

## Predicting Products of Chemical Reactions

This worksheet is designed to help you predict products of simple reactions of the four basic reaction types (synthesis, decomposition, single replacement, and double replacement) and combustion reactions.

For the first few reactions, the type of reaction is listed, you should predict the products, then balance. Further questions just have the reactants listed and you should decide on the type of reaction, as well as the correct products. Many of these reactions fall into the category of redox reactions, though do not let that confuse you...each can be described in terms of the four basic reaction types (except the combustion reactions).

Although states (s, l, g, aq) of the reactants and products are very important in a chemical reaction, don't worry about determining those for these problems. Rather, focus on what products might result from the reactants given. Pay particular attention to the ionic charge of species that you know form ions with only one possible charge (*e.g.*, alkali metals, alkaline earth metals, halogens, etc.)

- a. Combustion:  $C_6H_{12} + O_2 \rightarrow$
- b. Combustion:  $C_4H_6 + O_2 \rightarrow$
- c. Combustion:  $C_6H_{10}O_3 + O_2 \rightarrow$
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1. Synthesis:  $Mg + I_2 \rightarrow$
2. Double displacement:  $CuCl_2 + H_2S \rightarrow$
3. Double displacement:  $NaOH + HClO_4 \rightarrow$
4. Decomposition:  $ZnCO_3 + \text{heat} \rightarrow$
5. Single replacement:  $HCl + Zn \rightarrow$
6. \_\_\_\_\_  $Na + MgCl_2 \rightarrow$
7. \_\_\_\_\_  $CaCl_2 + K_2CO_3 \rightarrow$
8. \_\_\_\_\_  $K + Cl_2 \rightarrow$
9. \_\_\_\_\_  $BaCl_2 + K_3PO_4 \rightarrow$
10. \_\_\_\_\_  $H_2SO_4 + KOH \rightarrow$
11. \_\_\_\_\_  $Al_2(CO_3)_3 + \text{heat} \rightarrow$
12. \_\_\_\_\_  $Al + O_2 \rightarrow$
13. \_\_\_\_\_  $Pb(NO_3)_2 + KOH \rightarrow$
14. \_\_\_\_\_  $H_2SO_4 + BaCl_2 \rightarrow$
15. \_\_\_\_\_  $Ca + AgCl \rightarrow$
16. \_\_\_\_\_  $H_3PO_4 + FeBr_3 \rightarrow$
17. \_\_\_\_\_  $Li + N_2 \rightarrow$
18. \_\_\_\_\_  $HCl + Mg(OH)_2 \rightarrow$
19. \_\_\_\_\_  $Mg(OH)_2 + \text{heat} \rightarrow$
20. \_\_\_\_\_  $Fe(OH)_3 + \text{heat} \rightarrow$