

From the above results it is concluded that oximes in the crystalline state correspond closely with the classical oxime formula $=C=N-OH$.

It may be a general phenomenon with the aromatic aldioximes that the *syn* forms are associated in dimers and the *anti* forms in chains, as was found for the *p*-chlorobenzaldioximes. This concept is supported by evidence from infra-red absorption spectra of *syn* and *anti* forms of some aromatic aldioximes⁶, and offers an explanation of the curious fact that for these oximes the *trans* forms (*syn*) generally have lower melting points than the *cis* forms (*anti*).

Two of the types of molecular association found in oximes are paralleled by the dimers and chains found in the crystal structures of carboxylic acids; the intermediate form, that is, the trimers in the crystals of the symmetrical oximes acetoxime and cyclohexanone oxime⁷, has no counterpart in the known structures of carboxylic acids.

A detailed account of this work will be published elsewhere⁸.

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Spiral Crystals of Meconin

THE growth of zinc sulphide¹ and magnesium sulphate² crystals in spiral form has recently been reported. Spiral crystals of meconin (6 : 7-dimethoxy-phthalide) with melting point 101–101.5° C. (lit. 102.5°) have been isolated from an aqueous propanolic solution which had been saturated with chloroform.



Only six spirals, 2–3.3 mm. in length, appeared together with the regular needle form. An attempt to reproduce this spiral crystal form was unsuccessful. The photograph, taken by I. McGill, shows three crystals, the central one of which was 2 mm. long.

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A New Metallic Layer Structure

DURING the course of an investigation into the system manganese/mercury, I confirmed the existence of the intermediate phase Mn_2Hg_6 , reported by Prelinger¹ and described its crystal habit and determined the dimensions of its unit cell². Since then, satisfactory Weissenberg photographs have been obtained from very small crystals (0.01–0.02 mm. in diameter). The only systematic absences observed were $0kl$ for k odd, which lead to three possible space groups, namely, $P4/mbm$ (D_{2d}^{10}), $P4b2$ (D_{2d}^{12}) and $P4bm$ (C_{2v}^{10}). Furthermore, the $hk0$ and $hk2$ intensities display the same trend, which is different from that of the hkl intensities. If the ten mercury atoms in the cell are all placed at $z = 0$ and the four manganese atoms at $z = \frac{1}{2}$, it is apparent that the geometrical structure factor for the first of the three space groups is identical for all reflexions with $l = 2n$, but the manganese contributions reverse their signs for $l = 2n + 1$. This arrangement of atoms is only possible in the space group $P4/mbm$. From packing considerations a structure could be derived which gave good agreement between the observed and calculated intensities. The geometrically derived parameters are $u = 0.075$ and $v = 0.206$ for the eight mercury atoms at positions $\pm(u, 0; v, 0; u + \frac{1}{2}, \frac{1}{2} - v, 0; v + \frac{1}{2}, n + \frac{1}{2}, 0)$ and $u = 0.178$ for the manganese atoms at $\pm(u, u + \frac{1}{2}, \frac{1}{2}; u + \frac{1}{2}, u, \frac{1}{2})$, the two remaining mercury atoms being situated at special positions $(\frac{1}{2}, 0, 0)$ and $(0, \frac{1}{2}, 0)$. Further refinement of these parameters by Fourier methods is under way; the results will be published more fully elsewhere.

The above structure leads to a closely packed arrangement in which each mercury in the (001) planes is in direct contact with its four nearest mercury neighbours in the same plane, and with one mercury atom above and below it. Each manganese atom is also in direct contact with six mercury atoms—for example, A, B and C in Fig. 1 and the atoms directly above them—and fits exactly into the vacant site between them.

The new metallic layer structure displays a remarkable similarity to that of tetramminopalladium chloride monohydrate, $Pd(NH_3)_4Cl_2 \cdot H_2O$ and its platinum isomorph³. The two extra (heavy metal) atoms per unit cell of the complex occupy the special positions $(0, 0, 0)$ and $(\frac{1}{2}, \frac{1}{2}, 0)$, which are unoccupied in Mn_2Hg_6 . Although it would seem rather surprising that an alloy crystallizes with basically the same atomic arrangement as a co-ordination complex, the close packing in the structure of Mn_2Hg_6 emphasizes its typically metallic character.

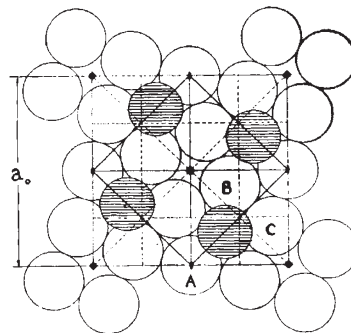


Fig. 1. Projection on (001) of the structure of Mn_2Hg_6 , with two formula units per unit cell. The atomic radii taken are $r_{Hg} = 1.50$ Å. and $r_{Mn} = 1.35$ Å.