(1) *Dodecahydrotriphenylene*, $C_{18}H_{24}$

Space group C_{6v}^4–$C6mc$ or D_{6h}^4–$C6/mmc$, $I_a = 5{\cdot}91$, $I_c = 7{\cdot}63$ A., volume of the unit cell $V = 230{\cdot}5$ A.^{3}. Using the density averaged from literature data (Egloff, 1947), $d_4^{20} = 1{\cdot}145$ g.cm.$^{-3}$, the number of molecules in the unit cell is $n = 0{\cdot}663$ or $\doteqdot \frac{2}{3}$. This fractional number is the result of a statistical occupation of the individual homologous points in a closest packing of spheres or rotational ellipsoids in the sense of a one-dimensional disorder (Jagodzinski, 1949 *a*, *b*, *c*). This disorder becomes apparent from the continuous streaks along layer lines of the first and the second kind, streaks which are characteristic for these structures. A full account of this phenomenon will be published later in collaboration with H. Jagodzinski.

(2) *Perhydrocoronene*, $C_{24}H_{36}$

The hexagonal unit cell has the dimensions $I_a = 10{\cdot}27$, $I_c = 5{\cdot}00$ A. and $V = 458$ A.^{3}. Using the approximate density, $d \doteqdot 1{\cdot}08$ g.cm.$^{-3}$, the number of molecules in the unit cell is $n = 1$.

References

Egloff, G. (1947). *Physical Constants of Hydrocarbons.* New York: Reinhold.

Jagodzinski, H. (1949*a*). *Acta Cryst.* **2**, 201.

Jagodzinski, H. (1949*b*). *Acta Cryst.* **2**, 208.

Jagodzinski, H. (1949*c*). *Acta Cryst.* **2**, 298.

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X-ray crystallography of cyanamide, H_2NCN.

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Crystals of cyanamide, suitable for X-ray study, are rather difficult to obtain, owing to the fact that cyanamide transforms readily in the presence of traces of moisture to the dimer dicyandiamide. The material used in this study was kindly supplied by Dr D. Kaiser, of this Laboratory. It consisted of a large crystalline aggregate, which had developed in an *o*-dimethylphthalate solution of the material, over a period of several years. A small fragment was detached from the mass of material and sealed into a small-diameter, thin-walled pyrex capillary together with some of the mother liquor. During this manipulation care was exercised to ensure that the crystal fragment did not come into direct contact with the atmosphere.

A preliminary rotation pattern showed that a principal crystallographic direction lay almost parallel with the axis of rotation of the capillary, thus furnishing a convenient crystal rotation axis. Weissenberg patterns and a rotation pattern were taken about this axis (subsequently designated the *b* axis) with nickel-filtered copper radiation ($\lambda = 1{\cdot}542$ A.). Measurements on the rotation pattern yielded the following unit cell dimensions:

$$a = 9{\cdot}03 \pm 0{\cdot}02, \quad b = 7{\cdot}06 \pm 0{\cdot}02, \quad c = 6{\cdot}82 \pm 0{\cdot}01 \text{ A.}$$

Reflections of the type $0kl$ occur only with k even, $h0l$ only with l even, and $hk0$ only with h even. These data are consistent with the space group *Pbca*, in which the general positions are eight-fold. Assuming eight H_2NCN per unit cell, the calculated density is 1·282 g.cm.$^{-3}$. The measured density (20° C.) is 1·282 g.cm.$^{-3}$.

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Examination of two alkalimonofluochromates.

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The previously known compounds

(I) $KCrO_3F$ and (II) NH_4CrO_3F

(Werner, 1895; Hoffmann, 1912–14, vol. 2, pp. 529, 536; Olsson, 1927) were produced by treating $K_2Cr_2O_7$ and $(NH_4)_2Cr_2O_7$ with hot dilute hydrofluoric acid in excess, followed by evaporation. After standing at room temperature, the crystals were recrystallized from diluted hydrofluoric acid. In this way beautiful, well-developed crystals were obtained: the ammonium compound as ruby-red needles as large as 23 mm. in length, the potassium compound as red to orange-coloured crystals. The chemical analyses were performed on fresh, air-dried material with the following results:

(I) Found	Cr, 32·8 %	K, 24·7 %	F, 11·4 %
Calc.	32·89	24·73	12·02

0·0899 g. was treated with hydrochloric acid and KI. The titration required 16·9 ml. of a $Na_2S_2O_3$ solution (0·1009 N).

(II) Found	Cr, 37·4 %
Calc.	37·96

0·0830 g. required 17·7 ml. of a $Na_2S_2O_3$ solution (0·1009 N).

$KCrO_3F$. Tetragonal; specific gravity: 2·66 (Ketelaar & Wegerif (1938): 2·72; Beck (1940): 2·66); refractive indices: $\varepsilon = 1{\cdot}644$, $\omega = 1{\cdot}622$; optically positive.

NH_4CrO_3F. Orthorhombic; specific gravity: 2·22; refractive indices: $\alpha = 1{\cdot}623 \pm 0{\cdot}002$, $\gamma = 1{\cdot}639 \pm 0{\cdot}002$; $2V = 64° \pm 2°$; optically positive.

A. H. Nielsen has carried out the synthetic and analytical work. Richard Bøgvad has made the determinations of the optical data and of the specific gravities.

References

Beck, G. (1940). *J. Prakt. Chem.* **156**, 237.

Hoffmann, M. K. (1912–14). *Lexikon der anorganischen Verbindungen.* Leipzig: Barth.

Ketelaar, J. A. A. & Wegerif, E. (1938). *Rec. Trav. chim. Pays-Bas*, **57**, 1269.

Olsson, F. (1927). Dissertation, Uppsala.

Werner, A. (1895). *Z. anorg. Chem.* **9**, 407.