Chemistry Name: _____

Section _____ BINARY NAMES GUIDED NOTES Date: _____

Binary Compound Nomenclature

There are three types of binary compounds.

Type I: simple binary ionic compounds

Used for cations with a single oxidation state

Name the cation first using just the element name

Name the anion last but change the suffix (or ending) to 'ide'

Example: the name for Al_2O_3 is aluminum oxide

Type II: ambiguous binary ionic compounds

Used for cations with multiple oxidation states

Name the first ion by using the element name

but add a Roman numeral in parentheses

that shows the oxidation state of the cation

Name the anion last but change the suffix (or ending) to 'ide'

Example: the name for Fe_2O_3 is iron(III) oxide

Type III: molecular binary compounds

Used when both elements are nonmetals

Use Greek prefixes that indicate the number of

atoms for each element

The prefixes are:

1. mono
2. di
3. tri
4. tetra
5. penta
6. hexa
7. hepta
8. octa
9. nona
10. deca

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The root names after the prefixes are the same as those used in Type I.

Example: the name for N_2O_3 is dinitrogen trioxide

Never use the prefix mono for the first element.

Example: the name for SO_3 is sulfur trioxide

Compounds that begin with hydrogen use no prefixes.

Example: the name for H_2S is hydrogen suflide

Avoid double vowels like ao or oo

Example: the name for CO is carbon monoxide (not carbon monooxide)

Important exceptions:

The name for NH_3 is ammonia

The name for H_2O is water

The name for H_2O_2 is hydrogen peroxide

The name for $HCl_{(aq)}$ is hydrochloric acid

Recognizing Peroxides

The first clue to recognizing peroxides (and superoxides) is that both have oxygen-to-oxygen single bonds (XO_2)

The only way to unequivocally identify peroxides (and superoxides) is by calculating their oxidation states

Example: assign oxidation states and name the following:

H_2O_2	H^{+1}	O^{-1}	hydrogen peroxide
KO_2	K^{+1}	$O^{-1/2}$	potassium superoxide
K_2O	K^{+1}	O^{-2}	potassium oxide

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