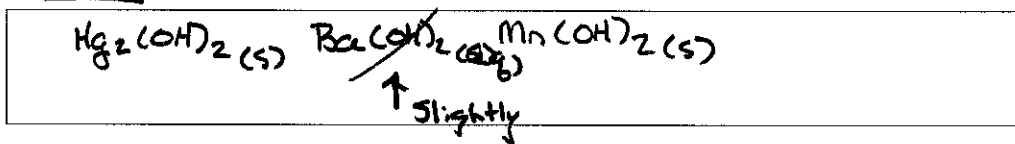
a. No precipitate formed when an aqueous solution of  $\text{NaCl}$  was added to the sample solution.



b. No precipitate formed when an aqueous solution of  $\text{Na}_2\text{SO}_4$  was added to the sample solution.



c. A precipitate formed when the sample solution was made basic with  $\text{NaOH}$ .



④

Need cations soluble w/  $\text{Cl}^-$  &  $\text{OH}^-$   
 But insoluble w/  $\text{SO}_4^{2-}$