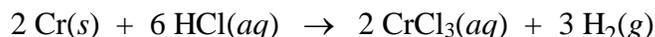


## Chapters 8 &amp; 9 Study Questions

- Sodium carbonate and iron(III) chloride react to form a precipitate.
  - Write a balanced molecular equation for this reaction.
  - Write a balanced complete ionic equation for this reaction.
  - Write a balanced net ionic equation for this reaction.
- Using a solubility table, decide whether a precipitate will form when the following solutions are mixed. If a precipitate forms, write a net ionic equation for the reaction.
  - iron(III) nitrate and potassium hydroxide
  - ammonium chloride and lithium carbonate
  - sodium sulfide and nickel(II) sulfate
- For each of the following equations
  - indicate whether it is a combustion (C), synthesis (S), decomposition (D), single replacement (SR), or double displacement (DD)
  - indicate which reactions are oxidation-reductions (OR), precipitations (P) or acid-base (AB) reactions.
  - predict the products and record their formulas. If no reaction occurs, write "NR."  
(Use Tables as needed to help you decide if a reaction occurs.)
  - balance the equation.

a) $\text{Li}(s) + \text{Cl}_2(g) \rightarrow$	b) $\text{Sr}(\text{NO}_3)_2(aq) + \text{K}_2\text{SO}_4(aq) \rightarrow$
c) $\text{C}_3\text{H}_6(g) + \text{O}_2(g) \rightarrow$	d) $\text{CaCl}_2(aq) + \text{NaNO}_3(aq) \rightarrow$
e) $\text{Fe}(s) + \text{MgSO}_4(aq) \rightarrow$	f) $\text{KI}(l) \rightarrow$
g) $\text{Al}(s) + \text{HCl}(aq) \rightarrow$	h) $\text{HNO}_3(aq) + \text{KOH}(aq) \rightarrow$

- Write a chemical equation for the ionization of iron(III) nitrate when it dissolves in water.
- Chromium reacts with hydrochloric acid in a single replacement reaction. The balanced equation is:



- How many moles of HCl are needed to produce 1.60 moles of  $\text{CrCl}_3$ ?
- How many grams of chromium are required to react with 0.450 moles of HCl?
- How many atoms of chromium are required to produce 12 moles of  $\text{H}_2$ ?
- How many grams of Cr are needed to produce 3.20 g  $\text{H}_2$ ?
- In an experiment, 10.2 grams of  $\text{CrCl}_3$  are produced starting from 8.30 grams of HCl. What was the theoretical yield and the percent yield in this experiment?
- When 6.0 moles of Cr are combined with 12.0 moles of HCl, which reactant is limiting? How many moles of excess reactant are left over?
- How many grams of  $\text{CrCl}_3$  are produced starting from 13.0 g of Cr and 43.8 g of HCl?

## Summary of Chapter 8: Reactions in Aqueous Solutions

- predicting whether a reaction will occur
- precipitation reactions
  - strong electrolytes
  - using a solubility table
  - predicting whether a precipitate occurs
  - writing equations for precipitation reactions
    - molecular equations
    - complete ionic equations
    - net ionic equations
  - acids, bases
    - acid-base reactions
  - common strong acids
  - common strong bases
- double displacement reactions
  - precipitation reactions
  - acid-base reactions
- oxidation-reduction reactions
  - synthesis (combination)
  - decomposition
  - combustion reactions
  - single replacement reactions

## Summary of Chapter 9: Chemical Quantities

- interpreting balanced chemical equations
- stoichiometric calculations:
  - mole relationships between reactants and products
  - mass relationships between reactants and products
- limiting reactant
- theoretical yield
- experimental yield
- calculating percent yield