

Periodic Table of the Elements



GROUP 1
IA

1	1.00794	1	1.00794
H	¹ S _{1/2} 2.2	H	¹ S _{1/2} 2.2
Hydrogen	0.0899 13.5984 -259.14 -252.87 (v) 37	Hydrogen	0.0899 13.5984 -259.14 -252.87 (v) 37 FCC

Atomic Number	1	1.00794	Atomic Weight
Symbol	H	¹ S _{1/2} 2.2	Ground-State Level
Name	Hydrogen		Electronegativity (Pauling)
*Density (g/cm ³)	0.0899	13.5984	Ionization Energy (eV)
*Melting Point (°C)	-259.14	-252.87	*Boiling Point (°C)
Atomic radius (pm)	(v) 37	FCC	Crystal Structure [Note]
			Electron Configuration
			Possible Oxidation States [Note]

Phase at STP	Gas	Liquid	Solid	Synthetic
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Common Constants

Absolute Zero	-273.15 °C	Gravitation Constant	<i>G</i> 6.67428x10 ⁻¹¹ m ³ kg ⁻¹ s ⁻²
Atomic Mass Unit	1.660539x10 ⁻²⁷ kg	Molar Gas Constant	<i>R</i> 8.314472 J mol ⁻¹ K ⁻¹
Avogadro Constant	6.022142x10 ²³ mol ⁻¹	Molar Volume (Ideal Gas)	0.02241410 m ³ /mol
Base of Natural Logarithms	<i>e</i> 2.718281828	PI	<i>π</i> 3.14159265358979
Boltzmann constant	<i>k</i> 1.380650x10 ⁻²³ J/K	Planck Constant	<i>h</i> 6.626069x10 ⁻³⁴ J s
Electron Mass	<i>m_e</i> 9.10938215x10 ⁻³¹ kg	Proton-Electron Mass Ratio	<i>m_p/m_e</i> 1836.15267389
Electron Radius (Classical)	<i>r₀</i> 2.8179403x10 ⁻¹⁵ m	Rydberg Constant	<i>R_∞</i> 10 973 732 m ⁻¹
Electron Volt	1.602176x10 ⁻¹⁹ J	<i>R_{∞c}</i>	3.289842x10 ¹⁵ Hz
Elementary Charge	<i>e</i> 1.602176x10 ⁻¹⁹ C	<i>R_{∞hc}</i>	13.6057 eV
Faraday Constant	<i>F</i> 96485.339 C/mol	<i>ch/k</i>	0.01438769 m K
fine-structure constant	<i>α</i> 0.0072973525	Second Radiation Constant	<i>hc</i> 299 792 458 m/s
First Radiation Constant	<i>2πhc²</i> 3.741749x10 ⁻¹⁸ W m ²	Speed of Light in a Vacuum	343.2 m/s
		Speed of sound in air at STP	101 325 Pa
		Standard Pressure	

13 IIIA 14 IVA 15 VA 16 VIA 17 VIIA 18 VIIIA

3	6.941	4	9.012182
Li	² S _{1/2} 0.98	Be	¹ S ₀ 1.57
Lithium	0.535 5.3917 180.54 1342 (m) 152 BCC	Beryllium	1.848 9.3227 1287 2470 (m) 112 HCP

11	22.989770	12	24.3050
Na	² S _{1/2} 0.93	Mg	¹ S ₀ 1.31
Sodium	0.968 5.1391 97.72 883 (m) 186 BCC	Magnesium	1.738 7.6462 650 1090 (m) 160 HCP

19	39.0983	20	40.078	21	44.955910	22	47.867	23	50.9415	24	51.9961	25	54.938049	26	55.845	27	58.933200	28	58.6934	29	63.546	30	65.409												
K	³ S _{1/2} 0.82	Ca	¹ S ₀ 1.00	Sc	³ D _{3/2} 1.36	Ti	² F ₂ 1.54	V	⁴ F _{3/2} 1.63	Cr	⁵ S _{3/2} 1.66	Mn	⁶ S _{5/2} 1.55	Fe	⁴ D _{5/2} 1.83	Co	⁴ F _{9/2} 1.88	Ni	³ F ₄ 1.91	Cu	² S _{1/2} 1.90	Zn	¹ S ₀ 1.65	Ga	² P _{1/2} 1.81	Ge	³ P ₀ 2.01	As	³ S _{3/2} 2.18	Se	³ P ₂ 2.55	Br	² P _{3/2} 2.96	Kr	¹ S ₀ 3
Potassium	0.856 4.3407 63.38 759 (m) 227 BCC	Calcium	1.55 6.1132 842 1484 (m) 197 FCC	Scandium	2.985 6.5615 1541 2830 (m) 162 HCP	Titanium	4.507 6.8281 1668 3287 (m) 147 HCP	Vanadium	6.11 6.7462 1910 3407 (m) 134 BCC	Chromium	7.14 6.7665 1907 2671 (m) 128 BCC	Manganese	7.47 7.4340 1246 2061 (m) 127 scubic	Iron	7.874 7.9024 1538 2861 (m) 126 BCC	Cobalt	8.9 7.8810 1495 2927 (m) 125 HCP	Nickel	8.908 7.6398 1455 2913 (m) 124 FCC	Copper	8.92 7.7264 1084.62 2927 (m) 128 FCC	Zinc	7.14 9.3942 419.53 907 (m) 134 scHex	Gallium	5.904 5.9993 29.76 2204 (m) 135 scBCO	Germanium	5.323 7.8986 938.3 2820 (v) 122 scubic	Arsenic	5.727 9.7886 817 614 (v) 119 rhom.	Selenium	4.819 9.7524 2.12 685 (v) 116 scHex	Bromine	4.281 9.7524 3.12 11.8138 (v) 114 BCO	Krypton	3.75 13.9996 -157.36 -153.22 (v) 110

