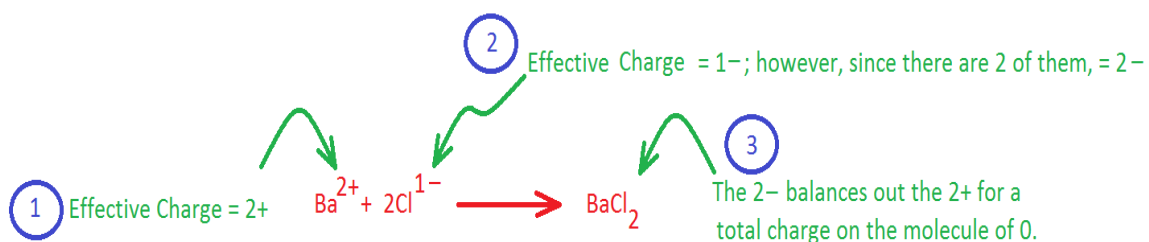


Effective charge: the charge on an atom in a molecule or complex ion that it would have on its own as an individual ion.

E.g.  $\text{BaCl}_2$

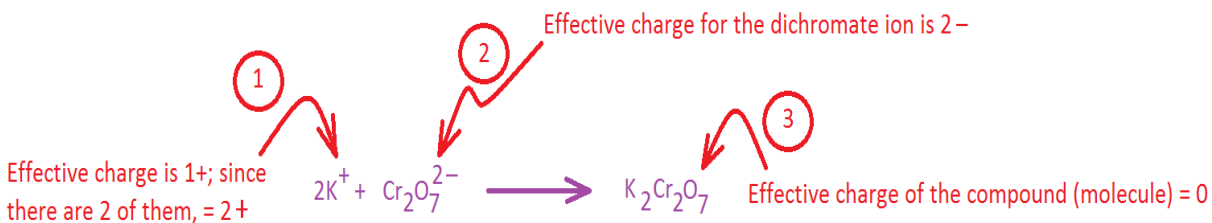
To determine effective charge, re-write the compound as if it consisted of two (2) ions:



In something as simple as this example, the effective charges are determined by using the periodic table -- it's why you need to memorize the groups the elements are in -- using ROMAN numerals!

What if you had a compound like  $\text{K}_2\text{Cr}_2\text{O}_7$ ?

In this case you need to have your poly-atomic anions memorized, e.g., table on page 7 of the Chemical Nomenclature experiment you completed in lab in Week 5 of this semester.



NOTE: you can actually make this far more complicated (and we will in about week 12 or 13) and write out the effective charges (called oxidation numbers) for each entity in potassium dichromate:

K is +1 (times 2); Cr is +6 (times 2) and O is 2- (times 7) -- giving  $2+ + 12+ + 14- = 0$

Directions: Complete 100% prior to the next class.

1) Write out the chemical formulas for each compound/molecule, below, and indicate the **effective charge for the molecule ONLY!**:

A) Barium chloride

B) Potassium dichromate

C) Barium sulfate

D) Barium chromate

E) Sodium carbonate

F) Aluminum nitrate

G) Boron nitrite

H) Magnesium phosphate

I) Aluminum phosphate

J) Carbonic acid

2) Now write out the effective charge for **each of the cations** in #1, A-J:

3) Now write out the effective charge for **each of the anions** in #1, A-J:

4) Now add up **the effective charge for each cation and each anion combination** in #1, A-J:

5) Does each addition value equal the value you entered in #1, A-J? Explain.