in the presence of air in the steam is more than at lower concentrations.

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ROTATIONAL ANALYSIS OF SOME VISIBLE BANDS OF BiF MOLECULE

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THE visible (A-X) band system of BiF has been investigated in emission in high frequency discharge by Howell[1] and in absorption by Morgan.[2] Rao and Rao[3,4] have made rotational analysis of 9 bands, (0, 0), (0, 1), (1, 0), (0, 2); (0, 3), (2, 0), (1, 4), (2, 5) and (3, 3) of this system by photographing them in the second order of a 21 ft. concave grating spectrograph with a dispersion of 1·25 Å/mm. The present study of these bands was undertaken to determine more accurately the molecular constants of BiF by recording them under higher dispersion and resolution.

The bands were excited in a hollow cathode discharge. Exposures of six to eight hours on concave grating spectrograph with a dispersion of 0·33 A/mm. An enlargement of the (0, 0) Blue Rapid Plates were sufficient to record these bands in the second order of a 35 ft. band is shown in Fig. 1. An inspection of the rotational structure of the bands reveals the presence of only two branches, P and R, well resolved even for low J values.

Rotational analysis of fifteen bands (0, 0), (0, 1), (1, 0), (0, 2), (0, 3), (1, 2), (2, 1), (2, 2), (3, 3), (1, 4), (2, 5), (3, 6), (3, 7), (2, 6) and (4,7) have been made by fixing the absolute J numbering by the criterion suggested by Youngner and Winnans.[5] The combination differences for common level are correct to ± ·03 cm.$^{-3}$ The $\Delta_2F(J)/J + \frac{1}{2}$ plot is quite smooth upto low J values. Rotational constants for these bands are given in Table I.

TABLE I

Band assignment	B_v' (cm.$^{-1}$)	B_v'' (cm.$^{-1}$)	D_v' (cm.$^{-1}$) $\times 10^{-6}$	D_v'' (cm.$^{-1}$)	ν_0 (cm.$^{-1}$)
0, 0	0·2090	0·2295	0·25	0·27	22892·13
0, 1	0·2090	0·2279	0·25	0·22	22384·10
1, 0	0·2082	0·2295	0·25	0·27	23260·35
0, 2	0·2090	0·2264	0·25	0·17	21881·00
0, 3	0·2090	0·2247	0·25	0·18	21382·25
1, 2	0·2082	0·2264	0·25	0·17	22257·65
2, 1	0·2075	0·2279	0·26	0·22	23130·55
2, 2	0·2075	0·2264	0·26	0·17	22627·75
3, 3	0·2070	0·2247	0·26	0·17	22492·10
1, 4	0·2082	0·2233	0·25	0·17	21264·99
2, 5	0·2075	0·2217	0·26	0·18	21145·10
3, 6	0·2070	0·2206	0·26	0·18	21023·50
3, 7	0·2070	0·2191	0·26	0·18	20543·25
2, 6	0·2075	0·2203	0·26	0·18	20660·41
4, 7	0·2065	0·2191	0·26	0·18	20901·75

$r_e' = 2·150$ Å; $r_e'' = 2·050$ Å.

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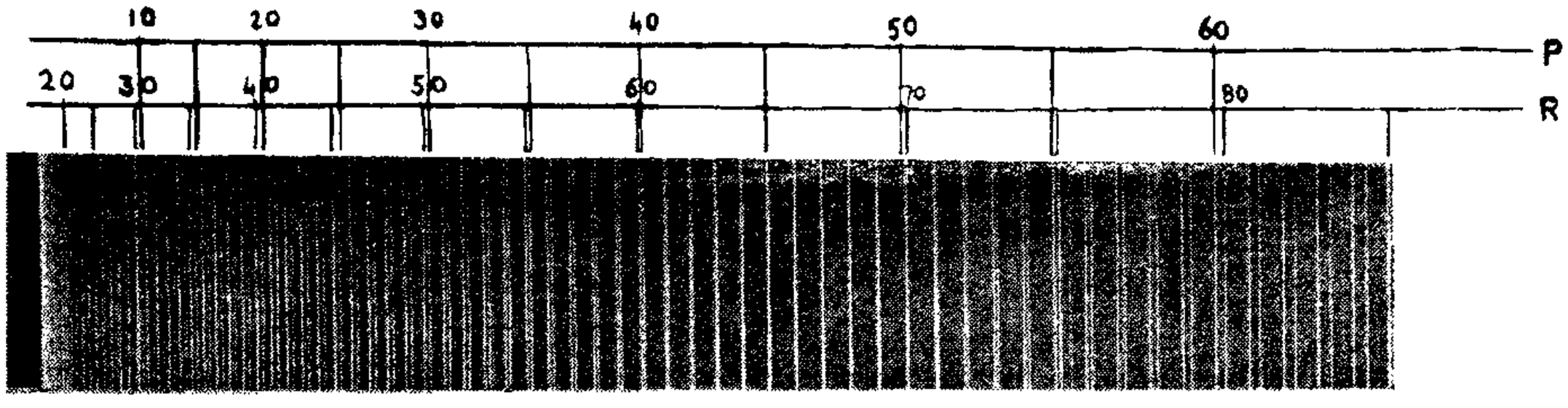

FIG. 1. Rotational structure of the 0, 0 band of the A–X system of BiF.

