Predicting Single Replacement Reactions

1. **Which of the following equations represents a single replacement reaction? Circle your choice.**
   a. $Be(OH)_2 \rightarrow BeO(s) + CO_2(g)$
   b. $Na(s) + HCl(l) \rightarrow H_2(g) + NaCl(aq)$
   c. $H_2(g) + Cl_2(g) \rightarrow 2\ HCl(l)$
   d. $AgNO_3(aq) + KI(aq) \rightarrow AgI(s) + KNO_3(aq)$

2. **Use the activity series of Metals to decide if a reaction will occur.**
   a. $Al(s) + NiSO_4(aq) \rightarrow$ Reaction will occur / No reaction (circle your choice)
   b. $Zn(s) + MgBr_2(aq) \rightarrow$ Reaction will occur / No reaction (circle your choice)
   c. $Li(s) + H_2O(l) \rightarrow$ Reaction will occur / No reaction (circle your choice)
   d. $Cu(s) + Mg(NO_3)_2(aq) \rightarrow$ Reaction will occur / No reaction (circle your choice)
   e. $Mg(s) + AgNO_3(aq) \rightarrow$ Reaction will occur / No reaction (circle your choice)

* look @ the activity series. The single, alone element must be more reactive than the element in the compound. If its not ⇒ no Reaction.

3. **Multiple Choice: For each of the following single replacement reactions, complete the equation by circling the letter that identifies the correct missing product(s).**
   - $Mg(s) + Zn(SO_4)(aq) \rightarrow Zn(s) + \underline{Mg^{+2}SO_4^{-2}}$
     a. $Zn(SO_4)$ b. $Mg + SO_4$ c. $Mg(SO_4)$ d. $Mg(SO_4)_2$
   - $Li(s) + Ca(OH)_2(aq) \rightarrow Ca(s) + \underline{LiOH}$
     a. $Li(OH)_2$ b. $Li(OH)$ c. $(OH)Li$ d. $Ca(OH)_2$
   - $K(s) + \cancel{H_2O(l)}$ [written as HOH] $\rightarrow \underline{H_2} + \underline{KOH}$
     a. H and KOH b. H_2 and KO c. H_2 and KOH d. KH and HO
   - $Cl_2(g) + NaBr(ag) \rightarrow \underline{Br_2} + NaCl(aq)$
     a. Br b. Br_2 c. Br^{1-} d. ClBr

* must know charges. Remember cation charge + anion charge = 0 or you must criss-cross.

4. **Each reaction will occur. Predict products with correct formulas for the following single replacement reactions.**
   a. 2 Al(s) + 3 $FeCl_2$ → 2 $AlCl_3$ + 3 Fe (s)
   b. 2 Li (s) + 2 HOH ($\cancel{H_2O(l)}$) → 2 LiOH + __ $H_2(g)$
   ~~c. ___ Ni(s) + ___ $AgNO_3(aq)$ →~~
   ~~d. ___ $H_2O(l)$ + ___ K(s) →~~
   e. ___ $Br_2(l)$ + 2 NaI(aq) → 2 NaBr + __ I_2
   f. ___ Zn(s) + 2 HCl(aq) → __ $ZnCl_2$ + __ H_2
   g. ___ HF(aq) + ___ $Cl_2(g)$ → NO Reaction (Chlorine is less reactive than Fluorine)

* do not carry subscripts except for polyatomic ions determine new subscripts by criss-crossing

Predicating Combustion Reactions

Always a hydrocarbon (CH compound) + $O_2(g) \rightarrow CO_2(g) + H_2O(g)$

1. ___ $CH_4(g)$ + 2 $O_2(g)$ → __ CO_2 + 2 H_2O
2. 2 $C_4H_{10}(g)$ + 13 $O_2(g)$ → 8 CO_2 + 10 H_2O