

LETTERS TO THE EDITOR

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TERM VALUES IN THE 'f³' ELECTRON CONFIGURATION

APPLYING Slater's wave-mechanical method* (1929) to the problem of the 'f³' equivalent electron configuration, the term-values are calculated. The same problem was treated by Racah (1943) by his new tensor method. The results seem to be the same. A few discrepancies are, however, noticed and discussed.

The energies are computed in terms of the well-known F's and G's from the tables for a^k's and b^k's given by Condon (1933). All the term values are collected in Table I. Terms occurring twice are bracketed, and only their mean values are given. The

values given by Racah are also converted into F's by the relationships given by Racah and presented in the table for comparison. It can be seen that ⁴D, ⁴S, ²L, ²F and ²D of our values do not agree with those given by Racah.

²L.—The calculation is simple since it occurs uniquely as (3⁺ 3⁻ 2⁺). The term value can be calculated thus:

$$\begin{aligned}
 (3^+ 3^-) &= F_0 + 25/225 F_2 + 9/1089 F_4 \\
 &\quad + 1/7361 \cdot 6 F_6 \\
 (3^- 2^+) &= F_0 \quad \quad \quad - \quad \quad \quad 21 F_4 - 6F_6 \\
 (3^+ 2^+) &= F_0 \quad \quad \quad - \quad \quad \quad 21 F_4 - 6F_6 \\
 &\quad \quad \quad \quad \quad \quad - \quad 25 G_2 - 30 G_4 - 7 G_6
 \end{aligned}$$

which on simplification gives the result shown in the second column in the table.