

made at field strengths of 8,000 oersteds. Fine quartz fibres were used, their torsion constants being determined by separate oscillation experiments.

Iodine crystallizes in the orthorhombic system.⁴ Molecules of I₂ have their axes on the *ac* plane, these axes making angles of $+\phi$ or $-\phi$ with the *a*-axis. The atoms in an iodine molecule are 2.70 Å apart. Between neighbouring molecules, the separation is 3.54 Å in the *ac* plane and 4.35 Å in adjacent planes. Cleavage takes place, therefore, easily along the *ac* plane.

With the cleavage face of an iodine crystal horizontal, it is easy to locate the *a* and *c*-axes. Investigations on five crystals gave the following average values for the principal specific susceptibilities.*

$$\chi_a = -0.354, \chi_b = -0.331 \text{ and } \chi_c = -0.366.$$

Since the iodine molecules lie in the *ac* plane, the specific susceptibility normal to the axis of the molecule becomes χ_b . With this simplifying assumption a calculation of the specific susceptibilities of the iodine molecule parallel and perpendicular to the axis, gives $\chi_{\parallel} = -0.389$ and $\chi_{\perp} = -0.331$. The corresponding gram molecular susceptibilities are 98.74 and 84.03 respectively. The angle ϕ works to 51°. The axes of the iodine molecules in the crystal are thus found to be inclined to the *a*-axis of the crystal at angles of $+51^\circ$ or -51° . The available X-ray data do not appear to be specific on this issue.

Department of Physics,
Central College,
Bangalore,
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S. RAMACHANDRA RAO.
H. S. VENKATARAMIAH.

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* The susceptibility values are given in 10^{-6} unit.

'KYANOPHYLITE'—A NEW MINERAL OF THE HYDROUS ALUMINIUM SILICATE GROUP, DERIVED FROM KYANITE, FROM MAVINHALLI, MYSORE

ABOUT a mile and a half W.S.W. of Mavinhalli, in the ground consisting of the composite series of kyanite graphite schists, talc biotite schists, sillimanite quartz schists and other types of granulitic rocks, are found some loose bits and small lumps of an apple-green mineral which looks like some variety of talc or chlorites. It is, however, much harder than any of these minerals, and contains a large percentage of alumina and practically no magnesia at all. On chemical analysis, one of the specimens gave the following percentages:—
SiO₂-45.20; Al₂O₃-41.04; CaO-3.72; MgO-0.0; K₂O-0.73; Na₂O-3.84; Loss on ignition (mostly H₂O)-5.00.

The data show that it is essentially a hydrous aluminium silicate.

In thin sections the mineral forms feather-like aggregates, and shows fairly low refraction (about 1.58 to 1.60) and low birefringence,—the interference tints being low greys and hardly rising above yellow and red of the first order. In its physical and optical properties it does not correspond to any of the known varieties of the group of hydrous

aluminium silicate minerals. The mineral forms a new type possessing its own individual characters, and will be described in detail in the next volume (XLIII) of the *Records of the Mysore Geological Department*.

Mysore Geological Dept.,
Bangalore,
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B. RAMA RAO.

MIXTURES OF TETRYL AND T.N.T.

ACCORDING to Giua,¹ and Taylor and Rinckenbach,² tetryl (trinitrophenylmethylnitramine) and T.N.T. form a compound which melts at 67.6° C. and which contains the tetryl and the T.N.T. in the molecular proportion 1:2 respectively. Their conclusion is based on the presence of a very flat maximum in the melting-point diagram for tetryl/T.N.T. mixtures at a point which corresponds to the above proportions and melting-point. Efremov and Tikhomirova,³ using a similar technique, reported that they could find no evidence for the existence of a compound.

As an alternative method of investigation we have determined the molecular weight of the alleged compound by measuring the depression of the freezing-point produced when it is dissolved in benzene. With three separate samples, prepared by melting the tetryl (m.p. 129.1° C.) and T.N.T. (m.p. 80.3° C.) together, figures of 233, 232 and 233 were obtained taking 51.2° C. as the molecular depression for benzene. These figures are, approximately, what would be expected from a mixture. The compound would have a molecular weight of 741.

In addition, it is possible to separate the tetryl and the T.N.T. by treatment with carbon tetrachloride at 0° C.⁴

Clearly, then, tetryl and T.N.T. in the molecular ratio 1:2 do not behave as a compound in solution at about 0-5° C.

We wish to thank the Director of Armaments for permission to publish this observation.

Inspectorate of Military
Explosives, Kirkee,
May 24, 1945.

M. D. OWEN.
J. VERGHESE.

1. Giua, *Gaz. Chim. Ital.*, 1915, 45, 2, 32. 2. Taylor and Rinckenbach, *Ind. and Eng. Chem.*, 1923, 15, 73. 3. Efremov and Tikhomirova, *Ann. Inst. Anal. Phys. Chim.*, 1920, 3, 269-301. 4. *Allen's Commercial Organic Analysis*, 3, 637.

A CHEMICAL METHOD FOR THE ESTIMATION OF ALKALOIDS PRESENT IN ARGEMONE OIL AND ITS APPLICATION TO A MIXTURE OF ARGEMONE AND MUSTARD OILS

ON account of its supposed role in causing epidemic dropsy argemone oil has received considerable attention in recent years. The theory is that when argemone oil is present in mustard oil as adulterant the ingestion of such mustard oil would produce epidemic dropsy in man. Lal *et al.*¹ were not able to substantiate this theory by isolating any toxic substance from this oil. The present authors² have, however, been able to isolate at least two toxic factors of alkaloidal nature from argemone oil. Whether they are responsible