



Conversion Factors and Useful Information

International Metric System – Le Systeme International d'Unites (SI Units)

Base Units of the International Metric System (SI)		
Quantity	Name of the Unit	Symbol
Length	meter	m
Mass	kilogram	kg
Time	second	s
Temperature	Kelvin	K
Electric current	ampere	A
Luminous intensity	candela	cd
Amount of substance	mole	mol

Recommended Decimal Multiples and Submultiples with Corresponding Prefixes and Names

Factor	Prefix	Symbol	Meaning
10 ¹²	tera	T	One trillion times
10 ⁹	giga	G	One billion times
10 ⁶	mega	M	One million times
10 ³	kilo	k	One thousand times
10 ²	hecto	h	One hundred times
10	deca	da	Ten times
10 ⁻¹	deci	d	One tenth of
10 ⁻²	centi	c	One hundredth of
10 ⁻³	milli	m	One thousandth of
10 ⁻⁶	micro	μ	One millionth of
10 ⁻⁹	nano	n	One billionth of
10 ⁻¹²	pico	p	One trillionth of
10 ⁻¹⁵	femto	f	One quadrillionth of
10 ⁻¹⁸	atto	a	One quintillionth of

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Pressure

From/to	mm Hg	in. Hg	in. H ₂ O	ft H ₂ O	atm	lb/in. ²	Kg/cm ²
mm Hg	1	0.03937	0.5553	0.04460	0.00132	0.01934	0.00136
in. Hg	25.40	1	13.60	1.133	0.03342	0.4912	0.03453
in. H ₂ O	1.868	0.07355	1	0.08333	0.00246	0.03613	0.00254
ft. H ₂ O	22.42	0.8826	12	1	0.02950	0.4335	0.03048
atm	760	29.92	406.8	33.90	1	14.70	1.033
lb/in. ²	51.71	2.036	27.67	2.301	0.06805	1	0.07031
kg / cm ²	735.6	28.96	393.7	32.81	0.9678	14.22	1

Volume

From/to	cm ³	liter	m ³	in. ³	ft ³
cm ³	1	0.001	1 x 10 ⁻⁶	0.06102	3.53 x 10 ⁻⁵
liter	1000	1	0.001	61.02	0.03532
m ³	1x10 ⁶	1000	1	6.10x10 ⁴	35.31
in. ³	16.39	0.01639	1.64 x 10 ⁻⁵	1	5.79 x 10 ⁻⁴
ft ³	2.83 x 10 ⁻⁴	28.32	0.02832	1728	1

Temperature

$^{\circ}\text{C} = 5/9(^{\circ}\text{F} - 32)$	$^{\circ}\text{F} = 9/5(^{\circ}\text{C} + 32)$
$\text{K} = ^{\circ}\text{C} + 273.2$	$^{\circ}\text{R} = ^{\circ}\text{F} + 459.7$

Conversion Factors – Flow

Desired units / Given units	$\frac{m^3}{sec}$	$\frac{m^3}{min}$	$\frac{m^3}{hour}$	$\frac{ft^3}{sec}$	$\frac{ft^3}{min}$	$\frac{ft^3}{hour}$	$\frac{L}{sec}$	$\frac{L}{min}$	$\frac{cm^3}{sec}$	$\frac{cm^3}{min}$
$\frac{m^3}{sec}$	1	60	3600	35.3144	21.1887×10^2	12.7132×10^4	999.973	59.998×10^3	1×10^5	6×10^7
$\frac{m^3}{min}$	0.0167	1	60	0.5886	35.3144	21.189×10^2	16.667	999.973	16.667×10^3	1×10^4
$\frac{m^3}{hour}$	2.778×10^{-3}	16.667×10^{-3}	1	98.90×10^{-6}	0.5886	35.3144	27.777×10^{-2}	16.667	2.777×10^2	1.666×10^4
$\frac{ft^3}{sec}$	28.317×10^{-3}	1.699	101.94	1	60	3600	28.316	16.9896×10^2	2.8317×10^4	1.699×10^6
$\frac{ft^3}{min}$	4.7195×10^{-6}	28.317×10^{-3}	1.699	16.667×10^{-2}	1	60	47.193×10^{-2}	28.316	4.7195×10^3	2.8317
$\frac{ft^3}{hour}$	7.8658×10^{-6}	4.7195×10^{-4}	28.317×10^{-3}	2.778×10^{-4}	16.667×10^{-2}	1	7.866×10^{-3}	0.4719	78.658	4.7195×10^2
$\frac{L}{sec}$	1.000027×10^{-3}	6.00016×10^{-2}	3.6	35.316×10^{-3}	2.11896	127.138	1	60	1000.027	16.667
$\frac{L}{min}$	1.6667×10^{-6}	1.000027×10^{-3}	6.00016×10^{-2}	5.886×10^{-6}	35.316×10^{-3}	2.11896	1.6667×10^{-2}	1	16.667	1000.027
$\frac{cm^3}{sec}$	6×10^{-6}	6×10^{-6}	3.6×10^{-3}	3.5314×10^{-6}	2.1189×10^{-3}	1.271×10^{-3}	9.99973×10^{-4}	5.9998×10^{-2}	1	16.667×10^{-2}
$\frac{cm^3}{min}$	1×10^{-6}	1×10^{-4}	6×10^{-6}	5.886×10^{-7}	0.3531×10^{-6}	2.11887×10^{-3}	5.9998×10^{-2}	9.99973×10^{-6}	60	1

