Infrared Spectra of Cerium (Ce I and Ce II)
Between 0.8 and 2.4 μm

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The cerium spectrum emitted by an electrodeless lamp has been observed with a SISAM spectrometer in the region from 0.82 to 2.42 μm. Of the 2076 lines observed, about 1100 lines have been classified as transitions in the energy level system of Ce I and 400 lines in Ce II. The average deviation between the observed wave numbers and those calculated from the two energy levels is ± 0.023 cm^{-1}.

Key words: Cerium spectra; Ce I and II; infrared spectra; spectra; wavelengths.

1. Introduction

The analysis of Ce I was begun about ten years ago at the National Bureau of Standards by Martin [1963] and has been carried forward to an advanced state, v. Martin [1971]. The analysis of Ce II on the other hand has been carried on intermittently over the past forty years by Albertson and Harrison [1937]; Harrison, Albertson, and Hosford [1941]; Racah [1955]; Goldschmidt [1968], and Corliss [1971].

In both of these spectra observations of the infrared are of great interest because of the existence of low lying levels of both parities. The observations reported here were important in confirming the low even levels of Ce I and they contain hundreds of transitions of Ce II. The present infrared list is published separately, since it is based on data obtained with a single instrument that covers a range mostly inaccessible by photographic techniques. Cerium spectra photographed at NBS have considerably more lines than the present list in the region of overlap, 0.8–1.0 μm. The complete NBS wavelength lists and analyses for Ce I and Ce II are, however, not yet ready for publication.

2. Observations

The measurements were made at the Laboratoire Aimé Cotton with the low resolution SISAM spectrometer and methods previously described by Verges [1969]. The instrument used has a resolution of 0.2 cm^{-1} and lines were observed in air from 0.82 to 2.42 μm. The light source was an electrodeless lamp of the type described by Corliss, Bozman, and Westfall [1953]. It contained about a milligram of cerium iodide and was excited in a microwave cavity at 2450 MHz with a maximum power of about 50 W. No experimental separation of Ce I and Ce II was made.

A channel spectrum from a Fabry-Perot interferometer furnished a scale of wave numbers on the records of the cerium spectrum and the absolute values were referred to interferometric values of argon lines at 5901.373 cm^{-1} and 12096.588 cm^{-1}. The faintest lines in each region are assigned an intensity 1 and stronger lines are assigned ordinal numbers in a geometric progression of ratio 2, i.e., $N = \log_2 2I$. The numbers range from 1 to 7, representing an intensity span from 1 to 64. Numbers in widely separated regions of the spectrum are not necessarily comparable.

3. Results and Classification of Infrared Lines

The wavelengths in air, wave numbers in vacuum and intensities of 2076 infrared cerium lines are listed in table 1. For classified lines the numerical values of the lower and upper energy levels with their J values are given, the decimal parts being omitted. The levels are taken from the most recent NBS lists (unpublished).

The line list was searched for all possible transitions in Ce II with $\Delta J = \pm 1, 0$ by using all known levels below 22 300 cm^{-1} and a tolerance of ± 0.075 cm^{-1}. Levels above a certain energy in each spectrum were not used, so as to reduce the number of mere chance coincidences of observed wave numbers with calculated level differences. Nearly all the 400 lines thus classified fell within ± 0.05 cm^{-1} of the calculated values. The wave numbers of the Ce I levels are somewhat more precisely known, and the list was searched with a tolerance of ± 0.05 cm^{-1} by using all levels below 22 065 cm^{-1}. In this case nearly all of the 1100 classified lines fell within ± 0.04 cm^{-1} of the calculated values. The difference between the observed and calculated wave numbers is given in the last column of table 1 in units of 0.001 cm^{-1}. Its average value is ± 0.023 cm^{-1}.

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TABLE 1. *Observed infrared cerium lines*

Wave-length Å	Wave-number (cm⁻¹)	Intensity	Spectrum	Classification		O−C (.001 cm⁻¹)
8215.42	12168.887	1				
8220.68	12161.101	3	I	3210°_5	15371_4	37
8223.61	12156.768	2	I	4746°_6	16903_5	15
8239.45	12133.397	3	I	6809°_8	18942_7	47
8245.20	12124.935	3	I	1388°_3	13513_4	2
8251.36	12115.884	3				
8252.52	12114.181	3				
8261.11	12101.584	2	I	2437°_4	14539_3	1
8300.72	12043.837	2	I	5572°_4	17615_4	18
8310.27	12029.997	2	I	3210°_5	15240_4	−38
8336.96	11991.484	1	I	9333°_6	21324_6	−29
8396.38	11906.622	3	I	5802°_7	17708_7	23
8401.93	11898.757	1	I	7174°_4	19072_3	16
8440.88	11843.851	2	I	4173°_4	16017_3	−12
8460.04	11817.028	1	I	4199°_5	16016_5	−13
8467.35	11806.826	2	I	4160°_3	15967_2	22
8482.73	11785.419	2				
8495.85	11767.219	5	I	2369°_3	14136_3	−34
8504.95	11754.629	2	I	5637°_1	17391_1	3
8511.34	11745.804	2	II	$2879^\circ_{5\,1/2}$	$14625_{5\,1/2}$	−13
8523.38	11729.212	4	I	2369°_3	14098_2	−24
8539.14	11707.565	1	II	$1410^\circ_{4\,1/2}$	$13117_{4\,1/2}$	−55
8543.44	11701.672	1	I	6303°_2	18005_3	4
8560.93	11677.766	1				
8564.57	11672.803	4	I	2208°_5	13881_5	16
8566.65	11669.968	1	I	4173°_4	15843_4	13
8567.46	11668.865	4	I	3976°_6	15644_6	26
8582.21	11648.810	1	I	3100°_4	14748_4	16
8612.62	11607.680	5	I	3764°_5	15371_4	41
8615.93	11603.221	2	I	1388°_3	12992_2	47
8619.36	11598.603	2				
8629.30	11585.243	2	I	3976°_6	15561_5	1
8631.39	11582.438	1	I	6303°_2	17886_2	43
8636.55	11575.518	3	I	2208°_5	13784_5	24
8639.35	11571.766	1	I	8055°_6	19627_6	17
8647.65	11560.660	5	I	4455°_6	16016_5	7
8653.86	11552.364	2	I	3196°_4	14748_4	26
8659.72	11544.546	2				
8664.34	11538.391	4	I	3210°_5	14748_4	29
8668.24	11533.199	1				
8672.52	11527.507	3	I	4417°_5	15945_4	15
8677.53	11520.852	2	I	5315°_7	16836_6	8
8691.00	11502.996	2	I	4746°_6	16249_6	22
8692.04	11501.620	2	I	4199°_5	15700_4	9
8702.38	11487.954	2	II	$3793^\circ_{6\,1/2}$	$15281_{6\,1/2}$	−24
8704.24	11485.499	3	I	6809°_8	18294_7	−17
8706.65	11482.320	2				
8709.47	11478.602	2	I	6663°_5	18141_4	−19
8714.68	11471.740	1	I	5637°_1	17108_2	6
8716.66	11469.134	1	II	$987^\circ_{4\,1/2}$	$12456_{3\,1/2}$	−9
8725.69	11457.265	1	I	5210°_2	16668_3	−18
8735.93	11443.835	2	I	2437°_4	13881_5	20
8748.30	11427.654	1	I	4160°_3	15587_2	10
8749.16	11426.530	1	II	$6549^\circ_{2\,1/2}$	$17976_{2\,1/2}$	28
8751.04	11424.076	1	I	4455°_6	15879_5	54
			I	9996°_3	21420_2	−48
8756.26	11417.265	3	I	6475°_4	17892_4	−8
8767.19	11403.032	2	I	3196°_4	14599_4	41
8771.90	11396.909	2	I	9333°_6	20730_5	−3
8772.13	11396.610	4	II	$2879^\circ_{5\,1/2}$	$14276_{5\,1/2}$	−4
8772.77	11395.779	2	I	4160°_3	15555_3	70
			II	$4737^\circ_{2\,1/2}$	$16133_{2\,1/2}$	−68
8778.85	11387.886	2	I	4173°_4	15561_5	34
8782.18	11383.568	5	I	5315°_7	16699_6	−12
8783.00	11382.505	2	I	4173°_4	15555_3	7
8793.77	11368.565	2				
8798.96	11361.859	2	I	0°_4	11361_4	−35
8808.21	11349.928	1	I	5572°_4	16921_3	22
8808.89	11349.051	2	I	5519°_3	16868_2	33
8810.85	11346.527	5	I	2437°_4	13784_5	5
8813.92	11342.575	2	I	3196°_4	14539_3	−29
8842.62	11305.761	1	I	6856°_4	18162_4	9
8845.16	11302.514	2	I	5571°_0	16873_1	−29
8853.36	11292.046	1	I	8055°_6	19347_6	30
8860.18	11283.354	3	I	4417°_5	15700_4	−5
8870.84	11269.795	1	I	4746°_6	16016_5	13
8871.11	11269.452	2	I	9830°_6	21100_6	−4
8875.30	11264.132	2	I	5802°_7	17066_6	−5
8891.21	11243.976	3	II	$1873^\circ_{3\,1/2}$	$13117_{4\,1/2}$	−8
8904.68	11226.967	1	I	3312°_4	14539_3	−4
8909.79	11220.528	2	I	7841°_5	19062_5	−14
8910.74	11219.332	2				
8927.57	11198.182	5	I	4173°_4	15371_4	29
8942.42	11179.586	2	I	8055°_6	19235_6	14
8964.10	11152.548	2	I	7467°_5	18619_5	23
8970.27	11144.877	4				
8971.13	11143.808	3				
8984.06	11127.770	1				
8989.42	11121.135	1	I	5572°_4	16693_4	57
			I	8991°_5	20112_4	−18
8992.29	11117.586	5	I	4160°_3	15277_3	17
9001.98	11105.618	3	I	4455°_6	15561_5	29
9016.72	11087.464	2				
9024.69	11077.672	3	II	$4203^\circ_{6\,1/2}$	$15281_{6\,1/2}$	0
9025.87	11076.224	5	I	2437°_4	13513_4	−21
9031.11	11069.797	1				
9032.43	11068.179	3	I	6234°_3	17302_3	29
9033.23	11067.199	2				
9041.08	11057.590	1	I	8603°_6	19661_5	45
9043.41	11054.741	2	II	$8927^\circ_{5\,1/2}$	$19982_{4\,1/2}$	53
9050.13	11046.533	2				
			I	8587°_7	19627_6	34
			I	9135°_3	20174_4	−21
9056.30	11039.007	1	I	6856°_4	17895_5	27
9058.33	11036.533	2				
9058.60	11036.204	3	I	3100°_4	14136_3	33
			I	$3703^\circ_{3\,1/2}$	$14739_{2\,1/2}$	34
9060.71	11033.634		II	$4201^\circ_{1\,1/2}$	$15235_{1\,1/2}$	−38
			II	$5118^\circ_{2\,1/2}$	$16152_{3\,1/2}$	53
9062.09	11031.954	2				
9063.93	11029.714	2				
9065.00	11028.412	1				
9068.09	11024.654	1				
9071.06	11021.045	2				
9075.12	11016.114	3	I	5572°_4	16588_4	−13
9076.16	11014.852	4				
9076.53	11014.403	2	II	$5118^\circ_{2\,1/2}$	$16133_{2\,1/2}$	−11
9086.24	11002.632	2				
9086.96	11001.761	3				
9092.97	10994.489	1				
9094.26	10992.929	5				
9100.99	10984.800	4				
9105.33	10979.565	1				
9106.25	10978.455	2				
9106.98	10977.575	2	I	7715°_5	18692_4	18
9108.00	10976.346	2				
9115.72	10967.050	1				
9118.30	10963.947	3	II	$2563^\circ_{5\,1/2}$	$13527_{4\,1/2}$	−56

TABLE 1. *Observed infrared cerium lines* — Continued

Wave-length Å	Wave-number (cm⁻¹)	In-ten-sity	Spec-trum	Classification	O−C (.001 cm⁻¹)	Wave-length Å	Wave-number (cm⁻¹)	In-ten-sity	Spec-trum	Classification	O−C (.001 cm⁻¹)
9127.68	10952.680	3	I	6663°_5 17615_4	13	9360.48	10680.282	1	II	$7713^\circ_{41/2}$ $18393_{31/2}$	35
9128.07	10952.212	5	I	2437°_4 13389_3	14	9362.96	10677.453	1			
9131.41	10948.206	3	I	8509°_4 19457_3	22	9364.88	10675.264	2			
9133.23	10946.025	5	I	7715°_5 18661_5	—27	9368.61	10671.014	5			
			II	$2581^\circ_{41/2}$ $13527_{41/2}$	48	9374.17	10664.685	2	I	7933°_5 18598_6	—17
9138.49	10939.724	6	I	3196°_4 14136_3	9	9377.64	10660.739	5	I	3974°_0 14635_1	0
9139.30	10938.755	2	I	5409°_2 16347_2	13	9378.13	10660.182	2	I	7348°_4 18008_5	39
9141.65	10935.943	5	I	3710°_1 14646_2	11	9380.60	10657.375	3	I	7348°_4 18005_3	22
9143.40	10933.850	6							I	8101°_2 18758_3	49
9151.02	10924.745	2	I	3710°_1 14635_1	15	9383.36	10654.240	4			
9152.06	10923.504	3	I	7696°_6 18619_5	29	9386.40	10650.789	4			
9153.31	10922.012	2				9387.37	10649.689	2	I	4746°_6 15396_6	30
9169.13	10903.168	3	I	4160°_3 15063_3	0				I	9119°_0 19768_1	—48
9172.18	10899.542	3	I	6809°_8 17708_7	—36	9398.79	10636.749	2	II	$2581^\circ_{41/2}$ $13217_{31/2}$	16
			I	9830°_6 20730_5	15	9400.78	10634.497	2	I	6234°_3 16869_4	36
9172.93	10898.651	2				9401.22	10634.000	4	I	6234°_3 16868_2	22
9173.13	10898.413	2				9404.29	10630.528	3			
9173.96	10897.427	2				9408.74	10625.500	4	I	4020°_1 14646_2	10
9175.46	10895.646	1	I	8400°_5 19296_4	23	9410.90	10623.062	4	I	2369°_3 12992_2	15
9180.23	10889.984	1	I	4173°_4 15063_3	27	9418.61	10614.366	3	I	4020°_1 14635_1	76
9181.19	10888.846	2							I	9947°_2 20562_1	29
9182.78	10886.960	3	I	8055°_6 18942_7	8	9431.70	10599.634	2	I	5409°_2 16008_3	40
			I	10774°_3 21661_3	28	9441.40	10588.744	3			
9185.22	10884.068	6				9446.61	10582.905	1			
9197.08	10870.033	1				9446.86	10582.625	1			
9201.32	10865.024	2	I	5519°_3 16384_3	34	9450.13	10578.963	1			
9205.95	10859.560	1				9452.93	10575.829	1			
9210.73	10853.924	4	I	9135°_3 19988_3	37	9453.18	10575.549	1			
9219.10	10844.070	2	I	8400°_5 19244_4	13	9454.89	10573.637	1			
			I	9947°_2 20791_1	17	9464.89	10562.465	1			
9226.31	10835.596	5	I	3764°_5 14599_4	6	9465.68	10561.584	1			
9227.02	10834.762	5				9466.01	10561.216	2	ι	$4266^\circ_{31/2}$ $14827_{31/2}$	—15
9227.38	10834.339	1	I	8400°_5 19235_6	—28	9469.66	10557.145	3			
9227.56	10834.128	1				9474.25	10552.030	3	I	5097°_1 15649_0	33
9233.38	10827.299	3	I	7467°_5 18294_6	8	9478.16	10547.677	1			
9237.03	10823.020	3	I	4417°_5 15240_4	19	9480.51	10545.063	1			
9238.26	10821.579	1	I	4766°_2 15587_2	—24	9484.08	10541.093	5			
9241.40	10817.902	1				9486.51	10538.393	2			
9242.36	10816.779	1				9490.85	10533.574	5	I	6856°_4 17390_4	19
9244.08	10814.766	2	I	4746°_6 15561_5	47	9492.00	10532.298	2			
9245.86	10812.684	5	I	5572°_4 16384_3	17	9503.03	10520.073	1			
9254.49	10802.601	2	I	3100°_4 13902_3	—7	9505.77	10517.041	1			
			I	8270°_3 19072_3	—47	9513.94	10508.010	2			
9254.74	10802.309	1				9522.35	10498.729	2	I	7696°_6 18194_5	49
9258.46	10797.969	2	I	5210°_2 16008_3	44	9533.07	10486.923	2			
9258.80	10797.573	3	II	$4165^\circ_{41/2}$ $14963^\circ_{51/2}$	11	9533.59	10486.351	3	I	10243°_4 20730_5	—3
9264.20	10791.279	3	I	5409°_2 16200_3	22	9535.09	10484.702	3	I	7169°_3 17654_3	35
9285.36	10766.687	1				9536.91	10482.701	1	I	8762°_4 19244_4	40
9291.42	10759.665	5							II	$3793^\circ_{61/2}$ $14276_{51/2}$	30
9294.37	10756.250	2				9539.83	10479.492	3			
9297.81	10752.270	1	I	2208°_5 12960_6	—22	9541.71	10477.428	1			
9317.79	10729.214	3	I	3210°_5 13939_6	5	9542.39	10476.681	1	II	$5675^\circ_{41/2}$ $16152_{31/2}$	53
9319.67	10727.050	3				9545.35	10473.432	1	II	$4266^\circ_{31/2}$ $14739_{21/2}$	61
9320.33	10726.291	1				9549.71	10468.650	1			
9321.19	10725.301	3				9558.57	10458.947	1	I	6856°_4 17315_4	68
9321.96	10724.415	1							I	8603°_6 19062_5	—19
9330.50	10714.599	1	I	6337°_3 17051_3	18	9559.08	10458.389	1	I	6234°_3 16693_4	29
9337 (6	10706.154	5	I	3196°_4 13902_3	1	9569.07	10447.471	3	I	5802°_7 16249_6	—21
9343.39	10699.818	1				9578.11	10437.610	2	I	7348°_4 17785_3	—27
9355.03	10686.504	1				9578.84	10436.815	2			
9355.73	10685.705	2				9581.91	10433.471	1			
9356.10	10685.282	2				9583.07	10432.208	2	I	7933°_5 18365_5	41
9357.60	10683.569	2	II	$3703^\circ_{31/2}$ $14387_{41/2}$	50	9589.36	10425.365	3	I	5519°_3 15945_4	5
9358.03	10683.078	1				9591.09	10423.484	1			

