

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1A	2A																8A
1	2											5	6	7	8	9	2
H	He											B	C	N	O	F	He
1.008												10.81	12.01	14.01	16.00	19.00	4.003
3	4											13	14	15	16	17	10
Li	Be											Al	Si	P	S	Cl	Ne
6.941	9.012											26.98	28.09	30.97	32.07	35.45	20.18
11	12											13	14	15	16	17	18
Na	Mg											Al	Si	P	S	Cl	Ar
22.99	24.31											26.98	28.09	30.97	32.07	35.45	39.95
19	20											31	32	33	34	35	36
K	Ca											Ga	Ge	As	Se	Br	Kr
39.10	40.08											69.72	72.59	74.92	78.96	79.90	83.80
37	38											49	50	51	52	53	54
Rb	Sr											In	Sn	Sb	Te	I	Xe
85.47	87.62											114.8	118.7	121.8	127.6	126.9	131.3
55	56											81	82	83	84	85	86
Cs	Ba											Tl	Pb	Bi	Po	At	Rn
132.9	137.3											204.4	207.2	209.0	(210)	(210)	(222)
87	88												114		116		118
Fr	Ra																
(223)	(226)												(289)		(289)		(293)

58	59	60	61	62	63	64	65	66	67	68	69	70	71
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
140.1	140.9	144.2	144.9	150.4	152.0	157.3	158.9	162.5	164.9	167.3	168.9	173.0	175.0
90	91	92	93	94	95	96	97	98	99	100	101	102	103
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
232.0	231.0	238.0	237	239.1	243.1	247.1	247.1	252.1	252.1	257.1	256.1	259.1	260.1

TABLA DE EQUIVALENCIAS DE UNIDADES

LONGITUD

1 m = 3.2808 ft = 100 cm = 39.3701 in
1 cm = 10^{-2} m = 0.393701 in = 0.032808 ft
1 mm = 10^{-3} m
1 μ m (1 micra) = 10^{-6} m
1 Å (1 Angstrom) = 10^{-10} m = 10^{-8} cm
1 in = 2.54 cm = 0.0254 m
1 ft = 30.48 cm = 12 in = 0.3048 m
1 yd = 0.91459841 m
1 mi = 1.609 km = 1609.34 m = 5280 ft

NOTA:

in: inch (pulgada) plg

ft: feet (pies)

yd: yard (yarda)

mi: mille (milla)

MASA

1 kg = 1000 g = 2.2046 lb
1 lb = 0.453593 kg = 453.593 g = 16 oz
1 ton métrica = 1000 kg = 2205 lb
1 ton corta = 2000 lb
1 ton larga = 2240 lb
1 oz = 28.35 g = 0.02835 kg
1 slug = 32.1739 lb

VOLUMEN

1 m³ = 1000 L = 35.3147 ft³ = 264.17 gal = 61023.7 in³ = 10³ dm³ = 10⁶ cm³
1 in³ = 16.39 cm³
1 ft³ = 28.3168 L = 0.02831 m³ = 28316.8 cm³
1 gal = 4.546 L = 0.004546 m³ = 277.42 in³
1 L = 1000 cm³ = 1000 mL = 1 dm³
1 cm³ = 1 mL

PRESIÓN

1 Pa = 1 N/m²
1 bar = 10⁵ Pa = 100 kPa = 0.1 MPa = 0.986923 atm = 14.5038 psia = 1.0197 kg_f/cm²
= 750.062 mm Hg = 75.0062 cm Hg = 750.062 torr = 401.48 in H₂O = 10⁸ barias
1 atm = 1.01325 bar = 101.325 kPa = 0.101325 MPa = 101325 Pa = 14.696 lb_f/in² (psi)
= 1.0332 kg_f/cm² = 76 cm Hg = 760 mm Hg = 406.8 in H₂O = 33.9 ft H₂O
= 1.05 x 10⁴ mm H₂O = 1.05 x 10³ cm H₂O = 1013250 dina/cm² = 760 torr = 29.9212 in Hg
1 mm Hg = 13.6 mm H₂O = 1.33 mbar = 133.322 Pa = 1 torr = 0.1 cm Hg = 0.03937 in Hg
1 lb_f/in² (psi) = 68948 dina/cm² = 703.1 kg_f/m² = 6894.8 Pa = 0.0680 atm = 2.036 in Hg = 0.0689 bar

