Naming Compounds Handout Key

p. 2

Name each of the following monatomic cations:

Li^{+} = lithium ion

Ag^{+} = silver ion

Al^{+3} = aluminum ion

Mn^{+2} = manganese (II) ion

H^{+} = hydrogen ion

Fe^{+3} = iron (III) ion

K^{+} = potassium ion

Ca^{+2} = calcium ion

Cd^{+2} = cadmium ion

Cu^{+2} = copper (II) ion

Mg^{+2} = magnesium ion

Sn^{+4} = tin (IV) ion

Co^{+3} = cobalt (III) ion

Na^{+} = sodium ion

Ti^{+4} = titanium (IV) ion

Ni^{+2} = nickel (II) ion

p. 3

Name each of the following monatomic anions:

F^{-} = fluoride ion

Br^{-} = bromide ion

I^{-} = iodide ion

Cl^{-} = chloride ion

Se^{-2} = selenide ion

S^{-2} = sulfide ion

P^{-3} = phosphide ion

O^{-2} = oxide ion

p. 4

Name each of the following polyatomic ions:

CN^- = cyanide ion

CrO_4^{-2} = chromate ion

SO_4^{-2} = sulfate ion

NO_3^- = nitrate ion

OH^- = hydroxide ion

PO_4^{-3} = phosphate ion

NH_4^+ = ammonium ion

$C_2H_3O_2^-$ = acetate ion

Combine each pair of ions to get the formula of the compound they form:

$NH_4^+ + F^- \Rightarrow NH_4F$

$Li^+ + CN^- \Rightarrow LiCN$

$Sr^{+2} + CO_3^{-2} \Rightarrow SrCO_3$

$Al^{+3} + PO_4^{-3} \Rightarrow AlPO_4$

$Na^+ + C_2H_3O_2^- \Rightarrow NaC_2H_3O_2$

$K^+ + OH^- \Rightarrow KOH$

$Ni^{+2} + CrO_4^{-2} \Rightarrow NiCrO_4$

$Fe^{+3} + N^{-3} \Rightarrow FeN$

$Cd^{+2} + SO_4^{-2} \Rightarrow CdSO_4$

$Co^{+3} + P^{-3} \Rightarrow CoP$

p. 5

Combine each pair of ions to get the formula of the compound they form:

$Cu^+ \quad O^{-2}$ → Cu_2O

$Sn^{+4} \quad SO_4^{-2}$ → $Sn(SO_4)_2$

$K^+ \quad P^{-3}$ → K_3P

$Li^+ \quad CO_3^{-2}$ → Li_2CO_3

$Fe^{+3} \quad S^{-2}$ → Fe_2S_3

$Ni^{+2} \quad PO_4^{-3}$ → $Ni_3(PO_4)_2$

p. 6

Combine each pair of ions to get the chemical formula, then name the compound:

Individual ions	Compound Formula	Compound Name
Mg^{+2} F^{-}	MgF_2	magnesium fluoride
Ni^{+2} S^{-2}	NiS	nickel (II) sulfide
Ca^{+2} Br^{-}	$CaBr_2$	calcium bromide
Al^{+3} P^{-3}	AlP	aluminum phosphide
Co^{+2} NO_2^{-}	$Co(NO_2)_2$	cobalt (II) nitrite
K^{+} CrO_4^{-2}	K_2CrO_4	potassium chromate
Fe^{+3} O^{-2}	Fe_2O_3	iron (III) oxide

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Give the name for each compound given its chemical formula:

Formula	Individual Ions	Name of Compound
$MgCl_2$	Mg^{+2} Cl^-	magnesium chloride
$LiOH$	Li^+ OH^-	lithium hydroxide
$ZnCO_3$	Zn^{2+} CO_3^{2-}	zinc carbonate
K_2S	K^+ S^{2-}	potassium sulfide
$FePO_4$	Fe^{3+} PO_4^{3-}	iron (III) phosphate
SnO_2	Sn^{4+} O^{2-}	tin (IV) oxide
$CuBr_2$	Cu^{2+} Br^-	copper (II) bromide
Ag_3N	Ag^+ N^{3-}	silver nitride
$Mn(CN)_2$	Mn^{2+} CN^-	manganese (II) cyanide
$AgC_2H_3O_2$	Ag^+ $C_2H_3O_2^-$	silver acetate

p. 9

Give the name for each compound given its chemical formula:

Name of Compound	individual ions	Formula
lithium cyanide	Li^{+} CN^{-}	LiCN
iron (III) sulfate	Fe^{+3} SO_4^{-2}	$Fe_2(SO_4)_3$
calcium iodide	Ca^{+2} I^{-}	CaI_2
tin (IV) dichromate	Sn^{+4} $Cr_2O_7^{-2}$	$Sn(Cr_2O_7)_2$
cadmium nitrite	Cd^{+2} NO_2^{-}	$Cd(NO_2)_2$
copper (II) acetate	Cu^{+2} $C_2H_3O_2^{-}$	$Cu(C_2H_3O_2)_2$
zinc carbonate	Zn^{+2} CO_3^{-2}	$ZnCO_3$
lead (II) phosphide	Pb^{+2} P^{-3}	Pb_3P_2
potassium sulfite	K^{+} SO_3^{-2}	K_2SO_3
cobalt (II) nitride	Co^{+2} N^{-3}	Co_3N_2
nickel (II) permanganate	Ni^{+2} MnO_4^{-}	$Ni(MnO_4)_2$

p. 10

Name the following molecular compounds:

SO_3 = sulfur trioxide

$SiBr_4$ = silicon tetrabromide

XeF_6 = xenon hexafluoride

ClF_3 = chlorine trifluoride

N_2O_4 = dinitrogen tetraoxide

Cl_2O_7= dichlorine heptaoxide

PCl_5 = phosphorus pentachloride

P_4O_{10} = tetraphosphorus decaoxide

p. 11

Give the formulas for each of the following molecular compounds:

nitrogen trichloride	dibromine heptaoxide	dinitrogen pentasulfide
NCl_3	Br_2O_7	N_2S_5

Name each of the following ions, and determine the formula and name of the corresponding acid that forms from the ion.

	Name of Ion	**Formula of Acid**	**Name of Acid**
Cl^- =	chloride ion	⇒ HCl (aq) =	hydrochloric acid
CO_3^{-2} =	carbonate ion	⇒ H_2CO_3 (aq) =	carbonic acid
SO_3^{-2} =	sulfite ion	⇒ H_2SO_3 (aq) =	sulfurous acid
PO_4^{-3} =	phosphate ion	⇒ H_3PO_4 (aq) =	phosphoric acid
NO_3^- =	nitrate ion	⇒ HNO_3 (aq) =	nitric acid

p. 12

Name each of the following acids:

HBr (aq)= hydrobromic acid

H_2CrO_4 (aq)= chromic acid

H_2S (aq)= hydrosulfuric acid

$HC_2H_3O_2$ (aq)= acetic acid

H_2Se (aq)= hydroselenic acid

H_2SO_4 (aq)= sulfuric acid

Give the formula for each of the following acids: [Don't forget to indicate (aq)!]

perchloric acid = **SKIP**

nitrous acid = HNO_2 (aq)

phosphoric acid = H_3PO_4 (aq)

chromic acid = H_2CrO_4 (aq)

hydroiodic acid = HI (aq)

carbonic acid = H_2CO_3 (aq)

sulfurous acid = H_2SO_3 (aq)

nitric acid = HNO_3 (aq)

PUTTING IT ALL TOGETHER:

Name each of the following compounds:

$BaCl_2$ = barium chloride

$NiBr_2$= nickel (II) bromide

HNO_3(aq) = nitric acid

SO_2= sulfur dioxide

AgF = silver fluoride

$PbSe_2$= lead (IV) selenide

$CuSO_3$= copper (II) sulfite

PF_5= phosphorus pentafluoride

K_2SO_4= potassium sulfate

$Cr(C_2H_3O_2)_3$ = chromium (III) acetate

FeP= iron (III) phosphide

$Al_2(CO_3)_3$ = aluminum carbonate

$NiMnO_4$ = nickel (II) permanganate

$Cd(OH)_2$ = cadmium hydroxide