2.5 C2 Ionic Compound

November 27, 2023 10:11 AM

Science 9 – Chemistry Topic 2.5 – Concept 2: You can determine the formula of an ionic compound from its name. (Read p.158-161)

Chemical Formula of Binary Ionic Compounds

- The chemical formula of a binary ionic compound is written with element symbols to identify each ion.
- Binary chemical compounds consist of <u>2</u> ions. The first is a <u>positively</u> charged <u>metal</u> ion while the second is a <u>heartively</u> charged <u>non</u> <u>metal</u> ion.
- In some cases, a small number called a <u>Subscript</u> is written on the <u>right</u> of one or both symbols.
- If there is <u>no</u> subscript, assume the number to be <u>1</u>.
 - o E.g. Ag₂O means Ag₂O ___.



Writing Formulas of Ionic Compounds

- Although ionic compounds are made up of ions, the compound as a whole is electrically __ncutval__.

 - o E.g. Al₂O₃, KI, MgCl₂
- When writing the formula of a binary ionic compound, you need to first determine the <u>Charge</u> on the ion. (This can be found on a periodic table!)

Group 1 metals all form ions wi a charge of 1+.

- Common charges:
 - o Group 1 metals always have a charge of 41
 - o Group 2 metals always have a charge of +2.
 - o Group 13 metals usually have a charge of <u>+3</u>.
 - \circ Group 16 nonmetals usually have a charge of $\frac{-2}{1}$
- o Group 17 nonmetals usually have a charge of ______.
 - Some metals can form more than one ion. -> multivalent

 o E.g. Mn: Mn2t Mn3t Mn4t, Fe: Fe2t Fe3t

		Group 2 metals all form ions with a charge of 2+.					
	3 1+		/ "	iui a ciiaige	0124.		
2	Li Lithium 6.9	Be Beryllum 9.0				hat some me more than or	
3	11 1+ Na Sodium 23.0	12 2+ Mg Magnesium 24.3	3	4	5/	6	7
4	19 1+ K Potassium 39.1	20 2+ Ca Calcium 40.1	21 3+ Sc Scandium 45.0	22 4+ Ti 3+ Titanium 47.9	23 5+ V 4+ Vanadium 50.9	24 3+ Cr 2+ Chromium 52.0	25 2+ Mn 3+ Manganese 54.9
5	37 1+ Rb Rubidium 85.5	38 2+ Sr Strontium 87.6	39 3+ Y Yttrium 88.9	40 4+ Zr Zirconium 91.2	41 3+ Nb 5+ Nobium 92.9	42 2+ Mo 3+ Molybdenum 95.9	43 7+ TC Technetium (98)

Examples

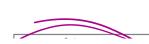
Steps	Calcium chloride		
1. Identify each <u>ion</u> and its <u>Charge</u> .	Ca ²⁺ CI	Ca Criss-Cross	
2. Determine the numbers of <u>loss</u> needed to <u>balance</u> positive charges with negative charges.	Ca ^{2†} C1 ⁻	Ca ₁ Cl ₂	
3. Use <u>Subscripts</u> to write the formula. Remember to write the <u>Metal</u> ion first. *Do not include a subscript if the subscript is " <u>1</u> ".	CaCl ₂	CaCl ₂	

Steps	Aluminum sulfide		
Identify each ion and its charges			Al@th
Determine the numbers of ions needed to balance positive charges with negative charges.	Al 31 Al 31	S ²⁻ S ²⁻ S ²⁻	Al ₂ S ₃
3. Use subscripts to write the formula. Remember to write the metal ion first. *Do not include a subscript if the subscript is "1".	6+ Al	<u>6-</u> ₂ S ₃	Al ₂ S ₃

Maghesium Sulphide

Mg252 → Mg,S, → MgS

 $A_2B_6 \rightarrow AB_3$



WB P.94 - 95 \: HW

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	Name of Compound	lons	Formula
	sodium bromide	Na Br	Na Br
	aluminum chloride	13+ CF	Al Cl3
	magnesium oxide	Mg ²⁺ O ²⁻	Mg2O2 -> MgO
	barium iodide		Ba I ₂
-	lithium phosphide	Li + p3-	LiaP
-	beryllium oxide	Ro 2+ 02-	Be O
	calcium bromide	Ca ^{2t} Br ^{l-}	Ca Brz
_	potassium iodide	K+ I-1	KI
-	radium nitride	Ra ^{2t} N ³⁻	Ra3N2
	magnesium sulfide	Mg ^{2t} S ²	MgS
	aluminum nitride mct H	Alst N3-	AĬN
×	barium hydride non metal H	Ba ^{2t} H	Ba H ₂
-	potassium fluoride	K ⁺ F -	KF
-	strontium phosphide	Sr ^{2t} p ³⁻	Sr ₃ P ₂ Cs ₂ Se
-	cesium selenide	Cs It Se ²⁻	Cs 2 Se
	zinc oxide	Zn^{2t} O^{2-}	ZnO
-	cesium phosphide	Cs1+ P3-	Cs ₃ P
_	beryllium hydride	Be ^{2t} H	Be H ₂
-	lithium chloride	Li H Cl-	LiCl
	magnesium iodide	Mg ^{2t} I ¹⁻	MgI2
-	zinc fluoride	Zn2t F-	ZnF ₂
-	silver sulfide	Aglt S2-	Ag ₂ S
_ ~	beryllium selenide	Be ^{2t} Se ²	BeSe
*	gallium carbide	Ga 3+ C4-	Ga 4C3
-	rubidium nitride	KPH N3-	Rb ₃ N
-	*calcium carbide C4-	Ca ²⁺ C ⁴⁻	Ca4C2 - (Ca2C)
-	C ⁴⁻	Caci C'4	(a4C2 -> (Ca2C)