

A. Balance and complete each of the following reactions. Name the products formed.

1.  $\text{Ca(s)} + \text{O}_2\text{(g)} \rightarrow$
2.  $\text{Na(s)} + \text{O}_2\text{(g)} \rightarrow$
3.  $\text{Al(s)} + \text{O}_2\text{(g)} \rightarrow$
4.  $\text{C(s)} + \text{O}_2\text{(g)} \rightarrow$
5.  $\text{Si(s)} + \text{O}_2\text{(g)} \rightarrow$
6.  $\text{C}_2\text{H}_6 + \text{O}_2\text{(g)} \rightarrow$
7.  $\text{C}_2\text{H}_5\text{OH} + \text{O}_2\text{(g)} \rightarrow$
8.  $\text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2\text{(g)} \rightarrow$
9.  $\text{Na}_2\text{O} + \text{H}_2\text{O} \rightarrow$
10.  $\text{CaO} + \text{H}_2\text{O} \rightarrow$
11.  $\text{MgO} + \text{H}_2\text{O} \rightarrow$
12.  $\text{ZnO} + \text{H}_2\text{O} \rightarrow$
13.  $\text{SrO} + \text{H}_2\text{O} \rightarrow$
14.  $\text{P}_4\text{O}_6 + \text{H}_2\text{O} \rightarrow$
15.  $\text{SO}_3 + \text{H}_2\text{O} \rightarrow$
16.  $\text{N}_2\text{O}_5 + \text{H}_2\text{O} \rightarrow$
17.  $\text{Cl}_2\text{O}_5 + \text{H}_2\text{O} \rightarrow$
18.  $\text{H}_2\text{(g)} + \text{O}_2\text{(g)} \rightarrow$

see following  
pages

note: you do not need  
to insert "(s)",  
"(l)", "(aq)", + "(g)"  
suffixes.

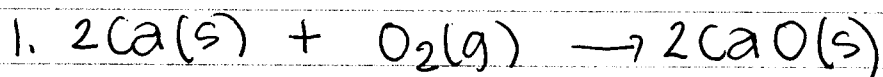
B. Name the following polyatomic ions.

FLASH CARDS

1.  $\text{CO}_3^{-2}$  carbonate ion
2.  $\text{PO}_3^{-3}$  phosphite ion
3.  $\text{OH}^{-1}$  hydroxide ion
4.  $\text{NO}_3^{-1}$  nitrate ion
5.  $\text{NH}_4^{+1}$  ammonium ion

6.  $\text{SO}_3^{-2}$  sulfite ion
7.  $\text{PO}_4^{-3}$  phosphate ion
8.  $\text{SO}_4^{-2}$  sulfate ion
9.  $\text{CN}^{-1}$  cyanide ion
10.  $\text{NO}_2^{-1}$  nitrite ion

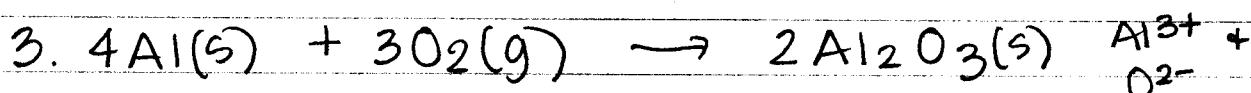
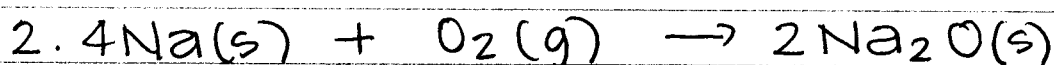
A.



