Formula Mass

INTERPRETING FORMULAS QUANTITATIVELY

An Example

- Air is a mixture of gases: nitrogen, oxygen, carbon dioxide, water vapor, etc..

- Stormy weather is preceded by a falling barometer because, as the percentage of water in the air increases, the weight of the air decreases.

- Prove this by calculating the masses of the components of air. Refer to your *Periodic Table.*

The Masses of the Gases

- <u>Nitrogen</u> is N_2.
- Its atomic mass is 14 amu.
- There are two atoms.
- The mass must be 28 amu.

- <u>Carbon dioxide</u> is CO_2.
- Carbon is 12 amu.
- Oxygen is 16 amu, but there are two for 32 amu.
- The total is 42 amu.

- <u>Oxygen</u> is O_2.
- Its atomic mass is 16 amu.
- There are two atoms.
- The mass must be 32 amu.

- <u>Water</u> is H_2O.
- Hydrogen is 1 amu, but there are two for 2 amu.
- Oxygen is 16 amu.
- The total is 18 amu.

Water is the lightest of the gases.

A Formal Approach

- **Procedure:** To find the formula mass, add up the product of the subscript and the mass from the periodic table for each element shown in the formula.

- **Example**: silver nitrate

  $AgNO_3$

Element	Subscript	Mass	Product
Ag =	1 ×	108 =	108 amu
N =	1 ×	14 =	14 amu
O =	3 ×	16 =	48 amu
			170 amu