Identifying Soluble and Insoluble Compounds

Name_____

Classify each of the following compounds as a Nitrate (NO_3^{-1}), Chloride (Cl^{-1}), Carbonate (CO_3^{-2}), Sulfate (SO_4^{-2}), Hydroxide (OH^{-1}), or Sulfide (S^{-2}), and then state whether it is soluble or insoluble:

1) $Ba(NO_3)_2$
Classification:_____
Solubility:_____

2) $CoCO_3$
Classification:_____
Solubility:_____

3) $Ca(OH)_2$
Classification:_____
Solubility:_____

4) $BaSO_4$
Classification:_____
Solubility:_____

5) CaS
Classification:_____
Solubility:_____

6) $SrSO_4$
Classification:_____
Solubility:_____

7) $PbCl_2$
Classification: _____
Solubility:_____

8) K_2S
Classification: _____
Solubility:_____

9) $Ba(OH)_2$
Classification: _____
Solubility:_____

10) NaCl
Classification: _____
Solubility:_____

11) $Cu(OH)_2$
Classification: _____
Solubility:_____

12) $Fe(NO_3)_2$
Classification: _____
Solubility:_____

Predicting precipitates:

Determine whether each pair of solutions would react to form a precipitate (an insoluble compound). Make your predictions then try them with the solutions on the lab bench.

If a reaction occurs write the chemical equation in words, in formulas and as a net ionic equiation. Be sure to include states of matter.

1) Reactants: Calcium Chloride and Sodium Carbonate

2) Reactants:Sodium Sulfide and Sodium Carbonate

3) Reactants: Sodium Hydroxide and Lead(II) Nitrate

4) Reactants: Cobalt(II) Nitrate and Sodium Sulfide

5) Reactants: Lead(II) Nitrate and Sodium Nitrate

If you have time, see if you can find other combinations of two reactants that will cause a reaction. Remember, only use 3-4 drops of each one. Write the reactions you discover below:

Precipitate Lab Answers

1) Calcium chloride + sodium carbonate ---> sodium chloride + calcium carbonate

$CaCl_{2(aq)} + NaCO_{3(aq)} \rightarrow NaCl_{(aq)} + CaCO_{3(s)}$

$Ca^{+2}_{(aq)} + CO_3^{-2}{}_{(aq)} \rightarrow CaCO_{3(s)}$

2) sodium sulfide + sodium carbonate ---> sodium carbonate + sodium sulfide

$Na_2S_{(aq)} + Na_2CO_{3(aq)} \rightarrow Na_2CO_{3(aq)} + Na_2S_{(aq)}$

3) sodium hydroxide + lead(II) nitrate ---> lead(II) hydroxide + sodium nitrate

$NaOH_{(aq)} + Pb(NO_3)_{2(aq)} \rightarrow Pb(OH)_{2(s)} + NaNO_{3(aq)}$

$Pb^{+2}_{(aq)} + OH^{-1}_{(aq)} \rightarrow Pb(OH)_{2(s)}$

4) cobalt(II) nitrate + sodium sulfide ---> sodium nitrate + cobalt(II) sulfide

$Co(NO)_{3(aq)} + Na_2S_{(aq)} \rightarrow NaNO_{3(aq)} + CoS(s)$

$Co^{+2}_{(aq)} + S^{-2}_{(aq)} \rightarrow CoS(s)$

5) lead(II) nitrate + cobalt(II) nitrate ---> cobalt(II) nitrate + lead(II) nitrate

$Pb(NO_3)_{2(aq)} + Co(NO_3)_{2(aq)} \rightarrow Co(NO_3)_{2(aq)} + Pb(NO_3)_{2(aq)}$