PART II

CHAPTER 4

EXPERIMENTAL OBSERVATIONS

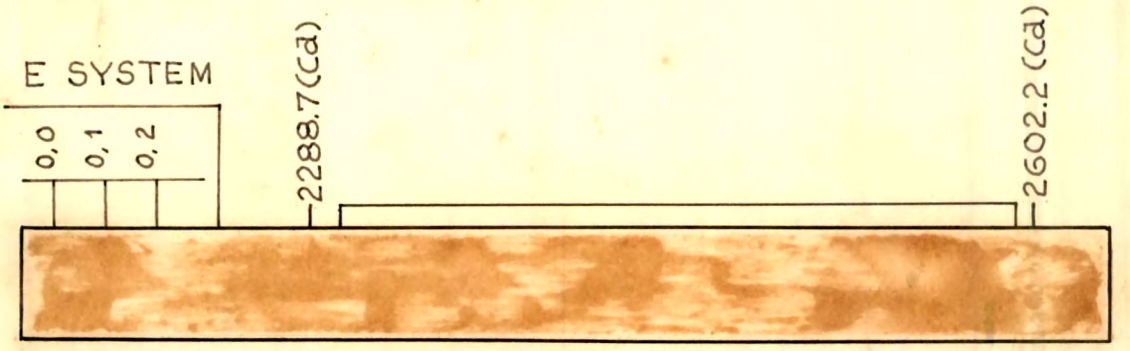
In order to obtain better definations of the spectra and hence better results it is necessary to maintain certain characteristic conditions of discharge for the halides of cadmium. In all the cases, the pure sample was placed in a quartz boat kept at the centre of the quartz tube. One end of the tube had an adaptor whereas a quartz window was fixed on the other end. The pressure in the tube was reduced by joining the tube with high vacuum rotary pump via the adaptor. It was maintained constant to a few microns of mercury for the duration of exposure. Now the two ring electrodes were wrapped on the tube and were kept at such a distance so as to obtain the maximum

brilliance of the discharge. The frequency range used for the discharge was 10 - 15 MC./sec. As remarked earlier, in the case of cadmium chloride and cadmium bromide, the discharge was maintained bright white in colour by manipulating the degree of heating of the substance. An etna burner was found to be vary suitable for the purpose of heating the space between and beyond the electrodes externally. In the case of cadmium iodide, the colour of the discharge was golden yellow. This was also maintained by following the procedure just described above. In all these cases Ilford Process plates were used to record the different spectra and exposures of about 30 to 40 minutes were found to be adequate in getting fairly good plates. The various observations obtained during the present investigation will now be given separately for (A) cadmium chloride, (B) cadmium bromide and (C) cadmium iodide.

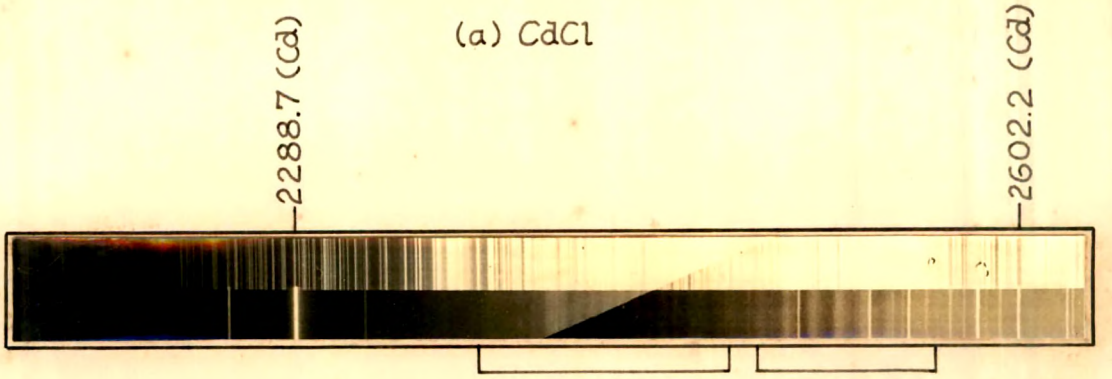
(A) CADMIUM CHLORIDE

In the ultra-violet region in addition to the Cornell's system, a continuum has been observed extending between $\lambda\lambda$ 2400-2650 A.U. with an intensity

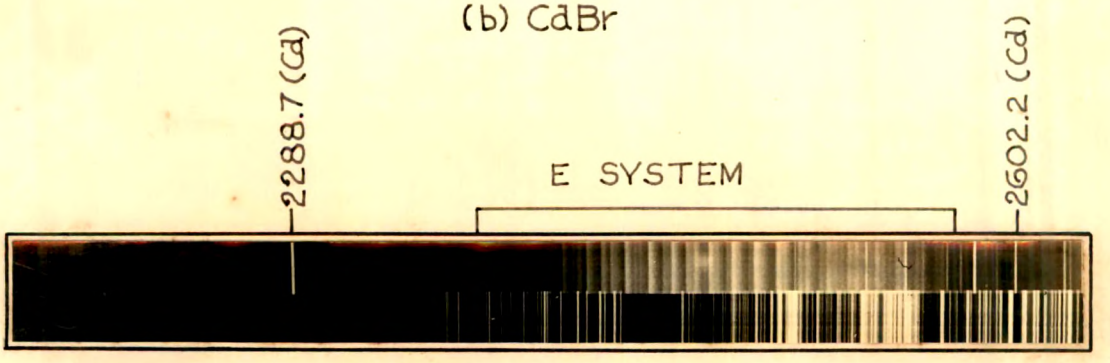
maximum at about λ2580 A.U. Inspite of the long duration of exposures the attempts to observe C and D systems were not fruitful, mainly because of overlapping of OH bands. These bands existed due to the fact that the sample contained some water molecules. Several unsuccessful attempts were made to remove these bands by altering the degree of heating of the space between and beyond the electrodes. The reproduction of the Cornell's system along with a continuum is given in plate 1(a); and the position of C and D systems in the region λλ2983-3174 A.U. is indicated in plate 2(a). The spectrum in the visible region extending from λλ3700-4900 A.U. has been reproduced in plates (3a) and (4) recorded on the medium quartz and E_2 - Glass spectrographs respectively. The reproduction in the plate (3a) indicates the nature of the bands and their extent. The bands are clearly degraded to red and those on the longer wavelength side have sharp edges and are diffuse and broad towards the shorter wavelength side. The bands in the region λλ3600-4000 A.U. are faint, but the partial resolution in the structure can be seen. In table (4) wave number and visually estimated values of the intensities of the bands are given. In column (5) the wave numbers of the bands



(a) CdCl



(b) CdBr



(c) CdI

PLATE 1

BAND SPECTRA OF CdCl, CdBr AND CdI RESP. TAKEN WITH M. Q. SPECTROGRAPH.

E-SYSTEM.

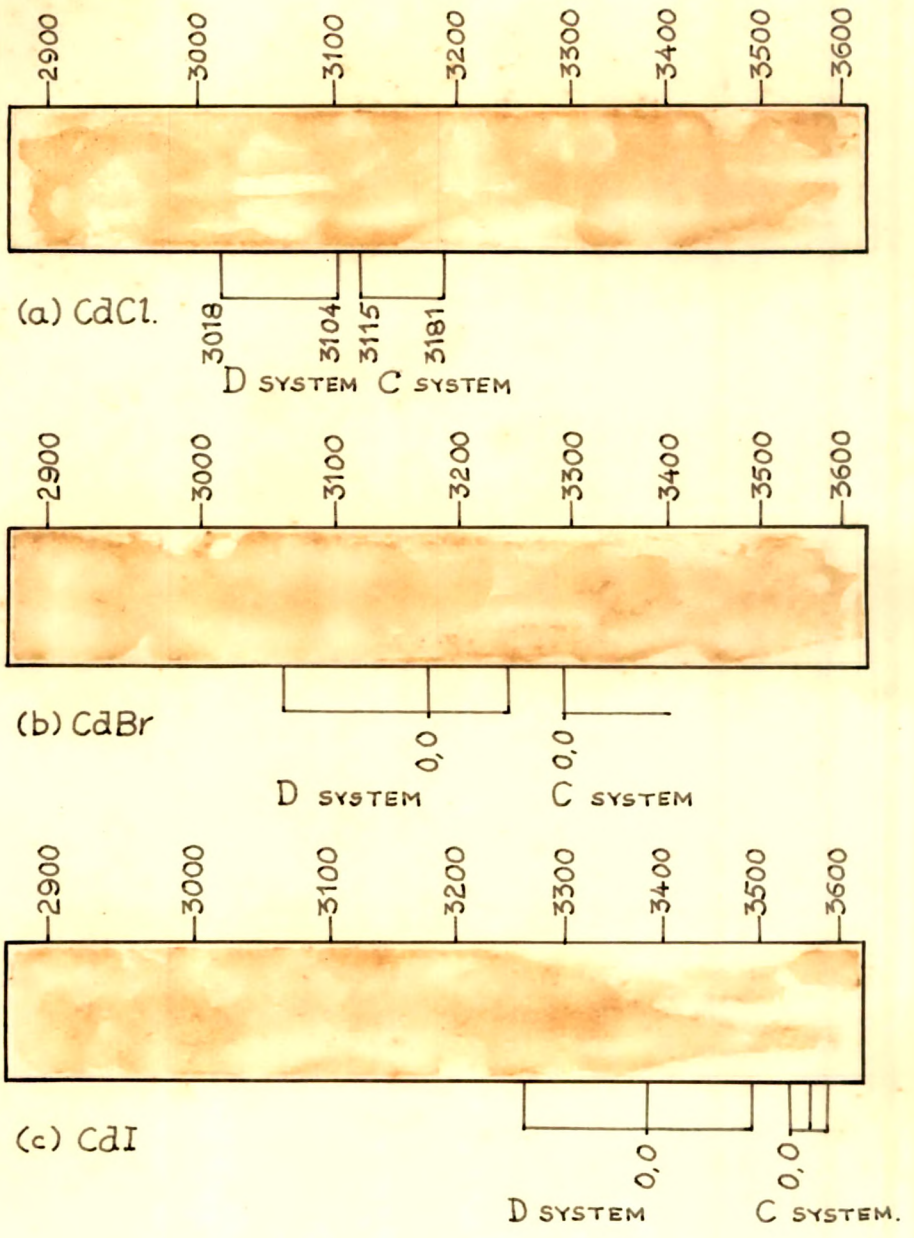


PLATE 2

BAND SPECTRA OF CdCl, CdBr AND CdI RESP. TAKEN WITH M. Q. SPECTROGRAPH.

C AND D SYSTEMS.

