

THE ULTRA-VIOLET BANDS OF HgCl

EMISSION bands due to the HgCl molecule are known in two regions in the ultra-violet. While there is agreement about the analysis of one of the systems (*i.e.*, lying between $\lambda 2650$ and $\lambda 2400$) the assignment and analysis of the other (*i.e.*, lying between 2900 and 2700) do not appear to have been definite. Cornell¹ formed these into sequences of what he termed as Q heads and interpreted the accompanying weaker bands to be P branches. Wieland² doubts Cornell's classification and attributes the weak P heads and the stronger Q heads to the isotopic molecules HgCl³⁷ and HgCl³⁵. Sastry³ extended Cornell's Q sequences of heads, designated them as Q₁ heads and arranged the additional bands that he measured into Q₂ sequences.

In a recent paper on the bands of HgF and other related molecules, Howell⁴ has suggested the possible existence of a second system of HgCl bands in the region $\lambda 2900$ to $\lambda 2700$. In the light of his observations, a reinvestigation of the HgCl bands between $\lambda 2900$ and 2700, has been made by the authors to examine (1) if Wieland's interpretation of the isotopic origin of the P heads can be correct and (2) if the second system suggested by Howell can be definitely established.

Estimates of the intensities have been made of the P and Q heads, particularly of the (0,0) and (1,0) sequences. The P head intensity is found to fall off much more rapidly than the corresponding Q head intensities, which is inconsistent with Wieland's interpretation.

Eight diffuse bands, with unresolved structure, in this region (which were mentioned by Cornell and only partially recorded by Sastry) have been measured. As suggested by Howell, these could be arranged into a second system with the (0,0) band at $\lambda 2790.29$ and (0,1) at $\lambda 2811.38$. This system can be regarded as the second component of the $2\pi - 2\Sigma$ system of HgCl, the first being the one further to the violet between 2650 and 2400. The doublet interval between these components is approximately equal to 3889 cms.^{-1} entirely in keeping with the value 3934 found for HgF bands by Howell. Full details will be published elsewhere.

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1. Cornell, *Phy. Rev.*, 1938, 54, 341. 2. Wieland, *Helv. Phy. Acta.* 1929, 2, 46, and 1941, 14, 420. 3. Sastry, *Proc. Nat. Inst. Sci. Ind.*, 1941, 7, 351. 4. Howell, *Proc. Roy. Soc.*, (Lond.), 1943, A.182, 95.

TOURMALINE SCHISTS FROM HOLENARSIPUR, HASSAN DISTRICT, MYSORE STATE

DURING a recent visit to the schistose rocks occurring to the east and north-east of Yennehleranganbetta near Holenarsipur, specimens of what looked like a black mineral were collected. They occur in great profusion all along the western flanks of the line of hills commencing from south-west of Tattakere and ending

in $\Delta 3061$ due east of Yennehleranganbetta ($\Delta 3161$). *In situ* occurrences were not noticed.

The specimens were found in lumps of different sizes varying in diameter from $\frac{1}{2}$ " to $2\frac{1}{2}$ ". They have a dull black colour, and on a casual examination in the field may be mistaken for an amphibole. The lumps are often smooth but sometimes exhibit a crude columnar habit, and freshly broken surfaces reveal a very fine fibrous structure. Irregular transverse and longitudinal cracks traverse the specimens. The specific gravity was found to be 3.12.

Under the microscope, they were seen to be composed entirely of a very compact aggregate of minute tourmaline crystals forming a felted mass. As will be seen from Fig. 1, there is a definite schistosity produced by most of the crystals lying in parallel orientation, only a few crystals not conforming to the prevailing direction.

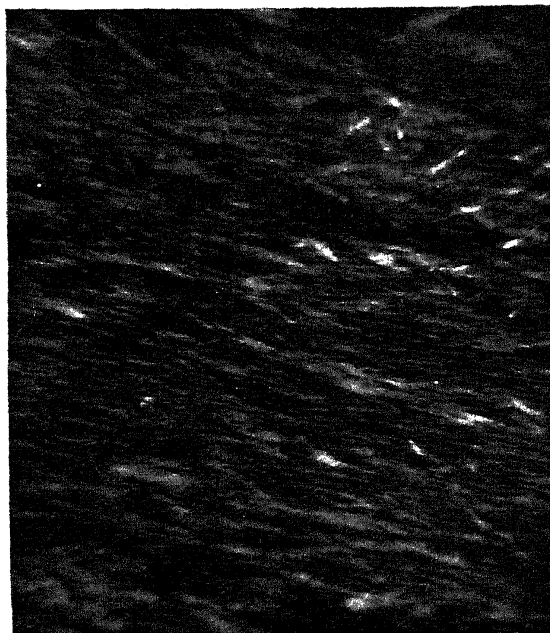


FIG. 1

Photomicrograph of Tourmaline schist. Polarised light. $\times 50$. The little prisms of tourmaline generally have a common orientation.

The following are the optical characters of the mineral. Absorption $O > E$. Optically negative. Birefringence, $\omega - \epsilon = .032$. Indices of refraction, $\epsilon = 1.630$, $\omega = 1.662$. Pleochroic scheme, X = colourless, Z = dirty green.

The specific gravity, refringence, and birefringence of the mineral indicate that it may be an intermediate member either of the dravite-schorlite or schorlite-elbaite series of tourmalines. Spectrographic examination of the arc spectrum of the mineral powder was kindly made for me by Dr. B. V. Raghavendra Rao of the Physics Department, Central College. This revealed the presence of the most persistent and easily reversible line of lithium at $\lambda 6707.86 \text{ \AA}$. The presence of lithium indicates that the tourmaline belongs to the schorlite-elbaite series; the specific gravity and optical characters conform to an isomorphous mixture