<u>NOTES: 9.3-9.4 –</u> <u>Molecular Compounds</u> <u>and Acids</u>

Chemical Formulas and Names of Compounds

Binary Molecular Compounds:

 binary molecular compounds: composed of <u>2 nonmetallic</u> <u>elements</u>

- composed of MOLECULES
- ionic charges are NOT used to assign formulas or names to them

Binary Molecular Compounds:

often, nonmetals combine with one another in more than one way
 <u>EXAMPLE</u>:

Binary Molecular Compounds:

 often, nonmetals combine with one another in more than one way
 EXAMPLE:

carbon and oxygen combine as:
 CO = <u>carbon monoxide</u>
 CO₂ = <u>carbon dioxide</u>

Molecular Compound Naming Rules

- First element name <u>do not</u> <u>change</u>
- Second element <u>drop the ending</u> <u>and add -ide</u>
- Use <u>PREFIXES</u> to indicate how many – only exception is if there is only one of the first element

Prefixes: see Table 9.4 – p.281

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

•	N ₂ O	=
•	PCl ₃	=
•	SF ₆	=
	N_2O_4	=
•	PCI ₅	=
	XeF ₆	=
•	Cl ₂ O ₈	=
•	OF ₂	=
•	CBr ₄	=
•	SI ₃	=

• N_2O • PCI_3 = • SF_6 = • N_2O_4 • PCI_5 • XeF_6 = • Cl_2O_8 = • OF_2 • CBr₄ • SI_3

dinitrogen monoxide

• N_2O • PCI_3 = • SF_6 = • N_2O_4 • PCI_5 • XeF_6 = • Cl_2O_8 = • OF_2 • CBr₄ • SI_3

<u>dinitrogen monoxide</u> <u>phosphorus trichloride</u>

• N_2O • PCI_3 = • SF_6 = • N_2O_4 = • PCI_{5} • XeF_6 = • Cl_2O_8 = \bullet OF₂ • CBr₄ • SI_3

<u>dinitrogen monoxide</u> <u>phosphorus trichloride</u> <u>sulfur hexafluoride</u>

• N_2O • PCI_3 = • SF_6 = • N_2O_4 = • PCI_5 • XeF_6 = • Cl_2O_8 = \bullet OF₂ • CBr₄ • SI_3

<u>dinitrogen monoxide</u> <u>phosphorus trichloride</u> <u>sulfur hexafluoride</u> <u>dinitrogen tetroxide</u>

- N_2O
- PCI_3

=

=

=

=

=

=

- SF_6 =
- N_2O_4
- PCI_{5} • XeF_6
- Cl_2O_8
- OF_2
- CBr₄
- SI_3

dinitrogen monoxide phosphorus trichloride sulfur hexafluoride dinitrogen tetroxide phosphorus pentachloride

- N_2O
- PCI_3

=

=

=

- SF_6 =
- N_2O_4
- PCI_5 =
- XeF_6 • Cl_2O_8
- = • OF_2
- CBr₄ • SI_3

dinitrogen monoxide phosphorus trichloride sulfur hexafluoride dinitrogen tetroxide phosphorus pentachloride xenon hexafluoride

- \bullet N₂O
- PCI_3

=

=

- SF_6 =
- N_2O_4
- PCI_5 =
- XeF_6
- Cl_2O_8 = • OF_2
- CBr₄
- SI_3

dinitrogen monoxide phosphorus trichloride sulfur hexafluoride dinitrogen tetroxide phosphorus pentachloride xenon hexafluoride dichlorine octoxide

- N_2O
- PCI_3
- SF_6
- N_2O_4
- PCI_{5} =
- XeF_6
- Cl_2O_8 • OF_2
- CBr₄ • SI_3
- = =

=

=

=

dinitrogen monoxide phosphorus trichloride sulfur hexafluoride dinitrogen tetroxide phosphorus pentachloride xenon hexafluoride dichlorine octoxide oxygen difluoride

Name the following MOLECULAR compounds:

- N_2O = • PCI_3 = • SF_6 = • N_2O_4 = • PCI_5 = • XeF_6 = • Cl_2O_8 = • OF_2 = • CBr₄ = • SI_3 =
- dinitrogen monoxide phosphorus trichloride sulfur hexafluoride dinitrogen tetroxide phosphorus pentachloride xenon hexafluoride dichlorine octoxide oxygen difluoride carbon tetrabromide