Table 1. *Observed infrared cerium lines*—Continued

Wavelength Å	Wavenumber (cm⁻¹)	Intensity	Spectrum	Classification		O−C (.001 cm⁻¹)
9591.93	10422.572	1	I	8270°_3	18692_4	28
9592.90	10421.518	2	II	$4203^\circ_{6\frac12}$	$14625_{5\frac12}$	—49
9600.05	10413.756	2	I	3100°_4	13513_4	32
			I	9787_3	20200_2	12
9615.43	10397.099	2	I	5210°_2	15607_2	24
9617.92	10394.407	2	I	3210°_5	13605_6	—9
			I	10774_3	21168_2	25
9618.60	10393.673	2	I	6475°_4	16869_4	—39
9620.44	10391.685	1	II	$3995^\circ_{3\frac12}$	$14387_{4\frac12}$	30
9622.88	10389.050	2				
9637.70	10373.074	1	I	5572°_4	15945_4	38
9642.31	10368.115	1	I	7853°_1	18221_1	42
9651.19	10358.575	4	I	6809°_8	17167_7	23
9655.93	10353.491	2				
9656.39	10352.997	2	I	10723°_4	21076_4	32
9659.86	10349.278	3				
9668.92	10339.581	1	I	4455°_6	14795_5	47
9669.45	10339.014	2				
9676.76	10331.204	1				
9678.67	10329.165	3	I	5315°_7	15644_6	25
9683.75	10323.747	1	I	5519°_3	$15843_4\cdot$	49
9686.92	10320.368	2	I	7841°_5	18162_4	12
			I	10586°_4	20907_4	24
9689.76	10317.343	2				
9694.47	10312.331	3	II	$3363^\circ_{2\frac12}$	$13675_{2\frac12}$	31
			II	$7259^\circ_{3\frac12}$	$17571_{4\frac12}$	6
9696.41	10310.267	1				
9696.90	10309.746	2				
9701.99	10304.338	3	II	$3745^\circ_{1\frac12}$	$14049_{1\frac12}$	54
9705.69	10300.410	2	I	3764°_5	14064_4	36
			I	8762°_4	19062_5	38
9712.88	10292.785	1				
9722.41	10282.695	2	II	$9198^\circ_{3\frac12}$	$19481_{4\frac12}$	—23
9725.54	10279.386	3				
9739.28	10264.884	2				
9739.67	10264.473	3				
9741.26	10262.798	2				
9742.59	10261.397	1				
9744.67	10259.207	5	I	2208°_5	12467_5	37
9759.41	10243.712	2				
9763.74	10239.169	3	I	8055°_6	18294_7	50
9768.22	10234.473	2				
9769.91	10232.703	2				
9772.01	10230.504	2	I	6303°_2	16534_2	37
9773.60	10228.839	1	I	7933°_5	18162_4	66
			I	11271°_4	21499_3	12
9774.09	10228.327	1				
9774.54	10227.856	2				
9779.05	10223.139	1	II	$4910^\circ_{5\frac12}$	$15134_{4\frac12}$	41
9780.75	10221.362	2				
9781.72	10220.348	1	I	7169°_3	17390_4	—14
9783.38	10218.614	4				
9785.96	10215.920	2	I	7174°_4	17390_4	—37
9788.98	10212.768	2				
9792.27	10209.337	2				
9798.57	10202.773	1				
9799.56	10201.742	1				
9801.82	10199.390	2				
9802.39	10198.797	3	II	$8280^\circ_{2\frac12}$	$18479_{1\frac12}$	—27
9805.90	10195.146	4	I	6856°_4	17051_3	63
			I	9135°_3	19330_2	30
9806.95	10194.055	2				
9808.27	10192.683	3	I	6475°_4	16668_3	33
9817.00	10183.619	1	I	8509°_4	18692_4	35
			I	10723°_4	20907_4	15
			II	$5675^\circ_{4\frac12}$	$15859_{4\frac12}$	20
9819.47	10181.057	2				
9822.55	10177.865	1				
9824.51	10175.834	1	I	3764°_5	13939_6	49
9826.80	10173.463	2	I	6663°_5	16836_6	42
9830.52	10169.613	1	I	7174°_4	17343_5	35
			I	10612°_2	20782_3	—29
9842.74	10156.987	2	I	7841°_5	17998_4	—31
9846.24	10153.377	4	I	4455°_6	14609_7	45
9849.51	10150.006	3				
9850.70	10148.780	2	I	7467°_5	17615_4	47
9852.62	10146.802	3	I	5409°_2	15555_3	46
9857.94	10141.326	2	I	7174°_4	17315_4	44
			I	9425°_2	19566_1	—5
9859.81	10139.403	2	I	8055°_6	18194_5	39
9865.04	10134.027	2	II	$7341^\circ_{5\frac12}$	$17475_{4\frac12}$	—12
9869.98	10128.955	3				
9877.48	10121.264	1	I	5637°_1	15758_2	40
9881.17	10117.485	2	I	3764°_5	13881_5	49
9883.28	10115.325	1				
9885.13	10113.432	2				
9893.53	10104.845	1	I	5904°_2	16008_3	20
9894.37	10103.987	2				
9897.48	10100.812	1	I	8101°_2	18201_1	29
9906.53	10091.585	1	I	8101°_2	18192_3	6
9907.78	10090.312	1	I	7348°_4	17438_4	45
			II	$4737^\circ_{2\frac12}$	$14827_{3\frac12}$	61
9909.81	10088.245	1	I	5519°_3	15607_2	15
9912.01	10086.006	2	I	6856°_4	16942_4	39
9914.30	10083.676	3	I	5674°_1	15758_2	47
9915.45	10082.506	1	I	1279°_4	11361_4	36
9916.49	10081.449	1	I	$9462^\circ_5\cdot$	19544_4	49
9917.22	10080.707	2				
9920.20	10077.679	1				
9921.54	10076.318	2				
9922.90	10074.937	4				
9924.34	10073.475	2	II	$3363^\circ_{2\frac12}$	$13436_{2\frac12}$	60
9926.70	10071.080	2	I	8991°_5	19062_5	33
9930.65	10067.074	2				
9932.20	10065.503	1				
9934.01	10063.669	2				
9939.79	10057.817	4				
9943.92	10053.640	2				
9944.80	10052.750	2				
9955.88	10041.562	1				
9958.83	10038.588	1	I	11626°_1	21664_0	—39
9961.08	10036.320	4				
9963.64	10033.742	2				
9967.10	10030.259	4				
9984.69	10012.588	2	I	5637°_1	15649_0	47
9986.93	10010.343	5				
9993.16	10004.102	4	II	$5513_{5\frac12}$	$15517_{6\frac12}$	43
9994.25	10003.011	1	I	11337°_3	21340_3	6
			II	$5819^\circ_{4\frac12}$	$15822_{3\frac12}$	65
9998.96	9998.299	2				
10002.20	9995.060	2				
10002.48	9994.780	2				
10005.09	9992.173	2				
10007.89	9989.377	1				
10011.46	9985.815	1	II	$4266^\circ_{3\frac12}$	$14252_{3\frac12}$	34
10013.27	9984.010	1				

TABLE 1. *Observed infrared cerium lines*—Continued

Wavelength Å	Wavenumber (cm⁻¹)	Intensity	Spectrum	Classification	O−C (.001 cm⁻¹)
10016.60	9980.691	1	I	9947°_2 19928_3	45
10021.24	9976.070	1	I	4160°_3 14136_3	31
10022.33	9974.985	1	I	5674°_1 15649_0	40
10031.59	9965.777	1	I	8101°_2 18066_1	33
10033.61	9963.771	2	I	8088°_2 18052_2	−6
10056.41	9941.181	2			
10058.82	9938.799	4			
10064.36	9933.328	2	II	$3593^\circ_{4 1/2}$ $13527_{4 1/2}$	−34
10070.45	9927.321	2			
10072.75	9925.055	2			
10074.57	9923.262	1			
10078.27	9919.618	2			
10088.78	9909.285	1			
10091.03	9907.075	2	II	$6638^\circ_{4 1/2}$ $16545_{5 1/2}$	70
10096.07	9902.130	2	I	9903°_1 19805_2	−37
10096.20	9902.002	2	I	8509°_4 18411_4	41
10097.50	9900.727	3			
10102.78	9895.553	1	I	7890°_4 17785_3	45
10103.18	9895.161	1	II	$4844^\circ_{1 1/2}$ $14739_{2 1/2}$	45
10105.04	9893.340	2	I	10249°_0 20142_1	0
10107.65	9890.785	1			
10112.97	9885.582	1			
10114.56	9884.028	1	I	9996°_3 19880_2	−31
10116.61	9882.025	1			
10118.45	9880.228	1			
10136.59	9862.547	1			
10137.00	9862.148	1			
10137.16	9861.992	3			
10142.07	9857.218	1	II	$5964^\circ_{3 1/2}$ $15822_{3 1/2}$	53
10142.80	9856.509	1	I	8509°_4 18365_5	−6
10144.88	9854.488	5	I	5904°_2 15758_2	36
10150.28	9849.245	2	I	8762°_4 18611_3	−14
10151.29	9848.265	3	I	7467°_5 17315_4	−12
10151.61	9847.955	5	I	5904°_2 15751_1	12
10155.76	9843.930	1	I	10586°_4 20430_3	45
10156.91	9842.816	4	I	5802°_7 15644_6	−18
10158.79	9840.994	1	I	3764°_5 13605_6	2
10159.87	9839.948	1			
10160.77	9839.077	1			
10163.32	9836.608	3	I	6856°_4 16693_4	15
			I	7853°_1 17689_2	−19
10164.81	9835.166	1			
10165.50	9834.499	2	I	8307°_3 18141_4	−39
10168.49	9831.607	1	I	6836°_2 16668_3	45
10169.83	9830.311	2	II	$7341^\circ_{5 1/2}$ $17171_{5 1/2}$	69
10174.53	9825.770	3	I	10604°_3 20430_3	2
			II	$5455^\circ_{7 1/2}$ $15281_{6 1/2}$	6
10175.65	9824.689	1	I	10673°_6 20498_5	21
10177.57	9822.836	3	I	11796°_4 21619_4	−28
10184.37	9816.277	1			
10185.44	9815.246	3	II	$2641^\circ_{3 1/2}$ $12456_{3 1/2}$	57
10189.00	9811.816	2	I	3312°_4 13124_5	46
10192.89	9808.072	2	I	3976°_6 13784_5	25
10193.87	9807.129	1	I	7841°_5 17649_6	48
10196.86	9804.253	1			
10201.65	9799.650	3			
10202.00	9799.314	3			
10203.26	9798.103	3			
10203.62	9797.758	2			
10204.69	9796.730	2			
10205.06	9796.375	3			
10207.31	9794.216	1	I	10318°_3 20112_4	49
10209.23	9792.374	1	II	$4459^\circ_{3 1/2}$ $14252_{3 1/2}$	72

Wavelength Å	Wavenumber (cm⁻¹)	Intensity	Spectrum	Classification	O−C (.001 cm⁻¹)
10215.51	9786.354	1			
10216.69	9785.224	3	I	8101°_2 17886_2	32
10219.41	9782.619	3			
10228.19	9774.222	1			
10228.43	9773.993	1	I	6234°_3 16008_3	−45
10231.42	9771.136	1	I	8430°_1 18201_1	12
10234.38	9768.310	3			
10235.52	9767.222	1	I	12297°_5 22064_6	37
10237.93	9764.923	2			
10240.78	9762.205	1	I	8603°_6 18365_5	12
10241.43	9761.586	2	I	8400°_5 18162_4	5
10245.08	9758.108	4	I	5519°_3 15277_3	7
10245.44	9757.765	2	II	$9723^\circ_{4 1/2}$ $19481_{4 1/2}$	58
10246.39	9756.861	1	I	9787°_3 19544_4	−23
10250.16	9753.272	1	II	$4523^\circ_{4 1/2}$ $14276_{5 1/2}$	1
10251.29	9752.197	3	I	7169°_3 16921_3	−31
10252.14	9751.388	3	I	11061°_7 20812_7	18
10253.71	9749.895	3	I	3764°_5 13513_4	28
			I	8902°_3 18652_3	−40
10255.54	9748.155	2	II	$3508^\circ_{0 1/2}$ $13256_{1 1/2}$	−60
10255.85	9747.861	3	I	7174°_4 16921_3	37
10258.80	9745.058	5	I	2369°_3 12114_4	11
10261.76	9742.247	3	I	5006°_3 14748_4	21
10265.22	9738.963	4			
10271.21	9733.284	4	I	10586°_4 20320_4 ·	16
			II	$3703^\circ_{3 1/2}$ $13436_{2 1/2}$	38
10279.10	9725.813	2			
10279.39	9725.538	4			
10289.71	9715.784	2	I	8351°_0 18066_1	20
10290.45	9715.085	2	II	$2382^\circ_{4 1/2}$ $12097_{3 1/2}$	56
10290.96	9714.604	2	II	$4910^\circ_{5 1/2}$ $14625_{5 1/2}$	57
10297.05	9708.858	2	II	$5118^\circ_{2 1/2}$ $14827_{3 1/2}$	40
10298.77	9707.237	1	II	$10274^\circ_{3 1/2}$ $19982_{4 1/2}$	16
10299.36	9706.681	2	I	8587°_7 18294_7	9
10302.85	9703.393	1	I	7348°_4 17051_3	50
10304.97	9701.397	1			
10308.74	9697.849	3	I	6836°_2 16534_2	26
10309.61	9697.030	1	I	8088°_2 17785_3	5
10311.65	9695.112	3	I	7174°_4 16869_4	15
10315.64	9691.362	1	II	$3745^\circ_{1 1/2}$ $13436_{2 1/2}$	−5
10318.36	9688.807	3	I	7841°_5 17530_5	1
			I	9947°_2 19636_3	−6
10321.79	9685.587	2			
10323.56	9683.927	3	I	5904°_2 15587_2	6
10325.30	9682.295	3	I	7933°_5 17615_4	−39
10327.42	9680.307	2	I	6337°_3 16017_3	10
			II	$3995^\circ_{3 1/2}$ $13675_{2 1/2}$	41
10331.51	9676.475	6	I	2437°_4 12114_4	−10
10333.25	9674.846	3	I	7715°_5 17390_4	−31
10333.80	9674.331	5	I	8055°_6 17729_5	−17
10336.10	9672.178	2	I	10673°_6 20346_6	4
10336.48	9671.823	5			
10338.74	9669.708	2			
10339.98	9668.549	5	I	5572°_4 15240_4	4
10356.50	9653.126	1	I	8509°_4 18162_4	24
10357.32	9652.362	1	II	$5924^\circ_{1 1/2}$ $15576_{1 1/2}$	6
10357.75	9651.961	3	I	5904°_2 15555_3	−24
			I	11517°_1 21168_2	18
10360.91	9649.017	1	I	8762°_4 18411_4	−26
10374.57	9636.313	2			
10378.55	9632.617	1	I	8509°_4 18141_4	−21
10381.45	9629.927	2			
10382.61	9628.851	3	I	3976°_6 13605_6	−44

TABLE 1. *Observed infrared cerium lines*—Continued

Wavelength Å	Wavenumber (cm⁻¹)	Intensity	Spectrum	Classification		O−C (.001 cm⁻¹)
10387.12	9624.670	5	I I	$5969^\circ_{5\frac12}$	$15593_{6\frac12}$	32
10396.33	9616.144	2	I	8270°_3	17886_2	14
10396.87	9615.644	1	I I	$6517^\circ_{2\frac12}$	$16133_{2\frac12}$	42
10402.24	9610.680	3	I	4173°_4	13784_5	23
10403.14	9609.849	1				
10403.56	9609.461	1				
10404.32	9608.759	1	I I	$5118^\circ_{2\frac12}$	$14727_{1\frac12}$	27
10405.09	9608.048	3	I	6337°_3	15945_4	−1
10405.40	9607.762	3	I	8400°_5	18008_5	50
10410.93	9602.658	1	I	11796°_4	21399_3	11
10411.30	9602.317	1	I	10673°_6	20276_5	44
10412.86	9600.878	3	I	8088°_2	17689_2	44
10413.54	9600.251	3	I	7715°_5	17315_4	50
			I I	$11340^\circ_{3\frac12}$	$20940_{3\frac12}$	8
10423.12	9591.428	2				
10428.73	9586.268	2	I	11578°_1	21165_1	−39
10437.06	9578.617	1	I	6621°_3	16200_3	16
10439.85	9576.057	1				
10442.27	9573.838	1				
10455.70	9561.541	1				
10456.86	9560.480	3				
10458.78	9558.725	3				
10462.79	9555.062	1	I	7348°_4	16903_5	−18
10465.90	9552.222	2				
10466.42	9551.748	1	I	8762°_4	18313_3	13
10470.44	9548.081	2	I	6836°_2	16384_3	−31
10471.13	9547.451	2	I	9996°_3	19544_4	−6
10477.24	9541.884	3				
10486.68	9533.294	3	I	6475°_4	16008_3	3
10488.96	9531.222	1	I	6234°_3	15766_3	−33
10492.26	9528.224	1	I	6856°_4	16384_3	42
10496.95	9523.967	2				
10497.29	9523.658	2	I	6234°_3	15758_2	−7
10498.94	9522.162	2	I	4417°_5	13939_6	−12
			I	10318°_3	19840_4	−30
10499.96	9521.237	1				
10504.22	9517.375	1				
10505.26	9516.433	1	I	9830°_6	19347_5	−22
10505.82	9515.926	1	I I	$10454^\circ_{1\frac12}$	$19970_{2\frac12}$	23
10511.11	9511.137	2				
10513.34	9509.119	3	I	9787°_3	19296_4	−13
10515.91	9506.795	2	I	8695°_1	18201_1	27
			I	9903°_1	19409_2	20
10517.04	9505.774	1	I	9200°_2	18706_2	−20
10521.46	9501.781	1	I	7841°_5	17343_5	2
10524.29	9499.226	2	I	8509°_4	18008_5	−6
10525.15	9498.449	3	I	7169°_3	16668_3	11
10529.20	9494.796	1	I	8400°_5	17895_5	−12
10530.70	9493.444	1				
10532.32	9491.983	2				
10534.51	9490.010	2				
10543.27	9482.125	1	I	6856°_4	16338_4	−19
10545.29	9480.309	3	I	9462°_5	18943_5	1
10550.93	9475.241	3	I	8055°_6	17530_5	6
10556.03	9470.663	1				
10557.15	9469.659	2				
10563.59	9463.886	3				
10565.55	9462.130	1				
10566.59	9461.199	1	I	6337°_3	15798_3	34
10568.93	9459.104	3	I	10879°_5	20338_5	4
10569.78	9458.343	2	I	9947°_2	19406_3	8
			I I	$5675^\circ_{4\frac12}$	$15134_{4\frac12}$	49
10571.74	9456.590	2	I	7933°_5	17390_4	34
10572.91	9455.543	1	I	8430°_1	17886_2	10
10575.64	9453.102	3	I	4455°_6	13908_7	32
10580.09	9449.126	1	I	9709°_2	19158_2	4
10587.02	9442.941	2				
10598.45	9432.757	2	I	8762°_4	18194_5	−6
10600.59	9430.853	4	I	3764°_5	13194_4	12
10604.02	9427.803	1	I	5315°_7	14743_6	−19
10606.36	9425.723	2	I	4455°_6	13881_5	35
10608.14	9424.141	1	I	8603°_6	18027_7	3
10613.00	9419.826	3	I	8366°_2	17785_3	−12
10614.60	9418.406	2	I	7169°_3	16588_4	−44
10615.36	9417.731	3				
10619.43	9414.122	6				
10629.02	9405.628	4	I	4199°_5	13605_6	−4
10630.93	9403.938	1				
10632.99	9402.116	3	I	7467°_5	16869_4	23
10646.48	9390.203	2	I	11357°_5	20747_4	2
			I I	$5437^\circ_{3\frac12}$	$14827_{3\frac12}$	−4
10647.73	9389.101	1	I	10723°_4	20112_4	8
10648.71	9388.237	5	I	6663°_5	16051_4	−14
10650.14	9386.976	3	I	6621°_3	16008_3	37
10653.90	9383.663	3	I	11578°_1	20962_2	6
10655.32	9382.413	3	I	8307°_3	17689_2	−24
			I	9947°_2	19330_2	20
10655.94	9381.867	2	I	7933°_5	17315_4	−12
10658.38	9379.719	3	I	8762°_4	18141_4	−2
10659.03	9379.147	5	I	0°_4	9379_4	0
10665.82	9373.176	3	I	6234°_3	15607_2	−12
			I	9947°_2	19321_2	−20
10667.69	9371.533	3	I	8603°_6	17975_6	4
10669.42	9370.013	1	I	4766°_2	14136_3	15
			I	7696°_5	17066_6	−22
10670.03	9369.478	5	I	7467°_5	16836_6	−8
10670.57	9369.004	4	I	12454°_2	21823_1	−25
10671.86	9367.871	3	I	6475°_4	15843_4	−37
10673.40	9366.520	3	I	4417°_5	13784_5	−12
10674.80	9365.291	1	I I	$4910^\circ_{5\frac12}$	$14276_{5\frac12}$	−52
10680.79	9360.039	5	I	3764°_5	13124_5	37
10688.17	9353.576	2	I	4160°_3	13513_4	−15
10688.70	9353.112	1	I	6234°_3	15587_2	−22
10696.46	9346.327	4	I I	$5616^\circ_{4\frac12}$	$14963^\circ_{5\frac12}$	−44
10697.25	9345.637	1	I	8270°_3	17615_4	−6
10700.23	9343.034	2	I	11810°_4	21153_5	3
10703.25	9340.398	2	I	4173°_4	13513_4	17
10711.69	9333.038	1				
10717.07	9328.353	1	I	5210°_2	14539_3	47
			I	4455°_6	13784_5	−41
10718.13	9327.430	2				
10725.29	9321.203	2	I	6234°_3	15555_3	4
10726.84	9319.857	1	I	7348°_4	16668_3	−33
10728.76	9318.189	1	I	10318°_3	19636_3	−8
10731.82	9315.532	1	I	11030°_6	20346_6	−18
10732.53	9314.916	2	I I	$5819^\circ_{4\frac12}$	$15134_{4\frac12}$	−21
10735.25	9312.555	1	I I	$5969^\circ_{5\frac12}$	$15281_{6\frac12}$	−49
10736.33	9311.619	2	I	11301°_2	20613_3	−15
			I I	$7233^\circ_{5\frac12}$	$16545_{5\frac12}$	−18
10743.32	9305.560	2	I	7841°_5	17147_4	−22
10750.03	9299.752	5	I	9996°_3	19296_4	46
10757.54	9293.260	2	I	5315°_7	14609_7	−24
10757.84	9293.000	2	I I	$1410^\circ_{4\frac12}$	$10703_{4\frac12}$	−7
10758.35	9292.560	3	I	9135°_3	18427_3	47
10760.63	9290.591	4				
10763.37	9288.226	5	I	8055°_6	17343_5	18
10771.01	9281.638	3	I	3710°_1	12992_2	36
10771.73	9281.017	1	I	9425°_2	18706_2	44

