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The Low Terms in Cr III, Cr IV, Mn IV and Fe V

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Most of the strong lines arising from the d^3, d^24s and d^24p configurations of Cr IV and the d^4, d^34s and d^34p configurations of Cr III, Mn IV and Fe V have been classified. The presence of forbidden lines of these ions in astronomical sources is discussed.

As previously pointed out[1] the doubly and more highly ionized ions of the elements Cr to Zn are the only astronomically abundant ions whose low metastable terms have not been completely enough located to determine whether forbidden transitions from these terms are represented in the spectra of nebulae, novae, the corona etc. The present paper reports the results of the second of a series[2] of investigations whose purpose is to supply this deficiency.

White has made a fairly extensive analysis of Cr III[3] and Cr IV.[4] He did not, however, locate the stable $d^4\,{}^5D$ terms in Cr III and his very doubtful identification of intercombination lines in Cr IV has since proved incorrect. These earlier analyses did not, therefore, provide information for the location of any forbidden transitions from the metastable states in the astronomically observable range. In both Mn IV and Fe V White[3] identified the lines of one multiplet involving high level terms only.

Table I gives the newly identified lines of Cr IV and Table II the term values fixed both by them and by the lines previously classified by White. The wave-lengths are not of as high an accuracy as might be desired as they were measured on low dispersion (16.7A per mm) plates which were taken for another purpose. The classification of the lines was based on an interpolation between V III and Mn V and Fe VI and could therefore be made with great definiteness. In particular over 25 intercombination lines were available to fix the relative positions of the doublet and quartet terms.

The newly identified lines of Cr III and all classified lines of Mn IV and Fe V are listed in Tables III, IV and V, respectively. In Table VI are given the corresponding term values of these ions. The lines of wave-length less than 625A

[1] I. S. Bowen, Rev. Mod. Phys. **8**, 79 (1936).
[2] I. S. Bowen, Phys. Rev. **47**, 924 (1935).
[3] H. E. White, Phys. Rev. **33**, 914 (1929).
[4] H. E. White, Phys. Rev. **33**, 672 (1929).

TABLE I. *Classified lines of Cr IV.*

INT.	λ	ν	CLASSIFICATION d^3 — d^24p
2	573.82	174271	$^4F_{3\frac{1}{2}}-(^3P)^4D_{3\frac{1}{2}}$
5	575.11	173880	$^4F_{4\frac{1}{2}}-(^3P)^4D_{3\frac{1}{2}}$
1	575.88	173647	$^4F_{1\frac{1}{2}}-(^3P)^4D_{1\frac{1}{2}}$
3	576.30	173521	$^4F_{3\frac{1}{2}}-(^3P)^4D_{2\frac{1}{2}}$
3	576.68	173406	$^4F_{2\frac{1}{2}}-(^3P)^4D_{1\frac{1}{2}}$
3	595.09	168042	$^2G_{4\frac{1}{2}}-(^1G)^2H_{5\frac{1}{2}}$
5	612.70	163212	$^4P_{1\frac{1}{2}}-(^3P)^4P_{2\frac{1}{2}}$
4	613.76	162930	$^4P_{2\frac{1}{2}}-(^3P)^4P_{2\frac{1}{2}}$
4	614.09	162843	$^4P_{\frac{1}{2}}-(^3P)^4P_{1\frac{1}{2}}$
			$^2G_{3\frac{1}{2}}-(^1G)^2G_{3\frac{1}{2}}$
0	614.51	162731	$^4P_{1\frac{1}{2}}-(^3P)^4P_{1\frac{1}{2}}$
4	614.95	162615	$^4P_{\frac{1}{2}}-(^3P)^4P_{\frac{1}{2}}$
			$^2G_{4\frac{1}{2}}-(^1G)^2G_{4\frac{1}{2}}$
3	615.36	162507	$^4P_{1\frac{1}{2}}-(^3P)^4P_{\frac{1}{2}}$
3	615.68	162422	$^4P_{2\frac{1}{2}}-(^3P)^4P_{1\frac{1}{2}}$
5	616.82	162122	$^2H_{5\frac{1}{2}}-(^1G)^2H_{5\frac{1}{2}}$
3	617.06	162059	$^4F_{2\frac{1}{2}}-(^3F)^2D_{2\frac{1}{2}}$
4	618.23	161752	$^4F_{3\frac{1}{2}}-(^3F)^2D_{2\frac{1}{2}}$
1	620.20	161238	$^4F_{2\frac{1}{2}}-(^3F)^4D_{2\frac{1}{2}}$
5	621.41	160924	$^4F_{3\frac{1}{2}}-(^3F)^4D_{2\frac{1}{2}}$
4	622.13	160738	$^4F_{2\frac{1}{2}}-(^3F)^4D_{1\frac{1}{2}}$
3	623.59	160362	$^4P_{2\frac{1}{2}}-(^3P)^4D_{3\frac{1}{2}}$
			$^4F_{3\frac{1}{2}}-(^3F)^2F_{3\frac{1}{2}}$

INT.	λ	ν	CLASSIFICATION d^3 — d^24p
4	625.08	159980	$^4F_{4\frac{1}{2}}-(^3F)^2F_{3\frac{1}{2}}$
2	625.40	159898	$^4P_{1\frac{1}{2}}-(^3P)^4D_{2\frac{1}{2}}$
4	625.95	159757	$^4F_{3\frac{1}{2}}-(^3F)^2F_{2\frac{1}{2}}$
1	626.58	159597	$^4P_{\frac{1}{2}}-(^3P)^4D_{1\frac{1}{2}}$
			$^4P_{2\frac{1}{2}}-(^3P)^4D_{2\frac{1}{2}}$
2	636.92	157006	$^4P_{\frac{1}{2}}-(^3P)^4S_{1\frac{1}{2}}$
3	637.40	156887	$^4P_{1\frac{1}{2}}-(^3P)^4S_{1\frac{1}{2}}$
5	637.64	156828	$^2H_{4\frac{1}{2}}-(^1G)^2G_{3\frac{1}{2}}$
5	638.16	156701	$^2H_{5\frac{1}{2}}-(^1G)^2G_{4\frac{1}{2}}$
3	638.61	156590	$^4P_{2\frac{1}{2}}-(^3P)^4S_{1\frac{1}{2}}$
3	675.14	148117	$^4P_{1\frac{1}{2}}-(^3F)^2D_{2\frac{1}{2}}$
2	676.47	147826	$^4P_{2\frac{1}{2}}-(^3F)^2D_{2\frac{1}{2}}$
5	677.60	147580	$^4P_{2\frac{1}{2}}-(^3F)^4D_{3\frac{1}{2}}$
4	678.87	147304	$^4P_{1\frac{1}{2}}-(^3F)^4D_{2\frac{1}{2}}$
0	679.19	147234	$^2G_{3\frac{1}{2}}-(^3F)^2D_{2\frac{1}{2}}$
2	680.19	147018	$^2G_{3\frac{1}{2}}-(^3F)^4D_{3\frac{1}{2}}$
			$^4P_{2\frac{1}{2}}-(^3F)^4D_{2\frac{1}{2}}$
5B	680.83	146880	$^4P_{\frac{1}{2}}-(^3F)^4D_{1\frac{1}{2}}$
2	681.20	146800	$^4P_{1\frac{1}{2}}-(^3F)^4D_{1\frac{1}{2}}$
3	681.88	146653	$^2G_{4\frac{1}{2}}-(^3F)^4D_{3\frac{1}{2}}$
4	682.82	146451	$^2G_{3\frac{1}{2}}-(^3F)^4D_{2\frac{1}{2}}$
			$^4P_{2\frac{1}{2}}-(^3F)^2F_{3\frac{1}{2}}$
1	684.35	146124	$^4P_{1\frac{1}{2}}-(^3F)^2F_{2\frac{1}{2}}$

