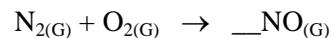


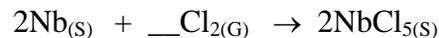
<p>What type of chemical reaction is this:</p> $\text{CH}_{4(\text{G})} + 2\text{O}_{2(\text{G})} \rightarrow 2\text{H}_2\text{O}_{(\text{G})} + \text{CO}_{2(\text{G})}$	<p>What type of chemical reaction set up is this:</p> $\text{C}_5\text{H}_{12} + \text{O}_2 \rightarrow$	<p>What type of chemical reaction is this:</p> $\text{PQ} \rightarrow \text{P} + \text{Q}$	<p>Is this reaction exo or endothermic?</p> $2\text{Mg}_{(\text{S})} + \text{O}_{2(\text{G})} \rightarrow 2\text{MgO}_{(\text{S})} + \text{heat}$
<p>What type of chemical reaction is this:</p> $\text{H}_2\text{O}_2 \rightarrow \text{O}_2 + \text{H}_2\text{O}$	<p>What type of chemical reaction is this:</p> $\text{PF}_{5(\text{S})} \rightarrow \text{P}_{(\text{S})} + \text{F}_{2(\text{G})}$	<p>What type of chemical reaction is this:</p> $\text{RZ}_{(\text{AQ})} + \text{QP}_{(\text{AQ})} \rightarrow \text{RP}_{(\text{AQ})} + \text{QZ}_{(\text{S})}$	<p>Is this reaction exo or endothermic?</p> $\text{Fe}_2\text{S}_{3(\text{S})} + \text{heat} \rightarrow 2\text{Fe}_{(\text{S})} + 3\text{S}_{(\text{S})}$
<p>What type of chemical reaction is this:</p> $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$	<p>What type of chemical reaction set up is this:</p> $\text{Be}(\text{ClO}_4)_{2(\text{AQ})} + \text{MgCrO}_{4(\text{AQ})} \rightarrow$	<p>What type of chemical reaction is this:</p> $\text{WX} + \text{Y} \rightarrow \text{WXY}$	<p>Is this reaction exo or endothermic?</p> $\text{N}_{2(\text{G})} + \text{O}_{2(\text{G})} + \text{heat} \rightarrow 2\text{NO}_{(\text{G})}$
<p>What type of chemical reaction set up is this:</p> $\text{Li}_3\text{PO}_{4(\text{AQ})} + \text{Ca}(\text{HCO}_3)_{2(\text{AQ})} \rightarrow$	<p>What type of chemical reaction set up is this:</p> $\text{NaCl}_{(\text{AQ})} + \text{Li}_{(\text{S})} \rightarrow$	<p>What type of chemical reaction is this:</p> $\text{Q}_{(\text{S})} + \text{ML}_{(\text{AQ})} \rightarrow \text{L}_{(\text{S})} + \text{QM}_{(\text{AQ})}$	<p>Is this reaction exo or endothermic?</p> $\text{CH}_{4(\text{G})} + 2\text{O}_{2(\text{G})} \rightarrow 2\text{H}_2\text{O}_{(\text{G})} + \text{CO}_{2(\text{G})}$
<p>What type of chemical reaction set up is this:</p> $\text{CaCrO}_{4(\text{AQ})} + \text{K}_{(\text{S})} \rightarrow$	<p>What type of chemical reaction is this:</p> $2\text{Mg}_{(\text{S})} + \text{O}_{2(\text{G})} \rightarrow 2\text{MgO}_{(\text{S})}$	<p>What type of chemical reaction is this:</p> $2\text{H}_{2(\text{G})} + \text{O}_{2(\text{G})} \rightarrow 2\text{H}_2\text{O}_{(\text{G})}$	<p>Is this reaction exo or endothermic?</p> $2\text{Al}_2\text{O}_{3(\text{S})} + \text{heat} \rightarrow 4\text{Al}_{(\text{S})} + 3\text{O}_{2(\text{G})}$

$\text{Mg}_{(s)} + \text{O}_{2(g)} \rightarrow 2\text{MgO}_{(s)} + \text{heat}$ <p>Energy is a product = exothermic</p>	$\text{PQ} \rightarrow \text{P} + \text{Q}$ <p>This represents decomposition</p>	$\text{C}_5\text{H}_{12} + \text{O}_2 \rightarrow$ <p>This is the set up for combustion</p>	$\text{CH}_{4(g)} + 2\text{O}_{2(g)} \rightarrow 2\text{H}_2\text{O}_{(g)} + \text{CO}_{2(g)}$ <p>This is combustion</p>
$\text{Fe}_2\text{S}_{3(s)} + \text{heat} \rightarrow 2\text{Fe}_{(s)} + 3\text{S}_{(s)}$ <p>Energy is a reactant = endothermic</p>	$\text{RZ}_{(aq)} + \text{QP}_{(aq)} \rightarrow \text{RP}_{(aq)} + \text{QZ}_{(s)}$ <p>This represents double replacement</p>	$\text{PF}_{5(s)} \rightarrow \text{P}_{(s)} + \text{F}_{2(g)}$ <p>This is decomposition</p>	$\text{H}_2\text{O}_2 \rightarrow \text{O}_2 + \text{H}_2\text{O}$ <p>This is decomposition</p>
$\text{N}_{2(g)} + \text{O}_{2(g)} + \text{heat} \rightarrow 2\text{NO}_{(g)}$ <p>Energy is a reactant = endothermic</p>	$\text{WX} + \text{Y} \rightarrow \text{WXY}$ <p>This represents synthesis</p>	$\text{Be}(\text{ClO}_4)_{2(aq)} + \text{MgCrO}_{4(aq)} \rightarrow$ <p>This is the set up for double replacement</p>	$\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$ <p>This is synthesis</p>
$\text{CH}_{4(g)} + 2\text{O}_{2(g)} \rightarrow 2\text{H}_2\text{O}_{(g)} + \text{CO}_{2(g)}$ <p>Combustion is ALWAYS exothermic</p>	$\text{Q}_{(s)} + \text{ML}_{(aq)} \rightarrow \text{L}_{(s)} + \text{QM}_{(aq)}$ <p>This represents single replacement</p>	$\text{NaCl}_{(aq)} + \text{Li}_{(s)} \rightarrow$ <p>This is the set up for single replacement</p>	$\text{Li}_3\text{PO}_{4(aq)} + \text{Ca}(\text{HCO}_3)_{2(aq)} \rightarrow$ <p>This is the set up for double replacement</p>
$2\text{Al}_2\text{O}_{3(s)} + \text{heat} \rightarrow 4\text{Al}_{(s)} + 3\text{O}_{2(g)}$ <p>Energy is a reactant = endothermic</p>	$2\text{H}_{2(g)} + \text{O}_{2(g)} \rightarrow 2\text{H}_2\text{O}_{(g)}$ <p>This is synthesis</p>	$2\text{Mg}_{(s)} + \text{O}_{2(g)} \rightarrow 2\text{MgO}_{(s)}$ <p>This is synthesis</p>	$\text{CaCrO}_{4(aq)} + \text{K}_{(s)} \rightarrow$ <p>This is the set up for single replacement</p>

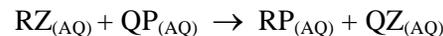
Balance this by filling in the missing coefficient in the equation.



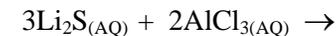
Balance this by filling in the missing coefficient in the equation.



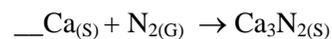
Use Table F, does this reaction occur?



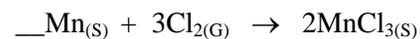
Use Table F, does this reaction occur?



Balance this by filling in the missing coefficient in the equation



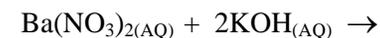
Balance this by filling in the missing coefficient in the equation



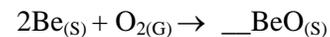
Use Table F, does this reaction occur?



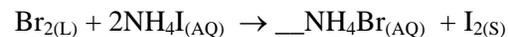
Use Table F, does this reaction occur?



Balance this by filling in the missing coefficient in the equation



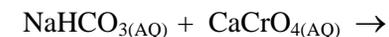
Balance this by filling in the missing coefficient in the equation



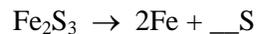
Use Table F, does this reaction occur?



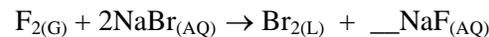
Use Table F, does this reaction occur?



Balance this by filling in the missing coefficient in the equation



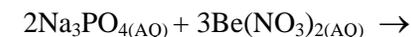
Balance this by filling in the missing coefficient in the equation



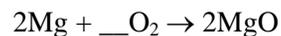
Use Table F, does this reaction occur?



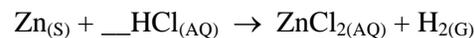
Use Table F, does this reaction occur?



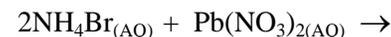
Balance this by filling in the missing coefficient in the equation



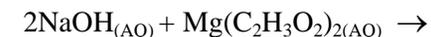
Balance this by filling in the missing coefficient in the equation



Use Table F, does this reaction occur?

