Table 1. *Interplanar spacings for* Hg_3TeO_6

Preparation according to Hutchins (1905). Reflections marked by a cross are also given by Westman & Magnéli (1957)

hkl	d_c	d_o	
220	4·73 Å	4·73 Å	*vw*
310	4·24	4·24	*vw*
311	4·05	4·05	*w*
320	3·72	3·72	*vw*
321	3·58+	3·58	*s*
400	3·35+	3·35	*m*
410 322	3·25	3·25	*vw*
411 330	3·16+	3·16	*vs*
331	3·07	3·06	*vw*
420	3·00+	3·00	*vs*
332	2·86	2·86	*w*
422	2·73+	2·73	*vs*
510 431	2·63	2·65	*vw*
521	2·45+	2·45	*m*
440	2·37	2·37	*vw*
530 433	2·30+	2·29	*m*
610	2·20	2·20	*w*
611 532	2·18+	2·17	*m*

The white precipitate should be kept at 80 °C. for several weeks to ensure complete recrystallization. The recrystallized product contains coarse and strongly yellow crystals of mercury tellurate that may be selected by hand.

According to Westman & Magnéli (1957) mercury tellurate is cubic ($a_0 = 13·3921 \pm 0·0013$ Å) and the reflections found by them indicate that $h+k+l=2n$, and thus that the unit cell is body-centered. Guinier exposures of mercury tellurate prepared as mentioned above show some additional reflections indicating that the unit cell is primitive. The obtained reflections do not allow a positive determination of the space group of the investigated material, but if the absence of the 002 reflection is systematic the space group is probably $P4_132$ or $P4_332$. If the absence of 002 is accidental, the point groups 23, $m3$, $\bar{4}3m$, and $m3m$ are also possible.

The interplanar spacings of mercury tellurate are given in Table 1.

References

Hutchins, E. B. (1905). *J. Amer. Chem. Soc.* **27**, 1178.

Westman, S. & Magnéli, A. (1957). *Acta Chem. Scand.* **11**, 1587.

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The unit cell and space group of 2,6-dimethoxy-3,5-dichloro-4-methylbenzoic acid. By

R. Paterson and G. A. Sim, *Chemistry Department, The University, Glasgow, W. 2., Scotland*

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During studies of substituted benzene derivatives (Ferguson & Sim, 1961) crystals of 2,6-dimethoxy-3,5-dichloro-4-methylbenzoic acid were examined. From oscillation, rotation and Weissenberg photographs taken with Cu$K\alpha$ radiation we have found the unit cell to be orthorhombic with dimensions

$$a = 7·05 \pm 0·02,\ b = 33·1 \pm 0·1,\ c = 20·69 \pm 0·07 \text{ Å} .$$

The systematic absences observed are those of the space group D_{2h}^{15}–$Pbca$. The measured crystal density is 1·43 g.cm.$^{-3}$, giving sixteen molecules in the unit cell. The calculated density is 1·458 g.cm.$^{-3}$.

No further work on this compound is contemplated.

Reference

Ferguson, G. & Sim, G. A. (1961). *Proc. Chem. Soc.*, p. 162.

Book Reviews

Works intended for notice in this column should be sent direct to the Editor (A. J. C. Wilson, Department of Physics, University College, Cathays Park, Cardiff, Great Britain). As far as practicable books will be reviewed in a country different from that of publication.

The Interpretation of X-ray Diffraction Photographs. By N. F. M. Henry, H. Lipson and W. A. Wooster. Pp. 224 with many figs. London: Macmillan. Sec. Ed. 1960. Price 63*s*.

Since the first edition was published in 1951, 'Henry, Lipson and Wooster' has established itself as an essential reference book on the library shelves, or more often on the desks, of a majority of X-ray crystallographers. Its value for the practical man, as well as for teaching purposes, has been universally recognized. The advent of a second edition is therefore to be very warmly welcomed. Not only will it enable many more individuals to become familiar with the details of its excellently written text, but it will also make it possible to replace those copies which are suffering the consequences of continuous use over a period of nine years.

One notable feature of the present edition is that several major revisions have been effected, in order to incorporate new matter, without changing the overall length of the text appreciably. Indeed the text finishes on page 224 as it did in the original edition. This has been managed partly by transferring some items, including tables, which were previously included in the body of the book, to appendices, but also by adding paragraphs about recent developments towards the ends of chapters.

The publication during the last ten years of several other text books on particular crystallographic topics has enabled some of the original introductory matter to be omitted. In the present edition chapter 1 deals with Crystal Lattices and Symmetry Classes, which originally formed the greater part of chapter 10. The new chapter 10 contains a detailed treatment of the precession method, and also an account of methods of study of triclinic crystals, using the examples of axinite and chalcanthite. The explanation of the precession method follows on quite logically from the discussion of moving-film techniques given in chapter 7, to which several pages on the rotation-retigraph method have been added.

