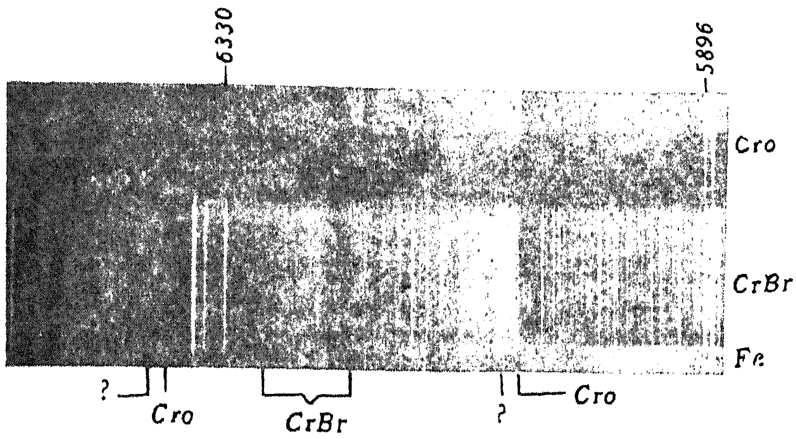

PLATE A

Chromium Bromide Bands—Glass Littrow

TABLE I

Catalogue of Cr Br Bands

Wave-length	Intensity	Wave-number	Regularities
6422·0	1	15567	
6469·4	1	15598	?
6399·8	1	15621	
6308·9	1	15846	
6301·4	2	15865	
6296·8	2	15877	
6292·8	1	15887	52
6289·8	1	15894	54
6280·7	2	15917	53
6275·4	2	15931	
6272·0	2	15940	
6267·0	2	15952	51
6251·8	1	15991	51
6247·2	1	16003	
6243·7	1	16017	
6238·1	2	16026	
6215·6	0	16084	
6211·8	1	16094	
6198·8	2	16128	
6136·8	1	16291	?

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Waltair, *July* 12, 1949.

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TOURMALINE FROM DEVARNARSIPUR, BHADRAVATI, MYSORE

IN studying an interesting type of Chlorite-Tourmaline rock from Devarnarsipur, Sri. M. G. C. Naidu has examined the Chlorite and identified it as Amesite.[1] The tourmaline of the rock mentioned as Schorlite, has now been taken for detailed study.

Under the microscope the tourmaline appears as long blades with criss-cross texture. Some rounded basal sections also occur. The colour is pale blue, and easily distinguished from the associated, pale-green, scaly amesite.

The following are the optical characters of the mineral:—

Negative Elongation

Absorption parallel to vertical cross wire
O>E

Optically Negative.

Birefringence, $\omega - \varepsilon = 0 \cdot 026$ (determined by Bereck's Compensator)

Indices of refraction $\varepsilon = 1 \cdot 630$ $\omega = 1 \cdot 655$

Distinct dichroism. X (E) = Colourless
Z (O) = Pale Blue.

The chemical composition was computed from the Variation diagram as given by Winchell.[2] This shows the tourmaline to be an isomorphous mixture of,

36 p.c. of Schorlite
$[H_8 Na_2 (Fe, Mn)_6 B_6 Al_{12} S_{12} O_{62}]$

64 p.c. of Dravite
$[H_8 Na_2 Mg_6 B_6 Al_{12} Si_{12} O_{62}]$

in the proportion of 4 : 7 approximately.

Giovanni D' Achiardi[3] has noted that the variation in the colour of tourmalines varies with axial ratio. For example, the lowest value of axial ratio, 0·441154, is for yellow-green tourmalines, and the highest value, 0·454079, is for the yellow-tourmalines. Since crystals with the rhombohedral terminations are not found in the tourmaline under study, it is not possible to calculate its axial ratio. Therefore its relation to the colour cannot be determined.

Guido Carobbi and Renzo Pieruccini[4] correlate the colour of tourmalines with the value of double refraction; as for example $\omega - \varepsilon = 0{\cdot}0200$ is associated with pink, 0·0204 with colourless, and 0·0220 with greenish-yellow tourmalines. Here the value is 0·0255 and according to Winchell, this is towards the green and the blue tourmalines.[5]

From the spectrographic study, they find that lithium and copper are present in almost all samples of tourmalines from the Island of Elba and that the latter is greater in quantity in the blue crystals. As regards the blue crystals from Elba, it is suggested that copper and lithium substitute for magnesium as an isomorphous substitute. It also stated that copper in minute traces is a common substitute for the isomorphous group Mg-Fe″ in the silicates of the rocks. It is therefore suggested that in the tourmaline under study, lithium and copper have substituted the Mg-Fe″ of a Ferro-Magnesium mineral.

Scharizer[6] and T. W. Warner[7] have attributed that the change in colour of tourmaline is mainly due to the presence of minor constituents. G. Carobbi and R. Pieruccini state that the blue colour of tourmaline is due to the presence of copper and particularly due to the strongly deforming action of Cu″.

The sample of the tourmaline under study was kindly analysed spectrographically by Dr. R. S. Krishnan, Department of Physics, Indian Institute of Science, Bangalore, and showed the following elements:

B, Si, Al, Fe, Mg, Cu, K, Na, & Li.

Winchell classifies the tourmaline series into Dravite-Schorlite and Schorlite-Elbaite series, the distinction between the two series being based on the presence of lithium in the Schorlite-Elbaite series and the absence of it in the Dravite-Schorlite series. Accordingly Dr. C. S. Pichamuthu[8] describes a tourmaline from Yenneholeranganbetta as belonging to the Schorlite-Elbaite series. In regard to colour, Winchell distinguishes the Dravite-Schorlite series as being brown, less commonly blue or green to black; and Schorlite-Elbaite series as black to delicate tints of pink, green or yellow.

Since according to the analysis of Dr. Krishnan, a persistent line of lithium has been indicated at λ6708Å the tourmaline of Devarnarsipur must be regarded after Winchell as belonging to the Schorlite-Elbaite series. But on the basis of the scheme of colour given by him, it should be put into the Dravite-Schorlite series. In view of the fact that T. W. Warner and G. Carobbi have now recently shown that lithium is present in all tourmalines and cannot therefore be a distinguishing criterion for classification, it is obvious that on the basis of the colour scheme the Devarnarsipur tourmaline should be placed in the Dravite-Schorlite series. This view is also in accordance with the fact that the copper is replacing the Mg-Fe″ of the mineral and gives the blue colour associated with the Dravite-Schorlite series.

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CHEMISTRY OF SUGARCANE JUICE IN RELATION TO MANUFACTURING QUALITIES—A STUDY WITH SPECIAL REFERENCE TO THE OPEN PAN INDUSTRY

THE important bearing of non-sugars on the manufacturing qualities of sugarcane juices is familiar in vacuum pan practice. Kortscher[1] discusses the injurious effects of various organic non-sugars in the colloidal state and Alvarez[2] connects superior factory quality with smaller amounts of gums and albuminoids. The so-called "harmful" nitrogen compounds[3], comprising amino acids, organic bases etc., are commonly regarded as very undesirable. Various evil effects are also attributed to different mineral constituents, such as Silica, iron, alumina and magnesia [2,4]. Gomez and Boon[5] mention the existence of silica in the form of soluble sili-