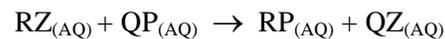


Use Table F, does this reaction occur?



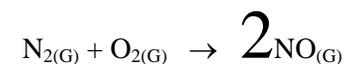


$\text{Al}_2\text{S}_3$  will be solid = YES  
double replacement occurs



These are symbols, not real compounds.

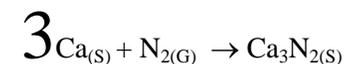
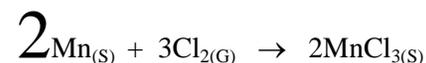
2 AQ products = no reaction



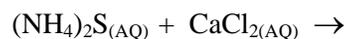
Both products will be AQ, so  
NO, no double replacement here



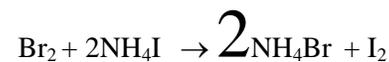
$\text{AgCl}$  will be solid = YES  
double replacement occurs



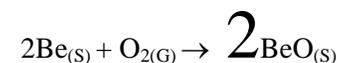
Both products will be AQ, so  
NO, no double replacement here



$\text{CaS}$  will be solid = YES  
double replacement occurs



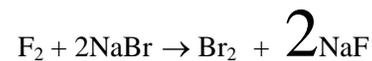
Phase symbols omitted for space



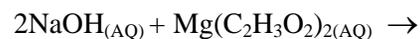
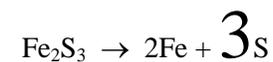
$\text{Be}_3(\text{PO}_4)_{2(\text{S})}$  forms = YES  
double replacement occurs



Both products will be AQ, so  
NO, no double replacement here



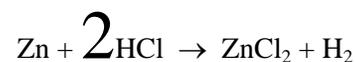
Phase symbols omitted for space



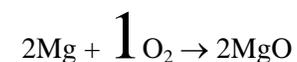
$\text{Mg}(\text{OH})_{2(\text{S})}$  forms = YES  
double replacement occurs



$\text{PbBr}_{2(\text{S})}$  forms = YES  
double replacement occurs



Phase symbols omitted for space

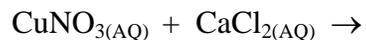


We don't write "one" but it is 1.

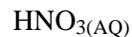
<p>Use table F, is this compound aqueous or solid in water?</p> <p><math>\text{Cs}_2\text{S}</math></p>	<p>Use table F, is this compound aqueous or solid in water?</p> <p><math>\text{Mg}_3(\text{PO}_4)_2</math></p>	<p>Is this a cation replacement or an anion replacement reaction?</p> <p><math>\text{Zn}_{(\text{s})} + 2\text{HCl}_{(\text{aq})} \rightarrow \text{ZnCl}_{2(\text{aq})} + \text{H}_{2(\text{g})}</math></p>	<p>Is this a cation replacement or an anion replacement reaction?</p> <p><math>\text{F}_{2(\text{l})} + 2\text{NH}_4\text{I}_{(\text{aq})} \rightarrow 2\text{NH}_4\text{F}_{(\text{aq})} + \text{I}_{2(\text{s})}</math></p>
<p>Use table F, is this compound aqueous or solid in water?</p> <p><math>\text{SrI}_2</math></p>	<p>Use table F, is this compound aqueous or solid in water?</p> <p><math>\text{K}_2\text{CO}_3</math></p>	<p>Is this a cation replacement or an anion replacement reaction?</p> <p><math>\text{F}_{2(\text{g})} + 2\text{NaBr}_{(\text{aq})} \rightarrow \text{Br}_{2(\text{l})} + 2\text{NaF}_{(\text{aq})}</math></p>	<p>Use table J, is this reaction possible?</p> <p><math>\text{Cl}_{2(\text{l})} + 2\text{NH}_4\text{I}_{(\text{aq})} \rightarrow</math></p>
<p>Use table F, is this compound aqueous or solid in water?</p> <p><math>\text{CuSO}_4</math></p>	<p>Use table F, is this compound aqueous or solid in water?</p> <p><math>\text{NaOH}</math></p>	<p>Is this a cation replacement or an anion replacement reaction?</p> <p><math>\text{Br}_{2(\text{l})} + 2\text{NH}_4\text{I}_{(\text{aq})} \rightarrow 2\text{NH}_4\text{Br}_{(\text{aq})} + \text{I}_{2(\text{s})}</math></p>	<p>Use table J, is this reaction possible?</p> <p><math>\text{Rb}_{(\text{s})} + \text{Ni}(\text{ClO}_3)_{2(\text{aq})} \rightarrow</math></p>
<p>Use table F, is this compound aqueous or solid in water?</p> <p><math>\text{TiCl}_4</math></p>	<p>Use table F, is this compound aqueous or solid in water?</p> <p><math>\text{Ba}(\text{C}_2\text{H}_3\text{O}_2)_2</math></p>	<p>Is this a cation replacement or an anion replacement reaction?</p> <p><math>\text{Ba}(\text{ClO}_3)_{2(\text{aq})} + 2\text{Li}_{(\text{s})} \rightarrow 2\text{LiClO}_{3(\text{aq})} + \text{Ba}_{(\text{s})}</math></p>	<p>Use table J, is this reaction possible?</p> <p><math>\text{Ni}_{(\text{s})} + \text{Rb}(\text{ClO}_3)_{2(\text{aq})} \rightarrow</math></p>
<p>Use table F, is this compound aqueous or solid in water?</p> <p><math>\text{CaCl}_2</math></p>	<p>Use table F, is this compound aqueous or solid in water?</p> <p><math>\text{NH}_4\text{C}_2\text{H}_3\text{O}_2</math></p>	<p>Is this a cation replacement or an anion replacement reaction?</p> <p><math>3\text{Al}_{(\text{s})} + 2\text{Ni}(\text{ClO}_3)_{2(\text{aq})} \rightarrow 3\text{Al}(\text{ClO}_3)_{3(\text{aq})} + 2\text{Ni}_{(\text{s})}</math></p>	<p>Use table J, is this reaction possible?</p> <p><math>\text{Co}_{(\text{s})} + \text{Fe}(\text{NO}_3)_{2(\text{aq})} \rightarrow</math></p>

