Name: _____

AP WORKSHEET 4b: Solubility

1. Write a **balanced** equation, **with state symbols**, to show the dissociation of each of the following ionic solids into their respective ions when dissolved in water. (10)

(a) $K_2S(s) \xrightarrow{H_2O}$

(b) $Ni(NO_3)_2(s) \xrightarrow{H_2O}$

(c) $MgSO_4(s) \xrightarrow{H_2O}$

(d) $Na_3PO_4(s) \xrightarrow{H_2O}$

(e) $(NH_4)_2CO_3(s) \xrightarrow{H_2O}$

2. Predict whether each of the following compounds is soluble or insoluble in water. (10)

(a) Magnesium Phosphate _____

(b) Silver Nitrate _____

(c) Barium Carbonate _____

(d) Iron (III) Hydroxide _____

(e) Calcium Chloride _____

(f) Aluminum Sulfide _____

(g) K_2SO_4 _____

(h) Li_2CO_3 _____

(i) NaOH _____

(j) NH_4Br _____

3. Consider each of the following pairs of **aqueous solutions** being mixed.

On the basis of the solubility rules;

Either

- Write a full, balanced chemical equation for the double displacement reaction that takes place indicating the precipitate formed by adding the (*s*) state symbol in the equation, and using (*aq*) state symbols where appropriate, **AND** write the **Net Ionic Equation** including the state symbols.

or

- If NO precipitate (solid) forms, write **NO REACTION** instead of a full, balanced chemical equation, **AND DO NOT** write a Net Ionic Equation. (26)

(a) Potassium sulfide and Barium chloride (Hint: Barium sulfide is soluble.)

Balanced Chemical Equation:

Net Ionic Equation (if appropriate):

(b) Lead(II) nitrate and Ammonium chromate

Balanced Chemical Equation:

Net Ionic Equation (if appropriate):

(c) Sodium sulfate and Lithium nitrate

Balanced Chemical Equation:

Net Ionic Equation (if appropriate):

(d) Silver nitrate and Sodium sulfate (Hint: Silver sulfate forms an unexpected precipitate.)

Balanced Chemical Equation:

Net Ionic Equation (if appropriate):

(e) Potassium phosphate and Cobalt(II) nitrate

Balanced Chemical Equation:

Net Ionic Equation (if appropriate):

(f) $RbCl$ and $BaCl_2$

Balanced Chemical Equation:

Net Ionic Equation (if appropriate):

(g) KOH and $NaNO_3$

Balanced Chemical Equation:

Net Ionic Equation (if appropriate):

(h) $Mg(NO_3)_2$ and NH_4HCO_3 (Hint: The hydrogen carbonate ion is typically soluble.)

Balanced Chemical Equation:

Net Ionic Equation (if appropriate):

(i) Na_2CO_3 and $LiNO_3$

Balanced Chemical Equation:

Net Ionic Equation (if appropriate):

(j) Na_3PO_4 and $CuCl_2$

Balanced Chemical Equation:

Net Ionic Equation (if appropriate):

(k) $SrCl_2$ and Li_2SO_4 (Hint: Strontium sulfate forms an unexpected precipitate.)

Balanced Chemical Equation:

Net Ionic Equation (if appropriate):