

REACTION CATEGORY	TOTAL AND NET IONIC EQUATIONS
REACTION DESCRIPTION	In describing reactions that occur in solution, it is often desirable to write the equation for the reaction in ionic form, indicating the ionic species that actually exist in solution.
REACTION FORMAT <i>(shown as an example)</i>	$2\text{Na}^{1+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) + \text{Ba}^{2+}(\text{aq}) + 2\text{Cl}^{-}(\text{aq}) \text{-----}>$ $2\text{Na}^{1+}(\text{aq}) + 2\text{Cl}^{-}(\text{aq}) + \text{BaSO}_4(\text{s})$
REACTION GUIDELINES	<p>In writing a total ionic equation for reactions in water:</p> <ol style="list-style-type: none"> 1. We indicate all soluble ionic materials as ions, followed by (aq). 2. All substances that react with water to form ions are written as ions followed by (aq). 3. All insoluble ionic solids are written with (s) following their formula. 4. All soluble unionized species are written with their molecular formula followed by (aq). 5. In the above equation, we note that the sodium and chloride ions are unchanged and are present on both sides of the equation. Since they are not undergoing chemical reaction, they can be referred to as spectator ions. If we subtract the spectator ions from each side of the equation, we then have a net ionic equation.
REACTION GUIDELINE EXAMPLES	<p>For example, if we were describing the reaction of a solution of BaCl_2 with a solution of Na_2SO_4 to form the insoluble solid BaSO_4 we would write:</p> $\cancel{2\text{Na}^{1+}(\text{aq})} + \cancel{\text{SO}_4^{2-}(\text{aq})} + \text{Ba}^{2+}(\text{aq}) + \cancel{2\text{Cl}^{-}(\text{aq})} \text{-----}>$ $\cancel{2\text{Na}^{1+}(\text{aq})} + \cancel{2\text{Cl}^{-}(\text{aq})} + \text{BaSO}_4(\text{s})$ <p>Eliminating the spectator ions gives the net ionic equation</p> $\text{Ba}^{2+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \text{-----}> \text{BaSO}_4(\text{s})$ <p>The net ionic equation is a statement of the chemistry that occurred, namely, aqueous barium 2+ ion reacted with aqueous sulfate 2- ion to form solid barium sulfate.</p>

Practice Equations

**Write the balanced net ionic equation for the following reactions.
[Assume 100% ionization of all aqueous (aq) substances.]**

The starting equations are not necessarily balanced.

