^{149}Dy IT decay (0.490 s) 1980Da18,1976St08,1980Ja16

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 185,2 (2022)	23-Aug-2022

Parent: ^{149}Dy: E=2661.2 *5*; J^π=(27/2)$^-$; $T_{1/2}$=0.490 s *15*; %IT decay=99.3 *3*

^{149}Dy-E: 2660.94 *34* in the Adopted Levels.

^{149}Dy-J^π,$T_{1/2}$: From the Adopted Levels.

^{149}Dy-%IT decay: from $\%\varepsilon+\%\beta^+$=0.7 *3* (1988Ba02).

1980Da18 (also 1983JuZY): ^{152}Gd(α,7nγ) E=106 MeV, this measurement updates and extends that by 1976St08 at the same laboratory; measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma(\theta)$, $\gamma\gamma(\theta)$, γ(t), $\gamma\gamma$(t). ^{136}Ce(^{16}O,3nγ) E=92 MeV ^{16}O beam from the Emperor Tandem at the MPI Heidelberg on >99% enriched ^{136}Xe target (in oxide form); measured conversion electrons with a solenoid spectrometer. Deduced levels, J^π, isomer $T_{1/2}$, configurations, conversion coefficients, γ-ray multipolarities, transition strengths. Systematics of neighboring isotones. See also the ^{152}Gd(α,7nγ) dataset for additional data.

1976St08 (also 1976St01): ^{152}Gd(α,7nγ) E=106 MeV α beam was produced from the Julich cyclotron. Target was 1.2 mg enriched (>99.6%) ^{152}Gd on a 500 μg/cm^2 mylar backing. γ rays were detected with two Ge(Li) detectors. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma(\theta)$, $\gamma\gamma(\theta)$, γ(t), $\gamma\gamma$(t). Deduced levels, J^π, isomer $T_{1/2}$, γ-ray multipolarities. 1976St08 extends the measurement of 1976St01 and determines $T_{1/2}$, spin and parity of the isomer.

1980Ja16: ^{144}Sm(^{12}C,Xγ) E=70-130 MeV ^{12}C beam from the Grenoble variable-energy cyclotron. Measured Eγ, $\gamma\gamma$-coin, γ(t) with a Ge(Li) and a NaI detector. Deduced isomer $T_{1/2}$.

Others:

2003Li42: ^{149}Dy isomer nuclei produced in fragmentation of ^{209}Bi beam at 900 MeV/nucleon; separated in flight with the fragment separator (FRS) and stored in the cooler ring (ESR) at GSI. Measured half-life of fully-ionized isomeric state at 2661 keV.

See 1988Ba02 (also 1987BaZV) and 1993KlZZ for ε decay of this isomer.

^{149}Dy Levels

E(level)	J^π†	$T_{1/2}$†	Comments
0.0	7/2$^-$	4.2 min *2*	
1073.2 *1*	(13/2)$^+$		
2251.81 *15*	(17/2)$^+$		
2550.4 *2*	(21/2)$^+$		
2661.2 *5*	(27/2)$^-$	0.490 s *15*	$T_{1/2}$: adopted value from weighted average of 0.500 s *30* (1976St08), 0.510 s *10* (1980Ja16), 0.47 s *1* (1987BaZV). Other: for fully-ionized atom, $T_{1/2}$=11 s 1 (2003Li42). Configuration=$\pi h^2_{11/2}\otimes\nu f_{7/2}$ (1976St08,1980Da18).

† From the Adopted Levels.

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γ(^{149}Dy)

