# Tabla periódica de los elementos

Alcalinos | Alcalino-térreos | Lantánidos | Actínidos | Metales de transición | Otros metales | Metaloides | Otros no metales | Gases nobles | Sin clasificar | Grupo 17 = Halógenos

**Clave**

Grupo
# Xy
Nombre Atom
MW
ox. no.
EN
$r_a$/$r_i$
p.f./p.e.
**f**,$Xy_n$,$Xy^{+/-}$ abc
el. conf.

Radio iónico relativo ($r_i$,$Xy^{+/-}$)

Radio atómico relativo ($r_a$)

Nota: los valores escritos en gris son predicciones

- #: Número atómico
- Xy: Símbolo químico
- Nombre Atom: Si está escrito en negro, el átomo es generalmente producido sintéticamente
- MW: Peso molecular (g/mol)
- ox. no: Los estados de oxidación más comunes
- EN: Electro negatividad (escala de Pauling)
- $r_a$: Radio atómico (pm)
- $r_i$: Radio iónico (pm)
- p.f: Punto de fusión (K)*
- p.e: Punto de ebullición (K)*
- **f**: Fases *: sólido (**s**), líquido (**l**), gas (**g**)
- $Xy_n$: Forma elemental
- $Xy^{+/-}$: Ion correspondiente a $r_i$
- el. conf.: Configuración electronica
- abc: estructura cristalina

*Valores en 273.15 K, 1 bar

- bcc: Cuerpo centrado cúbico
- cub: Cúbico
- dhcp: Doble hexagonal
- fcc: Cara céntrica
- fcd: Cara-centrado diamante-cúbico
- hcp: Hexagonal cerrado
- hex: Hexagonal
- mon: Monoclínico
- ort: Ortorrómico
- rho: Romboédrico
- she: Simple hexagonal

**Ecuaciones:**

Concentración: $c = n/V$ [mol/L]
Cantidad de sustancia: $n$ [mol]
Volumen: $V$ [L]
Número de partículas: $N = n \cdot N_A$
Presión: p [Pa]
Ecuación de gas ideal: $pV = nRT = Nk_BT$

**Factores de conversión:**

1 μm = $10^{-6}$ m; 1 nm = $10^{-9}$ m; 1 Å (Angs.) = $10^{-10}$ m; 1 pm = $10^{-12}$ m; 1 fm = $10^{-15}$ m
1 bar = $10^5$ N/m$^2$ = $10^5$ Pa; 1 atm = 101325 Pa = 1.01325 bar
Torr = 1/760 atm = 1.333 mbar = 1 mmHg
1 L = $10^{-3}$ m$^3$ = 1 dm$^3$ = $10^3$ cm$^3$ = $10^6$ mm$^3$

**Constantes:**

| | | |
|---|---|---|
| Número Avogadro | $N_a$ | = 6.022 141 79(30) • $10^{-23}$ mol$^{-1}$ |
| Masa de protones | $m_p$ | = 1.672 621 777(74) • $10^{-27}$ kg |
| Masa de electrones | $m_e$ | = 9.109 382 91(40) • $10^{-31}$ kg |
| Masa de neutrón | $m_n$ | = 1.674 927 351(74) • $10^{-27}$ kg |
| Temperatura estándar | $T_s$ | = 273.15 K = 0 °C |
| Constante de gas universal | $R$ | = 8.314 472(15) J/(mol•K) |
| Constante de Boltzmann | $k_B$ | = 1.380 650 4(24) • $10^{-23}$ J/K |
| Velocidad de la luz | $c$ | = 2.997 924 58 • $10^8$ m/s |
| Cargo elemental | $e$ | = 1.602 176 487(40) • $10^{-19}$ C |
| Constante de Planck | $h$ | = 6.626 068 96 (33) • $10^{-34}$ J•s |
| | $\hbar = h/2\pi$ | = 1.054 571 628(53) • $10^{-34}$ J•s |
| Unidad de masa atómica | 1 u | = 1.660 538 921(73) • $10^{-27}$ kg |

La masa atómica unificada es igual a 1/12 de la masa de una sola Átomo C aislado.


