Which of these is the formula for disulfur heptoxide?

A. S_2O_7 
B. S_7O_2
C. SO_2
D. N_2O

Which of these is the correct chemical formula for a molecule of oxygen?

A. O
B. O^{-2}
C. O^{+2}
D. O_2 

Which of these is the correct name for BF_3?

A. Boron fluoride
B. Boron trifluorate
C. Boron perfluorate
D. Boron trifluoride

Which of these is the correct name of the molecular compound, Cr_2O_7?

A. Dichromate
B. Monochromium tetroxide
C. Dichromium heptoxide
D. Dichromium oxide

Which of these is the charge on the ion formed when sulfur gains 2 electrons?

A. +2
B. -2 
C. +3
D. -3

How many oxygen atoms are represented in $Ca_3(PO_4)_2$?

A. 1
B. 4
C. 8 
D. 12

Which of these salts is formed from the ions, Li^+ and SO_4^{2-}?

A. $LiSO_4$
B. Li_2SO_4 
C. $Li(SO_4)_2$
D. $Li_3(PO_4)_2$

What is the oxidation number of the Fe atom in $Fe_3(PO_4)_2$?

A. -2
B. +2 
C. +3
D. -3

Which of these is the formula for aluminum phosphide?

A. AlP 
B. Al_2P_3
C. Al_3P_2
D. $Al_2(PO_4)_3$

Which of these is the formula for calcium nitride?

A. CaN
B. Ca_2N_3
C. Ca_3N_2 
D. $Ca(NO_3)_2$

Which of these is true of a balanced equation?

A. The total number of atoms changes.
B. The kinds of molecules remain the same.
C. The total number of molecules remains the same.
D. The number of atoms of each element remains the same.

What are the coefficients for the following equation?

$$\_\_\_Al_2(SO_4)_3 + \_\_\_KOH \rightarrow \_\_\_Al(OH)_3 + \_\_\_K_2SO_4$$

A. 1, 3, 2, 3
B. 1, 6, 2, 3 
C. 2, 12, 4, 6
D. 4, 6, 2, 3

What is the coefficient for $MgCl_2$ when the equation is balanced?

$$\_\_\_Mg + \_\_\_HCl \rightarrow \_\_\_MgCl_2 + \_\_\_H_2$$

A. 1
B. 2
C. 3
D. 6

Potassium metal reacts with water to form potassium hydroxide and hydrogen gas

Which of these chemical equations <u>best</u> represents the word equation?

A. $K + H_2O \rightarrow KOH + 2H$

B. $K + H_2O \rightarrow KO + H_2$

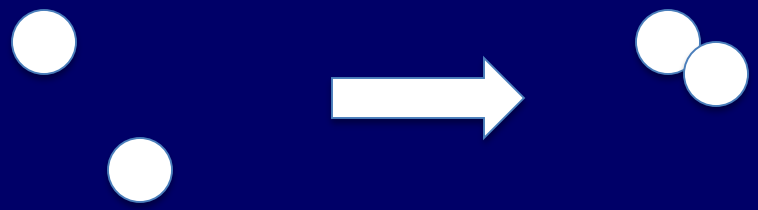
C. $K + 2H_2O \rightarrow K(OH)_2 + H_2$

D. $2K + 2H_2O \rightarrow 2KOH + H_2$ 

Potassium chlorate decomposes to form potassium chloride and oxygen. Which of these is the balanced equation

A. $2KClO_3 \rightarrow 2KCl + 3O_2$ 
B. $KClO_3 \rightarrow KCl + O$
C. $2KClO_3 \rightarrow KCl_2 + O_2$
D. $3KClO_3 \rightarrow 2KCl + 4O_2$

What type of reaction is shown below?



A. Combination
B. Decomposition
C. Single replacement
D. Double replacement

The following equation is an example of which type of reaction?

$$2H_2O \rightarrow 2H_2 + O_2$$

A. Combination
B. Decomposition 
C. Single Replacement
D. Double Replacement

Which of these reactants is common to all combustion reactions?

