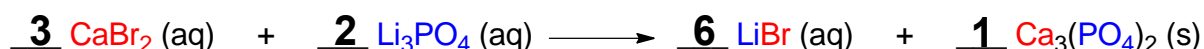## CONCEPT: COMPLETE IONIC EQUATIONS

Introduction to Complete Ionic Equations

● **Complete Ionic Equations** show _____ compounds as dissociated ions.

     □ Solids, Liquids and Gases _____ break up into ions.

     □ The *complete ionic equation* comes from the molecular equation.

        - Distribute the *coefficient* of each compound to determine the correct number of ions.

EXAMPLE: Convert the following balanced molecular equation into a complete ionic equation.

$$\underline{\mathbf{3}}\ CaBr_2\ (aq)\quad +\quad \underline{\mathbf{2}}\ Li_3PO_4\ (aq)\quad \longrightarrow\quad \underline{\mathbf{6}}\ LiBr\ (aq)\quad +\quad \underline{\mathbf{1}}\ Ca_3(PO_4)_2\ (s)$$

Net Ionic Equations

● Shows the ions participating in the chemical reaction by removing the *spectator ions*.

     □ **Spectator Ions:** Are both reactants and products, but not part of the net ionic equation.

     □ The net ionic equation comes from the complete ionic equation.

EXAMPLE: Based on the given reactants, provide both the balanced molecular equation and the complete ionic equation.

$$\underline{\quad}\ (NH_4)_2SO_4\ (aq)\quad +\quad \underline{\quad}\ CaCl_2\ (aq)\quad \longrightarrow$$

STEP 0: Follow the **STEPS 1** to **4** in order to determine the balanced molecular equation.

STEP 5: Break up only the _____ compounds into their respective ions.

STEP 6: Cancel out the spectator ions from the complete ionic equation in order to isolate the net ionic equation.

PRACTICE: Provide the net ionic equation that occurs when the following aqueous compounds are mixed together:

Copper (II) Bromide and Lithium Hydroxide

PRACTICE: Which of the following reagents could be used to separate the two anions from a solution containing magnesium nitrate and cesium hydroxide?

    a) NH_4CN

    b) $NaCl$

    c) KNO_3

    d) $ZnBr_2$

    e) $CsBrO_3$

PRACTICE: Which of the following reagents could be used to separate the two cations from a solution containing Lead (IV) acetate and cesium permanganate?

    a) $Sr(NO_3)_2$

    b) $TiC_2H_3O_2$

    c) K_2S

    d) $NaClO_4$

    e) KNO_3