

6.3: Electron Configuration

Electron Configuration

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Ground State Electron Configuration of Atoms

Atomic No.	Element	Configuration
1	H	1s ¹
2	He	1s ²
3	Li	[He] 2s ¹
4	Be	[He] 2s ²
5	B	[He] 2s ² 2p ¹
6	C	[He] 2s ² 2p ²
7	N	[He] 2s ² 2p ³
8	O	[He] 2s ² 2p ⁴
9	F	[He] 2s ² 2p ⁵
10	Ne	[He] 2s ² 2p ⁶
11	Na	[Ne] 3s ¹
12	Mg	[Ne] 3s ²
13	Al	[Ne] 3s ² 3p ¹
14	Si	[Ne] 3s ² 3p ²
15	P	[Ne] 3s ² 3p ³
16	S	[Ne] 3s ² 3p ⁴
17	Cl	[Ne] 3s ² 3p ⁵
18	Ar	[Ne] 3s ² 3p ⁶
19	K	[Ar] 4s ¹
20	Ca	[Ar] 4s ²
21	Sc	[Ar] 3d ¹ 4s ²
22	Ti	[Ar] 3d ² 4s ²
23	V	[Ar] 3d ³ 4s ²
24	Cr	[Ar] 3d ⁵ 4s ¹
25	Mn	[Ar] 3d ⁵ 4s ²
26	Fe	[Ar] 3d ⁶ 4s ²
27	Co	[Ar] 3d ⁷ 4s ²
28	Ni	[Ar] 3d ⁸ 4s ²
29	Cu	[Ar] 3d ¹⁰ 4s ¹
30	Zn	[Ar] 3d ¹⁰ 4s ²
31	Ga	[Ar] 3d ¹⁰ 4s ² 4p ¹
32	Ge	[Ar] 3d ¹⁰ 4s ² 4p ²
33	As	[Ar] 3d ¹⁰ 4s ² 4p ³
34	Se	[Ar] 3d ¹⁰ 4s ² 4p ⁴
35	Br	[Ar] 3d ¹⁰ 4s ² 4p ⁵

Atomic No.	Element	Configuration
36	Kr	[Ar] 3d ¹⁰ 4s ² 4p ⁶
37	Rb	[Kr] 5s ¹
38	Sr	[Kr] 5s ²
39	Y	[Kr] 4d ¹ 5s ²
40	Zr	[Kr] 4d ² 5s ²
41	Nb	[Kr] 4d ⁴ 5s ¹
42	Mo	[Kr] 4d ⁵ 5s ¹
43	Tc	[Kr] 4d ⁵ 5s ²
44	Ru	[Kr] 4d ⁷ 5s ¹
45	Rh	[Kr] 4d ⁸ 5s ¹
46	Pd	[Kr] 4d ¹⁰
47	Ag	[Kr] 4d ¹⁰ 5s ¹
48	Cd	[Kr] 4d ¹⁰ 5s ²
49	In	[Kr] 4d ¹⁰ 5s ² 5p ¹
50	Sn	[Kr] 4d ¹⁰ 5s ² 5p ²
51	Sb	[Kr] 4d ¹⁰ 5s ² 5p ³
52	Te	[Kr] 4d ¹⁰ 5s ² 5p ⁴
53	I	[Kr] 4d ¹⁰ 5s ² 5p ⁵
54	Xe	[Kr] 4d ¹⁰ 5s ² 5p ⁶
55	Cs	[Xe] 6s ¹
56	Ba	[Xe] 6s ²
57	La	[Xe] 5d ¹ 6s ²
58	Ce	[Xe] 4f ¹ 5d ¹ 6s ²
59	Pr	[Xe] 4f ³ 6s ²
60	Nd	[Xe] 4f ⁴ 6s ²
61	Pm	[Xe] 4f ⁵ 6s ²
62	Sm	[Xe] 4f ⁶ 6s ²
63	Eu	[Xe] 4f ⁷ 6s ²
64	Gd	[Xe] 4f ⁷ 5d ¹ 6s ²
65	Tb	[Xe] 4f ⁹ 6s ²
66	Dy	[Xe] 4f ¹⁰ 6s ²
67	Ho	[Xe] 4f ¹¹ 6s ²
68	Er	[Xe] 4f ¹² 6s ²
69	Tm	[Xe] 4f ¹³ 6s ²
70	Yb	[Xe] 4f ¹⁴ 6s ²
71	Lu	[Xe] 4f ¹⁴ 5d ¹ 6s ²
72	Hf	[Xe] 4f ¹⁴ 5d ² 6s ²
73	Ta	[Xe] 4f ¹⁴ 5d ³ 6s ²
74	W	[Xe] 4f ¹⁴ 5d ⁴ 6s ²
75	Re	[Xe] 4f ¹⁴ 5d ⁵ 6s ²