E_γ †@	I_γ #&	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	α[a]	$I_{(\gamma+ce)}$ &	Comments
110.8 *4*	3.52 *8*	2661.2	(27/2)$^-$	2550.4	(21/2)$^+$	E3	27.3 *7*	100	%Iγ=3.50 *7* ce(K)/(γ+ce)=0.1086 *30*; ce(L)/(γ+ce)=0.651 *12*; ce(M)/(γ+ce)=0.164 *5* ce(N)/(γ+ce)=0.0370 *12*; ce(O)/(γ+ce)=0.00435 *15*; ce(P)/(γ+ce)=6.74×10^{-6} *20* α(K)=3.07 *5*; α(L)=18.4 *5*; α(M)=4.63 *12* α(N)=1.044 *26*; α(O)=0.1229 *31*; α(P)=0.0001904 *35* I_γ: for fully-ionized atom, Iγ≈100 per 100 decays of the isomer with $T_{1/2}$=11 s *1* (2003Li42); since internal conversion is not allowed for bare atoms. I_γ: relative intensity≈3. Mult.: α(L)exp=13 *5* (1980Da18), 16 *4* (1987BaZV).
298.6 *1*	93.86 *8*	2550.4	(21/2)$^+$	2251.81	(17/2)$^+$	E2	0.0654 *9*	100	%Iγ=93.20 *29* A_2=0.00 *2*; A_4=−0.04 *3* (1976St01); α(K)exp=0.049 *7* (1980Da18) ce(K)/(γ+ce)=0.0460 *6*; ce(L)/(γ+ce)=0.01198 *17*; ce(M)/(γ+ce)=0.00276 *4* ce(N)/(γ+ce)=0.000627 *9*; ce(O)/(γ+ce)=8.24×10^{-5} *12*; ce(P)/(γ+ce)=2.393×10^{-6} *34* α(K)=0.0490 *7*; α(L)=0.01276 *18*; α(M)=0.00294 *4* α(N)=0.000668 *9*; α(O)=8.78×10^{-5} *12*; α(P)=2.55×10^{-6} *4* I_γ: relative intensity=83 *8* (1980Da18). Mult.: α(K)exp and γ(θ).
1073.2 *1*	99.446 *8*	1073.2	(13/2)$^+$	0.0	7/2$^-$	E3	0.00557 *8*	100	%Iγ=98.75 *30* A_2=+0.01 *3*; A_4=+0.02 *4* (1976St01); α(K)exp=0.0046 *5* (1980Da18) ce(K)/(γ+ce)=0.00453 *6*; ce(L)/(γ+ce)=0.000784 *11*; ce(M)/(γ+ce)=0.0001754 *25* ce(N)/(γ+ce)=4.04×10^{-5} *6*; ce(O)/(γ+ce)=5.73×10^{-6} *8*; ce(P)/(γ+ce)=2.77×10^{-7} *4* α(K)=0.00456 *6*; α(L)=0.000788 *11*; α(M)=0.0001763 *25* α(N)=4.06×10^{-5} *6*; α(O)=5.76×10^{-6} *8*; α(P)=2.78×10^{-7} *4* I_γ: relative intensity=100 (1980Da18). Mult.: from α(K)exp.
1178.6 *1*	99.782 *3*	2251.81	(17/2)$^+$	1073.2	(13/2)$^+$	E2	2.18×10^{-3} *3*	100	%Iγ=99.08 *30* A_2=+0.01 *3*; A_4=−0.03 *4* (1976St01); α(K)exp=0.0017 *3* (1980Da18) ce(K)/(γ+ce)=0.001836 *26*; ce(L)/(γ+ce)=0.000265 *4*; ce(M)/(γ+ce)=5.80×10^{-5} *8* ce(N)/(γ+ce)=1.337×10^{-5} *19*; ce(O)/(γ+ce)=1.937×10^{-6}

$^{149}_{66}Dy_{83}$-2

^{149}Dy IT decay (0.490 s) 1980Da18,1976St08,1980Ja16 (continued)

γ(^{149}Dy) (continued)

E_γ †@	E_i(level)	Comments
		27; ce(P)/(γ+ce)=1.061×10^{-7} *15* α(K)=0.001840 *26*; α(L)=0.000265 *4*; α(M)=5.81×10^{-5} *8* α(N)=1.340×10^{-5} *19*; α(O)=1.941×10^{-6} *27*; α(P)=1.063×10^{-7} *15*; α(IPF)=3.36×10^{-6} *5* I_γ: relative intensity=91 *9* (1980Da18). Mult.: from α(K)exp and γγ(θ). IPC/T=3.35E−6 5. (298.6γ)(1178.6γ)(θ): A_2=+0.05 *7* (1976St01).

† From 1980Da18. The same data are also presented in ^{152}Gd(α,7nγ) dataset.

‡ From ce data, γ(θ) and γγ(θ) in 1980Da18 and γ(θ) in 1976St01. The same multipolarities are adopted in the Adopted Gammas. The same γ(θ) and γγ(θ) are also presented in ^{152}Gd(α,7nγ) dataset.

Deduced by evaluators from assumed I(γ+ce)=100 and theoretical α from BrIcc.

@ From a least-squares fit to γ-ray energies.

& For absolute intensity per 100 decays, multiply by 0.993 *3*.

a Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

$^{149}_{66}Dy_{83}$-3

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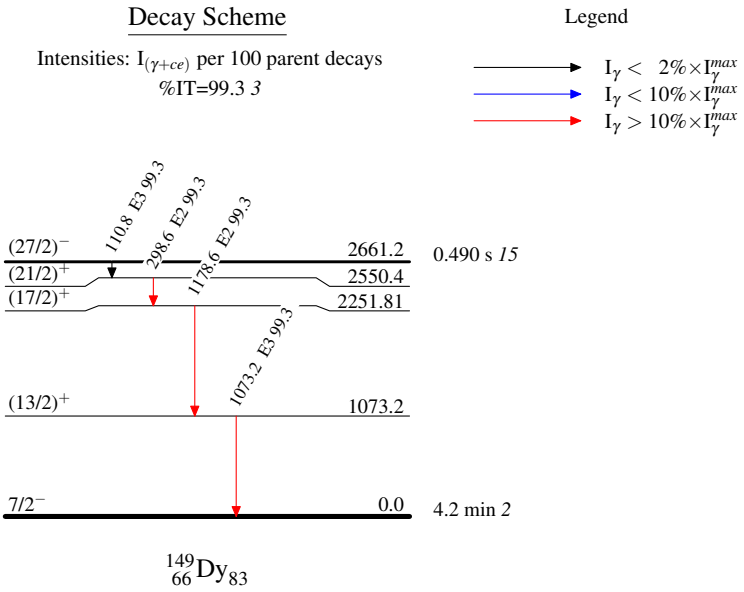

$^{149}_{66}Dy_{83}$