

REVIEW QUESTIONS

## Chapter 2

1. Complete the missing information in the table below:

Symbol	$^{51}\text{V}$	$^{79}\text{Se}^{2-}$	$^{59}\text{Ni}^{2+}$	$^{31}\text{P}^{3-}$	$^{40}\text{Ca}^{2+}$
Protons	23	34	28	15	20
Neutrons	28	45	31	16	20
Electrons	23	36	26	18	18
Net Charge	0	2-	2+	3-	2+
Atomic No.	23	34	28	15	20
Mass No.	51	79	59	31	40

2. The following are the results of analysis of two samples containing phosphorous and oxygen. From these results determine if the two samples are the same compound. If the compounds are different, show that the data follows the law of multiple proportions.

	<u>Mass of P</u>	<u>Mass of O</u>	<u>Mass of Sample</u>
Sample A	2.581 g	3.322 g	5.903 g
Sample B	3.718 g	2.881 g	6.599 g

Determine percentage of P in each sample:

$$\text{Sample A} = \frac{2.581 \text{ g}}{5.903 \text{ g}} \times 100 = 43.72\% \text{ P} \qquad \text{Sample B} = \frac{3.718 \text{ g}}{6.599 \text{ g}} \times 100 = 56.34\% \text{ P}$$

Since the two samples do not possess the same percentage of P, they are not the same (Law of Definite Composition)

Determine ratio of P to O in each sample:

$$\text{Sample A} \quad \frac{\text{P}}{\text{O}} = \frac{2.581 \text{ g}}{3.322 \text{ g}} = 0.777 \qquad \frac{0.777}{0.777} = 1 \qquad (3)$$

$$\text{Sample B} \quad \frac{\text{P}}{\text{O}} = \frac{3.718 \text{ g}}{2.881 \text{ g}} = 1.291 \qquad \frac{1.291}{0.777} = 1.66 \qquad (5)$$

Since the ratio of P to O is in small whole numbers, the Law of Multiple Proportions is valid.

3. Using only a periodic table, assign charges for each ion below, then complete the table with formulas and names for compounds formed by the combination of each cation and anion.

	Ca <u>2+</u>	K <u>1+</u>	Al <u>3+</u>	NH <sub>4</sub> <u>1+</u>
S <u>2-</u>	CaS	K <sub>2</sub> S	Al <sub>2</sub> S <sub>3</sub>	(NH <sub>4</sub> ) <sub>2</sub> S
	Calcium sulfide	Potassium sulfide	Aluminum sulfide	Ammonium sulfide
Cl <u>1-</u>	CaCl <sub>2</sub>	KCl	AlCl <sub>3</sub>	NH <sub>4</sub> Cl
	Calcium chloride	Potassium chloride	Aluminum chloride	Ammonium chloride
N <u>3-</u>	Ca <sub>3</sub> N <sub>2</sub>	K <sub>3</sub> N	AlN	(NH <sub>4</sub> ) <sub>3</sub> N
	Calcium nitride	Potassium nitride	Aluminum nitride	Ammonium nitride
NO <sub>2</sub> <u>1-</u>	Ca(NO <sub>2</sub> ) <sub>2</sub>	KNO <sub>2</sub>	Al(NO <sub>2</sub> ) <sub>3</sub>	NH <sub>4</sub> NO <sub>2</sub>
	Calcium nitrite	Potassium nitrite	Aluminum nitrite	Ammonium nitrite
SO <sub>4</sub> <u>2-</u>	CaSO <sub>4</sub>	K <sub>2</sub> SO <sub>4</sub>	Al <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub>	(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>
	Calcium sulfate	Potassium sulfate	Aluminum sulfate	Ammonium sulfate
NO <sub>3</sub> <u>1-</u>	Ca(NO <sub>3</sub> ) <sub>2</sub>	KNO <sub>3</sub>	Al(NO <sub>3</sub> ) <sub>3</sub>	NH <sub>4</sub> NO <sub>3</sub>
	Calcium nitrate	Potassium nitrate	Aluminum nitrate	Ammonium nitrate
CO <sub>3</sub> <u>2-</u>	CaCO <sub>3</sub>	K <sub>2</sub> CO <sub>3</sub>	Al <sub>2</sub> (CO <sub>3</sub> ) <sub>3</sub>	(NH <sub>4</sub> ) <sub>2</sub> CO <sub>3</sub>
	Calcium carbonate	Potassium carbonate	Aluminum carbonate	Ammonium carbonate
ClO <sub>3</sub> <u>1-</u>	Ca(ClO <sub>3</sub> ) <sub>2</sub>	KClO <sub>3</sub>	Al(ClO <sub>3</sub> ) <sub>3</sub>	NH <sub>4</sub> ClO <sub>3</sub>
	Calcium chlorate	Potassium chlorate	Aluminum chlorate	Ammonium chlorate
OH <u>1-</u>	Ca(OH) <sub>2</sub>	KOH	Al(OH) <sub>3</sub>	NH <sub>4</sub> OH
	Calcium hydroxide	Potassium hydroxide	Aluminum hydroxide	Ammonium hydroxide
PO <sub>4</sub> <u>3-</u>	Ca <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub>	K <sub>3</sub> PO <sub>4</sub>	AlPO <sub>4</sub>	(NH <sub>4</sub> ) <sub>3</sub> PO <sub>4</sub>
	Calcium phosphate	Potassium phosphate	Aluminum phosphate	Ammonium phosphate

