Ionic Nomenclature with Polyatomics

Polyatomic ions:

Naming ionic compounds that contain polyatomic ions is exactly the same as you have already learned:

- The cation is named first then the anion. Most polyatomics are negatively charged and end in -ate or -ite. The only positively charged polyatomic we will use is ammonium (NH_4^{+1})
  **Compounds containing ammonium are ionic although they contain NO METAL!
- The compound will be neutral overall
- Roman numerals are used with multivalent ions
- Reduce subscripts when possible

What's different about naming ionic compounds that contain polyatomic ions:

- If more than one of a polyatomic ion is needed to balance the charge, the polyatomic ion must be put in parenthesis in the formula. Never change the subscript from the polyatomic, you can only reduce subscripts added from criss-crossing the charges!

  Al^{+3} SO_4^{-2}

- When writing the name, usually you change the ending of the anion to -ide, but if the anion is a polyatomic, you don't change the ending!

  $NaCl$ sodium chloride
  $NaNO_2$ sodium nitrite

EXAMPLES

Give the name of each of the following.

$MgSO_4$ $Cd(ClO_3)_2$

K_2CO_3 $Al(NO_3)_3$

$CuCN$ $(NH_4)_2SO_3$ $FeCO_3$

Write the formula for each of the following.

Sodium arsenate Chromium (II) hydroxide

Silver acetate Barium perchlorate

Lithium bicarbonate Ammonium chloride Barium oxalate

HOMEWORK: Ionic Nomenclature with Polyatomic ions and Mixed

I. Complete the following ionic nomenclature with polyatomic ions problems by either giving the name or formula:

1. $NaNO_3$ _____
2. NH_4NO_2 _____
3. Ni_2SO_3 _____
4. Li_2CrO_4 _____
5. Iron (I) nitrate _____
6. Calcium phosphate _____
7. Potassium permanganate _____
8. Cobalt (II) chlorite _____

II. MIXED PRACTICE. This section contains 5.1 and 5.2 lectures. There will be binary ionic nomenclature and also ionic nomenclature with polyatomic ions. In the first blank of each problem, identify the following either univalent (U) or multivalent (M) ion. Finally in the second blank give either the formula or name based on the problem type.

___9. Na_2SO_4 _____
___10. Ag_3N _____
___11. NH_4MnO_4 _____
___12. $Hg(HSO_4)_2$_____
___13. $MnCl_2$_____
___14. MgO_____
___15. $Ca(NO_2)_2$_____
___16. K_3BO_3_____
___24. NH_4Cl_____

____27. Calcium phosphate _____
____ 28. Aluminum bromide _____
____29. Manganese (II) oxalate _____
____31. Iron (III) carbonate _____
____ 34. Tin (IV) fluoride _____
____35. Silver peroxide _____
___ 37. Strontium iodide_____
____ 38. Mercury (I) sulfite _____
____ 39. Cadmium hypochlorite _____