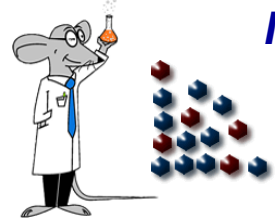


Periodic Table of the Elements



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Frequently used fundamental physical constants
 1 second = 9 192 631 770 periods of radiation corresponding to the transition between the two hyperfine levels of the ground state of ¹³³Cs

speed of light in vacuum	c	299 792 458 m s ⁻¹ (exact)
Planck constant	h	6.6261 x 10 ⁻³⁴ J s ($\hbar = h/2\pi$)
elementary charge	e	1.6022 x 10 ⁻¹⁹ C
electron mass	m_e	9.1094 x 10 ⁻³¹ kg
proton mass	m_p	1.6726 x 10 ⁻²⁷ kg
fine-structure constant	α	1/137.036
Rydberg constant	R_∞	10 973 732 m ⁻¹
Boltzmann constant	k	1.3807 x 10 ⁻²³ J K ⁻¹

† Based upon ¹²C. () Indicates the mass number of the most stable isotope.

Alkali Metals	Post-Transition Metals
Alkaline Earth Metals	Metalloids
Lanthanoids	Other-Non Metals
Actinoids	Halogens
Transition Metals	Noble Gases