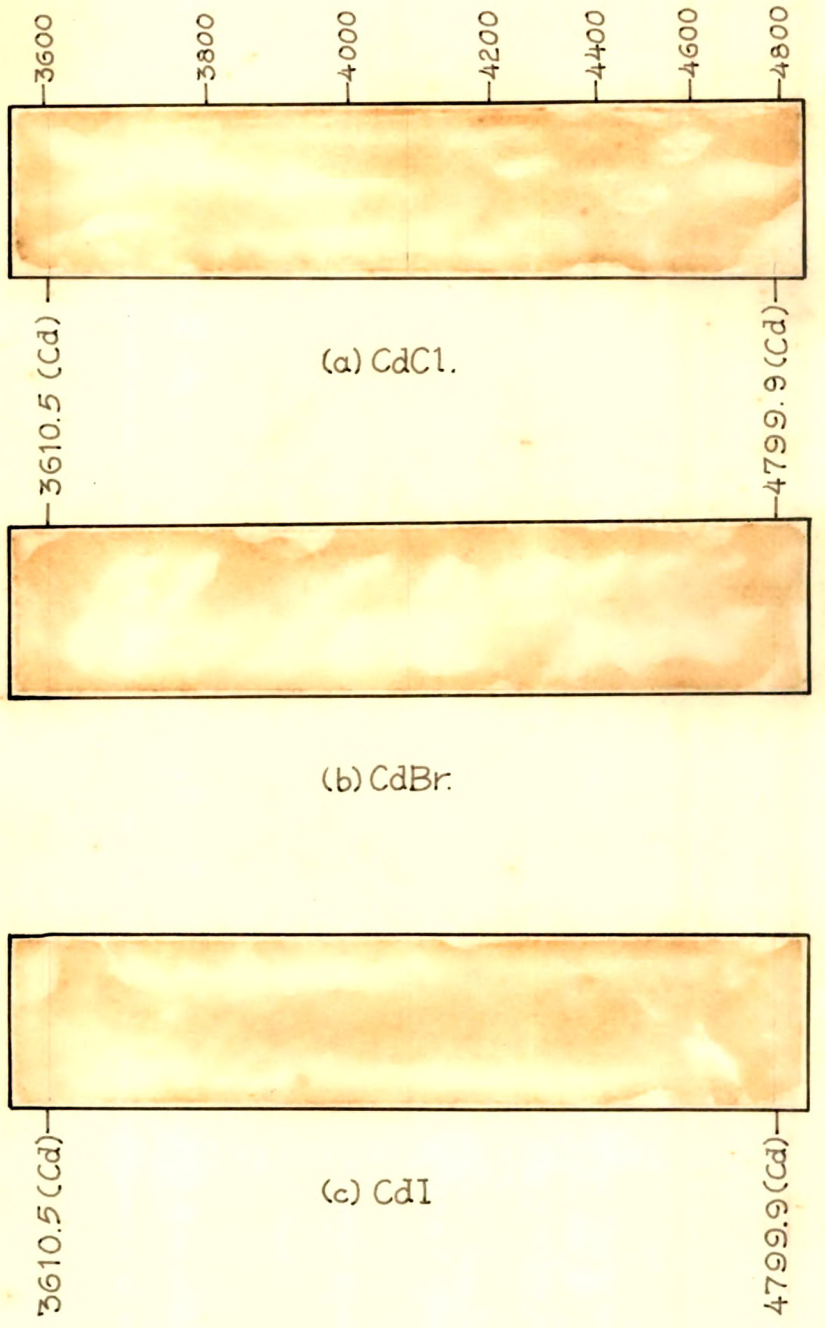


PLATE 3

BAND SPECTRA OF CdCl, CdBr AND CdI RESP.
TAKEN WITH HILGER M. Q. SPECTROGRAPH.
B-SYSTEMS.

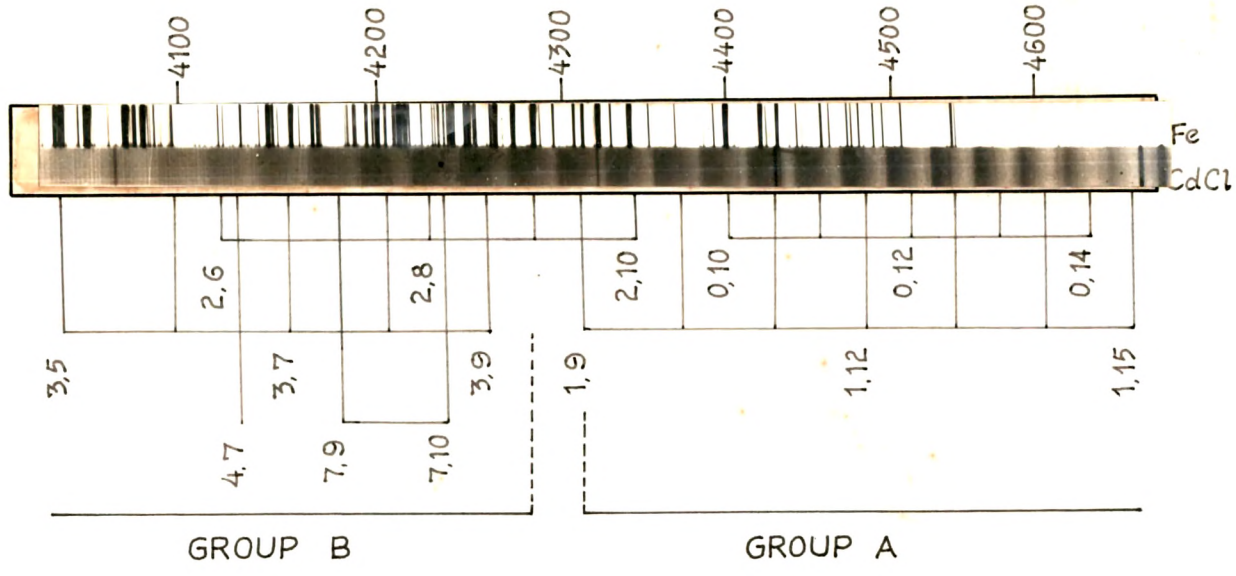


PLATE 4

BAND SPECTRUM OF CdCl TAKEN WITH A E_2 GLASS-SPECTROGRAPH.

B - SYSTEM.

reported by Ramasastry are given for the sake of comparision. The classification of the bands is given in column (4). The vibrational scheme is partially shown in table (5).

The spectrum in the region λλ5050-6500 A.U. is reproduced in plate (5). The bands are clearly degraded to red but are diffuse in nature. Due to this type of nature of the bands it was difficult to make accurate measurements. In table (6) the wave numbers and visually estimated intensities of the bands are given. A tentative arrangement showing the regularity of intervals is presented in table (7). A detailed analysis of all these observations is presented in the next chapter.

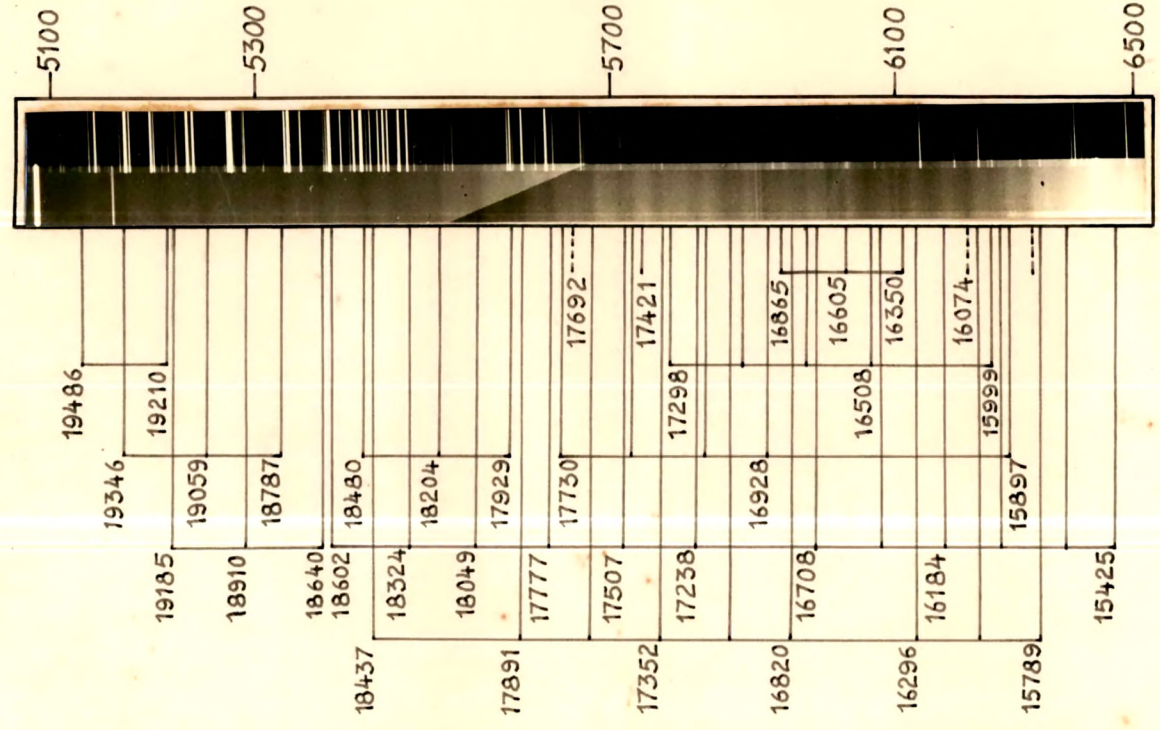


PLATE 5

BAND SPECTRUM OF CdCl TAKEN WITH E_2 GLASS-SPECTROGRAPH.

A - SYSTEM.

TABLE 4

BAND HEADS OF B - SYSTEM OF CdCl IN THE REGION λλ3700 - 4870 A.U.

Intensity.	Wavelength in A. U.	Wave Number in vacuum cm^{-1}	v',v"	Approximate value observed by Ramasastry.
1	4867.90	20537	1,18	-
1	4834.70	20678	0,17	-
1	4801.28	20822	1,17	-
1	4768.07	20967	0,16	20959
2	4735.32	21112	1,16	21112
0	4725.70	21155	6,18	-
2	4702.80	21258	0,15	-
1	4693.75	21299	11,19	-
2	4670.72	21404	1,15	-
1	4662.66	21441	6,17	-
4	4638.64	21552	0,14	21554
2	4631.34	21586	11,18	-
5	4607.22	21699	1,14	21706
3	4600.44	21731	6,16	-
6	4575.80	21848	0,13	-
3	4570.15	21875	11,17	21866

TABLE 4. (Contd.)

Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	v',v''	Approximate value observed by Ramasastry.
7	4545.22	21995	1,13	22008
2	4539.64	22022	6,15	-
10	4514.02	22147	0,12	22145
2	4510.97	22162	11,16	-
10	4484.26	22294	1,12	22298
1	4479.83	22316	6,14	-
9	4453.89	22446	0,11	22440
1	4452.50	22453	11,15	-
9	4424.72	22594	1,11	22588
0	4421.58	22610	6,13	-
8	4394.57	22749	0,10	22744
8	4366.35	22896	1,10	22888
8	4340.00	23035	2,10	23044
6	4335.86	23057	0,9	-
7	4315.46	23166	3,10	23125
7	4308.58	23203	1,9	-
2	4292.10	23292	4,10	-

TABLE 4. (Contd.)

Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}.	v',v"	Approximate value observed by Ramasastry.
7	4288.43	23312	7,11	-
7	4283.29	23340	2,9	-
3	4278.35	23367	0,8	-
6	4259.20	23472	3,9	-
7	4251.95	23512	1,8	-
4	4237.00	23595	4,9	-
7	4233.41	23615	7,10	23617
5	4226.96	23651	2,8	-
2	4215.91	23713	5,9	23729
5	4203.68	23782	3,8	-
5	4196.62	23822	1,7	-
4	4181.88	23906	4,8	-
6	4178.90	23923	7,9	23940
2	4172.27	23961	2,7	-
3	4166.89	23992	0,6	-
4	4149.42	24093	3,7	24078
4	4128.51	24215	4,7	24200
4	4125.79	24231	7,8	-

TABLE 4. (Contd.)

Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	v',v''	Approximate value observed by Ramasastry.
3	4118.65	24273	2,6	-
2	4113.05	24306	0,5	-
3	4108.83	24331	5,7	24360
2	4096.37	24405	3,6	-
2	4075.66	24529	4,6	24497
2	4073.83	24540	7,7	-
1	4065.55	24590	2,5	-
3	4058.12	24635	8,7	24636
2	4056.31	24646	5,6	-
1	4043.68	24723	3,5	-
3	4031.61	24797	10,7	-
1	4023.82	24845	4,5	-
2	4022,53	24853	7,6	-
2	4006.89	24950	8,6	-
1	4005.12	24961	5,5	-
2	3987.71	25070	6,5	-
-	+3982.62	25102	10,6	-
-	+3957.08	25264	8,5	-

TABLE 4. (Contd.)

Intensity	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	v',v"	Approximate value observed by Ramasastry.
-	+3937.91	25387	6,4	-
-	+3908.20	25580	8,4	-
-	+3888.74	25708	6,3	-
-	+3825.64	26132	7,2	-
-	+3788.24	26390	10,2	-
-	+3778.65	26457	7,1	-
-	+3742.15	26715	10,1	-
-	+3732.37	26785	7,0	-
-	+3719.32	26879	8,0	-
-	+3707.46	26965	9,0	-
-	+3696.76	27043	10,0	-

+ Measurements made on the plate taken with a medium quartz spectrograph.

TABLE 5

VIBRATIONAL SCHEME FOR B - SYSTEM OF CdCl

v' \ v''	5	6	7	8	9	10	11	12
0	(314) 24306(2)	23992(3)	-	(310) 23367(3) (145)	(308) 23057(6) (146)	(303) 22749(8) (147)	(299) 22446(9) (148)	22147(10) (147)
1	-	-	(310) 23822(5) (139)	(309) 23512(7) (139)	(307) 23203(7) (137)	(302) 22896(8) (139)	(300) 22594(9)	22294(10)
2	(317) 24590(1) (133)	(312) 24273(3) (132)	(310) 23961(2) (132)	(311) 23651(5) (131)	(305) 23340(7) (132)	23035(8) (131)	-	-
3	(318) 24723(1) (122)	(312) 24405(2) (124)	(311) 24093(4) (122)	(310) 23782(5) (124)	(306) 23472(6) (123)	23166(7) (126)	-	-
4	(316) 24845(1)	(314) 24529(2)	(309) 24215(4)	(311) 23906(4)	(303) 23595(4)	23292(2)		

TABLE 5. (Contd.)

v' \ v"	12	13	14	15	16	17	18
0	(299) 22147(10)	(296) 21848(6)	(294) 21552(4)	(291) 21258(2)	(289) 20967(1)	20678(1)	-
	(147)	(147)	(147)	(146)	(145)	(144)	
1	(299) 22294(10)	(296) 21995(7)	(295) 21699(5)	(292) 21404(2)	(290) 21112(2)	(285) 20822(1)	20537(1)

TABLE 6

BAND HEADS OF A - SYSTEM OF CdCl IN THE REGION λλ5050 - 6500 A.U.

Intensity	Wavelength in A.U.	Wave Number in vacuum cm^{-1}.	Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}.
10	6481.19	15425	7	5962.80	16766
10	6377.83	15675	3	5943.66	16820
9	6331.78	15789	6	5927.80	16865
9	*6320.17	15818	6	5905.74	16928
8	6288.76	15897	8	5870.37	17030
8	6276.13	15929	6	5851.81	17084
3	6248.67	15999	7	5814.71	17193
7	6232.30	16041	8	5799.53	17238
8	*6219.51	16074	7	5779.42	17298
7	6177.24	16184	8	5761.43	17352
5	6134.78	16296	9	*5738.61	17421
7	6114.52	16350	10	5725.79	17460
6	6079.57	16444	4	5710.42	17507
6	6055.99	16508	8	5673.48	17621
7	6020.62	16605	5	*5650.70	17692
6	5983.00	16708	5	5638.59	17730

TABLE 6. (Contd.)

Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}
5	5623.69	17777	1	5130.46	19486
4	5587.86	17891	1	5096.98	19614
2	5576.01	17929	1	5065.99	19734
3	5538.94	18049			
3	5491.78	18204			
2	5455.81	18324			
3	5422.37	18437			
2	5409.76	18480			
3	5374.28	18602			
2	5363.32	18640			
2	5321.35	18787			
2	5286.74	18910			
2	5245.41	19059			
2	5210.96	19185			
2	5204.18	19210			
1	5167.59	19346			

* These bands are not fitting in Table (7).

TABLE 7.

VIBRATIONAL SCHEME FOR A - SYSTEM OF CdCl

v' \ v"	v" + 0	v" + 1	v" + 2	v" + 3	v" + 4	v" + 5	v" + 6	v" + 7
0	19486(1)	(276) 19210(2)	-	-	-	-	-	-
	- (128) (-)	- (136) (-)	-	-	-	-	-	-
1	19614(1) (1134)	(268) 19346(1) (1142)	(287) 19059(2) (1130)	(272) 18787(2)	-	-	-	-
	18480(2)	(276) 18204(3)	(275) 17929(2)	-	-	-	-	-
	(120) (122)	(-) (120)	(126) (120)	(123) (-)	(-) (-)			
2	19734(1) (1132)	-	19185(2) (1136)	(275) 18910(2) (1133)	(270) 18640(2) (1133)			
	18602(3)	(278) 18324(2)	(275) 18049(3)	(272) 17777(5)	(270) 17507(4)	(269) 17238(8)	-	16708(6)
		(-) (113)		(-) (114)	(-) (114)	(-) (114)		(-) (112)
3	-	18437(3)	-	(270) 17891(4)	(269) 17621(8)	(268) 17352(8)	(264) 17084(6)	16820(3)

TABLE 7 (Contd.)

v'	v''	v'' + 5	v'' + 6	v'' + 7	v'' + 8	v'' + 9	v'' + 10	v'' + 11	v'' + 12
2		17238(8) (114)	-	(264) 16708(6) (112)	(260) 16444(6)	(255) 16184(7) (112)	(254) 15929(8) (112)	(250) 15675(10) (114)	15425(10)
3		(268) 17352(8) (108)	(264) 17084(6) (109)	16820(3) (108)	-	(255) 16296(5)	(252) 16041(7)	15789(9) (108)	-
4		(267) 17460(10)	17193(7) (105)	(265) 16928(6) (102)	-	-	-	15897(8)	-
5		-	(268) 17298(7)	(264) 17030(8)	(258) 16766(7) (99)	16508(6) (97)	-	15999(3)	-
6		-	-	-	(260) 16865(6)	(255) 16605(7)	16350(7)		

(B) CADMIUM BROMIDE

The work of the previous authors on the band spectra of this molecule is already briefly reported in chapter (2). In the present investigation the spectroscopic study was confined to the ultra-violet and visible regions.

In addition to the known systems C and D about thirty-seven new bands have been observed by the present author in the ultra-violet region $\lambda\lambda$2350-2550 A.U. The characteristics of the bands are as follows:

(1) degradation towards red,

(2) diffuse appearance

and (3) decreasing spacing of bands giving rise to various progressions.

On the longer wavelength side of these bands nearly thirteen bands also degraded to red are observed. These bands have been reproduced in plate (6a). Due to the diffuse nature of the bands, an exact analysis was not possible. However, it should be noted that there is regularity of intervals in both of the above groups of bands as shown in tables (9) and (10) whereas in

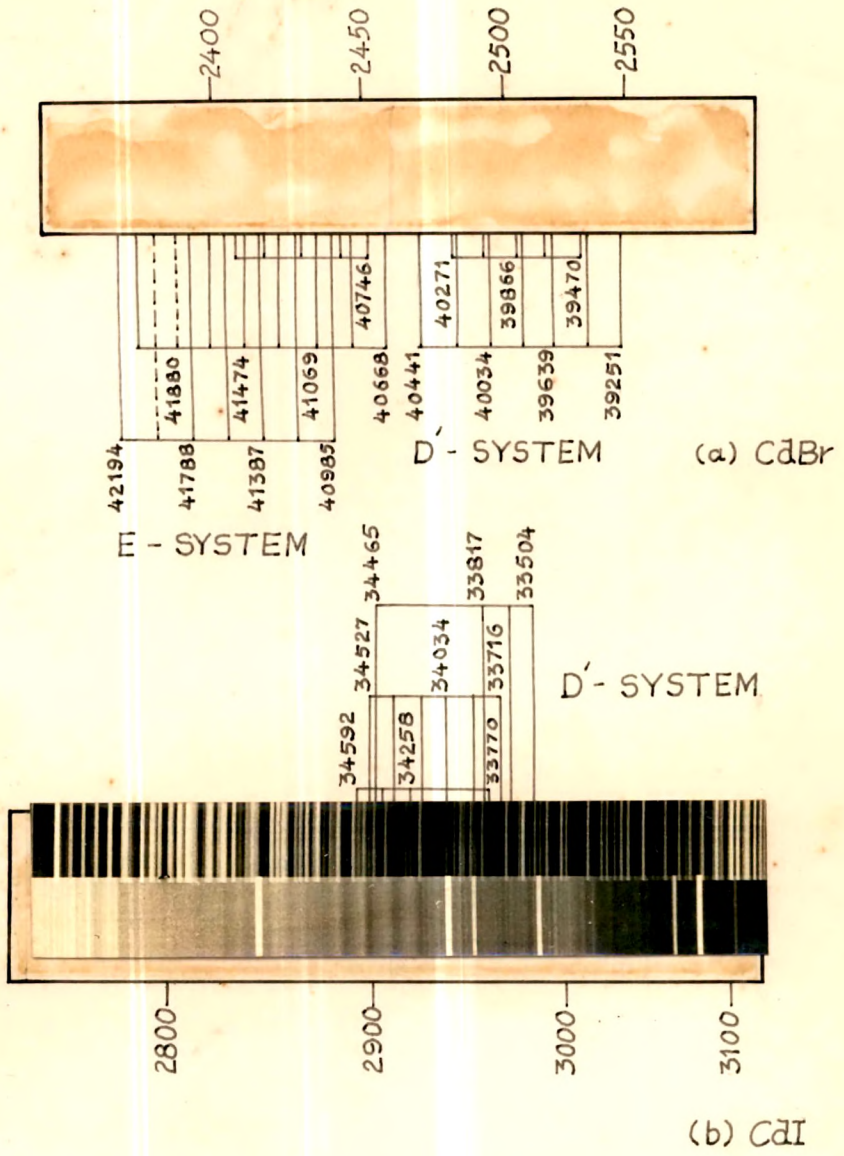


PLATE 6

BAND SPECTRA OF CdBr AND CdI RESP.
TAKEN WITH HILGER M. Q. SPECTROGRAPH.
D´ AND E SYSTEMS.

table (8) are given the measured wavelengths, wave numbers in vacuum and the visually estimated values of intensities of the bands.