NOTA:

psi: pounds per squared inch (libras *fuerza* sobre pulgada cuadrada)

psia: pounds per squared inch absolute (libras *fuerza* sobre pulgada cuadrada absolutas)

psig: pounds per squared inch gauge (libras *fuerza* sobre pulgada cuadrada manométricas)

torr: torricelli

FUERZA

$$1 \text{ N} = 1 \text{ kg m/s}^2$$

$$1 \text{ dina} = 1 \text{ g cm/s}^2$$

$$1 \text{ lb}_f = 32.174 \text{ lb ft/s}^2 = 4.4482 \text{ N}$$

$$1 \text{ kg}_f = 1000 \text{ g}_f = 9.807 \text{ kg m/s}^2 = 9.807 \text{ N}$$

ENERGÍA

$$1 \text{ J} = 1 \text{ kg m}^2/\text{s}^2 = 1 \text{ N m} = 1 \text{ Pa m}^3$$

$$1 \text{ erg} = 1 \text{ g cm}^2/\text{s}^2 = 1 \text{ dina cm}$$

$$1 \text{ J} = 0.239 \text{ cal} = 10^7 \text{ erg} = 1 \text{ N m} = 9.48 \times 10^{-4} \text{ Btu} = 9.87 \times 10^{-3} \text{ L atm} = 2.778 \times 10^{-2} \text{ kW h}$$

$$1 \text{ kJ} = 1000 \text{ J} = 10^3 \text{ Pa m}^3 = 10^4 \text{ bar cm}^3 = 239.01 \text{ cal} = 0.94845 \text{ Btu} = 737.562 \text{ lb}_f \text{ ft} \\ = 1.0197 \times 10^4 \text{ kg}_f \text{ cm} = 9.86923 \times 10^3 \text{ atm cm}^3$$

$$1 \text{ Btu} = 1055.04 \text{ J} = 252 \text{ cal} = 778.161 \text{ lb}_f \text{ ft} = 10.412 \text{ L atm}$$

$$1 \text{ cal} = 4.184 \text{ J} = 3.968 \times 10^{-3} \text{ Btu} = 4.19 \times 10^7 \text{ erg} = 4.13 \times 10^{-2} \text{ L atm} = 3.086 \text{ lb}_f \text{ ft}$$

$$1 \text{ L atm} = 24.2 \text{ cal} = 1.01 \times 10^9 \text{ erg} = 101 \text{ J} = 0.096 \text{ Btu} = 74.735 \text{ lb}_f \text{ ft}$$

$$0.082 \text{ L atm} = 1.987 \text{ cal} = 8.314 \text{ J}$$

NOTA:

Btu: British thermal unit (unidad térmica británica)

POTENCIA

$$1 \text{ W} = 1 \text{ J/s} = 1 \text{ N m/s} = 1 \text{ kg m}^2/\text{s}^3$$

$$1 \text{ W} = 0.23901 \text{ cal/s} = 0.8064 \text{ kcal/h} = 0.7376 \text{ ft lb}_f/\text{s} = 9.486 \times 10^{-4} \text{ Btu/s} = 3.4144 \text{ Btu/h} \\ = 1.341 \times 10^{-3} \text{ hp}$$

$$1 \text{ kW} = 1000 \text{ W}$$

NOTA:

hp: horse power (caballo de fuerza)

CANTIDAD DE SUSTANCIA

$$1 \text{ mol} = 1000 \text{ mmol} = 10^{-3} \text{ kgmol}$$

$$1 \text{ kgmol (kmol)} = 1000 \text{ mol} = 10^6 \text{ mmol} = 2.02462 \text{ lbmol}$$

$$1 \text{ lbmol} = 453.59 \text{ mol} = 453\,590 \text{ mmol}$$

RELACIONES DE ESCALAS TERMOMÉTRICAS

$$\frac{t(^{\circ}\text{C})}{100} = \frac{t(^{\circ}\text{F}) - 32}{180} = \frac{T(\text{K}) - 273.15}{100} = \frac{T(\text{R}) - 491.69}{180}$$

RELACIONES DE DIFERENCIAS DE TEMPERATURAS

$$\frac{\Delta t(^{\circ}\text{C})}{100} = \frac{\Delta t(^{\circ}\text{F})}{180} = \frac{\Delta T(\text{K})}{100} = \frac{\Delta T(\text{R})}{180}$$

Ejemplo: El factor para convertir de mm Hg a Pa es $\left(\frac{101325 \text{ Pa}}{760 \text{ mm Hg}} \right)$

UNIDADES COMUNES EN LAS QUE SE EXPRESA LA CONSTANTE UNIVERSAL DE LOS GASES

$R = 0.082 \text{ L atm/mol K}$
 $= 82.06 \text{ cm}^3 \text{ atm/mol K}$
 $= 8.314 \text{ m}^3 \text{ Pa/mol K}$
 $= 0.0834 \text{ L bar/mol K}$
 $= 8\,314 \text{ cm}^3 \text{ kPa/mol K}$
 $= 8.314 \text{ J/mol K}$
 $= 8.314 \times 10^7 \text{ erg/mol K}$
 $= 83.14 \text{ cm}^3 \text{ bar/mol K}$
 $= 62\,356 \text{ cm}^3 \text{ torr/mol K}$
 $= 62\,356 \text{ cm}^3 \text{ mm Hg/mol K}$
 $= 62.356 \text{ L mm Hg/mol K}$
 $= 1.987 \text{ cal/mol K}$
 $= 0.7302 \text{ ft}^3 \text{ atm/lbmol R}$
 $= 1.987 \text{ Btu/lbmol R}$
 $= 10.73 \text{ ft}^3 \text{ psia/lbmol R}$