TABLE 1. *Observed infrared cerium lines*—Continued

Wave-length Å	Wave-number (cm⁻¹)	In-ten-sity	Spec-trum	Classification		O−C (.001 cm⁻¹)	Wave-length Å	Wave-number (cm⁻¹)	In-ten-sity	Spec-trum	Classification		O−C (.001 cm⁻¹)
10774.64	9278.511	1					10917.65	9156.972	2	I	9462°_{5}	18619_{5}	−7
10777.43	9276.109	3	I	9135°_{3}	18411_{4}	38	10918.49	9156.268	1	I	3210°_{5}	12366_{5}	17
10778.11	9275.523	1					10919.31	9155.580	2	I	3312°_{5}	12467_{5}	−6
10779.82	9274.052	2					10923.31	9152.227	3	I	6856°_{4}	16008_{3}	−44
10781.46	9272.641	1					10926.83	9149.279	5	I	4455°_{6}	13605_{6}	35
10783.38	9270.990	3					10929.68	9146.893	3	I	8270°_{3}	17417_{2}	−7
10786.44	9268.360	1					10931.07	9145.730	1				
10788.36	9266.711	3	I	3100°_{4}	12366_{5}	28	10931.72	9145.186	2	I	8509°_{4}	17654_{3}	−22
10795.20	9260.839	1	II	$4266_{3\frac12}$	$13527_{4\frac12}$	−2	10934.19	9143.120	5	I	6238_{5}	15382_{6}	27
10797.47	9258.892	1	I	8430°_{1}	17689_{2}	−8	10937.41	9140.429	3	I	4762°_{3}	13903°_{3}	2
10802.00	9255.010	1	I	$99z3^{\circ}_{1}$	19158_{2}	−2				I	7696°_{6}	16836_{6}	−7
10803.38	9253.827	1	I	10586°_{4}	19840_{4}	−31	10941.68	9136.862	2	I	6234°_{3}	15371_{4}	7
			II	$7746_{2\frac12}$	$17000_{3\frac12}$	−7	10942.63	9136.068	2	I	11131°_{3}	20267_{3}	−6
10808.05	9249.829	1	I	11850°_{5}	21100_{6}	16	10944.16	9134.791	2	I	4746°_{6}	13881_{5}	−25
10809.93	9248.220	1					10948.40	9131.254	2	I	8307°_{3}	17438_{4}	−2
10814.61	9244.218	2	I	6836°_{2}	16080_{2}	−35	10949.33	9130.478	3	I	6836°_{2}	15967_{2}	19
10819.48	9240.057	1					10950.50	9129.502	1	I	11578°_{1}	20708_{2}	−27
10822.83	9237.197	4	I	5409°_{2}	14646_{2}	−11	10951.05	9129.044	2	I	10901°_{2}	20030_{3}	36
10823.24	9236.847	4	I	8762°_{4}	17998_{4}	0	10952.37	9127.944	2	I	12454°_{2}	21582_{3}	29
10824.76	9235.550	3					10956.79	9124.261	2	I	10586°_{4}	19711_{3}	26
10826.27	9234.262	2					10958.88	9122.521	1	II	$3995^{\circ}_{3\frac12}$	$13117_{4\frac12}$	61
10827.56	9233.162	3	I	7841°_{5}	17075_{5}	10	10960.62	9121.073	1	I	7467°_{5}	16588_{4}	31
10831.18	9230.076	4	I	9462°_{5}	18692_{4}	−11	10960.92	9120.823	2				
			I	12351°_{4}	21581_{5}	−11	10972.14	9111.497	2				
10832.21	9229.198	4	I	5519°_{3}	14748_{4}	4	10983.91	9101.733	1				
10834.43	9227.307	5	I	7715°_{5}	16942_{4}	17	10994.10	9093.297	3	I	10586°_{4}	19680_{4}	−8
10835.95	9226.013	6	I	5409°_{2}	14635_{1}	6				II	$3363^{\circ}_{2\frac12}$	$12456_{3\frac12}$	−29
			I	7467°_{5}	16693_{4}	21				II	$7059^{\circ}_{4\frac12}$	$16152_{3\frac12}$	−16
10839.29	9223.170	1	I	5572°_{4}	14795_{5}	−45	11001.11	9087.503	2				
10840.48	9222.158	2					11001.92	9086.834	2	II	$5010^{\circ}_{2\frac12}$	$14097_{3\frac12}$	−7
10842.23	9220.669	1	I	8509°_{4}	17729_{5}	3	11009.61	9080.487	3	I	6475°_{4}	15555_{3}	35
10844.25	9218.951	4	I	6337°_{3}	15555_{3}	21	11010.39	9079.843	1	I	5519°_{3}	14599_{4}	−3
10847.10	9216.529	2	I	6663°_{5}	15879_{5}	−22	11011.28	9079.110	3	I	6621°_{3}	15700_{4}	24
10849.63	9214.380	1	I	10774°_{3}	19988_{3}	0	11011.83	9078.656	1				
10854.11	9210.577	3	I	7174°_{4}	16384_{3}	−7	11014.91	9076.118	2	II	$2382^{\circ}_{4\frac12}$	$11458_{5\frac12}$	0
10858.13	9207.167	5	I	7696°_{6}	16903_{5}	−2	11023.25	9069.251	1	I	11131°_{3}	20200_{2}	−2
10862.57	9203.404	1	I	8991°_{5}	18194_{5}	−34	11025.11	9067.721	1				
10870.20	9196.943	6	I	3764°_{5}	12960_{6}	2	11027.19	9066.010	2	I	10774°_{3}	19840_{4}	−15
			II	$8278_{5\frac12}$	$17475_{4\frac12}$	−33	11029.58	9064.046	1	I	5571°_{0}	14635_{1}	−40
10874.69	9193.146	3	I	4746°_{6}	13939_{6}	−19	11033.20	9061.072	5	I	8587°_{7}	17649_{6}	9
10876.97	9191.219	1	I	8695°_{1}	17886_{2}	41	11035.19	9059.438	3	I	10901°_{2}	19961_{1}	−1
			II	$5942_{3\frac12}$	$15134_{4\frac12}$	−32	11040.33	9055.220	1	II	$6521_{1\frac12}$	$15576_{1\frac12}$	−7
10879.40	9189.166	1					11040.82	9054.818	1	II	$4201_{1\frac12}$	$13256_{1\frac12}$	17
10881.54	9187.359	3	I	4417°_{5}	13605_{6}	−22	11042.27	9053.629	2	II	$0_{3\frac12}$	$9053_{3\frac12}$	−6
10884.70	9184.692	1	I	7890°_{4}	17075_{5}	14	11043.56	9052.572	1	I	10243°_{4}	19296_{4}	0
			I	11545°_{4}	20730_{5}	−44	11044.12	9052.113	1	I	7890°_{4}	16942_{4}	16
10886.10	9183.511	1					11045.44	9051.031	2	I	8366°_{2}	17417_{2}	−20
10887.81	9182.068	5					11047.37	9049.450	1	I	7174°_{4}	16223_{5}	−36
10889.46	9180.677	1	II	$7011_{4\frac12}$	$16192^{\circ}_{4\frac12}$	18	11052.28	9045.429	1	I	11578°_{1}	20624_{2}	5
10891.71	9178.781	2	I	9135°_{3}	18313_{3}	19				I	12454°_{2}	21499_{3}	1
10893.98	9176.868	3	I	5572°_{4}	14748_{4}	−2	11061.66	9037.759	4	I	6663°_{5}	15700_{4}	7
10894.61	9176.337	2	I	6621°_{3}	15798_{3}	3	11065.54	9034.590	5	I	4160°_{3}	13194_{4}	24
10900.08	9171.732	1								I	6337°_{3}	15371_{4}	4
10901.94	9170.167	1					11067.81	9032.737	1	I	8270°_{3}	17302_{3}	43
10903.67	9168.712	2	II	$8402_{3\frac12}$	$17571_{4\frac12}$	−18				I	11030°_{6}	20063_{6}	27
10904.16	9168.300	5	I	8270°_{3}	17438_{4}	−16	11069.22	9031.587	2	I	7890°_{4}	16921_{3}	36
10907.29	9165.669	1	I	11626°_{1}	20791_{1}	−12	11070.36	9030.657	2	I	10774°_{3}	19805_{2}	−27
10907.94	9165.123	1	II	$5969_{5\frac12}$	$15134_{4\frac12}$	73				I	12425°_{4}	21456_{5}	27
10908.79	9164.409	4	II	$4511_{2\frac12}$	$13675_{2\frac12}$	−61	11075.58	9026.400	1				
10909.69	9163.653	2					11078.66	9023.891	1				
10911.47	9162.158	5	I	4746°_{6}	13908_{7}	−40	11080.15	9022.677	3	II	$7522_{5\frac12}$	$16545_{5\frac12}$	36
10912.61	9161.201	1	I	7890°_{4}	17051_{3}	−11	11081.74	9021.383	1	I	4173°_{4}	13194_{4}	28
10914.23	9159.841	6	I	6856°_{4}	16016_{5}	−8	11082.73	9020.577	3	I	7853°_{1}	16873_{1}	−3
10917.18	9157.366	2					11083.46	9019.983	1				

TABLE 1. *Observed infrared cerium lines* — Continued

Wavelength Å	Wavenumber (cm⁻¹)	Intensity	Spectrum	Classification	O−C (.001 cm⁻¹)
11084.10	9019.462	1	I	5519°_3 14539_3	1
11090.85	9013.973	4	I	3100°_4 12114_4	9
11102.95	9004.149	1	II	$4523^\circ_{41/2}$ $13527_{41/2}$	—56
11104.16	9003.168	2	I	7696°_6 16699_6	—5
11105.11	9002.398	2	I	8509°_4 17511_3	11
11105.85	9001.798	3	II	$4266^\circ_{31/2}$ $13268_{21/2}$	—16
11106.64	9001.158	1	I	9830°_6 18831_5	—15
11110.50	8998.031	2	I	5637°_1 14635_1	21
11114.85	8994.509	1	I	8695°_1 17689_2	—36
11127.51	8984.276	1			
11131.59	8980.983	3	II	$9723^\circ_{41/2}$ $18704_{51/2}$	5
11137.04	8976.588	1	I	10243°_4 19220_4	8
11143.23	8971.602	2	I	5674°_1 14646_2	—13
11156.63	8960.826	2	I	10879°_5 19840_4	—11
11157.16	8960.400	5	I	5674°_1 14635_1	—13
11168.12	8951.607	5	II	$4266^\circ_{31/2}$ $13217_{31/2}$	9
11169.49	8950.509	2	I	4173°_4 13124_5	—6
11170.45	8949.740	2	II	$5675^\circ_{41/2}$ $14625_{51/2}$	—2
11172.07	8948.442	1	I	9462°_5 18411_4	—22
11174.42	8946.560	2	II	$1873^\circ_{31/2}$ $10820_{21/2}$	14
11184.68	8938.353	1	II	$4737^\circ_{21/2}$ $13675_{21/2}$	3
11192.70	8931.949	3			
11195.92	8929.380	2	I	6836°_2 15766_3	—39
			I	8509°_4 17438_4	23
11198.64	8927.211	2	I	8603°_6 17530_5	—18
11200.89	8925.418	2	I	5210°_2 14136_3	2
11208.51	8919.350	1			
11210.85	8917.488	4	I	3196°_4 12114_4	—19
11229.47	8902.702	2			
11235.33	8898.058	1			
11241.53	8893.151	1	II	$8278_{51/2}$ $17171^\circ_{51/2}$	—28
11244.00	8891.197	1			
11245.26	8890.201	4	I	7696°_6 16586_5	—11
			I	12793°_5 21683_5	—16
11252.11	8884.789	2	II	$5942^\circ_{31/2}$ $14827_{31/2}$	—33
11253.44	8883.739	1	II	$12057^\circ_{21/2}$ $20940_{31/2}$	17
11258.48	8879.762	3	II	$2879^\circ_{51/2}$ $11759_{51/2}$	—3
11285.67	8858.368	3	I	4746°_6 13605_6	—4
11294.27	8851.623	2	II	$8448_{21/2}$ $17300^\circ_{31/2}$	—50
11294.76	8851.239	2	I	7841°_5 16693_4	42
11299.34	8847.652	2	I	7169°_3 16017_3	45
11322.63	8829.453	1			
11329.76	8823.896	2	II	$4203^\circ_{61/2}$ $13027_{61/2}$	75
11351.50	8806.997	3	I	9379_4 18186°_3	—14
			I	5802°_7 14609_7	17
11352.17	8806.477	2	I	11030°_6 19836_7	11
11356.22	8803.336	2	I	9903°_3 18706_2	—43
			II	$5924^\circ_{11/2}$ $14727_{11/2}$	5
11358.05	8801.918	2	I	3312°_4 12114_4	43
11358.84	8801.306	1	I	10604°_3 19406_3	38
11360.15	8800.291	1	I	10879°_5 19680_4	6
			II	$7059^\circ_{41/2}$ $15859_{41/2}$	6
11364.00	8797.310	3	I	7169°_3 15967_2	—25
11366.12	8795.669	1	I	9425°_2 18221_1	6
11368.60	8793.750	3	I	8509°_4 17302_3	16
11374.52	8789.173	3			
11383.31	8782.386	1			
11384.94	8781.129	2	I	8055°_6 16836_6	8
11388.10	8778.692	1	I	12297°_5 21076_4	—3
11393.09	8774.847	2	II	$5964^\circ_{31/2}$ $14739_{21/2}$	—19
11400.00	8769.529	1	I	10774°_3 19544_4	29
11401.21	8768.598	1	I	8762°_4 17530_5	—36
			II	$8531_{31/2}$ $17300^\circ_{31/2}$	—23
11402.48	8767.621	1	I	8101°_2 16868_2	38
			I	9830°_6 18598_6	—31
11403.00	8767.221	1	I	9425°_2 18192_3	—15
			II	$8804^\circ_{41/2}$ $17571_{41/2}$	52
11414.86	8758.112	3	II	$4459^\circ_{31/2}$ $13217_{31/2}$	—5
11416.58	8756.793	1	I	4762_4 13519_5	34
11418.24	8755.520	1	I	11357°_5 20112_4	—48
11419.74	8754.370	2			
11423.76	8751.289	3	I	6836°_2 15587_2	—9
			I	9135°_3 17886_2	9
11426.14	8749.466	1	I	8762°_4 17511_3	—3
			I	12873°_2 21623_2	47
11427.85	8748.157	1	I	13315°_4 22063_4	17
11428.76	8747.461	1	I	10879°_5 19627_6	—20
11429.60	8746.818	1	I	8400°_5 17147_4	10
11431.48	8745.379	1	II	$4511^\circ_{21/2}$ $13256_{11/2}$	—64
11432.76	8744.400	4			
11435.32	8742.442	3	I	5904°_2 14646_2	4
11454.95	8727.461	2	I	13219°_6 21946_5	1
11455.46	8727.072	5	I	5409°_2 14136_3	—13
11460.37	8723.333	1			
11465.15	8719.696	4	I	8400°_5 17120_5	25
11467.54	8717.879	1	I	11271°_4 19988_3	—18
			II	$6517^\circ_{21/2}$ $15235_{11/2}$	—70
11479.39	8708.880	1	I	11131°_3 19840_4	—40
11480.00	8708.417	1	I	6663°_5 15371_4	—3
			II	$7746^\circ_{21/2}$ $16454_{21/2}$	59
11482.62	8706.430	1	I	4417°_5 13124_5	38
11486.02	8703.853	5	I	3764°_5 12467_5	34
11491.75	8699.513	2	II	$4737^\circ_{21/2}$ $13436_{21/2}$	47
11499.96	8693.302	1	I	7853°_1 16546_0	3
11501.91	8691.828	1	I	5210°_2 13902_3	—25
11502.41	8691.451	2	I	10604°_3 19296_4	—12
11502.85	8691.118	1			
11505.56	8689.071	1	I	5409°_2 14098_2	2
11508.99	8686.481	1			
11512.52	8683.818	1	I	13139°_2 21823_1	—29
11514.03	8682.679	1	I	10723°_4 19406_3	34
11515.81	8681.337	1	I	6238_5 14920°_4	9
			I	7853°_1 16534_2	5
11518.82	8679.069	2			
11522.15	8676.560	1			
11525.02	8674.400	1	I	8400°_5 17075_5	23
11526.03	8673.639	1			
11526.61	8673.203	1	I	10673°_6 19347_5	—13
11527.88	8672.248	1	I	8270°_3 16942_4	—28
11533.16	8668.277	3	I	4455°_6 13124_5	23
11538.43	8664.318	1	I	10879°_5 19544_4	6
11538.63	8664.168	1	I	12359°_1 21023_2	24
11543.85	8660.250	1	II	$5437^\circ_{31/2}$ $14097_{31/2}$	—40
11546.73	8658.090	1	I	13219°_6 21877_6	—10
			II	$4459^\circ_{31/2}$ $13117_{41/2}$	44
11557.98	8649.663	1	I	13297°_5 21946_5	26
11568.43	8641.849	1	I	9333°_6 17975_6	12
11571.00	8639.930	1	I	9947°_2 18587_2	3
			I	10604°_3 19244_4	32
			I	11874°_3 20513_2	—19
11574.78	8637.108	1	I	8509°_4 17146_3	10
11578.59	8634.266	1	I	11796°_4 20430_3	—24
11579.56	8633.543	1	I	10586°_4 19220_4	—44
11582.15	8631.612	1			
11586.36	8628.476	1	I	7169°_3 15798_3	1
11587.24	8627.821	1	I	10243°_4 18871_4	—4
11589.75	8625.952	3			

