

Write correct skeleton equations for these synthesis reactions, then balance. Pay attention to substances that react with water, the product will usually be dissolved in water. Unless you are told that a substance is a liquid or gas, assume that it is a solid. Label the reaction as redox or not.

1. Magnesium chloride and oxygen gas react.
2. Sodium and oxygen gas react
3. Solid diphosphorus pentoxide combine with liquid water to produce aqueous phosphoric acid (one of those six acids you have been asked to memorize.)
4. Aqueous potassium hydroxide is the product of the synthesis of potassium oxide and liquid water.
5. Barium oxide reacts with gaseous carbon dioxide.
6. Aluminum oxide reacts with gaseous carbon dioxide
7. Aqueous nitric acid is the product of the combination of gaseous dinitrogen pentoxide and water.
8. Sodium chloride and oxygen gas react.
9. Radium and chlorine gas react.
10. Aluminum oxide combines with liquid water to produce aqueous aluminum hydroxide.

## ANSWERS

- skeleton:  $\text{MgCl}_{2(s)} + \text{O}_{2(g)} \rightarrow \text{Mg}(\text{ClO}_3)_{2(s)}$   
 balanced:  $\text{MgCl}_{2(s)} + 3 \text{O}_{2(g)} \rightarrow \text{Mg}(\text{ClO}_3)_{2(s)}$  redox
- skeleton:  $\text{Na}_{(s)} + \text{O}_{2(g)} \rightarrow \text{Na}_2\text{O}_{(s)}$   
 balanced:  $4 \text{Na}_{(s)} + \text{O}_{2(g)} \rightarrow 2 \text{Na}_2\text{O}_{(s)}$  redox
- skeleton:  $\text{P}_2\text{O}_{5(s)} + \text{H}_2\text{O}_{(L)} \rightarrow \text{H}_3\text{PO}_4$   
 balanced:  $\text{P}_2\text{O}_{5(s)} + 3 \text{H}_2\text{O}_{(L)} \rightarrow 2 \text{H}_3\text{PO}_4$  not redox
- skeleton:  $\text{K}_2\text{O}_{(s)} + \text{H}_2\text{O}_{(L)} \rightarrow \text{KOH}_{(aq)}$   
 balanced:  $\text{K}_2\text{O}_{(s)} + \text{H}_2\text{O}_{(L)} \rightarrow 2 \text{KOH}_{(aq)}$  not redox
- skeleton:  $\text{BaO}_{(s)} + \text{CO}_{2(g)} \rightarrow \text{BaCO}_{3(s)}$   
 balanced: already balanced not redox
- skeleton:  $\text{Al}_2\text{O}_{3(s)} + \text{CO}_{2(g)} \rightarrow \text{Al}_2(\text{CO}_3)_{3(s)}$   
 balanced:  $\text{Al}_2\text{O}_{3(s)} + 3 \text{CO}_{2(g)} \rightarrow \text{Al}_2(\text{CO}_3)_{3(s)}$  not redox
- skeleton:  $\text{N}_2\text{O}_{5(g)} + \text{H}_2\text{O}_{(L)} \rightarrow \text{HNO}_3_{(aq)}$   
 balanced:  $\text{N}_2\text{O}_{5(g)} + \text{H}_2\text{O}_{(L)} \rightarrow 2 \text{HNO}_3_{(aq)}$  not redox
- skeleton:  $\text{NaCl}_{(s)} + \text{O}_{2(g)} \rightarrow \text{NaClO}_3_{(s)}$   
 balanced:  $2 \text{NaCl}_{(s)} + 3 \text{O}_{2(g)} \rightarrow 2 \text{NaClO}_3_{(s)}$  redox
- skeleton:  $\text{Ra}_{(s)} + \text{Cl}_{2(g)} \rightarrow \text{RaCl}_{2(s)}$   
 balanced: already balanced redox
- skeleton:  $\text{Al}_2\text{O}_{3(s)} + \text{H}_2\text{O}_{(L)} \rightarrow \text{Al}(\text{OH})_3_{(aq)}$   
 balanced:  $\text{Al}_2\text{O}_{3(s)} + 3 \text{H}_2\text{O}_{(L)} \rightarrow 2 \text{Al}(\text{OH})_3_{(aq)}$  not redox