

${}^{90}\text{Y}$   $\beta^-$  decay (64.00 h) 1976Gr16,1990Zh20

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	E. Browne	NDS 82, 379 (1997)	1-May-1997

Parent:  ${}^{90}\text{Y}$ :  $E=0$ ;  $J^\pi=2^-$ ;  $T_{1/2}=64.00$  h 21;  $Q(\beta^-)=2280.1$  16;  $\% \beta^-$  decay=100.0

$\text{Y}(n,\gamma)$ , chemical separation.  $4\pi\beta$ -counting,  $\gamma(t)$  with Ge(Li) (1976Gr16).

${}^{90}\text{Sr}$  source with  ${}^{90}\text{Y}$  in equilibrium. Measured  $I_\gamma$  with hyperpure Ge detector in low-background setup (1990Zh20).

 ${}^{90}\text{Zr}$  Levels

E(level)	$J^\pi$	$T_{1/2}$
0	$0^+$	stable
1760.72 20	$0^+$	
2186.282 10	$2^+$	

 $\beta^-$  radiations

For relative measurement of the longitudinal electron polarization, see 1971Jo17.

For studies of shape factors, see 1964Da16, 1966Ri01, 1971Na09, 1975Fi07, 1983Ha35.

For measurements of  $\beta^-$  using liquid scintillator detectors see 1993Gr09, 1993Gr18, 1994Gr21, 1994Gr30, 1995Gr04; using solid scintillator detectors, see 1993Va11, 1993Ya17, 1994Us01, 1994Sz09; detecting Cerenkov radiation, see 1994Br45, 1995Ra27; using gas-flow proportional counters, see 1996Be48; using photomultipliers, see 1992Bo35; using ion-chambers, see 1996Wo08.

E(decay)	E(level)	$I\beta^-^\dagger$	Log $ft$	Comments
(93.8 16)	2186.282	$1.4 \times 10^{-6}$ 3	11.08 10	av $E\beta^- = 25.0$ 7 $I\beta^-$ : From measured intensity of 2186 $\gamma$ (1976Gr16).
(519.4 16)	1760.72	0.0115 14	9.657 <sup>1u</sup> 12	av $E\beta^- = 185.6$ 10 $I\beta^-$ : From measured $I(\gamma^\pm)/I(\beta^-)=0.000034$ 4 (1961La07) and $I(\text{ce})/I(\gamma^\pm)=2.38$ 8 (1962Ne02).
(2280.1 16)	0	99.9885 14	9.228 <sup>1u</sup> 3	av $E\beta^- = 933.7$ 12 Measured $\beta^-$ endpoint energies: 2265 keV 5 (1957Yu06); 2261 keV 3 (1958Jo33); 2271 keV 2 (1961Ni02); 2268 keV 2 (1964An12); 2273 keV 5 (1964La13); 2284 keV 5 (1964Da16); 2275 keV 5 (1966Ha15); 2280 keV 5 (1966Ri01); 2275 keV 3 (1993Gr17).

$^\dagger$  Absolute intensity per 100 decays.

 $\gamma({}^{90}\text{Zr})$ 

Probability of two-photon decay for 1760.7,  $0^+$  to  $0^+$  transition is 0.040% 5, weighted av of 0.051% 25 (1973Na01), 0.0317% 77 (1973As04), 0.039% 12 (1989Mu12), and 0.052% 10 (1993Ba65). Others: 1961La07, 1970Ha27, 1970Va09.

Probability of one-photon E0 transition for 1760.7 relative to internal conversion is  $5 \times 10^{-7}$  2 (1990Zh20). Probability of two-photon E0 transition relative to internal pair conversion is  $7.4 \times 10^{-4}$  14 (1993Ba65).

$E_\gamma^\dagger$	$I_\gamma^\ddagger$	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Mult.	$I_{(\gamma+\text{ce})}^\ddagger$	Comments
1760.70 20		1760.72	$0^+$	0	$0^+$	E0	0.0115 14	ce(K)/( $\gamma+\text{ce}$ )=0.89 1; ce(L)/( $\gamma+\text{ce}$ )=0.11 1 Probability of one-phonon E0 transition relative to internal conversion is $5 \times 10^{-7}$ 2 (1990Zh20).
2186.242 25	$1.4 \times 10^{-6}$ 3	2186.282	$2^+$	0	$0^+$	E2		$I_\gamma$ : From absolute counting (1976Gr16). Other: $1.12 \times 10^{-6}$ 6 from measurement of activity in

Continued on next page (footnotes at end of table)

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${}^{90}\text{Y}$   $\beta^-$  decay (64.00 h) [1976Gr16,1990Zh20](#) (continued)

$\gamma({}^{90}\text{Zr})$  (continued)

$E_i$ (level)

Comments

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equilibrium with a  ${}^{90}\text{Sr}$  source ([1990Zh20](#)). The method of normalization of [1990Zh20](#) is however not described.

† From adopted gammas.

‡ Absolute intensity per 100 decays.

${}^{90}\text{Y} \beta^-$  decay (64.00 h) 1976Gr16,1990Zh20Decay SchemeIntensities:  $I_{(\gamma+ce)}$  per 100 parent decays