APPENDIX I - ELECTRONIC STRUCTURE AND VALENCES OF THE ELEMENTS*

Period	Z	Element	Electronic Structure	Common Valences
1	1	H	$1s^1$	+1
	2	He	$1s^2$	0
2	3	Li	$1s^2 2s^1$	+1
	4	Be	$1s^2 2s^2$	+2
	5	B	$1s^2 2s^2 2p^1$	+3
	6	C	$1s^2 2s^2 2p^2$	+4, +2
	7	N	$1s^2 2s^2 2p^3$	+5, +3, -3
	8	O	$1s^2 2s^2 2p^4$	-2
	9	F	$1s^2 2s^2 2p^5$	-1
	10	Ne	$1s^2 2s^2 2p^6$	0
3	11	Na	$[Ne]3s^1$	+1
	12	Mg	$[Ne]3s^2$	+2
	13	Al	$[Ne]3s^2 3p^1$	+3
	14	Si	$[Ne]3s^2 3p^2$	+4
	15	P	$[Ne]3s^2 3p^3$	+5, +3, -3
	16	S	$[Ne]3s^2 3p^4$	+6, +4, +2, -2
	17	Cl	$[Ne]3s^2 3p^5$	-1
	18	Ar	$[Ne]3s^2 3p^6$	0
4	19	K	$[Ar]4s^1$	+1
	20	Ca	$[Ar]4s^2$	+2
	21	Sc	$[Ar]3d^1 4s^2$	+3
	22	Ti	$[Ar]3d^2 4s^2$	+4, +3
	23	V	$[Ar]3d^3 4s^2$	+5, +4, +3, +2
	24	Cr	$[Ar]3d^5 4s^1$	+6, +3, +2
	25	Mn	$[Ar]3d^5 4s^2$	+4, +3, +2
	26	Fe	$[Ar]3d^6 4s^2$	+3, +2
	27	Co	$[Ar]3d^7 4s^2$	+3, +2
	28	Ni	$[Ar]3d^8 4s^2$	+3, +2
	29	Cu	$[Ar]3d^{10} 4s^1$	+2, +1
	30	Zn	$[Ar]3d^{10} 4s^2$	+2
	31	Ga	$[Ar]3d^{10} 4s^2 3p^1$	+3, +1
	32	Ge	$[Ar]3d^{10} 4s^2 3p^2$	+4, +2
	33	As	$[Ar]3d^{10} 4s^2 3p^3$	+5, +3, -3
	34	Se	$[Ar]3d^{10} 4s^2 3p^4$	+6, +4, -2
	35	Br	$[Ar]3d^{10} 4s^2 3p^5$	-1
	36	Kr	$[Ar]3d^{10} 4s^2 3p^1$	0
5	37	Rb	$[Kr]5s^1$	+1
	38	Sr	$[Kr]5s^2$	+2
	39	Y	$[Kr]4d^1 5s^2$	+3
	40	Zr	$[Kr]4d^2 5s^2$	+4
	41	Nb	$[Kr]4d^3 5s^2$	+5, +3
	42	Mo	$[Kr]4d^5 5s^1$	+6, +4, +3, +2
	43	Tc	$[Kr]4d^5 5s^2$	+7
	44	Ru	$[Kr]4d^6 5s^2$	+8, +4, +3, +2