<p>ANION replacement</p> $\text{F}_{2(\text{L})} + 2\text{NH}_4\text{I}_{(\text{AQ})} \rightarrow 2\text{NH}_4\text{F}_{(\text{AQ})} + \text{I}_{2(\text{S})}$	<p>CATION replacement</p> $\text{Zn}_{(\text{S})} + 2\text{HCl}_{(\text{AQ})} \rightarrow \text{ZnCl}_{2(\text{AQ})} + \text{H}_{2(\text{G})}$	$\text{Mg}_3(\text{PO}_4)_2(\text{AQ})$	$\text{Cs}_2\text{S}_{(\text{S})}$
<p><math>\text{Cl}_{2(\text{L})} + 2\text{NH}_4\text{I}_{(\text{AQ})} \rightarrow</math> Yes, <math>\text{NH}_4\text{Cl}_{(\text{AQ})}</math> forms</p>	<p>ANION replacement</p> $\text{F}_{2(\text{G})} + 2\text{NaBr}_{(\text{AQ})} \rightarrow \text{Br}_{2(\text{L})} + 2\text{NaF}_{(\text{AQ})}$	$\text{K}_2\text{CO}_3(\text{AQ})$	$\text{SrI}_{2(\text{AQ})}$
<p><math>\text{Rb}_{(\text{S})} + \text{Ni}(\text{ClO}_3)_2(\text{AQ}) \rightarrow</math> Yes, <math>\text{RbClO}_3</math> forms</p>	<p>ANION replacement</p> $\text{Br}_{2(\text{L})} + 2\text{NH}_4\text{I}_{(\text{AQ})} \rightarrow 2\text{NH}_4\text{Br}_{(\text{AQ})} + \text{I}_{2(\text{S})}$	$\text{NaOH}_{(\text{AQ})}$	$\text{CuSO}_4(\text{S})$
<p><math>\text{Ni}_{(\text{S})} + \text{Rb}(\text{ClO}_3)_2(\text{AQ}) \rightarrow</math> No, Rb is “higher” on table J than Ni</p>	<p>CATION replacement</p> $\text{Ba}(\text{ClO}_3)_2(\text{AQ}) + 2\text{Li}_{(\text{S})} \rightarrow 2\text{LiClO}_3(\text{AQ}) + \text{Ba}_{(\text{S})}$	$\text{Ba}(\text{C}_2\text{H}_3\text{O}_2)_2(\text{AQ})$	$\text{TiCl}_4(\text{AQ})$
<p><math>\text{Co}_{(\text{S})} + \text{Fe}(\text{NO}_3)_2(\text{AQ}) \rightarrow</math> No, Fe is “higher” on table J than Co</p>	<p>CATION replacement</p> $3\text{Al}_{(\text{S})} + 2\text{Ni}(\text{ClO}_3)_2(\text{AQ}) \rightarrow 3\text{Al}(\text{ClO}_3)_3(\text{AQ}) + 2\text{Ni}_{(\text{S})}$	$\text{NH}_4\text{C}_2\text{H}_3\text{O}_2(\text{AQ})$	$\text{CaCl}_2(\text{AQ})$

Use table F,  
is this double replacement?



