Chemistry Worksheet
Reaction Types

Name: KEY
Block:

Double-replacement - $AB^{(aq)} + CD^{(aq)} \rightarrow CB + AD^{(s)}$

5. Acid-base Reactions (**A-B**) (neutralization):

a. ___ HCl (*aq*) + ___ NaOH (*aq*) → $H_2O(l) + NaCl(aq)$

b. ___ HNO_3 (*aq*) + ___ LiOH (*aq*) → $H_2O(l) + LiNO_3(aq)$

c. 2 HBr (*aq*) + ___ $Ba(OH)_2$ (*aq*) → $2H_2O(l) + BaBr_2(aq)$

d. ___ H_3PO_4 (*aq*) + 3 KOH (*aq*) → $3H_2O(l) + K_3PO_4(aq)$

6. Combustion Reactions (**C**) (redox – burning a hydrocarbon, or CHO compound):

a. ___ CH_4 (*g*) + 2 O_2 (*g*) → $2H_2O(l) + CO_2(g)$

b. 2 C_2H_6 (*g*) + 7 O_2 (*g*) → $6H_2O(l) + 4CO_2(g)$

c. 2 CH_3OH (*l*) + 3 O_2 (*g*) → $4H_2O(l) + 2CO_2(g)$

d. 2 C_8H_{18} (*l*) + 25 O_2 (*g*) → $18H_2O(l) + 16CO_2(g)$

7. Write letter code (see above) for the type of reaction in the first space, then complete and balance the chemical equation:

type

a. SR: 2 Li (*s*) + ___ $MgBr_2$ (*s*) → $2LiBr(aq) + Mg(s)$

b. PR: ___ $AlCl_3$ (*aq*) + 3 $AgNO_3$ (*aq*) → $Al(NO_3)_3(aq) + 3AgCl(s)$

c. S: 4 Na (*s*) + ___ O_2 (*g*) → $2Na_2O(s)$

d. D: 2 H_2O (*l*) → $2H_2(g) + O_2(g)$

e. PR: ___ $Ba(NO_3)_2$ (*aq*) + ___ K_2SO_4 (*aq*) → $BaSO_4(s) + 2KNO_3(aq)$

f. D: 2 $KClO_3$ (*aq*) → 2 KCl (*aq*) + $3O_2(g)$

g. SR: 3 $CuCO_3$ (*s*) + 2 Al (*s*) → $Al_2(CO_3)_3(aq) + 3Cu(s)$

h. S: 2 Mg (*s*) + ___ O_2 (*g*) → $2MgO(s)$

i. C: ___ C_2H_5OH (*l*) + 3 O_2 (*g*) → $2CO_2(g) + 3H_2O(g)$

j. AB: 2 HF (*aq*) + ___ $Ca(OH)_2$ (*aq*) → $2H_2O(l) + CaF_2(aq)$

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Write the products for each chemical reaction, including states. Then balance the chemical equation. Fill in all coefficients, including those for which the value is one (1).

1. Synthesis Reactions (**S**) (direct combination – redox):

a. ___ Ca (*s*) + ___ S (*s*) → CaS (s)

b. 2 Na (*s*) + ___ S (*s*) → Na_2S (s)

c. 2 K (*s*) + ___ Cl_2 (*g*) → 2KCl (s)

d. ___ Mg (*s*) + ___ Cl_2 (*g*) → $MgCl_2$ (s)

2. Decomposition Reactions (**D**) (often redox, sometimes metathesis):

a. ___ BaS (*s*) → Ba(s) + S(s)

b. 2 Na_2O (*s*) → 4Na(s) + O_2 (g)

c. 2 LiCl (*s*) → 2Li(s) + Cl_2 (g)

d. 2 $AlBr_3$ (*s*) → 2Al(s) + 3Br_2 (l)

3. Single Replacement Reactions (**SR**) (redox – use activity series):

a. ___ K (*s*) + ___ NaBr (*aq*) → Na(s) + KBr (aq)

b. 2 Li (*s*) + ___ $MgBr_2$ (*aq*) → Mg(s) + 2LiBr (aq)

c. 2 Al (*s*) + 3 $ZnCl_2$ (*aq*) → 2$AlCl_3$ (aq) + 3Zn (s)

d. ___ F_2 (*g*) + 2 NaI (*aq*) → 2NaF (aq) + I_2 (s)

4. Precipitation Reactions (**PR**) ("double replacement", "double displacement" – metathesis):

a. ___ $AgNO_3$ (*aq*) + ___ NaCl (*aq*) → AgCl (s) + $NaNO_3$ (aq)

b. ___ $BaCl_2$ (*aq*) + ___ K_2CO_3 (*aq*) → $BaCO_3$ (s) + 2KCl (aq)

c. ___ $FeCl_3$ (*aq*) + 3 NaOH (*aq*) → $Fe(OH)_3$ (s) + 3NaCl (aq)

d. ___ $(NH_4)_2SO_4$ (*aq*) + ___ $Pb(NO_3)_2$ (*aq*) → $2NH_4NO_3$ (aq) + $PbSO_4$ (s)

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