

$^{89}\text{Y}(^{60}\text{Ni,pn}\gamma)$ 1985Br07

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	N. Nica and B. Singh		NDS 181, 1 (2022)	9-Mar-2022

E=230-250 MeV. Also includes $^{90}\text{Zr}(^{60}\text{Ni},2\text{pn}\gamma)$ and $^{92}\text{Zr}(^{58}\text{Ni},2\text{pn}\gamma)$.

 ^{147}Dy Levels

E(level) [†]	J^{π} [‡]	$T_{1/2}$	E(level) [†]	J^{π} [‡]	$T_{1/2}$	E(level) [†]	J^{π} [‡]	$T_{1/2}$
0.0	(1/2 ⁺)		2659.3 <i>II</i>	(17/2 ⁺)		3325.4 <i>II</i>	(23/2 ⁻)	
72.0 <i>3</i>	(3/2 ⁺)		2680.8 <i>II</i>	(19/2 ⁺)	7 [@] ns <i>1</i>	3407.3 <i>II</i>	(27/2 ⁻)	0.40 [@] μs <i>1</i>
750.7 <i>II</i>	(11/2 ⁻)	55.2 [#] s <i>5</i>	2693.3 <i>II</i>	(21/2 ⁺)		3558.5? <i>II</i>		
2404.1 <i>II</i>	(15/2 ⁻)		2937.7 <i>II</i>	(21/2 ⁺)		3650.7 <i>II</i>	(27/2 ⁻)	16 [@] ns <i>3</i>
2462.2 <i>II</i>	(15/2 ⁺)		3081.3 <i>II</i>	(19/2 ⁻)				

[†] From least-squares fit to $E\gamma$'s.

[‡] From Adopted Levels from g.s. up to the 750-keV level inclusive. The remaining levels have J^{π} assigned by 1985Br07 on the basis of shell-model considerations. All assignments are tentative (evaluator).

[#] From Adopted Levels.

[@] From 1985Br07 in ($^{60}\text{Ni},\text{xpn}\gamma$).

$^{89}\text{Y}(^{60}\text{Ni,pn}\gamma)$ **1985Br07 (continued)**

$\gamma(^{147}\text{Dy})$

E_γ	I_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. #	$\delta^\#$	$\alpha^\#$	$I_{(\gamma+ce)}$	Comments
(12.5)	0.3 CA	2693.3	(21/2 ⁺)	2680.8	(19/2 ⁺)	[M1]		173.7	55 5	I _γ : I(γ+ce)(12.5) was equated to I(γ+ce)(244.3)+I(γ+ce)(632.1) to obtain I _γ . I _γ : calculated from I(γ+ce)(21.5) obtained from transition balance between the 2659 and 2681 levels.
(21.5)	3.4 4	2680.8	(19/2 ⁺)	2659.3	(17/2 ⁺)	[M1]		34.7	120 12	
58.0 1	33 3	2462.2	(15/2 ⁺)	2404.1	(15/2 ⁻)	E1 @		1.287		α(exp)=1.2 3 from intensity balance of γ rays (1985Br07).
72.0 3		72.0	(3/2 ⁺)	0.0	(1/2 ⁺)	M1(+E2)	<0.4	6.4 3		
81.9 1	20 1	3407.3	(27/2 ⁻)	3325.4	(23/2 ⁻)	E2 @		5.78		α(exp)=5.6 5 from intensity balance of γ rays (1985Br07).
92.3 3	1.0‡ 3	3650.7	(27/2 ⁻)	3558.5?		(M1)		3.01		Mult.: deduced by 1985Br07 based on intensity balance.
151.2 ^a 3	2.5‡ 5	3558.5?		3407.3	(27/2 ⁻)	(E2)		0.613		Mult.: deduced by 1985Br07 based on intensity balance.
197.1 1	71 3	2659.3	(17/2 ⁺)	2462.2	(15/2 ⁺)	M1 @		0.353		α(exp)=0.39 8 from intensity balance of γ rays (1985Br07).
218.6 1	5.5 5	2680.8	(19/2 ⁺)	2462.2	(15/2 ⁺)	[E2]		0.1761		
243.4 3	5‡ 1	3650.7	(27/2 ⁻)	3407.3	(27/2 ⁻)	[E2]		0.1243		
244.1& 2	7.6 7	3325.4	(23/2 ⁻)	3081.3	(19/2 ⁻)	[E2]		0.1231		
244.3& 2	16 3	2937.7	(21/2 ⁺)	2693.3	(21/2 ⁺)	[M1]		0.196		
255.2 2	19 1	2659.3	(17/2 ⁺)	2404.1	(15/2 ⁻)	[E1]		0.0259		
256.9 1	65 3	2937.7	(21/2 ⁺)	2680.8	(19/2 ⁺)	[M1]		0.1713		
387.7 1	88 3	3325.4	(23/2 ⁻)	2937.7	(21/2 ⁺)	[E1]		0.00922		
632.1 1	35 2	3325.4	(23/2 ⁻)	2693.3	(21/2 ⁺)	[E1]		0.00309		
677.2 2	8.5 7	3081.3	(19/2 ⁻)	2404.1	(15/2 ⁻)	[E2]		0.00717		
678.7		750.7	(11/2 ⁻)	72.0	(3/2 ⁺)	(M4)		0.210		
1653.4 2	100 4	2404.1	(15/2 ⁻)	750.7	(11/2 ⁻)	[E2]		1.26×10 ⁻³		
1711.5 2	32 2	2462.2	(15/2 ⁺)	750.7	(11/2 ⁻)	[M2+E3]		0.0028 7		

† Normalized to 100 for the 1653.4-keV photon intensity. Delayed intensities from decay of 0.4-μs isomer (3407 level).