Is this an acid or a base?



Using Table J, is this a single  
replacement reaction or not?



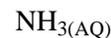
Using Table J, is this a single  
replacement reaction or not?



Use table F,  
is this double replacement?



Is this an acid or a base?



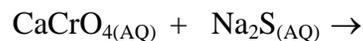
Using Table J, is this a single  
replacement reaction or not?



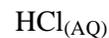
Using Table J, is this a single  
replacement reaction or not?



Use table F,  
is this double replacement?



Is this an acid or a base?



Using Table J, is this a single  
replacement reaction or not?



Using Table J, is this a single  
replacement reaction or not?



Use table F,  
is this double replacement?



Is this an acid or a base?



Using Table J, is this a single  
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Using Table J, is this a single  
replacement reaction or not?



Is this an acid or a base?



Is this an acid or a base?



Using Table J, is this a single  
replacement reaction or not?



Using Table J, is this a single  
replacement reaction or not?



$\text{F}_{2(\text{G})} + 2\text{HCl}_{(\text{AQ})} \rightarrow$ <p>Single Replacement = Yes fluorine replaces chlorine here.</p>	$\text{Ba}_{(\text{S})} + \text{SnCl}_{4(\text{AQ})} \rightarrow$ <p>Single Replacement = Yes barium replaces tin here.</p>	$\text{HNO}_{3(\text{AQ})}$ <p>This is nitric acid</p>	$\text{CuNO}_{3(\text{AQ})} + \text{CaCl}_{2(\text{AQ})} \rightarrow$ <p>Yes, double replacement here <math>\text{CuCl}_{2(\text{S})}</math> forms</p>
$\text{Ca}_{(\text{S})} + \text{HCl}_{(\text{AQ})} \rightarrow$ <p>Single Replacement = Yes calcium replaces hydrogen here.</p>	$\text{Li}_{(\text{S})} + \text{KCl}_{(\text{AQ})} \rightarrow$ <p>Single Replacement = Yes lithium replaces potassium here.</p>	$\text{NH}_{3(\text{AQ})}$ <p>This is ammonia, which is a weak base</p>	$\text{AgHCO}_{3(\text{AQ})} + \text{FeBr}_{2(\text{AQ})} \rightarrow$ <p>No double replacement here, both products are AQ</p>
$\text{Ti}_{(\text{S})} + \text{SnBr}_{2(\text{AQ})} \rightarrow$ <p>Single Replacement = Yes titanium replaces tin here.</p>	$\text{Zn}_{(\text{S})} + \text{CuSO}_{4(\text{AQ})} \rightarrow$ <p>Single Replacement = Yes zinc replaces copper here.</p>	$\text{HCl}_{(\text{AQ})}$ <p>This is hydrochloric acid</p>	$\text{CaCrO}_{4(\text{AQ})} + \text{Na}_2\text{S}_{(\text{AQ})} \rightarrow$ <p>Yes, double replacement here <math>\text{CaS}_{(\text{S})}</math> forms</p>
$\text{Al}_{(\text{S})} + \text{Ba}(\text{ClO}_3)_{2(\text{AQ})} \rightarrow$ <p>Single Replacement = No Al cannot replace Ba here.</p>	$\text{Ag}_{(\text{S})} + \text{AuF}_{3(\text{AQ})} \rightarrow$ <p>Single Replacement = Yes silver replaces gold here.</p>	$\text{KOH}_{(\text{AQ})}$ <p>This is potassium hydroxide, which is a strong base</p>	$(\text{NH}_4)_3\text{PO}_{4(\text{AQ})} + \text{RbNO}_{3(\text{AQ})} \rightarrow$ <p>No double replacement here, both products are AQ</p>
$\text{Sr}_{(\text{S})} + \text{Pb}(\text{NO}_4)_{4(\text{AQ})} \rightarrow$ <p>Single Replacement = Yes strontium replaces lead here.</p>	$\text{Mg}_{(\text{S})} + \text{NaCl}_{(\text{AQ})} \rightarrow$ <p>Single Replacement = No Mg cannot replace Na here.</p>	$\text{H}_2\text{SO}_{4(\text{AQ})}$ <p>This is sulfuric acid</p>	$\text{H}_3\text{PO}_{4(\text{AQ})}$ <p>This is Phosphoric acid</p>