**REFERENCIAS:**

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[ri] R. D. Shannon, *Acta Cryst.*, **1976**, *A32*, 751-767 and https://en.wikipedia.org/wiki/ionic_radius.
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| I–IA | II–IIA | III–IIIA | IV–IVA | V–VA | VI–VIA | VII–VIIA | VIII–VIIIA | IX–VIIIA | X–VIIIA | XI–IB | XII–IIB | XIII–IIIB | XIV–IVB | XV–VB | XVI–VIB | XVII–VIIB | XVIII–VIIIB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 **H** Hidrógeno<br>1.00794<br>-1,1<br>52.9/154 2.20<br>13.99/20.271<br>g,$H_2$,H hex<br>$1s^2$ | | | | | | | | | | | | | | | | | 2 **He** Helio<br>4.002602(2)<br>-<br>31/- n.a.<br>0.95/4.222<br>g,He hcp<br>$1s^2$ |
| 3 **Li** Litio<br>6.941<br>1<br>167/90 0.98<br>453.65/1603<br>s,$Li_n$,$Li^+$ bcc<br>$1s^22s^1$ | 4 **Be** Berilio<br>9.0121831(5)<br>2<br>112/59 1.57<br>1560/2742<br>s,$Be_n$,$Be^{2+}$ hcp<br>$1s^22s^2$ | | | | | | | | | | | 5 **B** Boro<br>10.81<br>3<br>87/41 2.04<br>2349/4200<br>s,$B_n$,$B^{3+}$ rho<br>$1s^22s^22p^1$ | 6 **C** Carbono<br>12.011<br>-4,-3,-2,-1,1,2,3,4<br>67/30 2.55<br>3915 (subl.)<br>s,$C_n$,$C^{4+}$ she,fcd<br>$1s^22s^22p^2$ | 7 **N** Nitrógeno<br>14.007<br>-3,3,5<br>56/132/27 3.04<br>63.15/77.355<br>g,$N_2$,$N^{3-}$,$N^{5+}$ hex<br>$1s^22s^22p^3$ | 8 **O** Oxígeno<br>15.999<br>-2<br>48/126 3.44<br>54.36/90.188<br>g,$O_2$,$O^{2-}$ cub<br>$1s^22s^22p^4$ | 9 **F** Flúor<br>18.998403163<br>-1<br>42/119 3.98<br>53.48/85.03<br>g,$F_2$,$F^-$ cub<br>$1s^22s^22p^5$ | 10 **Ne** Neón<br>20.1797(6)<br>-<br>38/- n.a.<br>24.56/27.104<br>g,Ne fcc<br>$1s^22s^22p^6$ |
| 11 **Na** Sodio<br>22.98976928(2)<br>1<br>190/116 0.93<br>370.94/1156.09<br>s,$Na_n$,$Na^+$ bcc<br>[Ne]$3s^1$ | 12 **Mg** Magnesio<br>24.305<br>2<br>145/86 1.31<br>923/1363<br>s,$Mg_n$,$Mg^{2+}$ hcp<br>[Ne]$3s^2$ | | | | | | | | | | | 13 **Al** Aluminio<br>26.9815385(7)<br>3<br>118/67.5 1.61<br>933.47/2743<br>s,$Al_n$,$Al^{3+}$ fcc<br>[Ne]$3s^23p^1$ | 14 **Si** Silicio<br>28.085<br>-4,4<br>111/54 1.90<br>1687/3538<br>s,$Si_n$,$Si^{4+}$ fcd<br>[Ne]$3s^23p^2$ | 15 **P** Fósforo<br>30.973761998<br>-3,5<br>98/52 2.19<br>317/553 (white)<br>s,$P_n$,$P^{5+}$ bcc<br>[Ne]$3s^23p^3$ | 16 **S** Azufre<br>32.06<br>-2,2,4,6<br>88/170 2.58<br>388.36/717.8<br>s,$S_8$,$S^{2-}$ ort<br>[Ne]$3s^23p^4$ | 17 **Cl** Cloro<br>35.45<br>-1,1,3,5,7<br>79/167 3.16<br>171.6/239.11<br>g,$Cl_2$,$Cl^-$ ort<br>[Ne]$3s^23p^5$ | 18 **Ar** Argón<br>39.948(1)<br>-<br>71/- n.a.