Period

1	IA 1 ¹ S _{1/2} Hydrogen H 1.00794 1s ¹ 13.5984	IIA	IIIB	IVB	VB	VIB	VII B	VIII B	IB	IIB	IIIA	IVA	VA	VIA	VIIA	VIIIA 2 ¹ S ₀ Helium He 4.00260 1s ² 24.5874		
2	3 ² S _{1/2} Lithium Li 6.941 [He]2s ¹ 5.3917	4 ¹ S ₀ Beryllium Be 9.012182 [He]2s ² 9.3227									5 ² P _{1/2} Boron B 10.811 [He]2s ² p ¹ 8.2980	6 ³ P ₀ Carbon C 12.0107 [He]2s ² p ² 11.2603	7 ⁴ S _{3/2} Nitrogen N 14.0067 [He]2s ² p ³ 14.5341	8 ³ P ₂ Oxygen O 15.9994 [He]2s ² p ⁴ 13.6181	9 ² P _{3/2} Fluorine F 18.99840 [He]2s ² p ⁵ 17.4228	10 ¹ S ₀ Neon Ne 20.1797 [He]2s ² p ⁶ 21.5645		
3	11 ² S _{1/2} Sodium Na 22.989770 [Ne]3s ¹ 5.1391	12 ¹ S ₀ Magnesium Mg 24.3050 [Ne]3s ² 7.6462									13 ² P _{1/2} Aluminum Al 26.98154 [Ne]3s ² p ¹ 5.9858	14 ³ P ₀ Silicon Si 28.0855 [Ne]3s ² p ² 8.1517	15 ⁴ S _{3/2} Phosphorus P 30.97376 [Ne]3s ² p ³ 10.4867	16 ³ P ₂ Sulphur S 32.065 [Ne]3s ² p ⁴ 10.3600	17 ² P _{3/2} Chlorine Cl 35.453 [Ne]3s ² p ⁵ 12.9676	18 ¹ S ₀ Argon Ar 39.948 [Ne]3s ² p ⁶ 15.7596		
4	19 ² S _{1/2} Potassium K 39.0983 [Ar]4s ¹ 4.3407	20 ¹ S ₀ Calcium Ca 40.078 [Ar]4s ² 6.1132	21 ² D _{3/2} Scandium Sc 44.95591 [Ar]3d ¹ 4s ² 6.5615	22 ³ F ₂ Titanium Ti 47.867 [Ar]3d ² 4s ² 6.8281	23 ⁴ F _{3/2} Vanadium V 50.9415 [Ar]3d ³ 4s ² 6.7462	24 ⁷ S ₃ Chromium Cr 51.9961 [Ar]3d ⁵ 4s ¹ 6.7665	25 ⁶ S _{5/2} Manganese Mn 54.93805 [Ar]3d ⁵ 4s ² 7.4340	26 ⁵ D ₄ Iron Fe 55.845 [Ar]3d ⁶ 4s ² 7.9024	27 ⁴ F _{9/2} Cobalt Co 58.93320 [Ar]3d ⁷ 4s ² 7.8810	28 ³ F ₄ Nickel Ni 58.6934 [Ar]3d ⁸ 4s ² 7.6398	29 ² S _{1/2} Copper Cu 63.546 [Ar]3d ¹⁰ 4s ¹ 7.7264	30 ¹ S ₀ Zinc Zn 65.409 [Ar]3d ¹⁰ 4s ² 9.3942	31 ² P _{1/2} Gallium Ga 69.723 [Ar]3d ¹⁰ 4s ¹ 5.9993	32 ³ P ₀ Germanium Ge 72.64 [Ar]3d ¹⁰ 4s ² p ² 7.8994	33 ⁴ S _{3/2} Arsenic As 74.92160 [Ar]3d ¹⁰ 4s ³ p ³ 9.7886	34 ³ P ₂ Selenium Se 78.96 [Ar]3d ¹⁰ 4s ² p ⁴ 9.7524	35 ² P _{3/2} Bromine Br 79.904 [Ar]3d ¹⁰ 4s ² p ⁵ 11.8138	36 ¹ S ₀ Krypton Kr 83.798 [Ar]3d ¹⁰ 4s ² p ⁶ 13.9996
5	37 ² S _{1/2} Rubidium Rb 85.4678 [Kr]5s ¹ 4.1771	38 ¹ S ₀ Strontium Sr 87.62 [Kr]5s ² 5.6949	39 ² D _{3/2} Yttrium Y 88.90585 [Kr]4d ¹ 5s ² 6.2173	40 ³ F ₂ Zirconium Zr 91.224 [Kr]4d ² 5s ² 6.6339	41 ⁶ D _{1/2} Niobium Nb 92.90638 [Kr]4d ⁴ 5s ¹ 6.7589	42 ⁷ S ₃ Molybdenum Mo 95.94 [Kr]4d ⁵ 5s ¹ 7.0924	43 ⁶ S _{5/2} Technetium Tc [98] [Kr]4d ⁵ 5s ² 7.28	44 ⁵ F ₅ Ruthenium Ru 101.07 [Kr]4d ⁷ 5s ¹ 7.3605	45 ⁴ F _{9/2} Rhodium Rh 102.90550 [Kr]4d ⁸ 5s ¹ 7.4589	46 ¹ S ₀ Palladium Pd 106.42 [Kr]4d ¹⁰ 8.3369	47 ² S _{1/2} Silver Ag 107.8682 [Kr]4d ¹⁰ 5s ¹ 7.5762	48 ¹ S ₀ Cadmium Cd 112.411 [Kr]4d ¹⁰ 5s ² 8.9938	49 ² P _{1/2} Indium In 114.818 [Kr]4d ¹⁰ 5s ² p ¹ 5.7864	50 ³ P ₀ Tin Sn 118.710 [Kr]4d ¹⁰ 5s ² p ² 7.3439	51 ⁴ S _{3/2} Antimony Sb 121.760 [Kr]4d ¹⁰ 5s ³ p ³ 8.6084	52 ³ P ₂ Tellurium Te 127.60 [Kr]4d ¹⁰ 5s ² p ⁴ 9.0096	53 ² P _{3/2} Iodine I 126.90447 [Kr]4d ¹⁰ 5s ² p ⁵ 10.4513	54 ¹ S ₀ Xenon Xe 131.293 [Kr]4d ¹⁰ 5s ² p ⁶ 12.1298
6	55 ² S _{1/2} Cesium Cs 132.90545 [Xe]6s ¹ 3.8939	56 ¹ S ₀ Barium Ba 137.327 [Xe]6s ² 5.2117	57 - 71	72 ³ F ₂ Hafnium Hf 178.49 [Xe]4f ¹⁴ 5d ² 6s ² 6.8251	73 ⁴ F _{3/2} Tantalum Ta 180.9479 [Xe]4f ¹⁴ 5d ³ 6s ² 7.5496	74 ⁵ D ₀ Tungsten W 183.84 [Xe]4f ¹⁴ 5d ⁴ 6s ² 7.8640	75 ⁶ S _{5/2} Rhenium Re 186.207 [Xe]4f ¹⁴ 5d ⁵ 6s ² 7.8335	76 ⁵ D ₄ Osmium Os 190.23 [Xe]4f ¹⁴ 5d ⁶ 6s ² 8.4382	77 ⁴ F _{9/2} Iridium Ir 192.217 [Xe]4f ¹⁴ 5d ⁷ 6s ² 8.9670	78 ³ D ₃ Platinum Pt 195.078 [Xe]4f ¹⁴ 5d ⁹ 6s ¹ 8.9588	79 ² S _{1/2} Gold Au 196.96655 [Xe]4f ¹⁴ 5d ¹⁰ 6s ¹ 9.2255	80 ¹ S ₀ Mercury Hg 200.59 [Xe]4f ¹⁴ 5d ¹⁰ 6s ² 10.4375	81 ² P _{1/2} Thallium Tl 204.3833 [Xe]4f ¹⁴ 5d ¹⁰ 6s ² p ¹ 6.1082	82 ³ P ₀ Lead Pb 207.2 [Xe]4f ¹⁴ 5d ¹⁰ 6s ² p ² 7.4167	83 ⁴ S _{3/2} Bismuth Bi 208.98038 [Xe]4f ¹⁴ 5d ¹⁰ 6s ³ p ³ 7.2855	84 ³ P ₂ Polonium Po [209] [Xe]4f ¹⁴ 5d ¹⁰ 6s ² p ⁴ 8.414	85 ² P _{3/2} Astatine At [210] [Xe]4f ¹⁴ 5d ¹⁰ 6s ² p ⁵ 8.414	86 ¹ S ₀ Radon Rn [222] [Xe]4f ¹⁴ 5d ¹⁰ 6s ² p ⁶ 10.7485
7	87 ² S _{1/2} Francium Fr [223] [Rn]7s ¹ 4.0727	88 ¹ S ₀ Radium Ra [226] [Rn]7s ² 5.2784	89 - 103	104 ³ F ₂ ? Rutherfordium Rf [261] [Rn]5f ¹⁴ 6d ² 7s ² ? 6.0?	105 Dubnium Db [262]	106 Seaborgium Sg [266]	107 Bohrium Bh [264]	108 Hassium Hs [277]	109 Meitnerium Mt [268]	110 Darmstadtium Ds [281]	111 Roentgenium Rg [272]	112 Copernicium Cn [285]	113 Ununtrium Uut [?]	114 Ununquadium Uuq [289]	115 Ununpentium Uup [?]	116 Ununhexium Uuh [292]	117 Ununseptium Uus [?]	118 Ununoctium Uuo [?]

