			Covalent Radii				van der Waals Radii		
Z	Symbol	Name	r_1/pm[a]	r_2/pm[b]	r_3/pm[c]	r_t/pm[d]	r_B/pm	r_c/pm[h]	r_{eq}/pm[h]
1	H	hydrogen	32	-	-	-	110[f]	-	-
2	He	helium	46	-	-	-	140[g]	-	-
3	Li	lithium	133	124	-	137	181[g]	220	263
4	Be	beryllium	102	90	85	106.1	153[e]	190	223
5	B	boron	85	78	73	88.2	192[e]	180	205
6	C	carbon	75	67	60	77.3	170[g]	170	196
7	N	nitrogen	71	60	54	68.9	155[g]	160	179
8	O	oxygen	63	57	53	67.4	152[g]	155	171
9	F	fluorine	64	59	53	57.5	147[g]	150	165
10	Ne	neon	67	96	-	-	154[g]	240	-
11	Na	sodium	155	160	-	-	227[g]	220	277
12	Mg	magnesium	139	132	127	141.2	173[g]	210	242
13	Al	aluminium	126	113	111	128.5	184[e]	210	240
14	Si	silicon	116	107	102	117.6	210[g]	210	226
15	P	phosphorus	111	102	94	108.4	180[g]	195	214
16	S	sulfur	103	94	95	104.2	180[g]	180	206
17	Cl	chlorine	99	95	93	107.6	175[g]	180	205
18	Ar	argon	96	107	96	-	188[g]	-	-
19	K	potassium	196	193	-	-	275[g]	280	302
20	Ca	calcium	171	147	133	-	231[e]	240	278
21	Sc	scandium	148	116	114	138.6	-	230	262
22	Ti	titanium	136	117	108	-	-	215	244
23	V	vanadium	134	112	106	-	-	205	227
24	Cr	chromium	122	111	103	-	-	205	223
25	Mn	manganese	119	105	103	140.3	-	205	225
26	Fe	iron	116	109	102	120.9	-	205	227
27	Co	cobalt	111	103	96	125.6	-	200	225
28	Ni	nickel	110	101	101	-	-	200	223
29	Cu	copper	112	115	120	127.1	-	200	227
30	Zn	zinc	118	120	-	130.4	-	210	224
31	Ga	gallium	124	117	121	127.5	187[g]	210	241
32	Ge	germanium	121	111	114	122.5	211[e]	210	232
33	As	arsenic	121	114	106	117.4	185[g]	205	225
34	Se	selenium	116	107	107	114.5	190[g]	190	218
35	Br	bromine	114	109	110	119.5	183[g]	190	210
36	Kr	krypton	117	121	108	-	202[g]	-	-
37	Rb	rubidium	210	202	-	-	303[e]	290	315
38	Sr	strontium	185	157	139	-	249[e]	255	294
39	Y	yttrium	163	130	124	-	-	240	271
40	Zr	zirconium	154	127	121	-	-	230	257
41	Nb	niobium	147	125	116	-	-	215	246
42	Mo	molybdenum	138	121	113	-	-	210	239
43	Tc	technetium	128	120	110	-	-	205	237
44	Ru	ruthenium	125	114	103	-	-	205	237
45	Rh	rhodium	125	110	106	-	-	200	232
46	Pd	palladium	120	117	112	-	-	205	235
47	Ag	silver	128	139	137	147.3	-	210	237
48	Cd	cadmium	136	144	-	148.2	-	220	237
49	In	indium	142	136	146	145.5	193[g]	220	253
50	Sn	tin	140	130	132	140.0	217[g]	225	246
51	Sb	antimony	140	133	127	136.3	206[e]	220	241
52	Te	tellurium	136	128	121	133.5	206[g]	210	236
53	I	iodine	133	129	125	134.5	198[g]	210	222
54	Xe	xenon	131	135	122	-	216[g]	-	-
55	Cs	caesium	232	209	-	-	343[e]	300	330
56	Ba	barium	196	161	149	-	268[e]	270	305
57	La	lanthanum	180	139	139	-	-	250	281
58	Ce	cerium	163	137	131	-	-	-	-
59	Pr	praseodymium	176	138	128	-	-	-	-
60	Nd	neodymium	174	137	-	-	-	-	-
61	Pm	promethium	173	135	-	-	-	-	-
62	Sm	samarium	172	134	-	-	-	-	-
63	Eu	europium	168	134	-	-	-	-	-
64	Gd	gadolinium	169	135	132	-	-	-	-
65	Tb	terbium	168	135	-	-	-	-	-
66	Dy	dysprosium	167	133	-	-	-	-	-
67	Ho	holmium	166	133	-	-	-	-	-
68	Er	erbium	165	133	-	-	-	-	-
69	Tm	thulium	164	131	-	-	-	-	-
70	Yb	ytterbium	170	129	-	-	-	-	-
71	Lu	lutetium	162	131	131	-	-	-	-

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[c] triple-bond additive covalent radii, Ref. [3] [d] tetrahedral covalent radii for crystals, Ref. [4]
[e] Consitent van der Waals Radii (compatible with Bondi), Ref. [5] [f] Consitent van der Waals Radius (correction of Bondi), Ref. [6] [g] Consitent van der Waals Radii (Bondi), Ref. [7] [h] Recommended crystallographic van der Waals Radii (Batsanov), Ref. [8] [i] Recommended equilibrium van der Waals Radii (Batsanov), Ref. [8]