4. Fill in the missing name or formula for each compound listed below. Fill in column 1 without using any notes, and then fill in column 2 with the use of notes.

	1	2
Barium nitrate	<b>Ba(NO<sub>3</sub>)<sub>2</sub></b>	
Ferrous chloride	<b>FeCl<sub>2</sub></b>	
Silver hydroxide	<b>AgOH</b>	
Strontium phosphate	<b>Sr<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub></b>	
Copper(II) acetate	<b>Cu(C<sub>2</sub>H<sub>3</sub>O<sub>2</sub>)<sub>2</sub></b>	
Zinc nitrite	<b>Zn(NO<sub>2</sub>)<sub>2</sub></b>	
Potassium sulfite	<b>K<sub>2</sub>SO<sub>3</sub></b>	
Ammonium carbonate	<b>(NH<sub>4</sub>)<sub>2</sub>CO<sub>3</sub></b>	
Iodine heptafluoride	<b>IF<sub>7</sub></b>	
Bromine trifluoride	<b>BrF<sub>3</sub></b>	
CuClO <sub>4</sub>	<b>Copper(I) perchlorate</b>	<b>Cuprous perchlorate</b>
Ag <sub>2</sub> SO <sub>4</sub>	<b>Silver sulfate</b>	
N <sub>2</sub> O <sub>5</sub>	<b>Dinitrogen pentoxide</b>	
Hg <sub>2</sub> I <sub>2</sub>	<b>Mercury(I) iodide</b>	<b>Mercurous iodide</b>
PbO <sub>2</sub>	<b>Lead (IV) oxide</b>	<b>Plumbic oxide</b>
OF <sub>2</sub>	<b>Oxygen difluoride</b>	

5. For each compound shown below, determine if the name or formula is incorrect, and write the correct form in the space provided:

a) $\text{Ag}_2\text{S}$	<del>Disilver sulfide</del>	<u>Silver sulfide</u>
b) $\text{MgOH}$	Magnesium hydroxide	<u><math>\text{Mg(OH)}_2</math></u>
c) $\text{Ca(NO}_3)_2$	<del>Calcium (II) nitrate</del>	<u>Calcium nitrate</u>
d) $\text{SnO}_2$	<del>Tin (II) oxide</del>	<u>Tin (IV) oxide</u>
e) $\text{PbS}$	<del>Lead sulfide</del>	<u>Lead (II) sulfide</u>
f) $\text{ZnCl}_2$	<del>Zinc dichloride</del>	<u>Zinc chloride</u>
g) $\text{SO}_2$	<del>Sodium dioxide</del>	<u>Sulfur dioxide</u>
h) $\text{CaSO}_4$	<del>Calcium sulfide</del>	<u>Calcium sulfate</u>
i) $\text{Ba}_2\text{O}$	Barium oxide	<u>BaO</u>
j) $\text{Cu}_2\text{O}$	<del>Copper (II) oxide</del>	<u>Copper (I) oxide</u>

6. Balance the following equations by providing the missing coefficients:

