Werkstoff · Dr. Lars Röglin

Periodensystem der Elemente

Periodic Table of the Elements

Ergänzungen
H *H_2
C *Graphit, subl.
N *N_2
O *O_2
F *F_2
P *weiß (rot: 870. schwarz: 883)
**weiß (rot, subl.: 704)
S *orthorhombisch, alpha
Cl *Cl_2
Ti *hexagonal
As *grau
Se *hexagonal, grau
Br *Br_2
Sn *weiß
I *I_2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 **H** Wasserstoff Hydrogen 1s [1,0078; 1,0082] -1,**1** 13,99* / 20,271* 0,084 2,2 / 7,18																	2 **He** Helium Helium $1s^2$ 4,0026 **0** - / 4,222 0,170
3 **Li** Lithium Lithium [He] 2s [6,938; 6,997] **1** 453,65 / 1603 530 0,98 / 3,01	4 **Be** Beryllium Beryllium [He] $2s^2$ 9,0122 **2** 1560 / 2742 1850 1,57 / 4,9											5 **B** Bor Boron [He] $2s^2$ 2p [10,806; 10,821] **3** 2349 / 4200 2460 2,04 / 4,29	6 **C** Kohlenstoff Carbon [He] $2s^2$ $2p^2$ [12,009; 12,012] -4,-3,-2,-1,0,1,2,3,4 - / 3915* 3510 2,55 / 6,27	7 **N** Stickstoff Nitrogen [He] $2s^2$ $2p^3$ [14,006; 14,008] **-3**,-2,-1,1,2,**3**,4,5 63,15* / 77,355* 1,170 3,04 / 7,3	8 **O** Sauerstoff Oxygen [He] $2s^2$ $2p^4$ [15,999; 16,000] **-2**, -1 54,3* / 90,188* 1,33 3,44 / 7,54	9 **F** Flour Flourine [He] $2s^2$ $2p^5$ 18,998 **-1** 53,48* / 85,04* 1,58 3,98 / 10,41	10 **Ne** Neon Neon [He] $2s^2$ $2p^6$ 20,180 **0** 24,56 / 27,104 0,84
11 **Na** Natrium Sodium [Ne] 3s 22,990 **1** 370,944 / 1156,09 970 0,93 / 2,85	12 **Mg** Magnesium Magnesium [Ne] $3s^2$ [24,304; 24,307] **2** 923 / 1363 1740 1,31 / 3,75											13 **Al** Aluminium Aluminium [Ne] $3s^2$ 3p 26,982 **3** 933,47 / 2743 2700 1,61 / 3,23	14 **Si** Silicium Silicon [Ne] $3s^2$ $3p^2$ [28,084; 28,086] **-4,4** 1687 / 3538 2330 1,9 / 4,77	15 **P** Phosphor Phosphorus [Ne] $3s^2$ $3p^3$ 30,974 -3,3,**5** 317,3* / 550** 1820 2,19 / 5,62	16 **S** Schwefel Sulfur [Ne] $3s^2$ $3p^4$ [32,059; 32,076] -2,2,4,**6** 368,4* / 717,8* 2060 2,58 / 6,22	17 **Cl** Chlor Chlorine [Ne] $3s^2$ $3p^5$ [35,446; 35,457] **-1**,1,3,5,7 171,6* / 239,11* 2,95 3,16 / 8,3	18 **Ar** Argon Argon [Ne] $3s^2$ $3p^6$ 39,948 **0** 83,81 / 87,302 1,66
