Short Communications

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Anomalous scattering factors for Co $K\alpha_1$ radiation.

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Anomalous scattering factors $\Delta f'$ and $\Delta f''$ for Co $K\alpha_1$ radiation ($\lambda = 1.78892$ Å) have been calculated by interpolation of the photoelectron cross-section information given by Cromer & Liberman [Los Alamos Scientific Laboratory Report LA-4403 (1970)].

Cobalt radiation is very often used in studies of biological materials, particularly those which contain iron. In response to numerous requests for the values of $\Delta f'$ and $\Delta f''$ for cobalt radiation, calculations have been made for the elements from Li through Cf.

Relativistic calculations of $\Delta f'$ and $\Delta f''$ for commonly used wavelengths have been made by Cromer & Liberman (1970*a*). In an associated report (Cromer & Liberman, 1970*b*) all of the necessary cross-section information and a Fortran program were given for computing $\Delta f'$ and $\Delta f''$ for any wavelength between that of Cr $K\alpha_1$ ($\lambda = 2.28962$ Å) and of Ag $K\alpha_1$ ($\lambda = 0.55936$ Å). For these calculations the only new information needed is the cross section for the desired radiation for each of the orbitals that have a significant contribution to $\Delta f'$ and $\Delta f''$. These cross sections can be obtained with sufficient accuracy by interpolation.

The results are given in Table 1. It should be emphasized that the tabulated values of the mass absorption coefficients are for only the photoelectric contribution. This point was not explicitly made in the previous work.

References

Cromer, D. T. & Liberman, D. (1970*a*). *J. Chem. Phys.* **53**, 1891–1898.

Cromer, D. T. & Liberman, D. (1970*b*). Los Alamos Scientific Laboratory Report, LA-4403, 163 pp.

Table 1. $\Delta f'$, $\Delta f''$ *and mass absorption coefficient (photoelectric) for* Co $K\alpha_1$ *radiation* ($\lambda = 1.78892$ Å)

	$\Delta f'$	$\Delta f''$	μ/ϱ (cm² g⁻¹)		$\Delta f'$	$\Delta f''$	μ/ϱ (cm² g⁻¹)		$\Delta f'$	$\Delta f''$	μ/ϱ (cm² g⁻¹)
Li	0·00	0·00	0·4	Br	−0·47	1·67	126·8	Ho	−6·98	4·71	173·4
Be	0·00	0·00	1·3	Kr	−0·44	1·87	135·6	Er	−6·53	5·00	181·6
B	0·01	0·01	3·1	Rb	−0·36	2·09	148·4	Tm	−6·18	5·31	190·9
C	0·02	0·01	6·3	Sr	−0·26	2·36	163·7	Yb	−5·88	5·62	197·4
N	0·04	0·03	10·7	Y	−0·19	2·62	179·3	Lu	−5·65	5·95	206·5
O	0·06	0·04	16·7	Zr	−0·13	2·90	193·4	Hf	−5·49	6·31	214·6
F	0·09	0·07	23·2	Nb	−0·08	3·21	209·8	Ta	−5·30	6·68	224·1
Ne	0·12	0·11	33·9	Mo	−0·05	3·53	223·6	W	−5·13	7·06	233·2
Na	0·16	0·17	44·1	Tc	−0·03	3·88	237·8	Re	−4·98	7·45	243·1
Mg	0·20	0·24	59·3	Ru	−0·02	4·25	255·2	Os	−4·87	7·86	251·1
Al	0·25	0·33	73·7	Rh	−0·02	4·64	273·8	Ir	−4·76	8·30	262·1
Si	0·29	0·44	94·8	Pd	−0·06	5·06	288·6	Pt	−4·67	8·74	272·2
P	0·33	0·57	112·4	Ag	−0·14	5·50	309·4	Au	−4·58	9·21	284·0
S	0·36	0·73	138·8	Cd	−0·26	5·96	322·3	Hg	−4·59	9·69	293·5
Cl	0·37	0·92	157·6	In	−0·37	6·46	341·6	Tl	−4·55	10·19	303·0
Ar	0·37	1·14	173·0	Sn	−0·54	6·98	357·1	Pb	−4·60	10·71	314·0
K	0·32	1·38	215·1	Sb	−0·75	7·52	375·3	Bi	−4·62	11·24	326·6
Ca	0·25	1·66	252·0	Te	−1·03	8·10	385·5	Po	−4·67	11·80	341·3
Sc	0·12	1·98	266·9	I	−1·36	8·70	416·5	At	−4·72	12·37	357·8
Ti	−0·09	2·32	294·2	Xe	−1·81	9·34	432·3	Rn	−4·94	12·96	354·5
V	−0·44	2·70	321·5	Cs	−2·32	10·04	458·9	Fr	−5·05	13·56	369·2
Cr	−0·99	3·11	363·5	Ba	−2·97	10·72	474·2	Ra	−5·21	14·16	380·6
Mn	−2·14	3·56	393·6	La	−3·93	11·45	500·6	Ac	−5·40	14·78	395·5
Fe	−3·20	0·49	53·3	Ce	−5·12	12·21	529·4	Th	−5·78	15·43	404·0
Co	−2·07	0·57	59·1	Pr	−7·90	13·40	577·4	Pa	−5·93	16·11	423·6
Ni	−1·62	0·67	69·0	Nd	−8·49	11·96	503·5	U	−6·26	16·78	428·1
Cu	−1·34	0·77	73·7	Pm	−9·98	9·28	383·3	Np	−6·74	17·46	447·6
Zn	−1·15	0 89	82 3	Sm	−10·68	9·88	399·3	Pu	−6·98	18·16	452·2
Ga	−0·99	1·01	88·4	Eu	−12·17	3·67	146·7	Am	−7·41	18·86	471·3
Ge	−0·85	1·16	96·8	Gd	−9·66	3·90	150·5	Cm	−7·87	19·51	479·9
As	−0·73	1·31	106·3	Tb	−8·46	4·16	158·9	Bk	−8·57	20·37	500·9
Se	−0·62	1·48	114·0	Dy	−7·59	4·43	165·5	Cf	−9·35	21·12	511·2