Period	Z	Element	Electronic Structure	Common Valences
	45	Rh	$[Kr]4d^7 5s^2$	+4, +3, +2
	46	Pd	$[Kr]4d^8 5s^2$	+4, +2
	47	Ag	$[Kr]4d^{10} 5s^1$	+1
	48	Cd	$[Kr]4d^{10} 5s^2$	+2
	49	In	$[Kr]4d^{10} 5s^2 5p^1$	+3, +1
	50	Sn	$[Kr]4d^{10} 5s^2 5p^2$	+4, +2
	51	Sb	$[Kr]4d^{10} 5s^2 5p^3$	+5, +3, -3
	52	Te	$[Kr]4d^{10} 5s^2 5p^4$	+6, +4, -2
	53	I	$[Kr]4d^{10} 5s^2 5p^5$	-1
	54	Xe	$[Kr]4d^{10} 5s^2 5p^6$	0
6	55	Cs	$[Xe]6s^1$	+1
	56	Ba	$[Xe]6s^2$	+2
	57	La	$[Xe]5d^1 6s^2$	+3
	58	Ce	$[Xe]4f^2 5d^0 6s^2$	+4, +3
	59	Pr	$[Xe]4f^3 5d^0 6s^2$	+4, +3
	60	Nd	$[Xe]4f^4 5d^0 6s^2$	+3
	61	Pm	$[Xe]4f^5 5d^0 6s^2$	+3
	62	Sm	$[Xe]4f^6 5d^0 6s^2$	+3, +2
	63	Eu	$[Xe]4f^7 5d^0 6s^2$	+3, +2
	64	Gd	$[Xe]4f^7 5d^1 6s^2$	+3
	65	Tb	$[Xe]4f^9 5d^0 6s^2$	+4, +3
	66	Dy	$[Xe]4f^{10} 5d^0 6s^2$	+3
	67	Ho	$[Xe]4f^{11} 5d^0 6s^2$	+3
	68	Er	$[Xe]4f^{12} 5d^0 6s^2$	+3
	69	Tm	$[Xe]4f^{13} 5d^0 6s^2$	+3, +2
	70	Yb	$[Xe]4f^{14} d^0 6s^2$	+3, +2
	71	Lu	$[Xe]4f^{14} 5d^1 6s^2$	+3
	72	Hf	$[Xe]4f^{14} 5d^2 6s^2$	+4
	73	Ta	$[Xe]4f^{14} 5d^3 6s^2$	+5
	74	W	$[Xe]4f^{14} 5d^4 6s^2$	+6, +4, +3, +2
	75	Rh	$[Xe]4f^{14} 5d^5 6s^2$	+7, +6, +4, +2
	76	Os	$[Xe]4f^{14} 5d^6 6s^2$	+8, +4, +3, +2
	77	Ir	$[Xe]4f^{14} 5d^7 6s^2$	+6, +4, +3, +2
	78	Pt	$[Xe]4f^{14} 5d^9 6s^1$	+4, +2
	79	Au	$[Xe]4f^{14} 5d^{10} 6s^1$	+3, +1
	80	Hg	$[Xe]4f^{14} 5d^{10} 6s^2$	+2, +1
	81	Tl	$[Xe]4f^{14} 5d^{10} 6s^2 6p^1$	+3, +1
	82	Pb	$[Xe]4f^{14} 5d^{10} 6s^2 6p^2$	+4, +2
	83	Bi	$[Xe]4f^{14} 5d^{10} 6s^2 6p^3$	+5, +3
	84	Po	$[Xe]4f^{14} 5d^{10} 6s^2 6p^4$	+4, +2
	85	At	$[Xe]4f^{14} 5d^{10} 6s^2 6p^5$	+7, +5, +3, +1
	86	Rn	$[Xe]4f^{14} 5d^{10} 6s^2 6p^6$	0
7	87	Fr	$[Rn]7s^1$	+1
	88	Ra	$[Rn]7s^2$	+2
	89	Ac	$[Rn]6d^1 7s^2$	+3
	90	Th	$[Rn]5f^0 6d^2 7s^2$	+4
	91	Pa	$[Rn]5f^2 6d^1 7s^2$	+5, +4

Period	Z	Element	Electronic Structure	Common Valences
	92	U	$[Rn]5f^3 6d^1 7s^2$	+6, +5, +4, +3
	93	Np	$[Rn]5f^4 6d^1 7s^2$	+6, +5, +4, +3
	94	Pu	$[Rn]5f^6 6d^0 7s^2$	+6, +5, +4, +3
	95	Am	$[Rn]5f^7 6d^0 7s^2$	+6, +5, +4, +3
	96	Cm	$[Rn]5f^7 6d^1 7s^2$	+3

*From Faure (1998)