- N_2O
- PCI_3

=

=

=

=

=

_

- SF_6 =
- N_2O_4
- PCI_{5} =
- XeF_6
- Cl_2O_8 = -
- OF_2 • CBr₄
- SI_3

dinitrogen monoxide phosphorus trichloride sulfur hexafluoride dinitrogen tetroxide phosphorus pentachloride xenon hexafluoride dichlorine octoxide oxygen difluoride carbon tetrabromide sulfur triiodide

- Acids are compounds that produce hydrogen ions (H⁺) when dissolved in water...
- Consider an acid to be a combination of anions connected to H⁺ ions
- Like ionic compounds, <u>the overall</u> charge must be zero (electrically neutral)

 When the name of the anion (X) ends in "ide" the acid name begins with the prefix "hydro". The stem of the anion has the suffix "ic" and is followed by the word "acid"

Example: HCl (X = chloride)



(X = fluoride)

Example: HCl (X = chloride) Hydrochloric acid





Example: HCl (X = chloride) Hydrochloric acid

Example: HF (X = fluoride) Hydrofluoric acid

 When the anion ends in "ite", the acid name is the stem of the anion with the suffix "ous", followed by the word "acid".

Example: H_2SO_3 (X = sulfite)

<u>Example</u>: HNO_2 (X = nitrite)

Example: H_2SO_3 (X = sulfite) **Sulfurous acid**

<u>Example</u>: HNO_2 (X = nitrite)

Example: H_2SO_3 (X = sulfite) **Sulfurous acid**

Example: HNO2 (X = nitrite) Nitrous acid

 If the anion name ends in "ate", then the acid name is the stem of the anion with the suffix "ic", followed by the word "acid".

Example: HNO_3 (X = Nitrate)

Example: H_2CO_3 (X = Carbonate)

<u>Example</u>: HNO_3 (X = Nitrate) Nitric acid

Example:

H_2CO_3 (X = Carbonate)

Example: HNO₃ (X = Nitrate) **<u>Nitric acid</u>**

Example: H_2CO_3 (X = Carbonate) <u>Carbonic acid</u>

Name of Acid:	Formula of Acid:
Hydrochloric acid	
	H ₃ PO ₄
Nitric acid	
Acetic acid	
	H ₂ CO ₃
	HBr
Chlorous acid	

Name of Acid:	Formula of Acid:
Hydrochloric acid	HCI
	H ₃ PO ₄
Nitric acid	
Acetic acid	
	H ₂ CO ₃
	HBr
Chlorous acid	

Name of Acid:	Formula of Acid:
Hydrochloric acid	HCI
Phosphoric acid	H ₃ PO ₄
Nitric acid	
Acetic acid	
	H ₂ CO ₃
	HBr
Chlorous acid	

Name of Acid:	Formula of Acid:
Hydrochloric acid	HCI
Phosphoric acid	H ₃ PO ₄
Nitric acid	HNO ₃
Acetic acid	
	H ₂ CO ₃
	HBr
Chlorous acid	

Name of Acid:	Formula of Acid:
Hydrochloric acid	HCI
Phosphoric acid	H ₃ PO ₄
Nitric acid	HNO ₃
Acetic acid	HC ₂ H ₃ O ₂
	H ₂ CO ₃
	HBr
Chlorous acid	

Name of Acid:	Formula of Acid:
Hydrochloric acid	HCI
Phosphoric acid	H ₃ PO ₄
Nitric acid	HNO ₃
Acetic acid	HC ₂ H ₃ O ₂
Carbonic acid	H ₂ CO ₃
	HBr
Chlorous acid	

Name of Acid:	Formula of Acid:
Hydrochloric acid	HCI
Phosphoric acid	H ₃ PO ₄
Nitric acid	HNO ₃
Acetic acid	HC ₂ H ₃ O ₂
Carbonic acid	H ₂ CO ₃
Hydrobromic acid	HBr
Chlorous acid	

Name of Acid:	Formula of Acid:
Hydrochloric acid	HCI
Phosphoric acid	H ₃ PO ₄
Nitric acid	HNO ₃
Acetic acid	HC ₂ H ₃ O ₂
Carbonic acid	H ₂ CO ₃
Hydrobromic acid	HBr
Chlorous acid	HCIO ₂

The best way to achieve success with writing chemical names and formulas is to practice, practice, practice!!