DO NOT WRITE ON THIS CARD

Relative Atomic Masses
based on $^{12}C = 12.0000$

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1 **H** Hydrogen 1.0079																	2 **He** Helium 4.0026
2	3 **Li** Lithium 6.941	4 **Be** Beryllium 9.0122											5 **B** Boron 10.81	6 **C** Carbon 12.011	7 **N** Nitrogen 14.007	8 **O** Oxygen 15.999	9 **F** Fluorine 18.998	10 **Ne** Neon 20.180
3	11 **Na** Sodium 22.990	12 **Mg** Magnesium 24.305											13 **Al** Aluminium 26.982	14 **Si** Silicon 28.086	15 **P** Phosphorus 30.974	16 **S** Sulfur 32.06	17 **Cl** Chlorine 35.453	18 **Ar** Argon 39.948
4	19 **K** Potassium 39.098	20 **Ca** Calcium 40.08	21 **Sc** Scandium 44.956	22 **Ti** Titanium 47.87	23 **V** Vanadium 50.942	24 **Cr** Chromium 51.996	25 **Mn** Manganese 54.938	26 **Fe** Iron 55.845	27 **Co** Cobalt 58.933	28 **Ni** Nickel 58.69	29 **Cu** Copper 63.546	30 **Zn** Zinc 65.41	31 **Ga** Gallium 69.72	32 **Ge** Germanium 72.64	33 **As** Arsenic 74.922	34 **Se** Selenium 78.96	35 **Br** Bromine 79.904	36 **Kr** Krypton 83.80
5	37 **Rb** Rubidium 85.468	38 **Sr** Strontium 87.62	39 **Y** Yttrium 88.906	40 **Zr** Zirconium 91.224	41 **Nb** Niobium 92.906	42 **Mo** Molybdenum 95.94	43 **Tc** Technetium (98)	44 **Ru** Ruthenium 101.07	45 **Rh** Rhodium 102.91	46 **Pd** Palladium 106.42	47 **Ag** Silver 107.87	48 **Cd** Cadmium 112.41	49 **In** Indium 114.82	50 **Sn** Tin 118.71	51 **Sb** Antimony 121.76	52 **Te** Tellurium 127.60	53 **I** Iodine 126.904	54 **Xe** Xenon 131.29
6	55 **Cs** Caesium 132.91	56 **Ba** Barium 137.33	*	72 **Hf** Hafnium 178.49	73 **Ta** Tantalum 180.95	74 **W** Tungsten 183.84	75 **Re** Rhenium 186.21	76 **Os** Osmium 190.2	77 **Ir** Iridium 192.22	78 **Pt** Platinum 195.08	79 **Au** Gold 196.97	80 **Hg** Mercury 200.59	81 **Tl** Thallium 204.38	82 **Pb** Lead 207.2	83 **Bi** Bismuth 208.98	84 **Po** Polonium (209)	85 **At** Astatine (210)	86 **Rn** Radon (222)
7	87 **Fr** Francium (223)	88 **Ra** Radium (226)	**	104 **Rf** Rutherfordium (261)	105 **Db** Dubnium (262)	106 **Sg** Seaborgium (266)	107 **Bh** Bohrium (264)	108 **Hs** Hassium (277)	109 **Mt** Meitnerium (268)	110 **Ds** Darmstadtium (271)	111 **Rg** Roentgenium (272)	112 **Uub** Ununbium (285)	113 **Uut** Ununtrium (284)	114 **Uuq** Ununquadium (289)	115 **Uup** Ununpentium (288)	116 **Uuh** Ununhexium (293)	117 **Uus** Ununseptium	118 **Uuo** Ununoctium (294)