19 **K** Kalium Potassium [Ar] 4s 39,098 **1** 336,7 / 1032 860 0,82 / 2,42	20 **Ca** Calcium Calcium [Ar] $4s^2$ 40,078(4) **2** 1115 / 1757 1540 1 / 2,2	21 **Sc** Scandium Scandium [Ar] $3d4s^2$ 44,956 **3** 1814 / 3109 2990 1,36 / 3,34	22 **Ti** Titan Titanium [Ar] $3d^2$ $4s^2$ 47,867 2,3,**4** 1941* / 3560* 4510 1,54 / 3,45	23 **V** Vanadium Vanadium [Ar] $3d^3$ $4s^2$ 50,942 0,2,3,4,**5** 2183 / 3680 6090 1,63 / 3,6	24 **Cr** Chrom Chromium [Ar] $3d^5$ 4s 51,996 0,**2**,**3**,4,5,6 2180 / 2755 7140 1,66 / 3,72	25 **Mn** Mangan Manganese [Ar] $3d^5$ $4s^2$ 54,938 -1,0,**2**,3,4,6,7 1519 / 2334 7440 1,55 / 3,72	26 **Fe** Eisen Iron [Ar] $3d^6$ $4s^2$ 55,845(2) -2,0,2,**3**,4,6 1811 / 3134 7870 1,83 / 4,06	27 **Co** Cobalt Cobalt [Ar] $3d^7$ $4s^2$ 58,933 -1,0,2,3 1768 / 3200 8890 1,88 / 4,3	28 **Ni** Nickel Nickel [Ar] $3d^8$ $4s^2$ 58,639 0,2,3,4 1728 / 3003 8910 1,91 / 4,4	29 **Cu** Kupfer Copper [Ar] $3d^{10}$ 4s 63,546(3) 1,**2** 1357,77 / 2835 8920 1,9 / 4,48	30 **Zn** Zink Zinc [Ar] $3d^{10}$ $4s^2$ 65,38(2) **2** 692.68 / 1180 7140 1,65 / 4,45	31 **Ga** Gallium Gallium [Ar] $3d^{10}$ $4s^2$ 4p 69,723 **3** 302,9146 / 2673 5910 1,81 / 3,2	32 **Ge** Germanium Germanium [Ar] $3d^{10}$ $4s^2$ $4p^2$ 72,630(8) 2,**4** 1211,4 / 3106 5320 2,01 / 4,6	33 **As** Arsen Arsenic [Ar] $3d^{10}$ $4s^2$ $4p^3$ 74,922 -3,**3**,5 1090 / 887* 5720 2,18 / 5,3	34 **Se** Selen Selenium [Ar] $3d^{10}$ $4s^2$ $4p^4$ 78,971(8) -2,**4**,6 494* / 958* 4820 2,55 / 5,89	35 **Br** Brom Bromine [Ar] $3d^{10}$ $4s^2$ $4p^5$ [79,901; 79,907] **-1**,1,3,5,7 265,8* / 332* 3140 2,96 / 7,59	36 **Kr** Krypton Krypton [Ar] $3d^{10}$ $4s^2$ $4p^6$ 83,798(2) **0**,2 115,78 / 119,735 3,48
37 **Rb** Rubidium Rubidium [Kr] 5s 85,468 **1** 312,45 / 961 1530 0,82 / 2,34	38 **Sr** Strontium Strontium [Kr] $5s^2$ 87,62 **2** 1050 / 1650 2630 0,95 / 2	39 **Y** Yttrium Yttrium [Kr] $4d5s^2$ 88,906 **3** 1799 / 3203 4470 1,22 / 3,19	40 **Zr** Zirconium Zirconium [Kr] $4d^2$ $5s^2$ 91,224(2) 2,3,**4** 2128 / 4650 6510 1,33 / 3,64	41 **Nb** Niob Niobium [Kr] $4d^4$ 5s 92,906 3,**5** 2750 / 5017 8580 1,6 / 4,0	42 **Mo** Molybdän Moybdenum [Kr] $4d^5$ 5s 95,95 0,2,3,4,5,**6** 2896 / 4912 10280 2,16 / 3,9	43 **Tc** Technetium Technetium [Kr] $4d^5$ $5s^2$ [97] **4**,**7** 2430 / 4538 11490 1,9	44 **Ru** Ruthenium Ruthenium [Kr] $4d^7$ 5s 101,07(2) -2,0,2,**3**,4,5,6,7,8 2607 / 4423 12450 - / 4,5	45 **Rh** Rhodium Rhodium [Kr] $4d^8$ 5s 102,91 0,**1**,**2**,**3**,4,5,6 2237 / 3968 12410 2,28 / 4,3	46 **Pd** Palladium Palladium [Kr] $4d^{10}$ 106,42 **0**,**2**,4 1828,05 / 3236 12020 2,2 / 4,45	47 **Ag** Silber Silver [Kr] $4d^{10}$ 5s 107,87 **1**,**2** 1234,93 / 2483 10490 1,93 / 4,44	48 **Cd** Cadmium Cadmium [Kr] $4d^{10}$ $5s^2$ 112,41 **2** 594,22 / 1040 8640 1,69 / 4,33	49 **In** Indium Indium [Kr] $4d^{10}$ $5s^2$ 5p 114,82 **1**,**3** 429,75 / 2345 7310 1,78 / 3,1	50 **Sn** Zinn Tin [Kr] $4d^{10}$ $5s^2$ $5p^2$ 118,71 **2**,**4** 505,08* / 2875* 7290 1,96 / 4,3	51 **Sb** Antimon Antimony [Kr] $4d^{10}$ $5s^2$ $5p^3$ 121,76 -3,**3**,5 903,78 / 1908 6690 2,05 / 4,85	52 **Te** Tellur Tellurium [Kr] $4d^{10}$ $5s^2$ $5p^4$ 127,60(3) -2,**4**,6 722,66 / 1261 6250 - / 5,49	53 **I** Iod Iodine [Kr] $4d^{10}$ $5s^2$ $5p^5$ 126,90 **-1**,1,3,5,7 386,85* / 457,4* 4940 2,66 / 6,76	54 **Xe** Xenon Xenon [Kr] $4d^{10}$ $5s^2$ $5p^6$ 131,29 **0**,2,4,6,8 161,4 / 165,051 4.49
55 **Cs** Cäsium Caesium [Xe] 6s 132,91 **1** 301,7 / 944 1900 0,79 / 2,18	56 **Ba** Barium Barium [Xe] $6s^2$ 137,33 **2** 1000 / 1910 3650 0,89 / 2,4	57 **La** Lanthan Lanthanum [Xe] $5d6s^2$ 138,91 **3** 1193 / 3737 6160 1,1 / 3,1	72 **Hf** Hafnium Hafnium [Xe] $4f^{14}$ $5d^2$ $6s^2$ 178,48(2) **4** 2506 / 4876 13310 1,3 / 3,8	73 **Ta** Tantalum Tantalum [Xe] $4f^{14}$ $5d^3$ $6s^2$ 180,95 **5** 3290 / 5731 16680 1,5 / 4,11	74 **W** Wolfram Tungsten [Xe] $4f^{14}$ $5d^4$ $6s^2$ 183,84 0,2,3,4,5,**6** 3695 / 6203 19260 2,36 / 4,4	75 **Re** Rhenium Rhenium [Xe] $4f^{14}$ $5d^5$ $6s^2$ 186,21 0,2,3,4,6,**7** 3459 / 5869 21030 1,09 / 4,02	76 **Os** Osmium Osmium [Xe] $4f^{14}$ $5d^6$ $6s^2$ 190,23(3) -2,0,2,3,**4**,5,6,7,8 3306 / 5285 22590 2,2 / 4,9	77 **Ir** Iridium Iridium [Xe] $4f^{14}$ $5d^7$ $6s^2$ 192,22 -1,0,1,2,3,4,5,6,9 2719 / 4403 22560 2,2 / 5,4	78 **Pt** Platin Platinum [Xe] $4f^{14}$ $5d^9$ 6s 195,08 0,**2**,**4**,5,6 2041,4 / 4098 21450 2,28 / 5,6	79 **Au** Gold Gold [Xe] $4f^{14}$ $5d^{10}$ 6s 196,97 1,**3**,5 1337,33 / 3243 19320 2,54 / 5,77	80 **Hg** Quecksilber Mercury [Xe] $4f^{14}$ $5d^{10}$ $6s^2$ 200,59 1,**2** 234,32 / 629,88 13550 2 / 4,91	81 **Tl** Thallium Thallium [Xe] $4f^{14}$ $5d^{10}$ $6s^2$ 6p [204,38; 204,39] **1**,3 577 / 1746 11850 2,04 / 3,2	82 **Pb** Blei Lead [Xe] $4f^{14}$ $5d^{10}$ $6s^2$ $6p^2$ 207,2 2,**4** 600,61 / 2022 11340 2,33 / 3,9	83 **Bi** Bismut Bismuth [Xe] $4f^{14}$ $5d^{10}$ $6s^2$ $6p^3$ 208,98 3,**5** 544,7 / 1837 9800 2,02 / 4,69	84 **Po** Polonium Polonium [Xe] $4f^{14}$ $5d^{10}$ $6s^2$ $6p^4$ [209] 2,**4**,6 527 / 1235 (alpha) 9200	85 **At** Astat Astatine [Xe] $4f^{14}$ $5d^{10}$ $6s^2$ $6p^5$ [210] **-1**,1,3,5,7 575 / (ca.) 610 2,2 / -	86 **Rn** Radon Radon [Xe] $4f^{14}$ $5d^{10}$ $6s^2$ $6p^6$ [222] **0**,2 202 / 211,5 9,23
87 **Fr** Francium Francium [Rn] 7s [223] **1** 300 / (ca.) 950 348	88 **Ra** Radium Radium [Rn] $7s^2$ [226] **2** 973 / 2010 5500	89 **Ac** Actinium Actinium [Rn] $6d7s^2$ [227] **3** (ca) 1323 / 3471 10070	104 **Rf** Rutherfordium Rutherfordium [Rn] $5f^{14}$ $6d^2$ $7s^2$ [267] 4 (vermutet)	105 **Db** Dubnium Dubnium [Rn] $5f^{14}$ $6d^3$ $7s^2$ [270] 3,4,5 (vermutet)	106 **Sg** Seaborgium Seaborgium [Rn] $5f^{14}$ $6d^4$ $7s^2$ [269] 6 (vermutet)	107 **Bh** Bohrium Bohrium [Rn] $5f^{14}$ $6d^5$ $7s^2$ [270] **7**	108 **Hs** Hassium Hassium [Rn] $5f^{14}$ $6d^6$ $7s^2$ [270] 8 (vermutet)	109 **Mt** Meitnerium Meitnerium [Rn] $5f^{14}$ $6d^7$ $7s^2$ [278] 3,4,6 (vermutet)	110 **Ds** Darmstadtium Darmstadtium [Rn] $5f^{14}$ $6d^8$ $7s^2$ [281] 2,4,6 (vermutet)	111 **Rg** Roentgenium Roentgenium [Rn] $5f^{14}$ $6d^9$ $7s^2$ [281] 3 (vermutet)	112 **Cn** Copernicium Copernicium [Rn] $5f^{14}$ $6d^{10}$ $7s^2$ [285] **2**	113 **Nh** Nihonium Nihonium [Rn] $5f^{14}$ $6d^{10}$ $7s^2$ 7p [286] **3**	114 **Fl** Flerovium Flerovium [Rn] $5f^{14}$ $6d^{10}$ $7s^2$ $7p^2$ [289] **4**	115 **Mc** Moscovium Moscovium [Rn] $5f^{14}$ $6d^{10}$ $7s^2$ $7p^3$ [289] **3**	116 **Lv** Livermorium Livermorium [Rn] $5f^{14}$ $6d^{10}$ $7s^2$ $7p^4$ [293] **2**	117 **Ts** Tennessine Tennessine [Rn] $5f^{14}$ $6d^{10}$ $7s^2$ $7p^5$ [293] **1**	118 **Og** Oganesson Oganesson [Rn] $5f^{14}$ $6d^{10}$ $7s^2$ $7p^6$ [294] **0**
			58 **Ce** Cer Cerium [Xe] 4f $5d$ $6s^2$ 140,12 **3**,**4** 1068 / 3716 6770 1,12 / -	59 **Pr** Praseodym Prasaeodymium [Xe] $4f^3$ $6s^2$ 140,91 **3**,4 1208 / 3403 6480 - / 1,13	60 **Nd** Neodym Neodymium [Xe] $4f^4$ $6s^2$ 144,24 **3**,4 1297 / 3347 7000 1,14 / -	61 **Pm** Promethium Promethium [Xe] $4f^5$ $6s^2$ [145] **3** 1315 / 3273 7220	62 **Sm** Samarium Samarium [Xe] $4f^6$ $6s^2$ 150,36(2) 2,**3** 1345 / 2173 7540 1,17 / -	63 **Eu** Europium Europium [Xe] $4f^7$ $6s^2$ 151,96 2, **3** 1099 / 1802 5250	