TABLE 1. *Observed infrared cerium lines*—Continued

Wave-length Å	Wave-number (cm⁻¹)	Intensity	Spectrum	Classification		O−C (.001 cm⁻¹)
11590.01	8625.759	5	II	$7233^\circ_{5\,1/2}$	$15859_{4\,1/2}$	25
11591.08	8624.963	2	II	$5651^\circ_{5\,1/2}$	$14276_{5\,1/2}$	22
11593.05	8623.497	1	I	4766°_2	13389_3	−6
			I	7715°_5	16338_4	29
11599.40	8618.776	1	I	6621°_3	15240_4	49
			I	11061°_7	19680_6	−15
11601.27	8617.387	1	I	11650°_2	20267_3	−30
11602.76	8616.280	2	II	$4910^\circ_{5\,1/2}$	$13527_{4\,1/2}$	1
11604.89	8614.699	3	I	8307°_3	16921_3	28
			I	9996°_3	18611_3	−39
11612.17	8609.298	1	I	8902°_3	17511_3	8
			I	12297°_5	20907_4	−36
11615.38	8606.919	1				
11617.31	8605.489	1				
11624.32	8600.299	4	II	$7259^\circ_{3\,1/2}$	$15859_{4\,1/2}$	12
11628.39	8597.289	1	II	$8402^\circ_{3\,1/2}$	$17000_{3\,1/2}$	−64
11629.07	8596.786	1	I	7348°_4	15945_4	−25
			I	11030°_6	19627_6	−18
11631.62	8594.902	3	II	$4523^\circ_{4\,1/2}$	$13117_{4\,1/2}$	12
11634.17	8593.018	1	I	5315°_7	13908_7	−4
11635.32	8592.169	1	II	$4844^\circ_{1\,1/2}$	$13436_{2\,1/2}$	−22
11635.79	8591.822	2	I	11650°_2	20242_3	3
11641.06	8587.932	4	I	6475°_4	15063_3	20
11643.35	8586.243	4	I	13139°_2	21725_1	46
			II	$4165_{4\,1/2}$	$12751^\circ_{5\,1/2}$	−11
11652.26	8579.677	3	I	8587°_7	17167_7	−30
11652.81	8579.272	1	I	8088°_2	16668_3	−5
			I	11131°_3	19711_3	−25
11653.63	8578.669	1	II	$2879^\circ_{5\,1/2}$	$11458_{5\,1/2}$	−4
11655.37	8577.388	3	I	6663°_5	15240_4	−4
11658.60	8575.012	5	II	$2879^\circ_{5\,1/2}$	$11454_{6\,1/2}$	3
11665.84	8569.690	1				
11666.60	8569.132	1				
11668.10	8568.030	4	II	$5819^\circ_{4\,1/2}$	$14387_{4\,1/2}$	32
11673.37	8564.162	2	I	8603°_6	17167_7	12
11677.15	8561.390	1				
11683.63	8556.641	1	I	11874°_3	20430_3	0
11687.18	8554.042	2				
11688.13	8553.347	3	I	7696°_6	16249_6	−43
			I	8762°_4	17315_4	35
11688.80	8552.857	1	I	4762°_4	13315_4	7
11700.03	8544.648	2	I	5519°_3	14064_4	17
11705.22	8540.859	1	I	8762°_4	17302_3	42
11711.86	8536.017	3	II	$5716^\circ_{3\,1/2}$	$14252_{3\,1/2}$	60
11713.12	8535.098	1	I	9830°_6	18365_5	−18
11718.01	8531.537	2				
11723.63	8527.447	3	I	7696°_6	16223_5	14
11728.18	8524.139	1	I	10723°_4	19247_3	24
11731.37	8521.821	1	I	13139°_2	21661_3	−47
11734.79	8519.337	3	I	9135°_3	17654_3	18
			II	$4737^\circ_{2\,1/2}$	$13256_{1\,1/2}$	13
11741.13	8514.737	1	I	10243°_4	18758_3	4
			II	$7061^\circ_{0\,1/2}$	$15576_{1\,1/2}$	12
11741.90	8514.179	1	I	6234°_3	14748_4	26
11744.42	8512.352	2	I	9462°_5	17975_6	−2
11746.37	8510.939	3	II	$8789^\circ_{2\,1/2}$	$17300^\circ_{3\,1/2}$	1
11753.27	8505.942	1	I	13219°_6	21725_5	−16
11757.66	8502.766	2	I	11337°_3	19840_4	−5
			II	$4201^\circ_{1\,1/2}$	$12704_{1\,1/2}$	38
11767.26	8495.829	4	II	$6638^\circ_{4\,1/2}$	$15134_{4\,1/2}$	34
11770.40	8493.563	3	I	5409°_2	13902_3	39
11772.11	8492.329	1	I	5572°_4	14064_4	21
11781.64	8485.460	1				
11784.81	8483.177	2	I	6856°_4	15339_5	19
11788.14	8480.781	2	I	9135°_3	17615_4	−12
11791.59	8478.300	2	I	8587°_7	17066_6	27
11792.02	8477.991	1	I	7467°_5	15945_4	40
11799.34	8472.731	1				
11802.87	8470.197	1	I	10774°_3	19244_4	15
11805.93	8468.002	1	I	10604°_3	19072_3	−6
11806.25	8467.772	2	I	10879°_5	19347_6	23
11811.69	8463.872	2	I	9830°_6	18294_6	29
11815.34	8461.258	4	II	$3995^\circ_{3\,1/2}$	$12456_{3\,1/2}$	−34
11820.98	8457.221	5	II	$5819^\circ_{4\,1/2}$	$14276_{5\,1/2}$	37
11825.78	8453.788	1				
11833.00	8448.630	6	II	$0^\circ_{3\,1/2}$	$8448_{2\,1/2}$	−11
11839.08	8444.291	1	II	$5942^\circ_{3\,1/2}$	$14387_{1\,1/2}$	−20
11843.63	8441.047	5	I	8695°_1	17136_1	34
			I	12720°_4	21161_4	−29
11844.80	8440.213	1	II	$1873^\circ_{3\,1/2}$	$10314_{4\,1/2}$	−20
11848.12	8437.848	1				
11848.36	8437.677	1	II	$6389^\circ_{4\,1/2}$	$14827_{3\,1/2}$	−3
11851.32	8435.570	3	I	13629°_5	22064_6	−37
11851.98	8435.100	1				
11854.66	8433.193	2				
11855.14	8432.852	2	I	9462°_5	17895_5	18
			I	12359°_1	20791_1	−13
			I	12793°_5	21226_5	−4
11858.00	8430.818	4				
11861.84	8428.088	2	I	10586°_4	19014_4	−2
			I	13297°_5	21725_5	−47
11862.94	8427.307	1				
11864.75	8426.021	2	II	$5010^\circ_{2\,1/2}$	$13436_{2\,1/2}$	47
11868.26	8423.529	1	II	$4844^\circ_{1\,1/2}$	$13268_{2\,1/2}$	−30
11869.19	8422.869	3	I	8270°_3	16693_4	−33
11870.49	8421.947	3	II	$5675^\circ_{4\,1/2}$	$14097_{3\,1/2}$	0
11871.25	8421.408	2	II	$9053^\circ_{3\,1/2}$	$17475_{4\,1/2}$	−4
11876.04	8418.011	1				
11878.02	8416.608	1	I	10879°_5	19296_4	48
11884.95	8411.700	1	I	6234°_3	14646_2	47
11892.63	8406.268	5	II	$7746^\circ_{2\,1/2}$	$16152_{3\,1/2}$	65
11903.94	8398.281	1	I	10673°_6	19072_6	25
11904.33	8398.006	2				
11908.83	8394.833	1				
11910.41	8393.719	3	II	$3703^\circ_{3\,1/2}$	$12097_{3\,1/2}$	44
11921.62	8385.827	1	I	8307°_3	16693_4	−15
11922.21	8385.412	1	I	8762°_4	17147_4	0
11924.10	8384.082	2	I	6856°_4	15240_4	23
11924.90	8383.520	1	I	10774°_3	19158_2	−9
11927.13	8381.953	4	II	$4322^\circ_{2\,1/2}$	$12704_{1\,1/2}$	39
11927.73	8381.531	5	II	$5716^\circ_{3\,1/2}$	$14097_{3\,1/2}$	41
11931.58	8378.826	1	I	12351°_4	20730_5	11
11933.65	8377.373	1	I	4746°_6	13124_5	−9
11938.39	8374.047	1	II	$2641^\circ_{3\,1/2}$	$11015_{3\,1/2}$	26
			II	$7202^\circ_{2\,1/2}$	$15576_{1\,1/2}$	13
11941.07	8372.167	1	I	7780°_5	16152_5	−24
11943.12	8370.730	1	I	7696°_6	16066_6	0
11946.67	8368.243	4	II	$6913^\circ_{6\,1/2}$	$15281_{6\,1/2}$	27
11951.60	8364.791	3	I	6234°_3	14599_4	−14
11953.22	8363.657	1	I	11517°_1	19880_2	−5
11955.55	8362.027	2	I	13219°_6	21581_5	9
11957.21	8360.867	1	I	8307°_3	16668_3	−13
11960.94	8358.259	2	I	8762°_4	17120_5	−16
11978.52	8345.993	1	I	13315°_4	21661_3	24
11983.49	8342.531	1				
11987.23	8339.928	1				
11989.05	8338.662	1	I	12366°_5	20705°_6	−38
			I	11650°_2	19988_3	43

TABLE 1. *Observed infrared cerium lines*—Continued

Wave-length Å	Wave-number (cm⁻¹)	In-ten-sity	Spec-trum	Classification	O−C (.001 cm⁻¹)
11992.46	8336.291	3	I	7715°_{5} 16051_{4}	49
11999.73	8331.241	1	I	6303°_{2} 14635_{1}	—17
12002.41	8329.380	5			
12010.11	8324.040	1			
12014.34	8321.110	3	II	$2382^{\circ}_{41/2}$ $10703_{41/2}$	44
12015.60	8320.237	5	I	7696°_{6} 16016_{5}	38
12017.98	8318.589	1			
12022.52	8315.448	1	II	$1410^{\circ}_{41/2}$ $9725_{31/2}$	13
12030.37	8310.022	2	I	7890°_{4} 16200_{3}	—41
			II	$6517^{\circ}_{21/2}$ $14827_{31/2}$	17
12031.29	8309.387	3	I	6337°_{3} 14646_{2}	3
			I	5572°_{4} 13881_{5}	17
			II	$5942^{\circ}_{31/2}$ $14252_{31/2}$	14
12038.44	8304.451	1	I	6234°_{3} 14539_{3}	31
12040.39	8303.106	3			
12045.20	8299.791	1			
12047.16	8298.440	1	I	8991°_{5} 17289_{6}	13
12048.22	8297.710	3	II	$7278^{\circ}_{11/2}$ $15576_{11/2}$	66
12055.95	8292.390	1	I	8400°_{5} 16693_{4}	—31
12060.12	8289.523	1	I	8762°_{4} 17051_{3}	7
12060.59	8289.200	1	I	5315°_{7} 13605_{6}	3
12061.86	8288.327	2	II	$2581^{\circ}_{41/2}$ $10869_{41/2}$	43
12075.97	8278.643	2	II	$5819^{\circ}_{41/2}$ $14097_{31/2}$	51
			II	$8175^{\circ}_{21/2}$ $16454_{21/2}$	—33
12083.54	8273.456	3			
12090.70	8268.557	1	I	9462°_{5} 17731_{4}	34
12097.54	8263.882	5	II	$2382^{\circ}_{41/2}$ $10646_{51/2}$	51
12100.63	8261.772	3	I	3100°_{4} 11361_{4}	28
12104.59	8259.069	1	I	8088°_{2} 16347_{2}	3
12105.73	8258.291	1			
12107.14	8257.329	2	II	$5010^{\circ}_{21/2}$ $13268_{21/2}$	—12
12110.53	8255.018	1	I	9135°_{3} 17390_{4}	3
12114.31	8252.442	2			
12116.87	8250.698	4	II	$7278^{\circ}_{11/2}$ $15529_{21/2}$	31
12119.81	8248.697	3	I	8587°_{7} 16836_{6}	23
12135.11	8238.297	2	II	$5437^{\circ}_{31/2}$ $13675_{21/2}$	—10
12139.08	8235.603	2	II	$6389^{\circ}_{41/2}$ $14625_{51/2}$	44
12141.71	8233.819	1	I	7467°_{5} 15700_{4}	1
12142.65	8233.181	1			
12144.51	8231.921	1			
12146.62	8230.491	1			
12148.94	8228.919	1	I	9425°_{2} 17654_{3}	30
12149.94	8228.242	1			
12152.01	8226.840	1	I	6836°_{2} 15063_{3}	16
12154.73	8224.999	2	I	7841°_{5} 16066_{6}	14
12161.38	8220.501	1			
12164.30	8218.528	1			
12167.41	8216.427	2	I	9200°_{2} 17417_{2}	—15
12170.46	8214.368	1	I	4746°_{6} 12960_{6}	45
12172.55	8212.958	1	I	11850°_{5} 20063_{6}	30
12179.75	8208.103	5	II	$11742^{\circ}_{51/2}$ $19950_{61/2}$	—5
12181.57	8206.877	1	I	6856°_{4} 15063_{3}	—15
12183.05	8205.880	3	I	12425°_{4} 20631_{5}	—25
			I	13519°_{5} 21725_{5}	9
12184.77	8204.721	2	I	13315°_{4} 21520_{4}	2
12188.93	8201.921	1	I	7169°_{3} 15371_{4}	25
12191.34	8200.300	3	II	$4165^{\circ}_{41/2}$ $12365_{41/2}$	42
12198.09	8195.762	1	II	$8804^{\circ}_{41/2}$ $17000_{31/2}$	—30
12201.64	8193.377	3	I	4173°_{4} 12366_{5}	38
			II	$4511^{\circ}_{21/2}$ $12704_{11/2}$	7
12204.93	8191.169	1	I	13605°_{6} 21796°_{6}	0
			I	9200°_{2} 17391_{1}	17
12206.69	8189.988	1			
12213.01	8185.750	3	II	$2634^{\circ}_{21/2}$ $10820_{21/2}$	—65
12216.22	8183.599	5	I	7696°_{6} 15879_{5}	31
12221.00	8180.398	2	I	8762°_{4} 16942_{4}	—1
12223.22	8178.912	2	I	5210°_{2} 13389_{3}	—8
			II	$2641^{\circ}_{31/2}$ $10820_{21/2}$	—4
12224.37	8178.143	2	I	13089°_{3} 21267_{4}	38
			II	$12762^{\circ}_{41/2}$ $20940_{31/2}$	—60
12226.39	8176.792	6	II	$7341^{\circ}_{51/2}$ $15517_{61/2}$	30
12228.16	8175.608	2			
12228.98	8175.060	1			
12229.92	8174.431	1	I	7841°_{5} 16016_{5}	—22
12230.95	8173.743	3	II	$7061^{\circ}_{01/2}$ $15235_{11/2}$	11
12233.92	8171.759	1	I	10586°_{4} 18758_{3}	18
12235.18	8170.917	1	I	10901°_{2} 19072_{3}	—9
12238.65	8168.601	1			
12239.37	8168.120	3	I	8055°_{6} 16223_{5}	3
12243.19	8165.571	2	I	7174°_{4} 15339_{5}	10
			II	$3593^{\circ}_{41/2}$ $11759_{51/2}$	—7
12243.66	8165.258	1	I	3196°_{4} 11361_{4}	—29
12245.17	8164.251	2	I	13519°_{5} 21683_{5}	6
12248.04	8162.338	2			
12251.79	8159.840	1	I	8762°_{4} 16921_{3}	—13
12257.48	8156.052	2	I	8991°_{5} 17147_{4}	—34
12261.81	8153.172	1	I	9462°_{5} 17615_{4}	—15
12267.52	8149.377	1	I	8902°_{3} 17051_{3}	41
			II	$5118^{\circ}_{21/2}$ $13268_{21/2}$	—23
12273.13	8145.652	1	I	10612°_{2} 18758_{3}	6
			II	$5513^{\circ}_{51/2}$ $13659_{41/2}$	30
12279.71	8141.287	1	I	8762°_{4} 16903_{5}	33
12281.52	8140.087	1	II	$2563^{\circ}_{51/2}$ $10703_{41/2}$	12
12284.81	8137.907	1	II	$5118^{\circ}_{21/2}$ $13256_{11/2}$	16
12286.38	8136.867	2	I	7780°_{6} 15917_{7}	—7
			I	13283°_{3} 21420_{2}	—15
12290.64	8134.047	6	II	$4322^{\circ}_{21/2}$ $12456_{31/2}$	6
12293.60	8132.089	4	I	6663°_{5} 14795_{5}	25
			I	11796°_{4} 19928_{3}	—11
12294.93	8131.209	6	II	$0^{\circ}_{31/2}$ $8131_{41/2}$	0
12297.39	8129.582	2			
12302.86	8125.968	1	I	7890°_{4} 16016_{5}	—11
12305.76	8124.053	2	I	6475°_{4} 14599_{4}	—4
12308.79	8122.053	2	II	$2581^{\circ}_{41/2}$ $10703_{41/2}$	5
12312.78	8119.421	2			
12315.16	8117.852	1			
12316.77	8116.791	2	II	$4910^{\circ}_{51/2}$ $13027_{61/2}$	—8
12324.96	8111.397	5	I	8587°_{7} 16699_{6}	—13
12335.30	8104.598	1	I	11301°_{2} 19406_{3}	—21
12336.77	8103.632	1	I	8430°_{1} 16534_{2}	27
12342.73	8099.719	5	I	1279°_{4} 9379_{4}	—4
12357.76	8089.868	6	II	$5437^{\circ}_{31/2}$ $13527_{41/2}$	50
12367.20	8083.693	1	I	8991°_{5} 17075_{5}	37
12368.46	8082.869	2	I	7933°_{5} 16016_{5}	18
			II	$2563^{\circ}_{51/2}$ $10646_{51/2}$	29
12372.22	8080.413	1	I	6663°_{5} 14743_{6}	13
12375.41	8078.330	2	I	11517°_{1} 19595_{2}	14
12376.74	8077.462	2	I	8307°_{3} 16384_{3}	30
12379.10	8075.922	4	II	$7746^{\circ}_{21/2}$ $15822_{31/2}$	45
12380.64	8074.917	1	II	$7059^{\circ}_{41/2}$ $15134_{41/2}$	—62
12386.59	8071.039	3	II	$7522^{\circ}_{51/2}$ $15593_{61/2}$	19
12394.28	8066.031	2	II	$987^{\circ}_{41/2}$ $9053_{31/2}$	7
12397.88	8063.689	3	I	6475°_{4} 14539_{3}	17
12401.85	8061.107	3	I	9709°_{2} 17770_{2}	15
12402.71	8060.549	2			
12403.66	8059.931	2			
12404.99	8059.067	1			
12412.58	8054.139	2	II	$7522^{\circ}_{01/2}$ $15576_{11/2}$	38

