

this line to inter-molecular oscillations of polymerised groups of molecules in the solid. In a note⁶ to *Current Science*, I have shown that this frequency-shift agrees approximately with the Lindemann frequency as well as with the Pauling rotational frequency of solid CO₂. I was thus led to conclude that the new line observed by Sirkar arises from coherent rotational oscillations of molecules in the crystal lattice. This point of view has been fully supported by later theoretical and experimental researches on the subject by several authors.

In the present note, the following frequencies, duly corrected for low temperatures, are adopted for the calculation of specific heat of carbon dioxide: 668, 1,336 and 2,350 cm.⁻¹ for internal frequencies and 63 cm.⁻¹ for rotational frequency and 122, 61.5 and 32 cm.⁻¹ for the first, second and third order lattice translational frequencies. The specific heat, C_v at any temperature T° K. is represented by the relation,

$$C_v = 1/3E \left(\frac{958}{T} \right) + 1/3E \left(\frac{1915}{T} \right) + 2/3E \left(\frac{2370}{T} \right) + 8/3 \cdot 1/3E \left(\frac{93}{T} \right) + 3/4 \cdot E \left(\frac{180}{T} \right) + \frac{7}{4 \times 8} E \left(\frac{90}{T} \right) + \frac{7}{4 \cdot 8 \cdot 8} E \left(\frac{45}{T} \right).$$

TABLE I

T°K	C _v Raman Theory	C _p Observ.	C _v Observ.	C _p B & Z
15	0.52	.54	.54	.52
20	1.286	1.23	1.23	1.16
30	3.067	3.08	3.08	2.95
40	4.624	4.69	4.65	4.70
50	5.824	6.10	5.88	6.11
60	6.715	7.18	6.82	7.17
70	7.437	7.97	7.48	7.98
80	7.866	8.58	7.77	8.61
90	8.237	9.11	8.29	9.12
100	8.541	9.53	8.53	9.54

The experimental value of C_v is computed from the data for C_p and the melting point of CO₂. The values of temperature, C_v (calculated), C_p (observed) and C_v (observed) are given in columns 1 to 4 of Table I. Column 5 gives the values of C_p calculated by Brucksch and Ziegler⁷ on the basis of the theoretical views of Andrews and Lord for comparison. The excellent agreement between the experimental values of specific heat and those calculated according to Raman's theory shows that the latter is applicable to molecular compounds as well.

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ABSORPTION SPECTRA OF ORTHO-DICHLOROBENZENE

A CAREFUL study of the ultra-violet absorption spectra of *o*-dichlorobenzene has been made using a very simple method of developing the absorption bands. A hydrogen discharge tube was used as the ultra-violet source and the vapour was contained in a tube 20 cm. long and 2.5 cm. in diameter with plane quartz windows at both ends. Twelve absorption bands have been obtained at the optimum condition corresponding to 14 mm. mercury pressure and a temperature of 24° C.

The following are the wavelengths and wave-numbers of the band heads:—

No. of bands	λ in A° (in air)	ν per cm. ⁻¹ (in vacuum)
1	2,799.1	35,716.5
2	2,794.2	35,779.1
3	2,774.1	36,038.4
4	2,767.3	36,126.9
5	2,762.6	36,187.1
6	2,757.5	36,254.0
7	2,751.6	36,293.5
8	2,713.3	36,844.5
9	2,708.2	36,913.9
10	2,684.9	37,234.2
11	2,680.0	37,302.3
12	2,596.1	38,507.8

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AN ORTHOPYROXENE FROM DODKANYA, MYSORE

AN orthopyroxene occurs in large grains, sometimes 1 cm. in length, in a norite of the gneissic complex of Dodkanya bordering the Ultra-basic intrusives of the area. Mr. B. Rama Rao, Director of Geology, Mysore Geological Department, has had this mineral analysed in connection with his memoir on "Charnockites", which he is now writing. The analysis is herein reproduced with his kind permission.

The orthopyroxene is striated on the (100) and pyramidal faces, and, under crossed nicols, shows, occasionally, minute lamellæ, crossing the prismatic cleavages on pyramidal faces. The lamellæ are localised in certain areas of the same plate. The mineral plates show strain shadows. When tilted on the Universal Stage, the lamellæ on the pyramidal faces disappear towards (010) and (001) faces, but become sharp on the (100) face with alternating dark and bright bands. They give an extinction angle of ± 6° on pyramidal faces, which are cut near (010—100) zone, and ± 3° on the same faces, when tilted to the (100) position. The very minute lamellæ are, therefore, slightly variable in chemical composition. The mineral contains plenty of inclusions of plagioclase, which develop radial pressure cracks in the orthopyroxene host; and