A Brief Table of X-Ray Line Energies and Widths

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August, 1986

A bibliography of works consulted is included at the end of the table. Unless otherwise noted, the energies of the various K and L lines were taken from the paper by Bearden (1967). Krause and Oliver (1979) give a table of semi-empirical values for all the K-alpha line widths beginning with neon. The articles by Faessler and Tomboulian give a compilation of experimental data from various sources on the widths of x-ray lines associated with the valence bands of metals. For many lines, no data on width could be found, and in these cases only the line energy has been given.

Line	Energy (eV)	FWHM (eV)	Resolution (E/ΔE)	COMMENT
3 Lithium (Li)				
K-alpha	53	4	13.3	Energy and FWHM from Faessler (p.774). Bearden gives energy as 54.3.
4 Beryllium (Be)				
K-alpha	109	5	21.8	From Faessler (p.775)
6 Carbon (C)				
K-alpha	277	7.8	35.5	FWHM for graphite from Faessler, p.777.
7 Nitrogen (N)				
K-alpha	392.4			

8 Oxygen (O)				
K-alpha	524.9	6	87	Energy from Bearden. FWHM estimated from plots in Faessler (p.779). Width and location of peak vary with different oxides.
9 Fluorine (F)				
K-alpha	676.8	2	338	Energy from Bearden. FWHM estimated from plots in Faessler (p.781) of KF. Width and location of peak vary depending on the fluorine compound used. LiF, NaF, and MgF_2 all have somewhat broader peaks.
10 Neon (Ne)				
K-alpha	848.6	0.24	3534	Energy from Bearden. FWHM from Krause.
11 Sodium (Na)				
K-alpha	1040.9	0.3	3470	Energy from Bearden. FWHM from Krause.
K-beta	1071.1			
12 Magnesium (Mg)				
K-alpha	1253.7	.36	3483	Energy from Bearden. FWHM from Krause.
K-beta	1300	4	325	From Faessler. Peak is quite assymmetric - it is much wider to the left of the maximum.

13 Aluminum (Al)				
K-alpha	1486.7	.43	3457	From Bearden/Krause.
K-beta	1555	8	194	From Faessler. Bearden gives 1557 for energy. Peak is broad to the left of the maximum, but drops sharply to the right. Aluminum oxide has the peak shifted to 1550, with secondary peaks around 1535 and 1557 due to the presence of oxygen.
15 Phosphorous (P)				
K-alpha1	2013.7	.57	3533	Energy from Bearden, FWHM from Krause.
K-alpha2	2012.7	.56	3594	
K-beta	2139.1			
17 Chlorine (Cl)				
K-alpha1	2622.4	.72	3642	Energy from Bearden, FWHM from Krause.
K-alpha2	2620.8	.72	3640	
K-beta	2815.6			
18 Argon (Ar)				
K-alpha	2957.7	.81	3651	Energy from Bearden, FWHM from Krause.
K-beta	3190.5			
20 Calcium (Ca)				
K-alpha1	3691.7	.98	3767	Energy from Bearden, FWHM from Krause.
K-alpha2	3688.1	.98	3763	
K-beta	4012.7			

21 Scandium (Sc)				
K-alpha1	4090.6	1.05	3896	From Bearden/Krause
K-alpha2	4086.1	1.06	3855	
K-beta	4460.5			
L-alpha	395.4			
L-beta	399.6			
22 Titanium (Ti)				
K-alpha1	4510.8	1.16	3889	From Bearden/Krause
K-alpha2	4504.9	1.18	3818	
K-beta	4931.8			
L-alpha	452.2	4	113	Energy from Bearden, FWHM estimated from graph in Tomboulian.
L-beta	458.4			
23 Vanadium (V)				
K-alpha1	4952.2	1.26	3930	From Bearden/Krause
K-alpha2	4944.6	1.28	3863	
K-beta	5427.3			
L-alpha	511.3	5	102	Energy from Bearden, FWHM estimated from graph in Tomboulian.
L-beta	519.2			

