

LETTERS TO THE EDITOR

SPIN OF THE 1251 KeV LEVEL IN ^{97}Nb

The ground state spin of ^{97}Zr is estimated¹ to be $1/2^+$. The 1251 KeV level of ^{97}Nb , first proposed by Hofstetter and Sugihara², is fed by the 1410 KeV beta group from ^{97}Zr with an intensity of 3.1% and a log ft value 8.1. From different measurements^{2,3,4} the possible spin-parity characters of the 1251 KeV level are $1/2^-$, $3/2^+$ and $5/2^+$. The corresponding 1.41 MeV beta transition, then, shall be of non-unique or unique first forbidden type or a second forbidden case. A measurement of β - γ angular correlation will shed light on the spin-parity nature of the 1251 KeV level. Hence a careful measurement of the anisotropy of the 1.41 (β)-0.508 MeV (γ) cascade in the decay of ^{97}Zr nucleus is undertaken. Such an attempt does not appear to have been done earlier. The experiment is carried out on a conventional fast-slow scintillation assembly.

The value of β - γ anisotropy, A , thus obtained is 0.431 ± 0.124 . From this, the value of the correlation coefficient, $A_2(\beta, \gamma) = \epsilon$, is determined to be 0.297 ± 0.086 .

The large value of A excludes the possibility of the spin of the 1251 KeV level being $1/2^-$ inasmuch as, A is zero for an intermediate state with a spin $1/2$. If it is $3/2^+$, the beta transition will be an allowed one. The value of A is zero in this case also, which is contrary to the experiment. Thus the $3/2^+$ possibility is excluded. A $5/2^+$ assignment⁴ classifies the transition as second forbidden type. However, the log ft value 8.1 is too low for the beta transition to be of second forbidden type. Also, the absence of a gamma transition from 1251 KeV state to the ground state of ^{97}Nb , which will be of E2 type if the spin of the initial state were $5/2^+$, rules out this possibility. Finally we have to consider the two choices $3/2^-$ and $5/2^-$. The latter possibility classifies the 1.41 MeV beta transition to be of unique first forbidden type for which $A_2(\beta)$ could be theoretically computed⁵ to be -0.75 . $A_2(\beta)$ determined from experimental correlation coefficient $A_2(\beta, \gamma)$ is -0.556 ± 0.160 . From the close agreement between these two within experimental uncertainties, we infer the spin of the 1251 KeV level as $5/2^-$. On the other hand, if the spin of the 1251 KeV level were to be $3/2^-$, the 1410 KeV beta transition would be a non-unique first forbidden transi-

tion. The ζ of the transition is 13.14, which is greater than $W_0 - 1 (= 2.76)$. So if the ζ approximation were to be valid in this case, we expect isotropic β - γ directional correlation and a statistical shape. A measurement of the spectrum shape of the 1.41 MeV transition would help not only in confirming or rejecting the $3/2^-$ possibility but also in assigning to the 1251 KeV level of ^{97}Nb uniquely $5/2^-$ or $3/2^-$ character, which are concluded in the present investigation, though the $5/2^-$ assignment seems more probable.

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ATOMIC ABSORPTION SPECTROPHOTOMETRIC ANALYSIS OF THE SEEDS OF *STRYCHONUS POTATORAM* LINN.

Strychnos potatoram Linn. is a natural poly-electrolyte of local origin and belongs to the family "STRYCHNACEAE" (formerly Loganiaceae). The seed is used for clearing muddy water⁵ and has long been recognised for its medicinal properties^{1,2}. Complex polysaccharides and other organic constituents^{3,4} have been reported in these seeds.

In the present studies the ash of the seeds was used for the estimation of metallic constituents by standard methods. However, metals like Ni, Co, Bi, Ag, Zn and Fe were estimated by atomic absorption spectrophotometric analysis (Perkin Elmer Make A.A.S.).

The ash was mixed with 40 ml of HCl (1:1) and digested for 30 minutes on a water-bath. The