In the C system six additional bands observed during the present investigation are shown in plate (2b). In table (11) are presented their measured wavelengths of the new bands marked with *whereas their vibrational scheme is given in table (12).

The spectra in the visible region λλ3900-4900 A.U. recorded on Hilger medium quartz and E_2 glass spectrographs respectively are reproduced in the plates (3b) and (7). A careful study of the plates reveals the following :

(1) Degradation of the bands towards red,

(2) Sharp edges of the bands on the longer wavelength side,

(3) Diffuseness and broadening towards the shorter wavelength side.

and (4) Sharp double headed bands in the region λλ4400-4800 A.U.

The bands described in (4) are reproduced with

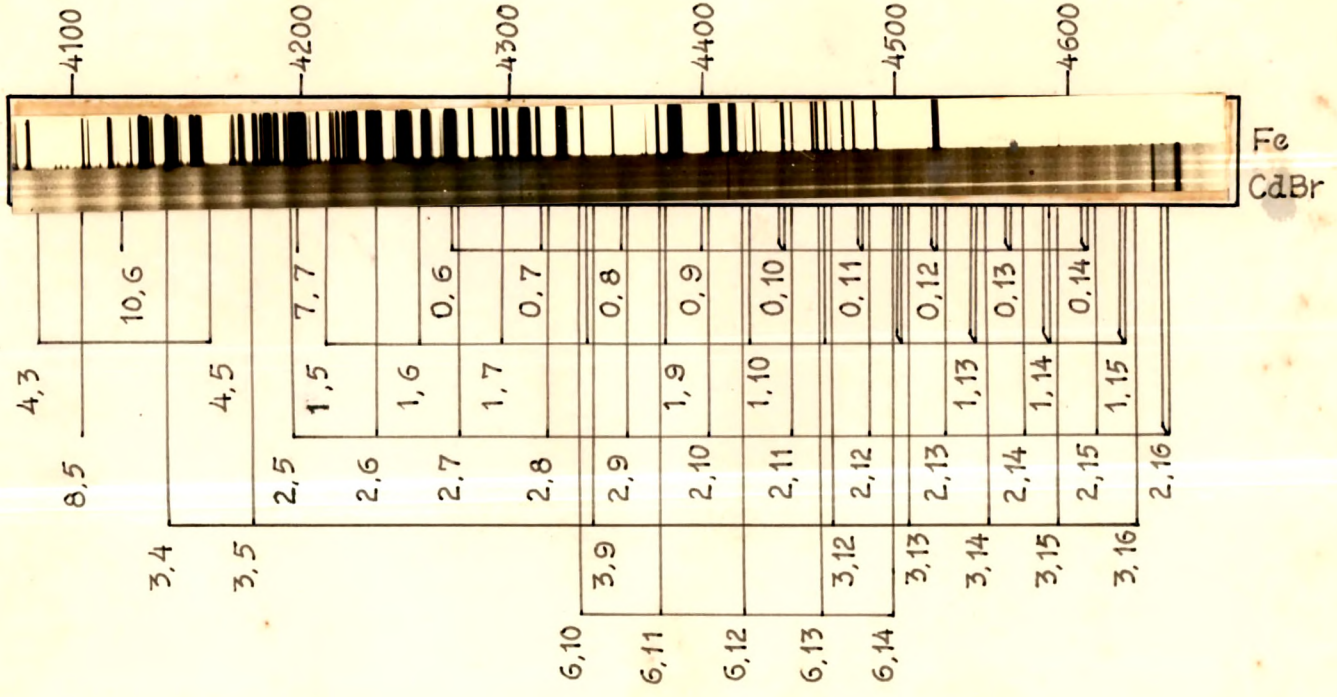


PLATE 7

BAND SPECTRUM OF CdBr TAKEN WITH E_2 GLASS-SPECTROGRAPH.

B-SYSTEM.

slightly more magnification in plate (8). In table (13), wavelengths, wave numbers in vacuum and visually estimated values of the intensities of the bands are given. In the last column, the wave numbers of the bands, reported by Ramasastry are given for the sake of comparision. The classification of the bands is given in column (4). The vibrational scheme for this system of bands is partly given in table (14). The calculated values along with the observed isotopic shifts for about ten bands have been given in table (15).

The spectrum in the region λλ5100-6500 A.U. is reproduced in plate (9). The bands are clearly degraded to longer wavelength side but are diffuse in nature. Two groups of bands appear to lie on a continuum having their intensity maxima at 5750 A.U. and 6450 A.U. respectively. Due to the diffuse nature of the bands, utmost care was taken for their measurements and best averages of the several measurements are recorded in table (16) along with their visually estimated values of intensities. An arrangement showing regularity of intervals is presented in table (17).

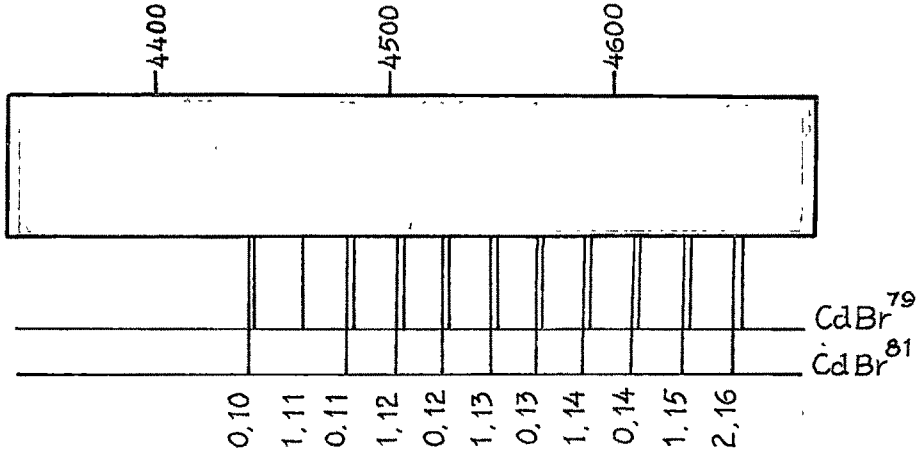


PLATE 8

BAND SPECTRUM OF CdBr TAKEN WITH A E_2 GLASS-SPECTROGRAPH.

B - SYSTEM. (ISOTOPIC EFFECT)

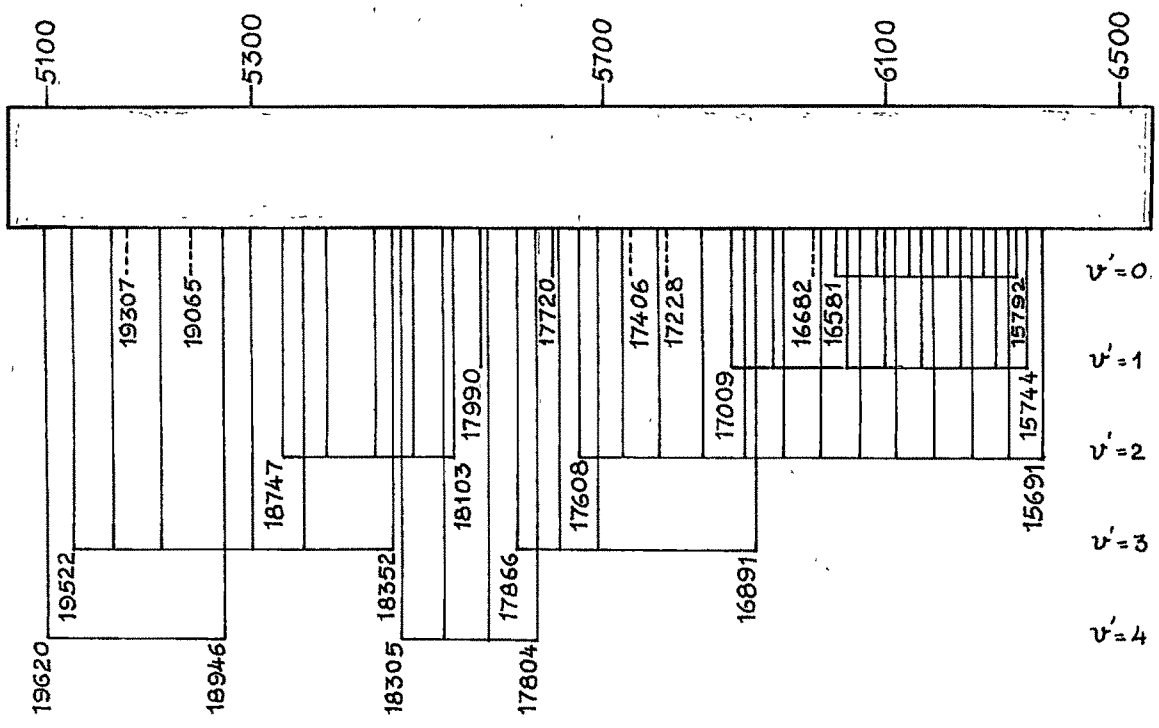


PLATE 9

BAND SPECTRUM OF CdBr TAKEN WITH E_2 GLASS - SPECTROGRAPH.

A - SYSTEM.

TABLE 8.

BAND HEADS OF D' AND E SYSTEMS OF CdBr IN THE REGION λ2350-2550 A.U.

Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	Intensity.	Wavelength in A.U.	Wave Number In vacuum cm^{-1}
1	2546.94	39251	6	2439.18	40985
3	2534.48	38444	5	2434.20	41069
2	2532.81	39470	5	2429.10	41155
4	2522.01	39639	5	2427.33	41185
4	2520.23	39667	4	2422.27	41271
5	2511.24	39809	3	2417.64	41350
8	2509.66	39834	4	2415.48	41387
8	2507.65	39866	3	2410.42	41474
7	2497.12	40034	3	2405.60	41557
7	2495.01	40068	3	2403.58	41592
7	2484.52	40237	3	2398.50	41680
7	2482.43	40271	2	2392.31	41788
6	2471.99	40441	3	2387.05	41880
6	2458.20	40668	2	2380.91	41988
6	2453.49	40746	2	2375.42	42085
6	2446.16	40868	1	2369.28	42194
6	2441.38	40948	1	*2365.08	42269

TABLE 8 (Contd.)

Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}
0	*2361.06	42341			
0	*2359.33	42372			
0	*2351.40	42515			

* Unclassified bands.

TABLE 9

VIBRATIONAL SCHEME FOR D' SYSTEM OF CdBr.

v'	v"	v" + 0	v" + 1	v" + 2	v" + 3	v" + 4	v" + 5	v" + 6
0		(203) 40271(7)	(202) 40068(7)	(199) 39866(8)	(197) 39667(4)	39470(2)	-	-
		(170)	(169)	(168)	(167)	(169)		
1		(204) 40441(6)	(203) 40237(7)	(200) 40034(7)	(195) 39834(8)	(195) 39639(4)	(193) 39444(3)	39251(1)
2		-	-	-	-	(170) 39809(5)	-	-

TABLE 10.

VIBRATIONAL SCHEME FOR E - SYSTEM OF CdBr.

v' \ v"	v" + 0	v" + 1	v" + 2	v" + 3	v" + 4	v" + 5	v" + 6	v" + 7
0	-	-	(207) 41557(3)	(195) 41350(3)	(207) 41155(5)	(202) 40948(6)	40746(6)	-
			(123)	(124)	(116)	(121)	(122)	
1	(205) 42085(2)	(200) 41880(3)	(206) 41680(3)	(203) 41474(3)	(202) 41271(4)	(201) 41069(5)	(200) 40868(6)	40668(6)
	(109)	(108)	(108)	(118)	(116)	(116)	(117)	
2	(206) 42194(1)	(200) 41988(2)	(196) 41788(2)	(205) 41592(3)	(202) 41387(4)	(200) 41185(5)	40985(6)	-

TABLE 11.

BAND HEADS OF C - SYSTEM OF CdBr.

Intensity	Wavelength in A. U.	Wave Number in vacuum cm^{-1}
2	*3349.01	29851
3	*3346.09	29877
2	*3340.28	29929
5	3323.74	30078
5	*3318.11	30129
8	3298.62	30307
6	*3296.09	30331
6	*3293.30	30356

* Observed in the present investigation.

TABLE 12.

VIBRATIONAL SCHEME FOR C SYSTEM OF CdBr.

v'' / v'	0	1	2	3	4	5
0	30307(8)	(229) 30078(5)	(227) 29851(2)	-	-	-
1	-	(253) 30331(6)	-	29877(3) (252)	-	-
2	-	-	(227) 30356(6)	30129(5)	-	-
3	-	-	-	-	-	29929(2)

TABLE 13.

BAND HEADS OF B - SYSTEM OF CdBr IN THE REGION λλ 3900 - 4900 A.U.

Intensity.	Wavelength in A.U.	Wave Number in Vacuum cm^{-1}	v',v"	Value observed by Ramasastry.
2	4908.53	20367	0,20	-
1	4884.55	20467	1,20	-
1	4867.19	20540	4,21	-
1	4861.28	20565	2,20	-
2	4834.24	20680	1,19	20691
2	4808.43	20791	0,18	20793
3	4785.65	20890	1,18	20905
1	4768.52	20965	4,19	-
2	4762.62	20990	2,18	-
3	4759.67	21004	0,17	21014
3	4734.98	21118	-	21120
1	4729.05	21140	6,19	-
2	4720.79	21177	4,18	-
3	4714.78	21204	2,17(79)	21215
2	4709.03	21230	2,17(81)	-
1	4700.81	21267	5,18	-
2	4693.75	21299	3,17(79)	-

TABLE 13 (Contd.)

Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}.	v',v"	Value observed by Ramasastry.
2	4688.02	21325	3,17(81)	21319
4	4668.10	21416	2,16(79)	-
3	4662.88	21440	2,16(81)	21444
3	4647.70	21510	3,16	-
4	4642.74	21533	1,15(79)	21531
4	4638.04	21555	1,15(81)	21555
4	4631.77	21584	9,18	-
5	4622.13	21629	2,15	-
4	4618.72	21645	0,14(79)	21644
4	4614.03	21667	0,14(81)	21668
4	4608.92	21691	5,16	-
5	4601.71	21725	3,15	-
5	4597.26	21746	1,14(79)	-
4	4592.62	21768	1,14(81)	21758
3	4586.93	21795	9,17	-
6	4576.63	21844	2,14	-
6	4573.29	21860	0,13(79)	-
5	4568.92	21881	0,13(81)	21874

TABLE 13 (Contd.)

Intensity.	Wavelength in A.U.	Wave-Number in vacuum cm^{-1}	v',v"	Value observed by Ramasastry.
3	4563.89	21905	5,15	-
6	4556.40	21941	3,14	-
7	4551.43	21965	1,13(79)	-
6	4547.49	21984	1,13(81)	21979
4	4542.12	22010	9,16	-
7	4531.83	22060	2,13	-
8	4528.13	22078	0,12(79)	-
7	4524.44	22096	0,12(81)	-
4	4519.32	22121	5,14	-
8	4512.19	22156	3,13	-
9	4507.30	22180	1,12(79)	-
9	4503.85	22197	1,12(81)	22194
3	4501.83	22207	6,14	-
4	4495.95	22236	-	-
9	4487.68	22277	2,12	-
9	4484.06	22295	0,11(79)	22295
9	4480.84	22311	0,11(81)	-
9	4468.42	22373	3,12	-

TABLE 13 (Contd.)

Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}.	v',v''	value observed by Ramasastry.
9	4463.04	22400	1,11	22407
4	4459.06	22420	6,13	-
9	4444.19	22495	2,11	-
10	4440.63	22513	0,10(79)	22522
9	4437.68	22528	0,10(81)	-
3	4432.95	22552	5,12	-
10	4420.41	22616	1,10	-
8	4416.30	22637	6,12	-
9	4400.95	22716	2,10	-
8	4397.27	22735	0,9	22731
9	4377.63	22837	1,9	22844
7	4374.38	22854	6,11	-
8	4359.50	22932	2,9	-
7	4354.94	22956	0,8	22954
8	4340.57	23032	3,9	-
8	4335.68	23058	1,8	-
4	4332.85	23073	6,10	-

TABLE 13. (Contd.)

Intensity.	Wave length in A.U.	Wave Number in vacuum cm^{-1}	v',v"	value observed by Ramasastry.
8	4317.51	23155	2,8	-
7	4313.42	23177	0,7	23168
				23213 (Chlorine line)
7	4294.51	23279	1,7	23278
7	4276.33	23378	2,7	-
3	4272.30	23400	0,6	23390
6	4253.58	23503	1,6	23496
6	4235.90	23601	2,6	23609
7	4218.76	23697	3,6	-
3	4213.60	23726	1,5	23723
5	4197.32	23818	7,7	-
4	4196.27	23824	2,5	23826
5	4179.08	23922	3,5	-
4	4175.76	23941	-	23942
4	4163.24	24013	4,5	-
3	4158.40	24041	7,6	24039
3	4140.31	24146	3,4	24149

TABLE 13. (Contd.)

Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	v',v"	Value observed by Ramasastry.
2	4120.68	24261	10,6	24267
3	4105.96	24348	8,5	24364
3	+4086.66	24463	4,3	24469
2	+4068.53	24572	8,4	24580
2	+4049.08	24690	4,2	24694
2	+4031.77	24796	8,3	24803
2	+4012.52	24915	4,1	24908
2	+3997.75	25007	5,1	25010
1	+3978.82	25126	13,3	25129
1	+3961.48	25236	5,0	25230
1	+3943.20	25352	13,2	25346
1	+3927.08	25457	11,1	25448
0	+3917.10	25522	12,1	-

\+ Measurements made on the plate taken with a medium quartz spectrograph.

TABLE 14.

VIBRATIONAL SCHEME FOR B - SYSTEM OF CdBr.

v'' / v'	4	5	6	7	8	9	10	11
0	-	-	223 23400(3) (103)	221 23177(7) (102)	221 22956(7) (102)	222 22735(8) (102)	218 22513(10) (103)	22295(9) (105)
1	-	223 23726(3) (98)	224 23503(6) (98)	221 23279(7) (99)	221 23058(8) (97)	221 22837(9) (95)	216 22616(10) (100)	22400(9) (95)
2	-	223 23824(5) (98)	223 23601(6) (96)	223 23378(7)	223 23155(8)	216 22932(8) (100)	221 22716(9)	22495(9)
3	224 24146(3)	225 23922(5) (91)	23697(7)	-	-	23032(8)	-	-
4	-	24013(4)	-	-	-	-	-	-

TABLE 14 (Contd.)

v'' / v'	11	12	13	14	15	16	17	18
0	217 22295(9)	218 22078(8)	215 21860(6)	21645(4)	-	-	213 21004(3)	20791(2)
	(105)	(102)	105)	(101)				(99)
1	220 22400(9)	215 22180(9)	219 21965(7)	213 21746(5)	21533(4)	-	-	20890(3)
	(95)	(97)	(95)	(98)	(96)			(100)
2	218 22495(9)	217 22277(9)	216 22060(7)	215 21844(6)	213 21629(5)	212 21416(4)	214 21204(3)	20990(2)
		(96)	(96)	(97)	(96)	(94)	(95)	
3	-	217 22373(9)	215 22156(8)	216 21941(6)	215 21725(5)	211 21510(3)	21299(2)	-
4	-	-	-	-	-	-	-	21177(2)

TABLE 15

ISOTOPIC BAND HEADS OF B - SYSTEM OF CdBr

Assignment v' , v"	Observed Shift in cm^{-1}	Calculated shift in cm^{-1}
0,10	15	15
0,11	16	17
0,12	18	19
0,13	21	20
0,14	22	22
1,12	17	18
1,13	19	19
1,14	22	21
1,15	22	23
2,16	24	24
2,17	26	25
3,17	26	25

TABLE 16.

BAND HEADS OF A - SYSTEM OF CdBr IN THE REGION λλ 5100 - 6400 A.U.

Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}
10	6392.91	15638	8	6047.90	16530
10	6371.32	15691	7	6029.33	16581
10	6349.87	15744	7	6010.84	16632
10	6330.57	15792	-	5992.83	16682
10	6309.40	15845	8	5953.57	16792
9	6287.97	15899	8	5933.08	16850
9	6268.25	15949	4	5918.67	16891
8	6247.88	16001	8	5897.03	16953
8	6227.26	16054	2	5877.62	17009
3	6207.15	16106	9	5841.21	17115
8	6187.56	16157	-	5802.88	17228
8	6166.57	16212	10	5786.10	17278
6	6146.85	16264	-	*5743.55	17406
7	6127.63	16315	10	5731.70	17442
7	6107.05	16370	10	5699.03	17542
4	6087.34	16423	9	5677.67	17608
8	6069.23	16472	9	5644.92	17707

TABLE 16. (Contd.)

Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}.	Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}.
9	5641.78	17720	-	*5178.03	19307
8	5615.16	17804	2	5165.99	19352
7	5595.68	17866	2	5120.90	19522
6	5563.29	17970	1	5095.42	19620
7	5557.10	17990			
4	5534.64	18063			
5	5524.42	18103			
5	5512.07	18137			
2	5479.74	18244			
4	5461.47	18305			
4	5447.50	18352			
5	5429.14	18418			
5	5381.80	18576			
2	5350.12	18686			
5	5332.71	18747			
5	5301.60	18857			
4	5276.69	18946			
3	*5243.76	19065			
3	5211.23	19184			

* Unclassified bands.

TABLE 17.

VIBRATIONAL SCHEME FOR A - SYSTEM OF CdBr.

v' \ v"	v" + 0	v" + 1	v" + 2	v" + 3	v" + 4	v" + 5	v" + 6	v" + 7
1	-	-	-	-	-	(159) 17009(2)	16850(8)	-
	-	-	-	-	-	-	(1140) 17990(7)	-
						(106) (-)	(103) (113)	
2	-	-	(166) 17608(9)	(164) 17442(10)	(163) 17278(10)	(162) 17115(9)	(161) 16953(8)	16792(8)
	-	-	(1139) 18747(5)	(1134) 18576(5)	(1140) 18418(5)	(1129) 18244(2)	(1150) 18103(5)	-
			(99) (110)	(100) (110)	(-) (-)	(-) (108)	(-) (-)	(99) (-)
3	-	(159) 17866(7)	(165) 17707(9)	17542(10)	-	-	-	16891(4)
	19184(3)	-	(1150) 18857(5)	(1144) 18686(2)	-	18352(4)	-	-

TABLE 17. (Contd.)

v'	v"	v" + 7	v" + 8	v" + 9	v" + 10	v" + 11	v" + 12	v" + 13	v" + 14
0			(158) 16581(7)	(159) 16423(4)	(158) 16264(6)	(157) 16106(3)	(157) 15949(9)	(154) 15792(10)	15638(10)	-
		(1139) 17720(9)	-	-	-	-	-	-	-
			(107) (160)	(106) (158)	(106) (158)	(105) (155)	(107) (155)	(106)	
1		-	16530(8)	16370(7)	16212(8)	16054(8)	15899(9)	15744(10)	-
		-	-	-	-	-	-	-	-
			(102)	(102)	(103)	(103)	(102)	(101)	
2			(160) 16792(8)	(160) 16632(7)	(157) 16472(8)	(158) 16315(7)	(156) 16157(8)	(156) 16001(8)	(154) 15845(10)	15691(10)
		-	-	-	-	-	-	-	-

(C) CADMIUM IODIDE

In addition to the known systems C, D and E in the ultra-violet region, a few fragmentary bands extending from λλ2890-2985 A.U. have been observed for the first time. The bands are degraded to longer wavelength side and form three v'-progressions. The measurments of the bands, their visually estimated values of intensities are given in table (18). Since the bands are few in number, and are obtained under low dispersion, an exact analysis is not possible. However the regularities of the bands are represented in table (19). The bands are reproduced in plate (6b).

In the reinvestigation of the E system a few new bands have been observed. The vibrational assignments are given in table (20). In column (4), the band head data reported by Ramasastry have been given. In the present investigation the high-frequency oscillatory discharge was used to excite the spectra in this region and the band system observed is much better in definition than that reported by Wieland (1929) and Ramasastry (1946). The bands have been reproduced in plate (10). The vibrational scheme of

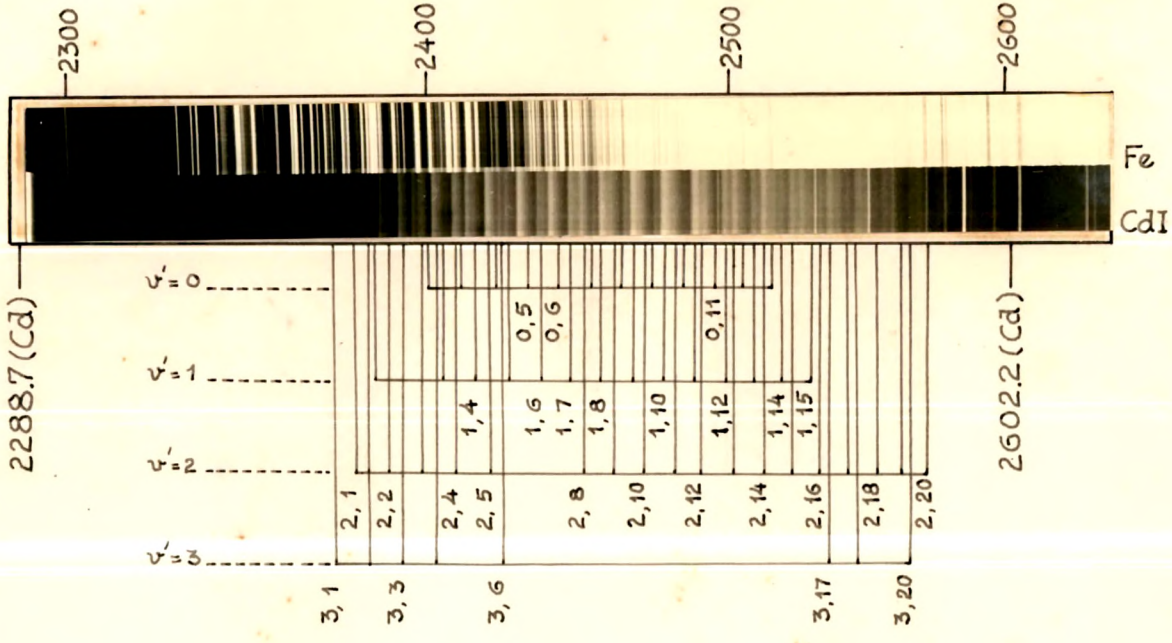


PLATE 10

BAND SPECTRUM OF CdI TAKEN WITH HILGER M. Q. SPECTROGRAPH.

E - SYSTEM.

E system is represented in table (21).

The bands of the C and D systems have been reproduced in plate (2c). As reported by previous workers, bands are degraded to violet and form two sub-systems having an interval of about 902 cm^{-1}. Since only a few bands have been observed in addition to those reported by previous workers, no measurements have been made.

The system in the visible region photographed on the Hilger medium quartz and E_2 glass spectrographs is reproduced in plates (3c) and (11); respectively. The bands are clearly degraded to red. Since the bands lie on a continuum, the sharpness of the bands was not enough for the exact measurements. However, by adjusting the instrument for very sharp focus and also adjusting the time of exposures, bands have been obtained which could be easily measured. In table (22), the wavelengths, wave numbers in vacuum and visually estimated values of intensity of the bands are given. The classification of bands is given in column (4) of the table (22). The differences in the observed and calculated values are shown in the last column.

The spectrum in the region λλ5100-6380 A.U.

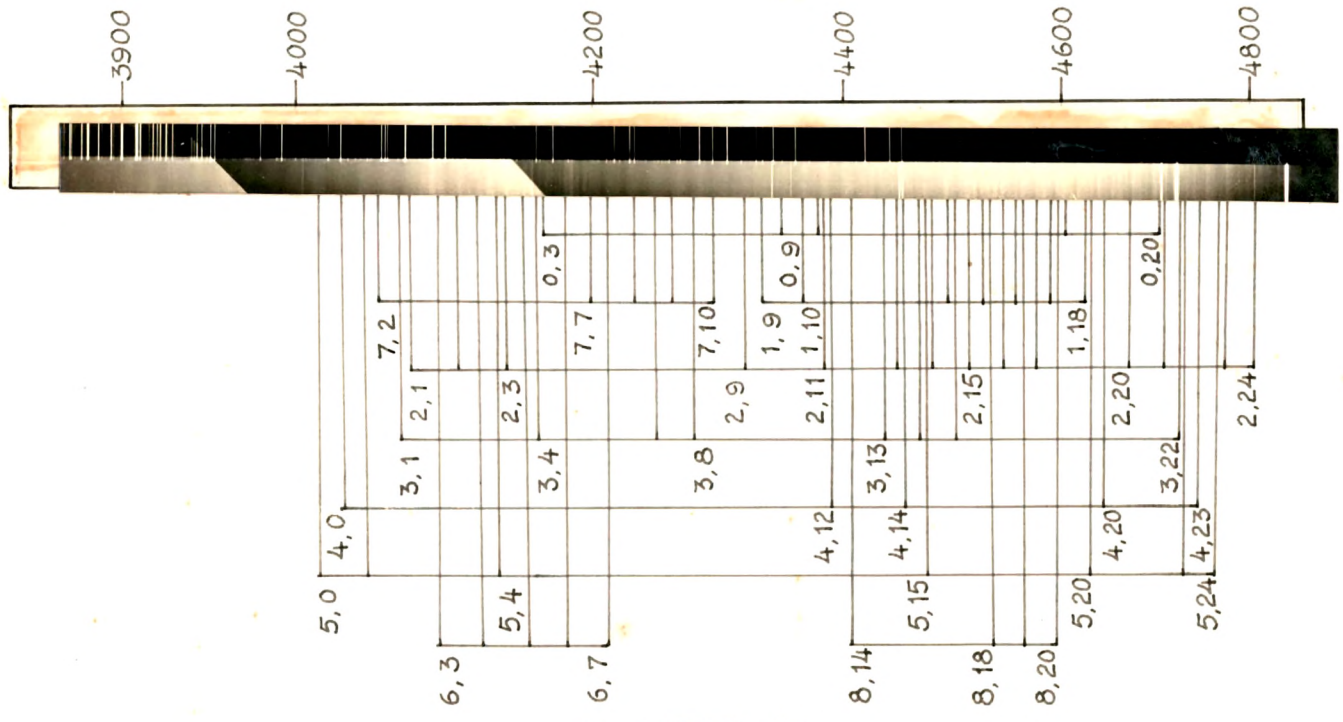


PLATE 11.

BAND SPECTRUM OF CdI TAKEN WITH E_2 GLASS - SPECTROGRAPH.

B - SYSTEM.

is reproduced in plate (12). The bands are degraded to longer wavelength and are line like in nature. Two groups of bands appear to lie on a continuum having their intensity maxima at λ5700 A.U. and λ6500 A.U. respectively. The best averages of several measurements are recorded in table (23) along with their visually estimated values of intensities. In the last column, the values of the wave numbers of the band heads reported by Subbaraya, Rao and Rao (1935) are given. The arrangement of bands showing the regularity of intervals of the lower and upper states is shown in table (24).

