

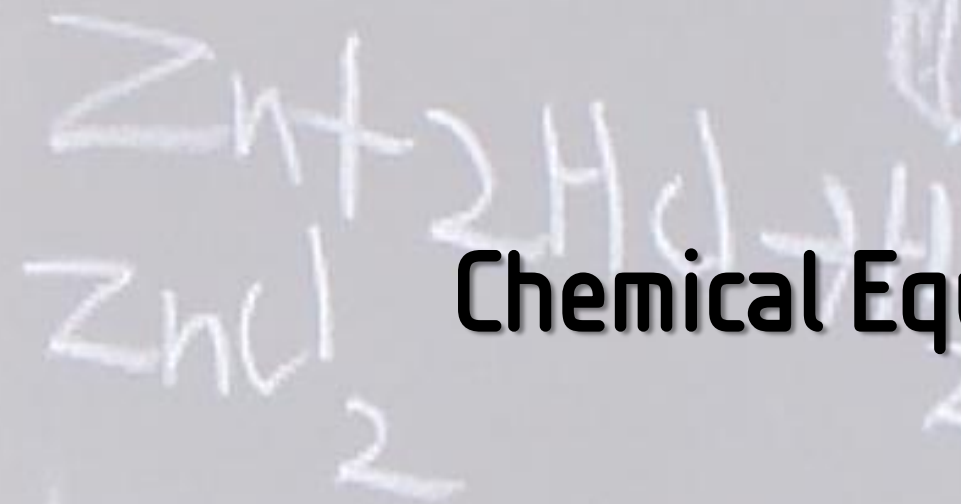
Chemical Equations

Describing Chemical Reactions

Zinc



magnesium



$\text{Mg} + 2\text{HCl}$

MgCl_2

Radium

uranium

Format

- **Format:** Reactant yields Product



- Reactant (substances reacting) on left
- Yield sign (\rightarrow) at center
- Products (new substances formed) on right

Some Symbols

- Phase

- solid precipitate – (s) or ↓
- liquid – (ℓ)
- gas – (g) or ↑
- dissolved in water or aqueous – (aq)

- Energy

- heat – Δ
- electricity – elec.
- light – ↑|

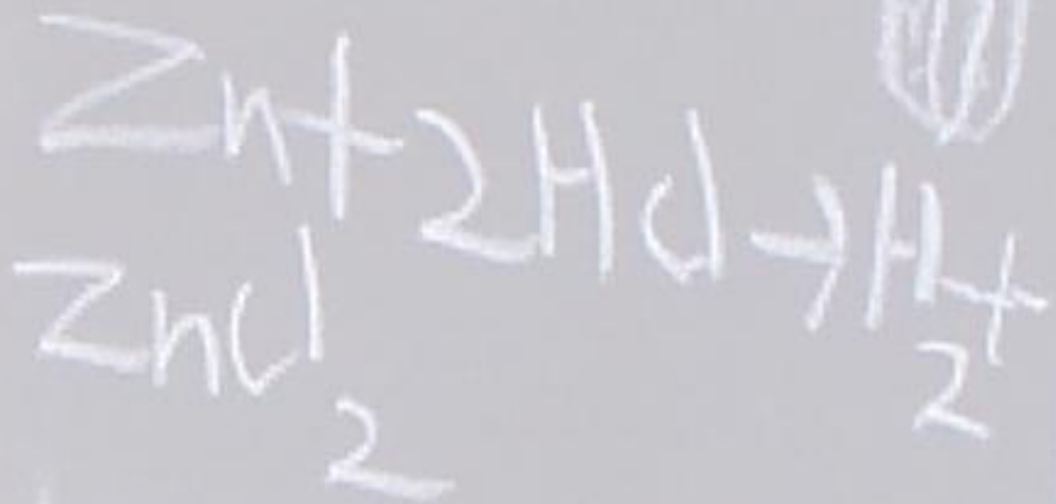
What the Equation Shows

- Identity of reactants and products using chemical formulas and symbols
- Phases of the reactants and products
- Any energy changes involved
- The mole ratios of all the substances or conservation of mass

Zinc



Magnesium



Mg + 2HCl

MgCl₂

Examples

EQUATIONS USING FORMULAS AND SYMBOLS

Radium

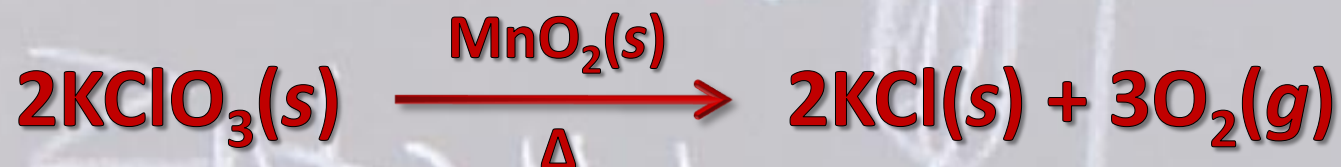
Uranium

Example 1



- **Reactants:** dissolved silver nitrate reacts with dissolved sodium chloride
- **Products:** dissolved sodium nitrate and a solid precipitate consisting of silver chloride forms
 - The *Table of Solubilities in Water* shows which product is the precipitate

Example 2



- **Reactants:** solid potassium chlorate
- **Products:** solid potassium chloride and oxygen gas
- **Other:** manganese dioxide is a catalyst and the reaction is endothermic.
 - Symbols for manganese dioxide and heat are shown above and below the yield sign because they are neither reactants nor products.