*Lanthanoids	57 **La** Lanthanum 138.905	58 **Ce** Cerium 140.12	59 **Pr** Praseodymium 140.91	60 **Nd** Neodymium 144.24	61 **Pm** Promethium (145)	62 **Sm** Samarium 150.36	63 **Eu** Europium 151.96	64 **Gd** Gadolinium 157.25	65 **Tb** Terbium 158.93	66 **Dy** Dysprosium 162.50	67 **Ho** Holmium 164.93	68 **Er** Erbium 167.26	69 **Tm** Thulium 168.93	70 **Yb** Ytterbium 173.04	71 **Lu** Lutetium 174.97
**Actinoids	89 **Ac** Actinium (227)	90 **Th** Thorium 232.04	91 **Pa** Protactinium 231.04	92 **U** Uranium 238.03	93 **Np** Neptunium (237)	94 **Pu** Plutonium (244)	95 **Am** Americium (243)	96 **Cm** Curium (247)	97 **Bk** Berkelium (247)	98 **Cf** Californium (251)	99 **Es** Einsteinium (252)	100 **Fm** Fermium (257)	101 **Md** Mendelevium (258)	102 **No** Nobelium (259)	103 **Lr** Lawrencium (262)

CHEMICAL DATA CARD

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PHYSICAL CONSTANTS

Avogadro's constant	N_A or L	6.022×10^{23} mol^{-1}
Bohr radius	a_o	5.292×10^{-11} m
Boltzmann's constant	k	1.381×10^{-23} J K^{-1}
Electron rest mass	m_e	9.110×10^{-31} kg
Electronic charge	e	1.602×10^{-19} C
Faraday	F	9.649×10^{4} C mol^{-1}
Gas constant	R	8.314 J K^{-1} mol^{-1}
Molar volume, ideal gas, 0 ºC, 1 bar	$V_m^{\ominus}$	22.71 dm^3 mol^{-1}
Nernst factor	2.303 RT/F	0.059 V at 25 ºC
Neutron rest mass	m_n	1.675×10^{-27} kg
Permittivity of vacuum	ε_o	8.854×10^{-12} J^{-1} C^2 m^{-1}
	$4\pi\varepsilon_o$	1.113×10^{-10} J^{-1} C^2 m^{-1}
Planck's constant	h	6.626×10^{-34} J s
Proton rest mass	m_p	1.673×10^{-27} kg
Rydberg's constant	R_H	1.097×10^{7} m^{-1}
Triple point temperature of water	-	273.16 K
Temperature, conventional reference	$T^{\ominus}$	298.15 K (25 ºC)
Velocity of light	c	2.998×10^{8} m s^{-1}

PREFIXES

f	p	n	μ	m	c	d	k	M	G	T
femto	pico	nano	micro	milli	centi	deci	kilo	mega	giga	tera
10^{-15}	10^{-12}	10^{-9}	10^{-6}	10^{-3}	10^{-2}	10^{-1}	10^{3}	10^{6}	10^{9}	10^{12}

CONVERSION FACTORS AND DEFINITIONS

Ångstrom	Å	10^{-10} m
Atmosphere	atm	1.013×10^{5} Pa (or N m^{-2})
		760 Torr
Atomic mass unit (a.m.u.)	m_u	1.661×10^{-27} kg
Bar	bar	10^{5} Pa (or N m^{-2})
Bohr magneton	μ_B	9.273×10^{-24} A m^2
Calorie	cal	4.184 J
Coulomb	C	A s
Debye	D	3.336×10^{-30} C m
Electron volt	eV	1.602×10^{-19} J
		(or 96.485 kJ mol^{-1})
Hartree		4.3598×10^{-18} J
Frequency	Hz	s^{-1}
Joule	J	N m (or kg m^2 s^{-2} or V C)
Kelvin temperature	T/K	T/ºC + 273.15
Litre	l	1.0 dm^3 (or 10^{-3} m^3)
Newton	N	J m^{-1} (or kg m s^{-2})
Nuclear magneton	μ_N	5.051×10^{-27} A m^2
Pascal	Pa	N m^{-2} (or kg m^{-1} s^{-2})
Torr (or mm of mercury)	Torr	1.333×10^{2} Pa (or N m^{-2})
		1.333×10^{-3} bar
Volt	V	J C^{-1} (or kg m^2 A^{-1} s^{-3})
Watt	W	J s^{-1} (or kg m^2 s^{-3})