<br>83.81/87.302<br>g,Ar fcc<br>[Ne]$3s^23p^6$ |
| 19 **K** Potasio<br>39.0983(1)<br>1<br>243/152 0.82<br>336.7/1032<br>s,$K_n$,$K^+$ bcc<br>[Ar]$4s^1$ | 20 **Ca** Calcio<br>40.078(4)<br>2<br>194/114 1.00<br>1115/1757<br>s,$Ca_n$,$Ca^{2+}$ fcc<br>[Ar]$4s^2$ | 21 **Sc** Escandio<br>44.955908(5)<br>3<br>184/88.5 1.36<br>1814/3109<br>s,$Sc_n$,$Sc^{3+}$ hcp<br>[Ar]$3d^14s^2$ | 22 **Ti** Titanio<br>47.867(1)<br>4<br>176/74.5 1.54<br>1941/3560<br>s,$Ti_n$,$Ti^{4+}$ hcp<br>[Ar]$3d^24s^2$ | 23 **V** Vanadio<br>50.9415(1)<br>5<br>171/68 1.63<br>2183/3680<br>s,$V_n$,$V^{5+}$ bcc<br>[Ar]$3d^34s^2$ | 24 **Cr** Cromo<br>51.9961(6)<br>3,6<br>166/58 1.66<br>2180/2944<br>s,$Cr_n$,$Cr^{6+}$ bcc<br>[Ar]$3d^54s^1$ | 25 **Mn** Manganeso<br>54.938044(3)<br>2,4,7<br>161/60 1.55<br>1519/2334<br>s,$Mn_n$,$Mn^{7+}$ bcc<br>[Ar]$3d^54s^2$ | 26 **Fe** Hierro<br>55.845(2)<br>2,3,6<br>156/39 1.83<br>1811/3134<br>s,$Fe_n$,$Fe^{6+}$bcc,fcc<br>[Ar]$3d^64s^2$ | 27 **Co** Cobalto<br>58.933194(4)<br>2,3<br>152/68.5 1.88<br>1768/3200<br>s,$Co_n$,$Co^{3+}$ hcp<br>[Ar]$3d^74s^2$ | 28 **Ni** Níquel<br>58.6934(4)<br>2<br>149/83 1.91<br>1728/3003<br>s,$Ni_n$,$Ni^{2+}$ fcc<br>[Ar]$3d^84s^2$ | 29 **Cu** Cobre<br>63.546(3)<br>2<br>145/87 1.90<br>1357.77/2835<br>s,$Cu_n$,$Cu^{2+}$ fcc<br>[Ar]$3d^{10}4s^1$ | 30 **Zn** Cinc<br>65.38(2)<br>2<br>142/88 1.65<br>692.68/1180<br>s,$Zn_n$,$Zn^{2+}$ hcp<br>[Ar]$3d^{10}4s^2$ | 31 **Ga** Galio<br>69.723(1)<br>3<br>136/76 1.81<br>302.91/2673<br>s,$Ga_n$,$Ga^{3+}$ ort<br>[Ar]$3d^{10}4s^24p^1$ | 32 **Ge** Germanio<br>72.630(8)<br>-4,2,4<br>125/67 2.01<br>1211.40/3106<br>s,$Ge_n$,$Ge^{4+}$ fcd<br>[Ar]$3d^{10}4s^24p^2$ | 33 **As** Arsénico<br>74.921595(6)<br>-3,3,5<br>114/72 2.18<br>887 (subl.)<br>s,$As_n$,$As^{3+}$ rho<br>[Ar]$3d^{10}4s^24p^3$ | 34 **Se** Selenio<br>78.971(8)<br>-2,2,4,6<br>103/184 2.55<br>494/958<br>s,$Se_8$,$Se^{2-}$ hex<br>[Ar]$3d^{10}4s^24p^4$ | 35 **Br** Bromo<br>79.904<br>-1,1,3,5<br>94/182 2.96<br>265.8/332.0<br>l,$Br_2$,$Br^-$ ort<br>[Ar]$3d^{10}4s^24p^5$ | 36 **Kr** Kriptón<br>83.798(2)<br>2<br>88/- 3.00<br>115.78/119.93<br>g,Kr fcc<br>[Ar]$3d^{10}4s^24p^6$ |