37	85.4678	38	87.62	39	88.90585	40	91.224	41	92.90638	42	95.94	43	101.07	44	101.07	45	102.90550	46	106.42	47	107.8682	48	112.411	49	114.818	50	118.710	51	121.760	52	127.60	53	126.90447	54	131.293		
Rb	² S _{1/2} 0.82	Sr	¹ S ₀ 0.95	Y	² D _{3/2} 1.22	Zr	² F ₂ 1.33	Nb	² D _{3/2} 1.60	Mo	⁵ S _{3/2} 2.16	Tc	⁶ S _{5/2} 1.9	Ru	⁴ F _{5/2} 2.20	Rh	⁴ F _{9/2} 2.28	Pd	¹ S ₀ 2.20	Pt	³ D _{5/2} 2.28	Au	² S _{1/2} 1.93	Cd	¹ S ₀ 1.69	In	² P _{1/2} 1.78	Sn	³ P ₀ 1.96	Sb	³ S _{3/2} 2.05	Te	³ P ₂ 2.10	I	² P _{3/2} 2.66	Xe	¹ S ₀ 2.60
Rubidium	1.532 4.1771 39.31 688 (m) 248 BCC	Strontium	2.63 5.6949 777 1382 (m) 215 FCC	Yttrium	4.472 6.2173 1526 3345 (m) 180 HCP	Zirconium	6.511 6.6339 851 1409 (m) 146 BCC	Niobium	8.57 6.7589 2028 3744 (m) 139 BCC	Molybdenum	10.28 7.0924 2623 4639 (m) 136 BCC	Technetium	11.5 7.28 2157 4265 (m) 136 HCP	Ruthenium	12.37 7.3605 2334 4150 (m) 134 HCP	Rhodium	12.45 7.4589 1964 3695 (m) 134 FCC	Palladium	12.023 8.3369 961.78 2162 (m) 144 FCC	Silver	10.49 5.762 961.78 2162 (m) 144 FCC	Cadmium	8.65 8.9938 321.07 767 (m) 151 scHex	Indium	7.31 5.7864 156.6 2072 (m) 167 scHex	Tin	7.31 7.3439 231.93 2602 (v) 141 scHex	Antimony	6.697 8.6084 630.63 1808 (v) 138 scRhom.	Tellurium	6.24 9.0096 449.51 988 (v) 135 hex	Iodine	4.94 10.4513 113.7 184.3 (v) 133 BCO	Xenon	5.9 12.1298 -111.8 -108 (v) 130		

55	132.90545	56	137.327	72	178.49	73	180.9479	74	183.84	75	186.207	76	190.23	77	192.217	78	195.078	79	196.96655	80	200.59	81	204.3833	82	207.2	83	208.98038	84	(209)	85	(210)	86	(222)		
Cs	² S _{1/2} 0.79	Ba	¹ S ₀ 0.89	Hf	² F ₂ 1.3	Ta	² F ₂ 1.5	W	² D _{5/2} 2.36	Re	⁵ S _{3/2} 1.9	Os	⁴ D _{5/2} 2.2	Ir	⁴ F _{9/2} 2.2	Pt	³ D _{5/2} 2.28	Au	² S _{1/2} 2.54	Hg	² S _{1/2} 2	Tl	² P _{1/2} 1.62	Pb	³ P ₀ 2.33	Bi	³ S _{3/2} 2.02	Po	³ P ₂ 2.0	At	² P _{3/2} 2.2	Rn	¹ S ₀ 2.2		
Cesium	1.879 3.8939 28.44 671 (m) 265 BCC	Barium	3.51 5.2117 727 1870 (m) 222 BCC	Lanthanide Series	13.31 6.8251 2233 4603 (m) 159 HCP	Hafnium	16.65 7.5496 3017 5458 (m) 146 BCC	Tantalum	19.25 7.8640 3422 5556 (m) 139 BCC	Tungsten	21.02 7.0335 3186 5596 (m) 137 HCP	Rhenium	22.61 6.4832 3033 5012 (m) 135 HCP	Osmium	22.65 8.9670 2466 4428 (m) 136 FCC	Iridium	21.09 9.5988 1768.3 3825 (m) 139 FCC	Platinum	19.3 9.2255 1064.18 2856 (m) 144 FCC	Gold	19.3 9.2255 384.6 264 (m) 151 scRhom.	Mercury	13.534 10.4375 -38.83 356.73 (m) 170 HCP	Thallium	11.85 6.1082 304 1473 (m) 170 HCP	Lead	11.34 7.4167 327.46 1749 (m) 175 FCC	Bismuth	9.78 7.2855 271.3 1564 (v) 146 scRhom.	Polonium	9.196 8.414 254 962 (m) 176 HCP	Astatine	302 - (v) 145	Radon	9.73 10.7485 -71 -61.7 (v) 145

