

Driving Forces for Chemical Reactions

Formation of an insoluble compound (precipitate)

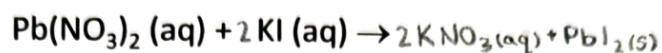
Formation of a gas

Formation of a weak or non-electrolyte

Solubility of Ionic Compounds

TABLE 5.1 Solubility Rules for Ionic Compounds in Water	
Compounds Containing the Following Ions Are Generally Soluble	Exceptions
Li^+ , Na^+ , K^+ , and NH_4^+	None
NO_3^- and $\text{C}_2\text{H}_3\text{O}_2^-$	None
Cl^- , Br^- , and I^-	When these ions pair with Ag^+ , Hg_2^{2+} , or Pb^{2+} , the resulting compounds are insoluble.
SO_4^{2-}	When SO_4^{2-} pairs with Sr^{2+} , Ba^{2+} , Pb^{2+} , Ag^+ , or Ca^{2+} , the resulting compound is insoluble.
Compounds Containing the Following Ions Are Generally Insoluble	Exceptions
OH^- and S^{2-}	<p>When these ions pair with Li^+, Na^+, K^+, or NH_4^+, the resulting compounds are soluble.</p> <p>When S^{2-} pairs with Ca^{2+}, Sr^{2+}, or Ba^{2+}, the resulting compound is soluble.</p> <p>When OH^- pairs with Ca^{2+}, Sr^{2+}, or Ba^{2+}, the resulting compound is slightly soluble.</p>
CO_3^{2-} and PO_4^{3-}	When these ions pair with Li^+ , Na^+ , K^+ , or NH_4^+ , the resulting compounds are soluble.

Precipitation Reactions

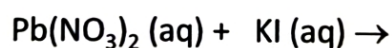


Predict the products

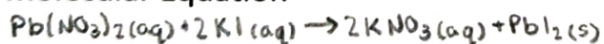
Write products based on ions exchanging places with each other.

If a reaction takes place, one of the products must be a solid, gas or weak/non-electrolyte.

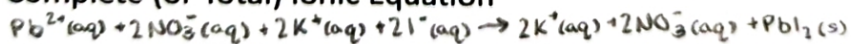
Representing Aqueous Reactions



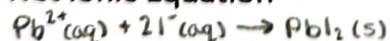
Molecular Equation



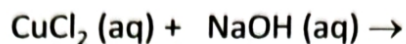
Complete (or Total) Ionic Equation



Net Ionic Equation



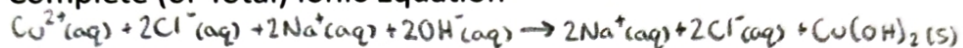
Representing Aqueous Reactions



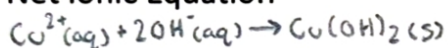
Molecular Equation



Complete (or Total) Ionic Equation



Net Ionic Equation



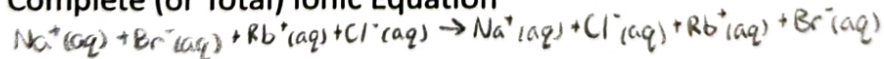
Representing Aqueous Reactions



Molecular Equation



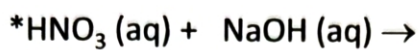
Complete (or Total) Ionic Equation



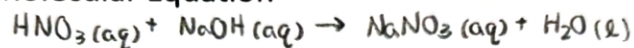
Net Ionic Equation

None

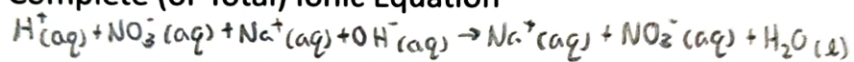
Representing Aqueous Reactions



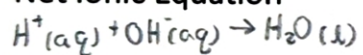
Molecular Equation



Complete (or Total) Ionic Equation



Net Ionic Equation



*HNO₃ ionizes completely in water