24 Chromium (Cr)				
K-alpha1	5414.7	1.35	4011	
K-alpha2	5405.5	1.37	3946	From Bearden/Krause
K-beta	5946.7			
L-alpha	572.8	4	143	Energy from Bearden, FWHM estimated from graph in Tomboulian.
L-beta	582.8			
25 Manganese (Mn)				
K-alpha1	5898.8	1.48	3986	
K-alpha2	5887.6	1.50	3925	From Bearden/Krause
K-beta	4904.5			
L-alpha	637.4	4	159	Energy from Bearden, FWHM estimated from graph in Tomboulian.
L-beta	648.8			
26 Iron (Fe)				
K-alpha1	6403.8	1.61	3978	
K-alpha2	6390.8	1.62	3945	From Bearden/Krause
K-beta	7057.9			
L-alpha	705.0	3.5	201	Energy from Bearden. FWHM from Faessler(p.788) Iron oxide has FWHM of 5.0 for L-alpha and L-beta.
L-beta	718.5			

27 Cobalt (Co)				
K-alpha1	6930.3	1.76	3938	From Bearden/Krause.
K-alpha2	6915.3	1.76	3929	
K-beta	7649.4			
L-alpha	776.2	4.0	194	Energy from Bearden. FWHM from Faessler (p.788). CoO has similar FWHM.
L-beta	791.4	4.0	198	
28 Nickel (Ni)				
K-alpha1	7478.2	1.94	3855	From Bearden/Krause.
K-alpha2	7460.9	1.96	3807	
K-beta	8264.7			
L-alpha	851.5	2.7	315	Energy from Bearden, FWHM from Faessler. Peak is broad to left, but cuts off sharply to right of max. FWHM for nickel oxide is 2.9 for L-alpha, 2.8 for L-beta. (Faessler p.789)
L-beta	868.8			
29 Copper (Cu)				
K-alpha1	8047.7	2.11	3814	From Bearden/Krause.
K-alpha2	8027.8	2.17	3699	
K-beta	8905.3			
L-alpha	929.7	3.7	251	Energy from Bearden, rest of L-data is from Faessler. Alpha peak is wider to right than to left of the maximum. CuO spectrum looks almost identical to Cu, has FWHM of 3.2 for alpha. (Faessler p.790).
L-beta	949.8	3.5	271	

30 Zinc (Zn)				
K-alpha1	8638.9	2.32	3724	From Bearden/Krause.
K-alpha2	8615.8	2.39	3605	
K-beta	9572.0			
L-alpha	1011.7	1.75	578	Energy from Bearden, rest of data from Faessler. Alpha peak much broader to right, with several secondary peaks. ZnO has similar shape, but with extra peaks around L-beta. FWHM of ZnO is same as for pure Zn. (Faessler p. 791)
L-beta	1034.7	2.15	481	
39 Yttrium (Y)				
K-alpha1	14958.4	5.02	2980	From Bearden/Krause.
K-alpha2	14882.9	5.18	2873	
K-beta	16737.8			
L-alpha1	1922.6			
L-alpha2	1920.4			
L-beta	1995.8			
40 Zirconium (Zr)				
K-alpha1	15775.1	5.4	2921	From Bearden/Krause.
K-alpha2	15690.9	5.62	2792	
K-beta	17667.8			
L-alpha1	2042.4			
L-alpha2	2039.9			
L-beta1	2124.4			
L-beta2	2219.4			

41 Niobium (Nb)				
K-alpha1	16615.1	5.8	2865	
K-alpha2	16521.0	6.01	2749	From Bearden/Krause.
K-beta	18622.5			
L-alpha1	2165.9			
L-alpha2	2163.0			
L-beta1	2257.4			
L-beta2	2367.0			
42 Molybdinum (Mo)				
K-alpha1	17479.3	6.31	2770	
K-alpha2	17374.3	6.49	2677	From Bearden/Krause.
K-beta	19608.3			
L-alpha1	2293.2			
L-alpha2	2289.9			
L-beta1	2394.8			
L-beta2	2518.3			
47 Siver (Ag)				
K-alpha1	22162.9	9.16	2420	
K-alpha2	21990.3	9.32	2359	From Bearden/Krause.
K-beta	24942.3			
L-alpha1	2984.3			
L-alpha2	2978.2			
L-beta1	3150.9			
L-beta2	3347.8			

50 Tin (Sn)				
K-alpha1	25271.3	11.2	2256	From Bearden/Krause
K-alpha2	25044.0	11.3	2216	
K-beta	28486.0			
L-alpha1	3443.9			
L-alpha2	3435.4			
L-beta1	3662.8			
L-beta2	3904.9			

54 Xenon (Xe)				
K-alpha1	29779	14.6	2040	From Bearden/Krause
K-alpha2	29458	14.8	1990	
K-beta	33624			
L-alpha1	4109.9			

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