‡ Normalization with respect to the intensities of the lines below the 0.4-μs isomer (3407 level) is estimated to be accurate within a factor of 2.

From Adopted Gammas for transitions below the 750.4-keV level. Remaining assignments are taken from 1985Br07 who assign them based on intensity-balance considerations and J^π values of initial and final levels.

@ From α extracted from intensity-balance requirements by 1985Br07.

& Obtained from I_γ=24 2 for the 244.1-244.3 doublet by assuming I(γ+ce) of the 244.1-keV transition equals that of the 677.2-keV ¹⁴⁷Dy transition.

^a Placement of transition in the level scheme is uncertain.

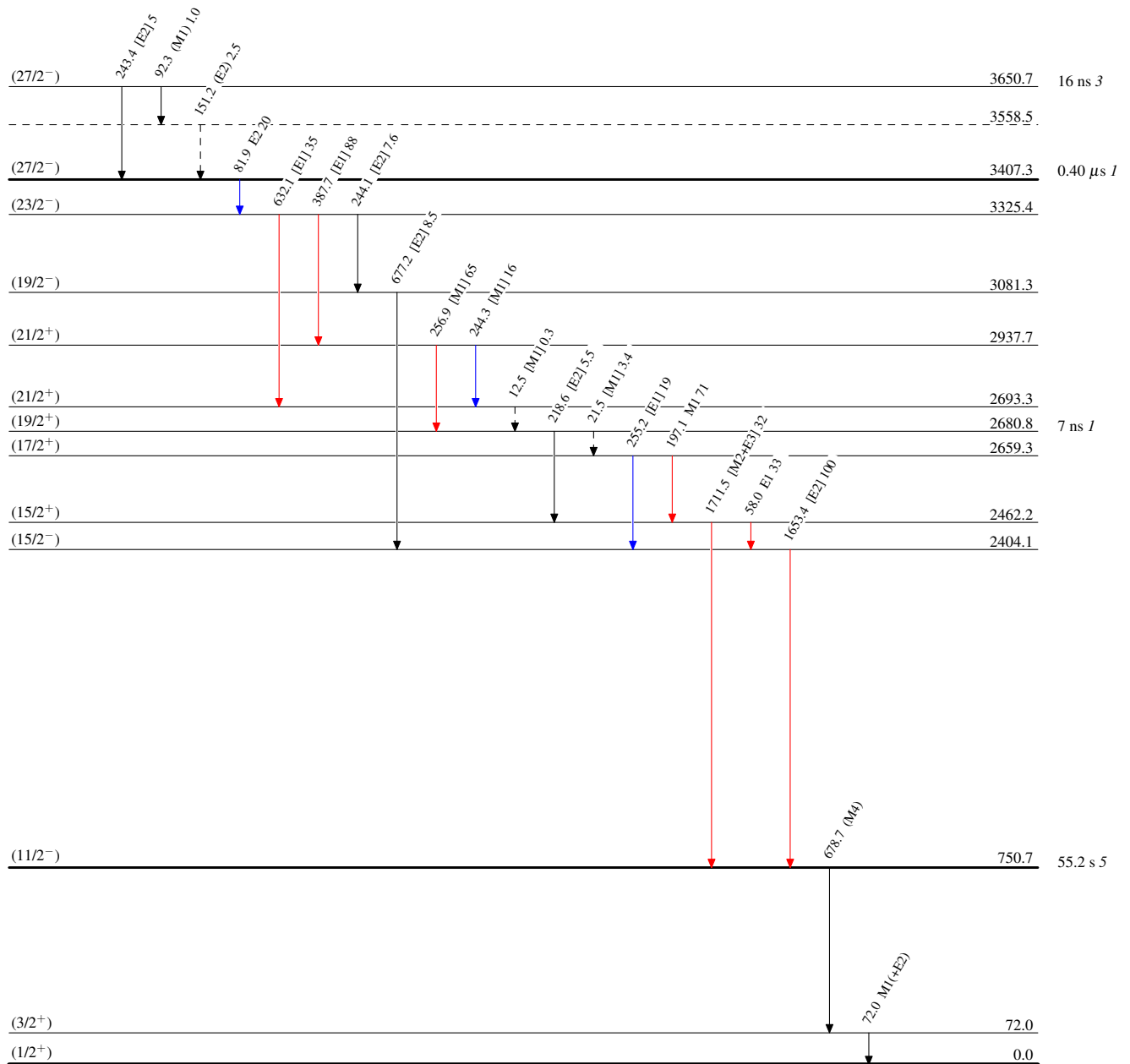
$^{89}\text{Y} (^{60}\text{Ni}, \text{pn}\gamma)$ 1985Br07

Level Scheme

Intensities: Relative I_γ

Legend

- $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $I_\gamma > 10\% \times I_\gamma^{\text{max}}$
- - - - - γ Decay (Uncertain)



$^{147}_{66}\text{Dy}_{81}$