INT.	λ	ν	CLASSIFICATION d^24s — d^24p
2	1722.84	58044	$(^3F)^4F_{2\frac{1}{2}}-(^3F)^2D_{2\frac{1}{2}}$
4	1733.93	57673	$(^3F)^4F_{3\frac{1}{2}}-(^3F)^2D_{2\frac{1}{2}}$
5	1739.17	57499	$(^3F)^4F_{1\frac{1}{2}}-(^3F)^4D_{2\frac{1}{2}}$
7	1746.94	57243	$(^3F)^4F_{2\frac{1}{2}}-(^3F)^4D_{2\frac{1}{2}}$
5	1754.74	56989	$(^3F)^4F_{1\frac{1}{2}}-(^3F)^4D_{1\frac{1}{2}}$
6	1758.47	56868	$(^3F)^4F_{3\frac{1}{2}}-(^3F)^4D_{2\frac{1}{2}}$
5	1762.79	56728	$(^3F)^4F_{2\frac{1}{2}}-(^3F)^4D_{1\frac{1}{2}}$
2	1775.87	56310	$(^3F)^4F_{3\frac{1}{2}}-(^3F)^2F_{3\frac{1}{2}}$
3	1783.98	56054	$(^3F)^4F_{2\frac{1}{2}}-(^3F)^2F_{2\frac{1}{2}}$
4	1791.04	55834	$(^3F)^4F_{4\frac{1}{2}}-(^3F)^2F_{3\frac{1}{2}}$
1	1796.09	55677	$(^3F)^4F_{3\frac{1}{2}}-(^3F)^2F_{2\frac{1}{2}}$
1	1910.21	52350	$(^3F)^2F_{2\frac{1}{2}}-(^3F)^2D_{2\frac{1}{2}}$
0	1918.59	52122	$(^3F)^2F_{2\frac{1}{2}}-(^3F)^4D_{3\frac{1}{2}}$
4	1937.65	51609	$(^3F)^2F_{3\frac{1}{2}}-(^3F)^2D_{2\frac{1}{2}}$
2	1939.76	51553	$(^3F)^2F_{2\frac{1}{2}}-(^3F)^4D_{2\frac{1}{2}}$
3	1946.59	51372	$(^3F)^2F_{3\frac{1}{2}}-(^3F)^4D_{3\frac{1}{2}}$
3	1968.42	50802	$(^3F)^2F_{3\frac{1}{2}}-(^3F)^4D_{2\frac{1}{2}}$
0	2033.74	49171	$(^3F)^2F_{3\frac{1}{2}}-(^3F)^4F_{4\frac{1}{2}}$
2	2042.99	48948	$(^3F)^2F_{2\frac{1}{2}}-(^3F)^4F_{2\frac{1}{2}}$
2	2055.51	48650	$(^3F)^2F_{3\frac{1}{2}}-(^3F)^4F_{3\frac{1}{2}}$
0	2058.20	48586	$(^3F)^2F_{2\frac{1}{2}}-(^3F)^4F_{1\frac{1}{2}}$

B. Too strong, probably a blend.

TABLE II. *Term values of Cr IV.*

$d^3\ {}^4F_{1\frac{1}{2}}$	0	$d^2({}^3F)4p\,{}^4F_{1\frac{1}{2}}$	158515
${}^4F_{2\frac{1}{2}}$	237	${}^4F_{2\frac{1}{2}}$	158880
${}^4F_{3\frac{1}{2}}$	553	${}^4F_{3\frac{1}{2}}$	159341
${}^4F_{4\frac{1}{2}}$	949	${}^4F_{4\frac{1}{2}}$	159855
${}^4P_{\frac{1}{2}}$	14058	${}^2F_{2\frac{1}{2}}$	160299
${}^4P_{1\frac{1}{2}}$	14177	${}^2F_{3\frac{1}{2}}$	160929
${}^4P_{2\frac{1}{2}}$	14476	${}^4D_{1\frac{1}{2}}$	160972
${}^2G_{3\frac{1}{2}}$	15056	${}^4D_{2\frac{1}{2}}$	161486
${}^2G_{4\frac{1}{2}}$	15405	${}^4D_{3\frac{1}{2}}$	162058
${}^2H_{4\frac{1}{2}}$	21067	${}^2D_{2\frac{1}{2}}$	162294
${}^2H_{5\frac{1}{2}}$	21320	${}^2G_{3\frac{1}{2}}$	164905
$d^2({}^3F)4s\,{}^4F_{1\frac{1}{2}}$	103983	${}^2G_{4\frac{1}{2}}$	165425
${}^4F_{2\frac{1}{2}}$	104245	$d^2({}^3P)4p\,{}^4S_{1\frac{1}{2}}$	171065
${}^4F_{3\frac{1}{2}}$	104620	${}^4D_{1\frac{1}{2}}$	173645
${}^4F_{4\frac{1}{2}}$	105096	${}^4D_{2\frac{1}{2}}$	174074
${}^2F_{2\frac{1}{2}}$	109935	${}^4D_{3\frac{1}{2}}$	174827
${}^2F_{3\frac{1}{2}}$	110685	${}^4P_{\frac{1}{2}}$	176684
$d^2({}^3F)4p\,{}^4G_{2\frac{1}{2}}$	157347	${}^4P_{1\frac{1}{2}}$	176903
${}^4G_{3\frac{1}{2}}$	157923	${}^4P_{2\frac{1}{2}}$	177398
${}^4G_{4\frac{1}{2}}$	158619	$d^2({}^1G)4p\,{}^2G_{3\frac{1}{2}}$	177895
${}^4G_{5\frac{1}{2}}$	159441	${}^2G_{4\frac{1}{2}}$	178021
		${}^2H_{5\frac{1}{2}}$	183445

were measured on plates which were taken on a 2 meter grazing incidence spectrograph and which have a dispersion from 1.5 to 2A per mm. The longer wave-lengths were obtained with two normal incidence gratings having dispersions of 16.7 and 3.5A per mm. Unfortunately the grating with the 3.5A per mm dispersion formed ghosts of enough strength to prove somewhat troublesome in the analysis of a complicated spectrum.

