Acta Cryst. (1962). **15**, 294

Atomic scattering factors for ytterbium.

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(*Received* 13 *November* 1961)

A systematic effort was started more than a year ago in the Burroughs Professional Services group, to compute the atomic wave field of the Lanthanides and from them the atomic scattering factors. The Hartree procedure is used basically to obtain the wave functions without exchange and relativistic effects first (Holm & Eichhorn, 1961). It is intended to utilize these data later to incorporate Fock corrections.

All computations were carried out on a Burroughs 220 computer with the aid of special programs developed therefore (Eichhorn, 1959). The range of sin θ/λ was made to extend to the silver radiation wave length and the intervals of computation were chosen at the same fine mesh applied in earlier calculations (Eichhorn, 1957, 1958). The total computation time for the table listed here, was 4 hours and 34 minutes; this time includes ALGOL compilation of the relevant program version, input and output—both file cards and tabulation.

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Table 1. *Atomic scattering factors for ytterbium*

Selfconsistent field without exchange ($Z = 70$, 13 shells)

sin θ/λ cm.10^{-8}	Atomic scat. factor	sin θ/λ cm.10^{-8}	Atomic scat. factor	sin θ/λ cm.10^{-8}	Atomic scat. factor	sin θ/λ cm.10^{-8}	Atomic scat. factor
0·00	70·000	0·46	41·675	0·90	25·023	1·36	17·322
0·02	69·726	0·48	40·649	0·92	24·516	1·38	17·120
0·04	68·971			0·94	24·043		
0·06	67·896	0·50	39·654	0·96	23·591	1·40	16·924
0·08	66·660	0·52	38·690	0·98	23·149	1·42	16·734
		0·54	37·757			1·44	16·550
0·10	65·364	0·56	36·856	1·00	22·710	1·46	16·371
0·12	64·046	0·58	35·985	1·02	22·281	1·48	16·196
0·14	62·707			1·04	21·871		
0·16	61·341	0·60	35·141	1·06	21·483	1·50	16·025
0·18	59·942	0·62	34·321	1·08	21·119	1·52	15·860
		0·64	33·523			1·54	15·698
0·20	58·514	0·66	32·744	1·10	20·774	1·56	15·540
0·22	57·067	0·68	31·983	1·12	20·442	1·58	15·387
0·24	55·613			1·14	20·121		
0·26	54·167	0·70	31·242	1·16	19·810	1·60	15·238
0·28	52·741	0·72	30·523	1·18	19·508	1·62	15·092
		0·74	29·829			1·64	14·949
0·30	51·344	0·76	29·161	1·20	19·217	1·66	14·808
0·32	49·982	0·78	28·520	1·22	18·940	1·68	14·668
0·34	48·662			1·24	18·677		
0·36	47·386	0·80	27·900	1·26	18·427	1·70	14·529
0·38	46·159	0·82	27·298	1·28	18·189	1·72	14·389
		0·84	26·707			1·74	14·247
0·40	44·977	0·86	26·127	1·30	17·961	1·76	14·101
0·42	43·837	0·88	25·562	1·32	17·741	1·78	13·953
0·44	42·737			1·34	17·529		
						1·80	13·803

Acta Cryst. (1962). **15**, 294

Thermal expansion of tin in the β-γ transition region.

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(*Received* 25 *September* 1961 *and in revised form* 16 *October* 1961)

Tin metal shows anomalous changes in some physical properties in the range 161–200 °C. These changes have been attributed to a structural transformation from tetragonal to rhombic symmetry (Evans, 1923; Mantell, 1949). However, Nishakawa & Asahara (1920) and Matuyama (1931) took X-ray photographs at high temperatures and reported that there was no evidence of a structural change.

