

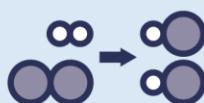


Writing Chemical Equations

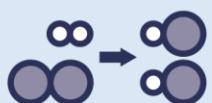
1. Complete the following table:

Chemical name	Chemical Formula
Hydrochloric Acid	HCl
Nitric Acid	HNO ₃
Sulfuric acid	H ₂ SO ₄
Hydrogen	H ₂
Calcium chloride	CaCl ₂
Sodium Hydroxide	NaOH
Sodium chloride	NaCl
Copper carbonate	CuCO ₃
Copper sulphate	CuSO ₄
Copper oxide	CuO
Potassium carbonate	K ₂ CO ₃
Potassium nitrate	KNO ₃

2. Complete the general equations to show the products formed in each of the reactions with acids:
 - Metal + acid → salt + hydrogen
 - Metal oxide + acid → salt + water
 - Metal hydroxide + acid → salt + water
 - Metal carbonate + acid → salt + water + carbon dioxide
3. Use the general equations from question 2 to predict the products of these reactions and complete the word equations:
 - Calcium + hydrochloric acid → calcium chloride + hydrogen
 - Hydrochloric acid + sodium hydroxide → sodium chloride + water
 - Sulfuric acid + copper carbonate → copper sulfate + water + carbon dioxide



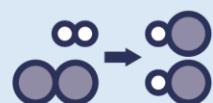
- d. Hydrochloric acid + copper oxide → **copper chloride + water**
- e. Nitric acid + potassium carbonate → **potassium nitrate + water + carbon dioxide**
4. Use the table in Q1 to help you write **balanced** symbol equations for each of the reactions in Q3.
- $\text{Ca} + 2 \text{HCl} \rightarrow \text{CaCl}_2 + \text{H}_2$**
 - $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$**
 - $\text{H}_2\text{SO}_4 + \text{CuCO}_3 \rightarrow \text{CuSO}_4 + \text{H}_2\text{O} + \text{CO}_2$**
 - $2 \text{HCl} + \text{CuO} \rightarrow \text{CuCl}_2 + \text{H}_2\text{O}$**
 - $2 \text{HNO}_3 + \text{K}_2\text{CO}_3 \rightarrow 2 \text{KNO}_3 + \text{H}_2\text{O} + \text{CO}_2$**
5. Use Q3/Q4 to help you answer these questions.
- Which reactions would cause a positive result for the squeaky pop test?
a. Calcium + hydrochloric acid → calcium chloride + hydrogen
 - Which reactions would cause a positive result for the limewater test?
c. Sulfuric acid + copper carbonate → copper sulfate + water + carbon dioxide
e. Nitric acid + potassium carbonate → potassium nitrate + water + carbon dioxide



6. Alkali metals react with oxygen to form metal oxides. Write a word equation and a **balanced** symbol equation to show the reaction of lithium, sodium and potassium with oxygen.



7. Alkali metals react with water to form metal hydroxides and hydrogen gas. Write a word equation and a **balanced** symbol equation to show the reaction of lithium, sodium and potassium with water.

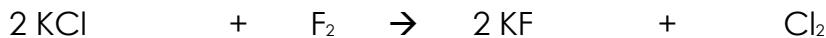




Stretch:

8. A more reactive halogen can displace a less reactive halogen from an aqueous solution of its salts.

e.g. Potassium chloride + fluorine → Potassium fluoride + chlorine



A displacement reaction occurs in this case because fluorine is more reactive than chlorine, so fluorine displaces the chlorine from the salt.

Determine if a reaction would occur in each case. If a reaction would occur write a word and balanced symbol equation for each one:

