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

Ba^{+2} = barium 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

S^{-2} = sulfide ion

P^{-3} = phosphide ion

p. 4

Name each of the following polyatomic ions:

CN^{-} = cyanide ion

SO_4^{-2} = sulfate ion

OH^{-} = hydroxide ion

NH_4^{+} = ammonium ion

CrO_4^{-2} = chromate ion

NO_3^{-} = nitrate ion

PO_4^{-3} = phosphate ion

$C_2H_3O_2^{-}$ = acetate ion

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

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

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

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

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

$Cu^{+2} + SO_4^{-2} \Rightarrow CuSO_4$

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

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

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

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

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

p. 5 Combine each pair of ions to get the formula of the compound they form:

Cu^{+} O^{-2}	Sn^{+4} SO_4^{-2}	K^{+} P^{-3}
Cu_2O	$Sn(SO_4)_2$	K_3P
Li^{+} CO_3^{-2}	Fe^{+3} S^{-2}	Ni^{+2} PO_4^{-3}
Li_2CO_3	Fe_2S_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

p. 8

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} $Cr_2O_7^{-2}$	$Sn(Cr_2O_7)_2$
silver nitrite	Ag^{+} NO_2^{-}	$AgNO_2$
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

p. 11

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
CO_3^{-2} = carbonate ion ⇒	H_2CO_3 (aq) =	carbonic acid
Cl^- = chloride ion ⇒	HCl (aq) =	hydrochloric 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_2SO_4 (aq)= sulfuric acid

$HC_2H_3O_2$ (aq)= acetic acid

HF (aq)= hydrofluoric acid

H_2SO_4 (aq)= sulfuric acid

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

phosphoric acid = H_3PO_4 (aq)

nitrous acid = HNO_2 (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

PbS_2= lead (IV) sulfide

$NiSO_3$= nickel (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

$NiSO_4$ = nickel (II) sulfate

$Zn(OH)_2$ = zinc hydroxide

$KMnO_4$ = potassium permanganate

$Sn(CN)_2$ = tin (II) cyanide