To convert a value from a given unit to a desired unit, multiply the given value by the factor opposite the given unit and beneath the desired unit.

Conversion Factors – ppm vs. $\mu g/m^3$

Desired units / Given units	Parts per million by volume – ppm					
	O ₃	NO ₂	SO ₂	H ₂ S	CO	HC as methane
$\mu g/m^3$	5.10×10^{-4}	5.32×10^{-4}	3.83×10^{-4}	7.19×10^{-4}	-	-
mg/m^3	-	-	-	-	0.875	1.53

Desired units / Given units	$\mu g/m^3$				mg/m^3	
	O ₃	NO ₂	SO ₂	H ₂ S	CO	HC
ppm	1960	1880	2610	1390	1.14	0.654

To convert a value from a given unit to a desired unit, multiply the given value by the factor opposite the given units and beneath the desired unit.

Atomic Weight and Numbers

Name	Symbol	Atomic number	Atomic weight	Name	Symbol	Atomic number	Atomic weight
Actinium	Ac	89	-	Mercury	Hg	80	200.59
Aluminum	Al	13	26.9815	Molybdenum	Mo	42	95.94
Americium	Am	95	-	Neodymium	Nd	60	144.24
Antimony	Sb	51	121.75	Neon	Ne	10	20.183
Argon	Ar	18	39.948	Neptunium	Np	93	-
Arsenic	As	33	74.9216	Nickel	Ni	28	58.71
Astatine	At	85	-	Niobium	Nb	41	92.906
Barium	Ba	56	137.34	Nitrogen	N	7	14.0067
Berkelium	Bk	97	-	Nobelium	No	102	-
Beryllium	Be	4	9.0122	Osmium	Os	75	190.2
Bismuth	Bi	83	208.980	Oxygen	O	8	15.9994
Boron	B	5	10.811	Palladium	Pd	46	106.4
Bromine	Br	35	79.904	Phosphorus	P	15	30.9738
Cadmium	Cd	48	112.40	Platinum	Pt	78	195.09
Calcium	Ca	20	40.08	Plutonium	Pu	94	-
Californium	Cf	98	-	Polonium	Po	84	-
Carbon	C	6	12.01115	Potassium	K	19	39.102
Cerium	Ce	58	140.12	Praseodymium	Pr	59	140.907
Cesium	Cs	55	132.905	Promethium	Pm	61	-
Chlorine	Cl	17	35.453	Protactinium	Pa	91	-
Chromium	Cr	24	51.996	Radium	Ra	88	-
Cobalt	Co	27	58.9332	Radon	Rn	86	-
Copper	Cu	29	63.546	Rhenium	Re	75	186.2
Curium	Cm	96	-	Rhodium	Rh	45	102.905
Dysprosium	Dy	66	162.50	Rubidium	Rb	37	84.57
Einsteinium	Es	99	-	Ruthenium	Ru	44	101.07
Erbium	Er	68	167.26	Samarium	Sm	62	150.35
Europium	Eu	63	151.96	Scandium	Sc	21	44.956
Fermium	Fm	100	-	Selenium	Se	34	78.96
Fluorine	F	9	18.9984	Silicon	Si	14	28.086
Francium	Fr	87	-	Silver	Ag	47	107.868
Gadolinium	Gd	64	157.25	Sodium	Na	11	22.9898
Gallium	Ga	31	69.72	Strontium	Sr	38	87.62
Germanium	Ge	32	72.59	Sulfur	S	16	32.064
Gold	Au	79	196.967	Tantalum	Ta	73	180.946
Hafnium	Hf	72	178.49	Technetium	Tc	43	-
Helium	He	2	4.0026	Tellurium	Te	52	127.60
Holmium	Ho	67	164.930	Terbium	Tb	65	158.924
Hydrogen	H	1	1.00797	Thallium	Tl	81	204.37
Indium	In	49	114.82	Thorium	Th	90	232.038
Iodine	I	53	126.9044	Thulium	Tm	59	168.934
Iridium	Ir	77	196.2	Tin	Sn	50	118.69
Iron	Fe	26	55.847	Titanium	Ti	22	47.90
Krypton	Kr	36	83.80	Tungsten	W	74	183.85
Lanthanum	La	57	138.91	Uranium	U	92	238.03
Lawrencium	Lr	103	-	Vanadium	V	23	50.942
Lead	Pb	82	207.19	Xenon	Xe	54	131.30
Lithium	Li	3	6.939	Ytterbium	Yb	70	173.04
Lutetium	Lu	71	174.97	Yttrium	Y	39	88.905
Magnesium	Mg	12	24.312	Zinc	Zn	30	65.37
Manganese	Mn	25	54.9380	Zirconium	Zr	40	91.22
Mendelevium	Md	101	-				