| 37 **Rb** Rubidio<br>85.4678(3)<br>1<br>265/166 0.82<br>312.45/961<br>s,$Rb_n$,$Rb^+$ bcc<br>[Kr]$5s^1$ | 38 **Sr** Estroncio<br>87.62(1)<br>2<br>219/132 0.95<br>1050/1650<br>s,$Sr_n$,$Sr^{2+}$ fcc<br>[Kr]$5s^2$ | 39 **Y** Itrio<br>88.90584(2)<br>3<br>212/104 1.22<br>1799/3203<br>s,$Y_n$,$Y^{3+}$ hcp<br>[Kr]$4d^15s^2$ | 40 **Zr** Circonio<br>91.224(2)<br>4<br>206/86 1.33<br>2128/4650<br>s,$Zr_n$,$Zr^{4+}$ hcp<br>[Kr]$4d^25s^2$ | 41 **Nb** Niobio<br>92.90637(2)<br>5<br>198/78 1.60<br>2750/5017<br>s,$Nb_n$,$Nb^{5+}$ bcc<br>[Kr]$4d^45s^1$ | 42 **Mo** Molibdeno<br>95.95(1)<br>4,6<br>190/73 2.16<br>2896/4912<br>s,$Mo_n$,$Mo^{6+}$ bcc<br>[Kr]$4d^55s^1$ | 43 **Tc** Tecnecio<br>(98)<br>4,7<br>183/70 1.9<br>2430/4538<br>s,$Tc_n$,$Tc^{7+}$ hcp<br>[Kr]$4d^55s^2$ | 44 **Ru** Rutenio<br>101.07(2)<br>3,4<br>178/76 2.2<br>2607/4423<br>s,$Ru_n$,$Ru^{4+}$ hcp<br>[Kr]$4d^75s^1$ | 45 **Rh** Rodio<br>102.90550(2)<br>3<br>173/80.5 2.28<br>2237/3968<br>s,$Rh_n$,$Rh^{3+}$ fcc<br>[Kr]$4d^85s^1$ | 46 **Pd** Paladio<br>106.42(1)<br>2,4<br>169/100 2.20<br>1828.05/3236<br>s,$Pd_n$,$Pd^{2+}$ fcc<br>[Kr]$4d^{10}$ | 47 **Ag** Plata<br>107.8682(2)<br>1<br>165/129 1.93<br>1234.93/2435<br>s,$Ag_n$,$Ag^{1+}$ fcc<br>[Kr]$4d^{10}5s^1$ | 48 **Cd** Cadmio<br>112.414(4)<br>2<br>161/109 1.69<br>594.22/1040<br>s,$Cd_n$,$Cd^{2+}$ hcp<br>[Kr]$4d^{10}5s^2$ | 49 **In** Indio<br>114.818(1)<br>3<br>156/94 1.78<br>429.75/2345<br>s,$In_n$,$In^{3+}$ tet<br>[Kr]$4d^{10}5s^25p^1$ | 50 **Sn** Estaño<br>118.710(7)<br>-4,2,4<br>145/83 1.96<br>505.08/2875<br>s,$Sn_n$,$Sn^{4+}$tet,fcd<br>[Kr]$4d^{10}5s^25p^2$ | 51 **Sb** Antimonio<br>121.760(1)<br>-3,3,5<br>133/74 2.05<br>903.73/1908<br>s,$Sb_n$,$Sb^{5+}$ rho<br>[Kr]$4d^{10}5s^25p^3$ | 52 **Te** Telurio<br>127.60(3)<br>-2,2,4,6<br>123/207 2.1<br>722.66/1261<br>s,$Te_n$,$Te^{2-}$ hex<br>[Kr]$4d^{10}5s^25p^4$ | 53 **I** Yodo<br>126.90447(3)<br>-1,1,3,5,7<br>115/206 2.66<br>386.85/457.4<br>s,$I_2$,$I^-$ ort<br>[Kr]$4d^{10}5s^25p^5$ | 54 **Xe** Xenón<br>131.293(6)<br>2,4,6<br>108 2.60<br>161.40/165.051<br>g,Xe fcc<br>[Kr]$4d^{10}5s^25p^6$ |
