CONCEPT: MOLECULAR EQUATIONS

Introduction to Molecular Equations

● A *Molecular Equation* shows the intact _____ instead of their dissociated ionic forms.

□ **Molecular Equation: Reactant 1 + Reactant 2** ⟶ _____ + _____ .

__2__ $HClO_4$ (aq) + __1__ $Ba(OH)_2$ (aq) ⟶ __1__ $Ba(ClO_4)_2$ (aq) + __2__ H_2O (l)

- **Neutralization Equation: Acid + Base** ⟶ _____ + _____ .
- **Gas Evolution Equation: Reactant 1 + Reactant 2** ⟶ _____ + _____ .
- **Precipitation Equation:** If at least one of the products formed is a _____ ionic compound.

EXAMPLE: Which of the following is a precipitation reaction?

a) HCl (aq) + KOH (aq) ⟶ H_2O (l) + KCl (aq)

b) Mg (s) + $AgNO_3$ (aq) ⟶ Ag (s) + $Mg(NO_3)_2$ (aq)

c) $ZnBr_2$ (aq) + 2 KOH (aq) ⟶ $Zn(OH)_2$ (s) + 2 KBr (aq)

Solving Molecular Equations

● A molecular equation can be written when given **Reactant 1** and **Reactant 2**.

EXAMPLE: Predict whether a chemical reaction occurs and write the balanced molecular equation.

___ LiOH (aq) + ___ $MgSO_4$ (aq) ⟶

STEP 1: Break up **Reactant 1** and **Reactant 2** into their ionic forms.

STEP 2: **Swap Ionic Partners** by remembering that opposite charges attract.

□ Apply the rules for combining ions based on the numerical values of their charges.

STEP 3: A reaction only occurs if a _____, _____, or liquid water is formed as a product.

□ If both of the products formed are _____ (soluble) then NO REACTION has occurred and we STOP.

□ Use the Solubility Rules to determine if the products formed will be soluble or insoluble.

STEP 4: If necessary, balance your molecular equation by placing the correct coefficients in front of each molecule.

CONCEPT: MOLECULAR EQUATIONS

PRACTICE: Predict whether a chemical reaction occurs and write the balanced molecular equation.

___ Ag_2SO_4 (aq) + ___ KCl (aq) ⟶

PRACTICE: Predict whether a chemical reaction occurs and write the balanced molecular equation.

___ $MgBr_2$ (aq) + ___ $NaC_2H_3O_2$ (aq) ⟶

PRACTICE: Determine the balanced equation for the neutralization equation.

___ $Ca(OH)_2$ (aq) + ___ HCN (aq) ⟶