Atomic No.	Element	Configuration
76	Os	[Xe] 4f ¹⁴ 5d ⁶ 6s ²
77	Ir	[Xe] 4f ¹⁴ 5d ⁷ 6s ²
78	Pt	[Xe] 4f ¹⁴ 5d ⁹ 6s ¹
79	Au	[Xe] 4f ¹⁴ 5d ¹⁰ 6s ¹
80	Hg	[Xe] 4f ¹⁴ 5d ¹⁰ 6s ²
81	Tl	[Xe] 4f ¹⁴ 5d ¹⁰ 6s ² 6p ¹
82	Pb	[Xe] 4f ¹⁴ 5d ¹⁰ 6s ² 6p ²
83	Bi	[Xe] 4f ¹⁴ 5d ¹⁰ 6s ² 6p ³
84	Po	[Xe] 4f ¹⁴ 5d ¹⁰ 6s ² 6p ⁴
85	At	[Xe] 4f ¹⁴ 5d ¹⁰ 6s ² 6p ⁵
86	Rn	[Xe] 4f ¹⁴ 5d ¹⁰ 6s ² 6p ⁶
87	Fr	[Rn] 7s ¹
88	Ra	[Rn] 7s ²
89	Ac	[Rn] 6d ¹ 7s ²
90	Th	[Rn] 6d ² 7s ²
91	Pa	[Rn] 5f ² 6d ¹ 7s ²
92	U	[Rn] 5f ³ 6d ¹ 7s ²
93	Np	[Rn] 5f ⁴ 6d ¹ 7s ²
94	Pu	[Rn] 5f ⁶ 7s ²
95	Am	[Rn] 5f ⁷ 7s ²
96	Cm	[Rn] 5f ⁷ 6d ¹ 7s ²
97	Bk	[Rn] 5f ⁹ 7s ²
98	Cf	[Rn] 5f ¹⁰ 7s ²
99	Es	[Rn] 5f ¹¹ 7s ²
100	Fm	[Rn] 5f ¹² 7s ²
101	Md	[Rn] 5f ¹³ 7s ²
102	No	[Rn] 5f ¹⁴ 7s ²
103	Lr	[Rn] 5f ¹⁴ 7s ² 7p ¹
104	Rf	[Rn] 5f ¹⁴ 6d ² 7s ²
105	Db	[Rn] 5f ¹⁴ 6d ³ 7s ²
106	Sg	[Rn] 5f ¹⁴ 6d ⁴ 7s ²
107	Bh	[Rn] 5f ¹⁴ 6d ⁵ 7s ²
108	Hs	[Rn] 5f ¹⁴ 6d ⁶ 7s ²
109	Mt	[Rn] 5f ¹⁴ 6d ⁷ 7s ²
110	Ds	[Rn] 5f ¹⁴ 6d ⁹ 7s ¹
111	Rg	[Rn] 5f ¹⁴ 6d ¹⁰ 7s ¹
112	Cn	[Rn] 5f ¹⁴ 6d ¹⁰ 7s ²
113	—	[Rn] 5f ¹⁴ 6d ² 7s ² 7p ¹
114	Fl	[Rn] 5f ¹⁴ 6d ² 7s ² 7p ²
115	—	[Rn] 5f ¹⁴ 6d ² 7s ² 7p ³

Atomic No.	Element	Configuration
116	Lv	[Rn] 5f ¹⁴ 6d ² 7s ² 7p ⁴
117	—	[Rn] 5f ¹⁴ 6d ¹⁰ 7s ² 7p ⁵
118	—	[Rn] 5f ¹⁴ 6d ¹⁰ 7s ² 7p ⁶

All electron configurations in this table are from experimental determinations except for elements 103-118, which are predicted theoretically. For elements 103-118, only a few atoms can be produced at a time and it is very difficult to determine electron configurations.

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