| 55 **Cs** Cesio<br>132.90545196<br>1<br>298/181 0.79<br>301.7/944<br>s,$Cs_n$,$Cs^+$ bcc<br>[Xe]$6s^1$ | 56 **Ba** Bario<br>137.327(7)<br>2<br>253/149 0.89<br>1000/2118<br>s,$Ba_n$,$Ba^{2+}$ bcc<br>[Xe]$6s^2$ | 57-71 | 72 **Hf** Hafnio<br>178.49(2)<br>4<br>208/85 1.30<br>2506/4876<br>s,$Hf_n$,$Hf^{4+}$ hcp<br>[Xe]$4f^{14}5d^26s^2$ | 73 **Ta** Tantalio<br>180.94788(2)<br>5<br>200/78 1.50<br>3290/5731<br>s,$Ta_n$,$Ta^{5+}$bcc,tet<br>[Xe]$4f^{14}5d^36s^2$ | 74 **W** Wolframio<br>183.84(1)<br>4,6<br>193/74 2.36<br>3695/6203<br>s,$W_n$,$W^{6+}$ bcc<br>[Xe]$4f^{14}5d^46s^2$ | 75 **Re** Renio<br>186.207(1)<br>4<br>188/67 1.9<br>3459/5869<br>s,$Re_n$,$Re^{7+}$ hcp<br>[Xe]$4f^{14}5d^56s^2$ | 76 **Os** Osmio<br>190.23(3)<br>4<br>185/53 2.2<br>3306/5285<br>s,$Os_n$,$Os^{8+}$ hcp<br>[Xe]$4f^{14}5d^66s^2$ | 77 **Ir** Iridio<br>192.217(3)<br>3,4<br>180/82 2.20<br>2719/4403<br>s,$Ir_n$,$Ir^{3+}$ fcc<br>[Xe]$4f^{14}5d^76s^2$ | 78 **Pt** Platino<br>195.084(9)<br>2,4<br>177/94 2.28<br>2041.4/4098<br>s,$Pt_n$,$Pt^{2+}$ fcc<br>[Xe]$4f^{14}5d^96s^1$ | 79 **Au** Oro<br>196.966569(5)<br>3<br>174/99 2.54<br>1337.33/3243<br>s,$Au_n$,$Au^{3+}$ fcc<br>[Xe]$4f^{14}5d^{10}6s^1$ | 80 **Hg** Mercurio<br>200.592(3)<br>1,2<br>171/116 2.00<br>234.3210/629.88<br>l,$Hg_n$,$Hg^{2+}$ rho<br>[Xe]$4f^{14}5d^{10}6s^2$ | 81 **Tl** Talio<br>204.38<br>1,3<br>156/102.5 1.62<br>577/1746<br>s,$Tl_n$,$Tl^{3+}$ hcp<br>[Xe]$4f^{14}5d^{10}6s^26p^1$ | 82 **Pb** Plomo<br>207.2(1)<br>2,4<br>154/133 1.87<br>600.61/2022<br>s,$Pb_n$,$Pb^{2+}$ fcc<br>[Xe]$4f^{14}5d^{10}6s^26p^2$ | 83 **Bi** Bismuto<br>208.98040(1)<br>3<br>143/90 2.02<br>544.7/1837<br>s,$Bi_n$,$Bi^{5+}$ rho<br>[Xe]$4f^{14}5d^{10}6s^26p^3$ | 84 **Po** Polonio<br>(209)<br>-2,2,4<br>135/108 2.0<br>527/1235<br>s,$Po_n$,$Po^{4+}$ cub<br>[Xe]$4f^{14}5d^{10}6s^26p^4$ | 85 **At** Ástato<br>(210)<br>-1,1<br>127/n.a. 2.2<br>575/610<br>n.a./n.a.,n.a. fcc<br>[Xe]$4f^{14}5d^{10}6s^26p^5$ | 86 **Rn** Radón<br>(222)<br>2<br>120 2.2<br>202/211.5<br>g,Rn fcc<br>[Xe]$4f^{14}5d^{10}6s^26p^6$ |