Because of the overlapping of the $d^3({}^4F)4p\,{}^5F$, ${}^5D$ and ${}^3D$ terms the intensities of the lines in the multiplets involving these terms are quite anomalous. Some ambiguity exists therefore as to the assignment of some of these levels. There is also some uncertainty as to whether the terms designated as $d^3({}^2H)4p\,{}^3G$ should be given this classification or should be assigned to $d^3({}^2H)4p\,{}^3H$.

Tables II and VI provide the data for fixing the wave-lengths of most of the strong forbidden lines corresponding to transitions from the low metastable states of these ions. In general a comparison of these wave-lengths with the observed spectra of various astronomical sources, in which forbidden lines are known to appear, has not yielded significant coincidences. In the case of the 1931–32 spectra of Nova Pictoris,[5] which

[5] H. Spencer Jones, M. N. R. A. S. 92, 728 (1932).

TABLE III. *Classified lines of Cr III.*

INT.	λ	ν	CLASSIFICATION d^4 — d^34p
4	920.697	108613.4	${}^5D_2-({}^4P){}^5P_3$
6	922.158	108441.3	${}^5D_3-({}^4P){}^5P_3$
4	922.527	108397.9	${}^5D_1-({}^4P){}^5P_2$
6	923.549	108278.0	${}^5D_2-({}^4P){}^5P_2$
2	923.787	108250.1	${}^5D_0-({}^4P){}^5P_1$
7	924.044	108220.0	${}^5D_4-({}^4P){}^5P_3$
2	924.307	108189.2	${}^5D_1-({}^4P){}^5P_1$
5	925.011	108106.8	${}^5D_3-({}^4P){}^5P_2$
3	925.323	108070.4	${}^5D_2-({}^4P){}^5P_1$
7	966.216	103496.5	${}^3H_4-({}^2H){}^3G_3$
1	966.393	103477.6	${}^3H_4-({}^2H){}^3G_4$
8	967.531	103355.9	${}^3H_5-({}^2H){}^3G_4$
1	968.010	103304.7	${}^3H_5-({}^2H){}^3G_5$
8	969.255	103172.0	${}^3H_6-({}^2H){}^3G_5$
6	999.332	100066.8	${}^3G_3-({}^2H){}^3G_3$
1	999.513	100048.7	${}^3G_3-({}^2H){}^3G_4$
6B	1000.812	99918.9	${}^3G_4-({}^2H){}^3G_3$
6	1001.010	99899.1	${}^3G_4-({}^2H){}^3G_4$
2	1001.490	99851.2	${}^3G_4-({}^2H){}^3G_5$
			${}^5D_4-({}^4F){}^3G_5$
4	1002.437	99756.9	${}^5D_3-({}^4F){}^3G_4$
			${}^3G_5-({}^2H){}^3G_4$
8	1002.901	99710.7	${}^3G_5-({}^2H){}^3G_5$
3	1003.370	99664.1	${}^5D_2-({}^4F){}^3G_3$
4	1025.584	97505.4	${}^5D_2-({}^4F){}^3D_3$
3	1027.412	97331.9	${}^5D_3-({}^4F){}^3D_3$
5	1028.293	97248.5	${}^5D_1-({}^4F){}^3D_2$
3	1029.514	97133.2	${}^5D_2-({}^4F){}^3D_2$
4	1029.777	97108.4	${}^5D_4-({}^4F){}^3D_3$
3	1030.065	97081.3	${}^5D_0-({}^4F){}^3D_1$
7	1030.428	97047.1	${}^5D_4-({}^4F){}^5F_5$
4	1030.854	97006.9	${}^5D_3-({}^4F){}^5F_4$
1	1031.418	96953.9	${}^5D_3-({}^4F){}^3D_2$
1	1031.522	96944.1	${}^5D_2-({}^4F){}^5F_3$
0	1031.962	96902.8	${}^5D_2-({}^4F){}^3D_1$
1	1032.382	96863.4	${}^5D_1-({}^4F){}^5F_2$
8	1033.183	96788.3	${}^5D_4-({}^4F){}^5F_4$
8	1033.389	96769.0	${}^5D_3-({}^4F){}^5F_3$
			${}^5D_0-({}^4F){}^5F_1$
8	1033.656	96744.0	${}^5D_2-({}^4F){}^5F_2$
			${}^5D_3-({}^4F){}^5D_4$

INT.	λ	ν	CLASSIFICATION d^4 — d^34p
2	1033.944	96717.0	${}^5D_1-({}^4F){}^5F_1$
4	1035.244	96595.6	${}^5D_2-({}^4F){}^5F_1$
5	1035.516	96570.2	${}^5D_3-({}^4F){}^5F_2$
2	1035.743	96549.0	${}^5D_4-({}^4F){}^5F_3$
8	1035.901	96534.3	${}^5D_2-({}^4F){}^5D_3$
8	1036.010	96524.2	${}^5D_4-({}^4F){}^5D_4$
5	1037.768	96360.7	${}^5D_3-({}^4F){}^5D_3$
5	1038.124	96327.6	${}^5D_1-({}^4F){}^5D_2$
0	1039.398	96209.5	${}^5D_2-({}^4F){}^5D_2$
4	1040.012	96152.7	${}^5D_0-({}^4F){}^5D_1$
3	1040.131	96141.7	${}^5D_4-({}^4F){}^5D_3$
0	1040.649	96093.9	${}^5D_1-({}^4F){}^5D_1$
2	1041.302	96033.6	${}^5D_3-({}^4F){}^5D_2$
1	1041.962	95972.8	${}^5D_2-({}^4F){}^5D_1$
1	1058.626	94462.0	${}^3H_5-({}^2G){}^3G_5$
7	1060.115	94329.4	${}^3H_6-({}^2G){}^3G_5$
6	1060.999	94250.8	${}^3H_5-({}^2G){}^3G_4$
5	1062.636	94105.6	${}^3H_4-({}^2G){}^3G_3$
4	1072.080	93276.6	${}^3F_4-({}^2G){}^3G_5$
4	1073.699	93136.0	${}^3F_3-({}^2G){}^3G_4$
1	1074.508	93065.8	${}^3F_4-({}^2G){}^3G_4$
5	1076.120	92926.4	${}^3F_2-({}^2G){}^3G_3$
1	1098.849	91004.3	${}^3G_4-({}^2G){}^3G_5$
4	1100.553	90863.4	${}^3G_5-({}^2G){}^3G_5$
3	1101.392	90794.2	${}^3G_4-({}^2G){}^3G_4$
3	1102.847	90674.4	${}^3G_3-({}^2G){}^3G_3$
0	1104.653	90526.2	${}^3G_4-({}^2G){}^3G_3$
0	1204.422	83027.4	${}^3H_5-({}^4F){}^3G_5$
8	1206.433	82889.0	${}^3H_6-({}^4F){}^3G_5$
6	1209.114	82705.2	${}^3H_5-({}^4F){}^3G_4$
5	1211.098	82569.7	${}^3H_4-({}^4F){}^3G_3$
4	1247.826	80139.4	${}^3P_1-({}^4F){}^3D_2$
1	1251.401	79910.4	${}^3P_1-({}^4F){}^3D_1$
5	1252.597	79834.1	${}^3P_2-({}^4F){}^3D_3$
2B	1253.655	79766.8	${}^3P_1-({}^4F){}^5F_2$
0	1256.066	79613.7	${}^3P_1-({}^4F){}^5F_1$
2	1258.517	79458.6	${}^3P_2-({}^4F){}^3D_2$
3B	1261.556	79267.2	${}^3P_2-({}^4F){}^5F_3$
2	1262.336	79218.2	${}^3P_1-({}^4F){}^5D_2$
1	1264.751	79066.9	${}^3P_2-({}^4F){}^5F_2$
3	1266.021	78987.6	${}^3P_1-({}^4F){}^5D_1$