s - block

d - block

p - block

Atomic Number → 6
 Name → Carbon
 Symbol → **C**
 Atomic Weight → 12.0107
 Ground-State Configuration → [He]2s²p²
 Ionization Energy (eV) → 11.2603

Ground-State Level → 6 ³P₀

f - block

57 ² D _{3/2} Lanthanum La 138.9055 [Xe]5d ¹ 6s ² 5.5769	58 ¹ G ₄ Cerium Ce 140.116 [Xe]4f ¹ 5d ¹ 6s ² 5.5387	59 ⁴ I _{9/2} Praseodymium Pr 140.90765 [Xe]4f ³ 6s ² 5.473	60 ⁵ I ₄ Neodymium Nd 144.24 [Xe]4f ⁴ 6s ² 5.5250	61 ⁶ H _{5/2} Promethium Pm [145] [Xe]4f ⁵ 6s ² 5.582	62 ⁷ F ₀ Samarium Sm 150.36 [Xe]4f ⁶ 6s ² 5.6437	63 ⁸ S _{7/2} Europium Eu 151.964 [Xe]4f ⁷ 6s ² 5.6704	64 ⁹ D ₂ Gadolinium Gd 157.25 [Xe]4f ⁷ 5d ¹ 6s ² 6.1498	65 ⁶ H _{15/2} Terbium Tb 158.92534 [Xe]4f ⁹ 6s ² 5.8638	66 ⁵ I ₈ Dysprosium Dy 162.500 [Xe]4f ¹⁰ 6s ² 5.9389	67 ⁴ I _{15/2} Holmium Ho 164.93032 [Xe]4f ¹¹ 6s ² 6.0215	68 ³ H ₆ Erbium Er 167.259 [Xe]4f ¹² 6s ² 6.1077	69 ² F _{7/2} Thulium Tm 168.93421 [Xe]4f ¹³ 6s ² 6.1843	70 ¹ S ₀ Ytterbium Yb 173.04 [Xe]4f ¹⁴ 6s ² 6.2542	71 ² D _{3/2} Lutetium Lu 174.967 [Xe]4f ¹⁴ 5d ¹ 6s ² 5.4259
89 ² D _{3/2} Actinium Ac [227] [Rn]6d ¹ 7s ² 5.17	90 ³ F ₂ Thorium Th 232.0381 [Rn]6d ² 7s ² 6.3067	91 ⁴ K _{11/2} Protactinium Pa 231.03588 [Rn]5f ² 6d ¹ 7s ² 5.89	92 ⁵ L ₆ Uranium U 238.02891 [Rn]5f ³ 6d ¹ 7s ² 6.1941	93 ⁶ L _{11/2} Neptunium Np [237] [Rn]5f ⁴ 6d ¹ 7s ² 6.2657	94 ⁷ F ₀ Plutonium Pu [244] [Rn]5f ⁶ 7s ² 6.0260	95 ⁸ S _{7/2} Americium Am [243] [Rn]5f ⁷ 7s ² 5.9738	96 ⁹ D ₂ Curium Cm [247] [Rn]5f ⁸ 6d ¹ 7s ² 5.9914	97 ⁶ H _{15/2} Berkelium Bk [247] [Rn]5f ⁹ 7s ² 6.1979	98 ⁵ I ₈ Californium Cf [251] [Rn]5f ¹⁰ 7s ² 6.2817	99 ⁴ I _{15/2} Einsteinium Es [252] [Rn]5f ¹¹ 7s ² 6.42	100 ³ H ₆ Fermium Fm [257] [Rn]5f ¹² 7s ² 6.50	101 ² F _{7/2} Mendelevium Md [258] [Rn]5f ¹³ 7s ² 6.58	102 ¹ S ₀ Nobelium No [259] [Rn]5f ¹⁴ 7s ² 6.65	103 ² P _{1/2} ? Lawrencium Lr [262] [Rn]5f ¹⁴ 6d ¹ 7s ² 4.9?