A estrutura da materia

A táboa periódica

Tabla periódica de los elementos

grupo 1 … 18 · período 1 … 7

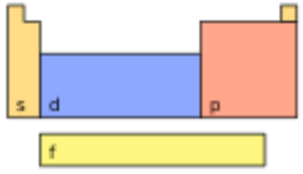
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1.00794 1312.0 2.20 1 **H** Hidrógeno $1s^1$																	4.002602 2372.3 2 **He** Helio $1s^2$
2	6.941 520.2 0.98 3 **Li** Litio $1s^2\,2s^1$	9.012182 899.5 1.57 4 **Be** Berilio $1s^2\,2s^2$											10.811 800.6 2.04 5 **B** Boro $1s^2\,2s^2\,2p^1$	12.0107 1086.5 2.55 6 **C** Carbono $1s^2\,2s^2\,2p^2$	14.0067 1402.3 3.04 7 **N** Nitrógeno $1s^2\,2s^2\,2p^3$	15.9994 1313.9 3.44 8 **O** Oxígeno $1s^2\,2s^2\,2p^4$	18.998403 1681.0 3.98 9 **F** Flúor $1s^2\,2s^2\,2p^5$	20.1797 2080.7 10 **Ne** Neón $1s^2\,2s^2\,2p^6$
3	22.98976 495.8 0.93 11 **Na** Sodio [Ne] $3s^1$	24.3050 737.7 1.31 12 **Mg** Magnesio [Ne] $3s^2$											26.98153 577.5 1.61 13 **Al** Aluminio [Ne] $3s^2\,3p^1$	28.0855 786.5 1.90 14 **Si** Silicio [Ne] $3s^2\,3p^2$	30.97696 1011.8 2.19 15 **P** Fósforo [Ne] $3s^2\,3p^3$	32.065 999.6 2.58 16 **S** Azufre [Ne] $3s^2\,3p^4$	35.453 1251.2 3.16 17 **Cl** Cloro [Ne] $3s^2\,3p^5$	39.948 1520.6 18 **Ar** Argón [Ne] $3s^2\,3p^6$
4	39.0983 418.8 0.82 19 **K** Potasio [Ar] $4s^1$	40.078 589.8 1.00 20 **Ca** Calcio [Ar] $4s^2$	44.95591 633.1 1.36 21 **Sc** Escandio [Ar] $3d^1\,4s^2$	47.867 658.8 1.54 22 **Ti** Titanio [Ar] $3d^2\,4s^2$	50.9415 650.9 1.63 23 **V** Vanadio [Ar] $3d^3\,4s^2$	51.9962 652.9 1.66 24 **Cr** Cromo [Ar] $3d^5\,4s^1$	54.93804 717.3 1.55 25 **Mn** Manganeso [Ar] $3d^5\,4s^2$	55.845 762.5 1.83 26 **Fe** Hierro [Ar] $3d^6\,4s^2$	58.93319 760.4 1.91 27 **Co** Cobalto [Ar] $3d^7\,4s^2$	58.6934 737.1 1.88 28 **Ni** Níquel [Ar] $3d^8\,4s^2$	63.546 745.5 1.90 29 **Cu** Cobre [Ar] $3d^{10}\,4s^1$	65.38 906.4 1.65 30 **Zn** Zinc [Ar] $3d^{10}\,4s^2$	