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Saturation Vapor Pressure Over Water (°C, mm Hg)*

Values for fractional degree between 50 and 89 were obtained by interpolation											
Temp. °C	0.0	0.2	0.4	0.6	0.8	Temp. °C	0.0	0.2	0.4	0.6	0.8
-15	1.436	1.414	1.390	1.368	1.345	42	61.50	62.14	62.80	63.46	64.12
-14	1.560	1.534	1.511	1.485	1.460	43	64.80	65.48	66.16	66.86	67.56
-13	1.691	1.665	1.637	1.611	1.585	44	68.26	68.97	69.69	70.41	71.14
-12	1.834	1.804	1.776	1.748	1.720						
-11	1.987	1.955	1.924	1.893	1.863	45	71.88	72.62	73.36	74.12	74.88
						46	75.65	76.43	77.21	78.00	78.80
-10	2.149	2.116	2.084	2.050	2.018	47	79.60	80.41	81.23	82.05	82.87
-9	2.326	2.289	2.254	2.219	2.184	48	83.71	84.56	85.42	86.28	87.14
-8	2.514	2.475	2.437	2.399	2.362	49	88.02	88.90	89.79	90.69	91.59
-7	2.715	2.674	2.635	2.593	2.553						
-6	2.931	2.887	2.843	2.800	2.757	50	92.51	93.5	94.4	95.3	96.3
						51	97.20	98.2	99.1	100.1	101.1
-5	3.163	3.115	3.069	3.022	2.976	52	102.09	103.1	104.1	105.1	106.2
-4	3.410	3.359	3.309	3.259	3.211	53	107.20	108.2	109.3	110.4	111.4
-3	3.673	3.620	3.567	3.514	3.461	54	112.51	113.6	114.7	115.8	116.9
-2	3.956	3.898	3.841	3.785	3.730						
-1	4.258	4.196	4.135	4.075	4.016	55	118.04	119.1	120.3	121.5	122.6
						56	123.90	125.0	126.2	127.4	128.6
0	4.579	4.513	4.448	4.385	4.320	57	129.82	131.0	132.3	133.5	134.7
						58	136.08	137.3	138.5	139.9	141.2
0	4.579	4.647	4.715	4.785	4.855	59	142.60	143.9	145.2	146.6	148.0
1	4.926	4.998	5.070	5.144	5.219						
2	5.294	5.370	5.447	5.525	5.605	60	149.38	150.7	152.1	153.5	155.0
3	5.685	5.766	5.848	5.931	6.015	61	156.43	157.8	159.3	160.8	162.3
4	6.101	6.187	6.274	6.363	6.453	62	163.77	165.2	166.8	168.3	169.8
						63	171.38	172.9	174.5	176.1	177.7
5	6.543	6.635	6.728	6.822	6.917	64	179.31	180.9	182.5	184.2	185.8
6	7.013	7.111	7.209	7.309	7.411						
7	7.513	7.617	7.722	7.828	7.936	65	187.54	189.2	190.9	192.6	194.3
8	8.045	8.155	8.267	8.380	8.484	66	196.09	197.8	199.5	201.3	203.1
9	8.609	8.727	8.845	8.965	9.086	67	204.96	206.8	208.6	210.5	212.3
						68	214.17	216.0	218.0	219.9	221.8
10	9.209	9.333	9.458	9.585	9.714	69	223.78	225.7	227.7	229.7	231.7
11	9.844	9.976	10.109	10.244	10.380						
12	10.518	10.658	10.799	10.941	11.085	70	233.7	235.7	237.7	239.7	241.8
