

5. Reactions in Solution Precipitation

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Lab 5. Reactions in Solution Precipitation

Purpose:

To practice identifying reactions that result in precipitation and practice recognizing and writing equations for double replacement reactions by testing pairs of reagents and looking for signs of chemical change and writing molecular and ionic equations for the reactions.

Prelab:

- a. Zinc Sulfide: ZnS
b. Chromium(III) Hydroxide: $\text{Cr}(\text{OH})_3$
c. Lead(II) Phosphate: $\text{Pb}_3(\text{PO}_4)_2$
- a. Sodium Chloride: $\text{NaCl} \rightarrow \text{Na}^+ + \text{Cl}^-$
b. Copper(II) Chloride: $\text{CuCl}_2 \rightarrow \text{Cu}^{2+} + 2\text{Cl}^-$
c. Iron(III) Sulfate: $\text{Fe}_2(\text{SO}_4)_3 \rightarrow 2\text{Fe}^{3+} + 3\text{SO}_4^{2-}$
- $\text{Fe}(\text{NO}_3)_3 + \text{K}_2\text{CO}_3 \rightarrow \text{Fe}_2(\text{CO}_3)_3 (\text{s}) + \text{KNO}_3$
- $0.2\text{M} * 1\text{L} = M_1 * 2\text{L}$ $M_1 = \underline{0.1\text{M}}$

Procedure:

- Use 4-5 drops of each reagent for each pair of your tests. Note and record any sign of reaction. Test all possible pair of combinations of one group A reagent with one group B reagent. Record your observations in the data table in your notebook. Recall that not all pairs will react, and that sometimes the evidence of reaction, especially formation of a precipitate, take a few moments to appear.
- If there are any combinations about which you doubt, repeat the tests.
- Return pipettes containing unused portions of the reagent

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solutions to the proper location. Some of the solutions contain transition metal ions, so should not be washed down the drain. Instead, dump the contents onto a paper towel in the tray labeled "transition metal waste". Wash some items with water and clean others with cotton swabs.

Safety: Barium is toxic, don't touch. wash hands thoroughly.

Data Table:

	CoCl₂	CuCl₂	AlCl₃	BaCl₂	NiCl₂
NaI	No Reaction	Turned Brown, Precipitated	No Reaction	No Reaction	No Reaction
Na ₂ CO ₃	Precipitated	Precipitated	Precipitated	Precipitated	Precipitated
Na ₃ PO ₄	Turned Purple, Precipitated	Precipitated	Precipitated	Precipitated	Precipitated
Na ₂ SO ₄	No Reaction	No Reaction	No Reaction	Precipitated	No Reaction
NaOH	Turned Purple, Precipitated	Precipitated	Precipitated	Precipitated	Precipitated

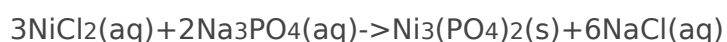
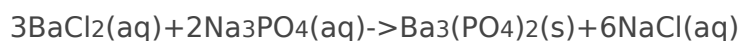
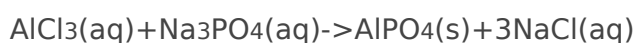
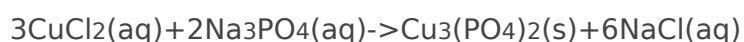
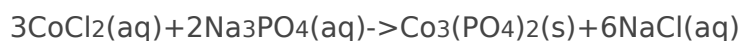
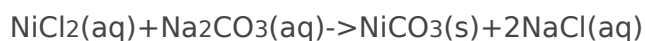
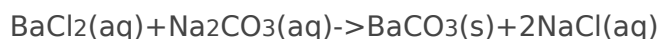
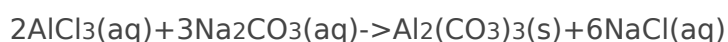
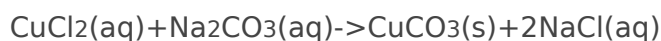
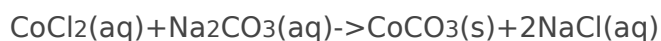
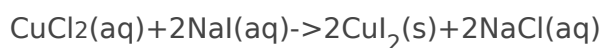
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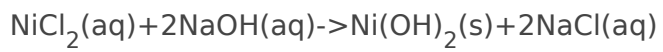
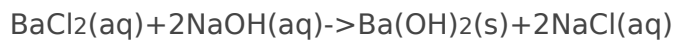
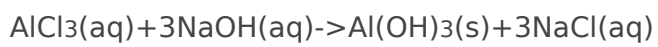
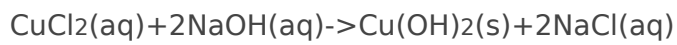
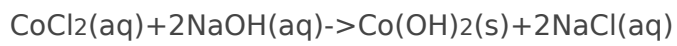
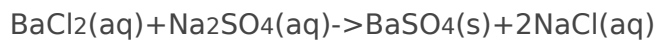
Conclusion:

a. Formula of Precipitates

	CoCl₂	CuCl₂	AlCl₃	BaCl₂	NiCl₂
NaI		CuI ₂			
Na ₂ CO ₃	CoCO ₃	CuCO ₃	Al ₂ (CO ₃) ₃	BaCO ₃	NiCO ₃
Na ₃ PO ₄	Co ₃ (PO ₄) ₂	Cu ₃ (PO ₄) ₂	AlPO ₄	Ba ₃ (PO ₄) ₂	Ni ₃ (PO ₄) ₂
Na ₂ SO ₄				BaSO ₄	
NaOH	Co(OH) ₂	Cu(OH) ₂	Al(OH) ₃	Ba(OH) ₂	Ni(OH) ₂

b. Molecular Formulas





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c. Net ionic formulas