TABLE 1. *Observed infrared cerium lines* — Continued

Wave-length Å	Wave-number (cm⁻¹)	In-ten-sity	Spec-trum	Classification	O−C (.001 cm⁻¹)
12413.26	8053.698	1			
12419.44	8049.690	4	I	3312°_4 11361_4	35
12422.03	8048.012	5	II	$7233^\circ_{5 1/2}$ $15281_{6 1/2}$	29
12433.33	8040.698	2	I	8307°_3 16347_2	29
			I	12359°_1 20399_1	—17
12433.82	8040.381	1			
12435.14	8039.527	1	I	13622°_2 21661_3	11
12437.75	8037.840	1	I	7841°_5 15879_5	17
12446.62	8032.112	1			
12447.69	8031.422	2	I	8307°_3 16338_4	27
12460.20	8023.358	1	I	7348°_4 15371_4	10
12467.52	8018.647	1	I	8366°_2 16384_3	4
12486.05	8006.747	6	I	228°_2 8235_2	—8
12498.46	7998.797	2	I	5904°_2 13902_3	43
12501.43	7996.897	1	II	$4459^\circ_{3 1/2}$ $12456_{3 1/2}$	18
12502.27	7996.360	2			
12505.60	7994.230	2			
12509.11	7991.987	1	I	8088°_2 16080_2	17
12511.38	7990.537	2	I	11357°_5 19347_6	31
12513.21	7989.369	1	I	7890°_4 15879_5	20
12514.68	7988.430	3			
12516.31	7987.390	3			
12523.27	7982.951	2			
12525.01	7981.842	1	I	8366°_2 16347_2	—37
12526.87	7980.657	3			
12528.36	7979.707	1	I	8101°_2 16080_2	13
12533.27	7976.581	3	I	11271°_4 19247_3	42
			II	$8175^\circ_{2 1/2}$ $16152_{3 1/2}$	59
12534.29	7975.932	3			
12537.55	7973.858	1	I	9135°_3 17108_2	—9
12538.44	7973.292	1	I	9947°_2 17921_3	27
12547.98	7967.230	1	II	$4737^\circ_{2 1/2}$ $12704_{1 1/2}$	—20
12548.31	7967.021	2			
12550.20	7965.821	1	II	$3793^\circ_{6 1/2}$ $11759_{5 1/2}$	0
12573.18	7951.262	1	II	$7011^\circ_{4 1/2}$ $14963_{5 1/2}$	—37
12575.86	7949.568	1			
12577.11	7948.777	3	I	7696°_6 15644_6	45
12578.89	7947.653	1	I	6238°_5 14186°_6	20
12582.22	7945.549	4	II	$4511^\circ_{2 1/2}$ $12456_{3 1/2}$	51
12584.63	7944.028	1	I	9787°_3 17731_4	20
12589.35	7941.049	2	I	12720°_4 20661_3	35
12593.96	7938.142	1			
12595.19	7937.367	1			
12595.60	7937.109	1			
12598.09	7935.540	1	I	9200°_2 17136_1	33
12600.27	7934.167	1			
12603.79	7931.951	2	II	$2382^\circ_{4 1/2}$ $10314_{4 1/2}$	23
12608.27	7929.133	1	I	7467°_5 15396_6	7
			I	13297°_5 21226_5	—15
12608.85	7928.768	1	I	10723°_4 18652_3	38
			II	$13012^\circ_{2 1/2}$ $20940_{3 1/2}$	31
12609.29	7928.491	3	I	8088°_2 16017_3	46
12611.01	7927.410	2	I	9462°_5 17390_4	1
12625.06	7918.588	1			
12627.34	7917.158	1	I	8430°_1 16347_2	26
12628.31	7916.550	1	I	9135°_3 17051_3	7
12635.56	7912.008	3	I	11030°_6 18942_7	0
			I	11545°_4 19457_3	13
12640.14	7909.141	5	II	$987^\circ_{4 1/2}$ $8896_{5 1/2}$	16
12641.56	7908.253	3	I	9200°_2 17108_2	—6
			I	13089°_3 20998_4	35
12642.56	7907.627	3	I	8101°_2 16008_3	—16
12644.15	7906.633	3	II	$1410^\circ_{4 1/2}$ $9316_{3 1/2}$	31
12654.05	7900.447	2	II	$7233^\circ_{5 1/2}$ $15134_{4 1/2}$	18
12658.77	7897.501	4	I	7780°_6 15677°_7	39
12665.84	7893.093	1	I	12720°_4 20613_3	36
12667.03	7892.351	1	I	6856°_4 14748_4	—34
			I	7348°_4 15249_4	31
12676.64	7886.368	4	II	$6389^\circ_{4 1/2}$ $14276_{5 1/2}$	12
12685.32	7880.972	3	I	11061°_7 18942_7	45
12690.48	7877.767	3	I	8991°_5 16869_4	—34
12696.00	7874.342	2	I	10318°_3 18192_3	14
12698.87	7872.563	1	I	7467°_5 15339_5	5
12710.79	7865.180	1	I	7696°_6 15561_5	44
12713.65	7863.411	1			
12715.61	7862.199	1	I	13924°_3 21786_2	4
			II	$6389^\circ_{4 1/2}$ $14252_{3 1/2}$	—31
12719.18	7859.992	2	II	$4844^\circ_{1 1/2}$ $12704_{1 1/2}$	15
12724.78	7856.533	3	I	10901°_2 18758_3	—8
			I	13297°_5 21153_5	42
12732.47	7851.788	4	II	$1873^\circ_{3 1/2}$ $9725_{3 1/2}$	—10
12734.09	7850.789	3			
12742.53	7845.589	2	I	13315°_4 21161_4	—34
			I	13815°_4 21661_3	48
12743.18	7845.189	3	I	8991°_5 16836_6	—6
12747.94	7842.259	2			
12766.60	7830.797	5	II	$5437^\circ_{3 1/2}$ $13268_{2 1/2}$	6
12777.23	7824.282	2	I	8055°_6 15879_5	30
			I	8762°_4 16586_5	—14
12779.42	7822.941	1	I	8400°_5 16223_5	28
			I	13139°_2 20962_2	1
12783.74	7820.298	1	I	11337°_3 19158_2	22
12792.73	7814.802	1	I	12297°_5 20112_4	—21
12795.30	7813.232	2			
12795.58	7813.061	2			
12798.83	7811.077	6	II	$5716^\circ_{3 1/2}$ $13527_{4 1/2}$	60
12804.76	7807.460	3	I	9135°_3 16942_4	33
12808.34	7805.278	1	I	13519°_5 21324_6	19
12809.52	7804.559	1	I	10901°_2 18706_2	28
12812.28	7802.878	1	I	5802°_7 13605_6	—13
			I	13297°_5 21100_6	25
12817.11	7799.937	1	I	6809°_8 14609_7	—22
12819.75	7798.331	2	I	12948°_5 20747_4	—4
12826.91	7793.978	2			
12828.57	7792.969	2			
12831.12	7791.421	2	I	11271°_4 19062_5	11
12838.03	7787.227	3	I	9333°_6 17120_5	47
12839.18	7786.529	3	II	$987^\circ_{4 1/2}$ $8774_{4 1/2}$	74
12844.01	7783.601	3	II	$4165^\circ_{4 1/2}$ $11949_{3 1/2}$	—42
12844.28	7783.438	3	II	$7746^\circ_{2 1/2}$ $15529_{2 1/2}$	36
12847.23	7781.650	3			
12849.08	7780.530	2	II	$5437^\circ_{3 1/2}$ $13217_{3 1/2}$	—43
12850.83	7779.470	3	II	$10924^\circ_{4 1/2}$ $18704_{5 1/2}$	31
12858.90	7774.588	1	II	$4322^\circ_{2 1/2}$ $12097_{3 1/2}$	30
12878.06	7763.021	1	I	6238°_5 14001°_6	—4
12878.88	7762.527	1			
12884.75	7758.990	6	II	$7522^\circ_{5 1/2}$ $15281_{6 1/2}$	4
12891.11	7755.163	1	I	10243°_4 17998_4	—30
12894.01	7753.418	2	I	13622°_2 21375_2	—35
12895.21	7752.697	3	I	13572°_7 21324_6	—24
12897.02	7751.609	2			
12899.21	7750.293	1	I	10901°_2 18652_3	22
12900.16	7749.722	3	II	$8402^\circ_{3 1/2}$ $16152_{3 1/2}$	0
12901.63	7748.839	2	II	$6638^\circ_{4 1/2}$ $14387_{4 1/2}$	—16
12903.49	7747.722	1	I	11796°_4 19544_4	—15
12907.21	7745.489	1			
12911.38	7742.987	1	I	13572°_7 21314_7	6
12914.70	7740.997	1	II	$8804^\circ_{4 1/2}$ $16545_{5 1/2}$	—38

TABLE 1. *Observed infrared cerium lines*—Continued

Wave-length Å	Wave-number (cm⁻¹)	In-ten-sity	Spec-trum	Classification	O−C (.001 cm⁻¹)	Wave-length Å	Wave-number (cm⁻¹)	In-ten-sity	Spec-trum	Classification	O−C (.001 cm⁻¹)
12918.78	7738.552	2	I	8270°_3 16008_3	−29	13172.72	7589.371	3	I	8055°_6 15644_6	−45
12925.45	7734.559	2	I	9996°_3 17731_4	−21	13181.32	7584.419	3	II	$5942^\circ_{3\frac12}$ $13527_{4\frac12}$	−13
			II	$6517^\circ_{2\frac12}$ $14252_{3\frac12}$	4	13185.25	7582.159	1			
12926.18	7734.122	1	I	9135°_3 16869_4	−31	13190.41	7579.193	1	I	7169°_3 14748_4	0
12928.12	7732.961	1	II	$2581^\circ_{4\frac12}$ $10314_{4\frac12}$	52				I	11578°_1 19158_2	9
			II	$5942^\circ_{3\frac12}$ $13675_{2\frac12}$	39	13194.82	7576.659	3	II	$4165^\circ_{4\frac12}$ $11742^\circ_{5\frac12}$	−39
12932.24	7730.498	1	II	$8402^\circ_{3\frac12}$ $16133_{2\frac12}$	−57	13200.93	7573.153	1	I	8270°_3 15843_4	−46
12937.73	7727.218	3							I	12022°_2 19595_2	−7
12941.76	7724.811	1	I	14338°_5 22063_4	−24	13203.25	7571.822	1			
12944.16	7723.379	1	I	14001°_6 21725_5	−8	13210.42	7567.712	1			
12944.95	7722.908	1				13212.73	7566.389	4	II	$7059^\circ_{4\frac12}$ $14625_{5\frac12}$	−39
12946.05	7722.251	2	II	$0^\circ_{3\frac12}$ $7722_{2\frac12}$	−33	13219.82	7562.331	2	II	$5964^\circ_{3\frac12}$ $13527_{4\frac12}$	−6
12950.90	7719.360	6	I	7841°_5 15561_5	−30	13233.02	7554.788	1			
			II	$4737^\circ_{2\frac12}$ $12456_{3\frac12}$	−17	13237.13	7552.442	1			
12956.49	7716.029	3	I	1663°_3 9379_4	1	13238.01	7551.940	1	I	5572°_4 13124_5	4
12958.12	7715.059	1	I	11357°_5 19072_6	−7				II	$5716^\circ_{3\frac12}$ $13268_{2\frac12}$	−49
12959.19	7714.422	1	I	8509°_4 16223_5	−11	13249.50	7545.391	1	I	12793°_5 20338_5	2
12963.06	7712.118	2	I	11650°_2 19362_1	−4	13251.36	7544.332	3	I	8400°_5 15945_4	−48
			II	$6913^\circ_{6\frac12}$ $14625_{5\frac12}$	8	13253.37	7543.188	5	I	1663°_3 9206_3	3
12964.30	7711.381	2	I	7933°_5 15644_6	−3	13255.21	7542.141	4	I	10243°_4 17785_3	−15
12966.50	7710.072	1	I	8307°_3 16017_3	23	13257.13	7541.048	2	II	$8280^\circ_{5\frac12}$ $15822_{3\frac12}$	−69
			II	$12260^\circ_{3\frac12}$ $19970_{2\frac12}$	−19	13258.94	7540.019	2	I	13519°_5 21059_5	−23
12967.72	7709.347	1	I	8088°_2 15798_3	33				I	14273°_3 21813_3	−14
12968.46	7708.907	1				13261.14	7538.768	2	I	14186°_6 21725_5	−12
12969.82	7708.099	2	I	9709°_2 17417_2	−38	13266.63	7535.648	1	II	$10035^\circ_{5\frac12}$ $17571_{4\frac12}$	−41
			II	$5819^\circ_{4\frac12}$ $13527_{4\frac12}$	−19	13269.52	7534.007	2	II	$11949^\circ_{3\frac12}$ $19483_{2\frac12}$	−22
12970.46	7707.718	4	II	$6389^\circ_{4\frac12}$ $14097_{3\frac12}$	−45	13272.86	7532.111	3	I	11874°_3 19406_3	−29
12981.05	7701.430	3	II	$10274^\circ_{3\frac12}$ $17976_{2\frac12}$	−10				II	$6517^\circ_{2\frac12}$ $14049_{1\frac12}$	−24
12982.06	7700.831	2	I	13297°_5 20998_4	27	13276.12	7530.262	1			
12983.38	7700.048	3	I	7696°_6 15396_6	−27	13277.22	7529.638	2			
12995.93	7692.613	2				13279.47	7528.362	2	II	$6521^\circ_{1\frac12}$ $14049_{1\frac12}$	−58
12997.24	7691.837	1	I	10673°_6 18365_5	−40	13280.06	7528.028	3	I	13572°_7 21100_6	−22
12998.87	7690.873	2				13284.79	7525.347	3	I	7715°_5 15240_4	−35
13005.13	7687.171	1	I	10318°_3 18005_3	−42	13300.80	7516.289	6	II	$3793^\circ_{6\frac12}$ $11309_{7\frac12}$	−53
13007.35	7685.859	2	I	8902°_3 16588_4	−36	13306.46	7513.092	1	I	9830°_6 17343_5	−33
			I	13044°_4 20730_5	18	13307.49	7512.511	1	I	12600°_3 20112_4	−6
13011.48	7683.419	1	I	9425°_3 17108_2	−18				I	13450°_3 20962_2	47
13016.48	7680.468	5	II	$5437^\circ_{3\frac12}$ $13117_{4\frac12}$	−33	13317.03	7507.129	3			
13022.21	7677.088	2	I	8088°_2 15766_3	−47	13327.06	7501.479	2			
13025.99	7674.860	2	I	8270°_3 15945_4	−1	13331.45	7499.009	2	I	8088°_2 15587_2	−5
13029.22	7672.958	2	I	9200°_2 16873_1	−34	13334.44	7497.327	1	I	11850°_5 19347_6	37
			I	12988°_4 20661_3	−30	13338.67	7494.950	4	II	$2563^\circ_{5\frac12}$ $10058_{6\frac12}$	−59
13041.57	7665.692	3	II	$7061^\circ_{0\frac12}$ $14727_{1\frac12}$	−8	13349.89	7488.650	1			
13043.29	7664.681	3	II	$3793^\circ_{6\frac12}$ $11458_{5\frac12}$	−48	13350.76	7488.162	1	I	8270°_3 15758_2	−46
13044.60	7663.911	1				13353.94	7486.379	6	II	$1410^\circ_{4\frac12}$ $8896_{5\frac12}$	−55
13047.36	7662.290	1				13354.99	7485.791	3	I	5904°_2 13389_3	−29
13049.51	7661.028	3	I	11796°_4 19457_3	2	13360.88	7482.491	5			
			II	$3793^\circ_{6\frac12}$ $11454_{6\frac12}$	−36	13363.20	7481.192	1	I	7890°_4 15371_4	−25
13051.72	7659.730	2	I	8307°_3 15967_2	−47	13365.76	7479.759	2			
13057.41	7656.392	2	I	7715°_5 15371_4	−18	13367.12	7478.998	3	I	8587°_7 16066_6	31
			I	13569°_4 21226_5	−8	13371.37	7476.621	2			
13063.64	7652.741	1	I	8695°_1 16347_2	−35	13374.70	7474.759	1	I	11357°_5 18831_5	13
13065.33	7651.751	1	I	10243°_4 17895_5	−7	13379.85	7471.882	3	II	$5964^\circ_{3\frac12}$ $13436_{2\frac12}$	−60
13067.09	7650.721	1	I	8101°_2 15751_1	−40	13387.79	7467.451	2	I	9200°_2 16668_3	−31
			I	8400°_5 16051_4	−26				I	10318°_3 17785_3	−47
13079.71	7643.339	3	II	$1410^\circ_{4\frac12}$ $9053_{3\frac12}$	5				I	14186°_6 21654_7	−41
13080.77	7642.719	2	I	8366°_2 16008_3	−13	13391.95	7465.131	1			
13088.87	7637.990	6	II	$6638^\circ_{4\frac12}$ $14276_{5\frac12}$	−51	13395.15	7463.348	2	I	13283°_3 20747_4	0
13101.27	7630.761	3				13396.44	7462.629	1			
13109.40	7626.028	1				13402.31	7459.360	2			
13116.23	7622.057	3	II	$7341^\circ_{5\frac12}$ $14963^\circ_{5\frac12}$	−48	13403.53	7458.681	2			
13118.74	7620.599	3	I	10673°_6 18294_6	−4	13406.52	7457.018	1	I	11301°_2 18758_3	42
13123.66	7617.742	1	II	$8927^\circ_{5\frac12}$ $16545_{5\frac12}$	−16				I	13450°_3 20907_4	46
13125.83	7616.483	1							II	$3363^\circ_{2\frac12}$ $10820_{2\frac12}$	−36

TABLE 1. *Observed infrared cerium lines*—Continued

Wave-length Å	Wave-number (cm⁻¹)	Intensity	Spectrum	Classification	O−C (.001 cm⁻¹)
13421.80	7448.528	2			
13424.66	7446.942	1	I	7348°_4 14795_5	—48
13426.72	7445.799	1			
13431.91	7442.922	2	II	$1873^\circ_{3\frac12}$ $9316_{3\frac12}$	—43
13433.43	7442.080	2			
13436.05	7440.629	1	I	9462°_5 16903_5	—45
13437.64	7439.748	1			
13440.28	7438.287	1			
13447.22	7434.448	6	II	$2879^\circ_{5\frac12}$ $10314_{4\frac12}$	—34
13454.06	7430.669	3			
13457.34	7428.857	2	I	14027°_4 21456_5	47
13460.54	7427.091	1	I	13194_4 20621°_4	14
13462.45	7426.038	2	II	$12057^\circ_{2\frac12}$ $19483_{2\frac12}$	—63
13464.57	7424.868	1			
13468.67	7422.608	3			
13470.54	7421.578	3	II	$5283^\circ_{0\frac12}$ $12704_{1\frac12}$	—16
13471.84	7420.862	2			
13474.49	7419.402	3	II	$8402^\circ_{3\frac12}$ $15822_{3\frac12}$	6
13478.22	7417.349	1	I	14531°_4 21948_3	4
13487.22	7412.399	1	I	13219°_6 20631_5	—15
13488.11	7411.910	1	I	10901°_2 18313_3	20
13499.02	7405.920	1	I	6475°_4 13881_5	16
13506.77	7401.670	4	II	$5716^\circ_{3\frac12}$ $13117_{4\frac12}$	—30
13508.61	7400.662	2	I	7348°_4 14748_4	16
			II	$8175^\circ_{2\frac12}$ $15576_{1\frac12}$	—34
13509.89	7399.961	1	I	8366°_2 15766_3	11
			I	9709°_2 17108_2	6
13512.16	7398.718	1			
13515.15	7397.081	1	I	12948°_5 20346_6	—38
13518.30	7395.357	1			
13524.73	7391.842	1	II	$7233^\circ_{5\frac12}$ $14625_{5\frac12}$	—35
13547.66	7379.331	1			
13553.08	7376.379	1	II	$5651^\circ_{5\frac12}$ $13027_{6\frac12}$	—17
13565.86	7369.430	1	I	7169°_3 14539_3	—30
13569.93	7367.220	1	I	10774°_3 18141_4	—22
13572.01	7366.091	1			
13583.48	7359.871	1	II	$4737^\circ_{2\frac12}$ $12097_{3\frac12}$	—23
			II	$8169^\circ_{1\frac12}$ $15529_{2\frac12}$	—21
13585.01	7359.042	1	I	9787°_3 17146_3	—45
13594.93	7353.672	2	II	$8175^\circ_{2\frac12}$ $15529_{2\frac12}$	—48
13618.96	7340.697	2			
13622.17	7338.967	1	I	12297°_2 19636_3	—39
13624.15	7337.901	3	II	$5118^\circ_{2\frac12}$ $12456_{3\frac12}$	—43
13628.09	7335.779	1	I	11357°_5 18692_4	22
13636.08	7331.481	1			
13636.70	7331.148	1			
13637.70	7330.610	2	I	13301°_6 20631_5	—46
13655.49	7321.060	1	I	8430°_3 15751_1	—42
13662.60	7317.250	3	I	5674°_1 12992_2	—35
13672.47	7311.968	2	II	$3703^\circ_{3\frac12}$ $11015_{3\frac12}$	—21
13697.01	7298.868	2	I	12022°_2 19321_2	48
			II	$5819^\circ_{4\frac12}$ $13117_{4\frac12}$	65
13712.83	7290.447	4	II	$987^\circ_{4\frac12}$ $8278_{5\frac12}$	—12
13781.01	7254.379	4	II	$4203^\circ_{6\frac12}$ $11458_{5\frac12}$	—44
13808.91	7239.722	2	II	$8278_{5\frac12}$ $15517^\circ_{6\frac12}$	23
13812.10	7238.050	2	II	$5513^\circ_{5\frac12}$ $12751_{5\frac12}$	—45
13814.83	7236.619	1	I	13924°_3 21161_4	—3
13852.00	7217.201	2	II	$7059^\circ_{4\frac12}$ $14276_{5\frac12}$	—24
13870.09	7207.788	1	I	6856°_4 14064_4	—34
13924.35	7179.701	2	II	$1873^\circ_{3\frac12}$ $9053_{3\frac12}$	3
13926.58	7178.551	3	I	8902°_3 16080_2	—24
			II	$2879^\circ_{5\frac12}$ $10058_{6\frac12}$	—4
13966.43	7158.069	1	II	$6517^\circ_{2\frac12}$ $13675_{2\frac12}$	—35
13975.51	7153.418	4	II	$7233^\circ_{5\frac12}$ $14387_{4\frac12}$	—70
13984.32	7148.912	1	II	$5969^\circ_{5\frac12}$ $13117_{4\frac12}$	—3
13994.84	7143.538	4	I	12366_5 19510°_4	40
			II	$987^\circ_{4\frac12}$ $8131_{4\frac12}$	—59
14001.70	7140.038	1	I	11271°_4 18411_4	—43
14007.17	7137.249	2	II	$6389^\circ_{4\frac12}$ $13527_{4\frac12}$	—41
14011.45	7135.069	2	II	$5616_{4\frac12}$ $12751^\circ_{5\frac12}$	4
14018.78	7131.339	1			
14027.57	7126.870	2	II	$8402^\circ_{3\frac12}$ $15529_{2\frac12}$	—50
14029.72	7125.778	1	I	14273°_3 21399_3	—22
			II	$6549^\circ_{2\frac12}$ $13675_{2\frac12}$	—37
14067.76	7106.509	2	I	8902°_3 16008_3	—15
14068.35	7106.211	4			
14074.99	7102.859	3	II	$7522^\circ_{5\frac12}$ $14625_{5\frac12}$	—22
14098.41	7091.060	1	II	$2634^\circ_{2\frac12}$ $9725_{3\frac12}$	—8
14098.77	7090.879	1			
14104.36	7088.068	2	I	5904°_2 12992_2	—40
14117.52	7081.461	1	II	$7746^\circ_{2\frac12}$ $14827_{3\frac12}$	21
14120.41	7080.012	3	I	7715°_5 14795_5	—41
			I	12600°_3 19680_4	21
14134.73	7072.839	2			
14148.39	7066.010	1	I	11545°_4 18611_3	22
14151.74	7064.338	4	I	8307°_3 15371_4	0
14166.58	7056.937	4	I	8587°_7 15644_6	—32
14176.18	7052.159	5	I	8509°_4 15561_5	22
			II	$3593^\circ_{4\frac12}$ $10646_{5\frac12}$	—39
14195.30	7042.660	2	I	14116°_4 21158_3	44
			II	$7233^\circ_{5\frac12}$ $14276_{5\frac12}$	—14
14197.32	7041.658	2	I	13297°_5 20338_5	—22
			I	15021°_7 22063_7	—46
14197.80	7041.420	2	I	8603°_6 15644_6	8
14204.09	7038.302	2	I	6475°_4 13513_4	—32
14257.86	7011.758	7	II	$0^\circ_{3\frac12}$ $7011_{4\frac12}$	—56
14272.21	7004.708	1	I	11545°_4 18550_4	5
14280.14	7000.819	1	I	12988°_4 19988_3	—26
14283.79	6999.030	3			
14288.51	6996.718	1			
14296.00	6993.052	1	II	$7259^\circ_{3\frac12}$ $14252_{3\frac12}$	—50
14318.10	6982.258	1			
14321.95	6980.381	1			
14327.00	6977.921	1			
14342.54	6970.360	2	I	8270°_3 15240_4	—9
14377.07	6953.619	1	I′	8991°_5 15945_4	—40
14380.65	6951.888	1			
14386.11	6949.250	2	I	12992_2 19941°_2	—16
			II	$7878^\circ_{3\frac12}$ $14827_{3\frac12}$	—49
14407.65	6938.860	1	I	8762°_4 15700_4	8
14410.93	6937.281	1	I	11301°_2 18238_2	—2
			I	12297°_5 19235_6	—35
14411.56	6936.978	1			
14415.09	6935.279	2	II	$4523^\circ_{4\frac12}$ $11458_{5\frac12}$	—50
14416.48	6934.610	3	II	$2382^\circ_{4\frac12}$ $9316_{3\frac12}$	—49
14422.28	6931.822	1	II	$8927^\circ_{5\frac12}$ $15859_{4\frac12}$	—32
14424.36	6930.822	2			
14429.32	6928.440	2			
14438.30	6924.130	1			
14444.56	6921.130	2	I	12425°_4 19347_5	—35
14454.42	6916.408	2	I	9135°_3 16051_4	29
			I	9333°_6 16249_6	29
14462.80	6912.401	1	II	$7713^\circ_{4\frac12}$ $14625_{5\frac12}$	—13
14469.08	6909.401	1	I	11626°_1 18535_1	19
			II	$7818^\circ_{1\frac12}$ $14727_{1\frac12}$	10
14474.09	6907.009	1	I	7841°_5 14748_4	19
14485.33	6901.650	1	I	7841°_5 14743_6	—20
14488.50	6900.140	2	II	$1873^\circ_{3\frac12}$ $8774_{4\frac12}$	11

