

Solubility Rules, Precipitation & Net-Ionic Equations

SCH3U_07 - 08

I'm Dreaming of a White Precipitate¹

I'm dreaming of a white precipitate
just like the ones I used to make
where the colours are vivid
and the chemist is livid
to see impurities in the snow.

I'm dreaming of a white precipitate
with every chemistry test I write
May your equations be balanced and right
and may all your reactions be bright.

¹ www.delta.edu/~slime/chemsongs

For each of the following reactions, use solubility rules to determine which of the product in each reaction is the precipitate. For each reaction, indicate the precipitate using the subscript _(s), and the subscript _(aq) for the soluble product. For each reaction, write the balanced, total ionic, and the net ionic equation.

- $\text{AgNO}_3 \text{ (aq)} + \text{CaCl}_2 \text{ (aq)} \longrightarrow \text{Ca(NO}_3)_2 + \text{AgCl}$
- $\text{Pb(NO}_3)_2 \text{ (aq)} + \text{Na}_2\text{SO}_4 \text{ (aq)} \longrightarrow \text{PbSO}_4 + \text{NaNO}_3$
- $\text{Na}_2\text{CO}_3 \text{ (aq)} + \text{Mg(NO}_3)_2 \text{ (aq)} \longrightarrow \text{NaNO}_3 + \text{MgCO}_3$
- $\text{FeCl}_3 \text{ (aq)} + (\text{NH}_4)_2\text{S} \text{ (aq)} \longrightarrow \text{Fe}_2\text{S}_3 + \text{NH}_4\text{Cl}$
- $\text{CuCl}_2 \text{ (aq)} + \text{Na}_3\text{PO}_4 \text{ (aq)} \longrightarrow \text{Cu}_3(\text{PO}_4)_2 + \text{NaCl}$
- $\text{Pb(CH}_3\text{COO)}_2 \text{ (aq)} + (\text{NH}_4)_2\text{S} \text{ (aq)} \longrightarrow \text{PbS} + \text{CH}_3\text{COONH}_4$
- $\text{CuCl}_2 \text{ (aq)} + \text{NaOH} \text{ (aq)} \longrightarrow \text{NaCl} + \text{Cu(OH)}_2$
- $(\text{NH}_4)_2\text{CO}_3 \text{ (aq)} + \text{MgCl}_2 \text{ (aq)} \longrightarrow \text{MgCO}_3 + \text{NH}_4\text{Cl}$

For the following equations, balance the equations then write the net ionic equations:

- $\text{Al(OH)}_3 \text{ (aq)} + \text{HNO}_3 \text{ (aq)} \longrightarrow \text{Al(NO}_3)_3 + \text{H}_2\text{O}$
- $\text{Ca(OH)}_2 \text{ (aq)} + \text{HCl} \text{ (aq)} \longrightarrow \text{CaCl}_2 + \text{H}_2\text{O}$
- $\text{NaHCO}_3 \text{ (aq)} + \text{H}_2\text{SO}_4 \text{ (aq)} \longrightarrow \text{Na}_2\text{SO}_4 + \text{H}_2\text{O} + \text{CO}_2$
- $\text{Al} \text{ (s)} + \text{H}_2\text{SO}_4 \text{ (aq)} \longrightarrow \text{Al}_2(\text{SO}_4)_3 + \text{H}_2$
- $\text{CaO} \text{ (s)} + \text{HNO}_3 \text{ (aq)} \longrightarrow \text{Ca(NO}_3)_2 + \text{H}_2\text{O}$
- $\text{Na}_2\text{CO}_3 \text{ (s)} + \text{H}_3\text{PO}_4 \text{ (aq)} \longrightarrow \text{Na}_3\text{PO}_4 + \text{H}_2\text{O} + \text{CO}_2$
- $\text{Mg} \text{ (s)} + \text{HCl} \text{ (aq)} \longrightarrow \text{MgCl}_2 + \text{H}_2$