13	11.231	11.379	11.528	11.680	11.833	71	243.9	246.0	248.2	250.3	252.7
14	11.987	12.144	12.302	12.462	12.624	72	254.6	256.8	259.0	261.2	263.4
						73	265.7	268.0	270.2	272.6	274.8
15	12.788	12.953	13.121	13.290	13.461	74	277.2	279.4	281.8	284.2	286.6
16	13.634	13.809	13.987	14.166	14.347	75	289.1	291.5	294.0	296.4	298.8
17	14.530	14.715	14.903	15.092	15.284	76	301.4	303.8	306.4	308.9	311.4
18	15.477	15.673	15.871	16.071	16.272	77	314.1	316.6	319.2	322.0	324.6
19	16.477	16.685	16.894	17.105	17.319	78	327.3	330.0	332.8	335.6	338.2
						79	341.0	343.8	346.6	349.4	352.2
20	17.535	17.853	17.974	18.197	18.422						
21	18.650	18.880	19.113	19.349	19.587	80	355.1	358.0	361.0	363.8	366.8
22	19.827	20.070	20.312	20.565	20.815	81	369.7	372.6	375.6	378.8	381.8
23	21.068	21.324	21.583	21.845	22.110	82	384.9	388.0	391.2	394.4	397.4
24	22.377	22.648	22.922	23.198	23.476	83	400.6	403.8	407.0	410.2	413.6
						84	416.8	420.2	423.6	426.8	430.2
25	23.756	24.039	24.326	24.617	24.912						
26	25.209	25.509	25.812	26.117	26.426	85	433.6	437.0	440.4	444.0	447.5
27	26.739	27.055	27.374	27.696	28.021	86	450.9	454.4	458.0	461.6	465.2
28	28.349	28.680	29.015	29.354	29.697	87	468.7	472.4	476.0	479.8	483.4
29	30.043	30.392	30.745	31.102	31.461	88	487.1	491.0	494.7	498.5	502.2
						89	506.1	510.0	513.9	517.8	521.8
30	31.824	32.191	32.561	32.934	33.312						
31	33.695	34.082	34.471	34.864	35.261	90	525.76	529.77	533.90	537.86	541.95
32	35.663	36.068	36.477	36.891	37.308	91	546.05	550.18	554.35	558.53	562.75
33	37.729	38.155	38.584	39.018	39.457	92	566.99	571.26	575.55	579.87	584.22
34	39.898	40.344	40.796	41.251	41.710	93	588.60	593.00	597.43	601.89	606.38
						94	610.90	615.44	620.01	624.61	629.24
35	42.175	42.644	43.117	43.595	44.078	95	633.90	638.59	643.30	648.05	652.82
36	44.563	45.054	45.549	46.050	46.556	96	657.62	662.45	667.31	672.20	677.12
37	47.067	47.582	48.102	48.627	49.157	97	682.07	687.04	692.05	697.10	702.17
38	49.692	50.231	50.774	51.323	51.879	98	707.27	712.40	717.56	722.75	727.98
39	52.442	53.009	53.580	54.156	54.737	99	733.24	738.53	743.85	749.20	754.58
40	55.324	55.91	56.51	57.11	57.72	100	760.00	765.45	770.93	776.55	782.00
41	58.34	58.96	59.58	60.22	60.86	101	787.57	793.18	798.82	804.50	810.21

* Handbook of chemistry and physics, 45th edition. 1965. Chemical Rubber Publishing Company.