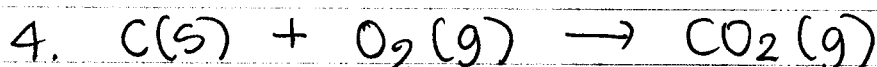
(metal +  $\text{O}_2 \rightarrow$  metal oxide)

$\text{CaO}$  = calcium oxide

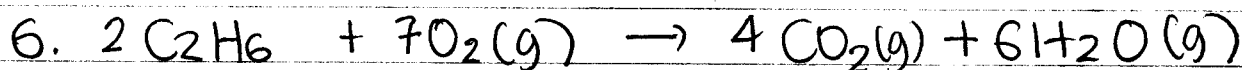
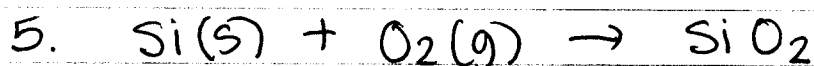
$\text{Ca}^{2+}$  (alkaline earth)  
 $\text{O}^{2-}$  oxide ion



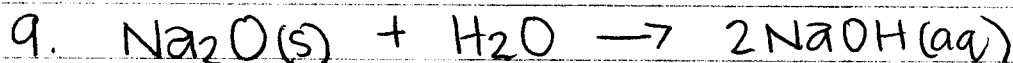
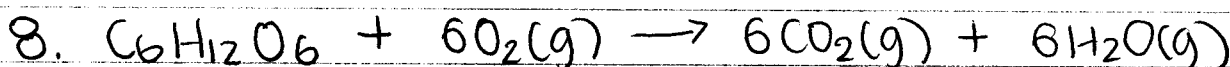
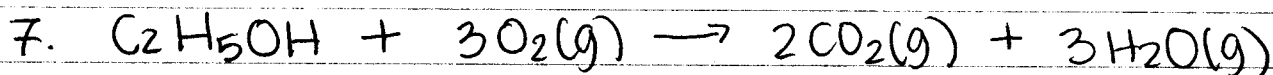
$\text{Al}^{3+}$  +  
 $\text{O}^{2-}$



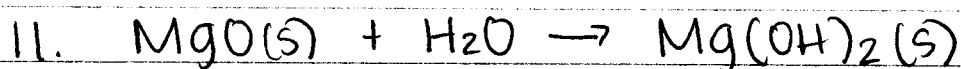
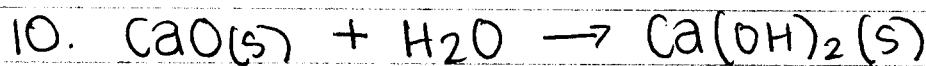
(non-metal +  $\text{O}_2 \rightarrow$  non-metal oxide)



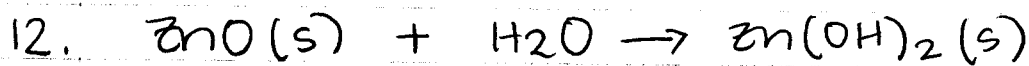
(hydrocarbon +  $\text{O}_2 \rightarrow$  carbon dioxide + water)



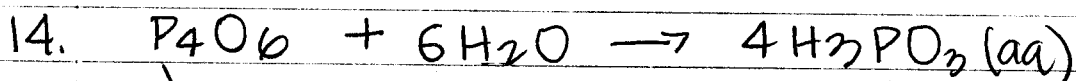
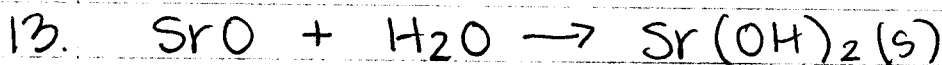
(metal oxide + water  $\rightarrow$  base)



A. continued



↑  
charge on Zn  
is +2  
Why? O ⇒ -2 charge



↘ P = +3  
oxidation state

↘ +3 oxidation state here



↑  
+6 oxidation state

↑  
+6 oxidation state

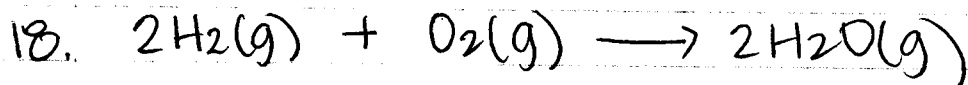
(non-metal oxide + water → acid)