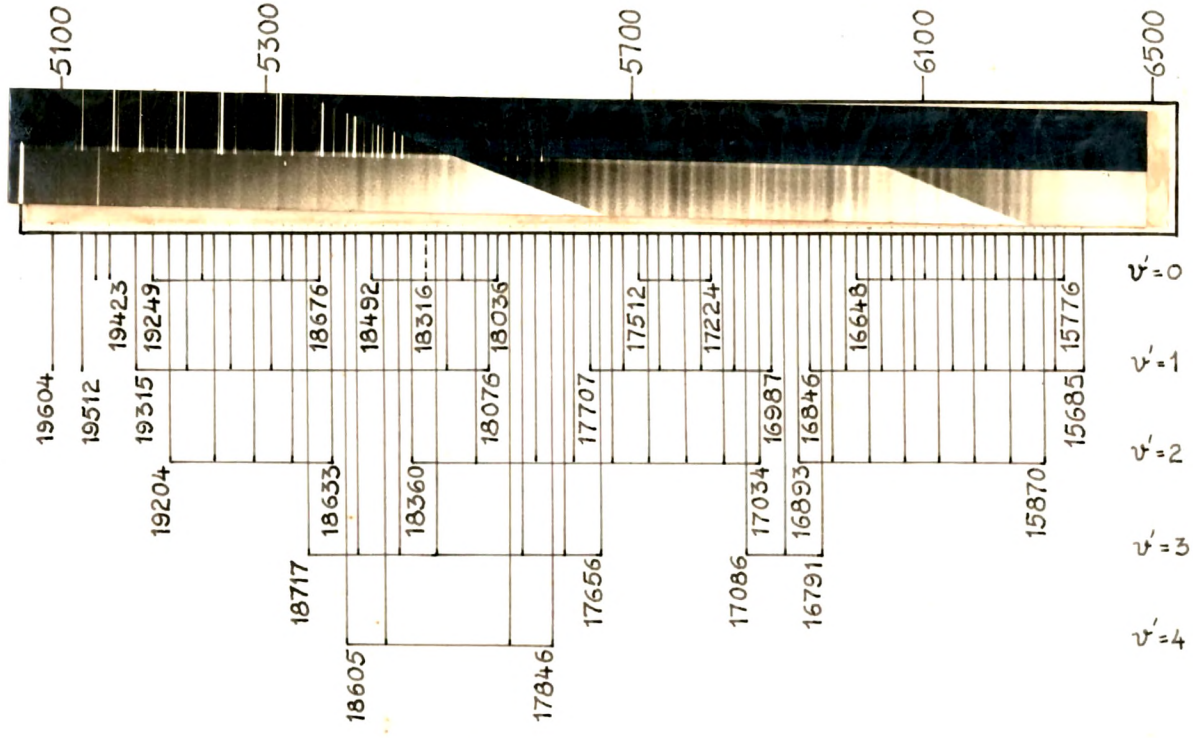


PLATE 12

BAND SPECTRUM OF CaI TAKEN WITH E_2 GLASS-SPECTROGRAPH.

A - SYSTEM.

TABLE 18

BAND HEADS OF D' - SYSTEM OF CdI IN THE REGION λλ 2890 - 2985 A.U.

Intensity	Wavelength in A. U.	Wave Number in vacuum cm^{-1}
4	2983.85	33504
7	2970.02	33660
5	2965.09	33716
8	2960.35	33770
7	2956.23	33817
5	2951.26	33874
6	2937.38	34034
10	2923.38	34197
7	2918.17	34258
8	2909.34	34362
7	2904.02	34425
8	2900.65	34465
5	2895.44	34527
6	2889.99	34592

TABLE 19

VIBRATIONAL SCHEME FOR D' - SYSTEM OF CdI

v'	v"	v" + 0	v" + 1	v" + 2	v" + 3	v" + 4	v" + 5	v" + 6	v" + 7
0		34592(6)	(167) 34425(7)	(167) 34258(7)	-	-	33770(8)	-	-
			(102)	(104)			(104)		
1		-	(165) 34527(5)	(165) 34362(8)	(163) 34197(10)	(160) 34034(6)	(158) 33874(5)	33716(5)	-
				(103)				(101)	
2		-	-	34465(8)	-	-	-	(157) 33817(7)	33660(7)

TABLE 20.

BAND HEADS OF E - SYSTEM OF CdI IN THE REGION λλ 2365 ~ 2600 A.U.

Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}.	Wave Number observed by Ramasastry & Rao	Assignment. v',v"
0	2593.53	38546	-	-
0	2587.15	38641	-	-
0	2584.54	38680	-	-
1	2582.47	38711	-	3,22
3	2572.50	38861	-	3,21
2	2569.13	38912	-	2,20
5	2562.55	39012	-	3,20
4	2559.14	39064	-	2,19
5	2549.15	39217	-	2,18
1	2546.23	39262	-	4,19
6	2542.66	39317	-	3,18
6	2539.18	39371	-	2,17
4	2536.34	39415	-	4,18
6	2532.62	39473	39478	3,17
7	2529.22	39526	39527	2,16
2	2526.47	39569	-	4,17
3	2525.96	39577	-	1,15

TABLE 20. (Contd.)

Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}.	Wave Number observed by Ramasastry & Rao.	Assignment. v',v"
2	2522.58	39630	-	3,16
4	2519.21	39683	39674	2,15
6	2515.92	39735	39727	1,14
6	2512.50	39789	-	0,13
3	2509.22	39841	-	2,14
8	2505.82	39895	39892	1,13
6	2502.38	39950	39954	0,12
2	2499.31	39999	39980	2,13
9	2495.63	40058	40054	1,12
8	2492.20	40113	40114	0,11
2	2489.29	40160	40156	2,12
-	-	-	40178	-
9	2485.57	40220	40227	1,11
9	2481.99	40278	40270	0,10
3	2479.29	40322	40325	2,11
7	2475.54	40383	-	1,10
10	2471.93	40442	40441	0,9

TABLE 20 (Contd.)

Intensity	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	Wave Number observed by Ramasastry & Rao	Assignment. v',v''
3	2469.37	40484	40483	2,10
1	2467.54	40514	40510	-
6	2465.47	40548	40553	1,9
9	2461.82	40608	40608	0,8
3	2459.40	40648	40646	2,9
2	2457.29	40683	40680	4,10
7	2455.41	40714	40717	1,8
8	2451.74	40775	40776	0,7
2	2449.51	40812	40810	2,8
-	-	-	40840	-
7	2445.38	40881	40878	1,7
7	2441.62	40944	40934	0,6
-	-	-	40999	-
7	2435.37	41049	41050	1,6
2	2433.54	41080	-	3,7
5	2431.52	41114	41113	0,5
-	-	-	41164	-
7	2425.39	41218	41221	1,5

TABLE 20. (Contd.)

Intensity	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	Wave Number observed by Ramasastry & Rao.	Assignment. v',v"
2	2423.62	41248	41243	3,6
4	2421.45	41285	41280	0,4
3	2419.22	41323	41326	2,5
6	2415.31	41390	41390	1,4
4	2411.35	41458	41456	0,3
5	2409.43	41491	41489	2,4
-	-	-	41525	-
4	2405.43	41560	41562	1,3
2	2403.52	41593	41586	3,4
3	2401.32	41631	41626	0,2
4	2399.54	41662	41664	2,3
-	2396.83	41709	-	-
3	2395.40	41734	41737	1,2
3	2393.50	41767	41769	3,3
2	2391.21	41807	41805	0,1
3	2389.38	41839	41840	2,2
-	-	-	41858	-
1	2386.65	41887	41875	-

TABLE 20 (Contd.)

Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}.	Wave Number observed by Ramasastry & Rao.	Assignment. v',v"
2	2385.39	41909	41907	1,1
3	2383.80	41937	41937	3,2
-	-	-	41954	-
-	-	-	41980	-
2	2379.49	42013	42017	2,1
1	2373.79	42114	42113	3,1
1	2369.50	42190	-	2,0
0	2363.85	42291	-	3,0

TABLE 21.

VIBRATIONAL SCHEME FOR E - SYSTEM OF CdI

v'' / v'	0	1	2	3	4	5	6	7
0	-	(176) 41807(2) (102)	(173) 41631(3) (103)	(173) 41458(4) (102)	(171) 41285(4) (105)	(170) 41114(5) (104)	(169) 40944(7) (105)	40775(8) (106)
1	-	(175) 41909(2) (104)	(174) 41734(3) (105)	(170) 41560(4) (102)	(172) 41390(6) (101)	(169) 41218(7) (105)	(168) 41049(7)	40881(7)
2	(177) 42190(1) (101)	(174) 42013(2) (101)	(177) 41839(3) (98)	(171) 41662(4) (105)	(168) 41491(5) (102)	41323(3)	-	-
3	(177) 42291(0)	(177) 42114(1)	(170) 41937(3)	(174) 41767(3)	41593(2)	-	(168) 41248(2)	41080(2)

TABLE 21. (Contd.)

v'' / v'	7	8	9	10	11	12	13	14
0	(167) 40775(8) (106)	(166) 40608(9) (106)	(164) 40442(10) (106)	(165) 40278(9) (105)	(163) 40113(8) (107)	(161) 39950(6) (108)	39789(6) (106)	-
1	(167) 40881(7)	(166) 40714(7) (98)	(165) 40548(6) (100)	(163) 40383(7) (101)	(162) 40220(9) (102)	(163) 40058(9) (102)	(160) 39895(8) (104)	39735(6) (106)
2	-	(164) 40812(2)	(164) 40648(3)	(162) 40484(3)	(162) 40322(3)	(161) 40160(2)	(158) 39999(2)	39841(3)
3	41080(2)	-	-	-	-	-	-	-
4	-	-	-	40683(2)	-	-	-	-

TABLE 22.

BAND HEADS OF B - SYSTEM OF CdI IN THE REGION λλ3850 - 4870 A.U.

Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	v',v''	$\nu_{obs.} - \nu_{cal.}$
0	4867.90	20537	5,27	2
0	4850.43	20611	4,26	6
1	4845.25	20633	2,25	4
1	4840.80	20652	7,27	0
2	4834.48	20679	5,26	-1
2	4828.40	20705	1,24	0
2	4811.67	20777	2,24	0
1	4805.43	20804	7,26	6
2	4790.00	20871	-	-
1	4786.09	20888	6,25	1
2	4777.18	20927	2,23	1
2	4766.93	20971	5,24	-4
3	4752.88	21034	6,24	-1
3	4745.90	21065	4,23	4
0	4741.38	21085	0,21	4
3	4731.51	21129	5,23	5
1	4727.70	21146	3,22	1

TABLE 22 (Contd.)