INT.	λ	ν	CLASSIFICATION d^4 — d^34p
2	1268.033	78862.3	${}^3P_2-({}^4F){}^5D_3$
1	1273.314	78535.2	${}^3P_2-({}^4F){}^5D_2$
			${}^3F_4-({}^4F){}^5F_3$
1	1275.344	78410.2	${}^3F_3-({}^4F){}^5F_2$
2B	1276.756	78323.5	${}^3F_2-({}^4F){}^5F_1$
0	1278.676	78205.9	${}^3F_3-({}^4F){}^5D_3$
2	1279.890	78131.7	${}^3F_4-({}^4F){}^5D_3$
1	1283.12	77935.0	${}^3F_2-({}^4F){}^5D_2$
2	1284.108	77875.1	${}^3F_3-({}^4F){}^5D_2$
			d^34s — d^34p
0	1986.92	50329.2	$({}^4F){}^5F_4-({}^4F){}^3G_5$
1	1989.06	50275.0	$({}^4F){}^5F_3-({}^4F){}^3G_4$
1	1999.53	50011.8	$({}^4F){}^5F_3-({}^4F){}^3G_3$
			$({}^4F){}^5F_4-({}^4F){}^3G_4$
			$({}^4F){}^5F_5-({}^4F){}^3G_5$
0	2010.12	49748.3	$({}^4F){}^5F_4-({}^4F){}^3G_3$
2B	2011.85	49705.5	$({}^4F){}^5F_5-({}^4F){}^3G_4$
1	2091.43	47814.2	$({}^4F){}^5F_1-({}^4F){}^3D_2$
1	2097.36	47679.0	$({}^4F){}^5F_2-({}^4F){}^3D_2$
4	2101.14	47593.2	$({}^4F){}^5F_4-({}^4F){}^3D_3$
2	2101.46	47585.9	$({}^4F){}^5F_1-({}^4F){}^3D_1$
4	2106.24	47477.9	$({}^4F){}^5F_3-({}^4F){}^3D_2$
3	2107.48	47450.1	$({}^4F){}^5F_2-({}^4F){}^3D_1$
0	2127.64	47000.5	$({}^4F){}^5F_4-({}^4F){}^5D_4$
7	2141.84	46688.9	$({}^4F){}^5F_5-({}^4F){}^5D_4$
1	2143.28	46657.4	$({}^4F){}^5F_1-({}^4F){}^5D_1$
7	2144.84	46623.5	$({}^4F){}^5F_4-({}^4F){}^5D_3$
5	2147.86	46557.9	$({}^4F){}^5F_3-({}^4F){}^5D_2$
4	2149.35	46525.9	$({}^4F){}^5F_2-({}^4F){}^5D_1$
0	2496.41	40057.5	$({}^4F){}^3F_2-({}^4F){}^5D_3$
0	2504.59	39926.7	$({}^4F){}^3F_3-({}^4F){}^5F_2$
2	2516.65	39735.4	$({}^4F){}^3F_2-({}^4F){}^5D_2$
3	2517.54	39721.3	$({}^4F){}^3F_3-({}^4F){}^5D_3$
3	2518.99	39698.4	$({}^4F){}^3F_4-({}^4F){}^5F_3$
3	2531.73	39498.7	$({}^4F){}^3F_2-({}^4F){}^5D_1$
5	2538.47	39393.8	$({}^4F){}^3F_3-({}^4F){}^5D_2$
4	2545.09	39291.4	$({}^4F){}^3F_4-({}^4F){}^5D_3$