↑  
+5 oxidation  
state

↑  
+5 oxidation state

17. skip



$$\textcircled{f} 96\text{g O}_2 \times \frac{1\text{ mole O}_2}{32.0\text{g O}_2} \times \frac{2\text{ moles KClO}_3}{3\text{ moles O}_2} \times \frac{122.5\text{g}}{1\text{ mole KClO}_3} =$$

C. Practice Quiz Problems.

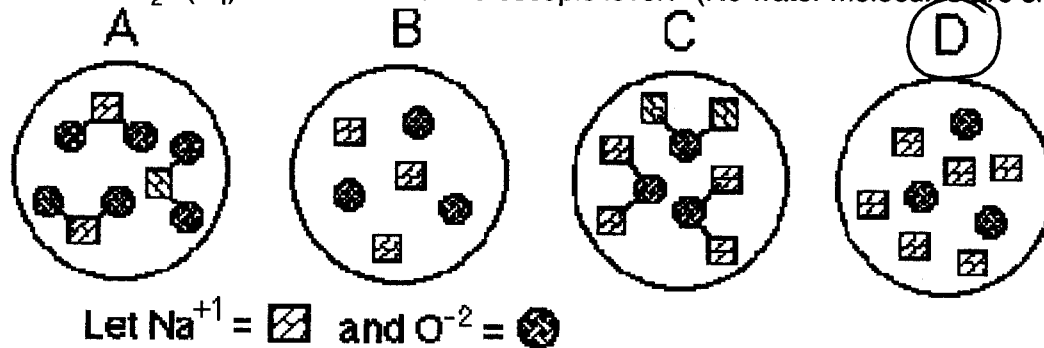
1. Using the equation,  $2\text{KClO}_3 \rightarrow 2\text{KCl} + 3\text{O}_2$ , calculate how many grams of potassium chlorate would be decomposed in producing 96 grams of oxygen.

- a. 61.3 grams  
 b. 122.5 grams  
 c. 100 grams  
 d. 245 grams  $\textcircled{f}$   
 e. none of these

2. Consider the equation:  $\text{P}_4(\text{s}) + 5\text{O}_2(\text{g}) \rightarrow \text{P}_4\text{O}_{10}(\text{s})$ . The tetraphosphorus decoxide formed when 1 gram of phosphorus is burned in pure oxygen will weigh:

- a. slightly less than the original phosphorus.  
 b. the same as the original phosphorus.  
 c. more than the original phosphorus. (combines with  $\text{O}_2$  from the air!)  $\textcircled{c}$   
 d. considerably less than the original phosphorus.  
 e. none of these.

3. What does  $\text{Na}_2\text{O}(\text{aq})$  look like at the microscopic level? (No water molecules are shown)



4. When phosphorus is burned in the air, the resulting oxide is classified as:

- a. a basic oxide  
 b. an acid anhydride  $\textcircled{b}$   
 c. a basic anhydride  
 d. a metallic oxide  
 e. a hydroxide

5. If sulfur trioxide is added to water, the resulting product is:

- a.  $\text{H}_2\text{SO}_3$   
 b.  $\text{H}_2\text{SO}_4$   $\textcircled{b}$   
 c.  $\text{H}_2\text{S}$   
 d.  $\text{SO}_2$   
 e. none of these

6. A non-metallic oxide when added to water will react to form a

- a. binary acid  
 b. base  
 c. salt  
 d. ternary acid  $\textcircled{d}$   
 e. none of these

7. If  $\text{P}_4\text{O}_{10}$  is mixed with water, the result is:

- a.  $\text{H}_3\text{PO}_4$   $\textcircled{a}$   
 b.  $\text{H}_3\text{PO}_3$   
 c.  $\text{PH}_3$   
 d.  $\text{H}_2\text{P}_4\text{O}_{11}$   
 e. no reaction

Complete and balance the following reactions.