69.723 578.8 1.81 31 **Ga** Galio [Ar] $3d^{10}\,4s^2\,4p^1$	72.64 762.0 2.01 32 **Ge** Germanio [Ar] $3d^{10}\,4s^2\,4p^2$	74.92160 947.0 2.18 33 **As** Arsénico [Ar] $3d^{10}\,4s^2\,4p^3$	78.96 941.0 2.55 34 **Se** Selenio [Ar] $3d^{10}\,4s^2\,4p^4$	79.904 1139.9 2.96 35 **Br** Bromo [Ar] $3d^{10}\,4s^2\,4p^5$	83.798 1350.8 3.00 36 **Kr** Criptón [Ar] $3d^{10}\,4s^2\,4p^6$
5	85.4678 403.0 0.82 37 **Rb** Rubidio [Kr] $5s^1$	87.62 549.5 0.95 38 **Sr** Estroncio [Kr] $5s^2$	88.90585 600.0 1.22 39 **Y** Itrio [Kr] $4d^1\,5s^2$	91.224 640.1 1.33 40 **Zr** Zirconio [Kr] $4d^2\,5s^2$	92.90638 652.1 1.60 41 **Nb** Niobio [Kr] $4d^4\,5s^1$	95.96 684.3 2.16 42 **Mo** Molibdeno [Kr] $4d^5\,5s^1$	(98) 702.0 1.90 43 **Tc** Tecnecio [Kr] $4d^5\,5s^2$	101.07 710.2 2.20 44 **Ru** Rutenio [Kr] $4d^7\,5s^1$	102.9055 719.7 2.28 45 **Rh** Rodio [Kr] $4d^8\,5s^1$	106.42 804.4 2.20 46 **Pd** Paladio [Kr] $4d^{10}$	107.8682 731.0 1.93 47 **Ag** Plata [Kr] $4d^{10}\,5s^1$	112.441 867.8 1.69 48 **Cd** Cadmio [Kr] $4d^{10}\,5s^2$	114.818 558.3 1.78 49 **In** Indio [Kr] $4d^{10}\,5s^2\,5p^1$	118.710 708.6 1.96 50 **Sn** Estaño [Kr] $4d^{10}\,5s^2\,5p^2$	121.760 834.0 2.05 51 **Sb** Antimonio [Kr] $4d^{10}\,5s^2\,5p^3$	127.60 869.3 2.10 52 **Te** Telurio [Kr] $4d^{10}\,5s^2\,5p^4$	126.9044 1008.4 2.66 53 **I** Yodo [Kr] $4d^{10}\,5s^2\,5p^5$	131.293 1170.4 2.60 54 **Xe** Xenón [Kr] $4d^{10}\,5s^2\,5p^6$
6	132.9054 375.7 0.79 55 **Cs** Cesio [Xe] $6s^1$	137.327 502.9 0.89 56 **Ba** Bario [Xe] $6s^2$	174.9668 523.5 1.27 71 **Lu** Lutecio [Xe] $4f^{14}\,5d^1\,6s^2$	178.49 658.5 1.30 72 **Hf** Hafnio [Xe] $4f^{14}\,5d^2\,6s^2$	180.9478 761.0 1.50 73 **Ta** Tantalio [Xe] $4f^{14}\,5d^3\,6s^2$	183.84 770.0 2.36 74 **W** Wolframio [Xe] $4f^{14}\,5d^4\,6s^2$	186.207 760.0 1.90 75 **Re** Renio [Xe] $4f^{14}\,5d^5\,6s^2$	190.23 840.0 2.20 76 **Os** Osmio [Xe] $4f^{14}\,5d^6\,6s^2$	192.217 880.0 2.20 77 **Ir** Iridio [Xe] $4f^{14}\,5d^7\,6s^2$	195.084 870.0 2.28 78 **Pt** Platino [Xe] $4f^{14}\,5d^9\,6s^1$	196.9665 890.1 2.54 79 **Au** Oro [Xe] $4f^{14}\,5d^{10}\,6s^1$	200.59 1007.1 2.00 80 **Hg** Mercurio [Xe] $4f^{14}\,5d^{10}\,6s^2$	204.3833 589.4 1.62 81 **Tl** Talio [Xe] $4f^{14}\,5d^{10}\,6s^2\,6p^1$	207.2 715.6 2.33 82 **Pb** Plomo [Xe] $4f^{14}\,5d^{10}\,6s^2\,6p^2$	208.9804 703.0 2.02 83 **Bi** Bismuto [Xe] $4f^{14}\,5d^{10}\,6s^2\,6p^3$	(210) 812.1 2.00 84 **Po** Polonio [Xe] $4f^{14}\,5d^{10}\,6s^2\,6p^4$	(210) 890.0 2.20 85 **At** Astato [Xe] $4f^{14}\,5d^{10}\,6s^2\,6p^5$	(220) 1037.0 86 **Rn** Radón [Xe] $4f^{14}\,5d^{10}\,6s^2\,6p^6$
7	(223) 380.0 0.70 87 **Fr** Francio [Rn] $7s^1$	(226) 509.3 0.90 88 **Ra** Radio [Rn] $7s^2$	(262) 470.0 103 **Lr** Laurencio [Rn] $5f^{14}\,7s^2\,7p^1$	(261) 580.0 104 **Rf** Rutherfordio [Rn] $5f^{14}\,6d^2\,7s^2$	(262) 105 **Db** Dubnio [Rn] $5f^{14}\,6d^3\,7s^2$	(266) 106 **Sg** Seaborgio [Rn] $5f^{14}\,6d^4\,7s^2$	(264) 107 **Bh** Bohrio [Rn] $5f^{14}\,6d^5\,7s^2$	(277) 108 **Hs** Hassio [Rn] $5f^{14}\,6d^6\,7s^2$	(268) 109 **Mt** Meitnerio [Rn] $5f^{14}\,6d^7\,7s^2$	(271) 110 **Ds** Darmstatio [Rn] $5f^{14}\,6d^8\,7s^2$	(272) 111 **Rg** Roentgenio [Rn] $5f^{14}\,6d^{10}\,7s^1$	(285) 112 **Cn** Copernicio [Rn] $5f^{14}\,6d^{10}\,7s^2$	(284) 113 **Nh** Nihonio [Rn] $5f^{14}\,6d^{10}\,7s^2\,7p^1$	(289) 114 **Fl** Flerovio [Rn] $5f^{14}\,6d^{10}\,7s^2\,7p^2$	(288) 115 **Mc** Moscovio [Rn] $5f^{14}\,6d^{10}\,7s^2\,7p^3$	(292) 116 **Lv** Livermorio [Rn] $5f^{14}\,6d^{10}\,7s^2\,7p^4$	(294) 117 **Ts** Teneso [Rn] $5f^{14}\,6d^{10}\,7s^2\,7p^5$	(294) 118 **Og** Oganesón [Rn] $5f^{14}\,6d^{10}\,7s^2\,7p^6$