87	(223)	88	(226)	104	(261)	105	(262)	106	(266)	107	(264)	108	(277)	109	(268)	110	(281)	111	(272)	112	(285)	113	(289)	114	(289)	115	(289)	116	(292)	117	(293)	118	(294)
Fr	² S _{1/2} 0.7	Ra	¹ S ₀ 0.9	Rf	³ F ₂ ?	Db	³ F ₂ ?	Sg	³ F ₂ ?	Bh	³ F ₂ ?	Hs	³ F ₂ ?	Mt	³ F ₂ ?	Ds	³ F ₂ ?	Rg	³ F ₂ ?	Cn	³ F ₂ ?	Nh	³ F ₂ ?	Uuq	³ F ₂ ?	Mc	³ F ₂ ?	Lv	³ F ₂ ?	Ts	³ F ₂ ?	Og	³ F ₂ ?
Francium	- 4.0727 - 1737 (m) 179 BCC	Radium	5 5.2784 700 1737 (m) 179 BCC	Rutherfordium	6.0 ?	Dubnium		Seaborgium		Bohrium		Hassium		Meitnerium		Darmstadtium		Roentgenium		Copernicium		Nihonium		Ununquadium		Moscovium		Livermorium		Tennessee		Oganesson	

Notes:
- Density units are g/cm³ for solids and g/L or kg/m³ at 0° Celsius for gases
- Atomic Weight based on ¹²C
- () indicate mass number of most stable isotope
- Common Oxidation States in bold
- Electron Config. based on IUPAC guidelines
- \$ indicates crystal structure is unusual or may require explanation
- (m) Metallic radius, (v) Covalent radius

References:
[1] NIST.gov, *Wolfram.com (Mathematic), CRC Handbook of Chemistry and Physics 81st Edition, 2000-2001, and others

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57	138.9055	58	140.116	59	140.90765	60	144.24	61	(145)	62	150.36	63	151.964	64	157.25	65	158.92534	66	162.500	67	164.93032	68	167.259	69	168.93421	70	173.04	71	174.967
La	² D _{3/2} 1.10	Ce	¹ G ₄ 1.12	Pr	⁴ F _{3/2} 1.13	Nd	³ F ₄ 1.14	Pm	⁴ F _{5/2} 1.17	Sm	⁷ F _{5/2} 1.17	Eu	⁶ S _{7/2} 1.13	Gd	⁹ D ₂ 1.20	Tb	⁶ H _{15/2} 1.22	Dy	⁵ F ₈ 1.22	Ho	⁴ F _{15/2} 1.23	Er	³ H ₆ 1.24	Tm	² F _{7/2} 1.25	Yb	¹ S ₀ 1.27	Lu	² D _{5/2} 1.27
Lanthanum	6.146 5.5769 920 3464 (m) 187 scHex	Cerium	6.689 5.5387 798 3360 (m) 182 FCC	Praseodymium	6.64 5.473 931 3290 (m) 182 scHex	Neodymium	7.01 5.5250 1021 3100 (m) 181 scHex	Promethium	7.264 5.582 1100 3000 (m) 183 HCP	Samarium	7.353 5.6437 1072 1803 (m) 180 scHex	Europium	5.244 5.6704 822 1527 (m) 180 BCC	Gadolinium	7.901 6.1498 1313 3250 (m) 180 HCP	Terbium	8.219 5.8638 1356 3230 (m) 177 HCP	Dysprosium	8.551 5.9389 1412 2567 (m) 178 HCP	Holmium	8.795 6.0215 1474 2700 (m) 176 HCP	Erbium	9.066 6.1077 1497 2868 (m) 176 HCP	Thulium	9.321 6.1843 1545 1950 (m) 176 HCP	Ytterbium	6.57 6.2542 819 1196 (m) 176 FCC	Lutetium	9.841 5.4259 1663 3402 (m) 174 HCP

Lanthanides

Actinides