TABLE IV. *Classified lines of Mn IV.*

Int.	λ	ν	Classification d^4 — d^34p
1	540.102	185150	$^5D_2-(^4P)^5P_3$
4	540.882	184883	$^5D_3-(^4P)^5P_3$
2	541.111	184805	$^5D_1-(^4P)^5P_2$
4	541.666	184616	$^5D_2-(^4P)^5P_2$
7	541.860	184550	$^5D_4-(^4P)^5P_3$
			$^5D_0-(^4P)^5P_1$
4	542.100	184468	$^5D_1-(^4P)^5P_1$
5	542.453	184348	$^5D_3-(^4P)^5P_2$
3	542.650	184281	$^5D_2-(^4P)^5P_1$
4	558.493	179053	$^3H_4-(^2H)^3G_3$
5	559.232	178817	$^3H_5-(^2H)^3G_4$
6	560.184	178513	$^3H_6-(^2H)^3G_5$
0	570.130	175399	$^5D_4-(^4F)^3G_5$
3	571.793	174888	$^3G_3-(^2H)^3G_3$
4	572.686	174616	$^3G_4-(^2H)^3G_4$
0	573.352	174413	$^3G_5-(^2H)^3G_4$
6	573.697	174308	$^3G_5-(^2H)^3G_5$
3	579.156	172665	$^5D_2-(^4F)^3D_3$
6	580.040	172402	$^5D_3-(^4F)^3D_3$
4	580.385	172299	$^5D_1-(^4F)^3D_2$
3	581.099	172088	$^5D_0-(^4F)^3D_1$
			$^5D_2-(^4F)^3D_2$
			$^5D_4-(^4F)^3D_3$
7	581.453	171983	$^5D_1-(^4F)^3D_1$
			$^5D_4-(^4F)^5F_5$
5	581.652	171924	$^5D_3-(^4F)^5F_4$
0	581.912	171847	$^5D_3-(^4F)^3D_2$
0	582.088	171795	$^5D_2-(^4F)^3D_1$
			$^5D_2-(^4F)^5F_3$
6	582.785	171590	$^5D_1-(^4F)^5F_2$
			$^5D_4-(^4F)^5F_4$
6	582.994	171528	$^5D_3-(^4F)^5F_3$
5	583.384	171414	$^5D_2-(^4F)^5F_2$
1	583.476	171387	$^5D_0-(^4F)^5F_1$
2	583.819	171286	$^5D_1-(^4F)^5F_1$
5	584.059	171216	$^5D_3-(^4F)^5D_4$
2	584.124	171197	$^5D_4-(^4F)^5F_3$
5	584.296	171146	$^5D_3-(^4F)^5F_2$
7	584.443	171103	$^5D_2-(^4F)^5F_1$
6	584.826	170991	$^5D_2-(^4F)^5D_3$
8	585.217	170877	$^5D_4-(^4F)^5D_4$
5	585.582	170770	$^5D_1-(^4F)^5D_2$
5	585.736	170725	$^5D_3-(^4F)^5D_3$
4	586.240	170579	$^5D_2-(^4F)^5D_2$
4	586.881	170392	$^5D_4-(^4F)^5D_3$
3	587.143	170316	$^5D_3-(^4F)^5D_2$
2B	594.243	168281	$^3H_4-(^2G)^3G_5$
6B	594.959	168079	$^3H_5-(^2G)^3G_5$
6	595.678	167876	$^3H_6-(^2G)^3G_5$
6	596.169	167738	$^3H_5-(^2G)^3G_4$
6	597.097	167477	$^3H_4-(^2G)^3G_3$
5	600.249	166598	$^3F_4-(^2G)^3G_5$
4	601.147	166349	$^3F_3-(^2G)^3G_4$
2	601.517	166246	$^3F_4-(^2G)^3G_4$
4	602.531	165967	$^3F_2-(^2G)^3G_3$
3	602.824	165886	$^3F_3-(^2G)^3G_3$
5	610.958	163677	$^3G_5-(^2G)^3G_5$
5	611.469	163541	$^3G_4-(^2G)^3G_4$
5	612.303	163318	$^3G_3-(^2G)^3G_3$

Int.	λ	ν	Classification d^4 — d^34p
0	613.162	163089	$^3G_4-(^2G)^3G_3$
3	642.204	155714	$^3F_3-(^4F)^3F_4$
6	642.598	155618	$^3F_4-(^4F)^3F_4$
3	643.976	155285	$^3F_2-(^4F)^3F_3$
4	644.294	155209	$^3F_3-(^4F)^3F_3$
2	644.701	155111	$^3F_4-(^4F)^3F_3$
6	645.840	154837	$^3F_2-(^4F)^3F_2$
2	645.943	154812	$^3H_5-(^4F)^3G_5$
5B	646.152	154762	$^3F_3-(^4F)^3F_2$
8	646.815	154604	$^3H_6-(^4F)^3G_5$
4B	647.101	154535	$^3H_4-(^4F)^3G_4$
8	647.952	154332	$^3H_5-(^4F)^3G_4$
8	648.722	154149	$^3H_4-(^4F)^3G_3$
6	652.211	153325	$^3F_4-(^4F)^3G_5$
4	653.826	152946	$^3F_3-(^4F)^3G_4$
4	654.005	152904	$^3G_4-(^4F)^3F_4$
3	654.249	152847	$^3F_4-(^4F)^3G_4$
7	654.891	152697	$^3G_5-(^4F)^3F_4$
5	655.152	152636	$^3G_3-(^4F)^3F_3$
			$^3F_2-(^4F)^3G_3$
4	655.444	152563	$^3F_3-(^4F)^3G_3$
6	656.162	152401	$^3G_4-(^4F)^3F_3$
6	657.083	152188	$^3G_3-(^4F)^3F_2$
4	660.359	151433	$^3P_0-(^4F)^3D_1$
6	661.730	151119	$^3P_1-(^4F)^3D_2$
8B	663.131	150800	$^3P_1-(^4F)^3D_1$
1	663.395	150740	$^3P_0-(^4F)^5F_1$
8	663.897	150626	$^3P_2-(^4F)^3D_3$
8	664.843	150412	$^3G_5-(^4F)^3G_5$
			$^3P_1-(^4F)^5F_2$
1	665.031	150369	$^3G_3-(^4F)^3G_4$
7	666.050	150139	$^3G_4-(^4F)^3G_4$
6B	666.363	150068	$^3P_2-(^4F)^3D_2$
8	666.700	149993	$^3F_4-(^4F)^3D_3$
			$^3G_3-(^4F)^3G_3$
6	667.009	149923	$^3G_5-(^4F)^3G_4$
2	667.745	149758	$^3G_4-(^4F)^3G_3$
			$^3P_2-(^4F)^3D_1$
			$^3P_2-(^4F)^5F_3$
4	668.433	149604	$^3F_2-(^4F)^3D_2$
6	668.512	149586	$^3P_1-(^4F)^5D_2$
6	668.743	149534	$^3F_3-(^4F)^3D_2$
3	669.486	149368	$^3P_2-(^4F)^5F_2$
7	669.799	149299	$^3F_2-(^4F)^3D_1$
1	670.607	149119	$^3F_4-(^4F)^5F_3$
6	671.357	148952	$^3P_2-(^4F)^5D_3$
1	671.891	148834	$^3F_3-(^4F)^5F_2$
5	673.215	148541	$^3P_2-(^4F)^5D_2$
0	673.449	148489	$^3F_2-(^4F)^5D_3$
0	673.804	148411	$^3F_3-(^4F)^5D_3$
6	674.244	148314	$^3F_4-(^4F)^5D_3$
6	675.658	148004	$^3F_3-(^4F)^5D_2$
			d^34s — d^34p
0	1442.40	69329	$(^4F)^3F_2-(^2G)^3G_3$
0	1444.00	69252	$(^4F)^3F_3-(^2G)^3G_4$
0	1450.22	68955	$(^4F)^3F_4-(^2G)^3G_5$
1	1577.17	63405	$(^4F)^5F_4-(^4F)^3G_4$
			$(^4F)^5F_5-(^4F)^3G_5$

