

5 • Chemical Reactions**DOUBLE REPLACEMENT WORKSHEET**

Write the products for each reaction. Indicate the state of each compound. Balance the equation.

1.	Solutions of sodium sulfate and barium chloride are combined. Ions: $\text{Na}^+ \quad \text{SO}_4^{2-} \quad \text{Ba}^{2+} \quad \text{Cl}^- \quad \text{Na}^+ \quad \text{Cl}^- \quad \text{Ba}^{2+} \quad \text{SO}_4^{2-}$
	$\text{Na}_2\text{SO}_4 (\text{aq}) + \text{BaCl}_2 (\text{aq}) \rightarrow 2 \text{NaCl} (\text{aq}) + \text{BaSO}_4 (\text{s})$
2.	Solutions of potassium hydroxide and aluminum bromide are combined. Ions: $\text{K}^+ \quad \text{OH}^- \quad \text{Al}^{3+} \quad \text{Br}^- \quad \text{K}^+ \quad \text{Br}^- \quad \text{Al}^{3+} \quad \text{OH}^-$
	$3 \text{KOH} (\text{aq}) + \text{AlBr}_3 (\text{aq}) \rightarrow 3 \text{KBr} (\text{aq}) + \text{Al}(\text{OH})_3 (\text{s})$
3.	Solutions of calcium acetate and potassium sulfate are combined. Ions: $\text{Ca}^{2+} \quad \text{C}_2\text{H}_3\text{O}_2^- \quad \text{K}^+ \quad \text{SO}_4^{2-} \quad \text{Ca}^{2+} \quad \text{SO}_4^{2-} \quad \text{K}^+ \quad \text{C}_2\text{H}_3\text{O}_2^-$
	$\text{Ca}(\text{C}_2\text{H}_3\text{O}_2)_2 (\text{aq}) + \text{K}_2\text{SO}_4 (\text{aq}) \rightarrow \text{CaSO}_4 (\text{s}) + 2 \text{KC}_2\text{H}_3\text{O}_2 (\text{s})$
4.	Solutions of lead nitrate and lithium iodide are combined. Ions: $\text{Pb}^{2+} \quad \text{NO}_3^- \quad \text{Li}^+ \quad \text{I}^- \quad \text{Pb}^{2+} \quad \text{I}^- \quad \text{Li}^+ \quad \text{NO}_3^-$
	$\text{Pb}(\text{NO}_3)_2 (\text{aq}) + 2 \text{LiI} (\text{aq}) \rightarrow \text{PbI}_2 (\text{s}) + 2 \text{LiNO}_3 (\text{aq})$
5.	Solutions of silver fluoride and magnesium chloride are combined. Ions: $\text{Ag}^+ \quad \text{F}^- \quad \text{Mg}^{2+} \quad \text{Cl}^- \quad \text{Ag}^+ \quad \text{Cl}^- \quad \text{Mg}^{2+} \quad \text{F}^-$
	$2 \text{AgF} (\text{aq}) + \text{MgCl}_2 (\text{aq}) \rightarrow 2 \text{AgCl} (\text{s}) + \text{MgF}_2 (\text{s})$
6.	Solutions of silver nitrate and potassium chromate are combined. Ions: $\text{Ag}^+ \quad \text{NO}_3^- \quad \text{K}^+ \quad \text{CrO}_4^{2-} \quad \text{Ag}^+ \quad \text{CrO}_4^{2-} \quad \text{K}^+ \quad \text{NO}_3^-$
	$2 \text{AgNO}_3 (\text{aq}) + \text{K}_2\text{CrO}_4 (\text{aq}) \rightarrow \text{Ag}_2\text{CrO}_4 (\text{s}) + 2 \text{KNO}_3 (\text{aq})$
7.	Solutions of hydrochloric acid and sodium hydroxide are combined. Ions: $\text{H}^+ \quad \text{Cl}^- \quad \text{Na}^+ \quad \text{OH}^- \quad \text{H}^+ \quad \text{OH}^- \quad \text{Na}^+ \quad \text{Cl}^-$
	$\text{HCl} (\text{aq}) + \text{NaOH} (\text{aq}) \rightarrow \text{H}_2\text{O} (\text{l}) + \text{NaCl} (\text{aq})$
8.	Solutions of nitric acid and calcium hydroxide are combined. Ions: $\text{H}^+ \quad \text{NO}_3^- \quad \text{Ca}^{2+} \quad \text{OH}^- \quad \text{H}^+ \quad \text{OH}^- \quad \text{Ca}^{2+} \quad \text{NO}_3^-$
	$2 \text{HNO}_3 (\text{aq}) + \text{Ca}(\text{OH})_2 (\text{aq}) \rightarrow 2 \text{H}_2\text{O} (\text{l}) + \text{Ca}(\text{NO}_3)_2 (\text{aq})$

9.	<p>Solutions of sulfuric acid and potassium hydroxide are combined.</p> <p>Ions: $\text{H}^+ \quad \text{SO}_4^{2-} \quad \text{K}^+ \quad \text{OH}^- \quad \text{H}^+ \quad \text{OH}^- \quad \text{K}^+ \quad \text{SO}_4^{2-}$</p> <hr/> <p>$\text{H}_2\text{SO}_4 (\text{aq}) + 2 \text{KOH} (\text{aq}) \rightarrow 2 \text{H}_2\text{O} (\text{l}) + \text{K}_2\text{SO}_4 (\text{aq})$</p>
10.	<p>Sodium acetate is dissolved in water. (Hint: write water as HOH.)</p> <p>Ions: $\text{Na}^+ \quad \text{C}_2\text{H}_3\text{O}_2^- \quad \text{H}^+ \quad \text{OH}^- \quad \text{Na}^+ \quad \text{OH}^- \quad \text{H}^+ \quad \text{C}_2\text{H}_3\text{O}_2^-$</p> <hr/> <p>$\text{NaC}_2\text{H}_3\text{O}_2 (\text{s}) + \text{HOH} (\text{l}) \rightarrow \text{NaOH} (\text{aq}) + \text{HC}_2\text{H}_3\text{O}_2 (\text{aq})$</p>
11.	<p>Calcium fluoride is dissolved in water.</p> <p>Ions: $\text{Ca}^{2+} \quad \text{F}^- \quad \text{H}^+ \quad \text{OH}^- \quad \text{Ca}^{2+} \quad \text{OH}^- \quad \text{H}^+ \quad \text{F}^-$</p> <hr/> <p>$\text{CaF}_2 (\text{s}) + 2 \text{HOH} (\text{l}) \rightarrow \text{Ca}(\text{OH})_2 (\text{aq}) + 2 \text{HF} (\text{aq})$</p>
12.	<p>Potassium phosphate is dissolved in water.</p> <p>Ions: $\text{K}^+ \quad \text{PO}_4^{3-} \quad \text{H}^+ \quad \text{OH}^- \quad \text{K}^+ \quad \text{OH}^- \quad \text{H}^+ \quad \text{PO}_4^{3-}$</p> <hr/> <p>$\text{K}_3\text{PO}_4 (\text{s}) + 3 \text{HOH} (\text{l}) \rightarrow 3 \text{KOH} (\text{aq}) + \text{H}_3\text{PO}_4 (\text{aq})$</p>