A NOTE ON THE SPECTRUM OF SINGLY IONISED ZINC.

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The classification of the spectrum of singly ionised zinc was first attempted by G. Von Salis,[1] and later considerably improved upon by Takahashi,[2] who analysed a large number of new lines observed by himself. In a recent paper L. and E. Bloch [3] have published a list of 63 lines of Zn II between λ 4568 to λ 2265, out of which fifty are new. The present analysis accounts for 33 of these. 11 lines have been found to be due to combination between the already known terms while the rest appear to be the result of combinations of the known terms with the eight new terms which have been discovered. Perhaps the chief interest of this note lies in the assignment of four out of the eight new terms to the configuration $3d^9\ 4s\ 4p$, following the spectrum of Cu II where these terms are strongly present. It is probable that some of the terms whose L, J and S values could not be properly ascertained are portions of quartet terms, but one could not put them down as such without introducing a great element of uncertainty.

Table of new terms :—

Configuration.	Nomenclature.	J.	Term.	
$3d^9\ 4s\ 4p$	^{2}P	[illegible]	58952·7	
	^{2}P	[illegible]	46891·0	
	^{2}F	[illegible]	42913·4	
	^{2}F	[illegible]	35253·0	
	X_1	[illegible] or [illegible]	32195·2	
	X_2	[illegible]	29234·1	
	X_3	[illegible] or [illegible]	24713·3	
	Z_1	[illegible] ?	56410·2	even term.

List of Lines.

λ	ν	I	Combination.
4451·05	22460·3	1	$X_2 - 3d^{10}9d\ ^2D_{5/2}$
4306·12	23216·3	1d	$3d^94s^2\ ^2D_{3/2} - 3d^94s4p\ ^2P_{1/2}$
4304·11	23227·1	2d	$X_1 - 3d^{10}mg\ ^2G$
4300·90	23244·4	1d	$3d^94s4p\ ^2F_{5/2} - 3d^{10}7d\ ^2D_{3/2}$
4296·08	23270·5	1	$3d^{10}4d\ ^2D_{5/2} - X_3$
4279·57	23360·3	2	$X_1 - 3d^{10}8d\ ^2D_{5/2}$
4221·94	23679·2	4	$3 - 3d^{10}9s\ ^2S_{1/2}$
4148·54	24098·1	4	$Z_1 - 6$
3996·71	25013·6	0	$Z_1 - 7$
3988·94	25062·2	6	$3d^{10}5s\ ^2S_{1/2} - 7$
3585·85	27879·4	1	$3d^{10}7s\ ^2S_{1/2} - 3d^94s4p\ ^2P_{1/2}$
3510·74	28475·9	0	$3d^94s4p\ ^2F_{5/2} - 3d^{10}9d\ ^2D_{3/2}$
3510·29	28479·4	0	$3d^94s4p\ ^2F_{5/2} - 3d^{10}9d\ ^2D_{5/2}$
3508·88	28491·0	0	$X_1 - B(2)$
3373·76	29632·0	1	$3d^{10}6d\ ^2D_{3/2} - 3d^94s4p\ ^2P_{1/2}$
3302·92	30267·5	5	$3d^{10}8s\ ^2S_{1/2} - 3d^{10}5p\ ^2P_{1/2}$
3255·75	30706·1	3	$3d^94s4p\ ^2F_{7/2} - 3dmg\ ^2G$
3234·09	30911·7	4	$3d^94s4p\ ^2F_{5/2} - 3d^{10}7d\ ^2D_{5/2}$
3197·02	31270·0		$3d^{10}7d\ ^2D_{3/2} - 3d^{10}5p\ ^2P_{1/2}$
3153·97	31696·9	1	$Z_1 - X_3$
3121·02	32031·4	0	$3d4s4p\ ^2P_{3/2} - 3d^{10}5d\ ^2D_{3/2}$
3118·78	32054·5	0	$3d^94s4p\ ^2P_{3/2} - 3d^{10}5d\ ^2D_{5/2}$
3105·19	32194·8	1	$3d^{10}4f\ ^2F - B(3)$
2950·58	33881·7	0	$3d^94s4p\ ^2P_{1/2} - 3d^{10}8s\ ^2S_{1/2}$
2887·41	34623·0	4	$9 - B(3)$ } $X - B(5)$ }
2801·90	35679·6	4	$3d^{10}4d\ ^2D_{3/2} - 3d^{10}6f\ ^2F_{5/2}$
2800·80	35693·6	6	$3d^{10}4d\ ^2D_{5/2} - 3d^{10}6f\ ^2F_{7/2}$ } $X_3 - B(10)$ }
2768·52	36109·7	1	$X_3 - B(11)$
2766·62	36134·5	1	$3d^94s4p\ ^2F_{7/2} - 3d^{10}9d\ ^2D_{5/2}$
2658·17	37608·7	5	$X_2 - B(6)$
2627·20	38052·0	2	$3d^94s4p\ ^2P_{1/2} - 3d^{10}8d\ ^2D_{3/2}$
2567·78	38932·5	2	$3d^{10}4d\ ^2D_{5/2} - 3d^{10}7f\ ^2F_{7/2}$
2265·37	44129·2	1	$3 - B(10)$

REFERENCES.

[1] *Ann. der Phys.*, vol. 76, p. 145, 1925.

[2] *Ann. der Phys.*, vol. 3, p. 27, 1929.

[3] L. and E. Bloch, *J. de Physique*, vol. 5, p. 229, 1934.