

## **Double Displacement Reactions**

- A double displacement reaction involves the exchange of cations between two ionic compounds.

## **Precipitate Reactions**

- A precipitate is a solid that separates from a solution in a chemical reaction.
- In order to predict whether a precipitation reaction will take place, you need to consult a solubility table.
- If a precipitate forms, that compound will be represented by a (s).
- If no precipitate forms, no reaction will take place.

**Table 17.3** Solubilities of Ionic Compounds\* aq = aqueous (dissolves in water); s = solid (does not dissolve in water)

Ions	Acetate	Bromide	Carbonate	Chlorate	Chloride	Fluoride	Hydrogen Carbonate	Hydroxide	Iodide	Nitrate	Nitrite	Phosphate	Sulfate	Sulfide	Sulfite
<b>Aluminum</b>	s	aq		aq	aq	s		s	—	aq		s	aq	—	
<b>Ammonium</b>	aq	aq	aq	aq	aq	aq	aq	—	aq	aq	aq	aq	aq	aq	aq
<b>Barium</b>	aq	aq	s	aq	aq	s		aq	aq	aq	aq	s	s	—	s
<b>Calcium</b>	aq	aq	s	aq	aq	s		s	aq	aq	aq	s	s	—	s
<b>Cobalt(II)</b>	aq	aq	s	aq	aq	—		s	aq	aq		s	aq	s	s
<b>Copper(II)</b>	aq	aq	s	aq	aq	aq		s		aq		s	aq	s	
<b>Iron(II)</b>	aq	aq	s		aq	s		s	aq	aq		s	aq	s	s
<b>Iron(III)</b>	—	aq			aq	s		s	aq	aq		s	aq	—	
<b>Lead(II)</b>	aq	s	s	aq	s	s		s	s	aq	aq	s	s	s	s
<b>Lithium</b>	aq	aq	aq	aq	aq	aq	aq	aq	aq	aq	aq	s	aq	aq	aq
<b>Magnesium</b>	aq	aq	s	aq	aq	s		s	aq	aq	aq	s	aq	—	aq
<b>Nickel</b>	aq	aq	s	aq	aq	aq		s	aq	aq		s	aq	s	s
<b>Potassium</b>	aq	aq	aq	aq	aq	aq	aq	aq	aq	aq	aq	aq	aq	aq	aq
<b>Silver</b>	s	s	s	aq	s	aq		—	s	aq	s	s	s	s	s
<b>Sodium</b>	aq	aq	aq	aq	aq	aq	aq	aq	aq	aq	aq	aq	aq	aq	aq
<b>Zinc</b>	aq	aq	s	aq	aq	aq		s	aq	aq		s	aq	s	s

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Example: magnesium chloride reacts with calcium hydroxide

Example: barium chloride reacts with potassium sulfate

Example: magnesium chloride reacts with potassium sulfate

## **Gas Producing Reactions**

- A double displacement reaction will take place if the reaction produces a gas.

Example: sodium sulfide reacts with hydrochloric acid

## ***Formation of Carbon Dioxide***

Example: Acetic acid combines with baking soda

## ***Formation of Ammonia***

Example: Ammonium chloride combines with sodium hydroxide

Summary of double displacement that form gases

Reactant	Products

## Neutralization Reactions

- When an acid and base are mixed, water will be produced as a water and a salt.

Example: aqueous magnesium hydroxide reacts with aqueous hydrogen chloride

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