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Table 1. *Observed infrared cerium lines*—Continued

Wavelength Å	Wavenumber (cm⁻¹)	Intensity	Spectrum	Classification	O−C (.001 cm⁻¹)
14512.08	6888.928	1	II	$6638^\circ_{41/2}$ $13527_{41/2}$	−48
14546.60	6872.580	1	I	9996°_{3} 16869_{4}	−25
14556.94	6867.698	6	II	$1410^\circ_{41/2}$ $8278_{51/2}$	−71
14575.70	6858.859	1	I	12707°_{2} 19566_{1}	−25
			I	13315°_{4} 20174_{1}	−29
14589.40	6852.418	2	II	$3793^\circ_{61/2}$ $10646_{51/2}$	−23
14633.11	6831.950	1	I	9135°_{3} 15967_{2}	−37
			II	$8131_{41/2}$ $14963_{51/2}$	45
14641.62	6827.979	3	II	$6389^\circ_{41/2}$ $13217_{31/2}$	−67
14642.78	6827.438	2	I	2378°_{2} 9206_{3}	−39
14650.35	6823.910	1			
14651.70	6823.281	1	I	11796°_{4} 18619_{5}	−36
14654.65	6821.908	1	I	12960°_{6} 19782°_{5}	−26
14654.65	6821.908	1	II	$9723^\circ_{41/2}$ $16545_{51/2}$	−19
14661.44	6818.749	1	I	11874°_{3} 18692_{4}	−27
14668.75	6815.351	1	I	7933°_{5} 14748_{4}	−35
			I	13297°_{5} 20112_{4}	−41
14679.91	6810.169	1			
14680.43	6809.928	2	I	15255°_{5} 22064_{6}	2
14711.30	6795.638	1			
14717.88	6792.600	1			
14727.88	6787.988	1	I	7348°_{4} 14136_{3}	−34
14730.24	6786.901	2	I	9462°_{5} 16249_{6}	5
14740.65	6782.108	2	I	7853°_{1} 14635_{1}	−15
14770.00	6768.631	2	I	2437°_{4} 9206_{3}	−44
			I	8509°_{4} 15277_{3}	−11
14784.22	6762.120	1			
14790.45	6759.272	2	II	$4165_{41/2}$ $10924^\circ_{41/2}$	−51
14796.56	6756.481	1			
14812.85	6749.051	3	II	$5616_{41/2}$ $12365^\circ_{41/2}$	−16
14831.64	6740.500	2	I	13881_{5} 20621°_{4}	18
			II	$5716_{31/2}$ $12456_{31/2}$	−33
14843.05	6735.319	1	I	15077°_{4} 21813_{3}	48
			II	$6521^\circ_{11/2}$ $13256_{11/2}$	−43
14845.23	6734.330	2	I	9333°_{6} 16067_{7}	−34
14865.87	6724.980	1	II	$10274_{31/2}$ $17000_{31/2}$	−68
			II	$15565_{21/2}$ $22290_{11/2}$	73
14874.98	6720.861	5	II	$1410^\circ_{41/2}$ $8131_{41/2}$	−46
14900.17	6709.499	1	I	8991°_{5} 15700_{4}	−27
			I	13629°_{5} 20338_{5}	−35
14932.64	6694.910	3			
14944.45	6689.619	4			
14960.93	6682.250	1	II	$2634^\circ_{21/2}$ $9316_{31/2}$	14
14979.45	6673.988	1	II	$7713^\circ_{41/2}$ $14387_{41/2}$	−37
14988.63	6669.901	1	I	10673°_{6} 17343_{5}	14
14991.80	6668.491	1	I	13194_{4} 19863_{5}	32
14993.42	6667.770	1	I	11337°_{3} 18005_{3}	−22
15013.44	6658.879	2	I	13124_{5} 19782°_{5}	4
			I	14417°_{4} 21076_{4}	14
15020.02	6655.962	1	I	14186°_{6} 20842_{6}	25
15039.21	6647.469	2	II	$7011_{41/2}$ $13659^\circ_{41/2}$	−49
15051.73	6641.939	1	I	11357°_{5} 17998_{4}	1
			I	14417°_{4} 21059_{5}	31
15073.15	6632.501	1	I	14609_{7} 21241°_{7}	−20
15166.54	6591.660	1	I	12351°_{4} 18943_{5}	−32
15176.23	6587.451	2	I	11061°_{7} 17649_{6}	−33
15182.27	6584.831	1	I	11301°_{2} 17886_{2}	−10
15194.85	6579.379	1			
15199.08	6577.548	3	I	8762°_{4} 15339_{5}	−43
15202.15	6576.220	1	I	12720°_{4} 19296_{4}	−17
15204.69	6575.121	1	I	4762_{4} 11337°_{3}	−19
15205.69	6574.689	3	II	$1873^\circ_{31/2}$ $8448_{21/2}$	−14
15210.94	6572.419	2			
15217.84	6569.439	4	I	12960_{6} 19530°_{5}	10
15219.18	6568.861	2			
15220.78	6568.171	1			
15226.11	6565.871	1	I	9135°_{3} 15700_{4}	−7
15228.57	6564.811	1	I	15382°_{6} 21946_{5}	−9
15230.66	6563.910	1	II	$8175^\circ_{21/2}$ $14739_{21/2}$	12
15233.45	6562.708	1	I	12114_{4} 18676°_{4}	−2
15253.46	6554.098	2	II	$4266_{31/2}$ $10820_{21/2}$	12
15254.67	6553.579	1	I	8055°_{6} 14609_{7}	17
			I	11874°_{3} 18427_{3}	−16
			I	12793°_{5} 19347_{5}	19
15259.42	6551.539	1	I	13389°_{3} 19941°_{2}	−15
15269.49	6547.218	2			
15271.52	6546.348	2	I	8088°_{2} 14635_{1}	17
15277.65	6543.721	5	I	13519°_{5} 20063_{6}	18
			II	$4910^\circ_{51/2}$ $11454_{61/2}$	−16
15280.76	6542.389	2	I	11650°_{2} 18192_{3}	−9
15283.02	6541.422	2	I	10604°_{3} 17146_{3}	3
15328.91	6521.839	2			
15337.96	6517.991	2	I	15063°_{5} 21581_{5}	−24
15340.03	6517.111	2	I	12425°_{4} 18943_{5}	−3
15346.27	6514.461	3	II	$2382^\circ_{41/2}$ $8896_{51/2}$	−31
15357.94	6509.511	3	II	$10035^\circ_{51/2}$ $16545_{51/2}$	−44
15385.72	6497.758	2	II	$4322^\circ_{21/2}$ $10820_{21/2}$	−10
15395.33	6493.702	2			
15402.81	6490.548	1	I	13301°_{6} 19791_{5}	−44
15409.83	6487.591	1			
15429.50	6479.321	4			
15431.15	6478.628	2			
15435.22	6476.920	2			
15437.17	6476.102	2			
15444.26	6473.129	3	II	$7202^\circ_{21/2}$ $13675_{21/2}$	−66
15460.59	6466.291	1	II	$13515^\circ_{31/2}$ $19982_{41/2}$	−52
15477.01	6459.431	2	II	$11015^\circ_{31/2}$ $17475^\circ_{41/2}$	−29
15498.92	6450.300	1	I	8088°_{2} 14539_{3}	0
15507.86	6446.581	1	I	10673°_{6} 17120_{5}	26
			II	$8280^\circ_{21/2}$ $14727_{11/2}$	−13
15508.90	6446.149	2			
15518.60	6442.120	1	II	$4203^\circ_{61/2}$ $10646_{51/2}$	−15
15519.71	6441.659	2	I	8307°_{3} 14748_{4}	23
			I	13219°_{6} 19661_{5}	−27
15528.77	6437.901	2	I	7780_{6} 14218_{6}	20
15531.18	6436.902	2	I	9947°_{2} 16384_{3}	−16
			II	$4266_{31/2}$ $10703_{41/2}$	−10
15533.79	6435.820	2	I	7348°_{4} 13784_{5}	−31
15548.60	6429.690	2	I	13194_{4} 19624°_{3}	−8
			I	13451°_{1} 19880_{2}	0
15563.05	6423.720	2			
15586.00	6414.262	2	I	7467°_{5} 13881_{5}	−21
15588.46	6413.249	1	I	9787°_{3} 16200_{3}	−23
15591.38	6412.048	2	II	$2641^\circ_{31/2}$ $9053_{31/2}$	−20
15596.22	6410.058	1	I	10879°_{5} 17289_{6}	−26
15605.22	6406.362	2	I	7780_{6} 14186°_{6}	−2
			I	13124_{5} 19530°_{5}	−7
15608.98	6404.818	2	I	8991°_{5} 15396_{6}	−16
15610.95	6404.010	1			
15640.75	6391.809	2	II	$2382^\circ_{41/2}$ $8774_{41/2}$	−13
15642.46	6391.110	5			
15654.17	6386.329	4	I	13124_{5} 19510°_{4}	7
15667.93	6380.721	1	I	9462°_{5} 15843_{4}	−22
			I	13214°_{1} 19595_{2}	38
15674.81	6377.920	2			
15676.75	6377.131	2	I	13605_{6} 19982°_{6}	−6

TABLE 1. *Observed infrared cerium lines*—Continued

Wavelength Å	Wavenumber (cm⁻¹)	Intensity	Spectrum	Classification	O−C (.001 cm⁻¹)
15679.01	6376.211	1	I	8270°_3 14646_2	15
15680.61	6375.561	1	I	8902°_3 15277_3	15
			I	14531°_4 20907_4	−24
15684.82	6373.850	2	I	14218°_6 20591_6	−3
			II	$7878^\circ_{31/2}$ $14252_{31/2}$	0
15702.53	6366.661	1			
15705.76	6365.351	3	I	12366_5 18732°_5	−18
15709.47	6363.848	1	I	13297°_5 19661_5	−15
15713.32	6362.289	1	II	$3363^\circ_{21/2}$ $9725_{31/2}$	−18
15717.64	6360.540	2	II	$4459^\circ_{31/2}$ $10820_{21/2}$	−66
15740.46	6351.319	1	I	9996°_3 16347_2	−11
15756.71	6344.769	1	I	11271°_4 17615_4	−35
15758.37	6344.101	2	I	7169°_3 13513_4	−22
			I	14001°_6 20346_6	40
15761.40	6342.881	2	I	8400°_5 14743_6	−14
15777.92	6336.240	2	II	$12057^\circ_{21/2}$ $18393_{31/2}$	26
15784.75	6333.498	7	II	$2563^\circ_{51/2}$ $8896_{51/2}$	−3
15811.56	6322.759	3	I	12467_5 18790°_5	−18
15821.72	6318.699	2	II	$3995^\circ_{31/2}$ $10314_{41/2}$	−9
15822.82	6318.260	2	II	$7341^\circ_{51/2}$ $13659^\circ_{41/2}$	−64
15829.83	6315.462	6	I	13194°_4 19510°_4	−20
			II	$2581^\circ_{41/2}$ $8896_{51/2}$	−12
15832.14	6314.540	5			
15843.48	6310.021	3	I	12366_5 18676°_4	29
15845.59	6309.180	1	II	$4511^\circ_{21/2}$ $10820_{21/2}$	−45
15881.92	6294.748	1	I	12720°_4 19014_4	0
15885.37	6293.381	1			
15888.23	6292.248	2	I	8307°_3 14599_4	−40
15903.87	6286.060	1	I	8509°_4 14795_5	−20
15904.81	6285.689	1			
15911.41	6283.081	1			
15918.36	6280.338	4	I	8366°_2 14646_2	−8
15921.80	6278.981	3	I	3100°_4 9379_4	−15
15943.72	6270.349	1	I	13409°_3 19680_4	3
15944.94	6269.869	2			
15947.25	6268.961	1	I	13513_4 19782°_5	−48
			I	8270°_3 14539_3	−1
			I	12793°_5 19062_5	−32
15948.93	6268.300	2			
15950.36	6267.738	2	I	10879°_5 17147_4	−6
15958.40	6264.581	6	II	$3793^\circ_{61/2}$ $10058_{61/2}$	−30
15977.12	6257.241	6	II	$1873^\circ_{31/2}$ $8131_{41/2}$	−30
15997.81	6249.148	1	I	8991_5 15240_4	−19
16030.18	6236.529	2	I	9135_3 15371_4	−18
16033.29	6235.319	1			
16034.83	6234.721	2	I	13389_3 19624°_3	0
16041.99	6231.938	1	I	8307°_3 14539_3	35
16048.27	6229.499	1	I	10673°_6 16903_5	−33
16050.77	6228.529	2	I	13315°_4 19544_4	−7
			II	$5513^\circ_{51/2}$ $11742_{51/2}$	−10
16101.15	6209.040	2	I	12467_5 18676°_4	41
16113.11	6204.431	1	I	8430°_1 14635_1	34
16114.57	6203.869	2	I	9996°_3 16200_3	23
			I	14116°_4 20320_4	44
			I	14310°_2 20513_2	−20
16120.75	6201.491	1	I	9053_3 15255°_5	87
			II	$10798^\circ_{21/2}$ $17000_{31/2}$	27
16124.97	6199.868	1	I	15677°_7 21877_6	42
16127.64	6198.842	1	I	8400°_5 14599_4	−25
16130.64	6197.689	1			
16140.06	6194.072	3			
16143.32	6192.821	3	II	$2581^\circ_{41/2}$ $8774_{41/2}$	16
16147.83	6191.091	1			
16150.18	6190.190	2			
16161.88	6185.709	1			
16167.05	6183.731	2	I	11131°_3 17315_4	3
			I	11517°_1 17700_0	−22
			II	$11387^\circ_{31/2}$ $17571_{41/2}$	67
16176.08	6180.279	1	II	$4523^\circ_{41/2}$ $10703_{41/2}$	2
16193.27	6173.718	1	I	11337°_3 17511_3	−18
			I	11357°_5 17530_5	−6
16195.99	6172.681	1	I	11517°_1 17689_2	−21
			I	12707°_2 18880_2	−4
16213.04	6166.190	1	I	7715°_5 13881_5	−17
16214.70	6165.559	2	I	7348°_4 13513_4	−16
16226.33	6161.140	2	I	8902°_3 15063_3	−5
16233.02	6158.601	4			
16250.65	6151.919	2			
16251.76	6151.499	2	I	12720°_4 18871_4	8
16257.10	6149.478	2	I	12793°_5 18943_5	−30
			II	$2382^\circ_{41/2}$ $8531_{31/2}$	29
16261.41	6147.849	1	I	13214°_1 19362_1	36
			I	15917°_7 22064_6	−39
			II	$2641^\circ_{31/2}$ $8789_{21/2}$	38
16274.93	6142.741	1	I	9135_3 15277_3	−11
16302.32	6132.421	1	II	$5964^\circ_{31/2}$ $12097_{31/2}$	49
16307.48	6130.480	2	I	9425°_2 15555_3	18
16313.79	6128.109	1	I	13219°_6 19347_6	−43
16320.71	6125.511	2	II	$5616^\circ_{41/2}$ $11742_{51/2}$	2
16325.83	6123.590	1			
16327.32	6123.031	4	II	$4523^\circ_{41/2}$ $10646_{51/2}$	−10
16350.45	6114.369	1	II	$6913^\circ_{61/2}$ $13027_{61/2}$	5
16360.40	6110.651	2	I	13513_4 19624°_3	−21
16368.46	6107.642	3	I	12114_4 18221°_5	−25
16376.48	6104.651	7	II	$987^\circ_{41/2}$ $7092_{51/2}$	−8
16392.62	6098.640	1	I	9462_5 15561_5	0
16403.32	6094.662	1	I	10774°_3 16869_4	14
16415.37	6090.188	2			
16420.68	6088.219	1	I	10604°_3 16693_4	−43
16424.91	6086.651	1			
16429.82	6084.832	1	I	11810°_4 17895_5	−34
16432.88	6083.699	2	II	$5675^\circ_{41/2}$ $11759_{51/2}$	8
16438.74	6081.530	1	I	11357°_5 17438_4	0
16445.23	6079.130	2	I	13784_5 19863°_5	−26
16456.11	6075.111	1	II	$10924^\circ_{41/2}$ $17000_{31/2}$	−35
16458.06	6074.391	1	I	12988_4 19062_5	33
16459.99	6073.679	1			
16460.96	6073.321	1	I	13908_7 19982°_6	9
16463.86	6072.251	1			
16464.35	6072.070	1	I	12114_4 18186°_3	25
16478.46	6066.871	1	I	3312°_4 9379_4	−36
			II	$6389^\circ_{41/2}$ $12456_{31/2}$	63
16486.18	6064.030	1			
16495.78	6060.501	1			
16500.30	6058.841	1	I	6238_5 12297°_5	−5
			II	$7059^\circ_{41/2}$ $13117_{41/2}$	−3
16507.41	6056.231	2	I	9787°_3 15843_4	2
16509.89	6055.321	1	I	10612°_2 16668_3	−1
16530.48	6047.779	1	II	$4266^\circ_{31/2}$ $10314_{41/2}$	4
16531.41	6047.439	2	I	8088°_2 14136_3	29
16537.20	6045.321	1	I	11850°_5 17895_5	34
16545.28	6042.369	3	I	13939_6 19982°_6	24
16551.80	6039.989	1			
16553.14	6039.500	2	I	7841°_5 13881_5	11
16595.18	6024.200	7	II	$987^\circ_{41/2}$ $7011_{41/2}$	−2
16614.87	6017.061	3	II	$2879^\circ_{51/2}$ $8896_{51/2}$	13

