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g and τ Results for High-Spin Isomers in ^{91}Nb and ^{91}Zr

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The *g*-factors and lifetimes of the $17/2^-$ state at 2378 keV in ^{91}Nb and the $(15/2^-)$ state in ^{91}Zr have been determined. The states were populated by the $^{89}\text{Y}(\alpha, 2n)^{91}\text{Nb}$ and the $^{88}\text{Sr}(\alpha, n)^{91}\text{Zr}$ reactions with pulsed α beams of 21 and 16 MeV, respectively. Time-differential measurements of ω_L and τ were made with NaI or Ge(Li) detectors at $\pm 45^\circ$ and with external magnetic fields. For the $17/2^-$ state in ^{91}Nb , both the 394- and 1948-keV γ rays (see Fig. 1) were used. The 1984-keV γ contained both a prompt and a delayed component while the 394-keV γ was all delayed; both γ rays showed a positive A_2 as expected for the transitions. A $g = 1.25 \pm 0.04$ and $\tau = 14.4 \pm 0.5$ nsec were extracted from the data. The calculated *g*-factor

for a $(\pi g_{5/2}^2, \pi p_{1/2})$ $17/2^-$ state is $g = 1.29$ using empirical *g*-factor values.

For the ^{91}Zr experiment, both the 94- and 2171-keV γ rays (see Fig. 1) had delayed as well as prompt components, which indicates that the lifetime is associated with a level above the 2265-keV state. The 94-keV γ showed a negative A_2 while the 2171-keV γ a positive A_2 , which suggests a $13/2^- \xrightarrow{M1} 11/2^- \xrightarrow{E3} 5/2^+$ cascade. The values $g = 0.71 \pm 0.01$ and $\tau = 41.8 \pm 1.2$ nsec extracted from the data, are consistent with a $15/2^-$ state just above the $13/2^-$ state, although the transition to the $13/2^-$ state was unobserved in the range $E_\gamma > 80$ keV. The expected *g*-factor for a $(\pi g_{9/2}, \pi p_{1/2}, \nu d_{5/2})$ $15/2^-$ state is $g = 0.64$.

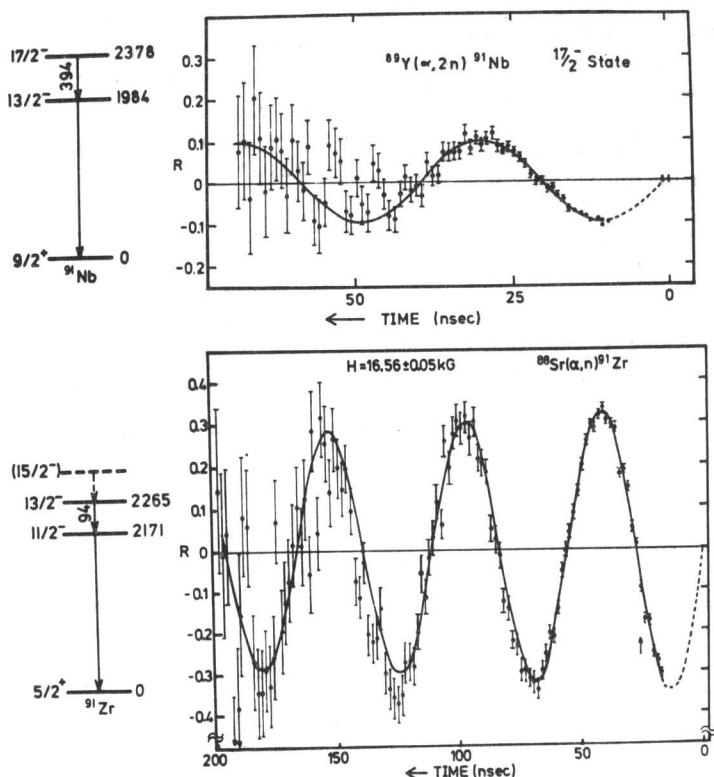


Fig. 1.