

VALENCIA COLLEGE

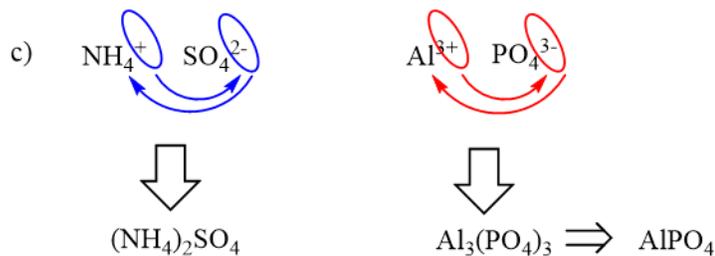
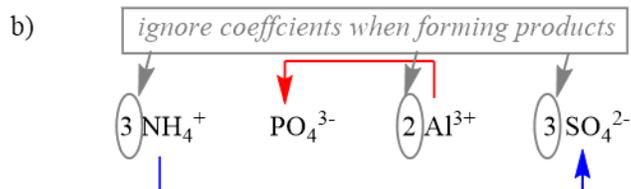
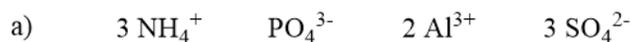
Chemistry

Appendix 2: Writing Products of Double Replacement Reaction

When an ionic compound is placed in water, it dissolves allowing it to interact with other ions in solution. This type of reaction is called a double replacement reaction. Acid - base reactions are also double replacement reaction.

- Dissociate the two compounds mixed, include their charges. (Ignore the amounts; those are considered when balancing a chemical reaction).
- Combine the cation of the first with the anion of the second; and combine the cation of the second with the anion of the first (always write the cation first).
- Cross over the numbers of the charge, write them as subscripts (don't include the plus or minus).
- Reduce to smallest ratio (called the empirical formula). But don't change the chemical formula of a polyatomic ion, just reduce the numbers that were crossed over.
- Using the solubility rules in Appendix 3, identify the phases of the products.

Example: When a solution of $(\text{NH}_4)_3\text{PO}_4$ was mixed with a solution of $\text{Al}_2(\text{SO}_4)_3$ a precipitate was formed. Applying the steps above to determine the identity of the solid:



Note: place the polyatomic group in parenthesis when the formula has more than one.

- Notice that the second compound was reduced from a 3:3 ratio to a 1:1 ratio.
- Based on solubility rules, $(\text{NH}_4)_2\text{SO}_4$ is soluble (aqueous, *aq*), and AlPO_4 is insoluble (solid, *s*). So the solid formed is AlPO_4 .