64 **Gd** Gadolinium Gadolinium [Xe] $4f^7$ $5d$ $6s^2$ 157,25(3) **3** 1585 / 3273 7890 1,2 / -	65 **Tb** Terbium Terbium [Xe] $4f^9$ $6s^2$ 158,93 3,4 1629 / 3396 8250	66 **Dy** Dysprosium Dysprosium [Xe] $4f^{10}$ $6s^2$ 162,50 **3**,4 1680 / 2840 8560 1,22 / -	67 **Ho** Holmium Holmium [Xe] $4f^{11}$ $6s^2$ 164,93 **3** 1734 / 2873 8780 1,23 / -	68 **Er** Erbium Erbium [Xe] $4f^{12}$ $6s^2$ 167,26 **3** 1802 / 3141 9050 1,24 / -	69 **Tm** Thulium Thulium [Xe] $4f^{13}$ $6s^2$ 168,93 2,**3** 1818 / 2223 9320 1,25 / -	70 **Yb** Ytterbium Ytterbium [Xe] $4f^{14}$ $6s^2$ 173,05 2,**3** 1097 / 1703 6970	71 **Lu** Lutetium Lutetium [Xe] $4f^{14}$ $5d$ $6s^2$ 174,97 **3** 1925 / 3675 9840 1,27 / -	
			90 **Th** Thorium Thorium [Rn] $6d^2$ $7s^2$ 232,04 **4** 2115 / 5061 11720 1,3 / -	91 **Pa** Protactinium Protactinium [Rn] $5f^2$ $6d$ $7s^2$ 231,04 4,**5** 1841 / (ca.) 4300 15370 1,5 / -	92 **U** Uran Uranium [Rn] $5f^3$ $6d$ $7s^2$ 238,03 3,4,5,**6** 1405,3 / 4404 18970 1,38 / -	93 **Np** Neptunium Neptunium [Rn] $5f^4$ $6d$ $7s^2$ [237] 3,4,**5**,6 917 / 4273 20480 1,36 / -	94 **Pu** Plutonium Plutonium [Rn] $5f^6$ $7s^2$ [244] **3**,4,5,6 912,5 / 3501 19740 1,28 / -	95 **Am** Americium Americium [Rn] $5f^7$ $7s^2$ [243] **3**,4,5,6 1449 / 2880 13670 1,3 / -	96 **Cm** Curium Curium [Rn] $5f^7$ $6d$ $7s^2$ [247] **3**,4 1613 / 3383 13510	97 **Bk** Berkelium Berkelium [Rn] $5f^9$ $7s^2$ [247] **3**,4 1323* / - 13250 1,3 / -	98 **Cf** Californium Californium [Rn] $5f^{10}$ $7s^2$ [251] **3**,4 1173 / - 15100 1,3 / -	99 **Es** Einsteinium Einsteinium [Rn] $5f^{11}$ $7s^2$ - **3** 1133 / - 1,3 / -	100 **Fm** Fermium Fermium [Rn] $5f^{12}$ $7s^2$ - **3** 1800 / - 1,3 / -	101 **Md** Mendelevium Mendelevium [Rn] $5f^{13}$ $7s^2$ - **3** 1100 / - 1,3 / -	102 **No** Nobelium Nobelium [Rn] $5f^{14}$ $7s^2$ - **2**,3 1100 / - 1,3 / -	103 **Lr** Lawrencium Lawrencium [Rn] $5f^{14}$ $7s^2$ 7p - **3** 1900 / -	

Elektronenkonfiguration
relative Atommasse
wichtige Oxidationszahlen
Schmelz- /Siedepunkt in Kelvin
Dichte in kg/m³ (bei 293 K)
Elektroneg. Pauling/Pearson

electron configuration
atomic weight
important oxidation numbers
melting / boiling point in Kelvin
density in kg/m³ (at 293 K)
electroneg. Pauling / Pearson

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