One point in the first edition which was mildly criticized was that discussion of the measurement of intensities by X-ray diffractometry had been omitted. Now a few paragraphs on the diffractometer method will be found in chapter 14. This addition appears to be sufficient, since any detailed account of the X-ray diffractometer as an analytical tool would be out of place in a book on photographic methods.

Several of the diagrams and figures have been revised or redrawn. Where this has been done the changes effect improvement, examples chosen at random being the new diagrams of figures 37 and 39, illustrating the relations between direct and reciprocal lattices, and the beautiful fibre photograph of tungsten wire reproduced on page 124.

Amongst the new appendices, the concise guidance to the indexing of powder photographs of triclinic crystals in appendix 8 and the problems and solutions comprising appendix 9 will interest many readers. The tables are substantially unchanged, except that numbers 11, 12 and 13 appeared previously within the text. The generally good standard of printing and binding of the first edition has been maintained.

H. P. Rooksby

The Research Laboratories
of The General Electric Co. Ltd.
Wembley, Middlesex
England

X-ray Powder Photography in Inorganic Chemistry. By R. W. M. d'Eye and E. Wait. Pp. VIII + 222 with many figures and tables. London: Butterworths Scientific Publications. 1960. Price 45*s*.

Étant donné le sujet et les dimensions du livre de MM. d'Eye & Wait, étant donné aussi le nombre d'ouvrages récents sur la diffraction des rayons X, on ne peut en attendre qu'il soit très original. On doit le juger par rapport au but précis qu'ont choisi les auteurs. C'est, d'après la préface, 'to provide a conveniently small book setting out as simply as we can just those things which we think a chemist who wishes to use X-Ray powder photography needs to know'.

Le premier chapitre décrit les propriétés des rayons X, donne la description de tubes à rayons X (même du tube à gaz!), de monochromateurs. Puis les chambres Debye–Scherrer et à focalisation sont décrites. Ensuite sont traitées les méthodes d'indexation de diagrammes de poudre (en particulier les méthodes de Lipson, et même Ito), la détermination précise des paramètres.

Le 6ème chapitre est intitulé: 'Some necessary crystallographic theory'. On y trouve les descriptions du réseau, la définition d'indices de Miller, une démonstration de la loi de Bragg, quelques lignes sur le réseau réciproque, la symétrie des cristaux (systèmes cristallins et groupes spatiaux). Les formules pour le facteur de structures et les intensités de raies sont données sans démonstration. La fin du livre est surtout consacrée à des exemples de détermination de structures simples à partir des diagrammes de poudre.

Je ne voudrais pas critiquer le plan des auteurs simplement parce qu'il heurte notre manie française de logique cartésienne. Mais on nous dit que le livre est destiné au 'research chemist with no experience in crystallography'. Comment alors celui-ci peut-il tirer profit des premiers chapitres où l'on parle dans les premières pages de loi de Bragg (p. 5), d'indices de réflexion (p. 25), de diagrammes de Laue (p. 33), de distances interréticulaires (p. 70), de réseau réciproque (p. 72), etc. ... alors que les notions sont définies seulement et très sommairement à partir de la page 121? Jamais la formule des distances interréticulaires, même dans le cas du cristal cubique, n'est expliquée. A quoi sert de faire allusion à l'analyse de Fourier & Patterson (p. 194), alors que cette notion n'est pas du tout abordée dans l'ouvrage?

Je crains donc que ce livre ne soit pas suffisant par lui-même à un débutant, même s'il en commence la lecture par le milieu. D'autre part, pour le chimiste qui n'est pas un novice en cristallographie, il est regrettable qu'il soit restreint du point de vue expérimental à la technique photographique, étant donné le grand nombre de ceux qui utilisent aussi la diffractométrie par compteur.

Enfin, on doit signaler certains paragraphes, où des questions accessoires sont abordées de façon très sommaire, mais qui, néanmoins, contiennent des inexactitudes indubitables (agitation thermique, p. 51, corps amorphes, p. 216).

A. Guinier

Laboratoire de Physique de Solides
Faculté des Sciences de Paris–Orsay
Orsay, Seine et Oise
France

The Solution of Equations in Integers. By A. O. Gelfond, translated by J. B. Roberts. Pp. viii + 63. London and San Francisco: W. H. Freeman and Company, 1961. Price 6*s* or $1·00.

This book is an expansion of a lecture given at the mathematical olympiad at Moscow State University in 1951, and published in Russian in 1957. It is intended to be intelligible to the upper forms of grammar schools; much of the material has a general fascination. Linear, quadratic and cubic equations are treated in some detail, as is also Fermat's conjecture that $x^n + y^n = z^n$ has no positive integral solutions for $n \geq 3$. Unfortunately the problem of interest in powder photography, integral solutions of $h^2 + k^2 + l^2 = N$ for given N, is not mentioned.

A. J. C. Wilson

University College
Cardiff
Great Britain