

ANSWER KEY

PREDICTING PRODUCTS OF CHEMICAL REACTIONS

Name _____

Predict the products of the reactions below. Then, write the balanced equation and classify the reaction.

- magnesium bromide + chlorine
 $MgBr_2 + Cl_2 \rightarrow MgCl_2 + Br_2$ anionic single replacement
- aluminum + iron (III) oxide
 $Al + Fe_2O_3 \rightarrow Fe + Al_2O_3$ cationic single replacement
- silver nitrate + zinc chloride
 $2AgNO_3 + ZnCl_2 \rightarrow 2AgCl + Zn(NO_3)_2$ double replacement
- hydrogen peroxide (catalyzed by manganese dioxide)
 $2H_2O_2 \xrightarrow{MnO_2} 2H_2O + O_2$ decomposition
- zinc + hydrochloric acid
 $Zn + 2HCl \rightarrow ZnCl_2 + H_2$ cationic single replacement
- sulfuric acid + sodium hydroxide
 $H_2SO_4 + 2NaOH \rightarrow Na_2SO_4 + 2H_2O$ double replacement (neutralization)
- sodium + hydrogen
 $2Na + H_2 \rightarrow 2NaH$ synthesis
- acetic acid + copper
 $CH_3COOH + Cu \rightarrow$ no reaction (or $HC_2H_3O_2$) cationic single replacement

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BALANCING CHEMICAL EQUATIONS

Name _____

Rewrite and balance the equations below.

- $N_2 + 3H_2 \rightarrow 2NH_3$
- $2KClO_3 \rightarrow 2KCl + 3O_2$
- $2NaCl + Fe \rightarrow 2NaF + Cl_2$
- $2H_2 + O_2 \rightarrow 2H_2O$
- $2AgNO_3 + MgCl_2 \rightarrow 2AgCl + Mg(NO_3)_2$
- $2AlBr_3 + 3K_2SO_4 \rightarrow 6KBr + Al_2(SO_4)_3$
- $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$
- $C_2H_2 + 5O_2 \rightarrow 3CO_2 + 4H_2O$
- $2C_8H_{18} + 25O_2 \rightarrow 16CO_2 + 18H_2O$
- $FeCl_3 + 3NaOH \rightarrow Fe(OH)_3 + 3NaCl$
- $4P + 5O_2 \rightarrow 2P_2O_5$
- $2Na + 2H_2O \rightarrow 2NaOH + H_2$
- $2Ag_2O \rightarrow 4Ag + O_2$
- $S_8 + 12O_2 \rightarrow 8SO_3$
- $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$
- $2K + MgBr_2 \rightarrow 2KBr + Mg$
- $2HCl + CaCO_3 \rightarrow CaCl_2 + H_2O + CO_2$

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WORD EQUATIONS

Name _____

Write the word equations below as chemical equations and balance.

- zinc + lead (II) nitrate yield zinc nitrate + lead
 $Zn + Pb(NO_3)_2 \rightarrow Zn(NO_3)_2 + Pb$
- aluminum bromide + chlorine yield aluminum chloride + bromine
 $2AlBr_3 + 3Cl_2 \rightarrow 2AlCl_3 + 3Br_2$
- sodium phosphate + calcium chloride yield calcium phosphate + sodium chloride
 $2Na_3PO_4 + 3CaCl_2 \rightarrow Ca_3(PO_4)_2 + 6NaCl$
- potassium chlorate when heated yields potassium chloride + oxygen gas
 $2KClO_3 \rightarrow 2KCl + 3O_2(g)$
- aluminum + hydrochloric acid yield aluminum chloride + hydrogen gas
 $2Al + 6HCl \rightarrow 2AlCl_3 + 3H_2(g)$
- calcium hydroxide + phosphoric acid yield calcium phosphate + water
 $3Ca(OH)_2 + 2H_3PO_4 \rightarrow Ca_3(PO_4)_2 + 6H_2O$
- copper + sulfuric acid yield copper (II) sulfate + water + sulfur dioxide
 $Cu + 2H_2SO_4 \rightarrow CuSO_4 + 2H_2O + SO_2$
- hydrogen + nitrogen monoxide yield water + nitrogen
 $2H_2 + 2NO \rightarrow 2H_2O + N_2$

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CLASSIFICATION OF CHEMICAL REACTIONS

Name _____

Classify the reactions below as synthesis, decomposition, single replacement (cationic or anionic) or double replacement.

- $2H_2 + O_2 \rightarrow 2H_2O$ synthesis
- $2H_2O \rightarrow 2H_2 + O_2$ decomposition
- $Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$ cationic single replacement
- $2CO + O_2 \rightarrow 2CO_2$ synthesis
- $2HgO \rightarrow 2Hg + O_2$ decomposition
- $2KBr + Cl_2 \rightarrow 2KCl + Br_2$ anionic single replacement
- $CaO + H_2O \rightarrow Ca(OH)_2$ synthesis
- $AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$ double replacement
- $2H_2O_2 \rightarrow 2H_2O + O_2$ decomposition
- $Ca(OH)_2 + H_2SO_4 \rightarrow CaSO_4 + 2H_2O$ double replacement

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