Name: _____ Section: _____

Workshop #4: Reactions

Predict products and balance the following reactions (write total-ionic and net-ionic where requested). If no reaction takes place, write NR for no reaction. Be sure to include phases.

1. Synthesis (Combination or Composition) Reactions: $A + B \rightarrow AB$

   A. $Ca(s) + N_2(g) \rightarrow$

   B. $SrO(s) + H_2O(l) \rightarrow$

   C. $N_2O_5(s) + H_2O(l) \rightarrow$

   D. $CaO(s) + CO_2(g) \rightarrow$

2. Decomposition Reactions: $AB \rightarrow A + B$

   A. $HgO(s) \rightarrow$

   B. $MgSO_4 \cdot 7H_2O(s) \rightarrow$

   C. $KClO_3(s) \rightarrow$

   D. $BaCO_3(s) \rightarrow$

3. Combustion Reactions: *nonmetals* + $O_2 \rightarrow$ *nonmetal oxides:* H_2O, CO_2, SO_2, NO_2

   A. $CH_3CH_2OH(l) + O_2(g) \rightarrow$

   B. $B_2H_6(g) + O_2(g) \rightarrow$

   C. $NH_3(g) + O_2(g) \rightarrow$

   D. $C_{10}H_{22}(g) + O_2(g) \rightarrow$

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4. Single Replacement (Displacement) Reactions: *C* + *AB* → *AC* + *B* <u>*OR*</u> *CB* + *A*

   A. *molecular*: $Al(s) + CuCl_2(aq) \rightarrow$

   total-ionic:

   net-ionic:

   B. *molecular*: $H_2(g) + Fe_2O_3(s) \rightarrow$

   total-ionic:

   net-ionic:

   C. *molecular*: $Cl_2(g) + NaBr(aq) \rightarrow$

   total-ionic:

   net-ionic:

   D. *molecular*: $Na(s) + H_2O(l) \rightarrow$

   total-ionic:

   net-ionic:

5. Double Replacement (Displacement) Reactions: *AB* + *CD* → *AD* + *CB*

   A. *molecular*: $Ba(OH)_2(aq) + Fe_2(SO_4)_3(aq) \rightarrow$

   total-ionic:

   net-ionic:

   B. *molecular*: $HCl(aq) + Hg_2(NO_3)_2(aq) \rightarrow$

   total-ionic:

   net-ionic:

C. *molecular*: $CaCO_3(s)$ + $HC_2H_3O_2(aq)$ →

total-ionic:

net-ionic:

D. *molecular*: $HClO_4(aq)$ + $Fe(OH)_3(s)$ →

total-ionic:

net-ionic:

6. Redox (Oxidation-Reduction) Reactions:

A. $As_2O_3(s)$ + $NO_3^-(aq)$ → $AsO_4^{-3}(aq)$ + $NO(g)$ (under acidic conditions)

Oxidation half reaction:

Reduction half reaction:

Balanced reaction:

B. $Cl_2(g)$ → $Cl^-(aq)$ + $ClO^-(aq)$ (under basic conditions)

Oxidation half reaction:

Reduction half reaction:

Balanced reaction: