

Precipitation Reaction Predictions

Goal

To practice using solubility guidelines to predict the formation of precipitates.

What To Do

Using the general solubility guidelines from your text write YES if a precipitate forms and NO if a precipitate does not form.

Set A

	Ba(NO ₃) ₂	BaCl ₂	Na ₂ CrO ₄	NaNO ₃	K ₂ CrO ₄	KCl
Ba(NO ₃) ₂	NO	NO	YES	NO	YES	NO
BaCl ₂	NO	NO	YES	NO	YES	NO
Na ₂ CrO ₄	YES	NO	NO	NO	NO	NO
NaNO ₃	NO	NO	NO	NO	NO	NO
K ₂ CrO ₄	YES	NO	NO	NO	NO	NO
KCl	NO	NO	NO	NO	NO	NO

Set B

	Na ₂ SO ₄	MgCl ₂	Al ₂ (SO ₄) ₃	Ba(NO ₃) ₂	Sr(NO ₃) ₂	AlCl ₃
Na ₂ SO ₄	NO	NO	NO	YES	YES	NO
MgCl ₂	NO	NO	NO	NO	NO	NO
Al ₂ (SO ₄) ₃	NO	NO	NO	YES	YES	NO
Ba(NO ₃) ₂	YES	NO	YES	NO	NO	NO
Sr(NO ₃) ₂	YES	NO	YES	NO	NO	NO
AlCl ₃	NO	NO	NO	NO	NO	NO

Polyatomic Ions

Goal

To practice naming and writing formulas of polyatomic ions.

What To Do

Answer each question in the space provided.

1. Name the following compounds containing polyatomic ions.

- (a) CrSO₄ chromium (II) sulphate
 (b) Al(NO₃)₃ aluminum nitrate
 (c) (NH₄)₃PO₄ ammonium phosphate
 (d) AgIO₃ silver iodate
 (e) HgClO₃ mercury (I) chlorate
 (f) ZnCO₃ zinc carbonate
 (g) Ni(NO₃)₃ nickel (III) nitrate
 (h) Ba(BrO₃)₂ barium bromate
 (i) BeCO₃ beryllium carbonate

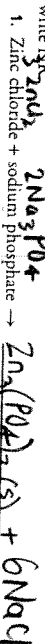
2. Write formulas for the following ionic compounds.

- (a) Iron(III) chlorate Fe(ClO₃)₃
 (b) Mercury(I) iodate HgIO₃
 (c) Aluminum sulfate Al₂(SO₄)₃
 (d) Lead(II) carbonate PbCO₃
 (e) Ammonium phosphate (NH₄)₃PO₄
 (f) Calcium nitrate Ca(NO₃)₂
 (g) Potassium permanganate KMnO₄
 (h) Silver fluoride AgF
 (i) Strontium sulfate SrSO₄
 (j) Sodium chromate Na₂CrO₄

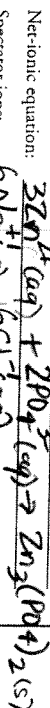
Goal To practice writing ionic and net-ionic equations.

What To Do

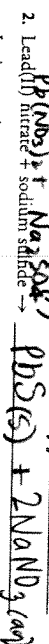
Using your solubility guidelines, decide which of the following combinations of ionic compounds will produce an insoluble precipitate. Write an ionic equation and net-ionic equation for each. Pick out the spectator ions. If no precipitate forms, write NP .



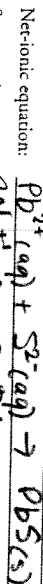
Ionic equation:



Spectator ions:



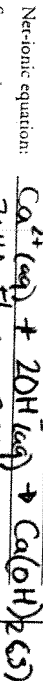
Ionic equation:



Spectator ions:



Ionic equation:



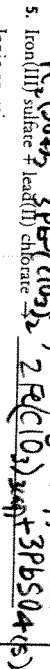
Spectator ions:



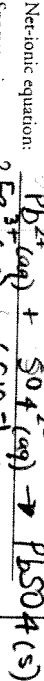
Ionic equation:



Spectator ions:



Ionic equation:



Spectator ions:

Goal To practice using solution terminology.

What To Do

Choose the correct term for each blank space from the list at the bottom of the page.

1. The experimental evidence that NaCl in aqueous solution is a(n) **conductor** tells us that this salt is an electrolyte.

2. $\text{Fe}^{3+}(\text{aq}) + 3\text{Cl}^{-}(\text{aq}) + 3\text{Na}^{+}(\text{aq}) + 3\text{OH}^{-}(\text{aq}) \rightarrow \text{Fe}(\text{OH})_3(\text{s}) + 3\text{Na}^{+}(\text{aq}) + 3\text{Cl}^{-}(\text{aq})$ is an example of a(n) **ionic equation**.

3. In the preceding question, the ions which do not participate in the reaction are called **spectator** ions.

4. Since potassium chloride is a(n) **salt**, it exists in water solution almost completely as ions.

5. Flame tests can be used to identify many **metallic** ions in solution.

6. Spectator ions are not included in a(n) **net ionic equations**.

7. **Soluble** generally means that more than 1 g of solute will dissolve in 100 mL of water at room temperature.

8. The bond between small ions is **stronger** than the bond between large ions with the same charge.

9. Fluoride ions are **less soluble** than chlorides, bromides and iodides because the fluoride ion is smaller.

10. The appearance of a **precipitate** indicates that an insoluble compound is present.

11. **Insoluble** means that the solubility is less than 0.1 g per 100 mL water.

12. **Double displacement** reactions can be recognized by the formation of a precipitate, gas or water.

conductor	double displacement	net ionic equation
ionic equation	metallic	soluble
insoluble	stronger	less soluble
precipitate	salt	spectator