| 87 **Fr** Francio<br>(223)<br>1<br>n.a./n.a. 0.7<br>n.a./n.a.<br>n.a.,n.a.,n.a. bcc<br>[Rn]$7s^1$ | 88 **Ra** Radio<br>(226)<br>2<br>n.a./162 0.90<br>973/2010<br>s,$Ra_n$,$Ra^{2+}$ bcc<br>[Rn]$7s^2$ | 89-103 | 104 **Rf** Rutherfordio<br>(267)<br>4<br>n.a./n.a. n.a.<br>2400/5800<br>s,n.a.,n.a. hcp<br>[Rn]$5f^{14}6d^27s^2$ | 105 **Db** Dubnio<br>(268)<br>5<br>n.a./n.a. n.a.<br>n.a./n.a.<br>s,n.a.,n.a. bcc<br>[Rn]$5f^{14}6d^37s^2$ | 106 **Sg** Seaborgio<br>(269)<br>6<br>n.a./n.a. n.a.<br>n.a./n.a.<br>s,n.a.,n.a. bcc<br>[Rn]$5f^{14}6d^47s^2$ | 107 **Bh** Bohrio<br>(270)<br>7<br>n.a./n.a. n.a.<br>n.a./n.a.<br>s,n.a.,n.a. hcp<br>[Rn]$5f^{14}6d^57s^2$ | 108 **Hs** Hassio<br>(269)<br>8<br>n.a./n.a. n.a.<br>n.a./n.a.<br>s,n.a.,n.a. hcp<br>[Rn]$5f^{14}6d^67s^2$ | 109 **Mt** Meitnerio<br>(278)<br>n.a.<br>n.a./n.a. n.a.<br>n.a./n.a.<br>s,n.a.,n.a. fcc<br>[Rn]$5f^{14}6d^77s^2$ | 110 **Ds** Darmstadio<br>(281)<br>n.a.<br>n.a./n.a. n.a.<br>n.a./n.a.<br>s,n.a.,n.a. bcc<br>[Rn]$5f^{14}6d^87s^2$ | 111 **Rg** Roentgenio<br>(282)<br>n.a.<br>n.a./n.a. n.a.<br>1814/3109<br>s,n.a.,n.a. bcc<br>[Rn]$5f^{14}6d^97s^2$ | 112 **Cn** Copernicio<br>(285)<br>n.a.<br>n.a./n.a. n.a.<br>n.a./n.a.<br>n.a.,n.a.,n.a. hcp<br>[Rn]$5f^{14}6d^{10}7s^2$ | 113 **Nh** Nihonio<br>(286)<br>n.a.<br>n.a./n.a. n.a.<br>700/1430<br>s,n.a.,n.a. hcp<br>[Rn]$5f^{14}6d^{10}7s^27p^1$ | 114 **Fl** Flerovio<br>(289)<br>n.a.<br>n.a./n.a. n.a.<br>340/420<br>s,n.a.,n.a. n.a.<br>[Rn]$5f^{14}6d^{10}7s^27p^2$ | 115 **Mc** Moscovio<br>(289)<br>n.a.<br>n.a./n.a. n.a.<br>670/1400<br>s,n.a.,n.a. n.a.<br>[Rn]$5f^{14}6d^{10}7s^27p^3$ | 116 **Lv** Livermorio<br>(293)<br>n.a.<br>n.a./n.a. n.a.<br>n.a./n.a.<br>s,n.a.,n.a. n.a.<br>[Rn]$5f^{14}6d^{10}7s^27p^4$ | 117 **Ts** Teneso<br>(294)<br>n.a.<br>n.a./n.a. n.a.<br>n.a./n.a.<br>s,n.a.,n.a. n.a.<br>[Rn]$5f^{14}6d^{10}7s^27p^5$ | 118 **Og** Oganesón<br>(294)<br>n.a.<br>n.a./n.a. n.a.<br>n.a./n.a.<br>s,n.a.,n.a. n.a.<br>[Rn]$5f^{14}6d^{10}7s^27p^6$ |