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SYNNEUSIS TWINNING IN PYROXENE

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THE Mid-Pennar Reservoir Project area (Long. 77° 20′ and 77° 25′; Lat. 14° 50′ and 14° 58′) in Anantapur District of Andhra Pradesh is traversed by dyke swarm cutting across granites, gneisses and amphibolites. A dyke near Ramapuram Temple has an exceptional width of about 200 feet. A small stream course running by the side of the temple cuts through the doletrite, laying bare for observation, the sharp and abrupt contact between the dyke and the granite. At the contact the dolerite shows chilled effects with variation in texture from extreme glassy type to increasing grain size inwards. Samples have been collected along a profile at regular intervals and detailed petrographic study has shown certain interesting results (Prasad and Chakrapani Naidu, 1966).[1] The significant feature revealed in this study, besides progressive increase in the grain size, is a general increase in the incidence of pyroxene twinning in contrast to the plagioclase twinning, from nearer the contacts of the dyke with the country rock towards the middle portion (Fig. 1).

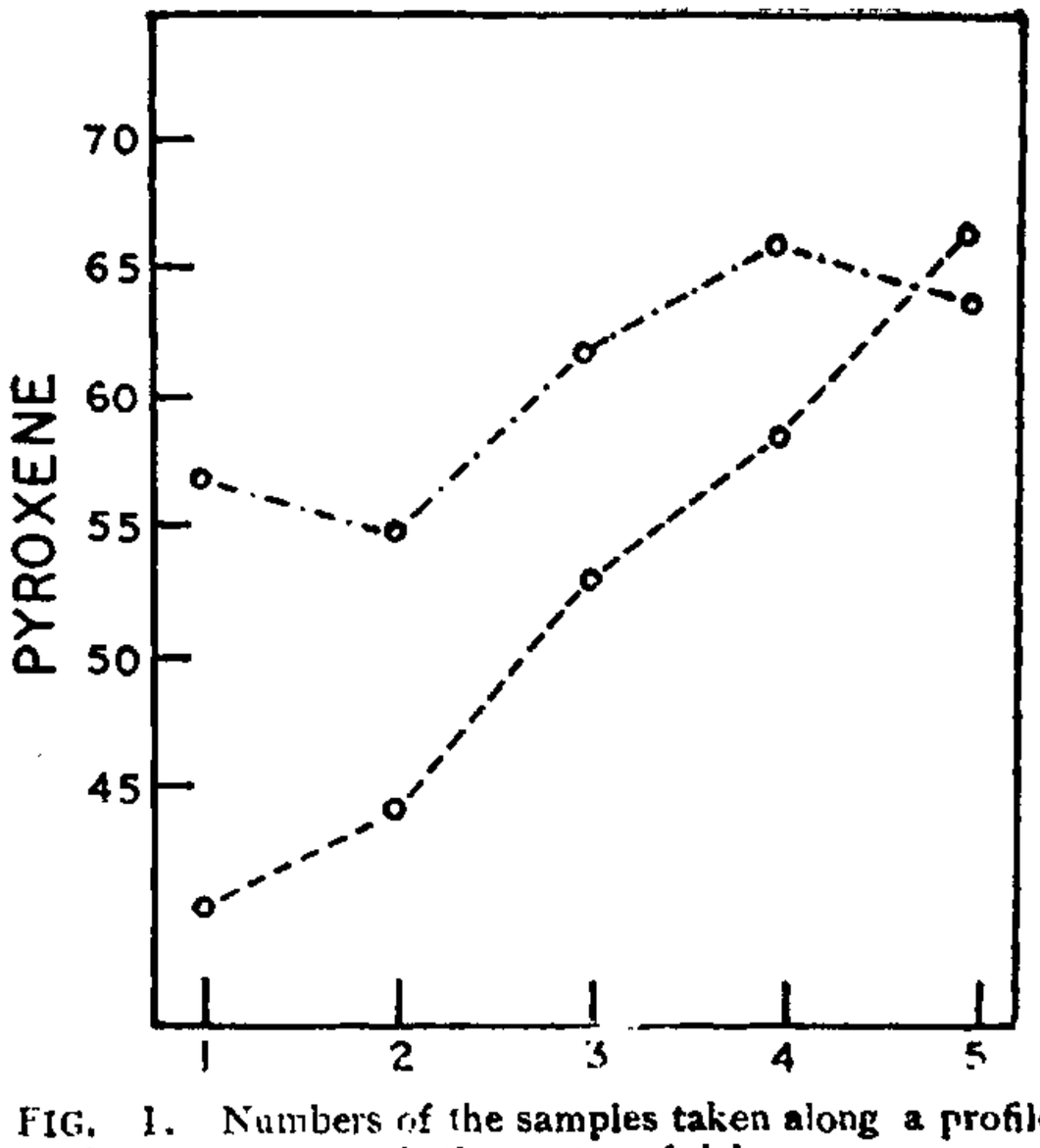

FIG. 1. Numbers of the samples taken along a profile from the contact towards the centre of dyke.
O— — —O Variation in the frequency of twinned pyroxene.
O—·—·—O Variation in the volume percentage of twinned pyroxene with respect to untwinned pyroxene.

The most striking and consistent feature in all the thin sections of the dyke examined is that the pyroxene twins occur in clusters (Fig. 2). They reveal the following characteristics:

1. There is no regular relation between the distribution of twin lamellæ and external morphological form.
2. They are associated with bending, twisting or fracturing of the crystal as is so common with secondary twinning.
3. The lamellæ are not regular and one or two lamellæ terminate abruptly within a crystal independently without showing any sysstematic distribution.