TABLE 1. *Observed infrared cerium lines*—Continued

Wave-length Å	Wave-number (cm⁻¹)	Intensity	Spectrum	Classification	O−C (.001 cm⁻¹)
16622.17	6014.419	1	I	$12351^{\circ}_{4}\ 18365_{5}$	14
16636.05	6009.401	2	I	$8088^{\circ}_{2}\ 14098_{2}$	8
16665.73	5998.699	1	I	$13784_{5}\ 19782^{\circ}_{5}$	—34
			I	$15101^{\circ}_{6}\ 21100_{6}$	5
16671.37	5996.669	1	I	$12297^{\circ}_{5}\ 18294_{6}$	0
16672.15	5996.389	2	I	$13409^{\circ}_{3}\ 19406_{3}$	—35
			I	$14116^{\circ}_{4}\ 20112_{4}$	0
16683.53	5992.298	1	I	$6475^{\circ}_{4}\ 12467_{5}$	11
16698.71	5986.851	1	I	$8762^{\circ}_{4}\ 14748_{4}$	32
			I	$14920^{\circ}_{4}\ 20907_{4}$	—2
16705.41	5984.450	1	II	$8402^{\circ}_{31/2}\ 14387_{41/2}$	2
16708.57	5983.318	1	I	$10604^{\circ}_{3}\ 16588_{4}$	5
16712.64	5981.861	2	I	$13881_{5}\ 19863^{\circ}_{5}$	—2
16714.63	5981.149	1	I	$14338_{5}\ 20320_{4}$	—18
16715.52	5980.830	1	I	$13315^{\circ}_{4}\ 19296_{4}$	45
16718.23	5979.861	4	I	$10243^{\circ}_{4}\ 16223_{5}$	—1
16722.51	5978.330	7	II	$3793^{\circ}_{61/2}\ 9771_{71/2}$	13
16729.42	5975.861	2	II	$4844^{\circ}_{11/2}\ 10820_{21/2}$	29
16742.25	5971.282	2	I	$9787^{\circ}_{3}\ 15758_{2}$	44
			I	$15255^{\circ}_{5}\ 21226_{5}$	—38
			II	$8280^{\circ}_{21/2}\ 14252_{31/2}$	51
16744.55	5970.461	1	I	$9996^{\circ}_{3}\ 15967_{2}$	22
16768.57	5961.909	2	I	$14743_{6}\ 20705^{\circ}_{6}$	0
16783.21	5956.709	3	I	$10243^{\circ}_{4}\ 16200_{3}$	—3
16792.26	5953.498	3	II	$3363^{\circ}_{21/2}\ 9316_{31/2}$	23
16808.09	5947.891	1	I	$7933^{\circ}_{3}\ 13881_{5}$	5
16808.91	5947.601	2	I	$13297^{\circ}_{5}\ 19244_{4}$	26
16829.29	5940.399	1	II	$5819^{\circ}_{41/2}\ 11759_{51/2}$	64
16832.86	5939.139	2	II	$6517^{\circ}_{21/2}\ 12456_{31/2}$	7
16844.85	5934.911	1	I	$11796^{\circ}_{4}\ 17731_{4}$	50
16848.69	5933.559	2	I	$9462^{\circ}_{5}\ 15396_{6}$	—21
16850.65	5932.869	1	I	$11357^{\circ}_{5}\ 17289_{6}$	27
16856.78	5930.711	2	II	$1410^{\circ}_{41/2}\ 7341_{51/2}$	4
16863.07	5928.499	5			
16871.89	5925.400	5	I	$13605_{6}\ 19530^{\circ}_{5}$	20
16884.23	5921.069	1			
16891.39	5918.559	1	I	$10774^{\circ}_{3}\ 16693_{4}$	12
16893.76	5917.729	1	I	$12366_{5}\ 18284^{\circ}_{5}$	—19
16897.55	5916.402	1	I	$15879_{5}\ 21796^{\circ}_{6}$	10
16905.16	5913.738	1	I	$9787^{\circ}_{3}\ 15700_{4}$	—19
16908.56	5912.549	1	I	$10673^{\circ}_{6}\ 16586_{5}$	—26
			I	$16152^{\circ}_{6}\ 22064_{6}$	—22
16917.60	5909.390	1			
16922.01	5907.850	1			
16940.07	5901.551	2			
16945.76	5899.570	1	I	$12720^{\circ}_{4}\ 18619_{5}$	0
16956.54	5895.819	2	II	$2382^{\circ}_{41/2}\ 8278_{51/2}$	—8
16958.72	5895.061	1	I	$13815^{\circ}_{4}\ 19711_{3}$	49
16962.61	5893.709	3	I	$7890_{4}\ 13784_{5}$	—12
16969.60	5891.282	2	I	$6475^{\circ}_{4}\ 12366_{5}$	—11
			I	$12720^{\circ}_{4}\ 18611_{3}$	11
16972.63	5890.230	3			
16989.71	5884.308	2	I	$8055^{\circ}_{6}\ 13939_{6}$	41
			II	$7233^{\circ}_{51/2}\ 13117_{41/2}$	14
16999.33	5880.978	1	I	$11850^{\circ}_{5}\ 17731_{4}$	2
17005.25	5878.931	2	I	$13194_{4}\ 19073^{\circ}_{5}$	40
			I	$9709^{\circ}_{2}\ 15587_{2}$	16
17015.33	5875.448	1			
17044.80	5865.290	1			
17047.10	5864.498	3	I	$12297^{\circ}_{5}\ 18162_{4}$	—31
17058.88	5860.449	7	II	$2563^{\circ}_{51/2}\ 8423_{61/2}$	0
17062.14	5859.329	2	I	$12454_{2}\ 18313_{3}$	—45
17063.24	5858.951	2			
17069.63	5856.758	2	I	$2378^{\circ}_{2}\ 8235_{2}$	—19

Wave-length Å	Wave-number (cm⁻¹)	Intensity	Spectrum	Classification	O−C (.001 cm⁻¹)
17076.97	5854.241	4	II	$4203^{\circ}_{61/2}\ 10058_{61/2}$	—64
			II	$4459^{\circ}_{31/2}\ 10314_{41/2}$	—53
17077.47	5854.069	5	II	$5455^{\circ}_{71/2}\ 11309_{71/2}$	—59
17080.74	5852.949	3	II	$2595^{\circ}_{11/2}\ 8448_{21/2}$	—52
17094.20	5848.340	1	II	$1873^{\circ}_{31/2}\ 7722_{21/2}$	—6
17098.03	5847.030	1	I	$9709^{\circ}_{2}\ 15555_{3}$	50
17099.40	5846.561	2	I	$7348^{\circ}_{4}\ 13194_{4}$	12
17103.03	5845.321	2	I	$15396_{6}\ 21241_{7}$	—2
			II	$10314_{41/2}\ 16159_{31/2}$	—56
17106.63	5844.090	4	I	$12297^{\circ}_{5}\ 18141_{4}$	24
17109.38	5843.151	4	I	$13219^{\circ}_{6}\ 19062_{5}$	42
17122.51	5838.670	1			
17125.01	5837.818	1			
17133.34	5834.980	1	I	$14001^{\circ}_{6}\ 19836_{7}$	4
17139.13	5833.009	2			
17148.09	5829.961	1	I	$12720^{\circ}_{4}\ 18550_{4}$	—24
17150.98	5828.978	2	I	$8307^{\circ}_{3}\ 14136_{3}$	—34
17165.55	5824.031	2	I	$4762_{4}\ 10586_{4}$	—22
17168.32	5823.091	2	II	$14097^{\circ}_{3}\ 19920_{31/2}$	—12
17175.23	5820.748	3	I	$9787^{\circ}_{3}\ 15607_{2}$	—12
			I	$15021^{\circ}_{7}\ 20842_{6}$	13
17187.16	5816.708	3	I	$12467_{5}\ 18284^{\circ}_{5}$	—47
			II	$8280^{\circ}_{21/2}\ 14097_{31/2}$	—55
17189.11	5816.048	2			
17194.10	5814.360	3	I	$9830^{\circ}_{6}\ 15644_{6}$	25
17196.23	5813.640	3			
17196.38	5813.589	1	I	$10774^{\circ}_{3}\ 16588_{4}$	—7
17203.98	5811.021	1	I	$12351^{\circ}_{4}\ 18162_{4}$	30
17208.43	5809.519	1			
17211.66	5808.428	2	I	$11337^{\circ}_{3}\ 17146_{3}$	—20
17213.91	5807.669	2	I	$10243^{\circ}_{4}\ 16051_{4}$	—28
17215.89	5807.001	2	II	$5651^{\circ}_{51/2}\ 11458_{51/2}$	1
17223.01	5804.601	3	I	$6663^{\circ}_{5}\ 12467_{5}$	0
17226.60	5803.391	4	II	$5651^{\circ}_{51/2}\ 11454_{61/2}$	56
17230.52	5802.071	2			
17254.10	5794.141	1	I	$8270^{\circ}_{3}\ 14064_{4}$	8
			II	$7233^{\circ}_{51/2}\ 13027_{61/2}$	10
17265.25	5790.399	3	II	$5969^{\circ}_{51/2}\ 11759_{51/2}$	—48
17288.45	5782.629	3	II	$5675^{\circ}_{41/2}\ 11458_{51/2}$	30
17306.76	5776.511	1			
17309.58	5775.570	1	I	$13572^{\circ}_{7}\ 19347_{6}$	42
17322.39	5771.299	5	I	$12960_{6}\ 18732^{\circ}_{5}$	45
17328.09	5769.401	1	I	$9996^{\circ}_{3}\ 15766_{3}$	0
17329.47	5768.941	2			
17340.41	5765.302	2	I	$13297^{\circ}_{5}\ 19062_{5}$	16
17364.15	5757.419	2			
17365.29	5757.041	1	I	$8307^{\circ}_{3}\ 14064_{4}$	—31
17386.07	5750.161	2			
17387.71	5749.618	3			
17399.11	5745.851	1	II	$9771_{71/2}\ 15517_{61/2}$	30
17404.20	5744.171	2	I	$8902^{\circ}_{3}\ 14646_{2}$	32
17426.29	5736.889	2			
17444.99	5730.740	2	I	$9830^{\circ}_{6}\ 15561_{5}$	2
17446.66	5730.191	1			
17482.21	5718.539	1	I	$14064_{4}\ 19782^{\circ}_{5}$	36
17493.56	5714.828	2	II	$2563^{\circ}_{51/2}\ 8278_{51/2}$	—8
17496.65	5713.819	2	I	$11337^{\circ}_{3}\ 17051_{3}$	36
			I	$12600^{\circ}_{3}\ 18313_{3}$	45
17508.54	5709.939	7	II	$5455^{\circ}_{71/2}\ 11165_{81/2}$	—3
17519.09	5706.500	6			
17524.13	5704.859	2	I	$9903^{\circ}_{1}\ 15607_{2}$	0
17548.86	5696.820	6	II	$2581^{\circ}_{41/2}\ 8278_{51/2}$	10
17567.18	5690.879	3			
17594.72	5681.971	6	II	$1410^{\circ}_{41/2}\ 7092_{51/2}$	1

TABLE 1. *Observed infrared cerium lines*—Continued

Wave-length Å	Wave-number (cm⁻¹)	In-ten-sity	Spec-trum	Classification		O−C (.001 cm⁻¹)	Wave-length Å	Wave-number (cm⁻¹)	In-ten-sity	Spec-trum	Classification		O−C (.001 cm⁻¹)
17613.67	5675.858	6	I	12366_5	18042°_4	18	18063.19	5534.609	1	I	13297°_5	18831_5	39
17623.07	5672.831	4					18068.15	5533.090	1	I	11810°_4	17343_5	28
17625.84	5671.939	3	I	7841°_5	13513_4	19	18080.73	5529.240	1				
17642.48	5666.590	3	I	13124_5	18790°_5	—4	18092.22	5525.729	2				
17653.38	5663.091	3	I	13572°_7	19235_6	7	18094.51	5525.029	2	I	10318°_3	15843_4	18
17664.58	5659.500	2	II	$7092_{5 1/2}$	$12751^\circ_{5 1/2}$	—35	18101.95	5522.759	2				
17671.98	5657.130	1	I	12351°_4	18008_5	9	18144.72	5509.740	1				
			I	14186°_6	19843_5	—6	18159.65	5505.211	3				
17675.61	5655.969	2	II	$10798_{2 1/2}$	$16454_{2 1/2}$	—17	18160.02	5505.098	3	II	$7522_{5 1/2}$	$13027_{6 1/2}$	—36
17685.30	5652.870	1					18176.33	5500.159	2	I	10723°_4	16223_5	28
17695.38	5649.650	2					18207.84	5490.640	2	I	9787°_3	15277_3	8
17696.22	5649.381	3	I	12948°_5	18598_6	21	18211.22	5489.621	6	II	$2641^\circ_{3 1/2}$	$8131_{4 1/2}$	—21
17697.54	5648.960	1	I	13881_5	19530°_5	24	18224.01	5485.768	2				
			II	$7878^\circ_{3 1/2}$	$13527_{4 1/2}$	50	18236.47	5482.020	2	I	13194_4	18676°_4	43
17703.24	5647.141	2					18244.39	5479.641	3	I	7715°_5	13194_4	28
17708.01	5645.620	2	I	12720°_4	18365_5	10				I	11357°_5	16836_6	30
17716.92	5642.781	1	II	$7061^\circ_{0 1/2}$	$12704_{1 1/2}$	—5				I	15333°_8	20812_7	18
17730.06	5638.599	4	I	6475°_4	12114_4	24	18269.50	5472.109	1	II	$8804_{4 1/2}$	$14276_{5 1/2}$	36
17732.13	5637.941	2	I	9425°_5	15063_5	18	18276.88	5469.900	2				
17735.31	5636.930	3	I	8902°_3	14539_3	24	18286.71	5466.959	3	I	12425°_4	17892_4	43
17738.17	5636.021	3	I	10243°_4	15879_5	23	18289.79	5466.039	3	I	14064_4	19530°_5	41
17760.52	5628.928	1	I	13881_5	19510°_4	41	18294.81	5464.539	2	I	9135°_3	14599_4	40
17766.10	5627.160	1	I	8509°_4	14136_3	48	18357.22	5445.961	1	I	10901°_2	16347_2	—45
17777.76	5623.470	1	I	7890°_4	13513_4	24				I	14064_4	19510°_4	11
			I	12297°_2	17921_3	12	18385.48	5437.590	1				
17787.25	5620.470	1	I	11301°_2	16921_3	27	18424.85	5425.971	1	II	$3363^\circ_{2 1/2}$	$8789_{2 1/2}$	22
17799.00	5616.759	1	II	$0^\circ_{3 1/2}$	$5616_{4 1/2}$	16	18435.83	5422.739	1				
17801.79	5615.879	1					18452.57	5417.820	1				
17808.19	5613.861	3	I	9135°_3	14748_4	15	18494.59	5405.510	1				
17816.38	5611.280	1	I	6238_5	11850°_5	—37	18507.53	5401.731	2				
			I	6856°_4	12467_5	12	18510.79	5400.780	2				
17817.65	5610.880	1					18556.04	5387.610	1	I	9379_4	14766°_5	31
17820.99	5609.828	1					18577.80	5381.299	3	I	15240_4	20621°_4	—7
17827.98	5607.629	1								II	$8278_{5 1/2}$	$13659_{4 1/2}$	37
17833.89	5605.771	1	I	13629°_5	19235_6	31	18578.66	5381.050	1				
17835.71	5605.199	1	I	14186°_6	19791_5	26	18587.30	5378.549	1	I	12351°_4	17729_5	—5
17845.58	5602.098	1	I	11545°_4	17147_4	—41	18597.91	5375.480	1	II	$15565^\circ_{2 1/2}$	$20940_{3 1/2}$	64
17847.42	5601.521	4	II	$1410_{4 1/2}$	$7011_{4 1/2}$	8	18606.15	5373.100	5	I	14609_7	19982°_6	50
17853.29	5599.679	2	I	10243°_4	15843_4	10				I	13214°_1	18587_2	28
17865.89	5595.730	3	I	13194_4	18790°_5	—25				I	13569°_4	18943_5	47
17867.97	5595.079	1	I	12297°_5	17892_4	46	18628.44	5366.671	1	I	11301°_2	16668_3	18
17872.21	5593.751	1	I	11796°_4	17390_4	4	18631.60	5365.760	1				
			I	12720°_4	18313_3	5	18634.31	5364.980	1	I	12873°_2	18238_2	9
17882.19	5590.629	2	I	13939_6	19530°_5	42	18638.93	5363.650	2				
17906.92	5582.909	1	II	$8804_{4 1/2}$	$14387_{4 1/2}$	22	18642.34	5362.669	1				
17917.19	5579.709	1	I	12425°_4	18005_3	—44	18658.66	5357.979	1	I	11545°_4	16903_5	—2
			II	$6517_{2 1/2}$	$12097_{3 1/2}$	60	18671.20	5354.380	2				
17918.02	5579.450	1	I	11810°_4	17390_4	8	18675.84	5353.050	3				
17924.51	5577.430	1	I	13409°_3	18987_2	12	18680.06	5351.840	2	I	8587°_7	13939_6	21
17943.43	5571.549	2	I	2208°_5	7780_6	4				I	13622°_2	18973_1	—14
17954.74	5568.039	6	II	$4203^\circ_{6 1/2}$	$9771_{7 1/2}$	28	18682.09	5351.259	2	I	12297°_5	17649_6	4
17965.93	5564.571	1	I	11874°_3	17438_4	21	18686.35	5350.039	1	II	$3703^\circ_{3 1/2}$	$9053_{3 1/2}$	1
17988.14	5557.701	3					18689.39	5349.169	1	I	10409°_1	15758_2	—15
18003.89	5552.839	1	I	13124_5	18676°_4	23	18700.15	5346.091	2				
18013.26	5549.950	5	II	$2581_{4 1/2}$	$8131_{4 1/2}$	2	18707.22	5344.070	2	I	15277_3	20621°_4	—3
18021.70	5547.351	1	I	11796°_4	17343_5	—15	18707.89	5343.879	2	I	10879°_5	16223_5	29
			II	$6549_{2 1/2}$	$12097_{3 1/2}$	—8	18708.69	5343.651	1				
18024.43	5546.511	1					18736.50	5335.719	2				
18026.16	5545.979	2					18737.30	5335.491	3				
18033.34	5543.770	1					18763.75	5327.970	1	I	10723°_4	16051_4	4
18040.83	5541.469	1	I	12351°_4	17892_4	—24	18779.05	5323.629	5	I	12960_6	18284°_5	—3
			II	$9198^\circ_{3 1/2}$	$14739_{2 1/2}$	28	18786.85	5321.419	1	I	13044°_4	18365_5	—11
18046.04	5539.869	1	I	11850°_5	17390_4	7				I	13089°_3	18411_4	47
18053.01	5537.730	1								II	$3995^\circ_{3 1/2}$	$9316_{3 1/2}$	—21