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| 57 **La** Lantano<br>138.90547(7)<br>3<br>n.a./117.2 1.1<br>1193/3737<br>s,$La_n$,$La^{3+}$ dhcp<br>[Xe]$5d^16s^2$ | 58 **Ce** Cerio<br>140.116(1)<br>3,4<br>n.a./101 1.12<br>1068/3716<br>s,$Ce_n$,$Ce^{4+}$ dhcp<br>[Xe]$4f^15d^16s^2$ | 59 **Pr** Praseodimio<br>140.90766(2)<br>3<br>n.a./113 1.13<br>1208/3403<br>s,$Pr_n$,$Pr^{3+}$ dhcp<br>[Xe]$4f^36s^2$ | 60 **Nd** Neodimio<br>144.242(3)<br>3<br>n.a./112.3 1.14<br>1297/3347<br>s,$Nd_n$,$Nd^{3+}$ dhcp<br>[Xe]$4f^46s^2$ | 61 **Pm** Prometio<br>(145)<br>3<br>n.a./111 1.13<br>1315/3273<br>s,$Pm_n$,$Pm^{3+}$dhcp<br>[Xe]$4f^56s^2$ | 62 **Sm** Samario<br>150.36(2)<br>3<br>n.a./109.8 1.17<br>1345/2173<br>s,$Sm_n$,$Sm^{3+}$ rho<br>[Xe]$4f^66s^2$ | 63 **Eu** Europio<br>151.964(1)<br>2,3<br>n.a./108.7 1.2<br>1099/1802<br>s,$Eu_n$,$Eu^{3+}$ bcc<br>[Xe]$4f^76s^2$ | 64 **Gd** Gadolinio<br>157.25(3)<br>3<br>n.a./107.8 1.2<br>1585/3273<br>s,$Gd_n$,$Gd^{3+}$ hcp<br>[Xe]$4f^75d^16s^2$ | 65 **Tb** Terbio<br>158.92535(2)<br>3<br>n.a./106.3 1.1<br>1629/3396<br>s,$Tb_n$,$Tb^{3+}$ hcp<br>[Xe]$4f^96s^2$ | 66 **Dy** Disprosio<br>162.500 (1)<br>3<br>n.a./105.2 1.22<br>1680/2840<br>s,$Dy_n$,$Dy^{3+}$ hcp<br>[Xe]$4f^{10}6s^2$ | 67 **Ho** Holmio<br>164.93033(2)<br>3<br>n.a./104.1 1.23<br>1734/2873<br>s,$Ho_n$,$Ho^{3+}$ hcp<br>[Xe]$4f^{11}6s^2$ | 68 **Er** Erbio<br>167.259(3)<br>3<br>n.a./103 1.24<br>1802/3141<br>s,$Er_n$,$Er^{3+}$ hcp<br>[Xe]$4f^{12}6s^2$ | 69 **Tm** Tulio<br>168.93422(2)<br>3<br>n.a./102 1.25<br>1818/2223<br>s,$Tm_n$,$Tm^{3+}$ hcp<br>[Xe]$4f^{13}6s^2$ | 70 **Yb** Iterbio<br>173.045(10)<br>3<br>n.a./100.8 1.1<br>1097/1469<br>s,$Yb_n$,$Yb^{3+}$ fcc<br>[Xe]$4f^{14}6s^2$ | 71 **Lu** Lutecio<br>174.9668(1)<br>3<br>n.a./100.1 1.27<br>1925/3675<br>s,$Lu_n$,$Lu^{3+}$ hcp<br>[Xe]$4f^{14}5d^16s^2$ |
