

check of this value was obtained from the only two reliable d_{310} values which were obtained at 467 °C. and at 523 °C. Calculation of the expansion coefficient from these two points gave a value of 33×10^{-6} per °C.

The measured values for the linear coefficient of expansion for the f.c.c. phase are in good agreement with the values of $22.5_2 \times 10^{-6}$ per °C. reported by Erling (1942) for the range 20–40 °C. and of 22.0×10^{-6} per °C. reported by Cath & Steenis (1936) for the range 0–300 °C. but is somewhat lower than the value of 25×10^{-6} per °C. obtained by Bridgman (1920). All three of these latter values were obtained by dilatometric measurements. No expansion data were available for comparison with the present value for the b.c.c. phase.

Reference values for the lattice parameters were obtained by extrapolating lattice parameters calculated from the individual reflections against the function proposed by Nelson & Riley (1945). For the f.c.c. phase a value, $a_0(26 \text{ °C.}) = 5.5884 \pm 0.0002 \text{ Å}$, was obtained and for the b.c.c. phase a value, $a_0(467 \text{ °C.}) = 4.480 \pm 0.005 \text{ Å}$, was obtained. Calculation of the volumes per atom for the two phases, based upon these lattice parameters and

the measured coefficients of expansion, shows that the volume change at the transition temperature, $\sim 450\text{--}460 \text{ °C.}$, is quite small. Indeed, the extremes of the quoted precisions are sufficient to cause the volume change at transition to shift from a contraction to an expansion. On the basis of volume considerations it might reasonably be expected that the transition should be relatively insensitive to pressure.

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Structure cristalline des orthovanadates et orthoarsénates de baryum et de strontium. Par

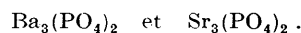
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(Reçu le 28 février 1959)

L'étude de certains vanadates et arsénates mixtes (Durif, 1957a, 1957b) dont la préparation nécessitait l'emploi comme matière première des orthovanadates et orthoarsénates de baryum et de strontium, nous a montré que la littérature cristallographique ne faisait pas mention de ces derniers composés, pourtant bien connus au point de vue chimique.

Ces quatre composés ont été préparés par calcination prolongée à 600 °C. des mélanges $X_2O_5 + 3MO$ ($X = V, As$; $M = Sr, Ba$).

Les diagrammes Debye-Scherrer montrent que ces quatre composés sont isotypes, rhomboédriques et appartiennent au type de structure décrit par Zachariasen (1948) pour les orthophosphates correspondants:



Le Tableau 1 rassemble leurs principales caractéristiques cristallographiques. La maille rhomboédrique renferme une seule unité $M_3(XO_4)_2$ avec la répartition atomique suivante:

1M en 1(a) 0, 0, 0. 2O en 2(c) \pm (x, x, x)
 2M en 2(c) \pm (x, x, x) 6O en 6(h) \pm (x, x, z; x, z, x; z, x, x)
 2X en 2(c) \pm (x, x, x)

En l'absence de monocristaux nous n'avons procédé à aucun essai de mesure des différents paramètres de positions.

Tableau 1. *Orthovanadates et orthoarsénates de baryum et de strontium*

Formules	Groupe d'espace: $D_{3d}^5-R\bar{3}m$				$V_{\text{mol.}}$	D_x (g.cm. ⁻³)
	a_h	c_h	α_r	α_r		
$Sr_3(VO_4)_2$	5,621 Å	20,14	7,458	44° 17'	183,7 Å ³	4,426
$Sr_3(AsO_4)_2$	5,581	19,98	7,399	44° 19'	179,6	4,969
$Ba_3(VO_4)_2$	5,783	21,34	7,859	43° 10'	206,0	5,142
$Ba_3(AsO_4)_2$	5,753	21,18	7,804	43° 15'	202,3	5,627

Tableau 2. *Depouillement d'un diagramme de vanadate de strontium*

hkl	$I_{\text{obs.}}$	$d_{\text{obs.}}$	$d_{\text{calc.}}$	hkl	$I_{\text{obs.}}$	$d_{\text{obs.}}$	$d_{\text{calc.}}$
101	<i>f</i>	4,59 Å	4,72 Å	205	<i>F</i>	2,06 Å	2,08 Å
104	<i>mf</i>	3,43	3,49	1,0,10	<i>F</i>	1,841	1,860
105	<i>F</i>	3,04	3,09	211	<i>f</i>	1,819	1,832
110	<i>F</i>	c. 2,76	2,81	119	<i>m</i>	1,736	1,749
202	<i>mf</i>	2,33	2,36	125	<i>F</i>	1,663	1,672
009	<i>mf</i>	2,21	2,24	300	<i>F</i>	1,611	1,622
204	<i>mf</i>	2,16	2,19	0,2,10	<i>F</i>	1,542	1,550
116	<i>mf</i>	2,13	2,15	220	<i>F</i>	1,401	1,404

Des considérations stériques basées sur la taille des groupements (XO_4) montrent qu'ils sont très voisins de ceux déterminés par Zachariassen (1948) pour les phosphates correspondants.