masa atómica o número másico del isótopo más estable — 55.845
1.ª energía de ionización en kJ/mol — 762.5
electronegatividad — 1.83
número atómico — 26
símbolo químico — Fe
nombre — Hierro
configuración electrónica — [Ar] $3d^6\,4s^2$
estados de oxidación más comunes están en negrita — +6 +5 +4 +3 +2 +1 −1 −2

- metales alcalinos
- alcalinotérreos
- otros metales
- metales de transición
- lantánidos
- actínidos
- metaloides
- no metales
- halógenos
- gases nobles
- elementos desconocidos

masas de elementos radiactivos entre paréntesis

Bloques de configuración electrónica



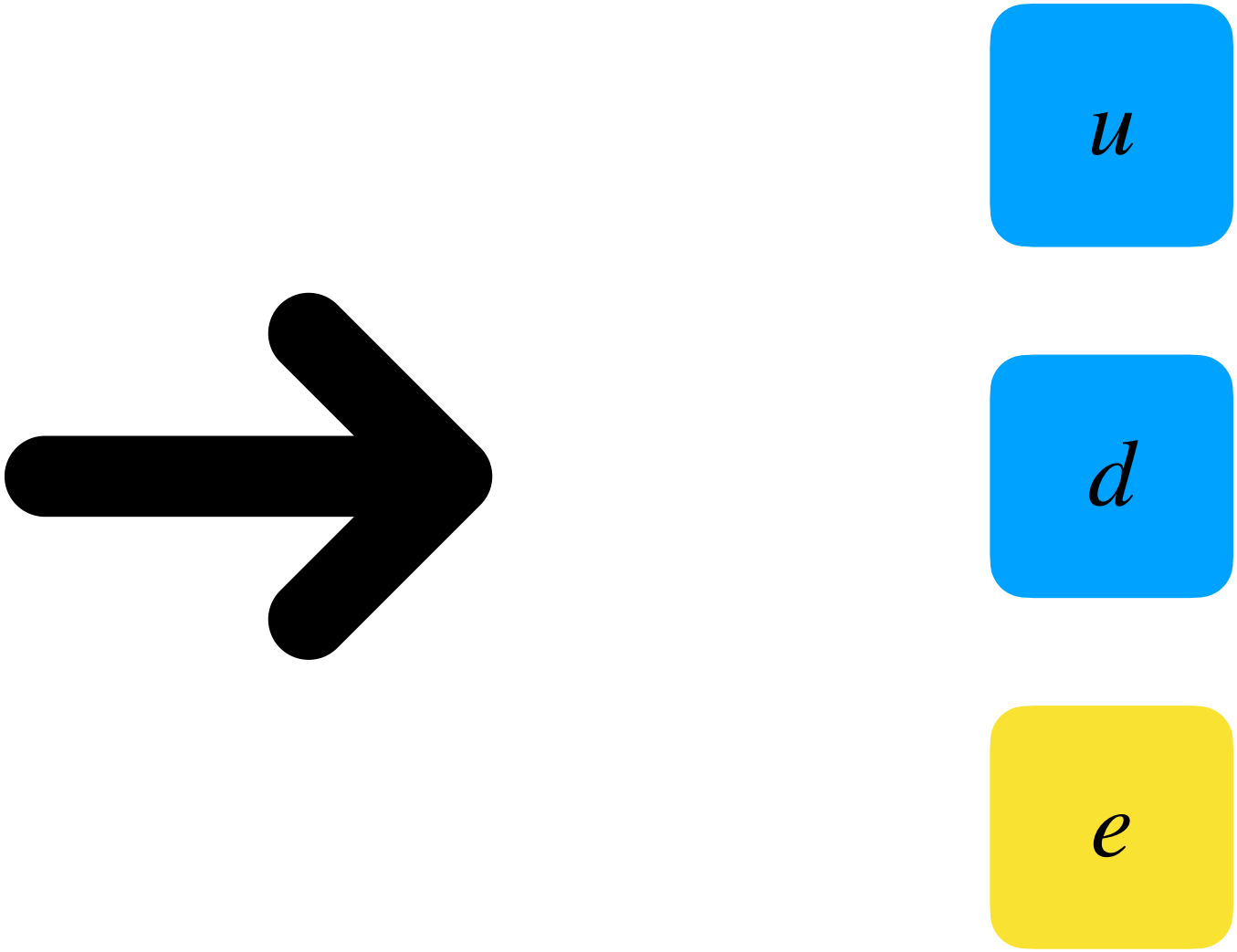
138.9054 538.1 1.10 57 **La** Lantano [Xe] $5d^1\,6s^2$	140.116 534.4 1.12 58 **Ce** Cerio [Xe] $4f^1\,5d^1\,6s^2$	140.9076 527.0 1.13 59 **Pr** Praseodimio [Xe] $4f^3\,6s^2$	144.242 533.1 1.14 60 **Nd** Neodimio [Xe] $4f^4\,6s^2$	(145) 540.0 61 **Pm** Prometio [Xe] $4f^5\,6s^2$	150.36 544.5 1.17 62 **Sm** Samario [Xe] $4f^6\,6s^2$	151.964 547.1 63 **Eu** Europio [Xe] $4f^7\,6s^2$	157.25 593.4 1.20 64 **Gd** Gadolinio [Xe] $4f^7\,5d^1\,6s^2$	158.9253 565.8 65 **Tb** Terbio [Xe] $4f^9\,6s^2$	162.500 573.0 1.22 66 **Dy** Disprosio [Xe] $4f^{10}\,6s^2$	164.9303 581.0 1.23 67 **Ho** Holmio [Xe] $4f^{11}\,6s^2$	167.259 589.3 1.24 68 **Er** Erbio [Xe] $4f^{12}\,6s^2$	168.9342 596.7 1.25 69 **Tm** Tulio [Xe] $4f^{13}\,6s^2$	173.054 603.4 70 **Yb** Iterbio [Xe] $4f^{14}\,6s^2$
(227) 499.0 1.10 89 **Ac** Actinio [Rn] $6d^1\,7s^2$	232.0380 587.0 1.30 90 **Th** Torio [Rn] $6d^2\,7s^2$	231.0358 568.0 1.50 91 **Pa** Protactinio [Rn] $5f^2\,6d^1\,7s^2$	238.0289 597.6 1.38 92 **U** Uranio [Rn] $5f^3\,6d^1\,7s^2$	(237) 604.5 1.36 93 **Np** Neptunio [Rn] $5f^4\,6d^1\,7s^2$	(244) 584.7 1.28 94 **Pu** Plutonio [Rn] $5f^6\,7s^2$	(243) 578.0 1.30 95 **Am** Americio [Rn] $5f^7\,7s^2$	(247) 581.0 1.30 96 **Cm** Curio [Rn] $5f^7\,6d^1\,7s^2$	(247) 601.0 1.30 97 **Bk** Berkelio [Rn] $5f^9\,7s^2$	(251) 608.0 1.30 98 **Cf** Californio [Rn] $5f^{10}\,7s^2$	(252) 619.0 1.30 99 **Es** Einstenio [Rn] $5f^{11}\,7s^2$	(257) 627.0 1.30 100 **Fm** Fermio [Rn] $5f^{12}\,7s^2$	(258) 635.0 1.30 101 **Md** Mendelevio [Rn] $5f^{13}\,7s^2$	(259) 642.0 1.30 102 **No** Nobelio [Rn] $5f^{14}\,7s^2$