A. CO_2
B. H_2
C. O_2 
D. H_2O

Determine the coefficient and formula of the missing product for the complete combustion of

$$2C_4H_{10} + 13O_2 \rightarrow 9CO_2 + ?$$

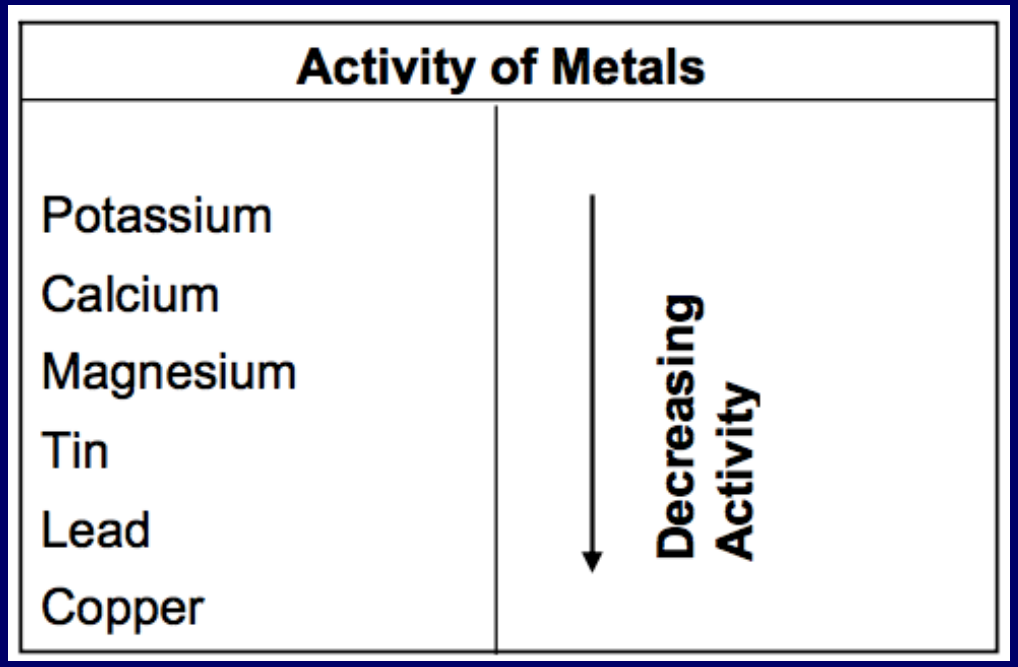
A. $2H_2$
B. O_2
C. $2H_2O$
D. $10H_2O$ 

What are the correct formulas and coefficients for the products of this double replacement reaction?

$$2KOH + H_2SO_4 \rightarrow$$

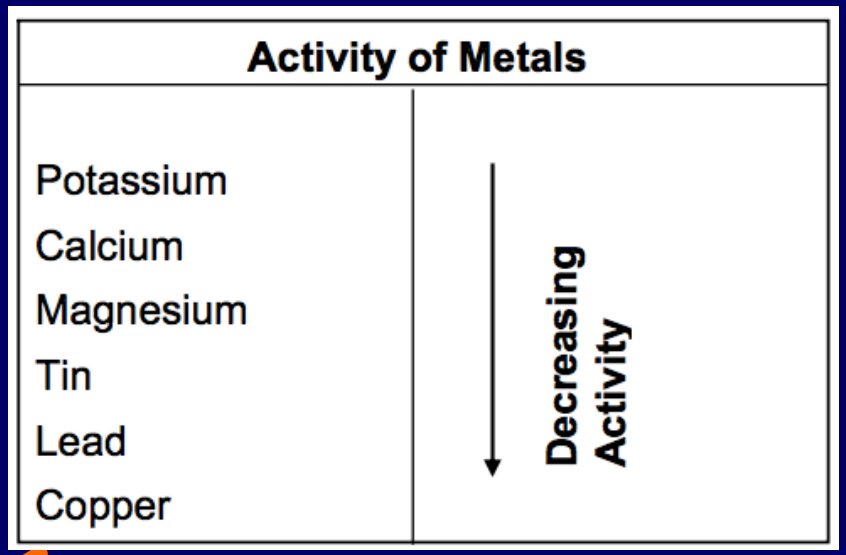
A. $K(SO_4)_3 + H_2O$
B. $KSO_4 + 2H_2O$
C. $K_2SO_4 + 2H_2O$ 
D. $3KSO_4 + 4H_2O$

A strip of copper metal is added to a solution containing a compound of each metal. Which of these metals would copper displace?



