Name: ANSWERS

Oxidation States Worksheet

Define the term oxidation state:

Using your textbook page 97-98 or your periodic table identify the oxidation states for the following elements. Note: some elements may have more than one oxidation state.

Element	Symbol	Oxidation State
Sodium	Na	+1
Cesium	Cs	+1
Bromine	Br	-1
Nitrogen	N	-3
Oxygen	O	-2
Calcium	Ca	+2
Beryllium	Be	+2
Aluminum	Al	+3
Sulphur	S	-2
Phosphorus	P	-3
Silver	Ag	+1
Mercury	Hg	+1, +2
Gold	Au	+1, +3
Cobalt	Co	+2, +3
Rubidium	Rb	+1
Potassium	K	+1
Gallium	Ga	+3
Copper	Cu	+1, +2
Nickel	Ni	+1, +3
Iron	Fe	+2, +3
Chromium	Cr	+6, +3, +2

*Elements in the first group have an oxidation number of +1. These elements give up 1 electron. Similarly elements in the second group have an oxidation number of +2 and give up two electrons

*Elements in the seventeenth group have an oxidation number of -1. These elements gain 1 electron during bonding. Elements in the VI group have an oxidation number of negative 2. These elements gain 2 electrons.

*The transition metals often have more than one oxidation state. The element with three oxidation states is V, Cr, Mn, W

Writing Chemical Formulas

Read pages 99-100 and complete practice problems 18 and 19.
****If you are having difficulties write out the steps 1-4 in your notebook on page 99 and follow them.****

In your own words, what is the zero sum rule? Using $CaCl_2$ show how to determine this chemical formula from the oxidation states of each element using the zero sum rule.

Charges in neutral molecules must cancel.
1 Ca atom +2 + 2Cl -1 = 0

What is an alternative method to determining the chemical formula for $CaCl_2$?

criss cross

Write the chemical formula for the following elements bonded to chromate.

a) Na Na_2CrO_4
b) Ba $BaCrO_4$
c) Zn $ZnCrO_4$
d) Mg $MgCrO_4$
e) Li Li_2CrO_4
f) Fe (+2) $FeCrO_4$
g) Fe (+3) $Fe_2(CrO_4)_3$

Write the chemical formula for the following elements bonded to phosphate.

a) K K_3PO_4
b) Be $Be_3(PO_4)_2$
c) Ca $Ca_3(PO_4)_2$
d) Co (+3) $CoPO_4$
e) Co (+2) $Co_3(PO_4)_2$
f) Ag Ag_3PO_4
g) Cd $Cd_3(PO_4)_2$
h) Sn (+2) $Sn_3(PO_4)_2$

Write the chemical formula for the following elements bonded to nitrate.

a) Na $NaNO_3$
b) Ga $Ga(NO_3)_3$
c) Al $Al(NO_3)_3$
d) Cu (+2) $Cu(NO_3)_2$
e) Cu (+1) $CuNO_3$
f) Fe (+3) $Fe(NO_3)_3$

Write the chemical formula for the following elements bonded to hydroxide.

a) K KOH
b) Zn $Zn(OH)_2$
c) Sn $Sn(OH)_2$
d) B $B(OH)_3$

What is wrong with the chemical formula for the following compounds?

Na_2Cl_2 $Na_6(PO_4)_2$

****If you are really stuck see problem tip on page 99****

not reduced
= NaCl

not reduced
= Na_3PO_4

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Chemical Compounds and Bonding: Nomenclature Review

GASES - monatomic and diatomic					
Write Formulas			**Write Names**		
1.	hydrogen gas	$H_2(g)$	8.	He	$He(g)$
2.	oxygen gas	$O_2(g)$	9.	Ne	$Ne(g)$
3.	nitrogen gas	$N_2(g)$	10.	Ar	$Ar(g)$
4.	fluorine gas	$F_2(g)$	11.	Kr	$Kr(g)$
5.	chlorine gas	$Cl_2(g)$	12.	Xe	$Xe(g)$
6.	bromine vapour	$Br_2(g)$	13.	Rn	$Rn(g)$
7.	iodine vapour	$I_2(g)$			

BINARY COMPOUNDS - REGULAR					
Write Formulas			**Write Names**		
1.	sodium chloride	$NaCl$	17.	CaO	calcium oxide
2.	calcium fluoride	CaF_2	18.	$AgCl$	silver chloride
3.	barium bromide	$BaBr_2$	19.	Ca_3N_2	calcium nitride
4.	lithium carbide	Li_4C	20.	H_2O	water
5.	silver iodide	AgI	21.	$SiBr_4$	silicon tetrabromide
6.	potassium oxide	K_2O	22.	Al_2S_3	aluminum sulphide
7.	aluminum bromide	$AlBr_3$	23.	$AgCl$	silver chloride
8.	calcium nitride	Ca_3N_2	24.	AlF_3	aluminum fluoride
9.	radium oxide	RaO	25.	$NaCl$	sodium chloride
10.	boron fluoride	BF_3	26.	KBr	potassium bromide
11.	hydrogen sulfide	H_2S	27.	BaS	barium sulphide
12.	rubidium hydride	RbH	28.	AlN	aluminum nitride
13.	cesium oxide	Cs_2O	29.	BAs	boron arsenide
14.	magnesium sulfide	MgS	30.	$HBr(l)$	hydrogen bromide
15.	calcium carbide	Ca_2C	31.	$ZnCl_2$	zinc chloride
16.	zinc oxide	ZnO	32.	MgI_2	magnesium iodide

woops