Int.	λ	ν	Classification d^34s — d^34p
1	1586.67	63025	$(^4F)^5F_4-(^4F)^3G_3$
1	1642.36	60888	$(^4F)^5F_1-(^4F)^3D_2$
5B	1647.70	60691	$(^4F)^5F_2-(^4F)^3D_2$
2	1651.78	60541	$(^4F)^5F_4-(^4F)^3D_3$
4	1653.84	60465	$(^4F)^5F_3-(^4F)^5F_4$
			$(^4F)^5F_4-(^4F)^5F_5$
4	1656.10	60383	$(^4F)^5F_3-(^4F)^3D_2$
4	1656.42	60371	$(^4F)^5F_2-(^4F)^3D_1$
			$(^4F)^5F_2-(^4F)^5F_3$
2	1661.19	60198	$(^4F)^5F_1-(^4F)^5F_2$
5	1664.74	60069	$(^4F)^5F_3-(^4F)^5F_3$
			$(^4F)^5F_4-(^4F)^5F_4$
6	1667.05	59986	$(^4F)^5F_2-(^4F)^5F_2$
			$(^4F)^5F_5-(^4F)^5F_5$
3	1670.11	59876	$(^4F)^5F_1-(^4F)^5F_1$
2	1675.35	59689	$(^4F)^5F_3-(^4F)^5F_2$
1	1675.78	59674	$(^4F)^5F_2-(^4F)^5F_1$
			$(^4F)^5F_4-(^4F)^5F_3$
1	1677.91	59598	$(^4F)^5F_5-(^4F)^5F_4$
6	1698.28	58883	$(^4F)^5F_5-(^4F)^5D_4$
5	1698.69	58869	$(^4F)^5F_4-(^4F)^5D_3$
5	1699.08	58855	$(^4F)^5F_3-(^4F)^5D_2$
1	1705.11	58647	$(^4F)^3F_2-(^4F)^3F_3$
1	1706.03	58616	$(^4F)^3F_3-(^4F)^3F_4$
4	1718.29	58197	$(^4F)^3F_2-(^4F)^3F_2$
6	1720.64	58118	$(^4F)^3F_3-(^4F)^3F_3$
6	1724.88	57975	$(^4F)^3F_4-(^4F)^3F_4$
2	1733.94	57672	$(^4F)^3F_3-(^4F)^3F_2$
4B	1740.07	57469	$(^4F)^3F_4-(^4F)^3F_3$
7*	1742.12	57401	$(^4F)^5F_5-(^4F)^5G_6$
7*	1751.60	57091	$(^4F)^5F_4-(^4F)^5G_5$
7*	1759.82	56824	$(^4F)^5F_3-(^4F)^5G_4$
6*	1766.34	56614	$(^4F)^5F_5-(^4F)^5G_5$
5*	1767.11	56590	$(^4F)^5F_2-(^4F)^5G_3$
5*	1772.20	56427	$(^4F)^5F_4-(^4F)^5G_4$
5*	1773.57	56384	$(^4F)^5F_1-(^4F)^5G_2$
4*	1776.58	56288	$(^4F)^5F_3-(^4F)^5G_3$
3*	1780.01	56180	$(^4F)^5F_2-(^4F)^5G_2$
4	1786.07	55989	$(^4F)^3F_2-(^4F)^3G_3$
1*	1789.08	55895	$(^4F)^5F_4-(^4F)^5G_3$
0*	1789.65	55877	$(^4F)^5F_3-(^4F)^5G_2$
5	1790.54	55849	$(^4F)^3F_3-(^4F)^3G_4$
7	1795.77	55686	$(^4F)^3F_4-(^4F)^3G_5$
0	1811.43	55205	$(^4F)^3F_4-(^4F)^3G_4$
1	1887.16	52990	$(^4F)^3F_3-(^4F)^3D_3$
1	1888.47	52953	$(^4F)^3F_2-(^4F)^3D_2$
3	1899.52	52645	$(^4F)^3F_2-(^4F)^3D_1$
			$(^4F)^3F_2-(^4F)^5F_3$
4	1907.14	52435	$(^4F)^3F_3-(^4F)^3D_2$
4	1910.29	52348	$(^4F)^3F_4-(^4F)^3D_3$
3	1918.61	52121	$(^4F)^3F_3-(^4F)^5F_3$
2	1928.95	51842	$(^4F)^3F_2-(^4F)^5D_3$
2	1932.94	51735	$(^4F)^3F_3-(^4F)^5F_2$
4	1942.90	51470	$(^4F)^3F_4-(^4F)^5F_3$
2	1944.23	51434	$(^4F)^3F_2-(^4F)^5D_2$
2	1948.75	51315	$(^4F)^3F_3-(^4F)^5D_3$
3	1964.33	50908	$(^4F)^3F_3-(^4F)^5D_2$
2	1973.43	50673	$(^4F)^3F_4-(^4F)^5D_3$

* Previously classified by White.

TABLE V. *Classified lines of Fe V.*

Int.	λ	ν	Classification d^4 — d^34p	Int.	λ	ν	Classification d^4 — d^34p	Int.	λ	ν	Classification d^4 — d^34p
3	364.292	274505	$^5D_2-(^4P)^5P_3$	0	381.467	262146	$^3G_4-(^2H)^3G_5$	3	386.737	258574	$^5D_3-(^4F)^5F_2$
4	364.795	274127	$^5D_3-(^4P)^5P_3$	0	381.671	262006	$^3G_5-(^2H)^3G_4$	4	386.783	258543	$^5D_3-(^4F)^5D_4$
3	364.973	273993	$^5D_1-(^4P)^5P_2$	4	381.881	261862	$^3G_5-(^2H)^3G_5$	4	386.897	258467	$^5D_2-(^4F)^5F_1$
3	365.339	273718	$^5D_2-(^4P)^5P_2$	3	383.484	260767	$^5D_2-(^4F)^3D_3$	5	387.199	258265	$^5D_2-(^4F)^5D_3$
6	365.440	273643	$^5D_4-(^4P)^5P_3$	3	384.212	260273	$^5D_1-(^4F)^3D_2$	6	387.500	258065	$^5D_4-(^4F)^5D_4$
			$^5D_0-(^4P)^5P_1$	2	384.610	260004	$^5D_0-(^4F)^3D_1$	4	387.616	257987	$^5D_1-(^4F)^5D_2$
3	365.634	273498	$^5D_1-(^4P)^5P_1$				$^5D_2-(^4F)^3D_2$	4	387.775	257882	$^5D_3-(^4F)^5D_3$
6	365.858	273330	$^5D_3-(^4P)^5P_2$	1	384.826	259858	$^5D_1-(^4F)^3D_1$	3	387.983	257743	$^5D_0-(^4F)^5D_1$
3	366.001	273223	$^5D_2-(^4P)^5P_1$	6	384.957	259769	$^5D_4-(^4F)^5F_5$	2	388.500	257400	$^5D_4-(^4F)^5D_3$
5	373.720	267580	$^3H_4-(^2H)^3G_3$	4	385.023	259725	$^5D_3-(^4F)^5F_4$	2	388.607	257329	$^5D_3-(^4F)^5D_2$
4	374.240	267208	$^3H_5-(^2H)^3G_4$	5	385.740	259242	$^5D_4-(^4F)^5F_4$				$^5D_2-(^4F)^5D_1$
2	374.464	267048	$^3H_5-(^2H)^3G_5$				$^5D_1-(^4F)^5F_2$	6	392.907	254513	$^3H_6-(^2G)^3G_5$
5	374.864	266763	$^3H_6-(^2H)^3G_5$	5	385.869	259155	$^5D_3-(^4F)^5F_3$	5	393.270	254278	$^3H_5-(^2G)^3G_4$
1	379.032	263830	$^5D_4-(^4F)^3G_5$	4	386.156	258963	$^5D_2-(^4F)^5F_2$	4	393.911	253864	$^3H_4-(^2G)^3G_3$
3	379.294	263648	$^5D_3-(^4F)^3G_4$	0	386.256	258896	$^5D_0-(^4F)^5F_1$	3	395.155	253065	$^3F_4-(^2G)^3G_5$
3	380.664	262699	$^3G_3-(^2H)^3G_3$	1	386.483	258744	$^5D_1-(^4F)^5F_1$	2	395.789	252660	$^3F_3-(^2G)^3G_4$
2B	381.152	262363	$^3G_4-(^2H)^3G_3$	1	386.585	258675	$^5D_4-(^4F)^5F_3$	3	396.773	252033	$^3F_2-(^2G)^3G_3$
3	381.260	262288	$^3G_4-(^2H)^3G_4$								