Le Tableau 2 reproduit le dépouillement des 16 premières raies d'un diagramme Debye-Scherrer de vana-

date de strontium effectué à la radiation du chrome (2,2909 Å).

References

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Notes and News

Announcements and other items of crystallographic interest will be published under this heading at the discretion of the Editorial Board. Copy should be sent direct to the Editor (P. P. Ewald, Polytechnic Institute of Brooklyn, 333 Jay Street, Brooklyn 1, N.Y., U.S.A.) or to the Technical Editor (R. W. Asmussen, Chemical Laboratory B of the Technical University of Denmark, Sølvgade 83, Copenhagen K, Denmark)

Crystallographia

The journal '*Crystallographia*' of the Academy of Sciences of the USSR is being published in (complete) translation by the American Institute of Physics. The translation began with the 1957 issues.

There are six issues per year, approximately 1,000 Russian pages. Annually \$25.00 domestic, \$27.00 foreign (\$10.00 and \$12.00 respectively for libraries of nonprofit degree-granting institutions). Subscription orders and inquiries should be addressed to: Translation Journals—American Institute of Physics, 335 East 45 Street, New York 17, N.Y., U.S.A.

The Electron Microscope Society of America

The 17th Annual Meeting of the *Electron Microscope Society of America* will be held September 9–12, 1959, at Ohio State University, Columbus, Ohio. Information concerning the meeting is obtainable from the Program Chairman Sydney S. Breese, Jr., Plum Island Animal Disease Lab., Greenport, L.I., N.Y. and regarding Scientific and Commercial Exhibits from Walter J. Frajola, N205 North Wing, Univ. Hospital, Ohio State University, Columbus, Ohio. Deadline for 150-word abstracts of contributed papers is June 1, 1959.

Structure Reports

Volume 14 of *Structure Reports* is now ready. Vol. 14 which is a cumulative index for 1940–50 has been prepared under the general editorship of A. J. C. Wilson, with N. C. Baenziger and C. S. Barrett (Metals), J. M. Bijvoet and J. Wyart (Inorganic Compounds) and J. Monteath Robertson (Organic Compounds) as section editors.

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L'Académie des sciences

L'Académie des sciences a élu membre titulaire le professeur Jean Wyart, de la Sorbonne.

Tables of Q as a Function of 2θ

Announcement from the Commission on Crystallographic Data

1. The parameter $\sin^2 \theta$ is often used for the indexing of powder diffraction patterns because general linear relations exist between its values for different lines. In published work such values are often listed along with d , so as to make it easier for the reader to follow the interpretation given. It is known that using $Q = 1/d^2 = (4/\lambda^2) \sin^2 \theta$ instead of $\sin^2 \theta$ greatly facilitates both checking and comparison of published data. Not only is $1/d^2$ independent of the wave-length, but it is also more directly related to unit-cell dimensions.

This function $Q(2\theta)$ has been given to 5 decimals in Å^{-2} (tabulated as $10^5 Q$) for limited but overlapping ranges of 2θ , for Cu $K\alpha$ and Cu $K\alpha_1$ (Donnay & Donnay, 1951). Published in a limited edition, the table was reprinted in 1955 and is still available.

2. New tables have recently been compiled and published (de Wolff, 1959), which give $Q(2\theta)$ to 5 decimals in Å^{-2} (tabulated as $10^4 Q$, to one decimal) for $2\theta = 4^\circ (0.01^\circ) 180^\circ$. Two volumes have appeared: Vol. I for Cu $K\alpha_1$ and Vol. II for Fe $K\alpha_1$. They can be ordered from the publishers, Technisch Physische Dienst. T.N.O. & T.H., Delft, Netherlands. Price 5 guilders or 10 sh. (U.K.) or \$1.50 per volume. To reduce handling charges all orders must be accompanied by cheque, bank or postal money orders. Banking transactions can be placed through Amsterdamsche Bank N.V., Delft, Netherlands. Tables for other radiations are in preparation.

3. Recently a table of inverse squares especially designed for converting d into Q was published (Azaroff & Buerger, 1958). By means of this table the experimentally determined angle θ can, indirectly, be converted into Q , but the procedure results in the accumulation of rounding off errors. This is particularly undesirable because Q , unlike d , serves as a starting point for further calculations. It is better, therefore, to use a $Q(2\theta)$ table for this purpose.

4. Finally there exists an inexpensive table (*National Bureau of Standards*, 1949) that gives $\sin x$ (and $\cos x$) for $x = 0 (0.01^\circ) 90^\circ$. This table will be found serviceable when no Q table is available for the wave-length used (Donnay & Donnay, 1959).

References

- AZAROFF, L. V. & BUERGER, M. J. (1958). 'The Powder Method in X-ray Crystallography' McGraw Hill, New