Systematic data on the temperature variation of the lattice parameters and the coefficients of thermal ex-

Table 1. *Lattice parameters of tin at various temperatures*

Temperature	a	c
33 °C.	5·8326 ± 0·0001 Å	3·1821 ± 0·0003 Å
106	5·8403	3·1908
148	5·8450	3·1958
166	5·8477	3·1991
178	5·8492	3·2004
180	5·8494	3·2009
186	5·8504	3·2021
194	5·8515	3·2035
200	5·8522	3·2038
212	5·8539	3·2061

Table 2. *Coefficients of expansion of tin at different temperatures*

Temperature	$\alpha_{\perp} \times 10^6$	$\alpha_{\parallel} \times 10^6$
30 °C.	16·5	32·4
50	17·0	33·9
70	17·8	34·9
90	18·7	36·5
110	19·7	39·0
130	20·2	41·2
150	21·6	43·7
160	22·3	45·9
170	22·8	47·8
190	24·3	51·2
200	25·4	53·7
210	26·2	56·9

pansion in the controversial region are not available. Therefore, the authors have determined the lattice parameters of tin up to 212 °C., in continuation of their earlier work (Deshpande & Sirdeshmukh, 1961). Because tin has a low Debye temperature, the intensity of powder lines falls rapidly at higher temperatures. To reduce exposure time and also for greater dispersion, a specially constructed focusing camera was used and the lattice parameters were calculated by Cohen's method. It was found that the back-reflection photographs do not show any change in the pattern up to 212 °C. and the diffraction lines continue to be sharp throughout. It was also observed that the lattice parameters increase continuously without any abrupt change in the expansion coefficients. The lattice parameters and the principal coefficients of expansion, at various temperatures, are given in Tables 1 and 2, respectively. (Since only one of the measured lines had a high l index, the accuracy of measurement of c is less than that of a). The values of the coefficients in the range 30–150 °C. agree, within limits of experimental errors, with the values reported earlier by the authors.

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International Union of Crystallography

Symposium in Kyoto, Japan, 25–30 September 1961

An International Conference on Magnetism and Crystallography was held in Kyoto, Japan, from 25 to 30 September 1961. This meeting was organized jointly by the Science Council, the Physical Society and the Crystallographic Society of Japan. It consisted of two parts which ran parallel: (I) an International Conference on Magnetism, under the sponsorship of the International Union of Pure and Applied Physics, and (II) an International Symposium on Electron and Neutron Diffraction, under the sponsorship of the International Union of Crystallography.

The Conference was attended by about 600 Japanese and 225 foreign scientists, the latter coming from 19 countries. The approximate ratio of those mainly interested in Parts I and II respectively amounted to 3 to 1. Generous financial assistance received from UNESCO through ICSU, and from the Charles F. Kettering Foundation (U.S.A.), had made possible the attendance of a large number of the scientists from abroad. For the same purpose, and for the defrayment of the further cost of the Conference, substantial financial support was also received from the Japanese Government and from a large number of industrial and commercial organizations in Japan. Without these generous contributions the meetings would certainly not have been so successful as they were, and the organizers and participants are most grateful for this help.

For the organization of the Conference various Committees had been established. The general responsibility was in the hands of an Organizing Committee under the chairmanship of S. Kaya, with I. Nitta as Vice-Chairman. For each of Parts I and II there were a Sub-Committee of the Organizing Committee and a Programme Committee. The Sub-Committee and the Programme Committee for Part I were both headed by T. Nagamiya, those for Part II by S. Miyake. A special Sub-Committee for two joint neutron-diffraction sessions stood under the chairmanship of Y. Takagi. For the printing of the preprints and the other material, and of the later publication of the proceedings of the Conference, a Publications Committee was responsible, on which K. Yosida served as Chairman. The excellent local arrangements for the Conference were made by a Local Committee under the guidance of K. Tanaka. All these Committees could apply for advice to an Advisory Board consisting of T. Fujiwara, T. Ito, M. Kotani and others.

The Commission on Electron Diffraction of the International Union of Crystallography, and in particular the Chairman of this Commission, L. O. Brockway, played an important role in the planning and preparations of Part II of the Conference. The first plans had already been made soon after the establishment of this Commission at the Fourth General Assembly of the Union in 1957. The rapid developments in the field of electron