TABLE V.—*Continued.*

Int.	λ	ν	Classification d^4 — d^34p
0	396.902	251951	$^3F_3-(^2G)^3G_3$
4	400.625	249610	$^3G_5-(^2G)^3G_5$
2	401.030	249358	$^3G_4-(^2G)^3G_4$
2	401.639	248980	$^3G_3-(^2G)^3G_3$
1	402.197	248634	$^3G_4-(^2G)^3G_3$
1	414.790	241086	$^3F_3-(^4F)^3F_4$
4	415.006	240962	$^3F_4-(^4F)^3F_4$
1	415.825	240486	$^3F_2-(^4F)^3F_3$
3	415.972	240401	$^3F_3-(^4F)^3F_3$
5B	416.208	240264	$^3F_4-(^4F)^3F_3$
2	416.910	239860	$^3F_2-(^4F)^3F_2$
1	417.048	239781	$^3F_3-(^4F)^3F_2$
6	417.382	239589	$^3H_6-(^4F)^3G_5$
0	417.516	239512	$^3H_4-(^4F)^3G_4$
6	418.033	239216	$^3H_5-(^4F)^3G_4$
5	418.457	238973	$^3H_4-(^4F)^3G_3$
3	419.915	238143	$^3F_4-(^4F)^3G_5$
5B	420.546	237786	$^3G_4-(^4F)^3F_4$
2	420.874	237601	$^3F_3-(^4F)^3G_4$
5	421.045	237504	$^3G_5-(^4F)^3F_4$
2	421.682	237146	$^3F_2-(^4F)^3G_3$
4	421.765	237099	$^3G_4-(^4F)^3F_3$
6	422.287	236806	$^3G_3-(^4F)^3F_2$
2	423.833	235942	$^3P_0-(^4F)^3D_1$
3	424.733	235442	$^3P_1-(^4F)^3D_2$
1	425.476	235031	$^3P_1-(^4F)^3D_1$
1	425.589	234968	$^3G_4-(^4F)^3G_5$
0	425.840	234830	$^3P_0-(^4F)^5F_1$
5	426.045	234717	$^3P_2-(^4F)^3D_3$
5	426.097	234688	$^3G_5-(^4F)^3G_5$
1	426.609	234407	$^3P_1-(^4F)^5F_2$
			$^3F_2-(^4F)^3D_3$
3	426.745	234332	$^3F_3-(^4F)^3D_3$
4	426.814	234294	$^3G_4-(^4F)^3G_4$
3	426.969	234209	$^3F_4-(^4F)^3D_3$

Int.	λ	ν	Classification d^4 — d^34p
3	427.190	234088	$^3G_3-(^4F)^3G_3$
1	427.320	234017	$^3G_5-(^4F)^3G_4$
2	427.442	233950	$^3P_2-(^4F)^3D_2$
1	427.782	233764	$^3G_4-(^4F)^3G_3$
2	427.918	233690	$^3P_0-(^4F)^5D_1$
0	428.000	233645	$^3F_2-(^4F)^3D_2$
3	428.131	233573	$^3F_3-(^4F)^3D_2$
0	428.292	233486	$^3P_2-(^4F)^5F_3$
5B	428.763	233229	$^3F_2-(^4F)^3D_1$
5B	428.909	233150	$^3P_1-(^4F)^5D_2$
1	429.206	232988	$^3F_4-(^4F)^5F_3$
1	430.053	232529	$^3F_3-(^4F)^5F_2$
2	430.624	232221	$^3P_2-(^4F)^5D_3$
3	431.541	231728	$^3F_4-(^4F)^5D_3$
3	432.340	231299	$^3F_3-(^4F)^5D_2$
1	432.919	230990	$^3F_2-(^4F)^5D_1$
			d^34s — d^34p
1	1302.99	76747	$(^4F)^5F_3-(^4F)^3G_3$
1	1303.59	76711	$(^4F)^5F_4-(^4F)^3G_4$
			$(^4F)^5F_5-(^4F)^3G_5$
1	1357.28	73677	$(^4F)^5F_2-(^4F)^3D_2$
1	1359.41	73561	$(^4F)^5F_1-(^4F)^3D_1$
5	1361.42	73453	$(^4F)^5F_4-(^4F)^3D_3$
4	1363.00	73368	$(^4F)^5F_3-(^4F)^5F_4$
3	1363.72	73329	$(^4F)^5F_4-(^4F)^5F_5$
3	1365.14	73253	$(^4F)^5F_3-(^4F)^3D_2$
			$(^4F)^5F_2-(^4F)^3D_1$
3	1365.73	73221	$(^4F)^5F_2-(^4F)^5F_3$
4	1371.00	72940	$(^4F)^5F_1-(^4F)^5F_2$
6	1373.68	72797	$(^4F)^5F_4-(^4F)^5F_4$
			$(^4F)^5F_3-(^4F)^5F_3$
6	1376.45	72651	$(^4F)^5F_5-(^4F)^5F_5$
			$(^4F)^5F_2-(^4F)^5F_2$
2	1380.18	72454	$(^4F)^5F_1-(^4F)^5F_1$