TABLE 1. *Observed infrared cerium lines*—Continued

Wave-length Å	Wave-number (cm⁻¹)	Intensity	Spectrum	Classification		O−C (.001 cm⁻¹)	Wave-length Å	Wave-number (cm⁻¹)	Intensity	Spectrum	Classification		O−C (.001 cm⁻¹)
18802.01	5317.128	1	I	$11271'_4$	16588_4	14	19583.68	5104.899	1	I	$12425'_4$	17530_5	36
18811.42	5314.469	2	II	$2140_{01/2}$	$7454_{11/2}$	7	19586.36	5104.200	1	II	$5716_{31/2}$	$10820_{21/2}$	−61
18822.25	5311.411	2					19590.51	5103.119	3	II	$3793_{61/2}$	$8896_{51/2}$	15
18828.14	5309.749	2	I	$11810'_4$	17120_5	19	19605.53	5099.210	1				
18833.85	5308.139	2	II	$5616_{41/2}$	$10924'_{41/2}$	5	19616.42	5096.379	2				
18852.49	5302.891	3	II	$3593_{41/2}$	$8896_{51/2}$	30	19617.45	5096.111	2	I	$10604'_3$	15700_4	22
18854.56	5302.309	2								I	$14310'_2$	19406_3	30
18899.22	5289.779	1	I	$11578'_1$	16868_2	−39	19617.96	5095.979	2	I	$10243'_4$	15339_5	41
			II	$7722_{21/2}$	$13012_{21/2}$	−45	19631.94	5092.350	2	I	$12297'_5$	17390_4	17
18909.05	5287.029	2	I	13389_3	$18676'_4$	30				II	$8175_{21/2}$	$13268_{21/2}$	8
18911.23	5286.420	1					19641.97	5089.749	2	I	13194_4	$18284'_5$	15
18941.61	5277.941	1	I	$8603'_6$	13881_5	28	19642.93	5089.501	3				
18945.42	5276.880	2	I	$10774'_3$	16051_4	7	19650.11	5087.641	2	II	$2634_{21/2}$	$7722_{21/2}$	24
18947.65	5276.259	2	I	$9787'_3$	15063_3	27	19652.51	5087.020	2	II	$8169'_{11/2}$	$13256_{11/2}$	16
18969.51	5270.178	1	I	$11850'_5$	17120_5	28	19657.53	5085.721	1	I	$12425'_4$	17511_3	23
18971.77	5269.551	1	I	$13044'_4$	18313_3	−15				II	$3703_{31/2}$	$8789_{21/2}$	−58
18977.61	5267.929	2					19658.96	5085.351	2	I	14539_3	19624_3	15
18980.24	5267.199	2	II	$8169'_{11/2}$	$13436_{21/2}$	53	19663.95	5084.060	2				
18985.68	5265.690	1					19669.79	5082.551	2	I	$8307'_3$	13389_3	33
18997.26	5262.480	1	I	$14417'_4$	19680_4	14	19671.81	5082.029	1				
19035.89	5251.801	1					19676.37	5080.851	1	II	$8175_{21/2}$	$13256_{11/2}$	19
19057.88	5245.741	1	I	$7715'_5$	12960_6	27	19695.56	5075.901	1				
19067.34	5243.138	1					19707.25	5072.890	1	I	$11796'_4$	16869_4	4
19079.23	5239.871	1								I	$8991'_5$	14064_4	−40
19083.86	5238.600	2	I	$10604'_3$	15843_4	40	19716.31	5070.559	2				
19095.71	5235.349	1					19722.96	5068.849	1	I	$10774'_3$	15843_4	5
19100.89	5233.929	1	I	4762_4	$9996'_3$	0	19724.55	5068.440	3	I	$8055'_6$	13124_5	−43
19103.77	5233.140	1	I	$14001'_6$	19235_6	2				II	$6389_{41/2}$	$11458_{51/2}$	25
19108.70	5231.790	2					19726.19	5068.019	2	I	14795_5	$19863'_5$	1
19116.37	5229.691	3					19730.78	5066.840	1	I	$9996'_3$	15063_3	35
19152.12	5219.929	1	I	$14027'_4$	19247_3	20				II	$11387_{31/2}$	$16454_{21/2}$	30
19161.22	5217.450	1					19755.11	5060.600	1	I	$15561'_4$	20621_4	20
19172.06	5214.500	3	I	8235_2	$13450'_3$	−38				I	15644_6	$20705'_5$	8
			II	$4511_{21/2}$	$9725_{31/2}$	21	19762.80	5058.631	1	I	$11810'_4$	16869_4	50
19189.43	5209.780	2	I	16586_5	$21796'_6$	33	19784.24	5053.149	1	I	$11850'_5$	16903_5	21
19209.30	5204.391	1					19794.42	5050.550	4	II	$4266_{31/2}$	$9316_{31/2}$	43
19219.35	5201.669	1	I	$13409'_3$	18611_3	15	19799.87	5049.160	2				
19230.18	5198.740	1	I	$10409'_1$	15607_2	32	19810.62	5046.420	2	I	$11301'_2$	16347_2	−20
19247.40	5194.089	2	I	12992_2	$18186'_3$	44	19815.53	5045.169	1	I	$14027'_4$	19072_3	−10
19247.88	5193.959	2					19820.52	5043.899	1	II	$3745_{11/2}$	$8789_{21/2}$	−2
19262.64	5189.979	3	I	$12425'_4$	17615_4	−15	19824.88	5042.790	1	I	$11545'_4$	16588_4	−13
19277.87	5185.879	1	\ I	$12600'_3$	17785_3	29	19838.73	5039.269	2	I	14743_6	$19782'_5$	11
19279.58	5185.419	2					19858.79	5034.179	2	II	$8402_{31/2}$	$13436_{21/2}$	5
19288.47	5183.029	3	I	$15917'_7$	21100_6	41	19864.35	5032.770	1	I	$4173'_4$	9206_3	−40
19304.37	5178.760	1								II	$4165_{41/2}$	$9198_{31/2}$	−3
19319.85	5174.611	1					19866.72	5032.170	1	I	6238_5	$11271'_4$	16
19321.94	5174.051	2	I	16067_7	$21241'_7$	28	19877.66	5029.400	1	I	$11517'_1$	16546_0	26
19330.80	5171.680	1	I	$10879'_5$	16051_4	−4				I	$12022'_2$	17051_3	−42
19343.44	5168.300	2	II	$3363_{21/2}$	$8531_{31/2}$	35	19887.35	5026.950	2	I	13194_4	$18221'_5$	16
19355.99	5164.949	1					19890.16	5026.239	2	I	13572_7	18598_6	−7
19372.38	5160.579	1	I	13124_5	$18284'_5$	6	19895.42	5024.911	2	I	14599_4	$19624'_3$	−38
19373.43	5160.300	2	I	$12351'_4$	17511_3	24	19900.49	5023.630	1	I	$10774'_3$	15798_3	9
19422.25	5147.329	6	II	$4910_{51/2}$	$10058_{61/2}$	44	19906.91	5022.010	1	I	$8762'_4$	13784_5	−14
19457.89	5137.901	4	II	$1873_{31/2}$	$7011_{41/2}$	24	19941.58	5013.279	1	I	7780_6	$12793'_5$	−22
19464.86	5136.061	2					19950.17	5011.121	1	I	$12720'_4$	17731_4	8
19467.82	5135.280	1	I	$15677'_7$	20812_7	23	19954.23	5010.101	1	I	$11337'_3$	16347_2	−17
19498.35	5127.239	4	I	13605_6	$18732'_5$	35	19973.01	5005.390	1	I	$11061'_7$	16066_6	1
			I	$13283'_3$	18411_4	−41	19975.92	5004.661	2	I	$8509'_4$	13513_4	−4
19521.15	5121.251	5	II	$6638_{41/2}$	$11759_{51/2}$	58	20007.31	4996.809	1	I	$10243'_4$	15240_4	−29
19527.52	5119.580	2	I	$8270'_3$	13389_3	2	20026.62	4991.991	2	I	16249_6	$21241'_7$	−17
19529.58	5119.040	1	I	$7841'_5$	12960_6	45	20028.91	4991.420	1	I	$10774'_3$	15766_3	−22
19551.93	5113.189	5	I	$8400'_5$	13513_4	44	20041.24	4988.349	3	II	$4737_{21/2}$	$9725_{31/2}$	−9
19562.25	5110.491	1					20046.18	4987.120	5	I	$14027'_4$	19014_4	−24
19565.24	5109.710	1								II	$5716_{31/2}$	$10703_{41/2}$	32

TABLE 1. *Observed infrared cerium lines*—Continued

Wavelength Å	Wavenumber (cm⁻¹)	Intensity	Spectrum	Classification	O−C (.001 cm⁻¹)	Wavelength Å	Wavenumber (cm⁻¹)	Intensity	Spectrum	Classification	O−C (.001 cm⁻¹)
20062.96	4982.949	1				20854.19	4793.891	1	II	$3995^\circ_{3\ 1/2}\ 8789_{2\ 1/2}$	—23
20077.14	4979.430	1							II	$4523^\circ_{4\ 1/2}\ 9316_{3\ 1/2}$	20
20085.04	4977.471	2	I	$10723^\circ_4\ 15700_4$	5	20859.42	4792.689	1	I	$8991^\circ_5\ 13784_5$	—10
			I	$13450^\circ_3\ 18427_3$	3	20876.62	4788.740	1			
20091.66	4975.831	1				20933.10	4775.820	1			
20093.08	4975.479	1	I	$13219^\circ_6\ 18194_5$	—21	20950.91	4771.760	1	I	$12366_5\ 17138^\circ_6$	7
20136.95	4964.640	1	I	$9830^\circ_6\ 14795_5$	—41	20962.55	4769.110	1	I	$12351^\circ_4\ 17120_5$	28
20140.85	4963.679	2	I	$10879^\circ_5\ 15843_4$	23	20976.98	4765.830	1	I	$7348^\circ_4\ 12114_4$	14
20157.82	4959.500	5	I	$1279^\circ_4\ 6238_5$	—9	20979.88	4765.171	1	I	$10879^\circ_5\ 15644_6$	21
20204.34	4948.081	2	I	$13784_5\ 18732^\circ_5$	28	20990.50	4762.760	5	I	$0^\circ_4\ 4762_1$	42
20235.63	4940.430	1				21000.33	4760.530	1	II	$5942^\circ_{3\ 1/2}\ 10703_{4\ 1/2}$	26
20248.09	4937.390	3	I	$9709^\circ_2\ 14646_2$	—42	21003.69	4759.769	1	I	$14920^\circ_4\ 19680_4$	—46
			I	$12454^\circ_2\ 17391_1$	17				II	$2581^\circ_{4\ 1/2}\ 7341_{5\ 1/2}$	22
			II	$7011_{4\ 1/2}\ 11949_{3\ 1/2}$	8	21027.85	4754.300	1			
20252.31	4936.361	1	I	$12793^\circ_5\ 17729_5$	—9	21037.98	4752.011	1	I	$9787^\circ_3\ 14539_3$	19
20269.68	4932.131	2				21056.99	4747.721	1			
20280.83	4929.419	1	I	$11271^\circ_4\ 16200_3$	14	21068.98	4745.019	1	I	$10318^\circ_3\ 15063_3$	5
			I	$14417^\circ_4\ 19347_5$	—32				II	$3703^\circ_{3\ 1/2}\ 8448_{2\ 1/2}$	—24
20283.99	4928.651	1				21091.29	4740.000	2	I	$6621^\circ_3\ 11361_4$	—2
20289.26	4927.371	1				21103.58	4737.239	2	I	$12793^\circ_5\ 17530_5$	—17
20292.15	4926.669	2	II	$5942^\circ_{3\ 1/2}\ 10869_{4\ 1/2}$	—70	21172.63	4721.790	1	I	$11626^\circ_1\ 16347_2$	5
20293.51	4926.339	2	I	$10774^\circ_3\ 15700_4$	—33				I	$13283^\circ_3\ 18005_3$	27
			I	$17138^\circ_6\ 22064_6$	—39	21199.34	4715.841	2	I	$11301^\circ_2\ 16017_3$	20
20325.11	4918.680	3	I	$13124_5\ 18042^\circ_4$	16	21203.57	4714.900	2	II	$5010^\circ_{2\ 1/2}\ 9725_{3\ 1/2}$	33
20357.85	4910.769	2	I	$14599_4\ 19510^\circ_4$	35	21221.98	4710.810	1	I	$9425^\circ_2\ 14136_3$	17
20366.23	4908.749	1				21225.31	4710.071	2	II	$2382^\circ_{4\ 1/2}\ 7092_{5\ 1/2}$	43
20368.26	4908.260	1	I	$11626^\circ_1\ 16534_2$	2	21234.96	4707.930	1	I	$13513^\circ_4\ 18221_5$	22
20383.13	4904.679	2	I	$12988^\circ_3\ 17892_4$	5	21268.98	4700.400	3	II	$7059^\circ_{4\ 1/2}\ 11759_{5\ 1/2}$	23
			II	$5964^\circ_{3\ 1/2}\ 10869_{4\ 1/2}$	34	21269.98	4700.179	1	I	$12948^\circ_5\ 17649_6$	44
20388.61	4903.361	1				21303.52	4692.779	1	II	$4203^\circ_{6\ 1/2}\ 8896_{5\ 1/2}$	—18
20417.97	4896.310	1	II	$5924^\circ_{1\ 1/2}\ 10820_{2\ 1/2}$	37	21334.52	4685.960	1	I	$10901^\circ_2\ 15587_2$	4
20454.61	4887.539	1	I	$8307^\circ_3\ 13194_4$	0	21363.56	4679.590	1	I	$13605^\circ_6\ 18284^\circ_5$	7
			I	$10673^\circ_6\ 15561_5$	40	21417.29	4667.851	2	I	$14064_4\ 18732^\circ_5$	29
20479.20	4881.671	1				21435.94	4663.789	1	I	$14310^\circ_2\ 18973_1$	—10
20499.78	4876.770	3	I	$13044^\circ_4\ 17921_3$	—22				II	$9723_{4\ 1/2}\ 14387_{4\ 1/2}$	11
			I	$13815^\circ_4\ 18692_4$	—26	21440.35	4662.830	1	II	$5651^\circ_{5\ 1/2}\ 10314_{4\ 1/2}$	21
			II	$5437^\circ_{3\ 1/2}\ 10314_{4\ 1/2}$	19	21486.20	4652.880	3	I	$13389^\circ_3\ 18042^\circ_4$	33
20512.31	4873.791	2				21521.22	4645.309	1			
20515.47	4873.040	1				21553.09	4638.440	2	II	$5675^\circ_{4\ 1/2}\ 10314_{4\ 1/2}$	32
20548.83	4865.129	2	I	$13297^\circ_5\ 18162_4$	30	21592.15	4630.049	2	II	$3793^\circ_{6\ 1/2}\ 8423_{6\ 1/2}$	—2
20553.18	4864.099	1	I	$10901^\circ_2\ 15766_3$	22	21594.43	4629.560	2	II	$2382^\circ_{4\ 1/2}\ 7011_{4\ 1/2}$	—10
20560.74	4862.311	1				21596.30	4629.159	2	II	$987^\circ_{4\ 1/2}\ 5616_{4\ 1/2}$	28
20609.62	4850.779	1	I	$13881_5\ 18732^\circ_5$	19	21621.99	4623.659	1	I	$12366_5\ 16990^\circ_6$	12
			I	$13939^\circ_6\ 18790^\circ_5$	—32				I	$12720^\circ_4\ 17343_5$	40
20615.18	4849.471	1				21663.50	4614.800	1	I	$8509^\circ_4\ 13124_5$	0
20619.35	4848.490	1	I	$12454^\circ_2\ 17302_3$	33	21674.49	4612.460	1	I	$14064_4\ 18676^\circ_4$	16
			I	$13044^\circ_4\ 17892_4$	—29	21700.46	4606.940	1	II	$5118^\circ_{2\ 1/2}\ 9725_{3\ 1/2}$	14
20622.20	4847.820	1	I	$13194^\circ_4\ 18042_4$	—4	21706.40	4605.679	1	II	$9053^\circ_{3\ 1/2}\ 13659^\circ_{4\ 1/2}$	—18
20629.09	4846.201	3	I	$13519^\circ_5\ 18365_5$	—46	21721.91	4602.391	1	II	$5455^\circ_{7\ 1/2}\ 10058_{6\ 1/2}$	—6
20635.57	4844.679	1	I	$13297^\circ_5\ 18141_4$	43	21742.70	4597.990	1	II	$5716^\circ_{3\ 1/2}\ 10314_{4\ 1/2}$	40
20642.08	4843.151	2				21781.54	4589.791	1	II	$10035^\circ_{5\ 1/2}\ 14625_{5\ 1/2}$	—4
20690.57	4831.801	1				21789.76	4588.059	1	I	$11357^\circ_5\ 15945_4$	—15
20698.93	4829.849	1	I	$14001^\circ_6\ 18831_5$	27	21811.91	4583.400	3	I	$11061^\circ_7\ 15644_6$	8
20706.52	4828.079	2	II	$3703^\circ_{3\ 1/2}\ 8531_{3\ 1/2}$	—16	21830.20	4579.560	1	II	$4737^\circ_{2\ 1/2}\ 9316_{3\ 1/2}$	34
20711.19	4826.990	1	II	$5819^\circ_{4\ 1/2}\ 10646_{5\ 1/2}$	35	21864.43	4572.391	1	I	$11271^\circ_4\ 15843_4$	30
20716.43	4825.769	1	I	$15879_5\ 20705^\circ_6$	12	21877.64	4569.630	2	I	$3210^\circ_5\ 7780_6$	11
20740.75	4820.111	4	II	$6638^\circ_{4\ 1/2}\ 11458_{5\ 1/2}$	10	21980.48	4548.250	2	I	$9333^\circ_6\ 13881_5$	28
20742.60	4819.681	2	I	$10243^\circ_4\ 15063_3$	9	21996.05	4545.030	1	I	$14116^\circ_4\ 18661_5$	—43
20745.01	4819.121	1	I	$11874^\circ_3\ 16693_4$	—14				II	$6913^\circ_{6\ 1/2}\ 11458_{5\ 1/2}$	63
20753.80	4817.080	2	I	$12600^\circ_3\ 17417_2$	17	22033.43	4537.320	2	II	$3593^\circ_{4\ 1/2}\ 8131_{4\ 1/2}$	—13
20769.80	4813.369	1	I	$10774^\circ_3\ 15587_2$	47	22073.61	4529.060	1	II	$2563^\circ_{5\ 1/2}\ 7092_{5\ 1/2}$	24
			I	$11131^\circ_3\ 15945_4$	—31	22087.95	4526.120	1	I	$13089^\circ_3\ 17615_4$	25
20814.51	4803.030	1	I	$13089^\circ_3\ 17892_4$	14				II	$987^\circ_{4\ 1/2}\ 5513_{5\ 1/2}$	20
			II	$11742_{5\ 1/2}\ 16545_{5\ 1/2}$	15	22092.83	4525.120	2	I	$3710^\circ_1\ 8235_2$	28

TABLE 1. *Observed infrared cerium lines*—Continued

Wavelength Å	Wavenumber (cm⁻¹)	Intensity	Spectrum	Classification	O−C (.001 cm⁻¹)	Wavelength Å	Wavenumber (cm⁻¹)	Intensity	Spectrum	Classification	O−C (.001 cm⁻¹)
22104.70	4522.690	2	I	12467_5 16990°_6	36	22790.27	4386.640	1	I	15396_6 19782°_5	41
22131.91	4517.130	1	I	10723°_4 15240_4	23	22846.10	4375.920	1	I	10901°_2 15277_3	39
22185.05	4506.310	1	I	17289_6 21796°_6	18				II	$7011_{4 1/2}$ $11387^\circ_{3 1/2}$	—1
22240.43	4495.089	1	II	$5819^\circ_{4 1/2}$ $10314_{4 1/2}$	37	22857.28	4373.780	2			
22277.65	4487.579	1				22864.13	4372.470	2	I	5006°_3 9379_4	41
22293.19	4484.451	1	II	$3793^\circ_{6 1/2}$ $8278_{5 1/2}$	12	22869.62	4371.420	2	II	$5942^\circ_{3 1/2}$ $10314_{4 1/2}$	54
22331.64	4476.730	1	I	10586°_4 15063_3	50	22909.71	4363.770	1	I	14001°_6 18365_5	6
22346.56	4473.741	1	II	$8278_{5 1/2}$ $12751^\circ_{5 1/2}$	5	23146.60	4319.110	2	I	13451°_1 17770_2	22
22356.91	4471.670	1	II	$11387_{3 1/2}$ $15859_{4 1/2}$	44	23216.64	4306.080	2	II	$5010^\circ_{2 1/2}$ $9316_{3 1/2}$	46
22404.16	4462.239	1	II	$9053_{3 1/2}$ $13515^\circ_{3 1/2}$	23	23339.24	4283.461	1			
22408.57	4461.361	1	II	$2879^\circ_{5 1/2}$ $7341_{5 1/2}$	41	23541.05	4246.740	2	II	$4201^\circ_{1 1/2}$ $8448_{2 1/2}$	0
22460.88	4450.971	2	I	9333°_6 13784_5	42	23620.25	4232.500	1	I	15277_3 19510°_4	20
22481.24	4446.940	1				23640.92	4228.800	1			
22500.01	4443.230	1	I	14218°_6 18661_5	24	23663.36	4224.790	2	II	$7233^\circ_{5 1/2}$ $11458_{5 1/2}$	56
22516.38	4439.999	2	I	4766°_2 9206_3	18	23766.36	4206.480	1	II	$1410^\circ_{4 1/2}$ $5616_{4 1/2}$	39
22586.53	4426.210	1	I	12720°_4 17146_3	17	23853.80	4191.060	1			
22685.24	4406.950	1	II	$5651^\circ_{5 1/2}$ $10058_{6 1/2}$	68	23855.45	4190.771	1	I	9379_4 13569°_4	—40
22714.41	4401.290	2	II	$7341_{5 1/2}$ $11742^\circ_{5 1/2}$	47	23999.65	4165.591	2	II	$0^\circ_{3 1/2}$ $4165_{4 1/2}$	38
22724.58	4399.321	2	I	11850°_5 16249_6	—27	24172.58	4135.790	1	II	$3995^\circ_{3 1/2}$ $8131_{4 1/2}$	43
			II	$7059_{4 1/2}$ $11458_{5 1/2}$	36	24230.41	4125.919	1	II	$4322^\circ_{2 1/2}$ $8448_{2 1/2}$	—7
22738.54	4396.620	2	II	$6913^\circ_{6 1/2}$ $11309_{7 1/2}$	40						

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