Intensity	Wave length in A.U.	Wave Number in vacuum cm^{-1}	v',v"	$\nu_{obs.} - \nu_{cal.}$
2	4718.78	21186	6,23	1
3	4709.66	21227	2,21	-1
1	4707.23	21238	0,20	4
3	4696.83	21285	-	-
3	4688.90	21321	-	-
2	4674.87	21385	2,20	4
4	4666.58	21423	5,21	-3
4	4653.33	21484	6,21	-3
3	4646.40	21516	4,20	0
4	4640.15	21545	7,21	1
4	4632.63	21580	5,20	1
2	4625.13	21615	1,18	-3
3	4622.56	21647	-	-
3	4611.26	21680	-	-
2	4606.60	21702	0,17	2
4	4597.26	21746	8,20	-5
3	4591.35	21774	1,17	0
3	4586.50	21797	6,19	4

TABLE 22. (Contd.)

Intensity	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	v',v"	$\nu_{obs.}-\nu_{cal.}$
4	4576.64	21844	2,17	-2
2	4571.19	21870	-	-
3	4563.89	21905	8,19	0
4	4557.65	21935	1,16	3
2	4550.60	21969	-	-
3	4543.77	22002	2,16	-2
4	4537.79	22031	-	-
2	4531.21	22063	8,18	3
3	4525.05	22093	1,15	2
2	4517.50	22130	-	-
4	4510.76	22163	2,15	0
4	4505.28	22190	-	-
2	4497.57	22228	3,15	-4
3	4493.32	22249	1,14	2
3	4490.70	22262	6,16	-1
3	4485.06	22290	-	-
4	4478.43	22323	2,14	0
3	4471.62	22357	5,15	-4

TABLE 22. (Contd.)

Intensity	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	v',v"	$\nu_{obs.} - \nu_{cal.}$
3	4465.63	22387	3,14	-5
5	4451.91	22456	4,14	-2
4	4447.15	22480	2,13	-4
1	4442.80	22502	0,12	2
5	4433.35	22550	3,13	-3
4	4428.83	22573	1,12	-1
3	4420.22	22617	4,13	-2
5	4406.20	22689	8,14	-4
4	4388.20	22782	4,12	1
5	4382.62	22811	2,11	1
4	4379.55	22827	0,10	-1
4	4374.95	22851	8,13	-3
5	4364.83	22904	1,10	1
4	4348.12	22992	0,9	-2
5	4333.23	23071	1,9	2
4	4326.48	23107	4,10	-3
4	4319.75	23143	2,9	2
3	4303.20	23232	6,10	-1
3	4292.85	23288	7,10	-3

TABLE 22 (Contd.)

Intensity	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	v',v"	$\nu_{obs.} - \nu_{cal.}$
4	4282.01	23347	8,10	2
5	4276.32	23378	3,8	1
4	4262.47	23454	7,9	-3
4	4253.95	23501	0,6	2
5	4251.77	23513	8,9	2
4	4245.81	23546	3,7	1
3	4230.90	23629	7,8	5
3	4223.39	23671	0,5	1
4	4215.91	23713	3,6	-2
4	4212.72	23731	6,7	-4
4	4201.21	23796	7,7	4
3	4196.62	23822	2,5	5
4	4182.93	23900	6,6	-5
2	4163.76	24010	0,3	-5
4	4156.14	24054	3,4	-4
4	4152.35	24076	6,5	1
2	4149.24	24094	1,3	-4
2	4142.20	24135	7,5	2
3	4138.25	24158	2,3	-4
3	4133.97	24183	5,4	-4

TABLE 22. (Contd.)

Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	v',v"	$\nu_{obs.}-\nu_{cal.}$
4	4123.40	24245	6,4	-2
2	4119.83	24266	1,2	2
3	4111.53	24315	-	-
1	4108.32	24334	2,2	-2
2	4099.89	24384	-	-
2	4094.20	24418	6,3	-3
2	4090.84	24438	1,1	-2
2	4086.32	24465	-	-
1	4078.98	24509	2,1	-3
2	4074.33	24537	5,2	2
2	4067.53	24578	3,1	-3
2	4061.75	24613	1,0	-4
2	4055.98	24654	7,2	2
2	4046.13	24708	5,1	-2
1	*4043.20	24726	-	-
1	*4033.07	24788	-	-
1	*4028.10	24819	4,0	-5
1	*4017.35	24885	5,0	-2
1	*3997.43	25009	7,0	4

TABLE 22. (Contd.)

Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	v',v''	$\nu_{obs.} - \nu_{cal.}$
0	*3988.66	25064	8,0	-5
0	*3973.30	25161	-	-
0	*3965.40	25211	-	-
0	*3948.33	25320	-	-
0	*3943.65	25350	-	-
0	*3933.88	25413	-	-
0	*3919.08	25509	-	-
0	*3903.78	25609	-	-
0	*3893.98	25680	-	-
0	*3886.93	25720	-	-
0	*3871.30	25824	-	-
0	*3860.96	25893	-	-
0	*3848.75	25975	-	-

* Measurements made on the plate taken with medium quartz spectrograph.

TABLE 23

BAND HEADS OF A - SYSTEM OF CdI IN THE REGION λλ 5100 - 6370 A.U.

Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	Measurements of Subbaraya, Rao and Rao
10	6373.76	15685	-
10	6336.99	15776	15767.1
10	6317.37	15825	15815.5
9	6299.46	15870	15864.0
9	6280.50	15918	15911.0
9	6261.97	15965	15959.0
8	6243.60	16012	16009.9
6	6223.38	16064	16067.4
8	6204.07	16114	16121.0
8	6187.18	16158	16158.2
8	6168.09	16208	16207.5
8	6149.50	16257	16256.6
8	6131.77	16304	16303.5
7	6113.02	16354	16353.8
6	6095.90	16400	16397.0
6	6077.35	16450	16451.4
7	6058.90	16500	16501.3

TABLE 23. (Contd.)

Intensity	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	Measurements of Subbaraya Rao and Rao.
7	6041.36	16548	16548.2
6	6023.52	16597	16598.0
6	6005.07	16648	16646.1
6	5987.45	16697	16695.1
5	5970.30	16745	16742.8
5	5953.83	16791	16794.8
5	5934.48	16846	16839.9
5	5917.97	16893	16887.5
5	5902.60	16937	16936.6
5	5885.23	16987	16986.6
5	5868.85	17034	17034.4
5	5851.20	17086	17083.7
4	5835.95	17130	17130.9
4	5820.12	17177	17176.9
5	5804.24	17224	17224.4
4	5787.45	17274	17274.1
5	5771.30	17322	17324.4

TABLE 23. (Contd.)

Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	Measurements of Subbaraya Rao & Rao
5	5755.46	17370	17371.8
5	5739.59	17418	17419.6
5	5724.48	17464	17464.0
5	5708.79	17512	17510.0
5	5692.86	17561	17559.5
5	5677.02	17610	-
5	5662.23	17656	-
4	5645.90	17707	-
4	5630.97	17754	-
4	5617.05	17798	-
4	5601.94	17846	-
3	5586.29	17896	-
3	5570.11	17948	-
3	5556.18	17993	-
3	5542.93	18036	-
2	5530.66	18076	-
2	5519.06	18114	-
4	5499.00	18180	-

TABLE 23. (Contd.)

Intensity	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	Measurements of Subbaraya Rao & Rao
2	5485.14	18226	-
2	5477.63	18251	-
2	*5458.20	18316	-
2	5445.10	18360	-
2	5432.09	18404	-
3	5418.55	18450	-
3	5406.24	18492	-
2	5386.43	18560	-
2	5373.41	18605	-
2	*5365.30	18633	-
2	5352.98	18676	-
2	5341.25	18717	-
3	*5325.32	18773	-
2	*5312.87	18817	-
2	5303.55	18850	-
3	*5285.34	18915	-
3	5260.60	19004	-
2	*5245.41	19059	-

TABLE 23. (Contd.)

Intensity.	Wavelength in A.U.	Wave Number in vacuum cm^{-1}	Measurements of Subbaraya, Rao & Rao
3	*5233.30	19103	-
3	5218.03	19159	-
1	*5205.80	19204	-
2	*5193.63	19249	-
1	5175.88	19315	-
1	*5147.10	19423	-
1	*5136.26	19464	-
0	*5123.63	19512	-
0	*5099.50	19604	-

* Unclassified bands.

TABLE 24.

VIBRATIONAL SCHEME FOR A - SYSTEM OF CdI

v' \ v''	v'' + 0	v'' + 1	v'' + 2	v'' + 3	v'' + 4	v'' + 5	v'' + 6
3	-	-	-	(149) 17086(5) (1165)	(146) 16937(5)	16791(5) (1157)	-
	(157) 18717(2)	(156) 18560(2)	(153) 18404(2)	18251(2)	-	(150) 17948(3)	17798(4)
		(-) (45)	(-) (46)			(-) (45)	(-) (48)
4	-	(155) 18605(2)	18450(3)	-	-	(147) 17993(3)	17846(4)
			(42)			(43)	
5	-	-	18492(3)	-	(144) 18180(4)	18036(3)	-
					(46)	(40)	
6	18850(2)	-	-	-	(150) 18226(2)	18076(2)	-

TABLE 24. (Contd.)

v'	v"	v" + 4	v" + 5	v" + 6	v" + 7	v" + 8	v" + 9	v" + 10	v" + 11
				(148)	(146)	(146)	(144)	(146)	(142)
		-	16648(6)	16500(7)	16354(7)	16208(8)	16064(6)	15918(9)	15776(10)
					(1158)	(1162)	(1160)		
0					(152)	(146)			
		-	-	-	17512(5)	17370(5)	17224(5)	-	-
			(49)	(48)	(46)	(49)	(50)	(47)	(49)
			(-)	(-)	(49)	(48)	(50)	(-)	(-)
		(149)	(149)	(148)	(143)	(143)	(149)	(140)	
	16846(5)	16697(6)	16548(7)	16400(6)	16257(8)	16114(8)	15965(9)	15825(10)	
1			(1159)	(1161)	(1161)	(1160)	(1165)	(1162)	
	-	-	(146)	(143)	(144)	(144)	(143)		
			17707(4)	17561(5)	17418(5)	17274(4)	17130(4)	16987(5)	
	(47)	(48)	(49)	(50)	(47)	(44)	(47)	(45)	
	(-)	(-)	(47)	(49)	(46)	(48)	(47)	(47)	
	(148)	(148)	(147)	(146)	(146)	(146)	(142)		
2	16893(5)	16745(5)	16597(6)	16450(6)	16304(8)	16158(8)	16012(8)	15870(9)	
		(1151)	(1157)	(1160)	(1160)	(1164)	(1165)	(1164)	
		(142)	(144)	(146)	(142)	(145)	(143)		
	-	17896(3)	17754(4)	17610(5)	17464(5)	17322(5)	17177(4)	17034(5)	