

Ionic equations

- This worksheet will help you practise writing ionic equations for neutralisation and precipitation reactions
- Where state symbols are not given, you'll need to use the **solubility rules** to determine whether a substance will ionise

Equations with state symbols included

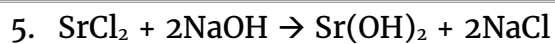
Write ionic equations for the following:

1. $\text{HNO}_{3(\text{aq})} + \text{NaOH}_{(\text{aq})} \rightarrow \text{NaNO}_{3(\text{aq})} + \text{H}_2\text{O}_{(\text{l})}$
2. $\text{HCl}_{(\text{aq})} + \text{KOH}_{(\text{aq})} \rightarrow \text{KCl}_{(\text{aq})} + \text{H}_2\text{O}_{(\text{l})}$
3. $\text{H}_2\text{SO}_{4(\text{aq})} + \text{Mg}(\text{OH})_{2(\text{aq})} \rightarrow \text{MgSO}_{4(\text{aq})} + 2\text{H}_2\text{O}_{(\text{l})}$
4. $\text{NH}_4\text{OH}_{(\text{aq})} + \text{HCl}_{(\text{aq})} \rightarrow \text{NH}_4\text{Cl}_{(\text{aq})} + \text{H}_2\text{O}_{(\text{l})}$
5. $\text{H}_2\text{CO}_{3(\text{aq})} + 2\text{NH}_{3(\text{aq})} \rightarrow (\text{NH}_4)_2\text{CO}_{3(\text{aq})}$
6. $\text{Pb}(\text{NO}_3)_{2(\text{aq})} + 2\text{LiCl}_{(\text{aq})} \rightarrow \text{PbCl}_{2(\text{s})} + 2\text{LiNO}_{3(\text{aq})}$
7. $\text{Ba}(\text{NO}_3)_{2(\text{aq})} + \text{MgSO}_{4(\text{aq})} \rightarrow \text{BaSO}_{4(\text{s})} + \text{Mg}(\text{NO}_3)_{2(\text{aq})}$
8. $\text{AgNO}_{3(\text{aq})} + \text{NaBr}_{(\text{aq})} \rightarrow \text{AgBr}_{(\text{s})} + \text{NaNO}_{3(\text{aq})}$
9. $2\text{AgNO}_{3(\text{aq})} + \text{MgI}_{2(\text{aq})} \rightarrow 2\text{AgI}_{(\text{s})} + \text{Mg}(\text{NO}_3)_{2(\text{aq})}$
10. $\text{CuSO}_{4(\text{aq})} + 2\text{NaOH}_{(\text{aq})} \rightarrow \text{Cu}(\text{OH})_{2(\text{s})} + \text{Na}_2\text{SO}_{4(\text{aq})}$

Using the solubility rules

Write ionic equations, including state symbols, for the following:

1. $\text{Ba}(\text{NO}_3)_2 + \text{K}_2\text{CO}_3 \rightarrow \text{BaCO}_3 + 2\text{KNO}_3$
2. $\text{PbNO}_3 + \text{CaCl}_2 \rightarrow \text{PbCl}_2 + \text{Ca}(\text{NO}_3)_2$
3. $\text{MgCl}_2 + 2\text{KOH} \rightarrow \text{Mg}(\text{OH})_2 + 2\text{KCl}$
4. $\text{CaBr}_2 + \text{Na}_2\text{SO}_4 \rightarrow \text{CaSO}_4 + 2\text{NaBr}$



Writing ionic equations from reaction descriptions

Write ionic equations for the following:

1. The neutralisation reaction between hydrochloric acid and barium hydroxide
2. The neutralisation reaction between sulfuric acid and ammonium hydroxide
3. The precipitation reaction between iron(II) sulfate and sodium hydroxide
4. The precipitation reaction between lead(II) nitrate and ammonium sulfate
5. The neutralisation reaction between nitric acid and silver carbonate