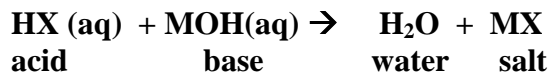


Neutralization Reactions tutorial

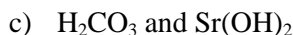
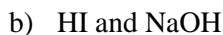
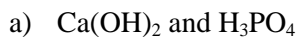
A neutralization reaction is simply a double replacement reaction between an acid and a base in which water and a salt is formed.



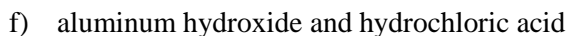
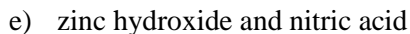
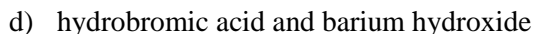
The neutralization portion occurs when the H^+ from the acid reacts with the OH^- from the base to produce water. The salt formed is a byproduct of the reaction made by combining the cation (positive ion) from the base with the anion (negative ion) from the acid.

Always make sure in the end that the chemical equation obeys the law of conservation of mass and is balanced.

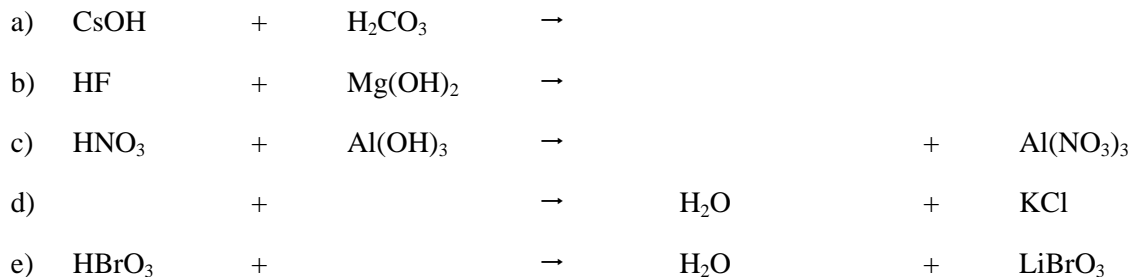
1. Write the balanced chemical equations for the neutralization reactions between:



For each of the following – first write the chemical formula for the acid and base, then complete the neutralization reaction.



2. Complete and balance the following equations representing neutralization reactions:



3. Give the name and the formula of the ionic compound produced by neutralization reactions between the following acids and bases:

Acid and Base reactants	Name of ionic compound	Formula
a) nitric acid and sodium hydroxide		
b) hydroiodic acid and calcium hydroxide		
c) magnesium hydroxide and hydrosulfuric acid		
d) ammonium hydroxide and hydrofluoric acid		
e) barium hydroxide and sulfuric acid		
f) chloric acid and rubidium hydroxide		
g) calcium hydroxide and carbonic acid		

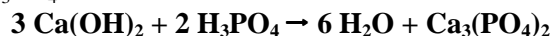
4. For each of the following ionic compounds, identify the acid and base that reacted to form them.

Salt	Acid	Base
a) NaCl		
b) $\text{Ca}_3(\text{PO}_4)_2$		
c) $\text{Zn}(\text{NO}_3)_2$		
d) $\text{Al}(\text{ClO}_3)_3$		
e) NH_4I		

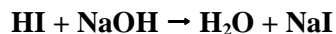
ANSWER KEY

1. Write the balanced chemical equations for the neutralization reactions between:

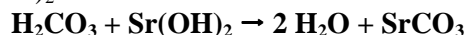
a) Ca(OH)_2 and H_3PO_4



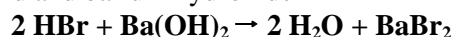
b) HI and NaOH



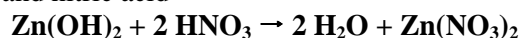
c) H_2CO_3 and Sr(OH)_2



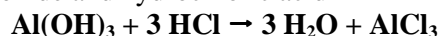
d) hydrobromic acid and barium hydroxide



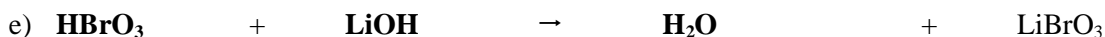
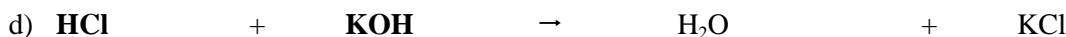
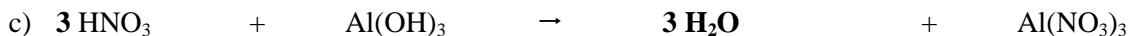
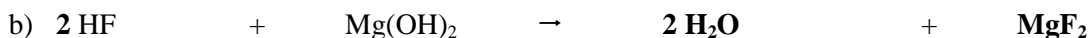
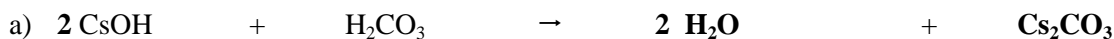
e) zinc hydroxide and nitric acid



f) aluminum hydroxide and hydrochloric acid



2. Complete and balance the following equations representing neutralization reactions:



3. Give the name and the formula of the ionic compound produced by neutralization reactions between the following acids and bases:

Acid and Base reactants	Name of ionic compound	Formula
a) nitric acid and sodium hydroxide	sodium nitrate	NaNO_3
b) hydroiodic acid and calcium hydroxide	calcium iodide	CaI_2
c) magnesium hydroxide and hydrosulfuric acid	magnesium sulfide	MgS
d) ammonium hydroxide and hydrofluoric acid	ammonium fluoride	NH_4F
e) barium hydroxide and sulfuric acid	barium sulfate	BaSO_4
f) chloric acid and rubidium hydroxide	rubidium chlorate	RbClO_3

g) calcium hydroxide and carbonic acid	calcium carbonate	CaCO₃
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4. For each of the following ionic compounds, identify the acid and base that reacted to form them.

	Salt	Acid	Base
a)	NaCl	HCl	NaOH
b)	Ca ₃ (PO ₄) ₂	H₃PO₄	Ca(OH)₂
c)	Zn(NO ₃) ₂	HNO₃	Zn(OH)₂
d)	Al(ClO ₃) ₃	HClO₃	Al(OH)₃
e)	NH ₄ I	HI	NH₄OH