Chem 1000 Standard Periodic Table

1												13	14	15	16	17	18
1.0079 **H** 1	2											10.81 **B** 5	12.011 **C** 6	14.0067 **N** 7	15.9994 **O** 8	18.9984 **F** 9	4.0026 **He** 2
6.94 **Li** 3	9.0122 **Be** 4											26.9815 **Al** 13	28.085 **Si** 14	30.9738 **P** 15	32.066 **S** 16	35.45 **Cl** 17	20.1797 **Ne** 10
22.990 **Na** 11	24.3050 **Mg** 12	3	4	5	6	7	8	9	10	11	12	69.723 **Ga** 31	72.60 **Ge** 32	74.9216 **As** 33	78.971 **Se** 34	79.904 **Br** 35	39.95 **Ar** 18
39.0983 **K** 19	40.078 **Ca** 20	44.9559 **Sc** 21	47.867 **Ti** 22	50.9415 **V** 23	51.9961 **Cr** 24	54.938 **Mn** 25	55.845 **Fe** 26	58.9332 **Co** 27	58.693 **Ni** 28	63.546 **Cu** 29	65.38 **Zn** 30	114.82 **In** 49	118.710 **Sn** 50	121.757 **Sb** 51	127.60 **Te** 52	126.905 **I** 53	83.798 **Kr** 36
85.4678 **Rb** 37	87.62 **Sr** 38	88.9059 **Y** 39	91.224 **Zr** 40	92.9064 **Nb** 41	95.95 **Mo** 42	(98) **Tc** 43	101.07 **Ru** 44	102.906 **Rh** 45	106.42 **Pd** 46	107.868 **Ag** 47	112.411 **Cd** 48	204.38 **Tl** 81	207.19 **Pb** 82	208.980 **Bi** 83	(209) **Po** 84	(210) **At** 85	131.29 **Xe** 54
132.905 **Cs** 55	137.327 **Ba** 56	**La-Lu**	178.49 **Hf** 72	180.948 **Ta** 73	183.84 **W** 74	186.207 **Re** 75	190.2 **Os** 76	192.23 **Ir** 77	195.08 **Pt** 78	196.967 **Au** 79	200.59 **Hg** 80	207.19 **Pb** 82	208.980 **Bi** 83	(209) **Po** 84	(210) **At** 85	(222) **Rn** 86	
(223) **Fr** 87	(226) **Ra** 88	**Ac-Lr**	(267) **Rf** 104	(268) **Db** 105	(271) **Sg** 106	(272) **Bh** 107	(270) **Hs** 108	(276) **Mt** 109	(281) **Ds** 110	(280) **Rg** 111	(285) **Cn** 112	(284) **Nh** 113	(289) **Fl** 114	(288) **Mc** 115	(293) **Lv** 116	(292) **Ts** 117	(294) **Og** 118

Radioactive elements: mass number given for longest lived isotope: e.g. (98)

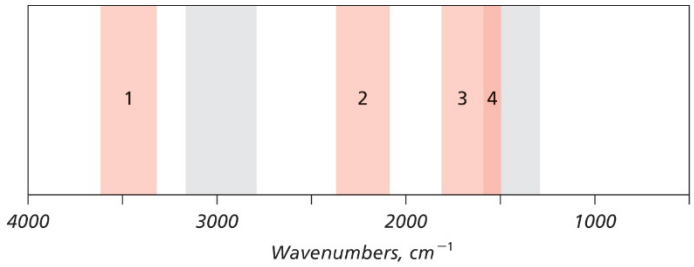
138.906 **La** 57	140.115 **Ce** 58	140.908 **Pr** 59	144.24 **Nd** 60	(145) **Pm** 61	150.36 **Sm** 62	151.965 **Eu** 63	157.25 **Gd** 64	158.925 **Tb** 65	162.50 **Dy** 66	164.930 **Ho** 67	167.26 **Er** 68	168.934 **Tm** 69	173.05 **Yb** 70	174.967 **Lu** 71
(227) **Ac** 89	232.038 **Th** 90	231.036 **Pa** 91	238.029 **U** 92	(237) **Np** 93	(244) **Pu** 94	(243) **Am** 95	(247) **Cm** 96	(247) **Bk** 97	(251) **Cf** 98	(252) **Es** 99	(257) **Fm** 100	(257) **Md** 101	(259) **No** 102	(262) **Lr** 103

Developed by Prof. R. T. Boeré (updated 2021)

Table of atomic orbital energies. All energies are in Ry.

	1s	2s	2p
H	-1.00		
He	-1.81		
Li	-4.77	-0.40	
Be	-8.9	-0.69	
B	-14.5	-1.03	-0.42
C	-21.6	-1.43	-0.79
N	-30.0	-1.88	-0.95
O	-39.9	-2.38	-1.17
F	-51.2	-2.95	-1.37
Ne	-64.0	-3.56	-1.59

All energies are from J.C. Slater, *Physical Review* (1955) **98**, 1039-1045.



Region	Frequency range, (cm^{-1})	Bond types	Functional groups
1	3500 – 3200	O—H N—H	Alcohol, phenol Amine, amide
2	2300 – 2100	C≡C C≡N	Alkyne Nitrile
3	1800 – 1650	C=O	Aldehyde Amide Anhydride (2 bands) Carboxylic acid Acid chloride Ester
4	1650 – 1500	C=C C=C C=N N=O	Alkene Arene Imine Nitro compound

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