

${}^{90}\text{Zr}({}^3\text{He,d})$ IAS 1973Fi14,1979Fi02

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 114, 1293 (2013)	1-Sep-2013

Others: 1970Mc19, 1971Kn07.

1979Fi02: ${}^{90}\text{Zr}({}^3\text{He,dp})$ through IAS; E=30.2 MeV; enriched ${}^{90}\text{Zr}$ target; semi detector telescopes. Measured d spectrum, deuteron-proton coincidence spectra, d-p(θ) (four angles). Studied proton branching from IAS to g.s. and first two excited states of ${}^{90}\text{Zr}$.

1973Fi14: E=30.2 MeV. 97.7% ${}^{90}\text{Zr}$ target. Semi $\Delta E, E$ detector telescopes. FWHM=70 keV. $\theta(\text{lab})=8^\circ$ to 45° (3° to 5° steps). Measured $\sigma(\theta)$. See 1971Kn07 for further discussion.

1970Mc19: E=24 MeV, FWHM=45-70 keV, $\theta(\text{lab})=10^\circ-80^\circ$ ($\leq 5^\circ$ steps). Measured $\sigma(\theta)$.

See 1971Kn07 for discussion of energy splitting between $T_>$ and $T_<$ for $2d_{5/2}$, $1g_{7/2}$, $3s_{1/2}$, $2d_{3/2}$ single-particle states in ${}^{91}\text{Nb}$.

 ${}^{91}\text{Nb}$ Levels

E(β),S(β) 12070 and 12150 levels poorly resolved; based on $\sigma(\theta)$ for the multiplet, 1973Fi14 calculate $S_p=0.35, 0.40$ respectively for L=5, 4, assuming relative strengths implied by S_n from ${}^{90}\text{Zr}(\text{d,p}){}^{91}\text{Zr}$ for Zr analog states. A small contribution to the 12150 component from the analog of the $(13/2)^-$ 2260 ${}^{91}\text{Zr}$ level may exist also.

E(level) [†]	L [‡]	S [‡]	Comments
0			
9.86×10^3	2	0.96	Analog of ${}^{91}\text{Zr}$ $5/2^+$ g.s. Proton decay of state observed; relative branching to ${}^{90}\text{Zr}$ g.s. and first excited state is >99 and <1, respectively (1979Fi02).
11.79×10^3	4	0.11 [#]	Analog of ${}^{91}\text{Zr}$ $7/2^+$ 1882 level. Proton decay of state observed; relative branching to ${}^{90}\text{Zr}$ g.s. and first excited state is 10 3 and 90 13, respectively (1979Fi02).
11.93×10^3	2	0.70	Analog of ${}^{91}\text{Zr}$ $3/2^+$ 2042 level. Proton decay of state observed (1979Fi02).
12.07×10^3			Analog of ${}^{91}\text{Zr}$ $(11/2)^-$ 2170 level. Proton decay of state observed (1979Fi02).
12.15×10^3			Analog of ${}^{91}\text{Zr}$ $(7/2)^+$ 2201 level. Proton decay of state observed (1979Fi02).
13.38×10^3	4	0.27	Analog of ${}^{91}\text{Zr}$ 3469 level.

[†] From 1973Fi14; uncertainty is 30-40 keV.

[‡] From DWBA using single-particle resonance method (1973Fi14). See 1973Fi14 for S deduced using analog resonance method.

[#] Only weakly excited. Statistical accuracy 30% to 40%.