Notas

- 1 kJ/mol = 96.485 eV.
- Todos los elementos tienen un estado de oxidación implícito cero.
- **Los estados de oxidación de los elementos 103, 110, 111, 112, 113, 114, 115, 116, 117 y 118 son predicciones.**
- **Las configuraciones electrónicas de los elementos 103, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117 y 118 son predicciones.**

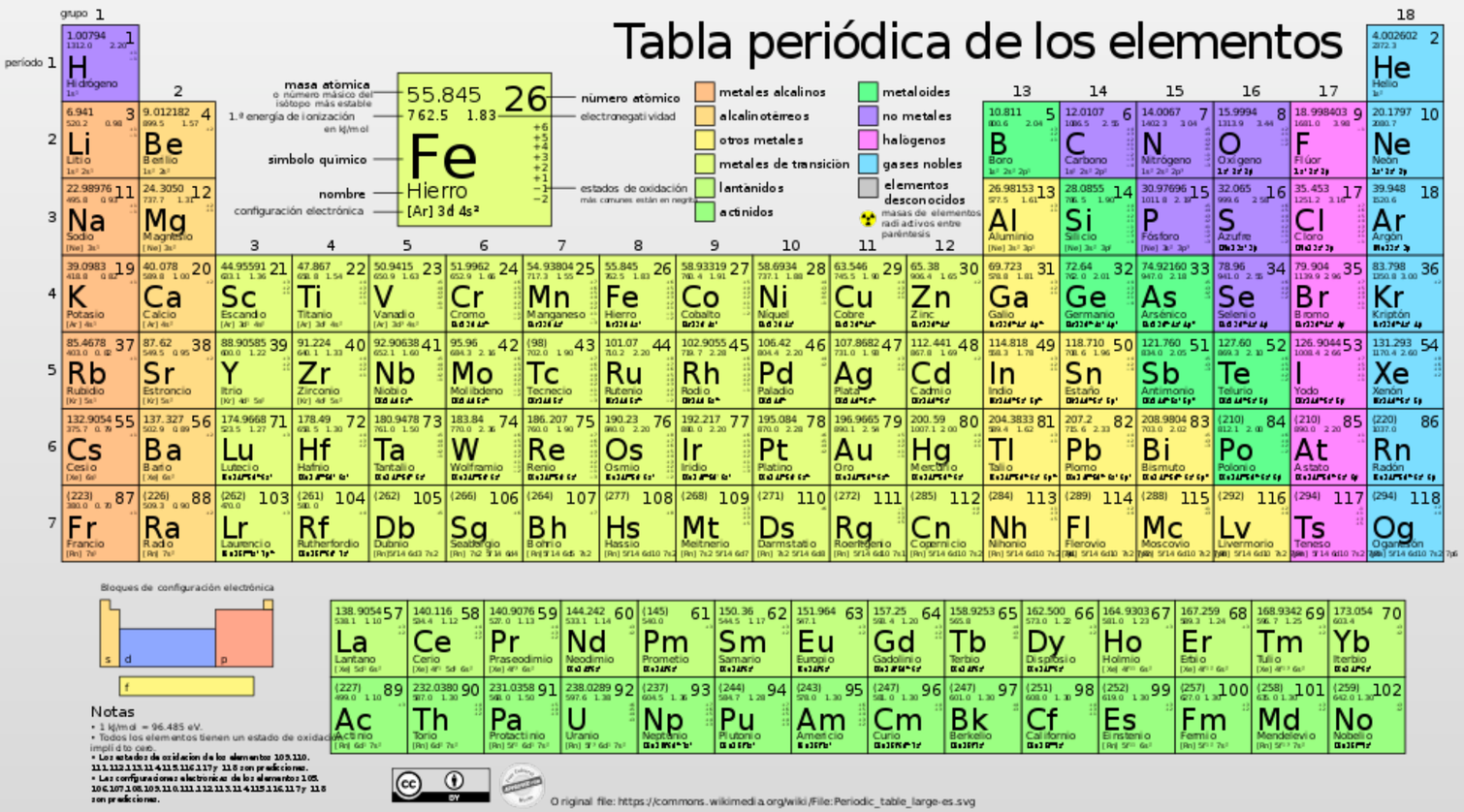
Original file: https://commons.wikimedia.org/wiki/File:Periodic_table_large-es.svg

Pódese explicar toda a materia estable con só dous quarks e o electrón!

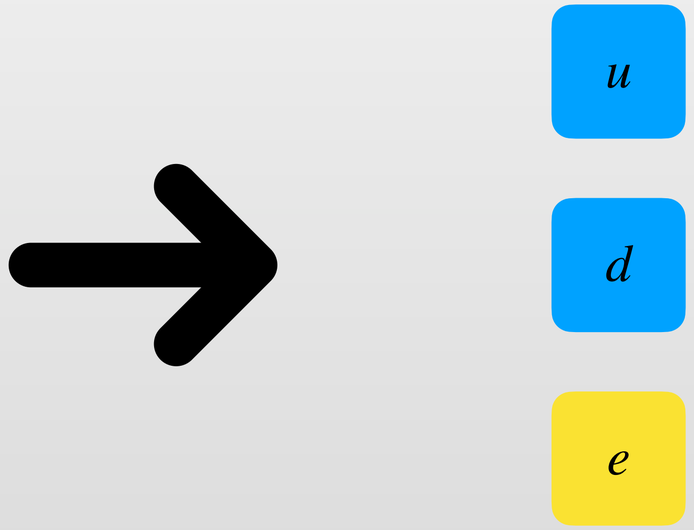


A estrutura da materia

A táboa periódica



Pódese explicar toda a materia estable con só dous quarks e o electrón!



Existen máis partículas?

Spoiler: sí

- Observaron que algúns núcleos desaparecían para dar lugar a outros:
  - Radioactividade
- Qué mantén estos núcleos unidos? Por qué algúns desaparecen?