| 89 **Ac** Actinio<br>(227)<br>3<br>n.a./126 1.1<br>n.a./n.a.<br>s,$Ac_n$,$Ac^{3+}$ fcc<br>[Rn]$6d^17s^2$ | 90 **Th** Torio<br>232.0377(4)<br>4<br>n.a./108 1.3<br>2023/5061.<br>s,$Th_n$,$Th^{4+}$ fcc<br>[Rn]$6d^27s^2$ | 91 **Pa** Protactinio<br>231.03588(2)<br>5<br>n.a./104 1.5<br>1841/4300<br>s,$Pa_n$,$Pa^{4+}$ tet<br>[Rn]$5f^26d^17s^2$ | 92 **U** Uranio<br>238.02891(3)<br>6<br>n.a./103 1.38<br>1405.3/4404<br>s,$U_n$,$U^{4+}$ ort<br>[Rn]$5f^36d^17s^2$ | 93 **Np** Neptunio<br>(237)<br>5<br>n.a./89 1.36<br>912/4447<br>s,$Np_n$,$Np^{5+}$ ort<br>[Rn]$5f^46d^17s^2$ | 94 **Pu** Plutonio<br>(244)<br>4<br>n.a./100 1.28<br>912.5/3505<br>s,$Pu_n$,$Pu^{4+}$ mon<br>[Rn]$5f^67s^2$ | 95 **Am** Americio<br>(243)<br>3<br>n.a./111.5 1.13<br>1449/2880<br>s,$Am_n$,$Am^{3+}$dhcp<br>[Rn]$5f^77s^2$ | 96 **Cm** Curio<br>(247)<br>3<br>n.a./99 1.28<br>1613/3383<br>s,$Cm_n$,$Cm^{4+}$dhcp<br>[Rn]$5f^76d^17s^2$ | 97 **Bk** Berkelio<br>(247)<br>3<br>n.a./110 1.3<br>1259/2900<br>s,$Bk_n$,$Bk^{3+}$ dhcp<br>[Rn]$5f^97s^2$ | 98 **Cf** Californio<br>(251)<br>3<br>n.a./109 1.3<br>1173/1925<br>s,$Cf_n$,$Cf^{3+}$ dhcp<br>[Rn]$5f^{10}7s^2$ | 99 **Es** Einstenio<br>(252)<br>3<br>n.a./92.8 1.3<br>1133/1269<br>s,$Es_n$,$Es^{2+}$ fcc<br>[Rn]$5f^{11}7s^2$ | 100 **Fm** Fermio<br>(257)<br>3<br>n.a./n.a. 1.3<br>1800/n.a.<br>s,n.a.,n.a. n.a.<br>[Rn]$5f^{12}7s^2$ | 101 **Md** Mendelevio<br>(258)<br>3<br>n.a./n.a. 1.3<br>1100/n.a.<br>s,n.a.,n.a. n.a.<br>[Rn]$5f^{13}7s^2$ | 102 **No** Nobelio<br>(259)<br>2<br>n.a./n.a. 1.3<br>1100/n.a.<br>s,n.a.,n.a. n.a.<br>[Rn]$5f^{14}7s^2$ | 103 **Lr** Lawrencio<br>(266)<br>3<br>n.a./n.a. 1.3<br>1900/n.a.<br>s,n.a.,n.a. n.a.<br>[Rn]$5f^{14}7s^27p^1$ |

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