WKS #2-2: Review Chapter 2 **Name** Answer Key

Problems from pp. 69-72 #2.9, 2.68, 2.70, 2.88; Mixed Naming & Formulas

2.9 Use the helium-4 isotope to define atomic number and mass number. Why does a knowledge of atomic number enable us to deduce the number of electrons present in an atom?

Helium–4, written $^{4}_{2}He$, has atomic number 2 because it has 2 protons (number at lower left) and mass number 4 because it has a *total* of 4 protons and neutrons (number at the upper left). Knowing the protons allows us to deduce the number of electrons in an atom because they must be the same to maintain charge neutrality.

2.68 What is wrong with the chemical formula for each of the following compounds (the name is correct)? Write the correct formula.

(a) $(NH_3)_2CO_3$ (ammonium carbonate): Ammonium is NH_4^+, not NH_3^+. The formula should be **$(NH_4)_2CO_3$**.

(b) CaOH (calcium hydroxide): Calcium has a +2 charge and hydroxide has a –1 charge. The formula should be **$Ca(OH)_2$**.

(c) $CdSO_3$ (cadmium sulfide): Sulfide is S^{2-}, not SO_3^{2-}. The correct formula is **CdS**.

(d) $ZnCrO_4$ (zinc dichromate): Dichromate is $Cr_2O_7^{2-}$, not CrO_4^{2-}. The correct formula is **$ZnCr_2O_7$**.

2.70 (a) Which elements are likely to form ionic compounds?

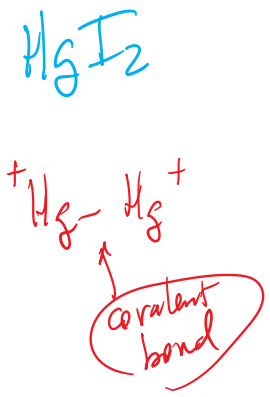
Ionic compounds are typically formed between metallic and nonmetallic elements.

(b) Which metallic elements are most likely to form cations with different charges?

In general, any metals other than the alkali metals, the alkaline earth metals, Al, Zn, Cd, and Ag (i.e. the transition metals, the *other* metals, the actinides and lanthanides) have variable charges.

2.88 Fill in the blanks in the following table.

Cation	Anion	Formula	Name
Mg^{2+}	**HCO_3^-**	**$Mg(HCO_3)_2$**	Magnesium hydrogen carbonate
Sr^{2+}	**Cl^-**	$SrCl_2$	**Strontium chloride**
Fe^{3+}	NO_2^-	**$Fe(NO_2)_3$**	**Iron(III) nitrite**
Mn^{2+}	**ClO_3^-**	**$Mn(ClO_3)_2$**	Manganese(II) chlorate
Sn^{4+}	**Br^-**	$SnBr_4$	**Tin(IV) bromide**
Co^{2+}	PO_4^{3-}	**$Co_3(PO_4)_2$**	**Cobalt(II) phosphate**
Hg_2^{2+}	I^-	**Hg_2I_2**	**Mercury(I) iodide**
Cu^+	**CO_3^{2-}**	Cu_2CO_3	**Copper(I) carbonate**
Li^+	**N^{3-}**	**Li_3N**	Lithium nitride
Al^{3+}	S^{2-}	**Al_2S_3**	**Aluminum sulfide**



Naming & Formulas of Ionics, Acids & Molecular Compounds

a) **KBr** potassium bromide

b) **H_2SO_4 (aq)** sulfuric acid

c) **N_2O_5** dinitrogen pentoxide

d) **NH_4Cl** ammonium chloride

e) **$FeCl_3$** iron(III) chloride

f) **HI (aq)** hydroiodic acid

g) **H_2SO_3 (aq)** sulfurous acid

h) **IF_7** iodine heptafluoride

i) **$Ba(ClO_2)_2$** barium chlorite

j) **HNO_3 (g)** hydrogen nitrate (gas)

k) **P_4O_{10}** tetraphosphorous decoxide

l) **TiO_2** titanium(IV) oxide

m) **CO** carbon monoxide

n) **$HClO_2$ (aq)** chlorous acid

o) LiF **lithium fluoride**

p) H_3PO_3 (aq) **phosphorous acid**

q) BF_3 **boron trifluoride**

r) $(NH_4)_2SO_4$ **ammonium sulfate**

s) $Ni(C_2H_3O_2)_2$ **nickel(II) acetate**

t) CS_2 **carbon disulfide**

u) H_2CO_3 **carbonic acid**

v) Ag_3PO_3 **silver phosphite**

w) HNO_2 (aq) **nitrous acid**

x) S_2Cl_2 **disulfur dichloride**

y) H_3PO_4 (aq) **phosphoric acid**

z) PbO **lead(II) oxide**

aa) CI_4 **carbon tetraiodide**

bb) NO **nitrogen monoxide**

cc) H_2S (aq) **hydrosulfuric acid**