

Writing formulas when given the name of a compound – Follow the flow chart

Start:

Is the name the same as that of an element from the periodic table?

yes

It's the atomic symbol of the element, except for P₄, S₈, and the diatomic elements

no
→

It's either ionic or covalent. Is the first word the name of a metal?

yes

It's ionic. Find the formula by finding the charges of the cation and anion – the formula will be found by swapping them. Example,
 $C^{+3} A^{-2} = C_2A_3$

no
→

It's covalent. Is H the first element?

yes

It's an acid. The formula is "H_x[anion]" where x is the charge of the anion.

no
→

Use prefixes and the names of elements to come up with the formula (exceptions: H₂O, CH₄, NH₃)

Writing names if given the formulas:

Start:

Does the formula only contain atoms of one element?

no

yes

It's the same as the name of that element.

It's either ionic or covalent. Does it contain a metal?

no

yes

It's ionic. Is the metal a transition metal?

yes

Name is "cation (Roman numeral) anion"
Roman numeral is found by the following:

$RN = \frac{(\text{charge on anion})(\text{number of anions})}{\text{number of cations}}$

Important note: Exceptions to this are Zn^{+2} , Cd^{+2} , Ag^{+1} - they do NOT need Roman numerals!

It's covalent. Does it start with "H"?

yes

no

use prefixes in front of the name of each element:
ex: dinitrogen tetroxide

It's an acid. Is there a polyatomic ion in the formula?

no

"hydro__ic acid:

yes

Name is either "-ic acid" or "-ous acid". What's the ending of the name of the cation?

"-ate"

"-ite"

"__ic acid" "__ous acid"