

LETTERS TO THE EDITOR

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ULTRA VIOLET BAND SPECTRUM OF HgBr

IN continuation of the work on HgCl bands,¹ the ultra-violet band systems of the homologous molecules, HgBr and HgI have been investigated under similar experimental conditions. The characteristic bands between $\lambda 2900$ and $\lambda 2650$, designated as the Class II system and suggested by Wieland² as belonging to the triatomic molecule HgBr₂, have been ascribed by the author to the diatomic molecule HgBr and a vibrational analysis has been obtained. The constants determined for the band heads of Hg²⁰²Br⁸¹ are

ω_c'	459.0 cm. ⁻¹	ν_c (mol)	34537.8 cm. ⁻¹
ω_c''	372.3 "	ν (atom)	4.92 volts
ω_c'/ω_c''	3.6 "	D'	1.81 "
ω_c'/ω_c''	3.8 "	D''	1.15 "

The assignment of the quantum numbers is confirmed by observations of the isotopic heads due to Hg²⁰²Br⁷⁹, for which the agreement between the observed and calculated positions is very close. The electronic transition giving rise to the band system is probably $^2\Sigma - ^2\Sigma$ with negligible spin doubling, the dissociation products being Hg(¹S) + Br(²P) and Hg(³P) + Br(²P) for the two electronic states. A full account of the work will be published shortly.

M. G. SASTRY.

Andhra University,
Waltair,
March 22, 1941.

CRYSTAL STRUCTURE OF COUMARIN

COUMARIN crystallises in the orthorhombic system with the axial ratio 0.9833 : 1 : 0.3696.¹ The dimensions of the unit cell obtained from measurements of a number of rotation photographs about the three crystallographic axes, using Cu K_{α} radiation, are 15.44, 7.92 and 5.66 Å. $a : 2b : c$ is in agreement with the axial ratio quoted above. In the rotation photographs, spots of the type hkl are present in all orders while okl is halved if k is odd and hko is halved if h is odd. The possible space-groups are therefore V_h'' and C_{2v}^5 , the former being a holohedral group and the latter a hemimorphic hemihedral one. Since coumarin exhibits hemimorphism about the b axis¹ it is to be concluded that C_{2v}^5 is the correct space-group.

Examination under a polarising microscope with convergent light reveals that the c axis is normal to the optic axial plane. The crystal is positive and the acute bisectrix is parallel to the b axis. This would mean that the vibration directions for the largest, mean and smallest refractive indices correspond to the a , c and b axes respectively.

The diamagnetic anisotropy of the crystal, determined for me by Dr. P. Nilakantan, is as follows:

$$(\chi_a - \chi_c)_M = 31.8 \times 10^{-6}, (\chi_a - \chi_b)_M = 109 \times 10^{-6}$$

$$\text{and } (\chi_c - \chi_b)_M = 79.0 \times 10^{-6}.$$

Hence the anisotropy in the ac plane is comparatively small and $\chi_b > \chi_c > \chi_a$.

¹ *Curr. Sci.*, 1941, 10, 669.

² *Helv. Acta Phys.*, 1929, 2, 46, 77.