Basics of Chemistry Cheat Sheet

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Mole

In the field of chemistry, a mole is defined as the amount of a substance that contains exactly 6.02214076 * 10^{23} 'elementary entities' of the given substance.

Number of Moles

$$\frac{Number-of-Particles}{6.02*10^{23}} = \frac{Given-Mass}{Molar-Mass} = \frac{Given-Volume-in-Litres}{22.4Litres} = Number-of-Moles$$

STP vs NTP

Properties	STP	NTP
Temperature (in Kelvin)	273.16 K ≈ 273 K	293.16K ≈ 293 K
Temperature (in Celsius)	0^oC	20^oC
Pressure	1 bar= 0.9862 atm≈ 1 atm	1 atm
Pressure (in Nm^2)	10^5 Nm^2	$1.01*10^5$ Nm^2

K= Kelvin↔(temperature)
^oC= Degree Celsius↔(temperature)
atm= atmosphere↔(pressure)
Nm^2= Newton*$(meter)^2$↔(pressure)

Percentage Composition of an Element

$$\frac{n*(Atomic-mass-of-element)}{Molar-mass-of-compound}*100$$

n= Number of atoms of the element in one molecule of the compound

Temperature Conversions

$$°F = (°C \times \frac{9}{5}) + 32$$
$$°C = (°F - 32) \times \frac{5}{9}$$
$$°C = (K - 273.15)$$
$$K = (°C + 273.15)$$

^{o}F= Degree Fahrenheit
^{o}C= Degree Celsius
K= Degree Kelvin

Laws of Chemistry

LAWS	SCIENTISTS	DATE
1. Law of Conservation of Mass	Antoine Lavoisier	1744
2. Law of Definite Composition/Proportions	Joseph Proust	1799
3. Law of Multiple Proportions	John Dalton	1804
4. Law of Gaseous volume	Gay Lussac	1808

Conversions

Volume

1 Litre= 10^3 mL= 10^3 cm^3= 10^{-3} m^3= 1 dm^3

Pressure

1 atm= 76 cm of Hg= 760 mm of Hg= 760 torr

1 atm= $1.01*10^5$ Nm^2

1 atm= $1.01*10^5$ Pa

1 bar= 0.9862 atm≈ 1 atm

mL= milli-litre
cm= centimeter
m= meter
dm= decimeter
atm= atmosphere
N= Newton
Pa= Pascals

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