Z	Symbol	Name	r_1/pm[a]	r_2/pm[b]	r_3/pm[c]	r_t/pm[d]	r_B/pm	r_c/pm[h]	r_{eq}/pm[h]
72	Hf	hafnium	152	128	122	-	-	225	252
73	Ta	tantalum	146	126	119	-	-	220	242
74	W	tungsten	137	120	115	-	-	210	236
75	Re	rhenium	131	119	110	-	-	205	235
76	Os	osmium	129	116	109	-	-	200	233
77	Ir	iridium	122	115	107	-	-	200	234
78	Pt	platinum	123	112	110	-	-	205	237
79	Au	gold	124	121	123	-	-	210	241
80	Hg	mercury	133	142	-	147.8	-	205	225
81	Tl	thallium	144	142	150	138	196[g]	220	253
82	Pb	lead	144	135	137	144.1	202[g]	230	253
83	Bi	bismuth	151	141	135	146.0	207[e]	230	252
84	Po	polonium	145	135	129	141.6	197[e]	-	-
85	At	astatine	147	138	138	-	202[e]	-	-
86	Rn	radon	142	145	133	-	220[e]	-	-
87	Fr	francium	223	218	-	-	348[e]	-	-
88	Ra	radium	201	173	159	-	283[e]	-	-
89	Ac	actinium	186	153	140	-	-	-	-
90	Th	thorium	175	143	136	-	-	240	275
91	Pa	protactinium	169	138	129	-	-	-	-
92	U	uranium	170	134	118	-	-	230	265
93	Np	neptunium	171	136	116	-	-	-	-
94	Pu	plutonium	172	135	-	-	-	-	-
95	Am	americium	166	135	-	-	-	-	-
96	Cm	curium	166	136	-	-	-	-	-
97	Bk	berkelium	168	139	-	-	-	-	-
98	Cf	californium	168	140	-	-	-	-	-
99	Es	einsteinium	165	140	-	-	-	-	-
100	Fm	fermium	167	-	-	-	-	-	-
101	Md	mendelevium	173	139	-	-	-	-	-
102	No	nobelium	176	159	-	-	-	-	-
103	Lr	lawrencium	161	141	-	-	-	-	-
104	Rf	rutherfordium	157	140	131	-	-	-	-
105	Db	dubnium	149	136	126	-	-	-	-
106	Sg	seaborgium	143	128	121	-	-	-	-
107	Bh	bohrium	141	128	119	-	-	-	-
108	Hs	hassium	134	125	118	-	-	-	-
109	Mt	meitnerium	129	125	113	-	-	-	-
110	Ds	darmstadtium	128	116	112	-	-	-	-
111	Rg	roentgenium	121	116	118	-	-	-	-
112	Cn	copernicium	122	137	130	-	-	-	-
113	Nh	nihonium	136	-	-	-	-	-	-
114	Fl	flerovium	143	-	-	-	-	-	-
115	Mc	moscovium	162	-	-	-	-	-	-
116	Lv	livermorium	175	-	-	-	-	-	-
117	Ts	tennessine	165	-	-	-	-	-	-
118	Og	oganesson	157	-	-	-	-	-	-

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References

[1] Pekka Pyykkö and Michiko Atsumi. "Molecular Single-Bond Covalent Radii for Elements 1-118". In: *Chem. Eur. J.* 15.1 (2009), pp. 186–197. DOI: 10.1002/chem.200800987.

[2] Pekka Pyykkö and Michiko Atsumi. "Molecular Double-Bond Covalent Radii for Elements Li-E112". In: *Chem. Eur. J.* 15.46 (2009), pp. 12770–12779. DOI: 10.1002/chem.200901472.

[3] Pekka Pyykkö, Sebastian Riedel, and Michael Patzschke. "Triple-Bond Covalent Radii". In: *Chem. Eur. J.* 11.12 (2005), pp. 3511–3520. DOI: 10.1002/chem.200401299.

[4] Pekka Pyykkö. "Refitted tetrahedral covalent radii for solids". In: *Phys. Rev. B* 85.2 (2012). DOI: 10.1103/physrevb.85.024115.

[5] Manjeera Mantina et al. "Consistent van der Waals Radii for the Whole Main Group". In: *J. Phys. Chem. A* 113.19 (2009), pp. 5806–5812. DOI: 10.1021/jp8111556.

[6] R. Scott Rowland and Robin Taylor. "Intermolecular Nonbonded Contact Distances in Organic Crystal Structures: Comparison with Distances Expected from van der Waals Radii". In: *J. Phys. Chem.* 100.18 (1996), pp. 7384–7391. DOI: 10.1021/jp953141+.

[7] A. Bondi. "van der Waals Volumes and Radii". In: *J. Phys. Chem.* 68.3 (1964), pp. 441–451. DOI: 10.1021/j100785a001.

[8] Stepan S. Batsanov. "Van der Waals Radii of Elements". In: *Inorg. Mater.* 37.9 (2001), pp. 871–885. DOI: 10.1023/a:1011625728803.