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Crystal structure of silver fulminate.

By KARTAR SINGH, *Institute of Armament Studies, Kirkee, Poona 3, India*

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The present note describes attempts which have been made to determine the crystal structure of silver fulminate. For preparation of this compound 30 c.c. of absolute alcohol were added to 19 c.c. of 21·5% solution of silver nitrate in nitric acid. Chemical reaction was carried at a temperature range of 60 to 80 °C. Well formed crystals of the compound were obtained by dissolving the freshly precipitated product in a 20% solution of ammonium acetate at a temperature of 50 °C. This saturated solution was cooled very slowly from 50 °C. to room temperature when glistening needle-shaped crystals of silver fulminate were obtained. The average length of the crystals was 4 to 5 mm. Chemical analysis gave 71·87% silver (theoretical 71·94).

The refractive indices of the crystal were determined by the Becke line method using as immersion media liquids such as carbon disulphide and mixtures of methylene iodide and arsenous sulphide. The refractive index of the crystal for sodium light polarized along the needle axis (or a-axis) is found to be 1·630 and for the light polarized perpendicular to the needle axis (or parallel to the b-axis) is found to be 1·831. The density of the crystals determined with the help of a pycnometer is 3·938 g.cm.$^{-3}$.

Study of oscillation and Weissenberg X-ray photographs reveals that the crystal is orthorhombic. The dimensions of the unit cell are found to be $a=6·04$, $b=3·88$ and $c=11·20$ Å. All observed reflections obey the relationship that the sum $(h+k+l)$ is even; the unit cell is, therefore, body centred. Further it is found that for the $0kl$ reflexions $h+l$ is even, for $h0l$ both h and l are even, and for $hk0$ both h and k are even. These observations suggest that the space group probably is $Imca$. The value of the density of the crystal calculated by assuming four molecules in the unit cell is 3·936 g.cm.$^{-3}$ which agrees reasonably well with the experimental results.

Sincere thanks are due to Prof. D. S. Kothari and Dr A. R. Varma of the Delhi University for kind help and useful discussions.

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Structure de $SP(C_2H_5)_3$ et $SeP(C_2H_5)_3$.

Par M. VAN MEERSSCHE et A. LÉONARD, *Laboratoire de Chimie Physique, Université de Louvain, Belgique*

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$SP(C_2H_5)_3$ (I) et $SeP(C_2H_5)_3$ (II) sont isomorphes. L'étude de la projection (001) de I a fait l'objet d'une note antérieure (Van Meerssche, 1954). Le présent travail est une détermination de la structure tridimensionnelle de $SP(C_2H_5)_3$ et de $SeP(C_2H_5)_3$. Ces substances cristallisent sous forme de longues aiguilles hexagonales. Les paramètres de la maille-unité valent:

	a	c
I	8,98 ± 0,01 Å	6,32 ± 0,01 Å
II	9,06 ± 0,01	6,54 ± 0,01

2 molécules par maille.

Données expérimentales utilisées dans l'analyse des structures:

I	$hk0$, $0k1$, $hk1$, $hk2$
II	$hk0$, —, $hk1$, $hk2$, $hk3$, $hk4$

Les intensités ont été lues visuellement sur des films de Weissenberg intégrés et corrigées pour l'absorption et l'extinction secondaire (F. Jellinek, 1958). Rayonnement incident: Cu $K\alpha$.

Les molécules possèdent la symétrie ponctuelle 3 et réalisent deux configurations énantiomorphes (A et B de la Fig. 1).

Selon le mode de répartition de ces deux formes, le groupe spatial serait $P6_3mc$ (répartition statistique représentée à la Fig. 1) ou $P31c$ (macle de cristaux à structure ordonnée, où chaque molécule A est entourée de $3B$ et inversément).

Bien qu'il ne nous ait pas été possible de décider avec certitude de la symétrie spatiale, $P6_3mc$ semble probable. La maille contiendrait alors des molécules 'statistiques', superposition de A et B, de symétrie $3m$.

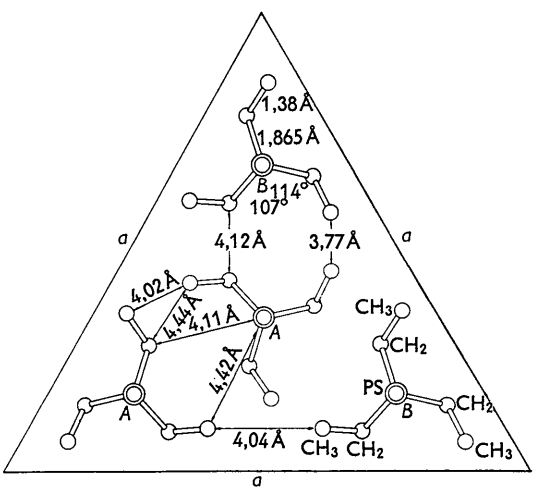

Fig. 1. $SP(C_2H_5)_3$. Projection sur le plan (001). Maille double. Répartition statistique des formes énantiomorphes A et B. Quelques distances intermoléculaires sont indiquées. Les distances entre CH_2 et S de la molécule située en dessous, sont de 4,15 Å. La molécule centrale est à $c/2$ en dessous des autres.