Int.	λ	ν	Classification d^34s — d^34p
1	1384.17	72246	$(^4F)^5F_4-(^4F)^5F_3$
1	1384.75	72215	$(^4F)^5F_3-(^4F)^5F_2$
2	1385.32	72186	$(^4F)^5F_3-(^4F)^5D_4$
0	1386.33	72133	$(^4F)^5F_5-(^4F)^5F_4$
5B	1388.07	72043	$(^4F)^3F_2-(^4F)^3F_3$
1	1389.05	71992	$(^4F)^3F_3-(^4F)^3F_4$
0	1389.97	71944	$(^4F)^5F_2-(^4F)^5D_3$
3	1394.77	71696	$(^4F)^5F_1-(^4F)^5D_2$
3	1397.99	71531	$(^4F)^5F_3-(^4F)^5D_3$
4	1400.30	71413	$(^4F)^3F_2-(^4F)^3F_2$
6	1402.45	71304	$(^4F)^3F_3-(^4F)^3F_3$
7	1406.78	71084	$(^4F)^3F_4-(^4F)^3F_4$
1	1408.19	71013	$(^4F)^5F_2-(^4F)^5D_1$
6	1409.19	70963	$(^4F)^5F_3-(^4F)^5D_2$
			$(^4F)^5F_4-(^4F)^5D_3$
7	1409.51	70947	$(^4F)^5F_5-(^4F)^5D_4$
3	1420.24	70411	$(^4F)^3F_4-(^4F)^3F_3$
8*	1430.61	69900	$(^4F)^5F_5-(^4F)^5G_6$
7*	1440.59	69416	$(^4F)^5F_4-(^4F)^5G_5$
6*	1448.91	69017	$(^4F)^5F_3-(^4F)^5G_4$
3*	1454.71	68742	$(^4F)^5F_5-(^4F)^5G_5$
5	1455.59	68701	$(^4F)^3F_2-(^4F)^3G_3$
5*	1456.23	68671	$(^4F)^5F_2-(^4F)^5G_3$
5	1459.85	68500	$(^4F)^3F_3-(^4F)^3G_4$
2*	1460.86	68453	$(^4F)^5F_4-(^4F)^5G_4$
3*	1462.67	68368	$(^4F)^5F_1-(^4F)^5G_2$
6	1464.73	68272	$(^4F)^3F_4-(^4F)^3G_5$
3*	1465.37	68242	$(^4F)^5F_3-(^4F)^5G_3$
4B	1479.49	67591	$(^4F)^3F_4-(^4F)^3G_4$
4B	1532.70	65244	$(^4F)^3F_3-(^4F)^3D_3$
2B	1533.27	65220	$(^4F)^3F_2-(^4F)^3D_2$
2	1543.66	64781	$(^4F)^3F_2-(^4F)^3D_1$
3	1544.50	64746	$(^4F)^3F_2-(^4F)^5F_3$
2B	1550.80	64483	$(^4F)^3F_3-(^4F)^3D_2$
1	1554.17	64343	$(^4F)^3F_4-(^4F)^3D_3$

TABLE VI. *Term values of Cr III, Mn IV and Fe V.*

	Cr III	Mn IV	Fe V		Cr III	Mn IV	Fe V		Cr III	Mn IV	Fe V
$d^4\ ^5D_0$	0	0	0	$d^3(^4F)4s\,^5F_3$	49830	112006	187162	$d^3(^4F)4p\,^5F_5$	97619	172863	261054
$^5D_1$	60	92	145	$^5F_4$	50091	112402	187725	$^3D_1$	97079	172081	259994
$^5D_2$	180	280	419	$^5F_5$	50409	112877	188401	$^3D_2$	97308	172391	260419
$^5D_3$	352	547	804	$^3F_2$	56652	119431	195212	$^3D_3$	97685	172948	261182
$^5D_4$	572	880	1285	$^3F_3$	56994	119955	195942	$^3G_3$	99844	175422	263911
$^3P_0$		20646	24054	$^3F_4$	57424	120599	196845	$^3G_4$	100103	175804	264445
$^3P_1$	17168	21274	24973	$d^3(^4F)4p\,^5G_2$	93768	167885	254805	$^3G_5$	100424	176283	265117
$^3P_2$	17852	22321	26466	$^5G_3$	94031	168295	255406	$^3F_2$	101446	177624	266625
$^3H_4$	17274	21273	24937	$^5G_4$	94377	168830	256179	$^3F_3$	101747	178070	267248
$^3H_5$	17398	21469	25229	$^5G_5$	94802	169492	257142	$^3F_4$	102102	178573	267932
$^3H_6$	17534	21676	25527	$^5G_6$	95305	170278	258301	$d^3(^4P)4p\,^5P_1$	108250	184560	273643
$^3F_2$	18452	22786	26765	$^5D_1$	96153		257746	$^5P_2$	108458	184896	274136
$^3F_3$	18512	22859	26846	$^5D_2$	96387	170861	258134	$^5P_3$	108793	185430	274928
$^3F_4$	18584	22957	26973	$^5D_3$	96714	171272	258685	$d^3(^2G)4p\,^3G_3$	111380	188753	278800
$^3G_3$	20705	25434	29820	$^5D_4$	97097	171760	259349	$^3G_4$	111648	189207	279507
$^3G_4$	20855	25666	30150	$^5F_1$	96776	171381	258887	$^3G_5$	111862	189553	280039
$^3G_5$	20997	25875	30429	$^5F_2$	96923	171694	259380	$d^3(^2H)4p\,^3G_3$	120771	200324	292518
$d^3(^4F)4s\,^5F_1$	49494	111502	186437	$^5F_3$	97121	172076	259959	$^3G_4$	120753	200284	292437
$^5F_2$	49629	111706	186736	$^5F_4$	97360	172471	260528	$^3G_5$	120708	200186	292291

TABLE VII. *Classified lines of Fe III*

Int.	λ	ν	Classification
7	1122.65	89075	$d^6\ ^5D_4-d^5(^6S)4p\,^5P_3$
5	1125.02	88887	$^5D_3-\quad ^5P_2$
3	1126.82	88745	$^5D_2-\quad ^5P_1$
3	1128.15	88641	$^5D_3-\quad ^5P_3$
3	1128.86	88585	$^5D_2-\quad ^5P_2$
3	1129.38	88544	$^5D_1-\quad ^5P_1$
3	1130.48	88458	$^5D_0-\quad ^5P_1$
3	1131.27	88396	$^5D_1-\quad ^5P_2$
1	1132.09	88332	$^5D_2-\quad ^5P_3$
8	1895.50	52756.5	$d^5(^6S)4s\,^7S-d^5(^6S)4p\,^7P_4$
7	1914.06	52245.0	$^7S-\quad ^7P_3$
7	1926.27	51913.8	$^7S-\quad ^7P_2$
6	2062.30	48489.6	$^5S-\quad ^5P_1$
7	2068.94	48333.9	$^5S-\quad ^5P_2$
8	2079.70	48083.9	$^5S-\quad ^5P_3$

showed some indications of the presence of forbidden Fe VI,[2] the evidence either for or against forbidden Fe V is very inconclusive. Thus the observed line at λ4121.2A agrees satisfactorily with the predicted λ4123.9A of the $^5D_4-{}^3H_6$ transition. Most of the other transitions, which one might expect to be strong, fall at positions where they would be blended with lines already ascribed to other elements.

Table VII lists a few lines of Fe III that can be classified at once because of their great strength.