A. Lead only
B. Potassium, calcium, and magnesium
C. All the metals except copper
D. None of the metals

A metal is added to a solution containing compounds of potassium and magnesium. Which of these metals would replace magnesium but not potassium?



A. Calcium
B. Copper
C. Tin or lead or copper
D. None of the listed metals would produce the desired effect

What must be true in order for the following reaction to occur?

$$3K + AlCl_3 \rightarrow 3KCl + Al$$

A. Al must be above Cl on the activity series.
B. K must be above Al on the activity series
C. Al must be above K on the activity series.
D. K must be above Cl on the activity series.

What must be true in order for the following reaction to occur?

$$2Na + ZnCl_2 \rightarrow 2NaCl + Zn$$

A. Zn must be above Cl on the activity series.
B. Na must be above Cl on the activity series
C. Na must be above Zn on the activity series. 
D. Zn must be above Na on the activity series.

$$Zn + Cu(NO_3)_2 \rightarrow Zn(NO_3)_2 + Cu$$

$$Zn + Pb(NO_3)_2 \rightarrow Zn(NO_3)_2 + Pb$$

$$Zn + NaNO_3 \rightarrow \text{No Reaction}$$

$$Pb + Cu(NO_3)_2 \rightarrow Pb(NO_3)_2 + Cu$$

Which of these ranks the metals from least reactive to most reactive?

A. Cu, Pb, Zn, Na ←
B. Pb, Cu, Zn, Na
C. Cu, Pb, Na, Zn
D. Na, Zn, Pb, Cu

What is the most likely charge on an ion of nitrogen?

A. -5
B. -3 
C. +3
D. +5

What is the coefficient and symbol for potassium iodide?

bromine + potassium iodide → potassium bromide + iodine

A. $2KI^-$

B. $2KI_2$

C. $2KI$ 

D. K_2

A chemist places a piece of zinc in a solution of lead(II) nitrate and notices pieces of lead drop out of solution.

What type of reaction has taken place?

A. Combination
B. Decomposition
C. Single replacement
D. Double replacement

What are the coefficients for the following equation?

$$\_\_\_C_4H_{10} + \_\_\_O_2 \rightarrow \_\_\_CO_2 + \_\_\_H_2O$$

A. 1, 6, 4, 5
B. 1, 6.5, 4, 5
C. 2, 13, 8, 10 
D. 2, 12, 8, 10

What is the coefficient for O_2 when the equation is balanced?

$$\_\_\_C_{10}H_{22} + \_\_\_O_2 \rightarrow \_\_\_CO_2 + \_\_\_H_2O$$

A. 15
B. 16
C. 30
D. 31 

Activity Series & Balancing Equations

A chemist places a piece of magnesium in copper (I) sulfate and notices pieces of copper drop out of solution.

- **Write a balanced equation, predict the products, and identify the type of reaction.**
- **Explain why this type of reaction occurs**

Be sure to include:

a) **The written and balanced chemical equation**
b) **The type of reaction**
c) **Justification for the reaction type and why the reaction occurs**

a) **The written and balanced chemical equation**

$$Mg + Cu_2SO_4 \rightarrow MgSO_4 + 2Cu$$

b) The type of reaction

Single replacement reaction

C. Justification for the reaction type and why the reaction occurs

Magnesium is more active than copper, so it has higher tendency to donate its electrons to copper. This causes copper to accept the electrons and come out of solution as a solid and for magnesium to enter the solution as an ion.