Les structures ont été déterminées par la méthode de l'atome lourd; les phases des facteurs de structure étant calculées à partir des contributions de P et S (ou Se). Ces atomes occupent d'ailleurs des positions spéciales $(\frac{1}{3}, \frac{2}{3}, z)$ et $(\frac{2}{3}, \frac{1}{3}, z+\frac{1}{2})$.

L'affinement a été réalisé au moyen de synthèses de Fourier normales et généralisées. R final: 12,6% pour I et 7,2% pour II.

La position du CH_3 est peu précise car ce radical est réparti sur deux sites qui se recouvrent partiellement.

Un compte rendu détaillé de ces déterminations paraîtra prochainement au Bulletin des Sociétés Chimiques Belges.

Distances interatomiques

	I	II
P–S(e)	1·864 ± 0·030	1·963 ± 0·020
P–C	1·865 ± 0·040	1·907 ± 0·030
C–C	1·38 ± 0·07	1·40 ± 0·05
S(e)PC	112°	114°
CPC	107°	106°
PCC	114°	110°

L'étude de ces structures nous a été suggérée par le Prof. J. M. Bijvoet qu'il nous est agréable de remercier ici.

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International Union of Crystallography

Conferences in Stockholm, 9–12 June 1959

Under the auspices of the Commission on Crystallographic Apparatus three Conferences were held in Stockholm, Sweden, during the four days 9–12 June 1959. In order to discuss the results of the first phase of an international cooperative project on the Precision Determination of Lattice Parameters, which had been undertaken by the Commission, only a Conference on this subject had been planned originally. Soon plans were made for arranging also a Conference on Counter Methods for Crystal-Structure Analysis. These methods are relatively new and are being developed at several laboratories throughout the world so that bringing the people concerned together at a working meeting was considered most desirable. At the last moment a Conference on X-Ray Wavelength Problems was added as a number of requests had been received for a discussion of this subject which is intimately related to the precision lattice-parameter determination.

By kind invitation of the Karolinska Institutet the meetings were held in the buildings of their Department of Medical Physics in Stockholm, immediately preceding the Second International Symposium on X-Ray Microscopy and X-Ray Microanalysis held there from 15 to 17 June. The Union is much indebted to the Swedish hosts for their cooperation in organizing the meetings and for the great hospitality again received in Stockholm after the Second General Assembly and International Congress was held there in 1951. Thanks are particularly due to Prof. Arne Engström who was already very much engaged in preparations for the forementioned Symposium, but agreed to make the necessary arrangements for the crystallography Conferences; and to Prof. Gunnar Hägg who kindly assisted in the preliminary arrangements for the Conferences, and who organized and arranged an excursion to his laboratory in Uppsala on Saturday 13 June.

The Conferences were a completely new venture for the Union. Unlike the triennial International Congresses and the intermediate Symposia held so far, the attendance at the Stockholm Conferences was limited to a rather small number of invited speakers and participants actively working in the fields concerned. Only 107 persons, 71 from abroad and 36 from Sweden, registered for one or more of the Conferences. In the programme more time was reserved for discussions than the time usually available for this purpose at other meetings. This made lively discussions possible after practically all papers. In addition, at the end of each of the three Conferences there was a lengthy discussion of the subject concerned which summarized expectations for future developments.

The great success of the Stockholm Conferences demonstrated the usefulness of such meetings at which specific problems are discussed by a small group of specialists. To a large extent the success of the meetings was, however, also due to the tremendous efforts undertaken by the Chairman of the Commission on Crystallographic Apparatus, W. Parrish, in preparing and arranging the meetings, and the Union owes him a deep debt of gratitude for his work. The assistance he received from his secretary, Mrs Dorothy Barrett, who prepared the many memoranda and handled the large amount of correspondence, and from the local secretary, Miss Gudren Bergendahl, who handled the whole registration for the meetings and assisted in the local arrangements, is also gratefully acknowledged.

The attendance of a great number of persons was made possible by generous financial help received from UNESCO through ICSU. In addition a number of U.S.A. Government Agencies provided funds for transportation of several participants from the U.S.A. whose presence at the meetings was of great importance.

The meetings were formally opened on Wednesday 10 June, although the additional Conference on X-Ray Wavelength Problems had already been held on the preceding day. Words of welcome were spoken by A. ENGSTRÖM, on behalf of the Karolinska Institutet, by G. HÄGG, on behalf of the Swedish crystallographers, and by A. J. C. WILSON, on behalf of the Executive Committee of the Union. During the remainder of the day and the morning of Thursday 11 June, the Conference